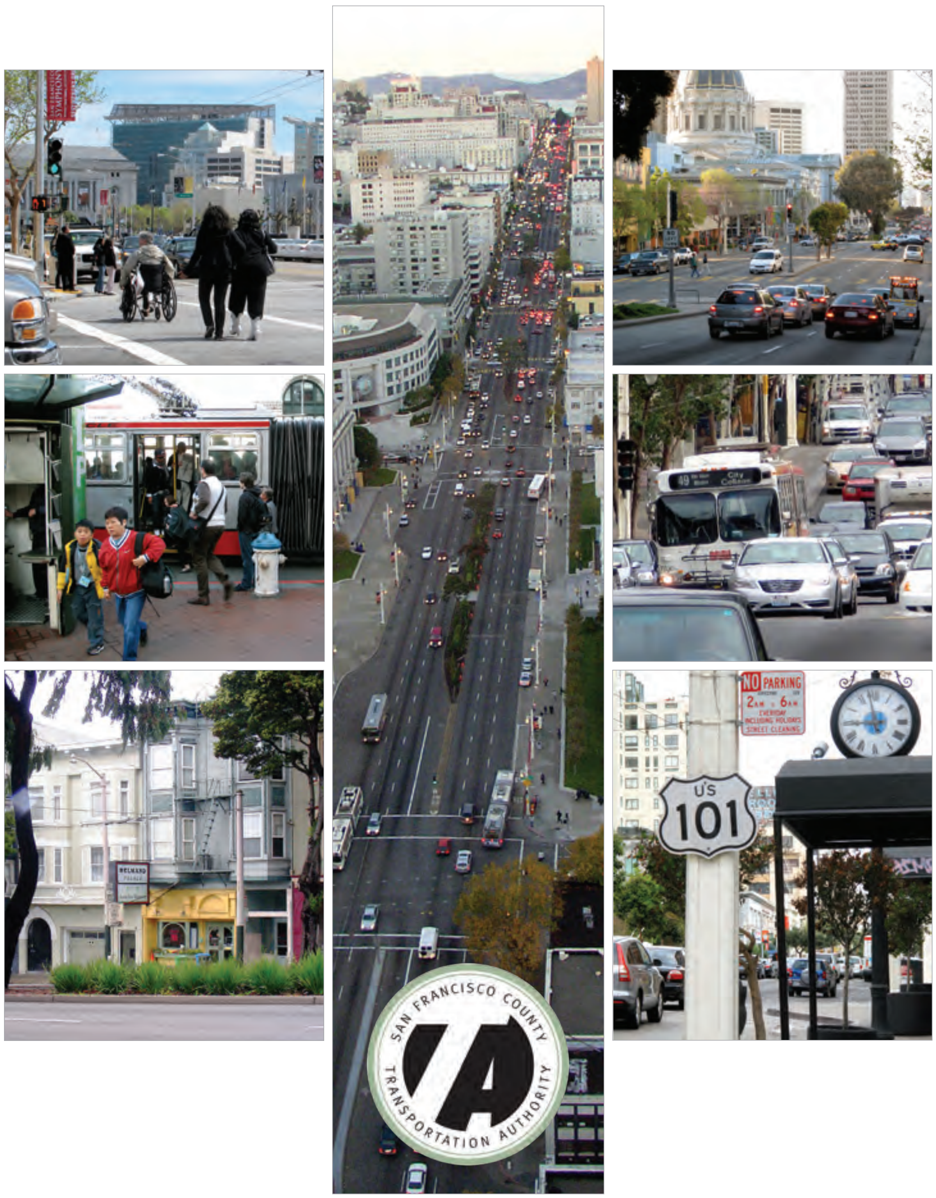
FINAL ENVIRONMENTAL IMPACT STATEMENT/
ENVIRONMENTAL IMPACT REPORT
(EIS/EIR)

Van Ness Avenue Bus Rapid Transit Project



SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY

IN PARTNERSHIP WITH

SFMTA Caltrans FTA

July 2013

SCH No. 2007092059

VAN NESS AVENUE BUS RAPID TRANSIT PROJECT

City and County of San Francisco, California

FINAL ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT

PREPARED PURSUANT TO:

National Environmental Policy Act of 1969, §102 (42 U.S.C. §4432); and Federal Transit Law (49 U.S.C. Chapter 53); 49 U.S.C. §303 (formally Department of Transportation Act of 1966, §4(f)); National Historic Preservation Act of 1966, §106 (16 U.S.C. §470f); Executive Order 11990 (Protection of Wetlands); Executive Order 11988 (Floodplain Management); and Executive Order 12898 (Environmental Justice).

By the

FEDERAL TRANSIT ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

and the

SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY

Leslie T. Rogers
Region IX Administrator
Federal Transit Administration

JUN 27 2013
Date of Approval

Maria Lombardo
Interim Executive Director
San Francisco County Transportation Authority

6/21/13
Date of Approval

Preface

Introduction

The San Francisco County Transportation Authority (SFCTA or Authority) proposes, in cooperation with the Federal Transit Administration (FTA) and the San Francisco Municipal Transportation Agency (SFMTA), to implement bus rapid transit (BRT) improvements along a 2-mile stretch of Van Ness Avenue in San Francisco, California.

This Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) has been prepared pursuant to the requirements of both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Both laws require that projects with a potential for significant adverse environmental effects be reviewed in an EIS and EIR, respectively. This Final EIS/EIR identifies three build alternatives for the Van Ness Avenue BRT Project that would meet the project's purpose and need, as well as the Locally Preferred Alternative (LPA), which is the project design selected by the project proponents to be carried forward for approval and subsequent construction. This document evaluates the environmental effects that would result from each project alternative, including the LPA. This document also identifies measures to avoid, minimize, and mitigate impacts.

Who is leading the environmental review of this project?

The Van Ness Avenue BRT Project is a collaborative effort. In cooperation with FTA, the Authority initiated this project and has led the effort to complete the environmental review and preliminary engineering (approximately 30 percent design completion). The Authority has partnered closely with SFMTA, which will take the subsequent lead in all major steps of project delivery following completion of the environmental review process, including final design, construction, operation, and maintenance. The Authority has also partnered closely with the California Department of Transportation (Caltrans), which owns the portion of Van Ness Avenue within the project limits, designated as U.S. Highway 101.

FTA is the Lead Agency under NEPA, and the Authority is the Lead Agency under CEQA. Caltrans and SFMTA participate as Cooperating Agencies under NEPA and as Responsible Agencies under CEQA in environmental review. Other participating agencies include Golden Gate Bridge Highway & Transportation District, Metropolitan Transportation Commission, San Francisco Department of Public Works, San Francisco Planning Department, San Francisco Public Utilities Commission, and the San Francisco Mayor's Office on Disability.

What is the purpose of this document?

As required by NEPA and CEQA, this document informs the public and governmental decision makers of potential environmental effects associated with the project and describes the measures that would be implemented to mitigate or lessen those effects (Chapters 3, 4, 5, 6, and 7). This document will be used by federal, state, regional, and local agencies to assess the environmental impacts of the project on resources under their jurisdiction, to make discretionary decisions regarding the project, and to exercise their review and permit authority over the project. This document also includes information on the cost to construct and operate this project (Chapter 9), and provides an evaluation of important considerations such as environmental impacts, need, feasibility, funding, cost for each project alternative, and selection of the LPA (Chapter 10). This process provides decision-makers and the public information so they may consider the likely effects of the project on the environment, together with other important factors such as feasibility, cost, and meeting the identified project purpose and needs.

The Draft EIS/EIR was made available for public review and comment from November 4 through December 23, 2011; it was the subject of a public hearing on November 30, 2011, and an online webinar on December 5, 2011. After considering public and agency comments on the Draft EIS/EIR and identifying the LPA, the SFCTA prepared this Final EIS/EIR that includes the responses to comments received on the Draft EIS/EIR, which are included as Appendix I of this document, and documentation on the LPA.

What is the difference between the Draft EIS/EIR and this Final EIS/EIR?

In this Final EIS/EIR, SFCTA and SFMTA recommend a preferred alternative, the LPA, to be carried forward. At the completion of this environmental process, FTA, SFCTA, and SFMTA expect to be able to approve and certify this Final EIS/EIR and make a determination on whether to implement the project LPA. An additional northbound station at the intersection of Van Ness Avenue and Vallejo Street, called the Vallejo Northbound Station Variant, is under consideration as a design variant under the LPA. The decision on whether to include the variant will be made at the time of project approval.

Material that is new or has been substantially revised since publication of the Draft EIS/EIR is indicated by a vertical bar in the margin. Changes between the Draft EIS/EIR and the Final EIS/EIR primarily reflect documentation of the LPA, as well as responses to comments received on the Draft EIS/EIR and staff-initiated changes to correct minor errors or improve/update presentation of information. These changes are delineated with the vertical margin bar.

Appendix I contains all comments received on the Draft EIS/EIR during the public comment period, as well as responses to those comments. Technical reports are available on request by contacting the SFCTA (project contact information provided below).In this Final EIS/EIR, SFCTA and SFMTA recommend a preferred alternative, the LPA, to be carried forward. At the completion of this environmental process, FTA, SFCTA, and SFMTA expect to be able to approve and certify this Final EIS/EIR and make a determination whether to implement the project LPA.

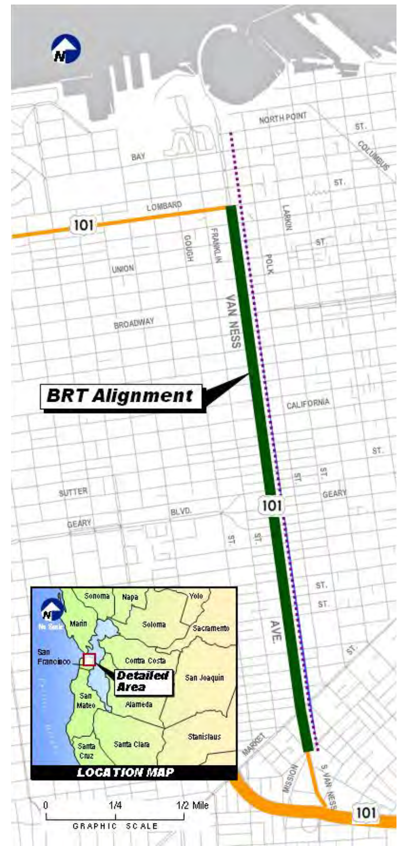
How can I be involved?

The project proponents encourage members of the public to remain involved with the project by reviewing the Final EIS/EIR and attending the SFCTA Board certification hearing, the SFMTA project approval meeting, and other project meetings such as Citizen Advisory Committee (CAC) meetings. Members of the public may also attend neighborhood and other stakeholder meetings in which the Van Ness Avenue BRT is discussed during the final design and construction phases of the project. If the project is approved, the SFMTA will distribute information about the formation of a Final Design and Construction Period CAC via the project Web site, direct mailings, and electronic newsletters. Requests to be added to the project mailing list to receive periodic updates on the project can be made by contacting:

Attn: Michael Schwartz, Senior Transportation Planner
San Francisco County Transportation Authority
1455 Market St., 22nd Floor
San Francisco, CA 94103
vannessbrt@sfcta.org

Executive Summary

S.1 | Introduction



The San Francisco County Transportation Authority (SFCTA or Authority) proposes, in cooperation with the Federal Transit Administration (FTA) and the San Francisco Municipal Transportation Agency (SFMTA), to implement bus rapid transit (BRT) improvements along a 2-mile stretch of Van Ness Avenue in San Francisco,[1] from Van Ness Avenue at Lombard Street in the north to South Van Ness Avenue at Mission Street in the south. This chapter provides a brief summary of the purpose of and need for the proposed project, the project alternatives, project performance, a summary of potential environmental impacts, and proposed mitigation measures. This summary should not be relied upon for a thorough understanding of these topics; references to sections of this Environmental Impact Statement/Environmental Impact Report (EIS/EIR) with complete information are provided below.

Substantive text changes between the Draft EIS/EIR circulated November 4 through December 23, 2011, and this Final EIS/EIR are demarcated by a vertical bar in the margin. Text changes primarily reflect documentation of the LPA, as well as responses to comments received on the Draft EIS/EIR and staff-initiated changes to correct minor errors or improve/update presentation of information..

S.2 | Agencies and Approvals

The Van Ness Avenue BRT Project is a collaborative effort. In cooperation with FTA, the Authority initiated this project and has led the effort to complete the environmental review and conceptual engineering. The Authority has partnered closely with SFMTA, which will take the subsequent lead in all major steps of project delivery following completion of the environmental review process, including preliminary and final design, construction, operation, and maintenance. The Authority has also coordinated project development with the California Department of Transportation (Caltrans).

FTA is the Lead Agency under NEPA, and the Authority is the Lead Agency under CEQA. Caltrans and SFMTA participate in the environmental review as Cooperating Agencies under NEPA and as Responsible Agencies under CEQA. Other participating agencies include Golden Gate Bridge Highway & Transportation District, Metropolitan Transportation Commission, San Francisco Department of Public Works, San Francisco Planning Department, San Francisco Public Utilities Commission, and the San Francisco Mayor's Office on Disability. The FTA and the Authority are responsible for approving/ certifying this Final EIS/EIR, and subsequently the Authority and SFMTA are responsible for approving this project. The SFCTA Board and the SFMTA would each approve the project through formal selection of a preferred alternative as the project definition. If the project is approved, the SFMTA would implement project design, construction, operation, and maintenance. The Authority would provide funding and ensure compliance with the Mitigation Monitoring and Reporting Program (MMRP - see Appendix J) and would also provide review and concurrence on deliverables for the project during the design phase. In addition, the Authority would be actively involved in the project through its oversight role as part of the significant Prop K funding programmed for the project (see Chapter 9). Caltrans, as the owner of the facility (Van Ness Avenue is US 101 in the project study area), would provide various approvals of permits and documents as part of project development and construction. See Chapter 2 on next steps, permits, and approvals for more details on agency roles and responsibilities.

[1] The City and County of San Francisco operate as a joint government body within the same geographical boundaries. Throughout this document, this governmental body and geographic area may be referred to as the "City of San Francisco," "San Francisco," "City," or "County."

EXECUTIVE SUMMARY

S.3 | Project Location

Van Ness Avenue BRT is proposed in the northeastern quadrant of the City and County of San Francisco, California. Van Ness Avenue serves as U.S. Highway 101 (US 101) through the central part of the city and is owned by Caltrans. The BRT alignment follows Van Ness Avenue/South Van Ness Avenue, a primary north-south arterial and transit spine, and extends approximately 2 miles from Mission Street to Lombard Street. Replacement of the overhead contact system (OCS) support pole/streetlight network, as part of the project, would extend from Mission Street to North Point Street.

S.4 | Project History

For more on the history and context of the project, see Chapter 1.

Van Ness Avenue has been identified as a high-priority transit improvement corridor in a number of planning studies and funding actions by the City, including the Authority's Four Corridors Plan (1995), Muni's Short-Range Transit Plan (since 1996), and Muni's Vision Plan and Vision for Rapid Transit (2000). The Authority's Countywide Transportation Plan (2004) called for BRT on Van Ness Avenue as part of a citywide BRT Network (defined initially by a core BRT network encompassing Van Ness Avenue, Geary Boulevard, and Potrero Avenue). The Authority conducted the Van Ness Avenue BRT Feasibility Study in partnership with SFMTA, comparing four BRT alternatives with a no project scenario. In 2006, the Authority and SFMTA Boards unanimously approved the study and called for continued project development. In 2007, the Authority entered into a formal partnership with SFMTA through a Memorandum of Agreement to develop the project. That year, the Authority initiated joint state and federal environmental review of Van Ness Avenue BRT. The same year, the Bay Area region designated Van Ness Avenue BRT as a regional priority, and the Authority requested entry for the project into FTA's Small Starts Program. FTA gave Van Ness Avenue BRT a "High" rating for cost effectiveness ("one of the Small Starts project justification criteria)," one of only two Small Starts projects in the nation at that time to receive such a designation, and has received the same rating for that criterion each year since. In 2009, SFMTA adopted the Transit Effectiveness Project (TEP), which included Van Ness Avenue in the Muni rapid network and identified it as a high-priority route for rapid transit and BRT treatments.

Van Ness Avenue functions as a major north to south transit corridor for the eastern part of San Francisco, with more than 16,000 daily boardings on Muni Routes 47 and 49.

S.5 | Project Purpose and Need

S.5.1 | PROJECT PURPOSE

Van Ness Avenue is a major north to south corridor for the eastern part of San Francisco. It functions as a major transit corridor, with more than 16,000 daily boardings on Muni Routes 47 and 49 between Mission and Lombard streets and more than 38,000 total daily boardings on those two routes overall. The Muni bus routes that travel along Van Ness Avenue provide regional transit connections to Bay Area Rapid Transit (BART), AC Transit, Caltrain, and SamTrans. Golden Gate Transit (GGT) also provides service along Van Ness Avenue.

For further discussion of the project's purpose and need, see Chapter 1.3.

As described in the previous section, rapid transit on Van Ness Avenue has been included as part of numerous local and regional plans. One purpose of the Van Ness Avenue BRT Project is to serve a critical function in the City's rapid transit network and help meet the following goals of the network as defined in the 2004 Countywide Transportation Plan:

- Improve transit levels of service for existing users quickly and cost effectively;
- Strengthen the citywide network of rapid transit services;
- Raise the cost effectiveness of Muni services and operational efficiency of the city's Transit Preferential Streets (TPS) roadway network; and
- Contribute to the urban design, identity, and livability of the BRT corridors as signature TPS streets.

The 2006 Van Ness Avenue BRT Feasibility Study identified specific needs for the corridor (see Section 1.3.2) and established the purpose of the Van Ness Avenue BRT project: to improve the safety and operational efficiency of Van Ness Avenue. With the development of BRT on Van Ness Avenue, the City hopes to:

- Significantly improve transit reliability, speed, connectivity, and comfort;
- Improve pedestrian comfort, amenities, and safety;
- Enhance the urban design and identity of Van Ness Avenue;
- Create a more livable and attractive street for local residential, commercial, and other activities; and
- Accommodate safe multimodal circulation and access within the corridor.

S.5.2 | PROJECT NEED

Van Ness Avenue BRT is intended to address numerous citywide needs, including reversing trends towards declining transit mode share, lowering transit productivity, and escalating operating costs. In addition, BRT improvements were identified to address the corridor-specific purpose described above and to meet the following corridor-specific needs:

- **Separate Transit from Auto Traffic to Improve Travel Time and Service Reliability.** Transit speeds are currently not competitive with automobiles on Van Ness Avenue. Buses now travel at half the speed of cars (only 5 miles per hour [mph]) within the project area. The longer that buses travel in mixed traffic, the more irregular the spacing becomes, causing bus bunching during peak periods.
- **Reduce Delays Associated with Loading and Unloading and Traffic Signals.** Time spent loading and unloading passengers and time spent waiting at traffic signals accounts for nearly 50 percent of total travel time on Van Ness Avenue.
- **Improve the Experience for Transit Patrons.** Existing transit service on Van Ness Avenue lacks many amenities for waiting passengers (e.g., bus shelters with seating and real time information) and for passengers onboard vehicles (e.g., poor ride quality). Improvement of these conditions would make the transit experience attractive to new riders and more comfortable for existing riders, both in and out of the vehicle.
- **Improve the Safety and Comfort of Pedestrians.** Van Ness Avenue has long street crossing distances, and most crossings do not have pedestrian infrastructure such as countdown signals, accessible pedestrian signals, corner bulbs, and nose cones. Pedestrians also experience more delay at signals than other users of Van Ness Avenue.
- **Raise the Operating Efficiency of Van Ness Avenue.** The Van Ness Avenue corridor has the potential to carry substantially more people, more efficiently, than today. Within the study area, automobile trips on Van Ness Avenue are expected to increase by up to 7.5 percent by 2015 if a BRT project is not built, while the transit mode share is expected to stay the same or decline without a BRT project. These trends would result in an increase in congestion on Van Ness Avenue.
- **Upgrade Streetscape to Support an Identity as a Rapid Transit and Pedestrian Environment.** Existing streetscape conditions are deficient, lacking in design consistency and pedestrian amenities.
- **Reduce operations costs.** If buses continue to operate in congested traffic, further degradation in transit speeds will increase the operating cost to maintain Muni's current service headways.
- **Support the Civic Destinations on the Corridor and Integrate Transit Infrastructure with Adjacent Land Uses.** Van Ness Avenue is already a strong market for transit, due largely to the existing transit-supportive land uses in the corridor; for instance, nearly half of the households in the corridor do not own automobiles. More jobs and housing are being planned along the corridor in future years.
- **Accommodate private vehicle circulation and commercial loading.** Van Ness Avenue is also designated as US 101. For this reason, attainment of transit and pedestrian improvement objectives must be balanced with the needs to accommodate mixed local and through traffic, bicycle, and goods circulation and access within the corridor.

See Chapter 2 for further discussion of BRT features and a description of alternatives included for analysis, as well as alternatives considered but rejected through the scoping process.

S.6 Project Description

S.6.1 BRT FEATURES

BRT is a new mode of transit in San Francisco and represents a package of features that together create rapid and reliable transit service for the benefit of passengers along a given corridor, and the transit system as a whole. The Van Ness Avenue BRT Project includes:

- **Dedicated bus lanes** separated from regular (mixed-flow) traffic to reduce delays and improve reliability.
- **Level or near level boarding** that minimizes the horizontal and vertical gap between the platform edge and vehicle door threshold to decrease passenger loading time, increase service reliability, and improve access for all users.
- **Consolidated transit stops** to reduce delays due to existing stop spacing that does not meet Muni standards (stop locations and details shown in Chapter 2, Table 2-3).
- **High-quality stations,** each with an elevated platform, canopy for weather protection, comfortable seating, vehicle arrival time information, landscaping, and other amenities. Platforms would be large enough to safely and comfortably accommodate waiting passengers, long enough to load two BRT vehicles, and designed to provide Americans with Disabilities Act (ADA) accessibility.
- **Proof of Payment** allowing passengers to swipe their fare cards either on the platform before the buses arrive or on-bus once boarded, allowing for all-door loading, and reducing passenger loading time.
- **Traffic signal optimization** using technology upgrades to allow real-time traffic management and optimal signal timing.
- **Transit Signal Priority (TSP)** to recognize bus locations and provide additional green light time for buses approaching intersections and reduce delay at red lights.
- **Fewer left-turn pocket lanes** for mixed-flow traffic by eliminating left turns at certain intersections to reduce conflicts with the BRT operation.
- **Pedestrian safety enhancements,** including enhanced median refuges, nose cones, and curb bulbs to reduce crossing distances at intersections and increase safety. Accessible pedestrian signals with crossing time countdowns would be installed at all signalized intersections in the project corridor.

S.6.2 PROJECT ALTERNATIVES

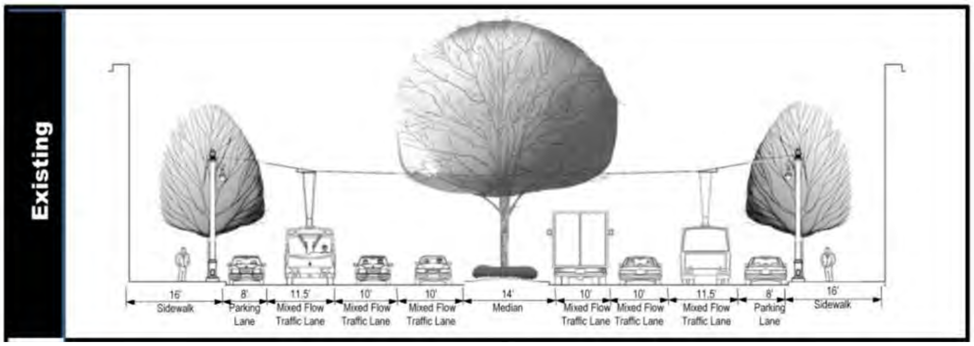
Based on the findings of the 2006 Van Ness Avenue BRT Feasibility Study and input received during the project scoping process, three build alternatives were defined and recommended for NEPA/CEQA analysis. A No Build Alternative was also defined, which considers planned and funded improvement projects within the Van Ness Avenue corridor that will be implemented by 2015 (opening year of the Van Ness Avenue BRT Project) or 2035 (the long-term horizon or "design" year). The project alternatives are described in the following subsections and further in Chapter 2, along with alternatives considered but rejected during the public scoping process.

Alternative 1: No Build

The No Build Alternative would include only improvements that are planned to occur regardless of whether BRT is implemented, including pavement rehabilitation and incremental replacement of the OCS and support poles/streetlights.

Alternative 1, the No Build Alternative, would include only improvements that are planned to occur regardless of whether BRT is implemented, including pavement rehabilitation and incremental replacement of the OCS and support poles/streetlights. New, low-floor buses, on-bus proof of payment, and real-time passenger information at major bus stops would result in minor improvements to transit service. Pedestrian improvements at select locations would include curb ramp upgrades, countdown signals, and accessible signals. Figure S-1 provides a typical cross section of Van Ness Avenue as it exists today, and this would remain the same under the No Build Alternative.

Figure S-1: Typical Cross Section of Existing Van Ness Avenue



Build Alternatives

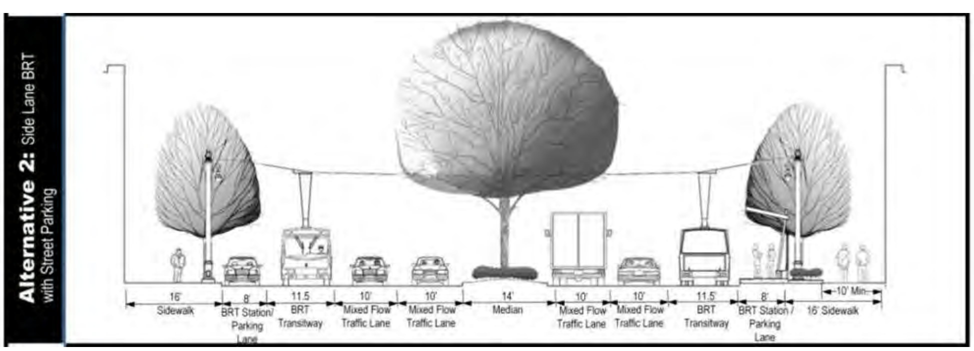
The three build alternatives would include all of the BRT features listed above in S.6.1, but with differing lane configurations and associated station placement at the intersections. The following subsections summarize the differences between the three alternatives, while Chapter 2 describes each alternative in detail. Appendix A contains detailed plan drawings for each build alternative. Under all build alternatives, GGT vehicles that currently operate on Van Ness Avenue would operate in the transitway and use select BRT stations exclusively.

The three build alternatives would include all of the BRT features but with differing lane configurations and associated station placement at the intersections.

Build Alternative 2: Side-Lane BRT with Street Parking

Build Alternative 2 (see Figure S-2) would provide a dedicated bus lane, or transitway, in the right-most lane of Van Ness Avenue located adjacent to the existing curbside street parking area. The transitway would be traversable for mixed-flow traffic that would enter the transitway to complete a right turn or to parallel park. Under Build Alternative 2, BRT stations would be located within the curbside parking area as curb extensions.

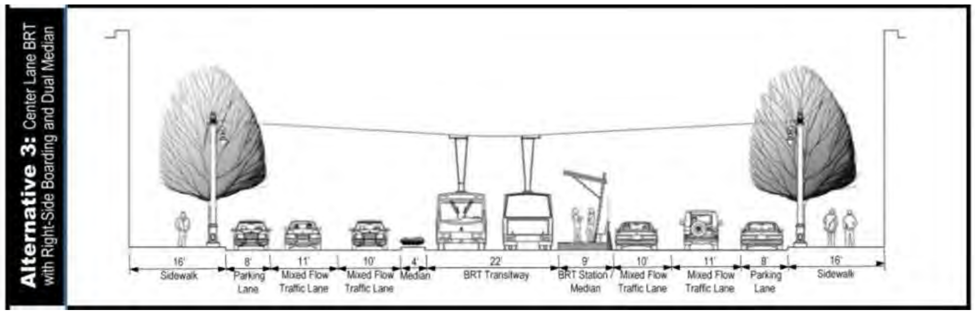
Figure S-2: Typical Cross Section of Van Ness Avenue with Build Alternative 2



Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians

Build Alternative 3 (see Figure S-3) would provide a transitway comprised of two side-by-side, dedicated bus lanes located in the center of the roadway in between two medians. The transitway would be separated from mixed-flow traffic by a 4-foot-wide median, widening to a 9-foot-wide median at BRT stations, allowing right-side boarding.

Figure S-3: Typical Cross Section of Van Ness Avenue with Build Alternative 3

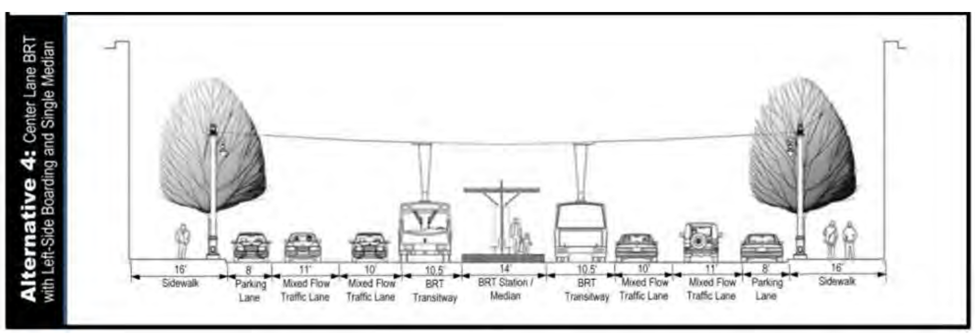


For detailed analysis of the Van Ness Avenue BRT Project performance for all transportation modes, see Chapter 3. Analysis of benefits and impacts of each alternative across all performance measures is provided in Chapter 10.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median

Build Alternative 4 (see Figure S-4) would provide a transitway in the center of the roadway comprised of a single, 14-foot-wide median flanked by dedicated northbound (NB) and southbound (SB) bus lanes. Station platforms would be located on the single center median, requiring left-side passenger boarding and alighting, as well as left-side doors on vehicles. All stations would have this single-median design, with the exception of the BRT stations proposed at Geary/O'Farrell, which would utilize a dual-median configuration similar to that proposed under Build Alternative 3 to accommodate GGT buses that are strictly right-side boarding. All GGT stops, except Geary/O'Farrell, along the BRT corridor would be eliminated in Build Alternative 4. At the northern end of the corridor, GGT vehicles would be routed along a portion of Chestnut Street to accommodate an additional stop at the corner of Chestnut Street and Van Ness Avenue. At the southern end, GGT buses would continue to stop at the intersections of McAllister and Polk streets (NB) and Golden Gate Avenue and Polk Street (SB). A second GGT stop within the BRT runningway at Union Street is also possible.

Figure S-4: Typical Cross Section of Van Ness Avenue with Build Alternative 4



Center-Lane Alternative Design Option B

Both center-running alternatives (Build Alternatives 3 and 4) contain a design option referred to as the Center-Lane Alternative Design Option B, or Design Option B. This design option would eliminate all but one NB left turn (at Lombard Street) and all but one SB left turn (at Broadway) in the project corridor.

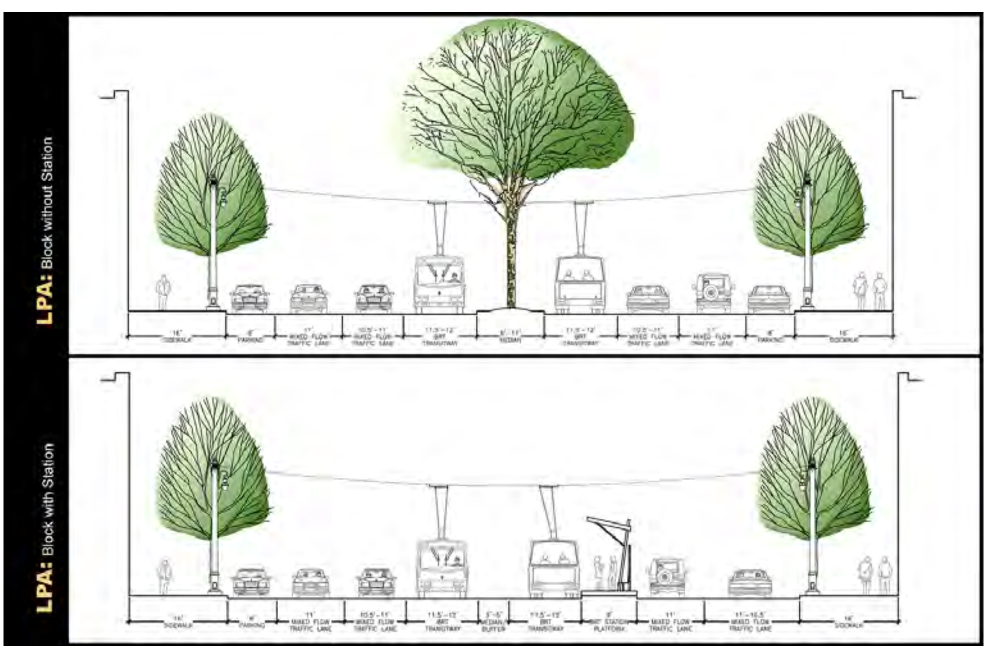
S.7 | Alternatives Analyzed and the LPA

As part of the alternatives analysis required by NEPA, the lead agencies are required to analyze the environmental impacts of all reasonable alternatives. Three build alternatives and a design option for center-lane Alternatives 3 and 4 were analyzed in the Draft EIS/EIR (see Chapter 2 for a description of alternatives), which was circulated for public review and comment from November 4 through December 23, 2011. As required by NEPA, an approved EIS must include the selection of a locally preferred alternative (LPA). The three build alternatives considered consisted of one side-lane option (Alternative 2) and two center-lane options (Alternatives 3 and 4), as well as a reduced left-turn variant (Design Option B). Based on technical analyses presented in the Draft EIS/EIR, as well as agency, stakeholder, and public input received during circulation of the Draft EIS/EIR, and results of risk analyses performed by a steering committee of SFCTA and SFMTA staff, the SFMTA and SFCTA jointly recommended, and subsequently selected, the LPA as a center -lane BRT with right - side boarding/single median and limited left turns for inclusion in the Final EIS/EIR. The LPA includes features of Build Alternatives 3 and 4, as described in greater detail in the following subsection. Section 10.3 describes the process of how the LPA was selected.

S.7.1 | LPA: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING/SINGLE MEDIAN AND LIMITED LEFT TURNS

The LPA is a combination and refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B) and is referred to as Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns. The LPA retains the high-performance features of Build Alternatives 3 and 4 (e.g., maximum transit priority, fewest conflicts), while avoiding the need to acquire left-right door vehicles or remove the entire existing median. Under the LPA, BRT vehicles would run alongside a single median for most of the corridor, similar to Build Alternative 4; however, at station locations, BRT vehicles would transition to the center of the roadway, allowing right-side loading at station platforms as under Build Alternative 3. Figure S-5 depicts the LPA on a block without a station and a block with a station. The LPA incorporates Design Option B, the left-turn removal design option that would eliminate all left turns from Van Ness Avenue between Mission and Lombard streets with the exception of a southbound (SB) (two-lane) left turn at Broadway Street. Incorporation of Design Option B would provide the greatest transit travel time benefits, reduce the weaving associated with the transitions buses must make between station locations and blocks without stations, and aid with the flow of north-south traffic along Van Ness Avenue. The LPA also includes a design variant to be decided at the time of project approval. The design variant is a NB transit station at Vallejo Street, referred to as the Vallejo Northbound Station Variant.

Figure S-5: LPA: Center-Running BRT with Right-Side Loading/Single Median and Limited Left Turns



S.8 | Project Performance in Meeting Purpose and Need

To help support decision making, this EIS/EIR documents BRT performance against a number of measures related to the Purpose and Need described in Section S-4 and Chapter 1. For more detailed analysis of Van Ness Avenue BRT Project performance for all transportation modes, see Chapter 3. Analysis of benefits and impacts of each alternative across all performance measures is provided in Chapter 10.

S.8.1 | IMPROVED TRANSIT PERFORMANCE AND RIDERSHIP

BRT would significantly improve transit travel time, reliability, passenger comfort, and ridership along Van Ness Avenue. In 2015, relative to Alternative 1 (No Build Alternative), the LPA would reduce transit travel time by 33 percent, reducing the travel time gap between autos and transit by as much as 50 percent (Source: VISSIM model).[2] Reliability for the LPA would also improve; the likelihood of a bus unexpectedly stopping (excluding loading and unloading passengers) would decrease by 52 percent, allowing more consistent travel times (Source: VISSIM model). Improved station facilities with level or near level boarding, additional amenities, and real-time arrival information would also improve transit passengers' comfort. With the LPA, transit boardings for Muni 47 and 49 lines throughout their routes would increase by 37 percent with BRT relative to Alternative 1, and up to half of the additional riders could be former drivers (Source: SF-CHAMP). With implementation of the LPA, Van Ness Avenue BRT would increase the street's transit mode share to 44 percent of all motorized trips, relative to 30 percent in Alternative 1 (Source: SF-CHAMP). See Section 3.2 for additional information on transit performance.

S.8.2 | ENHANCED PEDESTRIAN SAFETY AND COMFORT

The Van Ness Avenue BRT Project would incorporate features to increase pedestrian safety at intersections, including pedestrian countdown signals, enhanced median refuges, and additional curb bulbs. These features would shorten crossing distances, allowing nearly all intersections to meet local and federal standards for minimum pedestrian crossing speed, while giving pedestrians more information about when it is safe to cross. New ADA curb ramps and Accessible Pedestrian Signals (APS) along Van Ness Avenue would improve safety and access for all users. Pedestrians would also benefit from wider effective sidewalk widths in many locations, pedestrian-scale lighting, and additional median trees and landscaping and tree plantings along the sidewalk. See Section 3.4 for more information on nonmotorized transportation performance.

Relative to the No Build Alternative, the LPA would:

- **Reduce transit travel time by 33 percent, reducing the travel time gap between autos and transit by as much as 50 percent.**
- **Incorporate features to increase pedestrian safety at intersections.**
- **Carry more people per hour than each remaining mixed traffic lane, resulting in more efficient operations. Reinvestment of travel time savings into more frequent bus service could raise person throughput on Van Ness Avenue by 8 to 12 percent.**

S.8.3 | IMPROVED OPERATIONAL EFFICIENCY AND ACCOMMODATION OF PRIVATE VEHICLES AND COMMERCIAL LOADING

By the most conservative estimates, BRT would maintain the same levels of person-throughput on Van Ness Avenue relative to Alternative 1 (No Build Alternative). The dedicated transit lane would carry more people per hour than each remaining mixed traffic lane; however, by reinvesting saved operating resources into more frequent bus service, daily person throughput on Van Ness Avenue could increase by as much as 8 percent in certain locations. If intangibles such as marketing, branding, permanence, and quality are also considered (as they are for rail projects), daily person throughput could increase by as much as 12 percent on Van Ness Avenue in certain locations (Source: SF-CHAMP).

San Francisco's grid network supports the Van Ness Avenue BRT Project in many ways. The majority of drivers who would drive on Van Ness Avenue under the No Build Alternative in 2015 would continue to drive on Van Ness Avenue under any of the build alternatives (68 to 81 percent for locations north of Hayes Street, depending on the location), including the LPA (Source: CHS, 2013). Of the remaining 19 to 32 percent, many would continue to drive on a street within two blocks of Van Ness Avenue – mostly

[2] The proposed project is scheduled to begin service in 2016 and revenue operations are anticipated in 2018.

Franklin Street (Source: CHS, 2013); approximately a third would switch modes to transit or change their travel time of day or destination; and a small portion would continue driving on other parallel streets throughout San Francisco (Source: SF-CHAMP). Due in part to the many alternative options for current drivers on Van Ness Avenue, the implementation of BRT does not increase the net number of intersections operating at level of service (LOS) E or F in 2015 when compared with the No Build Alternative in that same year (Source: CHS, 2013). See Section 3.1 for additional information on multimodal system performance. See Table S-1 at the end of this summary and Section 3.3 for details on traffic circulation and impacts. Section 3.3 also discusses how the traffic effects of converting mixed-traffic lanes to dedicated bus lanes could be managed through signal timing, driver information, improvement of alternative routes, and implementation of numerous citywide transportation improvement and system management efforts that are currently underway.

S.8.4 | UPGRADED STREETSCAPE

A main component of the Van Ness Avenue BRT Project is to provide a consistent landscaped median treatment and pedestrian lighting, as well as establish a more unified identity for Van Ness Avenue as one of the City's most prominent arterials and a visible rapid transit service. The improved streetscape features of the LPA would enhance the amenity and urban design of Van Ness Avenue as a gateway into the city.

S.8.5 | SUPPORT OF CIVIC DESTINATIONS IN THE CORRIDOR AND INTEGRATE TRANSIT INFRASTRUCTURE WITH ADJACENT LAND USES

The improved streetscape features of the Van Ness Avenue BRT Project would enhance the amenity and urban design of Van Ness Avenue as a gateway into the city while achieving multimodal transportation goals. In addition to serving existing transit demand, the Van Ness Avenue corridor is meant to support recently approved nearby high-density mixed-use development plans. The project will also transform the street into a vibrant pedestrian promenade that supports the Civic Center and commercial uses. Rapid transit service along Van Ness Avenue would contribute to the City's transit-oriented development efforts by providing high-quality, reliable, comfortable transit that improves access to destinations within the corridor and elsewhere in the city. Placement of BRT infrastructure would demonstrate an investment in the corridor and provides a greater sense of permanence than typical bus facilities. Such facilities can support place-making and livability, while helping to stimulate further transit-oriented development.

S.8.6 | INCREASED TRANSIT OPERATIONAL EFFICIENCY AND CAPITAL COST EFFECTIVENESS

Muni operating resources in the BRT corridor could see a savings of 16 to 32 percent with BRT relative to the No Build Alternative because fewer buses could provide the same service frequency. The resulting savings could be reinvested in additional service on Van Ness Avenue or elsewhere in the Muni system. See Chapter 9 for more information on Operations Costs for each of the alternatives. As discussed in the Environmental Alternatives Screening Report prepared after scoping, the BRT alternatives provide a cost-effective way to deliver transit benefits to the Van Ness Avenue corridor. See Section S-9 and Chapter 9 for more information on Project Cost and Funding.

S.9 | Project Cost and Funding

The Van Ness Avenue BRT Project LPA is estimated to cost $126 million. Two sources are planned to provide a significant portion of the funding for the project:

As discussed in the Environmental Alternatives Screening Report, BRT provides a cost-effective way to deliver transit benefits to the Van Ness Avenue corridor.

- **Small Starts ($74,999,999 million).** This program, which is administered by FTA, provides competitive grants for new transit projects whose total capital costs do not exceed $250 million. The maximum grant award is $74,999,999 million. SFCTA and SFMTA have requested $74,999,999 million in Small Starts funding for the project. In 2012, the project was one of three Small Starts potential projects in the nation to receive a High rating for cost effectiveness and the only Small Starts project in the nation to receive a Medium - High rating for "project justification". (Source: Fiscal Year 2014 FTA Annual Report on Funding Recommendations)[3].

- **Proposition K Sales Tax ($20.5 million).** In November 2003, San Francisco voters approved Proposition K (Prop K), approving a new 30-year Expenditure Plan and extending the local half-cent transportation sales tax. The Board-adopted 2009 Proposition K Strategic Plan programs approximately $20.5 million in sales tax funds to the Van Ness Avenue BRT Project. The Authority will examine the Prop K programming during the next Strategic Plan update to determine if more Prop K funds can be used for the Van Ness Avenue BRT project.

The annual operations and maintenance costs associated with the LPA are significantly lower than those of the No Build Alternative, with cost savings estimated at 28 percent. The savings are attributed to the travel time benefits of the BRT, requiring fewer vehicles to provide a similar amount of service. See Chapter 9 for more information on Project Cost and Funding; Section 9.1.3 includes a broader discussion of funding sources.

S.10 | Summary of Environmental Impacts

Table S-1 summarizes the environmental impacts that would result due to each project alternative, the significance of the impacts, and proposed mitigation measures. Under CEQA significance criteria, the proposed project would result in no impacts or less than significant impacts relative to the following environmental factors:

- Agricultural Resources
- Greenhouse Gas (GHG) Emissions
- Mineral Resources
- Population, Housing, and Recreation
- Wind and Shadow
- Hydrology and Water Quality
- Land Use
- Noise and Vibration

With implementation of mitigation measures, the project would result in less than significant impacts relative to the following environmental factors:

- Aesthetics/Visual Resources
- Air Quality
- Biological Resources
- Community Impacts
- Cultural Resources
- Geology and Soils
- Hazardous Waste and Materials
- Public Services
- Transit Crowding (part of Chapter 3, Transportation Analysis)
- Utilities and Service Systems

Van Ness BRT would result in traffic circulation impacts at 6 to 11 intersections in the corridor, primarily along Franklin and Gough streets, but no significant impacts at other intersections, or to transit or nonmotorized transportation. If implemented, mitigation measures could reduce traffic impacts.

Implementation of any of the build alternatives may result in significant and unavoidable impacts in one environmental category: traffic circulation. Traffic circulation impacts would occur by 2035 at 11 intersections in the corridor for the LPA, primarily along Franklin and Gough streets. If implemented, mitigation measures could reduce traffic impacts to less than significant levels. However, the mitigation measures identified in Section 3.3.4, while reducing localized traffic delays in the short term, may ultimately be found by the Authority Board to not be feasible due to policy conflicts, specifically the need to balance traffic

[3] The Van Ness Avenue BRT Project received a score of "High" on all three project justification criteria where scoring measures have been defined. For the three criteria where measures have not yet been defined, all projects were assigned a rating of "medium." In all previous annual funding recommendations since 2007 (where all measures had been defined), Van Ness Avenue BRT Project has received a score of "High" for project justification, the only Small Starts Project in the nation to receive such a designation.

circulation with pedestrian and transit circulation and safety. In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand. Section 3.3.4 provides a more comprehensive description of those intersections that would be significantly impacted.

No unmitigable, significant impacts are projected for transit or to nonmotorized transportation. A detailed discussion of impacts, and associated improvement and mitigation measures is provided in Chapter 3, Transportation Analysis, and Chapter 4, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures. Analysis of cumulative impacts is presented in Chapter 5.

S.11 | Areas of Controversy

Primary areas of controversy raised by the public during review of the Draft EIS/EIR consist of: traffic congestion on Van Ness Avenue and diversion onto parallel streets in the project vicinity, including how increased traffic congestion would affect air quality and noise in the project area; the project's effects on trees on Van Ness Avenue and the desire to preserve trees; the effects of relocating existing bus stops and stop consolidation (limiting of stops); and concern about how the project alternatives were defined and that there should be more consideration of less costly express bus alternatives. A more detailed discussion of areas of controversy is provided in Section 7.7.

S.12 | Locally Preferred Alternative Selection

As described in Section 10.3, the Draft EIS/EIR for the proposed project was made available to the public for review from November 4 through December 23, 2011. During the Draft EIS/EIR review period, the project team solicited further public and agency input on the alternatives analysis, including input on the selection of an LPA, through a public hearing, webinar, and stakeholder meetings. In particular, input on those performance indicators that are directly related to the project purpose were sought. Once input was gathered from all of the parties, including comments received on the Draft EIS/EIR, SFCTA and SFMTA staff proposed an LPA. An LPA Report was prepared, including a summary of public and agency input, analysis of alternatives' performance, and the recommended LPA (SFCTA, 2012). The LPA Report was presented to the SFCTA and SFMTA Boards for adoption, and in summer 2012 was unanimously approved by the Board of Commissioners, which authorized the Executive Director to analyze the Staff Recommended LPA in the Final EIS/EIR. The LPA is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), and is referred to as Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns. The staff-recommended LPA combines features of Build Alternatives 3 and 4 in such a way that it reduces project risk associated with needing to rebuild the entire median (and associated environmental, utilities, and cost impacts) and needing to procure dual-side door vehicles (cost and operations impacts) without compromising the ability of the project to fulfill the purpose and need. Additional detail about the LPA selection process is provided in Sections 10.3.2 through 10.3.8.

S.13 | Project Timeline

This Final EIS/EIR was completed following selection of the LPA. The Final EIS/EIR includes all comments received during the public review of the Draft EIS/EIR (Appendix I), responds to those comments, documents the LPA, and proposes mitigation measures for significant impacts. The next steps include certification of this Final EIR by the SFCTA and approval of this Final EIS by the FTA, publication of a NEPA Notice of Availability of this Final EIS in the *Federal Register*, and subsequent approval of a Record of Decision (ROD) by the FTA. The Final EIS/EIR will be distributed to agencies that previously commented on the Draft EIS/EIR. FTA may sign the ROD no less than 30 days after the Notice of Availability is published in the *Federal Register*.

The SFCTA Board of Commissioners and SFMTA Board of Directors would next approve the project to pursue final design and construction phases of the LPA. A Statement of Overriding Considerations is prepared, which is a CEQA findings document that includes a summary of significant and unavoidable impact findings identified in the Final EIS/EIR and explains the justification for approving the project despite these impacts. The Statement of Overriding Considerations is presented at the time of project approval as part of the CEQA Findings. Inclusion of the Vallejo Northbound Station Variant in the project design would be determined at the time of project approval and documented in the CEQA Findings and Statement of Overriding Considerations.

Construction of the proposed project is planned to begin in 2016 and last 20 months. BRT service is anticipated to begin in 2018.

S.14 Opportunities for Public Input

The project proponents encourage members of the public to remain involved with the project by reviewing the Final EIS/EIR and attending the SFCTA Board certification hearing, attending project meetings with neighborhood groups and other stakeholders throughout the final design and construction phases of the project, visiting the project website (www.vannessbrt.org), and subscribing to the project e-mail newsletter and mailing list. Through these communication channels, the SFMTA will distribute information about the upcoming formation of the Final Design and Construction Period Citizen Advisory Committee (CAC), in addition to briefings to neighborhood and other local organizations. A list of upcoming meetings is made available on the project Web site: www.vannessbrt.org and will be publicized through the project electronic newsletter. Requests to be added to the newsletter and mailing list may be made by contacting:

Attn: Michael Schwartz
San Francisco County Transportation Authority
1455 Market St., 22nd Floor
San Francisco, CA 94103
vannessbrt@sfcta.org

Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Aesthetics/ Visual Resources Construction	No impact.	Less than significant impact. Less than significant impacts to aesthetics would result from temporary visual disruptions by construction activity, such as signage, soil stockpiles, and construction equipment. Nighttime construction would require artificial lighting, which would be minimized in residential areas and set up to avoid significant light and glare impacts on adjacent residential properties. *Improvement Measures:* IM-AE-C1: During project construction, SFMTA will require the contractor to maintain the site in an orderly manner, removing trash and waste, and securing equipment at the close of each day's operation. IM-AE-C2: To reduce glare and light used during nighttime construction activities, SFMTA will require the contractor to direct lighting onto the immediate area under construction only and to avoid shining lights toward residences, nighttime commercial properties, and traffic lanes.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.
Aesthetics/ Visual Resources Operation	No impact.	Less than significant impact with mitigation. Mitigation measures will be implemented to address impacts to visual character and scenic resources resulting from the following project features: replacement of the existing OCS support pole/streetlight network with taller network that meets current sidewalk and roadway lighting standards and can accommodate the BRT OCS loads, introduction of BRT stations and streetscape features, and reconstruction of the Van Ness Avenue median and implementation of new BRT stations adjacent to the sidewalk, which would involve removal of approximately 14 percent of existing sidewalk and median trees. *Mitigation Measures:* M-AE-1: Design sidewalk lighting to minimize glare and nighttime light intrusion on adjacent residential properties and other properties that would be sensitive to increased sidewalk lighting. M-AE-2: Design and install a replacement OCS support pole/streetlight network that (1) retains the aesthetic function of the existing network as a consistent infrastructural element along Van Ness Avenue, (2) assures a uniform architectural style, character, and color throughout the corridor that is compatible with the existing visual setting and (3) retains the architectural style of the original OCS support pole/ streetlight network. Within the Civic Center Historic District, design the OCS support pole/streetlight network to comply with the Secretary of Interior's Standards for the Treatment of Historic Properties and be compatible with the character of the historic district as described in the Civic Center Historic District designating ordinance as called for by the San Francisco Planning Code. M-AE-3: To the extent that the project alters sidewalk and median landscaping, design and implement a project landscape design plan, including tree type and planting scheme for median BRT stations and sidewalk plantings that replaces removed landscaping and re-establishes high-quality landscaped medians and a tree-lined corridor. To the extent feasible, use single-species street trees and overall design that provides a sense of identity and cohesiveness for the corridor. Place new trees close to corners, if feasible, for visibility. The project landscape design plan will require review and approval by the San Francisco Arts Commission, as well as review and approval by the SFDPW as part of their permitting of work in the street ROW, which ensures consistency with the San Francisco Better Streets Plan. The median landscape design plan within the Civic Center Historic District will be reviewed by the San Francisco HPC and the City Hall Preservation Advisory Commission. A Certificate of Appropriateness must be obtained from the HPC for the landscape plans within the Civic Center Historic District. M-AE-4: Design and install landscaped medians so that median design promotes a unified, visual concept for the Van Ness Avenue corridor consistent with policies in the Van Ness Area Plan, Civic Center Area Plan, and San Francisco Better Streets Plan. This design goal for a unified, visual concept will be balanced with the goal of preserving existing trees; thus, new tree plantings would be in-filled around preserved trees. M-AE-5: Design and install a project BRT station and transitway design plan (including station canopies, wind turbines, and other features) that is consistent with applicable City design policies in the San Francisco General Plan and San Francisco Better Streets Plan; and for project features located in the Civic Center Historic District, apply the Secretary of Interior's Standards for the Treatment of Historic Properties, Planning Code Article 10, Appendix J pertaining to the Civic Center Historic District, and other applicable guidelines, local interpretations, and bulletins concerning historic resources. Review and approval processes supporting this measure include: (1) San Francisco Art Commission	Less than significant impact with mitigation. Same as Build Alternative 2, except 25 percent of existing trees would be removed, all of them along the median. The same mitigation measures as Build Alternative 2 would be implemented.	Less than significant impact with mitigation. Same as Build Alternative 3.	Less than significant impact with mitigation. Same as Build Alternative 2, except 15 percent of existing trees would be removed. The same mitigation measures as Build Alternative 2 would be implemented.	Less than significant impact with mitigation. Same as Build Alternative 4.	Less than significant impact with mitigation. Same as Build Alternative 2, except 22 percent of existing trees would be removed. The same mitigation measures as Build Alternative 2 would be implemented.

1 The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		approval of the station and transitway design plan as part of its review of public structures; (2) SFDPW approval of the station and transitway design plan as part of its permitting of work in the street ROW, which it will include review for consistency with the San Francisco Better Streets Plan; (3) HPC approval of the portion of the station and transitway design plan located within the Civic Center Historic District as part of granting a Certificate of Appropriateness; and (4) City Hall Preservation Advisory Commission and City Planning Department advisement on design to HPC. M-AE-6: Context-sensitive design of BRT station features will be balanced with the project objective to provide a branded, cohesive identity for the proposed BRT service. The following design objectives that support planning policies described in Section 4.4.1 will be considered in BRT station design and landscaping: • Architectural integration of BRT stations with adjacent Significant and Contributory Buildings through station canopy placement, materials, color, lighting, and texture, as well as the presence of modern solar paneling and wind turbine features to harmonize project features with adjacent Significant and Contributory Buildings. • Integration of BRT stations and landscaping with existing and proposed streetscape design themes within the Civic Center Historic District in conformance with the Secretary of Interior's Standards for the Treatment of Historic Properties and compatible with the character of the historic district as described in the Civic Center Historic District designating ordinance as called for by the San Francisco Planning Code. • Marking the intersection of Van Ness Avenue and Market Street as a visual landmark and gateway to the city in design of the Market Street BRT station.					
Aesthetics/ Visual Resources <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>
Air Quality <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Construction activity would result in a less than significant impact under CEQA due to exceedances of nitrogen oxide (NOx) emissions. Implementation of Bay Area Air Quality Management District (BAAQMD) control measures would reduce this impact to a less than significant level. *Mitigation Measures:* M-AQ-C1: Construction contractors shall implement the BAAQMD *Basic Construction Mitigation Measures* listed in Table 4.15-4 and the applicable measures in the *Additional Construction Mitigation Measures*. This includes Measure 10 in the *Additional Construction Mitigation Measures*. M-AQ-C2: Construction contractors shall comply with BAAQMD Regulation 11 (Hazardous Pollutants) Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). The requirements for demolition activities include removal standards, reporting requirements, and mandatory monitoring and record keeping.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.
Air Quality <u>Operation</u>	<u>Less than significant impact.</u>	<u>Less than significant impact.</u> Localized carbon monoxide (CO) concentrations would result in less-than-significant impacts. An analysis of emissions from idling vehicles during peak congestion period at the most congested intersection showed idle emissions would be well below the State standards after implementation of the BRT in year 2035 traffic conditions. Toxic air contaminant (TAC) emissions would result in a less-than-significant impact under CEQA. The project would not increase TAC emissions. The proposed BRT would reduce regional operational emissions, resulting in a beneficial impact. Localized CO concentrations associated with each of the alternatives would not exceed State ambient air quality standards, and all alternatives would be consistent with the BAAQMD regional air quality plans. The project would reduce the volume of cars by providing the public with alternative means of transportation, which results in lower citywide vehicle miles traveled (VMT), reducing regional operational emissions.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.
Air Quality <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>Less than significant impact with mitigation.</u> Mitigation Measures M-AQ-C1 and M-AQ-C2 would avoid significant, cumulative air quality impacts during construction of the proposed project and other planned projects in the vicinity.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.

1 The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

EXECUTIVE SUMMARY

Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Greenhouse Gas Emissions Operation	No impact.	No impact. The proposed project would decrease automobile VMT and associated greenhouse gas emissions compared to baseline conditions, and it would cause a beneficial global warming impact.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.
Greenhouse Gas Emissions Cumulative	No cumulative impacts.	No cumulative impacts. Transit projects, like the proposed project, reduce the volume of cars resulting in overall reduction in greenhouse gas emissions.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.
Biological Environment Construction	No impact.	Less than significant impact with mitigation. Less than significant impacts to trees and nesting birds would result from temporary construction activity the disturbance of bird nests during breeding season. Mitigation measures will avoid disturbance of protected bird nests during breeding season, and require measures to preserve tree health during construction. Mitigation measures are required to address potential impacts to trees and nesting birds during project construction. *Mitigation Measures:* **M-BI-C1:** Best Management Practices (BMPs) identified in tree protection plans and tree removal permits resulting from the preconstruction tree survey will be implemented to preserve the health of trees during project construction. **M-BI-C2:** Disturbance of protected bird nests during the breeding season will be avoided. Tree and shrub removal will be scheduled during the non-breeding season (i.e., September 1 through January 31), as feasible. If tree and shrub removal are required to occur during the breeding season (i.e., February 1 through August 31), then the following measures will be implemented to avoid potential adverse effects to nesting birds: A qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitats within 500 feet of construction activities where access is available. Exclusionary structures (e.g., netting or plastic sheeting) may be used to discourage the construction of nests by birds within the project construction zone. A preconstruction survey of all accessible nesting habitats within 500 feet of construction activities is required to occur no more than 2 weeks prior to construction. If preconstruction surveys conducted no more than 2 weeks prior to construction identify that protected nests are inactive or potential habitat is unoccupied during the construction period, then no further mitigation is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by protected birds or that are located outside the no-disturbance buffer for active nests may be removed. If active protected nests are found during preconstruction surveys, then the project proponent will create a no-disturbance buffer (acceptable in size to the California Department of Fish and Wildlife [CDFW]) around active protected bird and/or raptor nests during the breeding season, or until it is determined that all young have fledged. Typical buffers include 500 feet for raptors and 50 feet for passerine nesting birds. The size of these buffer zones and types of construction activities restricted in these areas may be further modified during consultation with CDFW, and it will be based on existing noise and human disturbance levels at the project site. Nests initiated during construction are presumed to be unaffected, and no buffer will be necessary; however the “take” (e.g., mortality, severe disturbance to) of any individual protected birds will be prohibited. Monitoring of active nests when construction activities encroach upon established buffers may be required by CDFW.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Biological Environment Operation	No impact.	Less than significant impact. Less than significant impacts would result from removal of existing trees and landscaping. Build Alternative 2 would result in the removal of some median and sidewalk trees within the project limits. Replacement trees would be planted. Benefits of mature tree canopies would be reduced until new plantings mature, and replacement trees would not offer the same width canopy of many existing trees due to the OCS clearance requirements. The project would offset these impacts by planting more trees in the Van Ness corridor than currently present, resulting in less than significant impacts. *Improvement Measures:* Potential disturbance to migratory birds during project construction and tree removal is discussed in Section 4.15.11, Construction Impacts. To minimize impacts from removal of existing trees and	Less than significant impact. Same as Build Alternative 2. Replacement trees would be planted in the median. Sidewalk trees would not be affected under this alternative. Benefits of mature tree canopies would be reduced until new plantings mature, and replacement trees would not offer the same width canopy of many existing trees due	Less than significant impact. Same as Build Alternative 3.	Less than significant impact Build Alternative 4 would result in the removal of approximately 64 median trees, or 15 percent of median trees within the project limits. Sidewalk trees would not be affected.	Less than significant impact. Same as Build Alternative4.	Less than significant impact. The LPA would result in the removal of approximately 90 median trees, or 82 percent of median trees within the project limits. Approximately 95 new median trees

1 The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		landscaping, the following improvement measures and permit requirements would be incorporated into project design for each build alternative, including Design Option B: **IM-BI-1:** In compliance with local tree protection policies, mature trees shall be preserved and incorporated into the project landscape plan as feasible. Planting of replacement trees and landscaping will be incorporated into the landscape plan as feasible (also refer to mitigation measure M-AE-3, addressing aesthetic/visual impacts). **IM-BI-2:** A certified arborist will complete a preconstruction tree survey to identify protected trees that will be potentially impacted by the proposed project, and to determine the need for tree removal permits and tree protection plans under San Francisco Public Works Code requirements. **IM-BI-3:** In compliance with the Executive Order on Invasive Species, E.O. 13112, the landscaping included in the proposed project would not use species listed as noxious weeds.	to the OCS clearance requirements. The project would offset these impacts by planting more trees in the Van Ness corridor than currently present, and implementation of Improvement Measures IM-BI-1, IM-BI-2 and IM-BI-3 listed under Build Alternative 2, resulting in less than significant impacts.		Replacement trees would be planted. Benefits of mature tree canopies would be reduced until new plantings mature, and replacement trees would not offer the same width canopy of many existing trees due to the OCS clearance requirements. The project would offset these impacts by planting more trees in the Van Ness corridor than currently present, and implementation of Improvement Measures IM-BI-1, IM-BI-2 and IM-BI-3 listed under Build Alternative 2, resulting in less than significant impacts.		would be planted. Sidewalk trees would not be affected. Benefits of mature tree canopies would be reduced until new plantings mature, and replacement trees would not offer the same width canopy of many existing trees due to the OCS clearance requirements. The project would offset these impacts by planting more trees in the Van Ness corridor than currently present, and implementation of Improvement Measures IM-BI-1, IM-BI-2 and IM-BI-3 listed under Build Alternative 2, resulting in less than significant impacts.
<u>Biological Environment Cumulative</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>
Cultural Resources <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Less than significant impacts would occur to significant historic and architectural properties. Excavation work would occur within the Van Ness Avenue ROW, where there is a low probability of uncovering significant archaeological deposits. Implementation of mitigation measures is required to address potential impacts to archaeological resources and human remains that may be encountered during project construction. *Mitigation Measures:* **M-CP-C1:** Focused archival research will identify specific areas within the APE that are likely to contain potentially significant remains. Methods and findings will be documented as an addendum to the 2009 survey and sensitivity assessment (Byrd *et al.,* 2013). Research will be initiated once the project's APE map is finalized identifying the major Areas of Direct Impact (i.e., the stations and sewer relocation). Many documents, maps, and drawings cover long stretches of Van Ness Avenue, while other locations may be researched if documents indicate potential sensitivity in adjacent areas. The Addendum Survey Report will include the following: • A contextual section that addresses the development of urban infrastructure along Van Ness Avenue, as well as widening and grading activities along the thoroughfare. This overview will provide a basis for evaluating potential resources as they relate to the history of San Francisco and to its infrastructure. • Documentary research that identifies the types of documents available for the identified station locations: street profiles for grading, street widening maps showing demolished building sites, utility work plans, and others as appropriate. This will include researching various archives and records of public agencies in both San Francisco and Oakland (Caltrans).	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.

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Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		• Locations apt to have historic remains present within select areas of the APE (i.e., not removed by later grading or construction). • A cut-and-fill reconstruction of the entire APE corridor, comparing the modern versus mid-1800s ground surface elevations, to fine-tune the initial prehistoric sensitivity assessment, and refine the location of high-sensitivity locations where prehistoric remains may be preserved. • Relevant profiles and plan views of specific blocks to illustrate the methods used in analyzing available documentation. • Summary and conclusions to provide detailed information on locations that have the potential to contain extant prehistoric archaeological and historic-era remains that might be evaluated as significant resources, if any. Two results are possible based on documentary research: • No or Low Potential for Sensitive Locations – Major Areas of Direct Impact have no potential to retain extant archaeological remains that could be evaluated as significant resources. No further work would be recommended, beyond adherence to the Inadvertent Discovery Plan (M-CP-3). • Potentially Sensitive Locations – If the major Areas of Direct Impact contain locations with a moderate to high potential to retain extant historic or prehistoric archaeological remains that could be evaluated as significant resources, further work would be carried out, detailed in a Testing and Treatment Plan (see M-CP-2). The Phase I addendum report will be submitted to the SHPO for review and concurrence prior to initiation of construction. **M-CP-C2:** The Testing/Treatment plan, if required, would provide archaeological protocols to be employed immediately prior to project construction to test areas identified as potentially significant or having the potential to contain buried cultural resources. If such areas might be unavoidable, mitigation measures would be proposed. For historic-era resources, work would initially entail detailed, focused documentary research to evaluate the potential significance of any archaeological material identified during initial research that might be preserved. Significance would be based on the data-potential of possible remains applied to accepted research designs. Two results could ensue: • No Potentially Significant Remains. If no locations demonstrate the potential for significant remains, no further archaeological testing would be recommended. • Potentially Significant Remains. If any locations have the potential to contain significant remains, then appropriate field methods will be proposed, including compressed testing and data-recovery efforts. Testing will be initiated immediately prior to construction, when there is access to historic ground levels. • Should a site or site feature be found and evaluated as potentially significant, mitigation in the form of data recovery will take place immediately upon discovery should avoidance of the site not be possible. If required for prehistoric resources, a Treatment Plan would identify relevant research issues for resource evaluation, and pragmatic field methods to identify, evaluate, and conduct data recovery if needed. This could include a pre-construction geoarchaeological coring program or a compressed three-phase field effort occurring prior to construction, when the ground surface is accessible. The procedures detailed in the Treatment Plan would be finalized in consultation with the SHPO. A Phase 2 Test/Phase 3 Mitigation report will document all testing and data-recovery excavation methods and findings. **M-CP-C3:** If buried cultural resources are encountered during construction activities, pursuant to 36 CFR 800.13, construction would be halted and the discovery area isolated and secured until a qualified professional archaeologist assesses the nature and significance of the find. Unusual, rare, or unique finds—particularly artifacts or features not found during data recovery—could require additional study. Examples of these would include the following: • Any bone that cannot immediately be identified as non-human • Any types of intact features (e.g., hearths, house floors, cache pits, structural foundations) • Artifact caches or concentrations					

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		• Rare or unique items (i.e., engraved or incised stone or bone, beads or ornaments, mission-era artifacts) • Archaeological remains that are redundant with materials collected during testing or data recovery and that have minimal data potential need not be formally investigated. This could include debitage; most flaked or ground tools, with the exception of diagnostic or unique items (e.g., projectile points, crescents); shell; non-human bone; charcoal; and other plant remains. • Diagnostic and unique artifacts unearthed during construction would be collected and their origins noted. Artifact concentrations and other features would be photographed, flotation/soils/radiocarbon samples taken (as appropriate), and locations mapped using a GPS device. Upon discovery of deposits that may constitute a site, the agency official shall notify the State Historic Preservation Officer (SHPO) and any Indian tribe that might attach religious and cultural significance to the affected property. The notification shall describe the agency official's assessment of National Register eligibility of the property and proposed actions to resolve the adverse effects (if any). The SHPO, Indian tribe, and Advisory Council on Historic Preservation (the Council) shall respond within 48 hours of the notification. The agency official shall take into account their recommendations regarding National Register eligibility and proposed actions, and then carry out appropriate actions. The agency official shall provide the SHPO, Indian tribe, and the Council a report of the actions when they are completed. The above activities could be carried out quickly and efficiently, with as little delay as possible to construction work. The methods and results of any excavations would be documented, with photographs, in an Addendum Report. Any artifacts collected would be curated along with the main collection. Samples would be processed in a lab and analyzed, or curated with the collection for future studies, at the discretion of the project proponent. If major adjustments are made to the final project design, a qualified professional archaeologist should be consulted before work begins, to determine whether additional survey, research, and/or geoarchaeological assessments are needed. M-CP-C4: If human remains are discovered during project construction, the stipulations provided under Section 7050.5 of the State Health and Safety Code will be followed. The San Francisco County coroner would be notified as soon as is reasonably possible (CEQA Section 15064.5). There would be no further site disturbance where the remains were found, and all construction work would be halted within 100 feet of the discovery. If the remains are determined to be Native American, the coroner is responsible for contacting the California Native American Heritage Commission within 24 hours. The Commission, pursuant to California Public Resources Code Section 5097.98 would notify those persons it believes to be the most likely descendants (MLD). Treatment of the remains would be dependent on the views of the MLD. [LP1]					
Cultural Resources <u>Operation</u>	<u>No impact.</u>	<u>Less than significant impact.</u> Less than significant impacts would occur to significant historic and architectural properties. No impacts to archaeological resources would result during project operation. Mitigation measures M-AE-2, M-AE-3, M-AE-5, and M-AE-6, presented in Section 4.4.4 and in this table under Aesthetics/Visual Resources, ensure compatibility of the BRT project with historic elements such as the Civic Center Historic District.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.
Cultural Resources <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u> Same as Build Alternative 2.	<u>No cumulative impacts.</u> Same as Build Alternative 2.	<u>No cumulative impacts.</u> Same as Build Alternative 2.	<u>No cumulative impacts.</u> Same as Build Alternative 2.	<u>No cumulative impacts.</u> Same as Build Alternative 2.
Section 4(f) Resources <u>Construction</u>	<u>No direct or constructive use.</u>	<u>No direct or temporary use.</u> Project construction would not result in direct or constructive use of Section 4(f) resources.	<u>No direct or constructive use.</u> Same as Build Alternative 2.	<u>No direct or constructive use.</u> Same as Build Alternative 2.	<u>No direct or constructive use.</u> Same as Build Alternative 2.	<u>No direct or constructive use.</u> Same as Build Alternative 2.	<u>No direct or constructive use.</u> Same as Build Alternative 2.
Section 4(f) Resources <u>Operation</u>	<u>No direct or constructive use.</u>	<u>No direct or constructive use.</u> The proposed project would not result in direct use or constructive use of Section 4(f) resources.	<u>No direct or constructive use.</u> Same as Build Alternative 2.	<u>No direct or constructive use.</u> Same as Build Alternative 2.	<u>No direct or constructive use.</u> Same as Build Alternative 2.	<u>No direct or constructive use.</u> Same as Build Alternative 2.	<u>No direct or constructive use.</u> Same as Build Alternative 2.

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Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Section 4(f) Resources Cumulative	No impact.	No impact.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.
Geology/Soils/ Seismicity/ Topography Construction	No impact.	Less than significant impact with mitigation. Mitigation measures are required to avoid slope instability impacts during project construction. *Mitigation Measures:* M-GE-C1: All cuts deeper than 5 feet must be shored (AGS, 2009a). Shoring design of open excavations must be completed in consideration of the surcharge load from nearby structures, including an examination of the potential for lateral movement of the excavation walls as a result. The following construction BMPs related to shoring and slope stability will be implemented: • Heavy construction equipment, building materials, excavated soil, and vehicle traffic shall be kept away from the edge of excavations, generally a distance equal to or greater than the depth of the excavation. • During wet weather, storm runoff shall be prevented from entering the excavation. Excavation sidewalls can be covered with plastic sheeting, and berms can be placed around the perimeter of the excavated areas. • Sidewalks, slabs, pavement, and utilities adjacent to proposed excavations shall be adequately supported during construction.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Geology/Soils/ Seismicity/ Topography Operation	No impact.	No impact. The project would not result in soil erosion, and project design would avoid potential seismic hazards. There are no substantial geologic hazard impacts that would not be fully addressed by design requirements. *Improvement Measures:* IM-GE-1: Localized soil modification treatments will be performed as needed at locations where station platforms would be located in areas of fill or areas mapped as a liquefaction area. Such soil modification may include soil vibro-compaction or permeation grouting. IM-GE-2: Fill soils will be overexcavated and replaced with engineered fill as needed in areas where proposed project structures would be located in areas of fill or in liquefaction zones. IM-GE-3: Deeper foundations will be designed for station platforms and canopies located in areas of fill or areas mapped as a liquefaction area, as needed.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.
Geology/Soils/ Seismicity/ Topography Cumulative	No cumulative impacts.	No cumulative impacts.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.
Hazardous Waste/ Materials Construction	No impact.	Less than significant impact with mitigation. Mitigation measures are required to avoid and minimize hazardous materials exposure during project construction. *Mitigation Measures:* M-HZ-C1: A Worker Site Health and Safety Plan will be created with the following components, in response to potential recognized environmental conditions (RECs) identified in the Phase II review or other follow-up investigations, and results from preconstruction lead-based paint LBP and aerially deposited lead (ADL) surveys specified in Sections 4.8.3 and 4.8.4: • A safety and health risk/hazards analysis for each site task and operation in the work plan; • Employee training assignments; • Personal protective equipment requirements; • Medical surveillance requirements; • Air monitoring, environmental sampling techniques, and instrumentation; • Safe storage and disposal measures for encountered contaminated soil, groundwater, or debris, including temporary storage locations, labeling, and containment procedures. • Emergency response plan; and	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.

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		• Spill containment program. **M-HZ-C2:** Procedures will be included in the project Storm Water Pollution Prevention Plan (SWPPP) to contain any possible contamination, including protection of storm drains, and to prevent any contaminated runoff or leakage either into or onto exposed ground surfaces, as specified in Section 4.15.8, Hydrology and Water Quality Construction Impacts. **M-HZ-C3:** Necessary public health and safety measures will be implemented during construction.					
Hazardous Waste/ Materials Operation	No impact.	Less than significant impact with mitigation. Mitigation measures are required to reduce or eliminate hazardous materials-related impacts from ADL, LBP and nearby database listed, hazardous materials sites. *Mitigation Measures:* **M-HZ-1:** Phase II review, or follow-up investigation, for identified recognized environmental conditions (RECs) will be conducted prior to construction, including: • Field surveys of identified RECs to verify the physical locations of the REC sites with respect to the preferred build alternative project components and proposed construction earthwork, and observe the current conditions of the sites. • A regulatory file review for each identified REC to determine the current status of the sites and, if possible, the extent of the contamination. If the aforementioned field survey and file review reveal a likelihood of encountering contaminated soil or groundwater during project construction, then a subsurface exploration will be conducted within the areas proposed for construction earthwork activities. The subsurface investigation will be conducted within the project limits, adjacent to, or downgradient from the REC sites. If soil profiling reveals contaminant concentrations that meet the definition of hazardous materials, then the project contractor will be required to address the management of various hazardous materials and wastes in the Construction Implementation Plan, consistent with the federal and state of California requirements pertaining to hazardous materials and wastes management. **M-HZ-2:** Soils in landscaped medians that will be disturbed by project activities will be tested for ADL according to applicable hazardous material testing guidelines. If the soil contains extractible lead concentrations that meet the definition of hazardous materials, then a Lead Compliance Plan to be approved by Caltrans will be required prior to the start of construction or soil-disturbance activities. If lead levels present in surface soils reach concentrations in excess of the hazardous waste threshold, then onsite stabilization or disposal at a Class 1 landfill may be required, which will be specified in the Lead Compliance Plan. **M-HZ-3:** Paint used for traffic lane striping and on streetscape features, including the OCS support poles/streetlights, will be tested for LBP prior to demolition/removal to determine proper handling and disposal methods during project construction. If lead is detected, then appropriate procedures will be included in the Construction Implementation Plan to avoid contact with these materials or generation of dust or vapors.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Hazardous Waste/ Materials Cumulative	No cumulative impacts.	Less than significant impact with mitigation. Mitigation Measures M-HZ-C1 through M-HZ-C3 would avoid significant, cumulative impacts from hazardous materials exposure during construction of the proposed project and other planned projects in the vicinity.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Water Quality and Hydrology Construction	No impact.	Less than significant impacts. Compliance with permit requirements and standard best practices would avoid significant impacts to water quality during construction. *Improvement Measures:* **IM-HY-C1:** Preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) during project construction will minimize or avoid significant impacts to water quality. Completion of an SWPPP for the National Pollutant Discharge Elimination System (NPDES) General Permit will be required for construction of each build alternative and for earthwork activities under the No Build Alternative, such as the OCS support pole/streetlight replacement and repaving activities. The SWPPP will address water quality impacts associated with construction activities, including identification of all drainage facilities	Less than significant impacts. Same as Build Alternative 2.	Less than significant impacts. Same as Build Alternative 2.	Less than significant impacts. Same as Build Alternative 2.	Less than significant impacts. Same as Build Alternative 2.	Less than significant impacts. Same as Build Alternative 2.

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		onsite, placement of appropriate stormwater and non-stormwater pollution controls and best management practices (BMPs), erosion and sediment control, spill response and containment plans, inspection scheduling, maintenance, and training of all construction personnel onsite. The SWPPP will specify how construction-related stormwater impacts can be mitigated throughout the project site through practices such as: • The appropriate treatment of overflow stormwater during construction, including inlet protection devices, temporary silt fencing, soil stabilization measures, street sweeping, stabilized construction entrances, and temporary check dams. • Lining storage areas. • Proper and expeditious disposal of items to be removed, such as landscaping, curb bulb waste, existing bus stop shelters, and demolished OCS support poles/streetlights and signal poles. IM-HY-C2: Any construction work that impacts the combined sewer system (CSS) will require coordination with the San Francisco Public Utilities Commission (SFPUC), and construction-related activities shall conform to the "Keep it on Site" guide (SFPUC, 2009). IM-HY-C3: If groundwater is encountered during project excavation activities, the water will be pumped from the excavated area and contained and treated in accordance with all applicable State and federal regulations before being discharged to the existing local CSS. A batch discharge permit from SFPUC will be required prior to commencement of discharge to the CSS.					
Water Quality and Hydrology <u>Operation</u>	<u>No impact.</u>	<u>No impact.</u> The project would slightly increase pervious surface area and improve drainage and runoff water quality. *Improvement Measures:* IM-HY-1: Landscape areas provided by the project will be designed to minimize and reduce total runoff. The overuse of water and/or fertilizers on landscaped areas will be avoided. IM-HY-2: Opportunities to incorporate stormwater management tools set forth in the *San Francisco Better Streets Plan* will be investigated for implementation as project design progresses. Streetscape geometry, topography, soil type and compaction, groundwater depth, subsurface utility locations, building laterals, maintenance costs and safety, and pedestrian accessibility will be major considerations in determining the feasibility of implementing stormwater management tools. Permeable paving, infiltration planters, swales, and rain gardens will be considered. IM-HY-3: In compliance with the City Integrated Pest Management Policy (City Municipal Code, Section 300), prevention and non-chemical control methods will be employed in maintaining landscaping in the Van Ness Avenue corridor, including monitoring for pests before treating, and using the least-hazardous chemical pesticides, herbicides, and fertilizers only when needed and as a last resort. IM-HY-4: Proposed BRT stations will be equipped with trash receptacles to minimize the miscellaneous waste that may enter the storm drain system and clog storm drains or release pollutants.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Water Quality and Hydrology <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>Less than significant impact.</u> Compliance with permit requirements and standard best practices would avoid significant cumulative impacts to water quality during construction of the proposed project and other planned projects in the vicinity.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.
Land Use <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impact.</u> Construction would not change land uses or displace properties. Construction planning would minimize nighttime construction in residential areas and daytime construction in retail and commercial areas, as part of the Traffic Management Plan (TMP) implementation. The temporary removal of colored parking spaces during project construction is discussed under Community Impacts – Construction, below.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.
Land Use <u>Operation</u>	<u>No impacts</u>	<u>No impacts</u>	<u>No impacts</u>	<u>No impacts</u>	<u>No impacts</u>	<u>No impacts</u>	<u>No impacts</u>
Land Use <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>

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ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Noise and Vibration <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impacts.</u> Increases in noise and vibration at some locations would be temporary and are thus considered a less than significant impact. Project construction would comply with the City Noise Ordinance. *Improvement Measures:* Mitigation measure M-CI-C6 presented in Section 4.15 and in this table under Community Impacts provides a program for accepting and addressing noise and other complaints during project construction. To further reduce noise and vibration impacts during construction, the following best practices, identified as improvement measures, would be implemented: IM-NO-C1: Project construction will implement best practices in equipment noise and vibration control as feasible, including the following: • Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding). • Perform all construction in a manner that minimizes noise and vibration. Utilize construction methods or equipment that will provide the lowest level of noise and ground vibration impact. • Turn off idling equipment. • When possible, limit the use of construction equipment that creates high vibration levels, such as vibratory rollers and hammers. When such equipment must be used within 25 feet of any existing building, select equipment models that generate lower vibration levels. • Restrict the hours of vibration-intensive equipment or activities, such as vibratory rollers, so that annoyance to residents is minimal (e.g., limit to daytime hours as defined in the noise ordinance). IM-NO-C2: Project construction will conduct truck loading, unloading, and hauling operations so that noise and vibration are kept to a minimum by carefully selecting routes to avoid passing through residential neighborhoods to the greatest possible extent. IM-NO-C3: Perform independent noise and vibration monitoring in sensitive areas as needed to demonstrate compliance with applicable noise limits. Require contractors to modify and/or reschedule their construction activities if monitoring determines that maximum limits are exceeded at residential land uses per the City Noise Ordinance. IM-NO-C4: The construction contractor will be required by contract specification to comply with the City noise ordinances and obtain all necessary permits, particularly in relation to nighttime construction work.	<u>Less than significant impacts.</u> Same as Build Alternative 2.	<u>Less than significant impacts.</u> Same as Build Alternative 2.	<u>Less than significant impacts.</u> Same as Build Alternative 2.	<u>Less than significant impacts.</u> Same as Build Alternative 2.	<u>Less than significant impacts.</u> Same as Build Alternative 2.
Noise and Vibration <u>Operation</u>	<u>No impact.</u>	<u>No impact.</u> BRT operation would not increase noise and vibration; it would operate a less noisy fleet of diesel-electric hybrid and electric-powered vehicles than exists today. Noise levels along Van Ness Avenue and the parallel Franklin and Gough streets would remain below FTA and Caltrans impact criteria. *Improvement Measure:* IM-NO-1: Upkeep of roadway surface will be maintained throughout project operation to avoid increases in BRT noise and vibration levels.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Noise and Vibration <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>Less than significant impact.</u> Control measures IM-NO-C1 through IM-NO-C4 would be implemented to minimize noise and vibration disturbances at sensitive areas during construction. Project construction would comply with the City Noise Ordinance to avoid significant impacts during construction of the proposed project and other planned projects in the vicinity. Construction phasing would be coordinated with these projects to minimize construction-related impacts to sensitive receptors.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.
Population and Housing/Growth <u>Construction</u>	<u>No impact.</u>	<u>No impact.</u> Project construction would not lead to unplanned growth in the Van Ness Avenue corridor or the larger region, nor would it displace housing.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.

1 The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Population and Housing/Growth Operation	No impact.	No impact. The project would not lead to unplanned growth in the Van Ness Avenue corridor or larger region, nor would it displace housing.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.
Population and Housing/Growth Cumulative	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.
Public Services Construction	No impact.	Less than significant impact with mitigation. Less than significant impacts to public services would result from construction activities, such as temporary rerouting and loss of on-street parking. No sidewalk closures would be required. These impacts would cause temporary inconvenience to area residents, businesses, and people traveling through the corridor. Mitigation measures M-CI-C1 through M-CI-C7, described in this table under Community Impacts, would minimize impacts to Civic Center facilities and other public services during project construction.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Public Services Operation	No impact.	No impact. The BRT would not result in the need for new or physically altered governmental facilities and would not hinder service rations and response times. The project would benefit community facilities with improved transit access.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.
Public Services Cumulative	No cumulative impacts.	Less than significant impact with mitigation. Mitigation Measures M-CI-C1 through M-CI-C7, described in this table under Community Impacts, would lessen potentially significant, cumulative impacts to community facilities and government services during construction of the proposed project and other planned projects in the vicinity.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Transportation and Circulation Construction	No impact.	Less than significant impact with mitigation. Circulation impacts during construction due to lane closures, short-term detours, and reduced speeds would be temporary and are considered a less than significant impact with implementation of mitigation measures. All construction activity will be carried out in compliance and accordance with the California Manual on Uniform Traffic Control Devices (MUTCD), and applicable regulations of the SFPUC and San Francisco Department of Public Works (SFDPW) Bureau of Street Use and Mapping (BSM), and SFMTA Regulations for Working in San Francisco Streets Blue Book. *Mitigation Measures:* M-TR-C1: Temporary conversion of parking lanes to mixed-flow traffic lanes will be implemented to generally maintain two open traffic lanes in each direction and minimize traffic impacts. M-TR-C2: A contraflow lane system, including elimination of left turns in either direction along Van Ness Avenue, will be implemented during daytime construction under Build Alternative 2 to enable two lanes of mixed-flow traffic to generally remain open in each direction during construction and minimize traffic congestion on Van Ness Avenue. Appropriate signage and temporary traffic signals will be used to guide drivers, augmented by flagmen as needed. M-TR-C3: Plan required closures of a second mixed-flow traffic lane and detours for nighttime or off-peak traffic hours as feasible, and as in conformance with approved noise requirements. M-TR-C4: Maintain one east-west and north-south crosswalk leg open at all times at all intersections. M-TR-C5: Install sufficient barricading, signage, and temporary walkways as needed to minimize impacts to pedestrians and bicyclists. M-TR-C6: SFMTA will coordinate with GGT as part of the Transportation Management Plan (TMP) to plan temporarily relocated transit stops as needed, and minimize impacts to GGT service. M-TR-C7: Implement a TMP to minimize delay and inconvenience to the traveling public, including a public information program and wayfinding to provide local businesses and residents with information related to the construction activities and durations, temporary traffic closures and detours, parking restrictions, and bus stop relocations.	Less than significant impact with mitigation. Same as Build Alternative 2, except a contraflow lane system would not be required for Build Alternative 3; therefore, Mitigation Measure M-TR-C2 would not apply.	Less than significant impact with mitigation. Same as Build Alternative 3 without Design Option B.	Less than significant impact with mitigation. Same as Build Alternative 3.	Less than significant impact with mitigation. Same as Build Alternative 3 with Design Option B.	Less than significant impact with mitigation. Same as Build Alternative 3.

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Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Transportation and Circulation Operation	No impact.	Significant impact (to traffic) The project would not significantly impact traffic conditions on Van Ness Avenue. Traffic congestion on streets parallel to Van Ness Avenue would receive increased traffic that has diverted from Van Ness Avenue. Traffic impact significance findings for the near-term and horizon years follow. Less than significant impact (to traffic). Less than significant vehicular traffic circulation impacts would result in Year 2015 at the following intersection: • Gough/Green • South Van Ness/Mission/Otis and Duboce/Mission/Otis/US 101 Off-Ramp Less than significant vehicular traffic circulation impacts would result in Year 2035 at the following intersections: • Gough/Green • Gough/Clay • Mission/South Van Ness/Otis • Mission/Duboce/Otis/US 101 Off-Ramps • Van Ness/Pine Significant impact (to traffic). [2] Significant impacts that may not be mitigated would result in Year 2015 at the following intersections: • Gough/Hayes • Franklin/O'Farrell Significant impacts that may not be mitigated would result in Year 2035 at the following intersections: • Gough/Hayes • Franklin/Pine • Franklin/O'Farrell • Franklin/Eddy • Franklin/ McAllister *Mitigation Measures* M-Traffic Management Toolbox Develop and implement a traffic management toolbox to raise public awareness of circulation changes; advise drivers of alternate routes; and pedestrian improvements. Toolbox actions will include: • Provide driver wayfinding and signage, especially to assist infrequent drivers of the corridor who may not be aware of alternate routes, such as along the Larkin/Hyde and Franklin/Gough corridors. Coordinate with Caltrans to develop the driver wayfinding and signage strategy as part of mitigation measure M-TR-C5. Continue to monitor traffic after construction and during project operation. • Public Awareness Campaign and Transportation Management Plan (TMP) during and after Project Construction. As discussed as part of mitigation measure M-TR-C7, the TMP will implement a public awareness program of wayfinding during construction and will coordinate the public information program with regional agencies, including Caltrans and GGT. Continue to monitor traffic after construction and during project operation. • Pedestrian Amenities at Additional Corridor Locations. After construction, during project operation, monitor travel in the corridor to identify additional locations for pedestrian improvements based on a combination of pedestrian and vehicle volumes, infrastructure capabilities, and collision history. Less than significant impact (to transit). No significant impacts to transit would result. While one transit line that cross Van Ness Avenue would experience increased delay, this delay would not result in significant impacts to service reliability and travel time. BRT service would substantially improve transit service on Van Ness Avenue. Less than significant impact (to nonmotorized transportation). No significant impacts to nonmotorized travel would result. While transit stop consolidation would	Significant impact (to traffic). [2] The project would not significantly impact traffic conditions on Van Ness Avenue. Traffic congestion on streets parallel to Van Ness Avenue would receive increased traffic that has diverted from Van Ness Avenue. Traffic impact significance findings for the near-term and horizon years follow, including those impacts that are less than significant and those that are significant. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. Less than significant impact (to traffic). Less than significant vehicular traffic circulation impacts would result in Year 2015 at the following intersection: • Gough/Green • Duboce/Mission/Otis/US 101 off-ramp Less than significant vehicular traffic circulation impacts would result in Year 2035 at the following intersections: • Gough/Green • Franklin/Pine • Van Ness/Pine • Mission/Duboce/Otis/US 101 Off-Ramps Significant impact (to traffic). [2] Significant impacts that may not be mitigated to a less than significant level would result in Year 2015 at the following intersections: • Gough/Hayes • Franklin/O'Farrell • Mission/South Van Ness/Otis Significant impacts that may not be mitigated to a less than significant level would result in Year 2035 at the following intersections: • Gough/Sacramento • Gough/ Eddy	Significant impact (to traffic).[2] The project would not significantly impact traffic conditions on Van Ness Avenue. Traffic congestion on streets parallel to Van Ness Avenue would receive increased traffic that has diverted from Van Ness Avenue. Also, the elimination of all but two left turn opportunities off of Van Ness Avenue will result in an increase in drivers making multiple right turns in the project vicinity, causing some additional traffic on these adjacent collector streets. Traffic impact significance findings for the near-term and horizon years follow, including those impacts that are less than significant and those that are significant. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. Less than significant impact (to traffic). Less than significant vehicular traffic circulation impacts would result in Year 2015 at the following intersection: • Gough/Green • South Van Ness/Mission/Otis • Duboce/ Mission/ Otis/US 101 Off-Ramp Less than significant vehicular traffic circulation impacts would result in Year 2035 at the following intersections: • Gough/Green • Gough/Clay • Franklin/Pine • Mission/Duboce/Otis/US 101 Off-Ramps Significant impact (to traffic).[2] Significant impacts that may not be mitigated to a less than significant level will	Significant impact (to traffic). [2]Same as Build Alternative 3 without Design Option B. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. Less than Significant Impact (to traffic). Same as Build Alternative 3. Significant impact. [2] Same as Build Alternative 3. Less than significant impact with mitigation (to transit). Same as Build Alternative 3 without Design Option B. Same as Build Alternative 3 without Design Option B. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 3 without Design Option B, in addition to the following improvement measures: IM-NMT-2: For Build Alternative 4, bus vehicle design should incorporate an intuitive seating space for users requiring level boarding that is easily accessible to both the front door on the right side and the door behind the operator on the left side. IM-NMT-3: For Build Alternative 4, bus vehicle design should incorporate audible cues, such as stop	Significant impact (to traffic). [2] The project would not significantly impact traffic conditions on Van Ness Avenue. Traffic congestion on streets parallel to Van Ness Avenue would receive increased traffic that has diverted from Van Ness Avenue. Also, the elimination of all but two left turn opportunities off of Van Ness Avenue will result in an increase in drivers making multiple right turns in the project vicinity, causing some additional traffic on these adjacent collector streets. Traffic impact significance findings for the near-term and horizon years follow, including those impacts that are less than significant and those that are significant. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. Less than Significant Impact (to traffic). Same as Build Alternative 3 with Design Option B. Significant impact (to traffic). [2] Same as Build Alternatives 3 with Design Option B. Less than significant impact with mitigation (to transit). Same as Build	Significant impact (to traffic). [2] Same as Build Alternative 3 without Design Option B. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. Less than Significant Impact (to traffic). Same as Build Alternative 3 with Design Option B. Significant impact (to traffic). [2] Same as Build Alternative 3 with Design Option B. Less than significant impact with mitigation (to transit). Same as Build Alternative 3 without Design Option B. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 3 without Design Option B. Less than significant impact (to parking). Same as Build Alternative 2, except 105 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.

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2 These types of mitigation measures, while reducing localized traffic delays in the short term, may ultimately be found by the Authority Board to not be feasible due to policy conflicts, specifically the need to balance traffic circulation with pedestrian and transit circulation and safety. In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand. Thus, a conservative worst-case finding of significant and unavoidable impact under CEQA is assumed (see Section 3.3.4).

Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		increase the physical effort required to reach transit for some patrons relative to existing conditions, the average distances between stops are consistent with applicable Muni guidelines for rapid bus and light rail, and the project would offer pedestrian accessibility and safety benefits. The proposed project would not substantially change or degrade bicycle conditions. *Improvement Measures:* IM-NMT-1: Include comprehensive wayfinding, allowing all users to navigate to and from the correct platform. IM-NMT-4: Provide sufficient information to educate less-ambulatory passengers that board at BRT stations that they would need to exit through the front, right doors for stops outside the Van Ness Avenue corridor. Less than significant impact (to parking). The project would not have a significant impact on the transportation system from changes in parking supply. Build Alternative 2 would remove 33 parking spaces along Van Ness Avenue. *Improvement Measures:* IM-TR-1: On-street parking will be created where bus stops are consolidated or moved to the center of the street. IM-TR-2: Additional on-street parking will be provided where feasible by lane striping. IM-TR-3: Infill on-street parking spaces will be provided where they do not exist today as feasible. IM-TR-4: SFMTA will give priority to retaining color-painted on-street parking spaces, such as yellow freight zones white passenger loading zones, green short-term parking, and blue disabled parking. IM-TR-5: Blue handicapped parking spaces will be designed to provide a curb ramp behind each space.	• Gough/Hayes • Franklin/O'Farrell • Franklin/Eddy • Franklin/McAllister • Van Ness/Hayes • South Van Ness/Mission/Otis Less than significant impact with mitigation (to transit). A potentially significant impact to transit service could occur in year 2035 due to vehicle crowding. The following mitigation measure is required to reduce this impact to less than significant: M-TR-1: An additional vehicle will be added to the fleet as needed to provide additional service and reduce station vehicle crowding impacts. Less than significant impact (to transit) While some transit lines that cross Van Ness Avenue would experience some increased delay, this delay would not result in significant impacts to service reliability and travel time. BRT service would substantially improve transit service on Van Ness Avenue. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 2. Less than significant impact (to parking). Same as Build Alternative 2, except 68 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.	result in Year 2015 at the following intersections: • Gough/Hayes • Franklin/O'Farrell • Franklin/Market/Page Significant impacts that may not be mitigated to a less than significant level would result in Year 2035 at the following intersections: • Gough/Sacramento • Gough/Eddy • Gough/Hayes • Franklin/O'Farrell • Franklin/Eddy • Franklin/McAllister • Franklin/Market/Page • Mission/South Van Ness/Otis Less than significant impact with mitigation (to transit). Same as Build Alternative 3 without Design Option B. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 3 without Design Option B. Less than significant impact (to parking). Same as Build Alternative 2, except 31 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.	announcements, of which door will open to avoid any confusion for passengers. Less than significant impact (to parking). Same as Build Alternative 2, except 45 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.	Alternative 3 without Design Option B. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 4 without Design Option B. Less than significant impact (to parking). Same as Build Alternative 2, except 13 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.	
Transportation and Circulation Cumulative	No cumulative impacts.	Less than significant impact with mitigation. Mitigation Measures M-TR-C1 through M-TR-C7 would lessen significant, cumulative circulation impacts during construction of the proposed project and other planned projects in the vicinity. These impacts would be temporary and are thus considered less than significant with mitigation. Cumulative circulation impacts during operation of the proposed project and other planned projects in the vicinity are accounted for in the Operations section.	Less than significant impact with mitigation. Same as Build Alternative 2, except a contraflow lane system would not be required for Build Alternative 3; therefore, Mitigation Measure M-TR-C2 would not apply.	Less than significant impact with mitigation. Same as Build Alternative 3 without Design Option B.	Less than significant impact with mitigation. Same as Build Alternative 3.	Less than significant impact with mitigation. Same as Build Alternative 3 with Design Option B.	Less than significant impact with mitigation. Same as Build Alternative 3 with Design Option B.

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2 These types of mitigation measures, while reducing localized traffic delays in the short term, may ultimately be found by the Authority Board to not be feasible due to policy conflicts, specifically the need to balance traffic circulation with pedestrian and transit circulation and safety. In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand. Thus, a conservative worst-case finding of significant and unavoidable impact under CEQA is assumed (see Section 3.3.4).[3]

Table S-1: Summary of Environmental Impacts and Mitigation Measures

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Utilities and Service Systems <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impact.</u> Compliance with standard procedures will minimize the potential for damage to utilities, injury to construction workers, and proper completion of construction work. *Improvement Measures:* IM-UT-C1: Construction work involving utilities will be conducted in accordance with contract specifications, including the following requirements: • Obtain authorization from utility provider before initiating work • Contact Underground Service Alert in advance of excavation work to mark-out underground utilities • Conduct investigations, including exploratory borings if needed, to confirm the location and type of underground utilities and service connections • Prepare a support plan for each utility crossing detailing the intended support method • Take appropriate precautions for the protection of unforeseen utility lines encountered during construction • Restore or replace each utility as close as planned and work with providers to ensure its location is as good or better than found prior to removal	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.
Utilities and Service Systems <u>Operation</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Operation would not result in changes to utility demand and capacity. Some utilities would require relocation or modification for construction and to maintain access for utility providers to conduct maintenance, repair, and upgrade/replacement activities. These would result in less than significant impacts to utilities and service systems. Mitigation measures are required to avoid adverse impacts to utility systems and services. *Mitigation Measures:* M-UT-1: BRT construction will be closely coordinated with concurrent utility projects planned within the Van Ness Avenue corridor. M-UT-3: During planning and design, consideration must be given to ensure that the proposed BRT transitway and station facilities do not prevent access to the underground auxiliary water supply service (AWSS) lines. There must be adequate access for specialized trucks to park next to gate valves for maintenance. The gate valves must not be located beneath medians or station platforms. M-UT-4: In situations where utility facilities cannot be relocated, SFMTA will create a plan to accommodate temporary closure of the transitway and/or stations in coordination with utility providers to allow utility providers to perform maintenance, emergency repair, and upgrade/replacement of underground facilities that may be located beneath project features such as the BRT transitway, station platforms, or curb bulbs. Signage for BRT patrons and safety protocols for Muni operators and utility providers will be integrated into this plan.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2, except the following additional mitigation measure would also be required: M-UT-2: An inspection and evaluation of the sewer pipeline within the project limits will be undertaken to assess the condition of the pipeline and need for replacement. Coordination with SFPUC and SFDPW will continue and be tracked by Committee for Utility Liaison on Construction and Other Projects (CULCOP).	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3 without Design Option B.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3 with Design Option B.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3.
Utilities and Service Systems <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>Less than significant impact with mitigation.</u> Mitigation Measure M-UT-C1 would avoid significant cumulative impacts to utilities during construction of the proposed project and other planned projects in the vicinity.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.
Community Impacts <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Less than significant impacts on the community would result from construction activities, such as temporary rerouting and loss of parking; these impacts would cause temporary inconvenience to area residents, businesses, and people traveling through the corridor. Construction phase impacts to the community will be mitigated with special provisions to control rerouting, noise and fugitive dust. The temporary removal of colored parking spaces during project construction would be addressed by M-CI-IM-1 (see Community Impacts Operation). *Mitigation Measures:* M-CI-C1: A TMP that includes traffic rerouting, a detour plan, and public information procedures will be developed during the design phase with participation from local agencies, other major project proponents in the area (e.g., CPMC Cathedral Hill, Hayes Two-Way Conversion, and the Geary Corridor BRT projects), local communities, business associations, and affected drivers. Early and well-publicized announcements	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.

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ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		and other public information measures will be implemented prior to and during construction to minimize confusion, inconvenience, and traffic congestion. M-CI-C2: As part of the TMP, construction planning will minimize nighttime construction in residential areas and minimize daytime construction impacts on retail and commercial areas. M-CI-C3: As part of the TMP, construction scheduling and planning in the Civic Center area will take into consideration major civic and performing arts events. M-CI-C4: As part of the TMP public information program, SFMTA will coordinate with adjacent properties along Van Ness Avenue to determine the need for colored parking spaces and work to identify locations for replacement spaces or plan construction activities to minimize impacts from the loss of these spaces. M-CI-C5: As part of the TMP public information program, SFMTA will coordinate with adjacent properties along Van Ness Avenue to ensure that pedestrian access to these properties is maintained at all times. M-CI-C6. As part of the TMP, SFMTA's process for accepting and addressing complaints would be implemented. This includes provision of contact information for the Project Manager, Resident Engineer, and Contractor on project signage with direction to call if there are any concerns. Complaints are logged and tracked to ensure they are addressed. M-CI-C7. As part of the TMP, adequate passenger and truck loading zones will be maintained for adjacent land uses, including maintaining access to driveways and providing adequate loading zones on the same or adjoining street block face.					
Community Impacts <u>Operation</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Mitigation measures are required to minimize economic impacts on properties along Van Ness Avenue from parking removal. *Mitigation Measures:* M-CI-IM-1[3]: SFMTA will coordinate with all businesses that would be affected by removal of colored parking spaces, including short-term parking, to confirm the need for truck and/or passenger loading spaces and to identify appropriate replacement parking locations to minimize the impacts to these businesses. M-CI-IM-2[3]: SFMTA will apply parking management tools as needed to offset any substantial impacts from the loss of on-street parking, including adjustment of residential parking permits in the residential community north of Broadway, or SFpark, which is a package of real-time tools to manage parking occupancy and turnover through pricing (appropriate in areas of high-density commercial uses that rely on high parking turnover).	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.
Community Impacts <u>Cumulative</u>	<u>No cumulative impact.</u>	Cumulative impacts on community related and business activities from the loss of colored on-street parking spaces would be mitigated through the implementation of M-CI-IM-1 and M-CI-IM-2.	Same as Build Alternative 2.	Same as Build Alternative 2.	Same as Build Alternative 2.	Same as Build Alternative 2.	Same as Build Alternative 2.
Environmental Justice <u>Construction</u>	<u>No impact.</u>	<u>No impact.</u> Project construction would not disproportionately affect low income and minority populations.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Environmental Justice <u>Operation</u>	<u>No impact.</u>	<u>No impact.</u> The proposed project would not disproportionately affect low income and minority populations.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Environmental Justice <u>Cumulative</u>	<u>No impact.</u>	<u>No impact.</u>	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.

1 The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.
3 M-CI-IM-1 and M-CI-IM-2 constitute mitigation measures under NEPA and improvement measures under CEQA

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Acronyms and Abbreviations

°F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
AADT	annual average daily traffic
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AC	asphalt concrete
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ADA	Americans with Disabilities Act
ADL	aerially deposited lead
amsl	above mean sea level
ANACRSA	Archaeological and Native American Cultural Resources Sensitivity Assessment
APC	automatic passenger counter
APE	Area of Potential Effects
APS	Alternative Planning Strategy
APS	Accessible Pedestrian Signal
ARRA	American Recovery and Reinvestment Act
ASTM	American Society for Testing and Materials
AT	articulated trolley bus
ATCM	Air Toxics Control Measures
Authority	San Francisco County Transportation Authority
AVL	automatic vehicle location
AWSS	auxiliary water supply service
BAAB	Bay Area Air Basin
BAAQMD	Bay Area Air Quality Management District
BACI	Bay Area Climate Initiatives
BACT	best available control technology
BART	Bay Area Rapid Transit
bgs	below ground surface
BI	No Project Impact
BMPs	Best Management Practices
BMS	Better Market Street Project
BRT	bus rapid transit
BSM	SFDPW Bureau of Street Use and Mapping
BTUs	British Thermal Units

CAA	Clean Air Act
CAAAs	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CAC	Citizens Advisory Committee
CalEPA	California Environmental Protection Agency
California Register	California Register of Historical Resources
Cal-OSHA	California Division of Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CC	cable car
CCAA	California Clean Air Act
CCR	California Code of Regulations
CCSF	City and County of San Francisco
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CER	Conceptual Engineering Report
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CERFA	Community Environmental Response Facilitation Act of 1992
CESA	California Endangered Species Act of 1984
CFGC	California Fish and Game Code
CFR	*Code of Federal Regulations*
CH_4	methane
CHP	California Highway Patrol
CHRIS	California Historical Resources Information Center
CMAQ	Congestion Mitigation and Air Quality
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COZEEP	Construction Zone Enhanced Enforcement Program
CPMC	California Pacific Medical Center
CPUC	California Public Utilities Commission
CRA	California Resources Agency

CRHR	California Register of Historical Resources
CSAA	California State Automobile Association
CSS	combined sewer system
CULCOP	Committee for Utility Liaison on Construction and Other Projects
CWA	Clean Water Act
CWTP	2004 Countywide Transportation Plan
cy	cubic yards
dB	decibel
dBA	A-weighted decibel
DOT	United States Department of Transportation
DPM	diesel particulate matter
DSA	disturbed soil area
EDR	Environmental Database Reports
E.O.	Executive Order
EB	eastbound
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act of 1973
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
fps	feet per second
FR	*Federal Register*
FS	far side of intersection
FTA	Federal Transit Administration
FY	fiscal year
GGBHTD	Golden Gate Bridge, Highway and Transportation District
GGNRA	Golden Gate National Recreation Area
GGT	Golden Gate Transit
GHG	greenhouse gas
GPS	global positioning system
gsf	gross square feet
HAPs	hazardous air pollutants
HCM	Highway Capacity Manual
HOV	high-occupancy vehicle
HPC	Historic Preservation Commission

HPS	Historic Property Survey
HRIER	Historic Resources Inventory and Evaluation Report
HSC	historic street car
HSIP	Highway Safety Improvement Program
IES	Illuminating Engineering Society
IRRS	Interregional Road System
ISA	International Society of Arborculture
ISA	Initial Site Assessment
ISP	iron stone pipe
ITSP	Interregional Transportation Strategic Plan
kV	kilovolt
LBP	lead-based paint
LCFS	low-carbon fuel standard
L_{dn}	day-night average sound pressure level
L_{eq}	equivalent sound pressure level
L_{max}	maximum sound pressure level
LOS	level of service
L_p	sound pressure level
LPA	locally preferred alternative
LRDP	Long-Range Development Plan
LRV	light-rail vehicle
LSI	Less than Significant Impact
LUSTs	leaking underground storage tanks
M	metered
Ma	million years ago
MACT	maximum available control technology
MAPS	Mobility, Access, and Pricing Study
MBTA	Migratory Bird Treaty Act
MC	motor coach
MLD	most likely descendant
MLP	maximum load point
M_{max}	maximum moment magnitude earthquake
MMT	million metric tons
mph	miles per hour
MPO	metropolitan planning organization
MRI	magnetic resonance imaging
MSAT	mobile source air toxics

MTC	Metropolitan Transportation Commission
MTS	Metropolitan Transportation System
MUTCD	Manual on Uniform Traffic Control Devices
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
National Register	National Register of Historic Places
NB	northbound
NEPA	National Environmental Policy Act
NESHAPs	national emissions standards for hazardous air pollutants
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966
NHS	National Highway System
NM	nonmetered
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	naturally occurring asbestos
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOC	Notice of Completion
NOI	Notice of Intent
NOP	Notice of Preparation
NO_X	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPI	No Project Impact
NPS	National Park Service
NRHP	National Register of Historic Places
NS	near side of intersection
NTD	National Transit Database
O_3	ozone
OCS	Overhead Contact System
OHP	Office of Historic Preservation
O&M	operations and maintenance
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Act
Pb	lead
PCBs	polychlorinated biphenyls

PCGA	Project Construction Grant Agreement
PCP	Project Construction Plan
PDAs	Priority Development Areas
PDT	Project Development Team
PG&E	Pacific Gas and Electric
PI	Project Impact
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
POAQC	Projects of Air Quality Concern
ppb	parts per billion
ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
RCP	reinforced concrete pipe
RCRA	Resource Conservation and Recovery Act of 1976
RECs	Recognized Environmental Conditions
RHNA	Regional Housing Needs Allocation
RMS	root mean square
ROD	Record of Decision
ROG	reactive organic gas
ROW	right-of-way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SAR	Strategic Analysis Report
SB	Senate Bill
SB	southbound
SC/PI	Significant Contribution/Project Impact
SCS	Sustainable Communities Strategy
SEL	sound exposure level
SER	Standard Environmental Reference
SEWTP	Southeast Wastewater Treatment Plant
SFCTA	San Francisco County Transportation Authority
SFDPH	San Francisco Department of Public Health
SFDPW	San Francisco Department of Public Works
SFFD	San Francisco Fire Department
SFHPC	San Francisco Historic Preservation Commission

SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water Department
SHOPP	State Highway Operation and Protection Program
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	sulfur dioxide
SoMa	South of Market
SPUR	San Francisco Planning and Urban Research
SR2T	Safe Routes to Transit
SRO	single-room occupancy
SSGA	Small Starts Grant Agreement
STP	Surface Transportation Program
STRAHNET	Strategic Highway Network
SWITRS	Statewide Integrated Traffic Records System
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TACs	toxic air contaminants
TAZ	Traffic Analysis Zone
TBACT	toxic best available control technology
TC	trolley coach
TCMs	Transportation Control Measures
TEP	Transit Effectiveness Project
TIGER III	Transportation Investment Generating Economic Recovery
TIP	Transportation Improvement Plan
TJPA	Transbay Joint Powers Authority
TLC	Transportation for Livable Communities
TMDL	total maximum daily load
TMP	Transportation Management Plan
TPI	Transit Performance Initiative
TPS	Transit Preferential Streets
TPY	tons per year
TRB	Transportation Research Board
TSCA	Toxic Substances Control Act
TSF	Transportation Sustainability Fee

TSM	Transportation System Management
TSP	Transit Signal Priority
TSP	Transportation Sustainability Program
TVM	ticket vending machines
U.S.C.	United States Code
US 101	U.S. Highway 101
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VdB	vibration decibel
VCP	vitrified clay pipe
VMT	vehicle miles traveled
VOC	volatile organic compounds
vph	vehicles per hour
VRF	Vehicle Registration Fee
WB	westbound
WDR	Waste Discharge Requirements
YOE	Year of Expenditure

CHAPTER SUMMARY: There is strong demand and ridership growth potential for high-performance transit service in the Van Ness Avenue corridor. Despite the high demand, transit speeds and reliability are poor in the corridor. Degradation in transit performance is a projected citywide problem that is largely contributing to a decline in transit mode share. The proposed project is strategic in light of these needs. Chapter 1 examines the planning context and project needs, in terms of transit performance and multimodal circulation, as a means to provide focus on the purpose of the proposed BRT project. The project purpose is developed to address these needs and provide the rationale for the proposed improvements, as follows: improve transit reliability, speed, connectivity and comfort in the corridor; improve the pedestrian experience; enhance urban design and identity of Van Ness Avenue; create a more livable street; and accommodate safe multimodal circulation and access.

CHAPTER 1

Project Purpose and Need

1.1 Introduction

The San Francisco County Transportation Authority (SFCTA or Authority) proposes, in cooperation with the Federal Transit Administration (FTA) and the San Francisco Municipal Transportation Agency (SFMTA), to implement bus rapid transit (BRT) improvements along a 2-mile stretch of Van Ness Avenue in San Francisco,[4] from Van Ness Avenue at Lombard Street to South Van Ness Avenue at Mission Street. In cooperation with FTA, the Authority has initiated this joint Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) and Environmental Impact Report (EIR) under the California Environmental Quality Act (CEQA). The FTA is the Lead Agency under NEPA and the Authority is the Lead Agency under CEQA. The California Department of Transportation (Caltrans) owns the portion of Van Ness and South Van Ness avenues within the project limits, designated as U.S. Highway 101 (US 101). In this capacity, Caltrans has participated in the analysis of Van Ness BRT from the initial stages, including providing funding for the Van Ness Avenue BRT Feasibility Study (SFCTA, 2006). Caltrans continues to participate as a Responsible Agency under CEQA in the environmental review process. SFMTA is also participating as a Responsible Agency because they would implement the Van Ness Avenue BRT after project approval.

Van Ness Avenue is a major north to south artery for the eastern part of San Francisco. It also functions as a major transit street, with an average of over 16,000 daily transit trips (four times more than the two streets on either side of Van Ness Avenue combined) carried along Van Ness Avenue within the study area (see Section 3.1.1.1). SFMTA operates the Muni bus system in San Francisco. There are two Muni bus routes along the entire length of Van Ness Avenue within the project limits (Routes 47 and 49). Five other Muni routes serve a portion of Van Ness Avenue, and one (#19) operates along Polk Street, which runs parallel to Van Ness Avenue. In addition, 32 Muni transit routes cross Van Ness Avenue at various intersections along the corridor, providing transfer opportunities to other Muni routes. Several Muni routes provide regional transit connections to Bay Area Rapid Transit District (BART), AC Transit, Caltrain, Golden Gate Transit, and SamTrans. Golden Gate Transit

[4] The City and County of San Francisco operate as a joint government body within the same geographical boundaries. Throughout this document, this governmental body and geographic area may be referred to as the "City of San Francisco," "San Francisco," "City," or "County."

operates eight routes (Routes 54, 70, 72, 73, 76, 80, 93, and 97) along Van Ness Avenue south of Lombard Street, and one route (Route 10) crosses Van Ness Avenue at Golden Gate Avenue (inbound) and at McAllister Street (outbound).[5] (See Section 3.1 for more details on the city/county transit network.)

Van Ness Avenue is also designated as part of the larger US 101 highway arterial on the National Highway System (NHS), providing regional and interregional travel (i.e., commute and non-commute) and goods movement. US 101 extends from Los Angeles, California, to Olympia, Washington. Van Ness Avenue serves as one of San Francisco's key north-south arterials connecting freeway entrances and exits south of downtown with Lombard Street, which routes US 101 traffic to the Golden Gate Bridge. One block to the west is the high-capacity arterial pair of Franklin and Gough streets, which provides more than double the automobile capacity provided by Van Ness Avenue. Throughout the project corridor, Van Ness Avenue typically has six traffic lanes, a landscaped median, and parking on both sides. With approximately 45,000 jobs, 25,000 housing units, and key regional destinations such as the San Francisco Civic Center, the Van Ness Avenue corridor is one of the region's major employment and commercial centers, and supports one of the highest population densities of any transit corridor in San Francisco.

Approximately 33 percent of private vehicle traffic in the corridor is regional, while most (67 percent) is local.

Thus, the Van Ness Avenue corridor functions in the role of a local and a regional arterial, moving traffic to, from, and within the city. The corridor carries a mix of cars, trucks, transit, private employer shuttles, pedestrians, and bicycles. Generally, approximately 33 percent of private vehicle traffic on Van Ness Avenue in the study area is regional, while most (67 percent) is local.[6] Approximately 20 percent of all trips to, from, and within the neighborhoods surrounding Van Ness Avenue are currently made by transit, which is slightly above the city-wide share of 17 percent transit trips (SFCTA, 2009). At 46 percent, the percentage of households in the Van Ness Avenue corridor that do not own cars is 17 percentage points higher than the citywide average (SFCTA, 2009). Van Ness Avenue also functions as the key north/south transit "spine" of the Muni network, with 32 intersecting Muni routes between Mission and Lombard streets. These existing land use and transportation characteristics of the Van Ness Avenue corridor are highly conducive to transit use and particularly well suited to BRT.

The Authority and SFMTA have identified the Van Ness Avenue corridor in long-range planning studies as a top priority route for rapid transit treatments, and the corridor is included in the San Francisco Transit Priority Network. The San Francisco Transit Priority Network is intended to address the current citywide decline in transit mode share, which is a trend expected to continue into the future unless action is taken to improve transit travel times, reliability, and productivity (SFCTA, 2004) (see Section 3.1). The 2003 Proposition K Expenditure Plan and the 2004 Countywide Transportation Plan (CWTP) identify BRT on Van Ness Avenue as part of a strategic investment in a citywide network of rapid transit.

The Van Ness Avenue BRT Feasibility Study, completed by the Authority in 2006, identified the need for and purpose of BRT on Van Ness Avenue, developed conceptual BRT design alternatives, and identified preliminary initial impacts and benefits. The Van Ness Avenue BRT Feasibility Study found that several BRT configurations are possible for Van Ness Avenue and are likely to provide significant benefits. With the adoption of the Van Ness Avenue BRT Feasibility Study, both the Authority and SFMTA also called for the next phase of project development – environmental analysis and preliminary engineering. Following environmental scoping, four alternatives were defined and carried forward for evaluation in this Draft EIS/EIR, including one no-build alternative and three build alternatives, with a design variation. The project alternatives considered in the Draft EIS/EIR are presented in Chapter 2, Project Alternatives.

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[5] Throughout the document, transit service reflects operations at the time of issuance of the Notice of Preparation (NOP) in September 2007.

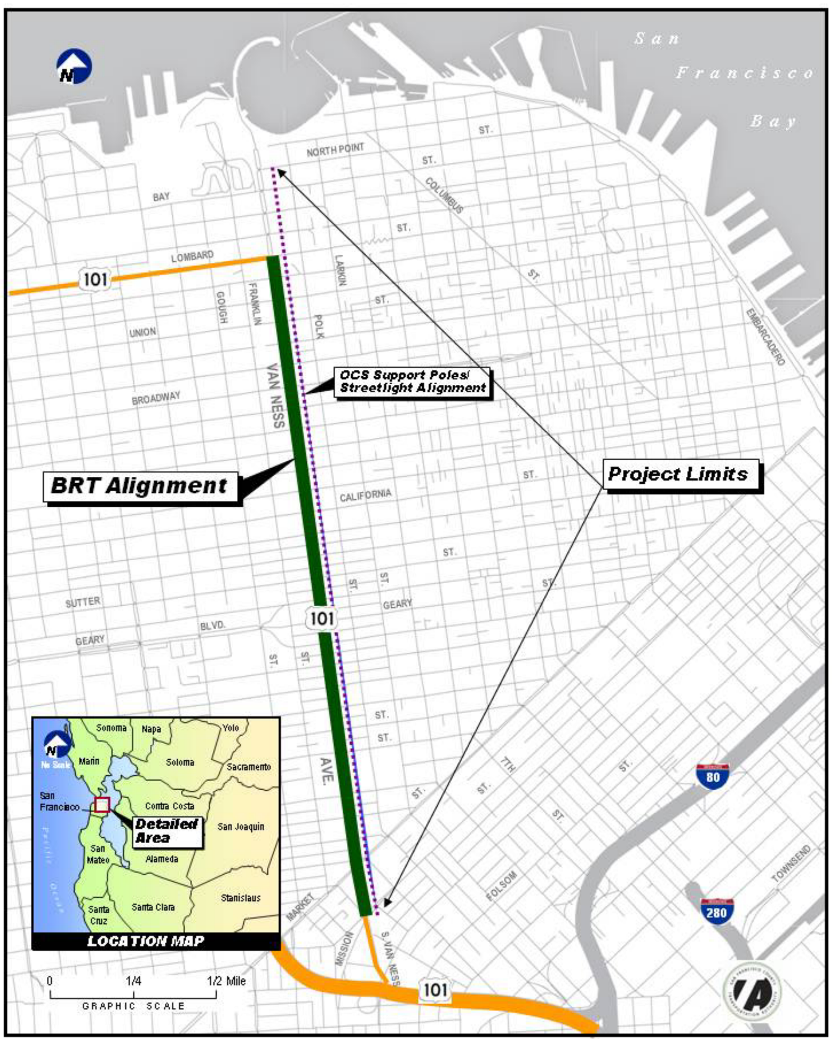
[6] Regional versus local traffic varies by location within the corridor, with higher proportions of regional traffic in the northern portion and lower proportions in the southern portion (SFCTA, 2009).

This Final EIS/EIR presents the environmental analysis and findings related to the Locally Preferred Alternative (LPA), which is the project design recommended by the SFCTA and SFMTA staffs to be carried forward for final design and construction. The LPA is a refinement of center-running alternatives (Build Alternatives 3 and 4) with the design variation, called Design Option B, that eliminates left turns, as described in Sections 2.2.2.4, 10.3, and 10.4. The LPA also incorporates a southbound (SB) station at Vallejo Street in response to community concerns regarding stop spacing. Furthermore, a northbound (NB) transit station at Vallejo Street is included as a design variant, referred to as the Vallejo Northbound Station Variant. The decision on whether to include the variant will be made at the time of project approval. Section 2.2.2.4 provides a detailed description of the LPA.

1.1.1 Project Location

The proposed project is located in the northeastern quadrant of the City and County of San Francisco, California. Figure 1-1 provides a project location map. The BRT project alignment follows South Van Ness and Van Ness avenues, which comprise a north-south primary arterial, extending approximately 2 miles from Mission Street in the south to Lombard Street in the north. The project includes replacement of the Overhead Contact System (OCS) support pole/ streetlight network, which extends from Mission Street north to North Point Street, also shown in Figure 1-1.

Figure 1-1: Project Location Map



The north and south project limits, or project "termini" constitute logical termini for the reasons described below. The project limits were identified in accordance with the project purpose and need, described in the following section, and in accordance with opportunities and constraints of the local environment. The southern project terminus, the intersection of Mission Street and South Van Ness Avenue, was identified in part due to the fact that the width of Mission Street does not allow for the same types of treatments that are proposed on Van Ness Avenue. Additionally, this intersection marks the start of the corridor along Van Ness Avenue where the 47 and 49 bus routes follow the same right-of-way (ROW).

The northern project terminus, the intersection of Lombard Street and Van Ness Avenue, was identified based on traffic patterns that show a significant decrease in traffic volume north of Lombard Street. Due to the lower traffic volumes, transit delays on Van Ness Avenue north of Lombard Street are significantly less frequent and severe than transit delays within the project limits.

1.1.2 Uses of this Environmental Impact Statement/Environmental Impact Report

KEY CONCEPT

This document informs the public and governmental decision makers of environmental effects associated with the project and describes the measures that would be undertaken to mitigate those effects.

This EIS/EIR is prepared pursuant to the requirements of NEPA, the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 *Code of Federal Regulations* [CFR] 1500-1508), and CEQA, Title 14, California Code of Regulations (CCR), Guidelines for Implementation of the California Environmental Quality Act (Sections 15000 to 15387). As required by NEPA and CEQA, this document informs the public and governmental decision-makers of environmental effects associated with the project and describes the measures that would be undertaken to mitigate those effects. This document will be used by federal, state, regional, and local agencies to assess the environmental impacts of the project on resources under their jurisdiction, to make discretionary decisions regarding the project, and to exercise review and permit authority over the project. Upon certification and approval of this document, the City of San Francisco will include the proposed project in their land use planning, zoning processes, and transportation planning, and will depict the proposed project on the circulation element maps of the City of San Francisco General Plan and supporting Area Plans.

1.2 Planning Context

As discussed in the next two sections, rapid transit in the Van Ness Avenue corridor has been consistently identified as a priority in local and regional transportation planning. At the same time, the role of the Van Ness Avenue corridor as part of US 101 and the state highway system is a critical component to the planning context.

1.2.1 Countywide Planning Context

Van Ness Avenue has been identified as a high-priority transit improvement corridor in a number of planning studies and funding actions by the City. The Authority's Four Corridors Plan (1995) and Muni's Vision for Rapid Transit (2000) identified Van Ness Avenue as a priority corridor for rapid transit improvements. Since 1996, Muni's Short-Range Transit Plan has called for rapid transit on Van Ness Avenue. In 2000, MTA's Vision Plan also called for rapid transit on Van Ness Avenue. In 2003, San Francisco voters approved Proposition K, which is the reauthorization of the City's ½ cent transportation sales tax. The Prop K Expenditure Plan serves as the investment component of the 2004 CWTP, which sets forth the City's "blueprint to guide the development of transportation funding priorities and policy." A key objective of the CWTP is the promotion and implementation of San Francisco's transit first policy through development of a network of fast, reliable transit, including BRT. The purposes of the multimodal transportation investment package recommended in the CWTP are to:

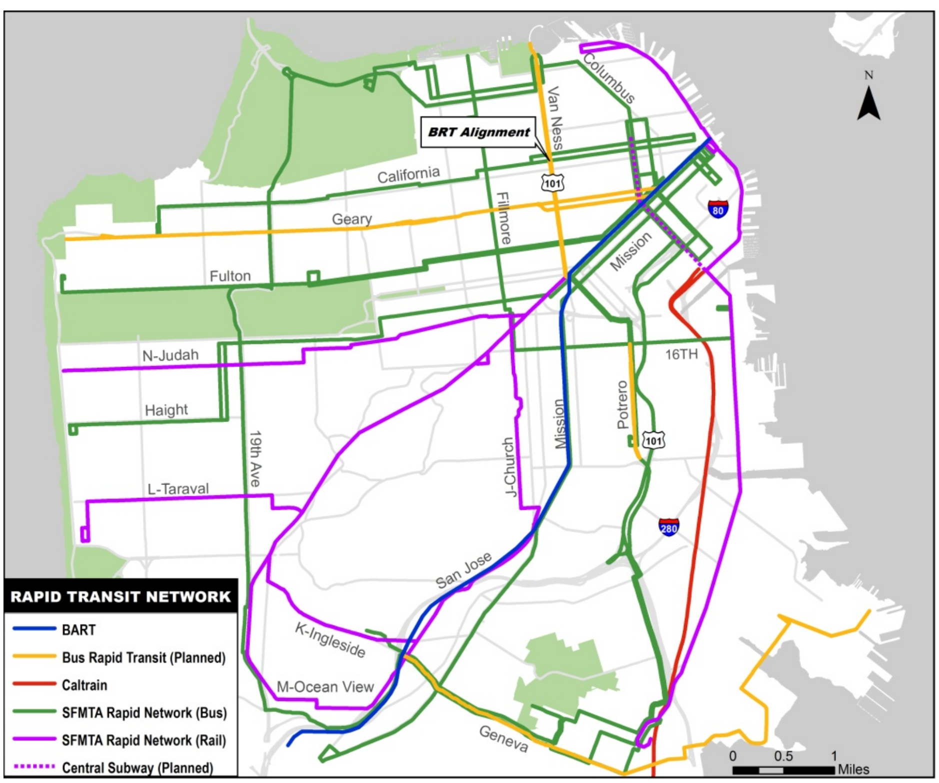
- Support the City's growth and development needs by addressing expected transportation system congestion impacts;
- Stem and reverse the trend toward transit mode share loss within San Francisco affordably and in the near term; and
- Improve the cost effectiveness and operational efficiency of the City's mature transportation system infrastructure and service.

The CWTP evaluated alternative approaches toward meeting these system needs and recommended a preferred scenario that calls for development of a citywide Bus Rapid Transit Network (defined initially by a core BRT network encompassing Van Ness Avenue, Geary Boulevard, and Potrero Avenue). The purpose of this rapid transit network is to:

- Improve transit levels of service for existing users quickly and cost effectively;
- Strengthen the citywide network of rapid transit services;
- Raise the cost effectiveness of Muni services and operational efficiency of the city's Transit Preferential Streets (TPS) roadway network; and
- Contribute to the urban design, identity, and livability of the BRT corridors as signature TPS streets.

Figure 1-2 shows the city's Rapid Transit Network identified in the CWTP. San Francisco currently lacks north-south rapid transit service in the northern half of the city. Van Ness Avenue, combined with Mission Street, functions as the primary north-south transit corridor in San Francisco; however, Van Ness Avenue lacks rapid transit service treatments, and existing transit services suffer from poor performance in terms of speed and reliability. These conditions affect two Muni transit lines (49 and 47) and eight Golden Gate Transit regional bus routes (54, 70, 72, 73, 76, 80, 93, and 97).

Figure 1-2: San Francisco Rapid Transit Network Map



Transportation 2035, adopted in 2009, serves as the blueprint for the development of transportation facilities in the nine-county San Francisco Bay Area. An update to this plan, Plan Bay Area, is currently underway and is scheduled for adoption in 2013.

Since adoption of the Van Ness Avenue BRT Feasibility Study, SFMTA has developed and adopted the Transit Effectiveness Project (TEP) (SFMTA, 2009). The TEP recommended comprehensive revisions to the Muni route structure to improve efficiency and meet emerging travel demand patterns. In addition, the TEP recommended a Rapid Network designation composed of the most critical and productive Muni lines. Van Ness Avenue is included in the rapid network and identified in the TEP as a high-priority route for rapid transit and BRT treatments.

As a result of recommendations in the CWTP, the Van Ness Avenue BRT Feasibility Study was initiated in 2004 and completed in 2006. During this time, the City defined BRT in San Francisco as a "full-featured" system with the following general elements:

- Dedicated lane
- Transit signal priority
- High-quality stations
- Distinctive vehicles
- Level or near level/all-door boarding (or proof-of-payment)

The Feasibility Study evaluated the feasibility of four alternative BRT configurations on Van Ness Avenue. Four BRT alternatives were developed and compared with a no project scenario, in conjunction with a comprehensive public and agency participation program. The feasibility study was unanimously approved by both the Authority and SFMTA Boards in December 2006.

1.2.2 | Regional Planning Context

1.2.2.1 | METROPOLITAN TRANSPORTATION COMMISSION

The Metropolitan Transportation Commission (MTC) serves as the Bay Area's transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area. The MTC functions as both a regional transportation planning agency for California, and for federal purposes, as the region's metropolitan planning organization (MPO). As such, it is responsible for regularly updating the Regional Transportation Plan (RTP), which is a comprehensive blueprint for the development of mass transit, highway, airport, seaport, railroad, bicycle, and pedestrian facilities. The most recent RTP, *Transportation 2035*, was adopted in 2009 and specifies how $218 billion in anticipated federal, state, and local transportation funds will be spent in the Bay Area during the next 25 years. Improvements to local and express bus services are included as a major project in the 2009 RTP, with BRT service on Van Ness Avenue specifically identified as part of this plan. Due to its regional reach, Van Ness Avenue BRT is one of only two Small Starts (FTA funding program for projects under $250 million) priorities in the region. MTC has made a programming commitment to the project, including $87.6 million in committed funds in the financially constrained and adopted 2009 RTP.

1.2.2.2 | CALTRANS

As part of US 101, the Van Ness Avenue corridor provides part of the surface street link of US 101 through San Francisco. US 101 is a major component of the Caltrans Interregional Transportation Strategic Plan (ITSP). Thus, accommodating traffic operations in the Van Ness Avenue corridor is essential; at the same time, Vision D of the June 1998 ITSP notes that mass transit can support interregional travel improvements with cost-effective investments in corridors that are densely populated and heavily traveled.

Development of BRT on Van Ness Avenue is consistent with Caltrans Deputy Directive 98 (October 2008), entitled "Integrating Bus Rapid Transit into State Facilities." The directive supports the integration of BRT on the State highway system, recognizing its potential to increase the "person-throughput" and vehicle occupancy rate, reduce congestion, mitigate pollution, reduce greenhouse gas (GHG) emissions, and improve goods movement. Deputy

Directive 98 places strong emphasis on the responsibility of Caltrans to ensure that BRT is integrated with other transportation modes on the State highway system through revised design policies and standards, as well as maintenance/operations functions.

Another relevant Caltrans Deputy Directive, Directive 64 (October 2008), is entitled "Complete Streets – Integrating the Transportation System." This directive supports the development of complete streets, encouraging alternative modes of transportation, during system planning and continuing through project development. A "complete street" is defined as a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists, appropriate to the function and context of the facility.

In 2003, Caltrans supported local planning efforts by providing a Community Planning Grant to study whether BRT can address transit needs and opportunities in the Van Ness Avenue corridor. This was important initial funding for the Van Ness Avenue BRT Feasibility Study, which was also supported by Proposition K funding.

1.3 Project Purpose and Need

1.3.1 | Project Purpose

The purpose of the Van Ness Avenue BRT Project has its origins in the 2004 CWTP, discussed above in Section 1.2.1, which identified the need for a rapid transit network citywide. The CWTP describes the purpose of the rapid network as follows:

- Improve transit levels of service for existing users quickly and cost effectively;
- Strengthen the citywide network of rapid transit services;
- Raise the cost effectiveness of Muni services and operational efficiency of the city's Transit Preferential Streets (TPS) roadway network; and
- Contribute to the urban design, identity, and livability of the BRT corridors as signature TPS streets.

Van Ness BRT is a key element of the rapid network (see Figure 1.2), and is intended to fulfill in part the more general purpose described above through improvements to Van Ness Avenue.

The project is intended to support the City's growth and development demands by addressing expected transportation system performance needs – including to stem and reverse the trend toward transit mode share loss within San Francisco – affordably and in the near term. The project is also intended to improve the cost effectiveness and operational efficiency of the City's mature transportation system infrastructure and service. The travel time and reliability benefits of BRT on Van Ness Avenue are expected to ripple throughout the City's transit network, facilitating transfers to other transit routes and systems. More than 40 percent of all Muni Routes 47 and 49 riders make at least one transfer to the many heavily used east-west cross routes, including Muni Metro, as well as regional services such as Golden Gate Transit, BART at 16th Street, and Caltrain at 4th/King. Van Ness Avenue riders with destinations along the Mission, Market, SOMA, Geary Boulevard, and Union Street corridors will benefit through shorter travel times and enhanced rider experience with the implementation of BRT.

DEFINITION

USER BENEFIT: Benefits of the project bestowed on existing passengers (e.g., shorter travel time, enhanced rider experience).

With a goal of having the Van Ness corridor meet the rapid network purpose, the Feasibility Study identified specific needs for the corridor (see Section 1.3.2), and improvements identified in the Study attempt to achieve that end. From this bottom-up perspective, the purpose of Van Ness BRT is to improve the safety and operational efficiency of Van Ness Avenue in order to:

- Significantly improve transit reliability, speed, connectivity, and comfort;
- Improve pedestrian comfort, amenities, and safety;
- Enhance the urban design and identity of Van Ness Avenue;
- Create a more livable and attractive street for local residential, commercial, and other activities; and
- Accommodate safe multimodal circulation and access within the corridor.

Attainment of the project objectives must be balanced with the needs to accommodate mixed traffic, bicycle, and goods circulation and access within the corridor, as well as maintain some on-street parking for loading/unloading and drop-off access.

1.3.2 | Project Need

The 2004 CWTP found that San Francisco's 17% transit mode share among San Francisco residents will decline by 2025 if measures are not taken to provide a competitive transit alternative to auto travel in major corridors such as Van Ness Avenue. In addition, the CWTP determined that trends towards lower transit productivity and rising operations costs must be reversed in order to provide sustainable transit service in San Francisco that will meet future demands. Van Ness Avenue BRT is expected to help address these citywide needs, and others, through specific improvements in the Van Ness corridor. The specific improvements identified in the Feasibility Study were based on the project's purpose described in the previous section and the corridor needs described in this section.

High Ridership: Approximately 43,000 passengers use Muni bus routes 47 and 49 and the Golden Gate Transit routes 54, 70, 72, 73, 76, 80, 93, and 97 daily, with more than 16,000 daily passenger boardings within the project limits.

1.3.2.1 | TRANSIT PERFORMANCE NEEDS

There is an existing strong demand in addition to large ridership growth potential for high transit service levels in the project corridor. Van Ness Avenue transit services currently operate at high frequencies (the Muni bus routes provide an average combined headway of 3.75 minutes during peak periods and 6 to 8 minutes in the off peak). Approximately 43,000 passengers use Muni bus routes 47 and 49 and the Golden Gate Transit routes 54, 70, 72, 73, 76, 80, 93, and 97 daily, with more than 16,000 daily passenger boardings within the project limits. A number of major east-west transit routes cross Van Ness Avenue and generate major bus-to-bus and bus-to-rail transfers with Van Ness Avenue transit services, including the Muni Metro lines at Market Street and Muni bus lines 38 (Geary) and 38L (Geary Limited). Transit has a 20 percent mode share for trips to, from, and within the neighborhoods surrounding Van Ness Avenue, which is greater than the 17 percent daily transit mode share citywide.

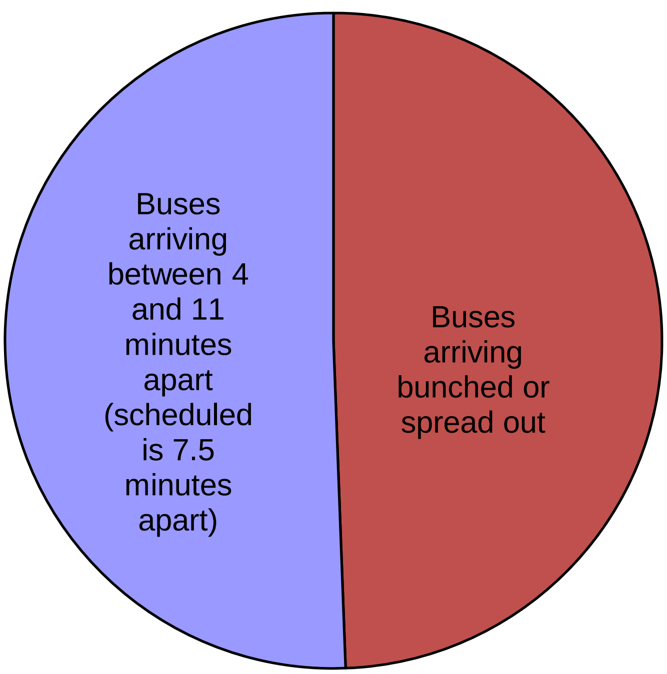
Transit in the Van Ness Avenue corridor has the potential to serve substantially more riders both today and in the future. Approximately 46 percent of households in the Van Ness Avenue corridor do not own cars, compared with 29 percent citywide (SFCTA BRT Feasibility Study, 2006, using BATS and Census 2000 survey data). At an average of 93 dwelling units per acre, Van Ness Avenue has the highest population density of any transit corridor in San Francisco. The existing population density, together with the concentration of employment and commercial activity along the corridor (approximately 45,000 jobs), establishes a strong transit market capable of supporting higher levels of transit investment. Furthermore, the Association of Bay Area Governments (ABAG) and the San Francisco Planning Department have targeted the Van Ness Avenue corridor for 21,000 additional jobs (50 percent increase) and 9,000 additional housing units (34 percent increase) between 2005 and 2015 (ABAG Projections, 2007), particularly near Market Street, and active infill development is underway throughout the corridor, consistent with the objectives of the Van Ness Avenue Area Plan and the Market/Octavia Better Neighborhoods Plan.

Despite the above-mentioned high existing and projected ridership demand, transit speeds and reliability are poor in the Van Ness Avenue corridor. Degradation in transit performance is a projected citywide problem that is largely contributing to a citywide decline in transit mode share. The Authority's 2004 CWTP found that the City's 17 percent transit mode share among city residents will decline by 2025 if measures are not taken to provide a competitive transit alternative to auto travel in major corridors such as Van Ness Avenue. A key need for transit service on Van Ness Avenue is to close the performance gap, in reliability and in travel time, between transit and automobile travel.

- **Separate Transit from Auto Traffic to Improve Travel Time and Service Reliability.** Transit speeds and reliability (both travel time and headway reliability) are poor on Van Ness Avenue, due in large part to conflicts with mixed-flow traffic. Buses spend approximately half their time on Van Ness Avenue completely stopped; these delays occur when moving in traffic, maneuvering to and from the curb to load and unload passengers, and waiting at signals. Signal and mixed-traffic delays account for well over half of total bus delay. Travel times on Van Ness Avenue between Clay and Mission average 16 minutes by transit and fewer than 9 minutes by private vehicle (see Section 3.2 for details). Even when time spent loading and unloading passengers is subtracted from transit travel time, buses still remain as much as 35 percent slower than cars (SFCTA, 2006).

  Travel in mixed traffic also causes reliability problems. As buses travel in mixed traffic, variation in headway increases, and buses begin to bunch, as shown in Figure 1-3 (Source: SFCTA field study performed as part of Van Ness BRT Feasibility Study, 2006). By the time SB Van Ness Avenue buses reach Market Street, buses are just as likely to be more than 50 percent off from scheduled spacing (i.e., less than 4 minutes apart or more than 11 minutes apart) as they are to arrive within 50 percent of scheduled spacing (i.e., 4- to 11-minute spacing). For example, buses are equally as likely to be 1 or more than 13 minutes apart (compared to the scheduled 7.5 minutes apart per route), reflecting unreliable service for waiting passengers.

Figure 1-3: Variation in Headways (Average Wait Times) at Market Street SB during the PM Peak

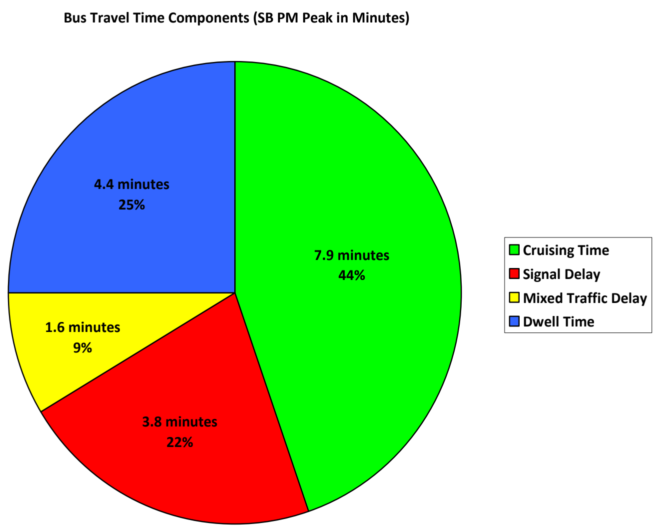


Finally, conflicts with mixed traffic affect transit operating efficiency and productivity. The delays caused by operating in mixed traffic add significantly to transit's route cycle time, increasing the number of vehicles and operators required to provide needed service frequencies.

BRT on Van Ness Avenue is forecast to decrease transit travel times by up to 32 percent and improve reliability by up to 50 percent (see Section 3.2 for details). Moreover, BRT is estimated to improve transit operating productivity by up to 33 percent, reducing the overall cycle time of Van Ness Avenue routes and saving substantial operating resources (see Chapter 9 for details).

- **Reduce Delays Associated with Loading and Unloading and Traffic Signals.** As shown in Figure 1-4, time spent loading and unloading passengers (dwell time), while part of service, does include unnecessary delays that contribute to slow travel times for buses. Dwell times are lengthy because passengers must enter the bus through a single door, ascend from the curb into the bus doorway, and wait in line while those without passes pay bus fare onboard. Passengers with mobility disabilities often need the assistance of lifts or ramps to enter and exit buses, which can further increase dwell time.

Figure 1-4: Components of Transit Travel Time on Van Ness Avenue (Southbound – PM Peak)



VAN NESS CORRIDOR TRANSIT NEEDS

1. Separate transit from auto traffic to improve travel time and service reliability.

2. Reduce delays associated with loading and unloading and traffic signals.

3. Expand the City's Network of Rapid Transit.

4. Improve the experience for transit patrons.

BRT stations with level or near level boarding platforms, proof-of-payment, and fare prepayment should facilitate faster and easier passenger loading and unloading by enabling passengers to simply walk or roll onto the bus through all vehicle doors. Boarding more passengers in less time would provide more transit capacity without the added costs of additional buses and drivers.

- **Improve the Experience for Transit Patrons.** Existing transit service on Van Ness Avenue lacks many amenities that would make the transit experience attractive to new riders and more comfortable for existing riders, both in and out of the vehicle. While waiting, transit passengers along Van Ness Avenue often lack shelter, seating, and real-time information. Waiting passengers jostle for sidewalk space with passing pedestrians. While riding, transit passengers often encounter crowded buses as a result of bunching and reliability problems, and experience poor ride quality as buses must weave around mixed traffic and into and out of sidewalk bus stops.

BRT will upgrade bus service with station amenities including larger shelters, additional seating, communications systems, ticket vending machines at selected stations, real-time service information, improved lighting, and security features. BRT station platforms would be separated from pedestrian traffic, and would include landscape and streetscape features to offer a buffer from vehicular traffic where feasible. BRT is intended to improve ride quality by eliminating the need to pull in and out of stops, and for most alternatives, the need to weave around mixed traffic. The BRT buses would accommodate more passengers, offer additional seating, and operate at more reliable headways, relieving crowding.

PROJECT GOALS BEYOND TRANSIT ENHANCEMENT

1. **Improve the safety and comfort of pedestrians.**
2. **Raise the operating efficiency of Van Ness Avenue by increasing person-throughput/ vehicle occupancy rate.**
3. **Upgrade streetscape to support an identity as a rapid transit and pedestrian environment.**
4. **Support the civic destinations on the corridor and integrate transit infrastructure with adjacent land uses.**

1.3.2.2 | MULTIMODAL CIRCULATION NEEDS

People currently use Van Ness Avenue to drive, walk, bike, and ride transit. Van Ness Avenue improvements are intended to improve multimodal circulation and the overall transportation effectiveness of the corridor, meeting the general needs identified in the CWTP and the corridor-specific needs identified in the BRT Feasibility Study. Support of non-motorized travel modes and overall system operation is critical to the success of high-quality transit in the corridor and would support local planning efforts to transform Van Ness Avenue into a pedestrian promenade, as well as a grand multimodal thoroughfare.

Multimodal circulation, corridor design, and land use planning needs for Van Ness Avenue include the following:

- **Improve the Safety and Comfort of Pedestrians.** Pedestrian trips comprise 26 percent of total daily trips to, from, and within the neighborhoods surrounding Van Ness Avenue, exceeding the citywide average of 17 percent. Every transit trip begins and ends with a walking trip, and nearly half of trips to, from, or within the Van Ness Avenue neighborhoods are a walk, bike, or transit trip, indicating the importance of non-motorized travel in the area along Van Ness Avenue. While the existing street design within the project limits meets City sidewalk width standards with its 16-foot-wide sidewalks, most intersections are without pedestrian countdown signals or Accessible Pedestrian Signals (APS), and many of the intersections do not meet San Francisco or Federal standards for minimum pedestrian speeds in order to cross Van Ness Avenue during the walk signal phase.[7] Pedestrians experience twice as much delay at intersections as vehicle occupants, especially waiting to cross Van Ness Avenue. The greater the delay, the higher the likelihood of noncompliance with signals, which results in compromised safety and traffic flow impacts (SFCTA 2011). At crossings without a pedestrian signal, pedestrians can be caught mid-crossing when the light turns yellow, with as little as 4 seconds to reach a curb or median refuge, indicating the strong need for pedestrian countdown and APS with sufficient crossing times at these crossings. Section 3.4 provides detailed information on pedestrian crossing conditions in the corridor.

  BRT will improve pedestrian safety and conditions through the provision of curb extensions (curb bulbs) to create greater pedestrian visibility, as well as shorter crossing distances coupled with signal timings that meet City and federal targets for walking speeds. The project will also implement APS, in addition to countdown signals, at all signalized intersections, as well as enhance refuge medians to meet or exceed City standards and include nose cones. These BRT features are expected to reduce the crosswalk pedestrian collisions commonly experienced on Van Ness Avenue.

- **Raise the Operating Efficiency of Van Ness Avenue by Maintaining Person-Throughput while Increasing the Capacity and Vehicle Occupancy Rate.** The Van Ness Avenue corridor, comprised of Van Ness Avenue and parallel streets from Gough Street to Hyde Street, has the potential to carry people more efficiently, than today. Within the study area, motorized trips on Van Ness Avenue are expected to increase by up to 7.5 percent by 2015 if a BRT project is not built, while the transit mode share is expected to stay the same or decline. These trends would cause an increase in congestion on Van Ness Avenue. These increasing demands on the street's limited ROW necessitate more

[7] APS are devices that communicate when to cross the street in a non-visual manner, such as audible tones, speech messages, and vibrating surfaces.

efficient operations and use of space to increase capacity for person-throughput in the corridor and raise the vehicle occupancy rate.

Due to the expected increase in transit ridership with BRT, Van Ness Avenue would operate more productively. With BRT, each transit lane would carry 13 percent (Build Alternative 2) to 36 percent (Build Alternatives 3, 4, and the LPA) more people than each mixed traffic lane, and the average vehicle occupancy on the street would increase to more than two people per vehicle (see Section 3.1 for details).

In addition, by creating a dedicated lane for transit, BRT would allow for increased bus operations on Van Ness Avenue without impacting the traffic network (i.e., additional buses would not conflict with auto traffic). BRT also makes it possible to provide similar service at a lower operating cost (see Chapter 9); this is because with BRT, each bus can complete its route in less time, so less vehicles and drivers would be needed to keep the same frequencies. Preliminary results indicate that 1 to 2 more buses per hour could be added on both the 47 and 49 BRT routes at no additional operating cost based on the travel time savings in the 2015 microsimulation model (see Section 3.2). If more operating funds were dedicated to Van Ness Avenue in the future, those investments would be more cost effective with BRT because the lower travel times would allow for a greater increase in frequency of bus operations. The center-lane BRT alternatives (Build Alternatives 3 and 4) would be more cost effective than Build Alternative 2 because those alternatives would have a lower travel time (see Chapter 3.2 for more details); and Build Alternatives 3 and 4 with Design Option B, as well as the LPA, would offer additional cost effectiveness for this reason.

- **Upgrade Streetscape to Support an Identity as a Rapid Transit and Pedestrian Environment.** Existing streetscape conditions are deficient, lacking in consistency and pedestrian amenities.

  A main component of the proposed build alternatives is to provide a consistent landscaped median treatment and pedestrian lighting, as well as establish a more unified identity for Van Ness Avenue as one of the City's most prominent arterials and a visible rapid transit service. The improved streetscape features of the proposed build alternatives would enhance the amenity and urban design of Van Ness Avenue as a gateway into the city.

- **Support the Civic Destinations on the Corridor and Integrate Transit Infrastructure with Adjacent Land Uses.** The project corridor is already a strong market for transit, due largely to the existing transit-supportive land use in the corridor, including the highest population density of any transit corridor in San Francisco, and nearly half of the households in the corridor do not own automobiles.

  In addition to existing transit demand, the Van Ness Avenue corridor is planned by the City for high-density mixed-use development and transformation of the street into a transit-served pedestrian promenade that supports the Civic Center and commercial uses. Rapid transit service along Van Ness Avenue would contribute to the City's transit-oriented development efforts by providing high-quality, reliable, comfortable transit that improves access to destinations within the corridor and elsewhere in the city. The placement of BRT infrastructure demonstrates an investment in the corridor and provides a greater sense of permanence than typical bus facilities.

- **Accommodate private vehicles and commercial loading.** Attainment of the project objectives must be balanced with the need to accommodate mixed traffic and goods circulation and access within the corridor, as well as maintain some on-street parking for loading/unloading and drop-off access. Private vehicle traffic in the future is anticipated to become more congested on Van Ness Avenue and on the streets immediately parallel in the no project scenario. Analysis indicates that the implementation of BRT is not forecast to increase the number of congested intersections (i.e., those operating at LOS E or F) in the corridor, in year 2015, relative to the No Build Alternative (see Section

3.3 for details). Parallel parking is located along most of Van Ness Avenue throughout the project corridor, providing drop-off and loading access to businesses, residents, and institutional uses fronting the avenue. Parking also provides persons with disabilities access to the commercial, residential, civic, and cultural centers in the project corridor. Accommodating truck maneuverability is also important in supporting land uses along the corridor, as well as regional goods movement.

1.3.3 | Project Ability to Meet the Purpose and Need

Chapter 10 discusses the performance of each alternative and the LPA, with or without the Vallejo Northbound Station Variant, on an array of indicators related to the Project Purpose and Need, as well as other issues of interest to stakeholders A full analysis of transportation performance can be found in Chapter 3, while analysis on the other areas of stakeholder and environmental concern can be found in Chapter 4.

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CHAPTER SUMMARY: The project proposed by the Authority will implement BRT improvements along approximately 2 miles of Van Ness and South Van Ness Avenue between Lombard and Mission streets in San Francisco. This chapter of the EIS/EIR describes the proposed action and the project alternatives that were considered to achieve the project purpose and need while avoiding or minimizing environmental impacts. Three build alternatives, including one side-lane running and two center-lane running alignments, a design option eliminating left turns, a Locally Preferred Alternative (LPA) refined from the center-lane running build alternatives incorporating the design option, and a "No Build" (no action) Alternative are analyzed. The build alternatives, including the LPA, propose operating BRT in a dedicated transit lane in the northbound and southbound directions, resulting in two mixed-flow and one transit lane in each direction, replacing existing Muni bus stops with BRT stations in the project corridor, and other transit enhancements such as transit signal priority.

CHAPTER 2

Project Alternatives

2.1 Alternatives Development Process

The Van Ness Avenue corridor has been identified as a high-priority transit improvement corridor in many planning studies and funding actions by the City. The Authority's Four Corridors Plan (1995) and Muni's Vision for Rapid Transit (2000) identified Van Ness Avenue as a priority corridor for rapid transit improvements. The Authority's 2004 CWTP reinforced these plans by recommending a citywide rapid transit network that would include BRT and TPS treatments as San Francisco's transit expansion strategy. The Van Ness Avenue corridor was included as part of the Rapid Network.

The New Expenditure Plan for San Francisco, which was approved by voters as Proposition K authorizing the City's ½ cent transportation sales tax measure in November 2003 identifies Van Ness Avenue for BRT funding. The New Expenditure Plan is the investment component of the 2004 CWTP.

2.1.1 | Van Ness Avenue BRT Feasibility Study

In 2006, the Authority and SFMTA Boards adopted the Van Ness Avenue BRT Feasibility Study, which was prepared by the Authority, and identified the need for and purpose of BRT on Van Ness Avenue. The plan developed conceptual BRT design alternatives and evaluated initial impacts and benefits. The Feasibility Study found that several BRT configurations are possible for Van Ness Avenue and are likely to provide significant benefits with relatively modest impacts, and it called for the next phase of project development, environmental analysis, and preliminary engineering. The Van Ness Avenue BRT Feasibility Study is discussed below, along with other key milestones in the project alternatives development process.

2.1.2 | Scoping Process

In September 2007, the Authority issued a federal Notice of Intent (NOI) and state Notice of Preparation (NOP) initiating the project scoping period under NEPA and CEQA, respectively. The purpose of the scoping period was to obtain feedback from the public, partner agencies, and all interested parties on the proposed project alternatives and the types of environmental impacts to be analyzed. Two formal scoping meetings were held with the public on October 2 and October 4, 2007, and one agency meeting, which included federal, state, regional, and local agencies, was held on October 4, 2007. The outcome of these meetings is presented in the Van Ness BRT Scoping Summary Report (November 30, 2007). The intent of the scoping process, as explained in the Scoping Summary Report, was to:

- Inform affected agencies and the public about the proposed Van Ness Avenue BRT Project, including compliance with NEPA and CEQA requirements;
- Identify a reasonable range of transit improvement alternatives to be evaluated for Van Ness Avenue;
- Identify potentially significant environmental impact areas that should be studied in the EIS/EIR; and
- Expand on the existing mailing list of agencies and individuals interested in the future actions related to Van Ness Avenue BRT and the EIS/EIR.

RESOURCES

To view the Van Ness BRT Feasibility Study, the Scoping Report, and the Alternatives Screening Report, visit www.sfcta.org/vanness.

Written and verbal comments were received on a wide range of alternatives, including a No Build Alternative, an express bus alternative, side lane and center lane running BRT alternatives, side lane BRT with a removed parking lane, and a subway alternative. Overall, center lane running BRT was the configuration most often preferred by the public, as documented in the Van Ness BRT Scoping Summary Report. Agency and public input received during the scoping period, in addition to findings of the Feasibility Study, CWTP, and other studies, helped define the range of alternatives recommended for NEPA and CEQA evaluation. Chapter 8, Consultation and Coordination, provides a detailed summary of the project scoping period and outreach activities.

2.1.3 Alternatives Screening/Analysis

The Alternatives Screening Report (2008) applied screening criteria to alternatives analyzed during the scoping process to determine the ability of each one to meet the project's purpose and need (see Chapter 1).

To identify the limited set of build alternatives to be analyzed in the Draft EIS/EIR, the Authority prepared an Alternatives Screening Report (March 2008). The report applied many screening criteria to determine the ability of each alternative to meet the purpose of and need for the project, as developed in the Van Ness Avenue BRT Feasibility Study. The project purpose and need statement reflects citywide BRT development policies found in the CWTP and project-level goals and needs identified during the conceptual planning work of the Feasibility Study.

The alternatives that were analyzed in this report include a No Build Alternative; TPS improvements; multiple BRT alignments, including center running and side running BRT; and surface light rail and subway alternatives. The report recommended three build alternatives for further study; these alternatives are presented in Section 2.2.

Table 2-1 displays the screening criteria used to analyze the alternatives in the screening report. The criteria address benefits and impacts.

Table 2-1: Alternatives Screening Report Criteria

TYPE OF BENEFIT	SCREENING CRITERIA
Transit Operations	Transit speed and reliability
	Transit mode share/ridership
Transit Rider Experience	Out-of-vehicle waiting experience
	In-vehicle ride quality
	Pedestrian access and safety
Urban Design	Streetscape, landscape, integration with land uses
Multimodal System Performance	Total person-delay
	Rapid network identity
	Time to benefits

Table 2-1: Alternatives Screening Report Criteria

TYPE OF IMPACT	SCREENING CRITERIA
Traffic and Parking	Traffic circulation (includes diversions, delay)
	Parking spaces
Cost	Capital cost
	Operating cost
Construction Impact	Duration and intensity of construction

Source: Van Ness Avenue BRT Alternatives Screening Report. March 2008.

2.1.4 | Identification of a Locally Preferred Alternative

The Draft EIS/EIR was distributed and made available to the public for review and comment from November 4 through December 23, 2011. As required by NEPA, an EIS must include the identification of a preferred alternative. The three build alternatives considered in the Draft EIS/EIR, and described in Section 2.2, consisted of one side-running alignment (Alternative 2) and two center-lane alignments (Alternatives 3 and 4), as well as a limited left-turn variant (Design Option B). Based on technical analyses presented in the Draft EIS/EIR, agency, stakeholder, and public input received during circulation of the Draft EIS/EIR and results of weighting and risk analysis performed by a steering committee of SFCTA and SFMTA staff, the SFCTA and SFMTA staff jointly recommended, and their boards subsequently selected, the LPA as a center-lane BRT with right-side boarding/single median and limited left turns for inclusion in the Final EIS/EIR.

The LPA represents an optimized, refined center-running alternative; BRT vehicles would operate alongside the median for most of the corridor, similar to Build Alternative 4 (see Section 2.2 for a full description of Build Alternative 4). At station locations, the BRT runningway would transition to the center of the roadway, allowing right-side loading using standard vehicles, similar to Build Alternative 3 (see Section 2.2 for a full description of Build Alternative 3). This alternative would retain the high-performance features of Build Alternatives 3 and 4 (e.g., maximum transit priority, fewest conflicts) while avoiding the need to acquire left-right door vehicles or remove the entire existing median. Because the limited left-turn variant (Design Option B) was shown in the Draft EIS/EIR to provide the greatest travel time benefits for transit, would reduce the weaving associated with the transitions, and aid with the flow of north-south traffic on Van Ness Avenue, the LPA incorporates Design Option B, eliminating all left turns from Van Ness Avenue between Mission and Lombard streets, with the exception of the southbound (SB) (two-lane) left turn at Broadway.

The LPA also involves some modifications to station locations versus those shown for the build alternatives in the Draft EIS/EIR. Specifically, the stations are now on the near side of intersections to allow for trucks turning onto Van Ness Avenue. Since the NB Market Street station would be less than one block from the Mission Street station, the NB Mission Street station would be removed under the LPA. There is currently a stop for the 49 at the 13th Street/Duboce/Mission/US 101 off-ramp intersection (one block from Mission Street/South Van Ness Avenue intersection) and a stop for the 47 at 11th and Mission Street (also one block from the Mission Street/South Van Ness Avenue) intersection. As a separate project, the TEP is studying routing that would accommodate a stop for the 47 Limited on South Van Ness Avenue just south of the Mission Street/South Van Ness Avenue intersection. Under the TEP, the 49 Limited would not make stops between the 16th/Mission stop and the Market Street BRT station; however, riders would still be able to board the 14 (Mission local) bus along Mission Street. That route would continue to stop at the Mission Street/South Van Ness Avenue intersection.

The LPA also involves the incorporation of a SB station at Vallejo Street in response to community concerns regarding stop spacing. A NB transit station at Vallejo Street is also

DEFINITION

LOCALLY PREFERRED ALTERNATIVE (LPA): The final selected physical design concept and scope for the Van Ness Avenue BRT Project, which will be one of the alternatives, or a combination of features from more than one of the alternatives reviewed in the Draft EIS/EIR and described in Section 2.2.

included as a design variant, referred to as the Vallejo Northbound Station Variant. The decision on whether to include the variant will be made at the time of project approval. Section 2.2.2.4 provides a detailed description of the LPA.

Upon project approval, the City of San Francisco would include the proposed project in their land use planning, zoning processes, and transportation planning. Additionally, the City would depict, or reference, the proposed project on the circulation element maps of the City of San Francisco General Plan and supporting Area Plans.

2.2 Project Alternatives

Based on the outcome of the Van Ness Avenue BRT screening process, four alternatives were defined in the Alternatives Screening Report prepared by the Authority in March 2008, including one No Build Alternative and three build alternatives. These alternatives have been refined in response to changes in funding and programming since the 2008 Screening Report, and they are presented in detail in the following sections.

2.2.1 Alternative 1: No Build (Baseline Alternative)

Alternative 1, the No Build Alternative, would not include BRT service and assumes that the existing roadway and transit services in the 2-mile-long Van Ness Avenue corridor would continue and be supplemented by funded improvement projects planned to occur within the near-term horizon year of 2015. These transportation system and infrastructure improvements are planned to occur regardless of implementation of any BRT build alternatives, including the LPA. The following transportation system and infrastructure improvements are included in the No Build Alternative:

- **Pavement Rehabilitation.** As part of US 101, which is a State highway, Van Ness Avenue qualifies for Caltrans State Highway Operation and Protection Program (SHOPP) funds, which may be used for capital improvements relative to maintenance, safety, and rehabilitation of state highways and bridges that do not add a new traffic lane to the system. Caltrans is developing cost and estimates as part of a Project Report for the Van Ness/Lombard Pavement Rehabilitation project for funds to be programmed in the 2014 SHOPP and made available in FY 2016/2017.
- **OCS and Support Pole/Streetlight Replacement.** SFMTA, together with the San Francisco Department of Public Works (SFDPW) and the San Francisco Public Utilities Commission (SFPUC), plans to replace the existing overhead wire contact system and support poles/streetlights along Van Ness Avenue from Market Street to North Point Street to address the failing structural condition of the system. Replacement of the support poles has been on SFMTA's list of desired Capital Improvement Projects since 2003 (DPW, 2009). Improvements would include removal and replacement of existing poles and light fixtures. This effort may be implemented as a comprehensive replacement project or as a phased maintenance program that would replace poles on a priority basis, with the most structurally compromised poles prioritized for replacement. Poles would be replaced in approximately the same locations on the sidewalk, within approximately 3 feet to 5 feet of the existing poles. The replacement poles would be designed to handle modern loads as required by the BRT. These poles would also provide street and sidewalk lighting. New lighting would be energy efficient, require low maintenance, and meet current lighting requirements for safety. A new duct bank would be constructed within the sidewalk area to support the streetlights and traffic signal interconnect conduits.
- **Traffic Signal Infrastructure for Real-Time Traffic Management.** The SFgo and Signal Replacement Program led by SFMTA is a package of technology-based transportation management system tools with the following objectives:
  - Advance the Transit First policy;

- Replace 50-year-old traffic signal and communications infrastructure;
- Provide transit priority and emergency vehicle preemption;
- Disseminate real-time traveler and parking information;
- Manage special events; and
- Enhance operations and maintenance.

The SFgo and Signal Replacement Program is comprised of many projects that would be implemented throughout the City, including the Van Ness Avenue corridor. Some elements of the SFgo and Signal Replacement Program are expected to be implemented on Van Ness Avenue by 2015 regardless of a BRT project and are part of the No Build Alternative. Other elements of the SFgo and Signal Replacement Program intended for Van Ness Avenue would be implemented as part of the BRT build alternatives, including the LPA, and they are presented in Section 2.2.2. The following signal infrastructure elements of the SFgo and Signal Replacement Program are planned for implementation in the Van Ness Avenue corridor by 2015; therefore, they are included in the No Build Alternative:

- **Traffic Signal Replacement.** Existing traffic signal heads and poles will be upgraded to mast arm poles (arched to hang over traffic lanes), and new signal heads will be installed at all intersections along Van Ness Avenue.
- **Pedestrian Countdown Signals.** As part of the SFgo and Signal Replacement Program, pedestrian countdown signals will be installed on all crosswalk legs at all signalized intersections along Van Ness Avenue. Pedestrian countdown signals are traffic signals located at crosswalks that, in addition to displaying the standard symbols for walk/ don't walk, also provide a flashing numerical countdown that indicates how much time is remaining before cross traffic is given a green light. Countdown signals increase pedestrian safety by giving clear and accurate information about crossing time so that pedestrians can complete their crossing before cross traffic receives the ROW.
- **Accessible Pedestrian Signals.** Accessible Pedestrian Signals (APS), or audible crossing indications, would likely be installed at some additional signalized intersections in the project corridor as part of the SFgo and Signal Replacement Program. APS provides audible crossing indications for visually impaired pedestrians. Currently, APS is installed on Van Ness Avenue at the intersections of Market, McAllister, Hayes, Grove, and Fell streets.
- **Curb Ramp Upgrades.** The SFgo and Signal Replacement Program will install curb ramps that meet current City standards and ADA requirements at all intersections along Van Ness Avenue to provide access by people in wheelchairs, as well as provide easier travel for those with strollers, carts, and the like.

- **High-Quality Bus Vehicles with Low-Floor Boarding.** SFMTA is gradually converting its fleet to low-floor buses, which will provide more-level boarding, resulting in easier and quicker boarding and alighting. Low-floor buses would not require passengers to climb steps to board or exit buses, helping to shorten dwell times, especially the time required for passengers in wheelchairs to board and alight. The replacement fleet in the Van Ness Avenue would include 60-foot articulated electric trolley coaches and diesel hybrid coaches, and it would be phased into operation by year 2015.
- **On-Bus Proof of Payment/All-Door Boarding.** In 2012, SFMTA implemented all-door boarding, allowing passengers with proof of payment, such as a Clipper Card, to board through any door and swipe their fare cards on receptors on the bus. All-door boarding will help to reduce dwell times.
- **Real-Time Arrival Information.** SFMTA is installing real-time bus arrival information displays (like NextMuni) at major bus stops with shelters along Van Ness Avenue.

Implementation of the aforementioned transportation system and infrastructure improvements is assumed under the No Build Alternative. These improvements would not result in changes to the basic sidewalk, intersection crossing, and median configurations; therefore, under the No Build Alternative, it is assumed that Van Ness Avenue would maintain the existing physical configuration, and median widths, sidewalk widths, crosswalk dimensions, crossing distances, and provision would be the same as today. Muni 47 and 49 buses would continue to serve curbside stations; existing parallel parking and all existing traffic turning movements would be maintained.

Under each build alternative, including the LPA, two mixed-flow traffic lanes (one southbound and one northbound) would be converted into two dedicated transit lanes.

2.2.2 Build Alternatives, including the LPA

Based on findings of the 2006 Van Ness Avenue BRT Feasibility Study and scoping process, three build alternatives were defined and recommended for NEPA/CEQA analysis in the Van Ness Avenue BRT Alternatives Screening Report.[8] Figure 2-1 presents cross sections of the build alternatives. Figure 2-2 presents a typical cross section of the LPA and the station locations. Figure 2-4 depicts the Vallejo Northbound Station Variant, an LPA design variation that includes a NB station at the Vallejo Street/Van Ness Avenue intersection. The decision on whether to include the Vallejo Northbound Station Variant will be made at the time of project approval. .Project features common to each of the alternatives are summarized in Table 2-2.

Each build alternative, including the LPA, proposes BRT operating along a dedicated transit lane, or transitway, for the 2-mile-long project corridor. Under each build alternative, including the LPA, two mixed-flow traffic lanes (one SB and one NB) would be converted into two dedicated transit lanes (one SB and one NB). In other words, the existing mixed-flow traffic lanes would be reduced from three lanes to two lanes in each direction to accommodate the BRT transitway. The build alternatives, including the LPA, would occur entirely within the existing street ROW, and no property acquisition would be required. None of the build alternatives, including the LPA, would require reduction in sidewalk width. Curbside parking would generally be maintained under each build alternative, including the LPA, although some loss of street parking would occur at locations throughout the project corridor under each of the three build alternatives and the LPA. Detailed information on parking is presented in Chapter 3, Section 3.5.

Under all build alternatives, including the LPA, the existing Muni bus stops along Van Ness Avenue would be removed and replaced with BRT stations. Proposed BRT service would meet Muni's standards for rapid stop spacing, providing eight NB and nine SB stop locations, or one stop every three blocks; the Vallejo Northbound Station variant would include an additional NB station for a total of 9 NB stations. This means that, on average, passengers would not need to walk farther than 1.5 blocks to reach a stop. There are currently 15 NB and 14 SB Muni bus stops along Van Ness and South Van Ness avenues between Mission and Lombard streets, with an average of 700 feet between stops, or a stop approximately every 2 blocks. This spacing does not meet the Muni service standard recommending spacing between stops of 800 feet to 1,000 feet along relatively flat streets such as Van Ness Avenue. Each build alternative proposes consolidation and removal of 6 existing bus stops in each direction to reduce dwell time delays and improve service reliability over existing conditions (the LPA would remove seven stops in the NB direction along the BRT corridor, including the Mission/South Van Ness stop. The LPA would remove five stops in the SB direction; if the Vallejo Northbound Station Variant is selected, six stops would be removed in the NB direction). Figure 2-3 depicts the existing Muni stops that would be discontinued and the proposed replacement BRT stations for Build Alternatives 2 through 4, and Figures 2-2 and 2-4 depict this information for the LPA. Stations would be placed within the existing street ROW at 10 intersections, listed in Table 2-3 for Build Alternatives 2 through 4 and depicted in Figure 2-3. Station placement for the LPA is listed in Table 2-4. Detailed plan drawings for each build alternative, including the LPA, are provided in Appendix A. Golden Gate Transit service would utilize the BRT transitway and BRT stations to a varied degree under each alternative, as described in Section 3.2.3.

[8] The alternatives presented in this document have been slightly modified from the alternatives in the 2008 Screening Report in response to changes in funding and programming that have occurred since the report was finalized. Namely, features of the No Build Alternative have been more clearly defined based on up-to-date funding and programming.

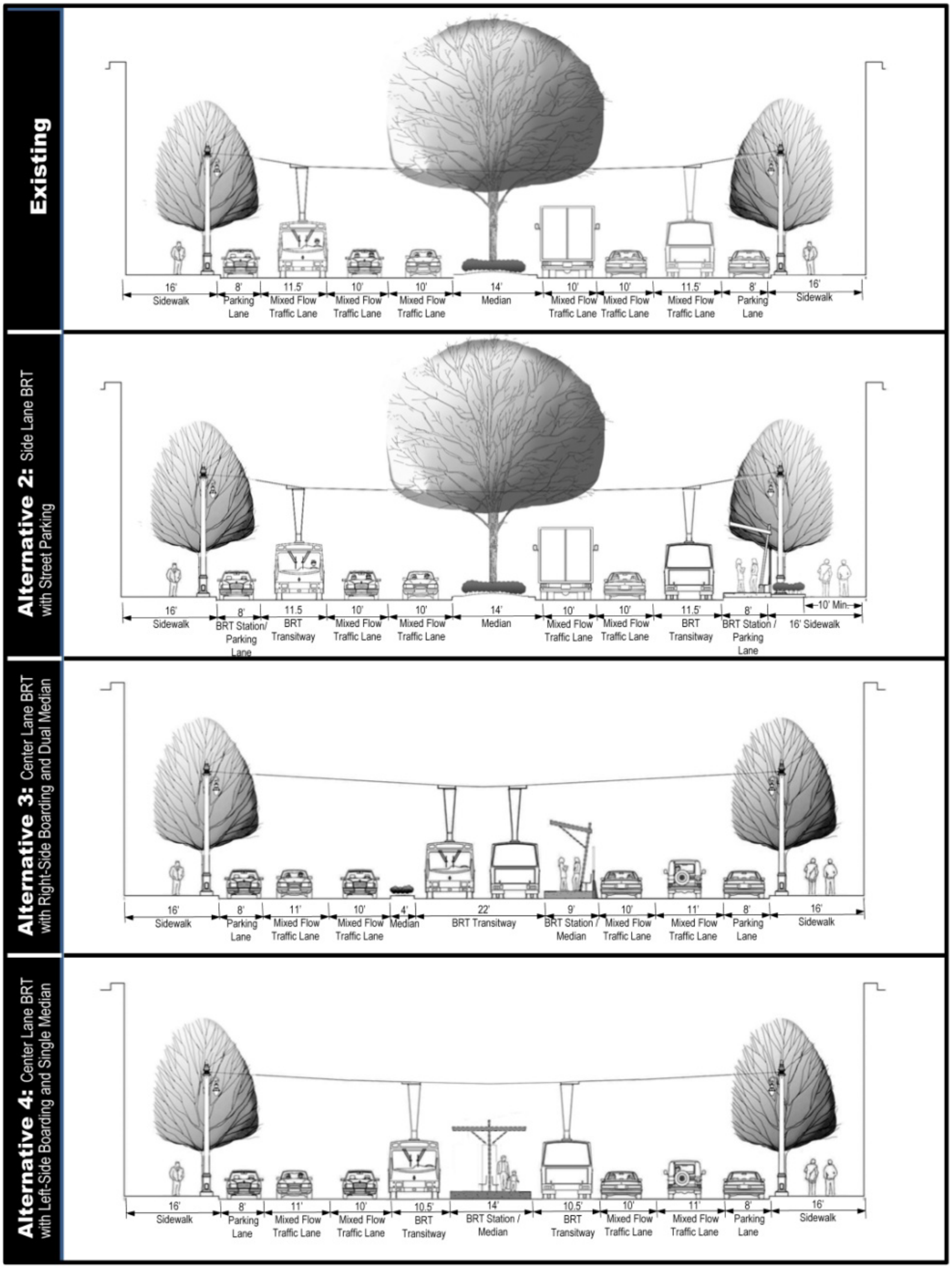

Figure 2-1. Typical Cross Sections of Build Alternatives 2-4

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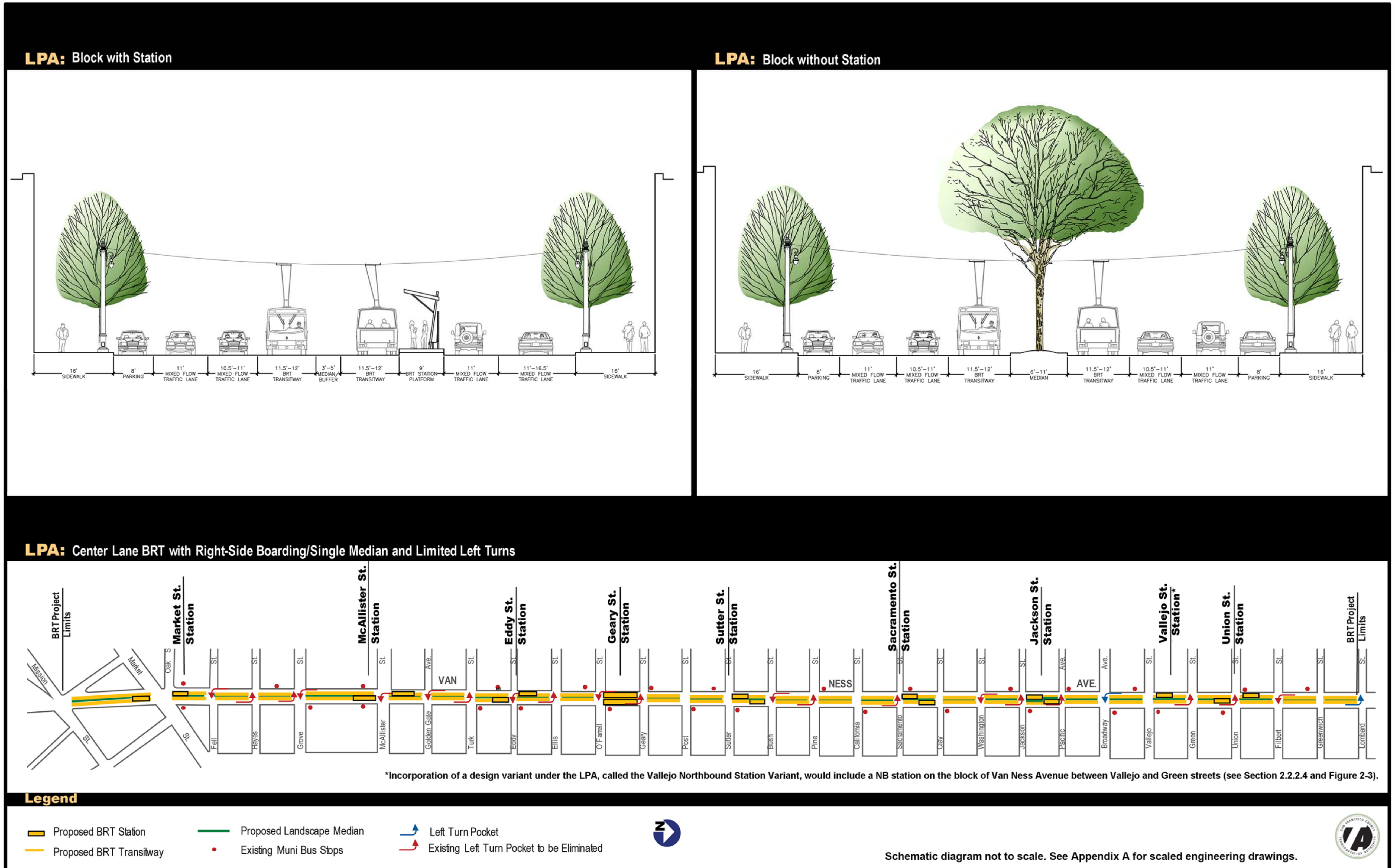

Figure 2-2: Cross Sections and Station & Left-Turn Pocket Location Map for the LPA

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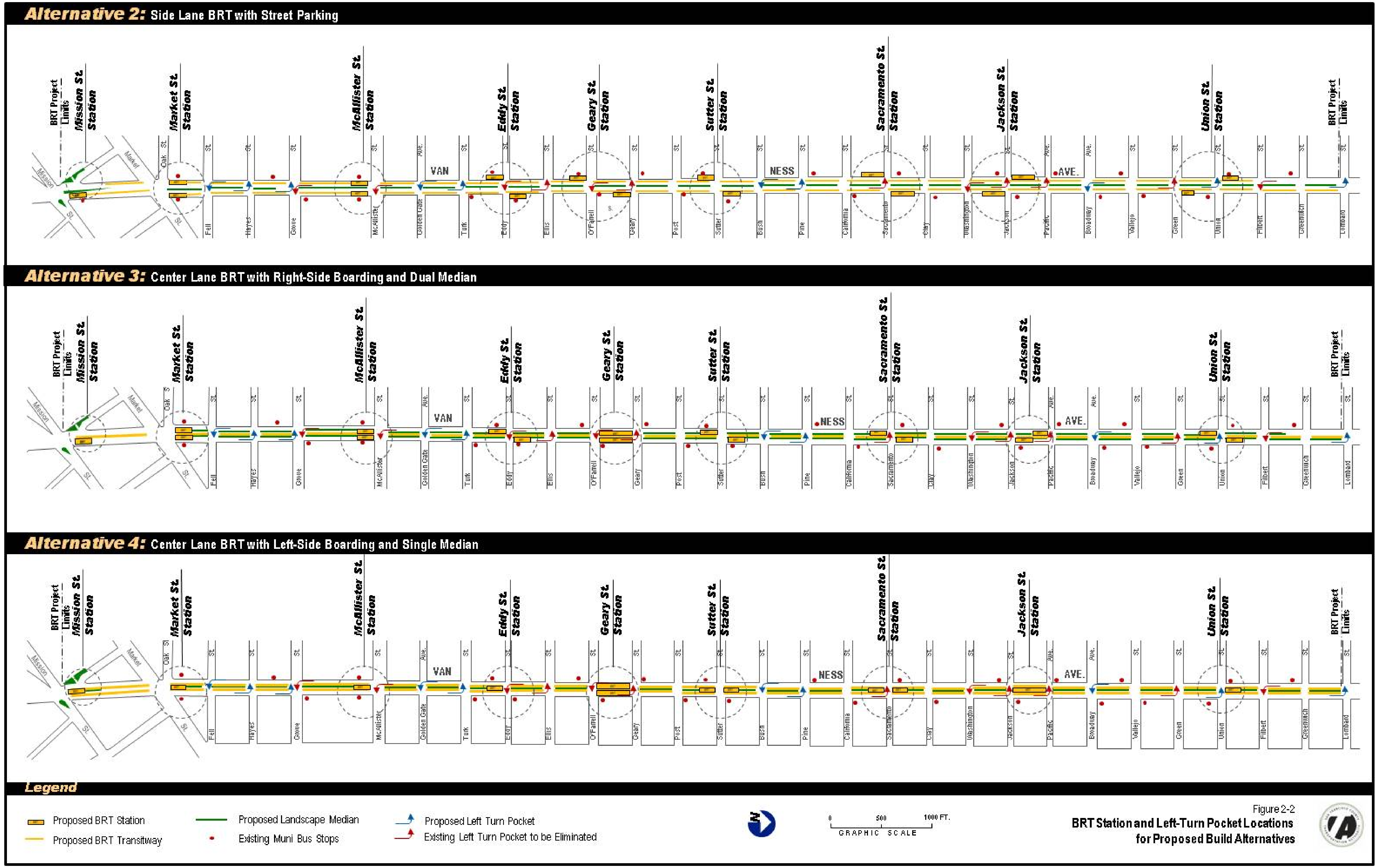

Figure 2-3. BRT Station and Left-Turn Pocket Locations for Build Alternatives 2-4

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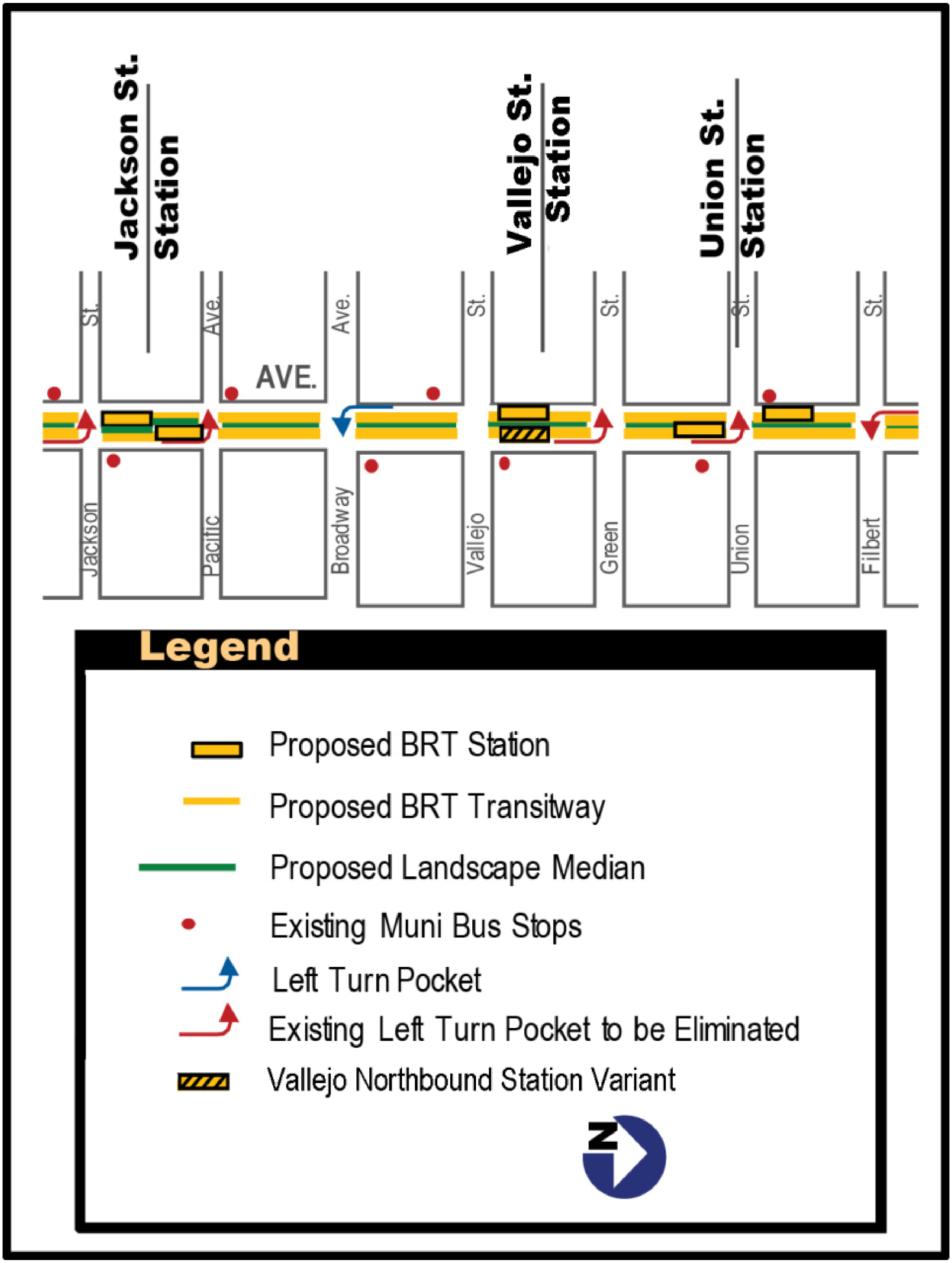


Figure 2-4. Vallejo Northbound Station Variant

Table 2-2: Major Project Features

PROJECT FEATURE	NO BUILD ALTERNATIVE	BUILD ALTERNATIVES*
High-Quality Bus Vehicles with Low-Floor Boarding	x	x
High-Quality Bus Vehicles with Level or Near Level Boarding**		x
Dedicated Bus Lanes (Transitway)		x
High-Quality Stations		x
On-Bus Proof of Payment/All-Door Boarding (swipe pass on bus)	x	
Platform Proof of Payment/All-Door Boarding*** (swipe pass on platform prior to bus arrival at selected stations)		x
Real-Time Arrival Information	x	x
Pavement Rehabilitation	x	x
Pavement Resurfacing		x
Pedestrian-Scale Lighting		x
Landscaping	x	x
Overhead Contact System (OCS) support pole/streetlight replacement	x	x
Curb Ramp Upgrades	x	x
Curb Bulbs Upgrades		x
Median Upgrades/Nose Cones for Pedestrian Safety		x
Traffic Signal Infrastructure, including Upgrade to Mast Arm Signals	x	x
Real-Time Traffic Management (upgraded controllers and fiber-optic signal interconnects)		x
Global Positioning System (GPS)-Based Transit Signal Priority (TSP)		x
Automatic Vehicle Location	x	
Pedestrian Countdown Signals	x	x
Accessible Pedestrian Signals (APS)	x****	x

*The Build Alternatives would include indicated project features with or without incorporation of the Center Alternative Design Option B as described in Sections 2.1.2.2 and 2.1.2.3. The LPA would also include the indicated project features.

**The Transportation Research Board defines level boarding as minimizing the horizontal and vertical gap between the platform edge and vehicle door threshold (TRB, July 2003). The design of Van Ness BRT will have the buses board as close to level as possible, minimizing the need to deploy a wheelchair ramp.

*** Not all BRT stations would have platform proof of payment with a receptor on the platform; however all stations would operate on a proof of payment system with receptors on each bus with at least the same technology as would exist under the No Build Alternative.

**** The No Build Alternative would likely include some additional APS at key intersections. The build alternatives, including the LPA, would include these signals at all intersections.

Table 2-3: Proposed BRT Station Locations for Build Alternatives 2-4

VAN NESS AVENUE CROSS STREET	BUILD ALTERNATIVE 2		BUILD ALTERNATIVE 3		BUILD ALTERNATIVE 4
	NORTHBOUND	SOUTHBOUND	NORTHBOUND	SOUTHBOUND	NORTHBOUND AND SOUTHBOUND
Mission Street	Curbside station 150' @ FS	No BRT station (existing stop on Otis St. retained)	Center-lane station, Dual-median configuration 150' @ FS	No BRT station (existing stop on Otis St. retained)	Center-lane, single median serving NB 150' @ FS NB
Market Street	Curbside station 150' @ FS	Curbside station 110' @NS	Center lane station, Dual-median configuration 150' @ FS	Center-lane station, Dual-median configuration 110' @ NS	Center-lane, single median serving NB and SB 150' @ FS NB
McAllister	Curbside station 150' @ FS	Curbside station 150' @FS	Center-lane station, Dual-median configuration 150' @ NS	Center-lane station, Dual-median configuration 150' @ FS	Center-lane, single median serving NB and SB 150' @ NS NB
Eddy Street	Curbside station 150' @ FS	Curbside station 112.5' @FS	Center-lane station, Dual-median configuration 150' @ FS		Center-lane, single median serving NB and SB 150' @ NS NB
O'Farrell Street	No station	Curbside station 102.5' @FS	Center-lane, dual-median configuration extends full block		Center-lane, dual-median* extends full block
Myrtle Street	No station	No station			
Geary Street	Curbside station 109.5'@NS	No station			
Sutter Street	Curbside station 104' @FS	Curbside station 109.7' @ FS	Center-lane station, dual-median configuration 150' @ FS		Center-lane, single-median serving NB and SB 150' @ FS
Sacramento Street	Curbside station 150' @FS	Curbside station 150' @FS	Center-lane station, dual-median configuration 150' @FS		Center-lane, single-median serving NB and SB 150' @ FS
Jackson Street	Curbside station 150' @NS	Curbside station 125' @NS	Center-lane station, dual-median configuration 150' @FS	No station	Center-lane, single-median serving NB and SB, extends full block
Pacific Avenue	No station	No station	No station	Center-lane station, dual-median configuration 150' @FS	
Broadway	No station	No station	No station	No station	No station
Green Street	Curbside station 95'@FS	No station	No station	No station	No station
Union Street		Curbside station 148'@NS	Center-lane station, dual-median configuration 150' @FS	Center-lane station, dual-median configuration 150' @NS	Center-lane, single-median serving NB and SB 150' @ FS

Notes: FS = Far Side of Intersection; ; NB = northbound; NS = Near Side of Intersection; SB = southbound
* Alternative 4 transitions to an Alternative 3 configuration (dual median, center lane) at this location.

Table 2-4: Proposed BRT Station Locations for LPA

VAN NESS AVENUE CROSS STREET	LOCALLY PREFERRED ALTERNATIVE	
	NORTHBOUND	SOUTHBOUND
Mission Street	No BRT Station (47 NB stop to be relocated to south side of intersection @NS)	No BRT station (existing stop on Otis Street retained)
Market Street	Center lane station, single median configuration 150' @ NS	Center lane station, single median configuration 150' @ NS
McAllister	Center lane station, single median configuration 150' @ NS	Center lane station, single median configuration 150' @ NS
Eddy Street	Center lane station, single median configuration 150' @ NS	Center lane station, single median configuration 150' @ NS
O'Farrell Street	Center lane stations, single median configuration extends full block	
Myrtle Street		
Geary Street		
Sutter Street	No station	Center lane station, single median configuration 150' @ NS
Bush Street	Center lane station, single median configuration 150' @ NS	No station
Sacramento Street	No station	Center lane station, single median configuration 150' @ NS
Clay Street	Center lane station, single median configuration 150' @ NS	No station
Jackson Street	No station	Center lane station, single median configuration 150' @ NS
Pacific Avenue	Center lane station, single median configuration 150' @ NS	No station
Broadway	No station	No station
Vallejo	No Station*	Center lane station, single median configuration 150' @ NS
Green Street	No station	No station
Union Street	Center lane station, single median configuration 150' @ NS	Center lane station, single median configuration 150' @ NS

*The Vallejo Northbound Station Variant is under consideration for the LPA, to be decided upon at project approval as explained in Section 2.2.2.4. This would include a 150' far side station platform at Vallejo Street in the northbound direction.

The three build alternatives, and the LPA, propose differing lane configurations and associated station placement at the intersections. Build Alternative 2 proposes dedicated transit lanes along the side of the roadway where the right-most travel lane in each direction currently exists, adjacent to the curbside parking area. Under Build Alternative 2, curb extensions would provide curbside BRT stations. Build Alternative 3 proposes dedicated transit lanes in the center of the roadway where the median currently exists, with two medians separating bus lanes from mixed-flow traffic. Build Alternative 3 BRT stations would be located in the center medians. Build Alternative 4 proposes dedicated transit lanes in the center of the roadway where the left-most travel lane in each direction currently exists along both sides of a single center median. Build Alternative 4 BRT stations would be located in the single center median. Additional information about the differing proposed stations and lane configurations is provided in Sections 2.2.2.1 through 2.2.2.3. Figures 2-1 and 2-4 depict the differing lane configuration for each build alternative.

As described in Section 2.2.2.4, under the LPA, BRT vehicles would run alongside a single median for most of the corridor, similar to Build Alternative 4; however, at station locations, BRT vehicles would transition to the center of the roadway, allowing right-side loading at station platforms as under Build Alternative 3.

Existing left-turn pockets for mixed-flow traffic would be eliminated at 12 intersections (6 NB movements and 6 SB movements) to reduce conflicts with the BRT operation and oncoming vehicles. The proposed BRT service under build alternatives 2, 3, and 4 would allow 4 automobile left-turn opportunities in the SB direction and 6 in the NB direction. Alternatives 3 and 4 with Design Option B would have only one left-turn opportunity in the SB direction and only one in the NB direction. The LPA, with or without Design Option B, would have the same left-turn opportunities as Alternatives 3 and 4 with design Option B.

Under the build alternatives, including the LPA, existing left-turn pockets for mixed-flow traffic would be eliminated at various intersections to reduce conflicts with the BRT operation and oncoming vehicles.

In addition, right-turn pockets for mixed-flow traffic would be introduced at certain intersections to reduce conflicts with the BRT operation. Table 2-5 identifies the locations of existing left-turn pockets and left-turn pockets proposed under each build alternative (except for the LPA). Under the LPA, right-turn pockets would be provided at three intersections along SB Van Ness Avenue at Mission/Otis/South Van Ness, Market Street, and Pine Street. The locations of left-turn pockets proposed under the build alternatives are illustrated in Figure 2-4 and Figure 2-2 for the LPA, as well as the existing left-turn pockets that would be removed.

Finally, pedestrian improvements outlined in the Market and Octavia Area Plan, approved in 2007 by the Board of Supervisors, will be implemented at the Mission and South Van Ness Avenue intersection. These include pedestrian bulbouts to reduce crossing distances and would also convert the turn from South Van Ness Avenue onto 12th Street such that traffic would be allowed to access South Van Ness Avenue from 12th Street (i.e., converting it from 1-way to 2-way). This would allow the project to close the southern part of the roadway connecting 12th Street to South Van Ness Avenue, increasing the pedestrian space without reducing traffic access. The project plans in Appendix A reflect the most recent plans for this intersection, which would be included in the BRT project.

The following transportation system and infrastructure improvements are included in the build alternatives, including the LPA:

- **High-Quality Bus Vehicles with Level or Near Level Boarding.** As described for the No Build Alternative, the build alternatives, including the LPA, would involve an upgrade from the existing buses to higher-capacity, higher-performance bus vehicles. The proposed BRT vehicles would offer increased passenger capacity over the Muni 47 line buses that presently operate in the Van Ness Avenue corridor. The proposed BRT vehicle fleet under each build alternative, including the LPA, would be a mix of 60-foot electric trolley coaches and 60-foot diesel hybrid motor coaches. The proposed BRT fleet would replace the vehicles that operate on the existing Muni bus lines 47 and 49, which currently comprise approximately a 50 percent split between 40-foot diesel motor coaches and 60-foot electric trolleys, respectively. The maximum frequency of BRT buses operating in the corridor would be equivalent to the current combined schedule of Routes 47 and 49 of approximately 15 to 16 buses per hour in the peak hour in both NB and SB directions. The design vehicle would be low-floor, and the bus station platform design would provide level or near level boarding from bus to station platform, reducing dwell times and improving service reliability over the existing conditions. Level or near level boarding would reduce the horizontal and vertical gap between the platform edge and vehicle door threshold. The design of each BRT station will allow for variation in the degree of level boarding achieved, and all BRT stations will provide more level boarding than existing Muni operations in the corridor on Routes 47 and 49.[9]

[9] The Transportation Research Board defines level boarding as minimizing the horizontal and vertical gap between the platform edge and vehicle door threshold (TRB, July 2003).

Table 2-5: Turn Pockets Proposed under Build Alternatives 2-4

INTERSECTION	NO BUILD ALTERNATIVE/EXISTING CONDITIONS				BUILD ALTERNATIVE 2				BUILD ALTERNATIVES 3 AND 4			
	NORTHBOUND		SOUTHBOUND		NORTHBOUND		SOUTHBOUND		NORTHBOUND		SOUTHBOUND	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
Mission Street								X				X
Market Street		X		X		X		X		X		X
Fell Street			X				X				X	
Hayes Street	X*				X				X			
Grove Street	X		X		X				X			
McAllister			X					X				X
Golden Gate			X			X	X			X	X	
Turk Street	X				X				X			
Eddy Street			X									
Ellis Street	X											
O'Farrell Street			X			X				X		
Geary Street	X							X				X
Post Street						X				X		
Sutter Street								X				X
Bush Street			X			X	X			X	X	
Pine Street	X				X			X	X			X
California Street						X				X		
Sacramento Stree t	X							X				X
Clay Street						X				X		
Washington Stree t			X									
Jackson Street	X											
Pacific Avenue	X											
Broadway			Xx				XX				XX	
Green Street	X											
Union Street	X				X				X			
Filbert Street			X									
Greenwich Street												
Lombard Street	XXX				XXX				XXX			
TOTAL	12		10		6		4		6		4	

Notes:
Xx = Double left-turn lane with one left-turn pocket (and a second, outside lane allowing left-turn and through traffic).
XX = Double left-turn lane
XXX = triple left-turn lane.
* Currently, there is a northbound, double left-turn lane at Hayes Street; however this would be changed to a single left-turn lane with implementation of the Hayes Two-Way Street Conversion Project being implemented by the SFMTA, described in Section 2.6.1; therefore a single left-turn lane is assumed for the future no-build conditions.

- **Dedicated Bus Lanes (Transitway).** BRT buses would operate in an exclusive, dedicated bus lane on the street surface. The BRT transitway would accommodate both SFMTA and Golden Gate Transit vehicles, which currently operate along the corridor, and would be available for use by emergency response vehicles. The bus lane would be distinguished from mixed-flow traffic lanes by colored pavement or other special markings or physical delineation.

- **Pavement Rehabilitation and Resurfacing.** Under the build alternatives, including the LPA, Van Ness Avenue would undergo curb-to-curb rehabilitation and resurfacing. This work would be planned in coordination with the Caltrans SHOPP plans for pavement rehabilitation as described in Section 2.2.1 for the No Build Alternative.

- **High-Quality Stations.** The BRT stations proposed under each build alternative, including the LPA, would include a platform, canopy, landscaped planter, and station amenities. Visual simulations of stations are provided in Chapter 4.4, Visual/Aesthetics. The station would sit upon a concrete bus pad elevated 10 to 12 inches above the street grade (approximately double the height of a standard curb). Stations would be approximately 150 feet in length, with a platform length of 130 feet to accommodate two 60-foot articulated BRT vehicles. The platform provides the area for passenger waiting, boarding, and station amenities. The station platform would range from 9 feet to 14 feet in width, depending on the project alternative and the need for a platform to accommodate single-direction travel, or both SB and NB travel. All station platforms for the LPA would be 9 feet in width, accommodating only single-direction travel. The station canopy would provide shelter from sun and rain, and it would be approximately 8 feet to 11 feet in height, depending on the incorporation of decorative architectural features and/or solar paneling, which would be determined during final design.[10] Station amenities would include ticket vending machines (TVMs) at selected stations, seating, lighting, a canopy and wind screens, garbage receptacles, and wayfinding information (maps/signage). In Build Alternative 2, a landscaped planter would be incorporated to beautify the stations. Stations would be designed to comply with ADA requirements. The stations would feature active data display and audio capability to indicate bus arrival time as required by ADA. Protective railings would be incorporated as appropriate for safety requirements.

- **Platform Proof of Payment/All-Door Boarding.** As described for the No Build Alternative, the build alternatives, including the LPA, would operate with all-door boarding BRT service, allowing passengers with proof of payment, such as a Clipper Card, to board through any door. In the build alternatives, including the LPA, SFMTA would have selected BRT platforms function as proof-of-payment areas where passengers would swipe their fare cards on receptors before the buses arrive, further helping to reduce dwell time.

Both the No Build and Build Alternatives would operate with all-door boarding BRT service, allowing passengers with proof of payment, such as a Clipper Card, to board through any door. In addition, at selected stations BRT passengers would be able to pay fares and swipe passes on receptors on the platforms before boarding the bus, further helping to reduce dwell time.

- **Real-Time Arrival Information.** As described for the No Build Alternative, the BRT stations under the build alternatives, including the LPA, would be equipped with real-time arrival information, providing real-time bus arrival information displays.

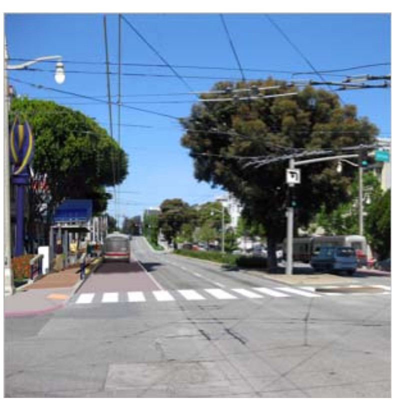
- **Transportation System Management (TSM) Capabilities.** The proposed BRT service under each build alternative, and the LPA, would utilize advanced traffic and TSM technologies, like those proposed under the SFgo and Signal Replacement Program, including:
  - **Traffic Signal Infrastructure for Real-Time Traffic Management.** Traffic signal poles would be upgraded to mast armed poles. Signal controllers and interconnects would be replaced with modern controllers and a new fiber-optic signal interconnect communications network that would allow real-time traffic management. Variable real-time message signs and traffic cameras would also be installed to manage traffic

[10] Chapter 4.4, Visual/Aesthetics, discusses the design process for proposed BRT stations and other project features located within the public ROW.

conditions and special events. The interconnects and controllers allow active monitoring and adjusting of traffic signal timings.

- **Global Positioning System (GPS)-Based Transit Signal Priority (TSP).** Under the build alternatives, including the LPA, TSP hardware would be installed on the traffic signal mast arms. TSP provides advance and extended green light time for buses approaching signals to reduce bus delay caused by red lights. The proposed BRT stations would be located on the far side of signalized intersections as feasible to optimize the capability of TSP. Buses would be granted a green light to travel through the intersection and then subsequently stop at a station, benefiting transit travel time and reliability.

- **Automatic Vehicle Location (AVL).** AVL would be utilized under the build alternatives, including the LPA, to manage transit route operations in real time.
- **Median Upgrades/Nose Cones for Pedestrian Safety.** Median refuges would be modified and widened where feasible to reduce the distance that pedestrians must cross during one light cycle, improving pedestrian safety at those locations. Nose cones would be installed where feasible to provide a protective buffer between pedestrians and automobile traffic. Under the LPA, all medians on Van Ness Avenue would be at least 6 feet wide, and nose cones would be installed for all east-west crossings of Van Ness Avenue. All upgrades to intersections would comply with ADA standards.
- **Curb Ramp Upgrades.** Curb ramps would be installed at all intersections along Van Ness Avenue. Curb ramps would meet current City standards and ADA requirements to provide access by people in wheelchairs, as well as provide easier travel for those with rolling devices such as strollers and carts.
- **Landscaping.** Medians would be landscaped to promote a unified, visual concept for the Van Ness Avenue corridor. BRT stations would include landscaped planters, and landscaping would be incorporated as feasible to provide a buffer between bus patrons and adjacent auto and pedestrian traffic. In addition, the discontinuation of existing Muni bus stops and removal of bus shelters as proposed under the build alternatives, and the LPA, would open up additional sidewalk space at these locations. This would enhance the pedestrian environment at these locations and offer opportunities for tree planting, landscaping, or streetscape features. Under the LPA, the project proposes to implement an approximate 2-foot-wide buffer in the form of planters in between existing sidewalk trees on the block between O'Farrell and Geary streets on the east side of the street, as well as the two blocks between Broadway and Green Street on both sides of the street due to the lack of parking and a striped buffer in the outside mixed traffic lane on those blocks. The planters would provide a buffer for pedestrians from moving traffic.



Build Alternative 2 provides a dedicated bus lane located adjacent to existing curbside street parking.

- **Curb Bulbs.** Curb bulbs are proposed at most signalized intersections to improve pedestrian safety by improving visibility between motorists and pedestrians, shortening the crossing distance across Van Ness Avenue, and reducing the speed of right-turning traffic.
- **Pedestrian Countdown Signals.** Pedestrian countdown signals would be installed on all crosswalk legs at all signalized intersections in the project corridor as part of the build alternatives, including the LPA.
- **Accessible Pedestrian Signals (APS).** APS, or push-buttons, would be installed on all crosswalk legs at all signalized intersections in the project corridor as part of the build alternatives, including the LPA.
- **OCS Support Pole/Streetlight Replacement.** Under the build alternatives, including the LPA, the OCS overhead wire and support pole system would be replaced and upgraded, as described in Section 2.2.1, along with the associated street and pedestrian lighting.

2.2.2.1 | BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING

Build Alternative 2 would provide a dedicated bus lane, or transitway, in the right-most lane of Van Ness Avenue located adjacent to the existing curbside street parking area. The transitway would extend from Mission Street to Lombard Street in both the NB and SB directions. The transitway would be traversable for mixed-flow traffic that would enter the transitway to complete a right turn or to parallel park. Under Build Alternative 2, BRT stations would be located within the curbside parking area as curb extensions, eliminating the need for buses to exit the transitway to pick up passengers. Golden Gate Transit vehicles that currently operate on Van Ness Avenue would operate in the transitway and use BRT stations exclusively, thus eliminating the existing Golden Gate Transit stop at Turk Street. A planter with trees and shrubs would be located along the sidewalk side of the BRT station platform to serve as a buffer between bus patrons and sidewalk pedestrians. Build Alternative 2 would include all of the project features described in Section 2.2.2. Build Alternative 2 would involve minimal modification to the existing median; therefore, existing trees and landscape plantings would not require removal. Figure 2-1 presents the typical cross section for Build Alternative 2.

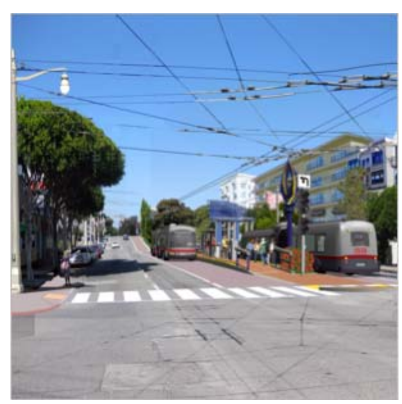
2.2.2.2 | BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS

Build Alternative 3 would provide a transitway comprised of two side-by-side, dedicated bus lanes located in the center of the roadway (where the median currently exists) in between two medians. The transitway would be separated from mixed-flow traffic by a 4-foot-wide median and a 9-foot-wide median. Golden Gate Transit vehicles that currently operate on Van Ness Avenue would operate in the transitway and use BRT stations exclusively, thus eliminating the existing Golden Gate Transit Turk Street Station. BRT stations would be located on the 9-foot median, allowing right-side boarding. Build Alternative 3 would require removal of much of the existing medians, including existing trees and landscaping, to construct the dual-median, center-lane transitway; therefore, opportunities to preserve existing trees and landscape would be minimal, and replacement trees and landscaping would be the most constrained among the build alternatives. New tree planting is proposed along the 9-foot-wide right-side medians and at locations of former curbside bus stops. Figure 2-1 presents the typical cross section for Build Alternative 3.

Build Alternative 3. Two side-by-side dedicated bus lanes are located in the center of the roadway between two medians.

Center-Lane Alternative Design Option B

Both center-running alternatives (Build Alternatives 3 and 4) contain a design option referred to as Design Option B. This design option would eliminate all but one NB left turn (at Lombard Street) and all but one SB left turn (at Broadway) in the project corridor. Design Option B would reduce conflicts at intersections with turning vehicles and increase the green light time available to BRT buses for through movement. The removal of left-turn pockets would allow more street parking at certain locations, as explained in Chapter 3, Section 3.5. Table 2-6 presents the turn pockets proposed under Build Alternatives 3 and 4 with incorporation of Design Option B. As discussed in Section 2.2.4, the LPA incorporates Design Option B.



Build Alternative 4. Stations are in the center of a 14-foot-wide median, flanked by dedicated bus lanes.

Table 2-6: Center-Lane Alternative Design Option B Proposed Turn Pockets

INTERSECTION	NO-BUILD ALTERNATIVE/ EXISTING CONDITIONS				BUILD ALTERNATIVES 3 AND 4				BUILD ALTERNATIVES 3 AND 4 WITH DESIGN OPTION B*			
	NORTHBOUND		SOUTHBOUND		NORTHBOUND		SOUTHBOUND		NORTHBOUND		SOUTHBOUND	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
Mission/Otis Street								X				X*
Market Street		X		X		X		X		X		X*
Fell Street			X				X					
Hayes Street	X				X							
Grove Street	X		X		X							
McAllister			X					X				X
Golden Gate			X			X	X			X	T*	
Turk Street	X				X							
Eddy Street			X									
Ellis Street	X											
O'Farrell Street			X			X				X		
Geary Street	X							X				X
Post Street						X				X		
Sutter Street								X				X
Bush Street			X			X	X			X		
Pine Street	X				X			X				X*
California Street						X				X		
Sacramento Street	X							X				X
Clay Street						X				X		
Washington Street			X									
Jackson Street	X											
Pacific Avenue	X											
Broadway			Xx				XX				XX*	
Vallejo Street												
Green Street	X											
Union Street	X				X							
Filbert Street			X									
Lombard Street	XXX				XXX				XXX*			

Notes:
T = transit only, turns only allowed by transit vehicles.
Xx = double left-turn lane with one left-turn pocket (and a second, outside lane allowing left-turn and through traffic).
XX = double left-turn lane.
* The LPA also incorporates Design Option B, but includes only those turn pockets indicated with an asterisk.
XXX = triple left-turn lane.

2.2.2.3 | BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN

Build Alternative 4 would provide a transitway in the center of the roadway comprised of a single, 14-foot-wide median flanked by dedicated NB and SB bus lanes where the left-most travel lane in each direction currently exists. Station platforms would be located on the single center median, requiring left-side passenger boarding and alighting, as well as left side doors on vehicles. All stations would have this single-median design, with the exception of the BRT stations proposed at Geary/O'Farrell, which would utilize a dual-median configuration similar to that proposed under Alternative 3 to accommodate Golden Gate Transit vehicles that only have right-side doors. As with the other build alternatives, including the LPA, Golden Gate Transit would operate exclusively in the transitway. Outside of the Geary/O'Farrell Station, all other Golden Gate Transit stops along the BRT corridor would be consolidated in Build Alternative 4. Golden Gate Transit vehicles operating along the Van Ness BRT corridor would make an additional stop at the corner of Chestnut Street and Van Ness Avenue to provide access in the northern end of the corridor. This would require routing Golden Gate Transit buses along Chestnut Street instead of Lombard Street between Laguna Street and Van Ness Avenue. To accommodate this rerouting, buses turning left onto Laguna Street eastbound (EB) on Lombard Street would be allowed. Additionally, Golden Gate Transit bus stops and shelters would be established or lengthened at the intersection of Chestnut Street and Van Ness Avenue either as new stops or shared with Muni buses. This could require the removal of a few parking spaces. As an alternative to this solution at Chestnut, the Authority would reconfigure the platform at Union Street to allow right-side boarding similar to the Geary Street station.

Build Alternative 4 would require some modification of the existing median landscaping, including removal of some existing trees and landscaping, to construct the center-lane transitway. Existing trees would be retained where feasible, and new trees would be planted in the median and at former bus stops. Figure 2-1 presents the typical cross section of the left-side boarding, single-median design for Build Alternative 4.

Center-Lane Alternative Design Option B

As explained in Section 2.1.2.2, Design Option B is under consideration for Build Alternatives 3 and 4, and it is incorporated in the LPA. The design option would eliminate all but one NB left turn (at Lombard Street) and all but one SB left turn (at Broadway). The proposed locations of turn pockets under Build Alternative 4 with or without incorporation of the Center-Lane Alternative Design Option B are provided in Table 2-6.

2.2.2.4 | THE LPA: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING/SINGLE MEDIAN AND LIMITED LEFT TURNS

The LPA is a combination and refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B) and is referred to as Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns. The LPA retains the high-performance features of Build Alternatives 3 and 4 (e.g., maximum transit priority, fewest conflicts), while avoiding the need to acquire left-right door vehicles or remove the entire existing median. Under the LPA, BRT vehicles would run alongside a single median for most of the corridor, similar to Build Alternative 4; however, at station locations, BRT vehicles would transition to the center of the roadway, allowing right-side loading at station platforms as under Build Alternative 3. Figure 2-2 depicts the LPA, schematically showing locations of stations and turn pockets, and it provides a cross section of the LPA on a block with a station and a block without a station. Detailed plan drawings of the LPA are provided in Appendix A. The LPA incorporates Design Option B, the left-turn removal design option, which would eliminate all left turns from Van Ness Avenue between Mission and Lombard streets with the exception of a SB (two-lane) left turn at Broadway Street. Incorporation of Design Option B would provide the greatest transit travel time benefits, reduce the weaving associated with the transitions buses must make between station locations and blocks without stations, and aid with the flow of north-south traffic along Van Ness Avenue. The LPA would include all project features described in Section 2.2.2.

The LPA station locations differ somewhat from those proposed under Build Alternatives 3 and 4 because all of the stations under the LPA are positioned at the near sides of intersections, whereas stations are generally proposed at the far side of intersections under Build Alternatives 3 and 4. In addition, under the LPA the NB Mission Street station proposed under Build Alternatives 3 and 4 was eliminated, and a new SB station at Vallejo Street was introduced. Lastly, a NB station at the Vallejo Street location is under consideration as a design variant under the LPA, called the Vallejo Northbound Station Variant. Incorporation of this NB station at the Vallejo Street/Van Ness Avenue intersection will be decided at the time of project approval, and impacts associated with this station are described throughout Chapters 3 through 7 of this document.[11] The station locations represented in the LPA respond to comments on the Draft EIS/EIR and public outreach regarding LPA selection, and efforts to further optimize transit operations.

The LPA would require substantially more modification of the existing median landscaping than Build Alternative 4 (but less than Build Alternative 3), including removal of more existing trees and landscaping at station platform locations and transition blocks leading to and from station locations. Existing trees would be retained where feasible, and new trees would be planted in the median and along the sidewalk at former bus stop locations. Under the LPA, the project proposes to implement an approximate 2-foot-wide buffer, in the form of planters in between existing sidewalk trees on the block between O'Farrell and Geary streets on the east side of the street and on the two blocks between Broadway and Green Street on both sides of the street due to the lack of parking and a striped buffer in the outside mixed traffic lane on those blocks. Figure 2-2 presents the typical cross section for the LPA. Figure 2-3 depicts the Vallejo Northbound Station Variant.

2.3 Construction Plan

Construction would include pavement rehabilitation as needed, pavement resurfacing from curb to curb, reconstruction of curb and gutters (including curb bulbs), reconfiguration of the median, construction of BRT stations, replacement of the OCS support poles/streetlights system, replacement of traffic signal infrastructure, and associated utility relocations.

An overview of the project Construction Plan (Arup, 2012) follows. Additional detail about the Construction Plan is provided in Section 4.15, Construction Impacts. Construction of the build alternatives, including the LPA, would occur within the existing street ROW. Construction would include the following major activities along the length of the proposed project: pavement rehabilitation as needed along the transitway, pavement resurfacing of Van Ness Avenue from curb to curb, reconstruction of curb and gutters (including curb bulbs), reconfiguration of the median, construction of BRT stations, replacement of the OCS support poles/streetlights system, replacement of traffic signal infrastructure, and associated utility relocations. BRT station construction would involve installing components such as platforms, canopies, ticket vending equipment, railings, lighting, signage, and station furniture[12]. The manner in which construction would take place would be similar for all of the build alternatives and the LPA. Table 2-7 lists the major construction activities.

Table 2-7: Anticipated Construction Areas and Excavation Depths

CONSTRUCTION ITEM	AREA	DEPTH (FEET)[1]
OCS Support Pole Replacement	3-foot-diameter excavation area, within sidewalk; located throughout project limits.	11.0
OCS Conduit Trench	2-foot-wide trench, within sidewalk; located throughout project limits.	3.0

[11] No new project impacts beyond impacts described in the Draft EIS/EIR were identified with incorporation of the Vallejo Northbound Station Variant into the project design (see discussions pertaining to the Vallejo Northbound Station Variant in Chapters 3 through 7 of this document).
[12] Exact features at each station will be determined during the design phase of the project.

Table 2-7: Anticipated Construction Areas and Excavation Depths

CONSTRUCTION ITEM	AREA	DEPTH (FEET)[1]
Sewer Pipeline Relocation	6-foot-wide trench, within street; replace or relocate sewer at platform stations and at any locations where the BRT proposes the transitway or mixed traffic lanes directly over the existing sewer facility.	11.5
Traffic Signal Poles	3-foot-diameter excavation area, located at intersections throughout project limits.	16.0
Controller Cabinets	2.5-foot by 4-foot excavation area, located within the sidewalk at intersections throughout project limits.	3.0
Curb Bulbs & Sidewalk Reconstruction	Approximately 30 feet of full-width sidewalk disturbance area, located at intersections throughout project limits (varies by project alternative).	1.5
Pavement Resurfacing	Curb-to-curb resurfacing.	0.7
Pavement Reconstruction/ Rehabilitation	Spot improvements, as needed, to travel lanes and parking lanes to remedy failed pavement areas.	1.5
New Pavement	New pavement would be provided where transitways encroach over existing median. The maximum width of new pavement construction would be 14 feet at station locations where transitways would replace existing 14-foot medians.	1.5
Station Platform	Typical station platform dimensions are 9 feet to 14 feet wide by 150 feet long at platforms, Geary/O'Farrell is the longest platform area of approximately 270 feet.	1.0
Station Canopy Foundation	2.5-foot-diameter excavation area at platforms.	5.0

[1] Depth below ground surface (bgs).

Source: Project Construction Plan for the Van Ness Avenue Bus Rapid Transit Project (2012).

Closure of one mixed-flow traffic lane in each direction and some on-street parking would be necessary for construction of all of the build alternatives, including the LPA. Temporary conversion of parking lanes to mixed-flow traffic lanes would be implemented in some cases to maintain two traffic lanes in each direction and minimize traffic impacts. In all cases, two lanes of mixed-flow traffic would generally remain open in each direction during construction, although temporary closures of an additional mixed-flow traffic lane would be required during construction tasks that could interfere with traffic or create safety hazards such as utility relocations, placement of concrete barriers, or large equipment. These closures would be planned for nighttime or off-peak traffic hours as feasible. Partial closure of the sidewalk would be required under all of the build alternatives, including the LPA, for curb bulb construction work, replacement of the OCS support poles/streetlights and associated duct trenching, signal installation, and reconfiguration of underground utilities.

All construction work would be conducted in compliance with obtained permits and regulations set forth by the City and Caltrans, in accordance with the SFMTA Regulations for Working in San Francisco Streets (Blue Book), the Manual on Uniform Traffic Control Devices (MUTCD), San Francisco Municipal Code (Noise Ordinance, Sections 2907 and 2908), and SFPUC and SFDPW Bureau of Street Use and Mapping (BSM) work orders. A traffic rerouting and detour plan would be coordinated during the project design phase.

2.3.1 Construction Approach and Schedule

Principles of the project construction approach to be implemented under each build alternative include the following:

- Maintain two mixed-flow traffic lanes in each direction (NB and SB) during peak hours, and as feasible during non-peak hours on Van Ness Avenue during project construction;
- The two mixed-flow traffic lanes would carry transit vehicles and maintain service for the 47 and 49 bus routes throughout construction;
- Assure 10-foot widths for all traffic lanes at a minimum;
- Place a physical barrier between traffic lanes and the construction zone (typically to be done by using a concrete k-rail barrier);
- Provide an appropriate buffer width between the construction zones and the adjacent traffic lanes, inclusive of the k-rail concrete barrier;
- Reduced speeds through construction work areas;
- Remove curbside parking as needed during construction of stations or the transitway; and
- Adhere to requirements and standards identified in the MUTCD and the San Francisco Blue Book, which govern temporary work zone installations.

To minimize disruption to the traveling public, all efforts will be made to keep two traffic lanes open in each direction during construction. Construction activities that require closure of the on-street parking lane and/or a second traffic lane in one direction would be staged on approximately three-block segments.

Construction of each build alternative, including the LPA, under the preferred construction approach, would occur on two three-block segments of Van Ness Avenue throughout the corridor at the same time to reduce the overall construction schedule. Thus, multiple construction crews would be working at different locations (in three-block segments) along the corridor at one time. To minimize disruption to the traveling public, construction activities that require closure of the on-street parking lane and/or a second traffic lane in one direction would be staged on approximately three-block segments. Construction on three-block segments could occur simultaneously in the northern and southern ends of the corridor to stagger associated parking and traffic circulation disruption, followed by construction in the central segment. The three build alternatives and the LPA have different street staging plans due to the nature of construction required for each. Build Alternative 2 would be constructed on one side of Van Ness Avenue at a time to accommodate open lanes of mixed-flow traffic in both NB and SB directions at all times. One traffic lane would remain open alongside the construction area, and three traffic lanes would remain open on the opposite side of the street, along with on-street parking. Under construction of Build Alternative 2, a contraflow system would likely be used during daytime construction to maintain two open traffic lanes in each direction. Construction of the BRT stations, transitway, and medians under Build Alternatives 3 and 4 would take place in an approximate 43-foot-wide area in the center of the roadway. Two traffic lanes would generally remain open on either side of the construction area. The parking lane on both sides of the street would be closed during the construction work to maintain two open traffic lanes in each direction.

Each alternative would have a range of durations, depending on the approach. The preferred approach of working in three-block segments in two parts of the corridor at once would have the duration be at or near the shorter end of the range for each of the alternatives (see Section 4.15). This approach is recommended in the Project Construction Plan prepared for the proposed project (Arup, 2012) and in the Caltrans Project Study Report-Project Report (Parsons, 2013). Construction of Build Alternative 2 under the preferred approach is anticipated to last approximately 19 months, as shown in Table 2-7; however, construction duration could be extended in the event a contraflow system is not implemented and construction activities requiring closure of a second lane in one direction would be restricted to nighttime. Construction for Build Alternative 3 under the preferred approach is anticipated to require 21 months, whereas construction for Build Alternative 4 under the preferred approach is anticipated to require 14 months. Replacement of the aging sewer pipeline beneath the entire transitway alignment (see Chapter 4.6, Utilities) would be coordinated with construction of Build Alternative 3, which accounts for the longer construction duration compared to Build Alternative 4. Under Build Alternative 4, it is anticipated that the sewer pipeline would require replacement only beneath stations and not the transitway, resulting in shorter construction duration. Table 2-8 summarizes the construction approach and schedule for each build alternative. Incorporation of Design Option B under Build Alternative 3 or 4 would not affect the construction schedule for these alternatives.

2.3.1.1 | LPA CONSTRUCTION STAGING

Construction staging for the LPA would be as described above for Build Alternatives 3 and 4, except that replacement of the aging sewer pipeline would be required at station locations and in areas where the transitway would cause direct load (i.e., weight) on the sewer. The duration for LPA construction would be longer than under Build Alternative 4 because it would require rebuilding the curb for the entire median, as well as replacement of the sewer pipeline as described above. The Build Alternative 4 design does not require rebuilding of the median curbs on blocks that are not proposed to have stations and do not currently have a left-turn pocket, and it also would not have locations with the transitway running directly over the sewer, meaning more linear feet of sewer would require replacement under the LPA than under Build Alternative 4. The duration for LPA construction would be shorter than under Build Alternative 3 because it is not anticipated to require complete replacement of the sewer pipeline beneath the entire transitway alignment as described for Build Alternative 3. Under this construction implementation scenario, construction using the preferred approach for the LPA is anticipated to require 20 months to substantial completion. The NB station would be constructed at the same time as the SB station, and related lane closures and staging would not be substanitally different. Incorporation of the Vallejo Northbound Station Variant would extend construction time for the Vallejo block or segment, but it would not extend the overall project schedule under the preferred approach, because station construction is not on a critical schedule path (i.e., construction of the station could occur simultaneous to other construction activities in that three-block segment).

Table 2-8: Preferred Construction Approach and Schedule

BUILD ALTERNATIVE	PREFERRED CONSTRUCTION APPROACH	DURATION*
Alternative 2	Construction along a single side of the street on mltiple segments, simultaneously.	19 months**
Alternative 3	Construction along both sides of the street in multiple segments, simultaneously.***	21 months
Alternative 4	Construction along both sides of the street in multiple segments, simultaneously.	14months
LPA	Construction along both sides of the street in two segments, simultaneously.****	20 months

*To substantial completion.

** Construction duration for Build Alternative 2 could be extended in the event a contraflow system is not implemented and construction activities requiring closure of a second lane in one direction would be restricted to nighttime.

***The duration for Build Alternative 3 construction would be longer than Build Alternative 4 due primarily to replacement of the sewer pipeline throughout the BRT alignment. Design Option B would not affect the construction schedule for either Build Alternative 3 or 4.

**** The duration for LPA construction is longer than Build Alternative 4 because it would require rebuilding of the median curb for the length of the corridor and also would require replacement of the sewer at station locations and in areas where the transitway would cause direct load on the sewer. Incorporation of the Vallejo Northbound Station Variant would extend construction time for the Vallejo block or segment, but it would not extend the overall project schedule under the preferred approach.

2.4 Project Schedule

The public hearing for the Draft EIS/EIR occurred November 30, 2011. On June 26, 2012, the SFCTA Board of Commissioners voted unanimously to select the "Center Lane Bus Rapid Transit with Right Side Boarding/Single Median and Limited Left Turns" as the LPA for the Van Ness Avenue BRT Project, authorized the Executive Director to analyze the Staff Recommended LPA in the Final EIS/EIR, and approved the Draft Van Ness Avenue BRT LPA Report. Final design will occur after project approval. Following completion of design, construction of the proposed project, is planned to begin in 2016 and last approximately 20 months, assuming the preferred construction approach is utilized as planned. Thus, BRT service is expected to begin in 2018.

2.5 Capital and Operating Costs of Build Alternatives

Total capital costs for the Van Ness Avenue BRT Project are estimated to range from $87 million to $130 million to design and construct, depending upon the project alternative, funded with a combination of local and federal sources.

Capital and operating costs for the build alternatives have been prepared as part of the Capital Costing and Assumptions report. This section presents the estimated costs in 2014 dollars for each project alternative. Additional detail on capital and operating costs is presented in Chapter 9, Financial Analysis.

2.5.1 | Capital Costs

Total capital costs for the Van Ness Avenue BRT Project are estimated to range from $93 million to $136 million (in 2014 dollars) to design and construct, depending upon the project alternative. The project build alternatives, including the LPA, would be funded with a combination of local and federal sources. The Proposition K Expenditure Plan, which was passed by San Francisco voters in 2004, dedicates close to $200 million for the citywide network of BRT and TPS improvements. Of this amount, approximately $20 million is allocated for BRT on Van Ness Avenue. This amount will serve as a local match to leverage up to $74,999,999 million from the FTA's Small Starts Program. Small Starts funding is specifically dedicated for major transit projects that cost less than $250 million and have Federal Section 5309 funding contributions of less than $75 million. BRT on Van Ness Avenue is eligible for these funds and, in 2012, the project was one of three Small Starts potential projects in the nation to receive a High rating for cost effectiveness and the only Small Starts project in the nation to receive a Medium-High rating for "project justification". (Source: Fiscal Year 2014 FTA Annual Report on Funding Recommendations)[13].

The proposed project received $15 million in Small Starts funds in FY 2011 and $30 million in FY 2012.Elements of the No Build Alternative are funded by a variety of sources. The replacement of OCS support poles/streetlights, including the streetlight upgrades, is funded through SFMTA's Overhead Rehabilitation Program and SFPUC's capital budget. The traffic signals upgrade and SFgo and Signal Replacement real-time traffic management program is funded by Proposition B, which is the transportation bond measure passed by California voters in 2006, as well as funds from MTC's Climate Initiatives Program. Roadway repaving will be funded through the State's SHOPP program.

[13] The Van Ness Avenue BRT Project received a score of "High" on all three project justification criteria where scoring measures have been defined. For the three criteria where measures have not yet been defined, all projects were assigned a rating of "medium." In all previous annual funding recommendations since 2007 (where the all measures had been defined), Van Ness Avenue BRT has received a score of "High" for project justification, the only Small Starts Project in the nation to receive such a designation.

2.5.2 Annual Operating Costs

Overall, the estimated annual operations cost for the No Build Alternative, in current year dollars, would total approximately $8.3 million, which does not include baseline maintenance costs. Annualized operations and incremental maintenance costs range from $5.9 million for Build Alternative 4 with Design Option B, which is a 29 percent savings relative to the No Build Alternative, to $7.1 million for Build Alternative 2, which is a 14 percent savings relative to the No Build Alternative. The key determinant of the cost to operate a service is the route "cycle time," which dictates the number of buses and drivers that are required to operate at a given frequency of service. By improving bus travel times and by reducing delays, BRT shortens the amount of time it takes a bus to complete its route. This enables the same number of drivers and buses to operate more cycles and ultimately provide a higher frequency of service; therefore, the proposed Van Ness Avenue BRT would reduce operating costs by reducing the amount of time required for a bus to complete its route. Each of the alternatives, including the LPA, would result in differing costs for maintenance of landscaping and the transitway, and all alternatives would include the costs for temporary shuttling of BRT vehicles between maintenance facilities for interim maintenance until SFMTA completes its planned maintenance facility expansion. These costs are described in greater detail in Chapter 9, Financial Analysis.

The annual operating and maintenance costs associated with the build alternatives, including the LPA, are significantly lower than those of the No Build Alternative, with cost savings ranging from 14 percent to 29 percent, depending on the build alternative. Operation of the Van Ness Avenue BRT Project would come from existing revenue sources for SFMTA.

By improving bus travel times and by reducing delays, BRT shortens the amount of time it takes a bus to complete its route, enabling the same number of drivers and buses to operate more cycles and ultimately provide a higher frequency of service.

The annual operating and maintenance costs associated with the build alternatives are significantly lower than those of the No Build Alternative, with cost savings ranging from 14 percent to 29 percent, depending on the build alternative.

2.6 Alternatives Considered and Withdrawn

Many alternatives were considered during project development and were analyzed in the Alternatives Screening Report (SFCTA, 2008). This section summarizes the alternatives that were not carried forward for analysis in the EIS/EIR.

2.6.1 Fatal Flaw Alternatives

Some alternatives failed to address one or more project screening criteria (Table 2-1) or would worsen existing conditions. The inability to provide improvement with respect to one or more of the screening criteria was considered a fatal flaw. Any alternative that would fail to meet one or more of the screening criteria was dropped from further consideration. In other words, only alternatives that addressed all elements of the project purpose and need were carried forward, along with the No Build Alternative. The following alternatives were dropped from further consideration due to a fatal flaw.

2.6.1.1 CURB-LANE BRT, NO PARALLEL PARKING

A curb-lane BRT with no parallel parking, which involved running transit in the existing parking lane in each direction to maintain three mixed travel lanes in each direction, was not recommended for further analysis in the EIS/EIR because although this alternative would provide transit benefits, it would worsen pedestrian safety conditions and would eliminate 393 parking spaces that also provide drop-off and loading/unloading access to businesses and residences fronting on Van Ness Avenue.

This alternative would require the removal of existing pedestrian safety treatments, including curb bulbs and median refuges where left turns are provided, and it would preclude installation of any new curb bulbs. Removal of the parking lane would result in no buffer between

Removal of the parking lane would result in no buffer between pedestrians on the sidewalk and moving traffic for the entire length of the corridor, which would substantially degrade the pedestrian environment.

pedestrians on the sidewalk and moving traffic for the entire length of the corridor, which would substantially degrade the pedestrian environment. It would also increase the number of traffic lanes that pedestrians would be exposed to when crossing Van Ness Avenue, requiring pedestrians to cross nine lanes of traffic without a median refuge where left turns are provided. Because the parking lanes themselves are not wide enough to serve as bus lanes and the width of the sidewalks is fixed, the center landscaped median would be reduced by 3 feet along its entire length and eliminated altogether where left-turn pockets are provided.

2.6.1.2 | SURFACE LIGHT RAIL AND SUBWAY

Surface light rail and subway alternatives were not recommended for further analysis based on cost-effectiveness analysis performed for the Alternatives Screening Report and BRT Feasibility Study. Rail technology would provide high levels of transit benefits but with significantly more capital, operating, and construction costs.

Light rail technology costs average more than $100 million per mile and subway technology more than $500 million per mile; light rail and subway also have higher operating costs than Muni bus technology. Three alternatives are not cost effective compared with BRT

Light rail technology costs average more than \$100 million per mile and subway technology more than \$500 million per mile; and light rail and subway also have higher operating costs than Muni bus technology. With \$90 million in Proposition K funds available through 2030 to implement strategic transit expansion projects (by matching federal funds), a subway alternative would exhaust citywide funds on one corridor and generate a \$900 million funding gap, half of which would need to be covered locally. Furthermore, cost effectiveness is one of the criteria FTA uses to evaluate Small Starts and New Starts projects. BRT on Van Ness Avenue has been demonstrated to be a more cost-effective alternative than more expensive rail technologies.

2.6.2 | Low-Performance Alternatives

Some alternatives had no fatal flaws, but they would provide only slight or modest levels of improvement. Projects that did little to meet the screening criteria were eliminated from further consideration. In other words, only alternatives that would provide the greatest ability to meet all aspects of the project purpose and need were carried forward. The following alternatives are considered low performance; therefore, they were eliminated from further consideration.

TPS Treatments without a Dedicated Bus Lane. These alternatives, which included treatments such as TPS and bus bulbs, were not recommended for further evaluation because the magnitude of expected benefits is low. TPS treatments without provision of a dedicated bus lane are expected to provide substantially less travel time reduction benefits provided by dedicated bus lanes.

Additionally, without a physically separated bus lane, buses would continue to operate in mixed traffic and experience associated reliability impacts. Of all transit delays, mixed-traffic delays have the greatest variability and result in the greatest unreliability in service; therefore, TPS treatments without provision of a dedicated transit lane would provide minimal benefit and are not sufficient to meet the project purpose and need.

Peak-Period Dedicated Bus Lane. A peak-period-only dedicated bus lane would provide transit travel time and reliability benefits only during the peak period. Van Ness Avenue corridor transit experiences delays and reliability problems throughout the day. Additionally, transit ridership on the Van Ness Avenue corridor is strong throughout the day, not just during the peak periods; therefore, a peak-period dedicated bus lane would not meet the project purpose and need, and it would provide low benefit overall.

2.7 Related and Planned Projects

In addition to the projects integrated in the No Build Alternative, several significant projects are planned within or near the Van Ness Avenue corridor that could overlap with the Van Ness Avenue BRT construction schedule. Table 2-9 identifies the other planned projects that could be implemented during the same timeframe but independent of the proposed BRT project. A discussion of these other planned projects follows, broken down by local transportation projects, regional transportation projects, local public works projects, and local planning and development projects.

Table 2-9: Related and Planned Projects

PROJECT/ ACTIVITY	START/ END DATES[1]	PROJECT DESCRIPTION
Doyle Drive Replacement/ Presidio Parkway	2010/2013	The Doyle Drive approach to the Golden Gate Bridge will be replaced with a new approach that provides widened traffic lanes, shoulder, and median. Additional project aspects include seismic and soil stability upgrades and improved landscaping.
Transbay Transit Center	2008/2017	Modernization of the existing Transbay Terminal in downtown San Francisco will include a new terminal that will accommodate the extension of Caltrain service, as well as the California High-Speed Rail Project.
California Pacific Medical Center (CPMC)	2011/2016	The CPMC Cathedral Hill Campus would expand its campus to include the entire block bounded by Van Ness Avenue, Geary, Franklin, and Post streets. The expanded campus includes a new medical center and medical offices of more than 1.5 million gross square feet (gsf).
Central Subway	2010/2019	This second phase of the Third Street Light Rail Project from Fourth and King to Jackson and Stockton streets is an underground subway project with multiple stations and tunnel openings.
Geary BRT	2014/2019	The Geary BRT project involves construction of a BRT system on Geary Boulevard between the Transbay Terminal and 33rd Avenue.
Hayes Two-Way Street Conversion	2011/2015	Conversion of Hayes Street from Gough Street to Polk Street from a one-way to a two-way street. Phase 1 from Gough Street to Van Ness Avenue completed in 2011.
SFgo and Signal Replacement	Ongoing in coordination with Van Ness BRT	Replace traffic signal infrastructure to provide fiber-optic interconnect communication on Franklin and Gough streets.
Road Repaving and Street Safety Bond Projects	Ongoing	A $248 million Road Repaving and Street Safety Bond Program to improve city infrastructure, including repaving streets, pedestrian and bicycle safety improvements, traffic flow improvements, and ADA upgrades. Near-term plans include repaving Gough, Franklin, and Polk streets, along with installation of pedestrian enhancements.
SFpark	2010/2012	Pilot test project involving installation of parking meters and sensors to utilize real-time parking data to implement demand-responsive pricing.
Polk Street Bicycle Lane Extension	2011/2013	Addition of northbound bicycle lane on Polk Street between Market Street and McAllister Avenue.

RESOURCE

For more information on Geary BRT, visit www.gearybrt.org.

Table 2-9: Related and Planned Projects

PROJECT/ ACTIVITY	START/ END DATES[1]	PROJECT DESCRIPTION
Mission Family Housing	2012	Residential development of approximately 90 units as part of the Mission Family Housing Project at 1040 Mission Street. Completed in 2012.
Veteran's Commons	To be completed in 2014	Redevelopment of community use into 76 studio apartments for veterans at the corner of Otis Street and Duboce Avenue.
1860 Van Ness Avenue	Completed/Sold	Development of a 35-unit mixed residential/commercial unit is proposed at the northeast corner of Van Ness Avenue and Washington Street. Completed and sold in 2012.
Eddy and Taylor Family Apartments	2011/Unknown	Residential development of approximately 130 units as part of the Eddy and Taylor Family Apartments Project at 168-186 Eddy and Taylor streets.
Better Market Street	2016	Streetscape improvement project on Market Street. Environmental review is planned for completion in 2016.
1800 Van Ness	2011/2014	Development of a 94-unit mixed-use building with 5,000 square feet of retail on the northeast corner of Van Ness Avenue and Clay Street.
100 Van Ness	2012/Unknown	100 Van Ness is an existing 29-story office building that is currently 96 percent vacant. The proposal is to change the use from office to multi-family residential, and renovate the interior of the building to create 399 multi-family residential units with ground floor retail, 118 parking spaces, and a 12,000-square-foot rooftop resident's playground above.
1285 Sutter Street	2012/2013	Located at the corner of Van Ness Avenue and Sutter Street in San Francisco, this project is a 13-story apartment building with 10,000 square feet of retail space on the ground floor. The concrete-frame development includes 107 apartment units for rent, as well as two levels of underground parking.
1401 Market Street	2011/Unknown	Construction of new mixed-use building containing approximately 719 dwelling units and up to 719 parking spaces.

[1] Some projects have been completed since circulation of the EIS/EIR. The status of such projects has been updated.

2.7.1 | Local Transportation Projects

Several local transportation projects are planned that traverse or overlap the proposed project, or are located in the project vicinity. Projects expected to be implemented by the time construction begins for the BRT project are described below.

Geary BRT Project. The San Francisco County Transportation Authority (SFCTA) and SFMTA propose to implement BRT along Geary Boulevard between Van Ness and 33rd avenues. SFCTA completed a feasibility study for BRT in the Geary corridor in 2007, and environmental analysis is underway. Construction of the Geary corridor BRT is anticipated to begin in 2014 and would occur following completion of construction of the Van Ness Avenue BRT, with construction planned to be completed in 2019.

Hayes Street Two-Way Conversion Project. SFMTA proposes conversion of Hayes Street from a one-way street to a two-way street, as called for in the Market Octavia Better Neighborhoods Plan. The proposed project involves conversion of Hayes Street to two-way from Gough Street to Polk Street. Between Van Ness Avenue and Franklin Street, there would be three westbound (WB) lanes and one EB lane, with AM and PM peak tow-away restrictions along the north side and prohibited parking along the south side. Between Franklin and Gough streets, there would be two lanes WB and one lane EB, with full-time metered parking along the north and south sides. Between Van Ness Avenue and Polk Street, four lanes WB and one lane EB are anticipated. In addition, Fell Street would become two-way between Franklin Street and Van Ness Avenue, with one lane WB and two lanes EB. Phase 1 of the project between Gough Street and Van Ness Avenue was implemented in 2011. The project implementation schedule for Phase 2 from Van Ness Avenue to Polk Street has not been finalized, but it is expected to be completed by 2015.

SFgo and Signal Replacement. As mentioned in Sections 2.2.1 and 2.2.2, the SFgo and Signal Replacement Program is comprised of many projects that would be implemented throughout the city, including the Van Ness Avenue corridor. As part of SFgo and Signal Replacement, SFMTA plans to replace signal controllers and interconnects with modern controllers and a new fiber-optic signal interconnect communications network on Franklin and Gough streets.

SFpark. SFpark is a 2-year, parking management pilot test project undertaken by SFMTA in 2010. In 2010, new parking meters and sensors beneath parking spaces were installed that collect real-time parking occupancy data. The real-time occupancy data are being used to implement demand-responsive pricing. Under SFpark, meter prices are adjusted up and down to match demand. High-demand spaces gradually go up in price, while other spaces decrease in cost. Real-time data and demand-responsive pricing work together to readjust parking patterns in the City so that parking is easier to find and drivers will do less "circling" to find parking. Sensor data is uploaded wirelessly to the SFpark data feed, which will then make that information available to the public via SFpark.org, street signs, and smart phone applications. SFpark will be evaluated through mid-2012 for Citywide expansion.

RESOURCE

For more information on SFpark, visit www.sfpark.org.

Polk Street Bicycle Lane – Market to McAllister Streets. As identified in the San Francisco Bicycle Plan, the Polk Street Bicycle Lane project would involve moving a portion of the existing NB Bicycle Route #25 from Market Street, Larkin Street, and McAllister Street onto Polk Street. This project would involve the installation of a Class II bicycle lane in the NB direction on Polk Street between Market Street and McAllister Street. A segment of this Class II bicycle lane would be contra-flow (i.e., it would allow NB bicycle travel on an otherwise one-way SB street). Polk Street is a one-way SB street between Grove Street and Market Street. Polk Street (Dr. Carlton B. Goodlett Place) is a two-way street between Grove Street and McAllister Street. This project would install a NB Class II bicycle lane between McAllister Street and Grove Street by narrowing travel lanes. The existing angled parking on the east side of Polk Street would be converted from front pull-in to back-in.

The segment between Grove Street and Market Street includes two design options. Option 1 would establish a NB contra-flow Class II bicycle lane on the east side of Polk Street from Market Street to Grove Street. This bicycle lane would be separated from traffic by a concrete median. Option 2 would convert the segment of Polk Street, from Market Street to Hayes Street, to two-way operation; narrow travel lanes; narrow sidewalk and median widths; and it would add a NB travel lane on Polk Street between Market Street and Hayes Street.

Road Repaving and Street Safety Bond Projects

A $248 million Road Repaving and Street Safety Bond was approved by voters in November 2011 (Proposition B). Recommended as part of the citywide Ten-Year Capital Plan to improve and invest in the City's infrastructure, the bond will repave streets, make repairs to deteriorating street structures, and improve streetscapes for pedestrian and bicyclist safety; improve traffic flow on local streets; and install sidewalk and curb ramps to meet the City's obligations under the ADA. More information on this program can be found at http://sfdpw.org/index.aspx?page=1580.

As part of this program, the City has prioritized Gough, Franklin, and Polk streets, parallel to the Van Ness Avenue BRT project study area, for resurfacing ahead of the construction start date of Van Ness Avenue BRT. For Gough and Franklin streets, the projects are being coordinated with the installation of pedestrian and traffic signal conduits to enable SFgo and pedestrian countdown signals for the length of the corridor. The Franklin Street project, which is scheduled to begin in 2013, has also included pedestrian bulbs at two intersections in the Market and Octavia Plan study area. Other improvements on Gough and Polk streets, including pedestrian and bicycle amenities, are being planned and coordinated by multiple City departments (Polk Street Corridor Improvement Project).

2.7.2 | Regional Transportation Projects

Planned projects of regional importance located in the Van Ness Avenue BRT Project area or otherwise affecting the Van Ness Avenue BRT Project area are discussed below.

Doyle Drive Replacement/Presidio Parkway Project. SFCTA, in cooperation with SFMTA, Caltrans, and the Golden Gate Bridge, Highway and Transportation District, is replacing the Doyle Drive approach to the Golden Gate Bridge. The Doyle Drive approach was built in 1937 as part of the Golden Gate Bridge and is part of US 101. The Doyle Drive Replacement Project, also known as the Presidio Parkway Project, will provide seismic and operational safety with widened traffic lanes and provision of shoulders and a median. The project will also include landscaping to better blend into its surroundings in the Presidio National Park. Project construction began in 2010, and the replaced Doyle Drive approach is expected to open to traffic in 2015.

Transbay Transit Center/Caltrain Downtown Redevelopment Project. The Transbay Joint Powers Authority (TJPA) is replacing the existing Transbay Terminal located in downtown San Francisco with a new five-story Transit Center with one above-grade bus level, ground-floor, concourse, and two below-grade rail levels serving Caltrain and future California High-Speed Rail. A Redevelopment Area Plan has been established for transit-oriented development in the vicinity of the Transbay Transit Center, including residential, office, and general commercial uses. The project is intended to revitalize the surrounding area and accommodate future transit projects, including the Caltrain Extension Project and the California High-Speed Rail Project. The Transbay Transit Center will provide a train depot for future high-speed rail. As part of Phase II, Caltrain commuter rail service will be extended from its current terminus outside the downtown area (at 4th and King streets) to the Transbay Transit Center. Construction of the Transbay Transit Center is underway and expected to be completed in 2017.

Central Subway Project. The Central Subway Project is the second phase of the Third Street Light Rail Project that links the Little Hollywood and Visitación Valley communities with Union Square and Chinatown. This project will better connect San Francisco's civic, business, and cultural centers with the diverse communities along the Central Subway corridor. Once complete, the project will improve service reliability and travel times, enhance transit connections, and provide economic opportunities and access to jobs for local residents. The Central Subway Project corridor is located along Third/Fourth Streets, Stockton Street, and Columbus Avenue from Fourth/King (the terminus of Phase 1 of the Third Street Light Rail) to Jackson/Stockton Streets, with a construction-related tunnel to Columbus Avenue/Union Street near Washington Park. Project construction began in 2010 and is expected to be completed in 2019.

2.7.3 | Local Planning Projects

Planned projects of generally local importance located in the Van Ness Avenue BRT Project area are discussed below.

Van Ness Avenue Area Plan. The City adopted the Van Ness Area Plan in 1986 and created a Van Ness Avenue Special Use District to the Planning Code in 1988 to implement the plan. The plan is intended to promote Van Ness Avenue as the City's most prominent north-south boulevard, lined with high-density mixed-use development that encourages transformation of the street, with its more formal design features and relatively wide sidewalks, into a transit-served pedestrian promenade. Chapter 4.1, Land Use, provides a summary of the Van Ness Area Plan key objectives. Since adoption of the special-use district, approximately 1,000 housing units have been developed along Van Ness Avenue.[14] The following such projects are located in the vicinity of the Van Ness Avenue BRT Project:

- **Mission Family Housing.** Approximately 90 units, which are to be located at the existing parking lot at 1036-1040 Mission Street, are proposed as part of the Mission Family Housing Project. This project was completed in 2012.
- **Eddy and Taylor Family Apartments.** Approximately 130 units, which are to be located at the existing parking lot at 168-186 Eddy and Taylor streets, are proposed as part of the Eddy and Taylor Family Apartments. Project construction is anticipated to be completed in 2012.
- **1860 Van Ness Avenue.** This project involves development of a 35-unit mixed residential/commercial unit proposed at the northeast corner of Van Ness Avenue and Washington Street. This project was completed and sold in 2012.

Market and Octavia Better Neighborhoods Plan. The City adopted the Market and Octavia Better Neighborhoods Plan in 2007 to encourage, among other things, the transformation of the area around South Van Ness Avenue from Market to Division streets, known as "SoMa West," into a new mixed-use residential neighborhood. This area encompasses the southern end of the Van Ness Avenue corridor. A key driver of the plan is to help transform the vacant land created by the recent dismantling of the Central Freeway, including Octavia Boulevard, into a pedestrian-friendly neighborhood. The Market and Octavia Better Neighborhoods Plan proposes new zoning for appropriate residential and commercial uses, prescribes streetscape and open space improvements, and places high-density land uses close to transit.

The plan enables creation of 2,500 new housing units around South Van Ness Avenue and Mission Street. To ensure pedestrian-friendly design, the plan developed a policy to limit the parking supply to one space per unit. Extensive public investments in streets, pedestrian crossings, and streetscapes are envisioned, some of which have been completed.[15] A development impact fee was instituted to support transportation, open space, and recreational improvements identified in the plan. Veteran's Commons in an example of a project consistent with the Market and Octavia Better Neighborhoods Plan and is located in the vicinity of the Van Ness Avenue BRT Project.

- **Veteran's Commons.** The Veteran's Commons project involves redevelopment of community use into 76 studio apartments for veterans at the corner of Otis Street and Duboce Avenue. Construction of this project is planned for completion in 2014.
- **100 Van Ness Avenue.** The 100 Van Ness Avenue project involves an existing 29-story office building that is currently 96 percent vacant. The proposal is to change the land use from office to multi-family residential, and renovate the interior of the building to create 399 multi-family residential units with ground floor retail, 118 parking spaces, and a 12,000-square-foot rooftop resident's playground above. Construction of this project began in 2012.
- **1285 Sutter Street.** The 1285 Sutter Street project is located at the corner of Van Ness Avenue and Sutter Street in San Francisco. This project involves redevelopment of a 13-story apartment building that will have 10,000 square feet of retail space on the ground floor. It will include 107 apartment units for rent, as well as two levels of underground parking. Construction of this project is planned for completion in 2013.
- **1401 Market Street.** The 1401 Market Street project is located at the intersection of Market and 10th streets. It involves construction of a new mixed-use building containing

[14] The Van Ness Avenue Area Plan is available at: http://www.sfgov.org/site/planning_index.asp?id=24897
[15] The Market and Octavia Better Neighborhoods Plan is available at: http://www.sfgov.org/site/planning_index.asp?id=25188

approximately 719 dwelling units and up to 719 parking spaces. Construction began in 2011.

RESOURCE

For more information on Better Market Street, visit www.bettermarketstreetsf.org.

Better Market Street Project. Led by SFDPW, the Better Market Street Project is part of the City’s mission to transform the streetscape and improve the public's experience along the public realm. The Better Market Street Project is expected to include improvements on Market Street supported by sustainable urban design and mobility principles that facilitate promenading opportunities and an enlivened sidewalk life; reliable and efficient transit service; and a safe, comfortable, and appealing bicycle facility along its entire length.

California Pacific Medical Center (CPMC) Cathedral Hill Campus. As a component of the CPMC Long Range Development Plan Project, the CPMC proposes to establish a new medical campus that would include a new hospital and new medical office building in the Cathedral Hill area of the Van Ness Avenue corridor, within the Van Ness Avenue BRT Project limits. The new hospital would replace the existing Cathedral Hill Hotel and the 1255 Post Street Office Building, which comprise the entire block bounded by Van Ness Avenue, Geary Boulevard, and Post and Franklin streets. Across Van Ness Avenue from the proposed hospital, on the western portion of the block formed by Van Ness Avenue and Geary, Cedar, and Polk streets, the CPMC proposes to replace seven existing buildings with the proposed medical office building. The CPMC Cathedral Hill Campus proposes to have a pedestrian tunnel under Van Ness Avenue to connect the hospital and medical office building.

The proposed hospital would be 15 stories and contain approximately 1,202,500 gross square feet (gsf) with 2 underground floors, and it would provide approximately 555 hospital beds[16]. The 2 underground floors would provide approximately 253,400 gsf and 513 off-street parking spaces. Entry to the parking garage would be from Post Street and Geary Boulevard. Separate, off-street emergency drop-off from Franklin Street for patients arriving by car would lead to the parking garage. The proposed pedestrian tunnel under Van Ness Avenue would connect with the bottom underground floor/parking level P3.

The proposed medical office building would be 9 stories and would contain approximately 381,000 gsf of office space and parking to support the proposed hospital. The proposed medical office building would have 9 parking levels that would provide approximately 542 parking spaces, which would be accessed via Geary Street. Parking Level A would provide a loading dock with access via Cedar Street. All vehicle entries on Geary and Cedar streets would be right turns because Cedar Street is one-way EB and Geary Street is one-way WB.

Van Ness Avenue would provide the main pedestrian entrances for both the proposed hospital and medical office building. Construction of the hospital, medical office building, and tunnel is anticipated to begin in 2011 and continue through 2016.

Central Freeway and Octavia Boulevard Circulation Study. The Central Freeway and Octavia Boulevard Circulation Study will evaluate and address transportation issues that remain following completion of the Octavia Boulevard/Central Freeway project in 2005. These multimodal transportation issues include transit routing and reliability, automobile traffic circulation, pedestrian crossings, connectivity to regional transit stations, bicycle access, general wayfinding, and travel demand management strategies. The study will help support and advance key priorities of the 2008 Market and Octavia Better Neighborhood Plan, including improved pedestrian circulation and transit facilities, as well as conversion of streets from one-way to two-way operation. Because the study area is an active local neighborhood, as well as a critical element of the transportation system for regional traffic coming to, from, or through the area, the study will strive to address the complexity of transportation needs at both the local and regional levels. Ongoing stakeholder and public

16 In April, 2013, CPMC announced that it was revising its proposal to reduce the hospital from 555 beds to up to 304 beds. Where the EIS/EIR takes the CPMC project into account in its cumulative analysis, it assumes the original larger hospital size, thereby providing a conservative assessment.

outreach will assist in prioritizing projects. The study team will guide selected projects through the funding and approval process.

2.8 Next Steps and Project Timeline

This Final EIS/EIR was completed following selection of the LPA in accordance with 23 CFR Part 771.125(a). This Final EIS/EIR, in compliance with NEPA and CEQA, responds to comments received during circulation of the Draft EIS/EIR (Appendix I), incorporates additional analysis and/or text explanation in response to comments received, and provides information demonstrating that the LPA is within the scope of the project alternatives considered in the Draft EIS/EIR.

Following completion of the Final EIS/EIR, the SFCTA as the lead agency under CEQA, and FTA as the lead agency under NEPA, would proceed to certify the document and approve the project. FTA would provide approval by signing and dating the cover page of the Final EIS/EIR. FTA would then submit the Final EIS/EIR to the U.S. Environmental Protection Agency (EPA), which places a NEPA Notice of Availability of the Final EIS for public review in the *Federal Register*. Additionally, the Final EIS/EIR is distributed to agencies that previously commented on the Draft EIS/EIR. Advertisements in local publications would also be placed to announce project approval and availability of the Final EIS/EIR. No less than 30 days after the Notice of Availability is published in the *Federal Register,* FTA may sign the Record of Decision (ROD), which is a NEPA document that states the EIS/EIR approval, identifies the alternatives considered, and discusses mitigation plans and monitoring commitments. The ROD describes the considerations in reaching project approval and why any identified measures to mitigate or minimize environmental harm were not adopted.

The SFCTA Board of Commissioners would certify the Final EIS/EIR through adoption of a resolution. The SFCTA would also adopt appropriate CEQA Findings, including a Mitigation Monitoring and Reporting Program and a Statement of Overriding Considerations if adopted mitigation measures or project alternatives will not reduce all impacts to a less than significant level. The SFCTA Board would approve the project through formal selection of a preferred alternative as the project definition. SFMTA would also adopt CEQA Findings in its role as a responsible agency under CEQA and approve the project through selection of a preferred alternative. Within 5 days of project approval, a CEQA Notice of Determination is filed with the San Francisco County Clerk, which starts a 30-day statute of limitations for court challenges to the EIR.

Various other agencies would also take approval actions related to the project, as explained in Section 2.2, including Caltrans, who will continue to own the ROW in the project corridor. Caltrans and the SFMTA would enter into a Cooperative Agreement to cover responsibilities and funding for the construction phase of the proposed project. The SFMTA will own the constructed BRT improvements, with exception to improvements to the BRT transitway, which will be owned by Caltrans. The SFMTA will operate and maintain the BRT transitway and facilities post construction. The major approvals required of Caltrans are listed in Table 2-10.

Approximately 85 percent of the needed capital funding for the build alternatives has been identified, as described in Section 2.5 and Chapter 9. The project build alternatives, including the LPA, would be funded with a combination of local and federal sources. Approximately $20 million from the Prop K Expenditure Plan is allocated for BRT on Van Ness Avenue. This amount will serve as a local match to leverage up to $74,999,999 million from the FTA's Small Starts Program. During the design phase of the project, SFCTA and SFMTA will apply for additional grants from various sources to complete the funding plan. The annual O&M costs associated with the build alternatives, including the LPA, are significantly lower than those of the No Build Alternative, with cost savings ranging from 14 to 29 percent. Operation of the Van Ness Avenue BRT Project would come from existing revenue sources for SFMTA, which include fare and parking revenues, operating grants (e.g., State Transit Assistance), traffic fees, and fines.

Sufficient conceptual engineering design of the build alternatives and the LPA has been completed to approximately the 10 percent level, to determine environmental impacts and mitigation measures for this EIS/EIR. The SFMTA would prepare 30 percent plans and the Conceptual Engineering Report (CER). The design process requires phased development of project plans and specifications, subject to review and approval by permit authorities at the 30-, 65-, 95-, and 100-percent design levels. The primary elements of the 30 percent design include roadway and pavement, sidewalks and medians, utilities base map updating, architectural and landscape design, and ongoing public outreach. Accommodation of ADA requirements would also occur at this stage when designing curb bulbs and curb ramps. The design schedule is: 30-percent design 2013-2014, 65- through 100-percent design documents 2014-2015, and advertisement for construction in 2015.

When design reaches a sufficient level of detail that the project cost, scope, and schedule are firm and final (usually around 65 percent) and when project funding has been fully identified for the entirety of the project, the FTA may issue a Small Starts Grant Agreement (SSGA), which would commit FTA funding of the project to the full amount planned (up to $74,999,999 million). The SFCTA may allocate Prop K sales tax funding to SFMTA to provide local match for all FTA grants received by the SFMTA. Currently, the Prop K Strategic Plan programs approximately $20.5 in sales tax funds to the Van Ness Avenue BRT Project (see Chapter 9 of this EIS/EIR for more details on funding).

The architectural and landscape design included as part of the 30 percent design/CER would provide details on station elements, including platform plans and cross sections. Landscape requirements for plantings, irrigation, and hardscape would be determined during this phase. OCS design, including poles, would be determined as part of the 30 percent design/CER. There would be ongoing coordination with SFDPW for landscape and OCS/light pole design. Major utilities and potential hazardous waste/materials would also be initially addressed as part of completion of the CER. Sewer line relocation would be determined under stations/platforms or underneath the BRT lane, in close consultation with the SFPUC. Recognized Environmental Concerns (RECs) pertaining to hazardous materials remediation would be addressed in accordance with federal and state hazardous materials and waste laws.

A schedule and cost Risk Assessment update for the FTA would be completed as part of the 65 percent plans, and then 95 percent plans would be prepared including construction permit applications for local, state, and federal agencies. The final, or 100 percent plans, specifications and estimate would include final permits, maintenance agreements, ROW certification, and contractor bid-ready plans and specifications.

Following completion of design, construction of the project, is planned to begin in 2016 and last approximately 14 to 21 months. BRT service is anticipated to begin in 2018. Caltrans and SFDPW would provide approvals for construction as noted below.

2.9 Permits and Approvals

Prior to commencement of construction activities, the following environmental-related approvals shown in Table 2-10 would be required. Formal permits may not be required in all cases. The SFMTA would pursue obtaining required permits.

Table 2-10: Anticipated Environmental-Related Permits and Approvals

AGENCY	APPROVAL OR PERMIT
SFDPW	Approves tree removals and replanting in public ROW.
	Approves landscape design plan, including tree type and planting scheme, for medians, sidewalks, and stations.
	The Director of Public Works must Approve nighttime construction work.
	Approves street excavation work.
Caltrans	Approves Project Study Report/Project Report, including conceptual design of the project.
	Approves MOU for conversion of a traffic lane to dedicated transit use.
	Approves Cooperative Agreement for construction.
San Francisco Planning Department	Prepares General Plan Referrals that determine consistency of project with General Plan, which support Board of Supervisors approval of sidewalk and grade changes.
San Francisco Arts Commission	Approves design of public structures.
San Francisco Historic Preservation Commission	Approves certificate of appropriateness regarding design of landscape and structures in the Civic Center Historic District.
City Hall Preservation Advisory Committee	Reviews design of project structures within the Civic Center Historic District adjacent to City Hall and advises the San Francisco Historic Preservation on the certificate of appropriateness approval.
SFPUC, San Francisco Fire Department, PG&E, and SFDPW	Coordination with utility providers regarding temporary or permanent relocation of utilities (including sewer line) through NOI and other filings with the San Francisco Street Construction Coordination Center and participation in the Committee for Utility Liaison on Construction and Other Projects (CULCOP). In addition, coordination with the San Francisco Fire Department regarding the Auxiliary Water Supply System.
SFPUC	Approves discharge for release of any construction wastewater, including groundwater, into the City's Combined Sewer System.
	Determines compliance with National Pollutant Discharge Elimination System (NPDES) Permit requirements for construction activities including contractor's preparation of a Stormwater Pollution Prevention Plan (SWPPP).
San Francisco Bay Area Regional Water Quality Control Board (RWQCB)	Receives General Construction Activity Stormwater Permit. An NOI to construct, which includes the SWPPP, must be filed with the San Francisco Bay RWQCB at least 30 days prior to any soil-disturbing activities.
San Francisco Board of Supervisors	Approves sidewalk and grade changes.
MTC	Air Quality Conformity Determination.

Source: Parsons, 2013.

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CHAPTER SUMMARY: The chapter is presented in five sections: Corridor Travel Patterns, Transit, Private Vehicle Traffic, Nonmotorized Travel, and Parking. Each section discusses existing conditions and the potential benefits and impacts (i.e., positive and negative) of implementation of each of the BRT alternatives, including the LPA. Consistent with CEQA/NEPA requirements, each section also discusses the environmental impacts of each of the build alternatives in both the near-term (2015) and long-term (2035) horizon years and addresses significant impacts.

CHAPTER 3

Transportation Analysis

Environmental analyses presented in this chapter are primarily based on the Vehicular Traffic Analysis Technical Memorandum[17] (CHS, 2013) prepared for the proposed Van Ness Avenue BRT Project, and the Analysis of Nonmotorized Transportation Impacts Technical Report prepared in support of the proposed project (Arup, 2013). These technical studies are incorporated in this EIS/EIR by reference.

The Vehicular Traffic Analysis Technical Memorandum provides an overview of the methodology to create travel demand forecasting, traffic analysis, and microsimulation modeling inputs to represent future year conditions, along with the resulting traffic related environmental impacts. It also includes a validation report for the San Francisco Chained Activity Modeling Process (SF-CHAMP), San Francisco's travel demand forecasting model, which is referenced directly throughout Chapter 3. Similarly, the report includes a data portfolio for the VISSIM microsimulation model used to better understand the performance of BRT. The VISSIM model is referenced directly in this chapter as well.

The Vehicular Traffic Technical Memorandum and Nonmotorized Transportation Impacts Technical Report are available upon request to SFCTA through the following contact:

Michael Schwartz
San Francisco County Transportation Authority
1455 Market Street, 22nd Floor
San Francisco, CA 94103
415-522-4823
michael.schwartz@sfcta.org

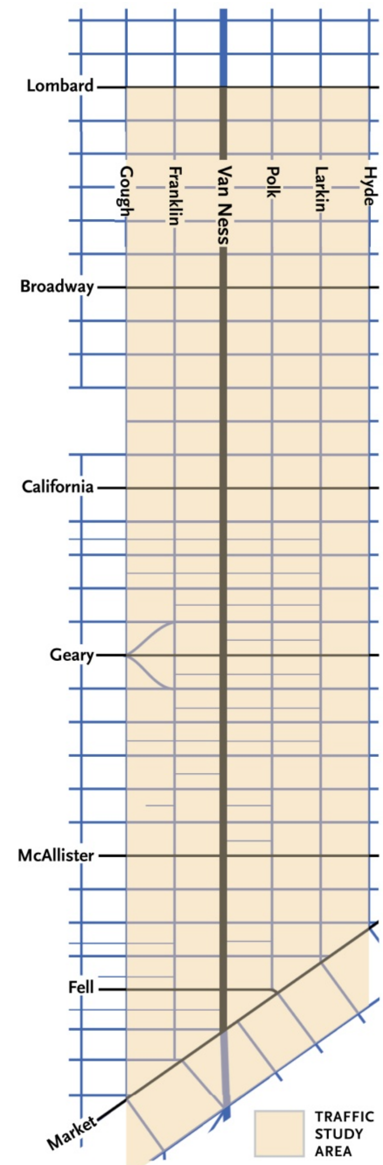


Figure 3.1-1: The Van Ness Avenue Corridor Study Area

3.0 Introduction

The Locally Preferred Alternative (LPA) is a refinement of the two center-running build alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B). For nearly all of the environmental impact areas and BRT performance areas described in Sections 3.1 through 3.3, the LPA has similar consequences to Build Alternatives 3 and 4 with Design Option B. In one instance (platform crowding in Section 3.2), the LPA performs similarly to Build Alternative 3 with Design Option B, but not Build Alternative 4 with Design Option B, and is so noted. The LPA performs differently than Build Alternatives 3 and 4 with Design Option B for metrics discussed in Sections 3.4 and 3.5, but the environmental consequences are consistent with Build Alternatives 3 and 4 with Design Option B. In addition, the Vallejo Northbound Station Variant performs similarly to the LPA on almost every environmental impact area and BRT performance area in Chapter 3.

[17] A draft of this study was prepared for the Draft EIS/EIR and it has been revised and finalized to address the LPA and responses to comments for the Final EIS/EIR.

Where there could be some minor differences in performance between the LPA and the Design Variant (mostly for transit travel time and reliability as discussed in Chapter 3.2), the text notes these differences.

3.1 Corridor Travel Patterns

Van Ness Avenue is a key thoroughfare within San Francisco's roadway grid system. It functions as a major transit spine in San Francisco's Muni network, and it is also part of the US 101 regional road system. This section provides an overview of the existing and future travel patterns along Van Ness Avenue, on parallel streets, and in the surrounding neighborhoods, with or without BRT. The travel demand projections discussed in this section serve as the basis for the operations models described in Sections 3.2 and 3.3, and provide several measures of performance of the build alternatives.

For Sections 3.1 through 3.3, Build Alternatives 3 and 4 are described together because these alternatives are not distinguishable by the travel demand forecasting, traffic analysis, or microsimulation models. Similarly, Build Alternatives 3 and 4 with Design Option B, along with the LPA, are described together for Sections 3.1 though 3.3. For Section 3.1 in particular, many of the figures reported for Build Alternatives 3 and 4 also apply to Design Option B (and the LPA) because travel demand forecasting estimates were not sensitive to the differences in travel patterns between those alternatives. For these analyses, the center-running alternatives are described together.

3.1.1 Existing Travel Patterns

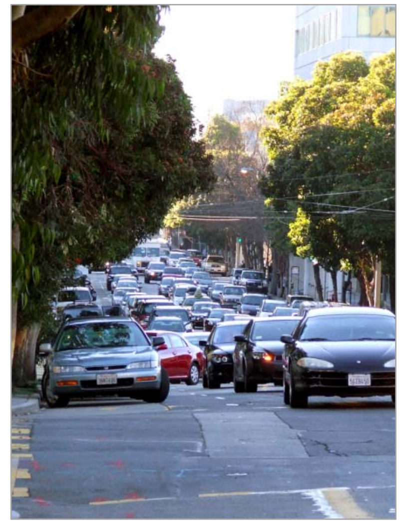
This section on existing travel patterns presents the following data to illustrate existing and future travel patterns: travel demand, regional versus local travel patterns, divertibility of trips, and mode splits. Most of the data for this section were obtained from SF-CHAMP.

SF-CHAMP is the San Francisco travel demand forecasting model, and it was used to determine how the project would change traffic patterns or modes of transport as described in Chapter 3 of the EIS/EIR. SF-CHAMP is a computer-based tool that can be used to assess the impacts of land use, socioeconomic, and transportation system changes on the performance of the local transportation system. SF-CHAMP was developed to reflect San Francisco's unique transportation system and socioeconomic and land use characteristics. The relationships and parameters in SF-CHAMP were statistically estimated from San Francisco residents' observed travel patterns and then tested to make sure the model matched observed transit line boardings, roadway volumes, and numbers of vehicles. For each modeled scenario, it uses a detailed representation of San Francisco's transportation system, as well as population and employment characteristics, to produce measures relevant to transportation and land use planning. Using future year transportation, land use, and socioeconomic inputs, the model forecasts future travel demand. A full description of SF-CHAMP and its validation report, the modeling inputs used in SF-CHAMP, including the representation of BRT in the model, and details about the modeling process used for this EIS/EIR can be found in the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

For the purposes of this section, the Van Ness Avenue corridor study area is defined as Van Ness Avenue and five parallel streets, including Gough and Franklin streets to the west and Polk, Larkin, and Hyde streets to the east. Figure 3.1-1 shows the Van Ness Avenue corridor travel pattern study area and the analysis screenlines. Turning movement traffic volume counts[18] collected in 2007 and the SF-CHAMP travel demand forecasting model were used

[18] These traffic turning movement counts were taken at 91 intersections and were a separate effort from the 24-hour traffic counts collected in March 2007 at 5 locations along Van Ness Avenue and 1 location each along Franklin and Gough streets to determine the peak traffic hour.

to examine motorized traffic (i.e., auto and transit) volumes at various screenlines (i.e., cross streets) along the corridor from Market Street to Lombard Street.



Franklin and Gough average a combined 59,000 daily automobile person trips, which is 50 percent more than Van Ness Avenue, making this pair the primary automobile route within the corridor study area.

3.1.1.1 | DEMAND

Van Ness Avenue is a major street within San Francisco's transportation network carrying on average 55,000 trips via motorized modes for a roadway segment on an average weekday of travel (see Table 3.1-1). At an average screenline, 39,000 people travel by private vehicle[19] daily on Van Ness Avenue, referred to by shorthand in this section as "automobile." This is approximately 31 percent of the total number of private vehicle trips made every day along the entire corridor. By contrast, at an average screenline, more than 16,000 people travel via transit daily on Van Ness Avenue, which comprises 80 percent of all transit trips in the Van Ness Avenue corridor study area. Franklin and Gough average a combined 59,000 daily automobile person trips, 50 percent more than Van Ness Avenue, making this pair the primary automobile route within the corridor study area.

Table 3.1-1: Existing Weekday Motorized Travel Demand at Average Screenline

	PRIVATE VEHICLE	TRANSIT	TOTAL
Van Ness Avenue	39,000 (71%)	16,000 (29%)	55,000 (100%)
Van Ness Avenue Corridor Study Area	126,000 (86%)	20,000 (14%)	146,000 (100%)

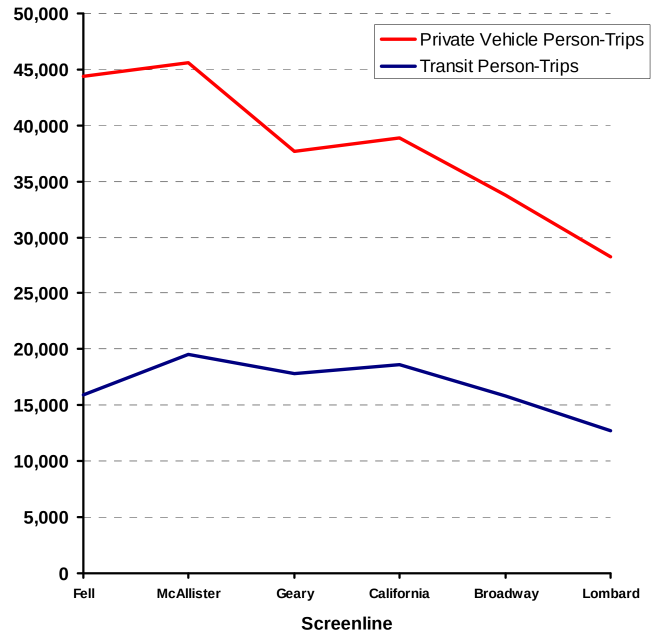
Note: The Van Ness Avenue corridor study area is defined as Van Ness Avenue and five parallel streets, including Gough and Franklin streets to the west and Polk, Larkin, and Hyde streets to the east. Screenlines were defined as motorized traffic that crossed specific streets up and down the corridor, specifically Fell, McAllister, Geary, California, Broadway, and Lombard.

Source: SF-CHAMP

Private vehicle trips along Van Ness Avenue are substantially higher in the southern portion of the study area near Fell and McAllister streets (see Figure 3.1-2) than in the northern portion. Van Ness Avenue automobile person trips peak at Fell Street, which has 60 percent more automobile trips than at Lombard Street; in the Van Ness Avenue corridor, inclusive of the parallel streets, there are more than twice as many daily automobile trips at Fell Street than at Lombard Street. Transit person trips have a different pattern. While the transit person trips are also higher in the southern section near Fell Street than in the northern section, the peak for transit demand is in the mid section between California and McAllister streets.

[19] Private vehicles include: automobiles, trucks, taxis, and motorcycles.

Figure 3.1-2: Existing (2005) Daily Motorized Person-Trips for Van Ness Avenue at Select Screenlines



Note: The existing conditions SF-CHAMP modeling is year 2005.

Source: SF-CHAMP

Although Van Ness Avenue is designated a regional arterial road in the San Francisco General Plan and is part of the US 101 system, the two parallel streets to the west, Franklin and Gough streets, carry more regional automobile trips than Van Ness Avenue.

Regional versus Local Trip Making

Although Van Ness Avenue is designated a regional arterial road in the San Francisco General Plan and is part of the US 101 system, the two parallel streets to the west, Franklin and Gough streets, carry substantially more regional automobile trips than Van Ness Avenue. Local trips are defined as having their origin and destinations within San Francisco; regional trips are defined as having at least one trip endpoint (i.e., origin or destination) outside of San Francisco; pass-through trips are a subset of regional trips that have both endpoints outside San Francisco (e.g., a trip from Marin County to San Mateo County). The one-way orientation of Franklin and Gough streets[20] (Franklin NB, Gough SB), comprising four lanes in each direction during the peak with coordinated signal timing, explains the higher attractiveness of the couplet to regional motorists.

Table 3.1-2 shows the typical origins and destinations of automobile drivers on Van Ness Avenue and Franklin and Gough streets during the PM peak period (i.e., 3:30 p.m. to 6:30 p.m.). The table shows that in the northern end of the corridor at Broadway, Franklin and Gough carry a higher number of regional auto trips than Van Ness Avenue and a significantly higher number of pass-through trips, even though there are fewer total vehicles during the PM peak. In the southern portion of the study area, Franklin/Gough carry a similar portion of regional auto trips, but a significantly higher number and percentage of pass-through auto trips. This indicates that during weekdays, Franklin and Gough streets serve as a regional connection for autos between the Golden Gate Bridge, the Bay Bridge, and the rest of the Bay Area, even more so than Van Ness Avenue.

[20] Gough Street is two-way north of Sacramento Street.

Table 3.1-2: Regional versus Local Auto Trips along Van Ness Avenue and Franklin/Gough Streets during the PM Peak

	TOTAL VEHICLE TRIPS	ALL LOCAL TRIPS[1]	ALL REGIONAL TRIPS[2]	REGIONAL PASS THROUGH TRIPS[3]
At Broadway Screenline				
Van Ness Avenue	8,200 (100%)	5,500 (67%)	2,600 (33%)	<100 (<1%)
Franklin/Gough Streets	6,500 (100%)	3,700 (58%)	2,800 (43%)	400 (6%)
Between Hayes and Grove				
Van Ness (SB only)	4,600 (100%)	3,700 (80%)	900 (20%)	<50 (<1%)
Franklin/Gough	13,000 (100%)	10,700 (80%)	2,600 (20%)	300 (2%)

1. All Local Trips are defined as trips beginning in San Francisco, passing through the screenline on Van Ness or Franklin/Gough, and ending in San Francisco.
2. All Regional Trips are defined as trips that cross the screenline on Van Ness or Franklin/Gough and have at least one of their end points in San Francisco.
3. Regional Pass-Through Trips are defined as trips that begin outside San Francisco, cross the screenline on Van Ness or Franklin/Gough, pass through the corridor, and end outside San Francisco. This is a subset of All Regional Trips.

Source: SF-CHAMP.

Trip Divertibility

San Francisco has a grid structure that allows drivers the opportunity to choose from many routes to get to their destinations. As shown in Table 3.1-3, SF-CHAMP forecasts indicate that less than half of local drivers on Van Ness Avenue have origins or destinations in neighborhoods surrounding Van Ness Avenue. This percentage is higher for regional travelers with an origin or destination outside of San Francisco. This means that these drivers could divert to a variety of routes outside of the main parallel streets in the corridor in the event BRT is implemented on Van Ness Avenue.

Table 3.1-3: Divertible and Nondivertible Trips along Van Ness Avenue (North of Broadway) during PM Peak Period

	TOTAL	LOCAL	REGIONAL
Divertible Trips	52%	41%	76%
Nondivertible Trips	48%	59%	24%
Total	100%	100%	100%

1. Divertible trips are trips that use Van Ness Avenue and pass through the corridor without either end point in a neighborhood surrounding Van Ness Avenue.
2. Nondivertible trips are trips that use Van Ness Avenue and have at least one end point in a neighborhood surrounding Van Ness Avenue, so the trips must use the corridor to depart from their origin and/or arrive at their destination.

Source: SF-CHAMP

3.1.1.2 | MODE SPLIT

Figure 3.1-3 shows the neighborhoods that surround Van Ness Avenue, as used in the following analysis of mode split. The trips made to, from, and within the neighborhoods that surround Van Ness Avenue are roughly evenly divided between private vehicle trips and other modes (i.e., transit, walking, or bicycling trips). Table 3.1-4 shows the mode split for trips that have an origin and/or a destination in a neighborhood surrounding Van Ness Avenue. Roughly 20 percent of trips to, from, or within these neighborhoods occur by transit. Regional trips are slightly more likely than local trips be on transit, in part due to the

Figure 3.1-3: Neighborhoods Surrounding Van Ness Avenue used for Mode Split Analysis

catchment area of the Civic Center BART station. More than 25 percent of all the trips that start or end in the Van Ness Avenue neighborhoods are nonmotorized (mainly pedestrian trips). More than half of all trips that start *and* end in the Van Ness Avenue neighborhoods (not shown in table) are walk or bike trips.

Table 3.1-4: Mode Split for Daily Trips To, From, or Within Neighborhoods Surrounding Van Ness Avenue

	TOTAL DAILY PERSONAL TRIPS	PRIVATE VEHICLE TRIPS	TRANSIT TRIPS	WALK/BIKE TRIPS
All Trips	597,000	54%	20%	26%
Local Trips	518,000	51%	20%	30%
Regional Trips	78,600	78%	22%	<1%

Source: SF-CHAMP

3.1.1.3 | COLLISIONS

Within the 2-mile length of Van Ness Avenue in the study area, nearly all collisions over a six year period (approximately 97 percent or 252 of 261) occurred at intersections, based on the most recent data available (2003-2008). The most common types of collisions on Van Ness Avenue over this period were broadside (41 percent), which occurred during vehicle turns, especially left-turn movements; rear end (29 percent), which occurred due to sudden stops and poor traffic signal visibility; auto-pedestrian (11 percent), all of which occurred in the roadway and most of which occurred in crosswalks; and sideswipe (11 percent), which occur mostly during vehicle lane changes. Pedestrian collision injuries on Van Ness Avenue have increased between 2008 and 2010, in spite of the implementation of a double-fine zone for speeding along the length of the study area.

The build alternatives incorporate design features intended to reduce the likelihood of each of these collision types, especially collisions between vehicles and pedestrians. The reduction of left-turn pockets, combined with provision of dedicated left-turn signals, would significantly reduce the likelihood of broadside collisions. The traffic signal mast arms and new signal heads provided as part of SFgo would significantly improve signal visibility, reducing the likelihood of rear-end collisions. Pedestrian countdown signals, improved signal timing, and shorter crossing distances would reduce the likelihood of collisions between vehicles and pedestrians (a more detailed analysis of pedestrian conditions, including collisions, is provided in Section 3.4). Finally, removing bus vehicles, which frequently merge in and out of traffic, from the mixed traffic lanes would contribute to reduced sideswipe collisions.

3.1.2 | Future Travel Patterns

This section discusses future travel patterns in 2015 and 2035 for the No Build Alternative and the three build alternatives (Build Alternative 2 and Build Alternatives 3 and 4, including Design Option B and the LPA). Data for this section were obtained from the SF-CHAMP travel demand forecasting model.

3.1.2.1 | PLANNED NETWORK IMPROVEMENTS

The build alternatives incorporate design features intended to reduce the likelihood of the most common types of vehicles collisions, especially collisions between vehicles and pedestrians.

SF-CHAMP, in its analysis of travel patterns in future years, incorporates transportation network improvements that are likely to be implemented independently of the Van Ness Avenue BRT. Between 2005 and 2015, the key changes to the transportation network assumed in the baseline and all of the build alternatives include:

- Two-way circulation on Hayes and Fell by 2015 (see Chapter 2, Project Description, for more details).

- Central Subway rail project by 2035. This project involves an extension of the T-Third light-rail line underground in the SoMa area beneath Fourth and Stockton Streets to Chinatown. For more information on this project, visit www.sfmta.com/cms/mcsp/cspover.htm.
- Geary BRT by 2035. This project involves similar improvements as the proposed project for Van Ness Avenue, including, a dedicated transit lane, proof of payment/all-door boarding, and TSP. For more information on the Geary BRT, visit www.gearybrt.org.

In addition, SF-CHAMP forecasts of future travel patterns assume growth in regional population and employment provided by ABAG (p2007), as used in the most recently adopted Regional Transportation Plan (RTP), Transportation 2035, for which an EIR was prepared[21]. The projections anticipate significant population and employment growth along the Van Ness Avenue corridor and throughout San Francisco. State of California Government Code 65089 states that databases (i.e., land use inputs) for models such as SF-CHAMP used to determine quantitative impacts of development on the circulation system "…shall be consistent with the databases used by the regional planning agency [i.e., MTC]". For this reason, land use projections used in the SF-CHAMP model for EIRs led by the San Francisco Planning Department, as well as this EIS/EIR, are within 1 percent of regional ABAG projections. The San Francisco Planning Department takes San Francisco's employment and housing growth forecast by ABAG at the county level and distributes the growth within the county to reflect anticipated developments in San Francisco, such as the CPMC and approved and planned projects within the Market and Octavia Area Plan study area. This methodology, which is consistent with local and regional best practices, has been approved by the MTC such that SF-CHAMP was found to be regionally consistent with MTC in San Francisco's Congestion Management Program Update. More information on the methodology to account for future land use growth in SF-CHAMP can be found in the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

Transit ridership would increase by 28 to 35 percent with the implementation of BRT; more than 50 percent of these new transit riders would be former private vehicle (auto) occupants.

3.1.2.2 | SYSTEM PERFORMANCE: PERSON THROUGHPUT, MODE SHARE, LANE PRODUCTIVITY, AND VEHICLE OCCUPANCY

Mode Share. With the BRT project, a greater percentage of trips in the corridor and on Van Ness Avenue will be made via transit relative to automobile than in the no-build scenario.

With the implementation of BRT, transit ridership would increase by 28 percent (Build Alternative 2) to 35 percent (Build Alternatives 3 and 4, with or without Design Option B, and the LPA); SF-CHAMP outputs indicate that up to 50 percent of these new transit riders could be former private vehicle (auto) occupants, contributing to one of the major goals of the project and the City's Transit First policy by reversing the trend towards declining mode share.

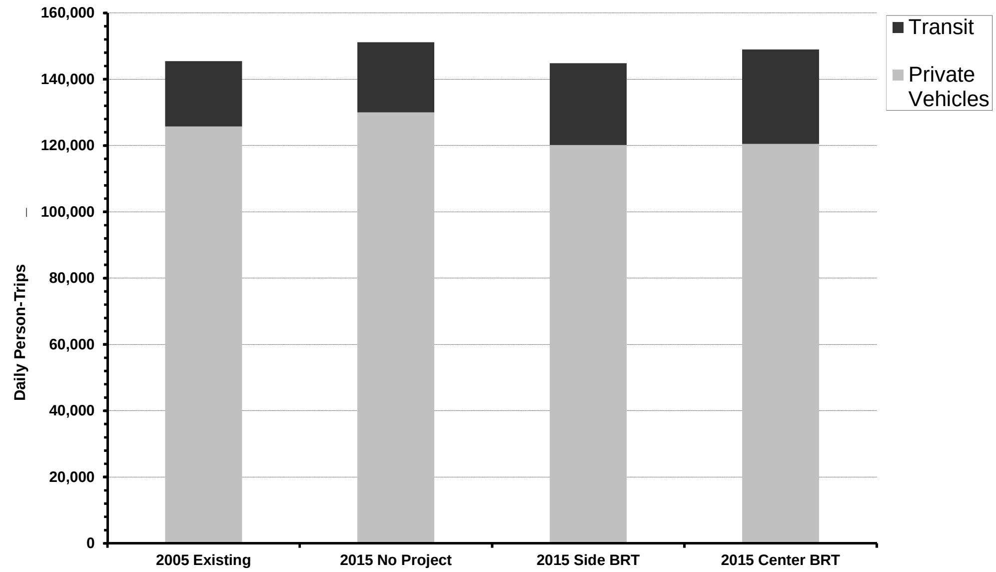
As a result of the increased ridership, average share of trips made by transit on Van Ness Avenue would increase from 29 percent to 40 percent (Build Alternative 2) or 44 percent (Build Alternatives 3 and 4, with or without Design Option B, and the LPA) of all motorized trips on Van Ness Avenue itself; at some locations, transit riders would comprise more than 50 percent of all motorized trips, meaning the two transit lanes would be carrying more people than the four remaining mixed-traffic lanes combined.

Person-Throughput. Person-throughput refers to the number of people that travel through a corridor (e.g., the Van Ness Avenue corridor, from Gough to Hyde streets) on a daily basis. Using outputs from SF-CHAMP, Figure 3.1-4 shows how average person-throughput levels are expected to change with the BRT alternatives. With Build Alternative 2, average daily person throughput in 2015 would decline slightly (4 percent) relative to the no project. With the center BRT alternatives (Build Alternatives 3 and 4, with or without Design Option B,

[21] The RTP and its associated EIR are available to the public at the MTC office at 101 Eighth Street, Oakland, CA 94607, and on the MTC Web site at www.mtc.ca.gov.

and the LPA) average daily person-throughput is maintained in the Van Ness Avenue corridor in the 2015 time horizon. This means that the corridor would carry as many people with center-running BRT as it would without the project. In 2035, all of the build alternatives maintain person throughput in the corridor versus 2035 No Project (change is less than 1 percent). While person-throughput levels are maintained (for Center BRT and the LPA) in the corridor on average between Market and Lombard, changes in person-throughput levels do vary from location to location due to changes in traffic patterns (see Section 3.1.2.3).

Figure 3.1-4: Average Daily Auto and Transit Trips in the Van Ness Avenue Corridor at Average Screenline*



*The LPA performs the same as Center BRT.

Source: SF-CHAMP

It should be noted that this analysis reports forecasted travel demand based on the assumption that the transit network and bus frequencies stay similar to existing conditions; however, BRT would create the capacity to carry more person-throughput than conservative assumptions forecast. Transit network improvements, such as the implementation of the Transit Effectiveness Project's Rapid Network, would also contribute to person-throughput increases in the Van Ness Avenue corridor, more cost effectively than in the No Build Alternative, and without additional vehicular traffic impacts. Preliminary results indicate that 1 to 2 more buses per hour could be added on both the 47 and 49 BRT routes at no additional operating cost based on the travel time savings in 2015 (see Section 3.2 and Chapter 9 of this EIS/EIR).

Lane Productivity. As shown in Table 3.1-5, SF-CHAMP outputs indicate that due to the increase in transit ridership on Van Ness Avenue with BRT service, each travel lane would carry more people per hour (both private vehicles and transit) as a result of BRT when compared with the No Build Alternative. While there would be a decrease in the number of mixed traffic lanes on Van Ness Avenue, the resulting auto travel lanes would carry more people on average than under the No Build Alternative. Transit would carry 13 percent to 36 percent more people in its dedicated lane than each mixed traffic lane carries, and it would provide the capacity to carry many more trips per hour as Muni's Rapid Network and the City's population grow.

Table 3.1-5: PM Peak Person Trips/Lane/Hour at Average Screenline

AVERAGE PM PEAK TRIPS/LANE/HOUR	TRANSIT	PRIVATE VEHICLES
2005 Existing	585	550
2015 No Build Alternative	610	620
2015 Build Alternative 2	780	670
2015 Build Alternatives 3 and 4*	930	670

*The LPA performs the same as Center BRT.

Source: SF-CHAMP

Vehicle Occupancy. Vehicle occupancy is another measure of roadway efficiency. In the 2015 No Build Alternative, an average of 1.7 people occupies each motorized vehicle on Van Ness Avenue, inclusive of private and transit vehicles. With the implementation of BRT and the increased number of people riding transit on Van Ness Avenue, vehicle occupancy would increase to 2.0 (Build Alternative 2) or 2.1 (Build Alternatives 3 and 4 and the LPA) people per vehicle. This means the street would function on average at typical high-occupancy vehicle (HOV) facility levels.

3.1.2.3 | VEHICLE DIVERSIONS

By converting one of the mixed travel lanes in each direction to a transit-only lane, Van Ness Avenue BRT would reduce the private vehicle capacity on Van Ness Avenue.[22] To predict the traffic volumes for all intersections under any scenario, a four-step process was followed and is described below. A complete description of this process can be found in the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

1. Traffic turning movement counts were collected at 91 of the 139 intersections in the traffic study area (see Figure 3.3-1 for a map of intersections in the traffic study area) in spring 2007, with a few additional intersections collected in 2008 and 2009 to better model the traffic south of Market Street. The counts were collected at all intersections on Gough, Franklin and Van Ness Avenue, and at an additional 11 intersections on Polk, Larkin, and Hyde streets within the vehicular traffic study area. Traffic counts were also collected at the intersection of the Duboce/13th/US 101 Freeway off-ramp. Intersections where turning movement counts were collected can be found in Appendix 4 of the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).[23]

2. The specific turning movement counts collected as part of Step 1 were used, along with a signal timing plan provided by the SFMTA, to calibrate the existing conditions (2007) Synchro traffic analysis model for all intersections in the vehicular traffic study area. This original set of volumes was balanced for all 139 study area intersections between the total number of vehicles arriving at an intersection and departing from an intersection. For study area intersections along Polk, Larkin, and Hyde streets where existing condition volumes were not collected using turning movement counts, this balancing exercise was used to estimate the amount of traffic in the existing conditions Synchro Model. Section 2.2 of the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013) describes the results of the existing conditions (2007) Synchro traffic model.

   The traffic volume estimates generated by SF-CHAMP for the near-term 2015 and long-term 2035 horizon years were used to calculate growth factors (i.e., percent change in volumes) between 2005[24] and 2015 and between 2005 and 2035 for each north-south

68 to 81 percent of all private vehicle (auto) trips on Van Ness Avenue under the No Build Alternative would continue to use Van Ness Avenue if BRT were to be implemented in 2015. The remaining 19 to 32 percent drive on a parallel street within the corridor; use transit; walk or bike; change the time of day of their trip; forego the trip; or continue driving using routes in another part of the city.

[22] Capacity is reduced by less than one-third because both buses and private vehicles currently use the right-most travel lane, so private vehicles would lose access to slightly less than a full lane of capacity.

[23] Please note that these manual intersection level traffic counts are different than the 24-hour tube counts used to understand general traffic volumes and the highest volume peak period during the week, as described in Section 3.3.2.2.

[24] SF-CHAMP represents transportation in 5-year increments. The 2005 estimates most closely match the 2007 existing conditions traffic volumes collected through field data.

street in four different sections of the corridor from the Duboce/13th/US 101 Freeway off-ramp to Lombard Street, and for the east-west streets by facility type (e.g., arterial, collector, and local streets) in the traffic study area from Mission to Lombard streets. These growth factors were applied to the 2007 traffic volumes and calibrated the existing conditions (2007) Synchro model to estimate 2015 near-term No Build and 2035 long-term No Build traffic volumes to minimize margins of errors. The initial set of future traffic volumes was balanced between the upstream departure volumes and downstream arrival volumes to ensure equilibrium of traffic volumes within the study area. Similarly, traffic volumes generated by SF-CHAMP were used to create growth factors on the parallel streets and side streets for BRT project scenarios. These growth factors were applied to the calibrated Synchro existing conditions model to estimate traffic volumes for each intersection in 2015 and 2035 for all of the build alternatives. The next two steps involved adjustments to the raw model outputs that account for differences in turning opportunities to more realistically represent diverted traffic within the corridor.

Using the raw estimated traffic volumes created through Steps 1 through 3 above, a series of adjustments were made based on knowledge of San Francisco traveler behavior.

The traffic diversion analyses indicate that, on average, private vehicles would decrease by 19 percent to 32 percent in 2015 during the PM peak on Van Ness Avenue with any of the build alternatives (including the LPA), or by roughly 315 to 650 vehicles per hour.[25] This means that 68 percent to 81 percent of all private vehicle trips on Van Ness Avenue under the No Build Alternative would continue to use Van Ness Avenue if BRT were to be implemented.[26]

The remaining 19 percent to 32 percent of private vehicle trips that would otherwise have used Van Ness Avenue under the No Build Alternative 1 (i.e., former Van Ness Avenue drivers) would change their tripmaking in a number of different ways. The changes are forecast to mostly be split between the following choices:

- Continue to make the trip during the PM peak period, but use one of the parallel streets (i.e., Gough, Franklin, Polk, Larkin, or Hyde streets) in the corridor instead; or
- Use transit (see increase in ridership described in Section 3.2); walk or bike; change the time of day of their trip; forego the trip; or continue to drive during the PM peak, but use a route through another part of the city.

Changes in Circulation Patterns within the Van Ness Avenue Corridor. With implementation of BRT, some drivers are expected to change routes, or divert, from Van Ness Avenue to parallel streets due to the reduction in overall vehicle capacity, as well as the reduction of left-turn opportunities from Van Ness Avenue. The reduction in left turns on Van Ness Avenue may make the accessibility of parallel streets relatively more attractive for local drivers in comparison, even at similar speeds. The operational effects and traffic impacts of diversions within the Van Ness Avenue corridor are discussed in greater detail in Sections 3.3.3.2 and 3.3.3.3. In 2015, under Build Alternatives 2-4, including the LPA, approximately 105 to 450 total vehicles in both directions (2 to 7 vehicles per minute) could divert away from Van Ness Avenue and make their trip on a parallel street within the corridor during the PM Peak instead. Franklin Street would be the parallel route most frequently used during the PM peak hour, compared with Gough, Polk, Larkin, and Hyde streets. The amount of additional private vehicle traffic varies widely up and down the 2-mile stretch of corridor analyzed, but any given segment of Polk, Franklin, or Gough streets could experience an

[25] The number of vehicles and trips affected varies along the 2-mile stretch of Van Ness Avenue analyzed.

[26] For Design Option B and the LPA, the elimination of additional left turns would cause vehicles to find alternative routes before they enter South Van Ness and Van Ness Avenue, the very southern end of the corridor near Market Street, having a significantly greater reduction in vehicle traffic volumes on Van Ness Avenue, particularly in the NB direction (up to 965 fewer vehicles per hour than in the No Build Alternative – nearly 50 percent of the vehicular traffic that would have used Van Ness Avenue in the No Build Alternative).

additional 50 to 250 vehicles per hour (vph), or roughly one to four additional vehicles per minute during the PM peak hour in 2015. Larkin and Hyde could also see an increase in traffic volume of approximately 20 to 100 vph (less than two vehicles per minute between the two streets combined during the PM peak hour).[27]

Again, the effect of these increases on traffic speeds and delays are discussed in detail in Section 3.3. With the other transportation system improvements that the Authority and the City are studying, such as those discussed in Section 3.3.4, the number of added vehicles on Franklin and Gough streets may be reduced, along with an improvement in pedestrian conditions on these streets. Intersection level turning movement traffic volumes for existing conditions and each alternative in 2015 and 2035 for the entire traffic study area can be found in the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

Changes in Circulation Patterns outside the Van Ness Avenue Corridor.[28] SF-CHAMP results also indicate that drivers are also expected to divert to routes outside the Van Ness Avenue corridor. These changes are expected as a response to travelers changing destinations or routes because of left-turn reductions and relative increase in the attractiveness of other corridors compared to the Van Ness Avenue corridor. These drivers, who in the absence of the BRT would have used Van Ness Avenue, would have a number of alternate routes to choose from. SF-CHAMP results indicate that, with implementation of BRT, in 2015, streets outside the corridor (east of Van Ness Avenue to The Embarcadero and west of Van Ness Avenue to Presidio Avenue) may see a total increase in traffic of approximately 200 vehicles in each direction with no street experiencing more than a 50 vph increase in each direction. This increase represents a relatively small percentage of the overall volumes in those corridors.

3.1.2.4 | EFFECTS ON TAXI AND SHUTTLE OPERATIONS

The BRT alternatives would not affect taxi or shuttle operations beyond the effects on private vehicle traffic described above and in Section 3.3. Private shuttles are currently prohibited from using transit lanes or stops citywide. With BRT on Van Ness Avenue, both shuttle services and taxis would continue to operate in mixed-flow traffic lanes. In 2011, the Authority completed a Strategic Analysis Report (SAR) on the Role of Shuttle Services in San Francisco's Transportation System.[29] The report examined existing shuttle services and regulations and developed policy recommendations. The SFMTA is currently developing the Muni Partners Program, a component of the multi-agency Transportation Demand Management Partnership Project led by the Authority.[30] The Partnership Project will examine the feasibility of allowing private shuttles to use transit lanes and stops. The design of the BRT system does not preclude the use of the facilities by private shuttles if it is later adopted as a City policy.

3.1.2.5 | EFFECTS ON TRUCK TURNING MOVEMENTS AND DIVERSIONS

The BRT alternatives would result in some changes to truck circulation from changes to curbed medians and curb bulbs, specifically restrictions in truck turns onto Van Ness Avenue due to smaller turning radii. Preliminary engineering and analysis indicate the following truck turn restrictions may be required for all build alternatives: WB right turn to NB Van Ness Avenue at Market Street, EB left turn to NB Van Ness Avenue and EB right

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27 The greatest increase in traffic volumes in the study area would be on Franklin Street, north of Market Street for Design Option B and the LPA. Due in large part to the reduction of left-turn pockets along Van Ness Avenue, left-turning vehicles under the Design Option B and LPA would use that segment of Franklin Street to go north, and thus would experience an increase of up to 560 vehicles in 2015 and 620 vehicles in 2035 with the implementation of the LPA. These increases in traffic volumes are significantly higher than the increases at other segments along Franklin Street (more than 3 times the average of increased volumes at other screenline intersections along the corridor), and even higher than intersections on other parallel streets (more than 5 times the increase on Gough Street). This causes operations at the intersection of Franklin and Market Street to operate at LOS F, with more than 100 seconds of delay for the left turn from Market Street onto Franklin Street in 2015 (see Section 3.3.3.2).

28 Diversions outside the corridor were found to be similar for all of the build alternatives.

29 The SAR is available at www.sfcta.org/shuttles.

30 Available on the project website at www.sfcta.org/tdm.

turn to SB Van Ness Avenue at O'Farrell Street, WB left turn to SB Van Ness Avenue at Geary Street, EB right turn to SB Van Ness Avenue at Union Street, EB right turn from NB Van Ness Avenue and WB right turn from SB Van Ness Avenue at Eddy Street, EB right turn from NB Van Ness Avenue at California Street. Build Alternatives 3 and 4 (and the LPA) are anticipated to require truck turn restrictions to EB right turn to NB Van Ness Avenue at Clay Street, EB right turn to SB Van Ness Avenue and WB right turn to NB Van Ness Avenue at Pacific Avenue, EB right turn to SB Van Ness Avenue at Broadway, Greenwich Street and Filbert Street, EB right turn from NB Van Ness Avenue and WB right turn from SB Van Ness Avenue at Hayes Street, WB right turn from SB Van Ness Avenue at Grove Street, McAllister Street and Clay Street, EB right turn from NB Van Ness Avenue and WB right turn from SB Van Ness Avenue at Pacific Avenue, Vallejo Street, Green Street, Union Street, Filbert Street, and Greenwich Street. Under the Vallejo Northbound Station Variant, WB trucks on Vallejo Street would not be able to turn right onto NB Van Ness Avenue.

The proposed Hayes Two-Way Street Conversion Project that is planned for completion in 2015 (see Section 2.7) is expected to preclude truck turns for all right turns, with the exception of the WB turn to NB Van Ness Avenue. In addition, advisory signs stating "Right Turn for Buses/Trucks Not Advised" are proposed at two-way street crossings at Pacific, Broadway, Vallejo, Green, Union, Filbert, Greenwich, and Lombard streets under all alternatives because of encroachment into opposing lanes. This is in addition to the existing advisory signs currently posted at Grove, McAllister, Eddy, California, and Clay streets. The aforementioned truck turning restrictions have been identified as potential turn restrictions during preliminary design. All truck turning restrictions would be identified during final design, and solutions will be sought to avoid prohibiting truck turns.

Under all of the build alternatives, including the LPA, it is unlikely that most trucks would divert from Van Ness Avenue to parallel streets due to the increased grade/slope on parallel streets (trucks are currently prohibited on Franklin Street north of California Street and are also prohibited on Gough Street north of Sacramento Street for this reason), and because they are either traveling regionally on US 101 or making deliveries on Van Ness Avenue.

3.1.3 Summary of Corridor Travel Patterns

The following are key findings about existing and future travel patterns in the Van Ness Avenue corridor and benefits of the proposed BRT project:

- Van Ness Avenue is the primary transit street in the Van Ness Avenue corridor study area (see Figure 3.1-1). Under typical existing conditions along the corridor, Van Ness Avenue carries more than 55,000 people daily, with 29 percent of them on transit.
- Franklin and Gough streets are the primary private vehicle (auto) streets in the Van Ness Avenue corridor study area. In 2005, Van Ness Avenue carried less than 31 percent of the corridor's automobile traffic, but more than 80 percent of the transit riders.
- In existing conditions, Franklin and Gough streets are the primary regional routes for private vehicles in the Van Ness Avenue corridor. This pair currently carries a higher number and proportion of regional private vehicle (auto) traffic than Van Ness Avenue.
- Less than half of travelers in private vehicles on Van Ness Avenue under existing conditions have an origin or destination in neighborhoods surrounding Van Ness Avenue, meaning many of them could divert to streets throughout San Francisco rather than use Van Ness Avenue or streets immediately parallel.
- Pedestrian and bicycle trips comprise approximately 25 percent of trips to, from, or within the neighborhoods surrounding Van Ness Avenue.
- With BRT, transit trips would comprise an average of 40 percent (Build Alternative 2) to 44 percent (Build Alternatives 3 and 4, with or without Design Option B, and the LPA) of motorized trips along Van Ness Avenue. At select locations, transit trips would comprise more than 50 percent of motorized trips, meaning the two transit lanes would carry more people than the remaining four mixed travel lanes combined.

KEY FINDINGS

Van Ness BRT is the primary transit street in the corridor, as opposed to Franklin and Gough streets, which are the primary private vehicle streets. BRT would help Van Ness Avenue function more efficiently and increase transit ridership. Vehicle diversions to all other streets in the corridor would add up to less than 7 vehicles per minute under the build scenarios. The project design would improve conditions that factor into the primary collision types that currently occur on Van Ness Avenue.

- With BRT, person throughput (total number of motorized trips on transit or in private vehicles) would decrease slightly under Build Alternative 2 and would be generally maintained in the center BRT alternatives, including the LPA, compared to the No Build Alternative; however, the number of trips made by transit would increase significantly.
- The BRT lane has significantly higher service capacity than the service assumed in the model. Future service investments would increase person-throughput without additional traffic operations impacts.
- With BRT, each remaining private vehicle lane would carry more people than under the No Build Alternative; however, transit would carry an average of 13 percent (Build Alternative 2) to 36 percent (Build Alternatives 3 and 4 and the LPA) more people in each of its dedicated lanes than each private vehicle lane would carry, and it would provide the capacity to carry many more trips per hour as Muni's Rapid Network and the City's population grow.
- BRT would increase the vehicle occupancy on Van Ness Avenue from 1.7 people per vehicle (existing and No Build Alternative) to 2.0 (Build Alternative 2) or 2.1 (Build Alternatives 3 and 4 and the LPA) people per vehicle. The street would function on average at typical HOV facility levels of approximately 2 people per vehicle.
- The proposed project would address all of the primary collision types that currently occur on Van Ness Avenue.

3.2 Transit Conditions

This section provides a discussion of the local and regional transit systems presently serving the corridor and the planned transit improvements that may affect the corridor; identifies and evaluates the potential environmental consequences of each of the alternatives on transit service; and describes mitigation measures that would reduce or avoid significant impacts. Other performance measures are shown in this section for planning purposes and to aid in the alternatives performance evaluation documented in Chapter 9.

The Locally Preferred Alternative (LPA) is a refinement of the two center-running build alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B). For nearly all of the environmental impact areas and BRT performance areas described in Section 3.2, the LPA (including the Vallejo Northbound Station Variant) has similar environmental consequences to Build Alternatives 3 and 4 with Design Option B, and is so noted. In one instance (platform crowding), the LPA performs the same as Build Alternative 3 with Design Option B, but not Build Alternative 4 with Design Option B, and is so noted. Unless otherwise noted, the Vallejo Northbound Station Variant is anticipated to perform similarly to the LPA. Some small differences in BRT performance (i.e., travel time and reliability benefits) between the LPA and the Vallejo Northbound Station Variant are noted in the text.

3.2.1 | Existing Transit Services, Ridership, and Performance

This section describes the existing transit setting in the Van Ness Avenue corridor, including existing transit services offered, demand, and transit operating performance. Two operators provide transit service along Van Ness Avenue: (1) SFMTA operates Muni buses; and (2) Golden Gate Bridge, Highway and Transportation District (GGBHTD) operates Golden Gate Transit (GGT) buses.

3.2.1.1 | SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY

SFMTA operates two Muni bus routes along the entire length of Van Ness Avenue within the project limits: Routes 47 and 49, which convert into one route, OWL 90, between 1:00 a.m. and 6:00 a.m.

SFMTA operates two 24/7 (i.e., 24 hours per day, 7 days per week) Muni bus routes along the entire length of Van Ness Avenue within the project limits: Routes 47 and 49, which convert into one route, OWL 90, between 1:00 a.m. and 6:00 a.m. Five other Muni routes, including one Sunday-only route, serve a portion of Van Ness Avenue, and one (#19) operates along Polk Street, which runs parallel to Van Ness Avenue to the east. In addition, 32 Muni transit routes, including all 6 Metro lines traveling under Market Street, cross Van Ness Avenue at various intersections along the corridor, providing transfer opportunities to other Muni routes. The subsections below describe each route that runs along the Van Ness Avenue corridor in detail, including service coverage, hours of operation, and headways.

The ridership data for Muni routes were obtained from SFMTA's TEP; the cited data were collected in 2006-2007. As part of the TEP, automatic passenger counter (APC) devices equipped with a GPS were installed on a statistically representative sample of the Muni bus fleet. These devices recorded the number of passengers boarding and alighting buses over a 24-hour period.

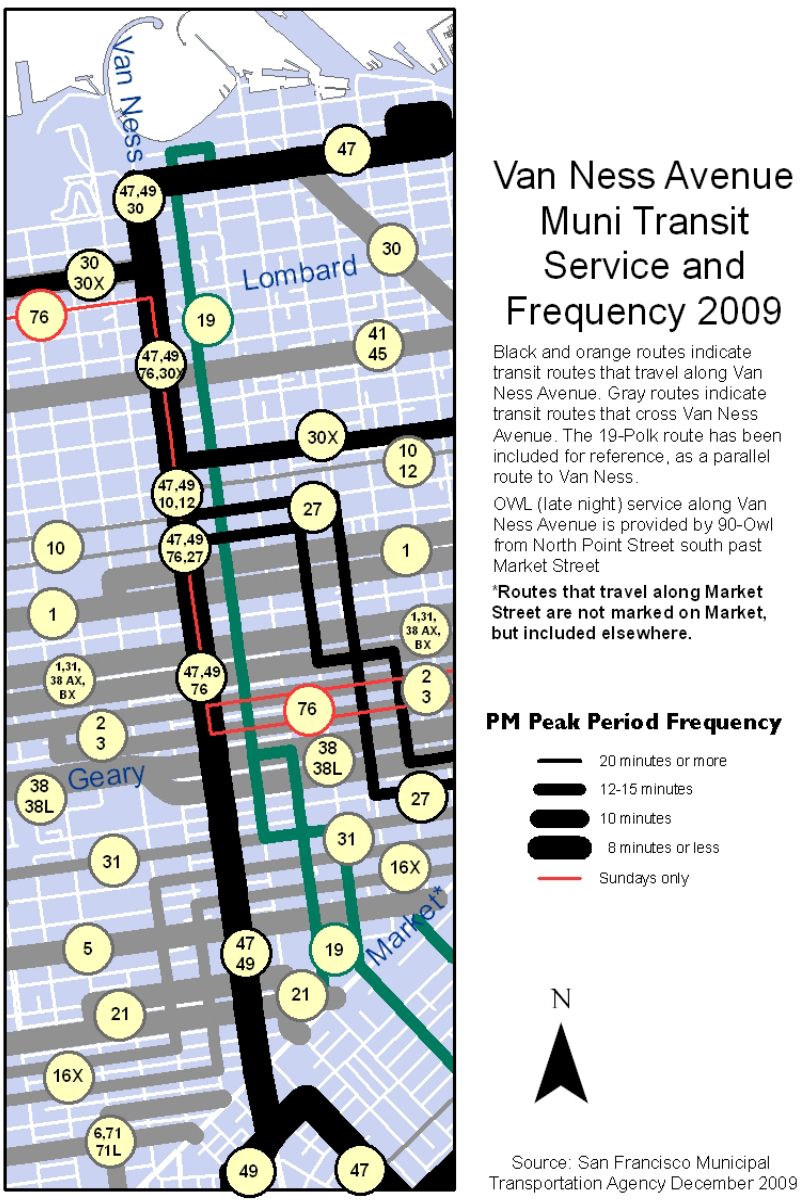
Current Muni fares are $2.00 for adults; $0.75 for seniors, people with disabilities, and youths (ages 5 to 17); and free for children under the age of 5. Transfer receipts are issued on board, free of charge, and are valid on any Muni route for up to 90 minutes from the time of boarding. Monthly passes are $64.00 for adults ($74.00 for passes that include BART fare within San Francisco city limits) $22.00 for seniors, youths, and persons with disabilities; and $32.00 for qualified low-income passengers. These basic fares apply to all buses, Metro/light rail lines, and historic streetcars, except cable cars. One-way cable car fares are $6.00 for those over the age of 5, and $3.00 for seniors and people with disabilities before 7:00 a.m.

and after 9:00 p.m. A proof-of-payment system is in effect on all Metro lines. Any person on an SFMTA vehicle or in the paid area of a Metro subway station must possess valid proof of fare payment in the form of a transfer/receipt, a monthly pass, or a Clipper (formerly Translink) card.

Existing Routes

Several Muni routes on Van Ness Avenue provide regional transit connections to BART, AC Transit, Caltrain, GGT, and SamTrans. Figure 3.2-1 shows the existing transit routes along the Van Ness Avenue BRT corridor.

Figure 3.2-1: Existing Transit Routes along and crossing Van Ness Avenue (does not include Market Street)



Routes Operating along Van Ness Avenue

Table 3.2-1 presents the routes operating along and parallel to Van Ness Avenue. Routes 47 and 49 are the principal transit routes serving the Van Ness Avenue corridor.

Table 3.2-1: Existing Muni Lines along the Proposed Van Ness Avenue BRT Corridor

ROUTES	SEGMENT WITHIN PROJECT AREA	WEEKDAY HOURS OF OPERATION	WEEKDAY AM/PM PEAK HEADWAYS (MIN)	AVERAGE WEEKDAY DAILY RIDERSHIP [1]	BOARDINGS BETWEEN MISSION & LOMBARD STREETS
ROUTES OPERATING ALONG VAN NESS AVENUE BRT PROJECT AREA					
47 – Van Ness (MC)	Lombard Street to Mission Street	6:00 a.m. – 1:05 a.m.	8	12,800	7,800
49 – Van Ness – Mission (TC)	Lombard Street to Mission Street	5:40 a.m. – 1:12 a.m.	8	25,300	9,000
90 – San Bruno Owl (MC)	Lombard Street to Mission Street	1:18 a.m. – 4:40 a.m.	N/A	350	200
76 – Marin Headlands (MC)	Lombard Street to Sutter Street	Sundays Only	N/A	N/A	N/A
30X – Marina Express (MC)	Lombard Street to Broadway	AM and PM Peaks Only	AM – 5 PM – 10	2,400	150
12 – Folsom – Pacific (MC)	Pacific Avenue to Washington Street	6:00 a.m. – 12:30 a.m.	20	6,900	360
27 – Bryant (MC)	Jackson Street to Washington Street	5:47 a.m. – 12:57 a.m.	12	7,400	230
ROUTES OPERATING PARALLEL TO VAN NESS AVENUE					
19 – Polk (MC)	Lombard Street to Eddy Street	5:21 a.m. – 1:23 a.m.	12	9,200	2,600

Note:
[1] Ridership accounts for the total daily boardings, in both the inbound and outbound directions.
MC = Motor Coach; TC = Trolley Coach

Sources: Muni Schedule (December 2009); Transit Effectiveness Project/APC Data (2006-2007)

47 – Van Ness. Muni Route 47 bus line, using diesel and diesel-hybrid buses, provides local service from Fisherman's Wharf to the Caltrain Station at Fourth and Townsend streets, passing through a mix of commercial, institutional, and residential uses along Van Ness and South Van Ness avenues and across SoMa areas on Bryant and Harrison streets. Route 47 runs along the entire length of the proposed Van Ness Avenue corridor.

49 – Van Ness – Mission. Muni Route 49 trolleybus line provides local service between Fort Mason and City College of San Francisco via Van Ness Avenue and Mission Street; it serves as a primary north-south arterial transit route in the city.

90 – San Bruno (Owl Service). Muni Route 90 Owl service is provided at night between North Point and Arleta via Van Ness Avenue, Potrero Avenue, Bayshore Boulevard, and San Bruno Avenue. Route 90 Owl replaces Routes 47 and 49 on Van Ness Avenue between 1:00 a.m. and 5:00 a.m.

76 – Marin Headlands. Route 76 provides local service between the Marin Headlands and the Caltrain Station via the Golden Gate Bridge and downtown, only on Sundays and some holidays.

30X – Marina Express. Route 30X operates over a limited portion of Van Ness Avenue and provides express bus service during weekday AM and PM peak periods only, connecting the Marina and Financial districts.

Routes 12 and 27. These two lines operate over a limited portion of Van Ness Avenue. Route 12 operates along Van Ness Avenue between Pacific Avenue and Washington Street, and Route 27 operates between Jackson and Washington streets.

Routes 12, 27, 30X, 76, and 90 use standard (40- foot) motor coach buses.

Routes Operating Parallel to Van Ness Avenue

19 – Polk. Route 19 provides service between the Marina District and Hunters Point along Polk Street, 7th/8th streets, various streets in Potrero Hill, and then Evans Street to the Hunters Point Shipyard. Route 19 runs on Polk Street, one block east of Van Ness Avenue, serving as an alternative north-south transit route next to Routes 47 and 49. Route 19 operates every 10 minutes during the AM and PM peak periods, every 24 minutes during midday (or every 12 minutes to the north of Townsend), and every 20 minutes from 6:00 p.m. to 1:30 a.m. Route 19 averages 9,200 daily passengers, 2,600 of whom board between Lombard and Eddy streets on Polk Street.

Routes Crossing Van Ness Avenue

There are 32 Muni transit lines that cross Van Ness Avenue between Mission and Lombard streets, including 24 bus routes, 6 light-rail transit lines (Metro), one historic streetcar (F-Line) and one cable car (C). Table 3.2-2 shows the basic characteristics of these lines. Appendix A gives more detailed description of each.

Table 3.2-2: Existing Muni Service crossing the Proposed Van Ness Avenue BRT Corridor

ROUTES CROSSING VAN NESS AVENUE	CROSS STREET(S) AT VAN NESS/ SOUTH VAN NESS AVENUE	WEEKDAY HOURS OF OPERATION	WEEKDAY AM/PM PEAK HEADWAYS (MIN)	AVERAGE WEEKDAY RIDERSHIP (1)
1 – California (TC)	Sacramento Street (outbound)/ Clay Street (inbound)	5:22 a.m. – 1:25 a.m.	3 – 8	23,600
1AX – California 'A' Express (MC)	Pine Street (outbound)/ Bush Street (inbound)	AM and PM Peaks Only	AM – 10 PM – 15	760
1BX – California 'B' Express (MC)	Pine Street (outbound)/ Bush Street (inbound)	AM and PM Peaks Only	AM – 6 PM – 15	1,700
2 – Clement (MC)	Sutter Street (outbound)/ Post Street (inbound)	5:17 a.m. – 7:18 p.m.	10	7,100
3 – Jackson (TC)	Sutter Street (outbound) / Post Street (inbound)	7:06 a.m. – 1:05 a.m.	10	4,200
5 – Fulton (TC)	McAllister Street	24 Hours	AM – 6 PM – 5	14,000
6 – Parnassus (TC)	Market Street	6:20 a.m. – 12:22 a.m.	10	7,200
10 – Townsend (MC)	Jackson Street (outbound)/ Washington Street (inbound)	5:06 a.m. – 8:44 p.m.	20	3,200
14 – Mission (TC)	Mission Street	24 Hours	AM – 12 PM – 6	32,800
14L – Mission Limited (MC)	Mission Street	8:40 a.m. – 3:51 p.m.	N/A	4,900
16X – Noriega Express (MC)	Turk Street (outbound)/ Golden Gate Avenue (inbound)	AM and& PM Peaks Only	AM – 10 PM – 15	910
21 – Hayes (TC)	Hayes Street (outbound)/ Grove Street (inbound)	5:36 a.m. – 12:52 a.m.	7	8,800

Table 3.2-2: Existing Muni Service crossing the Proposed Van Ness Avenue BRT Corridor

ROUTES CROSSING VAN NESS AVENUE	CROSS STREET(S) AT VAN NESS/ SOUTH VAN NESS AVENUE	WEEKDAY HOURS OF OPERATION	WEEKDAY AM/PM PEAK HEADWAYS (MIN)	AVERAGE WEEKDAY RIDERSHIP [1]
30 – Stockton (TC)	Chestnut Street and North Point Street	4:49 a.m. – 1:30 a.m.	3-6	23,700
31 – Balboa (TC)	Eddy Street	5:25 a.m. – 12:39 a.m.	12	9,000
31AX – Balboa 'A' Express (MC)	Pine Street (outbound)/ Bush Street (inbound)	AM and PM Peaks Only	AM – 8 PM – 10	900
31BX – Balboa 'B' Express (MC)	Pine Street (outbound)/ Bush Street (inbound)	AM and PM Peaks Only	AM – 10 PM – 15	770
38 – Geary (MC)	Geary Boulevard (outbound)/ O'Farrell Street (inbound)	24 Hours	6 – 12	33,000
38L – Geary Limited (MC)	Geary Boulevard (outbound)/ O'Farrell Street (inbound)	6:00 a.m. – 6:40 p.m.	5 – 7	21,300
38AX – Geary 'A' Express (MC)	Pine Street (outbound) / Bush Street (inbound)	AM and PM Peaks Only	AM – 10 PM – 15	990
38BX – Geary 'B' Express (MC)	Pine Street (outbound) / Bush Street (inbound)	AM and PM Peaks Only	AM – 8 PM – 15	1,200
41 – Union (TC)	Union Street	AM and PM Peaks Only	AM – 6 PM – 7	3,000
45 – Union – Stockton (TC)	Union Street	6:10 a.m. – 1:03 a.m.	9	12,100
71 – Haight – Noriega (MC)	Market Street	Non-peak Hours	10	10,300
71L – Haight–Noriega Limited (MC)	Market Street	AM and PM Peaks Only	10	2,100
J – Church (LRV)	Market Street	5:09 a.m. – 12:16 a.m.	9	16,700
K Ingleside/ T Third (LRV)	Market Street	5:09 a.m. – 12:16 a.m.	9	32,700
L – Taraval (LRV)	Market Street	24 Hours	8	29,800
M – Ocean View (LRV)	Market Street	5:42 a.m. – 12:10 a.m.	9	28,700
N – Judah (LRV)	Market Street	24 Hours	7	45,300
S – Castro Shuttle (LRV)	Market Street	7:32 a.m. – 6:55 p.m.	9 – 11	N/A
F – Market & Wharves (HSC)	Market Street	5:47 a.m. – 12:38 a.m.	7	18,500
C – California (CC)	California Street	6:23 a.m. – 12:32 a.m.	AM – 6 PM – 8	3,700

Note:
(1) Ridership accounts for the total daily boardings in both the inbound and outbound directions.
MC = Motor Coach; TC = Trolley Coach; LRV = Light Rail Vehicle; HSC = Historic Street Car; CC = Cable Car

Sources: Muni Schedule (December, 2009); Transit Effectiveness Project/APC Data (2006-2007).

3.2.1.2 | REGIONAL TRANSIT SERVICES

Golden Gate Transit

The GGBHTD provides regional transit services between San Francisco, Marin, and Sonoma counties with GGT buses and Golden Gate ferries. The information listed in this section reflects service levels as of 2007. Twenty-two (22) GGT bus routes serve San Francisco: 3 basic routes and 19 commute routes. Buses on the basic routes run daily at 60-minute headways, while commute buses run during peak periods in the peak direction only (to San Francisco in the morning; to Marin and Sonoma in the afternoon/evening) with more frequent service.

Of the 22 GGT bus routes, 8 routes (Routes 10, 54, 70, 72, 73, 76, 80, 93, and 97) travel along Van Ness Avenue south of Lombard Street, and one route (Route 10) crosses Van Ness Avenue at Golden Gate Avenue (inbound) and at McAllister Street (outbound). The other 13 routes, as well as most trips on routes 54, 72, and 76, travel along Van Ness Avenue north of Lombard Street, using Beach and Battery streets inbound and Sansome and North Point streets outbound to serve the Financial District.

Routes 10, 70, and 80 are basic routes; all of the other routes are commute routes. Routes 70, 73, 80, and 93 travel along Van Ness Avenue between Lombard and Golden Gate Avenue (inbound) and McAllister Street (outbound); Route 97 travels along Van Ness Avenue between Lombard Street and Broadway. Table 3.2-3 shows the basic characteristics of these lines.

The Golden Gate Bridge Highway and Transportation District provides regional transit services between San Francisco and Marin and Sonoma counties with Golden Gate Transit buses and Golden Gate ferries.

Table 3.2-3: Existing Golden Gate Transit Service in or near the Proposed Van Ness Avenue BRT Corridor

ROUTE	SERVICE AREA	TYPICAL WEEKDAY HOURS OF OPERATION	WEEKDAY PM PEAK HEADWAYS (1) (MIN)	AVERAGE PM PEAK RIDERSHIP (SF BOARDING ONLY)	PM PEAK LOAD FACTOR (2)
10	Marin City – Sausalito – San Francisco	6:38 a.m. – 7:31 p.m.	60	17	45%
70	Novato – San Rafael – Marin City – San Francisco	5:16 a.m. – 12:43 a.m.	30	15	61%
80	Santa Rosa – Novato – San Rafael – San Francisco	4:01 a.m. – 11:43 p.m.	60	15	81%
54	San Marin – Novato – San Francisco	AM and PM Peaks Only	10	179	45%
72	Santa Rosa – San Francisco	AM and PM Peaks Only	20	80	47%
73	Santa Rosa – San Francisco Civic Center	AM and PM Peaks Only	30	25	54%
76	East Petaluma – San Francisco	AM and PM Peaks Only	20-30	20	40%
93	Golden Gate Bridge Toll Plaza – Van Ness Ave – San Francisco Civic Center	AM and PM Peaks Only	30	16	N/A
97	Larkspur Ferry Terminal – San Francisco	5:30 a.m.	Once a day	N/A	N/A

Notes:
(1) Peak 1-hour between 4:00 p.m. and 7:00 p.m.
(2) Load factor refers to the ratio of ridership to bus seating capacity (Golden Gate Transit policy does not allow standees).

Source: Joshua Widmann, Golden Gate Transit .

The GGT service area is divided into seven fare zones: one in San Francisco, three in Marin County, two in Sonoma County, and one in Contra Costa County. The fares vary depending on trip length and number of fare zones crossed. In 2007, one-way adult bus fares between San Francisco and Marin County range from $3.60 to $5.30, and one-way adult fares between San Francisco and Sonoma County range from $7.60 to $8.40. One-way adult fares between San Francisco and Contra Costa County were $6.60. Half-price discount fares apply to youths (ages 8 to 18), seniors 65 years and older, persons with disabilities, and Medicare cardholders. In addition, purchasers of 20 tickets or more are eligible for a 20 percent discount.

Basic Service Routes

Route 10. Route 10 provides daily service between Marin City, Sausalito, and San Francisco, with additional service on weekdays to Tam Valley. Route 10 travels on Park Presidio Boulevard, Geary Boulevard, Golden Gate Avenue/McAllister Street, and Mission Street and also serves the Transbay Terminal.

Route 70. Route 70 provides daily service between Novato, San Rafael, Marin City, and San Francisco. Route 70 travels on Lombard Street, Van Ness Avenue, Golden Gate Avenue/McAllister Street, and Mission Street and serves the Transbay Terminal.

Route 80. Route 80 provides daily service between Sonoma, Marin, and San Francisco counties. Areas of service include Santa Rosa, Rohnert Park, Cotati, Petaluma, Novato, San Rafael, Marin City, and San Francisco (Civic Center and Financial District). Route 80 travels on Lombard Street, Golden Gate Avenue/McAllister Street, and Mission Street and serves the Transbay Terminal.

Commute Service Routes

Route 54. Route 54 is a weekday commute service that provides service between Novato and San Francisco. Most trips serve the Financial District, but one morning and one afternoon trip serve the San Francisco Civic Center via Lombard Street, Van Ness Avenue, and Golden Gate Avenue/McAllister Street.

Route 72. Route 72 is a weekday commute service that provides service between Santa Rosa, Rohnert Park, Cotati, and San Francisco. Most trips serve the Financial District, but one morning and one afternoon trip serve the San Francisco Civic Center via Lombard Street, Van Ness Avenue, and Golden Gate Avenue/McAllister Street.

Route 73. Route 73 is a weekday commute service that provides service between Santa Rosa, Rohnert Park, Petaluma, and San Francisco. It is an exclusive Civic Center service that operates via Lombard Street, Van Ness Avenue, and Golden Gate Avenue/McAllister Street.

Route 76. Route 76 provides service between East Petaluma and San Francisco during the AM and PM peak periods. While most Route 76 buses travel directly to the Financial District via Battery and Sansome streets, two buses (leaving Petaluma at 5:35 a.m. and 6:13 a.m.) are routed along Van Ness Avenue to Civic Center.

Route 93. Route 93. Route 93 provides weekday commute shuttle service from the Golden Gate Bridge Toll Plaza to the San Francisco Civic Center via Lombard Street, Van Ness Avenue, and Golden Gate Avenue/McAllister Street.

Route 97. Route 97 provides one morning express trip on weekdays from the Larkspur Ferry Terminal to the San Francisco Financial District via Lombard Street, Van Ness Avenue, and Broadway.

Employer Shuttle Services

Private shuttles, such as employer buses traveling to and from Silicon Valley and the Peninsula, are a rapidly growing regional transit service. The Van Ness Avenue corridor has recently seen expanded growth of large employer shuttle services traveling along Van Ness Avenue, in addition to pick-ups and drop-offs on Van Ness Avenue.

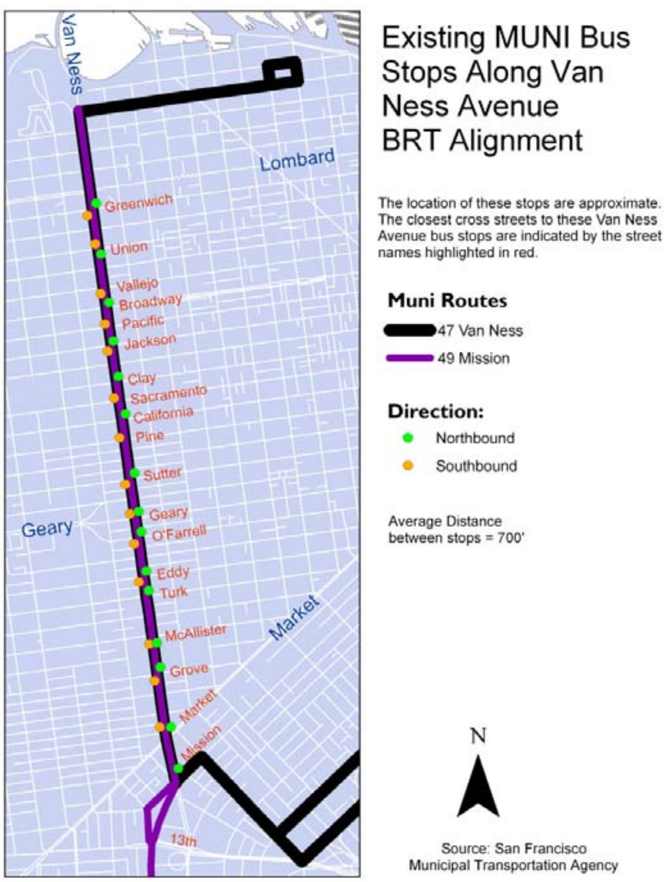
3.2.1.3 | EXISTING MUNI OPERATING CHARACTERISTICS

This section presents existing Muni bus performance along Van Ness Avenue, including crowding (i.e., load factor), travel speed and delay, travel time relative to driving, and reliability. Each of these measures was analyzed using the most recent data available. Crowding was analyzed using APC data collected in 2007 by SFMTA as part of the TEP. Both APC data (2007) and SFCTA's 2004 transit speed and delay survey data were used to analyze existing travel time, speed, and delay. Travel time and dwell time delay data were obtained from APC data; mixed traffic and signal time delay data are inferred from the APC data based on findings from the 2004 transit speed and delay survey. Reliability, which was measured by headway adherence, was based on headway data collected in 2004. The auto and transit travel time comparison was based on APC data (2007) and traffic counts performed in 2008.

Bus Stops and Transfers

Figure 3.2-2 presents the locations of existing bus stops for the Muni lines operating along Van Ness Avenue. There are 14 NB and 14 SB Muni bus stops along Van Ness Avenue between Market and Lombard streets, and an additional NB bus stop located at South Van Ness and Mission Street. The average stop spacing is approximately 700 feet, which is less than the Muni service standard of approximately 800 to 1,000 feet along streets with grades less than 10 percent, such as Van Ness Avenue.

Figure 3.2-2: Existing Transit Stops for Muni Routes 47/49 on Van Ness Avenue BRT Corridor



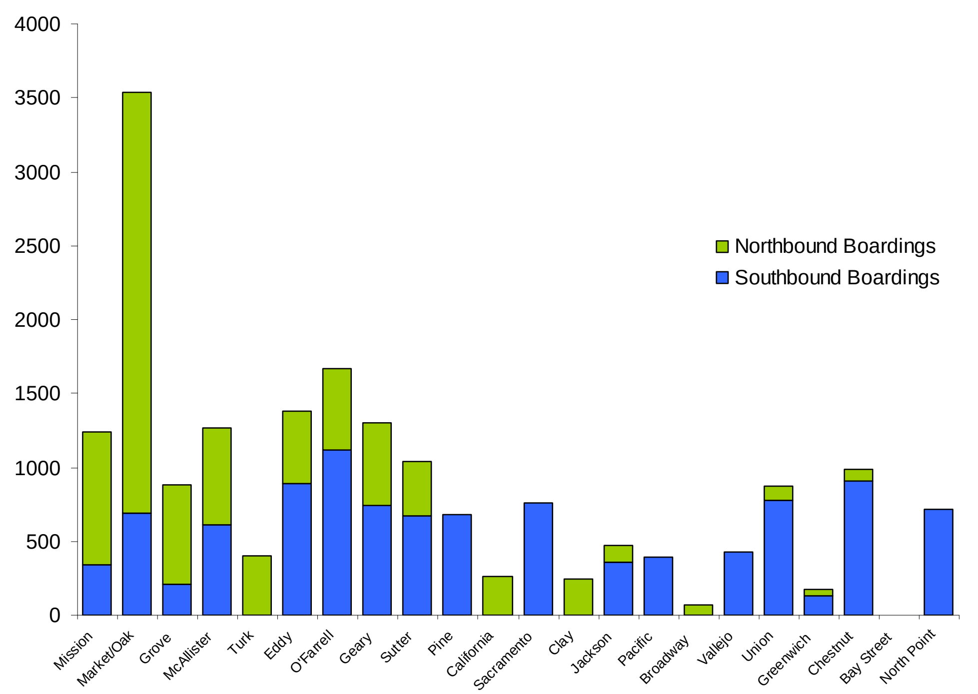
An onboard survey conducted in 2005 by SFCTA shows that major transfers between the 47/49 lines and crossing routes occur, in order of transfer activity, at Market Street, Geary Boulevard, Mission Street, Hayes Street, and California Street.

Today, the Muni 47 and 49 share the same stops along Van Ness Avenue in the study area between Mission and Greenwich streets. Outside the study area, they have different routes: Route 49 begins at North Point and travels south to City College along Van Ness Avenue, Mission Street, and Ocean Avenue, whereas Route 47 starts in Fisherman's Wharf, meets Route 49 at North Point and Van Ness Avenue, leaves South Van Ness Avenue at Mission Street and travels through SoMa to terminate at the 4th/King Caltrain station. The TEP recommended a slightly alternative route for the 47 through SoMa, which this study assumes is implemented in 2015 for all future year scenarios.

Ridership and Mode Shares

The total number of daily passenger boardings and loads on Routes 47 and 49 are shown by stop in Figure 3.2-3. As the chart indicates, boardings peak near Market Street in the NB direction, likely due to transfer activity. There are multiple locations with heavy boardings in the SB direction, and riders board the bus fairly consistently throughout the corridor. Major stops in the corridor are similar for both lines, and they consistently are at locations with transfers to other significant Muni transit lines. (e.g., Geary and O'Farrell have convenient transfers to the 38-Geary line).

Figure 3.2-3: Daily Boardings by Stop for Routes 47 and 49



Source: APC data (2006-2007).

Crowding (Load Factor)

Bus crowding is measured by load factor, which is the number of passengers on board a transit vehicle relative to capacity. Muni's Short-Range Transit Plan presents a definition of maximum capacity – the total number of passengers allowed, including the number of seats and a set number of standees – and a representative number for each vehicle type. Muni policy calls for vehicles to operate at 85 percent or less of the 100 percent, or "crush," load at the most crowded point (i.e., maximum load point [MLP]) along a route during the peak period. Table 3.2-4 shows the seating capacity, 85 percent capacity, and a 100 percent capacity for Routes 47, 49, and 19.

Table 3.2-4: Passenger Capacities

ROUTE	SEATING CAPACITY	85% CAPACITY	100% CAPACITY
Route 47 (MC)	39	54	63
Route 49 (AT)	57	80	94
Route 19 (MC)	39	54	63

MC – motor coach (40-foot); AT – articulated trolley coach (60-foot)

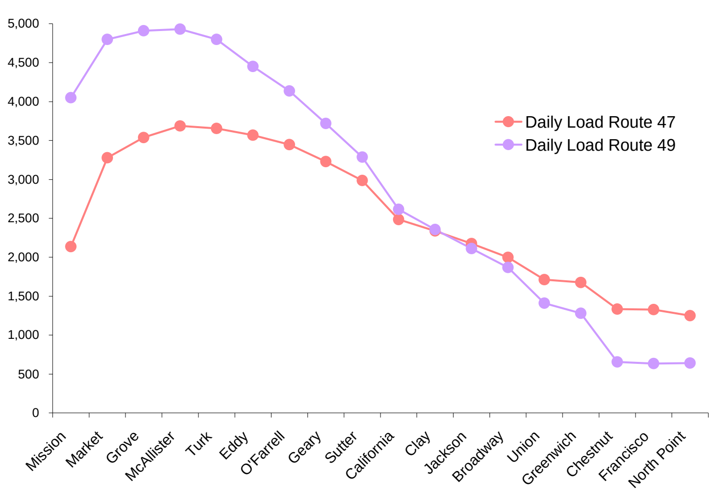
Table 3.2-5 presents the PM peak-hour ridership and vehicle load factors at the MLP for the Muni lines operating along Van Ness Avenue and Polk Street. For NB and SB trips, the MLP for Routes 47 and 49 occurs at Van Ness Avenue and McAllister Street near Civic Center, as seen in Figures 3.2-4 and 3.2-5. During the PM peak hour (usually between 3:00 p.m. and 5:00 p.m.), the Route 47 MLP occurs in the NB direction at Van Ness Avenue and McAllister Street, averaging 44 passengers per bus, with a load factor of 0.7. During the PM peak period, Route 49 can average as many as 49 people in the NB direction at its MLP at Van Ness Avenue and McAllister Street, with a load factor of 0.52. During the PM peak in the NB direction, Route 19 averages 45 passengers per bus at its MLP, with a load factor of 0.71.

Table 3.2-5: Existing Northbound PM Peak-Hour Muni Ridership and Load Factor

ROUTE [1]	MAXIMUM LOAD POINT	PM PEAK-HOUR RIDERSHIP	% OF SEATING CAPACITY AT MLP	% OF TOTAL CAPACITY AT MLP
47 – Van Ness (NB)	Van Ness Avenue & McAllister Street	340	113%	70%
49 – Van Ness – Mission (NB)	Van Ness Avenue & McAllister Street	391	86%	52%
19 – Polk Street (NB)	7th Street & Howard Street	223	114%	71%

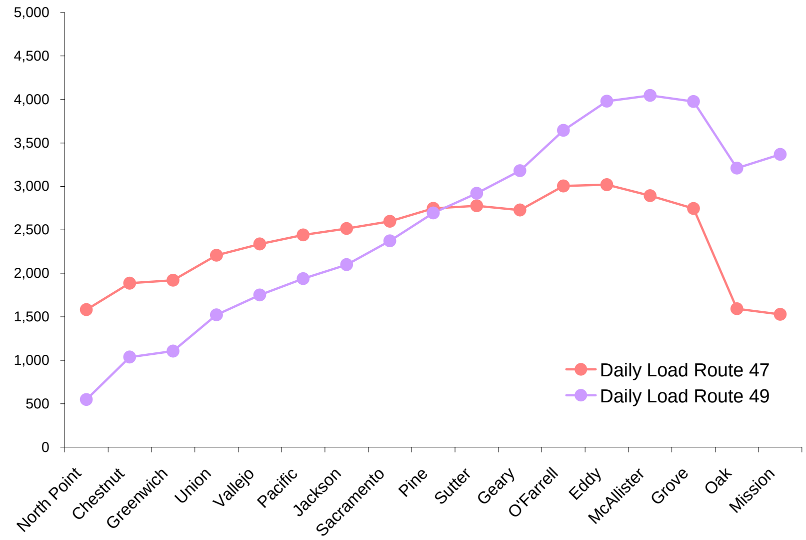
Source: APC data (2006-2007).

Figure 3.2-4: Northbound Daily Load (Passenger Volume) for Routes 47 and 49



Source: APC (2006-2007).

Figure 3.2-5: Southbound Daily Load (Passenger Volume) for Routes 47 and 49



Source: APC data (2006-2007)

The load factor analysis indicates that Van Ness Avenue buses operate with crowded, but not crush conditions, which is contrary to some riders' experiences. The average load factor for the corridor can mask the situation on any individual bus and may be closely related to reliability.

The load factor analysis indicates that Van Ness Avenue buses operate with crowded, but not crush conditions, which is contrary to some riders' experiences. The average load factor for the corridor can mask the situation on any individual bus. Because these loads are averaged over the peak hour, the difference between the data and anecdotal experience of crowded Van Ness Avenue buses may be explained by reliability issues; when headways are not evenly spaced, some buses will be extremely crowded and others much less crowded. The discussion of transit reliability is presented later in this section under Route Segment Reliability.

Travel Time, Speed, and Delays

Transit travel times (i.e., speeds), and the amount of time spent in delay, is a key indicator of transit performance. Transit delays come in various forms. Dwell time is defined as the time elapsed from the opening to the closing of the bus doors. This includes the onboard service time associated with fare payment, as well as boarding and disembarking, and is not all delay time; however, delays do occur during the dwell period associated with fare collection and loading/unloading. Signal delay is the time spent waiting at red lights. Mixed traffic delay includes time spent waiting to pull in and out of traffic and time spent behind parking, double-parked, or right-turning cars. It should be noted that mixed traffic contributes to some dwell time delays due to bus bunching and difficulties for buses pulling out of stops.

KEY FINDING

Van Ness Avenue buses spend approximately half of their travel time stopped in some sort of delay.

During the PM peak period, travel speeds are marginally lower in the SB direction (i.e., 5.5 mph) than in the NB direction (i.e., 6.3 mph), and time spent for various delays is slightly greater. Van Ness Avenue buses spend about half of their travel time stopped in some sort of delay. Signal and mixed-traffic delays account for more than 50 percent of total delay; 58 percent in the NB direction and 50 percent in the SB direction.

Van Ness Avenue buses today spend approximately 17 seconds in delay at a typical intersection. Even when dwell time is subtracted from transit travel times, buses remain slower than autos because they experience greater signal and mixed traffic delays than automobiles.

Van Ness Avenue buses currently average 5.2 mph, inclusive of dwell time. Current transit travel times on the BRT route are 17.5 minutes for the Muni 49 segment between Clay Street and Mission/Otis/Duboce (approximately 1.5 miles) and 14.4 minutes for the shorter Route 47 segment between Clay and Mission/Otis/South Van Ness (approximately 1.2 miles).

Route Segment Reliability

Reliability affects the amount of time passengers must wait at a transit stop for a transit vehicle to arrive, the consistency of passengers' arrival times at a destination from day to day, and passengers' total trip time. Reliability is measured here in terms of travel time variability and headway adherence, including percent of bunched buses.

Headway adherence is a standard measure of reliability when bus service operates at frequencies of six buses or more per hour. Headway adherence is important for frequent service, because the inability to keep a uniform headway is an indication of bus bunching, which leads to overcrowding for the lead bus and longer waits than expected for passengers. Bus bunching is caused, among other reasons, by buses operating in mixed-traffic operation. When a downstream bus is substantially delayed because of traffic congestion or inefficient signal progression, it could arrive at a bus stop at the same time as the next scheduled bus.

Bus bunching is caused by buses operating in mixed-traffic operation. When a downstream bus is substantially delayed because of traffic congestion or inefficient signal progression, it could arrive at a bus stop at the same time as the next scheduled bus.

A February 2004 SFCTA field survey illustrates current reliability conditions. Although during the PM peak, Muni Routes 47 and 49 are not bunched (i.e., defined as headways of less than 1 minute) at the beginning of their routes, approximately 4 percent of SB buses become bunched by the time they reach O'Farrell Street, and 7 percent become bunched by the time they reach Oak Street. As shown in Table 3.2-6-6, 45 percent of buses arrive at North Point with fairly evenly spaced headways between 6 and 9 minutes, which is nearly three times the number of buses that arrive with extremely irregular headways of 2 minutes or less or 13 minutes or greater. By O'Farrell Street, the buses are just as likely to arrive with extreme headways as they are to arrive with even spacing, with the trend continuing to Oak Street. Furthermore, because buses with short headways are bunched closely together, randomly arriving passengers are more likely to experience longer headways and on buses that are also more crowded. Routes 47 and 49 are intended to operate in an evenly staggered manner along the corridor because a relatively high proportion of the passengers exit at Market Street; therefore, when the two routes are considered together, the bunching problems are amplified.

Table 3.2-6: Headway Variability for Routes 47 and 49, Southbound during PM Peak

STOP LOCATION (SOUTHBOUND DIRECTION ONLY)	% OF BUSES ARRIVING WITH 6- TO 9-MINUTE HEADWAYS	% OF BUSES ARRIVING WITH 2-MINUTE-OR-LESS OR 13-MINUTE-OR-GREATER HEADWAYS
North Point	45	17
O'Farrell Street	31	28
Oak Street	32	31

Source: SFCTA Field Survey (2004).

3.2.2 | Future SFMTA Transit Services, Ridership, and Performance

3.2.2.1 | STOP LOCATIONS

Each of the BRT alternatives would provide 8 station platform locations NB and 9 station platform locations SB (reduction of 6 locations in each direction), as shown in Chapter 2, Figure 2-2. The LPA would provide 8 stations in the NB direction and 9 stations in the SB direction (the Vallejo Northbound Station Variant would include an additional NB station for a total of 9 NB stations), with the Mission Street NB station relocated south of the BRT corridor (the 47 would continue to stop at Mission Street/South Van Ness Avenue, but on the south, nearside, of the intersection). BRT station platform locations were selected based on current and expected future demand levels, as well as to preserve key transfer points between the BRT and other Muni Rapid routes. Further stop distances, and therefore further walking distances, were taken into account in ridership forecasting. The BRT stop

Each of the BRT alternatives would provide 9 station platform locations northbound and 8 station platform locations southbound. BRT station platform locations were selected based on current and expected future demand levels, as well as to preserve key transfer points between the BRT and other Muni Rapid routes.

locations would be spaced approximately 900 feet apart on average, which is a spacing that falls within SFMTA standards for stop spacing on rapid routes. Secondary effects on pedestrians and universal design from increased walking distances are discussed in Section 3.4, Nonmotorized Transportation.

3.2.2.2 TRANSIT RIDERSHIP

Methodology

The future year (2015 and 2035) Muni ridership forecast was developed using SFCTA's travel demand forecasting model – SF-CHAMP. SF-CHAMP provides the percent change in ridership on each line for each scenario modeled. SF-CHAMP does not forecast any difference in ridership between Build Alternatives 3 and 4 with or without Design Option B, which also applies to the LPA.

Transit Ridership Forecasts

Ridership on Routes 47 and 49 is projected to increase by 8 percent in 2015 under the No Build Alternative, by 29 percent under Build Alternative 2, or by 37 percent under Build Alternatives 3 and 4.

SF-CHAMP results indicate that ridership on Routes 47 and 49 would increase by 8 percent in 2015 under the No Build Alternative due to an increase in population and employment in the study area and throughout San Francisco, as well as minor transit improvements such as low-floor buses and stop consolidation on Mission Street. Systemwide Muni ridership will increase by 5 percent during this time period for similar reasons.

With the proposed project, Year 2015 transit boardings on Routes 47 and 49 would increase by 29 percent (Build Alternative 2) and 37 percent (Build Alternatives 3 and 4, with or without Design Option B, and the LPA) relative to existing conditions (see Table 3.2-7). Of the growth in boardings between the Build and No Build Alternatives, more than 80 percent is expected to occur on the Van Ness Avenue portions of Muni Routes 47 and 49. SFMTA systemwide boardings would increase by 6 percent under Build Alternative 2 and 7 percent under Build Alternatives 3 and 4, with or without Design Option B, and the LPA relative to existing conditions.

Table 3.2-7: Existing and Near-Term (2015) Daily Transit Boardings on Muni Routes 47 and 49

	2007 EXISTING	2015 NO BUILD ALTERNATIVE	2015 BUILD ALTERNATIVE 2	2015 BUILD ALTERNATIVES 3 AND 4 (WITH OR WITHOUT DESIGN OPTION B)*
#47	12,800	13,600	15,600	16,700
#49	25,300	27,300	33,500	35,600
Total	38,100	40,900	49,100	52,300
% Change relative to Existing	n/a	8%	29%	37%

*Same performance as LPA.

Source: APC data (2006-2007) and SF-CHAMP.

In the long-term horizon year (2035), ridership increases further due to population and employment growth, in addition to transit operational improvements. As shown in Table 3.2-8, under the No Build Alternative (Alternative 1), daily ridership increases by 23 percent (33 percent systemwide) relative to existing conditions. Under the build alternatives, daily ridership on Muni Routes 47 and 49 increases by 51 percent (Build Alternative 2) and 59 percent (Build Alternatives 3 and 4, with or without Design Option B, and the LPA). Of the growth in boardings between the Build and No Build Alternatives, more than 70 percent is expected to occur on the Van Ness Avenue portions of Muni Routes 47 and 49.

Table 3.2-8: Existing and Long-Term (2035) Daily Transit Boardings on Muni Routes 47 and 49

	2007 EXISTING	2035 NO BUILD ALTERNATIVE	2035 BUILD ALTERNATIVE 2	2035 BUILD ALTERNATIVES 3 AND 4 (WITH OR WITHOUT DESIGN OPTION B)*
#47	12,800	16,300	19,500	20,700
#49	25,300	30,600	37,800	40,000
Total	**38,100**	**46,900**	**56,300**	**60,700**
% Change relative to Existing	**n/a**	**23%**	**51%**	**59%**

*Same performance as LPA.

Source: APC data (2006-2007) and SF-CHAMP.

3.2.2.3 | TRANSIT TRAVEL TIME, SPEED, DELAY, AND RELIABILITY

Methodology

Future year (2015) Muni travel time, speed, delay, and reliability were estimated using the VISSIM microsimulation model for the weekday PM peak hour (5:00 p.m. to 6:00 p.m.). VISSIM is able to represent transit operations, including TSP, as well as dwell and mixed traffic delays, as its own mode. The VISSIM data portfolio can be found as an appendix to the Vehicular Traffic Transportation Technical Memorandum (CHS, 2013). The study area for the VISSIM model is along the BRT route from South Van Ness Avenue at Mission Street to Van Ness Avenue at Clay Street. The model also includes the block between Duboce/Mission/Otis/US 101 off-ramp and Mission/Otis/ South Van Ness for Route 49 and autos. Travel time and speed estimates from the VISSIM model presented here will vary slightly from the Synchro model estimates presented in Section 3.3 due to different modeled study areas, the simulation of signal priority in VISSIM, and other factors. The purpose of the VISSIM estimates presented in this section is to measure the relative travel time and speed difference between autos and transit and differences in speeds and delays between the BRT alternatives, whereas the purpose of the Synchro model results shown in Section 3.3 is to analyze the relative difference in automobile intersection Level of Service (LOS).

Future Year (2015) Transit Travel Time, Speed, and Delay

2015 No Build Alternative transit travel times remain similar to existing conditions. While autos would be able to travel between Van Ness Avenue at Clay Street and Duboce/ Mission/Otis/US 101 in approximately 9 minutes, it would take Route 49 nearly twice that amount of time (see Figure 3.2-7).

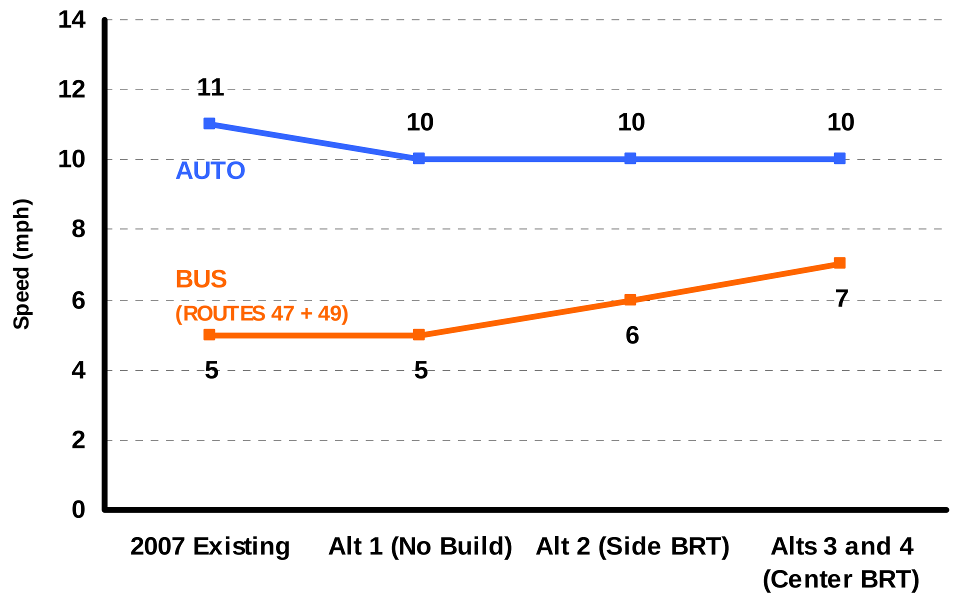
The proposed project would increase the average speed of Routes 47 and 49. As shown in Figure 3.2-6, average bus speed would increase from 5 mph under the No Build Alternative to 6 mph for Build Alternative 2 and to 7 mph under Build Alternatives 3 and 4 (with or without Design Option B) and under the LPA.[31] Auto speeds would be similar between the No Build Alternative and all of the build alternative scenarios (including the LPA)[32], resulting in a significantly reduced speed gap between modes.

The proposed project would increase the average speed of Routes 47 and 49 by 20 percent under Build Alternative 2 and 40 percent under Build Alternatives 3 and 4. Auto speeds are similar between the No Build Alternative and all of the build alternative scenarios, resulting in a significantly reduced speed gap between modes.

31 The Vallejo Northbound Station Variant does not affect the VISSIM model study area, which stops at Clay Street in the north. Due to the need for the BRT to stop one additional time in the NB direction at Vallejo Street under the Vallejo Northbound Station Variant, the BRT speed could be slightly slower than for the LPA without the variant.

32 The LPA would have fewer right-turn pockets than Build Alternatives 3 and 4; thus, the auto travel time could be slightly higher for the LPA than those alternatives. This change was taken into account for the auto traffic analysis in Section 3.3, which indicates minimal difference in travel time between the LPA and Build Alternatives 3 and 4 with Design Option B.

Figure 3.2-6: Average Speed on Van Ness Avenue by Mode – Existing, 2015 No Build Alternative, 2015 Build Alternative 2, and 2015 Build Alternatives 3 and 4*



*The LPA is anticipated to perform the same as Build Alternatives 3 and 4.

Source: VISSIM

Average transit travel times along Van Ness Avenue in a segment with full BRT treatment decrease by approximately 3 minutes with Build Alternative 2, approximately 4 minutes with Build Alternatives 3 and 4, and 4.5 minutes with Build Alternatives 3 and 4 with Design Option B, including the LPA.

As a result of the faster speeds shown above, average transit travel times along Van Ness Avenue between Mission/Otis/South Van Ness and Clay (approximately 1.2 miles in length) for Route 47 would decrease by 2.6 minutes (18 percent) with Build Alternative 2, 3.9 minutes (27 percent) with Build Alternatives 3 and 4, and 4.5 minutes (32 percent) with Build Alternatives 3 and 4 with Design Option B, and with the LPA (see Figure 3.2-7).[33,34] As shown in Figure 3.2-8, Route 49 would complete its longer segment to Duboce (approximately 1.5 miles in length and partially outside the area with full BRT treatment) in 12.9 to 14.3 minutes in the Build Alternatives (including the LPA) instead of 16.8 minutes under the No Build Alternative. Build Alternatives 3 and 4 with Design Option B (including the LPA)[35] would cut in half the travel time gap between autos and the Route 49 bus between Clay and Duboce/Mission/Otis. This travel time savings could be reinvested into more frequent headways or could be used as operational savings to be used throughout the Muni system.

Person delay on the Van Ness Avenue corridor provides a metric indicating the overall impact of the BRT project on the efficiency of traveling in the corridor for people on transit, in private vehicles, and on foot. Figure 3.2-9 summarizes average intersection delays per person between Clay and McCoppin streets by mode during the PM peak.

With the BRT alternatives, the average amount of delay per person along Van Ness Avenue intersections (18 seconds per person) would stay at similar levels to the No Build Alternative. Person-delay would decrease slightly with Build Alternatives 3 and 4 with

[33] Travel times shown are bidirectional averages. The BRT travel time savings are only for the segment of the corridor that contains the VISSIM model (Mission to Clay Street). If similar benefits (i.e., a 32 percent reduction in travel time) were to be assumed for the corridor all the way to Lombard Street, transit travel time would be reduced by 6 to 7 minutes for the LPA versus existing conditions (a reduction from 20 minutes for existing conditions versus 13 minutes for the LPA); this would represent a reduction of up to 14 minutes round trip. (Source for existing conditions travel time: Transit Effectiveness Project/APC Data, 2006-2007.)

[34] See note 33 above.

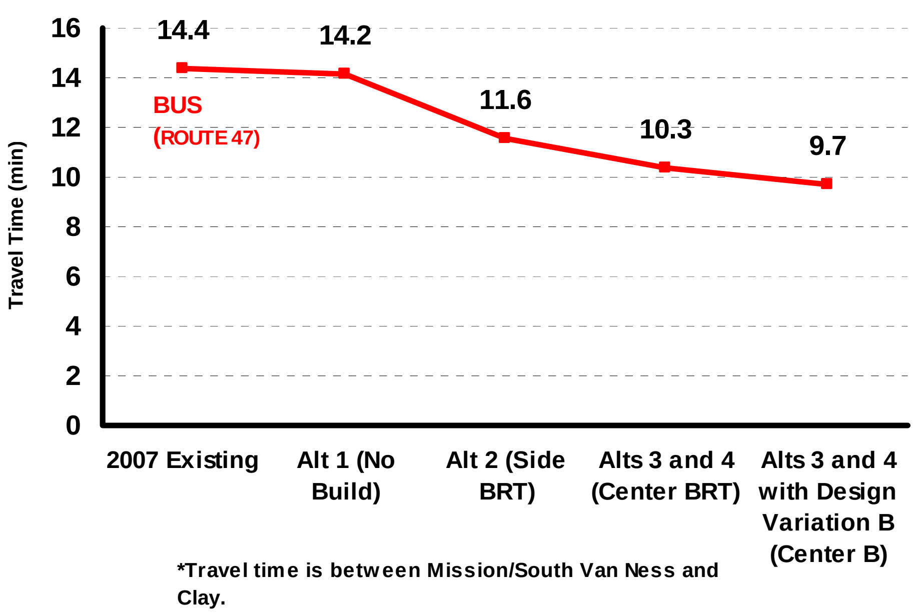
[35] See note 33 above.

Design Option B (including the LPA)[36] to approximately 17 seconds per person rather than 18. Delays would decrease for travelers on Van Ness Avenue, whether on transit or in private vehicles, as shown in Figure 3.2-9. Build Alternative 2 shows a greater decrease in delay due to the flexibility of having permissive left turns in addition to fully protected left turns, whereas Build Alternatives 3 and 4 can only have fully protected left turns for autos. Travelers on cross streets see slight increases in delays (approximately 5 percent) as a result.

Cross-Transit Delay

Cross-transit delay was calculated using the same methodology employed by the San Francisco Planning Department for the San Francisco Bicycle Plan EIR. The delay calculation consists of (1) changes in mixed-traffic delay, (2) changes in dwell times due to increased boardings, and (3) changes in time to pull out from stops due to increased traffic delays. The analysis indicates that only one route on the SFMTA rapid network that crosses Van Ness Avenue BRT would have an increase in mixed traffic delay and dwell time delay across the traffic study area of more than 60 seconds with the implementation of BRT when compared with the No Build Alternative in 2035. For this analysis, Year 2035 with Design Option B and the LPA was used because it represents the largest increase in ridership and the largest increase in traffic delays (see Section 3.3). The one cross route with greater than a 60-second increase in delay during the PM peak hour with the implementation of BRT would be the 31 inbound. The delay for this route in 2035 would increase by just more than 3 minutes (190 seconds) with the implementation of BRT. This is nearly 3 minutes less than the threshold established by the San Francisco Planning Department (1/2 of the 12-minute headway or 6 minutes) that would create a potentially significant impact. Pullout time would need to increase significantly for all routes (more than 50 seconds) for the delay to reach a threshold of significance.

Figure 3.2-7: Average Travel Time in Both Directions on Van Ness Avenue for Route 47 between Mission/Otis/South Van Ness and Clay/Van Ness – Existing, 2015 No Build Alternative, 2015 Build Alternative 2, and 2015 Build Alternatives 3 and 4

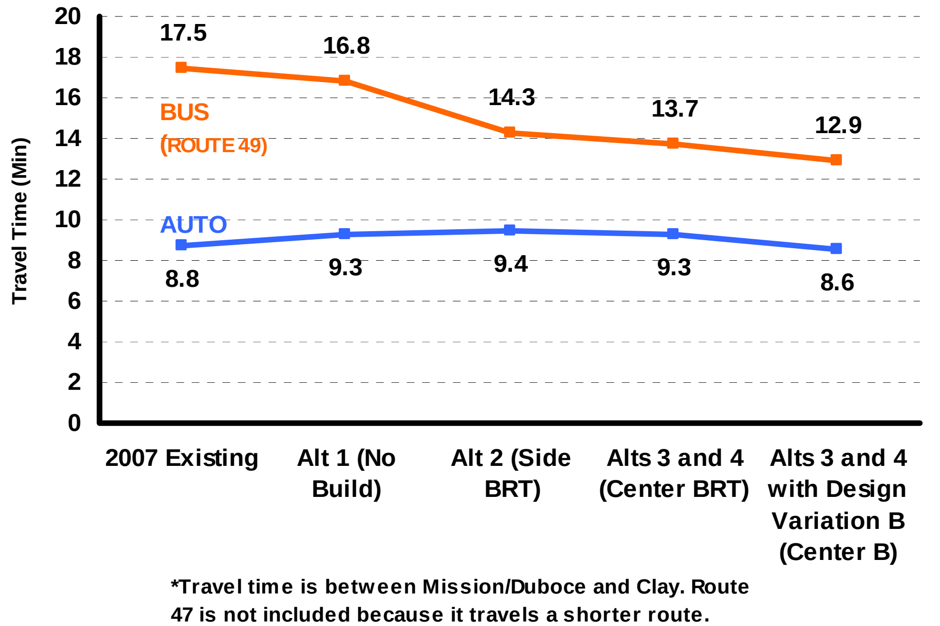


**The LPA is anticipated to perform the same as Build Alternatives 3 and 4 with Design Option B.

Source: VISSIM

[36] The LPA would have fewer right-turn pockets than Build Alternatives 3 and 4; thus, the auto travel time may be slightly different for the LPA than those alternatives. This change was taken into account for the auto traffic analysis in Section 3.3.

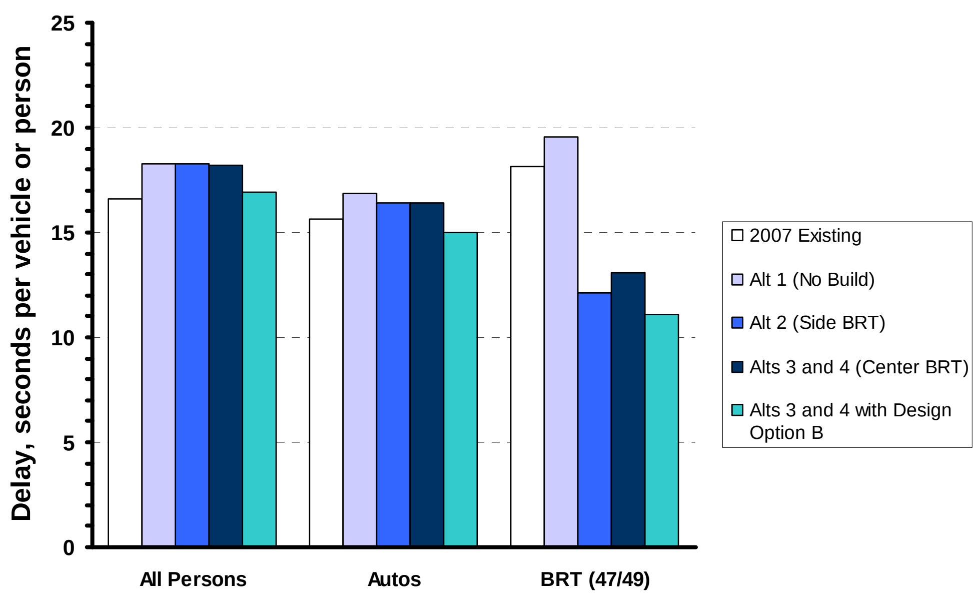
Figure 3.2-8: Average Travel Time in Both Directions on Van Ness Avenue by Mode from Duboce/Mission/Otis to Clay and Van Ness* – Existing, 2015 No Build Alternative, 2015 Build Alternative 2, and 2015 Build Alternatives 3 and 4**



**The LPA is anticipated to perform the same as Build Alternatives 3 and 4 with Design Option B.

Source: VISSIM

Figure 3.2-9: Average Delay by Mode for All Intersections between Clay and McCoppin*



*The LPA is anticipated to perform the same as Build Alternatives 3 and 4 with Design Option B.

Source: VISSIM

Reliability

Bus reliability is most easily measured in VISSIM by the number of unexpected stops experienced by the BRT service due to traffic signals, congestion, and mixed traffic movements. Under the No Build Alternative in 2015, Muni buses would have a 70 percent chance of at least one unexpected stop along any given block. With the proposed project, the likelihood of an unexpected stop would be reduced to 50 percent under Build Alternative 2 and to approximately 35 percent for Build Alternatives 3 and 4 with or without Design Option B, and for the LPA.[37] This is a strong indication that reliability would increase and headway variation would decrease significantly with BRT.

Similar travel time savings and reliability improvements are also expected for GGT, whose buses would benefit from traveling in the exclusive lane and TSP (see Table 3.2-9).

Table 3.2-9: Unexpected Delays Impacting Reliability of BRT Routes

SCENARIO	LIKELIHOOD OF AN UNEXPECTED STOP (PER BLOCK) FOR 47 AND 49 ROUTES
2015 No Build Alternative	71%
2015 Build Alternative 2	51%
2015 Build Alternatives 3 and 4	36%
2015 Build Alternatives 3 and 4 (with Design Option B)*	34%

*The LPA is anticipated to perform the same as Build Alternatives 3 and 4 with Design Option B. The Vallejo Northbound Station Variant could cause a slight increase (up to 10 seconds, on average) in travel time for GGT passengers due to Muni buses being stopped at the NB Vallejo Street station.

Source: VISSIM.

3.2.3 Future Regional Transit Services

This section describes potential changes in service for regional transit service that operates on Van Ness Avenue and presents detailed future transit ridership and performance (i.e., travel time, speed, delay, and reliability) conditions for Muni transit operations under each proposed BRT project alternative. As with Section 3.1, Build Alternatives 3 and 4, and the LPA, are described together because transit ridership and performance are not measurably different for each within the constraints of the models.

Golden Gate Transit

The proposed BRT transitway would accommodate SFMTA and GGT vehicles under all build alternatives, and GGT service would continue to operate on Van Ness Avenue with implementation of the BRT project. The existing GGT curbside stops would be eliminated, and GGT would likely use the closest BRT stations. Under all BRT project alternatives, GGT travel times and reliability would improve, benefitting from use of the BRT transitway, separation from mixed-flow traffic, and TSP. While the existing GGT routes along Van Ness Avenue would not change under Build Alternatives 2 and 3, and the LPA, the routing under Build Alternative 4 may be modified to provide a northern stop, as described further below.

Table 3.2-10 shows the changes in station locations that would occur under each build alternative. Approximately 80 percent of GGT riders on routes that travel along Van Ness Avenue either use the Geary/O'Farrell stop or use stops off of Van Ness Avenue (i.e., in the financial district); thus maintaining the existing Geary/O'Farrell stop and stops that provide access to the northern end of the BRT project area (an important transit transfer point), as

[37] The Vallejo Northbound Station Variant does not affect the VISSIM model study area, which stops at Clay Street in the north. Due to the need for the BRT to stop one additional time in the NB direction at Vallejo Street under the Vallejo Northbound Station Variant, the BRT reliability benefits could be slightly lower than for the LPA without the variant.

well as stops near City Hall, were identified as critical to GGT operations, and all build alternatives would achieve this. Under all build alternatives, the existing GGT Turk stop would be eliminated, although GGT could utilize the proposed Eddy Street BRT station one block north of Turk Street under Build Alternatives 2 and 3, and the LPA.

Table 3.2-10: Likely GGT Stop Locations with BRT Project by Project Alternative

EXISTING GGT STOPS ON VAN NESS AVENUE	PROPOSED GGT STOP LOCATIONS WITH BRT PROJECT		
	GGT STOP WITH ALTERNATIVE 2	GGT STOP WITH ALTERNATIVE 3	GGT STOP WITH ALTERNATIVE 4
Union Street (NB & SB)	Union Street Station (NB & SB)	Union Street Station (NB & SB)	Chestnut Street curbside stops *–or-* Union Street Station (NB & SB)*
Broadway Street/ Pacific Avenue (NB/ SB)	Jackson Street Station (NB & SB)	Jackson Street Station (NB &SB)	stop eliminated**
Clay Street/ Sacramento Street (NB/SB)	Sacramento Street Station (NB & SB)	Sacramento Street Station (NB & SB)	stop eliminated
Sutter Street (NB & SB)	Sutter Street Station (NB & SB)	Sutter Street Station (NB & SB)	stop eliminated
Geary Street/ O'Farrell Street (NB/SB)	Geary/O'Farrell Street Station (NB &SB)	Geary/O'Farrell Street Station (NB &SB)	Geary/O'Farrell Street Station (NB &SB)
Turk Street (NB)	Eddy Street Station (NB)	Eddy Street Station (NB)	stop eliminated

Notes:

* Under Build Alternative 4, either GGT would use curbside stops at Chestnut Street in association with a rerouting of GGT service along four blocks of Chestnut Street or GGT would utilize the BRT Union Street Station.

** Under Build Alternative 4, existing GGT stops would be eliminated, with the exception of a stop at Union Street and Geary/O'Farrell Street. Approximately 80 percent of GGT patrons either use the Geary/O'Farrell stop or do not stop on Van Ness Avenue.

Because GGT plans to use existing vehicles that do not permit left-side boardings, GGT routes would only stop at the Geary/O'Farrell BRT station within the BRT project area under Build Alternative 4. They would continue to utilize McAllister and Golden Gate stops, just off of Van Ness Avenue, in the southern end of the corridor. GGT routing to the north for Build Alternative 4 may utilize a new stop on Chestnut Street at Van Ness Avenue in the northern end of the corridor.

To create the new Chestnut Street stop under Build Alternative 4, GGT buses would travel along Chestnut Street instead of Lombard Street between Van Ness Avenue and Laguna Street. The GGT buses would share the existing EB curbside Muni stop with the Muni 30 and 30X buses, possibly requiring a lengthening of the stop, resulting in the removal of one to two street parking spaces next to these stops. For the creation of the new WB stop on Chestnut Street, another one to three spaces may be removed.

This proposed Chestnut Street rerouting would result in approximately 5 GGT vehicles per hour in each direction on Chestnut Street during peak periods, with lower frequencies during off peak times. GGT operating hours in San Francisco for routes that would be affected are from approximately 6:00 a.m. to 12:00 a.m., similar to current Muni service hours on Chestnut Street. As standard practice, GGT rerouting and stop consolidation that would indirectly result from implementation of the proposed BRT project would be subject to the agency's standard procedures for such operational changes, including public outreach to inform patrons of changes in service.

As an alternative to the above changes, under Build Alternative 4, a dual-median and center-lane transitway and station configuration similar to Build Alternative 3 could be provided at

Union Street. This would allow for right-side boarding required by GGT buses; thus, GGT would share the Union Street Station with BRT. Under this scenario, GGT buses would continue to travel along Lombard Street between Van Ness Avenue and Laguna Street.

Under all BRT project alternatives, GGT travel times and reliability would improve because service would benefit from use of the BRT transitway, separated from mixed-flow traffic, as well as TSP, even considering additional walk time due to elimination of existing GGT stops, under each build alternative, as well as the potential change in routing onto Chestnut Street under Build Alternative 4 (see Section 10.2.4.1).

Because the LPA would have right-side boarding, it would not require the above-described variation in GGT routing.

Employer Shuttle Services

Private shuttles are currently prohibited from using transit lanes or stops citywide. With implementation of BRT on Van Ness Avenue, employer and other private shuttles traveling along Van Ness Avenue would continue to operate in mixed-flow traffic lanes and would not travel within the BRT transitway or use BRT stations. In 2011, the Authority completed an SAR on the Role of Shuttle Services in San Francisco's Transportation System,[38] which examined existing shuttle services and regulations and developed policy recommendations. The SFMTA is currently developing the Muni Partners Program, a component of the multi-agency Transportation Demand Management Partnership Project led by the Authority.[39] The Partnership Project will examine the feasibilities of allowing private shuttles to use transit lanes and stops. The design of the BRT system does not preclude the use of the facilities by private shuttles if it is later adopted as a City policy.

3.2.3.1 | ENVIRONMENTAL IMPACTS – NEAR-TERM HORIZON YEAR (2015)

This section discusses Muni transit operations and cumulative impacts for the near-term (2015) No Build Alternative and the build alternatives.

Platform Crowding (2015)

Alternative 1: No Build (Baseline Alternative)

In existing conditions, there are no platforms. Instead, the bus stops make use of the existing 16-foot-wide sidewalk along Van Ness Avenue (on South Van Ness Avenue between Market and Mission streets, the sidewalk is 22 feet wide on both sides). This width is effectively reduced at bus stop locations. While there is evidence of crowding along sidewalks at high ridership stops (e.g., Oak/Market, Geary), there is sufficient sidewalk space farther down the block for passengers to wait in the event of extreme crowding. At the busiest stops, such as Market and Geary, waiting bus riders conflict with pedestrians trying to use the sidewalk. In the 2015 No Build Alternative scenario, the increase in transit ridership would worsen these situations.

KEY FINDING

Under all the Build Alternatives, there would not be a significant platform crowding impact.

Build Alternative 2: Side-Lane BRT with Street Parking

Build Alternative 2 would create right-side boarding platforms through sidewalk extensions (bus bulbs) approximately 9 feet in width and 160 feet in length. Expected passenger loads at the busiest station platform, Market Street, were analyzed to determine the likelihood of crowding under the project scenarios. Build Alternative 2 in 2015 would provide 27 to 30 square feet per passenger on the Market Street station platforms. Even in the event of extreme bus bunching, where the platform could be as much as twice as crowded, the amount of space would be greater than 13 square feet per person, which is higher than

[38] The SAR is available at www.sfcta.org/shuttles.
[39] Available on the project website at www.sfcta.org/tdm.

national standard guidelines and more than twice as much as local guidelines of 5 square feet per person. There would not be a significant platform crowding impact in 2015.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians (with or without Design Option B, including the LPA)

Build Alternative 3 would create dual platforms, each with similar dimensions and amount of usable space as Build Alternative 2 (25 to 28 square feet per passenger on the Market Street station platforms). The LPA platforms would have similar dimensions to Build Alternative 3, although the LPA would provide an additional 1-foot buffer between the station and the adjacent traffic lane, for a total of 5.5 feet of buffer between the center of the platform and traffic. Even in the event of bus bunching, where the platform could be as much as twice as crowded, the amount of space would be greater than 12 square feet per person, which is higher than national standard guidelines and more than twice as much as local guidelines (5 square feet per person). There would not be a significant platform crowding impact in 2015.

The LPA platform crowding conditions would be the same as Build Alternative 3. There would not be a significant platform crowding impact in 2015.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median (with or without Design Option B)

Build Alternative 4 would create platforms on the existing single center median. Each platform would be 13 feet to 14 feet wide and 160 feet in length and, in many cases, it would serve passengers in both directions. Build Alternative 4 would provide 22 to 26 square feet per passenger on the Market Street station platforms. Even in the event of bus bunching, where the platform could be as much as twice as crowded, the amount of space would be greater than 11 square feet per person, which is higher than national standard guidelines and more than twice as much as local guidelines (5 square feet per person). There would not be a significant platform crowding impact in 2015.

Crowding/Vehicle Load Factors (2015)

The future year (2015) load factor analysis is presented in Table 3.2-11. Note that peak load factor refers to occupancy of the vehicle; thus, the peak load at a particular location is not necessarily the same as the station with the most boardings.

Table 3.2-11: Year 2015 Muni Load Factor Analysis

PEAK HOUR (5:00 PM TO 6:00 PM)			EXISTING*	2015		
				NO BUILD ALTERNATIVE**	BUILD ALTERNATIVE 2	BUILD ALTERNATIVES 3 AND 4 (INCLUDING DESIGN OPTION B)**
Load Factor at Peak Location (% of total vehicle capacity)	47	SB	0.39	0.46	0.32	0.32
		NB	0.61	0.76	0.53	0.80
	49	SB	0.44	0.43	0.71	0.80
		NB	0.45	0.50	0.68	0.80

* Existing Load Factors are different than in Section 3.2.1.3 because the VISSIM model was coded with a peak hour of 5:00 pm to 6:00 pm instead of 3:00 pm to 4:00, which is the peak transit hour in existing conditions.

**The LPA is anticipated to perform the same as Build Alternatives 3 and 4.

Source: APC data (2006-2007) and SF-CHAMP.

Alternative 1: No Build (Baseline Alternative)

The crowding (i.e., Load Factor) increases slightly on the 47 to 0.46 SB and 0.76 NB under the No Build Alternative relative to the existing conditions. The load factor for Route 49 stays similar to existing conditions (0.43 SB and 0.5 NB). All of these load factors are below Muni's 0.85 load factor standard.

Build Alternative 2: Side-Lane BRT with Street Parking

Using SF-CHAMP ridership forecasts, Build Alternative 2 would show a decrease in load factors for Route 47 (0.32 SB and 0.53 NB) due to the greater effective capacity caused by increasing the vehicle size from 40 feet (existing) to 60 feet. Route 49 would show increased load factors under Build Alternative 2 (0.71 SB and 0.68 NB). The MLP is expected to be at either Market/Oak or McAllister under this alternative. These load factors are still below Muni's 0.85 load factor standard, so there would not be a significant crowding impact due to Build Alternative 2. As indicated in Section 3.2.1.3, reliability is a significant contributor to vehicle crowding levels in operation, so the reliability improvements (i.e., decrease in headway variation) relative to the No Build Alternative (see Section 3.2.2.2) could result in a less-crowded passenger experience even though the average loads would be higher.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians (with or without Design Option B)

Using SF-CHAMP ridership forecasts, Build Alternative 3 would show a decrease in load factors for Routes 47 (0.32 SB and 0.80 NB) due to the greater effective capacity caused by increasing the vehicle size from 40 feet (existing) to 60 feet. Route 49 would show increased load factors under Build Alternative 2. Route 49 would show increased load factors under Build Alternative 3 (0.80 SB and 0.80 NB). The MLP is expected to be at Market/Oak or McAllister for this alternative. These load factors are still below Muni's 0.85 load factor standard, so there would not be a significant in-vehicle crowding impact. As discussed above, reliability is a significant contributor to vehicle crowding levels in operation, so the reliability improvements (i.e., decrease in headway variation) relative to the No Build Alternative (see Section 3.2.2.2) could result in a less-crowded passenger experience even though the average loads would be higher.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median (with or without Design Option B) and the LPA

The findings for Build Alternative 4 and the LPA are the same as for Build Alternative 3. There would not be a significant crowding impact in 2015.

The LPA vehicle crowding conditions would be the same as Build Alternatives 3 and 4. There would not be a significant vehicle crowding impact in 2015.

3.2.3.2 | ENVIRONMENTAL IMPACTS – LONG-TERM HORIZON YEAR (2035)

This section discusses transit operations and cumulative impacts for the near-term (2035) No Build Alternative and the build alternatives.

Reliability improvements relative to the No Build Alternative could result in a less-crowded passenger experience even though the average hourly loads would be higher under the Build Alternatives.

Platform Crowding (2035)

Alternative 1: No Build (Baseline Alternative)

As in 2015, no separated platforms would be built for the No Build Alternative in 2035; therefore, there would still be spillover space on the sidewalk to hold waiting passengers, potentially causing sidewalk crowding. Similar to 2015, 2035 No Build Alternative conditions could get worse through the increase in transit ridership and no increase in space.

Build Alternative 2: Side-Lane BRT with Street Parking

The size and usable space on the platforms would not differ from year 2015, but the busiest station platform location is expected to be at Geary and O'Farrell due in part to the expected completion of the CPMC hospital, and BRT on Geary Boulevard (note that this peak boarding location is different than the MLP, which would continue to be at Oak/ Market or McAllister, as described later in this section). Build Alternative 2 in 2035 would provide 25 to 29 square feet per passenger on the Geary and O'Farrell station platforms. Even in the event of extreme bus bunching, where the platform could be as much as twice as crowded, the amount of space would be greater than 13 square feet per person, which is higher than national standard guidelines and more than twice as much as local guidelines. There would not be a significant platform crowding impact in 2035.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians (with or without Design Option B)

The amount of space on the station platforms in Build Alternative 3 and the LPA would not change between 2015 and 2035, but like Build Alternative 2, the busiest platform is expected to be at Geary and O'Farrell. Even in the event of bus bunching, where the platform could be as much as twice as crowded, the amount of space would be greater than 12 square feet per person, which is higher than national standard guidelines and more than twice as much as local guidelines. There would not be a significant platform crowding impact in 2035.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median (with or without Design Option B) and the LPA

Build Alternative 4 would provide similar platforms at the Geary and O'Farrell location as under Build Alternative 3 due to the need to accommodate Golden Gate Transit vehicles. Thus, the crowding analysis and results for Build Alternative 4 (with or without Design Option B) would be the same as Build Alternative 3. There would not be a significant platform crowding impact in 2035.

The LPA platform crowding conditions would be the same as Build Alternatives 3 and 4, although the LPA would provide an additional 1-foot buffer between the station and the adjacent traffic lane, for a total of 5.5 feet of buffer between the center of the platform and traffic. There would not be a significant platform crowding impact in 2035.

Crowding/Vehicle Load Factors (2035)

The future year (2035) load factor analysis is presented in Table 3.2-12.

Table 3.2-12: Year 2035 Muni Load Factor Analysis

PEAK PERIOD			EXISTING*	2035		
				NO BUILD ALTERNATIVE	BUILD ALTERNATIVE 2	BUILD ALTERNATIVES 3 AND 4 (WITH OR WITHOUT DESIGN OPTION B)**
Load Factor at Peak Location (% of total vehicle capacity)	47	SB	0.39	0.68	0.37	0.39
		NB	0.61	0.79	0.63	0.91
	49	SB	0.44	0.51	0.67	0.78
		NB	0.45	0.56	0.76	0.89

*Existing Load Factors are different than in Section 3.2.1.3 because the VISSIM model was coded with a peak hour of 5:00 pm to 6:00 pm instead of 3:00 pm to 4:00 pm, which is the peak transit hour in existing conditions.

**The LPA is anticipated to perform the same as Build Alternatives 3 and 4.

Source: APC data (2006-2007) and SF-CHAMP.

Alternative 1: No Build (Baseline Alternative)

The load factors for both Routes 47 (0.68 SB and 0.79 NB) and 49 (0.51 SB and 0.56 NB) would increase in 2035 relative to existing conditions. All of these load factors are below Muni's 0.85 load factor standard.

Build Alternative 2: Side-Lane BRT with Street Parking

Build Alternative 2 would increase load factors on both Routes 47 and 49, as shown in Table 3.2-12. The MLP is expected at either Oak or McAllister in this alternative. These load factors would still be below Muni's 0.85 load factor standard, so there would not be a significant in-vehicle crowding impact. As indicated for the near-term horizon year, reliability is a significant contributor to vehicle crowding levels in operation, so the reliability improvements (i.e., decrease in headway variation) relative to the No Build Alternative (see Section 3.2.2.2) could result in a less-crowded passenger experience even though the average loads would be higher.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians (with or without Design Option B)

Build Alternative 3 would show an increase in load factors on both Routes 47 and 49. The MLP is expected be at Market or McAllister for this alternative. The 2035 0.91 load factor for the NB Route 47 and the 0.89 load factor for the NB Route 49 would exceed Muni's 0.85 threshold and would constitute a significant in-vehicle crowding impact. As indicated in Section 3.2.1.3, reliability is a significant contributor to vehicle crowding levels in operation, so the reliability improvements (i.e., decrease in headway variation) relative to the No Build Alternative (see Section 3.2.2.2) could result in a less-crowded passenger experience even though the average loads would be higher.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median (with or without Design Option B) and the LPA

The findings for Build Alternative 4 are the same as for Build Alternative 3. There is a potentially significant vehicle crowding impact in 2035.

The LPA platform crowding conditions would be the same as Build Alternatives 3 and 4. There is a potentially significant vehicle crowding impact in 2035.

3.2.4 | Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following mitigation measure would reduce or avoid significant impacts from vehicle crowding, applicable to Build Alternative 3 and 4, with or without Design Option B, and the LPA:

M-TR-1: A mitigation measure of adding one additional vehicle operating on Routes 47 and 49 would decrease headways for each route sufficiently to bring the load factors below the 0.85 standard. This reduction in headways could be possible with no additional operating costs due to the expected travel time savings forecast in that horizon year.

3.2.5 | Transit Summary

Transit analysis through the use of SF-CHAMP, which is San Francisco's travel demand forecasting model, and the VISSIM microsimulation model indicates the following:

- Transit ridership would increase on Routes 47 and 49, as well as systemwide, with the Van Ness Avenue BRT Project.

KEY FINDING

Implementation of Build Alternative 2 would not have a significant impact on vehicle crowding in 2015 or 2035. Implementation of Build Alternatives 3 and 4 (with or without Design Option B) and the LPA would not have a significant impact on vehicle crowding in 2015 but would have a potentially significant impact in 2035.The impact could be mitigated by adding an additional vehicle to each route during the peak to decrease headways This may be possible at no additional operating cost through the reinvestment of travel time savings.

- Transit travel time would decrease and speed would increase for Routes 47 and 49 with the proposed project, significantly closing the travel time gap between autos and transit.
- Transit reliability would increase, with reduced variation in headways, with the proposed project.
- Implementation of the BRT under any of the alternatives would not have a significant impact on platform crowding in either 2015 or 2035.
- Implementation of Build Alternative 2 would not have a potentially significant impact on vehicle crowding in 2015 or 2035. Implementation of Build Alternatives 3 and 4 (with or without Design Option B) and the LPA would not have a significant impact on vehicle crowding in 2015 but is anticipated to have a significant impact in 2035. The impact could be mitigated by adding an additional vehicle to each route during the peak to decrease headways This may be possible at no additional operating cost through the reinvestment of travel time savings.
- Total GGT passenger travel times and reliability would improve under all of the build alternatives because service would benefit from use of the BRT transitway separated from mixed-flow traffic, as well as TSP.

3.3 Traffic

This section presents the local and regional roadway systems in the traffic study area and planned roadway improvements that may affect the study area; evaluates potential traffic impacts; and presents mitigation measures that would mitigate significant traffic impacts.

The Van Ness Avenue BRT Project traffic study includes six north-south streets that would most likely be affected by the proposed project: Van Ness Avenue, Franklin Street, and Gough Street from Mission Street to Lombard Street; Polk Street from Market Street to Pacific Avenue; Larkin Street from Market Street to California Street; and Hyde Street from Market Street to Pine Street (Figure 3.3-1). Please note that in this section "traffic" refers to private vehicle traffic (i.e., automobiles, trucks, motorcycles, shuttles, and taxis) only unless otherwise explicitly stated.

DEFINITION

In this section, "traffic" refers to private vehicle traffic (i.e., automobiles, trucks, motorcycles, shuttles, and taxis) only unless otherwise explicitly stated.

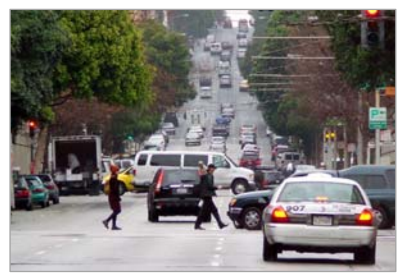
This section also presents the potential traffic impacts of the Locally Preferred Alternative (LPA) that was approved by the SFMTA Board in May 2012. The LPA is a refinement of the two center-running build alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B). For nearly all of the environmental impact areas described in Section 3.3, the LPA (including the Vallejo Northbound Station Variant) has similar environmental consequences to Build Alternatives 3 and 4 with Design Option B, and is so noted.

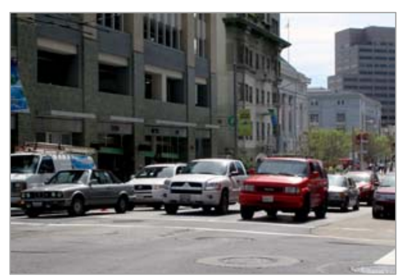
3.3.1 Traffic Evaluation Methodology

Traffic operations were analyzed for the existing conditions and future years 2015 and 2035, for the No Build Alternative, the three build alternatives, and Build Alternatives 3 and 4 with Design Option B and the LPA. Traffic volumes used in the existing conditions analysis were based on field counts collected mostly in 2007, and future traffic volumes were developed using the SF-CHAMP travel demand forecasting model described in Section 3.1 and in the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).[40] Traffic volumes for the intersections in the vicinity of the proposed CPMC hospital and medical office building were modified to reflect the projected vehicle trip generation for these two buildings in the CPMC EIR for the 2035 build alternatives and manually adjusted for reasonableness. Traffic operations analysis for existing and future year analyses used a SYNCHRO operations model created by CHS Consulting Group and further described in the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

Future-year intersection traffic volumes were developed based on growth factors obtained from the SF-CHAMP model between the years of 2005 and 2015, and between 2005 and 2035. The SF-CHAMP model uses the forecast population and employment produced by ABAG as the basis for future traffic volume forecasts. ABAG, the regional planning organization, provides biannual population and employment forecasts for each city in the Bay Area. The San Francisco Planning Department further breaks down the estimated total population and employment in San Francisco by various traffic analysis zones (TAZ) for the SF-CHAMP model based on zoning limitations and known development projects. For the Van Ness Avenue BRT modeling, the projected land use data for both the Year 2015 and 2035 scenarios were used as inputs in the SF-CHAMP model and were based on ABAG's Projections 2007. The Projection 2007 land use inputs were also used in the most recently adopted RTP, Transportation 2035, for which an EIR was prepared.

SFCTA provided growth factors from the SF-CHAMP model for each north-south street in four different sections – northern, mid, and southern sections of Van Ness Avenue and the SoMa – in the traffic study area and for the east-west streets by facility type (e.g., arterial,



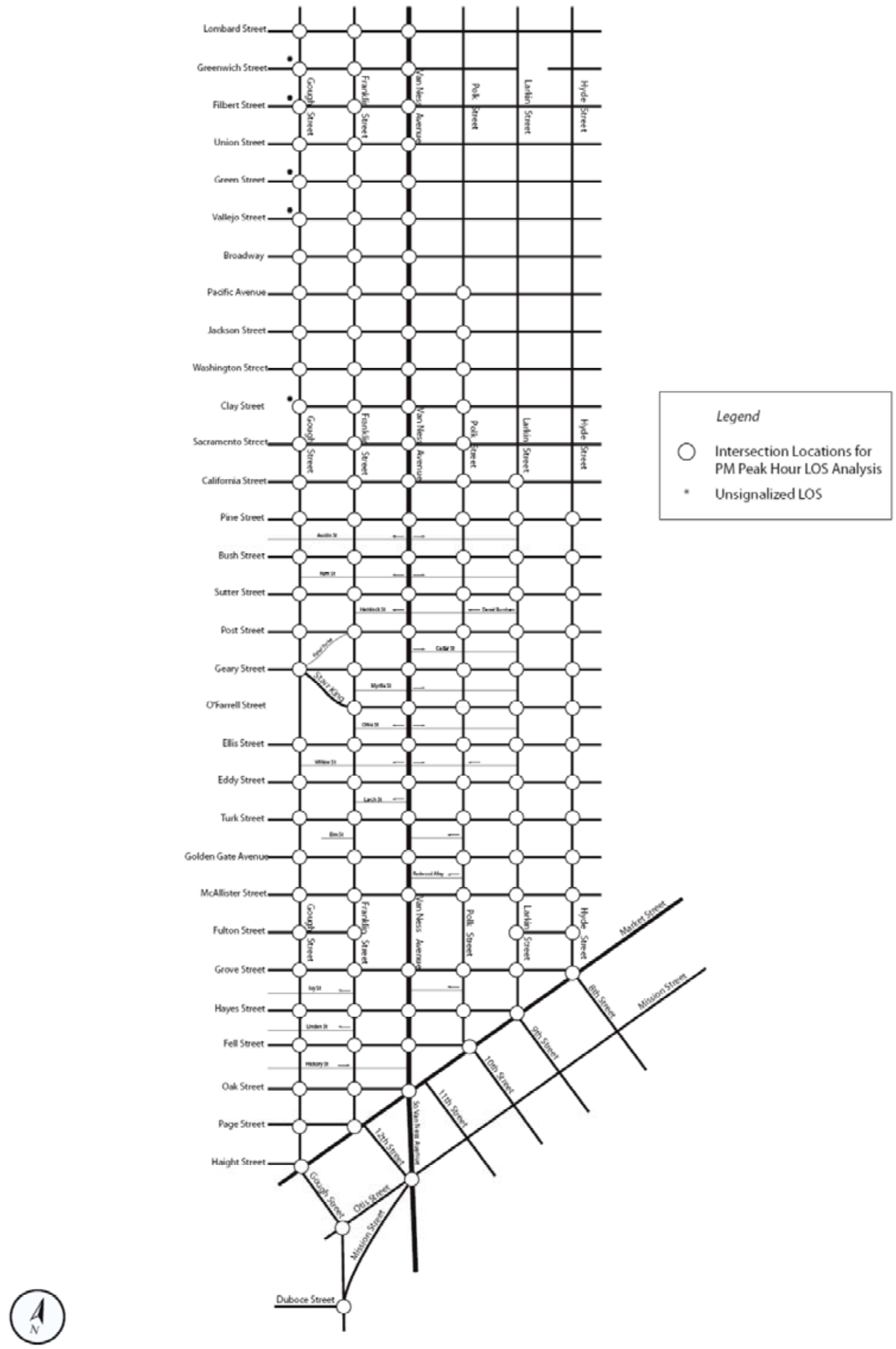


The Van Ness Avenue BRT Project traffic study included six north-south streets: Van Ness Avenue (top), Franklin Street (middle), and Gough Street from Mission to Lombard; Polk Street from Market to Pacific; Larkin Street (bottom) from Market to California; and Hyde Street from Market to Pine.

[40] As described in the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013), the existing conditions SYNCHRO Model includes the following field counts: traffic turning movements at 91 intersections, pedestrian counts, parking maneuver counts, and travel time and queue length data.

collector, and local streets). These growth factors were applied to the existing counts to obtain future traffic volumes for each intersection. The initial set of forecast traffic volumes were balanced within the traffic study area to ensure equilibrium of traffic volumes within the study area. The process for developing the traffic volumes used in the existing and future conditions traffic operations (i.e., SYNCHRO) models is more fully explained in Section 3.1 and the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

Figure 3.3-1: Street Network in the Proposed Van Ness Avenue BRT Project Corridor Traffic Study Area



Future-year signal timing and phasing data were initially provided by SFMTA and then optimized using the SYNCHRO model, which uses the same methodology specified in the Highway Capacity Manual (HCM) 2000. For the three build alternatives and the LPA, intersection geometries were modified in the SYNCHRO model for certain intersections where left-turn pockets were removed as a result of the proposed project. Details of the left-turn pocket locations are presented in Chapter 2, Table 2-3 and Figure 2-2.

As presented in Section 3.2, a VISSIM simulation model was created primarily for assessing the project's benefits to transit operations. VISSIM is a microsimulation model that is utilized for modeling transit, automobile, and pedestrian operations; simulating parking operations; and incorporating signal priority systems. This section, however, uses a SYNCHRO traffic operations model to assess intersection LOS impacts caused by the Van Ness Avenue BRT Project build alternatives along Van Ness Avenue and the five parallel north-south streets east and west of Van Ness Avenue.

Signalized intersection operations are evaluated based on average vehicular delay (seconds per vehicle). Unsignalized intersections are analyzed using an LOS based on the approach with the highest delay. The LOS is used to describe how efficiently an intersection operates for private vehicle traffic. The method used for signalized intersections generally defines LOS in terms of "control delay per vehicle," which refers to the average time spent by vehicles decelerating, stopping, and accelerating at traffic signals. Signalized intersection LOS is affected by traffic volumes, intersection lane configuration, and signal timing and coordination in a corridor. Unsignalized intersection LOS is defined in terms of average delay experienced per vehicle along the stop-controlled approach(es) at the intersection. Intersection LOS designations range from "A," which indicates negligible delays with free-flow speed (i.e., less than 10 seconds per vehicle for signalized intersections and unsignalized approaches) to "F," which indicates delays with queuing that may block upstream intersections (i.e., greater than 80 seconds per vehicle for signalized intersections and greater than 50 seconds for unsignalized approaches). Criteria used to assess the significance of private vehicle traffic impacts are presented in Section 3.3.3.

The Van Ness Avenue BRT Project traffic study area includes 139 intersections: 134 signalized intersections and 5 unsignalized intersections. Due to the large number of intersections in the traffic study area, the discussion of existing and future intersection and approach LOS focuses on those signalized intersections or worst approaches at unsignalized intersections operating at LOS E and F. The City and County of San Francisco uses LOS D as a threshold, so signalized intersections or worst approach at unsignalized intersections operating at LOS E or F are discussed in this chapter. Details of the intersection LOS for all 139 intersections in the traffic study can be found in Appendix 8 of the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

Average vehicular travel speed is presented in this EIS/EIR for planning and informational purposes. There are no criteria established by SFCTA or by the City and County of San Francisco to assess vehicular traffic's CEQA impacts using average travel speeds. Travel speed data provided in this EIS/EIR are presented for planning and informational purposes to compare overall changes in the operating conditions of roadway operations.

DEFINITION

LOS: Level of Service

Unsignalized Intersection Delay Criteria

LOS	AVERAGE DELAY (SEC/VEH)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

Signalized Intersection Delay Criteria

LOS	AVERAGE DELAY (SEC/VEH)
A	≤ 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Source: Highway Capacity Manual, 2000

3.3.2 Existing Conditions

This section describes the existing roadway operating conditions (including traffic volumes, travel speed, and intersection LOS) of the regional roadways and local streets in the Van Ness Avenue BRT Project area. Additional information on existing travel patterns in the Van Ness Avenue corridor traffic study area can be found in Section 3.1, Corridor Travel Pattern Overview.

3.3.2.1 | ROADWAY NETWORK

The discussion in this section presents only the role of the roadways in the traffic study area for private vehicle traffic. These roadways also serve various roles for transit, pedestrian, and bicycle traffic; those roles are described in Sections 3.2 and 3.4.

Regional Roadways

Van Ness Avenue and South Van Ness Avenue. Van Ness Avenue and South Van Ness Avenue within the traffic study area are part of US 101, which is a north-south principal arterial on the NHS whose purpose is to provide international, interstate, interregional, and intraregional travel (i.e., commute and non-commute) and goods movement. It is also a Strategic Highway Network (STRAHNET) Route and part of the Interregional Road System (IRRS). In 1998, the State specified certain portions of the IRRS as “Focus Routes” – State highway segments that are critical to the interregional movement of people and goods. This segment of US 101 was identified as a high-emphasis “Focus Route.” In the project region, US 101 is a conventional highway that connects San Francisco with Marin County to the north and the Peninsula to the south.

Along the project alignment, Van Ness Avenue typically has six traffic lanes, a landscaped median, and parking on both sides. The San Francisco General Plan classifies Van Ness Avenue as a Major Arterial Road and Freight Traffic Route between North Point and Market streets. It is also part of the Congestion Management Program (CMP) and Metropolitan Transportation System (MTS) network, and it is designated as a Primary Transit Street (Transit Important) and a Citywide Pedestrian Network.

Local Roadways

There are 5 north-south parallel streets and 28 major east-west streets crossing Van Ness Avenue and South Van Ness Avenue in the traffic study area; their function and characteristics are described below.

North-South Streets

Gough Street. Gough Street is a Major Arterial Road and Freight Traffic Route between Pine and Market streets, a secondary arterial road between Sacramento and Pine streets, and a local street north of Sacramento Street. It is also part of the CMP and MTS network. It is a two-way street north of Sacramento Street and a one-way SB street south of Sacramento Street. On-street parking is prohibited on some sections during the AM and PM peak periods to create additional lanes for traffic circulation.

Franklin Street. Franklin Street is a Major Arterial Road between Market and Lombard streets and a Freight Traffic Route between Market and California streets and a secondary arterial road between Lombard and Bay streets. It is also part of the CMP and MTS network. It is a one-way NB street from Market to Lombard streets and a two-way street north of Lombard Street. Franklin Street has three travel lanes. On-street parking is prohibited on some sections during the AM and PM peak periods to create additional lanes for traffic circulation.

Polk Street. Polk Street is a two-way street north of Grove Street, with one lane NB and one lane SB, and becomes a one-way SB street south of Grove Street. It is part of Citywide Bicycle Route 25, including a combination of Class II and Class III bicycle facilities.

Larkin Street. Larkin Street is a Secondary Arterial street between Market and Pine streets. Larkin Street, between Pine and Market streets, is part of the MTS network. It is a one-way NB street with three lanes from Market to California streets, and a two-way street north of California Street and between McAllister and Grove streets.

Hyde Street. Hyde Street is a Secondary Arterial from Pine to Market streets, a Transit-Oriented Street from Beach to Washington streets, and part of the MTS network between Pine and Market streets. It is a one-way street with three SB lanes between California and Market streets, and a two-way street with one lane in each direction between Jefferson and California streets. It shares the ROW with cable cars between Beach and Washington streets.

East-West Streets

There are 28 east-west streets in the traffic study area crossing Van Ness Avenue: 15 are arterial roads defined by the San Francisco General Plan, and 13 are collector and local streets. The following provides a brief description of the arterial roads.

Lombard Street. Lombard Street is a Major Arterial Road, Freight Traffic Route, and Transit Important Street west of Van Ness Avenue. It is also part of the CMP and MTS networks. Lombard Street between Van Ness Avenue and Richardson Avenue is part of US 101.

Broadway. Broadway is a Major Arterial Road and Freight Traffic Route, and it is part of the CMP and MTS networks between Franklin Street and The Embarcadero. Broadway is part of Citywide Bicycle Route 10 east of Webster Street.

Pine Street. Pine Street is a Major Arterial Road, a Freight Traffic Route, and a Transit Important Street east of Sansome Street. It is also part of the CMP and MTS networks. Pine Street is a WB one-way roadway with three traffic lanes.

Bush Street. Bush Street is a Major Arterial Road, a Freight Truck Route, and a Transit Important Street east of Kearny Street. It is also part of the CMP and MTS networks. Bush Street is an EB one-way roadway with three traffic lanes

Geary Street. Geary Street is a Major Arterial, a Transit Important Street, and a Freight Traffic Route. It has a bus-only lane between Gough and Market streets. East of Gough Street, it is a one-way WB street with two mixed travel lanes and a bus-only lane.

O'Farrell Street. O'Farrell Street is a Major Arterial, a Transit Important Street, and a Freight Traffic Route. It is a one-way EB arterial from Market Street to Franklin Street. O'Farrell Street forms a one-way couplet with Geary Street. Between Gough and Powell streets, O'Farrell Street has two EB travel lanes and a bus-only lane.

Hayes Street. Hayes Street is a Major Arterial and a Freight Traffic Route between Market and Gough streets. It is a one-way WB street from Market Street to Gough Street, with three to five travel lanes. West of Gough Street, it has one traffic lane in each direction.

Fell Street. Fell Street is a Major Arterial and Freight Traffic Route. It is also part of the CMP and MTS networks. Fell Street is a one-way WB street west of Gough Street. It forms a one-way couplet with Oak Street.

Market Street. Market Street is a Primary Transit Street, a Freight Traffic Route west of Franklin Street, and a Citywide Bicycle Route. Market Street is a two-way, four-lane street with a 120-foot ROW and wide sidewalks in downtown. It also has exclusive transit lanes from 12^{th} to 5^{th} streets in the EB direction and from 8^{th} Street to Van Ness Avenue in the WB direction, boarding islands, and marked Class I and Class II bicycle lanes west of 8^{th} Street. Market Street primarily serves as a transit corridor, providing rail and bus transit service on the surface and two underground levels of rail service – Muni Metro and BART.

Mission Street. Mission Street is a Transit-Oriented Street. It generally has two travel lanes in each direction, including transit-only lanes between 11th and Beale streets in the EB direction and between Spear and 11th streets in the WB direction. It also has left-turn restrictions between Main and 11th streets.

3.3.2.2 | ROADWAY TRAFFIC VOLUMES FOR DETERMINING THE PEAK TRAFFIC HOUR

Twenty-four (24)-hour traffic counts were collected in March 2007 at five locations along Van Ness Avenue and one location each along Franklin and Gough streets.[41] The purpose of the 24-hour counts was to determine the peak traffic hour. The twenty-four (24)-hour traffic count locations were selected because they represent blocks in the traffic study area with arterial roads as cross streets in the northern, mid-, and southern sections. These counts were taken to determine the peak hour for the intersection LOS analysis. Table 3.3-1 shows that Van Ness Avenue carries approximately 37,500 to 41,500 vehicles daily in the northern and mid-sections; approximately 7 percent of this volume occurs during the PM peak hour (5:00 p.m. to 6:00 p.m.), and approximately 6 percent occurs during the AM peak hour. Traffic volumes are generally higher in the southern portion of the corridor, with approximately 44,500 daily vehicles in both directions. The bidirectional Van Ness Avenue traffic volumes are higher during an average weekday PM peak hour than during an average weekday AM peak hour and weekend peak hours; therefore, the PM peak hour represents the worst-case scenario to assess vehicular traffic impacts of the proposed project and is used for the intersection LOS analysis. The two arterial roads to the west of Van Ness Avenue, Franklin and Gough streets, carry approximately 31,000 and 27,000 daily vehicles, respectively.

Van Ness Avenue carries approximately 37,500 to 41,500 vehicles daily in the northern and mid-sections. Traffic volumes are generally higher in the southern portion of the corridor, with approximately 44,500 daily vehicles in both directions. The PM peak hour represents the worst-case scenario to assess vehicular traffic impacts and is used for the intersection LOS analysis.

Table 3.3-1: Existing (2007) Traffic Counts: Average Weekday, Saturday, and Sunday Daily, AM and PM Peak-Hour Traffic Link Volumes

STREET SEGMENT	AVERAGE WEEKDAY			SATURDAY			SUNDAY		
	DAILY	AM PEAK HOUR	PM PEAK HOUR	DAILY	AM PEAK HOUR	PM PEAK HOUR	DAILY	AM PEAK HOUR	PM PEAK HOUR
VAN NESS AVENUE NORTHBOUND AND SOUTHBOUND									
Greenwich and Filbert	38,281	2,541	2,625	38,977	1,363	2,523	33,042	969	2,257
Pacific and Broadway	36,487	1,981	2,553	39,394	1,361	2,351	34,275	932	2,336
Geary and Post	41,499	2,356	2,762	--	--	--	39,357	1,042	2,500
Hayes and Grove	42,910	2,662	2,947	--	--	--	--	--	--
Market and Fell	44,499	2,702	2,966	--	--	--	--	--	--
GOUGH STREET SOUTHBOUND									
Ellis to Geary	27,007	1,959	1,787	25,435	920	1,637	21,315	510	1,425
FRANKLIN STREET NORTHBOUND									
Post to Sutter	30,901	2,309	2,225	29,681	1,335	1,857	24,556	735	1,725

Source: SFCTA, March 2007.

3.3.2.3 | VEHICULAR TRAVEL SPEED

Table 3.3-2 provides the average vehicular travel speeds for Van Ness Avenue and the five major north-south parallel streets in the traffic study area for the 2007 existing PM peak-hour conditions. Under the 2007 existing conditions, the speed within the traffic study area is lowest along Van Ness Avenue in the SB direction and highest along Van Ness Avenue in the NB direction. This is because during the PM peak hour, traffic signals are synchronized in the NB direction, but not in the SB direction. In other words, vehicles in the NB direction can have a relatively uninterrupted flow of traffic, but vehicles in the SB direction often have to stop at a red traffic light because of the lack of synchronization.

[41] These 24-hour traffic counts were a separate effort from the turning movement counts taken at 91 intersections by the Authority in spring 2007 (and some additional counts in 2008 and 2009) to calibrate the existing conditions (2007) SYNCHRO model. More information on traffic counts, including a figure showing the traffic count locations, is provided in the Traffic Memorandum (CHS, 2013).

Table 3.3-2: Average Speed – 2007 Existing Conditions

STREET	AVERAGE SPEED (MPH)	
	SOUTHBOUND	NORTHBOUND
Gough	8.4	-
Franklin	-	10.1
Van Ness	7.7	10.5
Polk	8.9	9.1
Larkin	-	9.5
Hyde	8.5	-

Source: SYNCHRO model, CHS Consulting Group (2013)

3.3.2.4 | PM PEAK-HOUR INTERSECTION LEVELS OF SERVICE

All of the intersections in the traffic study area, except for the intersection of Gough Street and Green Street, operate at LOS D or better conditions in 2007. The SB Gough approach is the only approach that operates at LOS F at the four-way stop-controlled intersection of Gough Street and Green Street. This is mainly due to the high volumes of SB traffic (531 vehicles) that must stop at the intersection. Figure 3.3-2 shows the intersection LOS for all 139 intersections analyzed for the 2007 existing conditions scenario.

Although most intersections within the traffic study area operate with minimal delays overall, certain specific movements along the six north-south roadways operate in stop-and-go conditions.

3.3.3 | Environmental Consequences

Year 2015 represents the near-term year for traffic analysis, as project construction is scheduled to begin in 2015. Year 2035 represents the long-term horizon year of approximately 20 years after the opening of the project. This section presents the anticipated traffic conditions in 2015 and 2035 for the No Build Alternative and the three build alternatives, including Design Option B and the LPA. It presents the future-year traffic volumes, and assumptions used to forecast future volumes, future travel speeds, intersection LOS for signalized intersections, and approach LOS for unsignalized intersections.

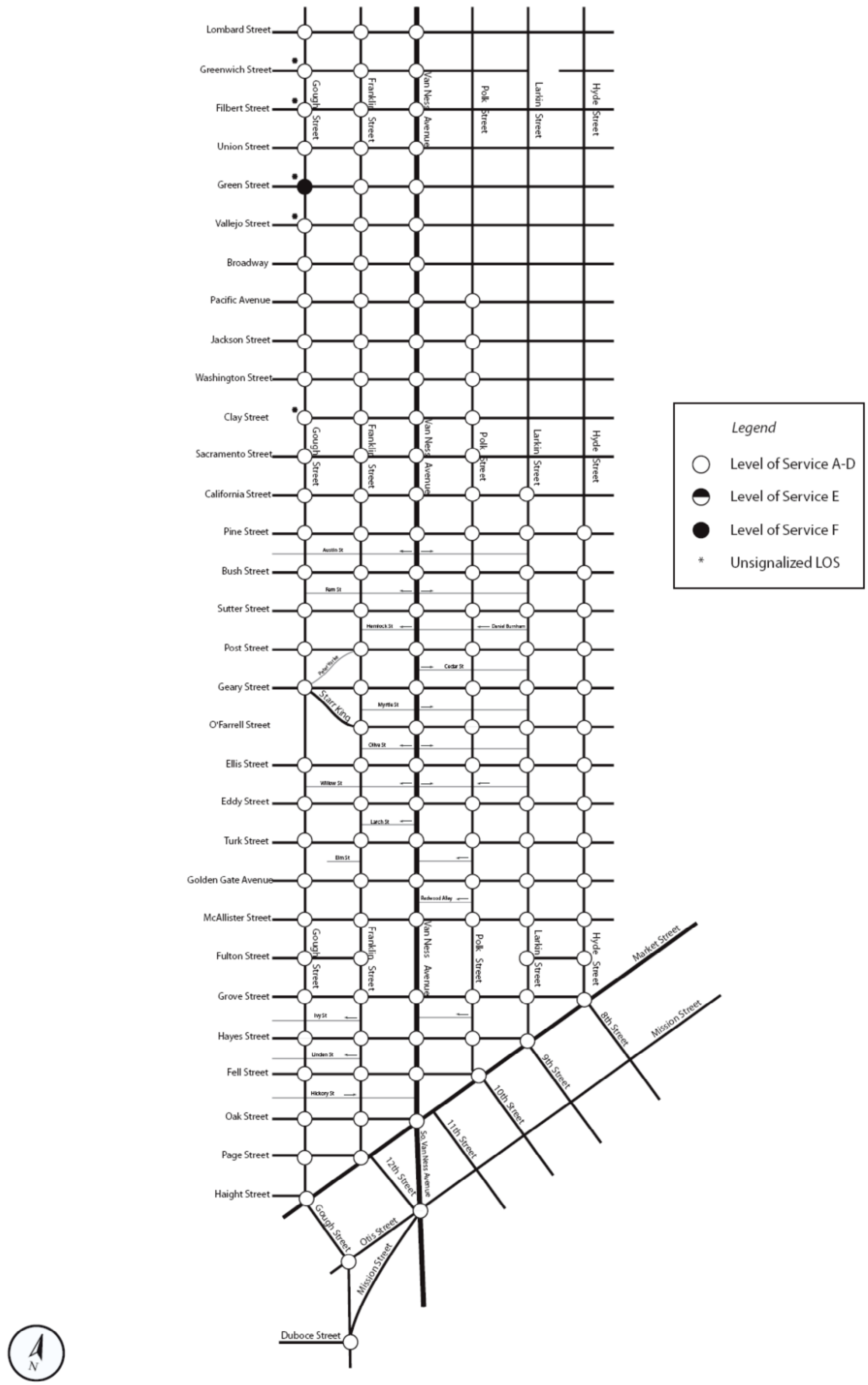
Traffic analysis results are presented in this section. For this EIS/EIR, the project-specific impacts were determined by comparing the existing conditions to the build alternatives, including the LPA, in Year 2015. It is important to note that this approach is a conservative way to define traffic impacts because the build alternatives in Year 2015 reflect traffic volumes and operations associated with population and employment growth in the study area expected between 2007 and 2015, in addition to the traffic volumes and operational changes associated with the project. For this reason, industry standard practice is to compare the build alternatives to the No Build Alternative in the future baseline year; however, to comply with the California Court of Appeal ruling for *Sunnyvale West Neighborhood Association v. City of Sunnyvale City Council* regarding selection of a CEQA baseline year, traffic impacts in this EIS/EIR were identified by comparing scenarios as follows:

- **Project-Specific Impacts:** Existing conditions compared with existing plus project[42] conditions;
- **Cumulative Impacts:** Existing conditions compared with Year 2035 Build Alternatives (including the LPA) conditions;
- **Project Contribution to Cumulative Impacts:** 2035 No Build Alternative conditions compared with Year 2035 Build Alternatives (including the LPA) conditions.

Traffic operating conditions under the No Build Alternative are also presented in Year 2015 for informational purposes.

[42] For this EIS/EIR, traffic operations for the Year 2015 build alternatives were used to represent the Existing plus Project scenarios for purposes of impact analysis. Conditions for the 2015 build alternatives are equivalent traffic operations or have a lower LOS than Existing plus Project conditions.

Figure 3.3-2: 2007 Existing PM Peak-Hour Intersection LOS



Although most intersections within the traffic study area operate with minimal delays overall, certain specific movements along the six north-south roadways operate in stop-and-go conditions, especially the southern sections of Van Ness Avenue and Gough Street. As presented above, the primary reasons for the differences are (1) higher traffic volumes in multiple, conflicting directions in this section, and (2) a lack of signal synchronization in the SB direction.

This section presents the criteria used to assess traffic impacts and identifies significant impacts and less-than-significant traffic impacts per the impact thresholds described above in Section 3.3.1 and below in Section 3.3.3.1. As described in Chapter 2, Project Description, there are three build alternatives: Build Alternative 2 (Side-Lane BRT with Street Parking), Build Alternative 3 (Center-Lane BRT with Right-Side Boarding and Dual Medians), and Build Alternative 4 (Center-Lane BRT with Left-Side Boarding and Single Median). There is also the LPA (Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns) and the Vallejo Northbound Station Variant.

This section presents traffic impacts for existing conditions, No Build Alternative, Build Alternative 2, Build Alternatives 3 and 4 together, and Build Alternatives 3 and 4 with Design Option B (and the LPA) together. Build Alternatives 3 and 4 have identical vehicular traffic operations, with the exception of right-turn movements at the intersection of Van Ness Avenue and Geary Street; therefore, traffic impacts for Build Alternatives 3 and 4 are presented together. Build Alternatives 3 and 4 may incorporate a design variation – Design Option B. Along Van Ness Avenue, Design Option B for these two build alternatives has only one SB left-turn opportunity (at Broadway) and only one NB left-turn opportunity (at Lombard Street). All of the other left-turn pockets in the NB and SB directions would be removed under Design Option B for Build Alternatives 3 and 4.

The LPA has nearly identical traffic operations as Build Alternatives 3 and 4 with Design Option B, except that the LPA only has right-turn pockets at three intersections on Van Ness Avenue, all in the SB direction, at Mission/Otis/South Van Ness, Market Street, and Pine Street. In addition, the LPA retains the two SB left-turn pockets at Broadway, similar to Build Alternatives 3 and 4. Therefore, traffic impacts for the LPA and Build Alternatives 3 and 4 with Design Option B are presented together with any differences between the alternatives noted in the chapter[43]. The Vallejo Northbound Station Variant would have one fewer (2 versus 3) mixed traffic lane in the SB direction for the block between Vallejo and Green streets versus the LPA. Under the LPA without the variant, this lane would be used to store left-turning traffic onto Broadway. Under the Vallejo Northbound Station Variant, this roadway space would be used by the far side NB station at Vallejo Street. In addition, the Vallejo Northbound Station Variant would require a turning restriction preventing trucks traveling WB on Vallejo Street from turning right onto Van Ness Avenue. Otherwise, the Vallejo Northbound Station Variant would operate identically to the LPA. A full description of each of the alternatives, including the LPA and the Vallejo Northbound Station Variant, can be found in Chapter 2.

3.3.3.1 | SIGNIFICANCE CRITERIA

To assess the environmental significance of traffic impacts for signalized and unsignalized intersections, the Authority uses the same criteria used by the San Francisco Planning Department, presented in the *San Francisco Traffic Impact Analysis Guidelines for Environmental Review*.

[43] A detailed comparison of the traffic operations and the traffic impacts between the LPA and Build Alternatives 3 and 4 with Design Option B is provided under the LPA traffic impacts discussion in the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

Project-Specific Impacts

Signalized Intersections

1. If the intersection LOS declines from LOS A, B, C, or D in existing conditions to LOS E or F in the existing plus project scenarios (represented by the 2015 build alternatives), then the project would cause a significant project-specific impact.
2. If the intersection LOS declines from LOS E in existing conditions to LOS F in the existing plus project scenarios (represented by the 2015 build alternatives), then the project would cause a significant project-specific impact.
3. If the intersection performs the same at either LOS E or F in both existing condition and existing plus project scenarios (represented by the 2015 build alternatives), then the project's contribution to significant impacts (i.e., contribution calculations) are performed as follows:
   - If the project does not contribute to critical movements at failing intersections or contributes vehicles to critical movements that operate at LOS D or better in existing plus project scenarios (represented by the 2015 build alternatives), then the project impact is considered less than significant.
   - If the project contributes 5 percent or more of the vehicles to a failing critical movement of a failing intersection in the existing plus project scenarios (represented by the 2015 build alternatives), then the project would cause a significant project-specific impact.

Unsignalized Intersections

1. If the LOS of the worst operating approach declines from LOS A, B, C, or D in existing conditions to LOS E or F in the existing plus project scenarios (represented by the 2015 build alternatives), and the intersection meets the Caltrans signal warrants, then the project would cause a significant project-specific impact.
2. If the worst operating approach performs at LOS E or F in both existing conditions and existing plus project scenarios (represented by the 2015 build alternatives) and the project traffic causes the Caltrans signal warrants to be met, then the project would cause a significant project-specific impact.

DEFINITION

CALTRANS SIGNAL WARRANTS: Caltrans thresholds for determining when a signal should be installed.

Cumulative Impacts

If in the Year 2035 there is a significant project-specific impact, then there is significant cumulative impact.

Significant cumulative impacts for all other signalized and unsignalized intersections are assessed in two steps as follows:

1. Cumulative impacts are assessed by utilizing the same procedure discussed under Project-Specific Impacts, except that the existing conditions scenario is compared with the long-term (2035) with-project scenario instead of the existing plus project scenario to assess cumulative impacts.
2. Significant cumulative impacts are assessed by calculating the project contribution to cumulative impacts for signalized and unsignalized intersections as follows:

Signalized Intersections

1. If the intersection LOS declines from LOS A, B, C, or D in the long-term (2035) No Build Alternative to LOS E or F in the Year 2035 build alternatives, then the project would cause a significant cumulative impact.
2. If the intersection LOS declines from LOS E in the long-term horizon year (2035) No Build Alternative to LOS F in the Year 2035 build alternatives, then the project would cause a significant cumulative impact.
3. If the intersection performs the same, at either LOS E or F, in the long-term horizon year (2035) for both the No Build Alternative and build alternatives, then the same

DEFINITION

CRITICAL MOVEMENTS: Critical movements are movements by vehicles at intersections with LOS E or F that would most greatly contribute to the degradation of LOS at those intersections.

procedure is used as in Criterion #3 under Project-Specific Impacts for signalized intersections to determine the project's contribution to significant cumulative impacts.

Unsignalized Intersections

1. If the LOS of the worst operating approach declines from LOS A, B, C, or D in the long-term horizon year (2035) No Build Alternative to LOS E or F in the Year 2035 build alternatives, and the intersection meets the Caltrans signal warrants, then the project would cause a significant cumulative impact.
2. If the worst approach performs at LOS E or F in the long-term horizon year (2035) for both the No Build Alternative and build alternatives, and the project traffic causes the Caltrans signal warrants to be met, then the project would cause a significant cumulative impact.

3.3.3.2 | NEAR-TERM (2015)

This section reports projected traffic conditions in the near-term (Year 2015) for the No Build Alternative and the build alternatives and the LPA. It presents near-term (Year 2015) traffic volumes and assumptions used in traffic projections, future roadway performance, and summary of the Van Ness Avenue BRT Project impacts.[44]

2015 Alternative 1: No Build Alternative

The 2015 No Build Alternative assumes the roadway network in 2015 would be identical to the 2007 existing conditions, with the exception of Hayes and Fell streets. SFMTA proposes to convert Hayes Street between Gough and Polk streets to two-way streets by converting one of the WB lanes to an EB lane. SFMTA also proposes to convert Fell Street between Van Ness Avenue and Franklin Street to a two-way street by converting one of the EB lanes in this block to WB. Details of the Hayes Street and Fell Street two-way conversions are provided in Section 2.2.

Signal timing and phasing for the 2015 No Build Alternative were initially optimized based on the minimum amount of time needed for pedestrian crossing based on national and City standards, as provided by SFMTA, and future No Build Alternative traffic volumes were estimated using the SF-CHAMP model.

Under the near-term 2015 No Build Alternative, traffic volumes along Van Ness Avenue would increase by approximately 0.5 to 1.9 percent annually from the 2007 levels, based on the SF-CHAMP model forecasts. Traffic along the east-west streets would increase by approximately 0.4 to 2.7 percent annually.

Vehicular Travel Speed. Tables 3.3-3 and 3.3-4 show that vehicular travel speeds would decrease slightly along Van Ness Avenue, Franklin Street, Gough Street, Polk Street (SB) and Hyde Street from the 2007 Existing Conditions. This decrease in travel speeds would be caused by the increases in traffic volumes in the traffic study area. In the 2015 No Build Alternative, vehicular travel speeds would increase from the 2007 existing conditions along two NB streets: NB Polk Street and Larkin Street. This is primarily because synchronization of the traffic signals along these streets can be improved over the current conditions.

[44] As noted previously, traffic operations for the Year 2015 build alternatives were used to represent the Existing plus Project scenarios for purposes of impact analysis. Conditions for the 2015 build alternatives are equivalent traffic operations or have a lower LOS than Existing plus Project conditions.

Table 3.3-3: 2015 No Build Alternative Southbound Average Speed

STREET	AVERAGE SPEED (MPH)	
	EXISTING CONDITIONS	2015 NO BUILD ALTERNATIVE
Gough	8.4	7.8
Franklin	-	-
Van Ness	7.7	7.0
Polk	8.9	8.5
Larkin	-	-
Hyde	8.5	8.4

Source: SYNCHRO model, CHS Consulting Group, 2013.

Table 3.3-4: 2015 No Build Alternative Northbound Average Speed

STREET	AVERAGE SPEED (MPH)	
	EXISTING CONDITIONS	2015 NO BUILD ALTERNATIVE
Gough	-	-
Franklin	10.1	9.8
Van Ness	10.5	10.1
Polk	9.1	9.8
Larkin	9.5	10.0
Hyde	-	-

Source: SYNCHRO model, CHS Consulting Group, 2013.

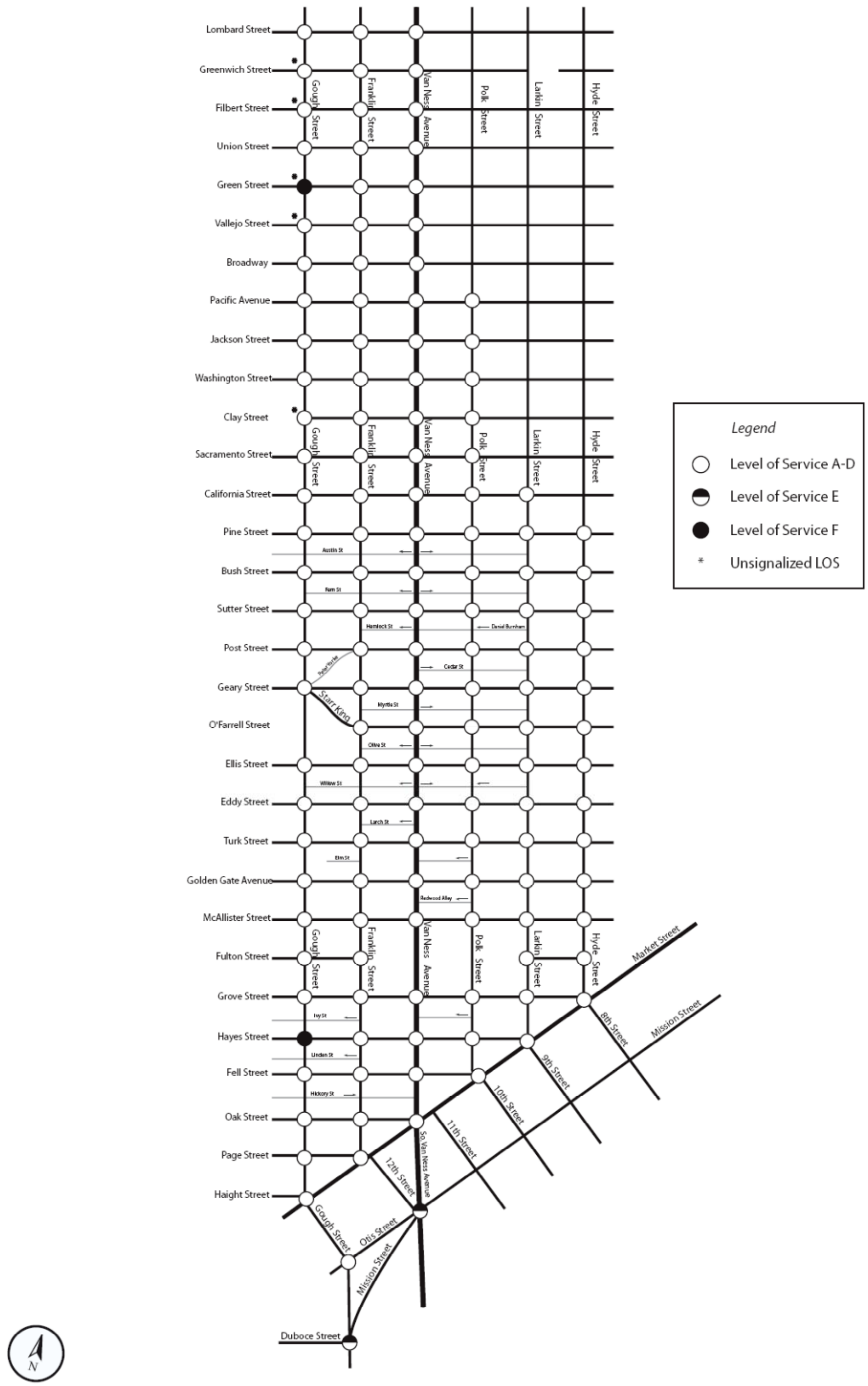
Intersection Levels of Service. In the 2015 No Build Alternative (Alternative 1), all but four intersections would operate at LOS D or better condition during the PM peak hour. Figure 3.3-3 presents the intersection LOS for the 139 study intersections. The traffic study area intersections that would operate at LOS E or F under the 2015 No Build Alternative are described below.

- **Gough/Green.** The SB approach, the worst approach at this four-way stop-controlled intersection, would perform at LOS F under both existing conditions and the 2015 No Build Alternative (Alternative 1).
- **Gough/Hayes.** This signalized intersection's operation would decline from LOS D under existing conditions to LOS F under the 2015 No Build Alternative (Alternative 1).
- **Duboce/Mission/Otis/US 101 Off-Ramps.** This signalized intersection's operation would decline from LOS D under existing conditions to LOS E under the 2015 No Build Alternative (Alternative 1).
- **South Van Ness/Mission/Otis.** This signalized intersection's operation would decline from LOS D under existing conditions to LOS E under the 2015 No Build Alternative (Alternative 1).

2015 Build Alternatives

As described in Chapter 2, the build alternatives, including the LPA, would include a full complement of BRT improvements in the project area, including signal priority for buses, new BRT bus stops and level or near level boarding, and dedicated bus lanes along Van Ness Avenue. The Van Ness Avenue BRT Project alternatives, including the LPA, would convert two mixed-travel lanes to bus-only lanes (i.e., one lane each in NB and SB directions) and reduce left-turn opportunities along Van Ness Avenue. The following summarizes the changes in roadway geometry and circulation patterns for the Year 2015 build alternatives and methods used to modify traffic circulation patterns and volumes for the SYNCHRO traffic analysis.

Figure 3.3-3: Near-Term (2015) No Build Alternative Intersection LOS



The decrease in roadway capacity associated with the build alternatives would cause motorists to divert from Van Ness Avenue to avoid increased congestion and delays.

- **Reduction in Roadway Capacity for Mixed Traffic.** The proposed project would reduce the mixed-traffic capacity along Van Ness Avenue by slightly less than one-third.
  - The decrease in roadway capacity would cause motorists to divert from Van Ness Avenue to avoid delays. The traffic analysis indicates that with the implementation of BRT in 2015, an average of 19 to 32 percent of traffic on Van Ness Avenue (depending on the location) would change their travel patterns, including driving on other streets, shifting the trip to other times of day, or shifting to other modes, such as transit, walking, and bicycling.[45] Further discussion of diversions can be found in Section 3.1.
  - The volume of traffic that would divert to the five parallel streets and study intersections in the project area was initially obtained from the SF-CHAMP model and then manually adjusted for reasonableness.
- **Left-Turn Prohibitions.** The build alternatives would include elimination of 13 left-turn bays along Van Ness Avenue in both NB and SB directions. Chapter 2, Project Description, provides a detailed list of prohibited left-turn bays for each of the build alternatives without Design Option B, presented in Table 2-4. Build Alternatives 3 and 4 could incorporate a design variation (Design Option B) where left-turn bays would only be provided at Broadway in the SB direction and at Lombard in the NB direction. The LPA incorporates Design Option B.

  With the reduced number of left-turn opportunities, some motorists wishing to make a left turn along Van Ness Avenue would alter behavior, including using a downstream or upstream left-turn opportunity or circulating around the block to reach their destination.

With the reduced number of left-turn opportunities, some motorists wishing to make a left turn along Van Ness Avenue would alter behavior, including using a downstream or upstream left-turn opportunity or circulate around the block to reach their destination.

- **Left-Turn Lane Reduction.** There are two locations where the number of left-turn bays would be reduced from two to one:
  - Hayes Street in the NB direction for all build alternatives;
  - Mission Street in the EB direction for all build alternatives; and

  Similar to existing conditions and the No Build Alternative (Alternative 1), under Build Alternative 2 Van Ness Avenue would have one exclusive left-turn lane and one shared left-turn/through lane at the SB approach to Broadway. Under Build Alternatives 3 and 4, and the LPA, there would be two exclusive SB left-turn lanes at the Van Ness Avenue SB approach to Broadway.[46] The reason for the difference in design at this approach between Build Alternative 2 and Build Alternatives 3 and 4 is because under Build Alternatives 3 and 4, left-turn movements can only be made during the dedicated left-turn signal phase to not cause potential collisions with SB Muni and GGT buses in the BRT lane. This is different than Build Alternative 2, under which SB left-turn vehicles can make a turn when there is a gap in the traffic stream in the NB direction, resulting in a higher capacity for the exclusive left-turn lane and shared left-turn/through lane under Build Alternative 2, similar to existing conditions.
- **Right-Turn Lane Reduction.** Van Ness Avenue between Geary and O'Farrell streets under Build Alternative 4 (Center-Lane BRT with Left-Side Boarding and Single Median) would have the same geometric design as Build Alternative 3 (Center-Lane BRT with Dual Medians). Due to the transition of Build Alternative 4 from a single-median BRT north of Geary Street to a dual-median BRT for this block, the SB Van Ness Avenue exclusive right-turn lane to Geary Street would not be provided under Build Alternative 4 or its design variation, Build Alternative 4 with Design Option B. This right turn would also be eliminated under the LPA.

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45 For Design Option B and the LPA, the reduction of additional left turns along Van Ness Avenue would cause NB drivers to divert to other parallel streets before they enter South Van Ness and Van Ness avenues. Consequently, the very southern end of the corridor near Market Street would experience a significantly greater reduction in vehicle traffic volumes on Van Ness Avenue, particularly in the NB direction (up to 965 fewer vph than in the No Build Alternative – nearly 50 percent).

46 This additional left-turn lane would require removal of on-street parking spaces on the east and west sides of Van Ness Avenue, north of Broadway.

The process used to develop future-year traffic volumes for the build alternatives is similar to that used for the No Build Alternative. The percentage change in traffic volumes between the 2015 No Build Alternative and each 2015 build alternative was applied. These percentages were provided by the SF-CHAMP model. Subsequent manual adjustments were made based on professional judgment and best practice. See the Vehicular Traffic Analysis Technical Memorandum for more detail (CHS, 2013).

Traffic signal cycle length and phasing for the build alternatives were modeled the same as the No Build Alternative, except at the intersections of Van Ness Avenue with Filbert Street and South Van Ness Avenue with Mission and Otis streets for Build Alternatives 3 and 4, including the LPA. The traffic signal phasing at these intersections was modified to allow buses to transition between a center-running configuration and mixed-flow traffic lanes along Van Ness Avenue, South Van Ness Avenue, Mission Street, and Otis Street. Additionally, traffic signals were optimized and coordinated for each of the build alternatives.

Travel Speed: Build Alternatives

As in the 2015 No Build Alternative, the average travel speed for all of the SB streets and NB Franklin Street and NB Van Ness Avenue in the 2015 build alternatives would decline in comparison to existing conditions. As seen in Tables 3.3-5 and 3.3-6, a comparison of the existing conditions and the 2015 build alternatives and the LPA speed shows the following:

- Speed along SB Gough, SB Polk, and NB Franklin would decrease by approximately 0.5 mph under the Year 2015 build alternatives when compared with the existing conditions. Speed along these corridors would decrease slightly more (up to 0.8 mph) under Year 2015 Build Alternatives 3 and 4 with Design Option B and the LPA due to the diversion of left-turning traffic from Van Ness Avenue to these parallel streets.
- Speed along SB Hyde Street would decrease by 0.2 mph from 8.5 mph in existing conditions to 8.3 mph in all three build alternatives and the LPA in Year 2015.
- Speed along Van Ness Avenue in both directions would decrease between 0.1 and 0.5 mph in Year 2015 Build Alternative 2 and Build Alternatives 3 and 4 with Design Option B and the LPA when compared with the existing conditions. Speed along Van Ness Avenue in both directions would decrease the most (1 to 1.3 mph) under Year 2015 Build Alternatives 3 and 4. This is mainly due to the increase in traffic volumes for NB left turns from Van Ness Avenue and changes in signal timing and phasing for these left turns. Left turns at these intersections can only be made under a protected phase. The LPA and the Northbound Station Variant would have the same speed as Build Alternatives 3 and 4 with Design Option B for all streets except Van Ness Avenue. Under the 2015 LPA and the Northbound Station Variant, the SB Van Ness Avenue speed would be the same as 2015 Build Alternative 4. The NB Van Ness Avenue speed would decrease slightly from 10.2 mph in Design Option B to 10.1 mph in the LPA (0.1 mph decrease). These small changes in speed may be attributed to the increase in right-turn traffic making turns from the shared lane under the LPA and thus slightly decreasing the speed of all movement in the curb lane.
- Speed along NB Polk and Larkin streets would increase between 0.4 and 0.8 mph when compared with the existing conditions. This is primarily because synchronization of the traffic signals along these streets can be improved over the current conditions.
- In many instances, there is almost the same amount of reduction in speed between existing conditions and the 2015 No Build Alternative (Alternative 1) as there is between existing conditions and the 2015 build alternatives. In other words, the Van Ness Avenue BRT Project alternatives do not impact speeds any more than general growth in citywide traffic in the No Build Alternative scenario would affect speeds. In some instances, speed actually increases under the 2015 build alternatives versus the 2015 No Build Alternative. With the exception of NB Franklin Street and Van Ness Avenue, project contributions to speed reductions are 0.3 mph or less.

Table 3.3-5: Private Vehicle 2015 Southbound Average Speed

STREET	AVERAGE SPEED (MPH)				
	EXISTING CONDITIONS	NO BUILD (ALTERNATIVE 1)	SIDE-LANE BRT (ALTERNATIVE 2)	CENTER-LANE BRT (ALTERNATIVES 3 AND4)	CENTER-LANE BRT WITH DESIGN OPTION B (ALTERNATIVES 3 AND 4) AND THE LPA
Gough	8.4	7.8	7.9	8.0	7.6
Franklin	-	-	-	-	-
Van Ness	7.7	7.0	7.2	6.7/6.6*	7.6/7.5*
Polk	8.9	8.5	8.4	8.3	8.2
Larkin	-	-	-	-	-
Hyde	8.5	8.4	8.3	8.3	8.3

*The two speeds shown on Van Ness Avenue represent Build Alternative 3/Build Alternative 4. The difference in speed is due to the lack of a right-turn pocket for SB traveling vehicles at Geary and Van Ness under Build Alternative 4. Speeds are the same between Build Alternatives 3 and 4 for all other streets. The LPA and the Northbound Station Variant would have the same average speed SB as Build Alternative 4 with Design Option B.

Table 3.3-6: Private Vehicle 2015 Northbound Average Speed

STREET	AVERAGE SPEED (MPH)				
	EXISTING CONDITIONS	NO BUILD (ALTERNATIVE 1)	SIDE-LANE BRT (ALTERNATIVE 2)	CENTER-LANE BRT (ALTERNATIVES 3 AND 4)	CENTER-LANE BRT WITH DESIGN OPTION B (ALTERNATIVES 3 AND 4) AND THE LPA
Gough	-	-	-	-	-
Franklin	10.1	9.8	9.5	9.6	9.3
Van Ness	10.5	10.1	10.3	9.2	10.2/ 10.1*
Polk	9.1	9.8	9.5	9.8	9.9
Larkin	9.5	10.0	9.9	10.1	10.1
Hyde	-	-	-	-	-

*The two speeds shown on Van Ness Avenue represent Build Alternatives 3 and 4 with Design Option B and the LPA. The difference in speed is due to the lack of right-turn pockets along NB Van Ness Avenue under the LPA. The LPA and the Northbound Station Variant would have the same average speed as SB Van Ness Avenue.

Traffic Impacts: 2015 Build Alternatives

This section presents the projected vehicular traffic impacts in year 2015 for the build alternatives (including the LPA). Implementation of each of the proposed build alternatives (including the LPA) is anticipated to result in adverse traffic effects, some of which are considered significant impacts based on the impact significance thresholds described in Section 3.3.3. The Van Ness Avenue BRT Project would cause significant traffic impacts only if the LOS for the 2015 build alternatives would be worse than the existing conditions based on the significance criteria presented in Section 3.3.3. Intersections that would continue to operate at LOS E or F in the build alternatives, but which are not impacted by project traffic based on the significance criteria presented in Section 3.3.3, are also identified below as less than significant impacts.

2015 Near-Term Build Alternative 2: Side-Lane BRT with Street Parking[47]

Under Build Alternative 2, three intersections would operate at LOS E or F during the PM peak hour in Year 2015. Table 3.3-7 presents a comparison of the average intersection delay and intersection LOS for the intersections that would operate at LOS E or F conditions under existing conditions, 2015 No Build Alternative or 2015 Build Alternative 2. Figure 3.3-4 presents the 2015 Build Alternative 2 intersection LOS for all study intersections.

Table 3.3-7: Existing Conditions, 2015 Build Alternative 2 (Side-Lane BRT), and No Build Alternative Intersection LOS (Delay) for Intersections that Operate at LOS E or F

INTERSECTION	LOS (DELAY)		
	EXISTING CONDITIONS	2015 NO BUILD ALTERNATIVE	2015 BUILD ALTERNATIVE 2
Gough/Green*	F (76.5)	F (80.3)	F (86.3)
Gough/Hayes	D (45.9)	F (86.7)	E (79.0)
Franklin/O'Farrell	D (39.3)	D (43.2)	E (60.6)
Otis/Mission/S. Van Ness	D (46.1)	E (59.3)	D (45.7)
Duboce/Mission/Otis/US 101 Off-Ramp	D (44.4)	E (67.1)	D (51.3)

* Unsignalized intersection.
Table shows worst approach LOS (Delay) for an unsignalized intersection.
Table shows intersection LOS (intersection average vehicular delay) for signalized intersections.

Source: SYNCHRO model, CHS Consulting Group, 2013.

Significant Project-Specific Impacts. The project traffic would cause significant project-specific impacts at two study intersections under the 2015 Build Alternative 2 as follows:

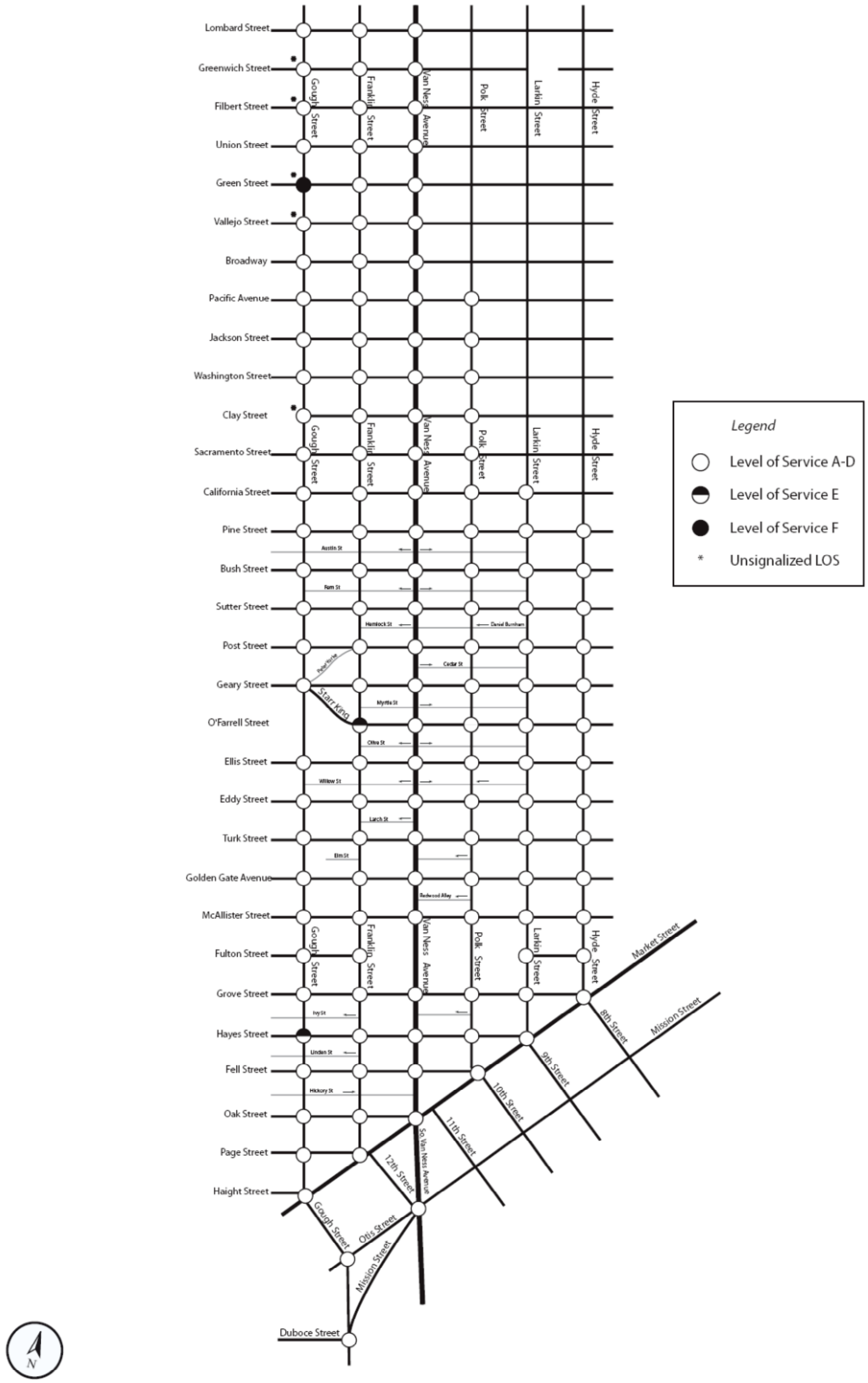
- **Gough/Hayes.** This intersection would decline from LOS D under the existing conditions to LOS E under the 2015 Build Alternative 2 (representing existing plus project conditions); therefore, the proposed project would cause significant project-specific impacts. This intersection would perform at LOS F under the 2015 No Build Alternative.
- **Franklin/O'Farrell.** This signalized intersection would decline from LOS D under the existing conditions to LOS E under the 2015 Build Alternative 2 (representing existing plus project conditions); therefore, the proposed project would cause significant project-specific impacts. This intersection would perform at LOS D under the 2015 No Build Alternative.

Less than Significant Project-Specific Impacts. Build Alternative 2 would cause less than significant traffic impacts at the intersection of Gough and Green streets as presented below:

- **Gough/Green.** The SB approach, the worst approach at this four-way stop-controlled intersection, would perform at LOS F under both the existing conditions and the 2015 Build Alternative 2 (representing existing plus project conditions); however, the intersection would not meet the Caltrans peak-hour signal warrant under both the existing conditions and the 2015 Build Alternative 2 scenario, and would therefore not be significant per the impact significance thresholds described in Section 3.3.3. The intersection would also operate at LOS F under the 2015 No Build Alternative, as would the SB approach. There are several possibilities to improve traffic operation at this intersection, including adding a traffic signal; removing some on-street parking spaces to create an additional SB approach lane; however, removing parking would worsen pedestrian conditions by eliminating the buffer provided by parked cars separating the sidewalk from the traffic lane, as discussed in Section 3.3.4 (see also Section 3.4, Nonmotorized Transportation), and past public outreach has indicated that the community prefers the stop-sign control of the intersection.

[47] As stated previously, for the purposes of environmental impact analysis, 2015 near-term build alternatives represent existing plus project conditions. Conditions for the 2015 build alternatives are equivalent traffic operations or have a lower LOS than existing plus project conditions.

Figure 3.3-4: Near-Term (2015) Build Alternative 2 Intersection LOS



- **South Van Ness/Mission/Otis and Duboce/Mission/Otis/US 101 Off-Ramp.** The intersections of South Van Ness/Mission/Otis and Duboce/Mission/Otis/US 101 off-ramp would decline from LOS D under the existing conditions to LOS E under 2015 No Build Alternative, and then improve to LOS D under the 2015 Build Alternative 2. This decline in performance between the existing conditions and the 2015 No Build Alternative is due to growth in background traffic. The improved performance between the 2015 No Build Alternative and 2015 Build Alternative 2 is mainly due to traffic diversion from the study area. As discussed in Section 3.1, the SF-CHAMP model estimated that due to the reduction of a mixed-traffic lane in each direction along Van Ness Avenue, approximately 24 to 32 percent of traffic would divert their trips away from Van Ness Avenue in the PM peak period, including diverting to other modes or other times of the day. Traffic diversion to streets outside of the project area could potentially improve the operations of some intersections within the traffic study area, such as the intersections of South Van Ness/Mission/Otis and Duboce/Mission/Otis/US 101 off-ramp.

Sensitivity Analysis at Van Ness Avenue and Geary Street Intersection: In anticipation of expected developments, the San Francisco Planning Department proposes to widen the sidewalk on the west side of Van Ness Avenue between Post and Geary streets. This proposed widening would necessitate the removal of the Van Ness Avenue SB exclusive right-turn lane onto Geary Street. A sensitivity analysis has been performed, assuming the proposed sidewalk widening occurs. With the approved sidewalk widening and removal of exclusive right-turn lane, LOS at this intersection would remain unchanged at LOS B.

2015 Near-Term Build Alternatives 3 and 4: Center-Lane BRT Configuration[48]

Under Build Alternatives 3 and 4, four intersections would operate at LOS E or F during the PM peak hour in Year 2015 (representing existing plus project conditions). Table 3.3-8 provides a comparison of the average intersection delay and intersection LOS for the intersections that would operate at LOS E or F under the existing conditions, the 2015 No Build Alternative, or 2015 Build Alternatives 3 and 4 scenarios. Figure 3.3-5 graphically presents 2015 Build Alternatives 3 and 4 intersection LOS for all intersections.

Table 3.3-8: Existing Conditions, 2015 Build Alternatives 3 and 4 (Center-Lane BRT), and No Build Alternative Intersection LOS (Delay) for Intersections that Operate at LOS E or F

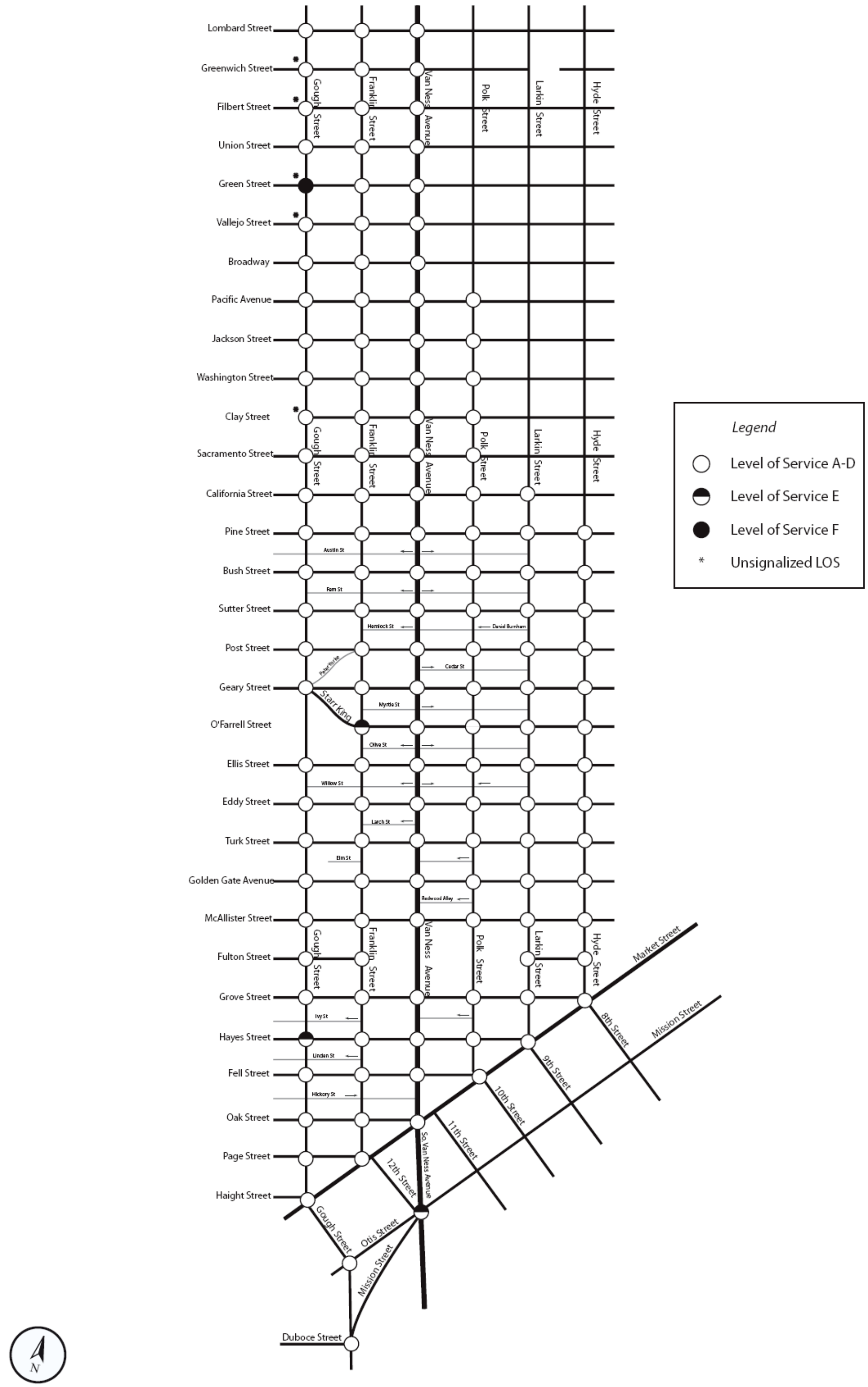
INTERSECTION			LOS (DELAY)
	EXISTING CONDITIONS	2015 NO BUILD ALTERNATIVE	2015 BUILD ALTERNATIVE 3 AND 4
Gough/Green*	F (76.5)	F (80.3)	F (80.7)
Gough/Hayes	D (45.9)	F (86.7)	E (79.7)
Franklin/O'Farrell	D (39.3)	D (43.2)	E (57.2)
Otis/Mission/S. Van Ness	D (46.1)	E (59.3)	E (68.8)
Duboce/Mission/Otis/ US 101 Off-Ramp	D (44.4)	E (67.1)	D (47.2)

* Unsignalized intersection.
Table shows worst approach LOS (Delay) for an unsignalized intersection.
Table shows intersection LOS (intersection average vehicular delay) for signalized intersections.

Source: SYNCHRO model, CHS Consulting Group, 2013.

48 As stated previously, for the purposes of environmental impact analysis, 2015 near-term build alternatives represent existing plus project conditions. Conditions for the 2015 build alternatives are equivalent traffic operations or have a lower LOS than existing plus project conditions.

Figure 3.3-5: Near-Term (2015) Build Alternatives 3 and 4 Intersection LOS



Significant Project-Specific Impacts. Build Alternatives 3 and 4 would cause significant project-specific impacts at three study intersections in Year 2015.

- **Gough/Hayes.** This intersection would decline from LOS D under existing conditions to LOS E under 2015 Build Alternatives 3 and 4 (representing existing plus project conditions); therefore, the proposed project would cause significant project-specific impacts. This intersection would perform at LOS F under the 2015 No Build Alternative.
- **Franklin/O'Farrell.** This signalized intersection would decline from LOS D under existing conditions to LOS E under 2015 Build Alternatives 3 and 4 (representing existing plus project conditions); therefore, the proposed project would cause significant project-specific impacts. This intersection would perform at LOS D under the 2015 No Build Alternative.
- **South Van Ness/Mission/Otis.** This signalized intersection would decline from LOS D under existing conditions to LOS E under 2015 Build Alternatives 3 and 4 (representing existing plus project conditions); therefore, the proposed project would cause significant project-specific impacts. This intersection would perform at LOS E under the 2015 No Build Alternative.

Less than Significant Project-Specific Impacts. Build Alternatives 3 and 4 would cause less than significant traffic impacts at the intersection of Gough and Green streets, and the intersection of Duboce/Mission/Otis/US 101 off-ramp, as presented below:

- **Gough/Green.** The SB approach, the worst approach at this four-way stop-controlled intersection, would perform at LOS F under both the existing conditions and the 2015 Build Alternatives 3 and 4 (representing existing plus project conditions); however, the intersection would not meet the Caltrans peak-hour signal warrant under both existing conditions and 2015 Build Alternatives 3 and 4, and would therefore not be significant per the impact significance thresholds described in Section 3.3.3. The intersection would also operate at LOS F under the 2015 No Build Alternative, as would the SB approach. There are several possibilities to improve traffic operations at this intersection, including adding a traffic signal; removing some on-street parking spaces to create an additional SB approach lane; however, past public outreach has indicated that the community prefers the stop-sign control of the intersection.
- **Duboce/Mission/Otis/US 101 Off-Ramp.** Similar to Build Alternative 2, the intersection of Duboce/Mission/Otis/US 101 off-ramp would decline from LOS D under the existing conditions to LOS E under the 2015 No Build Alternative, and then improve to LOS D under Build Alternatives 3 and 4 in Year 2015.
- **Design Variation between Build Alternative 3 and Build Alternative 4 and Sensitivity Analysis at Van Ness Avenue and Geary Street Intersection.** As discussed in Chapter 2, Van Ness Avenue between Geary and O'Farrell streets under Build Alternative 4 would have the same geometric design as Build Alternative 3. Due to this transition from a center-running BRT with a single median north of Geary Street to a right-side loading BRT with two medians for this block, the SB Van Ness Avenue exclusive right-turn lane to Geary Street would not be provided under Build Alternative 4. This intersection operates at LOS B under 2015 Build Alternative 3. Without the exclusive SB right-turn lane, LOS at this intersection would remain at LOS B under 2015 Build Alternative 4. The analysis for Build Alternative 4 also serves as the sensitivity analysis if the San Francisco Planning Department were to approve the proposed widening of the sidewalk under Build Alternative 3, thus requiring the elimination of the exclusive SB right-turn lane onto Geary Street from Van Ness Avenue.

2015 Near-Term Build Alternatives 3 and 4 with Design Option B: Center-Lane BRT (including the LPA)[49]

The LPA (including the Vallejo Northbound Station Variant)[50] would have the same traffic impacts in 2015 as Build Alternatives 3 and 4 with Design Option B. Because the LPA would have 11 fewer right-turn pockets, there are minor differences in approach average delay between the LPA and Build Alternatives 3 and 4 with Design Option B along Van Ness Avenue. However, none of these differences would cause a new significant intersection LOS impact or worsen a significant intersection LOS impact compared to the impacts outlined for Build Alternatives 3 and 4 with Design Option B. For details on LPA performance in 2015, please see the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

Under Build Alternatives 3 and 4 with Design Option B and the LPA, four intersections would operate at LOS E or F during the PM peak hour in Year 2015. Table 3.3-9 presents a comparison of the average intersection delay and intersection LOS for the intersections that would operate at LOS E or F under the existing conditions, the 2015 No Build Alternative, or 2015 Build Alternatives 3 and 4 with Design Option B, including the LPA scenarios. Figure 3.3-6 presents 2015 Build Alternatives 3 and 4 with Design Option B, including the LPA, intersection LOS.

Table 3.3-9: Existing Conditions, 2015 Build Alternatives 3 and 4 (Center-Lane BRT) with Design Option B, and No Build Alternative Intersection LOS (Delay) for Intersections that Operate at LOS E or F

INTERSECTION	LOS (DELAY)		
	EXISTING CONDITIONS	2015 NO BUILD ALTERNATIVE	2015 BUILD ALTERNATIVES 3 AND 4 WITH DESIGN OPTION B AND THE LPA
Gough/Green*	F (76.5)	F (80.3)	F (108.1)
Gough/Hayes	D (45.9)	F (86.7)	E (74.6)
Franklin/O'Farrell	D (39.3)	D (43.2)	E (55.9)
Franklin/Market/Page	C (27.2)	C (28.7)	F (103.7)
Otis/Mission/S. Van Ness	D (46.1)	E (59.3)	D (51.4)
Duboce/Mission/Otis/ US 101 Off-Ramp	D (44.4)	E (67.1)	D (46.4)

* Unsignalized intersection.
Table shows worst approach LOS (Delay) for an unsignalized intersection.
Table shows intersection LOS (intersection average vehicular delay) for signalized intersections.

Source: SYNCHRO model, CHS Consulting Group, 2013

Significant Project- Specific Impacts. Build Alternatives 3 and 4 with Design Option B and the LPA would cause significant project-specific impacts at three intersections in Year 2015 as follows:

- **Gough/Hayes.** This intersection would decline from LOS D under existing conditions to LOS E under 2015 Build Alternatives 3 and 4 with Design Option B and the LPA (representing existing plus project conditions); therefore, the proposed project would cause significant project-specific impacts. This intersection would operate at LOS F under the 2015 No Build Alternative.

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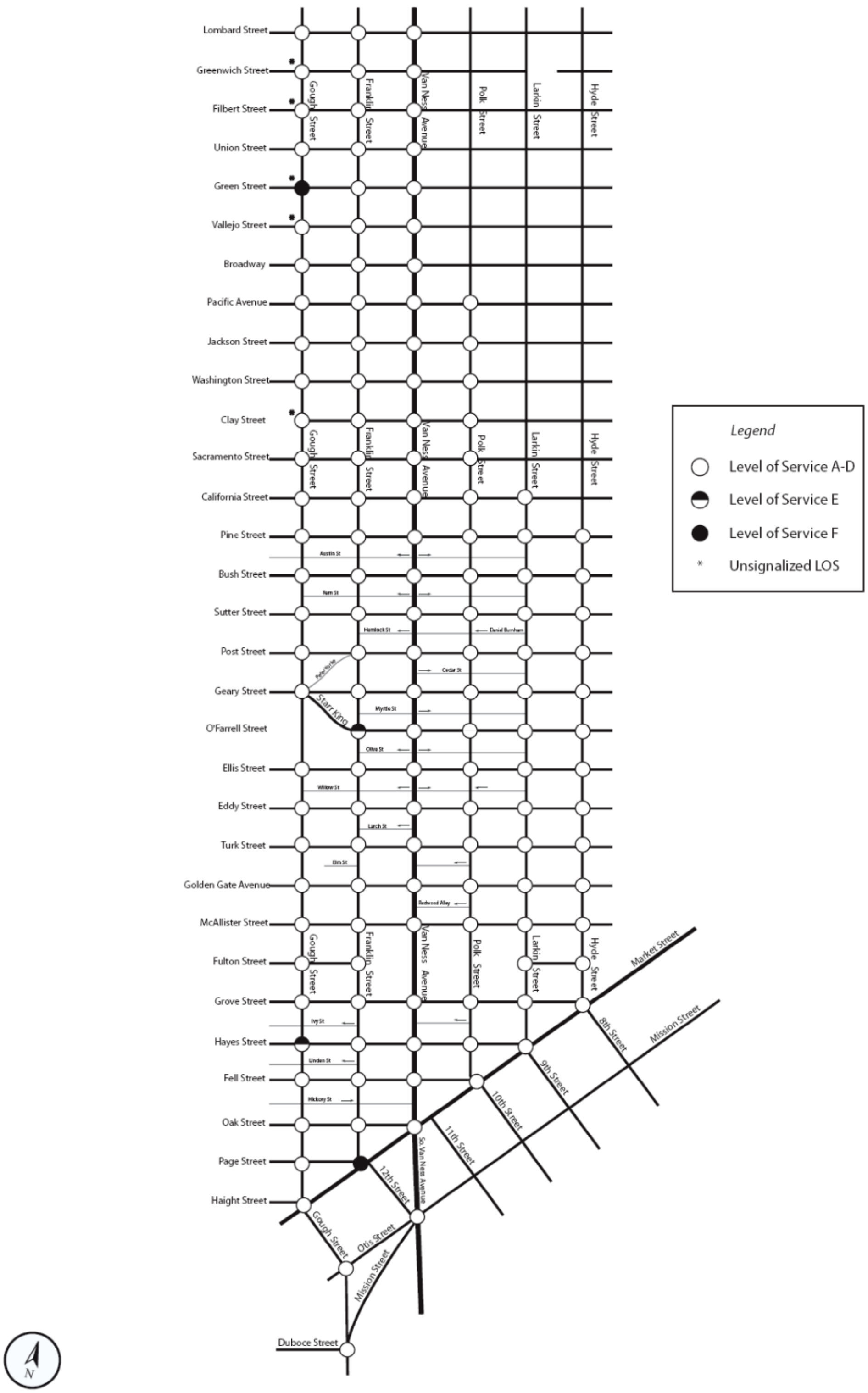
[49] As stated previously, for the purposes of environmental impact analysis, 2015 near-term build alternatives represent existing plus project conditions. Conditions for the 2015 build alternatives are equivalent traffic operations or have a lower LOS than existing plus project conditions.

[50] The Vallejo Northbound Station Variant would have one fewer (2 versus. 3) mixed traffic lanes in the SB direction for the block between Vallejo and Green streets versus the LPA. Under the LPA without the variant, this lane would be used to store left-turning traffic onto Broadway. Under the Vallejo Northbound Station Variant, that roadway space would be used for the additional far side NB station at Vallejo Street. In 2015, the Vallejo intersection would operate at LOS A during the PM peak under the LPA and would operate at a similar LOS with implementation of the Vallejo Northbound Station Variant.

Figure 3.3-6: Near-Term (2015) Build Alternatives 3 and 4 with Design Option B (and LPA) Intersection LOS



- **Franklin/O'Farrell.** This signalized intersection would decline from LOS D under existing conditions to LOS E under 2015 Build Alternatives 3 and 4 with Design Option B and the LPA (representing existing plus project conditions); therefore, the proposed project would cause significant project-specific impacts. This intersection would perform at LOS D under the 2015 No Build Alternative.

- **Franklin/Market.** This signalized intersection would degrade from LOS C under the existing conditions to LOS F under 2015 Build Alternatives 3 and 4 with Design Option B and the LPA (representing existing plus project conditions); therefore, the proposed project would cause significant project-specific impacts. This intersection would perform at LOS C under the 2015 No Build Alternative.

Less than Significant Project-Specific Impacts. In Year 2015, Build Alternatives 3 and 4 with Design Option B and the LPA would cause less than significant traffic impacts at the intersection of Gough and Green streets, and at the intersection of South Van Ness/ Mission/Otis and Duboce/Mission/Otis/US 101 off-ramp, as presented below:

Gough/Green. The SB approach, the worst performing approach at this four-way stop-controlled intersection, would perform at LOS F under both existing conditions and 2015 Build Alternatives 3 and 4 with Design Option B and the LPA; however, the intersection would not meet the Caltrans peak-hour signal warrant under both the existing conditions and the 2015 Build Alternatives 3 and 4 with Design Option B and the LPA, and would therefore not be significant per the impact significance thresholds described in Section 3.3.3. The intersection would also operate at LOS F under the 2015 No Build Alternative, as would the SB approach. There are several possibilities to improve traffic operation at this intersection, including adding a traffic signal; removing some on-street parking spaces to create an additional SB approach lane; however, past public outreach has indicated that the community prefers the stop-sign control of the intersection.

South Van Ness/Mission/Otis and Duboce/Mission/Otis/US 101 Off-Ramp. Similar to Build Alternative 2, the intersections of South Van Ness/Mission/Otis and Duboce/Mission/ Otis/US 101 off-ramp would decline from LOS D under existing conditions to LOS E under the 2015 No Build Alternative, and then improve to LOS D under Build Alternatives 3 and 4 with Design Option B and the LPA in Year 2015.

Design Variation between Build Alternative 3 and Build Alternative 4 with Design Option B and Sensitivity Analysis at Van Ness Avenue and Geary Street Intersection. As discussed in Chapter 2, Van Ness Avenue between Geary and O'Farrell streets under Build Alternative 4 with Design Option B would have the same geometric design as Build Alternative 3 with Design Option B. Due to this transition from a center-running BRT with a single median north of Geary Street to a right-side loading BRT with two medians for this block, the SB Van Ness Avenue exclusive right-turn lane to Geary Street would not be provided under Build Alternative 4 with Design Option B. This intersection operates at LOS B under 2015 Build Alternative 3 with Design Option B. Without the exclusive SB right-turn lane, LOS at this intersection would remain at LOS B under 2015 Build Alternative 4 with Design Option B. The analysis for Build Alternative 4 with Design Option B also serves as the sensitivity analysis if the San Francisco Planning Department were to widen the sidewalk under Build Alternative 3 with Design Option B, thus requiring the elimination of the exclusive SB right-turn lane onto Geary Street from Van Ness Avenue. The LPA would include removal of the right-turn pocket at this location.

LPA Vallejo Northbound Station Variant. The Vallejo Northbound Station Variant would have one fewer (two versus three) mixed traffic lanes in the SB direction for the block between Vallejo and Green streets versus the LPA. Under the LPA without the variant, this lane would be used to store left-turning traffic onto Broadway. Under the Vallejo Northbound Station Variant, that roadway space would be used for the additional far side NB station at Vallejo Street. In 2015, the Vallejo intersection would operate at LOS A during the PM peak under the LPA and would continue to operate at LOS A with implementation of the Vallejo Northbound Station Variant.

3.3.3.3 | LONG-TERM HORIZON YEAR (2035)

This section presents projected traffic conditions in the long-term horizon Year 2035 for the No Build Alternative and three build alternatives and the LPA. It presents long-term horizon year (2035) traffic volumes and assumptions used in traffic projection, future roadway performance, and a summary of the Van Ness Avenue BRT Project impacts.

2035 Alternative 1: No Build

No specific roadway capacity modifications within the traffic study area are known between 2015 and 2035, except the Geary Corridor BRT Project; hence, the 2035 No Build Alternative would have the identical roadway network as the 2015 No Build Alternative, as discussed under Section 3.3.3.1.

Signal timing and phasing for the 2035 No Build Alternative were initially optimized based on the minimum amount of time needed for pedestrian crossings provided by SFMTA and future No Build Alternative traffic volumes estimated using the SF-CHAMP model.

Under the long-term 2035 No Build Alternative, traffic volumes along Van Ness Avenue would increase by approximately 0.42 to 1.12 percent annually from the 2007 levels based on SF-CHAMP model forecasts. Traffic along the east-west streets would increase by approximately 0.35 to 1.49 percent annually. There would be higher increases along collector streets than arterial roads.

Vehicular Travel Speed. Under 2035 No Build Alternative, vehicular travel speeds would decrease along all north-south streets in the traffic study area. Tables 3.3-10 and 3.3-11 show SB and NB average speeds, respectively.

Table 3.3-10: 2035 No Build Alternative Southbound Average Speed

STREET	AVERAGE SPEED (MPH)	
	EXISTING CONDITIONS	2035 NO BUILD ALTERNATIVE
Gough	8.4	7.5
Franklin	-	-
Van Ness	7.7	6.6
Polk	8.9	8.1
Larkin	-	-
Hyde	8.5	7.6

Source: SYNCHRO model, CHS Consulting Group, 2013.

Table 3.3-11: 2035 No Build Alternative Northbound Average Speed

STREET	AVERAGE SPEED (MPH)	
	EXISTING CONDITIONS	2035 NO BUILD ALTERNATIVE
Gough	-	-
Franklin	10.1	9.1
Van Ness	10.5	8.9
Polk	9.1	8.8
Larkin	9.5	9.5
Hyde	-	-

Source: SYNCHRO model, CHS Consulting Group, 2013.

Intersection Levels of Service. Under the long-term 2035 No Build Alternative, all but seven intersections would operate at LOS D or better during the PM peak hour. Figure 3.3-7 presents the intersection LOS for the study intersections for 2035 No Build Alternative. The traffic study area intersections that would operate at LOS E or LOS F conditions are described below.

- **Gough/Green.** The SB approach, the worst approach at this four-way stop-controlled intersection, would perform at LOS F under existing conditions and the 2015 and 2035 No Build Alternative.
- **Gough/Hayes.** This signalized intersection would decline from LOS D under existing conditions to LOS F under both the 2015 and 2035 No Build Alternative.
- **Franklin/Pine.** This signalized intersection would slightly improve from LOS D under existing conditions to LOS C under the 2015 No Build Alternative and decline to LOS E under 2035 No Build Alternative.
- **Franklin/O'Farrell.** This signalized intersection would decline from LOS D under existing conditions and the 2015 No Build Alternative to LOS E under 2035 No Build Alternative.
- **Van Ness/Pine.** This signalized intersection would decline from LOS C under existing conditions and the 2015 No Build Alternative to LOS E under 2035 No Build Alternative.
- **South Van Ness/Mission/Otis.** This signalized intersection would decline from LOS D under existing conditions to LOS E under the 2015 and 2035 No Build Alternatives.
- **Duboce/Mission/Otis/US 101 Off-Ramp.** This signalized intersection would decline from LOS D under existing conditions and LOS E under the 2015 No Build Alternative to LOS F under 2035 No Build Alternative.

2035 Build Alternatives

The long-term 2035 build alternatives would have the same BRT configuration as in the near-term Year 2015 build alternatives. The changes in roadway geometry and circulation patterns, the methodology used to develop intersection traffic volumes, and traffic signal operation assumptions for the build alternative SYNCHRO traffic analysis are summarized under Section 3.3.3.1, 2015 Build Alternatives.

The following sections analyze the cumulative traffic impacts of the three build alternatives and the LPA, describing anticipated changes to vehicular travel speed, intersection delay, and LOS.

Travel Speed: Build Alternatives. As seen in 2035 No Build Alternative, the average travel speed for all the NB and SB streets in the 2035 build alternatives would decline in comparison to the existing condition. As seen in Tables 3.3-12 and 3.3-13, a comparison of the existing condition and 2035 build alternatives speed shows the following:

Table 3.3-12: 2035 Horizon Year Southbound Average Speed

STREET	AVERAGE SPEED (MPH)				
	EXISTING CONDITIONS	NO BUILD (ALTERNATIVE 1)	SIDE-LANE BRT (ALTERNATIVE 2)	CENTER-LANE BRT (ALTERNATIVES 3 AND 4)	CENTER-LANE BRT (ALTERNATIVES 3 AND 4) WITH DESIGN OPTION B AND THE LPA
Gough	8.4	7.5	6.1	6.5	5.9
Franklin	-	-	-	-	-
Van Ness	7.7	6.6	6.5	5.6/ 5.6*	6.6/ 6.5*
Polk	8.9	8.1	7.7	7.8	7.6
Larkin	-	-	-	-	-
Hyde	8.5	7.6	7.0	7.2	7.2

*The two speeds shown on Van Ness Avenue represent Build Alternative 3/Build Alternative 4. The difference in speed is due to the lack of a right-turn pocket for SB traveling vehicles at Geary Street and Van Ness Avenue under Build Alternative 4. Speeds are the same between Build Alternatives 3 and 4 for all other streets. The LPA and the Northbound Station Variant would have the same average speed SB as Build Alternative 4 with Design Option B.

Figure 3.3-7: Long-Term (2035) No Build Alternative Intersection LOS

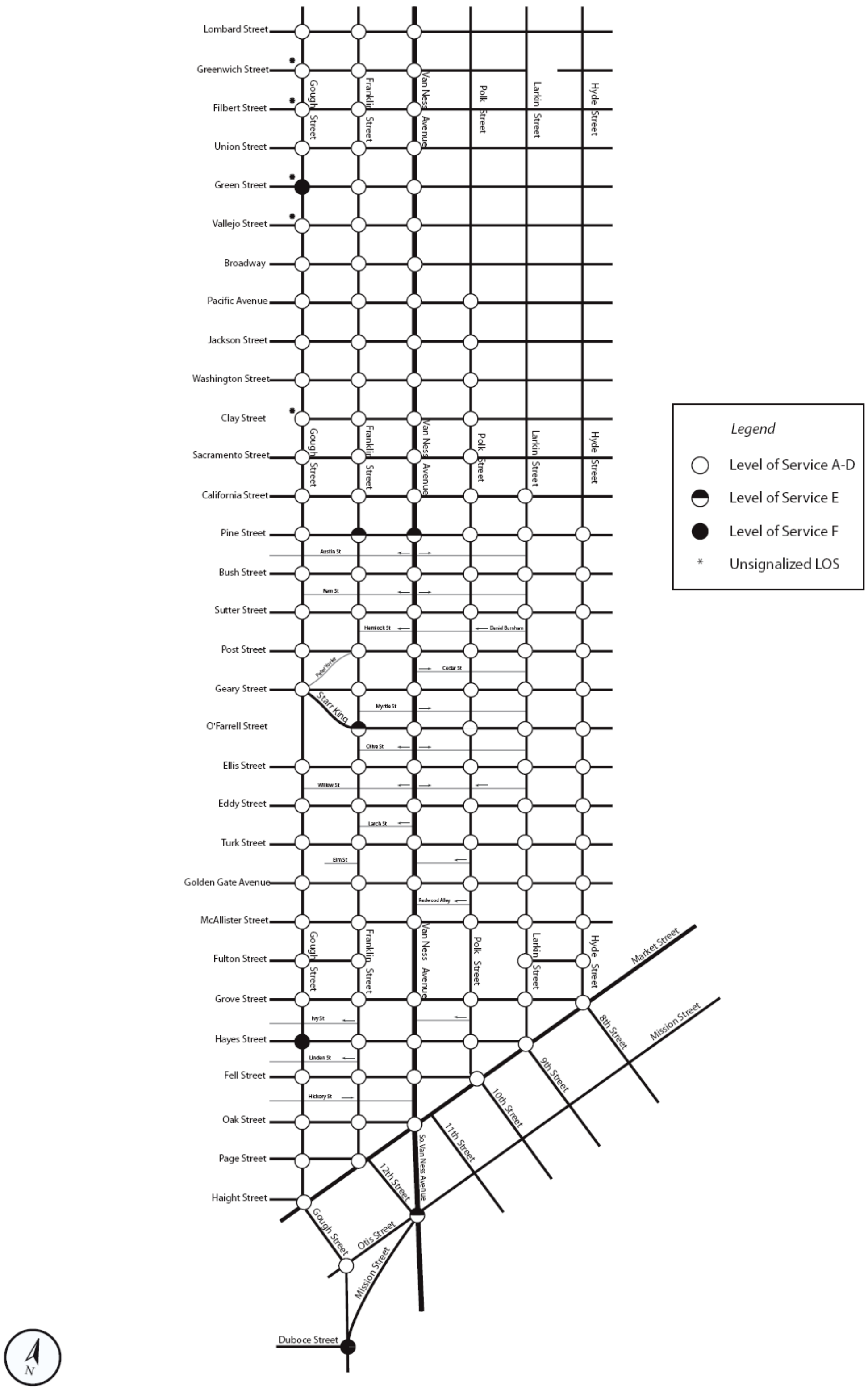


Table 3.3-13: 2035 Horizon Year Northbound Average Speed

STREET	AVERAGE SPEED (MPH)				
	EXISTING CONDITIONS	NO BUILD (ALTERNATIVE 1)	SIDE-LANE BRT (ALTERNATIVE 2)	CENTER-LANE BRT (ALTERNATIVES 3 AND 4)	CENTER-LANE BRT (ALTERNATIVES 3 AND 4) WITH DESIGN OPTION B AND THE LPA
Gough	-	-	-	-	-
Franklin	10.1	9.1	7.1	7.3	6.2
Van Ness	10.5	8.9	8.6	7.5	9.0/8.8*
Polk	9.1	8.8	8.5	8.5	8.5
Larkin	9.5	9.5	9.2	8.8	8.7
Hyde	-	-	-	-	-

*The two speeds shown on Van Ness Avenue represent Build Alternatives 3 and 4 with Design Option B and the LPA. The difference in speed is due to the lack of right-turn pockets along NB Van Ness Avenue under the LPA. The LPA and the Northbound Station Variant would have the same average speed as SB Van Ness Avenue.

- The speed along SB Gough Street would decrease by approximately 2 mph, and the speed along NB Franklin Street would decrease between 2.8 mph and 3 mph under Year 2035 Build Alternative 2 and 2035 Build Alternatives 3 and 4, respectively, when compared to the existing condition. Speed along these corridors would decrease the most (2.5 mph on Gough Street and 3.9 mph on Franklin Street) under Year 2035 Build Alternatives 3 and 4 with Design Option B and the LPA. This would occur due to the diversion of most left-turning traffic from Van Ness Avenue to these parallel streets after the elimination of most left-turn opportunities on Van Ness Avenue under Year 2035 Build Alternatives 3 and 4 with Design Option B with Design Option B.
- Speed along SB Polk and Hyde streets would decrease between 1.1 mph and 1.5 mph in all three build alternatives and the LPA in Year 2035 when compared with the existing conditions.
- Speed along NB Polk and Larkin streets would decrease between 0.3 and 0.8 mph in all three build alternatives and the LPA in Year 2035 when compared with the existing conditions. Speed along NB Polk Street under the build alternatives would be similar to the speed in 2035 No Build Alternative.
- Speed along Van Ness Avenue in both directions would decrease between 1.2 and 1.9 mph in Year 2035 for Build Alternative 2 and Build Alternatives 3 and 4 with Design Option B (including the LPA), respectively, when compared with the existing conditions. This speed along Van Ness Avenue under these two alternatives would be similar to the speed under 2035 No Build Alternative (± 0.3 mph). Speed along Van Ness Avenue in both directions would decrease the most (2.1 to 3 mph) under Year 2035 Build Alternatives 3 and 4. This is mainly due to the increase in traffic volumes for NB left turns from Van Ness Avenue and changes in signal timing and phasing for these left turns. Left turns at these intersections can only be made under a protected phase. The LPA and the Northbound Station Variant would have the same speed as Build Alternatives 3 and 4 with Design Option B for all streets except Van Ness Avenue. Under the 2015 LPA and the Northbound Station Variant, the SB Van Ness Avenue speed would be the same as 2015 Build Alternative 4. The NB Van Ness Avenue speed would decrease slightly from 9.0 mph in Design Option B to 8.8 mph in the LPA (0.2 mph decrease). These small changes in speed may be attributed to the increase in right-turn traffic making turns from the shared lane under the LPA and thus slightly decreasing the speed of all movement in the curb lane.

Traffic Impacts: 2035 Build Alternatives

This section presents the cumulative traffic impacts and the project traffic impacts in year 2035 for the build alternatives. Implementation of each of the proposed build alternatives is anticipated to result in adverse traffic effects, some of which are considered significant impacts based on the impact significance thresholds established in the San Francisco Traffic Impact Analysis Guidelines for Environmental Review (see Section 3.3.3). The cumulative traffic growth due to development projects by year 2035 would cause cumulative significant impacts only if the LOS for the 2035 build alternatives would be worse than the existing conditions. The Van Ness Avenue BRT Project would cause significant project impacts only if the LOS for the 2035 build alternatives would be worse than 2035 No Build Alternative based on the significance criteria presented in Section 3.3.3 or if a project-specific impact was already identified in Year 2015 (representing existing plus project conditions). Other adverse traffic effects considered less than significant per the San Francisco impact significance thresholds that would result from the proposed build alternatives are also identified in the following subsections. Intersections that would continue to operate at LOS E or F in the build alternatives, but are not impacted by project traffic based on the significance criteria, are identified below as less than significant impacts.

2035 Long-Term Horizon Year Build Alternative 2: Side-Lane BRT with Street Parking

Under Build Alternative 2, nine intersections would operate at LOS E or F during the PM peak hour in Horizon Year 2035. Figure 3.3-8 graphically presents 2035 Build Alternative 2 intersection LOS for all intersections. Table 3.3-14 presents a comparison of the average intersection delay and LOS for the intersections that operate at LOS E or F for the existing conditions, 2035 No Build Alternative, and 2035 Build Alternative 2 scenarios.

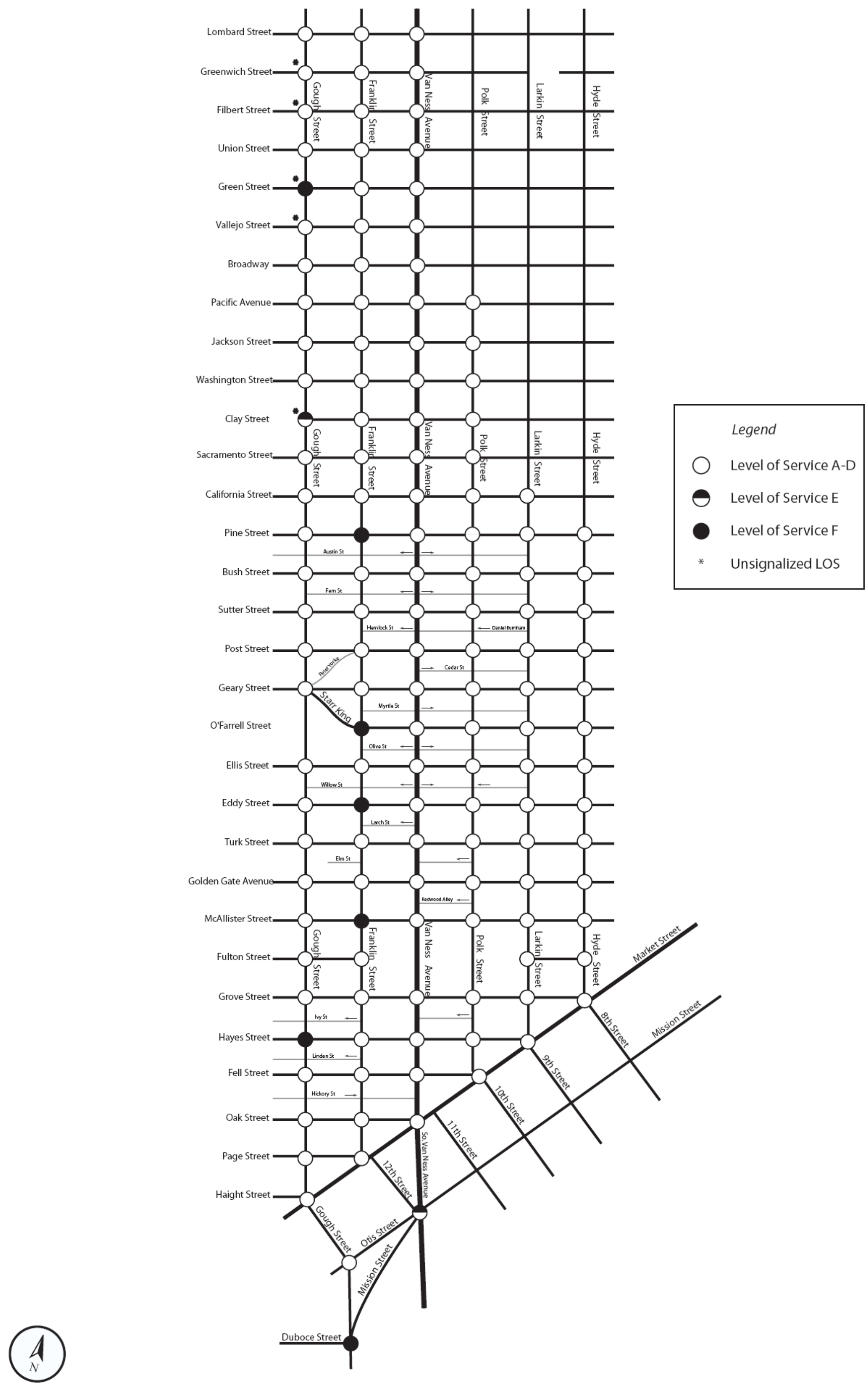
Table 3.3-14: Existing Condition, 2035 Build Alternative 2 (Side-Lane BRT), and No Build Alternative Intersection LOS (Delay) for Intersections that Operate at LOS E or F

INTERSECTION	EXISTING CONDITIONS	2035 NO BUILD ALTERNATIVE	2035BUILD ALTERNATIVE 2
	LOS (DELAY)	LOS (DELAY)	LOS (DELAY)
Gough/Green*	F (76.5)	F (93.6)	F (131.0)
Gough/Clay*	C (23.9)	D (29.8)	E (38.5)
Gough/Hayes	D (45.9)	F (98.1)	F (177.4)
Franklin/Pine	D (39.5)	E (66.7)	F (88.7)
Franklin/O'Farrell	D (39.3)	E (77.5)	F (133.1)
Franklin/Eddy	B (10.7)	C (24.1)	F (105.9)
Franklin/McAllister	B (15.7)	C (29.7)	F (90.2)
Van Ness/Pine	C (26.1)	E (64.9)	D (53.9)
Otis/Mission/S. Van Ness	D (46.1)	E (74.0)	E (65.7)
Duboce/Mission/Otis/US 101 Off-Ramp	D (44.4)	F (115.2)	F (93.5)

* Unsignalized intersection.
Table shows worst approach LOS (Delay) for an unsignalized intersection.
Table shows intersection LOS (intersection average vehicular delay) for signalized intersections.

Source: SYNCHRO model, CHS Consulting Group, 2013.

Figure 3.3-8: Long-Term (2035) Build Alternative 2 Intersection LOS



Significant Cumulative Impacts. Based on the significance criteria, the project traffic under Build Alternative 2 in the 2035 horizon year would cause significant cumulative impacts at five intersections as follows:

- **Gough/Hayes.** This intersection is assessed to have significant project-specific impacts under 2015 Build Alternative 2. Hence, based on the significance criteria (Section 3.3.3), the proposed project would cause significant cumulative impacts.
- **Franklin/Pine.** This signalized intersection would decline from LOS D under existing conditions to LOS F under 2035 Build Alternative 2; therefore, this intersection would have significant cumulative impacts under 2035 Build Alternative 2. Furthermore, this signalized intersection would decline from LOS E under 2035 No Build Alternative to LOS F under 2035 Build Alternative 2; therefore, the proposed project would cause significant cumulative impacts.
- **Franklin/O'Farrell.** This intersection is assessed to have significant project-specific impacts under 2015 Build Alternative 2. Hence, based on the significance criteria (Section 3.3.3), the proposed project would cause significant cumulative impacts.
- **Franklin/Eddy.** This signalized intersection would decline from LOS B under existing conditions to LOS F under 2035 Build Alternative 2; therefore, this intersection would have significant cumulative impacts under 2035 Build Alternative 2. Furthermore, this signalized intersection would decline from LOS C under 2035 No Build Alternative to LOS F under 2035 Build Alternative 2; therefore, the proposed project would cause significant cumulative impacts.
- **Franklin/McAllister.** This signalized intersection would decline from LOS B under the existing conditions to LOS F under 2035 Build Alternative 2; therefore, this intersection would have cumulative impacts under 2035 Build Alternative 2. Furthermore, this signalized intersection would decline from LOS C under 2035 No Build Alternative to LOS F under 2035 Build Alternative 2; therefore, the proposed project would cause significant cumulative impacts.

Less than Significant Cumulative Impacts. Five additional intersections would operate at LOS E or F under Build Alternative 2 in the 2035 Horizon Year; however, the contribution of project traffic is not significant based on the significance criteria. The intersections with less than significant project impacts include:

- **Gough/Green.** The SB approach, the worst approach at this four-way stop-controlled intersection, would perform at LOS F under both the existing condition and 2035 Build Alternative 2; however, the intersection would not meet the Caltrans peak-hour signal warrant under both the existing conditions and 2035 Build Alternative 2, and would therefore not be significant per the impact significance thresholds described in Section 3.3.3. The intersection would also operate at LOS F under 2035 No Build Alternative, as would the SB approach. There are several possibilities to improve traffic operation at this intersection, including adding a traffic signal; removing some on-street parking spaces to create an additional SB approach lane; however, removing parking would worsen pedestrian conditions by eliminating the buffer provided by parked cars separating the sidewalk from the traffic lane, as discussed in Section 3.3.4 (see also Section 3.4, Nonmotorized Transportation), and past public outreach has indicated that the community prefers the stop-sign control of the intersection.
- **Gough/Clay.** The WB Clay Street approach at this unsignalized intersection would perform at LOS C under the existing conditions and would decline to LOS E at the worst approach under 2035 Build Alternative 2; however, the intersection would not meet the Caltrans peak-hour signal warrant under both the existing conditions and 2035 Build Alternative 2, and would therefore not be significant per the impact significance thresholds described in Section 3.3.3. Potential options that may be used to improve traffic operations of this intersection include adding a traffic signal, removing some on-street parking spaces on Clay Street to create an additional WB-to-SB approach lane, or widening Gough Street SB to two lanes by removing on-street parking spaces; however,

these improvements would have the adverse effect of parking removal on pedestrian conditions along Clay and/or Gough Streets and are not recommended.

- **South Van Ness/Mission/Otis.** This signalized intersection would perform at LOS D under existing conditions and would decline to LOS E under Build Alternative 2; therefore, this intersection would have cumulative impacts under 2035 Build Alternative 2. Furthermore, this signalized intersection would perform at LOS E under both 2035 No Build Alternative and Build Alternative 2 conditions; however, the contribution of project traffic is less than 5 percent to all critical movements. Thus, based on the significance criteria, the proposed project would cause less than significant cumulative impacts. The LOS cannot be improved because there is no ROW available to add lanes at this intersection, and the traffic signal timings are constrained by the pedestrian minimum timings and cannot be allocated to congested movements.
- **Duboce/Mission/Otis/US 101 Off-Ramps.** This signalized intersection would decline from LOS D under existing conditions to LOS F under Build Alternative 2; therefore, this intersection would have cumulative impacts under 2035 Build Alternative 2. Furthermore, this signalized intersection would perform at LOS F under both 2035 No Build Alternative and Build Alternative 2; however, the project does not contribute traffic to any critical movement that performs at LOS E or F. Thus, based on the significance criteria, the proposed project would cause less than significant cumulative impacts. The LOS cannot be improved because there is no ROW available to add lanes at this intersection, and the traffic signal timings are constrained by the pedestrian minimum timings and cannot be allocated to congested movements.
- **Van Ness/Pine.** The intersections of Van Ness and Pine would decline from LOS C under existing conditions to LOS E under 2035 No Build Alternative, and then improve to LOS D under Build Alternative 2. This decline in performance between the existing conditions and 2035 No Build Alternative is due to growth in background traffic. The improved performance between 2035 No Build Alternative and 2035 Build Alternative 2 is mainly due to traffic diversion away from the intersection.

Sensitivity Analysis at Van Ness Avenue and Geary Street Intersection: In anticipation of expected developments, the San Francisco Planning Department proposes to widen the sidewalk on the west side of Van Ness Avenue between Post and Geary streets. This proposed widening would necessitate removal of the Van Ness Avenue SB exclusive right-turn lane onto Geary Street. A sensitivity analysis has been performed, assuming the proposed sidewalk widening occurs. With the approved sidewalk widening and removal of exclusive right-turn lane, LOS at this intersection would remain unchanged at LOS B.

2035 Long-Term Horizon Year Build Alternatives 3 and 4: Center-Lane BRT Configuration

Under Build Alternatives 3 and 4, 12 intersections would operate at LOS E or F during the PM peak hour in Horizon Year 2035. Table 3.3-15 provides a comparison of the average intersection delay and LOS for the intersections that would operate at LOS E or F under the existing conditions, 2035 No Build Alternative, and 2035 Build Alternatives 3 and 4 scenarios. Figure 3.3-9 presents 2035 Build Alternatives 3 and 4 intersection LOS for all intersections.

Figure 3.3-9: Long-Term (2035) Build Alternatives 3 and 4 Intersection LOS

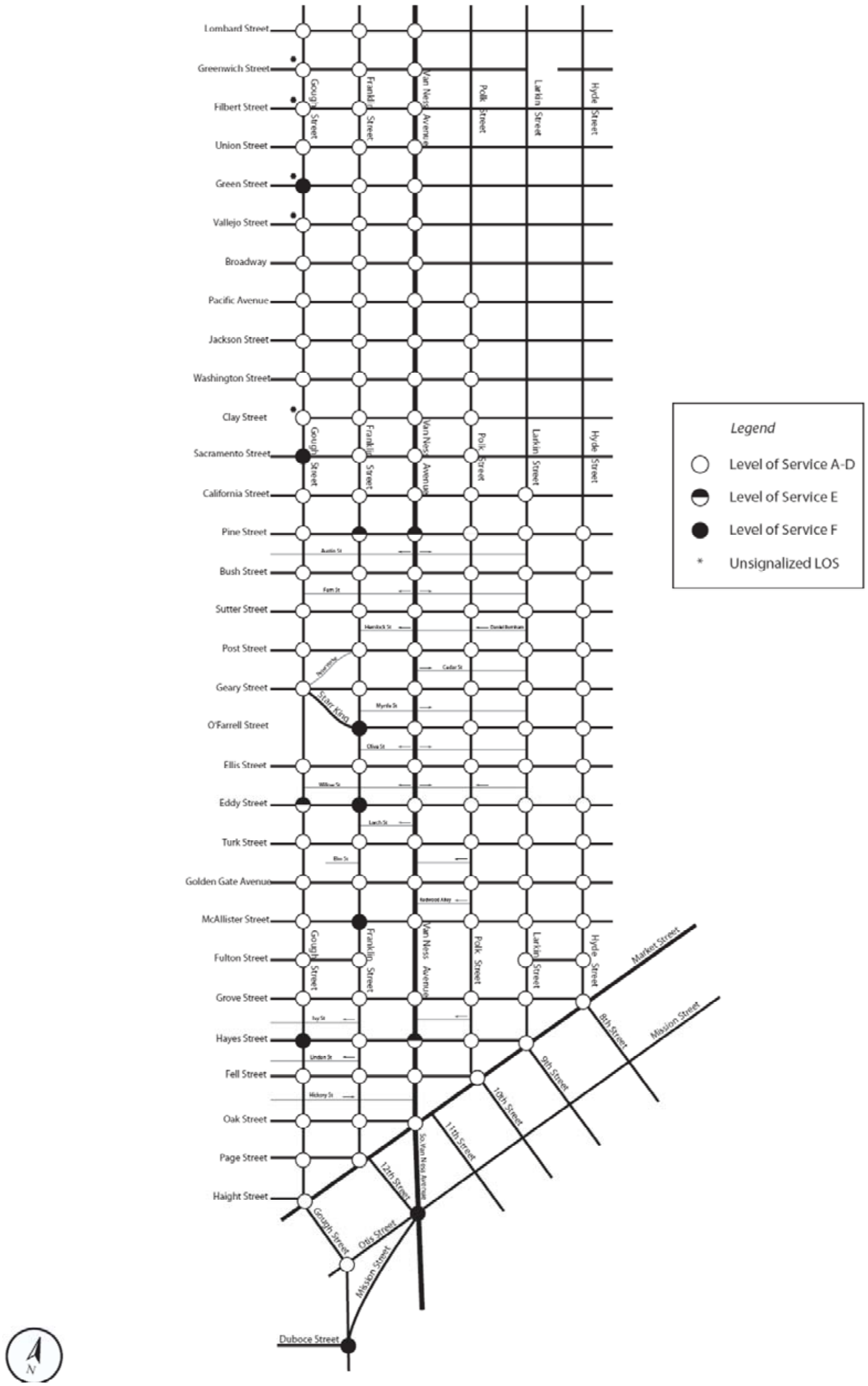


Table 3.3-15: Existing Conditions, 2035 Build Alternatives 3 and 4 (Center-Lane BRT), and No Build Alternative Intersection LOS (Delay) for Intersections that Operate at LOS E or F

INTERSECTION	EXISTING CONDITIONS	2035 NO BUILD ALTERNATIVE	2035 BUILD ALTERNATIVES 3 AND 4
	LOS (DELAY)	LOS (DELAY)	LOS (DELAY)
Gough/Green*	F (76.5)	F (93.6)	F (105.8)
Gough/Sacramento	C (27.1)	C (25.2)	F (81.6)
Gough/Eddy	A (8.9)	B (14.8)	E (55.9)
Gough/Hayes	D (45.9)	F (98.1)	F (122.0)
Franklin/Pine	D (39.5)	E (66.7)	E (77.7)
Franklin/O'Farrell	D (39.3)	E (77.5)	F (125.7)
Franklin/Eddy	B (10.7)	C (24.1)	F (102.0)
Franklin/McAllister	B (15.7)	C (29.7)	F (91.4)
Van Ness/Pine	C (26.1)	E (64.9)	E (59.4)
Van Ness/Hayes	B (17.9)	D (47.7)	E (74.0)
Otis/Mission/S. Van Ness	D (46.1)	E (74.0)	F (128.2)
Duboce/Mission/Otis/US 101 Off-Ramp	D (44.4)	F (115.2)	F (97.9)

* Unsignalized intersection.
Table shows worst approach LOS (Delay) for an unsignalized intersection.
Table shows intersection LOS (intersection average vehicular delay) for signalized intersections.

Source: SYNCHRO model, CHS Consulting Group, 2013.

Significant Cumulative Impacts. The Van Ness Avenue BRT Project would cause significant cumulative impacts at eight study intersections under 2035 Horizon Year Build Alternatives 3 and 4:

- **Gough/Sacramento.** This signalized intersection would decline from LOS C under existing conditions to LOS F under 2035 Build Alternatives 3 and 4; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. Furthermore, this signalized intersection would decline from LOS C under 2035 No Build Alternative to LOS F under 2035 Build Alternatives 3 and 4; therefore, the proposed project would cause significant cumulative impacts.
- **Gough/Eddy.** This signalized intersection would decline from LOS A under existing conditions to LOS E under 2035 Build Alternatives 3 and 4; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. This signalized intersection would decline from LOS B under 2035 No Build Alternative to LOS E under 2035 Build Alternatives 3 and 4; therefore, the proposed project would cause significant cumulative impacts.
- **Gough/Hayes.** This intersection is assessed to have significant project-specific impacts under 2015 Build Alternatives 3 and 4. Hence, based on the significance criteria (Section 3.3.3), the proposed project would cause significant cumulative impacts.
- **Franklin/O'Farrell.** This intersection is assessed to have significant project-specific impacts under 2015 Build Alternatives 3 and 4. Hence, based on the significance criteria (Section 3.3.3), the proposed project would cause significant cumulative impacts.
- **Franklin/Eddy.** This signalized intersection would decline from LOS B under existing conditions to LOS F under 2035 Build Alternatives 3 and 4; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. This signalized intersection would decline from LOS C under 2035 No Build Alternative to LOS F under 2035 Build Alternatives 3 and 4; therefore, the proposed project would cause significant cumulative impacts.

- **Franklin/McAllister.** This signalized intersection would decline from LOS B under existing conditions to LOS F under 2035 Build Alternatives 3 and 4; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. This signalized intersection would decline from LOS C under 2035 No Build Alternative to LOS F under 2035 Build Alternatives 3 and 4; therefore, the proposed project would cause significant cumulative impacts.
- **Van Ness/Hayes.** This signalized intersection would decline from LOS B under existing conditions to LOS E under 2035 Build Alternatives 3 and 4; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. This signalized intersection would decline from LOS D under 2035 No Build Alternative to LOS E under 2035 Build Alternatives 3 and 4; therefore, the proposed project would cause significant cumulative impacts.
- **South Van Ness/Mission/Otis.** This intersection is assessed to have significant project-specific impacts under 2015 Build Alternatives 3 and 4. Hence, based on the significance criteria (Section 3.3.3), the proposed project would cause significant cumulative impacts.

Less than Significant Cumulative Impacts. Four additional intersections would operate at LOS E or F under Build Alternative 2 in the 2035 Horizon Year; however, the contribution of project traffic is not significant based on the significance criteria. The intersections with less than significant project impacts include:

- **Gough/Green.** The SB approach, the worst approach at this four-way stop-controlled intersection, would perform at LOS F under both existing conditions and 2035 Build Alternatives 3 and 4; however, the intersection would not meet the Caltrans peak-hour signal warrant under both existing conditions and 2035 Build Alternatives 3 and 4, and would therefore not be significant per the impact significance thresholds described in Section 3.3.3. The SB approach would also operate at LOS F under 2035 No Build Alternative. There are several possibilities to improve traffic operations at this intersection, including adding a traffic signal; removing some on-street parking spaces to create an additional SB approach lane; however, removing parking would worsen pedestrian conditions by eliminating the buffer provided by parked cars separating the sidewalk from the traffic lane, as discussed in Section 3.3.4 (see also Section 3.4, Nonmotorized Transportation), and past public outreach has indicated that the community prefers the stop-sign control of the intersection.
- **Franklin/Pine.** This signalized intersection would degrade from LOS D under existing conditions to LOS E under 2035 Build Alternatives 3 and 4; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. Furthermore, this signalized intersection would perform at LOS E under 2035 No Build Alternative and Build Alternatives 3 and 4; however, the project does not contribute traffic to any critical movement that performs at LOS E or F. Thus, based on the significance criteria, the proposed project would cause less than significant cumulative impacts. One potential improvement measure is providing an exclusive WB right-turn lane from Van Ness Avenue to Franklin Street. This can be implemented by instituting a PM peak-hour tow-away zone along the north side of Pine between Van Ness Avenue and Franklin Street; however, this would have the adverse effect of parking removal on pedestrian conditions along Franklin Street.
- **Van Ness/Pine.** This signalized intersection would perform at LOS C under existing conditions and degrade to LOS E under 2035 Build Alternatives 3 and 4; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. Furthermore, this signalized intersection would perform at LOS E under 2035 No Build Alternative and Build Alternatives 3 and 4. The contribution of project traffic to the critical movement is not significant (i.e., no project traffic added to any critical movement); therefore, the proposed project would not cause significant cumulative impacts. One potential improvement measure is providing an exclusive WB right-turn storage lane of 50 feet. This can be implemented by eliminating two parking spaces on

the north side of Pine Street; however, this mitigation measure is not recommended due to the adverse effects of parking removal on pedestrian conditions along Pine Street.

- **Duboce/Mission/Otis/US 101 Off-Ramps.** This signalized intersection would perform at LOS D under existing conditions and degrade to LOS F under 2035 Build Alternatives 3 and 4; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. Furthermore, this signalized intersection would perform at LOS F under 2035 No Build Alternative and Build Alternatives 3 and 4. However, the project does not contribute traffic to any critical movement that performs at LOS E or F; therefore, the proposed project would not cause significant cumulative impacts. The LOS cannot be improved because there is no ROW available to add lanes at this intersection, and the traffic signal timings are constrained by the pedestrian minimum timings and cannot be allocated to congested movements. This intersection would experience a reduction in traffic volumes under Build Alternatives 3 and 4 in 2035 caused by the diversion of traffic volumes from Van Ness Avenue.

Design Variation between Build Alternative 3 and Build Alternative 4 and Sensitivity Analysis at Van Ness Avenue and Geary Street Intersection. As discussed in Chapter 2, Van Ness Avenue between Geary and O'Farrell streets under Build Alternative 4 would have the same geometric design as Build Alternative 3. Due to this transition from a center-running BRT with a single median north of Geary Street to a right-side loading BRT with two medians for this block, the SB Van Ness Avenue exclusive right-turn lane to Geary Street would not be provided under Build Alternative 4. This intersection operates at LOS B under 2035 Build Alternative 3. Without the exclusive SB right-turn lane, LOS at this intersection would operate at LOS C under 2035 Build Alternative 4. The analysis for Build Alternative 4 also serves as the sensitivity analysis if the San Francisco Planning Department were to widen the sidewalk under Build Alternative 3, thus requiring elimination of the exclusive SB right-turn lane onto Geary Street from Van Ness Avenue.

2035 Long-Term Horizon Year Build Alternatives 3 and 4 with Design Option B and the LPA: Center-Lane BRT

The LPA (including the Vallejo Northbound Station Variant)[51] would have the same traffic impacts as Build Alternatives 3 and 4 with Design Option B. Because the LPA would have 11 fewer right-turn pockets, there are minor differences in approach average delay between the LPA and Build Alternatives 3 and 4 with Design Option B along Van Ness Avenue. However, none of these differences would cause a new significant intersection LOS impact or worsen a significant intersection LOS impact compared to the impacts outlined for Build Alternatives 3 and 4 with Design Option B. For details on LPA performance in 2035, please see the Vehicular Traffic Analysis Technical Memorandum (CHS, 2013).

Under Build Alternatives 3 and 4 with Design Option B and the LPA, 12 intersections would operate at LOS E or F during the PM peak hour in Horizon Year 2035, which is the same number of intersections operating at LOS E or F under 2035 Build Alternatives 3 and 4. Table 3.3-16 presents a comparison of the average intersection delay and LOS for the intersections that would operate at LOS E or F under the existing conditions, 2035 No Build Alternative, and 2035 Build Alternatives 3 and 4 with Design Option B and LPA scenarios. Figure 3.3-10 presents 2035 Build Alternatives 3 and 4 with Design Option B intersection LOS for all intersections.

[51] The Vallejo Northbound Station Variant would have one fewer (2 versus 3) mixed traffic lanes in the SB direction for the block between Vallejo and Green streets versus the LPA. Under the LPA without the variant, this lane would be used to store left-turning traffic onto Broadway. Under the Vallejo Northbound Station Variant, that roadway space would be used for the additional far side NB station at Vallejo Street. In 2015, the Vallejo intersection would operate at LOS A during the PM peak under the LPA and would operate at a similar LOS with implementation of the Vallejo Northbound Station Variant.

Figure 3.3-10: Long-Term (2035) Alternatives 3 and 4 with Design Option B and the LPA Intersection LOS

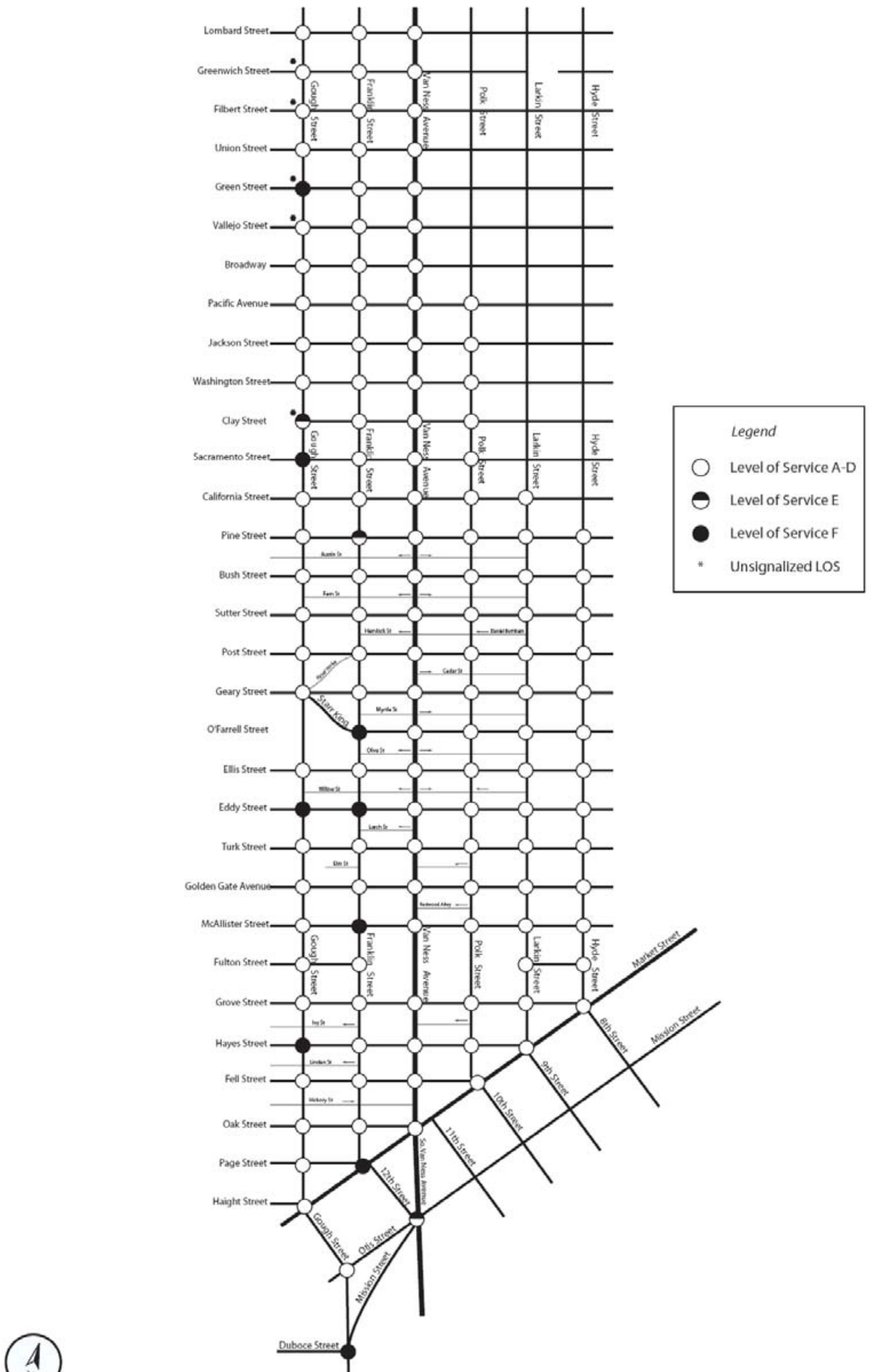


Table 3.3-16: Existing Conditions, 2035 Build Alternatives 3 and 4 (Center-Lane BRT) with Design Option B, and No Build Alternative Intersection LOS (Delay) for Intersections that Operate at LOS E or F

INTERSECTION	EXISTING CONDITIONS	2035 NO BUILD ALTERNATIVE	2035 BUILD ALTERNATIVES 3 AND 4 WITH DESIGN OPTION B AND THE LPA
	LOS (DELAY)	LOS (DELAY)	LOS (DELAY)
Gough/Green*	F (76.5)	F (93.6)	F (142.7)
Gough/Clay*	C (23.9)	D (29.8)	E (44.5)
Gough/Sacramento	C (27.1)	C (25.2)	F (102.2)
Gough/Eddy	A (8.9)	B (14.8)	F (107.3)
Gough/Hayes	D (45.9)	F (98.1)	F (126.2)
Franklin/Pine	D (39.5)	E (66.7)	E (78.8)
Franklin/O'Farrell	D (39.3)	E (77.5)	F (115.3)
Franklin/Eddy	B (10.7)	C (24.1)	F (113.1)
Franklin/McAllister	B (15.7)	C (29.7)	F (143.1)
Franklin/Market	B (17.9)	C (33.1)	F (148.3)
Van Ness/Pine	C (26.1)	E (64.9)	C (21.4)
Otis/Mission/S. Van Ness	D (46.1)	E (74.0)	E (79.0)
Duboce/Mission/Otis/US 101 Off-Ramp	D (44.4)	F (115.2)	F (97.2)

* Unsignalized intersection.
Table shows worst approach LOS (Delay) for an unsignalized intersection.
Table shows intersection LOS (intersection average vehicular delay) for signalized intersections.

Source: SYNCHRO model, CHS Consulting Group, 2013.

Significant Cumulative Impacts. Under Build Alternatives 3 and 4 with Design Option B and the LPA, the Van Ness Avenue BRT Project would cause significant traffic impacts at the following eight intersections in 2035.

- **Gough/Sacramento.** This signalized intersection would decline from LOS C under existing conditions to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA. Furthermore, this signalized intersection would decline from LOS C under 2035 No Build Alternative to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, the proposed project would cause significant cumulative impacts.
- **Gough/Eddy.** This signalized intersection would decline from LOS A under existing conditions to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA. Furthermore, this signalized intersection would decline from LOS B under 2035 No Build Alternative to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, the proposed project would cause significant cumulative impacts.
- **Gough/Hayes.** This intersection is assessed to have significant project-specific impacts under 2015 Build Alternatives 3 and 4 with Design Option B and the LPA. Hence, based on the significance criteria (Section 3.3.3), the proposed project would cause significant cumulative impacts.
- **Franklin/O'Farrell.** This intersection is assessed to have significant project-specific impacts under 2015 Build Alternatives 3 and 4 with Design Option B and the LPA. Hence, based on the significance criteria (Section 3.3.3), the proposed project would cause significant cumulative impacts.

- **Franklin/Eddy.** This signalized intersection would decline from LOS B under existing conditions to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4. Furthermore, this signalized intersection would decline from LOS C under 2035 No Build Alternative to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, the proposed project would cause significant cumulative impacts.
- **Franklin/McAllister.** This signalized intersection would decline from LOS B under existing conditions to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA. Furthermore, this signalized intersection would decline from LOS C under 2035 No Build Alternative to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, the proposed project would cause significant traffic impacts.
- **Franklin/Market/Page.** This intersection is assessed to have significant project-specific impacts under 2015 Build Alternatives 3 and 4 with Design Option B and the LPA. Hence, based on the significance criteria (Section 3.3.3), the proposed project would cause significant cumulative impacts.
- **South Van Ness/Mission/Otis.** This signalized intersection would decline from LOS D under existing conditions to LOS E under Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA. Furthermore, this signalized intersection would perform at LOS E under 2035 No Build Alternative and Build Alternatives 3 and 4 with Design Option B and the LPA. The contribution of project traffic to the critical movement is significant (i.e., greater than 5 percent). Thus, based on the significance criteria, the proposed project would cause significant cumulative impacts.

Less than Significant Cumulative Impacts. Four additional intersections would have less than significant impacts. These intersections would operate at LOS E or F under Build Alternatives 3 and 4 with Design Option B and the LPA in 2035; however, the contribution of project traffic would not be significant. The intersections with less than significant project impacts are:

- **Gough/Green.** The SB approach, the worst approach at this four-way stop-controlled intersection, would perform at LOS F under both the existing condition and 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; however, the intersection would not meet the Caltrans peak-hour signal warrant under both the existing condition and 2035 Build Alternatives 3 and 4 with Design Option B and the LPA, and would therefore not be significant per the impact significance thresholds described in Section 3.3.3. The intersection would also operate at LOS F under 2035 No Build Alternative, as would the SB approach. There are several possibilities to improve traffic operations at this intersection, including adding a traffic signal; removing some on-street parking spaces to create an additional SB approach lane; however, removing parking would worsen pedestrian conditions by eliminating the buffer provided by parked cars separating the sidewalk from the traffic lane, as discussed in Section 3.3.4 (see also Section 3.4, Nonmotorized Transportation), and past public outreach has indicated that the community prefers the stop-sign control of the intersection.
- **Gough/Clay.** The WB Clay Street approach at this unsignalized intersection would perform at LOS C under the existing conditions and would decline to LOS E at the worst approach under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; however, the intersection would not meet the Caltrans peak-hour signal warrant under both the existing condition and 2035 Build Alternative 3 and 4 with Design Option B and the LPA, and would therefore not be significant per the impact significance thresholds described in Section 3.3.3. Potential options that may be used to improve traffic operations of this intersection include adding a traffic signal, removing some on-street parking spaces on Clay Street to create an additional WB-to-SB

approach lane, or widening Gough Street SB to two lanes by removing on-street parking spaces; however, these improvements would have the adverse effect of parking removal on pedestrian conditions along Clay and/or Gough Streets and are not recommended.

- **Franklin/Pine.** This signalized intersection would decline from LOS D under existing conditions to LOS E under Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA. Furthermore, this signalized intersection would operate at LOS E under 2035 No Build Alternative and Build Alternatives 3 and 4 with Design Option B and the LPA; however, the contribution of project traffic to the critical movements performing at LOS E or F would not be significant (i.e., less than 5 percent); therefore, the proposed project would cause less than significant cumulative impacts. One potential improvement measure is providing an exclusive WB right-turn lane between Van Ness Avenue and Pine Street. This can be implemented by instituting a PM peak-period tow-away zone along the north side of Pine; however, this improvement would have the adverse effect of parking removal on pedestrian conditions along Pine Street and is not recommended.
- **Duboce/Mission/Otis/US 101 Off-Ramps.** This signalized intersection would perform at LOS D under existing conditions and decline to LOS F under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA; therefore, this intersection would have cumulative impacts under 2035 Build Alternatives 3 and 4 with Design Option B and the LPA. Furthermore, this signalized intersection would perform at LOS F under 2035 No Build Alternative and Build Alternatives 3 and 4 with Design Option B and the LPA; however, the contribution of project traffic to the critical movements would not be significant (i.e., less than 5 percent, or LOS D or better). The LOS cannot be improved because there is no ROW available to add lanes at this intersection and the traffic signal timings are constrained by the pedestrian minimum timings and cannot be allocated to congested movements.
- **Beneficial Impacts.** The intersections of Van Ness and Pine would decline from LOS C under the existing conditions to LOS E under 2035 No Build Alternative, and then improve to LOS C under Build Alternatives 3 and 4 with Design Option B and the LPA. This decline in performance between the existing conditions and 2035 No Build Alternative is due to growth in background traffic. The improved performance between 2035 No Build Alternative and 2035 Build Alternatives 3 and 4 with Design Option B and the LPA is mainly due to traffic diversions away from the intersection.

KEY FINDINGS

Under Build Alternatives 3 and 4 without Design Option B in the near-term Year 2015, traffic conditions at three intersections would be significantly impacted.

Under Build Alternatives 3 and 4 with Design Option B in the near-term Year 2015 (including the LPA), traffic conditions at two intersections would be significantly impacted.

Under Build Alternative 2, in the near-term Year 2015, the project would cause significant traffic impacts at two intersections.

Under the long-term Horizon Year 2035, the project would cause significant traffic impacts at five to eight intersections, depending on the alternative.

Design Variation between Build Alternative 3 and Build Alternative 4 with Design Option B and Sensitivity Analysis at Van Ness Avenue and Geary Street Intersection. As discussed in Chapter 2, Van Ness Avenue between Geary and O'Farrell streets under Build Alternative 4 with Design Option B would have the same geometric design as Build Alternative 3 with Design Option B. Due to this transition from a center-running BRT with a single median north of Geary Street to a right-side loading BRT with two medians for this block, the SB Van Ness Avenue exclusive right-turn lane to Geary Street would not be provided under Build Alternative 4 with Design Option B. This intersection operates at LOS B under 2015 Build Alternative 3 with Design Option B. Without the exclusive SB right-turn lane, LOS at this intersection would operate at LOS C under 2015 Build Alternative 4 with Design Option B. The analysis for Build Alternative 4 with Design Option B also serves as the sensitivity analysis if the San Francisco Planning Department were to widen the sidewalk under Build Alternative 3 with Design Option B, thus requiring elimination of the exclusive SB right-turn lane onto Geary Street from Van Ness Avenue. The LPA would include the removal of the right-turn pocket at this intersection.

LPA Vallejo Northbound Station Variant. The Vallejo Northbound Station Variant would have one fewer (2 versus 3) mixed traffic lanes in the SB direction for the block between Vallejo and Green streets versus the LPA. Under the LPA without the variant, this lane would be used to store left-turning traffic onto Broadway. Under the Vallejo Northbound Station Variant, that roadway space would be used for the additional far side NB station at Vallejo Street. In 2035, the Vallejo intersection would operate at LOS A during the PM peak under the LPA and would deteriorate to LOS B with implementation of the Vallejo Northbound Station Variant.

3.3.3.4 SUMMARY OF VEHICULAR TRAFFIC IMPACTS

This section provides a summary of the Van Ness Avenue BRT Project's vehicular traffic impacts for the three project alternatives for the near-term 2015 and long-term Horizon Year 2035. Table 3.3-17 provides a summary of traffic impacts at all intersections that would operate at LOS E or F in the existing, No Build, or Build Alternative conditions. Key findings are listed below. As explained in Section 3.3.2.2, the PM peak hour represents the worst-case scenario to assess vehicular traffic impacts of the proposed project and is used for the intersection LOS analysis.

- In the existing conditions, only the intersection of Gough and Green streets would perform at LOS E or F.
- In 2015 No Build Alternative, four intersections would perform at LOS E or LOS F. The intersection of Mission/South Van Ness/Otis is the only intersection on Van Ness Avenue that would perform at LOS E.
- In the near-term 2015 (representing existing plus project conditions), the project would cause significant project-specific impacts at the intersections of Gough/Hayes and Franklin/O'Farrell under all three build alternatives. Under Build Alternatives 3 and 4, the project would also cause significant project-specific impacts at the intersection at the South Van Ness/Mission/Otis intersection. Under Build Alternatives 3 and 4 with Design Option B and the LPA, the project would also cause significant project-specific impacts at the intersection of Franklin and Market streets.
- In 2015, the performance of the Mission/South Van Ness/Otis intersection would improve from LOS E to LOS D under Build Alternative 2, and Build Alternatives 3 and 4 with Design Option B and the LPA versus Alternative 1 (No Build Alternative), and the performance of the Mission/Duboce/Otis/US 101 off-ramps would also improve from LOS E to LOS D under all of the build alternatives versus Alternative 1 (No Build Alternative). This is due to the diversion of traffic using Van Ness Avenue under 2015 No Build Alternative to other modes, other times of the day, and streets outside the traffic study area because of the implementation of BRT.
- Under both near-term 2015 and long-term 2035 horizon years, Build Alternative 2 would have the least traffic impacts because of the availability of higher capacity for vehicles making turns from Van Ness Avenue with protect-permitted left turns, thus reducing diversions to other parallel streets.
- Under the long-term Horizon Year 2035 No Build Alternative (Alternative 1), seven intersections would perform at LOS E or LOS F. This is three more than in the 2015 build alternatives. The intersection of Mission/South Van Ness/Otis is the only intersection on Van Ness Avenue that would perform at LOS E or LOS F under 2035 No Build Alternative.
- In the long-term Horizon Year 2035, the project would cause significant traffic impacts at five to eight locations depending on the alternative.
- The project traffic in 2035 would cause significant cumulative impacts at seven of these same intersections under Build Alternatives 3 and 4 with or without Design Option B, including the LPA. One additional intersection, the Van Ness/Hayes intersection, would be impacted under Build Alternatives 3 and 4 without Design Option B. Under Build Alternatives 3 and 4 with Design Option B and the LPA, one additional intersection, the Franklin/Market intersection, would be impacted by project traffic.

Each build alternative, including the LPA, already incorporates features that help avoid or minimize traffic impacts. Nevertheless, the build alternatives are forecast to cause traffic delay impacts at certain locations. Engineering measures could mitigate some of these delay impacts in the near term but are not feasible due to policy conflicts, specifically the need to balance traffic circulation with pedestrian and transit circulation and safety.
In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand.

3.3.4 Avoidance, Minimization, and/or Mitigation Measures

This section describes avoidance, minimization, and mitigation measures that would lessen traffic impacts for each build alternative, including the LPA. Whether to adopt mitigation measures will be decided by the decision makers (i.e., the Authority Board). Decision makers will consider the Final EIS/EIR prior to deciding whether to approve the project. As part of that process, decision makers will make any required findings and, for CEQA purposes, those will include determining whether mitigation measures are feasible or infeasible, considering specific economic, legal, social, technological, or other considerations. If the

Table 3.3-17: Summary of Vehicular Traffic Impacts

INTERSECTION	EXISTING CONDITION	2015 NO BUILD ALTERNATIVE	PROJECT-SPECIFIC IMPACTS			2035 NO BUILD ALTERNATIVE	CUMULATIVE IMPACTS		
			2015 BUILD ALTERNATIVE 2 (SIDE-LANE BRT)	2015 BUILD ALTERNATIVES 3 AND 4 (CENTER-LANE BRT)	2015 BUILD ALTERNATIVES 3 AND 4 (CENTER-LANE BRT WITH DESIGN OPTION B) AND THE LPA		2035 BUILD ALTERNATIVE 2 (SIDE-LANE BRT)	2035 BUILD ALTERNATIVES 3 AND 4 (CENTER-LANE BRT)	2035 ALTERNATIVES 3 AND 4 (CENTER-LANE BRT WITH DESIGN OPTION B) AND THE LPA
Gough/Green	NPI	NPI	LSI	LSI	LSI	NPI	LSI	LSI	LSI
Gough/Clay	--	--	--	--	--	--	LSI	--	LSI
Gough/Sacramento	--	--	--	--	--	--	--	SCI	SCI
Gough/Eddy	--	--	--	--	--	--	--	SCI	SCI
Gough/Hayes	--	NPI	SPI	SPI	SPI	NPI	SCI	SCI	SCI
Franklin/Pine	--	--	--	--	--	NPI	SCI	LSI	LSI
Franklin/O'Farrell	--	--	SPI	SPI	SPI	NPI	SCI	SCI	SCI
Franklin/Eddy	--	--	--	--	--	--	SCI	SCI	SCI
Franklin/McAllister	--	--	--	--	--	--	SCI	SCI	SCI
Franklin/Market	--	--	--	--	SPI	--	--	--	SCI
Van Ness/ Pine	--	--	--	--	--	NPI	BI	LSI	BI
Van Ness/Hayes	--	--	--	--	--	--	--	SCI	--
Mission/South Van Ness/Otis	--	NPI	BI	SPI	BI	NPI	LSI	SCI	SCI
Mission/Duboce/ Otis/US 101 Off-Ramps	--	NPI	BI	BI	BI	NPI	LSI	LSI	LSI

Notes:

This EIS/EIR assumes the 2015 Build Alternatives are equivalent to the existing plus project conditions.

NPI – No Project Impact. The intersection performs at LOS E or LOS F under existing or No Build Alternative conditions.

SPI – Significant Project-Specific Impact. Project traffic would contribute significantly towards the decline of intersection operations from existing condition to existing plus project condition.

LSI – Less than Significant Project-Specific Impact or Cumulative Impact. Project traffic would not contribute significantly to intersections operating at the same LOS E or LOS F under (i) existing and existing plus project condition or (ii) cumulative Build and No Build Alternatives.

BI – No Project Impact. Project results in a change in operations from LOS E or LOS F under existing condition or cumulative No Build Alternative conditions, to LOS D or better under existing plus project condition or cumulative Build Alternatives.

SCI - Significant Cumulative Impact. Project traffic would contribute significantly towards the decline of intersection operations from existing condition to cumulative Build Alternatives.

decision makers determine that mitigation measures or project alternatives that reduce or avoid significant impacts are feasible, they will be adopted and incorporated into the project. If the decision makers determine that mitigation measures are infeasible and that significant and unavoidable impacts will occur, decision makers will need to adopt findings that the project will result in economic, legal, social, technological, or other benefits, notwithstanding the unavoidable environmental risks of the project.

The discussion also identifies engineering mitigation measures, which may ultimately be found by the Authority Board to be infeasible, to document the Authority's effort to consider means of lessening or avoiding the significant traffic impacts anticipated under each proposed build alternative, and to explain in each case some of the policy and engineering challenges. The circulation and public comment period of this Draft EIS/EIR provided an opportunity for input on this approach.

Each build alternative, including the LPA, would incorporate features that help avoid or minimize traffic impacts through project design, in keeping with the project's objective to accommodate traffic circulation. These include area-wide signal timing and optimization; signal priority for BRT on Van Ness Avenue, which also benefits (north/south) mixed traffic; reducing left-turn movements along the project alignment; and right-turn pockets at high-demand locations.

Nevertheless, the build alternatives, including the LPA, are forecast to cause traffic delay impacts at the locations identified in Section 3.3.3. As discussed in more detail below, engineering measures could, at some affected intersections, mitigate these delay impacts in the near term. The engineering mitigation measures primarily include removal of parking tow-away lanes or traffic turn pockets, which increase roadway capacity at the affected intersections.[52] Such mitigation measures were identified and tested for each project scenario.[53]

These types of mitigation measures, while reducing localized traffic delays in the short term, may ultimately be found by the Authority Board to not be feasible due to policy conflicts, specifically the need to balance traffic circulation with pedestrian and transit circulation and safety. In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand.

Pedestrian Conflicts. The use of tow-away zones and the addition of right-turn pockets would worsen pedestrian conditions by removing on-street parking, which acts as a buffer from moving traffic, increasing the levels of moving traffic itself and the associated conflicts with pedestrians at intersections, and raising exposure of pedestrians to motorized traffic where turn pockets are added. These outcomes would not support the project purpose and need to improve pedestrian comfort and safety (see Section 1.3).

The San Francisco General Plan Transportation Element specifically notes the important role of on-street parking as a buffer between pedestrians and traffic. Policy 18.2 provides that no additional tow-away zones should be instituted if they would worsen pedestrian safety and comfort. The buffer provided by parallel parking is especially important on Franklin and Gough streets, which have narrower sidewalks than the standards recommended in the San Francisco Better Streets Plan, and higher traffic volumes than Van Ness Avenue.

When evaluating this tradeoff between mitigating traffic delays and inducing new automobile trips, or worsening pedestrian conditions through parking removal, the Authority is guided by the Transit First Policy in the City Charter. The Transit First Policy states that "Decisions regarding the use of limited public street and sidewalk space shall encourage the use of public rights-of-way by pedestrians, bicyclists, and public transit" (City Charter Article VIIIA, 115, Transit First Policy).

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[52] Other mitigation measures include conversion of Otis Street to two-way and closing Page Street to vehicular traffic for some project scenarios; these are discussed in detail in this section.

[53] Traffic signal timings and offsets were optimized for all mitigation measures.

Induced Demand. Substantial evidence indicates that expanding roadway capacity induces new vehicle trips and is not an effective way to address congestion over the long term. New roadway capacity generates new automobile trips that were not previously made, returning delays to previous levels. Researchers, including Robert Cervero, Mark Hansen, and Robert Noland, published key findings on this topic starting in 1995.

In 2009, the California Resources Agency adopted revisions to the State CEQA guidelines that recognize the "induced demand" that results from typical traffic mitigation measures. The revisions removed from the Guidelines a suggestion to measure and mitigate traffic impacts with automobile LOS or volume to capacity ratios, citing induced demand as a key rationale for the change (December, 2009 Final Statement of Reasons, http://ceres.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf).

Even without these engineering mitigation measures, the number of intersections operating at LOS E or LOS F under the build alternatives in Year 2015 is no greater than the number of intersections operating at LOS E or F in the No Build Alternative scenario.

The following sections identify those locations that would experience a significant and unavoidable automobile traffic delay impact by 2015 and/or 2035. Even without the engineering mitigation measures described below, the number of intersections operating at LOS E or LOS F under the build alternatives in Year 2015 is no greater than the number of intersections operating at LOS E or F in the No Build Alternative scenario.

3.3.4.1 | NEAR-TERM (2015) BUILD ALTERNATIVES

This section identifies measures to reduce or eliminate Near-Term (2015) intersection impacts under the build alternatives (representing existing plus project conditions); however, the Authority Board may find these mitigation measures to be infeasible as explained below.

2015 Near-Term Build Alternative 2: Side-Lane BRT with Street Parking

As presented in Section 3.3.3.2, two intersections would have a significant and unavoidable traffic impact in 2015 under Build Alternative 2.

- **Gough/Hayes.** Traffic impacts at this intersection would primarily result from the Gough Street SB approach. Provision of a fourth SB through lane on Gough Street through the implementation of PM peak-period tow-away along the east side of Gough Street between Ivy and Linden would further improve the intersection's level of service to LOS D. However, a tow-away lane would worsen pedestrian conditions along the east side of Gough Street by removing parking during the peak period (see Section 3.4).If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause a significant and unavoidable impact in 2015 under Build Alternative 2.
- **Franklin/O'Farrell.** Traffic impacts at this intersection would primarily result from the approximately 360 vehicles making the EB left turn from O'Farrell Street during the PM peak hour and incurring extensive delays. Adding an exclusive EB left-turn lane would restore the LOS at this intersection to an acceptable level; however, this mitigation measure would cause adverse impacts on Muni bus services. O'Farrell Street has a bus-only lane on the south side of O'Farrell. Providing an EB left-turn lane at Franklin Street would require this bus-only lane to be converted to a general-purpose lane. Losing this bus lane would adversely impact Muni bus speed and cause delays. This is an especially difficult tradeoff given the planned Geary BRT service.. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause a significant and unavoidable impact in 2015 under Build Alternative 2.

2015 Near-Term Build Alternatives 3 and 4: Center-Lane BRT

As discussed in Section 3.3.3.2, project traffic in Year 2015 under Build Alternatives 3 and 4 would cause a significant impact at three intersections.

- **Gough/Hayes.** Traffic impacts at this intersection would be primarily a result of the Gough Street SB approach.. Provision of a fourth SB through lane on Gough Street through the implementation of a PM peak-period tow-away zone along the east side of Gough Street between Ivy and Linden would improve the intersection's LOS to LOS D. However, a tow-away lane would worsen pedestrian conditions along the east side of Gough Street by removing parking during the peak period (see Section 3.4).If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause a significant and unavoidable impact in 2015 under Build Alternatives 3 and 4.

- **Franklin/O'Farrell.** Traffic impacts at this intersection would primarily result from the approximately 360 vehicles making the EB left turn from O'Farrell Street during the PM peak hour and incurring extensive delays. Adding an exclusive EB left-turn lane would restore LOS at this intersection to an acceptable level. However, this mitigation measure would cause adverse impacts on Muni bus services. O'Farrell Street has a bus-only lane on the south side. Providing an EB left-turn lane at Franklin Street would require this bus-only lane to be converted to a general-purpose lane. Losing this bus lane would adversely impact Muni bus speed and cause delays. This is an especially difficult tradeoff given the planned Geary Corridor BRT service. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause a significant and unavoidable impact in 2015 under Build Alternatives 3 and 4.
- **South Van Ness/Mission/Otis.** The LOS at this intersection cannot be improved because there is no ROW available to add lanes. In addition, the traffic signal timings are constrained by the pedestrian minimum timings and cannot be allocated to congested movements. Therefore, this intersection cannot be mitigated, and project traffic would cause a significant and unavoidable impact in 2015 under Build Alternatives 3 and 4.

Year 2015 Near-Term Build Alternatives 3 and 4 with Design Option B and the LPA: Center-Lane BRT

As discussed in Section 3.3.3.1, project traffic in 2015 under Build Alternatives 3 and 4 with Design Option B and the LPA would cause a significant impact at three intersections.

- **Gough/Hayes.** Traffic impacts at this intersection would be primarily a result of the Gough Street SB approach. Provision of a fourth SB through lane on Gough Street through the implementation of a PM peak-period tow-away zone along the east side of Gough Street between Ivy and Linden would restore the intersection to LOS D. However, a tow-away lane would worsen pedestrian conditions along the east side of Gough Street by removing parking during the peak period (see Section 3.4). If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause a significant and unavoidable impact in 2015 under Build Alternatives 3 and 4 with Design Option B and the LPA.
- **Franklin/O'Farrell.** Traffic impacts at this intersection would be primarily a result of the approximately 360 vehicles making the EB left turn from O'Farrell Street during the PM peak hour and incurring extensive delays. Adding an exclusive EB left-turn lane as a mitigation measure would restore LOS at this intersection to an acceptable level; however, this mitigation measure would cause adverse impacts on Muni bus services. O'Farrell Street has a bus-only lane on the south side. Providing an EB left-turn lane at Franklin Street would require this bus-only lane to be converted to a general-purpose lane. Losing this bus lane would adversely impact Muni bus speed and cause delays. This is an especially difficult tradeoff given the planned Geary Corridor BRT service. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause a significant and unavoidable impact in 2015 under Build Alternatives 3 and 4 with Design Option B and the LPA.
- **Franklin/Market.** Traffic impacts at this intersection would be primarily a result of the delays for the EB left-turn approach from Market Street. This intersection performs poorly due to the additional NB vehicles making a U-turn onto Otis Street from Mission Street NB, turning right onto Gough Street NB, turning right onto EB Market Street, and turning left onto NB Franklin Street. Rerouting Muni buses from EB Page Street to the proposed two-way Haight Street, closing Page Street to vehicular traffic, and split-phase timing for EB Page Street added to the Market Street EB left-turn movement at this signalized intersection This would restore the intersection's performance to an

acceptable LOS; however, it would eliminate the Page Street phase of the traffic signal, which would make it difficult for bicycle users, who heavily utilize Page Street bike lanes, to access Market Street bike lanes. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant and unavoidable impacts at this intersection in 2015 under Build Alternatives 3 and 4 with Design Option B and the LPA.

3.3.4.2 | LONG-TERM (2035) BUILD ALTERNATIVES

This section identifies measures to reduce or eliminate Long-Term (2035) intersection impacts under the build alternatives; however, the Authority Board may find these measures to be infeasible, as explained below.

2035 Long-Term Horizon Year Build Alternative 2: Side-Lane BRT with Street Parking

As discussed in Section 3.3.3.2, project traffic in 2035 under Build Alternative 2 would cause a significant impact at five intersections.

- **Gough/Hayes.** Traffic impacts at this intersection would be primarily a result of the delays for the Gough Street SB approach. Provision of a fourth SB through lane on Gough Street through the implementation of a PM peak-period tow-away zone along the east side of Gough Street between Ivy and Linden and a 125-foot exclusive EB right-turn lane created by removing six parking spaces on the south side of Hayes Street would improve the intersection's level of service. However, parking removal would worsen pedestrian conditions along the east side of Gough Street and the south side of Hayes Street (see Section 3.4).If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause a significant and unavoidable impact in 2035 under Build Alternative 2.
- **Franklin/Pine.** Traffic impacts at this intersection would be primarily a result of the delays for the Pine Street approach. The mitigation measure includes providing an exclusive WB right-turn lane from Van Ness Avenue to Franklin Street. This mitigation measure can be implemented by instituting a PM peak-period tow-away zone along the north side of Pine between Van Ness Avenue and Franklin Street. The intersection would operate at LOS D after implementation of the mitigation. However, the removal of parking would have adverse effects on pedestrian conditions. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035 under Build Alternative 2.
- **Franklin/O'Farrell.** Traffic impacts at this intersection would be primarily a result of the delays for the O'Farrell Street approach. Adding an exclusive EB left-turn lane is a mitigation measure that would restore LOS at this intersection to an acceptable level; however, it would cause adverse impacts on Muni bus services. O'Farrell Street has a bus-only lane on the south side of O'Farrell. Providing an EB left-turn lane at Franklin Street would require this bus-only lane to be converted to a general-purpose lane. Losing this bus lane would adversely impact Muni bus speed and cause delays. This is an especially difficult trade-off given the planned Geary Corridor BRT service. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant and unavoidable impacts in 2035 under Build Alternative 2.
- **Franklin/Eddy.** Traffic impacts at this intersection would be primarily a result of the delays for the Eddy Street approach. The mitigation would be to provide a 50-foot-long exclusive EB left-turn lane by eliminating two parking spaces on the south side of Eddy. However, the removal of parking would have adverse effects on pedestrian conditions. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035under Build Alternative 2.
- **Franklin/McAllister.** Traffic impacts at this intersection would be primarily a result of the delays for the Franklin Street approach. The mitigation includes adding a fourth NB through lane created by instituting a PM peak-hour tow-away zone along the west side

of Franklin Street between Fulton and McAllister streets. This would extend the existing tow-away zone by one block south. However, the removal of parking would have adverse effects on pedestrian conditions along Franklin Street (see Section 3.4). If the Authority Board chooses not to adopt the mitigation measure, project traffic would cause significant impacts at this intersection in 2035 under Build Alternative 2.

2035 Long-Term Horizon Year Build Alternatives 3 and 4: Center-Lane BRT

As discussed in Section 3.3.3.2, the Van Ness Avenue BRT Project would cause a significant traffic impact at eight intersections in 2035 under Build Alternatives 3 and 4.

- **Gough/Sacramento.** Traffic impacts at this intersection would be primarily a result of the Gough Street approach. One mitigation measure is a second SB through lane along Gough Street. This can be implemented by instituting a PM peak-period tow-away zone on the west side of Gough Street between Clay and Sacramento streets. However, the removal of parking would have adverse effects on pedestrian conditions along Gough Street. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035 under Build Alternatives 3 and 4.
- **Gough/Eddy.** Traffic impacts at this intersection would be primarily a result of the delays for the Eddy Street approach. The mitigation includes providing a 50-foot-long exclusive EB right-turn lane created by eliminating three parking spaces on the south side of Eddy Street and relocating the bus stop on the near side of Gough to the far side of the intersection. However, this mitigation measure would have the adverse effects of parking removal for auto travel lane purposes on pedestrian conditions along Eddy Street in addition to potential transit access impacts. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant and unavoidable impacts at this intersection in 2035 under Build Alternatives 3 and 4.
- **Gough/Hayes.** Traffic impacts at this intersection would be primarily a result of the delays for the Gough Street SB approach. Conditions would be mitigated with provision of a fourth SB through lane on Gough Street through the implementation of a PM peak-period tow-away zone along the east side of Gough Street between Ivy and Linden. In addition, a 100-foot exclusive EB right-turn lane would be provided through the removal of five parking spaces on the south side of Hayes Street. However, this would have the adverse effects of parking removal on pedestrian conditions along Gough Street and Hayes Street. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant and unavoidable impacts at this intersection in 2035 under Build Alternatives 3 and 4.
- **Franklin/O'Farrell.** Traffic impacts at this intersection would be primarily a result of the delays for the O'Farrell Street approach. The performance of this intersection would be improved by increasing capacity on NB Franklin Street and EB O'Farrell Street through additional lanes; however, there is no ROW available along Franklin Street and the mitigation would impact transit along O'Farrell Street. In addition, adding an exclusive EB left-turn lane would cause adverse impacts on Muni bus services. O'Farrell Street has a bus-only lane on the south side of O'Farrell. Providing an EB left-turn lane at Franklin Street would require this bus-only lane to be converted to a general-purpose lane. Losing this bus lane would adversely impact Muni bus speed and cause delays. This is an especially difficult trade-off given the planned Geary Corridor BRT service. If the Authority Board finds the mitigation measures to be infeasible and does not adopt them, project traffic would cause significant and unavoidable impacts in 2035 under Build Alternatives 3 and 4.
- Franklin/Eddy. Traffic impacts at this intersection would be primarily a result of the delays for the Eddy Street approach. The mitigation measure is providing a 50-foot-long exclusive EB left-turn lane by eliminating two parking spaces on the south side of Eddy Street. However, this mitigation measure would have the adverse effects of parking removal for auto travel lane purposes on pedestrian conditions along Eddy Street. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it,

project traffic would cause significant impacts at this intersection in 2035 under Build Alternatives 3 and 4.

- **Franklin/McAllister.** Traffic impacts at this intersection would be primarily a result of the delays for the Franklin Street approach. The mitigation measure is a fourth NB through lane created by instituting a PM peak-period tow-away zone along the west side of Franklin Street between Fulton and McAllister streets. This would extend the existing tow-away zone by one block south; however, this mitigation measure would have adverse effects of parking removal for auto travel lane purposes on pedestrian conditions along Franklin Street. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035 under Build Alternatives 3 and 4.
- **Van Ness/Hayes.** Traffic impacts at this intersection would be primarily a result of the delays for the Van Ness Avenue left-turn approach. The reduction of two existing NB left-turn bays to one would not accommodate the forecast traffic volumes in 2035. This impact would be mitigated by diverting a portion of the left-turn volumes upstream in the SoMa area. Another mitigation measure would involve signage changes discussed earlier, from the intersection of Duboce/Mission/US 101 off-ramps to Mission and South Van Ness Avenue, and conversion of Otis Street to a two-way street from Duboce/Mission to McCoppin. These changes would divert some of the Van Ness Avenue NB left-turn traffic at Hayes Street to Otis, Gough, Market, and Franklin streets to reach their destinations. However, this mitigation measure would potentially cause secondary private vehicle, transit, and bicycle impacts at the Market and Franklin intersection (would cause the intersection to decline to LOS E) and at the Duboce/Mission intersection (would require the removal of parking on one side of the street between Duboce/Mission and Otis/Gough). If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant and unavoidable impacts in 2035 under Build Alternatives 3 and 4.
- **South Van Ness/Mission/Otis.** No improvement is proposed for this intersection because there is no ROW available to add lanes to this intersection, and the traffic signal timings are constrained by the pedestrian minimum timings and cannot be allocated to congested movements. This intersection cannot be mitigated without significant redesign of the intersection. Therefore, this intersection cannot be mitigated, and project traffic would cause significant and unavoidable impacts in 2035 under Build Alternatives 3 and 4.

2035 Long-Term Horizon Year Build Alternatives 3 and 4 with Design Option B and the LPA: Center-Lane BRT

As discussed in Section 3.3.3.2, project traffic under 2035 Build Alternatives 3 and 4 with Design Option B would cause a significant impact at eight intersections.

- **Gough/Sacramento.** Traffic impacts at this intersection would be primarily a result of the delays for the Gough Street approach. The mitigation measure is a second SB through lane along Gough Street implemented by instituting a PM peak-period tow-away zone on the west side of Gough Street between Clay and Sacramento streets. However, this mitigation measure would have the adverse effects of parking removal for auto travel lane purposes on pedestrian conditions along Gough Street. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035 under Build Alternatives 3 and 4 with Design Option B and the LPA.
- **Gough/Eddy.** Traffic impacts at this intersection would be primarily a result of the delays for the Eddy Street approach. The mitigation measure is to provide a 50-foot-long exclusive EB right-turn lane implemented by eliminating three parking spaces on the south side of Eddy Street and relocating the bus stop on the near side of Gough to the far side of the intersection. However, this mitigation measure would have the adverse effects of parking removal for auto travel lane purposes on pedestrian conditions along Eddy Street in addition to a potential transit access impact. If the Authority Board finds

the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035 under Build Alternatives 3 and 4 with Design Option B and the LPA.

- **Gough/Hayes.** Traffic impacts at this intersection would be primarily a result of the delays for the Gough Street SB approach. The mitigation is to provide a fourth SB through lane on Gough Street through the implementation of PM peak-period tow-away along the eastside of Gough Street between Ivy and Linden and a 100-foot exclusive EB right-turn lane created through the removal of five parking spaces on the south side of Hayes Street. However, parking removal would worsen pedestrian conditions along the east side of Gough Street and the south side of Hayes Street. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035 under Build Alternatives 3 and 4 with Design Option B and the LPA.
- **Franklin/O'Farrell.** Traffic impacts at this intersection would be primarily a result of the delays for the O'Farrell Street approach. The mitigation is to increase capacity on EB O'Farrell Street through additional lanes; however, ROW is unavailable along Franklin Street. In addition, adding an exclusive EB left-turn lane would cause adverse impacts on Muni bus services. O'Farrell Street has a bus-only lane on the south side of O'Farrell. Providing an EB left-turn lane at Franklin Street would require this bus-only lane to be converted to a general-purpose lane. Losing this bus lane would adversely impact Muni bus speed and cause delays. This is an especially difficult trade-off given the planned Geary Corridor BRT service. If the Authority Board finds the mitigation measures to be infeasible and does not adopt them, project traffic would cause significant and unavoidable impacts in 2035 under Build Alternatives 3 and 4 with Design Option B and the LPA.
- **Franklin/Eddy.** Traffic impacts at this intersection would be primarily a result of the delays for the Eddy Street approach. The mitigation measure is to provide a 50-foot-long exclusive EB left-turn lane by eliminating two parking spaces on the south side of Eddy Street. However, this mitigation measure would have the adverse effects of parking removal for auto travel lane purposes on pedestrian conditions along Eddy Street (see Section 3.4). If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035 under Build Alternatives 3 and 4 with Design Option B and the LPA.
- **Franklin/McAllister.** Traffic impacts at this intersection would be primarily a result of the delays for the Franklin Street approach. The mitigation measure is a fourth NB through lane implemented by instituting a PM peak-period tow-away zone along the west side of Franklin Street between Fulton and McAllister Street. This would extend the existing tow-away zone by one block south; however, this mitigation measure would have the adverse effects of parking removal for auto travel lane purposes on pedestrian conditions along Franklin Street. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant impacts at this intersection in 2035 under Build Alternatives 3 and 4 with Design Option B and the LPA.
- **Franklin/Market.** Traffic impacts at this intersection would be primarily a result of the delays for the EB Market left-turn approach. This intersection would perform poorly mainly due to the additional NB vehicles making a U-turn onto Otis Street from Mission Street NB, turning right onto Gough Street, right onto EB Market Street, and left onto NB Franklin Street. Traffic impacts at this intersection would be significant and unavoidable. While traffic operations would be improved by closing Page Street to EB vehicular traffic and adjusting signal timing at this intersection to provide more time for Market Street EB left-turn movements, these changes would adversely affect bicyclists using the Page Street bike lanes to access Market Street. If the Authority Board finds the mitigation measure to be infeasible and does not adopt it, project traffic would cause significant and unavoidable impacts in 2035 under Build Alternatives 3 and 4 with Design Option B and the LPA.
- **South Van Ness/Mission/Otis.** The LOS at this intersection cannot be improved because there is no ROW available to add lanes, and the traffic signal timings are constrained by

the pedestrian minimum timings and cannot be allocated to congested movements. Therefore, this intersection cannot be mitigated, and project traffic would cause significant and unavoidable impacts in 2035 under Build Alternatives 3 and 4 with Design Option B and the LPA.

Mitigation Measure M – Traffic Management "Toolbox"

Although these mitigations would not mitigate the traffic impacts to less than significant, SFMTA will attempt to manage resulting traffic through a "toolbox" of short-term traffic management strategies to improve traffic management in the study area. The approaches in the toolbox are not associated with any specific intersection delay, but they would assist the transition from no-build to build circulation patterns and support smooth multimodal circulation in the corridor and citywide under a build and cumulative scenario. The toolbox effort includes raising public awareness of circulation changes; advising drivers of alternate routes; and pedestrian improvements. These strategies cannot be readily represented in conventional traffic operations models; therefore, their potential effect on minimizing traffic delay impacts has not been quantified.

- **Driver Wayfinding and Signage.** Driver guidance will especially assist infrequent drivers of the corridor who may not be aware of alternate routes, such as along the Larkin/Hyde and Franklin/Gough corridors. Examples of wayfinding/signage opportunities include guidance from the US 101 off-ramps to 9th Street/Civic Center to the Hyde/Larkin NB corridor, and from NB Mission Street and the Duboce off-ramp to the Otis U-turn with access to NB Franklin Street. For infrequent drivers heading SB from the northern part of the corridor, signage/wayfinding could include use of North Point to access downtown, or right turns off of Van Ness Avenue, such as at Pine, to access Gough. The Authority will work with Caltrans to develop a driver wayfinding and signage strategy as part of mitigation measures M-TR-C2 and M-TR-C5, discussed in Section 4.15.1.2. The SFMTA would continue to monitor traffic after construction and during project operation. If the above-mentioned construction measures prove to be helpful in minimizing traffic delay impacts, the SFMTA may choose to implement similar strategies on an as-needed basis during project operation.
- **Public Awareness Campaign and Transportation Management Plan (TMP) during Project Construction.** The project construction period is an ideal time to raise public awareness of circulation changes resulting from the project and to implement wayfinding/signage, guidance to alternate routes, and use of parking control officers. As discussed as part of mitigation measure M-TR-C7 in Section 4.15.1, a TMP would be developed to implement these concepts during construction. These information channels could also create new patterns, helping inform drivers during project operation. This campaign should be carried out with regional agencies, including Caltrans and GGT. The SFMTA would continue to monitor traffic after construction and during project operation. If the above-mentioned construction measures prove to be helpful in minimizing traffic delay impacts, the SFMTA may choose to implement similar strategies on an as-needed basis during project operation.
- **Pedestrian Amenities at Additional Corridor Locations.** In the long term, pedestrian amenities, such as countdown signals and pedestrian curb bulbs, could help reduce the severity of automobile traffic delays through mode shift (i.e., drivers switching to walking). Recognizing this potential, the City has prioritized pedestrian improvements as part of the Road Repaving and Streets Safety Bond (Proposition B) Projects on Gough, Franklin, and Polk streets (see Section 2.7.1). Ongoing monitoring of travel in the corridor may identify additional locations for pedestrian improvements based on a combination of pedestrian and vehicle volumes, infrastructure capabilities, and collision history. These types of pedestrian improvements cannot be represented in standard traffic or travel demand models to show a reduction in traffic on an individual project/intersection basis. Rather, shifts from driving to walking tend to occur as a network of improvements is implemented. In the near term, they will not worsen traffic conditions.

3.4 Nonmotorized Transportation

This section summarizes the existing pedestrian and bicycle travel conditions, referred to as nonmotorized transportation, along Van Ness Avenue and how these conditions would change with both impacts and benefits by implementation of the BRT build alternatives. This section summarizes the findings of the Van Ness Avenue BRT Environmental Review – Analysis of Nonmotorized Transportation Impacts Technical Report prepared in support of the proposed project (Arup, 2013).

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences related to nonmotorized transportation under the LPA and with the Vallejo Northbound Station Variant are identified as part of the analysis presented for the build alternatives in this chapter. For many of the pedestrian and bicycle conditions described in this section, the LPA has identical environmental consequences to Build Alternatives 3 or 4 with Design Option B, and is so noted.

3.4.1 | Regulatory Setting

Several City policies and plans govern and guide the nonmotorized transportation environment along Van Ness Avenue. A summary of these policies and plans follows.

3.4.1.1 | EXECUTIVE DIRECTIVE 10-03

On December 20, 2010, Mayor Gavin Newsom signed an Executive Directive (10-03) directing San Francisco agencies to work toward a citywide target of a 25 percent reduction in serious and fatal pedestrian injuries by 2016 and a 50 percent reduction by 2021. The directive also states that the injury prevention goals should be linked with a complementary citywide goal of increasing walking as a share of trips in San Francisco.

3.4.1.2 | SAN FRANCISCO BETTER STREETS PLAN

The San Francisco Better streets Plan provides a blueprint for the future of San Francisco's pedestrian environment (San Francisco Planning Department, 2010). This citywide policy document describes the City's vision, provides design guidelines, and identifies next steps toward creating an improved pedestrian environment in San Francisco. The plan sets broad guidelines and does not prioritize policies or street improvement projects or give specific engineering guidance. Major themes and ideas of the San Francisco Better streets Plan guidelines include:

- Distinctive, unified streetscape design;
- Space for public life;
- Enhanced pedestrian safety;
- Improved street ecology;
- Universal design;
- Integrating pedestrians with transit;
- Creative use of parking lanes;
- Traffic calming to reduce speeding and enhance pedestrian safety;
- Pedestrian-priority designs; and
- Extensive greening of street space.

3.4.1.3 | SFGO

As described in Section 2.2.1, the SFgo program is a package of technology-based transportation management system tools being developed by SFMTA. The SFgo Program is comprised of many projects that would be implemented throughout the City, including the Van Ness Avenue corridor. The following infrastructure elements of SFgo that are relevant to nonmotorized transportation are planned for implementation in the Van Ness Avenue corridor by 2015:

- Installation of pedestrian countdown signals on all crosswalk legs at all signalized intersections along Van Ness Avenue. Pedestrian countdown signals increase pedestrian safety by giving clear and accurate information about crossing time so that pedestrians can complete their crossing before cross traffic receives the green light.
- Installation of APS at some additional signalized intersections on Van Ness Avenue. Currently, APS is installed on Van Ness Avenue at the intersections of Market, McAllister, Hayes, Grove, and Fell streets.
- Upgrade of curb ramps to meet current City standards and ADA requirements at all intersections along Van Ness Avenue to provide access to people in wheelchairs and overall improved pedestrian travel.

3.4.1.4 | SAN FRANCISCO BICYCLE PLAN

The San Francisco Bicycle Plan includes policies and goals that reflect the City's commitment to expanding the role and importance of bicycle transportation in San Francisco. The plan presents a framework for the City to provide a safe and attractive environment needed to promote bicycling. The plan includes 81 recommended action items to guide the City in becoming more bicycle friendly and specifies 60 near-term bicycle network improvement projects and other long-term improvement projects. Specific goals of the San Francisco Bicycle Plan include:

- Making bicycling an integral part of daily life in San Francisco;
- Increasing safe bicycle use;
- Refining and expanding the existing bicycle route network;
- Ensuring plentiful, high-quality bicycle parking;
- Expanding bicycle access to transit and bridges;
- Educating the public about bicycle safety;
- Improving bicycle safety through targeted enforcement;
- Promoting and encouraging safe bicycling;
- Adopting bicycle-friendly practices and policies; and
- Prioritizing and increasing bicycle funding.

The extension of bicycle lanes on Polk Street NB between Market and Grove streets is a near-term improvement project proposed near Van Ness Avenue. Improvements to the bike route on Polk Street are planned and are described in Section 5.3, Reasonably Foreseeable Projects.

3.4.1.5 | VAN NESS AVENUE AREA PLAN (JULY 1995)

The City adopted the *Van Ness Avenue Area Plan* in 1986 and created a Van Ness Avenue Special Use District of the Planning Code in 1988 to implement the plan. The plan is intended to promote Van Ness Avenue as the City's most prominent north-south boulevard, lined with high-density mixed-use development and including design features that support a transit-served pedestrian promenade. The *Van Ness Avenue Area Plan* identifies the following objectives and policies relevant to streetscape and nonmotorized transportation:

- Objective 8. Create an attractive street and sidewalk space that contributes to the transformation of Van Ness Avenue into a residential boulevard.
  - Policies 8.1 through 8.4 support landscaping and tree plantings, as well as maintaining existing sidewalk space abutting major renovation or new development projects.
  - Policies 8.5 through 8.7 support maintaining existing sidewalk widths and providing uniform aesthetic sidewalk treatments.
- Objective 9. Provide safe and efficient movement among all users on Van Ness Avenue.
  - Policies 9.1 through 9.4 support transit service, including reducing conflicts between transit vehicles and other moving and parked vehicles.
  - Policies 9.5 through 9.8 aim to reduce conflicts between pedestrians and automobiles by calling for off-street parking access from minor east-west streets and prohibitions on new parking access on Van Ness Avenue.

- Policies 9.10 through 9.12 include measures to enhance pedestrian circulation.
- Policy 9.13 discourages freight-loading facilities on Van Ness Avenue.

3.4.1.6 | MARKET AND OCTAVIA AREA PLAN (OCTOBER 2007)

The Market and Octavia Area Plan guides future development of the Market and Octavia area. The area plan focuses on improving and creating new opportunities for nonmotorized travel through infill redevelopment, dense new housing development, and civic and open spaces that provide attractive outdoor shared places. The plan specifically promotes high-density housing near transit to encourage more transit, pedestrian, and bicycle trips.

The Market and Octavia Area Plan focuses on creating new opportunities for nonmotorized travel through infill development and outdoor shared spaces.

3.4.1.7 | TENDERLOIN – LITTLE SAIGON NEIGHBORHOOD TRANSPORTATION STUDY

The Tenderloin – Little Saigon Neighborhood Transportation Study identifies the community's high-priority transportation needs and develops conceptual designs and strategies for transportation improvements to the Tenderloin and Little Saigon neighborhoods. The community's top priorities for improvement include pedestrian safety, slower traffic, transit reliability and access, and streetscape.

3.4.1.8 | ADA COMPLIANCE

In the past, it was generally accepted that upgrades to meet ADA requirements were made on the basis of "touch it, fix it," and identified deficiencies beyond the construction footprint could be added to a Transition Plan and deferred to a subsequent improvement project; however, following a recent Caltrans court settlement, this approach has been replaced with one wherein all noncompliant features within a project limit should be addressed to the maximum extent feasible. In Caltrans Design Bulletin 83-04, which covers issues of accessibility, Caltrans specifically recognizes that pavement resurfacing and rehabilitation projects now trigger ADA upgrades, even though curbs and sidewalks are not typically modified under such projects. Although preventive maintenance and routine maintenance work are not considered an alteration and are not required to follow the guidance, the San Francisco City Attorney has interpreted that pavement resurfacing work does trigger compliance with ADA requirements.

3.4.2 | Affected Environment

This section describes the existing pedestrian and bicycling conditions or the "affected environment" for nonmotorized transportation in the Van Ness Avenue corridor. Pedestrian trips make up 26 percent of total trips to, from, and within the neighborhoods surrounding Van Ness Avenue on a daily basis, exceeding the citywide average of 18 percent. Neither of these figures accounts for walking to reach transit, which is the primary mode for 20 percent of trips in the neighborhoods that surround Van Ness Avenue and 17 percent citywide. Because every transit trip begins and ends as a pedestrian trip, altogether up to 46 percent of trips to, from, or within the neighborhoods surrounding Van Ness Avenue include a walking or bicycling component, indicating the importance of nonmotorized travel in the area along Van Ness Avenue.

Pedestrian trips make up 26 percent of total trips to, from, and within the neighborhoods surrounding Van Ness Avenue on a daily basis, exceeding the citywide average of 18 percent. Because every transit trip begins and ends as a pedestrian trip, altogether up to 46 percent of trips to, from, or within the neighborhoods surrounding Van Ness Avenue include a walking or bicycling component.

3.4.2.1 | PEDESTRIAN CONDITIONS

The existing pedestrian conditions of Van Ness Avenue in the proposed BRT project area are described in this section.

Pedestrian Volumes and Crowding

Van Ness Avenue is characterized by dense development, mixed uses, short block lengths, gentle grades, short distances between destinations, and frequent transit service, both along Van Ness Avenue and on connecting cross streets (e.g., Market, Geary, O'Farrell, and California streets). These factors combine to generate significant pedestrian traffic throughout the corridor. The highest volumes of pedestrian crossings are in the Civic Center area from Grove Street to Market Street. Moderate activity is observed between California and O'Farrell streets, while lower activity intersections are located north of Sacramento Street, coinciding with largely residential areas. In summary, pedestrian crossing activity largely occurs in three areas: (1) Civic Center near City Hall; (2) Market Street due to numerous transit connections; and (3) major transit cross-corridors such as Geary Boulevard and O'Farrell Street (Arup, 2013).

Pedestrians do not experience crowding in Van Ness Avenue crosswalks.

Pedestrians do not experience crowding in Van Ness Avenue crosswalks. Crosswalk density is a measure of the "maneuvering area" provided for each pedestrian crossing the street, indicating the level of crowding, and it is a function of pedestrian volumes, crosswalk dimensions, green time, and expected walking speeds. Table 3.4-1 shows the HCM pedestrian crowding LOS thresholds. Table 3.4-2 displays the pedestrian crowding LOS calculated using the HCM method for the five intersections along Van Ness Avenue with the highest recorded pedestrian count volumes. There are two key assumptions: (1) that pedestrian volumes counted at each intersection are evenly distributed across all four crossings; and (2) that pedestrians arrive evenly spaced at the intersections rather than in platoons due to upstream traffic signals. In cases where crosswalk dimensions differ, the LOS rating reflects the crossing with the lowest score. Given these assumptions, crosswalk density does not appear to be a significant issue at these intersections. All crossings have an LOS A except at Grove Street, which receives an LOS C due to a relatively long and narrow crosswalk on the south side of the intersection and a shorter pedestrian green time than at other intersections.

Table 3.4-1: Pedestrian Crowding LOS Thresholds

LOS	MANEUVERING AREA PER PERSON (SQUARE FEET)
A	> 60
B	40 - 60
C	24 - 40
D	15 - 24
E	8 - 15
F	≤ 8

Source: Highway Capacity Manual (HCM), Transportation Research Board (TRB).

Table 3.4-2: Pedestrian Crowding LOS at High Pedestrian Count Intersections

INTERSECTION	DENSITY LOS CROSSING VAN NESS	DENSITY LOS CROSSING SIDE STREET
Geary	A	A
O'Farrell	A	A
Golden Gate	A	A
Grove	C	A
Market	A	A

Source: VISSIM simulation, HCM.

Crosswalk Conditions

Marked crosswalks are present on all four sides of every signalized intersection along Van Ness Avenue. Crosswalk width across Van Ness Avenue (i.e., the north and south legs of the intersection) vary considerably, from 10 feet at the Fell, Golden Gate, Post, Bush, Pine, and Lombard street intersections to 22 feet at McAllister Street and 24 feet at Market Street.

Typical crosswalks widths are between 12 and 15 feet across Van Ness Avenue. Crosswalks running parallel to Van Ness Avenue (i.e., on the west and east legs of the intersection) are on average 16 feet wide, which corresponds with adjoining sidewalk widths.

Two types of crosswalks are used along Van Ness Avenue – traditional parallel line crosswalks and high-visibility "ladder" crosswalks. Ladder crosswalks are located at Golden Gate, Turk, Pacific, and Broadway; all other intersections employ traditional parallel line crosswalks. Pedestrians have sufficient maneuvering space in crosswalks, even at the busiest crossings.

Each street corner along Van Ness Avenue has at least one curb ramp, allowing access by people in wheelchairs, as well as providing easier travel for those with strollers, carts, and the like; however, many ramps have not yet been upgraded to current City standards, which include the installation of tactile domes for easy identification by visually impaired pedestrians. Many intersections also have only one ramp, which necessitates more maneuvering of a wheelchair to cross the street, places users closer to moving traffic, and can be disorienting to visually impaired pedestrians.

Sidewalk Conditions

Along most of Van Ness Avenue, the sidewalks are 16 feet wide on both sides of the street. On South Van Ness Avenue between Market and Mission streets, the sidewalk is 22 feet wide on both sides. According to the Better streets Plan, Van Ness Avenue sidewalks should be a minimum of 15 feet wide. The existing sidewalks exceed the City's standard of 15 feet for a sidewalk along a commercial thoroughfare (San Francisco Planning Department, 2010). Effective sidewalk width, however, is sometimes reduced due to various streetscape elements, such as bus shelters and passenger waiting areas, trees and landscaping, parking meters, bicycle racks, newspaper racks, trash receptacles, and OCS support poles/ streetlights. At the same time, these features serve to buffer the sidewalk and pedestrians from vehicular traffic. A buffer, whether landscaping or curbside parking, can significantly improve the sidewalk environment and the perception of safety and comfort by pedestrians (PEDSAFE, 2004). Landscaped planters along the sidewalk between Market and McAllister streets in the Civic Center provide additional buffer between pedestrians and traffic, although these also reduce the effective sidewalk width. Nearly all blocks of Van Ness Avenue between Lombard and Mission streets, in both the NB and SB directions, permit some degree of curbside parking (i.e., with 8-foot-wide parking lanes).[54]

Street lighting along Van Ness Avenue is provided by the OCS support pole/streetlight network and is supplemented by lighting from adjacent properties. The existing streetlight network does not meet Illuminating Engineering Society (IES) RP-08 minimum illumination levels for safe roadway lighting on a major arterial/state highway such as Van Ness Avenue. The Van Ness Avenue BRT Feasibility Study (SFCTA, 2006) found pedestrian-scale lighting to be an important amenity that is currently lacking on Van Ness Avenue. The study explains that Van Ness Avenue has a high level of pedestrian night activities, and there is a need to improve visibility for vehicles in the roadway, as well as for pedestrians on the sidewalk.

Crossing Distance, Nose Cones, and Curb Bulbs

The longer the distance needed to cross an intersection, the longer the signal time is needed and the likelihood increases that pedestrians cannot complete the crossing in one signal cycle. Van Ness Avenue is a wide roadway with six mixed-flow traffic lanes. The average crossing distance on Van Ness Avenue is 90 feet (Arup, 2013). The most common crossing distance across Van Ness Avenue is 93 feet, but curb bulbs located at 17 crossings reduce that distance. In addition, the wide median located on some blocks of Van Ness Avenue

[54] The only block that does not permit parking along one side is the block of Van Ness Avenue between Fell and Hayes streets, where no parking is provided along the east side of the block.

serves as a refuge for pedestrians that are unable to finish crossing the street during one light cycle; however, the medians are not consistently located and range in width from 4 to 14 feet. In addition, many of the medians do not extend across the crosswalk to provide a protective nose cone (Arup, 2013). Nose cones provide a physical barrier from traffic, creating a protected space at the crosswalk median to wait for the next signal cycle to finish crossing the street. They are refuges that extend into the crosswalk with ramps or a level cut-through for ADA access. Fourteen (14) Van Ness Avenue intersections are equipped with at least one nose cone, with 3 intersections having nose cones for both the north and south crosswalks. The intersections with nose cones are listed in Table 3.4-3.

Table 3.4-3: Van Ness Avenue Intersections with Nose Cones – Existing Condition

VAN NESS AVENUE INTERSECTION	SOUTH LEG	NORTH LEG
Hayes Street		X
McAllister Street	X	
Golden Gate Avenue	X	
Turk Street		X
Ellis Street		X
O'Farrell Street	X	
Geary Street		X
Post Street	X	X
Sutter Street	X	X
Bush Street	X	
Pine Street		X
California Street	X	X
Sacramento Street		X
Clay Street	X	
Total	8	9

Source: SFMTA Striping Plans, 3/2004 and Topographic Maps 2009.

Crossing distances of side streets along the corridor (i.e., the east and west legs of Van Ness Avenue intersections) are between 38 and 50 feet. The crossing distance is significantly longer in locations with multiple legs, such as the west leg of the Mission Street crossing, which includes the Duboce and Otis streets legs. Crossings along the east and west legs at Market Street, Broadway, and Lombard are longer than normal.

Curb bulbs, also known as corner bulbouts or curb extensions, extend the sidewalk into the intersection and reduce effective curb-to-curb crossing width. Curb bulbs help slower-moving pedestrians finish crossing within one phase of the traffic light cycle. Additionally, curb bulbs increase pedestrian visibility, create a larger pedestrian queuing area, provide additional space for curb ramps (discussed below), produce traffic calming impacts by visually and physically narrowing the roadway, and can provide streetscape and landscaping opportunities. The existing, typical curb bulbs on Van Ness Avenue extend 7 feet into the street and reduce the crossing distance to 86 feet at 17 locations.

Pedestrian Signals

Pedestrian countdown signals visually display the remaining seconds to cross the street, reducing risk for crossing pedestrians. This is especially important on Van Ness Avenue due to the relatively long crossing distances. At crossings without a pedestrian countdown signal, pedestrians can be caught mid-crossing when the light turns yellow with as little as 4 seconds to reach a curb or median refuge, indicating the strong need for pedestrian signals at these intersections. Of the 29 signalized intersections along Van Ness Avenue between Lombard and Mission streets, 15 intersections have pedestrian countdown signals on all crossing legs, 3 intersections have them on some legs, while 11 intersections have no pedestrian signals of any kind (Arup, 2013). Under SFgo, plans call for the installation of pedestrian countdown signals on all legs of every intersection in the Van Ness Avenue corridor by 2015, as noted in the description for the No Build Alternative in Section 2.2.2.

Another type of pedestrian signal is the Accessible Pedestrian Signal (APS). APS is a pedestrian pushbutton that communicates when to cross the street in a nonvisual manner, such as audible tones, speech messages, and vibrating surfaces. According to SFMTA's APS inventory, the following five intersections along Van Ness Avenue are equipped with APS on some or all crossing legs: Market, Fell, Hayes, Grove, and McAllister streets. Under SFgo, plans call for the installation of additional APS on Van Ness Avenue signalized intersections.

Signal Timing

The adequacy of pedestrian crossing time is assessed in several ways. First, traffic signals must be timed so that pedestrians can cross the entire street in the time provided by the "walk" signal time combined with the "flashing don't walk" signal, yellow, and any all-red time before the green signal for opposing traffic begins; this time is referred to as the "walk split". The Federal Highway Administration's (FHWA) MUTCD recommends that pedestrian signals be timed so that the amount of crossing time is adequate for a pedestrian or wheelchair user starting 6 feet back from the curb face to complete the crossing at 3 feet per second (fps). The City of San Francisco seeks to provide enough time for a pedestrian moving at 2.5 fps, where possible.

In addition, guidelines call for pedestrian timing to allow any pedestrian who begins crossing during the "walk" signal to be able to complete the crossing within the combined "flashing don't walk," yellow, and all-red time; this is referred to as the "pedestrian clearance time." The MUTCD recommends that pedestrian signals be timed so that a pedestrian leaving the curb at the end of the "walk" signal and traveling at 3.5 fps reaches the opposite curb before a green signal is given to opposing traffic. Only one crossing along Van Ness Avenue meets the City standard for pedestrian clearance; however, most crossings exceed the minimum "walk" phase interval of 7.0 seconds, so pedestrian clearance guidelines likely could be met for some crossings by simply reducing the "walk" phase length and increasing the "flashing don't walk" phase length. Overall, pedestrian clearance times hover slightly above the 3.5 fps standard, ranging from 3.5 to 5.0 fps.

Pedestrian signal timing on Van Ness Avenue is slightly below City and national standards for crossing speeds at all but one intersection with a pedestrian signal, and at 40 percent of intersections without a pedestrian signal. At crossings with no pedestrian signal, the vehicular yellow light phase is the only indication that the crossing phase is about to end. The clearance time for pedestrians is effectively only 3.5 to 4.5 seconds. Walking speeds to finish this crossing before opposing traffic receives a green signal are up to 21.8 fps, more than six times the FHWA guideline speed for a pedestrian signal clearance phase. This reinforces the importance of a pedestrian signal to provide information to pedestrians on the amount of time remaining to safely cross the street.

Pedestrian Delay

Pedestrian delay reflects the average amount of time an approaching pedestrian must wait before crossing the street. Delay represents one way to evaluate LOS for pedestrians. As wait times increase, pedestrians are also more likely to disregard a traffic signal, potentially increasing the probability of collisions. In addition, pedestrian delay reduces the efficiency of walking as a travel mode. Table 3.4-4 shows the pedestrian delay LOS thresholds, as well as the likelihood of pedestrian noncompliance provided in the Transportation Research Board's (TRB) 2000 HCM.

Table 3.4-4: Pedestrian Delay LOS Thresholds for Signalized Intersections

LOS	AVERAGE DELAY (SECONDS)	LIKELIHOOD OF NONCOMPLIANCE
A	≤ 10.0	Low
B	10.1 - 20.0	
C	20.1 - 30.0	Moderate
D	30.1 - 40.0	
E	40.1 - 60.0	High
F	> 60.0	Very High

Source: Highway Capacity Manual (HCM), Transportation Research Board (TRB).

Using these thresholds, the average delay at all intersections along Van Ness Avenue, shown in Table 3.4-5, is LOS C. Pedestrian delay was simulated using VISSIM. Delay for pedestrians crossing Van Ness Avenue averages LOS D, with between 30 to 40 seconds of delay and a moderate to high likelihood of noncompliance with signals. Pedestrians crossing Mission Street at South Van Ness Avenue fare even worse, with delays between 40 and 60 seconds and a high probability of noncompliance. Pedestrians experience less delay traversing north-south across cross streets along the proposed BRT segment, where delays average 21 seconds.

Pedestrians typically experience twice as much delay at traffic signals along Van Ness Avenue than do vehicle occupants. In general, as wait times increase, pedestrians are less likely to comply with the traffic signal, potentially increasing the probability of collisions.

Table 3.4-5: Pedestrian Delay LOS at Van Ness Avenue Intersections

INTERSECTION	DELAY LOS CROSSING VAN NESS	DELAY LOS CROSSING SIDE STREET	AVERAGE DELAY LOS
Clay	C	B	C
Sacramento	C	B	C
California	C	B	C
Pine	D	C	C
Bush	D	C	C
Sutter	D	B	C
Post	C	B	C
Geary	D	B	C
O'Farrell	D	B	C
Ellis	C	B	C
Eddy	C	B	C
Turk	D	B	C
Golden Gate	D	B	C
McAllister	D	B	C
Grove	D	B	C
Hayes	D	C	C
Fell	D	B	C
Market	D	C	C
Mission	D	E	E
Average	D	C	C

Source: VISSIM simulation, Highway Capacity Manual (HCM).

Pedestrians typically experience twice as much delay at traffic signals along Van Ness Avenue than do vehicle occupants. Pedestrians must typically wait longer to proceed across Van Ness Avenue, with delays averaging 33 seconds. Delays at some crossings are much greater than average; the longest mean wait time is 52 seconds crossing Mission Street at South Van Ness Avenue. By comparison, the longest delay for vehicles at a single intersection approach is 35 seconds, which is also at Mission Street and South Van Ness Avenue.

Major Collision Locations and Vehicle Right-Turn Volumes

Collision information is collected in the California Statewide Integrated Traffic Records System (SWITRS) database. According to SWITRS data from 2003 to 2008, major collision locations coincide with heavy pedestrian volumes at Market Street, in the Civic Center area, and major transit cross-corridors. Of intersections where pedestrian counts were conducted, the Broadway, Geary, and O'Farrell intersections had the highest number of collisions per peak-hour crossing, indicating the highest risk.

Assessing the number of pedestrian collisions by the volume of pedestrians highlights intersections that are high risk. Peak-hour pedestrian crossings at selected intersections are used as a level of exposure in Table 3.4-6. Of locations where counts were conducted, pedestrians crossing at the intersections of Broadway, O'Farrell, Geary, and California streets had the highest risk of collision (note: SWITRS data do not collect time of day; therefore, pedestrian collisions at all times are compared to peak-hour crossings).

The intersections of Broadway, O'Farrell, Geary, and California streets have the highest risk of collisions involving pedestrians within the study area.

Table 3.4-6: Pedestrian Collisions by Location (2003-2008)

VAN NESS AVENUE INTERSECTION	NUMBER OF PEDESTRIAN COLLISIONS	NUMBER OF PEDESTRIAN COLLISIONS INVOLVING SERIOUS INJURY	NUMBER PEDESTRIAN COLLISIONS PER 1,000 PEAK-HOUR CROSSINGS
Mission	2		2.4
Market	2		1.1
Fell	4		
Hayes	2	1	
Grove	4	1	2.7
McAllister	2		
Golden Gate	2		2.1
Turk	3		
Eddy	1		
Ellis			
O'Farrell	4	3	3.9
Geary	4		3.5
Post	3		
Sutter	1		
Bush	1		
Pine	2	1	
California	3		3.3
Sacramento	1		1.6
Clay	1		
Washington			
Jackson	2	1	
Pacific	2	1	
Broadway	2	1	7.1
Vallejo	1	1	
Green	2	1	
Union	1		2.3
Filbert			

Table 3.4-6: Pedestrian Collisions by Location (2003-2008)

VAN NESS AVENUE INTERSECTION	NUMBER OF PEDESTRIAN COLLISIONS	NUMBER OF PEDESTRIAN COLLISIONS INVOLVING SERIOUS INJURY	NUMBER PEDESTRIAN COLLISIONS PER 1,000 PEAK-HOUR CROSSINGS
Greenwich			
Lombard			
Total	52	11	

Source: SWITRS, 2003-08 and pedestrian counts. Risk measures only shown where pedestrian counts collected.

The cause of many pedestrian-vehicle collisions is difficult to determine from SWITRS data because pedestrians were assigned fault in nearly half of all cases, and the most common infraction was an unspecified "pedestrian violation." Drivers were at fault in 40 percent of the collisions, most commonly for failing to yield ROW to pedestrians while executing a left turn. Drivers and pedestrians were also each cited in several cases for failing to obey traffic signs and signals.

The number of vehicular right turns is another factor in pedestrian safety at intersections that affects pedestrians crossing side streets, north or south along Van Ness Avenue. Locations with heavy right-turn volumes generally have more conflicts between vehicles and pedestrians or bicyclists, possibly increasing the number of collisions (Arup, 2013). See Table 3.4-12 for right-turn volumes at each intersection (existing conditions are assumed to be similar to the No Build Alternative).

This analysis using SWITRS data does come with a few caveats. First, there are a range of known factors for pedestrian and vehicle injuries beyond what is provided in SWITRS data. These include environmental factors such as traffic volumes and free-flow speeds, vehicle factors such as size and mass, institutional enforcement of safety laws, roadway design and geometry, and factors related to physical function such as age and disability. Second, pedestrian injuries are undercounted in San Francisco by 20 to 25 percent, resulting in underestimation of risk.[55] Finally, because the number of pedestrian injuries is small, it is possible that the differences in pedestrian injuries may not be fully representative of the difference in risk between those intersections.

Evaluation of Van Ness Avenue According to Universal Design Principles

Universal Design is the design of facilities and environments that are broadly and easily accessible to all people and do not require separated or specialized facilities. Using the Universal Design Principles developed by Ron Mace *et al.* at North Carolina State University, existing pedestrian conditions and access to transit along Van Ness Avenue was also evaluated in terms of its adherence to these principles (The Center for Universal Design, 1997).

Principle #1: Equitable Use. This principle refers to a design that is useful and marketable to people with diverse abilities. Pedestrians on Van Ness Avenue are not segregated either in their use of the sidewalk and street crossings or in their access to transit stops. Locations with curb ramps at all corners allow universal access to the sidewalk and to crosswalks, although access is more difficult at corners with only one ramp and not all ramps meet current City and ADA standards. Median refuges with protective nose cones, where provided (see Table 3.4-3), include a level cut-through in the crosswalk for wheelchair access. Most traffic signals along Van Ness Avenue do not provide equitable use by people with visual impairments because they do not feature APS. Bus stops are located on the sidewalk with no grade change and are accessed in the same manner by all transit users. There is no separate waiting area for passengers with disabilities. All users of buses currently enter through the front door; however, wheelchair users must use a ramp as opposed to

DEFINITION

Universal Design is the design of facilities and environments that are broadly and easily accessible to all people and do not require separated or specialized facilities. For more information, visit: www.ncsu.edu/www/ncsu/design/sod5/cud.

[55] http://www.ncbi.nlm.nih.gov/pubmet/16084782

ambulatory riders that use the steps. In addition, passengers that require a ramp must use the front door to exit the bus versus other users that are able to exit from either the back or the front door. This can limit boarding and exit opportunities for wheelchair users if there are obstacles at bus stops such as street furniture or parked cars.

Principle #2: Flexibility in Use. This principle refers to a design that accommodates a wide range of individual preferences and abilities. Sidewalks along Van Ness Avenue accommodate a range of physical abilities and speeds, but street crossings do not provide as much flexibility. Crossings are long, especially when crossing Van Ness Avenue. Several crosswalks do not have a median refuge, and signal timing typically does not allow for the slower walking speed of 2.5 fps suggested by City guidelines. Median refuges with railings, which are provided on some intersection crossings, allow slower pedestrians to rest before completing the street crossing during the following light cycle. Bus stops are not designed for activities other than waiting; therefore, they are inflexible in use.

Principle #3: Simple and Intuitive Use. This principle describes a design that is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level. The arrangement of pedestrian facilities along Van Ness Avenue is generally standard and intuitive, but locations where a single curb ramp angles toward the middle of the intersection are more disorienting to pedestrians with visual impairments, for whom curb ramps help provide orientation for a street crossing. Bus stops are in typical locations along the curb at street corners and are arranged in a conventional format; therefore, they are consistent with user expectations. Passengers know to wait on the sidewalk near the bus stop sign or bus shelter.

Principle #4: Perceptible Information. This principle refers to a design that communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities. Crosswalks on Van Ness Avenue use traditional and high-visibility markings; however, most traffic signals along Van Ness Avenue do not feature APS and do not provide perceptible information for people with visual impairments. In addition, tactile domes are not provided on all crosswalks for easy identification for people with visual impairments, and the single curb ramps that angle toward the middle of the intersection are disorienting. Bus stop signage and line information is provided only in a visual format and is not accessible to people with limited sight.

Principle #5: Tolerance for Error. This principle refers to design that minimizes hazards and the adverse consequences of accidental or unintended actions. Sidewalks are wide along Van Ness Avenue and generally buffered from moving traffic by street parking, providing significant tolerance for error. Street crossings provide less tolerance because of heavy traffic volumes, especially where crossings are long and refuges are not provided. A bus stop from the sidewalk requires minimal risk if the passenger is on the same side of the street as the stop, but reaching a bus stop on the other side requires crossing six lanes of traffic on Van Ness Avenue, entailing more risk. There is a significant tolerance for error while at a bus stop because the average sidewalk width is 16 feet, and there is traffic only on one side of the bus stop waiting area.

Principle #6: Low Physical Effort. This principle refers to design that can be used efficiently and comfortably with a minimum of fatigue. Van Ness Avenue has few hills, with no grades above 10 percent, and bus stops are located approximately every 700 feet, necessitating relatively low levels of physical effort to reach a transit stop. No significant effort is required to access a bus stop because they are level with the sidewalk. Some bus stops are also equipped with benches, allowing riders to sit and rest when they arrive.

Principle #7: Size and Space for Approach and Use. This principle refers to provision of appropriate size and space in design for approach, reach, manipulation, and use regardless of a user's body size, posture, or mobility. The 16-foot-wide sidewalks and bus stops along Van Ness Avenue provide adequate space to maneuver wheelchairs and other assistive devices. Visually locating a bus stop along Van Ness Avenue may be challenging because streetscape elements often obstruct a clear line of sight to bus stop shelters and signs, and these features are small relative to other structures on the street.

3.4.2.2 | BICYCLE CONDITIONS

Bicyclists using Van Ness Avenue must share travel lanes with automobiles because there are no designated bicycle lanes. Van Ness Avenue is not a popular cycling route due to heavy vehicle volumes and the absence of a bicycle lane. Although some bicyclists choose to use Van Ness Avenue, there is no accurate accounting of the bicycle trip volumes on the street. The San Francisco 2009 Bicycle Count Report does not include any data for Van Ness Avenue locations or intersections. Bicyclists typically use the right-most travel lane adjacent to curbside parking (or adjacent to the curb where parking is not permitted), or ride on the sidewalks. Van Ness Avenue has some U-shaped bicycle parking facilities, and field surveys indicate informal use of trees, posts, and news racks for bicycle parking.

The corridor's designated bicycle route is a Class II/III dedicated facility on Polk Street, which runs parallel to Van Ness Avenue one block east. This facility includes segments of dedicated bicycle lanes (between Market and Post and between Union and Lombard), as well as segments where vehicles and cyclists must share travel lanes (from Union to Post).

Bicycle-related collisions are much less common than pedestrian-related ones on Van Ness Avenue due to the lower volume of bicycle trips. Bicycle-related collisions have typically occurred in the southern end of the proposed BRT segment between Mission Street and Civic Center, which is an area where several designated bicycle routes cross Van Ness Avenue.

3.4.3 | Environmental Consequences

The following analysis identifies potential impacts and benefits for nonmotorized transportation: pedestrians and bicyclists. The analysis compares each build alternative, including the LPA, relative to the No Build Alternative. The build alternatives, including the LPA, are evaluated against applicable standards and, where no quantified standards apply, against the guidance and policies presented in Section 3.4.1.

A build alternative is considered to have an adverse impact on pedestrians or bicyclists if it performs worse than the No Build Alternative. As stated in the project purpose and need, Chapter 1, the intent of the build alternatives is to improve conditions for pedestrians compared to the No Build Alternative, in which case a beneficial impact is identified. If a build alternative performs the same as the No Build Alternative, it is considered to have no impact. The impact and benefit evaluation for nonmotorized transportation follows, presented separately for pedestrian and bicycle modes.

3.4.3.1 | PEDESTRIAN IMPACTS

Potential impacts to pedestrians on Van Ness Avenue are identified by evaluating crossing safety, sidewalk safety, and accessibility for each build alternative.

Pedestrian Crossing Safety

Implementation of any of the build alternatives would not increase pedestrian crossing volumes or cause crosswalk crowding.

Pedestrian Volumes. Table 3.4-7 provides the pedestrian crossing volume forecast for the project alternatives. At a minimum, as shown in Table 3.4-7, the No Build Alternative and Build Alternatives 2, 3, and 4 would have the same pedestrian crossing volumes, with or without incorporation of Design Option B, as would the LPA. Pedestrian volumes would be heaviest in the segment between Market and Grove streets, which also has the heaviest current crossing volumes. Table 3.4-7 shows that implementation of any of the build alternatives would not increase pedestrian crossing volumes or cause crosswalk crowding.[56]

[56] This does not account for the increased pedestrian volumes associated with the increased transit ridership discussed in Chapter 3.2.

Table 3.4-7: Forecast Hourly Pedestrian Crossing Volumes

VAN NESS AVENUE INTERSECTION	ALL PROJECT ALTERNATIVES (1-4)*
Union	440
Clay	950
Broadway	280
Sacramento	640
California	920
Pine	560
Bush	560
Sutter	580
Post	600
Geary	1,140
O'Farrell	1,020
Ellis	1,120
Eddy	1,120
Turk	1,120
Golden Gate	1,160
McAllister	1,200
Grove	1,870
Hayes	670
Fell	1,350
Oak	870
Market	2,280
Mission	880
Duboce	1060

*Approximate forecasted pedestrian crossing volumes for the build alternatives are the same as for the No Build Alternative.

Source: SFCTA, 2012.

Crosswalk Conditions and Crossing Experience. The crossing distances and crosswalk width would not change from existing conditions under the No Build Alternative.

Under the build alternatives, including the LPA, crosswalks would be restriped to meet City standards for crosswalk widths and reduce pedestrian crowding. Crossing distances would vary by build alternative due to geometric design differences in lane configuration and median location. Table 3.4-8 shows the average median refuge width and curb-to-curb pedestrian crossing distances for each build alternative. The average median refuge width for the LPA (not shown in the table) would be 9.5 feet, or 9.6 feet with the Vallejo Northbound Station Variant, which is greater than the No Build Alternative and Build Alternative 3 but less than Build Alternatives 2 and 4.

Table 3.4-8: Average Median Refuge Width and Crossing Distances

ALTERNATIVE	AVERAGE MEDIAN REFUGE WIDTH (FEET)	AVERAGE CROSSING DISTANCE (CURB-TO-CURB) (FEET)
No Build Alternative	9.0	91.1
Build Alternative 2	11.8	86.4
Build Alternative 3	6.0	89.5
Build Alternative 3 with Design Option B	6.4	88.7
Build Alternative 4	12.8	88.8
Build Alternative 4 with Design Option B	13.4	87.6

Note: The average median refuge width for Build Alternative 3 (with or without Design Option B) includes both medians, which are approximately 4 and 9 feet wide.

Source: SFCTA, 2012.

The north-south crossing distance at side streets would not change from existing conditions under the No Build Alternative and build alternatives, including the LPA.

Under the build alternatives, the east-west crossing distances across Van Ness Avenue would be reduced due to the addition of curb bulbs. In addition, each of the build alternatives, including Design Option B and the LPA, would incorporate median refuges with nose cones at all signalized intersections.

The distance to cross Van Ness Avenue itself (east-west) would not change from existing conditions under the No Build Alternative. Under the build alternatives, including the LPA, the east-west crossing distances across Van Ness Avenue would be reduced due to the addition of curb bulbs. The crossing distance for the LPA would be 89.4 feet, which on average is 1.7 feet less than existing conditions and the No Build Alternative. The crossing distance for the LPA would be longer by 0.6-foot to 2.9 feet compared to the other build alternatives, with the exception of Build Alternative 3 without Design Option B, which is longer than the LPA by 0.1-foot. Notably, the pedestrian conditions analysis for the LPA reflects Caltrans' new guidance in the 2012 Highway Design Manual, which effectively results in a narrower 5-foot-wide dimension for curb bulbs on Van Ness Avenue[57] compared to the 66-foot-dimension assumed for the other build alternatives. Thus, Build Alternatives 2 through 4, with or without Design Option B, would have a slightly greater crossing distance if the new Caltrans standard were to be applied in a similar manner as it was applied to the LPA.

In addition, each of the build alternatives, including Design Option B and the LPA, would incorporate median refuges with nose cones at all signalized intersections, which would substantially improve pedestrian crossing conditions. On average, Build Alternatives 2 and 4 would provide median refuges wider than under the No Build Alternative. Build Alternative 3 would result in a higher number of narrow median refuges than under the No Build Alternative, as indicated in Table 3.4-8. The LPA, with or without the Vallejo Northbound Station Variant, would provide median refuges consistently 6 feet or wider (only one refuge would be narrower than 6 feet, at Mission/South Van Ness Avenue – a result of an existing condition) compared to the No Build Alternative, which has 27 median refuges that are less than 6 feet wide.

The proposed build alternatives, including Design Option B, would improve signal and timing conditions and meet required crossing speeds for pedestrians at nearly all intersections.

Under the No Build Alternative, the SFgo Program would install pedestrian countdown signals on all crosswalk legs and curb ramps with tactile domes that meet current City standards and ADA requirements at all signalized intersections along Van Ness Avenue, as well as APS at some additional signalized intersections by 2015. The build alternatives, including the LPA, would provide pedestrian countdown signals, curb ramp upgrades, and APS at all signalized intersections on Van Ness Avenue, resulting in improved pedestrian crossing safety.

[57] Caltrans. 2012. Highway Design Manual. May 7. (http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm#hdm). Note the standard is for a 3-foot-wide buffer between the edge of the travelway and a curb bulb. Given the design constraints along Van Ness Avenue, the standard results in a 5-foot-wide curb bulb.

Pedestrian Signals and Timing. To evaluate signal timing, a crossing speed analysis was undertaken to estimate how quickly pedestrians would have to cross an intersection given the allotted signal time, also known as the full walk split (Arup, 2013). To compare average crossing speed performance among project alternatives, the number of intersections meeting FHWA (3.0 fps for full walk split) and City (2.5 fps for full walk split) targets is identified and compared to the No Build Alternative condition. The number of intersections meeting these walking speed targets for side street crossings is presented for each build alternative in Table 3.4-9. All of the build alternatives, including the LPA, would have the same number of side street crossings meeting the City and FHWA targets as the No Build Alternative and thus the same number of crossings (i.e., one, at Mission Street) that do not meet the FHWA target of 3.0 fps or slower.

Table 3.4-9: Side Street Crossings Meeting City and FHWA Walking Speed Targets during Full Walk Split

MEASURE	NO BUILD ALT.	BUILD ALT. 2	BUILD ALT. 3	BUILD ALT. 3 WITH DESIGN OPTION B	BUILD ALT. 4	ALT. 4 WITH DESIGN OPTION B
Number of crossings meeting City target of 2.5 fps for full walk split	27	27	27	27	27	27
Number of crossings meeting FHWA guideline of 3.0 fps for full walk split	28	28	28	28	28	28
Number of crossings exceeding FHWA guideline of 3.0 fps for full walk split[1]	1	1	1	1	1	1

1 The Mission Street crossing exceeds the FHWA target of 3.0 fps.

Source: SFCTA, 2012.

The number of intersections meeting the FHWA and City targets for east-west Van Ness Avenue crossings is presented in Table 3.4-10. Under the LPA (not shown in the table), 6 intersections would meet the City target and 24 intersections would meet the FHWA target, with 5 not meeting the FHWA standard. All of the build alternatives, including the LPA, would have more east-west Van Ness Avenue crossings that meet the City and FHWA targets than the No Build Alternative and, conversely, fewer crossings exceeding FHWA targets; therefore, the build alternatives, including the LPA, would improve conditions and meet required crossing speeds for pedestrians at nearly all intersections.

Table 3.4-10: Van Ness Crossings Meeting City and FHWA Walking Speed Targets during Full Walk Split

MEASURE	NO BUILD ALT.	BUILD ALT. 2	BUILD ALT. 3	BUILD ALT. 3 WITH DESIGN OPTION B	BUILD ALT. 4	ALT. 4 WITH DESIGN OPTION B
Number of crossings meeting City target of 2.5 fps for full walk split	3	14	8	8	8	8
Number of crossings meeting FHWA guideline of 3.0 fps for full walk split	21	27	25	25	25	25
Number of crossings exceeding FHWA guideline of 3.0 fps for full walk split	8	2	4	4	4	4

Source: SFCTA, 2012.

The build alternatives would not increase pedestrian delay at any intersection to LOS E or F and would not increase pedestrian delay at Mission Street, which already operates at LOS E, by more than 5 percent.

Pedestrian Delay. TRB's HCM provides thresholds for evaluating pedestrian delay, as described in Section 3.4.2.1. A build alternative would be considered to have an impact if it would cause an intersection that performs at LOS A through D under the No Build Alternative to perform with a pedestrian delay LOS of E or F or worsens pedestrian delay by more than 5 percent at an intersection that is already operating at pedestrian delay LOS E or F. Table 3.4-11 shows how the build alternatives would compare to the No Build Alternative in terms of average pedestrian delay and resulting LOS. The LPA (not shown in the table) would perform the same as Build Alternatives 3 and 4 with Design Option B. Pedestrian delay calculations are not available for the ten northernmost intersections in the study corridor. Of the intersections where data is available, only one intersection – Mission Street – currently operates at pedestrian LOS E. Based on these criteria, the build alternatives, including Design Option B and the LPA, would not have an impact because they would not increase pedestrian delay at any intersection currently operating at LOS A through D to operate at LOS E or F and would not increase pedestrian delay at Mission Street by more than 5 percent.

Table 3.4-11: Pedestrian Delay on Van Ness Avenue (seconds)

VAN NESS AVENUE INTERSECTION	EXISTING CONDITION (2007)		NO BUILD ALTERNATIVE		BUILD ALTERNATIVE 2		BUILD ALTERNATIVES 3 AND 4		BUILD ALTERNATIVES 3 AND 4 WITH DESIGN OPTION B	
	AVG. PED. DELAY[1]	LOS	AVG. PED. DELAY	LOS	AVG. PED. DELAY	LOS	AVG. PED. DELAY	LOS	AVG. PED. DELAY	LOS
Duboce (on Mission)	25	C	36	D	26	C	27	C	27	C
Mission	45	E	45	E	47	E	46	E	44	E
Market	29	C	33	D	35	D	35	D	35	D
Fell	25	C	24	C	28	C	30	C	28	C
Hayes	25	C	29	C	30	D	30	C	30	D
Grove	28	C	32	D	34	D	31	D	30	D
McAllister	24	C	26	C	27	C	29	C	27	C
Golden Gate	23	C	24	C	32	D	30	C	27	C
Turk	23	C	24	C	26	C	24	C	26	C
Eddy	22	C	22	C	27	C	27	C	25	C
Ellis	22	C	21	C	22	C	22	C	23	C
O'Farrell	22	C	24	C	26	C	24	C	24	C
Geary	22	C	24	C	26	C	26	C	26	C
Post	22	C	26	C	27	C	29	C	26	C
Sutter	23	C	26	C	27	C	27	C	26	C
Bush	26	C	30	C	35	D	30	C	36	D
Pine	29	C	33	D	32	D	28	C	33	D
California	22	C	255	C	27	C	27	C	26	C
Sacramento	23	C	25	C	27	C	28	C	30	D
Clay	22	C	23	C	26	C	26	C	24	C
Washington – Lombard	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 3.4-11: Pedestrian Delay on Van Ness Avenue (seconds)

VAN NESS AVENUE INTERSECTION	EXISTING CONDITION (2007)		NO BUILD ALTERNATIVE		BUILD ALTERNATIVE 2		BUILD ALTERNATIVES 3 AND 4		BUILD ALTERNATIVES 3 AND 4 WITH DESIGN OPTION B	
	AVG. PED. DELAY[1]	LOS	AVG. PED. DELAY	LOS	AVG. PED. DELAY	LOS	AVG. PED. DELAY	LOS	AVG. PED. DELAY	LOS
TOTAL INTERSECTIONS BY PEDESTRIAN DELAY LOS										
LOS A		0		0		0		0		0
LOS B		0		0		0		0		0
LOS C		19		15		13		13		17
LOS D		0		4		6		6		2
LOS E		1		1		1		1		1
LOS F		0		0		0		0		0

*Note: Pedestrian delay is provided in seconds. The delay seconds are approximate and could vary by ±3.0 seconds. This variation would not affect impact findings.

Major Collision Locations, Vehicle Right-Turn Volumes, and Left-Turn Opportunities. By reducing pedestrian crossing risk, as discussed above, all BRT alternatives would help to reduce the likelihood of collisions with pedestrians, including at those locations identified in Section 3.4.2.1. In addition, vehicle right-turn volumes were projected to determine areas with higher right-turn volumes; higher right-turn volumes are associated with more conflicts between vehicles and pedestrians or bicyclists. Table 3.4-12 shows the number of locations with right turns, grouped by hourly right-turn volume for each project alternative. The LPA (not shown in the table), with or without the Vallejo Northbound Station Variant, would perform similarly to Build Alternatives 3 and 4 with Design Option B. Right turns, in this case, include vehicles turning from side streets onto Van Ness Avenue and vehicles turning from Van Ness Avenue onto side streets. Project alternatives with fewer high-volume turning locations and more low-volume locations are considered safer for pedestrian crossings, as well as bicycle travel. The table indicates an improvement in pedestrian conditions: under all of the build alternatives and the LPA, there would be fewer locations with 151 or greater right turns per hour and more locations with 50 or fewer right turns per hour compared to the No Build Alternative.

Table 3.4-12: Right-Turn Locations by Hourly Volume

ALTERNATIVE	NUMBER OF RIGHT-TURN LOCATIONS BY HOURLY VOLUME				
	0-50 RIGHT TURNS/ HOUR	51-100 RIGHT TURNS/ HOUR	101-150 RIGHT TURNS/ HOUR	151-200 RIGHT TURNS/ HOUR	200 + RIGHT TURNS/ HOUR
No Build Alternative	13	23	11	11	5
Build Alternative 2	16	23	14	6	4
Build Alternatives 3 and 4	16	23	14	6	4
Build Alternatives 3 and 4 with Design Option B	16	21	16	6	4

Note: Total number of right-turn locations varies slightly by project alternative as simulated by the traffic operations models.

Source: SFCTA, 2010.

Finally, the build alternatives, including the LPA, would reduce the number of left-turn movements and allow left-turn movements only during a dedicated left-turn signal phase at the remaining left-turn pockets. This would also reduce conflicts between pedestrians and turning vehicles. In existing conditions, the most common reason cited for auto-pedestrian collisions on Van Ness Avenue, when drivers are at fault, is that of auto drivers failing to yield ROW to pedestrians when making left turns.

Overall, all of the build alternatives (including Design Option B) and the LPA would perform better than the No Build Alternative for collision reduction on Van Ness Avenue. In addition to incorporating crossing safety features as discussed in previous sections, the build alternatives would generally have fewer locations with high volumes of right-turning vehicles (with more than 150 right-turn movements per hour), more lower-volume right-turn locations (with 150 or fewer right-turn movements per hour), and fewer left-turn locations with vehicles only making left turns during a dedicated left-turn signal phase for Build Alternatives 3 and 4, with or without Design Option B. In addition to the above, the Van Ness Avenue corridor study area, which encompasses streets parallel to Van Ness Avenue from Gough to Hyde streets (see Chapter 3.3), would have an overall reduction in private vehicle volumes with the implementation of BRT. As noted in Section 3.4.2, a reduction in traffic volumes is associated with a reduction in pedestrian collisions.

It should be noted that Build Alternatives 3 and 4, and the LPA, would require all passengers to cross a portion of the street with every boarding and alighting to access the center platforms. Under Build Alternatives 3 and 4, and the LPA, passengers with a one-way trip could be exposed to additional traffic that they would not be exposed to under the side platforms of Build Alternative 2 and the No Build Alternative; however, most trips are round-trip, and passengers' exposure on the return trip in the opposite direction would be reduced by the same amount (because the person would only need to cross from the center median to the side of Van Ness Avenue instead of all the way across the road as under Build Alternative 2 and the No Build Alternative). Thus, the net amount of pedestrian exposure would be the same for all build alternatives, including the LPA, and the No Build Alternative.

Sidewalk Safety

This section evaluates pedestrian sidewalk safety along Van Ness Avenue. Standards and thresholds have not been established by the City or other regulatory bodies to measure how various factors influence sidewalk safety, so a qualitative assessment of sidewalk safety is presented drawing upon City policies and plans presented in Section 3.4.1.

Pedestrian sidewalk safety, or the perception of safety, is influenced by many factors, including the width of the sidewalk, the level of pedestrian activity on the sidewalk, the amount of space between moving traffic on the roadway and pedestrians, and the presence of objects that help buffer roadway activity from pedestrians on the sidewalk (i.e., parked cars, grade separations, fences, trees, and landscaping).

Under the No Build Alternative, sidewalk conditions along Van Ness Avenue would not change from what they are now, with the exception of improved sidewalk lighting that would occur with replacement of the OCS support pole/streetlight network. New lighting would meet current lighting requirements for safety and would improve the pedestrian environment. Street furniture, sidewalk width, and street parking spaces would remain.

Each of the build alternatives would result in improvements to sidewalk safety and comfort through the creation of curb bulbs, removal of existing bus shelters from sidewalks, and improved sidewalk lighting.

Under the build alternatives, including the LPA, the average sidewalk width of 16 feet would remain the same throughout Van Ness Avenue. Replacement of the OCS support pole/streetlight network under the build alternatives, including the LPA, would result in improved pedestrian lighting, which would improve sidewalk safety. Existing bus stop shelters and signage would be removed from the sidewalk because proposed BRT stations would be located on curb extensions or in the median, and they would not take up sidewalk space as do existing bus shelters. This would open up sidewalk space over conditions in the No Build Alternative. Moreover, curb bulbs proposed under the build alternatives, including the LPA, would create additional sidewalk space available to pedestrians compared to the No Build Alternative condition.

Streetscape features, such as curbside parking, sidewalk trees, landscaped planters, newspaper racks, and bicycle racks, would continue to serve as a buffer between the sidewalk and vehicular traffic throughout most of the corridor; however, each build alternative, including the LPA, would result in the removal of curbside parking along some blocks of Van Ness Avenue, as described in Section 3.5, Parking. Table 4.2-11 in Section 4.2, Community Impacts, lists the locations where a substantial reduction in parking would occur under each build alternative compared with the existing condition. As noted in detail in Table 4.2-10, parking would be completely removed, or nearly completely removed along both sides of the block on the following blocks of Van Ness Avenue:

- Between Sutter and Bush streets under the LPA;
- Between Bush and Pine streets under Build Alternative 4 without Design Option B;
- Between Sacramento and Clay streets under the LPA;
- Between Jackson and Pacific streets under the LPA;
- Between Broadway and Vallejo Street under Build Alternatives 3 and 4, with or without Design Option B, and the LPA; and
- Between Vallejo and Green streets under the LPA, including with the Vallejo Northbound Station Variant.

The following blocks are the only two locations where parking would be removed on the same side of the street for two consecutive blocks. For these blocks in the Civic Center, curbside planters are located between the sidewalk and street, serving as a buffer between the sidewalk and vehicular traffic. Under the LPA, the project proposes to implement an approximate 2-foot-wide buffer, possibly in the form of planters, on the blocks between Geary and O'Farrell streets and Broadway and Green Street on both sides of the street due to the lack of a buffer provided by a parking lane or planters on those blocks.

- Between Market and Fell streets under Build Alternative 3 with or without Design Option B (west side);
- Between Fell and Hayes streets under Build Alternative 3 without Design Option B, and under Build Alternative 4 without Design Option B (west side);
- Between Broadway and Vallejo Street under Build Alternatives 3 (east and west sides) and 4 (east and west sides), with or without Design Option B, and the LPA (east and west sides);[58] and
- Between Vallejo and Green streets under the LPA (east and west sides).[59]

Thus, the Van Ness Avenue corridor would retain a fairly even distribution of most curbside parking throughout the corridor under all of the build alternatives, including the LPA, and the loss of the street parking buffer on limited blocks under the build alternatives, including the LPA, would not substantially change overall sidewalk safety and comfort along Van Ness Avenue. The LPA would also include guardrails along the sidewalk side of the platform, except at station entrances next to crosswalks, as described for Alternative 3 in the Draft EIS/EIR. This design would reduce the amount of transit riders crossing outside of crosswalks to reach the station. In summary, each of the build alternatives (including Design Option B) and the LPA would result in improvements to sidewalk safety through the creation of curb bulbs, removal of existing bus shelters from sidewalks, and improved sidewalk lighting. Removal of a street parking buffer would occur in limited locations under the build alternatives, including the LPA; however, most street blocks would retain a street parking buffer.

All of the proposed build alternatives would result in overall improvements on the Universal Design principle of Equitable Use on Van Ness Avenue in comparison to the No Build Alternative.

Pedestrian Accessibility

Pedestrian accessibility is evaluated by application of the Universal Design principles. The seven principles of Universal Design described in Section 3.4.2.1 are used to evaluate the

[58] Parking would be removed on both sides of the street for the LPA with the Vallejo Northbound Station Design Variant.
[59] Ibid.

project alternatives. This analysis reviews the extent to which each alternative meets the needs of all users, while recognizing that different users may have different concerns. Some may be more interested in faster transit service through the corridor, while others prefer more frequent transit stops; therefore, the performance of each alternative is evaluated qualitatively with a description of the advantages and disadvantages if offers to users of different preferences.

Equitable Use. Each of the build alternatives, including the LPA, would benefit wheelchair users by installing raised station platforms to allow level or near level boarding. Wheelchair users would be able to roll directly onto the bus, entering just as other riders do, with all of the build alternatives, including the LPA. Under the No Build Alternative, new buses planned for the corridor by 2015 would ease vehicle access for most passengers by providing low-floor boarding; however, these buses would not provide level or near level boarding so wheelchair users would continue to use a separate wheelchair lift or ramp to enter and exit buses.

Transit stations under the No Build Alternative would be accessed in the same manner by all persons, as bus stops would remain as they currently exist. Under Build Alternative 2, BRT stations would be located on sidewalk extensions that would be accessed by a short ramp from the sidewalk and would be accessible to all persons. Steps would provide an additional means for ambulatory customers to reach the platform, resulting in differing platform access routes. Under Build Alternatives 3 and 4 and the LPA, center-lane BRT stations would be located on raised platforms accessed by a short ramp from the crosswalk. Transit waiting areas are shared between all users under each build alternative, including the LPA.

Sidewalk accessibility under the No Build Alternative would improve through implementation of the following SFgo initiatives: upgrade of curb ramps at all intersections along Van Ness Avenue to allow universal access to the sidewalk and to crosswalks, including access by people in wheelchairs and those with visual impairments through tactile domes; installation of APS at some signalized intersections to ease street crossings and transit access for pedestrians with limited vision; and installation of pedestrian countdown signals on all crosswalk legs at all signalized intersections along Van Ness Avenue. The build alternatives, including the LPA, would include the same aforementioned improvements to sidewalk accessibility, but to a greater extent than under the No Build Alternative because APS would be installed at all signalized intersections and curb bulbs would be installed at most signalized intersections to improve visibility between motorists and pedestrians, shorten the crossing distance across Van Ness Avenue, and reduce the speed of right-turning traffic. In addition, the removal of existing bus stops from the sidewalk, as proposed under the build alternatives, would open up additional sidewalk space.

In summary, all of the build alternatives, including the LPA, would result in overall improvements to Equitable Use on Van Ness Avenue in comparison to the No Build Alternative.

The BRT build alternatives improve pedestrian street crossings along Van Ness Avenue to accommodate a greater range of physical abilities. All of the proposed build alternatives would improve on the Universal Design principle of Flexibility in Use relative to the No Build Alternative.

Flexibility in Use. The No Build Alternative would not change Flexibility in Use characteristics of Van Ness Avenue. There would be no significant difference in Flexibility in Use of the BRT system between the build alternatives; however, the BRT build alternatives, including the LPA, improve pedestrian street crossings along Van Ness Avenue to accommodate a greater range of physical abilities. Under the No Build Alternative, the average crossing distance of Van Ness Avenue would remain approximately 91 feet, as summarized in Table 3.4-8. This distance is reduced by an average of nearly 5 feet under Build Alternative 2, an average of approximately 1-foot under Build Alternative 3, an average of approximately 2 feet under Build Alternative 4 with incorporation of corner bulbs, and an average of 1.7 feet under the LPA. All of the build alternatives, including the LPA, would reduce the crossing distances to median refuges through construction of corner bulbs, making it easier for slower pedestrians to reach a resting area if they are unable to cross the street during one light cycle. Table 3.4-13 provides the number of corner bulbs to be provided under all of the build alternatives. The LPA would provide 30 corner bulbs in the SB direction and 34 corner bulbs in the NB direction for a total of 64 corner bulbs. The average distance to a refuge would remain 41 feet under the No Build Alternative and decrease to between 37 and 38 feet under Build Alternatives 2 and 4 (39 feet with the LPA). Build Alternative 3 (including Design Option B) has two narrower medians at each intersection rather than a single wide median under other build alternatives; as a result, distances to the nearest median are shorter, averaging 27 to 28 feet, but there is less refuge space at each median. If the 4-foot medians in Build Alternative 3 are considered less than standard from a Universal Design standpoint, then the average distance to the larger, 9-foot refuge in Build Alternative 3 (and the stations in the LPA) would be similar to the distance under Build Alternatives 2 and 4; however, the distance to the 9-foot refuge (or station location for the LPA) from the curb would be different depending on the direction of crossing, because the median (or station location) configuration changes throughout the alignment. For example, the 9-foot refuge is located closer to the east curb when it provides a NB station and closer to the west curb when it provides a SB station. Thus, under Build Alternative 3 (and at station locations under the LPA), people would need to travel a longer distance to reach a refuge at some intersections in comparison to Build Alternatives 3 and 4 and the No Build Alternative.

All of the build alternatives, including the LPA, would include the installation of median nose cones at intersections, providing refuge space for slower pedestrians to rest if they are unable to cross the street during one light cycle. As detailed in Table 3.4-14, the build alternatives would provide between 52 and 55 median nose cones (56 for the LPA), with one at nearly every crossing, compared with 17 under the No Build Alternative. The LPA would provide median nose cones at all 29 intersections, with 28 median nose cones on a south leg of an intersection and 28 median nose cones on a north leg of an intersection for a total of 56 median nose cones.

Table 3.4-13: Number of Corner Bulbs by Alternative along Van Ness Avenue

ALTERNATIVE	CORNER BULBS IN SB DIRECTION	CORNER BULBS IN NB DIRECTION	TOTAL CORNER BULBS
No Build Alternative	14	15	29
Build Alternative 2	39	34	73
Build Alternative 3	25	26	51
Build Alternative 3 with Design Option B	31	28	59
Build Alternative 4	29	30	59
Build Alternative 4 with Design Option B	35	35	70

Source: SFCTA, 2010.

Table 3.4-14: Number of Nose Cones along Van Ness Avenue

ALTERNATIVE	INTERSECTIONS WITH NOSE CONES	NOSE CONES ON SOUTH LEG INTERSECTION	NOSE CONES ON NORTH LEG INTERSECTION	TOTAL NOSE CONES
No Build Alternative	14	8	9	17
Build Alternative 2	29	28	27	55
Build Alternative 3	26	26	26	52
Build Alternative 3 with Design Option B	26	26	26	52
Build Alternative 4	28	27	27	54
Build Alternative with Design Option B	28	27	27	54

Source: SFCTA, 2010.

Under Build Alternative 2 an additional 11 Van Ness Avenue intersections would meet the City's standard for walking speed of 2.5 fps at a crossing, while an additional 5 intersections would meet this standard under Build Alternatives 3 and 4 (including Design Option B). Under the LPA, an additional 3 intersections would meet this standard compared to the No Build Alternative. Under each build alternative, all of the intersections would meet the FHWA guidelines for a walking speed of 3 fps or less, with the exception of crossing Van Ness Avenue at Lombard and Mission streets, and crossing Mission Street at South Van Ness Avenue. For Build Alternatives 3 and 4 (including Design Option B and the LPA), crossing Van Ness Avenue at Jackson Street and Broadway would also require speeds slightly above this threshold (3.1 and 3.2 fps, respectively). The build alternatives, including the LPA, would also require a 3.2-fps speed crossing Van Ness Avenue at Filbert Street. Overall, the build alternatives would provide a significant improvement over the No Build Alternative, which has 9 intersections in the study that exceed the FHWA guidelines.

All of the build alternatives (including Design Option B and the LPA) would improve Flexibility in Use relative to the No Build Alternative.

Under Build Alternatives 3 and 4, locating and accessing transit stops may be more difficult for some users than under Build Alternative 2 and the No Build Alternative (Alternative 1) because the center-lane BRT stations would not be typical. Passengers would need to perceive that these BRT stations are located in the center of the street.

Simple and Intuitive Use. Under the No Build Alternative, the arrangement of pedestrian facilities on Van Ness Avenue would continue to be generally simple and intuitive, and it would improve through the provision of SFgo initiatives, including upgrade of curb ramps to remove ramps that point toward the middle of the intersection and installation of tactile domes, installation of APS at some signalized intersections, and installation of pedestrian countdown signals on all crosswalk legs at all signalized intersections.

Another change in Simple and Intuitive Use that would occur under the build alternatives is clear differentiation of space between pedestrian areas and transit waiting areas. This arrangement is likely to be more intuitive than under the No Build Alternative, where passengers would continue to wait on the sidewalk near the bus stop. Under Build Alternatives 3 and 4 and the LPA, locating and accessing transit stops may be more difficult for some users than under Build Alternative 2 and the No Build Alternative because the center-lane BRT stations would not be typical. Passengers would need to perceive that these BRT stations are located in the center of the street. Build Alternative 4 may be particularly challenging because users would need to determine the direction the bus platform serves because similar looking platforms would serve NB only, SB only, or both NB and SB bus service at different locations. Under Build Alternatives 3 and 4 and the LPA, passengers would also disembark buses on a platform with traffic on both sides, which may be disorienting. Build Alternative 3 and the LPA may be particularly challenging because the platform is relatively narrow. These challenges could also be mitigated or minimized with a comprehensive wayfinding system that would allow all users to navigate to and from the correct platform. Moreover, median transit stops are not without precedent. Many existing Muni light rail and bus stops are located at center islands, including the light rail stations on the T-Third, Market Street, 19th Avenue, and the Embarcadero.

Build Alternatives 3 and 4 may provide slightly less intuitive transit access than Build Alternative 2 and the No Build Alternative, but the Universal Design principle of Simple and Intuitive Use could be optimized through design measures.

The low-floor buses and raised platforms to be used in all of the build alternatives would allow wheelchairs to roll directly on and off the bus at BRT stations along Van Ness Avenue, providing easier access to most patrons at all stops within the BRT corridor. Outside the BRT corridor, wheelchair users would board and exit through the front right door, which would deploy a ramp. Wheelchair users would be able to board and exit through the same door under Build Alternatives 2 and 3 (including Design Option B) and the LPA. Under Build Alternative 4, all passengers, including wheelchair users, would board and exit from the left-side doors within the BRT corridor; these doors are located behind the driver. Under Build Alternative 4 (including Design Option B), wheelchair users that board within the BRT corridor to travel to a destination outside the corridor would need to negotiate to the opposite side of the bus (and vice-versa). Moreover, they would also need to make their way to the front of the bus to exit from the right-side front door outside the BRT corridor (and vice-versa). For Build Alternative 4, bus design should incorporate an intuitive seating space for users requiring level or near level boarding that is easily accessible to both the front door on the right side and the door behind the operator on the left side. In addition, stop announcements of which door will open could be used to help clarify confusion for passengers. As part of project implementation, sufficient information would be provided to inform ambulatory passengers that board at BRT stations that they would need to exit through the front, right doors for stops outside the Van Ness Avenue corridor.

In summary, the arrangement of pedestrian facilities along Van Ness Avenue would remain generally standard and intuitive under all of the build alternatives (including Design Option B) and the LPA. Build Alternatives 3 and 4 and the LPA may provide slightly less intuitive transit access than Build Alternative 2 and the No Build Alternative. Simple and Intuitive Use could be optimized through the following design measures:

- Comprehensive wayfinding system allowing all users to navigate to and from the correct platform;
- For Build Alternative 4, bus vehicle design should incorporate an intuitive seating space for users requiring level or near level boarding that is easily accessible to both the front door on the right side and the door behind the operator on the left side;
- For Build Alternative 4, stop announcements of which door will open could be used to help clarify any confusion for passengers.
- Sufficient information should be provided to inform less ambulatory passengers that board at BRT stations that they would need to exit through the front, right doors for stops outside the Van Ness Avenue corridor.

Perceptible Information. Under the No Build Alternative, the arrangement of pedestrian facilities would remain generally standard and intuitive, and improvements with the SFgo initiatives would include upgrade of curb ramps to remove all existing, disorienting curb ramps that angle toward the middle of intersections and replace them with curb ramps angled toward crosswalks at all intersections; installation of APS at some signalized intersections to ease street crossings and transit access for pedestrians with limited vision; and installation of pedestrian countdown signals on all crosswalk legs at all signalized intersections along Van Ness Avenue. The build alternatives, including the LPA, would include the same improvements, but to a greater extent than under the No Build Alternative because APS would be installed at all signalized intersections, and curb bulbs would be installed at most signalized intersections.

Under the center-lane configured BRT alternatives (Build Alternatives 3 and 4, including Design Option B, and the LPA), it may be more difficult for some users to perceive how to access the BRT stations, because the route from the sidewalk to the platform is less clear and direct than to a platform that is on the sidewalk or on a curb extension. Center-lane located BRT stations may be more difficult for some users to reach because they would require crossing a portion of the street, then turning up a ramp to enter the platform. To maximize perceptible information, all proposed BRT platforms should include ample wayfinding and nonvisual detection. Nonvisual detections, such as audible sounds or changes in pavement feel, could help improve nonvisual perception of the station location for center-lane configured alternatives.

Center-lane located BRT stations may be more difficult for some users to reach because they would require crossing a portion of the street, then turning up a ramp to enter the platform. To maximize perceptible information, all proposed BRT platforms should include ample wayfinding and detection.

Visual identification of transit stops would improve under the proposed project due to upgraded shelters, platforms, lighting, and signage. BRT alternatives with center-lane located stations (Build Alternatives 3 and 4 and the LPA) would likely be the easiest to identify because their location in the center of the street improves the line of sight to stations and lends additional visual prominence relative to stations on the side of the street; however, as noted in the “Simple and Intuitive” section above, under Build Alternative 4, the direction of bus travel at a given platform could be more difficult to perceive for some users.

In summary, Build Alternatives 3 and 4 (including Design Option B), and the LPA, may provide less perceptible information for transit station access than the No Build Alternative. Build Alternative 2 would provide more perceptible information than the No Build Alternative.

Tolerance for Error. Under the No Build Alternative, sidewalks would remain buffered from moving traffic by street parking, which provides significant tolerance for error, and street crossings would remain long, providing less tolerance. Bus patrons would continue to access bus stops from the sidewalk, which requires minimal risk.

Bus patrons would continue to access the BRT stations from the sidewalk under Build Alternative 2, offering minimal risk. Sidewalks would generally remain buffered from moving traffic by street parking, although some parking spaces would be removed in comparison to the No Build Alternative, as discussed in the sidewalk safety section, above. Under Build Alternative 2, street crossing distances would be shortened through provision of curb bulbs, and median refuges would be improved with protective nose cones and level cut-through for wheelchair access. These two aforementioned features would increase Tolerance for Error over the No Build Alternative.

Build Alternatives 2 and 4 would improve on the Universal Design principle of Tolerance for Error relative to the No Build Alternative with improved street crossings, but Build Alternative 3 and the LPA would decrease tolerance for error because of its narrower platforms located between traffic lanes.

The Tolerance for Error is less for accessing the BRT stations in the center-lane alternatives, including the LPA, relative to the No Build Alternative and Build Alternative 2 because users must cross a portion of the street before accessing the platform. Under Build Alternative 3 and the LPA, stations have the least Tolerance for Error because the platforms are the most narrow (approximately 9 feet in width) and because they have moving traffic on both sides: mixed-flow traffic on one side and bus lane traffic on the other side. Build Alternative 4 offers a greater Tolerance for Error for waiting passengers because the platforms are wider (approximately 14 feet), allowing passengers to wait farther from moving traffic. Under Build Alternatives 3 and 4 and the LPA, sidewalks would generally remain buffered from moving traffic by street parking; however, some additional parking spaces would be removed in comparison to the No Build Alternative, including cases where an entire street block or one side of a street block would lose street parking (see the sidewalk safety section, above). Under Build Alternatives 3 and 4 and the LPA, street crossing distances would be shortened through provision of curb bulbs (see Table 3.4-12), and median refuges would be improved with protective nose cones and level cut-through for wheelchair access, which would increase Tolerance for Error.

In summary Build Alternatives 2 and 4 (including Design Option B) would increase Tolerance for Error relative to the No Build Alternative with improved street crossings, but Build Alternative 3 (including Design Option B) and the LPA would decrease tolerance for error because of its narrower platforms located between traffic lanes.

Due to the increased distance between stops, none of the build alternatives would improve on the Universal Design principle of Physical Effort required to reach transit relative to the No Build Alternative and may pose a burden on some passengers.

Low Physical Effort. The physical effort required to reach bus stops would not change under the No Build Alternative. The build alternatives, including the LPA, would all require increased physical effort for some passengers to reach BRT stations because the number of bus stops in each direction between Mission and Lombard streets would be reduced from 15 NB and 8 SB in the No Build Alternative to 9 NB (8 for the LPA, and 9 for the LPA with the Vallejo Northbound Station Variant) and 8 SB (9 for the LPA and also with the Vallejo Northbound Station Variant) in the build alternatives; therefore, the average distance between bus stations would increase from approximately 700 feet under the No Build Alternative to 1,170 feet in each of the build alternatives (1,150 feet under the LPA and 1,080 feet under the LPA with the Vallejo Northbound Station Variant). In addition, some GGT passengers would need to walk farther under the build alternatives due to stop elimination. As a result, the average maximum distance from a location halfway between two stops would increase from 350 feet to 590 feet (570 feet under the LPA and 540 feet under the Vallejo Northbound Station Design Variant scenario). In addition, some GGT passengers would need to walk farther under the build alternatives due to stop elimination. Van Ness Avenue has few hills and only one block with an average slope steeper than 8 percent (Pacific Avenue to Broadway), which is the maximum permitted slope for an ADA-compliant ramp, although there may be some portions of other blocks that exceed this slope. Nevertheless, the increased distance between stops may be difficult to traverse for some passengers, such as elderly or disabled patrons. Under the LPA, the only stop spacing greater than 4 blocks occurs between Market and McAllister streets. In this area, grades are less than 1.5 percent. In all of the project alternatives, low-floor buses would decrease the physical effort required to board a transit vehicle, although their interior configurations may require stepping up to reach some seats once onboard.

In summary, due to the increased distance between stops, all of the build alternatives (including Design Option B) and the LPA would increase the physical effort required to reach transit relative to the No Build Alternative and may pose a burden on some passengers.

Size and Space for Approach and Use. Transit platforms under all of the build alternatives, including the LPA, are designed to provide adequate space for wheelchairs and other assistive devices. The existing sidewalks under the No Build Alternative and the approximate 14-foot-wide BRT station platforms under Build Alternative 4 would provide the largest space for approach and use. Build Alternatives 2 and 3 and the LPA would provide somewhat narrower station platforms (approximately 9 feet wide) that would slightly reduce Size and Space for Approach and Use compared with the No Build Alternative, although Build Alternative 2 would allow for the patron waiting area to spill onto the adjacent sidewalk.

As noted under Perceptible Information, BRT alternatives with center-lane-located stations (Build Alternatives 3 and 4) improve the line of sight to stations.

In summary, Build Alternative 4 (including Design Option B) would improve Size and Space for Approach and Use in comparison to the No Build Alternative due to the large platform size. Build Alternatives 2 and 3 (including Design Option B) and the LPA would reduce Size and Space for Approach and Use in comparison to the No Build Alternative because the 9-foot platforms would provide less room than the No Build Alternative condition.

Bicycle Impacts

The bicycle impact analysis considers the speed of adjacent traffic (i.e., in the right-most travel lane and other travel lanes), bicycle volumes, the width of the right-most travel lane adjacent to parking or the curb, volume of right turning motorized vehicles, bicycle safety, and comfort, as well as bicycle delay. Potential impacts resulting from the build alternatives are discussed relative to the No Build Alternative.

Build Alternative 4 would improve the Universal Design area of Size and Space for Approach and Use in comparison to the No Build Alternative due to the large platform size. Build Alternatives 2, 3, and the LPA would reduce Size and Space for Approach and Use in comparison to the No Build Alternative.

Speed of Adjacent Traffic. Speed of adjacent, motorized traffic can affect the safety and comfort of bicycle users along Van Ness Avenue. As demonstrated in Chapter 3.3, automobile speed along Van Ness Avenue would be similar under the No Build Alternative and the build alternatives. In addition, the speed limit would remain the same (25 mph) for all of the alternatives, including the No Build Alternative, meaning that there would be no regulatory change that would impact vehicle speeds. Finally, the coordination of signal timing along Van Ness Avenue with the implementation of TSP would mean that vehicles would travel at a more consistent speed, leading to less accelerating and braking. For these reasons, there would be no impact on bicyclists with the implementation of BRT with respect to the speed of adjacent vehicles.

Bicycle volumes on Van Ness Avenue would likely continue at a similar level in the future when compared with the rest of the bicycling network, whether or not one of the proposed BRT build alternatives is implemented.

Bicycle Volumes. At present, relatively few bicyclists use Van Ness Avenue for travel because a dedicated bicycle facility is on Polk Street, which is located one block to the east. Bicycle volumes on Van Ness Avenue would likely continue at a similar level in the future when compared with the rest of the bicycling network, whether or not one of the BRT build alternatives is implemented.

Width of Travel Lane Used by Cyclists. It is assumed that under the No Build Alternative bicyclists using Van Ness Avenue would continue to ride with vehicles in the right-most, mixed-flow, travel lane. The narrower the travel lane, the more likely conflicts could occur (Arup, 2013). Table 3.4-15 shows the width of the right-most, mixed-flow travel lane. The right-most, mixed-flow travel lane would remain approximately 11 feet wide throughout the Van Ness Avenue corridor under the No Build Alternative and under Build Alternatives 3 and 4; under the LPA, the typical width for the right-most, mixed-flow travel lane would be

11 feet in both SB and NB directions. Build Alternative 2 would have the narrowest lanes for cyclists since they would use the center mixed traffic lane, approximately 1-foot narrower than under the No Build Alternative.

Table 3.4-15: Width of Travel Lane Used by Bicycles

ALTERNATIVE	SB LANE (FT)	NB LANE (FT)	AVERAGE LANE WIDTH (FT)*
No Build Alternative	11	11	11
Build Alternative 2	10	10	10
Build Alternative 3	11	11	11
Build Alternative 3 with Design Option B	11	11	11
Build Alternative 4	11	11	11
Build Alternative 4 with Design Option B	11	11	11

*Refers to right-most, mixed-flow travel lane.

Source: SFCTA, 2010.

A wider travel lane could increase cyclists' perception of comfort and safety. On the other hand, with any of the average lane widths under consideration, it can also be argued that there is insufficient width to expect bicyclists to create their own safe travel zone; bicyclists riding along with moving traffic in a narrow lane would be expected to "take the lane" as allowed by the California Vehicle Code whenever they feel it is warranted for safety, particularly when riding adjacent to a parking lane to avoid being hit by opening car doors. This would effectively remove bicyclists from the zone of opening car doors; however, under Build Alternative 2, it would place bicyclists between auto and bus traffic. Overall, this situation would not alter the nature of the travel lane and its expected use by bicyclists; bicyclists would still "take the lane," whether to avoid parked cars or moving buses. In addition, as described in Section 3.4.2.2, bicyclists are more likely to take the Polk Street bicycle route parallel to Van Ness Avenue when traveling north or south along the Van Ness Avenue corridor.

Bicyclists are more likely to take the Polk Street bicycle route parallel to Van Ness Avenue when traveling north or south along the Van Ness Avenue corridor.

Vehicle Right-Turn Volume. The number of vehicular right turns affects bicyclists. Intersections with heavy right-turn volumes may have increased chances of vehicular incidents with pedestrians or bicyclists. Table 3.4-12 in Section 3.4.3.1 shows the number of locations with right turns, grouped by hourly volume for each build alternative. The LPA would perform similarly to Build Alternatives 3 and 4 with Design Option B. Locations with right turns include vehicles turning from side streets onto Van Ness Avenue and vehicles turning from Van Ness Avenue onto side streets. Alternatives with fewer high-volume turn locations and more low-volume locations are considered safer for bicyclists.

All of the build alternatives would have fewer high-volume right-turn locations compared to the No Build Alternative, helping to reduce conflicts between bicycles and motorized vehicles.

Overall, all of the build alternatives (including Design Option B) and the LPA would have fewer high-volume right-turn locations (i.e., with more than 150 per hour) and more lower-volume locations (i.e., with 150 or fewer per hour); therefore, all of the build alternatives would improve bicycle collision conditions compared to the No Build Alternative.

Bicycle Safety and Comfort. All of the build alternatives, including the LPA, would eliminate buses weaving into and out of traffic lanes, reducing some of the conflicts between bicyclists and buses.

Under Build Alternative 2, bicyclists would be riding between two lanes of moving vehicles. This would also mean that bicyclists would have to cross the bus lane to turn right, something that would not be necessary under the No Build Alternative and Build Alternatives 3 and 4 and the LPA.

The presence of parked cars to the right of bicyclists creates the possibility of bicyclists hitting opening doors. Under the No Build Alternative and center lane alternatives, including the LPA, bicyclists would ride adjacent to parked cars. Under Build Alternative 2, bicyclists are expected to ride in the mixed-flow traffic lane next to the bus lane, so they would not experience the same hazard of hitting parked vehicle doors; however, under Build Alternative 2, bicyclists would be riding between two lanes of moving vehicles, with autos to their left and buses to their right. This would also mean that bicyclists would have to cross the bus lane to turn right, something that would not be necessary under the No Build Alternative, Build Alternatives 3 and 4, and the LPA.

Bicycle Delay. TSP to speed transit along Van Ness Avenue would decrease bicycle signal delay in the north-south direction, while increasing bicycle signal delay crossing Van Ness Avenue in the east-west direction.

3.4.4 Avoidance, Minimization, and/or Mitigation Measures

The proposed project would not result in adverse impacts to non-motorized transportation; therefore, no mitigation measures are required. Nonetheless, the following impact minimization measures, or improvement measures, will be incorporated into project design to enhance use of the BRT system:

KEY FINDING

The proposed project would not result in adverse impacts to nonmotorized transportation.

IM-NMT-1. Include comprehensive wayfinding, allowing all users to navigate to and from the correct platform.

IM-NMT-2. For Build Alternative 4, bus vehicle design should incorporate an intuitive seating space for users requiring level or near level boarding that is easily accessible to both the front door on the right side and the door behind the operator on the left side.

IM-NMT-3. For Build Alternative 4, bus vehicle design should incorporate audible cues, such as stop announcements, of which door will open to avoid any confusion for passengers.

IM-NMT-4. Provide sufficient information to educate less-ambulatory passengers that board at BRT stations that they would need to exit through the front, right doors for stops outside the Van Ness Avenue corridor.

3.5 Parking

This section presents on-street parking supply and demand conditions within the Van Ness Avenue BRT project study area. Off-street parking was not included in this analysis because the proposed project would not affect any existing off-street parking facilities. The parking analysis study area encompasses Van Ness Avenue from Lombard to Market streets and South Van Ness Avenue from Market to Mission streets.

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The changes in parking under the LPA are identified as part of the analysis presented for the build alternatives in this chapter; however, because the LPA configuration is a variation of the configurations analyzed for the center-running alternatives (Build Alternatives 3 and 4), the LPA with or without the Vallejo Northbound Station Variant has slightly different results for parking gains and losses. However, the overall impact findings with the LPA are consistent with the findings for Build Alternatives 3 and 4 with Design Option B, as presented in this subsection.

3.5.1 Existing Conditions

Data on existing on-street parking conditions were collected on Wednesday, May 21, 2008, and Wednesday, December 17, 2008, between the hours of 11:00 a.m. and 3:00 p.m. The parking survey documented block by block along Van Ness Avenue and South Van Ness Avenue from Mission Street to Lombard Street the following information:

- Number of parking spaces by type:
  - Metered parking
  - Nonmetered, time-limited parking
  - Short-term parking (green-colored curbs)
  - Truck loading zones (yellow-colored curbs)
  - Passenger loading zones (white-colored curbs)
  - Parking for the disabled (blue-colored curbs)
- Occupancy for each type of space during weekday, midday.

Table 3.5-1 summarizes the total number of on-street parking spaces on Van Ness Avenue and South Van Ness Avenue and their midday occupancy. Parking studies conducted in 2010 and 2011, and reported in the Draft EIS/EIR, identified 442 on-street parking spaces in the study area, with approximately equal numbers of spaces on the east and west sides of the street. Most of the parking spaces identified in the study (74 percent) along Van Ness Avenue and South Van Ness Avenue are metered or nonmetered, time-limited, general parking spaces; 5 percent of the spaces are designated for loading (yellow curbs), 11 percent are for passenger loading (white curbs), 7 percent are for short-term use (green curbs), and 3 percent are for disabled vehicle parking (blue curbs).

Table 3.5-1: Parking Supply along Van Ness and South Van Ness Avenues between Mission and Lombard Streets (2010, 2011)

	GENERAL (METERED AND NONMETERED)	GREEN	YELLOW	WHITE	BLUE	TOTAL SUPPLY
Parking Spaces	326	30	23	50	13	442

Between Mission and Broadway streets, most of the on-street, general parking spaces are metered with a 1-hour time limit. Between Broadway and North Point streets, nonmetered parking spaces have a 2-hour limit, except vehicles with a residential parking permit.

Metered parking spaces are priced at $2.50 per hour from Mission to Eddy streets and $1.50 per hour from Eddy to Broadway streets.

The observed weekday midday parking occupancy rates for the general (i.e., metered and nonmetered) and green parking spaces along Van Ness Avenue and South Van Ness Avenue are fairly consistent along the 2-mile study area, with 66 percent of the occupied spaces on the east side and 64 percent on the west side of the street (see Table 3.5-2).

Table 3.5-2: Parking Occupancy along Van Ness and South Van Ness Avenues between Mission and Lombard Streets (2010)

LOCATION	GENERAL (METERED AND NONMETERED)	GREEN	TOTAL	SPACES OCCUPIED (METERED, NONMETERED, AND GREEN ONLY)	OCCUPANCY RATE (METERED, NONMETERED, AND GREEN ONLY)
East Side	146	20	166	110	66%
West Side	180	10	190	121	64%
Total	326	30	356	231	65%

In general, parking occupancy is slightly higher (i.e., 70 percent) than the average in the middle portion of the corridor between Golden Gate Avenue and Broadway Street, which supports mixed-use commercial and high-density residential uses. Parking occupancy is lower than the average (55 percent) north of Broadway Street, which is more residential in nature. For a detailed, block-by-block breakdown of occupancy, see Appendix B. The occupancy rate for the yellow parking spaces is higher on the west side of the street (80 percent) than on the east side (50 percent). Less than half of the white-colored curb spaces were occupied at the time of survey on both sides of Van Ness and South Van Ness avenues. A limited number of blue disabled parking spaces (13) are available on Van Ness Avenue, most of which are located near the Civic Center area. The occupancy rate for blue parking spaces is approximately 60 percent.

Sensors and new meters in the Civic Center and Hayes Valley area are part of the SFpark pilot text project. Real-time occupancy data will be used to implement demand-responsive pricing, anticipated to improve parking availability. For more information, visit www.sfpark.org

SFCTA surveyed double-parking behavior along Van Ness Avenue between Mission and Clay streets on Tuesday, July 15, 2008, between 5:00 p.m. and 6:00 p.m. In general, no double-parking was observed, except for the segment between Bush and Sutter streets. While double parking may occur occasionally at discrete locations along the Van Ness Avenue corridor, the frequency of double parking and its impacts on traffic is not considered significant.

As described in Section 2.6.1, SFMTA has installed parking sensors and new meters in the Civic Center and Hayes Valley area as part of the SFpark pilot project. The SFpark sensors and meters are located along Van Ness Avenue between Golden Gate Avenue and Hickory Street. In 2011, the real-time occupancy data will begin being used to implement demand-responsive pricing, which is anticipated to improve parking availability in these areas. SFpark will be evaluated by SFMTA through mid-2012 for Citywide expansion.[60]

3.5.2 | Environmental Consequences

The parking analysis assesses the change in total parking supply expected as a result of the Van Ness BRT project, and it highlights significant additions and reductions of parking along the corridor. Appendix B provides detailed information of these expected changes in total parking supply on a block-by-block basis. The expected changes are approximate based on the current project engineering. Exact changes in parking will be determined during project final design. Parking impacts for each project alternative are identical in the near-term (2015) and long-term (2035) horizon years; therefore, impacts are not presented separately for each year. It should be noted that parking demand along Van Ness Avenue

[60] www.sfpark.org

may change in the future as a result of the proposed project and changing land uses, as well as separate efforts to manage parking demand such as variable pricing of parking through the SFpark project.

SFCTA and SFMTA have worked to reduce parking removal through the following project design principles, as feasible:

- Replacement of on-street parking where bus stops are consolidated or moved to the center of the street;
- Addition of street parking made possible by lane restriping; and
- Provision of infill spaces where they do not exist today where feasible.

Thus, the parking figures reported for each project alternative in subsequent sections are the net result of incorporating the aforementioned design principals in project design thus far.

SFCTA and SFMTA have worked to reduce parking removal through the following project design principles, as feasible:

- **Replacement of on-street parking where bus stops are consolidated or moved to the center of the street;**
- **Addition of street parking made possible by lane restriping; and**
- **Provision of infill spaces where they do not exist today where feasible.**

Significance Criteria. The City and County of San Francisco (CCSF) does not consider parking supply as part of the physical environment; parking conditions are deemed to be nonstatic in that parking demand changes from day to day, year to year, and in response to changing land uses and transportation options, among other factors. Hence, the availability of parking spaces is not a permanent physical condition but changes over time as people change their modes and patterns of travel. Therefore, the displacement of existing parking spaces is not considered a significant impact for environmental review purposes.

SFCTA and SFMTA acknowledge, however, that if parking losses caused by a project are great, the secondary effects of drivers circling for parking could trigger traffic impacts. In addition, NEPA guidance encourages a discussion of the human environment and social and economic impacts of a project. Thus, the social impacts from parking removal are discussed in Section 4.2, Community Impacts, and changes in parking under each build alternative, including the LPA, are presented in this chapter for informational purposes to the public and decision makers.

3.5.2.1 | NO BUILD ALTERNATIVE

No changes to the existing parking supply on Van Ness Avenue and South Van Ness are expected under the No Build Alternative in the 2015 and 2035, with one exception associated with the proposed CPMC project. The Draft CPMC Long-Range Development Plan (LRDP) EIR specifies that the CPMC project would remove the following parking spaces on Van Ness Avenue (San Francisco Planning Department, 2010):

- 3 metered parking spaces on the west side of Van Ness Avenue between Post Street and Geary Street; and
- 2 metered loading spaces on the east side of Van Ness Avenue between Cedar Street and Geary Street.

Because the CPMC project has not yet been approved, this parking removal is not included as a baseline condition in the presentation of parking conditions in this chapter and is considered in the cumulative impact analysis presented in Chapter 5.

Another planned project that would affect parking in the project area is SFpark, which is described in Sections 2.6.1 and 3.5.1. SFMTA's SFpark project is anticipated to increase turnover of spaces, increasing the availability of parking along the corridor. The changes in parking supply and demand in the Van Ness Avenue corridor resulting from the SFpark pilot test project are unknown at this time; therefore, they are not considered in the parking analysis, although it is likely that the SFpark pilot test project and subsequent permanent expansion of this parking management program will have beneficial effects on parking in the corridor.

3.5.2.2 | BUILD ALTERNATIVES

Future parking supply was estimated by identifying losses and gains in on-street parking for each block that would result under each build alternative, including consideration of Design

Option B under Build Alternatives 3 and 4, and the LPA. Parking loss can result from new station platforms, the addition of corner bulbs, or new lane striping to accommodate exclusive right- and left-turn pockets. Parking gains can be a result of bus stop consolidation or from moving existing curb bus stop locations, restriping existing curb lanes for parking, or adding additional parking spaces through reallocation of existing parking. When estimating parking losses and gains, 20 linear feet is assumed as the distance required for each parking space, per SFMTA standards. Table 3.5.-3 summarizes the anticipated parking supply changes under the project alternatives. The expected changes are approximate based on the current project engineering. Exact changes in parking will be determined during project final design. When parking spaces are able to be retained on a block, it is assumed that a priority is given to the retention of colored parking spaces.

As explained above under the No Build Alternative, the likely expansion of SFMTA's SFpark project in the Van Ness Avenue corridor is anticipated to increase turnover of spaces and increase the availability of parking in the corridor. This anticipated change in parking would occur under all build alternatives and the LPA.

Table 3.5-3: Parking Supply and Demand along Van Ness Avenue – No Build and Build Alternatives[1]

	PARKING SUPPLY			NET CHANGE +/(-)			
	METERED, NON-METERED, AND GREEN SPACES	COLORED ZONE SPACES	TOTAL SPACES	METERED, NON-METERED, AND GREEN SPACES	COLORED ZONE SPACES	TOTAL SPACES	% SPACES
Alternative 1: No Build	356	86	442	-	-	-	-
Build Alternative 2	328	81	409	-28	-5	-33	-7
Build Alternative 3	304	70	374	-52	-16	-68	-15
Build Alternative 3 (Design Option B)	339	72	411	-17	-14	-31	-7
Build Alternative 4	325	72	397	-31	-14	-45	-10
Build Alternative 4 (Design Option B)	378	77	455	22	-9	13	3

1 The expected changes are approximate based on the current project engineering at the time the 2011 parking study was conducted. Exact changes in parking will be determined during project final design.

Build Alternative 2: Side-Lane BRT with Street Parking

Van Ness Avenue. Build Alternative 2 is expected to cause a net loss of 33 on-street parking spaces (12 on the east side and 21 spaces on the west side) along Van Ness Avenue and South Van Ness Avenue. Most of the net parking loss would occur between Broadway Street and Golden Gate Avenue, with a 17 percent loss of parking in this segment. Appendix B provides the parking gains and losses by block.

Of the 12 spaces that would be displaced on the east side of Van Ness Avenue, 7 spaces would be metered, nonmetered, and green zone spaces, and 5 would be spaces in yellow, white, and blue zones. No block would lose all of its parking under Build Alternative 2, although nearly all parking would be removed on the east side of Van Ness Avenue between Sutter and Bush streets.

On the west side of Van Ness Avenue, 21 parking spaces are expected to be displaced under Build Alternative 2. All of the displaced parking would be general parking.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians

Van Ness Avenue. Build Alternative 3 is expected cause an approximate loss of 68 on-street parking spaces (30 spaces on the east side and 38 spaces on the west side) along both sides of Van Ness Avenue and South Van Ness Avenue.

Of the 30 spaces expected to be displaced on the east side, 22 would be metered, nonmetered, and/or green parking spaces and 8 would be yellow, white, and blue spaces.

Parking would be removed completely on the east side in the following blocks:

- Between Market and Fell streets (6 existing spaces removed, including 5 yellow colored spaces and 1 blue colored space).
- Between Jackson and Pacific streets (5 existing spaces removed) to accommodate dual platforms.
- Between Broadway and Vallejo (8 existing spaces removed) to accommodate dual exclusive SB left-turn lanes.
- Between Green and Union streets (7 existing spaces removed, including 1 white colored parking space) to accommodate the combination of a platform and left-turn pocket.

On the west side of Van Ness Avenue, 38 parking spaces would be displaced with Build Alternative 3. Of the 38 spaces, 30 would be general spaces and 8 would be yellow, white, and blue spaces.

The following blocks would experience the removal of all parking, or nearly all parking, on the west side of Van Ness Avenue under Build Alternative 3:

- Between Geary and O'Farrell streets (8 existing spaces removed, including 5 white colored spaces) to accommodate the dual platforms for the length of the block.
- Between Vallejo and Broadway (8 existing spaces removed, including 2 white parking spaces) to accommodate dual exclusive SB left-turn lanes.
- Between Hayes and Fell streets (8 out of 11 spaces on the west side would be removed).
- Between Golden Gate Avenue and Turk Street (8 out of 10 spaces on the west side would be removed).

For specific, expected parking losses and additions on a block-by-block basis, see Appendix B.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians (with Design Option B)

Van Ness Avenue. Design Option B results in fewer parking removals because the absence of turn pockets would allow lane restriping to provide additional parking spaces.

Build Alternative 3 with Design Option B would cause a loss of 31 on-street parking spaces (14 spaces on the east side and 17 spaces on the west side) along Van Ness Avenue and South Van Ness Avenue.

Of the 14 spaces that would be displaced on the east side, 7 would be metered, nonmetered, and/or green colored parking spaces and 7 would be yellow, white, and blue spaces.

The following blocks would experience the removal of all parking on the east side of Van Ness Avenue under Build Alternative 3 with Design Option B:

- Between Market and Fell streets (6 existing spaces removed, including 5 yellow colored spaces and 1 blue colored space) to accommodate a right-turn pocket.

- Between Jackson and Pacific (5 existing spaces removed) to accommodate dual platforms.
- Between Broadway and Vallejo (8 existing spaces removed) to accommodate dual dedicated SB left-turn lanes.

On the west side of Van Ness Avenue, 17 net parking spaces would be removed in Build Alternative 3 with Design Option B. Of the 17 spaces, 10 would be general spaces and 7 would be yellow, white, and blue spaces.

The following blocks would experience the removal of all parking on the west side of Van Ness Avenue under Build Alternative 3 with Design Option B:

- Between Geary and O'Farrell streets (8 existing spaces removed, including 5 white colored spaces) to accommodate the dual platforms for the length of the block.
- Between Vallejo and Broadway (8 existing spaces removed, including 2 white parking spaces) to accommodate dual exclusive SB left-turn lanes.

For specific parking losses and additions on a block-by-block basis, see Appendix B.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median

Van Ness Avenue. Build Alternative 4 is expected to cause a loss of 45 on-street parking spaces (15 spaces on the east side and 30 spaces on the west side) along Van Ness Avenue and South Van Ness Avenue.[61]

Of the 15 spaces that would be displaced on the east side, 13 would be metered, nonmetered, and/or green parking spaces, and 2 spaces would be yellow, blue, or white (between Geary and O'Farrell streets). The following blocks would experience the removal of all, or nearly all, parking on the east side of Van Ness Avenue under Build Alternative 4:

- Between Golden Gate Avenue and Turk Street (9 out of 10 spaces would be removed).
- Between Bush and Pine streets (8 out of 9 spaces would be removed).
- Between Broadway and Vallejo (all 8 existing spaces removed) to accommodate dual-dedicated SB left-turn lanes.
- Between Green and Union streets (7 existing spaces removed, including 1 white colored parking space) to accommodate the combination of a platform and left-turn pocket.

On the west side of Van Ness Avenue, 30 parking spaces would be displaced in Build Alternative 4. Of the 30 spaces, 18 would be general spaces and 12 would be yellow, white, and blue spaces. Parking would be removed on the west side in the following blocks:

- Between Hayes and Fell streets (9 out of 11 spaces on the west side would be removed).
- Between Golden Gate Avenue and Turk Street (9 out of 10 spaces on the west side would be removed).
- Between Geary and O'Farrell streets (8 existing spaces removed, including 5 white colored spaces) to accommodate the dual platforms.
- Between Bush and Pine streets (10 existing spaces removed, including 2 yellow colored spaces and 1 white colored space) to accommodate a left-turn lane.
- Between Broadway and Vallejo streets (8 existing spaces removed, including 2 white spaces) to accommodate a left-turn lane.

For specific, estimated parking losses and additions on a block-by-block basis, see Appendix B.

[61] Up to 5 parking spaces on Chestnut Street may also be removed to lengthen the existing eastbound MUNI bus stop and to create a new westbound bus stop to accommodate GGT vehicles in the event of GGT rerouting as part of Build Alternative 4 described in Section 3.2.2.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and a Single Median (with Design Option B)

Van Ness Avenue. Design Option B results in fewer parking removals because the absence of turn pockets would allow lane restriping to provide for additional parking spaces. Build Alternative 4 with Design Option B would cause a gain of 13 on-street parking spaces (gain of 12 spaces on the east side and 1 space on the west side) along Van Ness Avenue and South Van Ness Avenue.[62]

Some spaces would be displaced under Build Alternative 4 with Design Option B, including 5 metered, nonmetered, and green parking spaces. The following block would have all of their parking displaced on the west side of Van Ness Avenue in Build Alternative 4 with Design Option B:

- Between Broadway and Vallejo streets (8 existing spaces removed, including 2 white spaces).

The following blocks would have all of their parking displaced on the west side of Van Ness Avenue in Build Alternative 4 with Design Option B:

- Between Geary and O'Farrell streets (8 existing spaces removed, including 5 white colored spaces) to accommodate dual platforms.
- Between Broadway and Vallejo streets (8 existing spaces removed, including 2 white spaces).

Nevertheless, 7 general parking spaces would be added on the west side under Build Alternative 4 with Design Option B; therefore, one parking space overall would be added on the west side in this project alternative.

For specific, estimated parking losses and additions on a block-by-block basis, see Appendix B.

LPA: Center-Running BRT with Right Side Boarding/Single Median and Limited Left Turns

Van Ness Avenue. Because the LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), the LPA results in slightly different parking gains and losses, presented in Table 3.5-4. The LPA would cause the loss of approximately 105 on-street parking spaces (49 spaces on the east side and 56 spaces on the west side) along both sides of Van Ness Avenue and South Van Ness Avenue.[63]

Of the 49 spaces that would be displaced on the east side, 42 would be metered, nonmetered, and/or green parking spaces and 7 would be yellow and white spaces.

Parking would be removed completely on the east side in the following blocks:

- Between O'Farrell and Geary streets (5 existing spaces removed, including 2 white spaces).
- Between Broadway and Vallejo Street (9 existing spaces removed).
- Between Vallejo and Green streets (8 existing spaces removed).[64]

On the west side of Van Ness Avenue, 56 net parking spaces would be removed under the LPA. Of the 56 spaces removed, 48 would be general and/or green spaces and 8 would be blue or white spaces.

The following blocks would experience the removal of all parking on the west side of Van Ness Avenue under the LPA:

[62] Ibid.
[63] The Vallejo Northbound Station Variant would result in the removal of one fewer parking space between Vallejo and Green streets on the east side of the street.
[64] Seven spaces would be removed under the Vallejo Northbound Station Variant.

- Between Market and Mission streets (11 existing spaces removed).
- Between Vallejo and Broadway streets (9 existing spaces removed, including 3 white spaces).
- Between Green and Vallejo streets (9 existing spaces removed, including 1 green space and 3 white spaces).
- Between Lombard and Greenwich streets (8 existing spaces removed, including 1 green space and 4 white spaces).

For estimated parking losses and additions on a block-by-block basis, see Appendix B.

The LPA would provide a net 351 parking spaces, which is fewer spaces than the amounts shown in Table 3.5-3 for the other alternatives. This is due in part to a more refined analysis of parking changes that was conducted for the LPA than the build alternatives. This more refined analysis considered the following factors that were not part of the analysis of the other build alternatives in the Draft EIS/EIR: use of updated existing conditions data; incorporation of longer curb bulbs per the Caltrans Highway Design Manual May 2012 update; inclusion of wider BRT lanes per MTA requirements set forth in 2012; and stricter adherence to ADA design requirements such as provision of curb ramps behind handicapped spaces (which largely are not present in existing conditions). Thus the parking analysis for the LPA is a more refined analysis than that presented for the build alternatives in the Draft EIS/EIR. A sensitivity analysis taking into account the aforementioned factors was performed for Build Alternative 3; this analysis indicated that applying the methodology used for the LPA to the other build alternatives would result in up to 32 more spaces removed for the alternatives than was presented in Table 4.5-3 of the Draft EIS/EIR. This would result in a similar number of on-street parking opportunities for the LPA as Build Alternative 3.

Table 3.5-4: Parking Supply and Demand along Van Ness Avenue – No Build and LPA[1]

	PARKING SUPPLY			NET CHANGE +/(-)			
	METERED, NON-METERED, AND GREEN SPACES	COLORED ZONE SPACES	TOTAL SPACES	METERED, NON-METERED, AND GREEN SPACES	COLORED ZONE SPACES	TOTAL SPACES	% SPACES
Alternative 1: No Build[2]	358	98	456	-	-	-	-
LPA[3, 4]	261	90	351	-97	-8	-105	-23

1 The expected changes are approximate based on the current project engineering. Exact changes in parking will be determined during project final design.

2 The refined analysis conducted in October 2012 (see Appendix B of this Final EIR/EIS), resulted in a higher number of existing parking spaces in the study area than were identified in the 2010 and 2011 parking studies, which are the basis for Tables 3.5-1 through 3.5-3.

3 The LPA is a refinement of the two center-running build alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B).

3 Existing conditions were revised during the supplemental parking survey for the LPA that was completed in October 2012.

4 The Vallejo Northbound Station Variant would result in removal of one fewer nonmetered space between Vallejo and Green streets on the east side of Van Ness Avenue.

3.5.3 | Avoidance, Minimization, and/or Mitigation Measures: Build Alternatives (2015 and 2035)

As discussed in Section 3.5.2, the City of San Francisco does not consider parking supply as part of the physical environment, and the displacement of existing parking spaces is not considered a significant impact in the City of San Francisco; therefore, no significant environmental impact from changes in parking would occur under any of the project alternatives, including the LPA, and no mitigation is required. Nonetheless, the following design principles intended to reduce parking removal will continue to be incorporated into project design as impact improvement measures applicable to each build alternative:

IM-TR-1: On-street parking will be created where bus stops are consolidated or moved to the center of the street.

IM-TR-2: Additional on-street parking will be provided where feasible by lane striping.

IM-TR-3: Infill on-street parking spaces will be provided where they do not exist today as feasible.

IM-TR-4: SFMTA will give priority to retaining color-painted on-street parking spaces, such as yellow freight loading zones, white passenger loading zones, green short-term parking, and blue disabled parking.

IM-TR-5: Blue handicapped parking spaces will be designed to provide a curb ramp behind each space.

The aforementioned improvement measures would be carried throughout project design to identify any additional areas where parking can be retained.

CHAPTER SUMMARY: This chapter summarizes how the No Build and the three build alternatives (including the LPA, with or without the Vallejo Northbound Station Variant) are expected to affect the environment, both positively and adversely, and also proposes avoidance, minimization, and mitigation measures for any adverse impacts. Topics covered in this chapter include Land Use, Growth Inducement, Community Impacts, Utilities, Visual/Aesthetics, Cultural Resources, Hydrology and Floodplain, Water Quality and Storm Water Runoff, Geology/Soils/Seismic/Topography, Hazardous Waste/Materials, Air Quality, Noise and Vibration, Energy, Biological Environment, and Construction Impacts.

CHAPTER 4

Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Environmental analyses presented in this chapter are primarily based on a series of technical studies prepared for the Van Ness Avenue BRT Project. These studies consist of the following:

- Tree Removal Evaluation and Planting Opportunity Analysis (BMS Design Group, 2013)
- Air Quality Technical Report and Addendum (Terry A. Hayes Associates Inc., 2013)
- Natural Resources Technical Memorandum (Garcia and Associates, 2009)
- Historic Property Survey (Parsons, 2010)
- Archaeological and Native American Cultural Resources Sensitivity Assessment (Far Western Anthropological Research Group, 2013)
- Historic Resources Inventory and Evaluation Report (JRP Historical Consulting, 2009)
- Finding of Effect (Parsons, 2013c)
- Visual Impact Assessment Memorandum (Parsons, 2010)
- Geologic Impacts Assessment Report (AGS Inc., 2009)
- Initial Site Assessment Report (AGS Inc., 2009)
- Overhead Cable System Support Poles/Streetlights Conceptual Engineering Report (San Francisco Department of Power and Water, 2009)
- Noise and Vibration Study (Parsons, 2010)
- Storm Water Data Report (Parsons, 2013d)
- Water Quality Technical Report (Parsons, 2013b)
- Vehicular Traffic Operations Technical Memorandum (CHS Consulting, 2013)
- Analysis of Non-motorized Transportation Impacts Technical Report and Addendum (Arup, 2013).
- BRT Design Criteria Technical Memorandum (BMS Design Group, 2008)
- Van Ness Avenue BRT Feasibility Study (San Francisco County Transportation Authority, 2006)

- Van Ness Corridor Initial Land Use and Urban Design Needs Assessment (City of San Francisco Planning Department, 2004)

The above technical studies were incorporated in the EIS/EIR by reference and are available upon request to SFCTA through the following contact:

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San Francisco, CA 94103
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4.0 Introduction

The Locally Preferred Alternative (LPA) is a refinement of the two center-running build alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B). For many of the environmental impact areas described in Chapter 4, the LPA, with or without the Vallejo Northbound Station Variant, has identical environmental consequences to Build Alternatives 3 or 4 with Design Option B and is so noted. For some environmental consequences, the LPA, with or without the Vallejo Northbound Station Variant, falls within the range presented for Build Alternatives 3 and 4 in this chapter. When this is the case, it is described as such, and detailed information is provided in Chapter 10, Section 10.4.1, to explain the specific effects of the LPA for the following environmental factors: community impacts, aesthetics/visual resources, biological resources, cultural resources, utilities and public services, hydrology and water quality, and construction impacts.

4.1 Land Use

4.1.1 | Affected Environment

This section describes the land use setting or "affected environment" for the Van Ness Avenue BRT Project, presenting an overview of the corridor land use and development patterns in the areas and activity centers along the 2-mile stretch of Van Ness Avenue in San Francisco. Land use is broadly defined to encompass types of land uses, development and growth trends, activity centers, and local and regional land use policies.

4.1.1.1 | EXISTING LAND USES

The Van Ness Avenue corridor, along with side and parallel streets, includes diverse neighborhoods and land uses within the project limits. Land uses in the vicinity of the Van Ness Avenue corridor include residential, commercial/ tourism, institutional, open space, and mixed uses. Figure 4.1-1 shows land designations in the project area based on zoning. Figure 4.1-2 shows designated areas of commercial and industrial land uses. As shown in the aforementioned figures, Van Ness Avenue is a major shopping corridor, zoned primarily as *High Density Residential-Commercial Combined (RC-4)*. Existing land use is described below from south to north between Mission and North Point streets in the City and County of San Francisco.

Between Mission and Market streets, Van Ness Avenue extends through primarily civic, commercial/tourism, light industrial, and mixed-use land uses. This stretch of Van Ness Avenue is zoned *Downtown Commercial (C3-6)* and *Public (P)*. Automobile dealerships, retail shops, and art galleries are also located along this stretch of the corridor. Residential land uses are located west of Van Ness Avenue between Franklin and Laguna streets and east of Van Ness Avenue between 12th and 7th streets.

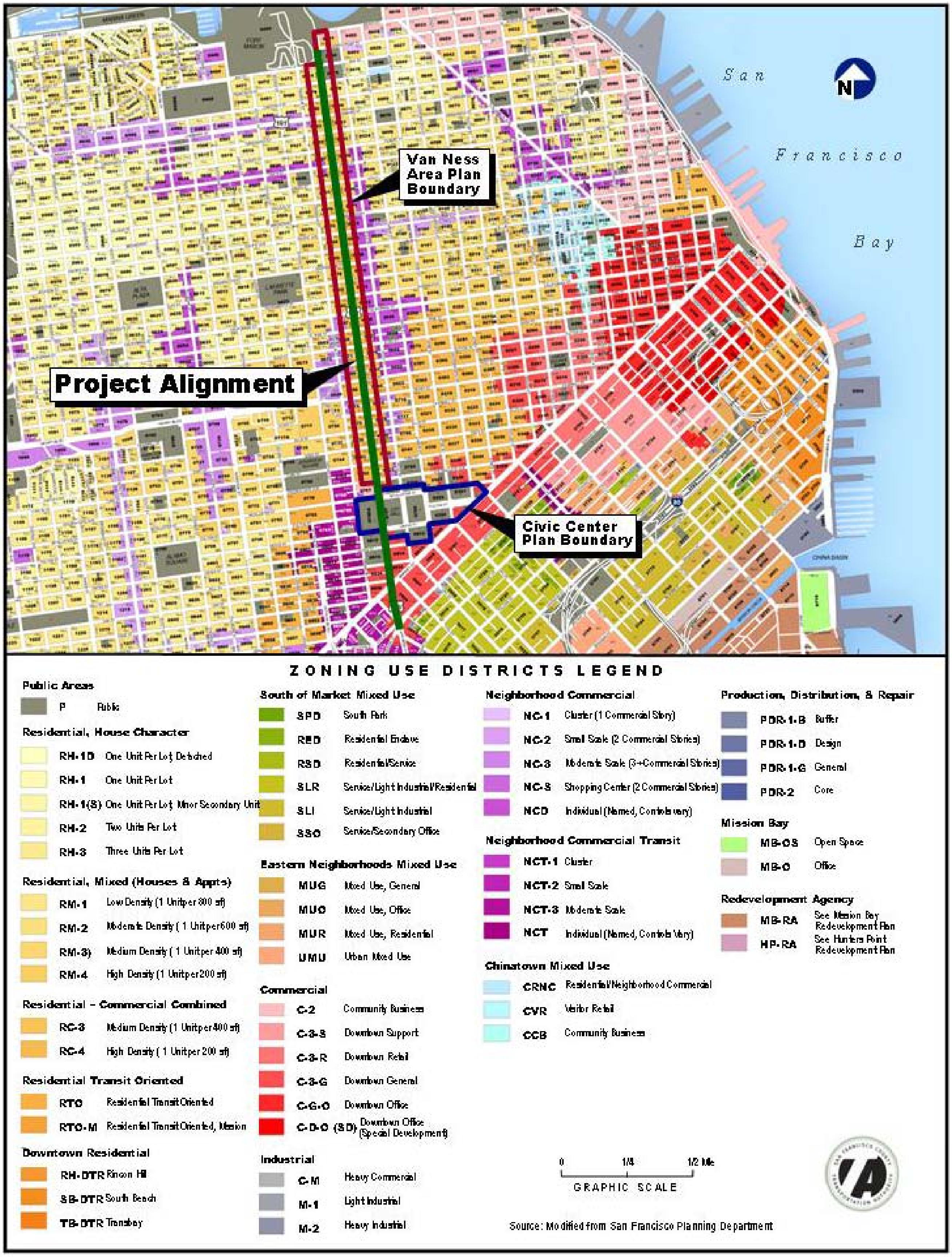

Figure 4.1-1: Zoning and Land Use

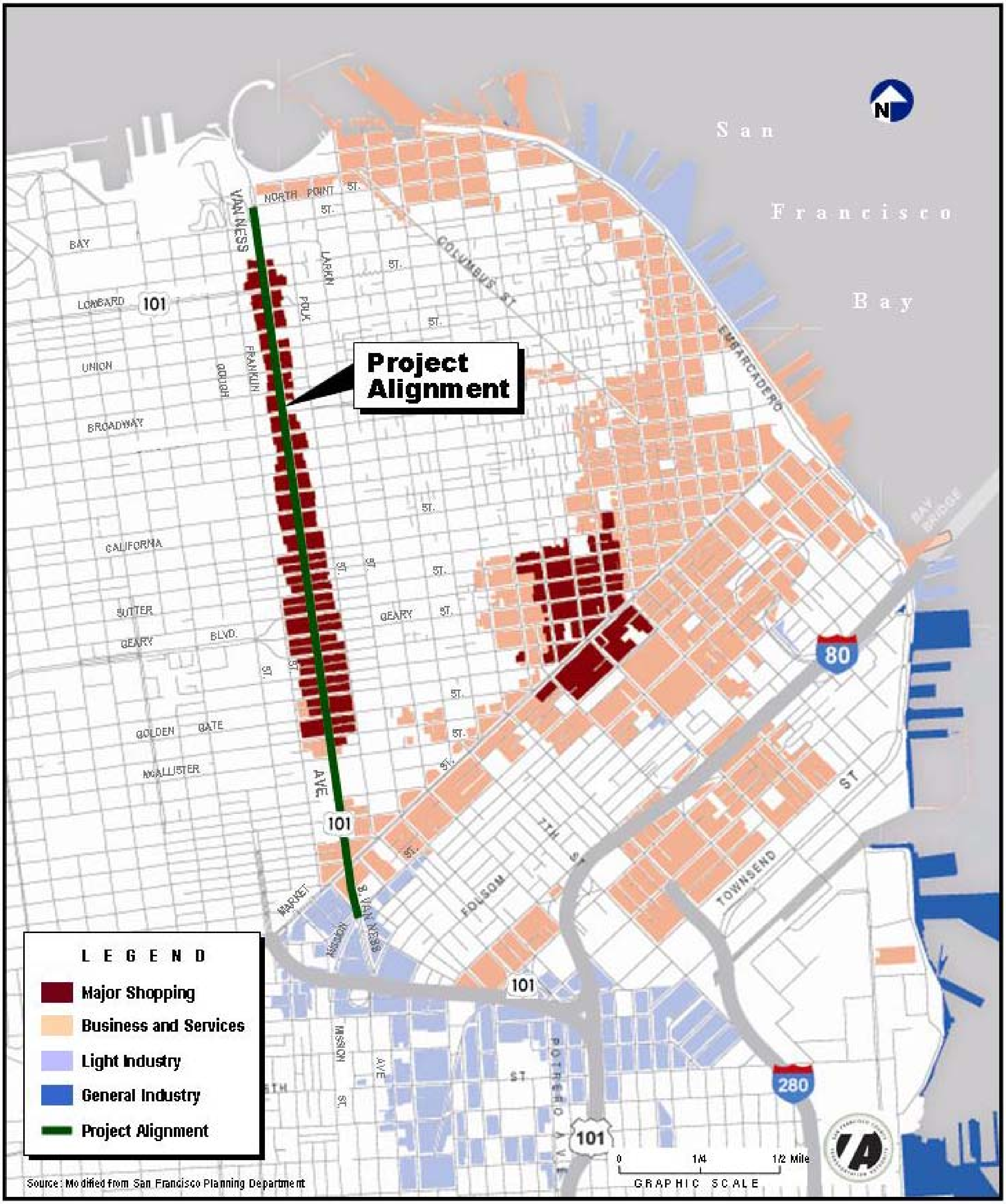

Figure 4.1-2: Commercial and Industrial Land Use

Land uses between Market and McAllister streets are primarily institutional, civic, and arts. The Civic Center is a major activity center in the Van Ness Avenue corridor that includes the San Francisco City Hall, Supreme Court of California, and other government facilities, in addition to the Civic Center Plaza, San Francisco Symphony, Opera Center, Herbst Theatre, Civic Auditorium, and other performing arts venues. This stretch of Van Ness Avenue is zoned *Downtown Commercial (C3-6)* and *Public (P)*. Residential, commercial, and mixed-use land uses are located one to two blocks west and east of Van Ness Avenue.

Van Ness Avenue supports a broad range of land uses between McAllister and California streets, including mixed-use, commercial/tourism, residential, and institutional. This stretch of Van Ness Avenue is zoned *High Density Residential-Commercial Combined (RC-4)* and *Community Business (C-2)*. A variety of retail and residential uses are situated in the Tenderloin/Polk Street and Cathedral Hill areas. The AMC Theatres multi-screen movie theater complex, automobile dealerships, and hotels are also located in these areas. The Regency Center is a landmark hotel and event venue, and it is a major activity center in the Van Ness Avenue corridor. Various high-density housing developments have been completed recently or are nearly complete in this segment of the corridor.

Between California Street and Broadway, Van Ness Avenue passes through residential, mixed-use, institutional, and commercial land uses. This stretch of Van Ness Avenue is zoned *High Density Residential-Commercial Combined (RC-4)*. A variety of religious and other institutions, as well as neighborhood-serving retail uses, are located along Polk Street, which is the primary neighborhood-scale commercial street in the area. This portion of the corridor is interspersed with large and small multi-unit residential buildings and relatively little new development.

Land uses along Van Ness Avenue, between Broadway and North Point Street, are primarily residential. A cluster of hotels are located near Lombard Street, and institutional and industrial land uses are situated in the Bay Street area. This segment of the corridor has a relatively well-defined pattern of individual apartment buildings lining the street, interspersed with neighborhood-serving retail uses, primarily located at the street corners. The Galileo Academy of Science and Technology, which is a high school, is located at the corner of Van Ness Avenue and Francisco Street. Fort Mason, which is part of the Golden Gate National Recreation Area (GGNRA) managed by the National Park Service (NPS), is located along the east side of Van Ness Avenue, north of Bay Street. Fort Mason is a major activity center in the Van Ness Avenue corridor that serves as an important cultural center in the city and is comprised of special event facilities, classrooms, offices, commercial establishments, open space, and waterfront facilities. This stretch of Van Ness Avenue is primarily zoned *Medium Density Residential-Commercial Combined (RC-3),* with some blocks zoned *Low Density Residential, Mixed (Houses and Apartments) (RM-1),* and *Public (P)*. Fort Mason and the Galileo Academy of Science and Technology comprise the *Public* zoned uses.

Development Trends

Development trends and growth projections for the City and the study area are primarily derived from data presented in the San Francisco General Plan, the United States Census Bureau's 2000 Census, the ABAG's Projections for 2007, and the FOCUS Program: a development and conservation strategy for the San Francisco Bay Area.

Based on the 2000 U.S. Census and the 2007 ABAG projections used in the adopted Regional Transportation Plan: Transportation 2035, the City is expected to gain 66,610 new households between 2000 and 2035, which represents a 20 percent increase in new households. As discussed in Section 4.2, Community Impacts, the Van Ness Avenue corridor is expected to see an increase in the number of households by 12,208, which is a 28 percent increase, during the same period. This growth trend is consistent with the City's land use policies and planned redevelopment, which is discussed below.

The Van Ness Avenue corridor is planned by the City for high-density mixed-use development, in addition to transformation of the street into a transit-served pedestrian promenade that supports the Civic Center and commercial uses along Van Ness Avenue. Overall, no major vacant parcels are available for development in the project area; however, some parcels have been identified as having the potential for reuse or additional development (ABAG, 2007). The City adopted the Van Ness Area Plan in 1986 and created a Van Ness Avenue Special Use District to the Planning Code in 1988 to implement the plan. The plan is intended to promote Van Ness Avenue as the City's most prominent north-south boulevard, lined with high-density mixed-use development. Since the adoption of the special use district, approximately 1,000 housing units have been developed along Van Ness Avenue (San Francisco Planning Department, 1995).

The FOCUS Program, led by ABAG and MTC, works with local governments and others in the Bay Area to collaboratively address issues such as high housing costs, traffic congestion, and protection of natural resources. A primary goal of FOCUS is to encourage future growth near transit and in the existing communities that surround the San Francisco Bay, enhancing existing neighborhoods and providing housing and transportation choices for all residents. FOCUS identifies Priority Development Areas (PDAs) or locally identified infill development opportunity areas within existing communities. PDAs are areas within an existing community that are near existing or planned fixed transit or are served by comparable bus service and are planned for more housing. The proposed PDAs included in FOCUS could accommodate more than half of the Bay Area's projected housing growth to the year 2035, mostly at relatively moderate densities (FOCUS, 2009). The Van Ness Avenue corridor is included in San Francisco's planned PDA.

Within the PDAs, there are five redevelopment project areas designated by the City Redevelopment Agency in the downtown San Francisco vicinity, including the Federal Office Building, Yerba Buena Center, SoMa, Transbay, and the Rincon Point-South Beach Redevelopment Project Areas. The redevelopment project areas include projects that support the City's goal for high-density, mixed-use, and residential infill development in the downtown area.

In summary, growth and development trends support high-density, transit-supportive redevelopment and infill in the project area.

4.1.1.2 | MAJOR PLANNED PROJECTS

Several residential and mixed-use development projects have recently been completed, are under construction, or are planned within the project corridor. Most of these residential developments include affordable housing and single-room occupancy (SRO) hotels planned to serve senior citizen and low-income populations. In addition, approximately 2,500 housing units are proposed around the South Van Ness Avenue and Mission Street area.

The CPMC has proposed a new campus, known as the Cathedral Hill Campus, on Van Ness Avenue between Geary Boulevard and Post Street. This major development along the project alignment would consist of a hospital and a medical office; it would occupy an entire block on both sides of Van Ness Avenue.

Major approved and active projects within the study corridor are listed in Table 4.1-1. For more detailed information on these projects, refer to Chapter 2, Section 2.7, Related and Planned Projects.

Table 4.1-1: Major Approved and Active Projects in the Study Area

NO.	PROJECT NAME	ADDRESS	APPROVED/ PLANNED USE	NUMBER OF RESIDENTIAL UNITS	PROJECT STATUS
1	810-826 Van Ness Avenue	810-826 Van Ness Avenue	Mixed Residential	53	Completed
2	990 Polk	990 Polk Street	Mixed Residential	110	Completed
3	Arnett Watson Apartments	650 Eddy Street	Mixed Residential	83	Completed
4	10th and Mission Family Housing	1400 Mission Street	Mixed Residential	156	Under construction
5	Mission Family Housing	1036-1040 Mission Street	Mixed Residential	90	Completed in 2012
6	Eddy and Taylor Family Apartments	168-186 Eddy Street; 238 Taylor Street	Mixed Residential	130	Completion anticipated in 2014
7	Market and Octavia Better Neighborhoods Plan	N/A*	Mixed Residential	2,500	Preliminary planning
8	California Pacific Medical Center (Cathedral Hill Campus)	Van Ness Avenue and Geary Boulevard	Medical	N/A	In planning
9	100 Van Ness	100 Van Ness	Multi-family Residential	399	In planning
10	1401 Market Street	1401 Market Street	Mixed Residential	719	Under construction

* The Plan comprises several individual housing projects around South Van Ness Avenue and Mission Street.

SOURCES: McCormick, 2008; San Francisco Planning Department, 2008b; San Francisco Planning Department, 2008d.

4.1.1.3 | REGIONAL AND LOCAL PLANNING GOALS AND POLICIES

Land use planning goals and policies are guided by the *San Francisco General Plan*. The information provided in the *San Francisco General Plan* is made more precise in individual area plans that cover designated geographic areas of the City. The *San Francisco General Plan* and associated area plans located within or near the project corridor are discussed below, in addition to other relevant regional and local planning documents.

San Francisco General Plan (October 2000)

The City is governed by the *San Francisco General Plan* in an effort to guide decision making for the future of the area. The plan contains objectives and policies in seven elements and eight area plans to ensure that future development is consistent with development goals of the City. Objectives and policies in the transportation element of the general plan give priority to public transit development and improvement, as well as other alternatives to the private automobile. Relevant general plan land use and transportation-related objectives and policies include the following:

Objectives and policies in the transportation element of the *San Francisco General Plan* give priority to public transit development and improvement.

- Encourage development that efficiently coordinates land use with transit service, requiring developers to address transit concerns as well as mitigate traffic problems.

- Use the transportation system as a means for guiding development and improving the environment.
- Maintain public transit as the primary mode of transportation in San Francisco and as a means through which to guide future development and improve regional mobility and air quality.
- Use rapid transit and other transportation improvements in the City and region as the catalyst for desirable development.
- Maintain and improve the TPS Program to make transit more attractive and viable as a primary means of travel.
- Encourage ridership and clarify transit routes by means of a citywide plan for street landscaping, lighting, and transit preferential treatments.
- Provide convenient transit service that connects the regional transit network to major employment centers outside the downtown area.

Van Ness Avenue Area Plan (July 1995)

The *Van Ness Area Plan* is intended to promote Van Ness Avenue as the City's prominent north-south boulevard.

The City adopted the *Van Ness Area Plan* in 1986 and created a Van Ness Avenue Special Use District of the Planning Code in 1988 to implement the plan. The plan is intended to promote Van Ness Avenue as the City's most prominent north-south boulevard, lined with high-density mixed-use development and including design features that support a transit-served pedestrian promenade. The *Van Ness Area Plan* identifies the following land use objectives and corresponding policies:

- Objective 1. Continue existing development of the avenue and add a significant increment of new housing between Redwood and Broadway Street.
  - Policies 1.1 through 1.5 support maximizing the number of housing units in this stretch of the corridor and providing more affordable housing, while maintaining commercial use in existing commercial structures.
- Objective 2. Maintain the scale, character, and density of this predominantly residential neighborhood located between Broadway and Bay streets.
  - Policy 2.1 supports infill with "carefully designed," medium-density, new housing.
- Objective 3. Transform the area between Bay Street and the Municipal Pier into an attractive gateway to the residential boulevard (Van Ness Avenue) and a transition from Fisherman's Wharf and the GGNRA.
  - Policies 3.1 through 3.2 support creating tree-lined sidewalks and a landscaped median within Van Ness Avenue, and supporting NPS plans for improvement within the boundaries of the GGNRA.
- Objective 4. Permit densities and land uses that are compatible with existing land uses and proposed residential development of Van Ness Avenue.

The *Van Ness Area Plan* identifies the following relevant streetscape objectives and corresponding policies:

- Objective 8. Create an attractive street and sidewalk space that contributes to the transformation of Van Ness Avenue into a residential boulevard.
  - Policies 8.1 through 8.4 support landscaping and tree plantings, and maintaining existing sidewalk space abutting major renovation or new development projects.
  - Policies 8.5 through 8.7 support maintaining existing sidewalk widths and providing uniform aesthetic sidewalk treatments.
  - Policies 8.8 through 8.10 support a uniform architectural style in the design of streetlights and poles, clustering of newspaper racks at specific corner locations, and provision of attractive street furniture at convenient locations throughout Van Ness Avenue.

Policies 8.5 through 8.10 of the *Van Ness Area Plan* support a uniform aesthetic for sidewalk and streetscape elements.

The *Van Ness Area Plan* identifies the following relevant transportation objectives and corresponding policies:

- Objective 9. Provide safe and efficient movement among all users on Van Ness Avenue.
  - Policies 9.1 through 9.4 support transit service, including reducing conflicts between transit vehicles and other moving and parked vehicles.
  - Policies 9.5 through 9.8 support auto circulation, including provision of parking from minor east-west streets and prohibiting new parking access from Van Ness Avenue.
  - Policies 9.10 through 9.12 include measures to enhance pedestrian circulation.
  - Policy 9.13 discourages freight loading facilities from Van Ness Avenue.

Policies 9.1 through 9.4 of the *Van Ness Area Plan* support transit service, including reducing conflicts between transit vehicles and other moving and parked vehicles.

The Civic Center Area Plan (October 1989)

The *Civic Center Area Plan* outlines a series of policies to guide development in and around City Hall and the surrounding government offices and cultural performing arts facilities. The plan provides a comprehensive program of street and pedestrian improvements in the area, including improvements to Van Ness Avenue.

Market and Octavia Area Plan (October 2007)

The *Market and Octavia Area Plan* is a community plan that grew out of the Market and Octavia Neighborhood Plan. The plan calls for new residential development centered on transit and provides land use, urban design, and transportation policies to support development. Extensive public investments in streets, including pedestrian crossings, and streetscapes are envisioned as part of the improvements to transit service on Van Ness Avenue, anchored by a new transit transfer facility on South Van Ness Avenue between Market and Mission streets. The *Market and Octavia Area Plan* identifies Van Ness Avenue as a potential BRT corridor and supports innovative transit solutions that include dedicated bus lanes on Van Ness Avenue.

Western SoMa Community Plan (Adopted March 2013)

The Draft Western SoMa Community Plan includes the southern portion of the project alignment. It supports improved pedestrian connections and transit improvements as part of the overall improvements to the transportation network that supports this mixed commercial and residential neighborhood.

Tenderloin-Little Saigon Neighborhood Transportation Plan Final Report (March 2007)

The *Tenderloin-Little Saigon Neighborhood Transportation Plan* is a community-based transportation plan that prioritizes community transportation needs and develops improvements in the Tenderloin and Little Saigon neighborhoods. The plan identifies primary needs of the community, including the need for improved transit service reliability and accessibility for low-income individuals.

San Francisco Better Streets Plan (Adopted December 2010)

The *San Francisco Better Streets Plan* provides a blueprint for the future of San Francisco's pedestrian environment. It describes a vision, provides design guidelines, and identifies next steps to create streets that are publicly accessible and support multi-modal use with a particular emphasis on pedestrians and transit. Policies promote design of street intersection crossings to maximize pedestrian safety and comfort.

Golden Gate National Recreation Area General Management Plan and Environmental Impact Statement (Draft September 2011)

NPS is in the process of finalizing the *General Management Plan,* which includes plans for the GGNRA and, more specifically, Fort Mason. The *General Management Plan* provides for facilities, and educational and programming plans at popular arrival nodes and recreation destinations in the GGNRA.

2004 Countywide Transportation Plan

The *2004 Countywide Transportation Plan* forecasts that the share of trips made by transit in the Van Ness Avenue corridor will decline in the future unless measures are taken to increase its competitiveness relative to autos.

The CWTP is the City's blueprint to guide transportation development and investment over the next 30 years and is consistent with the broader policy framework of the *San Francisco General Plan,* particularly its transportation element. The CWTP includes the following goals relevant to land use:

- Support economic vitality by maintaining local and regional accessibility to key employment, cultural, recreation, and community activity centers, investing in the multi-modal network to ensure efficient movement of people and goods.
- Support community vitality by supporting good land use planning, improving neighborhood access, and enhancing neighborhood livability, particularly through promotion of pedestrian activity to support neighborhood commercial activity.

The CWTP forecasts that the share of trips made by transit in the Van Ness Avenue corridor will decline in the future unless measures are taken to increase its competitiveness relative to autos, and it identifies the northwestern quadrant of San Francisco as a major gap in the City's rapid transit network. The plan identifies the Van Ness Avenue corridor as a prioritized project area for improving the regional transportation network.

4.1.2 | Environmental Consequences

The project build alternatives would affect land use similarly; therefore, they are addressed together, and differences in environmental consequences between them are noted in the discussion.

4.1.2.1 | CONSISTENCY WITH EXISTING AND PLANNED LAND USE

This section analyzes the consistency of the proposed Van Ness Avenue BRT Project with existing and future planned land use.

No Build Alternative

DEFINITION

RIGHT-OF-WAY (ROW): The designated area that lies between private property lines (i.e., building face to building face) fronting the street.

Under the No Build Alternative, no changes or adverse effects to existing or proposed land uses would occur. Implementation and construction of the transportation and streetscape improvements proposed under the No Build Alternative would occur within the existing transportation ROW, with no additional ROW required.

Existing and proposed land use plans and development trends are supportive of transit use, as summarized in Section 4.1.1.3. Existing land uses in the corridor would remain under the No Build Alternative, and they would benefit from improved transit service and enhanced urban design features. Under the No Build Alternative, future transit service in the Van Ness Avenue corridor would be improved over the existing condition, benefiting adjacent land uses; however, less benefit would be achieved in comparison to the build alternatives because the No Build Alternative would support to a lesser extent the transit-dependent, high-density, mixed-use infill development planned for the Van Ness Avenue corridor. The No Build Alternative would provide reduced benefit to existing and planned land use and its associated transit demand in comparison to the build alternatives.

Build Alternatives

Implementation of the build alternatives would occur within the existing transportation ROW, with no additional ROW required. Proposed BRT station platforms would not require ROW acquisition, nor would proposed lighting and streetscape improvements.

Existing and proposed land use plans and development trends are supportive of transit use, as summarized in Sections 4.1.1.1 and 4.1.1.3, respectively. The proposed project would introduce rapid transit to the corridor, providing improved support for the substantial high-density, mixed-use, transit-dependent land uses in the Van Ness Avenue corridor. The project build alternatives would benefit surrounding land uses by providing improved and quicker access to and from the high-density residential neighborhoods in the vicinity of Van Ness Avenue, and the commercial uses that serve as one of the City's major shopping areas. The build alternatives would provide improved transit service to the major activity centers in the corridor and would serve the proposed CPMC Cathedral Hill Campus. The urban design elements of the proposed build alternatives would also support the existing and planned commercial and civic land uses that front Van Ness Avenue.

No changes or adverse effects to existing or proposed land uses would be required or expected to occur under the proposed build alternatives, including the LPA with or without the Vallejo Northbound Station Variant.

4.1.2.2 | CONSISTENCY WITH REGIONAL AND LOCAL PLANNING GOALS AND POLICIES

This section analyzes the consistency of the proposed Van Ness Avenue BRT Project with applicable local and regional planning policies.

No Build Alternative

The No Build Alternative would support local planning goals to encourage development that efficiently coordinates land use with transit service; however, less benefit would be achieved in comparison with the build alternatives because the No Build Alternative would not accommodate to the same extent the development trends and projected travel demand for the corridor.

Although the No Build Alternative would support local and regional transportation planning goals in the City's General Plan and CWTP by providing improved transit, it would not fulfill policies in these plans to fill a major gap in the City's rapid transit network. Moreover, the No Build Alternative would not support the goal in the *Van Ness Area Plan* to reduce conflicts between transit vehicles and other moving and parked cars because the No Build Alternative would not provide a dedicated transit lane.

The No Build Alternative would support planning goals to promote pedestrian activity and the design objectives of the *San Francisco Better Streets Plan;* however, it would achieve less benefit to the pedestrian environment than the build alternatives because it would not provide curb bulbs and transit waiting areas buffered from auto and pedestrian traffic. Although existing medians would be maintained, pedestrian crossings would not be improved to the same extent as under the build alternatives because pedestrian visibility and reduced crossing of traffic lanes offered by curb bulbs would not be achieved.

The No Build Alternative is consistent with the improved streetscape and pedestrian improvements, and planned transit-served development goals specified in applicable planning documents; however, these goals and policies would not be realized to the same extent as under the build alternatives because the No Build Alternative does not provide the reliability benefit of a dedicated transit lane and superior improvements to the pedestrian environment. The No Build Alternative is consistent with the CWTP's goal to enhance and improve transit ridership, but it does not achieve goals in the plan to develop a citywide network of rapid bus.

Build Alternatives

The build alternatives are generally consistent with regional and local transportation planning goals in the City's General Plan and CWTP to fill a major gap in the City's rapid transit network. The proposed BRT would support general plan objectives to maintain local and regional accessibility to key employment and community activity centers provided in the Civic Center vicinity, as well as the major shopping corridor along Van Ness Avenue. Moreover, the build alternatives would support the goal in the *Van Ness Area Plan* to reduce conflicts between transit vehicles and other moving and parked cars with provision of a dedicated BRT lane; however, Build Alternative 2 would achieve less benefit from a dedicated lane in comparison to Alternatives 3 and 4 (including the LPA, with or without the Vallejo Northbound Station Variant), because buses under Build Alternative 2 would have conflicts with right-turning vehicles, parallel parking vehicles, and illegally parked vehicles.

KEY FINDING

No changes or adverse effects to existing or proposed land uses would be required or expected to occur under the proposed build alternatives.

The No Build Alternative would provide lesser benefit to existing and planned land uses and their associated transit demand than the build alternatives.

The build alternatives are consistent with planning goals to encourage development that efficiently coordinates land use with transit service. The build alternatives are consistent with policies in the *Van Ness Area Plan* to maximize housing units and infill development because this is transit-oriented development. As discussed in Section 4.1.2.1, land use plans for the Van Ness Avenue corridor are supportive of transit use, and the proposed build alternatives would provide high-level rapid transit service that would accommodate the development trends and projected travel demand for the corridor.

Lastly, the build alternatives are consistent with planning goals to promote pedestrian activity and streetscape design objectives of the *Van Ness Area Plan* and *San Francisco Better Streets Plan*. The build alternatives would provide landscaping and streetlights of uniform architectural style throughout the corridor to provide a consistent sidewalk aesthetic supporting Van Ness Area Plan streetscape policies. The project does not include landscaping and streetscape features north of Lombard Street, so policies to create a visual gateway between Bay Street and the Municipal Pier would not be supported; however, the proposed build alternatives would not conflict with future plans under this policy.

The proposed build alternatives would provide curb bulbs, or extensions of the sidewalk, at most intersections. Curb bulbs are intended to reduce pedestrian crossing distances, increase pedestrian visibility, and create pedestrian-friendly designated waiting areas at intersections. Introduction of curb bulbs is consistent with design objectives of the *San Francisco Better Streets Plan*. The LPA would provide a minimum 6-foot-wide pedestrian refuge on Van Ness Avenue at all signalized intersections, which is also consistent with the design objectives of the San Francisco *Better Streets Plan*.

It is anticipated that the Van Ness Avenue BRT Project would require a General Plan Referral before consideration by the Board of Supervisors for proposed changes to official grades or sidewalk and street widths. The Planning Commission and the Board of Supervisors may consider amending the General Plan as part of a future, comprehensive General Plan Update to incorporate specific mention of the Van Ness Avenue BRT Project as providing rapid transit on Van Ness Avenue.

In addition to curb bulbs, Build Alternative 2 would extend sidewalks to serve as station platforms. At station locations, approximately 5 feet of the existing sidewalk would be utilized for aesthetic treatments, such as a landscaped planter, that provide a buffer between waiting bus patrons and pedestrian traffic along the sidewalk. Any change in sidewalk width requires a General Plan Referral from the San Francisco Planning Department. Build Alternatives 3 and 4 would maintain existing sidewalk widths, consistent with *Van Ness Area Plan* policies.

Build Alternative 2 would increase the amount of landscaped median on Van Ness Avenue at locations where existing left-turn pockets would be removed. However, Build Alternative 3 would change the configuration of the median, splitting it into two smaller landscaped medians. Build Alternative 4 and the LPA (with or without the Vallejo Northbound Station Variant) would also remove some existing landscape that includes mature trees, as discussed in Section 4.4, Visual/Aesthetics. Reduction of the median would require a General Plan Referral from the San Francisco Planning Department.

Although General Plan Referrals would be required, the proposed project would be consistent with overall planning goals to improve the pedestrian environment by providing safe waiting areas buffered from auto and pedestrian traffic with attractive landscape and uniform, pedestrian-scale lighting.

4.1.3 | Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are required. Per established City procedures, a General Plan Referral would be required from the City Planning Department to permit any change in existing sidewalk width, as anticipated under Build Alternative 2. The SFMTA would prepare the General Plan Referral for approval by the San Francisco Planning Department and the Planning Commission.

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4.2 Community Impacts

This section analyzes existing and projected study area social conditions in terms of population characteristics such as income and ethnicity; household size and composition; employment and labor force; community/neighborhood characteristics, including public services and facilities; and economic and business characteristics.

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. For most analysis areas as part of this chapter, the LPA, with or without the Vallejo Northbound Station Variant, has impacts similar to Build Alternatives 3 and 4 with Design Option B. The LPA, with or without the Vallejo Northbound Station Variant, has slightly different results for parking gains and losses, as shown in this subsection. However, the overall community impact findings with the LPA are consistent with the findings for Build Alternatives 3 and 4 with Design Option B, as presented in this subsection.

4.2.1 | Community Character and Cohesion

4.2.1.1 | AFFECTED ENVIRONMENT

Demographic Characteristics

Demographic characteristics of the affected environment are derived from the 2000 U.S. Census and the ABAG *Projections 2007: Forecasts for the San Francisco Bay Area to the Year 2035*. Fifty-two (52) census tract block groups constitute the study area and were used for demographic characterization, as shown in Figure 4.2-1.

Population, Housing, and Employment Growth

Existing and projected population, housing, and employment growth trends within the study area and the City and County of San Francisco are described below and shown in Table 4.2-1.

Table 4.2-1: Population, Employment, and Housing Projections; 2000-2035

					POPULATION
	2000	2015	2025	2035	% CHANGE '00-35
Total Study Area	78,347	91,943	98,101	105,125	34
City and County of San Francisco	776,733	823,800	888,400	956,800	23
					HOUSING (HOUSEHOLDS)
	2000	2015	2025	2035	% CHANGE '00-35
Total Study Area	44,381	52,431	54,079	56,589	28
City and County of San Francisco	329,700	357,810	377,050	396,310	20
					EMPLOYMENT (JOBS)
	2000	2015	2025	2035	% CHANGE '00-35
Total Study Area	94,776	104,757	120,793	136,751	44
City and County of San Francisco	642,500	636,840	733,020	832,860	30

Source: U.S. Census Bureau, 2000; 2007 ABAG Projections.

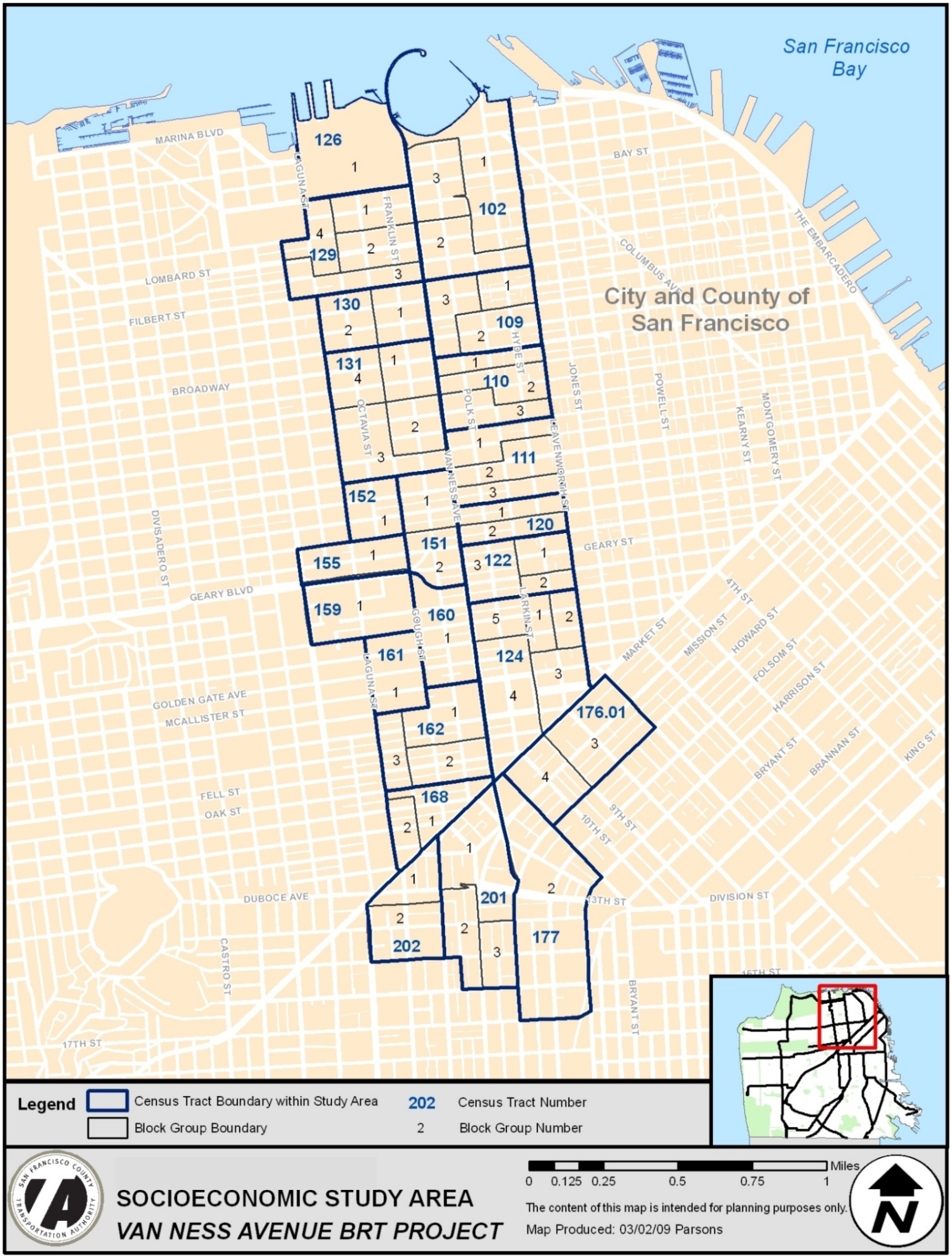


Figure 4.2-1: Socioeconomic Study Area

Population. Between 2000 and 2035, the population in the study area is projected to increase approximately 34 percent, from 78,347 to 105,125 persons. The City and County of San Francisco is anticipated to grow from 776,733 to 956,800 persons, which is an increase of approximately 23 percent.

Housing (Households). Between 2000 and 2035, the total number of households in the study area is expected to increase by approximately 28 percent, while the number of households in the City and County of San Francisco is expected to increase by 20 percent.

Employment (Jobs). Employment in the study area is anticipated to increase by 44 percent between 2000 and 2035. The total number of jobs in the City and County of San Francisco is projected to grow by 30 percent.

Ethnic Composition

The ethnicity profile of the study area population is derived from 2000 U.S. Census data. The racial categories used are White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other Race/Two or More Races, and Hispanic. For this analysis, persons of Hispanic origin were categorized separately and were not included in other ethnic categories.

For this analysis, racial and ethnic minority groups are defined as being comprised of people categorized as Hispanic or a race other than White in 2000 U.S. Census data.

As shown in Table 4.2-2, there is greater ethnic diversity in the City and County of San Francisco compared to the study area. For this analysis, racial and ethnic minority groups are defined as being comprised of people categorized as Hispanic or a race other than white in 2000 U.S. Census data. Overall, approximately 45 percent of all study area residents are members of minority groups. Approximately 24 percent of the population in the study area is Asian and 13 percent is Hispanic. Nearly 56 percent of the population in the City and County of San Francisco are members of minority groups, of which the Asian and Hispanic populations contribute approximately 31 and 14 percent, respectively.

45 percent of all study area residents are members of minority groups, as defined by this analysis: 24 percent are Asian and 13 percent Hispanic.

Table 4.2-2: Racial and Ethnic Composition

	TOTAL PERSONS	WHITE	%	BLACK OR AFRICAN AMERICAN	%	AMERICAN INDIAN/ ALASKA NATIVE	%
Study Area	78,347	42,612	54	3,829	5	281	0
City and County of San Francisco	776,733	338,909	44	58,791	8	2,020	0

	ASIAN	%	NATIVE HAWAIIAN/ OTHER PACIFIC ISLANDER	%	SOME OTHER RACE/ TWO OR MORE	%	HISPANIC	%
Study Area	18,895	24	183	0	2,755	3.5	9,792	13
City and County of San Francisco	238,173	31	3,602	1	25,734	3.3	109,504	14

Source: 2000 U.S. Census Data.

Household Size and Composition

Household characteristics in the study area and in the City and County of San Francisco are shown in Table 4.2-3. According to 2000 U.S. Census data, the total number of households in the study area was 44,381, with approximately 1.8 persons per household. The total number of households within the City and County of San Francisco was 329,700, with approximately 2.3 persons per household.

Table 4.2-3: Household Characteristics

STUDY AREA	NUMBER OF HOUSEHOLDS	AVERAGE HOUSEHOLD SIZE	TOTAL NUMBER OF FAMILIES
Total Study Area	44,381	1.8	11,516
City and County of San Francisco	329,700	2.3	145,186

Source: 2000 U.S. Census Data.

Household Income

In 2000, the median household income for the study area was $43,162,

In 2000 the median household income for the study area was $43,162, and no Census block groups within the study area had a median income that was below the Department of Health and Human Service poverty guideline In the City and County of San Francisco, the median household income was $55,221. (See Section 4.14, Environmental Justice, for further information about income and race within the study area.)

Households without Automobiles

Approximately 48 percent of the households in the study area are without a private automobile compared to approximately 29 percent in the City and County of San Francisco as a whole.

Transit-dependent populations are defined as households without automobiles. These individuals rely on public transportation services for access to employment opportunities, school, social/recreation functions, medical appointments, and mobility in general. Table 4.2-4 shows the representation of transit-dependent populations in the project study area based on 2000 U.S. Census data. Approximately 48 percent of the households in the study area are without a private automobile compared to approximately 29 percent in the City and County of San Francisco as a whole.

Table 4.2-4: 2000 Transit-Dependent Populations

STUDY AREA	TOTAL HOUSEHOLDS	HOUSEHOLDS WITHOUT PRIVATE TRANSPORT	% OF HOUSEHOLDS WITHOUT PRIVATE TRANSPORT
Total Study Area	44,381	21,064	48
City and County of San Francisco	329,700	94,178	29

Source: 2000 U.S. Census Data.

Community and Neighborhood Characteristics

The project corridor extends through portions of multiple neighborhoods in the planning subareas of the City and County of San Francisco. Planning areas and neighborhoods in the project vicinity are described below from south to north and are defined based on the SFGate Neighborhood Guide to the City of San Francisco.

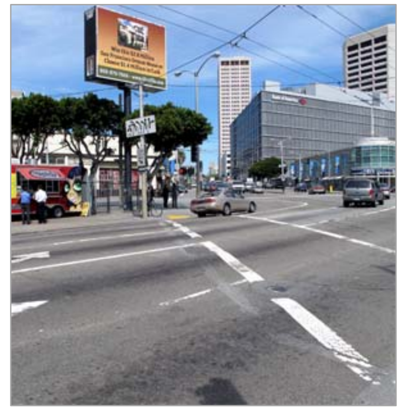
South of Market. The South of Market planning area is bounded by Market Street, the San Francisco Bay, Townsend Street, and US 101. Only the western side of this planning area (Western SoMa) lies immediately adjacent to the Van Ness Avenue corridor. Neighborhoods within the planning area are diverse and characterized by warehouses, auto repair shops, nightclubs, residential hotels, art spaces, loft apartments, furniture showrooms, condominiums, and some software and technology companies.

Hayes Valley/Lower Haight. The Hayes Valley/Lower Haight neighborhood extends between McAllister Street, Market Street/Duboce Avenue, Gough Street, and Webster Street and Divisadero Street. A variety of boutiques and high-end restaurants are located within this neighborhood.

Western Addition. The Western Addition neighborhood is situated between Van Ness Avenue, Golden Gate Park, the Upper and Lower Haight, and Pacific Heights. The Western

Addition neighborhood, particularly the Fillmore District, has served as a population base and cultural center for San Francisco's African American community.

Civic Center. The Civic Center planning area is located along Van Ness Avenue, north of its intersection with Market Street. The Civic Center area is the primary center of government and civic institutions within the city. In addition, several cultural centers are located within the planning area, including museums, theaters, and opera houses. One of San Francisco's lowest income neighborhoods, the Tenderloin, is located within the Civic Center area.



The project corridor extends through portions of neighborhoods as diverse as the auto shops and taco trucks on South Van Ness (above) to the boutiques of Hayes Valley (below) and Cow Hollow.

Lower Pacific Heights. The Lower Pacific Heights neighborhood is located between California Street, Geary Street, Presidio Avenue, and Van Ness Avenue. Historically, this area was considered part of the Western Addition.

Pacific Heights. The Pacific Heights neighborhood extends from Presidio Avenue to Van Ness Avenue and from California Street to Broadway. Many of the residents in this affluent neighborhood are young urban professionals. Most of the neighborhood's boutiques and restaurants are located along Fillmore Street, south of Pacific Avenue. Other businesses in Pacific Heights are located on California and Divisadero streets, as well as on Van Ness Avenue. The California Pacific Medical Center (CPMC) and the consulates of several countries are also situated within Pacific Heights.

Nob Hill and Russian Hill. The affluent Nob Hill and Russian Hill neighborhoods are located between Bay Street, Van Ness Avenue, Taylor Street, and Pine Street.

Marina/Cow Hollow. The Marina District is one of the northern districts of San Francisco. The district is bounded by Van Ness Avenue, Lyon Street, and the Presidio, and by US 101/ Lombard Street. Lombard Street is lined with motels, retail businesses, restaurants, and residential units. The Cow Hollow neighborhood is located within the Marina District. Union Street is the major shopping thoroughfare within the Cow Hollow neighborhood.

4.2.1.2 | ENVIRONMENTAL CONSEQUENCES

Community cohesion is defined as the degree to which residents have a sense of belonging to their neighborhood or experience attachment to community groups and institutions as a result of continued association over time. The proposed project potentially would have a positive impact on community cohesion because overall it would improve pedestrian conditions, namely the ease of crossing Van Ness Avenue and its cross streets. The proposed BRT facility would provide improved transit access to activity centers along the corridor, such as the Civic Center and AMC Theatres. Because the proposed BRT project would be constructed along an existing transportation route, the communities and neighborhoods adjacent to the corridor would not experience a disruption in cohesion. Moreover, no property displacements or relocations would occur as a result of the proposed project. Therefore, the proposed project would not result in a substantial physical or psychological barrier that would divide, disrupt, or isolate neighborhoods, individuals, or community activity centers.

KEY FINDING

The proposed project potentially would have a positive impact on community cohesion because overall it would improve pedestrian conditions and transit access. There would be no property displacements or relocations.

4.2.1.3 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The communities and neighborhoods in the immediate vicinity of the proposed project would not experience a disruption in cohesion; therefore, no related mitigation measures are required.

4.2.2 | Public Services and Community Facilities

4.2.2.1 | AFFECTED ENVIRONMENT

Public services and community facilities located within the study area, including police and fire, schools and universities, cultural facilities, hospital and medical, parks and recreational facilities, and houses of worship are listed in Tables 4.2-5 and 4.2-6 and are shown in Figures 4.2-2 and 4.2-3.

Schools and Universities

Six primary schools and one secondary public school are within the study area. Public schools are within the jurisdiction of the San Francisco Unified School District. Other educational facilities located within the study area include six private and two charter/alternative schools.

Libraries

Two branches of the San Francisco Public Library are within the study area. These libraries include the Main Branch Library and the Golden Gate Valley Branch Library. No other library branches are located within the study area.

Public services and community facilities are often located close together. The Tenderloin School and the old San Francisco Federal Building (above) are within two blocks of the Asian Art Museum. (below).

Police and Fire

Police protection and traffic enforcement in the study area are provided by the San Francisco Police Department and the San Francisco Sheriff's Department. Fire protection services are provided by the San Francisco Fire Department (SFFD). Emergency medical services are provided by the San Francisco Department of Public Health. There are two fire stations and no police stations located within the study area.

Hospital and Medical Facilities

The Saint Francis Memorial Hospital is located within the study area. The CPMC is planning a campus on Van Ness Avenue between Geary and Post streets, referred to as the CPMC Project (see Section 2.6).

Post Offices

One branch of the United States Post Office is located within the study area. There are no other post offices within the study area.

Cultural Facilities

Several cultural facilities are within the study area. These facilities include the Asian Art Museum, Mexican Museum, and the California Crafts Museum. Exhibit halls include the Veterans Building and the Brooks Exhibit Hall. Performance venues within the study area include the Davies Symphony Hall, the War Memorial Opera House, and the San Francisco Opera House.

San Francisco City Hall provides direct access to City services, including the City Attorney's Office, Department of Public Works, Mayor's Office of Neighborhood Services, County Clerk, and the General Services Agency.

Houses of Worship

There are many houses of worship of various denominations within the study area. These facilities, which serve as community focal points, are listed in Table 4.2-5 and shown in Figure 4.2-2.

Table 4.2-5: Public and Community Facilities

ID	NAME	LOCATION	ID	NAME	LOCATION
EDUCATIONAL FACILITIES (SCHOOLS AND LIBRARIES)					
SCHOOLS					
1	Sarah Dix Hamlin School	2129 Vallejo St.	9	St. Brigid School	2250 Franklin St.
2	Rosa Parks Elementary School	1501 O' Farrell St.	10	Spring Valley Elementary	1451 Jackson St.
3	Binet Montessori School	1715 Octavia St.	11	Sacred Heart Cathedral Prep.	1055 Ellis St.
4	Galileo High	1055 Bay St.	12	Swett (John) Elementary	727 Golden Gate Ave
5	Sherman Elementary	1651 Union St.	13	Life Learning Academy Charter	220 Golden Gate Ave.
6	Montessori House Of Children	1187 Franklin St.	14	Chinese American Intl School	150 Oak St.
7	Redding Elementary	1421 Pine St.	15	Marshall Elementary	1575 15Th St.
8	Tenderloin Elementary	627 Turk St.			
LIBRARIES					
29	Golden Gate Valley Branch Library	1801 Green St.	30	San Francisco Public Library	100 Larkin St.
EMERGENCY SERVICES (POLICE / FIRE STATIONS AND HOSPITALS)					
FIRE STATIONS			**HOSPITALS**		
16	Fire Department Station #3	1067 Post St.	18	Saint Francis Memorial Hospital	900 Hyde St.
17	Fire Department Station #41	1325 Leavenworth St.	49	California Pacific Medical Center	1255 Post St.
POST OFFICES					
32	United States Post Office	450 Golden Gate Ave.			
CULTURAL FACILITIES					
19	Mexican Museum	Building D, Fort Mason Center	24	Asian Art Museum of San Francisco	200 Larkin St.
20	California Crafts Museum	550 Sutter St.	25	San Francisco Opera House	199 Grove St.
21	Museum of Ophthalmology	655 Beach St.	26	Veterans Building	401 Van Ness Ave.
22	National Maritime Museum	2905 Hyde St.	27	War Memorial Opera House	301 Van Ness Ave.
23	Davies Symphony Hall	201 Van Ness Ave.	28	Brooks Exhibit Hall	99 Grove St.
31	San Francisco City Hall	1 Dr. Carlton B. Goodlet Pl.			
HOUSES OF WORSHIP					
33	Chinese Community Church	931 Larkin St.	41	First Church of Christ Scientist	1700 Franklin St.
34	Fort Mason Chapel	Upper Fort Mason	42	First Unitarian Church	1187 Franklin St.
35	Holy Trinity Russian Orthodox Cathedral	1520 Green St.	43	Hamilton Square Baptist Church	1212 Geary Blvd.
36	Norwegian Seamans Church	2454 Hyde St.	44	Old First Presbyterian Church	1751 Sacramento St.
37	Saint Marks Lutheran Church	1111 O'Farrell St.	45	Saint Lukes Episcopal Church	1755 Clay St.
38	Buddhist Church of San Francisco	1881 Pine St.	46	Saint Marys Cathedral	1111 Gough St.
39	First Chinese Southern Baptist Church	1255 Hyde St.	47	Trinity Episcopal Church	1668 Bush St.
40	Advent of Christ the King Church	261 Fell St.	48	Templo Calvario	1419 Howard St.

Source: Parsons, 2009.

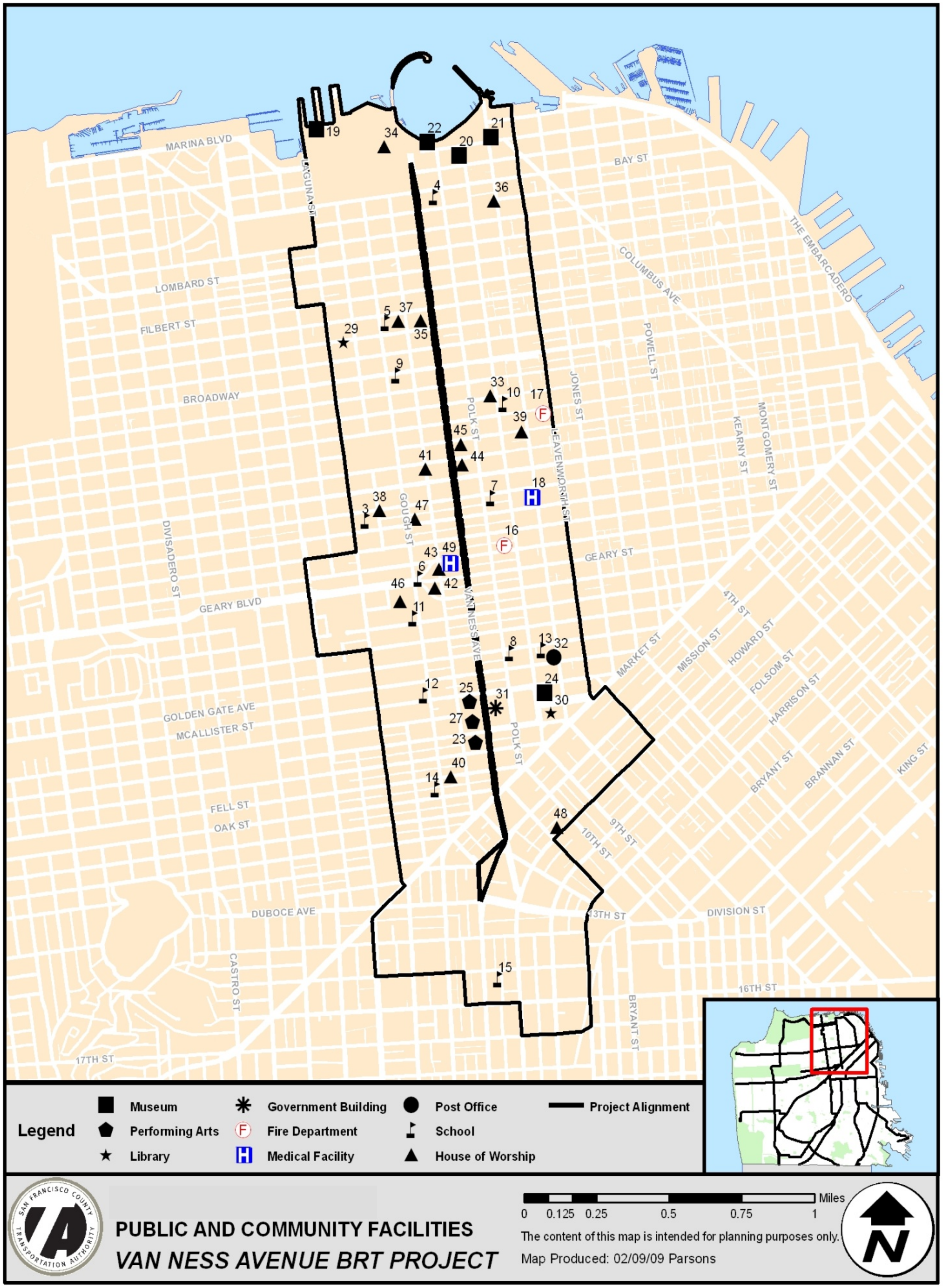


Figure 4.2-2: Public and Community Facilities

Parks and Recreation Facilities

As listed in Table 4.2-6 and shown in Figure 4.2-3, there are ten parks, five recreational facilities, and five other public spaces within the study area.

Table 4.2-6: Park and Recreation Facilities

ID	NAME	LOCATION
1	Joseph Conrad Memorial Park	Beach Street & Columbus Avenue
2	Russian Hill Park	Bay & Hyde Streets
3	Alice Marble Tennis Courts	Lombard & Hyde Streets
4	Mini-Park – Page & Laguna	Page & Laguna Streets
5	Mini-Park – Green & Hyde	Green & Hyde Streets
6	Tenderloin Playground	Ellis & Leavenworth Streets
7	Mini-Park – Turk & Hyde	Turk and Hyde Streets
8	U.N. Plaza	Market & McAllister Streets
9	Allyne Park	Green & Gough Streets
10	Lafayette Park	Sacramento & Gough Streets
11	Jefferson Square	Turk & Gough Streets
12	Hayward Playground	Golden Gate Avenue & Gough Street
13	Mini-Park – Washington Street	Washington & Hyde Streets
14	Helen Wills Playground	Broadway & Larkin Street
15	Sergeant J. Macaulay Park	O'Farrell & Larkin Streets
16	Civic Center Plaza	Grove & Larkin Streets
17	Fort Mason	Bay Street & Van Ness Avenue
18	Peace Plaza	Geary Boulevard & Buchanan Street
19	San Francisco Maritime National Historical Park	Beach Street
20	Strauss Playground	14th & Valencia Streets

Source: Parsons, 2009.

4.2.2.2 | ENVIRONMENTAL CONSEQUENCES

Improved transit access to public services and community facilities would occur as a result of the build alternatives, including the LPA. Inclusion of the Vallejo Northbound Station Variant would further enhance transit access. This enhanced accessibility within the study area would benefit the community and public facilities identified in Tables 4.2-5 and 4.2-6 and shown in Figures 4.2-2 and 4.2-3. Impacts during the construction phase are described in Section 4.15.2, Construction Community Impacts.

KEY FINDING

There would be no adverse affects on community facilities. Improved access to public services and community facilities would occur as a result of the build alternatives, benefitting those services and facilities.

4.2.2.3 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Because there would be no adverse effects on community facilities, no mitigation measures are proposed. Avoidance and minimization measures to be implemented during the construction phase are described in Section 4.15.2, Construction Community Impacts.

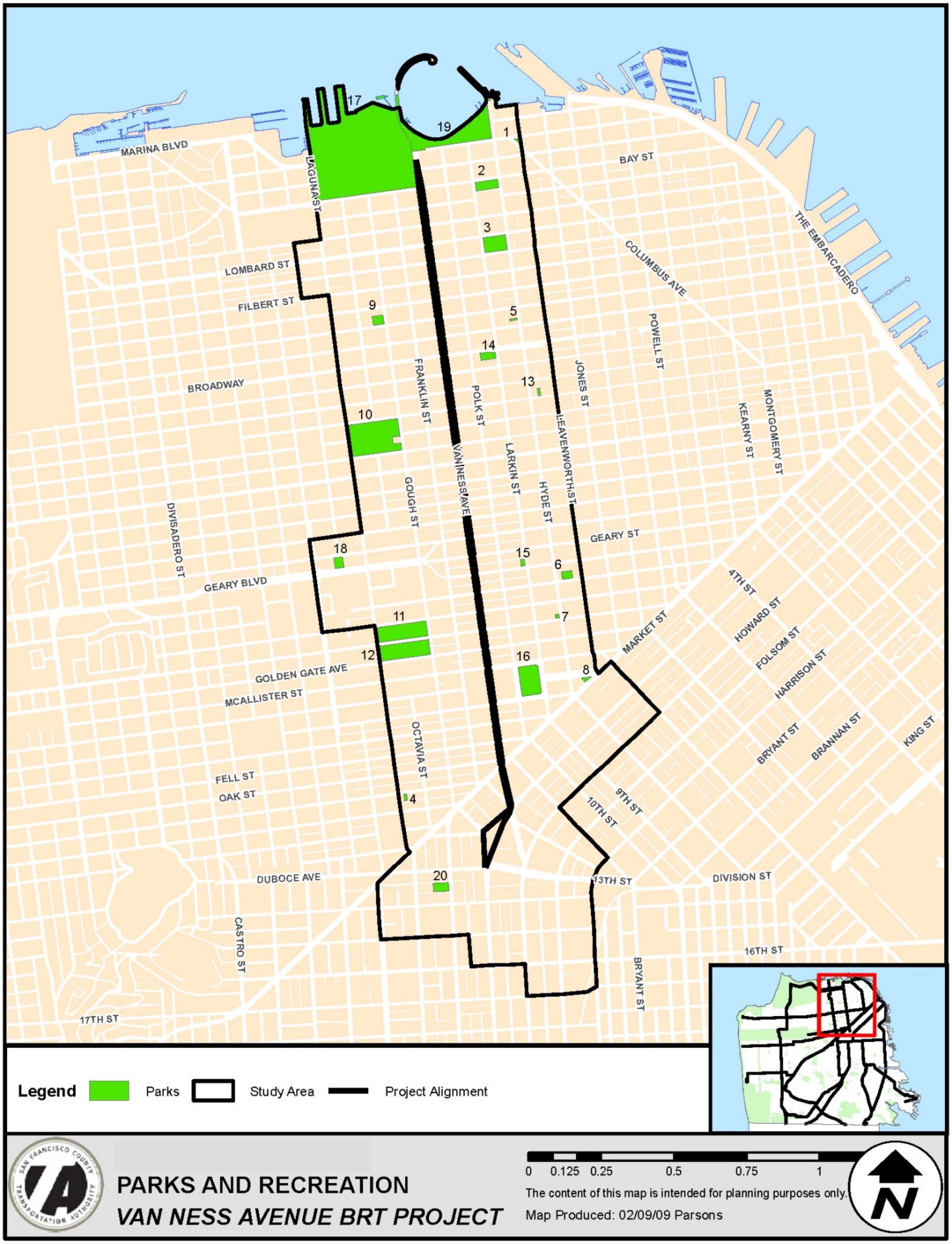


Figure 4.2-3: Parks and Recreation

4.2.3 | Relocations

There would be no residential or business relocations as a result of the proposed project.

4.2.4 | Economic and Business Environment

Government and institutional employment accounts for more than 50 percent of the jobs located along the corridor. 80 percent of the jobs east of Van Ness Avenue are in the retail and office sector.

This section evaluates potential adverse effects of the proposed project on business and commercial districts in the corridor.

4.2.4.1 | AFFECTED ENVIRONMENT

The Van Ness Avenue corridor, along with side and parallel streets, supports a wide range of businesses, cultural arts, religious organizations, and institutions. Retail, entertainment, and tourist activities are distributed throughout the corridor, with larger hotels concentrated along Van Ness Avenue near Geary and California streets. Many business associations are intermixed throughout the corridor that extend to side and parallel streets, notably the Hayes Valley Merchants Association, Polk Street Merchants Association, and South of Market Business Association.

Government and institutional employment accounts for more than 50 percent of the jobs located along this corridor, with most of the employment concentrated in the Civic Center area. Cultural and performing arts organizations also provide employment opportunities in the vicinity of the Civic Center. Eighty (80) percent of the jobs east of Van Ness Avenue are in the retail and office sector. Large-sale retail activities, such as automobile dealerships, home furnishings, and electronic sales, are located along Van Ness Avenue primarily between Broadway Street and the Civic Center. Neighborhood-serving retail stores are located along Van Ness Avenue north of Broadway Street and are clustered along adjacent commercial streets along much of the corridor.

Labor Force Characteristics

An estimated 48,892 civilians, age 16 and older, were in the study area labor force, according to the 2000 U.S. Census information. Of this total, 46,622 persons were employed and 2,270 were unemployed. As shown in Table 4.2-7, professional, scientific, management, administrative, and waste management occupations represented 24 percent of the labor force in the study area, followed by the arts, entertainment, recreation, accommodation, and food services occupations representing 13 percent of the labor force. Approximately 12 percent of the labor force works in the finance, insurance, real estate, and rental and leasing sectors.

Table 4.2-7: Labor Force by Occupation – 2000 (Civilians Age 16+)

	STUDY AREA		CITY AND COUNTY OF SAN FRANCISCO	
Agriculture, forestry, fishing and hunting, and mining	125	0%	825	0%
Construction	1,210	3%	14,961	4%
Manufacturing	2,512	5%	28,228	7%
Wholesale trade	1,048	2%	10,954	3%
Retail trade	4,804	10%	43,935	10%
Transportation and warehousing, and utilities	1,379	3%	19,111	4%
Information	4,022	9%	30,000	7%
Finance, insurance, real estate, and rental and leasing	5,616	12%	43,479	10%

Table 4.2-7: Labor Force by Occupation – 2000 (Civilians Age 16+)

	STUDY AREA		CITY AND COUNTY OF SAN FRANCISCO	
Professional, scientific, management, administrative, and waste management	11,170	24%	82,573	19%
Educational, health, and social services	5,267	44%	69,461	16%
Arts, entertainment, recreation, accommodation, and food services	6,190	13%	48,079	11%
Other services (except public administration)	2,107	5%	21,995	5%
Public administration	1,172	3%	14,222	3%
Employed labor force	46,622	95%	427,823	95%
Unemployed labor force	2,270	5%	20,609	5%
Total Labor Force	48,892		448,432	

Occupational patterns in the City and County of San Francisco are slightly different. Similar to the trend in the study area, the highest percentage (approximately 19 percent) of the labor force works in the professional, scientific, management, administrative, and waste management sector. Approximately 16 percent of the labor force works in the educational, health, and social services sector.

4.2.4.2 | ENVIRONMENTAL CONSEQUENCES

In general, the proposed Van Ness Avenue BRT project would not adversely affect the regional or local economy. The BRT service proposed under the build alternatives would improve transit access to jobs and commercial uses in the Van Ness Avenue corridor, which is likely to benefit the local economy. No business acquisitions or relocations would be required under the build alternatives, including the LPA; therefore, no associated loss of tax revenue would be recognized in the study area jurisdictions.

Beneficial Effects of the Proposed BRT Project

Improved transit services and higher transit ridership that would occur with implementation of any of the build alternatives, including the LPA, would provide greater support for increased business activity in the study area.

Improved transit services and higher transit ridership that would occur with implementation of any of the build alternatives, including the LPA, would provide greater support for increased business activity in the study area. There would be benefits to corridor retail, service, restaurant, and entertainment businesses from larger numbers of people using transit to access commercial areas and cultural and entertainment facilities, as well as from larger numbers of people moving through business and commercial areas on BRT buses and becoming familiar with the businesses, shopping, and entertainment opportunities available along the BRT route. Improved transit access with the proposed project would also provide greater benefits for the hospitals and medical centers in the corridor through improved transit services for patients, visitors, and employees. Similarly, the proposed build alternatives would provide benefits for office businesses, government centers, and educational institutions within the study area through improved transit services for workers, students, and visitors.

The BRT transit improvements would also enhance the image and desirability of commercial areas along the corridor and promote a more pedestrian-oriented environment. The proposed project would provide new BRT stations, a more consistent landscape theme along medians, and pedestrian safety improvements under each build alternative, which would enhance the image of the corridor. The benefits of enhanced desirability and image would generally apply to commercial areas and activity centers throughout the study area; and increased accessibility would be focused in the vicinity of BRT stations where there would be increased foot traffic.

Effects from Traffic and Local Circulation

The proposed project would affect local traffic circulation due to vehicular lane reductions and turning restrictions. As discussed in Section 3.3, the build alternatives would improve delays at some intersections and cause impacts at up to two intersections, depending on alternative (see Table 3.3-17) in year 2015. These delays are forecast during the PM peak period; the project effects on traffic circulation would be less at other times of the day and night when shopping, eating out, entertainment, and other commercial activities often occur. Overall, impacts from local vehicular traffic congestion at certain intersections along the Van Ness Avenue corridor are not anticipated to substantially affect local businesses within the project area.

Delays are forecast during the PM peak period; the project effects on traffic circulation would be less at other times of the day and night when shopping, eating out, entertainment, and other commercial activities often occur.

Effects from On-Street Parking Removal

The project build alternatives, including the LPA, would require the permanent removal of some on-street parking along parts of the corridor, as described in Section 3.5, Parking. This section considers whether the required removal of on-street parking could potentially have adverse effects on adjacent businesses by identifying locations where:

- All or much of the parking is removed along a particular block face; and
- Where colored parking spaces would be removed and could not be replaced along the same or an adjacent block face.

As explained in Section 3.5, street parking would generally be maintained throughout Van Ness Avenue depending on alternative, ranging from a gain of 3 percent under Build Alternative 4 with Design Option B, to a loss of 23 percent under the LPA, with or without the Vallejo Northbound Station Variant.[65] The build alternatives, including the LPA, would not require changes in parking on adjacent streets or in parking lots that serve the area. Nonetheless, depending on the project alternative, there are some locations where much or all of the parking along a particular block face would be removed, as shown in Table 4.2-8.

Overall, under each build alternative, including the LPA, parking spaces would be gained in the Civic Center area. The loss of parking along Van Ness Avenue that would occur mid-corridor in the high-density, mixed-use commercial/residential area would be similar among the proposed build alternatives. SFMTA would give priority to retaining on-street colored parking spaces.

Overall, under each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), parking spaces would be gained in the Civic Center area, which would offset the loss of parking listed in Table 4.2-8 for this segment. The loss of parking along Van Ness Avenue would not affect vehicular accessibility to the Civic Center uses with implementation of any of the build alternatives, including the LPA, (the drop-off zones provided along Van Ness Avenue would be retained under any alternative). The loss of parking along Van Ness Avenue that would occur mid-corridor in the high-density, mixed-use commercial/residential area would be similar among the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), although more concentrated parking removal on certain blocks would occur under Build Alternatives 3, 4, and the LPA (with or without the Vallejo Northbound Station Variant); whereas parking removal would be more evenly distributed throughout this segment under Build Alternative 2. In the northern portion of the corridor, the adjacent land uses are predominantly multi-unit residential with neighborhood-serving commercial properties. On-street parking would be entirely removed on one or more sides of Van Ness Avenue on three of the six blocks in this segment of the corridor, under the LPA (with or without the Vallejo Northbound Station Variant). Table 4.2-8 provides the percentage of change in total parking spaces in each of these segments and identifies the blocks of Van Ness Avenue where street parking would be almost entirely removed on one or more sides of Van Ness Avenue.

[65] The LPA would provide fewer spaces than any of the other alternatives. This is due in part to a more refined analysis of parking changes prepared for the LPA than for the build alternatives, which considered the following factors that were not part of the analysis in the Draft EIS/EIR: updated existing conditions, longer curb bulbs per the Caltrans Highway Design Manual May 2012 update, wider BRT lanes per MTA requirements set forth in 2012, and current more refined adherence to ADA design requirements such as provision of curb ramps behind handicapped spaces (which largely are not present in existing conditions). Thus the parking analysis for the LPA is a more refined analysis than that presented for the build alternatives. A sensitivity analysis taking into account the aforementioned factors was performed, indicating that applying the methodology used for the LPA to the build alternatives would result in up to 32 additional spaces removed for the build alternatives, meaning that Build Alternative 3 would result in the same amount of parking loss as the LPA.

Table 4.2-8: Blocks of Van Ness Avenue where Substantial Parking would be Removed

VAN NESS AVENUE SEGMENT	NUMBER OF TOTAL PARKING SPACES REMOVED (COLORED AND GENERAL SPACES)[1]	NET PERCENTAGE OF PARKING REMOVED[2]
Market Street to Golden Gate Avenue (Civic Center)[3]	• Removal of all 6 spaces on the west side of Van Ness Avenue between Market and Fell streets under Build Alternative 3 with Design Option B. • Removal of all 6 spaces on the east side of Van Ness Avenue between Market and Fell streets under Build Alternative 3. Removal of 10 out of 11 spaces on the west side of Van Ness Avenue between Fell and Hayes streets under Build Alternative 3 without Design Option B; and removal of 9 of 11 spaces on this same block under Build Alternative 4 without Design Option B. Eleven (11) spaces would be added to the east side of this block under Build Alternative 4 and 13 spaces would be added under Build Alternative 3 to offset the loss of parking on this block. • Removal of 8 out of 9 spaces on the east west side of Van Ness Avenue from Fulton to McAllister streets under Build Alternative 3. • Removal of 10 out of 12 spaces on the west side of Van Ness Avenue from McAllister Street to Golden Gate Avenue under the LPA.	• Build Alternative 2 would result in a 15% increase (+12 spaces) in parking spaces. • Build Alternative 3 would result in a 3% reduction (-3 spaces) in parking spaces. • Build Alternative 3 with Design Option B would result in a 2% increase (+2 spaces) in parking spaces. • Build Alternative 4 would result in a 27% increase (+22 spaces) in parking spaces. • Build Alternative 4 with Design Option B would result in a 31% increase (+25 spaces) in parking spaces. • LPA, with or without the Vallejo Northbound Station Variant, would result in a 13% increase (+11 spaces) in parking spaces.
Golden Gate Avenue to Broadway Street (High-Density, Mixed-Use Commercial/ Residential)[4]	• Removal of 9 out of 11 spaces on the west side of Van Ness Avenue between Golden Gate Avenue and Turk Street under Build Alternative 3 without Design Option B; and removal of 9 of 10 spaces on this same block under Build Alternative 4 without Design Option B. • Removal of 6 out of 8 spaces on the east side of Van Ness Avenue between Turk and Eddy streets under the LPA. • Removal of all 5 spaces on the west side of Van Ness Avenue between O'Farrell and Geary streets under Build Alternative 3 and the LPA. • Removal of all 8 spaces on the west side of Van Ness Avenue between O'Farrell and Geary streets under Build Alternative 4, with or without Design Option B. Three spaces would be gained on the east side of this block of Van Ness Avenue to partially offset the loss of parking on the west side. • Removal of all 5 spaces on the east side of Van Ness Avenue between O'Farrell and Geary streets under Build Alternative 3. • Removal of 4 out of 5 spaces on the west side of Van Ness Avenue between Post and Sutter streets under Build Alternative 3. • Removal of 4 out of 5 spaces on the east side of Van Ness Avenue between Sutter and Bush streets under Build Alternative 2. • Removal of 4 out of 5 spaces on the east side of Van Ness Avenue between Sutter and Bush streets, and removal of 8 out of 9 spaces on the west side of this block under the LPA. • Removal of all 10 spaces on the west side and 8 out of 10 spaces on the east side of Van Ness Avenue between Bush and Pine streets under Build Alternative 4 without Design Option B.	• Build Alternative 2 would result in a 17% reduction (–42 spaces) in parking spaces. • Build Alternative 3 would result in a 22% reduction (–54 spaces) in parking spaces. • Build Alternative 3 with Design Option B would result in a 9% reduction (–21 spaces) in parking spaces. • Build Alternative 4 would result in a 15% reduction (–37 spaces) in parking spaces. • Build Alternative 4 with Design Option B would result in a 1% increase (+2 spaces) in parking spaces. • LPA, with or without the Vallejo Northbound Station Variant, would result in a 22% reduction (–53 spaces) in parking spaces.

Table 4.2-8: Blocks of Van Ness Avenue where Substantial Parking would be Removed

VAN NESS AVENUE SEGMENT	NUMBER OF TOTAL PARKING SPACES REMOVED (COLORED AND GENERAL SPACES)[1]	NET PERCENTAGE OF PARKING REMOVED[2]
	• Removal of 10 out of 11 spaces on the east side of Van Ness Avenue between Sacramento and Clay streets, and removal of 4 out of 5 spaces on the west side of this block under the LPA. • Removal of all 5 spaces on the east side of Van Ness Avenue between Jackson and Pacific streets under Build Alternative 3, with or without Design Option B. • Removal of 4 out of 5 spaces on the east side of Van Ness Avenue between Jackson and Pacific streets, and removal of 8 out 9 spaces on the west side of this block under the LPA. • Removal of 7 out of 11 spaces on the east side of Van Ness Avenue between Pacific and Broadway streets under the LPA. Two spaces will be gained on the west side of this block to partially offset the loss of parking on the east side.	
Broadway to Lombard streets (Multi-Family Residential with Neighborhood-Commercial)	• Removal of all spaces on the east (9 spaces) and west sides (9 spaces) of Van Ness Avenue between Broadway and Vallejo streets under Build Alternatives 3 and 4, with or without Design Option B, and the LPA. Five parking spaces (4 under the LPA) would be gained on the west side of Van Ness Avenue one block south (Washington to Jackson Street) to partially offset the loss of parking on this adjacent block. • Removal of all 9 spaces along the west side of Van Ness Avenue from Vallejo to Green streets and all 8 spaces along the east side of this block under Build Alternative 3 and the LPA. • Removal of all 9 spaces along the east side of Van Ness Avenue between Green and Union streets under Build Alternatives 3 and 4, both without Design Option B. • Removal of 6 out of 9 spaces along the east side of Van Ness Avenue between Green and Union streets under the LPA. • Removal of all 8 spaces along the west side of Van Ness Avenue between Greenwich and Lombard streets under the LPA.	• Build Alternative 2 would result in a 3% reduction (–3 spaces) in parking spaces. • Build Alternative 3 would result in a 40% reduction (–41 spaces) in parking spaces. • Build Alternative 3 with Design Option B would result in a 12% reduction (–12 spaces) in parking spaces. • Build Alternative 4 would result in a 24% reduction (–22 spaces) in parking spaces. • Build Alternative 4 with Design Option B would result in a 14% reduction (–14 spaces) in parking spaces. • LPA would result in a 51% reduction (–52 spaces) in parking spaces. • LPA with the Vallejo Northbound Station Variant would result in a 51% reduction (-51 spaces) in parking spaces.

[1] Blocks of Van Ness Avenue where street parking would be almost entirely removed on one or more sides of Van Ness Avenue.
[2] Net percentage of parking removed is presented for the total number of parking, including colored spaces and general parking spaces.
[3] The addition of parking spaces on the blocks of Van Ness Avenue between Fell and Hayes, and Hayes and Grove, would offset the loss of parking in the Civic Center area that would occur under Build Alternatives 3 and 4; therefore loss of parking along Van Ness Avenue would not impact the Civic Center with implementation of any of the build alternatives.
[4] In this segment of the corridor, there is a high percentage of colored spaces (i.e., green [short-term parking], white [passenger loading], yellow [truck loading], and blue [disabled parking]). In keeping with SFMTA's policy to make retention of colored spaces a priority, there would be a proportionately higher percentage of general on-street parking spaces displaced in this segment of the corridor.

As stated in Section 3.5.2, SFMTA would give priority to retaining on-street colored parking spaces (i.e., green [short-term parking], white [passenger loading], yellow [truck loading], and blue [disabled parking]). As part of the project design, in any cases of conflicting needs for color zones, SFMTA would work to build consensus among fronting business owners and determine the best allocation of colored spaces to suit the needs of these establishments. Field surveys were conducted in January 2011 and October 2012 to identify the specific commercial and residential properties affected and the feasibility of providing replacement on-street colored parking spaces as part of project design (Parsons, 2011, SFCTA, 2013). Based on the survey, it was confirmed that in most cases colored spaces would be able to be retained on the same street block or on adjacent blocks. Passenger and truck loading zones could be provided on the same side of the street, where feasible, so that crossing a street for loading would not be needed; however, specific locations were identified where provision of replacement colored spaces on an adjoining block may not be feasible or where an affected business may have special needs requiring immediately adjacent parking, such as passenger loading zones that serve elderly or infirmed people or truck loading zones that support delivery of large commercial goods. Potentially significant colored parking zone impacts on the area's adjacent uses are identified in Table 4.2-9.

Table 4.2-9: Adverse Colored-Zone Parking Impacts

VAN NESS AVENUE BLOCK	POTENTIAL COLORED SPACE PARKING IMPACTS[1]
Golden Gate Avenue – Turk Street (west side)	• One out of three passenger loading spaces serving the Opera Plaza would be removed under Build Alternative 3 without Design Option B. • Two out of three passenger loading spaces serving the Opera Plaza would be removed under Build Alternative 4 without Design Option B.
O'Farrell Street – Geary Street (west side)	• The two passenger loading spaces serving The Avenue assisted-living residential facility[2] would be removed under Build Alternative 4, both with or without Design Option B. • The three passenger loading spaces serving The Chron media studio would be displaced under Build Alternative 4, both with or without Design Option B.
O'Farrell Street – Geary Street (east side)	• The two passenger loading spaces serving the Opal Hotel would be displaced under the LPA. These spaces could be replaced on Geary Street or Alice B. Toklas alley.
Sutter Street to Bush Street (east side)	• The one green short-term parking space and the two truck loading spaces that serve a sports bar would be displaced under the LPA. These spaces could be replaced along Fern alley.
Sutter Street to Bush Street (west side)	• The five green short-term parking spaces that serve the Chevrolet dealership, an Antique store, and BevMo would be removed under the LPA; however, none of these businesses currently pay for these spaces.
Bush Street – Pine Street (west side)	• The two truck loading spaces that serve the Mattress Discount Store would be displaced under Build Alternative 4 without Design Option B. • The one passenger loading space that serves The Inverness residential property would be displaced under Build Alternative 4 without Design Option B.
Sacramento Street to Clay Street (east side)	• The one passenger loading space that serves the St Luke's Episcopal Church would be displaced under the LPA.
Broadway Street – Vallejo Street (west side)	• The three passenger loading spaces that serve the Academy of Art University (shuttle stop) and a dental office would be displaced under Build Alternatives 3 and 4, both with or without Design Option B. • The three passenger loading spaces that serve the Academy of Art University (shuttle stop) and a dental office would be displaced under the LPA.

Table 4.2-9: Adverse Colored-Zone Parking Impacts

VAN NESS AVENUE BLOCK	POTENTIAL COLORED SPACE PARKING IMPACTS[1]
Vallejo Street to Green Street (west side)	• The one short-term green parking space that serves the mini-mart and the three passenger loading spaces that serve a Swiss restaurant and a chiropractor's office would be displaced under the LPA.
Greenwich Street to Lombard Street (west side)	• The one short term parking space that serves dry cleaners and the four passenger loading spaces that serve the Comfort Inn By the Bay hotel would be displaced under the LPA. The loading spaces could be relocated to Lombard Street.

[1] Colored parking spaces include green (short-term parking), white (passenger loading), yellow (truck loading), and blue (disabled parking).
[2] Under the LPA, with or without the Vallejo Northbound Station Variant, all white colored parking spaces would be retained in front of The Avenue assisted living facility.

KEY FINDINGS

The proposed BRT build alternatives, including the LPA, could have adverse effects on commercial and residential properties resulting from the displacement of on-street parking. Two mitigation measures are proposed to minimize the potential impacts.

4.2.5 Avoidance, Minimization, and/or Mitigation Measures

As described above, the BRT build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), could have adverse effects on commercial and residential properties resulting from the displacement of on-street parking. A detailed analysis of project-related impacts to parking and circulation, and measures to mitigate these impacts are addressed in Chapter 3, Transportation Analysis. Additional measures to minimize economic impacts on properties along Van Ness Avenue from parking removal include the following:

M-CI-IM-1[66]**:** SFMTA will coordinate with all businesses that would be affected by removal of colored parking spaces, including short-term parking, to confirm the need for truck and/or passenger loading spaces and to identify appropriate replacement parking locations to minimize the impacts to these businesses.

M-CI-IM-2[57]**:** SFMTA will apply parking management tools as needed to offset any substantial impacts from the loss of on-street parking, including adjustment of residential parking permits in the residential community north of Broadway Street, or SFpark, which is a package of real-time tools to manage parking occupancy and turnover through pricing (appropriate in areas of high-density commercial uses that rely on high parking turnover).

[66] M-CI-IM-1 and M-CI-IM-2 constitute a mitigation measure under NEPA and an improvement measure under CEQA.

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4.3 Growth

This chapter examines whether the proposed project would induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure) at a level in excess of what is projected for the Bay Area and for San Francisco, and result in changes in patterns of land use, population density, or growth rate. Increased development and population growth in an area are dependent on a variety of factors, including employment opportunities, land use controls and availability of developable land, and availability of infrastructure, including utilities.

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences related to growth under the LPA, with or without the Vallejo Northbound Station Variant, are identified as part of the analysis presented for the build alternatives in this chapter. There would be no difference in such impacts under the LPA compared with the impacts described for the build alternatives in this subsection.

4.3.1 | Affected Environment

The Van Ness Avenue corridor is a built out, urban environment with developed infrastructure and utilities. There are no major vacant parcels available for development in the project area, although some parcels have been identified as having the potential for reuse or redevelopment as high-density mixed-use (ABAG, 2007). Such planned projects are listed in Table 4.1-1, Major Approved and Active Projects in the Study Area. As summarized in Section 4.1.1.1, Development Trends, growth and development trends in the Van Ness Avenue corridor and vicinity support high-density, transit-supportive redevelopment and infill in the project area.

The Van Ness Avenue corridor supports the largest concentration of housing of any of the City's major transit corridors. Based on the 2000 U.S. Census and the 2007 ABAG projections used in the adopted Regional Transportation Plan: Transportation 2035, the City is expected to gain 66,610 new households, which is a 20 percent increase, between 2000 and 2035. The Van Ness Avenue BRT study area is expected to see an increase in the number of households by 12,208, which is a 28 percent increase, during the same period.

At the same time, the Van Ness Avenue corridor supports a wide range of businesses, institutions, cultural arts, and religious organizations anchored by the Civic Center area. The Van Ness Avenue corridor serves as a designated City "Major Commercial Area." Land use plans for the corridor, which are discussed in detail in Chapter 4.1, Land Use, envision high-density mixed-use development. The Van Ness Avenue corridor is designated part of a PDA by ABAG and MTC. Regional transportation and land use planning documents call for future growth to occur in PDAs because they contain transit and infill development opportunity areas and are within existing communities.

DEFINITION

PRIORITY DEVELOPMENT AREA (PDA): Locally identified, infill development opportunity areas within existing communities. They are generally areas of at least 100 acres where there is local commitment to developing more housing, along with amenities and services to meet the day-to-day needs of residents in a pedestrian-friendly environment served by transit.

4.3.2 | Environmental Consequences

Transportation projects are potentially population-growth inducing when they extend transportation and infrastructure service to the edge of an urban area, reducing travel times and improving access between employment opportunities and vacant or underdeveloped land to the extent that the travel time savings and enhanced accessibility outweigh other factors affecting locational decisions. A significant impact would occur if the project would directly or indirectly induce substantial population growth in an area.

The project corridor is a built-out, urban environment with sufficient infrastructure and utilities, and existing bus transit service. The No Build Alternative and proposed build alternatives (including the LPA, with or without the Vallejo Northbound Station Variant) would improve reliability and introduce travel time savings for transit patrons, but not to an extent that would influence land use development patterns and population densities at a level in excess of what is projected for the Bay Area and San Francisco.

While operation of the proposed build alternatives (including the LPA, with or without the Vallejo Northbound Station Variant), and to a lesser extent the No Build Alternative, would improve transit service and access to jobs and housing, they would not induce population growth at a level in excess of what is projected for the Bay Area and San Francisco. Implementation of the build alternatives (including the LPA) is not expected to generate substantial new development, but it would better accommodate existing and planned residential and commercial growth. The proposed build alternatives (including the LPA) would support the additional or higher-density development planned in the vicinity of stations and would in general accommodate the transit needs envisioned for growth planned in the Van Ness Avenue corridor and vicinity. Furthermore, the proposed build alternatives (including the LPA, with or without the Vallejo Northbound Station Variant), and to a lesser extent the No Build Alternative, would be generally consistent with San Francisco's "Transit First" policy, as well as regional government policies aimed at improving transportation access to job centers and recreational opportunities like those offered by the Civic Center and Fort Mason.

KEY FINDING

Implementation of the proposed build alternatives (including the LPA) is not anticipated to directly or indirectly induce population growth at a level in excess of what is projected for the Bay Area and for San Francisco; therefore, the project would not cause significant growth impacts.

The construction phase of the proposed build alternatives (including the LPA, with or without the Vallejo Northbound Station Variant) would also not influence population growth projected for the Bay Area and San Francisco. It is reasonable to expect that local workers would support construction of the proposed project, not workers moving into the area. Population growth within the City and region would not change as a result of project construction; therefore, implementation of the proposed project is not anticipated to result in growth-related impacts.

4.3.3 Avoidance, Minimization, and/or Mitigation Measures

Construction and operation of the proposed build alternatives (including the LPA, with or without the Vallejo Northbound Station Variant) would not lead to unplanned growth in the Van Ness Avenue corridor or larger region; therefore, it would not result in growth-related impacts. On the contrary, all of the build alternatives (including the LPA, with or without the Vallejo Northbound Station Variant), and the No Build Alternative to a lesser extent, would support planned growth and the planning goals of the City; therefore, avoidance, minimization, or mitigation measures are not required.

4.4 Aesthetics/Visual Resources

This section summarizes the regulatory setting; affected environment; environmental consequences; and measures to avoid, mitigate, or compensate for long-term, permanent impacts to visual resources in the Van Ness Avenue corridor because of the proposed project. Construction-phase impacts and avoidance measures are presented in Section 4.15.3. Key documents reviewed in support of this study include the *Van Ness Avenue Corridor Initial Land Use and Urban Design Needs Assessment* (City of San Francisco, 2004); *Van Ness Avenue Bus Rapid Transit Overhead Contact System Support Poles/Streetlights Conceptual Engineering Report* (SFDPW, 2009); *Historic Resources Inventory and Evaluation Report for the Van Ness Avenue Bus Rapid Transit Project* (JRP, 2009); Finding of Effect for the Van Ness Avenue Bus Rapid Transit Project (Parsons, 2013c); *San Francisco Better Streets Plan* (City of San Francisco, 2010); and *San Francisco General Plan* (City of San Francisco, 1990). Other supporting studies include a tree survey completed in 2009 and a tree removal and planting opportunity evaluation completed in 2012 by a certified arborist (BMS Design Group, 2009 and 2013).

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences related to visual resources under the LPA are identified as part of the analysis presented for the build alternatives in this chapter. Because the LPA configuration is a variation of the configurations analyzed for the center-running alternatives in the Draft EIS/EIR, the LPA has different results for the total tree removal impacts and replanting opportunities presented for the build alternatives. However, the overall impact findings with the LPA (with or without the Vallejo Northbound Station Variant) are consistent with the findings for Build Alternatives 3 and 4, as presented in this subsection.

4.4.1 | Regulatory Setting

A review of scenic/visual resource plans and policies applicable to development of BRT in the Van Ness Avenue corridor and relevant regulatory bodies and approvals follows.

4.4.1.1 | SCENIC/VISUAL RESOURCE PLANS AND POLICIES

This section provides a review of scenic/visual resource plans and policies applicable to development of BRT in the Van Ness Avenue corridor.

San Francisco General Plan, Urban Design Element (City of San Francisco, 1990)

Land use planning goals and policies are guided by the San Francisco General Plan. The Urban Design Element of the San Francisco General Plan concerns the physical character and order of the city, and the relationship between people and their environment (City of San Francisco, 1990).[67]

The Urban Design Element of the San Francisco General Plan concerns the physical character and order of the city, and the relationship between people and their environment.

Policies supportive of the aforementioned major urban design objectives that are relevant to a transportation project, such as the proposed project, are listed below:

- Policy 1.1: Recognize and project major views in the city, with particular attention to those of open space and water.
- Policy 1.5: Emphasize the special nature of each district through distinctive landscaping and other features.

[67] The Urban Design Element of the San Francisco General Plan was amended December 7, 2010, to incorporate reference to and elements of the Final Better Streets Plan adopted in December 2010.

- Policy 1.6: Make centers of activity more prominent through design of street features and by other means.
- Policy 1.7: Recognize the natural boundaries of districts and promote connections between districts.
- Policy 1.8: Increase the visibility of major destination areas and other points for orientation
- Policy 1.9: Increase the clarity of routes for travelers.
- Policy 1.10: Indicate the purposes of streets by adopting and implementing the Better Streets Plan, which identifies a hierarchy of street types and appropriate streetscape elements for each street type.
- Policy 2.4: Preserve notable landmarks and areas of historic, architectural, or aesthetic value, and promote the preservation of other buildings and features that provide continuity with past development.
- Policy 2.6: Respect the character of older development nearby in the design of new buildings.
- Policy 4.3: Provide adequate lighting in public areas.

San Francisco General Plan, Van Ness Area Plan (City of San Francisco, 1995)

The information provided in the San Francisco General Plan Urban Design Element is made more precise in individual area plans that cover designated geographic areas of the city. The plan is intended to promote Van Ness Avenue as the city's most prominent north-south boulevard, lined with high-density mixed-use development and including design features that support a transit-served pedestrian promenade. The Van Ness Area Plan identifies the following objectives and corresponding policies that pertain to aesthetics and the visual environment:

The Van Ness Area Plan is intended to promote Van Ness Avenue as the city's most prominent north-south boulevard, lined with high-density mixed-use development and including design features that support a transit-served pedestrian promenade.

- Policy 3.1: Create a tree-lined and landscaped median strip within the Van Ness Avenue street space and plant rows of trees in the sidewalk space.
- Policy 5.4: Preserve existing view corridors.
- Policy 8.5: Maintain existing sidewalk widths.
- Policy 8.6: Incorporate uniform sidewalk paving material, color, pattern, and texture throughout the length of Van Ness Avenue. Sidewalk and median strip paving materials should be concrete, light grey-tone in color, with a plain, brushed surface texture, except for a darker grey 12-inch curbside trim, which should add richness in color and texture to the Avenue.
- Policy 8.7: Trim sidewalk curbs with hydraulically pressed, precut 4-inch-square stone paving blocks to a horizontal depth of 12 inches. Replace median pavements with grey-tone interlocking paving blocks. The stone pavers should be of a complementary medium grey-tone color (e.g., Hanover Prest Paving R.D. No. 4).
- Policy 8.8: Assure a uniform architectural style, character, and color in the design of streetlights and poles.
- Painting all of the light poles along Van Ness Avenue a blue and gold color scheme, similar to that of the Civic Center light poles, would contribute to this special identity. If feasible, existing streetlight poles should be maintained and enhanced to contribute to the special identity of the Avenue. The angle and color of illumination on existing and new streetlights should be designed to minimize glare to nearby residential uses. Lighting should not damage adjacent landscape plantings and should provide safe and attractive lighting for pedestrians.
- Policy 8.9: Provide attractive street furniture at convenient locations and intervals throughout the length of the street. New bus shelters or replacement shelters should be placed between the trees along the tree line of the sidewalk. Benches should be attached to the ground and located between the trees along the tree line of the sidewalk adjacent to bus stops.
- Policy 9.12: Unify the design of trash bins, benches, news racks, street lighting fixtures, sidewalk surface treatment, canopies, awnings, and bus shelters throughout the length of the street.
- Policy 11.4: Encourage architectural integration of new structures with adjacent Significant and Contributory Buildings.

The Civic Center Area Plan (1989)

The Civic Center Area Plan outlines a series of policies to guide development in and around City Hall and the surrounding government offices and cultural performing arts facilities. The plan provides a comprehensive program of street and pedestrian improvements in the area intended to reinforce the identity of the Civic Center using common design elements such as sidewalk and street paving, lighting fixtures, landscaping, and street furniture. The plan calls for the use of color and texture of materials throughout the area to reinforce the overall unity and formalism of the Civic Center. The plan is oriented to guide new development; however, the following policy relates to aesthetics of streetscape:

The Civic Center Area Plan outlines a series of policies to guide development in and around City Hall and the surrounding government offices and cultural performing arts facilities.

- Policy 1.4: Provide a sense of identity and cohesiveness through unifying street and Plaza design treatments.

San Francisco General Plan, Market and Octavia Area Plan (City of San Francisco, 2007)

The Market and Octavia Area Plan calls for new residential development centered on transit and provides land use, urban design, and transportation policies to support development. Policies regarding aesthetics that are relevant to the proposed project include:

The Market and Octavia Area Plan calls for new residential development centered on transit and provides land use, urban design, and transportation policies to support development.

- Policy 4.3.3: Mark the intersections of Market Street with Van Ness Avenue…with streetscape elements that celebrate their particular significance. The designs for these principal intersections should include streetscape elements such as special light fixtures, gateways, and public art pieces that emphasize and celebrate the special significance of each intersection.

  The Van Ness Avenue intersection will be provided with pedestrian-oriented additions on the north side and major improvements on the south, associated with the introduction of the Van Ness Avenue Transitway[68] described in this plan. The intersection should be designed with prominent streetscape elements that signify the crossing of two important streets. This will break up the width of the street into three separate sections, thereby humanizing it and providing pedestrian refuges for people crossing Van Ness Avenue. Widened sidewalks can do the same at the corners, as can extended streetcar platforms on Market Street.

- Policy 1.2.5: Mark the intersection of Van Ness Avenue and Market Street as a visual landmark.

  Although this policy is primarily concerned with form and height of buildings, it nonetheless speaks to the City's interest in the visual context of this intersection.

San Francisco Better Streets Plan (2010)

The San Francisco Better Streets Plan provides a comprehensive set of guidelines to improve San Francisco's streetscapes to make them universally accessible to all, more attractive, safe, and comfortable. The plan calls for a comfortable pedestrian realm with significant pedestrian amenities and public spaces that include curb ramps, marked crosswalks, pedestrian signals, corner bulbs/extensions, street trees, tree grates, sidewalk planters, stormwater controls, pedestrian lighting, special paving, and site furnishings. The San Francisco Better Streets Plan explains that streetscapes should be designed to encompass a wide range of features and amenities; however, this does not mean that projects should contain all potential elements or not be built at all—rather, it suggests coordination of streetscape-related projects to make improvements simultaneously and look for opportunities to build additional low-cost elements into existing capital projects. The San Francisco Better Streets Plan was adopted by the San Francisco Board of Supervisors in December 2010. All public and private projects that

The San Francisco Better Streets Plan provides a comprehensive set of guidelines to improve San Francisco's streetscapes to make them universally accessible to all, more attractive, safe, and comfortable.

[68] The Van Ness Avenue Transitway described in the Market and Octavia Area Plan is referring to the Van Ness Avenue BRT Project (City of San Francisco, 2007).

propose changes to any public ROW are required to be consistent with the principles and guidelines for streetscape and pedestrian elements and overall streetscape design found in the Better Streets Plan. (S.F. Admin. Code Chapter 98.) The plan requires that permits be filed with the appropriate agency if any modifications to streetscape are anticipated as part of the project (City of San Francisco, 2013). A separate permit and approval process has not been developed by the City for the San Francisco Better Streets Plan. The plan has been adopted, and compliance with the plan design objectives will be considered through the existing permits and approval processes that apply to any project that would modify the streetscape.

The following policies of the San Francisco Better Streets Plan relate directly to aesthetics and are applicable to the proposed project:

- Policy 1.2: Provide distinctive design treatments for streets with important citywide functions. The following policy guidelines apply:
  - On streets identified as "Important to the City Pattern," use consistent rows of single species street trees; distinctive, consistent street lighting and site furnishings; special signage; and public art;
  - On streets that are identified as priority pedestrian corridors or zones, provide enhanced pedestrian amenities, facilities, and signage;
  - Define special locations, such as civic or commercial centers, entries to major open spaces, or community facilities, with special streetscape treatments.
- Policy 2.1: Design streets with comfortable spaces for casual interaction and gathering. The following policy guideline applies:
  - Create new spaces for social interaction, such as wide street furnishing zones, corner or mid-block bulb-outs, and the like.
- Policy 7.3: Design transit waiting areas for comfort, accessibility, and ease of use. The following policy guideline applies:
  - Improve existing transit waiting areas to improve attractiveness and remove barriers.
- Policy 7.6: Create convenient, safe pedestrian conditions at transfer waiting areas and transfer points.
  - Create clear wayfinding and directionality at transit transfer points.
- Policy 10.1: Maximize opportunities for street trees and other plantings. The following policy guideline applies:
  - Locate street trees first in available locations before laying out other street furnishings.
  - Allow tree plantings as near to corners for visibility of pedestrians, signs, and signals in order to slow traffic and visually narrow the street and intersection.
  - Allow trees and plantings to be as near as practicable to utilities and other objects in the ROW while still maintaining appropriate clearances.
- Policy 10.3: Provide an orderly and efficient streetscape environment that minimizes visual clutter. The following policy guideline applies:
  - Minimize the number of traffic signs, streetlight, catenary, traffic signal, and other utility poles, and share poles wherever feasible.
- Policy 10.5: Ensure adequate light levels and quality for pedestrians and other sidewalk users; minimize light trespass and glare to adjacent buildings.
  - Select palette of streetlight poles based on criteria including aesthetics, light quality and color, long-term maintenance, and energy efficiency.
  - Emphasize lighting for pedestrians and include pedestrian lighting in street improvement projects as appropriate
- Policy 10.7: Include and integrate public art improvements into street improvement projects.
- Policy 10.8: Balance desired design treatments with the ability to provide adequate maintenance.

4.4.1.2 | RELEVANT REGULATORY BODIES AND APPROVALS

San Francisco Planning Department and Commission

As described above, land use planning goals and policies are guided by the San Francisco General Plan and subarea plans. General Plan Amendments and General Plan Referrals are processes used by the City Planning Department to ensure a project is consistent with the San Francisco General Plan. Modifications to sidewalks and street grade require a General Plan Referral to determine consistency with the General Plan, and if a General Plan Amendment is needed. The Planning Department also assists the Historic Preservation Commission (HPC) in carrying out the requirements of Planning Code Article 10 related to review and approval of Certificates of Appropriateness, which is described in greater detail below as part of the HPC responsibilities.

San Francisco Arts Commission

The San Francisco Arts Commission approves the design of all public structures. The Civic Design Review Committee is a body within the San Francisco Arts Commission that is typically responsible for reviewing and approving the architectural design of structures on City property. Their review is required for any structure or landscaping on or over City property, including transit structures such as station platforms, bus shelters and station canopies, landscaped medians, and planters.

The San Francisco Arts Commission defers to the San Francisco HPC for review and approval of the design of structures located in a historic district.

San Francisco Historic Preservation Commission

Per Planning Code Sections 1005 and 1006, a Certificate of Appropriateness is required from the HPC for projects located within a designated historic district, such as the San Francisco Civic Center. To obtain a certificate of appropriateness, the HPC determines, among other considerations, whether the proposed project complies with the Secretary of the Interior's Standards for the Treatment of Historic Properties and other applicable guidelines, local interpretation, and bulletins. For property in historic districts, the HPC considers whether any changes will be compatible with the character of the historic district as described in the designating ordinance. In the case of property not already being compatible with the character of the district, reasonable efforts shall be made to produce compatibility and, in no event, shall there be a greater deviation from compatibility. This process involves a staff report presented at the HPC hearing, including a Planning Department recommendation for approval, disapproval, or approval with conditions of the Certificate of Appropriateness. The design, architectural style, arrangement, texture, materials, and color of project features are considered. Typically, the Architectural Review Committee of the HPC provides early direction and comments on projects submitted to them for review by the Commission during the design review process. The Architectural Review Committee's written comments and direction are advisory only and not considered binding.

City Hall Preservation Advisory Commission

The City Hall Preservation Advisory Commission advises the San Francisco Mayor, Board of Supervisors, Planning Commission, City Administrator, and the HPC on budgetary issues and matters relating to the operation, maintenance, repair, preservation, and public awareness of the San Francisco City Hall. The Advisory Commission reviews the design of project structures within the Civic Center Historic District adjacent to City Hall, and advises the San Francisco HPC on Certificate of Appropriateness approvals. The Advisory Commission's involvement with the Certificate of Appropriateness is advisory, and their approval is not required.

4.4.2 | Affected Environment

4.4.2.1 | PREVIOUS STUDIES

A Van Ness Corridor Initial Land Use and Urban Design Needs Assessment funded by a grant from Caltrans for community planning of the Van Ness Avenue and Taraval Street Corridors was completed by the City Planning Department in 2004. This assessment evaluated the pedestrian experience along Van Ness Avenue and concluded that, although Van Ness Avenue is functional as an automobile corridor, it lacks many of the basic amenities necessary to make it an attractive space for pedestrian use. The assessment found the placement of tree plantings, lighting, and street furniture to be discontinuous and disorganized. The assessment found that the large automobile traffic volumes and lack of pedestrian amenities and urban design features contribute to a setting that discourages pedestrians from using Van Ness Avenue longer than is necessary. The report concluded that the wide sidewalks, roadway median, and land uses of Van Ness Avenue hold the potential for it to become one of the City's grand boulevards. The report recommends the following urban design improvements to support a transformation of Van Ness Avenue into a more pedestrian-friendly, aesthetically pleasing environment:

- Continuous street tree plantings
- Transit shelter improvements
- Comprehensive street furniture
- Comprehensive street lighting

The report concludes that the historic elements to Van Ness Avenue's design, including light standards, signage, and interspersed tree plantings, can be integrated into a contemporary design that improves pedestrian amenities and emphasizes the avenue's role as a grand thoroughfare.

DEFINITION

VIEWSHED: An area of land, water, or other environmental element that is visible to the human eye from a fixed vantage point.

4.4.2.2 | VIEWSHED

The viewshed for the proposed project consists of the project corridor along Van Ness Avenue and its adjacent land uses, in addition to distant areas with views of and from the project area. Essentially, the project viewshed consists of the actual area in which project features would be visible. All project features would be located within the Van Ness Avenue roadway and sidewalk.

The project viewshed consists of the actual area in which project features would be visible, including the project corridor along Van Ness Avenue and its adjacent land uses, the neighboring hills and ridges of Nob Hill, Russian Hill, and Cathedral Hill, and the distant hilltops of Twin Peaks and Potrero Hill, and from downtown skyscrapers.

The project viewshed consists of urban landscape that varies in land use, topography, and character throughout the project limits. Some of the project area is relatively flat, while some is gently sloped. The changing slope along Van Ness Avenue provides differing viewsheds and offers scenic vistas at some locations. At the same time, the neighboring hills and ridges of Nob Hill, Russian Hill, and Cathedral Hill provide scenic views that include Van Ness Avenue. The width of the avenue and dominant visual elements of the corridor, such as City Hall, are easily identified from not only these hilltops, but also the distant hilltops of Twin Peaks and Potrero Hill, and from downtown skyscrapers.

4.4.2.3 | VIEWER GROUPS

Viewers of project features can be categorized in the following viewer groups:

- Pedestrians – Pedestrians walking to/from and along Van Ness Avenue within the project limits, or on other streets that offer views of the project area.
- Cyclists – Cyclists riding to/from and along Van Ness Avenue within the project limits, or on other streets that offer views of the project area.
- Transit Patrons – Bus patrons waiting at bus stops and traveling on buses through the project area.
- Motorists – Automobile and truck drivers and passengers traveling through the project area, or on other streets that offer views of the project area.

- Residents – Residents who live along Van Ness Avenue within the project limits or who live in nearby buildings with views of the project area.
- Commuters – Workers who commute to jobs located along Van Ness Avenue within the project limits or to nearby or distant buildings with views of the project area.
- Tourists – Visitors/tourists who have traveled to and through the Van Ness Avenue corridor with the intention of experiencing and viewing the cultural and visual resources of city-wide importance that are focally located within the project limits (i.e., Civic Center, Market Street, Fort Mason). Several hotels offer scenic views that encompass the Van Ness Avenue Corridor.

Sensitive Viewer Groups

Viewers that experience regular, consistent, or extended views of the project corridor are considered sensitive viewer groups because they would be most sensitive to changes in the viewshed. Residents and commuters are sensitive viewer groups for the proposed project because they experience frequent, extended, and consistent views of the project area, and they may experience these views not simply from within buildings, but also as pedestrians, cyclists, motorists, and transit patrons. These viewer groups are part of the local community through which the proposed project passes. Residents and commuters would be most sensitive to changes in the viewshed introduced by the proposed project. Tourists are also a sensitive viewer group because much of their purpose in being present in the Van Ness Avenue corridor is to enjoy the scenic quality of the avenue and/or particular visual resources in the corridor.

4.4.2.4 | VISUAL CHARACTER

The visual character of the project corridor is dense, mixed-use, and urban. The project corridor carries high volumes of transit, pedestrian, and automobile traffic, making it one of the noisier and busier streets in the city. The project corridor also intersects with multiple major thoroughfares, such as Mission, Market, and Geary streets. These roadways and intersections are wide and busy, and there is a thick network of OCS wires above them that is a character-defining feature of the Van Ness Avenue corridor and the identity of San Francisco. There are few vacant parcels in the project vicinity, and the overall Van Ness Avenue corridor is built-out in character.

Van Ness Avenue is one of the widest streets in the city, and it is notably wider than the adjacent streets. The median varies in dimension and composition throughout the corridor. Some blocks of Van Ness Avenue feature a landscaped median with mature trees up to 9 feet in canopy width, while some blocks feature a narrow, concrete median without landscaping or tree plantings. In addition to featuring landscaping and trees, the medians hold traffic signals, signage, and pedestrian refuge areas including nose cones (i.e., thumbnail islands). The sidewalks of Van Ness Avenue meet the San Francisco Better Streets Plan width standards, measuring approximately 16 feet wide throughout the corridor, except in the Civic Center where they are wider, measuring up to 32 feet wide in front of City Hall. Trees of varied species and age are planted along most of the sidewalks. The wide sidewalks and roadway, and landscaped medians are unique features for San Francisco streets, and they create a feeling of prominence about the avenue. Buildings of architectural significance located along Van Ness Avenue further contribute to this feeling of prominence, as described in Section 4.4.2.4 under Significant Buildings and Architecture.

The visual character of Van Ness Avenue reflects its history as a corridor in which development and infrastructural improvements have occurred largely in a piecemeal manner since it was established in 1858.

The architecture and infrastructure of Van Ness Avenue dates from historic periods up to the present, modern time. As explained in the Historic Resources Inventory and Evaluation Report (HRIER) prepared for the proposed project, the visual character of Van Ness Avenue reflects its history as a corridor in which "development and infrastructural improvements have occurred largely in a piecemeal manner since it was established in 1858," and the design and planning of Van Ness Avenue "reflect a myriad of public and private design intents, none of which reflect a sustained or cohesive architectural or engineering program" (JRP, 2009). Sidewalk and median trees, news racks, signage, call boxes, garbage receptacles and other street furniture are interspersed in an ad hoc fashion throughout the corridor. The only continuous design element on Van Ness Avenue is the OCS support pole/streetlight system, which lines both sidewalks of the street between Market and North Point streets (City of San Francisco, 2004). Due to this history of development, the architecture, landscaping, and streetscape of Van Ness Avenue and its viewshed vary substantially, giving the project corridor an eclectic feel.

This eclectic feel is present throughout the project corridor, although the overall character of the corridor changes slightly as influenced by land use pattern. The corridor is predominantly lined with multi-story buildings featuring commercial establishments on the ground floor. Images of the Van Ness Avenue corridor are provided in Figure 4.4-1. The visual character of the southern stretch of Van Ness Avenue between South Van Ness and Golden Gate avenues is influenced by two major civic features: the intersection of Market Street and Van Ness Avenue and the San Francisco Civic Center. Firstly, the intersection of Market Street and Van Ness Avenue marks the convergence of two of the city's most prominent streets. Like Van Ness Avenue, Market Street is one of the widest streets in the city, and it has historically been used for most City parades and ceremonial events, in addition to being the city's focal commercial center. It serves as the backbone of the City's regional transit systems and is the busiest pedestrian and cycling street in the city. Secondly, the Civic Center is a major center for civic resources, as well as art and entertainment activities, as discussed in Section 4.4.2.4, Important Visual Elements within Viewshed.

Between Golden Gate Avenue and Broadway Street, Van Ness Avenue supports a mix of commercial and residential uses, and it feels largely commercial and high density in character. This area is the core of the Van Ness Avenue corridor commercial district, which is one of the major commercial districts in the city (City of San Francisco, 2004). Most of the buildings are three or more stories, with the ground floor occupied by commercial establishments. The ground-floor commercial uses in this area are varied and provide an active and visually interesting atmosphere.

The northern end of the project corridor between Broadway and North Point streets is overall residential and lower density in feel. This segment of the corridor predominantly supports multi-family residential apartment buildings and neighborhood-serving commercial establishments. Most buildings are three-story residential buildings, with small-scale businesses occupying the ground floor. Several blocks in this segment exhibit a relatively well-defined pattern of buildings of similar height and character lining the street.

4.4.2.5 | IMPORTANT VISUAL ELEMENTS WITHIN THE VIEWSHED

Civic Center Historic District

The Civic Center is considered by many to have the finest and most complete manifestation of the City Beautiful Movement in the United States.

The stretch of Van Ness Avenue located between Hayes and Redwood streets is part of the Civic Center Historic District, shown in Figure 4.4-2. This stretch of the Van Ness Avenue corridor supports many civic uses that are housed in buildings of noteworthy architecture that are historic and monumental in character. The Civic Center Historic District is an important visual element in the Van Ness Avenue corridor, offering striking views of high-quality architecture that exemplifies the City Beautiful Movement. The City Beautiful Movement was an urban planning reform movement in the United States that flourished in the 1890s and 1900s with the intent of using beautification and monumental grandeur in cities to create moral and civic virtue among urban populations. The Civic Center is considered by many to have the finest and most complete manifestation of the City Beautiful Movement in the United States.[69]

[69] http://www.nps.gov/history/nhl/designations/listsofNHLs.htm. Accessed July 22, 2009.

Photo 1. Wide roadway, commercial corridor, and view of City Hall and distant downtown skyscape.

Photo 2. Varied architecture and mixed land use along Van Ness Avenue.

Photo 3. Colorful storefronts of Van Ness Avenue.

Photo 4. Wide landscaped medians of Van Ness Avenue.

Photo 5. Sidewalk bus shelter and parallel parking lane.

Photo 6. Eclectic streetscape of Van Ness Avenue.

Photo 7. Wide sidewalks of Van Ness Avenue.

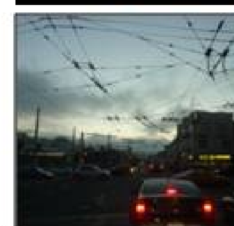

Photo 8. OCS wires at Van Ness Ave./ Union St.

Figure 4.4-1: Character-Depicting Images of the Van Ness Avenue Corridor

Figure 4.4-2: Civic Center Historic District Map

City Hall is a celebrated example of Beaux-Arts architecture, and it features a dome roof that is 366 feet in diameter and 390 feet tall, making it the fifth largest dome in the world.

One of the most visually striking of these buildings is San Francisco City Hall, which is located on Van Ness Avenue between Grove and McAllister streets. City Hall is visible from many points along the corridor, and the dome of the hall is visible from distant views of the corridor, including many scenic vistas of downtown San Francisco. City Hall is a celebrated example of Beaux-Arts architecture, and it features a dome roof that is 366 feet in diameter and 390 feet tall, making it the fifth largest dome in the world. City Hall's dome is a dominant feature of the city's downtown skyscape from several vistas in the city. It is often depicted in postcards, movies, and other media images, and it is a character-defining feature of San Francisco. The rear façade of City Hall faces Van Ness Avenue, across from the San Francisco War Memorial and Performing Arts Center. The San Francisco War Memorial and Performing Arts Center is comprised of a matched pair of buildings – the War Memorial Opera House and the War Memorial Veterans Building. The San Francisco War Memorial and Performing Arts Center is one of the largest performing arts centers in the United States, and its monumental architecture lends a strong, visual presence in the corridor. All of these buildings exhibit noteworthy architecture, both historic and monumental in character. The sidewalks of Van Ness Avenue through this area are wide, ranging up to 32 feet wide in places, and the buildings are generally set well back from the sidewalk behind landscaped planters that surround the building façades. Granite steps lead from the sidewalks to the entrances of City Hall and the Opera House. These features contribute to the feeling that this stretch of Van Ness Avenue is a grand boulevard.

Moreover, streetscape features within the Civic Center Historic District are designed and maintained to provide a cohesive visual quality. Garbage receptacles are painted white like the OCS support poles/streetlights. The bases of the OCS support poles/streetlights are painted gold within the district. Baskets of flowers hang from the poles. Recently installed sidewalk planters surrounded with low iron rod fencing are located curbside along the avenue in front of City Hall. The Van Ness Avenue center median located in front of City Hall and the War Memorial Building, between Grove and Hayes streets, features an approximate 4-foot-tall fence that is designed and painted in civic blue to mimic the ironwork found throughout the Civic Center. A row of consistently planted and uniformly pruned trees lines the planters in front of City Hall. The sidewalk trees consistently spaced between the OCS support poles/streetlights frame the rear façade of City Hall, contributing to its monumental presence.

The rear façade of City Hall faces Van Ness Avenue, across from the San Francisco War Memorial and Performing Arts Center.

The median along Van Ness Avenue between Hayes Street and Golden Gate Avenue is landscaped with red and white flowering shrubs, and it features red-blooming, mature trees. These street blocks feature some of the best-maintained landscaped medians in the project corridor. The well-maintained landscaping and streetscape in this stretch of the corridor, together with remarkable architecture of the civic buildings, makes this area one of the highest quality visual areas within the project corridor.

The pedestrian elements and plazas of the Civic Center are concentrated along Polk, Larkin, and Hyde streets. Van Ness Avenue plays a peripheral role in this monumental assemblage, as shown in Figure 4.4-3 (JRP, 2009). While the landscape and themes and the monumental architecture create a visual cohesiveness and scenic quality to the Civic Center Historic District, the district feels modern; therefore, one gets the feeling of prominence and monument along Van Ness Avenue in the Civic Center Historic District and less the feeling of being in a historic time.

The Civic Center is a major tourist destination due to the scenic experience it offers, in addition to the many cultural events held in the various buildings and plazas that comprise it. It is a major destination in the city for civic purposes, entertainment, tourism, and employment; therefore, all of the major viewer groups described in Section 4.4.2.2 frequent the historic district and would be sensitive to changes in its character and scenic quality.

Significant Buildings and Architecture

As stated in the City Urban Design Element, Van Ness Avenue is endowed with many attractive buildings, mostly older buildings, which reflect a flavor characteristic of San Francisco's unique architectural style and heritage (City of San Francisco, 1990). Several architecturally distinguished buildings of diverse design and age flank Van Ness Avenue throughout the project corridor. There are some common architectural themes among these buildings, but mostly they vary in style and context and are scattered throughout the corridor.

The City maintains a list of Significant Buildings and Contributory Buildings in Appendices A and B, respectively, of the Van Ness Area Plan. Significant Buildings are buildings identified as contributing to the rich architectural environment of Van Ness Avenue and warrant special consideration in planning. The Area Plan calls for preservation of these buildings (i.e., 32 listed) and for them to serve as a basis for the theme and scale of future, adjacent development. Several of these buildings, in addition to other buildings in the project corridor, are listed in or have been determined eligible for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR), or as a City Landmark (JRP, 2009).

Aside from the Civic Center Historic District described above, the NRHP- and CRHR-listed properties and properties designated as City Landmarks or Significant and Contributory Buildings do not occur cohesively or with visual continuity in the Van Ness Avenue corridor. Most buildings of noteworthy historic architecture are adorned with modern signage, awnings, or other features, and/or they occur within the context of surrounding modern architecture or streetscape.

All of the major viewer groups described in Section 4.4.2.2 experience views of significant buildings in the corridor. Sensitive viewer groups (i.e., residents, commuters, and tourists) would be sensitive to changes in the character and visual quality of these buildings.


Photo 9. Van Ness Avenue in Civic Center Historic District.


Photo 10. City Hall on Van Ness Avenue.


Photo 11. Wide sidewalks, planters and sculpture .


Photo 12. Hall of Justice & War Memorial Building on Van Ness Avenue.


Photo 13. Civic Center lighting standards.


Photo 14. Van Ness Ave/McAllister St. intersection looking south.

Photo 15. Civic Center Streetscape.

Photo 16. Civic Center signage.

Figure 4.4-3: Images of Civic Center Historic District

OCS Support Poles/Streetlights

The only continuous streetscape design element on Van Ness Avenue is the OCS support poles/streetlights, which line both sidewalks of the street between Market and North Point streets. Images of the OCS support poles/streetlights are depicted in Figure 4.4-4. The OCS support poles/streetlights are a streetscape feature unique to Van Ness Avenue that contribute to the eclectic visual character of the corridor. These poles were constructed in 1914 as part of the passenger Municipal Rail that was constructed up the median of Van Ness Avenue from Market Street to North Point. The poles served to support the OCS system of wires that ran the electric rail, and today they serve to power the Muni bus system on Van Ness Avenue. The OCS is a character-defining feature of the corridor, and it is associated with the larger identity and character of San Francisco. The poles also support the main lighting system for the corridor. A single teardrop, pendant light hangs from each pole over the roadway. Aside from the occasional modern cobra light pole and lights mounted on buildings, the OCS support poles/streetlights provide the only light for the roadway and sidewalks of Van Ness Avenue. Banners hang from below the pendant lights, and in the Civic Center, flower baskets also hang from the poles. Traffic signals and signage are affixed to many of the poles.

The poles are a slender, square form column of Corinthian classical architectural style that slightly taper with height. The poles reach a height of approximately 25 feet. The poles are concrete, and they are adorned with a decorative, foliated finial and base made of cast iron. The base is square with a modest foliated design (JRP, 2009). The poles are composed of reinforced concrete, and the entire pole is painted a uniform white, including the light fixtures. The teardrop-shaped light fixtures project from the upper portion of the pole, slightly beneath the decorative finial. These light fixtures were not part of the original pole design and were added in 1936 when the poles were moved to accommodate a 12-foot widening of the roadway. While all of the finials are original, the bases are a mixture of original cast iron and replacement fiberglass castings that replicate the original. The fiberglass base replicas are used to replace the damaged, original bases. Many of the poles are damaged, as shown in Figure 4.4-5. In addition to damaged and replaced bases, many of the columns are spalling, show deterioration, and are leaning (City of San Francisco, 2010). In the 1990s, the City began replacing the most damaged poles with modern poles of nondescript design, or adding these modern poles adjacent to the original poles so that the modern poles could carry the load of the OCS (City of San Francisco, 2010). In some places where these modern poles were added, the visual continuity of the original OCS support pole/streetlights, as well as the overall visual setting, is degraded by pole clutter (Figure 4.4-4, Photos 19 and 20).

An assessment of the pole's eligibility for listing on the NRHP and CRHR found that the original network of poles do not appear eligible for listing because their potential historic significance is undermined by a lack of physical integrity (JRP, 2009).[70] Although the OCS support poles/streetlights are not eligible for listing in the NRHP and CRHR, they are designated as California Office of Historic Preservation (OHP) Historical Resource Status Code 6L, which indicates that they may warrant special consideration in local planning, much like the Significant and Contributory Buildings identified by the City in the Van Ness Area Plan.

DEFINITION

OCS: Overhead Contact System. Overhead lines or wires used to transmit electrical energy to trams, trolleybuses or trains at a distance from the energy supply point.

The only continuous streetscape design element on Van Ness Avenue is the OCS support poles/streetlights, which line both sidewalks on the street between Market and North Point streets.

The OCS support poles/ streetlights are the only visually notable infrastructural element occurring consistently along Van Ness Avenue that displays design with aesthetic intent.

[70] The California State Historic Preservation Officer (SHPO) reviewed and concurred with the eligibility findings in a letter dated April 27, 2010.

Photo 17. OCS support pole/streetlights appearing as a linear feature in Civic Center.

Photo 19. Modern poles and storefront canopies inserted in between OCS support pole/streetlight network.

Photo 20. Pole clutter at Bay St./Van Ness Ave.

Photo 22. Well maintained OCS support pole/streetlight with gold trim in Civic Center Historic District.

Photo 21. Visually prominent pole/streetlight at corner of Van Ness Avenue/Geary Street.

Photo 18. OCS support pole/streetlight network more visually prominent in front of City Hall.

Figure 4.4-4: Images of OCS Support Poles/Streetlight Network

Figure 4.4-5: Damaged and Leaning OCS Support Pole/Streetlights

Regardless of the historic status of the OCS support poles/streetlights, they represent a streetscape element and visual resource in the Van Ness Avenue corridor and the Civic Center Historic District. The OCS support poles/streetlights are the only visually notable infrastructural element occurring consistently along Van Ness Avenue that displays design with aesthetic intent. As explained above, the OCS support poles/streetlights were built as part of the Municipal Rail, which was constructed to serve the Panama Pacific Exposition in 1915; Van Ness Avenue served as the eastern boundary to the Exposition site. The OCS support pole/streetlight network was designed to visually connect and provide a "ribbon of light" between the Civic Center and the Panama Pacific Exposition (JRP, 2009). This cohesive design intent of the poles/streetlights for the avenue is more noticeable along some blocks of Van Ness Avenue. Today, sidewalk trees, storefront canopies, and modern poles partially block views of the poles and streetlights along many blocks of Van Ness Avenue, and the role of the poles to bring a character-defining design intent to the avenue is diminished. At some locations, the poles are located closer to the street corner, where they have a more prominent presence, such as the southern corners of Van Ness Avenue and Geary Street (Figure 4.4-4, Photo 21). The OCS support poles/streetlights are more visually prominent in the Civic Center Historic District because views of them are less obstructed, and they appear as a more cohesive, linear feature due to the wide sidewalks and setbacks of buildings behind landscaped planters (Figure 4.4-4, Photo 17). The OCS support poles/streetlights within the district have less signage attached to them, and there are fewer modern support poles. For these reasons, they occur as more visually prominent features within the historic district in comparison to the remainder of the corridor, where they stand in greater proximity to adjacent buildings and are more often obstructed by trees, modern signage, and other pole clutter. In Photo 18 (Figure 4.4-4), it is possible to see how the OCS support poles/streetlights are more visually prominent in front of City Hall and then become less prominent farther north along Van Ness Avenue, where they are obstructed by trees, pole clutter, and adjacent buildings.

In addition, within the Civic Center Historic District, the bases of the poles are painted gold to contribute to the visual setting, uniformity, and character of the district. The white-buff color of the poles matches the color scheme of the Civic Center. The trees in front of City Hall have been uniformly pruned to reach approximately 75 percent of the height of the OCS support poles/streetlights. Together, the OCS support poles/streetlights and trees form a cohesive, linear feature that neatly frames City Hall and contributes to the monumental feeling of this location.

At night, the lighting of the teardrop-shaped pendant lights makes the OCS support pole/streetlight network more visually prominent, particularly in the Civic Center area where they are notably less obstructed by trees, signage, and adjacent buildings. The poles present a visual continuity to the multiple street blocks and buildings that comprise the Civic Center. The OCS support poles/streetlights provide nighttime, visual continuity beyond the Civic Center and throughout the project corridor. This visual continuity throughout the Van Ness

Avenue corridor is not nearly as prominent in daytime and is significantly less a character-defining feature for the corridor in daylight. In daylight and without the effects of nighttime lighting, the OCS support poles/streetlights fade into the streetscape, tree canopies, and backdrop of buildings.

The OCS support poles/streetlights are an important component of the viewshed experienced by all major viewer groups described in Section 4.4.2.2, including sensitive viewer groups (i.e., residents, commuters, and tourists); therefore, all viewer groups would be sensitive to changes in the character and visual quality of the OCS support poles/streetlights.

While most blocks of Van Ness Avenue feature a consistent row of sidewalk trees of varied type and maturity, the presence of trees in the median is less consistent throughout the corridor.

Landscaping and Trees

The landscaped medians and tree plantings along Van Ness Avenue contribute to the character and visual quality of the corridor; therefore, they are one of the most important visual features in the corridor. As described in the Van Ness Corridor Initial Land Use and Urban Design Needs Assessment, the Van Ness Avenue corridor lacks a comprehensive landscaping and tree-planting scheme. While most blocks of Van Ness Avenue feature a consistent row of sidewalk trees of varied type and maturity, the presence of trees in the median is less consistent throughout the corridor. Nonetheless, the trees and sporadic, wide medians are character-defining features of the corridor. A description of the varied landscaping and tree planting in the corridor follows.

A tree survey conducted in support of the proposed project identified 416 trees located within the project corridor (BMS Design Group, 2013). Of these trees, 102 trees are located in the median, and 314 trees are located along the sidewalks. The London Plane Tree is the most common sidewalk tree. The Brisbane Box is the most common median tree, comprising 39 percent of median trees. Twenty-eight (27 percent) of the median trees are mature and in good or excellent condition (health), 50 (49 percent) of the median trees are young trees and in good or excellent condition (health), and 24 (24 percent) of the median trees (both mature and young) are in fair or poor condition. Forty-two of the 102 median trees are mature; 60 are young trees. Many of the young trees were planted between 2006 and 2010 as part of the Van Ness Enhancements Project, which was a landscape improvement project completed by SFDPW. The mature sidewalk and median trees are not consistently spaced; however, most of the young trees have been planted evenly spaced apart and with some design aesthetic intent. Most of the young trees in the median are located along the narrow, concrete stretches of median without other landscaping. Most of the sidewalk trees are planted in tree wells without surrounding landscaping. There are no tree plantings or landscaping at existing bus shelters and stops along Van Ness Avenue. Aside from sidewalk planters and hanging flower baskets along Van Ness Avenue in the Civic Center, there are no landscaped areas except trees in tree wells in the corridor other than the median.

The medians of Van Ness Avenue are of varied dimension and composition throughout the corridor. Some medians are a narrow concrete strip without any plantings, while others have recently planted trees and no other landscaping. Some medians are landscaped with flowering shrubs and some feature mature trees, while others have young trees or no trees. The median in the block of Van Ness Avenue between California and Sacramento streets features large potted plants and no trees. Several landscaped medians feature a grey-colored trim composed of multiple rows of decorative unit pavers (concrete or granite) along the curb. This is consistent with streetscape policies in the Van Ness Area Plan and also helps facilitate ease of access to the plantings for maintenance workers. Multiple street blocks with a landscaped median feature a landscape theme of red, white, and blue flowering shrubs. This landscape theme is most evident in the well-maintained medians located within the Civic Center Historic District. Some of the mature, median trees paired with this shrub landscape theme feature matching red blossoms. The decorative block trim and the red-white-blue flowering shrubs are the only identifiable landscape themes in the project corridor; they are not typically found on consecutive street blocks, with the exception of within the Civic Center Historic District, where this theme is carried along three consecutive blocks. Images of the varying median configurations and sidewalk tree plantings are depicted in Figure 4.4-6.

Overall, the presence of median trees and landscaping varies throughout the project corridor, and some blocks offer a higher scenic quality. The variation in median width and composition throughout the corridor has a noteworthy effect on the visual quality of each street block. Street blocks featuring a wide, landscaped median with mature trees have a higher visual quality than street blocks without a landscaped median. The blocks of Van Ness Avenue featuring high-quality medians with mature trees that create a picturesque quality are listed in Table 4.4-1.

The landscaping and trees in the Van Ness Avenue corridor have a significant effect on the viewshed experienced by all major viewer groups described in Section 4.4.2.2, including motorists, pedestrians, cyclists, residents, commuters, and tourists. All of these viewer groups, including sensitive viewer groups (i.e., residents, commuters, and tourists) would be sensitive to changes in the scenic quality of landscaping and trees in the corridor.

Most of the scenic vistas are experienced by looking east or west along streets that cross Van Ness Avenue: the Market Street corridor and distant downtown skyscrapers, Nob Hill and the high rises of Union Square, the distant Presidio, and a glimpse of part of the Bay Bridge.

4.4.2.6 | SCENIC VISTAS

As mentioned in Section 4.4.2.1, Viewshed, the topography of the project area allows scenic vistas from the project corridor. Most of the vistas are experienced by looking east or west along streets that cross Van Ness Avenue. In the southern portion of the corridor, views to the east include scenic vistas of the Market Street corridor and distant downtown skyscrapers. Farther north, scenic views of Nob Hill and the high rises of Union Square are visible looking east from cross streets in the corridor. In the northern portion of the corridor, the cross streets of Filbert, Greenwich, and Lombard streets offer scenic, westerly views of the distant Presidio. The intersection of North Point and Van Ness Avenue offers a glimpse of part of the Bay Bridge to the east.

Table 4.4-1: High-Quality Landscaped Medians Featuring Mature Tree Canopies

VAN NESS AVENUE BLOCK	MEDIAN	LANDSCAPING	TREE CANOPY
Hayes – Grove streets	Extends half block; Features decorative block trim	Red-white-blue flowering shrubs	Mature tree canopy; red-blooming trees
Grove – McAllister streets	Three-quarters of block; Features decorative block trim; Blue-gold painted iron rod fence	Red-white-blue flowering shrubs	Mature tree canopy; red-blooming trees
McAllister Street – Golden Gate Avenue	Extends half block; Features decorative block trim	Red-white-blue flowering shrubs	Mature tree canopy
Turk – Eddy streets	Extends full block; Features decorative block trim	Red-white-blue flowering shrubs	Mature tree canopy; red-blooming trees
Ellis – O'Farrell streets	Extends full block; Features decorative block trim	White-flowering shrubs, sporadically planted	Mature tree canopy
Sutter – Bush streets	Extends full block; Features decorative block trim	Red-white-blue flowering shrubs	Mature tree canopy; red-blooming trees
Pine – California streets	Extends full block; Features decorative block trim	Red-white-blue flowering shrubs	Mature tree canopy
Sacramento – Clay streets	Extends full block; Features decorative block trim	White-flowering shrubs	Mature tree canopy
Broadway – Pacific streets	Extends full block	White-flowering shrubs	Mature tree canopy; red-blooming trees
Union – Filbert streets	Extends full block	White-flowering shrubs	Mature tree canopy

Photo 26. Varied tree type in Van Ness Avenue corridor.

Photo 29. Red-flowering shrubs match tree blossoms in high-quality landscaped median.

Photo 31. Young trees in narrow, concrete median.

Photo 27. Potted plants in landscaped median.

Photo 30. Civic Center sidewalk planters.

Photo 32. Civic Center landscaping along Van Ness Avenue.

Photo 28. Mature median trees.

Figure 4.4-6: Landscape and Trees in the Van Ness Avenue Corridor

The changing topography within the project corridor also allows scenic views of the corridor itself. The top of the east-west trending ridgeline that transverses the Van Ness Avenue corridor peaks along Van Ness Avenue approximately between Bush and Washington streets. The top of the south-facing ridgeline provides scenic vistas to the south of the Van Ness Avenue corridor, some of which offer limited views of City Hall. Certain locations provide a limited, scenic glimpse of distant Potrero Hill. The north-facing slope is greater than the south-facing slope and offers greater views. The top of the north-facing ridgeline offers views to the north that include a limited, scenic snapshot of the Bay and Angel Island. Views from the bottom of the slope looking south show a scenic portion of the Van Ness Avenue corridor where there is the largest concentration of mature trees in the median and sidewalks, and in which the tower of St. Brigid Church is a dominant visual feature. Figure 4.4-7 depicts some of these scenic vistas.

4.4.3 | Environmental Consequences

A project may have an adverse impact on aesthetics/visual resources if it would:

- Have a substantial adverse effect on a scenic vista;
- Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area, or which would substantially impact other people or properties;
- Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway; or other features of the built or natural environment that contribute to a scenic public setting; or
- Substantially degrade the existing visual character or quality of the site and its surroundings.

In addition, San Francisco has added a criterion regarding consideration of a proposed project's shadow effects, as evidenced in the San Francisco Planning Department Initial Study Checklist (San Francisco, 2008). The City's Initial Study Checklist states that a project is determined to have a significant shadow effect it if were to result in substantial new shadow on public open space under the jurisdiction of the Recreation and Park Commission during the 1-hour before sunrise to 1-hour before sunset at any time of the year, or if shadows were to obscure direct sunlight on certain downtown sidewalks. The proposed project would not cast new shadows on public open space under the jurisdiction of the Recreation and Park Commission, so this impact criterion is not discussed further.

Moreover, the City and County of San Francisco has established policies and regulations regarding visual resources that are discussed in detail in Sections 4.4.1.1 and 4.4.1.2. The proposed project may adversely affect visual resources if it conflicts with any objectives or policies in one of those applicable plans, including the San Francisco General Plan and San Francisco Better Streets Plan. Lastly, the City Planning Department has identified urban design improvements for Van Ness Avenue in the Van Ness Corridor Initial Land Use and Urban Design Needs Assessment, which the project is intended to support.

Station and pole designs would be finalized during the final design phase of the proposed project, reflecting comments from the public and other interested parties on the Draft EIS/EIR review.

4.4.3.1 | ANALYSIS OF KEY VIEWPOINTS

Key viewpoints, as shown in Figures 4.4-8 through 4.4-11, were identified to represent the visual character of the study corridor. The locations described below were selected because they are representative of areas where the project could affect existing visual quality and/or are proximate to important visual resources and sensitive visual receptors. Visual simulations of each build alternative, including the LPA, are presented in Figures 4.4-8 through 4.4-11 to identify changes that would result in the visual environment.

Photo 33. View of Van Ness Avenue Corridor looking south from Greenwich Street.

Photo 35. View of Nob Hill from Van Ness Avenue/O'Farrell Street.

Photo 34. View of Bay & Angel Island from Van Ness Avenue/Jackson Street.

Photo 36. View of Distant Presidio from Van Ness Avenue/Greenwich Street.

Figure 4.4-7: Scenic Vistas Viewed from within the Van Ness Avenue Corridor

The architectural design of the BRT stations and OCS support pole/streetlight network shown in the visual simulations are representative only. Station and pole designs would be determined during the final design phase of the proposed project, reflecting comments from the public, agencies, and other interested parties; therefore, a typical station and OCS support pole/streetlight design is depicted in the simulations presented in Figures 4.4-8 through 4.4-11. The landscape scheme, colored pavement, and tree type would also be determined during the project final design phase; therefore, the landscaping and tree type shown is representative only. The visual simulations depict landscaping and trees at an approximate 5-year maturity.

The No Build Alternative is represented in the existing conditions photograph because with the exception of continued spot replacement of OCS support poles/streetlights and upgrade of traffic signal poles to mast arm poles, no other physical structures would be installed. Moreover, because funding is not yet programmed for the aforementioned features and locations of pole replacement is not confirmed at this time, these features are not simulated.

A description of the key viewpoints follows, from south to north.

Viewpoint 1 – Van Ness Avenue at McAllister Street

Viewpoint 1, depicted in Figures 4.4-8 and 4.4-11, is from the perspective of the northern crosswalk on Van Ness Avenue at the Van Ness Avenue/McAllister Street intersection, looking south. This location is within the Civic Center Historic District. City Hall is visible along the east side of Van Ness Avenue, and the San Francisco War Memorial and Performing Arts Center is visible on the west side of Van Ness Avenue. The California Automobile Association high-rise office building is a dominant visual feature in the distant south of the viewshed. The OCS wires are visible over the roadways and intersection. The OCS support poles/streetlights are visible along the sidewalks of Van Ness Avenue. An existing Muni bus shelter is located at the southeast corner of Van Ness Avenue and McAllister Street. There is a nose cone (i.e., thumbnail island) pedestrian refuge in the far crosswalk and curb bulbs at both corners. The median features mature trees and landscaping. Red-blooming trees match the surrounding landscape of red, white, and blue blooming shrubs. This block of Van Ness Avenue features one of the best-maintained medians, which contributes to a picturesque quality at this location. The dome of City Hall is the dominant visual feature, and this area is characterized by the wide roadway of Van Ness Avenue and the monumental buildings of the Civic Center. This viewpoint features all major types of historic and visually important features found in the Van Ness Avenue corridor, including significant buildings, the Civic Center Historic District, the OCS support pole/streetlights in the area where they are visually prominent, and the highest quality landscaped median. All viewer groups experience this location, including tourist and commuter sensitive viewer groups. There are no immediate residential uses in this area; however, distant high-rise residential buildings offer views of City Hall and the corridor. The well-maintained landscaping and streetscape in this stretch of the corridor, together with remarkable architecture of the civic buildings, makes this area one of the highest quality visual areas within the project corridor; therefore, Viewpoint 1 represents a highly sensitive visual setting.

The well-maintained landscaping and streetscape in this stretch of the corridor, together with remarkable architecture of the civic buildings, makes this area one of the highest quality visual areas within the project corridor.

Visual simulations of Viewpoint 1 depict the proposed BRT features and replacement network of OCS support pole/streetlights. The dedicated transitway is depicted with red-colored pavement. The BRT bus fleet is shown traveling in the transitway. A typical station design is shown, which features a canopy with rooftop solar paneling, wind shields, seating, TVMs, signage/mapping, and garbage receptacles. A blue-and-gold-colored wind turbine, which would capture wind energy as a sustainable energy project feature, is depicted.[71] This turbine would also serve as a wayfinding element that would brand the BRT service and aid

71 Incorporation of wind turbines into the proposed BRT station design is still under evaluation. The turbines are included in the visual simulations to depict a scenario of the maximum anticipated visual changes that could occur with project implementation.

in marking BRT station locations. A railing is present to separate the station platform from adjacent traffic lanes. A ramp extends from the crosswalk up to the station platform, which sits approximately 10 inches to 12 inches above the street grade (i.e., approximately 6 inches above the sidewalk height). The station platform is approximately 150 feet in length for each build alternative and would range in width between 9 feet and 14 feet, depending on the project alternative (see Chapter 2.2.2, Build Alternatives). The platform for Build Alternative 4 is located within the footprint of the existing landscaped median and is 14 feet wide, whereas the platform for Build Alternatives 2 and 3 and the LPA needs to only accommodate single-direction travel and is approximately 9 feet in width. The station canopy is shown in a blue, silver, and white color scheme. The station canopy is approximately 9 feet to 15 feet above ground surface, and it is 38 feet in length. Under Build Alternative 2, a landscaped planter is incorporated into the BRT station design, which serves to enhance the aesthetics of the station.

Noteworthy differences in the visual setting between the build alternatives are apparent due to the difference in lane and median configuration.

The most noteworthy changes to the visual context of Viewpoint 1 result from changes in the transitway and median configuration, changes to the median landscape and trees, introduction of the BRT station (i.e., platform, canopy, solar paneling, and wind turbine), and replacement of the OCS support pole/streetlight network. Noteworthy differences in the visual setting between the build alternatives, including the LPA, are apparent due to the difference in lane and median configuration. Build Alternative 2 features a side-lane transitway adjacent to the curbside parking area. The station platform is on a curb extension from the sidewalk. The parking lane begins just south of the platform. The transitway for Build Alternatives 3 and 4 and the LPA is in the center lanes, as depicted in the simulations. The simulation for Build Alternative 3 shows the side-by-side transit lanes located between two median strips. The strip of median to the west is approximately 9 feet wide and supports the BRT station. The other median strip is narrower, at approximately 4 feet wide.[72] For the LPA, the station would only be in the NB direction in Viewpoint 1. The transitways would have a painted buffer between them for the length of the platform. This buffer would become a planted median just south of the station as the space between the transit lanes widens. The need to reconfigure the existing median into two median strips requires the removal of all existing median vegetation and trees; therefore, the Build Alternative 3 simulation shows less landscaped area than the existing median, and it shows replacement palm trees on the 9-foot-wide right-side medians. Similarly, the LPA requires removal of most existing median vegetation and trees on blocks with a station; therefore, the Build Alternative 3 simulation shows less landscaped area than the existing median in this simulation. Build Alternative 4 shows a single 14-foot-wide median with transit lanes located along either side of it. Existing median vegetation and trees are preserved, except where the BRT station is located; therefore, the Build Alternative 4 simulation shows the removal of existing landscaping and trees at the station site, and it shows the trees and landscaping south of the station retained but pruned to ensure that tree canopies would not interfere with the clearance requirements of the OCS wires.

Other visual changes under all of the build alternatives, including the LPA, include removal of the existing bus shelters located on the sidewalks of Van Ness Avenue near the southeast and southwest corners of the Van Ness Avenue/McAllister intersection. The traffic signal poles have been replaced with mast arm style signal poles that arch over the traffic lanes. Traffic signals are no longer mounted on the decorative OCS support poles/streetlights. Under Build Alternatives 3 and 4 and the LPA, the parallel OCS wires are shifted from the side lane to be centered over the center-lane transitway. The median features a nose cone pedestrian refuge framing the crosswalk with the median, and the crosswalk is paint-striped to improve visibility.

[72] Under the LPA, the median strip opposite the station platform varies in width between 3 and 5 feet.

Alternative 1: Intersection of McAllister Street and Van Ness Avenue, Existing Conditions

Alternative 2: Intersection of McAllister Street and Van Ness Avenue

Alternative 3: Intersection of McAllister Street and Van Ness Avenue

Alternative 4: Intersection of McAllister Street and Van Ness Avenue

Figure 4.4-8: Viewpoint 1: Visual Simulations of Intersection of McAllister Street and Van Ness Avenue

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The visual simulations for the build alternatives and LPA depict a replacement OCS support pole/streetlight network.[73] The proposed replacement pole/lighting network is comprised of modern materials embellished with decorative elements that mimic the architectural style of the original OCS support pole/streetlight network. The poles are approximately 5 feet taller than the original poles, measuring approximately 30 feet in height, because taller poles are needed to carry the OCS load better. Each pole incorporates two light fixtures instead of one fixture like the original poles to bring the corridor up to current roadway and pedestrian lighting standards. One light fixture serves to light the sidewalk, while the other light fixture hangs from an arm fixture extended over the roadway to improve roadway lighting. The replacement poles are round; however, square-shaped bases and finials are added to the poles to be reminiscent of the original square column poles. The bases and finials mimic the original pole bases and finials. Similarly, the replacement poles feature teardrop pendant light fixtures reminiscent of the existing light fixtures. The replacement poles are shown in the same solid, white color as the existing poles. The pole bases are shown painted gold like the existing pole bases within the Civic Center Historic District. The replacement poles include a rack to allow twin banners to be hung, instead of the single banner configuration currently used with the existing poles; therefore, the replacement poles are depicted with twin banners hung from each pole. In recognizing the visual value of the OCS support pole/streetlight network, the replacement OCS support pole/streetlight network displayed in the simulations was developed by SFDPW to create a feasible pole and light design that is reminiscent of the architectural style of the existing OCS support pole/streetlight network.

While the BRT station and transitway proposed under the build alternatives, including the LPA, are features compatible with the Van Ness Avenue corridor, the station canopy, wind turbines, and other features would partially obstruct ground-level views of City Hall and the War Memorial Complex buildings and would introduce modern features that could detract from the visual setting of these buildings. These impacts are addressed in Section 4.4.3.4, Important Visual Elements within Viewshed.

Viewpoint 2 – Van Ness Avenue at Sutter Street

Viewpoint 2, depicted in Figures 4.4-9 and 4.4-11, is from the perspective of the southern crosswalk on Van Ness Avenue at the Van Ness Avenue/Sutter Street intersection, looking north. This location is within the mixed-use commercial/high-density residential segment of the project corridor. The Regency Ballroom, a City-designated Significant Building, is visible on the northeast corner. There is an existing bus shelter at this location. The OCS wires are visible over the roadways and intersection. Although largely obstructed by sidewalk trees, modern poles, and signage, the OCS support poles/streetlights are visible along the sidewalks of Van Ness Avenue. There is a nose cone pedestrian refuge in the far crosswalk and curb bulbs at both corners. The median features mature trees and landscaping, and it is one of the best-maintained landscaped medians in the project corridor. Viewpoint 2 is considered a key viewpoint because it displays a City-designated Significant Building that is also a major performing arts venue, and one of the highest-quality landscaped medians in the project corridor. While the BRT station and transitway proposed under the build alternatives and LPA are features compatible with the Van Ness Avenue corridor, the station canopy and features would partially obstruct ground-level views of the Regency Ballroom. These impacts are addressed in Section 4.4.3.4, Important Visual Elements within Viewshed. All viewer groups experience this location, including tourists and commuter sensitive viewer groups; therefore, Viewpoint 2 represents a sensitive visual setting.

Viewpoint 2 is within the mixed-use commercial/high-density residential segment of the project corridor.

Visual simulations of Viewpoint 2 depict the proposed BRT features and replacement network of OCS support pole/streetlights. The transitway, BRT station, wind turbine, and

[73] As noted in Section 1.1, under the no-build scenario, the OCS support poles/streetlights would continue to be replaced with modern, nondescript poles on an as-needed basis, or as a comprehensive replacement project if the needed funding becomes available. For the purposes of the visual simulations, the existing condition is used to represent the OCS support poles/streetlights in the No Build Alternative because pole replacement plans are not confirmed at this time.

lane-median configuration are depicted as described under Viewpoint 1. As in Viewpoint 1, median landscaping is removed to accommodate the BRT station under Build Alternatives 3 and 4 and the LPA, and the existing mature trees have been replaced with planted palm trees on the 9-foot-wide right-side medians under Build Alternative 3. Other visual changes include removal of the existing bus shelter located on the sidewalk in front of the Regency Ballroom, near the northeast corner of Van Ness Avenue and Sutter Street. For Build Alternative 2, the median traffic signal pole has been replaced with a mast arm style signal pole that arches over the traffic lanes. Build Alternatives 3 and 4 and the LPA feature sidewalk mast arm poles. In addition, traffic signals are no longer mounted on the decorative OCS support poles/streetlights, but rather on mast arms extending from the replacement OCS support poles/streetlights. Under Build Alternatives 3 and 4 and the LPA, the parallel OCS wires are shifted from the side lane to be centered over the center-lane transitway. The median features a nose cone pedestrian refuge framing the crosswalk with the median, and the crosswalk is paint-striped to improve visibility. Each of the build alternatives, including the LPA, features curb bulbs and ramps, and a push-button APS pole at the corner of Sutter Street and Van Ness Avenue.

While the proposed BRT station and transitway are features compatible with the Van Ness Avenue corridor, the station canopy and features would partially obstruct ground-level views of the Regency Ballroom, which is a City-designated Significant Building. Moreover, placement of the station may conflict with the symmetrical character-defining style of the building from frontal views of the building.

Viewpoint 3 – Van Ness Avenue at Union Street

Viewpoint 3, depicted in Figures 4.4-10 and 4.4-11, is from the perspective of the southern crosswalk on Van Ness Avenue at the Van Ness Avenue/Union Street intersection, looking north. This location is within the residential segment of the project corridor. As shown in the figure, this area is comprised of lower-density apartment buildings and ground-floor, neighborhood-serving, commercial establishments. Viewpoint 3 is considered a key viewpoint because it represents the residential portion of the corridor, where the residential viewer group would be most sensitive to changes in the visual setting; therefore, Viewpoint 3 represents a sensitive visual setting.

Viewpoint 3 is within the residential segment of the project corridor. The area is comprised of lower-density apartment buildings and ground-floor, neighborhood-serving, commercial establishments.

This location features a wide, landscaped median with mature trees. The sidewalks also feature mature trees that shade portions of the sidewalk. There is an existing bus shelter on the west side of Van Ness Avenue. The OCS wires are visible over the roadways and intersection. Although largely obstructed by sidewalk trees, modern poles, and signage, the OCS support poles/streetlights are visible along the sidewalks of Van Ness Avenue. The increased height of the OCS support pole/streetlight network is more noticeable in this simulation and would likely be more noticeable throughout the northern portion of the corridor where the adjacent buildings are smaller in scale. A City-designated Significant Building (2517 Van Ness Avenue) is located just south of the bus shelter on the west side of Union Street; however, it is shielded by the sidewalk trees and the angle of the viewpoint. This property has a unique, ornate rooftop that is shielded by sidewalk trees. Most of the building façade is shielded by sidewalk trees and a canopy that extends from the door to the curb, and currently this building does not have a strong visual presence. The BRT station and transitway proposed under the build alternatives, including the LPA, would not obstruct views of the character-defining features of this building.

Visual simulations of Viewpoint 3 depict the proposed BRT features and replacement network of OCS support pole/streetlights. The transitway, BRT station, wind turbine, and lane-median configuration are depicted as described under Viewpoint 1. As in Viewpoint 1, median landscaping is removed to accommodate the BRT station under Build Alternatives 3 and 4 and the LPA, and the existing mature trees have been replaced with planted palm trees on the 9-foot-wide right-side medians under Build Alternative 3. The angle of Viewpoint 3 clearly shows the landscaped 4-foot-wide median of Build Alternative 3 and the LPA.

Alternative 1: Intersection of Sutter Street and Van Ness Avenue, Existing Conditions

Alternative 2: Intersection of Sutter Street and Van Ness Avenue

Alternative 3: Intersection of Sutter Street and Van Ness Avenue

Alternative 4: Intersection of Sutter Street and Van Ness Avenue

Figure 4.4-9: Viewpoint 2: Visual Simulations of Intersection of Sutter Street and Van Ness Avenue

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Alternative 1: Intersection of Union Street and Van Ness Avenue, Existing Conditions

Alternative 2: Intersection of Union Street and Van Ness Avenue

Alternative 3: Intersection of Union Street and Van Ness Avenue

Alternative 4: Intersection of Union Street and Van Ness Avenue

Figure 4.4-10: Viewpoint 3: Visual Simulations of Intersection of Union Street and Van Ness Avenue

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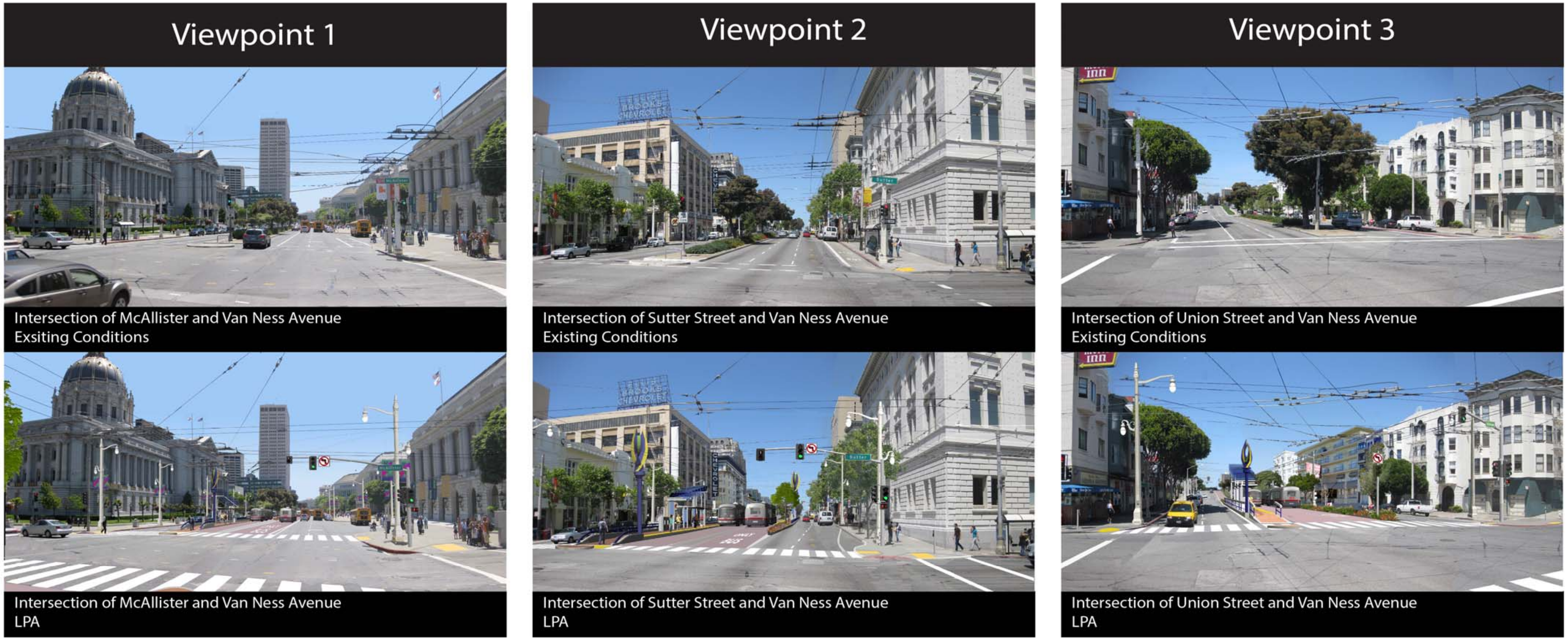

Figure 4.4-11: Viewpoints 1–3: Visual Simulations of the LPA at the Intersections of Van Ness Avenue with McAllister, Sutter, and Union Streets

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Other visual changes include removal of the existing sidewalk bus shelter located on the west side of Van Ness Avenue, near the northwest corner of Van Ness Avenue and Union Street. For Build Alternative 2, the median traffic signal pole has been replaced with a mast arm style signal pole that arches over the traffic lanes. Build Alternatives 3 and 4 and the LPA (with or without the Vallejo Northbound Station Variant) feature sidewalk mast arm poles. In addition, traffic signals are no longer mounted on the decorative OCS support poles/streetlights. Under Build Alternatives 3 and 4 and the LPA (with or without the Vallejo Northbound Station Variant) the parallel OCS wires are shifted from the side lane to be centered over the center-lane transitway. The median features a nose cone pedestrian refuge framing the crosswalk with the median, and the crosswalk is paint-striped to improve visibility. Each of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), features curb bulbs and ramps, and a push-button APS pole at the corner of Union Street and Van Ness Avenue.

4.4.3.2 | SCENIC VISTAS

The proposed project features would be confined to the roadway and sidewalks of Van Ness Avenue and would not obstruct scenic vistas described in Section 4.4.2.5. Existing scenic vistas in the project corridor would not be changed under the No Build Alternative or under any of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant). Moreover, incorporation of Center-Lane Alternative Design Option B, eliminating nearly all left turns and left-turn pockets, into the proposed project would not alter scenic vistas; therefore, the proposed project would not have an adverse effect on a scenic vista, and it would not conflict with planning policies described in Section 4.4.1 to protect major views.

4.4.3.3 | LIGHT, GLARE, AND SHADOW

No Build Alternative

Shadow effects would not change under the No Build Alternative, and there would be no impacts. The No Build Alternative would not improve existing lighting; therefore, it would not support the recommendation in the Van Ness Corridor Initial Land Use and Urban Design Needs Assessment to provide comprehensive street lighting for Van Ness Avenue.

Build Alternatives

With the exception of trees planted in the median or at the sites of removed sidewalk bus shelters, the project features proposed under each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), would not cast substantial shadows. The shadow cast from median trees and BRT station canopies would be minimal, and it would be consistent with the existing visual setting; therefore, no adverse shadow impacts would result under any build alternative, with or without incorporation of the Center-Lane Alternative Design Option B under Build Alternatives 3 and 4, and including the LPA (with or without the Vallejo Northbound Station Variant).

High traffic volumes, including buses on Van Ness Avenue, create sources of light and glare. Operation of the proposed BRT service would not increase light and glare. The replacement OCS support pole/streetlight network would increase lighting over existing conditions to meet current safety lighting standards. Adjacent residences may be sensitive to the replacement street lighting, which would increase nighttime illumination over existing conditions on the sidewalks and roadway. Glare mitigation measure M-AE-1, described in Section 4.4.4, would be required to ensure no adverse impacts to residents.

The build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would support the recommendation in the Van Ness Corridor Initial Land Use and Urban Design Needs Assessment to provide comprehensive street lighting for Van Ness Avenue.

KEY FINDING

With the exception of trees planted in the median or at the sites of removed sidewalk bus shelters, the project features proposed under each build alternative, including the LPA, would not cast substantial shadows.

The replacement OCS support pole/streetlight network would increase lighting over existing conditions to meet current safety lighting standards. Adjacent residences may be sensitive to the replacement street lighting.

4.4.3.4 | IMPORTANT VISUAL ELEMENTS WITHIN VIEWSHED

OCS Support Poles/Streetlights

Replacement of the OCS support pole/streetlight network is one of the most noteworthy changes to the visual context at each key viewpoint.

Replacement of the OCS support pole/streetlight network is one of the most noteworthy changes to the visual context at each key viewpoint presented in Section 4.4.3.1. Impacts resulting from changes to the OCS support poles/streetlights network would be experienced by all viewer groups, including sensitive viewer groups (i.e., residents, commuters, and tourists).

No Build Alternative. Though not depicted in the simulations presented in Section 4.4.3.1, under the No Build Alternative, the OCS support poles/streetlights would continue to be replaced with modern, nondescript poles on an as-needed basis, or as a comprehensive replacement project if funding becomes available.[74] Continued replacement of damaged OCS support poles/streetlights with modern poles of nondescript design would adversely affect this important visual element within the Van Ness Avenue corridor by further degrading the visual continuity and diminishing the character of the pole/streetlight network. In addition, the current practice of inserting supplemental, modern poles adjacent to existing OCS support poles/streetlights creates pole clutter, which also diminishes the character of the original pole/streetlight network and clutters the visual landscape of the corridor; therefore, the No Build Alternative would result in adverse impacts to this visual resource, which would grow in significance with the increased number of replaced poles.

Build Alternatives. The build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in the replacement of the existing OCS support pole/streetlight network, resulting in potentially adverse impacts to this visual resource. As explained in Section 4.4.2.4, the existing OCS support poles/streetlights are a streetscape feature unique to Van Ness Avenue that contributes to the eclectic visual character of the corridor. The OCS support poles/streetlight network is the only major infrastructural element occurring consistently along Van Ness Avenue that displays design with aesthetic intent; although this intent is diminished by the insertion of nondescript, modern poles into the network, pole clutter, and the visual obstruction of many of the poles by sidewalk trees, roadway signage, and storefront canopies. Nonetheless, the OCS support poles/streetlights appear as a visually important feature in parts of the Van Ness Avenue corridor, including the Civic Center and at certain street corners such as Van Ness Avenue and Geary Street. Removal of this network could result in an adverse impact to an important visual resource, and mitigation would be required to reduce this impact. Mitigation described in Section 4.4.4 would be in the form of a replacement OCS support pole/streetlight network that is compatible with the existing visual setting of the Van Ness Avenue corridor and that achieves the same daytime and nighttime visual continuity throughout the corridor as the existing network provides. The replacement OCS support pole/streetlight network displayed in the simulations (Figures 4.4-8 through 4.4-11) demonstrates that a feasible replacement pole/streetlight network could be compatible with the existing visual setting of the Van Ness Avenue corridor and be reminiscent of the existing network. Consistent with City planning policies, the replacement pole/streetlight network depicted in Figures 4.4-8 through 4.4-11 displays a high-quality design aesthetic that would contribute to a feeling of prominence and grandeur in the Van Ness Avenue corridor, and it would retain a feeling of visual continuity throughout the corridor. The increased height of the replacement poles and the secondary light fixture that would protrude out over the roadway would not be out of scale with the wide roadway and adjacent development along Van Ness Avenue, and it would visually emphasize the network over the existing conditions consistent with City planning policies to promote a feeling of Van Ness Avenue as a grand boulevard.

KEY FINDING

The replacement OCS support pole/streetlight network demonstrates that a feasible replacement pole/streetlight network could be compatible with the existing visual setting of the Van Ness Avenue corridor and be reminiscent of the existing network.

[74] Approximately 33 of the original 259 OCS support pole/streetlights (13 percent) have been removed or replaced with modern, nondescript poles. Approximately 46 original poles (16 percent) are immediately flanked by a modern replacement pole installed to support OCS wires, streetlights, and/or signage (JRP, 2009).

Moreover, beneficial impacts could result from a replacement OCS support pole/streetlight network. A replacement OCS support pole/streetlight network, featuring an architecturally distinctive pole/streetlight configuration as represented here, would support Policy 8.8 of the Van Ness Area Plan, which calls for a uniform architectural style, character, and color in the design of streetlights and poles. This policy would be better achieved with implementation of a project build alternative than under the No Build Alternative, because replacement modern poles would be removed under the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), which would reduce negative visual impacts of pole clutter and would achieve a more unified pole/streetlight network than under the No Build Alternative. Furthermore, a replacement OCS support pole/streetlight network would support Policy 10.3 of the Better Streets Plan to minimize visual clutter and share poles, and Policy 10.5 to provide adequate light levels and quality for pedestrians and other sidewalk users.

Policy 8.8 of the Van Ness Area Plan states that the existing streetlight poles should be maintained and enhanced if feasible to contribute to the special identity of Van Ness Avenue. Policy 8.8 also calls for the light poles to be painted a blue and gold color scheme, similar to that of the Civic Center light standards. Although the poles are depicted white-buff in the visual simulations, this color is only representative and would be decided upon during project final design along with the pole design. Moreover, the pole/streetlight network depicted in Figures 4.4-8 through 4.4-11 is representative only. It was designed by SFDPW to determine and demonstrate that it is feasible to install a pole/streetlight network that retains some of the character-defining features of the existing network, including white/buff-colored, tapered poles with decorative finials and bases from which teardrop-shaped pendant lights hang. This representative replacement OCS support pole/streetlight network was designed to support Policy 8.8 of the Van Ness Area Plan by designing a replacement pole/streetlight network that reflects some of the visual character of the existing network because it is not feasible to maintain the existing network.[75]

Mitigation measure M-AE-2 calls for installing a replacement OCS support pole/streetlight network that will embody the aesthetic character of the existing network, thereby assuring that no significant aesthetic or visual effect will occur. In addition, the architectural style, design, color, and texture of the replacement OCS support pole/streetlight network would be reviewed and approved by the San Francisco Arts Commission, and the portion in the Civic Center Historic District would be reviewed by the HPC and the City Hall Preservation Advisory Committee, and ultimately approved by the HPC. The HPC must approve a Certificate of Appropriateness, as discussed in Section 4.4.1, for all permitted structures in the Civic Center Historic District. .

Implementation of the Center-Lane Alternative Design Option B would not affect proposed OCS support pole/streetlight replacement and related impacts under Build Alternatives 3 and 4, or under the LPA (with or without the Vallejo Northbound Station Variant).

Landscape and Trees

Changes to the existing landscaped median and tree canopy are one of the most noteworthy impacts on the visual setting at each key viewpoint presented in Section 4.4.3.1. As described in Section 4.4.2.4, the landscaped medians and tree plantings along Van Ness Avenue contribute to the visual quality of the corridor, and they are one of the most important visual features in the corridor. All viewer groups, including sensitive viewer groups (i.e., residents, commuters, and tourists) would be sensitive to changes in the character and scenic quality of landscaping and trees in the corridor. Many comments regarding concern for tree loss were

Changes to the existing landscaped median and tree canopy are one of the most noteworthy impacts on the visual setting at each key viewpoint.

[75] Replacement of the OCS support pole/streetlight network has been on SFMTA's list of desired Capital Improvement Projects since 2003 because the network is deteriorated and unable to carry the OCS load sufficiently; therefore, the City has replaced several damaged poles and inserted modern poles to assist with the OCS load. The BRT system proposed under the build alternatives would require a new pole network to support the OCS load for the new BRT system, and to provide roadway and sidewalk lighting that meets current standards (City of San Francisco, 2009).

submitted by agencies and the public during circulation of the Draft EIS/EIR. For this reason, a more comprehensive Tree Removal Evaluation and Planting Opportunity Analysis was undertaken in fall 2012 to identify the maturity and health of trees in the corridor and thus better understand the impacts of tree removal and the opportunities for preserving trees and the parameters of new tree plantings (BMS Design Group, 2013). This analysis was undertaken for all of the build alternatives, including the LPA, and is discussed in the following subsections. The 2012 survey took into account the following factors that were not taken into account in the 2009 survey, the results of which were presented in the Draft EIS/EIR:

- In October 2012, Caltrans issued a design requirement for the project that new tree plantings must be set back by 35 feet from each intersection. This 35-foot setback must be applied to all new or replacement tree plantings and is not applicable to existing trees. In other words, existing median trees must not be removed to achieve the 35-foot setback. The 35-foot setback reduces the number of replacement trees that can be planted under all of the build alternatives, including the LPA.
- Sidewalk trees that would be removed under Build Alternative 2 were quantified, as well as locations where median trees would have to be removed to accommodate turn pockets.
- The maturity and condition of all median trees, as well as each sidewalk tree that would be removed under build Alternative 2, were evaluated to better understand the biological and aesthetic value of these trees and the impacts that would result from removal of existing trees under each build alternative, including the LPA. This evaluation informed impacts, as well as opportunities, for tree preservation reported in Sections 4.4 and 4.13.
- A 15-foot separation between existing trees to be preserved and new trees to be planted was assumed in determining the number of new trees that could be planted.

A more comprehensive list of potential replacement trees has been developed that takes into consideration the OCS clearance requirement of 5 feet between the OCS wires and all trees, and 5 feet between the top of the OCS wires and a tree canopy. These OCS setbacks require the bottom of a tree canopy to be a minimum of 23 feet from the ground or a tree of any height to have a tree canopy narrower than 11 feet. Thus, existing median trees that the project would not remove might nonetheless have to be removed because they could not survive the pruning that would be required to provide the needed OCS clearance. The OCS clearance also informs the list of potential replacement trees because replacement trees must be able to grow to maturity given the required pruning. Although the removal and replanting of trees provide urban design opportunities that support City planning goals, the preservation of trees is considered of greater value than the value of the aforementioned urban design opportunities. Existing trees are scenic resources; therefore, preservation of trees has been a design priority for each build alternative, including the LPA. The 2009 and 2012 tree surveys and evaluations have supported design efforts to reduce removal of existing trees under each build alternative, including the LPA. In conclusion, while the proposed project would result in the removal of a substantial number of existing trees, efforts were undertaken by the SFCTA, SFMTA and partnering agencies to avoid removal of tress best suited for preservation. The SFCTA, SFMTA, and SFDPW worked closely with Caltrans staff to obtain design exception approvals from Caltrans to allow a reduced tree planting setback and to provide narrower mixed traffic lane widths to increase the size of the median for trees deemed suitable for preservation.

No Build Alternative. No changes to the landscape and tree plantings are anticipated to occur under the No Build Alternative.

Build Alternatives and the LPA. A certified arborist evaluated each median tree on Van Ness Avenue within the project limits for tree health and condition, using a scale of 1 to 5, which is defined in Table 4.4-2 (BMS Design Group, 2013). Sidewalk trees that would be removed under Build Alternative 2 were also evaluated for health/condition. Only Build Alternative 2 would result in the removal of sidewalk trees, at locations adjacent to proposed BRT stations. The center-lane configured alternatives (Build Alternatives 3 and 4), including the

LPA (with or without the Vallejo Northbound Station Variant) would not affect existing sidewalk trees.

Table 4.4-3 shows a breakdown of existing median trees by health/condition that would be removed in each alternative, including the LPA. The Vallejo Northbound Station Variant would not affect tree removal or planting opportunities under the LPA. Mature trees of healthy condition 4 or 5 are considered to be of the greatest biological value and visual quality due to their health, height, and the mature canopies they provide. It would also require a longer period for replacement trees to grow to equivalent size as mitigation for their removal, and replacement trees would have a narrower canopy than many removed trees. Thus, removal of mature, healthy trees is considered of greater impact than removal of young trees or trees in fair or poor health. The project corridor has 28 median trees that are mature and of healthy condition 4 or 5, which represents 27 percent of trees in the corridor.

Table 4.4-2: Tree Health and Condition Rating Scale

RATING	TREE CONDITION/HEALTH
0	Tree is dead.
1	Tree in severe decline, dieback of scaffold branches and/or trunk; most of foliage from epicormics; extensive structural defects that cannot be abated.
2	Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
3	Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.
4	Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
5	A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.

Table 4.4-3: Removed Trees Summarized by Tree Health and Condition

BUILD ALTERNATIVE[1]	REMOVED TREES[2]			
	MATURE TREES CONDITION 4 OR 5	YOUNG TREES CONDITION 4 OR 5	TOTAL TREES CONDITION 4 OR 5	MATURE & YOUNG TREES CONDITION 1-3
Existing Conditions/ No Build Alternative	0	0	0	0
Alternative 2[3]	6	30	36	22
Alternative 3	28	50	78	24
Alternative 4	11	40	51	13
LPA[4]	23	44	67	23

[1] Implementation of Design Option B would not appreciably change the impacts to landscape and trees under Build Alternatives 3 and 4.

[2] No sidewalk trees would be impacted under Build Alternatives 3, 4, or the LPA.

[3] The existing conditions for Build Alternative 2 differ from those of the other build alternatives and LPA because affected sidewalk trees were evaluated.

[4] The LPA is a combination and refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B). Incorporation of the Vallejo Northbound Station Variant in the LPA design would not affect tree removal or planting opportunities under the LPA.

Source: Van Ness BRT Tree Removal Evaluation and Planting Opportunity Analysis performed by BMS Design Group (BMS Design Group, 2013).

Table 4.4-4 provides an overview of the anticipated number of trees that would be removed under each build alternative, including the LPA, and the number of replacement and infill trees that could be planted based on the spacing assumptions explained above.[76] The greatest number of existing trees would be preserved under Build Alternative 2, while it is assumed

[76] With different assumptions (closer spacing), more trees could be planted. This would be determined during final design, and a conservative scenario is evaluated in this analysis.

that no median trees would be preserved under Build Alternative 3. The total number of sidewalk and median trees that would be preserved under Build Alternative 4 and the LPA fall within the range of that for Build Alternatives 2 and 3. All build alternatives, including the LPA, would result in a substantial net gain of trees in the corridor when new planting opportunities are considered. Each build alternative, including the LPA, would result in new tree plantings at locations of removed sidewalk bus shelters, as feasible. In addition, under each build alternative, including the LPA, trees would be planted in areas of the median where trees do not currently exist, and where existing trees would require removal because they would not survive project construction. Increased sidewalk and median tree plantings over existing conditions would improve the visual setting, becoming more apparent over time as plantings mature, resulting in long-term, beneficial effects. At the same time, however, there would be a plant establishment period of several years for new trees to reach maturity. This would be a period of reduced benefits compared with the benefits offered by mature trees and their canopies. The trade-offs between increased plantings in the corridor and the loss of existing trees is discussed below for each build alternative, including the LPA.

Table 4.4-4: Summary of Anticipated Tree Removal and Planting Opportunities

TREES	EXISTING CONDITIONS/ NO BUILD ALTERNATIVE	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	LPA
Existing Median Trees	102	N/A	N/A	N/A	N/A
Existing Sidewalk Trees	314				
Removed Median Trees	0	20	102	64	90
Removed Sidewalk Trees	0	38	0	0	0
New Median Trees	0	103	163	113	95
New Sidewalk Trees	0	68	48	48	48
Total Trees	416	529	525	513	469

Note: The health and condition of the trees have been taken into account in this tree survey. Mature trees with canopies that would reach above the 5-foot OCS wire clearance were considered able to be preserved, as were trees with canopies that could be pruned to maintain clearance.

Source: Van Ness BRT Tree Removal Evaluation and Planting Opportunity Analysis (BMS Design Group, 2013).

Build Alternative 2. Minimal changes to existing median landscaping and trees in the Van Ness Avenue corridor would occur under Build Alternative 2. Build Alternative 2 would increase the median width at locations where existing left-turn pockets would be removed, which are indicated in Figure 2-2. This would increase the available median area for landscaping and tree planting, which would be a beneficial impact. A planter with trees and shrubs would be located along the sidewalk side of the BRT station platform to serve as a buffer between bus patrons and sidewalk pedestrians. As feasible, trees would be planted at the sites of removed sidewalk bus shelters, which would improve the visual setting at these locations. Again, Build Alternative 2 would require removal of sidewalk trees at locations adjacent to proposed BRT stations and median trees at locations where filling in left-turn pockets would significantly disturb the roots of those trees. Table 4.4-4 provides the anticipated number of trees that would be removed to accommodate Build Alternative 2, in addition to the number of new trees that would be planted. As indicated in Table 4.4-4, Build Alternative 2 is anticipated to result in the removal of 38 sidewalk trees and 20 median trees. At the same time, Build Alternative 2 is anticipated to increase the number of trees in the project corridor by 113 trees with new median tree plantings at locations where existing left-turn pockets are removed. Build Alternative 2 would not have to adhere to OCS clearance setbacks at the median in most locations;[77] therefore, a wider variety of median trees would be available to plant than under the center-lane configured alternatives.

Build Alternative 2 would result in the removal of approximately 6 trees that are mature and of healthy condition 4 or 5. Table 4.4-5 reports the tree removal and planting opportunity under Build Alternative 2 on those blocks featuring high-quality landscaped medians and mature tree canopies identified in Section 4.4.2.5, Table 4.4-1. Overall, Build Alternative 2 would preserve existing median landscaping and tree plantings on all these blocks and would not result in substantial impacts to the landscaping and tree features on the block (McAllister Street to Golden Gate Avenue) where impacts from tree and landscaping removal would be most noticeable. In fact, the infill of an additional 103 trees would provide a noticeable, positive change in the visual setting that would increase over time as tree plantings matured.

The median landscape design plan, including tree type and planting scheme for medians and curbside BRT stations, would require review and approval by the San Francisco Arts Commission, as well as review and approval by the SFDPW as part of their regulation of street excavations and trees. Furthermore, the Board of Supervisors would need to approve changes to sidewalk widths, which would require a determination by the City Planning Department of project consistency with the General Plan.

Table 4.4-5: Alternative 2 – Project Impact on High-Quality Landscaped Medians Featuring Mature Tree Canopies

VAN NESS AVENUE BLOCK	EXISTING TREES	TREE REMOVAL & PLANTING OPPORUNITY	NET TREE GAIN/LOSS
Hayes – Grove streets	2	All existing trees preserved.	0
Grove – McAllister streets	6	All trees preserved and 2 additional trees planted.	+2
McAllister Street – Golden Gate Avenue	6	3 out of 6 existing trees preserved and 6 additional trees planted.	+3
Turk – Eddy streets	4	All trees preserved and 1 additional tree planted.	+1
Ellis – O'Farrell streets	4	All trees preserved and 3 additional trees planted.	+3
Sutter – Bush streets	4	All trees preserved and 2 additional trees planted.	+2
Pine – California streets	4	All trees preserved and 1 additional tree planted.	+1
Sacramento – Clay streets	6	All existing trees preserved and no additional trees planted.	0
Pacific – Broadway streets	5	All existing trees preserved and 1 additional tree planted.	+1
Union – Filbert streets	6	All existing trees preserved and no additional trees planted.	0

Build Alternative 3. Build Alternative 3 would require removal and reconfiguration of existing medians to construct the dual-median, center-lane transitway. This would likely require removal of all existing median trees and landscaping.[78] The visual impact of this would be most noticeable along the blocks of Van Ness Avenue that feature high-quality landscaped medians with mature trees, and less noticeable on blocks that feature medians without

77 Some SFMTA routes and "deadhead" service currently use center-running OCS on certain blocks along Van Ness Avenue within the project study area.
78 It may be possible to preserve trees at certain locations in construction of Build Alternative 3; however, a worst-case scenario of removal of all existing trees, as depicted in the visual simulations, is considered for the purposes of visual analysis.

landscaping or mature trees. Table 4.4-6 reports the tree removal and planting opportunity under Build Alternative 3 on those blocks featuring high-quality landscaped medians and mature tree canopies identified in Section 4.4.2.5, Table 4.4-1.

Table 4.4-6: Alternative 3 – Project Impact on High-Quality Landscaped Medians Featuring Mature Tree Canopies

VAN NESS AVENUE BLOCK	EXISTING TREES	TREE REMOVAL & PLANTING OPPORUNITY	NET TREE GAIN/LOSS
Hayes – Grove streets	2	All trees removed and 6 trees planted.	+4
Grove – McAllister streets	6	All trees removed and 17 trees planted.	+11
McAllister Street – Golden Gate Avenue	6	All trees removed and 10 trees planted.	+4
Turk – Eddy streets	4	All trees removed and 10 trees planted.	+6
Ellis – O'Farrell streets	4	All trees removed and 10 trees planted.	+6
Sutter – Bush streets	4	All trees removed and 4 trees planted.	0
Pine – California streets	4	All trees removed and 10 trees planted.	+6
Sacramento – Clay streets	6	All trees removed and 4 trees planted.	–2
Pacific - Broadway streets	5	All trees removed and 10 trees planted.	+5
Union – Filbert streets	6	All trees removed and 3 additional trees planted.	–3

Note: Build Alternative 3 would likely require the removal of all median trees within the project limits. Thus, mature tree canopies and high-quality landscaping in medians would be removed. Replacement tree plantings and landscaping would be implemented on each of these blocks under Build Alternative 3, with and without Design Option B.

The dual median configuration under Build Alternative 3 includes 9-foot-wide and 4-foot-wide parallel medians. New trees would be planted along the 9-foot wide, right-side medians (as shown with palm trees in Figures 4.4-8 through 4.4-10); however, the 4-foot-wide, left-side median would not likely allow for tree planting, but it would allow for landscaping as depicted in Viewpoint 3, Union Street Simulation for Build Alternative 3. Removal of the existing median trees would noticeably degrade the visual environment of the corridor until replacement tree plantings mature. In addition, Build Alternative 3 would require replacement trees that are low growing or with a narrow canopy to avoid conflict with the OCS wires. Some example trees with narrow canopies could be palm trees as shown, or Italian Cypress, Skyrocket Juniper, Hillspire Juniper, and European Hornbeam. A narrower tree canopy would alter the character of the street blocks that currently feature median trees with wide canopies.

Table 4.4-4 provides the anticipated number of trees that would be removed to accommodate Build Alternative 3, in addition to the number of new trees that would be planted. As indicated in Table 4.4-4, Build Alternative 3 would require the removal of 102 median trees and, with replanting, is anticipated to increase the number of trees in the project corridor by 109 trees. The addition of these trees would be a substantial, visual benefit to the corridor once the trees reach maturity. Nonetheless, removal of the existing median trees would noticeably degrade the visual environment of the corridor until replacement plantings mature. Build Alternative 3 would result in the removal of approximately 28 trees that are mature and of healthy condition 4 or 5. Although a greater number of replacement trees would be planted, these would be trees with substantially narrower canopies than the existing trees, which would notably alter the visual character of Van Ness Avenue, especially on the blocks listed in Table 4.4-6. Compared with the other alternatives, Build Alternative 3 would offer the greatest opportunity to achieve urban design goals of a median with a consistent aesthetic; however, the loss of all existing trees would result in the greatest impact among the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant).

The adverse impact resulting from the removal of all existing median landscaping and trees would be reduced with the implementation of mitigation measures M-AE-3 and M-AE-4 of Section 4.4.4, in the form of a median landscape design plan that is consistent with median design policies in the Van Ness Area Plan, Civic Center Area Plan, and San Francisco Better Streets Plan. These City plans call for consistent rows of single-species median trees to provide a sense of identity and cohesiveness for the corridor. The Van Ness Area Plan also includes paving material and design requirements for medians, including a grey-colored decorative unit paver trim. The 9-foot-wide median configuration proposed under Build Alternative 3 would allow for such a landscape theme containing a consistent row of single-species trees, except on the blocks of Van Ness Avenue between O'Farrell and Geary streets, and Jackson and Pacific streets where the station platforms would extend the length of these blocks and allow for minimal to no landscaping. Currently, these blocks feature medians with minimal or no landscaping and young trees,[79] so the introduction of the station platform that would extend the length of these blocks (i.e., without trees and with minimal to no landscaping) would not substantially degrade the existing visual setting.

In addition, the consistent median configuration provided by Build Alternative 3 would provide a strong, central axis for visual continuity in the corridor, consistent with urban design policies summarized in Section 4.4.1. The median landscape design plan, including tree type[80] and planting scheme for medians and BRT stations, would require review and approval by the San Francisco Arts Commission, as well as review and approval by the SFDPW as part of their regulation of street excavations and trees. The median landscape design plan within the Civic Center Historic District must be reviewed and approved by the San Francisco HPC. The City Hall Preservation Advisory Commission would have the opportunity to review the median landscape design plan within the Civic Center Historic District to advise the HPC on their approval action. A Certificate of Appropriateness must be obtained from the HPC for the project landscape plan within the Civic Center Historic District. Incorporation of a median design plan described in mitigation measures M-AE-3 and M-AE-4 of Section 4.4.4, that conforms to the aforementioned policies, would be vetted through this approval process to ensure a high-quality design and mitigation of adverse impacts resulting from the loss of existing trees and landscaping.

Build Alternative 4. Build Alternative 4 would require some reconfiguration of existing medians to construct the single-median, center-lane transitway. Reconfiguration of the median would require removal of some existing trees and landscaping, namely at proposed station locations. This impact would be most noticeable along the blocks of Van Ness Avenue that feature high-quality landscaped medians with mature trees, identified in Section 4.4.2.5, Table 4.4-1. Table 4.4-7 reports the tree removal and planting opportunity under Build Alternative 4 on those blocks featuring high-quality landscaped medians and mature tree canopies. A BRT station would be located on 5 of these 10 street blocks (Grove to McAllister streets, Turk to Eddy streets, Sutter to Bush streets, Sacramento to Clay streets, and Union to Filbert streets), which would require approximately 150 feet of the existing median (i.e., approximately half the block) to be converted to a BRT station platform. Trees and landscaping along the other half of the block would be preserved, although some trees would need to be pruned to provide clearance for the replacement OCS. Overall, Build Alternative 4 would preserve half the trees on 6 of the 10 blocks, preserve all trees on 2 blocks, and would remove all trees on 1 block.

Build Alternative 2 is anticipated to increase the number of trees in the project corridor by 33 trees.

[79] Except for one mature tree located on a half-block-long section of median between Jackson and Pacific streets.
[80] Selection of median tree type would consider tree canopy size and maintenance requirements to ensure a 5-foot clear zone between tree canopies and OCS wires.

Table 4.4-7: Alternative 4 – Project Impact on High-Quality Landscaped Medians Featuring Mature Tree Canopies

VAN NESS AVENUE BLOCK	EXISTING TREES	TREE REMOVAL & PLANTING OPPORUNITY	NET TREE GAIN/LOSS
Hayes – Grove streets	2	Removal of existing trees and no new tree plantings.	–2
Grove – McAllister streets	6	4 out of 6 trees preserved and 6 trees planted.	+4
McAllister Street – Golden Gate Avenue	6	3 out of 6 trees preserved and 6 trees planted.	+3
Turk – Eddy streets	4	1 out of 4 trees preserved and 1 tree planted.	-2
Ellis – O'Farrell streets	4	All trees preserved and 3 trees planted.	+3
Sutter – Bush streets	4	2 out of 4 trees preserved and 1 tree planted.	–1
Pine – California streets	4	All trees preserved and 2 trees planted.	+2
Sacramento – Clay streets	6	2 of out 6 trees preserved and no new tree plantings.	–4
Pacific – Broadway streets	5	4 out of 5 trees preserved and 1 tree planted.	0
Union – Filbert streets	6	2 out of 6 trees preserved and no new tree plantings.	–4

Table 4.4-4 provides the anticipated number of trees that would be removed to accommodate Build Alternative 4, in addition to the number of new trees that would be planted. As indicated in Table 4.4-4, Build Alternative 4 would result in the removal of 64 median trees, or approximately 63 percent of median trees in the project corridor. Eleven (11) of the 64 trees are mature and of healthy condition 4 or 5, which represents removal of approximately 39 percent of existing healthy and mature trees in the corridor. This would result in a notable, adverse change in the visual quality of the project corridor until new tree plantings mature.

Build Alternative 4 is anticipated to increase the number of trees in the project corridor by 97 trees.

Build Alternative 4 is anticipated to increase the number of trees in the project corridor by 97 trees with replanting. The addition of these trees would be a substantial, visual benefit to the corridor once the trees reach maturity. Although some existing trees would be removed, incorporation of a median design plan described above for Build Alternative 3 would mitigate impacts resulting from the loss of these trees and landscaping. The design goal in City Planning documents is to provide consistent rows of single-species median trees that would be balanced with the goal of preserving existing trees; thus, new tree plantings would be in-filled around preserved trees. The 14-foot-wide median configuration proposed under Build Alternative 4 would allow for such a landscape theme containing a consistent row of single-species trees, except for the blocks of Van Ness Avenue between O'Farrell and Geary streets, and Jackson and Pacific streets where the station platforms would extend the length of these blocks. Currently, these blocks feature medians with minimal or no landscaping and young trees,[81] so the introduction of the 4-foot-wide landscaped median on these blocks, even without trees, would not substantially degrade the existing visual setting. Build Alternative 4 would increase the width and available landscape area of the median throughout Van Ness Avenue, which would result in beneficial impacts to the visual setting of the project corridor. The larger and consistently provided median would strengthen the visual connectivity and identity of the Van Ness Avenue corridor, consistent with urban design policies; therefore, impacts resulting from the removal of some existing median

[81] Except for one mature tree located on a half-block long section of median between Jackson and Pacific streets.

landscape and trees under Build Alternative 4 would be mitigated with incorporation of a median design plan described for Build Alternative 3 above, as well as mitigation measures M-AE-3 and M-AE-4 in Section 4.4.4.

Implementation of Center-Lane Alternative Design Option B would involve removal of the existing left-turn pockets, which may allow slightly wider medians and slightly greater landscaped area at these locations; therefore, implementation of Center-Lane Alternative Design Option B would not appreciably change the impacts to landscape and trees under Build Alternatives 3 and 4.

Implementation of Center-Lane Alternative Design Option B would not appreciably change the impacts to landscape and trees under Build Alternatives 3 and 4.

LPA. The LPA, as a refinement of Build Alternatives 3 and 4 with Design Option B, would require some reconfiguration of existing medians to construct the single-median, center-lane transitway on blocks without a station and would require nearly complete reconstruction of existing medians on blocks with a station that feature a dual median. Thus, tree removal and planting opportunities for the LPA (with or without the Vallejo Northbound Station Variant) fall within what is described above for Build Alternatives 3 and 4. As under Build Alternative 4, the greatest number of existing trees to be removed under the LPA would be required at station locations. In addition, the LPA would require reconstruction of additional areas north and south of stations to accommodate the transition between dual and single medians at station locations. Thus, the LPA would result in the removal of more trees than Build Alternative 4. As under Build Alternative 4, reconstruction of the existing median to accommodate BRT stations would be most noticeable along the blocks of Van Ness Avenue that feature high-quality landscaped medians with mature trees, as identified in Section 4.4.2.5, Table 4.4-1. Overall, the LPA would preserve all trees on 1 out of the 10 blocks and would remove all trees on 4 blocks. One or more trees would be preserved on the remaining 5 blocks. Table 4.4-8 reports the tree removal and planting opportunity under the LPA on those blocks featuring high-quality landscaped medians and mature tree canopies.

Table 4.4-8: LPA – Project Impact on High-Quality Landscaped Medians Featuring Mature Tree Canopies

VAN NESS AVENUE BLOCK	EXISTING TREES	TREE REMOVAL & PLANTING OPPORUNITY	NET TREE GAIN/LOSS
Hayes – Grove streets	2	All trees preserved and 7 trees planted.	+5
Grove – McAllister streets	6	2 out of 6 trees preserved and 6 trees planted.	+2
McAllister Street – Golden Gate Avenue	6	No existing trees preserved and no trees planted.	–6
Turk – Eddy streets	4	No existing trees preserved and no trees planted.	–4
Ellis – O'Farrell streets	4	2 out of 4 existing trees preserved and 4 trees planted.	+2
Sutter – Bush streets	4	No existing trees preserved and no trees planted.	–4
Pine – California streets	4	1 out of 4 trees preserved and 3 trees planted.	0
Sacramento – Clay streets	6	No trees preserved and no trees planted.	–6
Pacific – Broadway streets	5	No trees preserved and 2 trees planted.	–3
Union – Filbert streets	6	No trees preserved and 1 tree planted.	–5

A BRT station would be located on 6 of these 10 street blocks (Grove to McAllister streets, McAllister to Golden Gate streets, Turk to Eddy streets, Sutter to Bush streets, Sacramento to Clay streets, and Union to Filbert streets), which would require approximately 150 feet of the existing median (i.e., approximately half the block) to be converted to a BRT station platform. Trees and landscaping along the other half of the block would be preserved,

KEY FINDING

There would be no change or adverse impact to Significant Buildings and architecture under the build alternatives, including the LPA; however, the proposed BRT stations would alter the visual setting and views of some of these buildings as experienced by motorists, cyclists, and pedestrians traveling on Van Ness Avenue.

although some trees would have to be pruned to provide clearance for the replacement OCS. In addition, the station platforms would extend the length of the block between O'Farrell and Geary streets, preventing tree planting on this block.

The LPA would require the removal of 90 median trees and is anticipated to increase the number of trees in the project corridor by 53 trees with replanting, as shown in Table 4.4-4. The LPA would result in the removal of approximately 23 trees that are mature and of healthy condition 4 or 5, which is approximately 82 percent of existing healthy and mature median trees in the corridor. This would result in a notable, adverse change in the visual quality of the project corridor until new tree plantings mature.

Impacts resulting from the removal of some existing median landscape and trees under the LPA would be reduced with incorporation of a median design plan described for Build Alternative 3 above, as well as mitigation measures M-AE-3 and M-AE-4 in Section 4.4.4.

Significant Buildings and Architecture

As explained in Section 4.4.2.4, there are several buildings located along Van Ness Avenue in the project corridor that are identified by the City as Significant Buildings and Contributory Buildings for their contribution to the architectural environment of Van Ness Avenue. Most of these exhibit historic period architecture, and they are targeted for preservation and identified as warranting special consideration in planning. Similarly, many of these buildings and others hold historic status with the NRHP, CRHR, and as City Landmarks. These special-status buildings require special consideration in planning.

No Build Alternative. There would be no change or adverse impact to significant buildings and architecture under the No Build Alternative.

Build Alternatives. There would be no change or adverse impact to Significant Buildings and architecture under the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant); however, the proposed BRT stations would alter the visual setting and views of some of these buildings as experienced by motorists, cyclists, and pedestrians traveling on Van Ness Avenue. At eight locations, a BRT station is proposed in the roadway across from a City-designated Significant Building, City Landmark, or building that is listed or determined eligible for listing in the NRHP and CRHR. These buildings are identified as being contributors to the character of the Van Ness Avenue corridor. Table 4.4-9 lists the thirteen locations where a BRT station is proposed across from a special-status building under the build alternatives.

Under the LPA, BRT stations are proposed adjacent to buildings identified as a City-designated Significant Building, City Landmark, or building that is listed or determined eligible for listing in the NRHP and CRHR at twelve locations, indicated in Table 4.4-9. No such properties are located on the block of Van Ness Avenue between Vallejo and Green streets where the Vallejo Northbound Station Variant is under consideration for inclusion in the LPA design.

Figure 4.4-12 displays the locations and photos of each of the special-status buildings.

Table 4.4-9: Proposed BRT Station Locations and Special-Status Properties

PROPERTY	SPECIAL STATUS	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	LPA
11-35 Van Ness Avenue (Masonic Temple)	• Eligible for NRHP listing; • Eligible for CRHR listing; • San Francisco Significant Building	SB, curbside Market Street Station	SB and NB center lane Market Street Stations	SB and NB center lane Market Street Station	SB center lane Market Street Station
City Hall (Civic Center)	• Civic Center Historic District National Historic Landmark; • NRHP listed; • CRHR listed; • San Francisco City Landmark	NB, curbside McAllister Street Station	SB and NB center lane McAllister Street Stations	SB and NB center lane McAllister Street Station	NB center lane McAllister Street Station
War Memorial Building & Performing Arts Complex (Civic Center)	• Civic Center Historic District National Historic Landmark; • NRHP listed; • CRHR listed; • San Francisco City Landmark	SB, curbside McAllister Street Station			
799 Van Ness Avenue (Wallace Estate Co. Garage)	• Eligible for NRHP listing; • Eligible for CRHR listing; • San Francisco Significant Building	SB, curbside Eddy Street Station	SB center lane Eddy Street Station	SB and NB center lane Eddy Street Station	NB center lane Eddy Street Station
1000 Van Ness Avenue (Don Lee Building)	• San Francisco Significant Building	N/A – No station proposed in front of this property	SB and NB center lane Geary/O'Farrell Street Stations, which extend the entire length of block	SB and NB center lane Geary/O'Farrell Street Stations, which extend the entire length of block. (Alternative 3 configuration)	SB and NB center lane Geary/O'Farrell Street Stations, which extend the entire length of block.

The inclusion of small wind turbines, such as this one displayed in 2010 in Civic Center, would also be considered for appropriateness, because this tall, modern feature may detract from the adjacent historic period buildings.

Table 4.4-9: Proposed BRT Station Locations and Special-Status Properties

PROPERTY	SPECIAL STATUS	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	LPA
1050 Van Ness Avenue (Grosvenor Inn/Opal Hotel)	• San Francisco Significant Building	NB, curbside Geary/O'Farrell Street Station	SB and NB center lane Geary/O'Farrell Street Stations, which extend the entire length of block	SB and NB center lane Geary/O'Farrell Street Stations, which extend the entire length of block. (Alternative 3 configuration)	SB and NB center lane Geary/ O'Farrell Street Stations, which extend the entire length of block.
1300 Van Ness Avenue (Regency Ballroom)	• San Francisco Significant Building	NB, curbside Sutter Street Station	NB center lane Sutter Street Station	SB and NB center lane Sutter Street Station	SB center lane Sutter Street Station
1301 Van Ness Avenue (Commercial Showroom)	• San Francisco Significant Building	N/A – No station proposed in front of this property	NB center lane Sutter Street Station	SB and NB center lane Sutter Street Station	SB center lane Sutter Street Station
1320 Van Ness Avenue (Scottish Rite Temple)	• Eligible for NRHP listing	NB, curbside Sutter Street Station	NB center lane Sutter Street Station	NB center lane Sutter Street Station	SB center lane Sutter Street Station
1699 Van Ness Avenue (Paige Motor Car Co. Building)	• NRHP listed; • CRHR listed; • San Francisco Significant Building	SB, curbside Sacramento Street Station	SB, curbside Sacramento Street Station	SB and NB center lane Sacramento Street Station	N/A – No station proposed in front of this property
1725, 1735, 1745 Van Ness Avenue (Gothic apartments)	• San Francisco Significant Building	N/A – No station proposed in front of this property	NB center lane Sacramento Street Station	NB center lane Sacramento Street Station	SB center lane Sacramento Street Station
2000 Van Ness Avenue (Medical Arts Building)	• San Francisco Significant Building	N/A – No station proposed in front of this property	NB center lane Jackson Street Station	SB and NB center lane Jackson Street Station	SB center lane Jackson Street Station
2517 Van Ness Avenue (house/ Beauty School)	• San Francisco Significant Building	SB, curbside Union Street Station	N/A – No station proposed in front of this property	SB and NB center lane Union Street Station	SB center lane Union Street Station

Figure 4.4-12: Special Status Buildings Located Adjacent to Proposed BRT Stations

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While the BRT stations and transitway proposed under the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), are features compatible with the Van Ness Avenue corridor, the station canopy, wind turbines, and other features would partially obstruct ground-level views of adjacent Significant Buildings and would introduce modern features that could detract from the visual setting of these buildings. Because the Van Ness Area Plan calls for Significant Buildings to serve as a basis for the theme and scale of adjacent development, architectural integration of BRT stations with adjacent Significant Buildings would be considered. Modifications of the BRT station design themes through station canopy placement, materials, color, lighting, and texture would be considered to harmonize the BRT stations with the adjacent Significant Buildings as part of the project design. Architectural integration of BRT stations with adjacent Significant Buildings is described in mitigation measure M-AE-5 and M-AE-6 in Section 4.4.4, Civic Center Historic District

No Build Alternative. Under the No Build Alternative, there would be no change or adverse impact to special-status buildings of the Civic Center Historic District. Although to date no OCS support poles/streetlights have been replaced within the historic district, modern poles have been added to the network to help carry the OCS load. The current practice of inserting modern, nondescript poles into the OCS support pole/streetlight network on an as-needed basis would eventually degrade the character of the pole/streetlight network, or the existing OCS support pole/streetlight network would deteriorate to a level that requires comprehensive replacement. It is likely that per Article 10 of the Planning Code that the City would replace the network within the historic district with decorative poles that harmonize with the civic setting to avoid visual impacts within the Civic Center Historic District.

Build Alternatives. As discussed above in Section 4.4.3.4 under the Significant Buildings and Architecture, mitigation measures M-AE-5 and M-AE-6 are required to minimize potential impacts to the visual setting of special-status buildings, including City Hall and the War Memorial and Performing Arts Center. Context-sensitive design of BRT station features would be considered, including modifications of the BRT station design themes through station canopy placement, materials, color, lighting, and texture. With oversight from the San Francisco HPC and City Hall Preservation Advisory Commission, station design would be considered to harmonize the BRT stations with the adjacent City Hall and the War Memorial and Performing Arts Center. The inclusion of wind turbines, as currently envisioned, would also be considered for appropriateness, because this tall, modern feature may detract from the adjacent historic period buildings. The proposed landscaping, BRT stations, and replacement OCS support pole/streetlight network would be reviewed for consistency with the existing and proposed streetscape and lighting design themes in the Civic Center as noted in mitigation measures M-AE-2 through M-AE-5 in Section 4.4.4.

KEY FINDINGS

The simulations presented in Figure 4.4-8 demonstrate that the character of the Civic Center Historic District would not be significantly changed by any of the proposed build alternatives.

While the proposed changes associated with the build alternatives, including the LPA, would result in a slight alteration in the visual setting of Van Ness Avenue, they would not constitute a substantial change or adverse effect to the feeling or atmosphere in the Civic Center Historic District.

The simulations presented in Figures 4.4-8 and 4.4-11 demonstrate that the character of the Civic Center Historic District would not be significantly changed by any of the build alternatives, including the LPA.[82] Build Alternative 3 and the LPA would create the greatest visual change due largely to the removal of existing trees and landscaping. The simulation for Build Alternative 3 shows palm trees, which have a notably different appearance than the existing median trees, as the replacement median tree type. In addition, the presence of two side-by-side stations at this location under Build Alternative 3 and the LPA carries a more dominant visual presence than the more common single station per block configuration.[83] Considering these changes in the visual environment, they are compatible with the existing eclectic streetscape features and contemporary character of the Van Ness Avenue corridor, and they would not change the character of the larger Civic Center. Given the size and scale of City Hall and the War Memorial and Performing Arts Center, the proposed BRT station

[82] The Vallejo Northbound Station Variant is located on the block of Van Ness Avenue between Vallejo to Green streets, which is outside the Civic Center Historic District.

[83] Two side-by-side station platforms are proposed at the Market Street, McAllister Street, Geary/O'Farrell Street, and Jackson Street stations under Build Alternative 3; and at the Geary/O'Farrell Street station under Build Alternative 4 and the LPA.

would be largely inconsequential to the overall monumental size of these civic structures and their respective prominent architectural features.

As shown in the visual simulations (Figures 4.4-8 and 4.4-11), the replacement OCS support pole/streetlight network would be an architectural design compatible with the Civic Center Historic District, and the taller OCS support pole/streetlight network would not be out of scale or character with the setting of the Civic Center. The proposed replacement OCS support pole/streetlight network would achieve the same daytime and nighttime visual continuity throughout the corridor as the existing network provides; therefore, while the proposed changes associated with the build alternatives, including the LPA, would result in a slight alteration in the visual setting of Van Ness Avenue, they would not constitute a substantial change or adverse effect to the feeling or atmosphere in the Civic Center Historic District.

4.4.3.5 | VISUAL CHARACTER

No Build Alternative

No substantial changes to the character of the Van Ness Avenue corridor would occur under the No Build Alternative. With the exception of continued spot replacement of OCS support poles/streetlights and upgrade of traffic signal poles to mast arm poles, no other physical structures would be installed under the No Build Alternative. The mast arm traffic signals do not seem out of place, and they remain in character with the existing Van Ness Avenue corridor. Visual changes resulting from spot replacement of OCS support poles/ streetlights and associated mitigation are discussed in Section 4.4.3.4. No substantial changes or adverse impacts to the character of the project corridor would occur under the No Build Alternative.

Build Alternatives

KEY FINDINGS

The build alternatives would not substantially impact the visual character of the Van Ness Avenue corridor because the proposed BRT features are consistent with the urban, contemporary visual setting.

The removal of existing median trees would degrade the visual environment only until replacement plantings matured.

The project would improve the pedestrian environment by improving sidewalk lighting, installing curb bulbs, and generally widening the median to reduce crossing distances, making Van Ness Avenue an attractive space for pedestrian use.

The build alternatives, including the LPA, would alter the visual setting with the introduction of BRT features and the replacement OCS support pole/streetlight network as discussed above; however, these changes would not substantially change or impact the character of the Van Ness Avenue corridor because the proposed BRT features are consistent with the urban, contemporary visual setting of Van Ness Avenue, and the introduced features would not substantially degrade the surrounding visual environment for any viewer group. The removal of existing median trees under Build Alternatives 3 and 4 and the LPA would noticeably degrade the visual environment of the corridor. Although Build Alternative 3 would offer the greatest opportunity to achieve urban design goals of a median with a consistent aesthetic with all new tree plantings and landscape, the loss of all existing trees would result in the greatest impact among the build alternatives, including the LPA. This would result in a notable, adverse change in the visual quality of the project corridor until new tree plantings mature. Impacts resulting from the removal of existing median landscape and trees under each build alternative, including the LPA, would be reduced with incorporation of a median design plan described in mitigation measures M-AE-3 and M-AE-4 in Section 4.4.4. Increased sidewalk and median tree plantings over existing conditions would improve the visual setting, as plantings mature, resulting in long-term, beneficial effects.

The proposed project would improve the feel of the Van Ness Avenue corridor with regard to the pedestrian environment by improving sidewalk lighting, installing curb bulbs, and generally widening the median to reduce crossing distances at intersections. The proposed transit and streetscape improvements would support recommendations in the Van Ness Corridor Initial Land Use and Urban Design Needs Assessment to make Van Ness Avenue an attractive space for pedestrian use and would support City policies to promote Van Ness Avenue as a prominent boulevard.

4.4.4 Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and mitigation measures are recommended to address the potential adverse visual impacts to the Van Ness Avenue corridor that could result from implementation of the proposed project. With implementation of the following mitigation measures, the visual impacts of this project under any build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), would be reduced and would not result in a substantial change in overall visual quality for the area:

M-AE-1: Design sidewalk lighting to minimize glare and nighttime light intrusion on adjacent residential properties and other properties that would be sensitive to increased sidewalk lighting.

M-AE-2: Design and install a replacement OCS support pole/streetlight network that (1) retains the aesthetic function of the existing network as a consistent infrastructural element along Van Ness Avenue, (2) assures a uniform architectural style, character and color throughout the corridor that is compatible with the existing visual setting and (3) retains the architectural style of the original OCS support pole/streetlight network. Within the Civic Center Historic District, design the OCS support pole/streetlight network to comply with the Secretary of Interior's Standards for the Treatment of Historic Properties and be compatible with the character of the historic district as described in the Civic Center Historic District designating ordinance as called for by the San Francisco Planning Code.

M-AE-3: To the extent that the project alters sidewalk and median landscaping, design and implement a project landscape design plan, including tree type and planting scheme for median BRT stations and sidewalk plantings that replaces removed landscaping and re-establishes high-quality landscaped medians and a tree-lined corridor. To the extent feasible, use single species street trees and overall design that provides a sense of identity and cohesiveness for the corridor. Place new trees close to corners, if feasible, for visibility. The project landscape design plan will require review and approval by the San Francisco Arts Commission, as well as review and approval by the SFDPW as part of their permitting of work in the street ROW, which ensures consistency with the San Francisco Better Streets Plan. The median landscape design plan within the Civic Center Historic District will be reviewed by the San Francisco HPC and the City Hall Preservation Advisory Commission. A Certificate of Appropriateness must be obtained from the HPC for the landscape plans within the Civic Center Historic District.

M-AE-4: Design and install landscaped medians so that median design promotes a unified, visual concept for the Van Ness Avenue corridor consistent with policies in the Van Ness Area Plan, Civic Center Area Plan, and San Francisco Better Streets Plan. This design goal for a unified, visual concept will be balanced with the goal of preserving existing trees; thus, new tree plantings would be in-filled around preserved trees.

M-AE-5: Design and install a project BRT station and transitway design plan (including station canopies, wind turbines, and other features) that is consistent with applicable City design policies in the San Francisco General Plan and San Francisco Better Streets Plan; and for project features located in the Civic Center Historic District, apply the Secretary of Interior's Standards for the Treatment of Historic Properties, Planning Code Article 10, Appendix J pertaining to the Civic Center Historic District, and other applicable guidelines, local interpretations and bulletins concerning historic resources.

Review and approval processes supporting this measure include: (1) The San Francisco Art Commission approval of the station and transitway design plan as part of its review of public structures; (2) The SFDPW approval of the station and transitway design plan as part of its permitting of work in the street ROW, which it will include review for consistency with the San Francisco Better Streets Plan; (3) the HPC approval of the portion of the station and transitway design plan located within the Civic Center Historic District as part of granting a Certificate of Appropriateness; and (4) the City Hall Preservation Advisory Commission and City Planning Department advise on design to HPC.

M-AE-6: Context-sensitive design of BRT station features will be balanced with the project objective to provide a branded, cohesive identity for the proposed BRT service. The following design objectives that support planning policies described in Section 4.4.1 will be incorporated in the BRT station design and landscaping plans:

- Architectural integration of BRT stations with adjacent Significant and Contributory Buildings through station canopy placement, materials, color, lighting, and texture, as well as the presence of modern solar paneling and wind turbine features to harmonize project features with adjacent Significant and Contributory Buildings.
- Integration of BRT stations and landscaping with existing and proposed streetscape design themes within the Civic Center Historic District, in conformance with the Secretary of Interior's Standards for the Treatment of Historic Properties and compatible with the character of the historic district as described in the Civic Center Historic District designating ordinance as called for by the San Francisco Planning Code.
- Marking the intersection of Van Ness Avenue and Market Street as a visual landmark and gateway to the city in design of the Market Street BRT station.

4.5 Cultural Resources

The information in this section is largely derived from the Van Ness Avenue BRT *Historic Property Survey* (HPS) (Parsons, 2010a), which incorporates the following documents: an *Archaeological and Native American Cultural Resources Sensitivity Assessment*, prepared by Far Western Anthropological Research Group, Inc. (Byrd, *et al.,* 2013) a *Historic Resources Inventory and Evaluation Report* (HRIER), prepared by JRP Historic Consulting (Bunse and Allen, 2009), and the Finding of Effect prepared by Parsons (Parsons, 2013c). These documents are on file with SFCTA.

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The same APE for the build alternatives applies to the LPA, with or without the Vallejo Northbound Station Variant. The LPA configuration of BRT stations is a variation of the configurations analyzed for the center-running alternatives in the Draft EIS/EIR. Those differences are noted in this chapter and are discussed in detail in Chapter 10; however, the overall impact findings with the LPA, with or without the Vallejo Northbound Station Variant, are consistent with the findings for Build Alternatives 3 and 4, as presented in this subsection.

4.5.1 | Regulatory Setting

Just as the NHPA works to recognize and protect historical properties, at the state level historical resources are considered under CEQA, as well as California Public Resources Code.

Cultural resources encompass archaeological, historic, architectural, and traditional properties. An overview of the federal, state, and local regulations and policies relevant to cultural resources follows.

The National Historic Preservation Act of 1966 (NHPA), as amended, established the Advisory Council on Historic Preservation (ACHP) and set forth national policies and procedures regarding historic properties, defined as any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in the National Register of Historic Places (National Register or NRHP). Section 106 of the Act requires federal agencies to take into account the effects of their actions on historic properties. The goal of Section 106, as outlined in the regulations promulgated by the ACHP at Title 36 CFR Part 800, is to identify historic properties that could be affected by a project, assess the project's potential effects to such properties, and seek ways to avoid, minimize, or mitigate any adverse effects to historic properties.

Just as a federal law works to recognize and protect historical properties, at the state level historical resources are considered under CEQA, as well as California Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources (California Register or CRHR). The evaluation criteria of the CRHR closely mirror those of the NRHP. The CRHR also encompasses properties listed in or eligible for listing in the NRHP, as well as California Historical Landmarks numbered 770 or higher. The CRHR also includes locally designated city or county landmarks under a local preservation ordinance when the designation criteria are consistent with California Register criteria.

The City and County of San Francisco maintain a comprehensive list of its locally designated individual city landmarks and historic districts.[84] The boundaries of San Francisco's locally designated historic districts do not necessarily correspond with NRHP and CRHR historic

[84] Landmarks can be buildings, sites, or landscape features. Districts are defined generally as an area of multiple historic resources that are contextually united. A list of individual landmarks and descriptions of each historic district can be found in Article 10 of the Municipal Planning Code. There are 11 historic districts in San Francisco: Jackson Square, Webster Street, Northeast Waterfront, Alamo Square, Liberty-Hill, Telegraph Hill, Blackstone Court, South End, Civic Center, Bush Street-Cottage Row, and Dogpatch.

district boundaries because somewhat different standards and guidelines are used in their nomination submittal, and it holds true for the Civic Center Historic District. As a result, an important distinction often has to be made between the federal and state-designated cultural resources and historic preservation regulations and those of local governments such as San Francisco. The San Francisco Historic Preservation Commission makes recommendations to the Board of Supervisors on the designation of landmark buildings, historic districts, and significant buildings, as well as any construction, alteration, or demolition that would affect listed sites and resources.

Federal regulations require integration of the environmental review process with related federal and state cultural resources and other environmental laws. This section of the EIS/EIR satisfies the requirements for NEPA, as amended (42 United States Code [U.S.C.] 4321-43470); CEQA, as amended (PRC Section 21000 *et seq.*), and its implementing regulations (CCR 14 Section 15000 *et seq.*); and Section 106 of the NHPA (36 CFR 800).

The first step in complying with these various laws is the identification of cultural resources and evaluation of their significance based on the criteria of the above legislation and their guidelines (see Section 4.5.4.1). In large part, the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (46 FR 44716.44740) provide the relevant standards by which these identification and evaluation activities are carried out by professionals possessing qualifications in their respective disciplines.

4.5.2 | Archaeological Resources

4.5.2.1 | AFFECTED ENVIRONMENT

Archaeological APE

DEFINITION

AREA OF POTENTIAL EFFECTS (APE): Generally defined as the maximum geographic area or areas both horizontally and vertically within which a proposed project may cause changes in the character or use of historic properties.

The archaeological evaluation begins with the delineation of the Area of Potential Effects (APE). The APE is generally defined as the maximum geographic area or areas both horizontally and vertically within which a proposed project (referred to as an "undertaking" in Section 106 regulations) may cause changes in the character or use of historic properties, should any such properties be present. The California SHPO reviewed and concurred with the adequacy of the APE delineated for the project alternatives on May 10, 2010 (see Appendix D for the APE exhibit maps and Appendix C for the SHPO concurrence letter).

The archaeological APE boundary includes areas of the proposed project that would include reconfiguration and reconstruction of the existing pavement structural section, curb bulb and other sidewalk improvements, station platform improvements, potential relocation of disabled person parking areas and associated curb ramps, replacement of the existing OCS support poles/streetlights and associated trenching, potential utility relocations, and onsite construction staging areas. The archaeological APE nominally follows the back of sidewalk (i.e., ROW line) on Van Ness Avenue throughout the project limits, but it extends an additional 50 feet on certain cross streets where a potential need to provide replacement disabled person parking has been identified. Approximate areas and depths of anticipated construction activities requiring earthwork are provided in Table 4.5-1. As shown, traffic signal poles would require the deepest excavation, up to 16 feet below ground surface (bgs) in an approximate 3-foot-diameter area. Additional deep excavations would include removal and replacement of the existing OCS support poles/streetlights and relocation of a sewer pipeline running under the street for the center-running alternative alignments and/or station platform locations (see Table 4.5-1). Remaining earthwork would occur within 5.5 feet bgs.

Table 4.5-1: Anticipated Construction Areas and Excavation Depths

CONSTRUCTION ITEM	AREA	DEPTH (FT)
OCS Support Pole Replacement	3-foot-diameter excavation area, within sidewalk; located throughout project limits.	11.0
OCS Conduit Trench	2-foot-wide trench, within sidewalk; located throughout project limits.	3.0
Sewer Pipeline Relocation	6-foot-wide trench, within street; replace or relocate portion underneath BRT lanes under Build Alternative 3; replace or relocate portion underneath platform areas proposed under Build Alternative 4.	11.5
Traffic Signal Poles	3-foot-diameter excavation area, located at intersections throughout project limits.	16.0
Controller Cabinets	2.5-foot by 4-foot excavation area, located within the sidewalk at intersections throughout project limits.	3.0
Curb Bulbs and Sidewalk Reconstruction	Approximately 30 feet of full-width sidewalk disturbance area, located at intersections throughout project limits (varies by project alternative).	1.5
Pavement Rehabilitation	Curb-to-curb rehabilitation or resurfacing under each project alternative.	0.7
Pavement Reconstruction	Spot improvements as needed to travel lanes and parking lanes to remedy failed pavement areas.	1.5
New Pavement	22-foot-wide area within median throughout project limits, under Build Alternative 3.	1.5
Station Platform	6-foot- to 14-foot-wide by 150-foot-long area at platforms, platform locations vary by project alternative.	1.0
Station Canopy Foundation	2.5-foot-diameter excavation area at platforms, platform locations vary by project alternative.	5.0

Known Archaeological Resources In or Adjacent to the APE

The *Archaeological and Native American Cultural Resources Sensitivity Assessment* (Byrd, *et al.*, 2013) provides a summary of archaeological research in the APE; a discussion of the prehistoric and historical archaeological resources background of the study area; a description and listing of all known prehistoric and historical resources within a 0.25-mile radius of the APE; identification of anticipated property types that may be present within the study area; and a discussion of expected prehistoric and historical archaeological resources in the APE. Several methods were used to collect and analyze this information. To identify known prehistoric and historical resources included within the California Historical Resources Information System (CHRIS), a records search was conducted with the Northwest Information Center, located at Sonoma State University, on January 15, 2009, with follow-up contacts made on April 3 and May 7, 2009. The records search provided the mapped locations and descriptions of all recorded archaeological sites, as well as reports describing past archaeological research in the study area. The Office of Major Environmental Analysis in the City of San Francisco Planning Department was consulted in March 2009, and their list of project reports was examined. On November 24, 2008, the California Native American Heritage Commission (NAHC) responded to a request that they conduct a search of their Sacred Lands file for known cultural sites within or near the APE, indicating their records showed none. No areas of Native American concern were identified by those individuals on the contact list of Native Americans provided by the NAHC.

The California Native American Heritage Commission (NAHC) Sacred Lands file shows no cultural sites within or near the APE. No areas of Native American concern were identified by those individuals on the contact list of Native Americans provided by the NAHC.

Fifteen (15) previously recorded cultural resources have been identified within the area covered by the records search. Eight of these resources are located outside of the project APE. The seven remaining resources either abut or fall directly within the Van Ness Avenue BRT APE. They all date to the historic-era and include the Fort Mason Bateria (gun battery) National Register District; a trash scatter (900 Van Ness Avenue); and three historic features (two railway line remnants and an artifact feature), two isolated artifacts (a key and a bottle), and evidence of historic infrastructure elements underlying modern Van Ness Avenue. Of these, only Fort Mason has been formally recorded.

The seven previously recorded cultural resources within or abutting the APE date to the historic-era and include the Fort Mason Bateria (gun battery) National Register District; a trash scatter (900 Van Ness Avenue); and three historic features (two railway line remnants and an artifact feature), two isolated artifacts (a key and a bottle), and remnants of historic 19th century cable car lines underneath Van Ness Avenue.

The Fort Mason Historic District abuts the northwest edge of the project APE. First developed by the Spanish in 1797 as a small gun emplacement, the fort flourished during the 19th century as a U.S. military base. Although listed largely for its structural elements, the fort contains subsurface archaeological remains, including earthquake debris and privies (i.e., outhouse remains).

The archaeological remains found at 900 Van Ness Avenue are not well understood. The feature is described as a scatter of brick rubble and artifacts dating from the mid 1870s to the early 20th century, based on artifact manufacture dates; no stratigraphic (i.e., rock/soil layer) descriptions or historic context were provided. None of the remains were evaluated as important.

Remains located under Van Ness Avenue were identified during two archaeological construction monitoring projects conducted as part of the Van Ness Avenue Pedestrian Safety Improvements Project between Fell and Sacramento streets. The structural remnants of two of the original late 19th century cable car lines – the Ferries & Cliff House line at the Sacramento Street intersection with Van Ness Avenue and the Sutter Street main line at the Sutter Street intersection with Van Ness Avenue – were evaluated as potentially eligible for listing in the National Register.

Mission San Francisco de Asis (popularly called Mission Dolores) is located at 3321 Sixteenth Street, almost 0.6-mile from the southern end of the project. While the church was the centerpiece of the mission, the larger cultural landscape at one time contained features extending beyond the church, as discussed further below.

There are no previously known or recorded prehistoric archaeological sites located within or adjacent to the APE.

There are no previously known or recorded prehistoric archaeological sites located within or adjacent to the APE.

Identifying Prehistoric Archaeological Resource Sensitivity

The project APE is completely covered by urban development, and previously unidentified archaeological resources would only be encountered during subsurface excavation and not by means of a field survey. Prehistoric sites may exist within the project APE at the historic-era ground surface (prior to the establishment of Van Ness Avenue in 1858) and buried by artificial fill, as well as deeply buried below the historic ground surface by natural sedimentation. A sensitivity assessment was conducted to determine the potential for buried cultural resources in the APE, taking into account factors affecting past human use or occupation of earlier landforms in this part of San Francisco, combined with analysis of those factors that affected preservation of remains (i.e., erosion or burial). On the San Francisco Peninsula, most known prehistoric archaeological sites occur near past or present water sources, most often along the margins of the bay or ocean, or near freshwater lagoons, streams, or springs. Former surface or buried archaeological sites are not randomly distributed throughout the Bay Area landscape but rather occur in specific environmental settings. The 1857-59 U.S. Coast Geodetic Survey map of this area indicates that Van Ness Avenue had not been established by this time, and much of the surrounding area remained undeveloped. The project environs were largely comprised of vegetated and barren soil and gently rolling hills and sand dunes. Sources of freshwater depicted to be near the APE included Mission Creek and tributaries in the southern segment, in addition to a small ephemeral drainage from Russian and Nob Hill that crossed the APE between Vallejo and

Green streets closer to the northern portion. This drainage fed a series of small freshwater lagoons, including a marsh extending east to the APE near Francisco Street.

Overlaying the Van Ness Avenue BRT project corridor onto geologic maps provides a basis for assessing the potential for encountering deeply buried archaeological deposits/sites. The geologic deposits in the project area have varying potentials for prehistoric sites due to their difference in age and character. The prehistoric archaeological potential can be conceptualized as: (1) sites buried deeply below the historic ground surface by natural sediments, and (2) sites within the 1850s ground surface buried by late 19th and 20th century material.

Early to Late Pleistocene soils found underneath Van Ness Avenue between Chestnut Street and Union Street were deposited prior to known human occupation of the region and have a very low potential for deeply buried archaeological deposits. This also includes the small portion of bedrock underlying Lombard Street. Given the previous freshwater lagoons and a marsh near the northern area of the APE, small pockets of artificial fill generally correspond with lowlands from the historic era. The fill has a very low potential to contain intact material, but it may overlie intact prehistoric deposits, as evidenced by three previously recorded prehistoric archaeological sites in this area (SFR-29, -30, and -31; none within 0.25-mile of the APE). The presence of past freshwater suggests a moderate to high potential for prehistoric archaeological deposits underlying the artificial fill. Dune sand underlying the northern portion of the project area between Chestnut Street and North Point Street, in addition to the central portion of the project area, has some potential to contain buried archaeological deposits. Given the proximity of the previous sand dune in the northern area to freshwater lagoons and bay resources, and the presence of previously recorded prehistoric archaeological sites in this area, these dunes are considered to have a high potential for deeply buried sites. Conversely, given the lack of a known water source in the central portion of the APE, these underlying dunes probably have a low potential for prehistoric archaeological sites. The southernmost portion of the APE closer to Mission Creek is estimated to have a moderate to high potential for deeply buried prehistoric sites.

With respect to prehistoric archaeological sites on the 1850s surface, as shown in Table 4.5-2, the sensitivity assessment concluded: (1) the northern third of the project APE – from north of Pacific Avenue onward – is highly sensitivity; (2) the longest, central portion – from north of Pacific Avenue to McAllister Street – is of low sensitivity; and (3) the small segment south of McAllister Street is of moderate to high sensitivity.

Table 4.5-2: Prehistoric Archaeological Site Sensitivity within the APE

PROJECT SEGMENT	1850 GROUND SURFACE	DEEPLY BURIED
Northern APE limit to Chestnut Street	High sensitivity potential	High sensitivity potential
Chestnut Street to Pacific Avenue	High sensitivity potential	Very low sensitivity potential
Pacific Avenue to McAllister Street	Low sensitivity potential	Low sensitivity potential
McAllister Street to southern APE limit	Moderate to high sensitivity potential	Moderal to high sensitivity potential

It is likely that any intact prehistoric site discovered in these contexts would be eligible for the National Register because few prehistoric sites have been documented on the northern San Francisco Peninsula. The impact that the Van Ness Avenue BRT Project might have on these resources is discussed in Section 4.5.4.4 of this document.

Identifying Historical Archaeological Resources Sensitivity

Historic archaeological resources or sites may be defined as places where remnants of a past culture are present and where those remnants survive in a physical context that allows for their interpretation. The physical evidence, or archaeological remains, usually takes the form of artifacts (e.g., fragments of glass, ceramic pipes), features (e.g., remnants of walls), or ecological evidence (e.g., pollens representing plants that were in the area when the activities occurred).

For potential historical archaeological sites located in and adjacent to the APE, the sensitivity assessment was based on reviewing historic maps, historic-period documents, prior archaeological investigations in San Francisco Bay urban settings, and cultural resources reports, including the HRIER prepared for this project (Bunse and Allen, 2009). The potential for historical archaeological sites was determined to be as follows:

It is unlikely that any remains of the Spanish and Mexican Era survive in the project area.

Spanish and Mexican Era Remains. It is unlikely that any remains of this earliest historic era in San Francisco survive in the project area. Given the rare and valuable nature of these resources, however, two areas of possible occurrence have been identified: el Bateria de San Jose (later the site of Fort Mason) adjacent to the northernmost portion of the project area; and Mission San Francisco de Asis (Mission Dolores), near the southernmost extent. The minimal nature of the Bateria de San Jose construction and the activities surrounding it make it highly unlikely that remains are present under Van Ness Avenue. The church of Mission San Francisco de Asis is situated 0.6-mile from the southern end of the project area. The church is all that remains of a large agricultural and industrial center. With the church generally at the center, the edge of this complex would lie east of the southern project area terminus. Historic features associated with the mission included water systems (i.e., aqueducts, reservoirs, water cisterns) and agricultural facilities (i.e., gardens, corrals, and threshing floors) that extended into the surrounding countryside. It is possible, although not likely, that remains related to the mission may be encountered in the southern portion of the project area.

Prior excavations along portions of Van Ness Avenue have encountered evidence of the city's former infrastructure: lead pipes and brick cisterns from the earliest water systems; fragments of ceramic sewer pipes; gas pipes; and the remains of cable car infrastructure.

City Infrastructure. Prior excavations along portions of Van Ness Avenue have encountered evidence of the city's former infrastructure. These include lead pipes and brick cisterns from the earliest water systems, likely dating back to 1886. Fragments of ceramic sewer pipes may indicate the location and nature of these early sanitary facilities, and gas pipes are evidence of urban amenities brought to the western portion of the city. These may occur along any portion of the project area. Remains of cable car infrastructure have been identified in Van Ness Avenue at two intersections of cross streets where the cable cars once operated: at Sacramento Street, a former line was encountered on both sides of the street at a depth of 2 feet to 3 feet to 5.5 feet, and at Sutter Street, cable car remains were encountered approximately 2 feet bgs. Both features included concrete troughs associated with carrying the underground cable, as well as bracing and other support devices to stabilize the mechanism. These remains were previously determined eligible for listing in the National Register. Because cable car technology was first invented in San Francisco in 1873 and has since been recognized as a National Historic Landmark (NHL), any historical evidence should be carefully studied.

Building Remains. In general, foundations of buildings have a limited potential to provide important data on past events beyond documenting the locations and types of previous buildings on a site. Remains of mercantile structures may reflect localized architectural influences or innovative design elements in response to San Francisco's unique environment. Within the project area, numerous basements of stores and other commercial buildings fronting Van Ness Avenue between California and Market streets have been documented as originally extending some 8 feet beyond the current street edge.

Artifact Deposits. Individual or small clusters of artifacts, unless they are extraordinary, do not qualify as "significant" for their data potential under either the National Register or California Register. Eligible artifact features are those that have sufficient magnitude to warrant analysis, be associated with an identifiable household or group of people, and not be disturbed or contaminated by subsequent activities. Several types of potentially significant artifact deposits might be encountered in the project area:

- Deposits or other cultural remains associated with Fort Mason.
- Deposits associated with commercial buildings south of California Street, which had freight access through sidewalk openings. These were filled in prior to a Van Ness Avenue road resurfacing in the 1930s, providing an opportunity for disposing of unwanted refuse.
- Refuse deposits and perhaps residential privies in the Market to Mission section of Van Ness Avenue that cut through an existing neighborhood in the 1920s.
- Deposits associated with street or utility improvements whereby refuse was disposed (e.g., ceramics, glass, bricks).

Focused Documentary Research

There is the potential for buried resources. The project APE, however, is currently fully covered by modern development, and known or previously unidentified archaeological resources would only be encountered during subsurface excavation and not by pedestrian survey. Constraints of the modern urban environment make preconstruction archaeological field testing impracticable. The potential for encountering buried resources will be determined through focused documentary research and reconstructing the history of changes to the physical landscape, including cuts and fills to more accurately identify locations with potentially significant prehistoric remains. The research may result in recommendations for subsurface testing and possible mitigation, which would only take place just prior to construction, after design plans are finalized and only if a potentially significant resource was identified and could not be avoided.

4.5.3 | Historic and Architectural Resources

4.5.3.1 | AFFECTED ENVIRONMENT

Historic and Architectural Resources APE

In contrast to historic archaeological properties, historic and architectural resources are property types such as buildings, structures, objects, and districts that, in general, are still used or maintained. The evaluation of historic and architectural resources begins with the delineation of the APE. The APE is defined as the geographic area or areas within which an undertaking may cause direct or indirect changes in the character or use of historic properties, should any such properties be present. The SHPO reviewed and concurred with the adequacy of the historic and architectural APE delineated for the project alternatives on May 10, 2010 (see Appendix D for the APE exhibit maps and Appendix C for the SHPO concurrence letter).

Historic and Architectural Resources Methods

This section of the EIS/EIR summarizes information contained in the HRIER prepared for this project (Bunse and Allen, 2009).

Background research to account for all buildings, structures, and objects found within the project APE was conducted on all properties that were 45 years old or older at the time of review.

Once the architectural APE had been established, background research was conducted on all properties that were 45 years old or older at the time of review. Though National Register and California Register criteria state that a property generally must be at least 50 years old to be considered for historical significance, because transportation projects often have long lead times from the time environmental studies are conducted to final project approval, typically 3 to 5 years, properties that might turn 50 years old during the life of a project were considered as a safeguard.

The area was surveyed to account for all buildings, structures, and objects found within the project APE. This field reconnaissance helped determine which resources appeared to be 45 years of age or greater and to confirm the current condition of properties already listed or determined eligible for listing in the NRHP and/or CRHR. Additional background research was conducted through review of the First American Real Estate Solutions commercial database, municipal government records, other historic archival documents, photographs, and plans to confirm dates of construction and building histories. Fieldwork occurred in March and April 2009.

The investigation of historic-era resources included research regarding the development context, as well as resource-specific research conducted in archival and published records, and many secondary sources. Research was conducted at San Francisco Architectural Heritage; San Francisco Building Department; San Francisco City and County Public Utilities Commission; San Francisco Office of City Planning; California State Archives and Library; California Historical Society; Bancroft Library (UC Berkeley); Shields Library (UC Davis); Caltrans Headquarters in Sacramento; and Caltrans District 4 Office in Oakland. In addition, the CHRIS was reviewed and a records search was conducted for the project in February 2009. Additionally, the Northwest Information Center provided an updated printing of the "Historic Property Data file for San Francisco County," as of May 27, 2009. Researchers also reviewed the California Historical Landmarks and Points of Interest publications and updates, the National Register, and California Register, as well as San Francisco landmarks and local register listings and historic preservation guidance and publications. The HRIER included field checking any previously identified historic properties and providing updated information, where applicable.

Historic and Architectural Resources within the APE

There are 27 individual historic and architectural resources that appear to be 45 years of age or greater within the project APE that were reviewed for potential eligibility. In addition, 3 historic-era property types were also evaluated: the San Francisco Civic Center Historic District; the Van Ness Avenue roadway corridor; and a trolley pole system, or OCS support pole/streetlight system, located along both sides of Van Ness Avenue between Market Street and North Point Street. The former involved a Civic/Government complex, while the latter two involved infrastructure (see Table 4.5-3).

Table 4.5-3: Status of Historic Resources within the Project APE

HISTORIC RESOURCES	STATUS
PROPERTIES WITH PREVIOUS STANDING	
San Francisco Civic Center Historic District	• National Historic Landmark • NRHP listed • CRHR listed • San Francisco Historic District
11-35 Van Ness Avenue (Masonic Temple)	• determined eligible for NRHP listing • determined eligible for CRHR listing • San Francisco Category I (Significant) building
1699 Van Ness Avenue (Paige Motor Car Co. Building)	• NRHP listed • CRHR listed
PROPERTIES IDENTIFIED ELIGIBLE AS PART OF VAN NESS AVENUE BRT STUDY	
799 Van Ness Avenue (Wallace Estate Co. garage)	• determined eligible for NRHP listing • determined eligible for CRHR listing
945-999 Van Ness (Ernest Ingold Chevrolet Showroom)	• determined eligible for NRHP listing • determined eligible for CRHR listing
1320 Van Ness Avenue (Scottish Rite Temple)	• determined eligible for NRHP listing • determined eligible for CRHR listing
1946 Van Ness Avenue (California Oakland Motor Co. Showroom)	• determined eligible for NRHP listing • determined eligible for CRHR listing

Of these 30, 3 historic properties had previous standing in the NRHP, the CRHR, or as an NHL:

- San Francisco Civic Center Historic District; NHL; listed in NRHP and CRHR [see Figure 4.5-1, and identified as H-2 on Figures 4.5-2 and 4.5-3]
- 11-35 Van Ness Avenue (Masonic Temple); determined eligible for the NRHP [identified as H-1 on Figures 4.5-4 and 4.5-3]
- 1699 Van Ness Avenue (Paige Motor Car Co. Building); listed in the NRHP and CRHR [identified as H-6 on Figures 4.5-5 and 4.5-3]

No other historic and architectural (i.e., aboveground) resources within the APE had previous official status in the NRHP or CRHR. Although two of the resources were previously evaluated for the NRHP and the CRHR (1050-1066 Van Ness Avenue [current residential hotel] and 2001 Van Ness Avenue [current First Republic Bank), the SHPO did not previously provide an opinion on their eligibility, and neither property was listed in the most current Historic Property Data File for San Francisco County when the survey was undertaken (May 27, 2009).

Several of the resources in the APE also have local designation status. The Civic Center is a designated San Francisco Historic District. San Francisco City Hall, a central component of the Civic Center district, is an individual San Francisco City Landmark, as is the War Memorial building for its association with the founding of the United Nations in 1945.

Many of the resources in the APE have been documented by previous local reconnaissance surveys and some are listed as "significant" or "contributory" buildings in San Francisco's "Van Ness Avenue Area Plan." According to *San Francisco Preservation Bulletin 16:* "City and County of San Francisco Planning Department CEQA Review Procedures for Historic Resources," these types of previous ratings do not qualify as an adopted local register for the purposes of CEQA, and require further review. This further review was provided by submitting an advance copy of the Van Ness Avenue BRT HRIER and accompanying evaluation forms to the staff of the Historic Preservation Commission. As part of local agency coordination, an advance draft of this report was provided to the City of San Francisco Planning Department (Historic Preservation Commission staff) for review and comment. As the project corridor, Van Ness Avenue serves as US 101 through the City of San Francisco; a copy of the HPS was also provided to Caltrans for their review and comment.

Evaluations conducted as part of the HRIER were also consistent with *San Francisco Preservation Bulletin 5*: "Landmark and Historic District Designation Procedures," which directs that historic properties be evaluated for local designation using the California OHP Recordation Manual. As a result, the California OHP Historical Resource Status Codes for eight of the studied properties were assigned status code "6L," (which recognizes that a resource may merit special consideration in local planning, to reflect the Planning Department's concerns and suggestions (see Table 4.7-4).

The HRIER concluded that the status of the three properties previously listed or determined eligible for listing in the NRHP and CRHR remained unchanged, as did their status as historical resources for the purposes of CEQA. Of the 27 other properties evaluated within the APE, the HRIER concluded that 4 appear eligible for listing in the NRHP and CRHR; therefore, they appear to be historical resources for the purposes of CEQA. Those buildings are located at:

- 799 Van Ness Avenue [Wallace Estate Co. garage; identified as H-3 on Figures 4.5-2 and 4.5-3]
- 945-999 Van Ness Avenue [Ernest Ingold Chevrolet; identified as H-4 on Figures 4.5-6 and 4.5-3]
- 1320 Van Ness Avenue [Scottish Rite Temple; identified as H-5 on Figures 4.5-6 and 4.5-3]
- 1946 Van Ness Avenue [California Oakland Motor Co.; identified as H-7 on Figures 4.5-5 and 4.5-3]

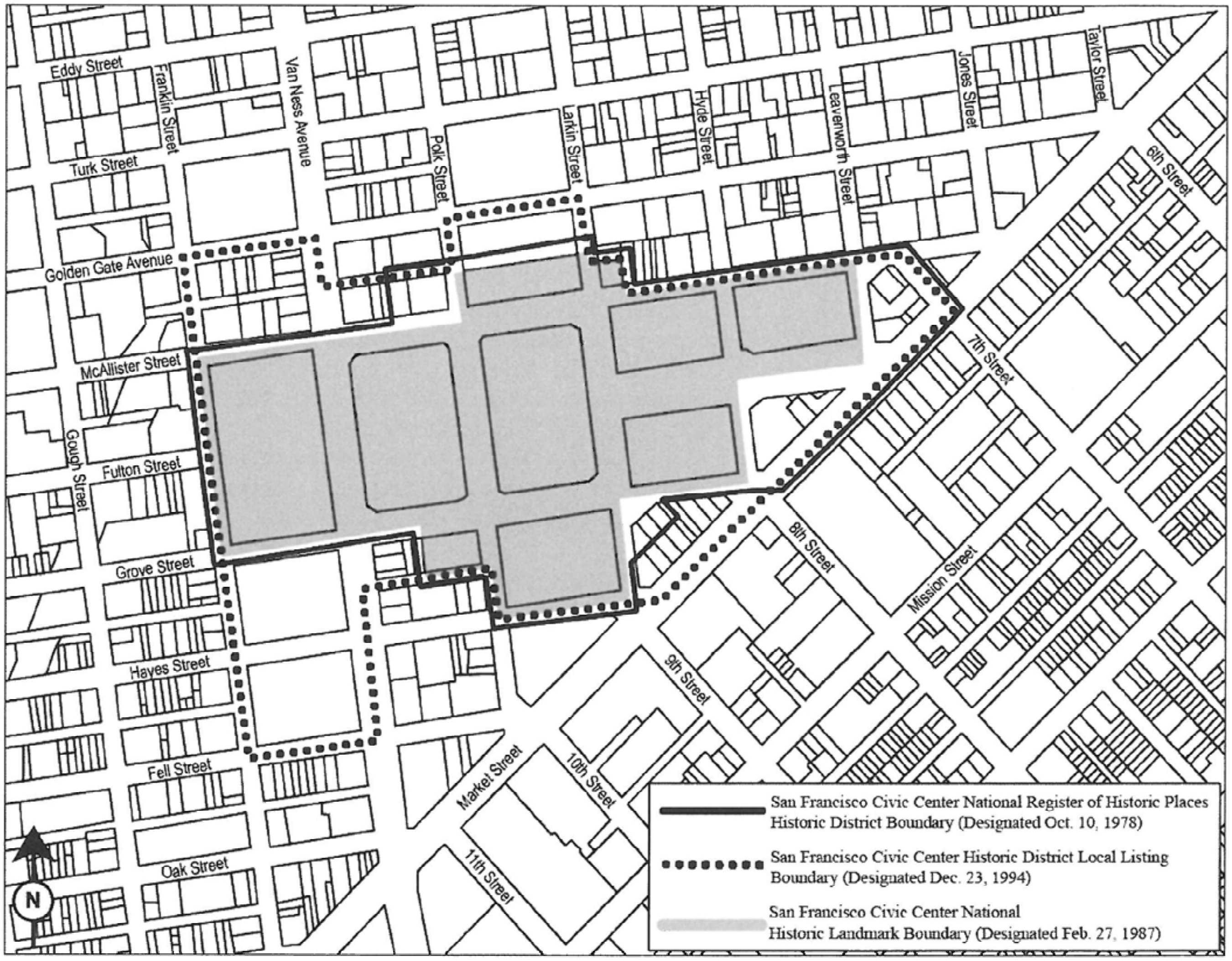

Figure 4.5-1: Civic Center Historic District Boundaries

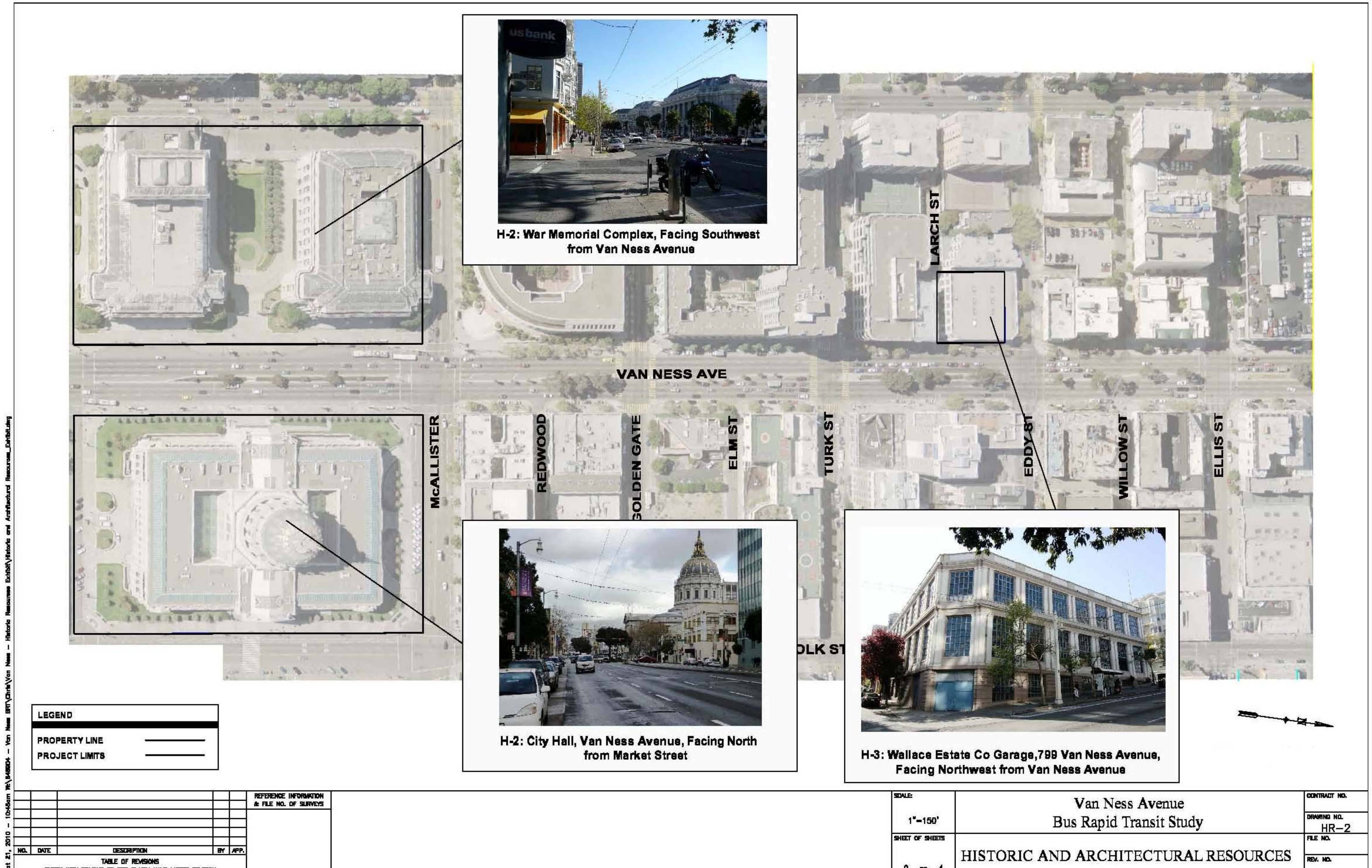

Figure 4.5-2: Historic Properties Listed or Eligible for Listing within Project APE

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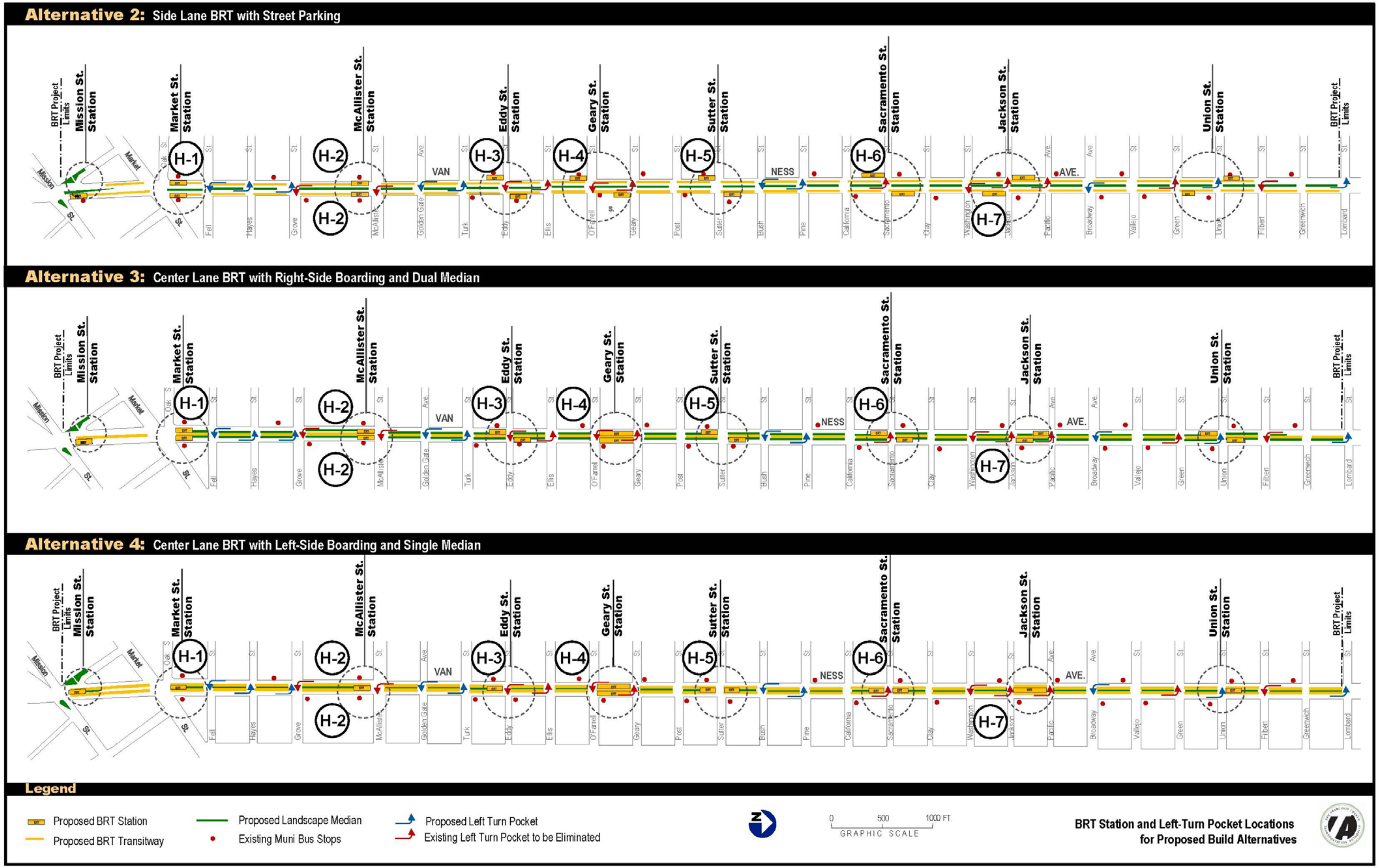

Figure 4.5-3: Project Features and Location Map of Historic Properties Listed or Eligible within Project APE

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Legend for Historic Properties Listed or Eligible within the APE (see map below):

H-1	Masonic Temple, 11-35 Van Ness Avenue
H-2	War Memorial Complex and City Hall
H-3	Wallace Estate Co. Garage, 799 Van Ness Avenue
H-4	Ingold Chevrolet, 945-999 Van Ness Avenue
H-5	Scottish Rite Temple, 1320 Van Ness Avenue
H-6	Paige Motor Car Co., 1699 Van Ness Avenue
H-7	California Oakland Motor Co., 1946 Van Ness Avenue

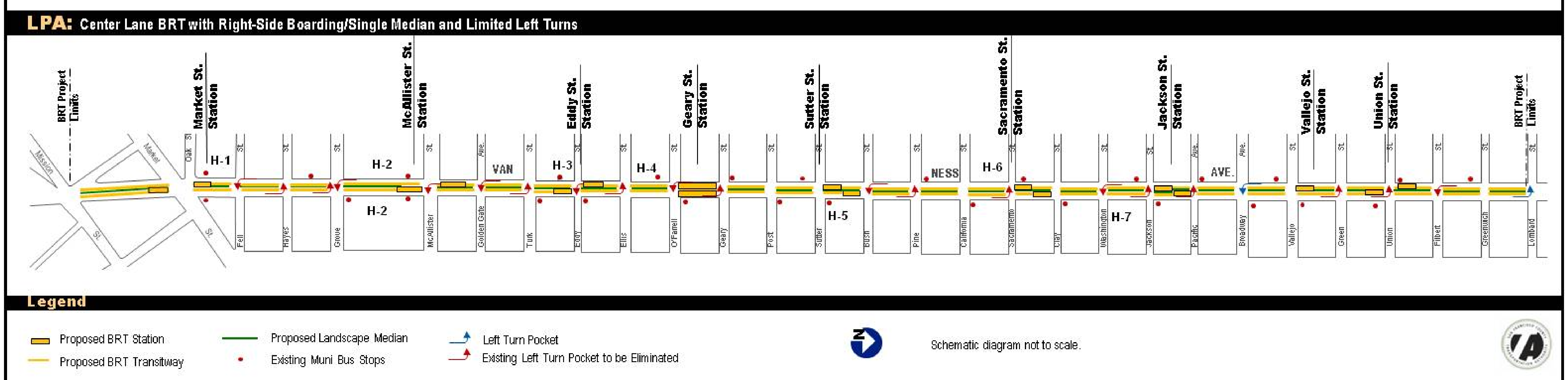

Figure 4.5-3: LPA Project Features and Location Map of Historic Properties Listed or Eligible within Project APE

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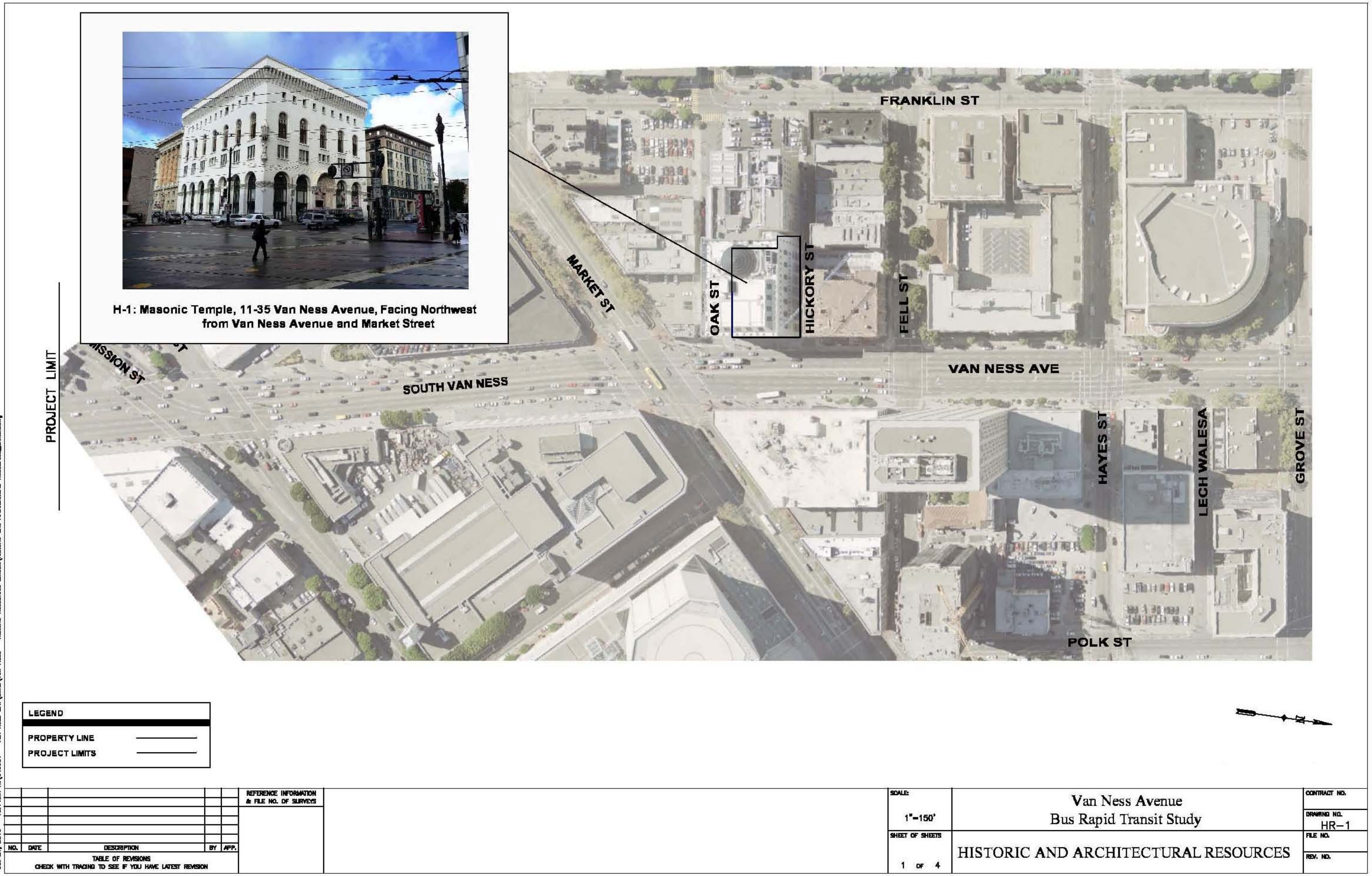

Figure 4.5-4: Historic Properties Listed or Eligible for Listing within Project APE

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Figure 4.5-5: Historic Properties Listed or Eligible for Listing within Project APE

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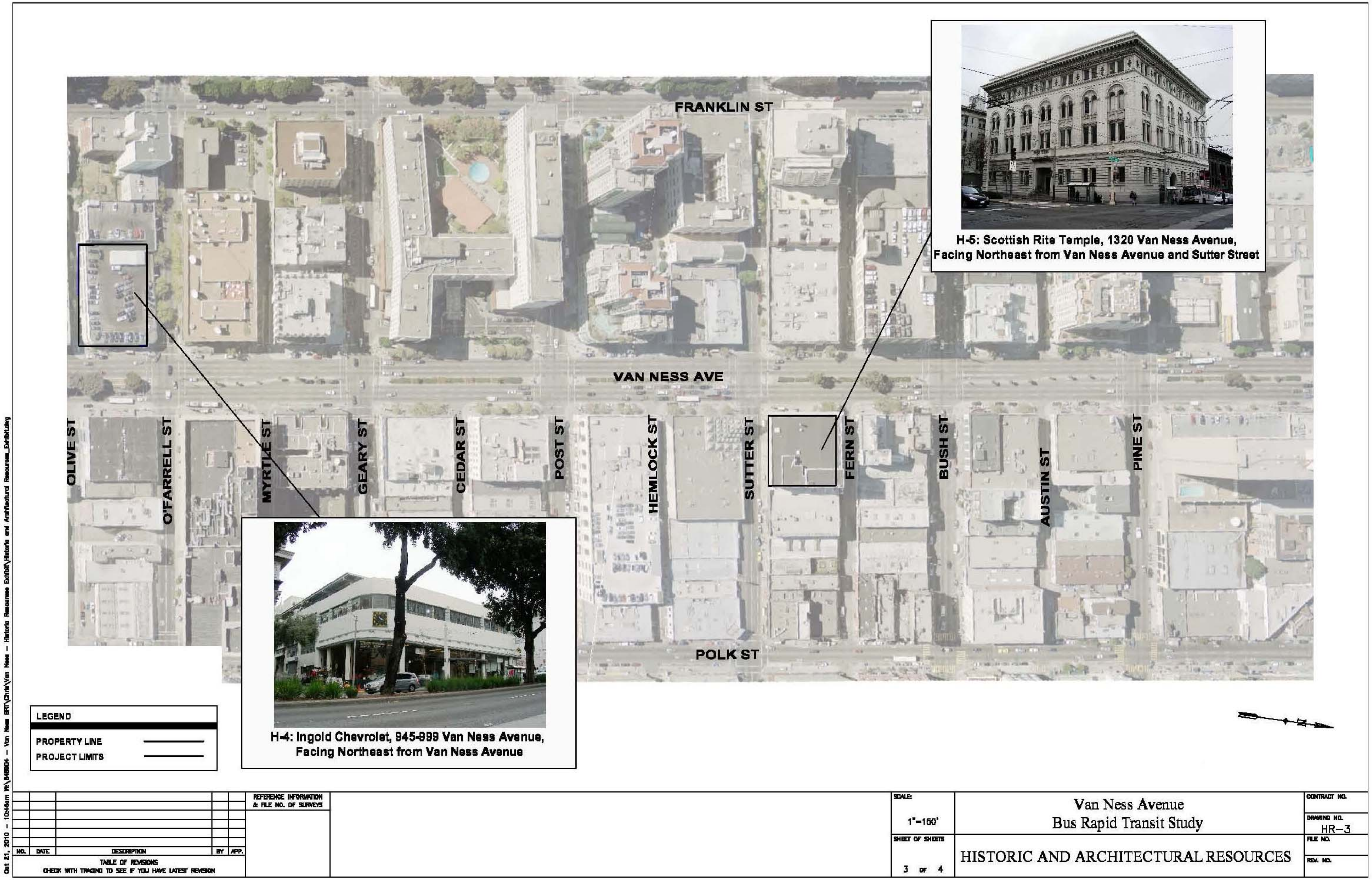

Figure 4.5-6: Historic Properties Listed or Eligible for Listing within Project APE

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Table 4.5-4: Properties Determined Not Eligible for National Register

PROPERTY TYPE	NAME	YEAR BUILT	OHP STATUS CODE
Infrastructure	Van Ness Avenue and northernmost block of South Van Ness Avenue	1858-ongoing	6L
Infrastructure	Van Ness Avenue Trolley Poles	1914, 1936	6L
Commercial	30 Van Ness Avenue	1908	6Z
Commercial	800 Van Ness Avenue	1920	6L
Residential	1050-1066 Van Ness Avenue	1908	6L
Commercial	1233 Van Ness Avenue	1913	6Z
Commercial	1243 Van Ness Avenue	1913	6Z
Commercial	1625 Van Ness Avenue	1919	6L
Commercial	1776 Sacramento Street	1919	6Z
Commercial	1730 Van Ness Avenue	1919	6Z
Commercial	1920 Van Ness Avenue	1918	6Z
Commercial	1930 Van Ness Avenue	1922	6Z
Commercial	1940 Van Ness Avenue	1920	6Z
Commercial	2001 Van Ness Avenue	1920	6Z
Commercial	2027 Van Ness Avenue	1936	6Z
Residential	2400 Van Ness Avenue	1907	6Z
Residential	2418 Van Ness Avenue	1909	6L
Residential	2420-2424 Van Ness Avenue	1914	6L
Residential	2430 Van Ness Avenue	1925	6Z
Residential	2501 Van Ness Avenue	1906	6Z
Residential	2509-2515 Van Ness Avenue	1902	6Z
Residential	2517-2521 Van Ness Avenue	1902	6L
Commercial	2525-2545 Van Ness Avenue	1942	6Z

California Office of Historic Preservation – Historical Resources Status Codes
6L: Found ineligible for NRHP and CRHR; may warrant special consideration in local planning
6Z: Found ineligible for NRHP, CRHR, or Local designation

The remaining resources in the APE, including remnants of a system of poles to support the overhead power supply wires for the electric streetcar system (i.e., OCS support poles/streetlights) and the Van Ness Avenue roadway corridor itself were evaluated and found not to be eligible for listing in either the NRHP or the CRHR; therefore, they are not considered historical resources for the purposes of CEQA. The SHPO concurred with these eligibility findings in a letter dated May 10, 2010 (see Appendix C).

4.5.4 | Environmental Consequences

4.5.4.1 | INTRODUCTION

In the context of a federally funded and permitted project, the significance of archaeological and architectural history resources is measured with reference to the evaluation criteria of the National Register (36 CFR 60). These criteria state that the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and which:

a. Are associated with events that have made a significant contribution to the broad patterns of our history; or
b. Are associated with the lives of persons significant in our past; or
c. Embody the distinctive characteristics of a type, period, or method of construction, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
d. Have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Under CEQA, if a project would cause a substantial adverse change in the significance of a historical resource or archaeological resource, it may have a significant effect on the environment.

The four criteria, in addition to a property generally having to be a minimum of 50 years of age for NRHP consideration, are essential to evaluation of eligibility because they "indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). Any action that, as part of an undertaking, could affect significant cultural resources is subject to review and comment under Section 106 of the NHPA. All projects in California undergoing environmental review must also address the cultural resources requirements of CEQA, with resources evaluated under the California Register criteria. Under CEQA, if a project would cause a substantial adverse change in the significance of a historical resource or archaeological resource as defined in Section 15064.5 of CEQA, it may have a significant effect on the environment.

4.5.4.2 | APPLICATION OF THE CRITERIA OF ADVERSE EFFECT

DEFINITION

ADVERSE EFFECT is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of a historic property's location, design, setting, materials, workmanship, feeling, or association.

The NHPA Section 106 regulations express that if there are historic properties in the APE that may be affected by a federal undertaking, the agency shall assess adverse effects, if any, in accordance with the Criteria of Adverse Effect defined at 36 CFR 800.5. These regulations state that an "adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of a historic property's location, design, setting, materials, workmanship, feeling, or association."

Application of the criteria of adverse effect is largely an assessment of an undertaking's impacts on the integrity of a historic property that contribute to its eligibility for listing in the NRHP. Effects can be direct, indirect, and cumulative. Direct effects include physical destruction or damage. Indirect effects include the introduction of visual, auditory, or vibration impacts to a historic property. For instance, a project can generally result in an adverse visual impact if it creates a demonstrable negative effect on aesthetics through elimination of open space related to a historic property, or by introducing an element that is incompatible, out of scale, in great contrast, or out of character with the surrounding historic setting, or if it would create an obstructive effect by blocking or intruding into a historic view, blocking a significant feature of a historic property, or substantially detract from a view of historic property.

Examples of adverse effects may include, but are not limited to, the following:

a. Physical destruction of or damage to all or part of the property;
b. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR 68) and applicable guidelines;
c. Removal of the property from its historic location;
d. Change of the character of the property's use or of physical features within the property's setting that contributes to its historic significance;
e. Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
f. Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or native Hawaiian organization; and

g. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The term "adverse effects" under Section 106 and the term "use" under Section 4(f) are not equivalent, and each carries specific meaning. A use occurs when a project permanently incorporates land from a Section 4(f) property, even if the amount of land used is very small. In addition, a use can result from a temporary occupancy of land within a Section 4(f) property, if that temporary occupancy meets certain criteria. A use also can result from proximity effects (e.g., noise, visual) that substantially impair the protected features of the property. A use that results from proximity effects is known as a "constructive use."

DEFINITION

USE: A use occurs when a project permanently incorporates or temporarily occupies land from a Section 4(f) property. A use also can result from proximity effects (e.g., noise, visual) that substantially impair the protected features of the property.

Constructive uses substantially impair the historic resource features or attributes of the Section 4(f) resource and may include these examples:

- The projected noise level increase attributable to a proposed project substantially interferes with the use and enjoyment of a resource protected by Section 4(f), such as enjoyment of a historic property where a quiet setting is a generally recognized characteristic.
- The proximity of a proposed project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. An example of substantial impairment to visual or aesthetic qualities would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or detracts from the setting of a park or historic site which derives its value in substantial part from its setting.
- A proposed project results in a restriction of access to the Section 4(f) resource, which substantially diminishes or eliminates the utility or function of the resource.
- The vibration impact from operation of a proposed project would substantially impair the use of a Section 4(f) resource, such as a projected vibration level that is great enough to affect the structural integrity of a historic building or substantially diminish the utility of a historic building.

FTA has determined that a constructive use does not occur when compliance with the requirements of 36 CFR 800.5 for proximity impacts of the proposed action, on sites listed on or eligible for the NRHP, results in an agreement of "no historic properties affected" or "no adverse effect" (23 CFR 774.15 [f][1]). For the proposed Van Ness Avenue BRT Project, a preliminary assessment of the project's effects on historic and architectural resources is discussed in Section 4.5.4.5, and formal findings of effect will be reviewed by the SHPO for concurrence as part of the Section 106 review process.

4.5.4.3 | CEQA STANDARDS OF SIGNIFICANCE FOR POTENTIAL IMPACTS

Under CEQA, proposed projects must be evaluated for their probability to cause significant effects on "historical resources." CEQA equates a "substantial adverse change" in the significance of a historic property with a significant effect on the environment (PRC Section 21084. 1). Thresholds of substantial adverse change are established in PRC Section 5020.1 and include demolition, destruction, relocation, or "alteration activities that would impair the significance of the historic resource." In other words, California laws use essentially the same standard as used by the federal government concerning what constitutes adverse effects.

California laws use essentially the same standard as the federal government concerning what constitutes adverse effects.

4.5.4.4 | PREHISTORIC AND HISTORICAL ARCHAEOLOGICAL RESOURCE IMPACTS

The methods used to identify known and potential prehistoric and historical archaeological resources within the Van Ness Avenue BRT APE are described in Section 4.5. Archaeological impacts and mitigation measures are primarily construction related and are discussed below.

As discussed in Section 4.5.2, constraints of the modern urban environment make archaeological field testing impracticable. Additional research will more accurately identify locations with potentially significant prehistoric remains. Similarly, while construction of any of the build alternatives would not affect known historical archaeological resources, there are several locations where construction activities could potentially uncover significant historic-era features or deposits (HPS, Parsons, 2010a). Focused archival research, however, can effectively identify areas where potentially significant resources might survive under the modern urban landscape and areas where such resources are unlikely. Procedures for this additional research are detailed in Section 4.4.5.

As noted earlier, archaeological sites on or eligible for listing in the NRHP are not considered Section 4(f) resources when the significance of those sites is derived from what important historic or prehistoric information may potentially be garnered through their excavation (i.e., whether the data is actually recovered), rather than archaeological sites warranting preservation in place and being found eligible under other criteria. Section 4.5.6 contains further discussion of Section 4(f).

Alternative 1: No Build (Baseline Alternative)

As detailed in Section 2.2, some minimal subsurface disturbance would take place with implementation of the No Build Alternative. SFMTA, together with DPW and SFPUC, plans to replace the existing OCS and supporting poles/streetlights along Van Ness Avenue from Market Street to North Point Avenue within approximately 3 feet to 5 feet from the location of the existing poles, which would involve some ground-disturbance activities in areas that may or may not contain archaeological resources. No impacts to known prehistoric or historical archaeological resources would occur with this alternative.

No impacts to known prehistoric or historical archaeological resources would occur with the No Build Alternative (Alternative 1) or Build Alternative 2.

Build Alternative 2: Side-Lane BRT with Street Parking

Build Alternative 2 would provide a dedicated bus lane in the rightmost lane of Van Ness Avenue in both the NB and SB directions, from Mission Street to Lombard Street, adjacent to the existing lane of parallel parking (see description in Section 2.2). The bus lanes would be traversable for mixed traffic. BRT stations would be located within the parking strip as extensions to the sidewalk. Under this alternative, the OCS overhead wire and support pole system would be replaced and upgraded, along with the associated street lighting. Build Alternative 2 also includes streetscape improvements and amenities, and replacement of the signal poles. Many of these activities would involve some form of ground disturbance (see Table 4.5-1) in areas that may or may not contain archaeological resources. No impacts to known prehistoric or historical archaeological resources would occur with this alternative.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians

Because much of the proposed construction work for Build Alternatives 3 and 4 would occur within the existing median of Van Ness Avenue, impacts to intact archaeological deposits appear to be a low probability. Design Option B would make no known difference to possible buried archaeological deposits.

Build Alternative 3 would involve placement of the bus platforms in existing landscaped dual medians (the medians would be approximately 4 feet to 9 feet wide in many locations; see full project description in Section 2.2). Table 4.5-1. depicts the anticipated excavation depths of associated work, including streetscape improvements and relocation of a sewer pipeline within the bus lane, with a 6-foot-wide trench to a depth of 11.5 feet. Most of the other work would occur at shallow depths, with the exception of the OCS support poles, which while small in diameter (3 feet), is proposed to extend between 11 feet and 16 feet bgs. Because much of the proposed construction work would occur within the existing median of Van Ness Avenue, which in earlier decades experienced placement and removal of trolley tracks, a major street widening, and construction of the landscaped concrete median, impacts to intact archaeological deposits appear to be a low probability.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median

Build Alternative 4 (see description in Section 2.2) involves placement of a dedicated bus lane adjacent to a single, 14-foot-wide median. Station platforms would be located on the single center median. Build Alternative 4 also includes the streetscape improvements associated with the other build alternatives. Build Alternative 4 would require replacement of the sewer outside the proposed bus platform areas. A 6-foot-wide trench excavated to a depth of 11.5 feet would be required at each platform area. Build Alternative 4 would also include OCS support pole/streetlight replacement, which while small in diameter (3 feet), would require excavation between 11 feet and 16 feet bgs. Previous construction activity in the 20th century, including installation and later removal of trolley tracks, a major road widening, and construction of concrete median, would have greatly affected the upper layers of the ground where the most of the planned excavation work associated with the BRT construction would occur (see Table 4.5-1). The potential to uncover intact and undisturbed significant archaeological deposits remains a low probability.

Center-Lane Alternative Design Option B

The design option would restrict left-turn lanes to only one SB left-turn lane at Broadway Street. It would make no known difference to possible buried archaeological deposits.

LPA: Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns

The LPA, a refinement of the center-running Build Alternatives 3 and 4, would involve placement of the bus station platforms in landscaped dual medians that fluctuate in width between 6 and 11 feet. Blocks without a station would have a single median. Potential impacts to prehistoric and historical archaeological resources under the LPA are identified as part of the analysis presented above for the center-lane configured, build alternatives (Build Alternatives 3 and 4). Because much of the proposed construction work for a center-lane configured design would occur within the existing median of Van Ness Avenue, which in earlier decades experienced placement and removal of trolley tracks, a major street widening, and construction of the landscaped concrete median, impacts to intact archaeological deposits appear to be of low probability for the LPA (with or without the Vallejo Northbound Station Variant).

4.5.4.5 | HISTORIC AND ARCHITECTURAL RESOURCES IMPACTS

As discussed in Section 4.5.4.2, seven characteristics define the quality of significance of a historic property: location, design, setting, materials, workmanship, feeling, and association. The Van Ness Avenue BRT Project alternatives, including the LPA, would occur entirely within the existing street ROW, and no property acquisition would be required; therefore, the proposed project would not affect the following characteristics under any of the alternatives under consideration:

Because the Van Ness Avenue BRT Project alternatives would occur entirely within the existing street ROW, and no property acquisition would be required, the proposed project would not affect the characteristics of location, design, materials, or workmanship.

Location. *The place where the historic property was constructed or the place where the historic event occurred.* All historic properties would remain in their original location under all of the Van Ness Avenue BRT alternatives. The proposed project would not diminish any of the significant properties' integrity of location.

Design. *The combination of elements that create the form, plan, space, structure, and style of a property.* No work proposed under any of the project alternatives would alter any character-defining features that create the form, plan, space, structure, and style of any of the eligible buildings or historic district. The project would not diminish the integrity of design.

Materials. *The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.* Under none of the project alternatives under consideration would materials be affected. There would be no diminishment of historic materials.

Workmanship. *The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.* None of the historic properties identified in the project APE would be altered under any of the project alternatives; therefore, there is no diminishment of this aspect of integrity.

As described below, of the three remaining characteristics used to define integrity, the proposed project was assessed to determine if the alternatives would affect:

Setting. The physical environment of a historic property.

Feeling. The property's expression of the aesthetic or historic sense of a particular period of time.

Association. The direct link between an important historic event or person and a historic property.

For historic properties located in a setting where the sense of quiet represents a characteristic of its historical significance, increases in noise and vibration could have the potential of causing adverse effects and/or significant impacts. This is clearly not the case of the properties located on Van Ness Avenue, which has served as the route of US 101 through San Francisco since just after World War II. The Noise and Vibration Study (Parsons, 2010b) found that application of the standard mitigation measures required by the City and Caltrans would reduce the construction impact to less than significant; however, temporary increases in noise and vibration would still occur at some locations. Operational project-generated and cumulative noise impacts along Van Ness Avenue would remain below both FTA and Caltrans impact criteria. The study also found that BRT transit vehicle operational vibration impacts would be less than significant relative to the applicable FTA criteria. Based on these conclusions, no damage to historic structures in the study area as a result of vibration is expected; therefore, as the existing project area's noise levels are typical for a dense urban environment, noise associated with the BRT system would not be substantially different with its implementation, and it would not be out of character with its urban setting.

No damage to historic structures as a result of vibration is expected; and as the existing project area's noise levels are typical for a dense urban environment, noise associated with the BRT system would not be substantially different with its implementation, and it would not be out of character with its urban setting.

A discussion of the potential project effects on built-environment historic resources needs also to include the compatibility of the proposed project with the character of the setting of the existing historic resources. The compatibility of the project is determined by such factors as the size and proportion of the project features relative to the surrounding historic structures and architectural design features, height of the new elements and shadows they might cast, color; and the amount of open space that project components may obscure. Because the Van Ness Avenue BRT Project would be implemented in an already completely urbanized environment, changes to the overall setting would be largely inconsequential. As the Van Ness Avenue corridor contains a mix of buildings dating from various time periods, as recognized in the Van Ness Area Plan, there is no consistent historic theme that unites the various elements; rather the avenue possesses a wide range of different architectural styles from the span of its decades.

In addition, Van Ness Avenue has experienced successive waves of change related to the evolution of transportation. From its dusty beginnings in the late 1850s as it was laid out by survey as a boulevard, to the introduction of macadam pavement and a trolley line in the early 20th century, Van Ness Avenue long served as a travel way. By the mid 1930s with construction of the Golden Gate Bridge to the north uniting San Francisco and Marin County, Van Ness Avenue and Lombard Street became integral auto corridors shouldering US 101 traffic. The federal government and City partnered to widen Van Ness Avenue in 1936 by widening the roadbed and narrowing the sidewalk to 16 feet to accommodate the surge of auto and truck traffic; in the early 1950s the avenue's trolley tracks were removed and concrete median installed. All of the features of the roadway have changed substantially over time, with new paving and curb cuts, and installation of medians, modern fire hydrants, streetlights, and various other infrastructural elements added throughout the last century;

therefore, because the BRT project would be constructed in a completely and evolving urbanized environment, changes to the overall setting would not be considered substantial.

Although the setting, feeling, and association reflected in the historic properties would be diminished under some of the Build Alternatives, this would not be so substantially adverse as to constitute changing any of the properties' NRHP eligibility status.

Alternative 1: No Build (Baseline Alternative)

As the alternative is detailed in Section 2.2, some activities would take place with implementation of the No Build Alternative. While most would involve system management changes, certain elements may have a slight physical change on the project setting. SFMTA, together with DPW and SFPUC, plans to replace the existing OCS/streetlight poles along Van Ness Avenue from Market Street to North Point Avenue, potentially replacing poles within approximately 3 feet to 5 feet from their current locations; replacement may be implemented as a comprehensive project or as a phased maintenance program, with the most structurally compromised poles replaced earliest. The existing traffic signal heads would also be replaced and the poles upgraded to become mast armed poles (i.e., arched to hang over the traffic lanes). In addition, SFMTA is proposing to install real-time bus arrival displays (NextMuni) at the major bus stops with shelters along Van Ness Avenue. When the scale of the No Build Alternative components are considered relative to the built-out and contemporary Van Ness Avenue traffic-related control infrastructure, these changes would be imperceptible to the overall setting, feeling, or association of any significant historic and architectural resources.

Build Alternative 2: Side-Lane BRT with Street Parking

As described in Section 2.2, BRT station platforms are proposed under all of the build alternatives. All of the proposed BRT stations would consist of a 130-foot-long platform, a canopy of 8 feet to 11 feet in height and landscaped planters (see visual simulations in Section 4.4.3, Analysis of Key Viewpoints, in Section 4.4, Aesthetics/Visual Resources). Other station amenities would include installing TVMs at selected stations, seating, lighting, garbage receptacles, and way-finding maps/signage. Figure 4.5-3 shows the proposed BRT station platform locations for each build alternative relative to the NRHP-eligible or listed historic and architectural properties within the project's APE.

Build Alternative 2, because it features station platforms at curbside locations in closest proximity to the affected historic properties, is considered to have the most notable effect on adjacent properties. Going from the south part of the project area to the north, for each of the seven historic properties within the APE, the proposed project would have effects relative to the potential impacts presented above (Section 4.5.4.2):

KEY FINDING

Under Build Alternative 2, for each of the seven historic properties within the APE, the proposed project would have effects relative to the potential impacts due to the implementation of station platforms blocking some of the viewshed of the historic properties.

- **11-35 Van Ness Avenue (Masonic Temple).** The proposed project would include installation of a BRT station platform in front of this building. This is at the location of the proposed SB Market Street BRT station. The marble and terracotta building, rectangular in form and solid in its massing, has a series of symmetrical Romanesque arches, with a distinctive and decorative inset central arch, and a prominent cornice among the significant character-defining stylistic elements. The greater proportion of design features are located well above the height of the proposed station 8-foot to 11-foot canopy, but the setting and feeling of balance reflected in the historic property would be diminished by the placement of the new bus station platform in front of the street-level façade by inserting an obstruction to viewers looking upon the historic building from across the street; however, the proposed undertaking would not be so substantially adverse as to constitute changing the property's NRHP eligibility status.
- **San Francisco Civic Center Historic District.** The section of Van Ness Avenue between McAllister Street and Grove Street is dominated by civic/government buildings of historic importance and classical architectural grandeur that have been collectively recognized with designation as the Civic Center Historic District. Under Build Alternative 2, a new BRT station is proposed on the east side of Van Ness Avenue, extending 150 feet south from the McAllister Street intersection in front of City Hall; it

would replace an existing curbside bus shelter of more diminutive size. On the opposite side of Van Ness Avenue, the same alternative would also replace the existing curbside bus shelter with a longer station and platform in front of the War Memorial Veterans Building and Opera House. This is at the location of the proposed NB and SB McAllister Street BRT stations.

The viewshed to either the War Memorial Building/Opera Hall paired buildings on the west side of Van Ness Avenue and City Hall on the east side would be only slightly changed under Build Alternative 2 (see Section 4.5 for a simulation of the bus station at this location). Given the size and scale of these historic properties from the perspective of being a short distance away, the replacement of the existing shelter with a larger BRT station and platform would be largely inconsequential to the overall monumental size of the civic structures and their respective prominent architectural features. The significant character-defining features are never out of view, but placement of the newer BRT infrastructure would partially detract from the view by an Observer, although it is important to remember that transportation infrastructure has always been part of the streetscape fronting these buildings. Though it represents just a small proportion, the new bus platform and low canopy would present a partial obstruction of each historic building from the perspective offered from those looking on from the immediate foreground from the north or south elevation, or from across Van Ness Avenue to either of the large civic buildings. In relationship to its overall historic setting, as one would experience the new BRT station up close, there would be slight diminishment in the feeling and association of the district's historicity with the introduction of the contemporary element. The type and color of scheme of the bus infrastructure could likely further enhance or detract from the feeling, association, and setting of the historic property.

There are sixteen 25-foot-tall trolley/streetlight poles on Van Ness Avenue between Grove and McAllister streets, some of which date back to 1914 when Muni first established a trolley line along Van Ness Avenue; these were subsequently modified and restylized in conjunction with the opening of the Golden Gate Bridge in 1937 and the rebirth of Van Ness Avenue (Bunse and Allen, 2009). Though the SHPO agreed with FTA's finding that the poles did not constitute a National Register-eligible property in and of themselves because of a major compromise in the overall integrity of the poles, they nonetheless represent a landscape and streetscape element of the Civic Center Historic District. The replacement poles for all build alternatives are proposed to be of compatible architectural design. The replacement poles would be approximately 30 feet tall. Though slightly taller than the original height, the OCS structures would not be out of character with the setting of the Civic Center Historic District.

- **799 Van Ness Avenue (Wallace Estate Co. Auto Garage).** Build Alternative 2 would result in the removal of an existing bus shelter and replacement with a 150-foot BRT station (platform and canopy) in front of this building. This is at the location of the proposed NB Eddy Street BRT station. Because the reinforced concrete frame building's most character-defining features are a second and third symmetrical arrangement of industrial windows flanking all exposed elevations, the setting, feeling, and association would not be greatly diminished by the proposed BRT changes at ground level. The property's NRHP eligibility status would not change.
- **945-999 Van Ness Avenue (Ernest Ingold Chevrolet Auto Showroom).** With the exception of the placement of some new OCS/streetlight poles on Van Ness Avenue as part of the BRT system, there are no physical changes anticipated under Build Alternative 2 in front of the property located near O'Farrell Street; therefore, none of the building's significant character-defining features, nor its setting, feeling, or association would be altered by the proposed project. The property's NRHP eligibility would not be affected.
- **1320 Van Ness Avenue (Scottish Rite Temple).** Build Alternative 2 would replace the current bus shelter with a station platform in front of this four-story building. This is at the

location of the proposed NB Sutter Street BRT station. The symmetrical steel frame concrete building rests on a smooth granite base. A simple dentil stringcourse separates the first story from the upper stories of the building, which are dominated by seven two-story arched window insertions. The fourth story is demarcated by a narrow course of windows, separated by eight embossed panels and a highly designed cornice. While the greater proportion of significant character-defining features are located well above the height of the proposed station canopy, the visual character of the historic property would be slightly diminished by its placement, and the property's setting and feeling would be altered. Even with the proposed changes induced by the project, the property's NRHP eligibility would remain.

- **1699 Van Ness Avenue (Paige Motor Car Co. Auto Showroom).** The former auto showroom at the corner of Van Ness Avenue and Sacramento Street would experience a slight obstructive effect under Build Alternative 2 because the proposed SB Sacramento Street BRT station platform would replace the smaller existing bus stop and would extend in front of the building's front door entrance. Therefore, the project would partially block the street frontage views of the historic property, including the distinctive arch-shaped two-story-tall floor-to-ceiling show window; however, because the character-defining features, in addition to the show windows, include the roof cornices, upper-story fenestration, and uniform layout symmetry, all would remain plainly visible to those viewing it. The changes would slightly diminish its overall setting and feeling but would not constitute a substantial change in the property's historic character. The property's NRHP eligibility would not be affected.
- **1946 Van Ness Avenue (California Oakland Motor Co. Auto Showroom).** There would be a slight obstructive effect to this property under Build Alternative 2 because the proposed NB Jackson Street BRT station platform would be located within the curbside parking area as a curb extension in front of the building's front door entrance, and it would partially block first-floor views of the historic property from the street level. It would not physically touch the building or affect its ingress/egress. Because the character-defining features are those that extend skyward and highlight its factory-like orderly grid, massive scale, and functionalism, there would be no measurable change to its overall setting, feeling, or association due to its highly urbanized setting. The property's NRHP eligibility would not change.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians

Build Alternative 3 (see description in Section 2.2) would involve placement of the bus platforms in existing landscaped dual medians (the medians would be approximately 4 feet to 9 feet wide in many locations), in addition to the OCS pole/street light replacement. See Figure 4.4-8 for a simulation of the Build Alternative 3 BRT bus station at the location of City Hall. Because much of the proposed construction work would occur within the existing median of Van Ness Avenue, which in earlier decades experienced placement and then removal of trolley tracks, a major street widening, and construction of a concrete median, the character-defining characteristics of none of the NRHP properties would be substantially affected. While the proposed changes associated with this alternative would result in a slight alteration in the urban setting, they would not constitute a significant change in the setting, feeling, or atmosphere to any of the seven significant historic and architectural properties in the APE.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median

Build Alternative 4 (see description in Section 2.2) involves placement of a dedicated bus lane adjacent to a single 14-foot-wide median. Station platforms would be located on the single center median. See Figure 4.4-8 for a simulation of the Build Alternative 4 BRT bus station platform at the location of the City Hall. Build Alternative 4 also includes the streetscape improvements associated with the other build alternatives and OCS pole/

streetlight replacement. Previous infrastructure construction activity, including a major widening of Van Ness Avenue in 1936-37, installing trolley tracks and subsequent removal of them, constructing concrete medians, and various other improvements as Van Ness Avenue transformed over time as US 101, have collectively continued to change the urban environment; therefore, while the proposed changes associated with this alternative would result in a slight alteration in the urban setting, they would not constitute a significant change in the feeling or association of any of the seven significant historic and architectural properties in the APE. Therefore, the NRHP eligibility status would not change for any of the seven significant historic and architectural properties in the APE.

Center-Lane Alternative Design Option B

The design option would involve incorporating left-turn lanes at certain street locations; it would make no difference to the qualities and important features of the NRHP-eligible or listed properties in the APE.

LPA: Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns

The LPA is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. Under the LPA, BRT vehicles would run alongside a single median for most of the corridor, similar to Build Alternative 4, and at station locations BRT vehicles would transition to the center of the roadway, allowing for right-side loading at station platforms similar to Build Alternative 3. The LPA BRT station platform locations are configured to optimize use of the median for landscaping, transit operations, and pedestrian safety; these station locations are shown in Figure 4.5-3, and more detailed information on the analysis and environmental consequences is presented in Chapter 10, Section 10.4.1.3.

KEY FINDING

Constructive use of the Section 4(f) historic architectural properties would not occur.

As described for Build Alternatives 3 and 4, while the proposed changes associated with the LPA (with or without the Vallejo Northbound Station Variant) would result in a slight alteration in the urban setting, they would not constitute a significant change in the feeling or association of any of the seven significant historic and architectural properties in the APE. Therefore, the NRHP eligibility status would not change for any of the seven significant historic and architectural properties in the APE. No NRHP-eligible or listed architectural resources were identified in the block of Van Ness Avenue between Vallejo and Green streets where the Vallejo Northbound Station Variant is under consideration. Moreover, FTA and SFCTA, in applying the Criteria of Adverse Effect, concluded that a finding of No Adverse Effect with Conditions (for focused documentary research for archaeological resources) is appropriate for the LPA and sought concurrence from the SHPO pursuant to 36 CFR 800.5(c). Upon review of this determination, the SHPO concurred that the project would not change the NRHP eligibility status for any of the seven significant historic and architectural properties in the APE and that the proposed undertaking would have no adverse effect on these properties, or on archaeological resources with the condition that the project proponents will produce detailed documentary research, and a site treatment plan if necessary (see Section 4.15.4.2) to identify and protect potential buried archaeological resources (see SHPO letter dated May 17, 2013, Appendix C).

4.5.5 Avoidance, Minimization, and/or Mitigation Measures

Opportunities for harmonizing the visual effects of project elements with adjacent historic properties will continue to be explored as the design consultation process goes forward.

As explained in Section 4.4, Aesthetics/Visual Resources, depending on the alternative selected, opportunities for harmonizing the visual effects of project elements with adjacent historic properties will continue to be explored as the design consultation process goes forward. In addition to design, appropriate lighting, materials, and color choices that complement the historic properties and are sensitive with their surroundings will be identified. Design will be guided by the Secretary of the Interior's *Standards for the Treatment of*

Historic Properties (Standards) to the extent applicable. In particular, the design for any of the platform boarding areas and shelters near the Civic Center NHL District will be reviewed by SFCTA, the HCP, City Hall Preservation Advisory Commission, and a historic architect hired by SFMTA for compliance with the Secretary of the Interior's Standards based on compatibility with the character-defining features of the district in terms of massing, size, scale, and architectural features. The Historic Preservation Commission shall make a determination regarding the Certificate of Appropriateness application for the work proposed in the historic district. The BRT infrastructure at this location will be designed to reinforce the established character of the historic district and provide visual continuity of the streetscape.

See the following mitigation measures presented in Section 4.4.4 that pertain to historic properties: M-AE-2, M-AE-3, M-AE-5, and M-AE-6. These mitigation measures incorporate approval processes and design parameters that ensure compatibility of the BRT project with historic elements such as the Civic Center NHL District. In addition, see Section 4.15.4 for the following mitigation measures to address potential impacts to archaeological resources prior to and during the construction period: M-CP-1, M-CP-2, M-CP-3, and M-CP-4. These mitigation measures are intended to ensure that more detailed investigation of archaeological resources is undertaken and that all actions are taken to protect archaeological resources discovered during construction. The mitigation measures listed in Sections 4.4.4 and 4.15.4 and referenced above are derived from the Finding of Effect with Conditions prepared by FTA and SFCTA for the LPA (Parsons, 2013c). As discussed above, the SHPO concurred with these measures as part of the basis for the determination of No Adverse Effect with Conditions for the LPA (see Appendix C).

With regard to the potential for impacts to archaeological resources, see mitigation measures M-CP-C1 and M-CP-C2 in Section 4.15.4.2. These mitigation measures provide for focused archival research to identify any specific areas within the APE that may be likely to contain potentially significant remains, and the development and implementation of a Testing and Treatment Plan in event that major areas of direct impact contain locations with a moderate to high potential to retain extant historic or prehistoric archaeological remains that could be evaluated as significant resources.

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4.6 Utilities

This section summarizes the regulatory setting; affected environment; environmental consequences; and measures to avoid, mitigate, or compensate for long-term, permanent impacts to utilities as a result of the proposed project. Construction-phase impacts and avoidance measures are presented in Section 4.15.5. Documents reviewed in support of this study include the *Water Quality Technical Report: Van Ness Avenue Bus Rapid Transit Project* (Parsons, 2013), *Project Construction Plan for the Van Ness Avenue Bus Rapid Transit Project* (Arup, 2012), and the *San Francisco Better Streets Plan* (City of San Francisco, 2010). In addition, a list of utility providers in the project area was obtained from Underground Service Alert (USA, 2008). Utility maps of the project corridor were created based on as-built plans obtained from utility providers and City Departments and information compiled by SFDPW for the Van Ness Avenue Feasibility Study.

The SFDPW maintains a Five-Year Plan to coordinate utility work and construction projects within the City public ROW to minimize impacts of construction and maintenance

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences related to utilities under the LPA, with or without the Vallejo Northbound Station Variant, are identified as part of the analysis presented for the build alternatives in this chapter. Since the LPA configuration is a variation of the configurations analyzed for the center-running alternatives in the Draft EIS/EIR, the LPA has slightly different implications to utilities (namely sewer) than as described for Build Alternatives 3 and 4. Nonetheless, the overall impact findings for the LPA, with or without the Vallejo Northbound Station Variant, are consistent with the findings for Build Alternatives 3 and 4, as presented in this subsection.

4.6.1 | Regulatory Setting

SFDPW coordinates utility work and construction projects within the City public ROW to minimize impacts of construction and maintenance activities on neighborhoods and on the people who are served by the utility systems. SFDPW employs several tools and depends on specific regulations to coordinate street excavation, utility work, and other construction in the public ROW, as described below. In addition, as the owner of the Van Ness Avenue ROW, Caltrans has mandatory standards, policies, and procedures for the placement and protection of underground utility facilities within highway ROW. These tools, standards, and policies are discussed below.

The SFDPW Five-Year-Plan is available online at www.sfdpw.org/index.aspx?page=370

4.6.1.1 | SAN FRANCISCO DEPARTMENT OF PUBLIC WORKS CODE, ARTICLE 2.4 AND DIRECTOR'S ORDER NO. 176, 707

Public Works Code Article 2.4 Excavation in the Public Right-of-Way governs excavation within the public ROW that is under jurisdiction of SFDPW. Article 2.4 requires any person excavating in the public ROW to obtain an excavation permit and comply with the Orders and Regulations of SFDPW Order No. 176, 707. This Order establishes rules and regulations for excavating and restoring streets in San Francisco that are under jurisdiction of SFDPW. These rules and regulations are intended to "balance the needs to preserve and maintain public health, safety, welfare, and convenience" by minimizing disruption to neighborhoods and the traveling public while upgrading and maintaining utility services (SFDPW, 2007). This Code and Director's Orders apply to the proposed Van Ness Avenue BRT Project and have been taken into account in the construction phasing and staging plan in the Project Construction Plan (PCP) (Arup, 2012).

4.6.1.2 | UTILITY AND PAVING FIVE-YEAR PLAN REPORTS, MAPS, AND DATABASE

DPW Order No. 176, 707 establishes the requirement for 5-year plans of major anticipated work. Each April and October, utility providers and municipal excavators, or City project proponents, must submit a 5-year plan to SFDPW that lists all major work anticipated to be completed within the public ROW. SFDPW coordinates these plans with the SFDPW Five-Year Paving Plan into a single, comprehensive Five-Year Plan and Map to identify conflicts and opportunities for joint work. This work is coordinated through the SFDPW-led Committee for Utility Liaison on Construction and Other Projects (CULCOP). The CULCOP includes every utility provider and municipal excavator in the City and meets monthly to discuss the scheduling of utility work and major projects. The Street Construction Coordination Center works closely with CULCOP to coordinate all work in City streets and provides an agency contact list for official written intent to begin construction, known as NOI, for distribution. Prior to issuance of an excavation permit, the permit application is checked against the Five-Year Plan and scheduled paving projects. The proposed BRT project is in the Five-Year Plan and is being tracked by CULCOP.

DEFINITION

5-YEAR MORATORIUM: No project may excavate on San Francisco streets that have been reconstructed, repaved, or resurfaced within a preceding 5-year timeframe.

Order No. 176, 707 establishes a 5-year plan moratorium on excavating in streets that have been reconstructed, repaved, or resurfaced within a preceding 5-year period. Such projects are listed in the *Streets under Excavation Moratorium* list maintained by SFDPW. The 5-year plan moratorium encourages utility owners to determine alternative methods of making necessary repairs to avoid excavating in newly paved streets. It also encourages utility providers and construction project proponents to coordinate and plan activities to avoid work in the recently disturbed public ROW. Waivers to the moratorium and permits to excavate in moratorium streets may be granted by the Director of Public Works for "good cause," such as to repair leaks, deploy new technology, provide new service, or other situations deemed to be in the best interest of the general public (SFDPW, 2007). Currently, there are no moratoria on Van Ness Avenue. The CULCOP that monitors and updates the Five-Year Plan has already begun to coordinate related and planned projects in the Van Ness Avenue corridor, including the proposed project.

A Five-Year Plan database is a tool that supports the aforementioned planning efforts by tracking projects. A user-friendly application of this database, which lists all active permits in the public ROW by street, is available online to the general public.

4.6.1.3 | REGULATIONS FOR WORKING IN SAN FRANCISCO STREETS (BLUE BOOK)

Regulations for Working in San Francisco Streets (the Blue Book) are put out by SFMTA and are intended to establish rules so that construction and repair work can be done safely and with the least interference to pedestrians, bicycles, transit, and vehicular traffic. It requires the use of control, warning, and guidance devices that must conform to the most current version of the CAMUTCD, which is the amended version of FHWA's MUTCD for use in California. The Blue Book states that only one general contractor at a time (and associated subcontractors) is allowed to work on any one block. This means that project construction and maintenance work must be coordinated with other projects, including those of utility providers, along the corridor to ensure that adequate and continuous traffic lanes remain open. In addition, typically only one crosswalk at an intersection is allowed to be closed at a time per the Blue Book. Furthermore, appropriate temporary crosswalk signs must be posted to guide pedestrians and bicyclists. The Blue Book rules would be applied to the proposed project as appropriate and at SFMTA's discretion because the Blue Book is intended for minor development or construction projects that are typically only a few blocks in extent.

RESOURCES

SFDPW public works code: www.municode.com/Library/clientCodePage.aspx?clientID=4201

SFMTA Blue Book: www.sfmta.com/cms/vcons/bluebook.htm

State of California General Order 95: docs.cpuc.ca.gov/published/GENERAL_ORDER/52593.pdf

Better Streets Plan: www.sf-planning.org/ftp/BetterStreets/index.htm

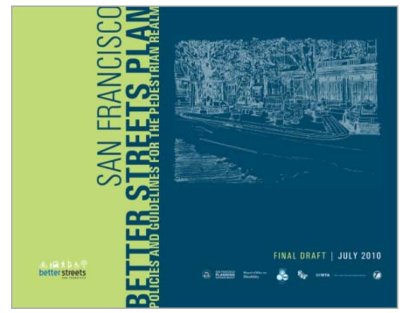
4.6.1.4 | STATE OF CALIFORNIA CODE OF REGULATIONS, SUBCHAPTER 5, ELECTRICAL SAFETY ORDERS, GROUP 2, ARTICLE 37

Maintenance and other work around the OCS is governed by the California Division of Occupational Safety and Health Administration (Cal-OSHA) Rule for working around the energized wires, specifically, Subchapter 5, Electrical safety orders, group 2, Article 37. This section sets the clearance requirements for equipment type used around energized OCS. Of specific relevance to the Van Ness Avenue BRT project are the minimum allowable clearances to wires and work requirements near overhead lines.

4.6.1.5 | CALTRANS REQUIREMENTS

Caltrans has mandatory standards, policies, and procedures for the placement and protection of underground utility facilities within highway ROW, as specified in Chapter 13 of the *Right-of-Way Manual* and the *Policy on High- and Low-Risk Underground Facilities within Highway Rights-of-Way*. Such policies require all utility relocations to be approved through an encroachment permit process, and they govern identification, location, and clearances, as well as activities during construction. Construction of the Van Ness Avenue BRT would require an encroachment permit and would need to comply with Caltrans requirements. Van Ness Avenue is classified as a conventional highway (US 101) within the limits of the project; therefore, it is not subject to the utility relocations requirements described in Chapter 17 of the PDPM "Encroachment in Caltrans Right-of–Way," which only apply to Freeways and Expressways.

4.6.1.6 | SAN FRANCISCO BETTER STREETS PLAN



The *San Francisco Better Streets Plan* sets forth guidelines for streetscape and pedestrian design as part of a larger planning effort to create a unified set of standards, guidelines, and implementation strategies for the City's pedestrian environment. Chapter 6.6, Utilities and Driveways, sets forth guidelines for well-organized utility design and placement that address the following goals:

- Minimization of streetscape clutter and maximization of space for plantings;
- Improved efficiency of utilities and integrated alignment with stormwater facilities, street furnishings, and lighting;
- Reduced cutting and trenching;
- Reduced long-term maintenance conflicts and potential costs;
- Reduction of long-term street and sidewalk closures; and
- Improved pedestrian safety, quality of life, and ROW aesthetics.

The *San Francisco Better Streets Plan* also includes guidelines for screening surface-mounted utilities and recommendations that support utility undergrounding to address aesthetic goals in Citywide streetscape improvement. Section 4.4, Visual/Aesthetics, discusses these and other City aesthetic streetscape policies.

4.6.2 | Affected Environment

Underground and aboveground utilities are present along Van Ness Avenue and throughout the project corridor. Utility facilities in the project corridor include utility poles and overhead wires, surface-mounted utility boxes, utility (i.e., water and sewer) mains, laterals and vaults, and valves. These features support the combined sewer (i.e., stormwater and wastewater combined system), water, gas, and telecommunications, as well as traffic signals, street lights, and Muni OCS support poles/streetlights. Utilities typically run parallel to Van Ness Avenue within the sidewalk, pavement, and median. Utilities also run perpendicular to Van Ness Avenue at cross street locations and at lateral connections serving adjacent land uses.

4.6.2.1 | UTILITIES AND MAJOR SERVICE PROVIDERS

Primary utility providers and facilities serving the project corridor include:

- SFPUC underground combined sewer/stormwater treatment system;
- City and County of San Francisco Water Department (SFWD) potable (i.e., drinking) water lines;
- SFFD auxiliary water supply service (AWSS) lines and underground cisterns;
- SFPUC Hetch Hetchy Water and Power street lights;
- SFMTA underground traction power duct bank and OCS facilities;
- SFMTA Bureau of Engineering traffic signal hardware and conduits;
- Pacific Gas and Electric (PG&E) underground natural gas lines;

- PG&E electrical transmission and distribution lines; and
- Telecommunications copper and fiber-optic lines, including those owned by AT&T, MCI, MFS, RCN, SBC, Level 3, and Comcast.

Related utility facilities in the project corridor include:

- Electrical and communications vaults located along duct-bank alignments to facilitate the installation of conductors and cables;
- Sewer manholes used for maintaining the sewer mains;
- Water main gate valves and other appurtenances for isolating sections of the main for maintenance; and
- Service laterals to adjacent land uses (e.g., residences and businesses) for all utilities.

A description of existing utility facilities in the Van Ness Avenue corridor follows.

Sewer / Stormwater Treatment System

SFPUC operates and maintains various sewer lines that run down the center of Van Ness Avenue from Market to Lombard streets and the associated manholes. The sewer also functions as a stormwater system, called the combined sewer system (CSS) as described in Section 4.9, Water Quality and Hydrology. The sizes and types of sewer lines include 3-foot by 5-foot brick; 12-inch to 27-inch vitrified clay pipe (VCP), which is located underneath the existing center median; a 16-inch reinforced concrete pipe (RCP); 15-inch and 16-inch iron stone pipe (ISP); and 16-inch brick pipe within Van Ness Avenue. The sewer dates from the 1840s and is in varied condition. Several sections have been upgraded over the years, but many emergency repair projects have been required in recent years due to pipe failure. Currently, SFPUC is preparing a Sewer Master Plan that will include a rating of each sewer in San Francisco and prioritization for upgrade work.

Potable (Drinking) Water

The SFWD of SFPUC operates the water system that feeds low-pressure fire hydrants and provides drinking water to the area. The system includes underground pipes, gate valves to control water flow, and hydrants along the west and east sides of Van Ness Avenue. Water lines are typically 4 to 8 inches in diameter.

The auxiliary water supply system (AWSS), constructed after the 1906 earthquake, is a water distribution system operated and maintained by the San Francisco Fire Department. It delivers water under high pressure for fire fighting and is independent from San Francisco's domestic water system. It consists of 2 pump stations, 2 water storage tanks, 1 reservoir, 172 cisterns, and approximately 135 miles of pipes.

Auxiliary Water Supply System

SFFD operates the AWSS system, which is a high-pressure water system that supplies water to SFFD. The system includes underground ductile iron and cast-iron pipes, underground cisterns, and aboveground gate valves to control water flow. A special truck with a motorized rig is used to turn gate valves. AWSS pipelines run along the east and west sides of Van Ness Avenue beneath the roadway, and they are typically 8 to 18 inches in diameter. The location of AWSS lines from the face of curb to the centerline of the pipes varies between 20 feet and 30 feet. Cisterns are large storage tanks buried under the roadway surface approximately 25 to 30 feet in diameter and 20 to 25 feet tall, and they hold approximately 75,000 gallons of water. The cisterns provide a source of water second to that of fire hydrants. Approximately 10 cisterns have been identified along Van Ness Avenue within the project corridor.

Traction Power Duct Bank

SFMTA operates and maintains a major duct bank, consisting of a series of concrete-encased ducts that runs the length of Van Ness Avenue beneath the SB parking lane. The duct bank provides traction power for the OCS, and it also carries a PG&E 12-kilovolt (kV) supply line and traffic signal interconnect conduits. The duct bank varies in size, but it typically carries up to nine 2- and 3-inch ducts within an approximate 1-foot 6-inch by 2-foot concrete encasement.

Gas and Electricity

Natural gas and electric power is supplied to the project corridor by PG&E. There are no aboveground electric transmission and distribution lines along Van Ness Avenue; however, overhead lines cross Van Ness Avenue at some cross street locations. A 12-kV line runs within the traction power duct bank.

Natural gas is supplied to the project corridor via a system of 2- to 4-inch-diameter underground pipelines located parallel to and across Van Ness Avenue. There are 12-inch gas mains in the vicinity of Market Street and gas mains ranging from 2 to 16 inches at various cross street locations. There are also many abandoned and deactivated gas mains along Van Ness Avenue.

Telecommunications Systems

Several telecommunications lines, including copper and fiber, are located beneath Van Ness Avenue within the project corridor. In addition, aboveground telephone lines cross Van Ness Avenue at various cross street locations.

4.6.2.2 | OTHER PLANNED UTILITY PROJECTS

Other planned projects involving utilities in the Van Ness Avenue ROW are included in the No Build Alternative, and these projects would be integrated into construction of a BRT build alternative in compliance with City policies to minimize community disturbance and identify potential conflicts and opportunities for joint work (see Section 4.6.2.3). These projects are reviewed below.

Due to structural failing, the OCS support poles/streetlights along Van Ness Avenue would be replaced under all alternatives, including the No Build Alternative.

OCS Support Poles/Streetlights

The existing 25-foot-tall OCS support poles/streetlights are proposed for replacement under the proposed build alternatives, as well as under the No Build Alternative, based on need and funding availability, as described in Section 2.2, Project Alternatives. SFMTA, together with SFDPW and SFPUC, would replace the OCS support poles/streetlights to address the failing structural condition of the aged pole system (DPW, 2009). With the build alternatives, replacement would include removal of all existing poles and light fixtures, and installation of new poles and light fixtures as described in Section 4.15, Construction Impacts. This construction would be integrated with construction of the proposed BRT project, and replacement OCS support poles/streetlights would be designed to handle modern loads as required by the existing bus fleet and/or the proposed BRT bus fleet; the replacement poles would be approximately 30 feet tall to accommodate the BRT. New lighting would be energy efficient, require low maintenance, and meet current lighting requirements for safety. A new duct bank would be constructed within the sidewalk area to support the streetlights and traffic signal interconnect conduits.

SFgo

SFMTA operates the traffic signals along Van Ness Avenue. The traffic signals along Van Ness Avenue, Franklin, and Gough streets are proposed for replacement as part of MTA's SFgo program (see Chapter 2), and this work would be coordinated with construction of TSM features, including a fiber-optic communication system between signals, proposed as part of the BRT build alternatives.

Pavement Rehabilitation

Caltrans is responsible for maintenance of the Van Ness Avenue pavement. Caltrans prepared a draft Capital Preventive Maintenance Project Report in 2008 to address pavement rehabilitation (i.e., repair and replacement of failed areas) on Van Ness Avenue between Golden Gate Avenue and Lombard Street. Pavement rehabilitation is included as a project in the Caltrans 2007 Ten-Year SHOPP Plan for 2011/2012 FY and the 2010 SHOPP. This project would be coordinated with construction of the proposed BRT project and the aforementioned utility projects.

Road Repaving and Street Safety Bond Projects

A $248 million Road Repaving and Street Safety Bond was approved by voters in November 2011 (Proposition B). Recommended as part of the citywide Ten-Year Capital Plan to improve and invest in the City's infrastructure, the bond will repave streets; make repairs to deteriorating street structures; improve streetscapes for pedestrian and bicyclist safety; improve traffic flow on local streets; and install sidewalk and curb ramps to meet the City's obligations under the Americans with Disabilities Act (ADA). More information on this program can be found at http://sfdpw.org/index.aspx?page=1580.

As part of this program, the City has prioritized Gough, Franklin and Polk streets, parallel to the proposed BRT project, for resurfacing ahead of the construction start date of Van Ness Avenue BRT. For Gough and Franklin streets, the projects are being coordinated with the installation of pedestrian and traffic signal conduits to enable SFgo and pedestrian countdown signals for the length of the corridor. The Franklin Street project, which is scheduled to begin in 2013, has also included pedestrian bulbs at two intersections in the Market and Octavia Plan Study area. Other improvements, including pedestrian improvements, on Gough and Polk streets are being planned by the City.

4.6.3 | Environmental Consequences

The proposed project could result in adverse impacts to utilities if it would:

- Result in the need for expanded or additional facilities by a utility provider, or if a utility provider determines that it has inadequate capacity to serve a project's projected demand in addition to existing demand;
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB); or
- Conflict with access to key public utilities by utility providers.

The utilities to be analyzed include all those listed under Section 4.6.2 above. In addition, impacts to offsite landfill capacity are considered.

4.6.3.1 | UTILITY DEMAND AND CAPACITY

As discussed in Section 4.9, Water Quality and Hydrology, the proposed project would result in a net, slight increase in pervious surface area in the corridor; therefore, the proposed project would not result in increased stormwater flows that would require new or expanded stormwater facilities. None of the project build alternatives, including the LPA, (with or without the Vallejo Northbound Station Variant), would impact the combined sewer/stormwater treatment system.

Similarly, the proposed project would result in an increase in landscaped areas; however, this increase is not anticipated to require substantially more water usage over the existing conditions or No Build Alternative. Maintenance of the proposed BRT bus fleet may require additional water usage and wastewater generation; however, the existing water and wastewater infrastructure would be sufficient to accommodate such increases. The proposed project would not otherwise require additional water usage or wastewater treatment. No changes to the potable water and auxiliary water supplies would result under any project alternative, including the LPA (with or without the Vallejo Northbound Station Variant).

Trash receptacles would be provided at BRT station platforms to accommodate additional garbage generated by bus patrons. This additional garbage would not affect landfill capacity.

The proposed project would not require additional capacity or infrastructure for natural gas or other utility systems in the project corridor. No change in utility usage or facility expansion would occur under the No Build Alternative, with the exception of the OCS support pole/streetlight upgrade and new duct bank constructed within the sidewalk area to provide streetlight power and traffic signal interconnect conduits for the SFgo Program. Construction of this duct bank and the OCS poles could result in conflicts with existing utilities, necessitating their relocation.

Replacement of the OCS support poles/streetlights would involve upgrade of the lighting system to a modern, energy-efficient system that meets current pedestrian and roadway lighting requirements (DPW, 2009). The proposed project would benefit the street lighting with improved energy efficiency, increased reliability, reduced risk to maintenance staff due to a new standardized electrical service, and decreased operational costs.

Incorporation of Design Option B under Build Alternative 3 or 4 would not result in changes to utility demand and capacity.

Due to the close proximity to existing facilities, some utilities would require relocation or modification to maintain access for utility providers.

4.6.3.2 | UTILITY FACILITY ACCESS AND PLANNING

In addition to serving as a transportation facility, Van Ness Avenue provides access to key public utilities. As noted in Section 4.6.2, several utility facilities are provided aboveground and belowground within the Van Ness Avenue corridor. Utility providers need to access these facilities for maintenance, repair, and upgrade/replacement. The proposed project involves construction of a dedicated transitway, station platforms, curb bulbs, center medians, and landscaping that all have the potential to conflict with access to public utilities by utility providers. Due to the close proximity to existing facilities, utilities would require relocation or modification in some instances to maintain access for utility providers to conduct maintenance, repair, and upgrade/replacement activities. For example, construction of curb bulbs may require relocation of some existing stormwater drainage facilities, fire hydrants, manholes, or other appurtenances. In other cases, these facilities would simply need to be modified and adjusted to grade at new curb bulb locations.

In situations where utility facilities cannot be relocated, SFMTA would have a plan in place to accommodate temporary closure of the transitway and/or stations to allow utility providers to perform maintenance, repair, and upgrade/replacement of underground facilities. Planning for utility access within the transitway would likely involve temporarily rerouting bus service to a mixed-flow traffic lane and providing temporary curbside stations or station consolidation if needed. Temporary rerouting of bus service could involve a change in bus vehicle from electric trolley to motor coach to eliminate reliance on the OCS. Signage for BRT patrons and safety protocols for Muni operators and utility providers would be coordinated. These planning efforts would avoid impacts to facility access by utility providers.

Construction of curb bulbs may require relocation of some existing stormwater drainage facilities, fire hydrants, manholes, or other appurtenances.

Based on available information, it is anticipated that construction and operation of the proposed project could be coordinated with utility providers to avoid adverse impacts to utility facilities. The only exception is potential impacts to the existing VCP sewer pipeline located beneath the Van Ness Avenue median. Due to the age of this sewer pipeline, it is conservatively assumed that construction of Build Alternatives 3 and 4 could potentially damage this pipeline because construction of BRT facilities would occur directly above it.[85] The proposed BRT transitway and stations under Build Alternative 3 (including Design Option B) would be located above the existing sewer pipeline. Under Build Alternative 4

[85] No impacts to the sewer main would result under Build Alternative 2 because construction and operation of the BRT would not occur above the sewer main.

(including Design Option B), only the portion of the proposed BRT transitway and stations located on the block of Van Ness Avenue between Geary and O'Farrell streets, and the transitional portions of the transitway just north and south of this block, would be located above the sewer pipeline. Under the LPA (with or without the Vallejo Northbound Station Variant), which combines design features of Build Alternatives 3 and 4, replacement of the aging sewer pipeline would be required at station locations and in areas where the vibration resulting from construction of the transitway has potential to damage the sewer.

An inspection of the sewer pipeline was performed in spring 2012. Based on preliminary results, 14 segments on 7 blocks are in poor condition and need to be replaced regardless of whether the Van Ness Avenue BRT Project is implemented. An additional 16 segments on 13 blocks need to be repaired. Even though the entire analysis of the sewer pipeline is still in progress, it can be assumed based on available data that potential adverse impacts to the sewer would result from Build Alternatives 3 and 4 and the LPA. For the segments where the inspection reveals that the sewer is deteriorated to the point at which construction of the BRT lane under Build Alternative 3 or 4, including the LPA, could damage it, SFPUC and SFMTA would coordinate to accelerate planned replacement, rehabilitation, or relocation of the sewer main as needed.

Complete relocation and replacement of the sewer pipeline within the project area is assumed under Build Alternative 3 (including Design Option B). Relocation and replacement of the sewer pipeline on Van Ness Avenue, approximately between Geary and O'Farrell streets, is assumed under Build Alternative 4. Under the LPA (with or without the Vallejo Northbound Station Variant), replacement of the sewer pipeline is assumed at station locations and in areas where the vibration resulting from construction of the transitway has potential to damage the sewer. This would ensure that construction of the BRT transitway would not damage the sewer pipeline and would minimize the likelihood that the new pavement constructed for the transitway would need to be excavated for future pipeline repair work per the goals of the City's Five-Year Plan and Streets under Excavation Moratorium. This relocation and replacement of the sewer pipeline is accounted for in the project construction schedule presented in Sections 2.6 and 4.15. Complete relocation and replacement of the sewer pipeline under Build Alternative 3, with or without incorporation of Design Option B, is anticipated to lengthen the construction timeframe between 4 and 12 months (Arup, 2012). Partial relocation and replacement of the sewer pipeline under Build Alternative 4, with or without incorporation of the Design Option B, is anticipated to lengthen construction between 2 and 4 months (Arup, 2012). Since the project has not completed its load (weight) analysis, there currently is no estimate for lengthening the timeframe due to replacement of sewer pipeline under the LPA, but the timeframe will fall between the full replacement of Build Alternative 3 and the partial replacement of Build Alternative 4. A more refined understanding of the sewer replacement work and its timeline will be part of 30 percent design work.

In conclusion, significant projects are planned within the Van Ness Avenue corridor that would involve utility work. Known projects to be coordinated with the proposed BRT project include replacement of the SFPUC sewer main pipeline, SFgo signal upgrades, Road Repaving and Street Safety Bond repaving and pedestrian improvement projects on Gough, Franklin, and Polk streets, and curb-to-curb pavement rehabilitation under the SHOPP. In addition, SFWD may plan to replace their water mains and laterals as part of the BRT construction. These projects and other planned projects in the project corridor listed in Section 1.3.4, Related Projects (e.g., CPMC, Doyle Drive, SFPark, and Geary BRT), would also be recognized and coordinated with CULCOP and the San Francisco Street Construction Coordination Center to avoid impacts to utilities to the largest extent possible.

4.6.4 | Avoidance, Minimization, and/or Mitigation Measures

In compliance with City and Caltrans policies, coordination with the utility providers and Caltrans would be initiated during the preliminary engineering phase of the project and would continue through final design and construction. Where feasible, utility relocations would be undertaken in advance of project construction. Design, construction, and inspection of utilities relocated for the BRT project would be done in accordance with City and Caltrans requirements. SFMTA would coordinate with the affected service provider in each instance to ensure that work is in accordance with the appropriate requirements and criteria.

The following avoidance and mitigation measures would be incorporated into project design and planning to avoid adverse impacts to utility systems and services:

M-UT-1. BRT construction will be closely coordinated with concurrent utility projects planned within the Van Ness Avenue corridor.

M-UT-2. An inspection and evaluation of the sewer pipeline within the project limits will be undertaken to assess the condition of the pipeline and need for replacement. Coordination with SFPUC and SFDPW will continue and be tracked by CULCOP.

M-UT-3. During planning and design, consideration must be given to ensure that the proposed BRT transitway and station facilities do not prevent access to the underground AWSS lines. There must be adequate access for specialized trucks to park next to gate valves for maintenance. The gate valves must not be located beneath medians or station platforms.

M-UT-4. In situations where utility facilities cannot be relocated, SFMTA will create a plan to accommodate temporary closure of the transitway and/or stations in coordination with utility providers to allow utility providers to perform maintenance, emergency repair, and upgrade/replacement of underground facilities that may be located beneath project features such as the BRT transitway, station platforms, or curb bulbs. Signage for BRT patrons and safety protocols for Muni operators and utility providers will be integrated into this plan.

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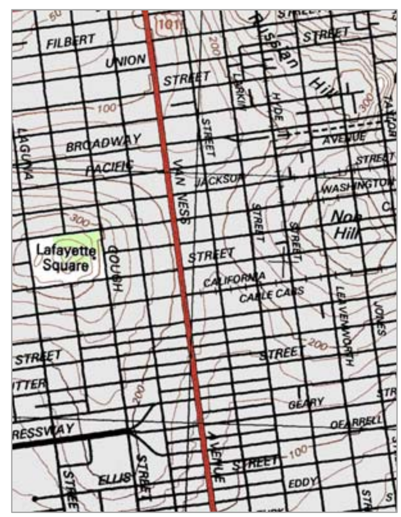
4.7 Geology/Soils/Seismic/Topography

This section describes the geologic resources along the project corridor and describes related impacts that could result from the Van Ness Avenue BRT Project. Geologic resources include geology, topography, subsurface soil conditions, groundwater, and seismicity. This section summarizes the findings of a Geologic Impacts Assessment Report prepared for the proposed project, which includes a review of published and online maps and reports presenting data on regional geology, seismic hazards, and faulting, in addition to San Francisco City records of geotechnical and environmental site investigations, and planning and database sources (AGS, 2009a).

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences related to geologic resources under the LPA, with or without the Vallejo Northbound Station Variant, are identified as part of the analysis presented for the build alternatives in this chapter. There would be no difference in such impacts under the LPA compared with the impacts described for the build alternatives in this subsection.

4.7.1 | Geologic Setting

4.7.1.1 | TOPOGRAPHY



The topography between Filbert and Eddy streets in the Van Ness Avenue corridor.

The terrain in northeastern San Francisco is hilly, consisting of gentle to moderately steep sloping ridgelines or hills and spur ridges, separated by small valleys or basins. The project alignment crosses near the low point of one of these east-west trending ridgelines that connects Nob Hill to the east and Pacific Heights to the west. Farther north, the project alignment crosses near the western toe of Russian Hill. The valleys and basins were typically filled by sediments, particularly by the irregular forms of alluvium and dune sands. To a lesser extent, the native topography has been altered by urban development, particularly by the grading and placement of fill materials to varying extents along the entire length of the project alignment.

The topography along the project corridor varies in ground elevations from 44 feet above mean sea level (amsl) at Van Ness Avenue and Mission Street, to a maximum elevation of 200 feet amsl at the Clay Street and Van Ness Avenue intersection. Gradients vary from less than 1.5 percent to as high as 8.0 percent along the project alignment. Figure 4.7-1 shows the slope gradient along the project alignment.

4.7.1.2 | GEOLOGY

The project corridor is situated within the Coast Ranges Geomorphic Province. This province forms a nearly continuous barrier between the Pacific Ocean to the west and the San Joaquin and Sacramento valleys to the east. The structural depression of the San Francisco Bay and the alignment of the ridges and valleys is a result of long-term ground deformation from regional tectonic stresses. These stresses are periodically relieved by ruptures occurring along the active fault traces in the region, notably along segments of the San Andreas Fault system and other related faults.

The area east of the San Andreas Fault, including the project alignment, is underlain at depth by late Mesozoic era (i.e., Jurassic to Cretaceous) bedrock of the Franciscan Complex, consisting mainly of shale, sandstone, chert, pillow basalt, and serpentinite. The bedrock is exposed in erosive cuts and bluffs, and also in the steeper terrain where it has remained uncovered by dune sand, alluvium, or artificial fill. The type of bedrock that is present reflects the tectonic environment in which it formed, ranging from a deep offshore to shallow onshore margin, where sediment was initially compressed to form rock over the top of the underlying

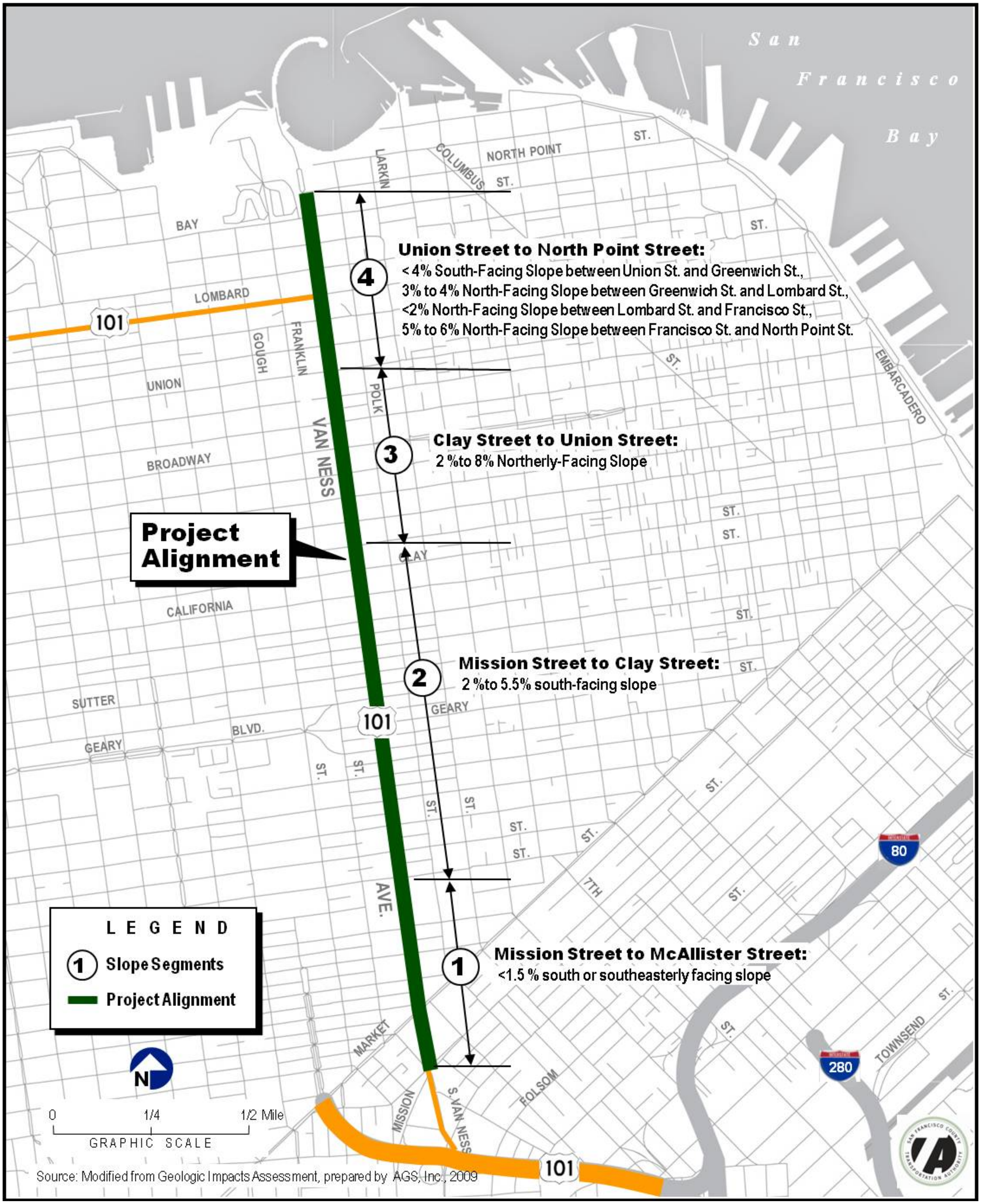


Figure 4.7-1: Project Alignment Slope Map

oceanic crust and later deformed in the process of the Pacific Plate subducting underneath the North American Plate. This type of tectonic regime continued until a shift during the Late Cenozoic Era, between 30 million years ago (Ma) and 25 Ma, when lateral strike-slip motion along the ancestral faults of the San Andreas Fault system became prevalent.

Four distinct geologic units underlie different portions of the project alignment. From youngest to oldest, these units are historic fill, dune sand, alluvium, and Franciscan Complex Bedrock. Figure 4.7-2 shows the geologic units along the project alignment. As shown in Figure 4.7-2, deposits of dune sand and alluvium underlie the Civic Center and South of Market portions of the project alignment. In these areas, the dune sand and alluvium deposits are more than 200 feet thick (AGS, 2009a). The sedimentary deposits thin out on the sides of Nob Hill, Pacific Heights, and Russian Hill, including the area of the project alignment, where Franciscan bedrock is likely to be found at moderately shallow depths of less than 100 feet (AGS, 2009a).

Four distinct geologic units underlie different portions of the project alignment: historic fill, dune sand, alluvium, and Franciscan Complex Bedrock.

4.7.1.3 | SUBSURFACE SOIL CONDITIONS

General subsurface soil conditions underlying the project alignment are described below by segment. More-detailed information on subsurface soil conditions is provided in the Geologic Impacts Assessment Report prepared for the proposed project (AGS, 2009a). The report explains that local areas of historical fill, including pavement fill and structural fill underneath the buildings and structures, are likely present throughout most of the project alignment due to the long urban history of the Van Ness Avenue corridor.

Mission Street to McAllister Street

As shown in Figure 4.7-2, dune sand (Qds) is mapped underneath most of this segment of the project alignment. Underneath the dune sand are variably thick layers of older alluvium and at depth, Franciscan Complex bedrock. Groundwater has been encountered in this area at a depth of approximately 20 feet (AGS, 2009a).

McAllister Street to Clay Street

Dune sand (Qds) is mapped underneath this segment of the project alignment, but the depth to bedrock is expected to be shallower than farther south, particularly at the higher elevations between California and Clay streets (Joyner, 1982). Soil borings to a depth of 25 feet bgs that were completed in 1998 in this area did not encounter groundwater.

Clay Street to Union Street

Dune sand (Qds) is mapped as far north as Broadway Street in this portion of the project alignment. A large contiguous deposit of fill (af) is mapped north of Broadway Street, to the south of Union Street. Immediately south of Union Street, there is a contact between the fill to the south and native alluvial soils (Qoa) to the north (Witter, *et al.,* 2006). Soil borings drilled in this area to depths of 26 feet bgs did not encounter groundwater.

Union Street to North Point Street

Alluvium (Qoa) is mapped underneath the Union Street intersection northward to the western portion of the Van Ness Avenue/Greenwich Street intersection, where there is a contact with the underlying Franciscan sandstone and shale bedrock (br). Shallow bedrock (br) occurs beneath the eastern portion of the Van Ness Avenue/Greenwich Street intersection northward to the southern edge of the Van Ness Avenue/Lombard Street intersection. Alluvium (Qoa) is mapped underneath the actual Van Ness Avenue/Lombard Street intersection northward to the Van Ness Avenue/North Point intersection (Graymer, *et al.,* 2006). Chestnut to North Point streets is underlain by dune sand (Qsd). No previous studies were identified that could provide known groundwater depths in this segment (AGS, 2009a).

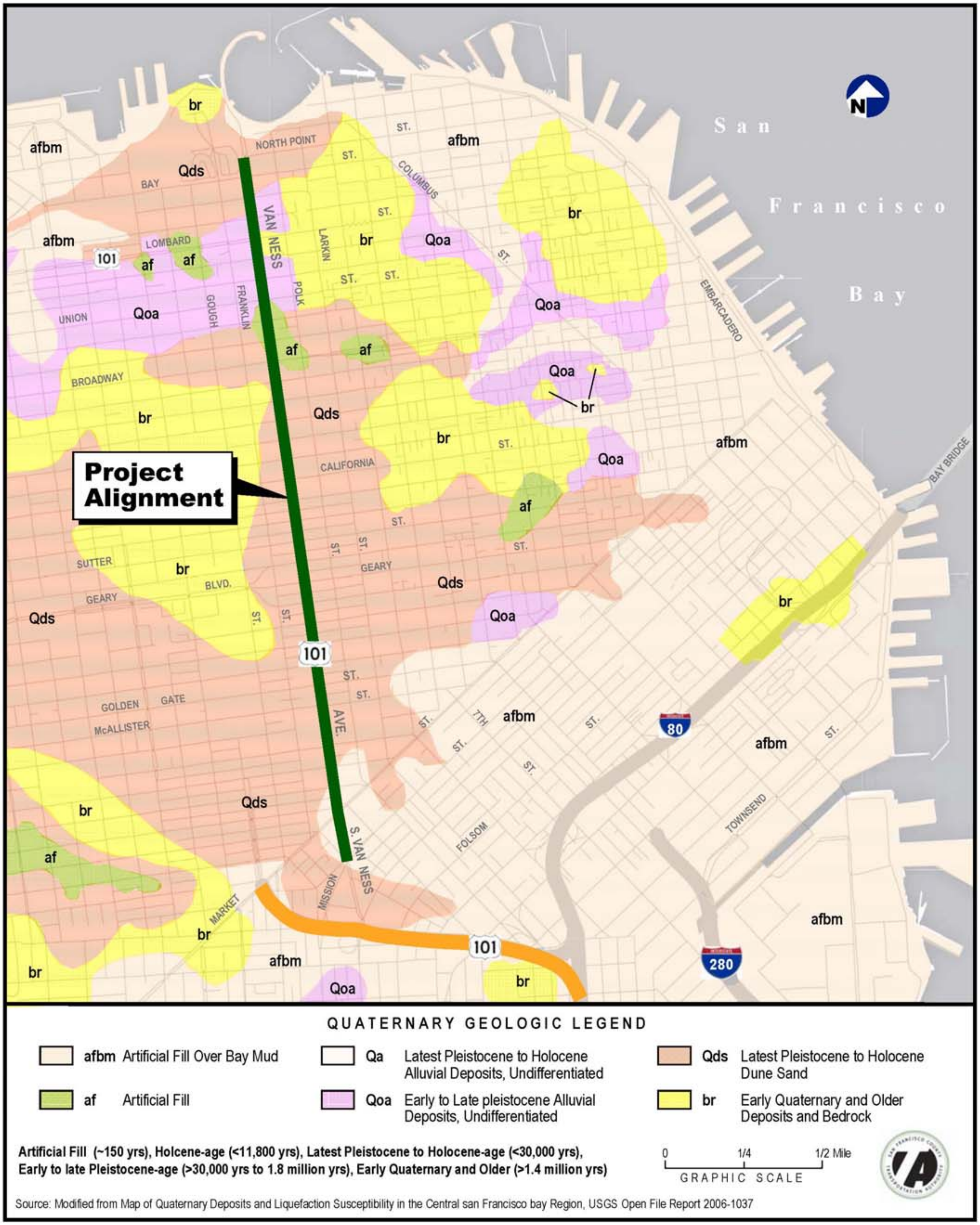


Figure 4.7-2: Mapped Soils Underlying Project Alignment

4.7.1.4 | GROUNDWATER

The project area is largely located within the Downtown Groundwater Basin (Basin 2-40) (AGS, 2009a). None of the geologic formations along the project alignment are considered useful aquifers due to poor overall water quality and high concentrations of undesirable minerals. In general, reported groundwater levels are expected to vary seasonally and annually based on rainfall patterns, microtopography and distribution of impervious surfaces, and the pattern of groundwater withdrawal or localized pumping. Geologic mapping indicates that the groundwater table occurs less than 20 feet bgs in most of the lower-lying areas along the project alignment, where the ground elevation is less than approximately 150 feet amsl. Available monitoring well data indicate depth to groundwater ranges from 5 to 20 feet bgs in two areas of the project corridor: (1) along Van Ness Avenue from Mission Street northward to the vicinity of Geary Boulevard; and (2) along Van Ness Avenue north of Broadway Street to Lombard Street. Monitoring well data indicate that groundwater depths exceed 20 feet bgs along Van Ness Avenue between Geary Boulevard and Broadway Street.

The direction in which groundwater flows changes with the varied topography along the project alignment. A Geocheck™ report prepared in 2008 for the proposed project indicates that groundwater flow in the vicinity of Mission and Market streets is to the east; on the south-facing hillside north of the Civic Center, the flow is generally to the south or southeast; and on the north-facing hillside north of Clay Street, the flow is generally to the northwest (EDR, 2008).

4.7.1.5 | SEISMICITY

The project corridor is located in a seismically active region with a history of strong earthquakes (AGS, 2009a). No active faults are known to cross the project corridor. Several major active faults are mapped within 30 miles of the project alignment, including the San Andreas, Hayward, Calaveras, and San Gregorio faults. Table 4.7-1 lists the major active faults that may affect the project area in order of proximity to the project corridor. Major faults in the project region are shown in Figure 4.7-3.

The maximum moment magnitude earthquake (Mmax) is defined as the largest earthquake that a given fault is calculated to be capable of generating. For the project corridor, the controlling Mmax would be a magnitude 7.9 event on the San Andreas Fault, which is located approximately 6.8 miles to the southwest of the southern project limit (AGS, 2009a).

Table 4.7-1: Active Fault Seismicity

FAULT	DISTANCE TO PROJECT AREA (MI)	MAXIMUM MOMENT MAGNITUDE EARTHQUAKE (MMAX)
San Andreas	6.8	7.9
San Gregorio	10.5	7.3
Hayward	11	7.1
Calaveras	23	6.8
Concord-Green Valley	25	6.9
Rodgers Creek	28	7.0
West Napa	29	6.7
Greenville	29	7.0

SOURCE: AGS, 2009a.

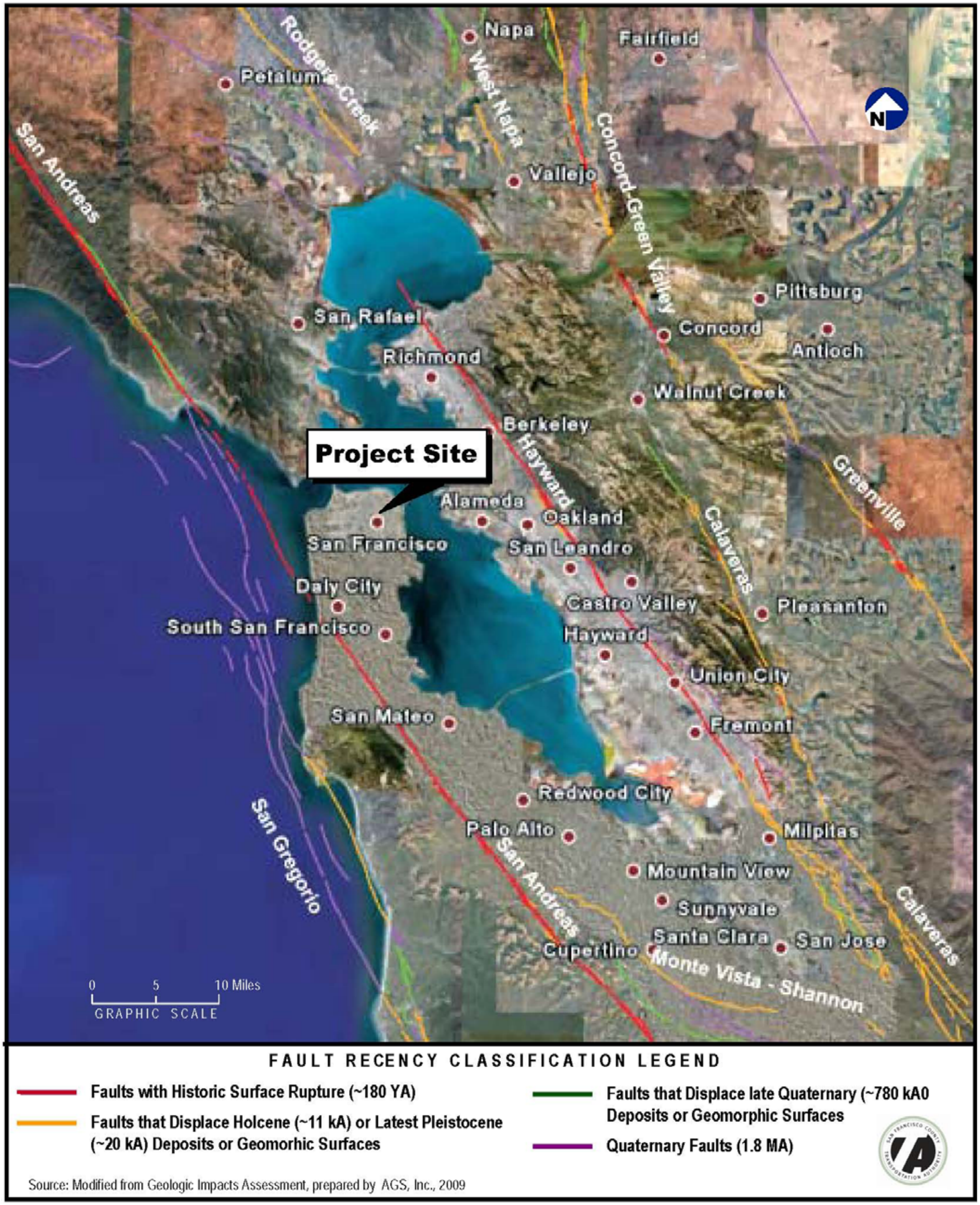


Figure 4.7-3: Earthquake Fault Map

4.7.1.6 | SEISMIC HAZARDS

Seismic hazards include primary and secondary effects from earthquakes, including fault rupture, ground shaking, liquefaction, ground settlement, slope instability and landslides, and tsunamis. The potential for these hazards to occur, as applicable to the proposed project, is discussed in this section.

Fault Rupture

There is no Alquist-Priolo Earthquake Fault Zone Map covering the San Francisco North Quadrangle, which includes the area of the project alignment, and geotechnical investigation reports completed in the area do not identify faulting; therefore, fault rupture is not anticipated in the project corridor.

Ground Shaking

The severity of future ground shaking along the project alignment is influenced by many factors, including the proximity of the project alignment to the location of the causative earthquake, the duration and intensity of the earthquake, and the type of geologic materials underlying the site. As described above, the project is located in a seismically active region with a history of strong earthquakes. The project area may be subject to very strong ground shaking (AGS, 2009a).

Liquefaction

Soil liquefaction is a phenomenon in which saturated, cohesionless soils lose their strength due to the build-up of excess pore water pressure, especially during cyclic loadings (i.e., shaking) such as those induced by earthquakes. In the process, the soil acquires mobility sufficient to permit horizontal and vertical movements if not confined. Soils most susceptible to liquefaction are loose, clean, uniformly graded, fine-grained sands. Gravels and coarse-grained sands are also susceptible to liquefaction, as are saturated silty and clayey sands. The consequences of liquefaction can include seismically induced settlements, additional lateral loads on piles, down drag forces on pile foundations, localized lateral deformation of soils, and flotation (i.e., buoyancy) of underground structures (i.e., tanks, pipelines, and manholes) underlain by the potentially liquefiable soils.

DEFINITION

SOIL LIQUIFACTION: When saturated, cohesionless soils lose their strength due to the build-up of excess pore water pressure, especially during cyclic loadings (i.e., shaking) such as those induced by earthquakes.

Two separate areas of the project alignment are considered susceptible to liquefaction, as shown in Figure 4.7-4. These are (1) the area between the Union Street and Broadway Street intersections, which is an area where historic fill is mapped; and (2) the area between the Hayes Street and Mission Street intersections, which is an area where artificial fill is mapped. Other portions of the project alignment are considered to have low to moderate susceptibility to liquefaction.

Seismically Induced Settlements

Seismic shaking may cause settlement of non-saturated soils to occur. Collapse of void space in porous soils reduces ground volume. Seismically induced settlements are expected to be concentrated where there are loose sandy soils with little fines and high porosity and in unconsolidated fill soils. Seismic shaking can result in consolidation of previously unconsolidated fill, which can trigger ground settlement. The dune sand areas, and potentially the artificial fill areas, within the project area may be subject to settlement.

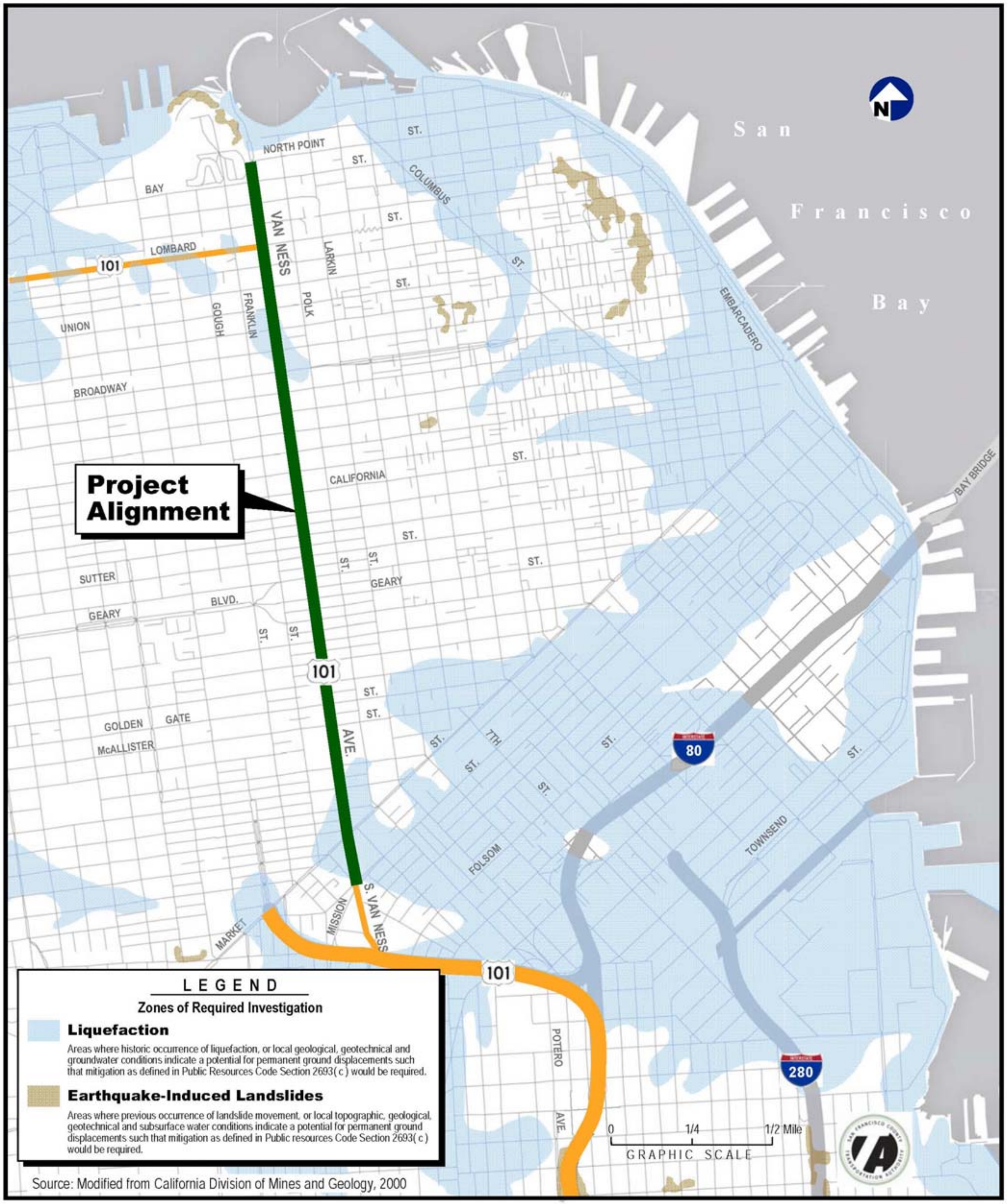


Figure 4.7-4: Seismic Hazard Map

Tsunamis

A tsunami is a series of traveling ocean waves of extremely long length generated by disturbances associated primarily with earthquakes occurring below or near the ocean floor. Underwater volcanic eruptions and landslides can also generate tsunamis. ABAG tsunami evacuation planning maps for the ocean side of San Francisco and San Mateo counties are based on modeling of potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources. According to the ABAG tsunami evacuation planning map for San Francisco and San Mateo counties, the project corridor is not located within a tsunami evacuation area.

RESOURCE

To see the ABAG tsunami evacuation planning map for San Francisco and San Mateo counties, go to: http://gis.abag.ca.gov.

4.7.1.7 | OTHER GEOLOGIC HAZARDS

Other types of geologic hazards typically depend upon the ground configuration and stability of underlying materials. These hazards exist regardless of the occurrence of earthquakes, but they are affected by factors such as weather and flooding potential, ground loading, construction-induced ground movements, and other types of natural disasters such as volcanic eruptions, non-seismically generated waves, and various types of slope failures. Hazards applicable to the project alignment are discussed in this section.

Slope Instability

Areas with the greatest potential for slope failure possess steep slopes and weak underlying rock or soil conditions. Increasing the risk of slope failure are saturated ground, rock bedding parallel to the slope gradient, and the occurrence of past landslides subject to reactivation, where there may be a zone or plane of weakness in the subsurface upon which ground movement could be triggered.

A major landslide or slope failure is not likely to occur along the project alignment. There are also no mapped landslides crossing the project alignment (Knudsen *et al.,* 2000), as depicted in Figure 4.7-4. The steepest slopes are between Pacific and Broadway (8 percent), and between Broadway and Vallejo (6.5 percent), as shown in Figure 4.7-1. The overall risk for slope instability or failure along the project alignment is low because slopes are flatter than 10 percent. More likely to occur would be minor slope failure, including instability resulting from local construction-induced settlements, or slumping if there were to be an improperly supported excavation near the base of a hillside.

A major landslide or slope failure is not likely to occur along the project alignment.

Settlement or Instability of Subsurface Materials

As described above in Section 4.7.1.6, dune sand and artificial fill areas in the project corridor may be subject to settlement.

4.7.2 | Environmental Consequences

The Van Ness Avenue corridor may be susceptible to the following geologic and seismic hazards: very strong ground shaking, liquefaction, and settlement. Risk of slope instability during project construction is discussed in Section 4.15.6.

Risk of slope instability during project construction is discussed in Section 4.15.6.

Each build alternative (including Design Option B) and the LPA (with or without the Vallejo Northbound Station Variant) would include the following project components subject to the aforementioned geologic and seismic hazards: new concrete paving (with an asphalt wearing surface) and rehabilitation or resurfacing of existing pavement throughout the BRT project alignment; sidewalk pedestrian curb bulbs; station platforms with approach ramps, canopies and signage; installation of modern OCS support poles/streetlights and associated conduit trench replacement, and potentially additional lighting. Build Alternatives 3 and 4 (including Design Option B) and the LPA (with or without the Vallejo Northbound

Station Variant) may involve replacement of all or portions of the existing, underground sewer pipeline.

The No Build Alternative would include the following project components subject to the aforementioned geologic and seismic hazards: curb-to-curb pavement resurfacing, construction of pedestrian curb ramps, installation of modern OCS support poles/ streetlights and associated conduit trench replacement, and potentially additional lighting.

KEY FINDINGS

Soils along the project alignment generally appear suitable for the support of these structures proposed as part of each build alternative, including the LPA, and the No Build Alternative. The risk of geologic hazards is low in the build alternatives, and the project would not increase those risks. No mitigations are proposed.

Soils along the project alignment generally appear suitable for the support of these structures proposed as part of each build alternative and the No Build Alternative. However, soil areas mapped as fill may be subject to settlement, and part of the project alignment is located in a liquefaction area; therefore, design of the aforementioned structures in each build alternative and in the No Build Alternative would include features to address very strong ground shaking, liquefaction, and settlement.

The scope of project structures is limited to that of streetscape features that would bear light loads; therefore, the risk of the aforementioned geologic hazards is low. The design of project features would meet seismic standards, and the project alternatives would not increase the risk of geologic hazards. Design features to address very strong ground shaking, liquefaction, and settlement are discussed below in Section 4.7.3.

4.7.3 Avoidance, Minimization, and/or Mitigation Measures

The results of the preliminary geologic assessment indicate that there are no substantial geologic hazard impacts that would not be fully addressed by design requirements, and no mitigation measures are proposed. Design features to address identified geologic hazards will be confirmed as the project progresses into advanced design. Some of these design features that may be applicable to each build alternative (including Design Option B) and the LPA (with or without the Vallejo Northbound Station Variant) are identified as the following improvement measures:

IM-GE-1. Localized soil modification treatments will be performed as needed at locations where station platforms would be located in areas of fill or mapped as a liquefaction area. Such soil modification may include soil vibro-compaction or permeation grouting.

IM-GE-2. Fill soils will be overexcavated and replaced with engineered fill as needed in areas where proposed project structures would be located in areas of fill or in liquefaction zones.

IM-GE-2. Deeper foundations will be designed for station platforms and canopies located in areas of fill or areas mapped as a liquefaction area, as needed.

4.8 Hazardous Waste/Materials

This section summarizes potential impacts from pre-existing hazardous materials that could expose construction workers or the general public to health risks and that may require implementation of special soil and/or groundwater management procedures. Section 4.15.7 discusses the potential impacts of hazardous materials and wastes that may be used or stored in conjunction with the project construction activities.

The LPA included in this Final EIS/EIR is a refinement of the center running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences related to hazardous waste and materials under the LPA, with or without the Vallejo Northbound Station Variant, are identified as part of the analysis presented for the build alternatives in this chapter. There would be no difference in such impacts under the LPA compared with the impacts described for the build alternatives in this subsection.

RESOURCES

For more information on federal laws pertaining to hazardous wastes/materials, please see:

RCRA:
www.epa.gov/osw/laws-regs/regs-haz.htm

CERCLA :
epa.gov/superfund/policy/cercla.htm

4.8.1 | Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for "cradle to grave" regulation of hazardous wastes. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, E.O. 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal RCRA and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous materials is vital if it is disturbed during project construction.

The 1927 Bernard Maybeck Packard showroom (left, now British Motors) sits across Olive Street from the Art Moderne then-Cadillac dealership, built 10 years later. The proliferation of automobile-related sales and service businesses along Van Ness Avenue began in the 1920s and has contributed to contamination of the corridor.

4.8.2 | Affected Environment

4.8.2.1 | SETTING

As far back as 1869, Van Ness Avenue has been used as a transportation corridor. At that time, only scattered structures existed along the corridor. By 1884, Van Ness Avenue remained mostly undeveloped; however, by the early 1900s, more structures had been built along Van Ness Avenue. After the 1906 earthquake, commercial businesses moved out of downtown San Francisco and relocated to Van Ness Avenue. By the 1920s, the two most common uses on Van Ness Avenue were large apartment buildings and automotive businesses, including repair shops, gasoline stations, and showrooms. After Van Ness Avenue was designated as US 101, the number of automotive businesses continued to increase until a general decline began in the late 1970s (JRP, 2009). Currently, Van Ness Avenue is a bustling six-lane City arterial street that also serves as State Route 101, connecting freeway entrances and exits to south of the city with Lombard Street and the Golden Gate Bridge that provide access north of the city. The project corridor is fully developed with a mix of commercial, residential, institutional, and light industrial uses.

DEFINITIONS

Recognized Environmental Conditions (RECs): The presence or likely presence of hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

4.8.2.2 | RECOGNIZED ENVIRONMENTAL CONCERNS FROM DATABASE LISTED SITES

An Initial Site Assessment (ISA) was prepared for the project alignment in 2009 by AGS, Inc. The ISA was prepared in general accordance with American Society for Testing and Materials (ASTM) E-1527-05 guidelines (AGS, 2009b). The ISA included review of standard environmental databases and local sources; a site reconnaissance; and review of historical Sanborn Maps. No interviews with property owners or agency officials were conducted. The ISA did not include detailed surveys of the project site or environmental sampling (i.e., soil, groundwater). Available information for the project alignment and surroundings was collected and evaluated to identify Recognized Environmental Conditions (RECs). According to the ASTM Standard Practice E 1527-05, the term REC means “the presence or likely presence of hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.” The term includes hazardous substances or petroleum products even under conditions in compliance with applicable laws. The term is not intended to include *de minimis* conditions that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

The 5 database listed sites that present an REC all contain leaking underground storage tanks (LUSTs).

The ISA prepared for the project alignment included review of standard environmental databases that includes listings of federal and state regulatory agencies that are responsible for recording incidents of spills, soil, and groundwater contamination; and transfer, storage, or disposal facilities that handle hazardous materials. The database search results are included as an appendix to the ISA prepared for the proposed project. In summary, 36 database listed sites were identified within 0.25-mile of the project alignment. With the exception of 5 sites, the remainder of the identified sites has been determined not to present a REC, as defined by the ASTM. The following key factors were evaluated in determining if a database listed site could pose a REC: type of hazardous material; whether groundwater or only soil was impacted; San Francisco Bay RWQCB case status, type, and date of remedial actions; distance from project alignment; topographic gradient; and groundwater depth. The 5 database listed sites are all leaking underground storage tanks (LUSTs). A summary of the file review identifying the name and location of each site, the type of hazardous material found, and action to date is presented in Table 4.8-1.

A potential for contaminated groundwater from the Former Mobil/BP Station (Map ID No. 39) and Chevron Station #90030 (Map ID No. 153) within the project footprint is assumed because these sites are located in close proximity to the project and remain open status, undergoing groundwater monitoring. The Former Mobil/BP Station (Map ID No. 39) has undergone soil and groundwater remediation, and it is undergoing groundwater monitoring.

This site is considered an REC because the case is still open and in review by the San Francisco Bay RWQCB. In 2009, groundwater samples taken from wells located approximately 15 feet west of the Van Ness Avenue curb measured residual contamination. Petroleum products are the potential contaminants of concern. Groundwater depths measured in these wells indicate that the water table occurs between 18.7 and 21.6 feet below the surrounding pavement surface.

Table 4.8-1: Recognized Environmental Concerns for the Van Ness Avenue BRT Project – Database Listed Sites

DATABASE LISTED SITE	PROPERTY ADDRESS	MAP ID[1]	HAZARDOUS MATERIAL
Former Mobil/ BP Station #11184	2559 Van Ness Avenue	39	(LUST, updated April 8, 2008). Underground fuel tanks were found to be leaking gasoline and other hydrocarbon constituents. Contamination has involved soil and groundwater. Post-remedial action groundwater monitoring is ongoing. The case status is open and in review.
Chevron Station #90030	1501 Van Ness Avenue, Berkeley	153	(LUST, updated April 8, 2008). A leaking underground tank with soil contamination was discovered in 1987. Groundwater was reportedly not encountered to 50 feet bgs. The abatement method was to excavate and dispose of the contaminated soil and piping with some sampling and testing. Groundwater monitoring is ongoing. The case status is open, and the site is still being assessed.
St. Clare Hotel	1332 and 1334 Van Ness Avenue	164	(LUST, updated April 8, 2008). A heating oil fuel tank was found to be leaking in 1997, and the tank was repaired. The abatement method was to excavate and dispose of the contaminated soil, and remove the floating product from the water table. The case was closed in 1997.
Former Texaco Station	851 Van Ness Avenue	209	(LUST, updated April 8, 2008). A leaking underground gasoline tank with soil and groundwater contamination was discovered in 1987. The abatement method was to excavate and dispose of the contaminated soil, and remove the floating product from the water table. The case was closed in 1994.
San Francisco Unified School District	135 Van Ness Avenue	273	(LUST, updated April 8, 2008). A leaking underground heating oil fuel tank was identified in 1998. The abatement method was to excavate and dispose of the contaminated soil, and remove the floating product from the water table. The case was closed in 1999.

[1] Locations of database listed sites are mapped in Figure 4.8-1 by Map ID number.

SOURCE: AGS, 2009b.

The Chevron Station at 1501 Van Ness Avenue has undergone soil remediation and is in the process of groundwater monitoring. The potential contaminant of concern is gasoline.

Chevron Station #90030 (Map ID No. 153) has undergone soil remediation and is in the process of groundwater monitoring. The potential contaminant of concern is gasoline. The most recent regulatory review took place in 2009. This site is considered an REC because the case is still open and in review by the San Francisco Bay RWQCB.

The St. Clare Hotel (Map ID 164), Former Texaco Station (Map ID 209), and San Francisco Unified School District (Map ID 273) have undergone soil and groundwater abatement, and they are of *case closed* status. Nonetheless, these sites are considered potential RECs because although they are of *case closed* status, they were closed at a time when the cleanup criteria may not have been as strict as current requirements. For this reason, and because these sites are located along Van Ness Avenue and in close proximity to the project alignment, the potential for contaminated groundwater within the project footprint from these sites is assumed.

4.8.2.3 | OTHER RECOGNIZED ENVIRONMENTAL CONCERNS

Soil in the medians of the avenue may be contaminated with aerially deposited lead (ADL) from the exhaust of cars burning leaded gasoline, and lead-based paint (LBP) may have been used on streetscape features within the project alignment.

Due to the long history of heavy vehicular activity along Van Ness Avenue, the soil in the medians of the avenue may be contaminated with aerially deposited lead (ADL) from the exhaust of cars burning leaded gasoline. Elevated levels of ADL in the medians of Van Ness Avenue would be considered an REC.

Similarly, due to the long built-up, urban history of Van Ness Avenue, lead-based paint (LBP) may have been used on streetscape features within the project alignment, including OCS support poles/streetlights, traffic signal poles, traffic lane striping, and other pavement markings. These streetscape features may contain LBP that exceeds limits established under Title 22, CCR, and requires disposal in a Class I disposal site. Presence of LBP in streetscape features to be demolished, removed, or otherwise disturbed is considered a potential REC.

4.8.3 | Environmental Consequences

Historic fill underlies part of the project alignment, and pockets of undocumented fill may be present throughout the project alignment. Undocumented historic fill could contain contamination and could pose an environmental risk.

The most prevalent potential environmental risks to the project under each build alternative (including Design Option B), and the LPA, are associated with sites of existing or former automotive businesses, gasoline stations, and other sites that have had, or still have, underground storage tanks. As shown in the records search, of particular concern are any leaks from underground tanks of gasoline or diesel fuel, oil and grease, or other hydrocarbon compounds that may have contaminated the subsurface. Other potential environmental risks include the presence of ADL in median soils and LBP in streetscape structures. In addition, as discussed in Section 4.8.1.3 and shown in Figure 4.8-1, historic fill underlies part of the project alignment, and pockets of undocumented fill may be present throughout the project alignment. Undocumented historic fill could contain contamination and could pose an environmental risk to the project. In summary, the following are considered potential RECs for the project under each build alternative:

- Five database listed LUST sites
- ADL in median soils
- LBP in streetscape structures
- Undocumented fill, which could contain contamination.

Each build alternative (including Design Option B) and the LPA (with or without the Vallejo Northbound Station Variant) would be subject to the aforementioned potential RECs. Project earthwork activities are listed in Table 4.5-1, Anticipated Construction Areas and Excavation Depths, which summarizes anticipated excavation depths and soil disturbance areas. Construction earthwork activities are common to all of the proposed build alternatives, with the exception of relocation of the underground sewer pipeline. It is anticipated that the underground sewer pipeline would be replaced in its entirety under Build Alternative 3 while under Build Alternative 4 and the LPA only a portion of the sewer pipeline would be replaced.

The No Build Alternative would not involve work in the median; therefore, it would not be subject to ADL impacts, if present. The No Build Alternative would involve the following earthwork activities listed in Table 4.5-1 that would be subject to the remaining identified, potential RECs: curb-to-curb pavement resurfacing, OCS support pole/streetlight and conduit trench replacement, and signal pole replacement.

Earthwork activities proposed under the build alternatives and No Build Alternative could be subject to identified RECs; therefore, preconstruction mitigation measures are required, as described below.

Figure 4.8-1: Recognized Environmental Conditions – Hazardous Materials Database Listed Sites

4.8.4 Avoidance, Minimization, and/or Mitigation Measures

KEY FINDINGS

All build alternatives would have the following potential RECs:

- **Five database-listed LUST sites**
- **ADL in median soils**
- **LBP in streetscape structures**
- **Undocumented fill that could contain contamination**

After the preferred alternative has been selected and prior to project construction, mitigations for these potential RECs include:

- **Field surveys of identified RECs**
- **Regulatory file review of each REC**
- **Testing of median soils for ADL**
- **Testing of paint for LBP**

If any of the above tests indicate the presence of hazardous materials, further appropriate mitigation measures in compliance with all state and federal regulations will be undertaken to ensure safe treatment of materials during construction, including updates to the Construction Implementation Plan.

The following mitigation measures are proposed for implementation after preliminary engineering of the LPA, with or without inclusion of the Vallejo Northbound Station Variant, and prior to project construction to reduce or eliminate hazardous materials-related impacts:

M-HZ-1. Phase II review, or follow-up investigation, for identified RECS will be conducted prior to construction, including:

- Field surveys of identified RECs to verify the physical locations of the REC sites with respect to the preferred build alternative project components and proposed construction earthwork, and observe the current conditions of the sites.
- A regulatory file review for each identified REC to determine the current status of the sites and, if possible, the extent of the contamination.
- If the aforementioned field survey and file review reveal a likelihood of encountering contaminated soil or groundwater during project construction, then a subsurface exploration will be conducted within the areas proposed for construction earthwork activities. The subsurface investigation will be conducted within the project limits, adjacent to, or downgradient from the REC sites. If soil profiling reveals contaminant concentrations that meet the definition of hazardous materials, then the project contractor will be required to address the management of various hazardous materials and wastes in the Construction Implementation Plan, consistent with the federal and state of California requirements pertaining to hazardous materials and wastes management.

M-HZ-2. Soils in landscaped medians that will be disturbed by project activities will be tested for ADL according to applicable hazardous material testing guidelines. If the soil contains extractible lead concentrations that meet the definition of hazardous materials, then a Lead Compliance Plan to be approved by Caltrans will be required prior to the start of construction or soil-disturbance activities. If lead levels present in surface soils reach concentrations in excess of the hazardous waste threshold, then onsite stabilization or disposal at a Class 1 landfill may be required, which will be specified in the Lead Compliance Plan.

M-HZ-3. Paint used for traffic lane striping and on streetscape features, including the OCS support poles/streetlights, will be tested for LBP prior to demolition/removal to determine proper handling and disposal methods during project construction. If lead is detected, then appropriate procedures will be included in the Construction Implementation Plan to avoid contact with these materials or generation of dust or vapors.

4.9 Hydrology and Water Quality

This section summarizes the hydrology and water quality regulatory setting; affected environment; environmental consequences; and measures to avoid, mitigate, or compensate for long-term, permanent impacts to hydrologic resources and water quality as a result of the proposed Van Ness Avenue BRT project. Construction-phase impacts and avoidance measures are presented in Section 4.15.8. Documents reviewed in support of this study include the *Water Quality Technical Report: Van Ness Avenue Bus Rapid Transit Project* (Parsons, 2013b), *Storm Water Data Report for the Van Ness Avenue BRT Project* (Parsons, 2013d), and *San Francisco Better Streets Plan* (City of San Francisco, 2010).

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences related to hydrology and water quality under the LPA, with or without the Vallejo Northbound Station Variant, are identified as part of the analysis presented for the build alternatives in this chapter. Since the LPA configuration is a variation of the configurations analyzed for the center-running alternatives in the Draft EIS/EIR, the LPA, with or without the Vallejo Northbound Station Variant, has slightly different results for the total disturbed soil area and pervious surface area; however, the overall impact findings with the LPA are consistent with the findings for Build Alternatives 3 and 4, as presented in this subsection.

4.9.1 | Regulatory Setting

An overview of the federal, state, and local regulations and policies relevant to hydrology and water quality impacts of the proposed project operation follows.

4.9.1.1 | CLEAN WATER ACT

The CWA of 1972 is the primary federal law governing water quality of the nation's waters. Under the enforcement authority of the United States Environmental Protection Agency (EPA), the CWA was enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The act also set water quality standards for surface waters and established the National Pollutant Discharge Elimination System (NPDES) program to protect water quality. The control of pollutant discharges is established through NPDES permits that contain effluent limitations and standards.

Implementation and enforcement of the NPDES program was delegated to the state level and is conducted through the California State Water Resources Control Board (SWRCB) and the nine RWQCBs, as discussed below. These agencies also implement the Waste Discharge Requirements (WDR) Program, which regulates discharges of waste into land under the California Water Code, as well as discharges of waste into California waters that are outside federal jurisdiction, as defined under the CWA.

RESOURCES

For more information on the Clean Water Act, visit: www.epa.gov/watertrain/cwa/.

To learn more about California Water Boards, visit: www.waterboards.ca.gov/.

To learn more about the Better Streets Plan, visit: www.sf-planning.org/ftp/BetterStreets/index.htm.

4.9.1.2 | EXECUTIVE ORDER 11988: FLOODPLAIN MANAGEMENT

E.O. 11988 (Floodplain Management), which was issued by President Carter in 1977, directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains that may cause short- or long-term adverse impacts, unless it is the only practicable alternative. The FTA requirements for compliance are outlined in the US Department of Transportation Order 5650.2. To comply, the following must be analyzed:

- Risks of the action
- Impacts on natural and beneficial floodplain values
- Degree to which the action provides direct or indirect support for development in the floodplain
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project

4.9.1.3 | PORTER-COLOGNE WATER QUALITY CONTROL ACT OF 1969

The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) is the major water quality control law for California that authorizes the State to implement provisions of the CWA. The Porter-Cologne Act establishes a regulatory program to protect California's water quality and beneficial uses. Under this act, the SWRCB provides policy guidance and review for the RWQCBs, and the RWQCBs implement and enforce provisions of the Act.

The RWQCBs regulate water quality under the Porter-Cologne Act through the regulatory standards and objectives set forth in water quality control plans (referred to as Basin Plans) prepared for each region. The Basin Plans identify existing and potential beneficial uses and provide numerical and narrative water quality objectives to protect those uses. The San Francisco Bay RWQCB adopted its Basin Plan in 1995 and most recently amended the plan in December 2011.

4.9.1.4 | SAN FRANCISCO REGIONAL WATER QUALITY CONTROL BOARD

The proposed project is located within the jurisdiction of the San Francisco RWQCB. All projects within the San Francisco Region are subject to the requirements of the San Francisco RWQCB, which is a State agency with regional jurisdiction covering most of the Bay Area counties. The function of the San Francisco RWQCB is to protect and improve the quality of the natural water resources in the region, including the San Francisco Bay and the Pacific Ocean, streams that flow into the bay and ocean, and groundwater throughout the region. The San Francisco RWQCB regulates waste discharges by issuing a variety of permits that place restrictions on waste discharges, such as concentrations of certain pollutants, or the amount of flow. Permits can also require dischargers to take certain kinds of actions (e.g., installing certain technologies to treat or contain wastes, or implementing practices to manage stormwater and urban runoff). Most of these permits are implemented through local agencies. For the proposed project, the responsible agency is SFPUC. For instance, prior to releasing any construction site water, including groundwater, into the City's CSS, a batch discharge permit is required by SFPUC, as discussed in their Keep it on Site Guide (SFPUC, 2009).

DEFINITION

WATERSHED: An area of land where all of the water that is under it—or drains off of it—goes into the same outlet.

REGULATION

Because the project would not affect Waters of the U.S., a 401 Water Quality Certification would not be required.

Section 401 of the CWA stipulates that any action that requires a federal license or permit and that may result in a discharge of pollutants into waters of the U.S. also requires water quality certification. Locally, this program is administered by the San Francisco RWQCB and is designed to ensure that the discharge will comply with applicable federal and State effluent limitations and water quality standards. Certification applies to construction and operation. Because the project would not affect Waters of the U.S., a 401 Water Quality Certification would not be required.

As described above under Section 4.9.1.1, the control of pollutant discharges is established through NPDES permits issued by the RWQCBs which contain effluent limitations and standards. The NPDES Permit requires that all owners of land within the state with construction activities resulting in more than 1-acre of soil disturbance (e.g., clearing, grubbing, grading, trenching, stockpile, utility relocation, temporary haul roads) comply with the California SWRCB General Construction Permit. A NOI to construct must be filed with the RWQCB at least 30 days prior to any soil-disturbing activities, as the RWQCB has enforcement responsibility for the General Construction Permit. The purpose of the permit is to ensure that the landowners or project proponents: (1) eliminate or reduce non-stormwater discharges to storm drains and receiving waters; (2) develop and implement an SWPPP; (3) inspect the water pollution controls specified in the SWPPP; and (4) monitor stormwater runoff from construction sites to ensure that the Best Management Practices (BMPs) specified in the SWPPP are effective. The General Construction Permit is also discussed in Construction Impacts Section 4.15.8 of this document.

4.9.1.5 | SAN FRANCISCO BETTER STREETS PLAN

The *San Francisco Better Streets Plan* sets forth guidelines for streetscape and pedestrian design as part of a larger planning effort to create a unified set of standards, guidelines, and implementation strategies for the City's pedestrian environment. The plan requires that permits be filed with the appropriate agency if any modifications to streetscape are anticipated as part of the project (City of San Francisco, 2013). The San Francisco Better Streets Plan recognizes that Van Ness Avenue moves significant volumes of people across town in a variety of travel modes and that it serves as a commercial and cultural hub that attracts people from across the city to shop, eat, and play. Chapter 6.2 of the plan is dedicated to stormwater management tools, recommending tools that infiltrate, retain, detain, or convey stormwater. These features include permeable paving, bioretention, flowthrough and infiltration planters, swales, rain gardens, channels and runnels, infiltration trenches, and infiltration boardwalks. A separate permit and approval process has not been developed by the City for the San Francisco Better Streets Plan. The plan has been adopted and compliance with the plan design objectives will be considered through the permits and approval processes that apply to any project that would modify the streetscape.

4.9.2 | Affected Environment

4.9.2.1 | HYDROLOGIC SETTING

The northern part of the project area is located in the Central San Francisco Bay Watershed, and the southern part of the project is located in the South Bay Watershed, as shown in Figure 4.9-1. In general, runoff flows through the City's drainage system, which drains northerly and easterly to the Bay. There are currently no natural surface water bodies, wetlands, or streams in the project area. Historically, there were small creeks flowing to the San Francisco Bay, but most of the creeks were filled during development of the city. The project area is almost entirely covered with impervious surfaces, with the exception of the existing landscaped center median and some tree and landscape plantings along the sidewalks of Van Ness Avenue. Freshwater drainage in San Francisco has been almost entirely diverted to the City's combined sewer and stormwater system, referred to as the Combined Sewer System or CSS, which collects and transports sanitary sewage and stormwater runoff in the same set of pipes. The stormwater drainage is collected by a system of 23,000 catch basins located throughout the city and conveyed through the CSS, treated, and eventually discharged through outfalls and overflow structures along the San Francisco Bay shoreline. Throughout the project limits, stormwater generally flows to curbside storm drain inlets that convey runoff to the CSS.

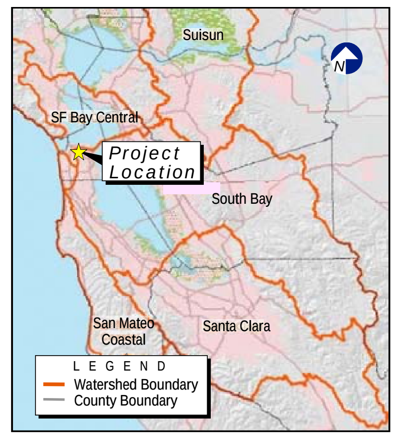


Figure 4.9-1: Hydrologic Setting

Water treatment plants on the east and west sides of the city provide full secondary treatment for all dry-weather flow, and storage and discharge structures provide the equivalent of primary treatment for wet-weather flows when the treatment capacity of the water treatment plants is reached. Flows from these structures are discharged through CSS discharge structures located along the city's bayside and ocean waterfronts. Wet-weather flows are intermittent throughout the rainy season, and CSS discharges vary in nature and duration, depending largely on the intensity of individual rainstorms. The combined flows are conveyed to three treatment facilities located in the city: the Oceanside Wastewater Treatment Plant, the Southeast Wastewater Treatment Plant (SEWTP), and the North Point Wet Weather Facility; the latter operates only when heavy rains occur. Runoff from the project site flows through the city's drainage system, which drains northerly and easterly toward the Bay, as shown in Figure 4.9-2, and is treated in the North Point Wet Weather Facility or SEWTP before discharging to the San Francisco Bay; therefore, the receiving

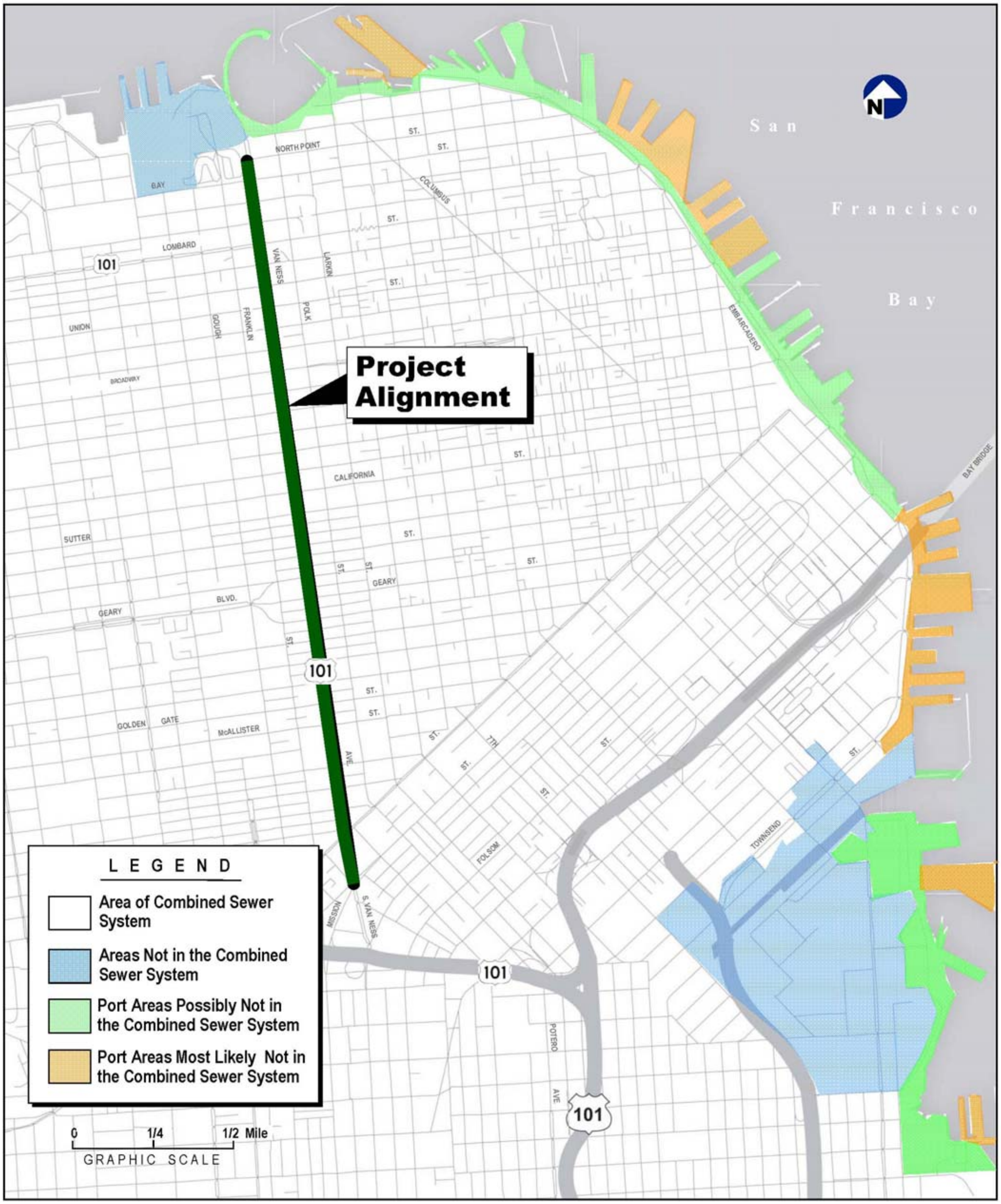


Figure 4.9-2: San Francisco Sewer System Map

water for the proposed project is the San Francisco Bay. Table 4.9-1 shows the pollutants for which Central and South San Francisco Bay is designated as impaired under Section 303(d) of the CWA.

Table 4.9-1: Federal 303(d) List of Impairments for Central and South San Francisco Bay

POLLUTANT STRESSOR	POTENTIAL SOURCE	CURRENT STATUS
Chlordane	Nonpoint source	TMDL required
DDT	Nonpoint source	TMDL required
Dieldrin	Nonpoint source	TMDL required
Dioxin compounds	Atmospheric deposition	TMDL required
Exotic species	Ballast water	TMDL required
Furan compounds	Atmospheric deposition	TMDL required
Mercury	Atmospheric deposition, industrial point sources, municipal point sources, natural sources, nonpoint source, resource extraction	Being addressed by EPA-approved TMDLs
PCBs	Unknown nonpoint source	TMDL required
Selenium	Agriculture, exotic species, industrial point sources, and natural sources	TMDL required

Note:
TMDL – total maximum daily load; PCBs – polychlorinated biphenyls

The San Francisco Bay Basin Plan has identified the following beneficial uses for Central San Francisco Bay: industrial service and process supply, commercial fishing, shellfish harvesting, estuarine habitat, fish migration, rare and endangered species habitat, fish spawning, wildlife habitat, contact recreation, non-contact recreation, and navigation. The San Francisco Bay Basin Plan has identified the following beneficial uses for South San Francisco Bay: industrial service supply, commercial fishing, shellfish harvesting, estuarine habitat, fish migration, rare and endangered species habitat, fish spawning, wildlife habitat, contact recreation, non-contact recreation, and navigation.

4.9.2.2 | FLOODPLAINS

The terrain in the project area of San Francisco is characteristically hilly, and the Van Ness Avenue BRT project corridor crosses near the low point of one east-west ridgeline that connects Nob Hill to the east with Pacific Heights to the west. Farther north, the project corridor crosses near the western toe of Russian Hill.

No major streams exist in the project vicinity, and the project site is not mapped as a flood hazard zone by the Federal Emergency Management Agency (FEMA) or any local planning maps. Lower-lying portions of the project area could be subject to localized flooding that can occur throughout the city during periods of intense precipitation, when storm drains become clogged with debris in low-lying areas.

4.9.2.3 | GROUNDWATER SETTING

The north portion of the project site is located within the Marina Groundwater Basin, and the south portion of the project site is located within the Downtown San Francisco Basin, as shown in Figure 4.9-3. Groundwater recharge to the groundwater basins occurs from infiltration of rainfall, landscape irrigation, and leakage of water and sewer pipes. None of the geologic formations along the project corridor are considered useful aquifers due to poor overall water quality and high concentrations of undesirable minerals (AGS, 2009b).

DEFINITIONS

PERMEABLE PAVING: An alternative to standard paving to help reduce stormwater runoff volumes by reducing impervious surface and providing temporary storage and/or groundwater recharge through infiltration.

FLOW-THROUGH AND INFILTRATION PLANTERS: Stormwater facilities that double as landscape features but are designed to combine stormwater runoff control and treatment with aesthetic landscaping and architectural detail.

SWALES: Long, narrow landscaped depressions primarily used to collect and convey stormwater and improve water quality.

RAIN GARDENS: Landscaped detention or bioretention features in a street designed to provide initial treatment of stormwater runoff.

CHANNELS AND RUNNELS: Concrete- or stone-lined pathways used to convey rainwater runoff along the surface to other stormwater control measures or the city collection system.

INFILTRATION TRENCHES: Shallow subsurface linear stormwater facilities, typically 2 to 5 feet deep and installed in relatively permeable soils to provide onsite stormwater retention by collecting and recharging stormwater runoff into the ground.

INFILTRATION BOARDWALKS: Raised boardwalks placed over exposed drainage rock or amended engineered soils to allow stormwater to pass beneath a walking surface for temporary storage or infiltration into the soils below.

Source: Better Streets Plan

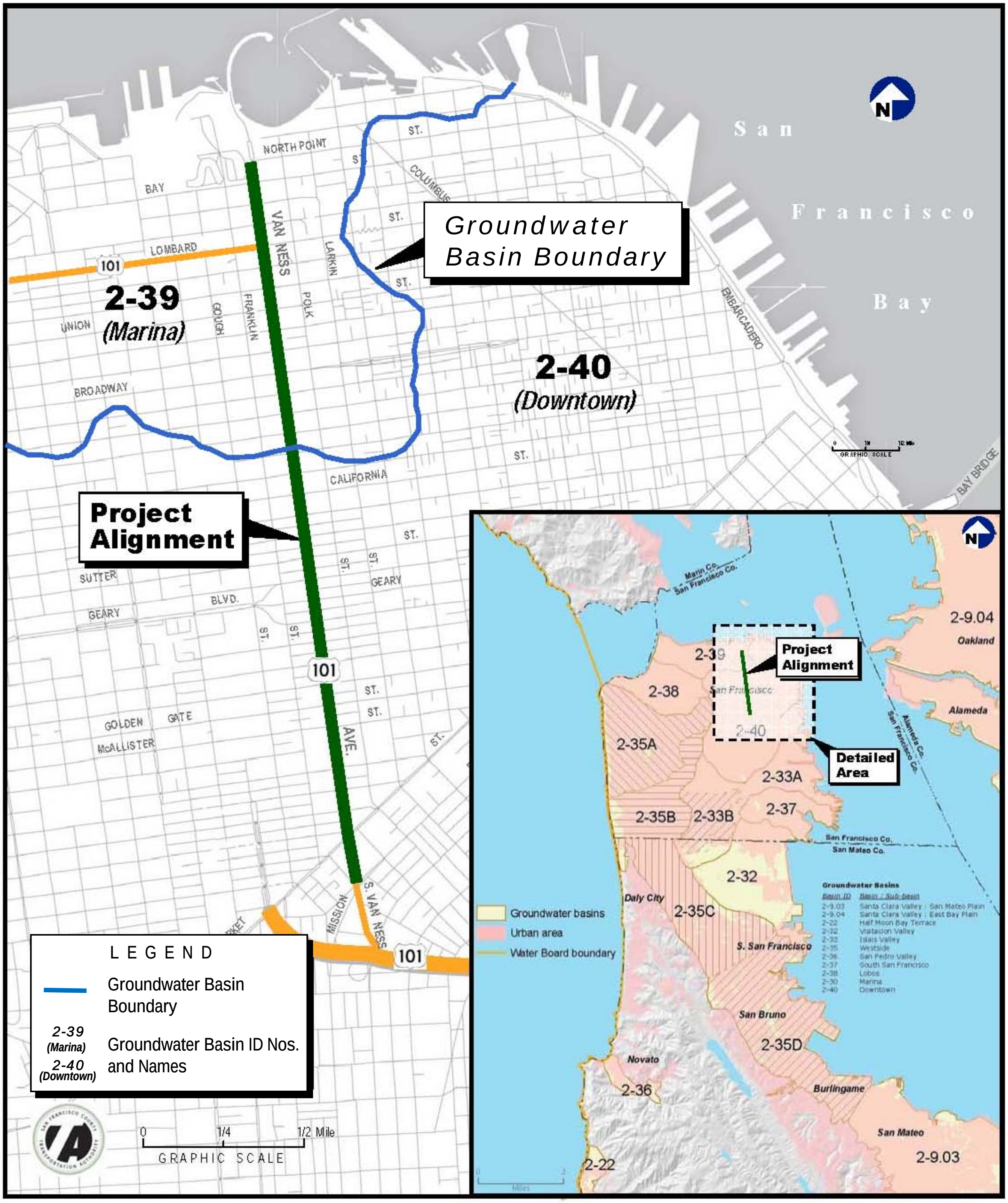


Figure 4.9-3: Regional Groundwater Basin Map

Geologic mapping indicates that the groundwater table occurs less than 20 feet bgs in most of the lower-lying areas along the project corridor where the ground elevation is less than approximately 150 feet amsl. Available monitoring well data reviewed as part of a geologic study performed for the proposed project indicates depth to groundwater ranging from 5 to 20 feet bgs in two areas: (1) along Van Ness Avenue from Mission Street northward to the vicinity of the Geary Boulevard intersection; and (2) north of the Broadway intersection to Lombard Street (AGS, 2009b). Between Geary Boulevard and the Broadway intersection, the monitoring well data indicates that either no groundwater was encountered or that depths to groundwater exceed 20 feet. In general, reported groundwater levels are expected to vary seasonally and annually based on rainfall patterns, variations in the topography distribution of impervious surfaces, and the pattern of groundwater withdrawal or localized pumping.

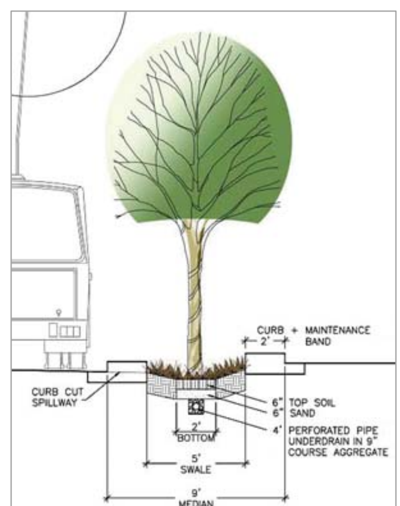
Groundwater flow in the Marina Groundwater Basin is generally to the north. Groundwater flow in the Downtown San Francisco Basin varies with the topography. The Environmental Database Reports (EDR) Geocheck™ Report prepared for the proposed project indicates that groundwater flow in the vicinity of Mission and Market streets is to the east (EDR, 2008). On the south-facing hillside north of the Civic Center, the flow is generally to the south or southeast, and on the north-facing hillside north of Clay Street, the flow is generally to the northwest.

The beneficial use of groundwater for the City includes municipal and domestic water supply, industrial water supply, industrial process supply, agricultural water supply, groundwater recharge, and freshwater replenishment to surface waters.

4.9.3 | Environmental Consequences

Under the rules and regulations of CEQA and NEPA, the proposed project would have significant and adverse hydrology and water quality impacts if it would result in any of the following:

- Violate any water quality standards or WDRs (for construction only);
- Substantially degrade water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- Substantially alter the existing drainage pattern of the area in a manner that would result in substantial erosion, sedimentation, or flooding within or downstream of the proposed project area;
- Create or contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems; or
- Place structures within a 100-year flood hazard area that would expose people or structures to significant risk of loss, injury, or death.



Under Build Alternative 3, vegetated swales could potentially be incorporated in one of the center medians to capture stormwater runoff from the transitway and could potentially infiltrate some of the runoff into the ground.

4.9.3.1 | HYDROLOGIC IMPACTS

The project area is almost entirely covered with impervious surfaces, with the exception of the existing landscaped center median and some tree and landscape plantings along the sidewalks of Van Ness Avenue. Under the build alternatives, including the LPA, with or without the Vallejo Northbound Station Variant, stormwater would continue to flow towards the curbside storm drains; under Build Alternative 3, additional curb inlets at the median islands would capture surface runoff from the transitway.

City policy, as proposed in the *Better Streets Plan,* is to reduce the quantity of stormwater runoff directly into the CSS. Opportunities to reduce stormwater runoff into the CSS – and improve the quality of runoff at the same time – as presented in the *Better Streets Plan* will be investigated further during 30 percent design engineering of the preferred alternative. Each of the build alternatives presents the opportunity to incorporate some such features, though feasibility still needs to be determined. For instance, under Build Alternative 3, vegetated swales could potentially be incorporated in one of the center medians. The swale (i.e., long narrow landscaped depressions primarily used to collect and convey stormwater and improve water quality) would capture runoff from the transitway and could potentially infiltrate some of the runoff into the ground. This would result in beneficial effects to groundwater recharge and reduced storm flows to the CSS. Incorporation of the vegetated swale would be considered in project final design.

Permeable paving, infiltration planters, swales, and rain gardens are *Better Streets Plan* concepts that will be considered. Under the build alternatives, runoff from station platforms and canopy structures could be directed to the landscaped median or platform planters, where feasible. Stormwater drainage and facilities would remain as described above with implementation of Design Option B under Build Alternatives 3 and 4, as well as the LPA.

The build alternatives, including the LPA, with or without the Vallejo Northbound Station Variant, would add, modify, and replace landscaping in the project corridor, each resulting in a minor, net decrease in impervious surface area and corresponding net increase in pervious surface area in the corridor. Table 4.9-2 provides the acreages of impervious and pervious surface area in the corridor for both the existing condition and with-project condition. Under the No Build Alternative, it is anticipated that pervious surface area would increase with implementation of streetscape improvements proposed in the *Better Streets Plan,* although no such improvements have been funded or scheduled for implementation at this time. For this reason, it is assumed that under the No Build Alternative no changes to stormwater facilities, drainage, or runoff volumes would occur, and this alternative is not included in Table 4.9-2.

Table 4.9-2 shows the total disturbed soil area (DSA)[86] for each build alternative, including Design Option B. As shown in Table 4.9-2, the introduction of additional landscaping under Build Alternative 2 would provide an approximate overall increase of 0.6-acre in pervious surface area over existing conditions within the project area. Similarly, Build Alternative 3 would result in an approximate increase of 0.1-acre of pervious surface area, and Build Alternative 4 would result in an approximate 0.5-acre increase in pervious surface area throughout the project limits. Implementation of Design Option B would involve removal of the existing left-turn pockets, which may allow slightly wider medians at these locations, resulting in slightly greater pervious surface area. The net increase of pervious surface area under the LPA (not shown in Table 4.9-2) would be similar to Build Alternative 3 (approximately 0.2-acre). The net increase of pervious surface area under the Vallejo Northbound Station Variant would be slightly greater than the LPA without the variant; however, it remains approximately 0.2-acre. The disturbed soil area (DSA) for the LPA would be 5.8 acres. Because there is no net increase in impervious area and the proposed project would not substantially increase impervious surface area in any one location that would significantly increase flows to a storm drain, the proposed improvements would not adversely impact the flow rate or volume entering the CSS.

There is no net increase in impervious area under any of the build alternatives, and the proposed project would not substantially increase impervious surface area in any one location that would significantly increase flows to a storm drain.

86 The DSA includes all construction activity that disturbs native soil and fill within the project limits. This does not include routine activity to maintain existing highways (i.e., facilities), preventive maintenance to maintain highway structures, or existing functions. Asphalt concrete (AC), Portland cement concrete, aggregate base, shoulder backing, bridge decks, sidewalks, buildings, road side ditches, gutters, dikes, and culverts are all part of existing highway facilities.
Construction activity in the context of NPDES stormwater and CWA is defined by EPA as "commencement of construction'" or the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities (63 CFR 7913). This does not include routine maintenance of highway facilities." For example an AC overlay with a thin lift of shoulder backing on top of an existing facility is routine maintenance and has no DSA.

Table 4.9-2: Existing and Proposed Approximate Impervious Surface Area in the Project Corridor*

	TOTAL PROJECT AREA[2] (AC)	TOTAL DSA[3] (AC)	EXISTING IMPERVIOUS (AC)	EXISTING PERVIOUS (AC)	WITH PROJECT IMPERVIOUS (AC)	WITH PROJECT PERVIOUS (AC)
Build Alternative 2	29.9	2.9	29.2	0.7	28.5	1.3
Build Alternative 3	29.9	8.1	29.2	0.7	29.1	0.8
Build Alternative 3 with Design Option B	29.9	8.4	29.2	0.7	29.1	0.8
Build Alternative 4	29.9	3.8	29.2	0.7	28.7	1.2
Build Alternative 4 with Design Option B	29.9	3.8	29.2	0.7	28.6	1.3

AC = Acres
* Acreages are approximated and may be subject to slight change as project design progresses.

In summary, the build alternatives, including the LPA, with or without the Vallejo Northbound Station Variant, would result in an approximate 0.1- to 0.6-acre increase of pervious surface (i.e., a 0.1- to 0.6-acre decrease in impervious surface) area throughout the project limits over the existing condition, depending on the alternative. These increases in pervious surface area are primarily due to the establishment of landscaped medians where existing medians are impervious surface (e.g., left-turn pocket locations that are filled in with new planted median). In addition, each build alternative, including the LPA, presents an opportunity to reduce storm flows into the CSS and improve groundwater recharge through *Better Streets Plan* concepts; however, at this stage of design, it is unclear which concepts are feasible, or where, under each alternative (including the LPA).

It is anticipated that Build Alternative 3 would offer the greatest opportunity to capture and potentially infiltrate storm runoff and reduce flows if a vegetated swale in the center median is incorporated into project design. Implementation of Design Option B under Build Alternative 3 may provide a slightly greater opportunity because it would offer larger landscaped median areas in locations where left-turn pockets are removed. As project design progresses, possibilities for including stormwater management tools specified in the *San Francisco Better Streets Plan* will be investigated. Rain gardens and infiltration plantings may be feasible for incorporation into design of the median and station platforms. Overall, the proposed project would result in beneficial impacts to storm drainage facilities along Van Ness Avenue.

Because each of the build alternatives, including the LPA, with or without the Vallejo Northbound Station Variant, would result in a reduction of stormwater runoff, the capacity of the existing or planned stormwater drainage system would not be exceeded, and the existing drainage pattern of the area would not be altered; therefore, there would be no adverse impacts to hydrology as a result of the proposed project.

The project and vicinity are not located within a floodplain or other known flood hazard zone; therefore, the proposed project is not subject to flood hazards and would not alter streams or other waterways. The No Build Alternative, build alternatives, and LPA would not result in flood hazards, although Van Ness Avenue may be subject to localized flooding when storm drains in low-lying areas become clogged during storm events. Section 4.9.4

describes avoidance and mitigation measures intended to prevent clogging of storm drains that capture runoff from the proposed bus platforms. Because the proposed project would not place structures within a 100-year flood hazard area, there would be no adverse floodplain impacts as a result of the proposed project.

4.9.3.2 | WATER QUALITY IMPACTS

The greatest potential for impacts to water quality from the proposed project would be during construction. With implementation of a Storm Water Pollution Prevention Plan (SWPPP) that identifies Construction Site BMPs that are described in the Caltrans Storm Water Quality Handbooks, Construction Site BMP Manual (Caltrans 2003), no water quality standards or WDRs would be violated; therefore, construction of the proposed project is not expected to have an adverse impact to the water quality of the San Francisco Bay. Construction-phase hydrology and water quality impacts are presented in Section 4.15.8, including compliance with the General Construction Permit.

KEY FINDINGS

The No Build Alternative and build alternatives, including the LPA, would not result in flood hazards.

The build alternatives, including the LPA, would result in beneficial impacts to storm drainage facilities along Van Ness Avenue. With implementation of avoidance and improvement measures specified in Section 4.9.4, operation of the proposed project would not result in significant water quality impacts.

Stormwater BMPs would be incorporated into project design and operations to the maximum extent practicable.

The removal and pruning of trees in the median of Van Ness Avenue would result in the loss of tree canopy, as described in Sections 4.2 and 4.13. Tree canopies provide water quality benefits; thus there would be a period of reduced water quality until the new tree plantings grow to mature canopies. However, this impact would not be substantial due in part to an overall increase in trees in the corridor, and because this impact would subside over time as replacement trees mature. Moreover, the project alternatives, including the LPA, with or without the Vallejo Northbound Station Variant, would overall reduce impervious surface area in the corridor. The decrease in impervious area from the BRT build alternatives and resultant decrease in runoff could be considered a water quality improvement because there would be less runoff that could potentially come in contact with pollutants such as suspended solids, organic and inorganic compounds, oils and grease, and miscellaneous waste from the roadways, BRT stations, and landscaping. Additionally, because all runoff generated from within the project limits is conveyed to the CSS and eventually treated, no water quality standards or WDRs would be violated as a result of the proposed project; therefore, operation of the Van Ness Avenue BRT project is not expected to have an adverse impact to the water quality of the San Francisco Bay. Consequently, there would be no impact to the beneficial uses identified for either South or Central San Francisco Bay.

It should be noted that the overuse of herbicides and fertilizers from landscaping could increase levels of nutrients and pesticides in the surface water runoff that is conveyed to the CSS. Section 4.9.4 describes avoidance and mitigation measures intended to reduce the discharge of pollutants from the storm drain system during and after construction. With implementation of avoidance and mitigation measures specified in Section 4.9.4, operation of the proposed project would not result in adverse water quality impacts.

4.9.3.3 | GROUNDWATER IMPACTS

Most of the estimated excavation depths associated with the build alternatives, including the LPA, with or without the Vallejo Northbound Station Variant, would be relatively shallow. The deepest excavations would most likely be at the locations where new OCS support poles/streetlights are proposed at intersections where excavation would be as deep as 16 feet bgs. According to the soils information obtained for the proposed project, groundwater was not encountered within 16 feet bgs for the entirety of the project limits. Groundwater supplies would not be depleted, and there would be no net deficit in aquifer volume.

4.9.4 | Avoidance, Minimization, and/or Mitigation Measures

Impact avoidance, minimization, and mitigation measures for hydrology and water quality to be implemented during project construction are discussed in Section 4.15.8. Stormwater BMPs would be incorporated into project design and operations to the maximum extent practicable to avoid water quality impacts. Implementation of the following improvement measures and standard practices under each build alternative and design option scenario would avoid adverse impacts to stormwater quality and facilities:

IM-HY-1. Landscape areas provided by the project will be designed to minimize and reduce total runoff. The overuse of water and/or fertilizers on landscaped areas will be avoided.

IM-HY-2. Opportunities to incorporate stormwater management tools set forth in the *San Francisco Better Streets Plan* will be investigated for implementation as project design progresses. Streetscape geometry, topography, soil type and compaction, groundwater depth, subsurface utility locations, building laterals, maintenance costs and safety, and pedestrian accessibility will be major considerations in determining the feasibility of implementing stormwater management tools. Permeable paving, infiltration planters, swales, and rain gardens will be considered.

IM-HY-3. In compliance with the City Integrated Pest Management Policy (City Municipal Code, Section 300), prevention and non-chemical control methods will be employed in maintaining landscaping in the Van Ness Avenue corridor, including monitoring for pests before treating, and using the least-hazardous chemical pesticides, herbicides, and fertilizers only when needed and as a last resort.

IM-HY-4. Proposed BRT stations will be equipped with trash receptacles to minimize the miscellaneous waste that may enter the storm drain system and clog storm drains or release pollutants.

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4.10 Air Quality

This section summarizes the air quality regulatory setting; affected environment; environmental consequences; and measures to avoid, mitigate, or compensate for long-term, permanent impacts to the air quality as a result of the proposed Van Ness Avenue BRT Project. Construction-phase impacts and avoidance measures are presented in Section 4.15.10. Documents prepared in support of this section include the *Van Ness BRT Project Air Quality Impact Report and Addendum (*TAHA, 2013).

Air quality in the United States is governed by the federal Clean Air Act (CAA). Air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA).

The LPA included in this Final EIS/EIR is a refinement of the center running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The air quality effects of the LPA are identified as part of the analysis presented for the build alternatives in this chapter. There would be no substantive difference in operational air quality impacts under the LPA compared with the impacts described for Build Alternatives 3 and 4 with Design Option B in this subsection 4.10.3.

4.10.1 | Regulatory Setting

An overview of the federal, state, and local regulations and polices relevant to air quality impacts of proposed project operation follows.

4.10.1.1 | FEDERAL, STATE, AND LOCAL GOVERNING BODIES AND REGULATIONS

Air quality in the United States is governed by the federal Clean Air Act (CAA). In addition to being subject to the requirements of the CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). At the federal level, the CAA is administered by EPA. In California, the CCAA is administered by the California Air Resources Board (CARB) at the state level and by Air Quality Management Districts at the regional and local levels. The proposed project is located within the Bay Area Air Quality Management District (BAAQMD).

EPA is responsible for establishing the National Ambient Air Quality Standards (NAAQS), which are required under the 1977 CAA and subsequent amendments. EPA regulates emission sources that are under the exclusive authority of the federal government and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by CARB.

CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for meeting the state requirements of the federal CAA, administering the CCAA, and establishing the California Ambient Air Quality Standards (CAAQS). The CCAA requires all air districts in the state to endeavor to achieve and maintain the CAAQS, which are generally more stringent than the corresponding federal standards.

The BAAQMD is primarily responsible for assuring that the national and state ambient air quality standards are attained in the San Francisco Bay Area. The BAAQMD has jurisdiction over an approximately 5,600-square-mile area, commonly referred to as the Bay Area Air Basin (BAAB). The District's boundary encompasses most of the nine Bay Area counties: Alameda County, Contra Costa County, Marin County, San Francisco County, San Mateo County, Santa Clara County, Napa County, southwestern Solano County, and southern Sonoma County. The discussion of project air quality setting and effects refers primarily to conditions within the BAAB, which from both the federal and state regulatory perspectives is considered one geographic entity.

4.10.1.2 | TOXIC AIR CONTAMINANT REGULATIONS

Toxic air contaminants (TACs), or in federal parlance under the federal CAA, hazardous air pollutants (HAPs), are pollutants that result in an increase in mortality, a serious illness, or pose a present or potential hazard to human health. It is important to understand that TACs are not considered criteria air pollutants; thus, they are not specifically addressed through the setting of ambient air quality standards. Instead, EPA and CARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology (MACT and BACT) to limit emissions. These, in conjunction with additional rules set forth by BAAQMD, establish the regulatory framework for TACs.

Federal Hazardous Air Pollutant Program. Title III of the federal Clean Air Act Amendments (CAAAs) requires EPA to promulgate national emissions standards for hazardous air pollutants (NESHAPs). The NESHAP may differ for major sources compared to area sources of HAPs (major sources are defined as stationary sources with potential to emit more than 10 tons per year [TPY] of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources).

Mobile Source Air Toxics (MSAT). EPA issued a Final Rule on Controlling Emissions of HAPs from Mobile Sources (66 *Federal Register* [FR] 17229, March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including the following EPA standards and programs: reformulated gasoline program; national low-emission vehicle standards; Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements; proposed heavy-duty engine and vehicle standards; and on-highway diesel fuel sulfur control requirements.

EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary 6 MSATs. FHWA published project-level MSAT assessment guidance in February 2006 as an air quality analysis tool for transportation projects.

State Toxic Air Contaminant Programs. California regulates TACs primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs, and adopted EPA's list of HAPs as TACs. Most recently, diesel exhaust particulate was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate toxic best available control technology (TBACT) to minimize emissions. None of the TACs identified by CARB have a safe threshold.

Bay Area Air Quality Management District. The BAAQMD has regulated TACs since the 1980s. At the local level, air pollution control or management districts may adopt and enforce CARB's control measures. Under BAAQMD Regulation 2-1 (General Permit Requirements), Regulation 2-2 (New Source Review), and Regulation 2-5 (New Source Review), all nonexempt sources that possess the potential to emit TACs are required to obtain permits from BAAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The BAAQMD limits emissions and public exposure to TACs through many programs. The BAAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. Naturally occurring asbestos (NOA) was identified as a TAC in 1986 by CARB. BAAQMD's NOA program requires that the applicable notification forms from the Air District's website be submitted by qualifying operations in accordance with the procedures detailed in the Air Toxics Control Measures (ATCM) Inspection Guidelines Policies and Procedures. The Lead Agency shall reference BAAQMD's ATCM Policies and Procedures to determine which NOA Notification Form is applicable to the proposed project (NOA Notification Forms). The ATCM requires regulated operations engaged in road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas where NOA is likely to be found, to employ the best available dust mitigation measures to reduce and control dust emissions.

DEFINITION

TOXIC AIR CONTAMINANTS (TACs): Pollutants that result in an increase in mortality, a serious illness, or pose a present or potential hazard to human health.

In addition, the BAAQMD has adopted Regulation 11, Rule 2, which addresses asbestos demolition, renovation, manufacturing, and standards for asbestos containing serpentine. The purpose of Regulation 11, Rule 2, is to control emissions of asbestos to the atmosphere during demolition, renovation, milling, and manufacturing and establish appropriate waste disposal procedures.

4.10.1.3 | FEDERAL GREENHOUSE GAS REGULATIONS

As the federal agency responsible for implementing the CAA, EPA also has responsibility for regulating GHG emissions.

DEFINITION

GREENHOUSE GASES (GHGs): These gases, produced by motor vehicle emissions (among other sources), allow visible and ultraviolet light from the sun to pass through the atmosphere, but prevent heat from escaping back out into space. This contributes to an increase in the temperature of the earth's atmosphere, or global warming. The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds.

Mandatory Greenhouse Gas Reporting Rule. On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement will provide EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of carbon dioxide (CO_2) per year.

Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. On April 23, 2009, EPA published their Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding) in the *Federal Register*. The Endangerment Finding is based on Section 202(a) of the CAA, which states that the Administrator (of EPA) should regulate and develop standards for "emission[s] of air pollution from any class of classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare."

4.10.1.4 | STATE GREENHOUSE GAS REGULATIONS

AB 1493 (2002). AB 1493 requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State." To meet the requirements of AB 1493, in 2004 CARB approved amendments to the CCR adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year.

AB 32 (2006), California Global Warming Solutions Act. AB 32 (Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006, enacted Sections 38500–38599 of the California Health and Safety Code. AB 32 requires the reduction of statewide GHG emissions to 1990 levels by 2020. The required reduction will be accomplished through an enforceable statewide cap on GHG emissions. To effectively implement the statewide cap on GHG emissions, AB 32 directs CARB to develop and implement regulations that reduce statewide GHG emissions generated by stationary sources. Specific actions required of CARB under AB 32 include adoption of a quantified cap on GHG emissions that represent 1990 emissions levels along with disclosing how the cap was quantified, institution of a schedule to meet the emissions cap, and development of tracking, reporting, and enforcement mechanisms to ensure that the State achieves the reductions in GHG emissions needed to meet the cap. In addition, AB 32 states that if any regulations established under AB 1493 (2002) cannot be implemented, then CARB is required to develop additional, new regulations to control GHG emissions from vehicles.

AB 32 Climate Change Scoping Plan. In December 2008, CARB adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 169 million metric tons (MMT) of carbon dioxide equivalent (CO_2e), or approximately 30 percent from the State's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002 to 2004 average emissions). The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the State's GHG inventory.

SBX1-2 (2011). SBX1-2 requires that 33 percent of the State's energy comes from renewable sources by 2020. SBX1-2 requires California's electric utilities to reach the 33 percent goal in three compliance periods. By December 31, 2013, the utilities must procure renewable energy products equal to 20 percent of retail sales. By December 31, 2016, utilities must procure renewable energy products equal to 25 percent of retail sales, and by December 31, 2020, utilities must procure renewable energy products equal to 33 percent of retail sales and maintain that percentage in the following years.

SB 1368 (2006). SB 1368 is the companion bill of AB 32 and required the California Public Utilities Commission (CPUC) to establish a GHG emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) established a similar standard for local publicly owned utilities. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by CPUC and CEC.

SB 97 (2007). SB 97 (Chapter 185, Statutes of 2007; PRC, Sections 21083.05 and 21097) acknowledges climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency (CRA) by July 1, 2009, guidelines for mitigating GHG emissions or the effects of GHG emissions, as required by CEQA. This bill also removes any claim of inadequate CEQA analysis of effects of GHG emissions associated with environmental review for projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 (Proposition 1B) or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1E).

SB 375 (2008). SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. As part of the alignment, SB 375 requires MPOs to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) that prescribes land use allocation in that MPO's RTP. The CARB, in consultation with MPOs, is required to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but they can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. The CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned GHG emission reduction targets. If MPOs do not meet the GHG reduction targets, transportation projects located in the MPO boundaries would not be eligible for funding programmed after January 1, 2012. This bill also extends the minimum time period for the Regional Housing Needs Allocation (RHNA) cycle from 5 years to 8 years for local governments located in an MPO that meets certain requirements.

E.O. S-3-05 (2005). E.O. S-3-05 proclaimed that California is vulnerable to the impacts of climate change. The executive order declared increased temperatures could reduce snowpack in the Sierra Nevada Mountains, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established targets for total GHG emissions that include reducing GHG emissions to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. The executive order also directed the secretary of CalEPA to coordinate a multiagency effort to reduce GHG emissions to the target levels.

E.O. S-13-08. E.O. S-13-08 directed California to develop methods for adapting to climate change through preparation of a statewide plan. The executive order directs OPR, in cooperation with the CRA, to provide land use planning guidance related to sea level rise and other climate change impacts by May 30, 2009. The order also directs the CRA to develop a State Climate Adaptation Strategy by June 30, 2009, and to convene an independent panel to complete the first California Sea Level Rise Assessment Report.

E.O. S-1-07. E.O. S-1-07 proclaimed the transportation sector as the main source of GHG emissions in California. The executive order proclaims the transportation sector accounts for more than 40 percent of statewide GHG emissions. The executive order also establishes a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020. In particular, the executive order established a Low-Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, the CARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels.

The transportation sector is the main source of GHG emissions in California, accounting for more than 40 percent of statewide emissions. Executive Order S-1-07 establishes a goal of reducing the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020.

4.10.1.5 | LOCAL GREENHOUSE GAS REGULATIONS

BAAQMD Climate Protection Program. The BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the BAAB. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled (VMT), and develop alternative sources of energy, all of which assist in reducing emissions of GHG and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

4.10.1.6 | NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS

State and federal standards for major air pollutants are summarized in Table 4.10-1. Primary standards were established to protect the public health. Secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare. Because the CAAQS are more stringent than the NAAQS, the CAAQS are used as the standard in the air quality analysis for the Van Ness Avenue BRT Project.

Primary air quality standards for major air pollutants were established to protect the public health. Secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

Attainment Status. Under CAA and CCAA requirements, areas are designated as either attainment or nonattainment for each criterion pollutant based on whether the NAAQS or CAAQS have been achieved. Areas are designated as nonattainment for a pollutant if air quality data show that a state or federal standard for the pollutant was violated at least once during the previous 3 calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a state standard and are not used as a basis for designating areas as nonattainment. Under the CCAA, the San Francisco County portion of the BAAB is designated as a nonattainment area for ozone (O_3), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Under the CAA, the San Francisco County portion of the BAAB is designated as a nonattainment area for O_3.

Table 4.10-1: State and National Ambient Air Quality Standards and Attainment Status for the Bay Area Air Basin

POLLUTANT	AVERAGING PERIOD	CALIFORNIA		FEDERAL	
		STANDARDS	ATTAINMENT STATUS	STANDARDS	ATTAINMENT STATUS
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m³)	Nonattainment	--	--
	8-hour	0.070 ppm (137 µg/m³)	Nonattainment	0.075 ppm (147 µg/m³)	Nonattainment
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m³	Nonattainment	150 µg/m³	Unclassified
	Annual Arithmetic Mean	20 µg/m³	Nonattainment	--	--
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	--	35 µg/m³	Nonattainment
	Annual Arithmetic Mean	12 µg/m³	Nonattainment	15 µg/m³	Attainment
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m³)	Attainment	9 ppm (10 mg/m³)	Attainment/ Maintenance
	1-hour	20 ppm (23 mg/m³)	Attainment	35 ppm (40 mg/m³)	Attainment/ Maintenance
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)	Attainment	53 ppb (100 µg/m³)[1]	Attainment
	1-hour	0.18 ppm (338 µg/m³)	--	100 ppb (188 µg/m³)[1]	Unclassified
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 µg/m³)	Attainment	0.14 ppm (365 µg/m³)	Attainment
	1-hour	0.25 ppm (655 µg/m³)	Attainment	75 ppb (196 µg/m³)	Attainment
	Annual Arithmetic Mean	--	--	0.030 ppm (80 µg/m³)	Attainment
Lead (Pb)	30-day average	1.5 µg/m³	Attainment	--	--
	Calendar Quarter	--	--	1.5 µg/m³	Attainment
	Rolling 3-Month Average	--	--	0.15 µg/m³	--
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per kilometer	Unclassified	No Federal Standards	
Sulfates	24-hour	25 µg/m³	Attainment		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m³)	Unclassified		
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m³)	No Information Available		

[1] EPA strengthened the NO_2 standard on January 22, 2010. EPA has not classified attainment status for the new standards; however, CARB anticipates that the BAAB will be designated as an attainment area for the new NO_2 standards. EPA is expected to issue final designations by January 22, 2012.

n/a = not available; — = not applicable; µg/m³ = micrograms per cubic meter; ppb = parts per billion; ppm = parts per million

SOURCE: CARB, 2011, CARB 2012.

Carbon Monoxide (CO). CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Automobile exhausts release most of the CO in urban areas. CO dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography, and atmospheric stability. The BAAB is in attainment for CO at both the federal and state levels.

Ozone (O_3). O_3, a colorless toxic gas, is the chief component of urban smog. O_3 enters the blood stream and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. O_3 also damages vegetation by inhibiting growth. O_3 forms in the atmosphere through a chemical reaction between reactive organic gases (ROG) and nitrogen oxides (NO_X) under sunlight. Motor vehicles are the major sources of ROG and NO_X. O_3 is present in relatively high concentrations within the BAAB. Automobiles are the single largest source of O_3 precursors in the BAAB. Under the CAA and the CCAA, the San Francisco County portion of the BAAB is designated as a nonattainment area for O_3.

Nitrogen Dioxide (NO_2). NO_2 is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from being a major contributor to ozone formation, NO_2 can increase the risk of acute and chronic respiratory disease. It is an eye and lung irritant, and high concentrations can cause difficulty breathing. Studies have linked short-term exposure to increased asthma symptoms, respiratory illness, more difficulty controlling asthma, and increased visits to emergency departments. In addition, NO_2 may be visible as a coloring component of a reddish-brown cloud on high pollution days, especially in conjunction with high ozone levels.

Sulfur Dioxide (SO_2). SO_2 is a product of high-sulfur fuel combustion. The main sources of SO_2 are coal and oil used in power stations, in industries, and for domestic heating. Industrial chemical manufacturing is another source of SO_2. SO_2 is an irritant gas that attacks the throat and lungs. SO_2 concentrations have been reduced to levels well below the state and national standards, but further reductions in emissions are needed to attain compliance with standards for sulfates and PM_{10}, of which SO_2 is a contributor. The BAAB is in attainment for SO_2 at both the federal and state levels.

Suspended Particulate Matter (PM_{10} and $PM_{2.5}$). Particulate matter consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Respirable particulate matter (PM_{10}) refers to particulate matter less than 10 microns in diameter, approximately one/seventh the thickness of a human hair. Fine particulate matter ($PM_{2.5}$) refers to particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair. PM_{10} and $PM_{2.5}$ pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. Major sources of PM_{10} include motor vehicles; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. $PM_{2.5}$ results from fuel combustion (from motor vehicles, power generation, industrial facilities), residential fireplaces, and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X, and volatile organic compounds. In the BAAB, most particulate matter is caused by combustion, factories, construction, grading, demolition, agricultural activities, and motor vehicles. Motor vehicles are currently responsible for approximately half of the particulates in the BAAB. The San Francisco County portion of the BAAB is a nonattainment area for PM_{10} and $PM_{2.5}$ under the CCAA.

Lead (Pb). Prior to 1978, mobile emissions were the primary source of Pb in air. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne Pb by nearly 95 percent. Currently, industrial sources are the primary source of airborne Pb.

Because the proposed project does not contain an industrial component, lead emissions were not analyzed in the air quality assessment.

Toxic Air Contaminants. In addition to the criteria air pollutants listed above, another group of pollutants, commonly referred to as TACs or HAPs, can result in health effects that can be quite severe. Many TACs are confirmed or suspected carcinogens, or they are known or suspected to cause birth defects or neurological damage. In addition, many TACs can be toxic at very low concentrations. For some chemicals, such as carcinogens, there are no thresholds below which exposure can be considered risk-free. Industrial facilities and mobile sources are significant sources of TACs. The electronics industry, including semiconductor manufacturing, has the potential to contaminate air and water due to the highly toxic chlorinated solvents commonly used in semiconductor production processes. Sources of TACs go beyond industry. Various common urban facilities also produce TAC emissions, such as gasoline stations (benzene), hospitals (ethylene oxide), and dry cleaners (perchloroethylene). Automobile exhaust also contains TACs such as benzene and 1,3-butadiene. Most recently, diesel particulate matter (DPM) was identified as a TAC by the CARB. DPM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. BAAQMD research indicates that mobile source emissions of DPM, benzene, and 1,3-butadiene represent a substantial portion of the ambient background risk from TACs in the BAAB.

Greenhouse Gases. Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of GHGs that contribute to global warming or global climate change have a broader, global impact. Global warming is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the earth's atmosphere. The principal GHGs contributing to global warming are CO_2, methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds. These gases allow visible and ultraviolet light from the sun to pass through the atmosphere, but they prevent heat from escaping back out into space. Among the potential implications of global warming are rising sea levels and adverse impacts to water supply, water quality, agriculture, forestry, and habitats. In addition, global warming may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health. Like most criteria and toxic air pollutants, much of the GHG production comes from motor vehicles. GHG emissions can be reduced to some degree by improved coordination of land use and transportation planning on the city, county, and subregional level, and other measures to reduce automobile use. Energy conservation measures also can contribute to reductions in GHG emissions.

4.10.2 | Affected Environment

The Bay Area Air Basin is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays that distort normal wind flow patterns.

4.10.2.1 | CLIMATE

The BAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays that distort normal wind flow patterns. The area is also characterized by moderately wet winters and dry summers. San Francisco lies at the northern end of the peninsula. Because most of San Francisco's topography is below 200 feet in elevation, marine air is able to flow easily across most of the city, making its climate cool and windy.

The annual average temperature in the proposed project area, as recorded at the San Francisco Mission Dolores Station, is approximately 57.3 degrees Fahrenheit (°F). The proposed project area experiences an average winter temperature of approximately 52.3°F and an average summer temperature of approximately 60.0°F. The frequency of hot, sunny days during the summer months in the BAAB is another important factor that affects air pollution potential. Because temperatures in many of the BAAB inland valleys are so much higher than near the coast, the inland areas are especially prone to photochemical air pollution.

The amount of annual precipitation can vary greatly from one part of the BAAB to another even within short distances. In general, total annual rainfall can reach 40 inches in the mountains, but it is often less than 16 inches in sheltered valleys. Total precipitation in the proposed project area averages approximately 21.1 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer.

Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait, the Golden Gate, or the San Bruno gap. Annual average wind speeds range from 5 to 10 mph throughout the peninsula, with higher wind speeds usually found along the coast. At the northern end of the peninsula in San Francisco, pollutant emissions are high, especially from motor vehicle congestion; however, winds here are generally fast enough to carry the pollutants away before they can accumulate. The highest air pollutant concentrations in the Bay Area generally occur during one of the two common types of inversions, when temperature increases as altitude increases, thereby preventing air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. In the winter, the BAAB frequently experiences stormy conditions with moderate to strong winds, as well as periods of stagnation with very light winds.

4.10.2.2 | AIR MONITORING DATA

The BAAQMD monitors air quality conditions at 23 locations throughout the BAAB. The closest air monitoring station to the project area is the San Francisco Arkansas Street Monitoring Station, which is approximately 1.2 miles from the intersection of Van Ness Avenue and Mission Street and 2.8 miles from the intersection of Van Ness Avenue and Lombard Street. Historical data from the San Francisco Arkansas Street monitoring station was used to characterize existing conditions within the vicinity of the proposed project area and to establish a baseline for estimating future conditions with and without the proposed Van Ness Avenue BRT project.

A BAAQMD air monitoring station.

A summary of the data recorded at this monitoring station during the 2009 to 2011 period is shown in Table 4.10-2. The CAAQS and NAAQS for the criteria pollutants are also shown in the table. As Table 4.10-2 indicates, the air quality monitoring data from 2009 to 2011 show no exceedances of State or federal standards of any criteria pollutants.

The San Francisco Department of Public Health (SFDPH) has created a map that displays $PM_{2.5}$ concentrations resulting from vehicle emissions on City streets.[87] The map was created by SFDPH using CARB's EMFAC2007 vehicle emissions model and the EPA-approved CAL3QHCR Line Source Dispersion Model. CAL3QHCR is a Gaussian dispersion model that estimates air pollution concentrations based on physical characteristics of emissions, meteorology, topography, and receptor horizontal and vertical location. The map shows potential roadway exposure zones, which means those areas within the City and County of San Francisco that, by virtue of their proximity to freeways and major roadways, may exhibit high $PM_{2.5}$ concentrations attributable to local roadway traffic sources. Based on dispersion model analysis, the Van Ness Avenue corridor currently has a relatively greater level of road traffic air pollution and associated air pollution health risks.

[87] City and County of San Francisco Department of Public Health Environmental Health Section, *Proportion of Streets with Annual Average Daily $PM_{2.5}$ Emissions 0.2 μg/m³ or Greater*, 2011.

Table 4.10-2: 2009-2011 Ambient Air Quality Data in Project Vicinity

POLLUTANT	POLLUTANT CONCENTRATION AND STANDARDS	NUMBER OF DAYS ABOVE STATE STANDARD		
		2009	2010	2011
Ozone (O_3)	Maximum 1-hr Concentration (ppm)	0.07	0.08	0.07
	Days > 0.09 ppm (State 1-hr standard)	0	0	0
	Maximum 8-hr Concentration (ppm)	0.06	0.05	0.05
	Days > 0.07 ppm (State 8-hr standard)	0	0	0
	Days > 0.075 ppm (Federal 8-hr standard)	0	0	0
Carbon Monoxide (CO)	Maximum 1-hr concentration (ppm)	3	1.8	1.8
	Days > 20 ppm (State 1-hr standard)	0	0	0
	Days > 35 ppm (Federal 1-hr standard)	0	0	0
	Maximum 8-hr concentration (ppm)	2.9	1.4	1.2
	Days > 9.0 ppm (State 8-hr standard)	0	0	0
	Days > 9.0 ppm (Federal 8-hr standard)	0	0	0
Nitrogen Dioxide (NO_2)	Maximum 1-hr Concentration (ppm)	0.06	0.09	0.09
	Days > 0.18 ppm (State 1-hr standard)	0	0	0
	Days > 0.100 (Federal 1-hr standard)	0	0	0
Respirable Particulate Matter (PM_{10})	Maximum 24-hr concentration ($\mu g/m^3$)	36.0	40	46
	Estimated Days > 50 $\mu g/m^3$ (State 24-hr standard)	0	0	0
	Estimated Days > 150 $\mu g/m^3$ (Federal 24-hr standard)	0	0	0
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean ($\mu g/m^3$)	*/a/	11	10
	Exceed State Standard (12 $\mu g/m^3$)		No	No
	Exceed Federal Standard (15 $\mu g/m^3$)		No	No
Sulfur Dioxide[3]	Maximum 24-hr Concentration (ppm) Days > 0.04 ppm (State 24-hr standard) Days > 0.14 ppm (Federal 24-hr standard)	*/a/	*/a/	*/a/

*/a/ Insufficient data.

SOURCE: BAAQMD, 2013; CARB, 2013.

4.10.2.3 | SENSITIVE RECEPTORS

The following categories of people, as identified by the CARB, are considered most sensitive to air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups are called sensitive receptors and include residential areas, hospitals, child-care facilities, elder care facilities, elementary schools, athletic facilities, playgrounds, and parks. Sensitive receptors that were identified on and near the Van Ness Avenue corridor include residential areas, schools, parks, retirement homes, and religious institutions. Public health research has found that the proximity and amount of vehicle traffic are associated in a statistically significant way with several adverse respiratory health outcomes – particularly in the sensitive receptors described above – including impairment of lung function in children, lung cancer, and asthma incidence or prevalence.

4.10.3 | Environmental Consequences

4.10.3.1 | METHODOLOGY AND SIGNIFICANCE CRITERIA

Regional operational emissions were quantified based on the VMT calculated for the proposed project using transportation models. Automobile emissions were quantified using light-duty emission factors obtained from the CARB EMFAC2011 Motor Vehicle Emissions Inventory Model. The on-road mobile source calculations assumed a systemwide vehicle speed of 11 mph based on the average speed for the Van Ness Avenue corridor as provided by SFCTA. The same methodology was used to quantify GHG emissions from automobiles, and the CO_2 emission rates were obtained from EMFAC2011.

Certain land uses and industrial operations are more likely to cause odor emissions; hence, the discussion of operational odor emissions is based on land uses and their estimated odor potential.

Regional transportation conformity was analyzed by conducting research to check if the proposed project was included in a conforming RTP or Transportation Improvement Plan (TIP) with substantially the same design concept and scope as that of the proposed project. Project-level conformity was analyzed by determining if the proposed project would cause localized exceedances of CO, $PM_{2.5}$, and/or PM_{10} standards, or if it would interfere with "timely implementation" of Transportation Control Measures (TCMs) called out in the State Implementation Plan (SIP).

The BAAQMD developed CEQA Guidelines to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality. These CEQA Guidelines were updated in June 2010 to include reference to thresholds of significance adopted by the BAAQMD Board on June 2, 2010. The Guidelines were further updated in May 2011. On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance. The court did not determine whether the thresholds of significance were valid on the merits, but found that the adoption of the thresholds of significance was a project under the definition provided by CEQA. The court issued a writ of mandate ordering the BAAQMD to set aside the thresholds of significance and cease dissemination of them until the BAAQMD had complied with any environmental review required by CEQA. The BAAQMD has appealed the Alameda County Superior Court's decision. The appeal is currently pending in the Court of Appeal of the State of California, First Appellate District.

In view of the court's order, the BAAQMD no longer recommends that the thresholds of significance from the CEQA Guidelines (updated May 2011) be used as a generally applicable measure of a project's significant air quality impacts. Lead agencies may determine appropriate air quality thresholds of significance based on substantial evidence in the record. Lead agencies may rely on the CEQA Guidelines (updated May 2011) for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures. Lead agencies may continue to rely on the BAAQMD's 1999 thresholds of significance and may continue to make determinations regarding the significance of an individual project's air quality impacts based on the substantial evidence in the record for that project.

SFCTA, as the lead CEQA agency, has determined that the proposed project would cause a significant impact if:

- Operations would cause a net increase in emissions;
- Increased traffic would generate CO concentrations at study intersections that exceed the State 1- and 8-hour standards shown in Table 4.10-1;
- Operations would result in carcinogenic risk that exceeds 10 persons in one million;
- Operations would create an odor nuisance;
- Project alternatives would not be consistent with the BAAQMD air quality plans; and/or
- Operations would cause a net increase in GHG emissions.

NEPA Adverse Impact Criteria. According to the CEQ regulations (40 CFR §§ 1500-1508), the determination of a significant impact is a function of context and intensity. Context means that the significance of an action must be analyzed in several contexts, such as society as a whole (i.e., human, national), the affected region, the affected interests, and the locality. Both short- and long-term effects are relevant. Intensity refers to the severity of impact. To determine significance, the severity of the impact must be examined in terms of the type, quality, and sensitivity of the resource involved; the location of the proposed project; the duration of the effect (i.e., short- or long-term), and other considerations of context. Adverse impacts will vary with the setting of the proposed action and the surrounding area.

4.10.3.2 | CEQA OPERATIONAL PHASE IMPACTS

Regional Operational Emissions – 2035

Regional operational emissions were estimated using EMFAC2011 emission rates. The citywide average vehicle speed was assumed to be 20 mph. Table 4.10-3 shows the net change in emissions for each of the build alternatives compared to the 2035 No Build Alternative.[88] The LPA, including the Vallejo Northbound Station Variant, as a refinement of the two center-running build alternatives, would also not result in a net change in emissions compared to the 2035 No Build Alternative. In addition, each alternative, including the LPA and the No Build Alternative, would replace current electric buses with new electric buses, and replace current diesel buses with lower-emitting diesel hybrid buses.

Table 4.10-3: Estimated Net Operational Emissions – 2035

	ROG	NOx	PM10	PM2.5
BUILD ALTERNATIVE 2 VS. NO BUILD ALTERNATIVE				
Pounds Per Day	(7)	(22)	(9)	(1)
Net Emissions Increase?	No	No	No	No
Tons Per Year	(1)	(4)	(2)	(1)
Net Emissions Increase?	No	No	No	No
BUILD ALTERNATIVES 3 & 4 (WITHOUT DESIGN OPTION B) VS. NO BUILD ALTERNATIVE				
Pounds Per Day	(8)	(24)	(10)	(4)
Net Emissions Increase?	No	No	No	No
Tons Per Year	(1)	(4)	(2)	(1)
Net Emissions Increase?	No	No	No	No
BUILD ALTERNATIVES 3 & 4 (WITH DESIGN OPTION B) VS. NO BUILD ALTERNATIVE				
Pounds Per Day	(1)	(4)	(2)	(1)
Net Emissions Increase?	No	No	No	No
Tons Per Year	(<1)	(1)	(<1)	(<1)
Net Emissions Increase?	No	No	No	No

SOURCE: TAHA, 20132.

Alternative 1: No Build (Baseline Alternative). The No Build Alternative assumes no BRT service. This alternative considers projected demographic and land use characteristics in addition to proposed traffic signal infrastructure for real-time traffic management improvements expected to be implemented independent of the Van Ness Avenue BRT Project by the near-term horizon year 2015, or long-range horizon year 2035. It is important to note that the No Build Alternative would neither increase nor decrease bus service on Van Ness Avenue; however, the proposed bus engine technology changes would reduce emissions below existing conditions.

[88] The 2035 No Build Alternative accounts for traffic growth by year 2035 without the BRT project.

Build Alternative 2: Side-Lane BRT with Street Parking. Under this alternative, as shown in Table 4.10-3, regional operational emissions would be reduced in the air basin compared to the No Build Alternative; therefore, the alternative would result in a beneficial impact under CEQA.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians. Under this alternative (both with and without Design Option B), as shown in Table 4.10-3, regional operational emissions would be reduced in the air basin compared to the No Build Alternative; therefore, the alternative would result in a beneficial impact under CEQA.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median. Under this alternative (both with and without Design Option B), as shown in Table 4.10-3, regional operational emissions would be reduced in the air basin compared to the No Build Alternative; therefore, the alternative would result in a beneficial impact under CEQA.

LPA: Center-Lane BRT with Right-Side Boarding /Single Median and Limited Left Turns. The LPA, including the Vallejo Northbound Station Variant, is a refinement of center-running build alternatives, Build Alternatives 3 and 4 with Design Option B, and the net change in VMT would be similar for the LPA (with or without the Vallejo Northbound Station Variant) and the center-running alternatives (source: SF-CHAMP); thus, the net change in operational emissions for year 2035 would be similar to the changes presented in Table 4.10-3 for Build Alternatives 3 and 4 with Design Option B.

Regional Operational Emissions – Existing Plus Project (2007)

Existing plus Project emissions were estimated using the same methodology employed for 2035 emissions. Emissions are presented for Existing plus Project Conditions, consistent with the traffic analysis prepared for this project in which the 2015 Build scenarios are compared with the existing condition (CHS Consulting Group, 2013). Table 4.10-4 shows the net change in emissions for each of the build alternatives compared to the 2007 Existing Conditions.

Table 4.10-4: Estimated Net Operational Emissions – 2007

	ROG	NO_X	PM_{10}	$PM_{2.5}$
BUILD ALTERNATIVE 2 VS. EXISTING CONDITIONS				
Pounds Per Day	(81)	(248)	(24)	(12)
Net Emissions Increase?	No	No	No	No
Tons Per Year	(15)	(45)	(4)	(2)
Net Emissions Increase?	No	No	No	No
BUILD ALTERNATIVES 3 & 4 (WITHOUT DESIGN OPTION B) VS. EXISTING CONDITIONS				
Pounds Per Day	(82)	(249)	(24)	(12)
Net Emissions Increase?	No	No	No	No
Tons Per Year	(15)	(45)	(4)	(2)
Net Emissions Increase?	No	No	No	No
BUILD ALTERNATIVES 3 & 4 (WITH DESIGN OPTION B) VS. EXISTING CONDITIONS*				
Pounds Per Day	(68)	(208)	(20)	(10)
Net Emissions Increase?	No	No	No	No
Tons Per Year	(12)	(38)	(4)	(2)
Net Emissions Increase?	No	No	No	No

*The LPA would have similar emissions to Build Alternatives 3 and 4 with Design Option B.

SOURCE: TAHA, 2013.

Build Alternative 2: Side-Lane BRT with Street Parking. Under this alternative, as shown in Table 4.10-4, regional operational emissions would be reduced in the air basin compared to existing conditions; therefore, the alternative would result in a beneficial impact under CEQA.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians. Under this alternative (both with and without Design Option B), as shown in Table 4.10-4, regional operational emissions would be reduced in the air basin compared to existing conditions; therefore, the alternative would result in a beneficial impact under CEQA.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median. Under this alternative (both with and without Design Option B), as shown in Table 4.10-4, regional operational emissions would be reduced in the air basin compared to existing conditions; therefore, the alternative would result in a beneficial impact under CEQA.

LPA: Center-Lane BRT with Right-Side Boarding /Single Median and Limited Left Turns. The LPA, including the Vallejo Northbound Station Variant, is a refinement of center-running build alternatives, Build Alternatives 3 and 4 with Design Option B, and the net change in VMT would be similar for the LPA, the Design Variant, and the center-running alternatives (source: SF-CHAMP); thus, the net change in operational emissions would be similar to the changes presented in Table 4.10-4 for Build Alternatives 3 and 4 with Design Option B.

Localized Carbon Monoxide Emissions

Emissions and ambient concentrations of CO have decreased dramatically in the BAAB with the introduction of the catalytic converter in 1975. There have been no exceedances of the State or federal standards for CO since 1991. The BAAB is currently designated as an attainment area for the CAAQS and NAAQS for CO; however, elevated localized concentrations of CO still require consideration in the environmental review process. Occurrences of localized CO concentrations, known as hotspots, are often associated with heavy traffic congestion, which most frequently occurs at signalized intersections of high-volume roadways.

Occurrences of localized CO concentrations, known as hotspots, are often associated with heavy traffic congestion and most frequently occur at signalized intersections of high-volume roadways. The BAAQMD has completed technical analyses that indicate that there is no potential for CO hotspots to occur when:

- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway). The fact that the Van Ness Avenue BRT study area is a highly developed urban area with multi-story buildings and contains streets with canyon-like air dispersion characteristics, means that this criterion may be applied to certain blocks along Van Ness Avenue and some of its parallel streets.

The proposed project would not increase traffic volumes at any intersection in the traffic study area (including Van Ness Avenue and five parallel streets: Gough, Franklin, Polk, Larkin, and Hyde) to a total of more than 24,000 vehicles per hour, and would therefore be consistent with the criteria above.

Further analysis of CO concentrations is not required. Localized CO concentrations would result in less-than-significant impacts. Under the No Build Alternative, the same updates in the bus fleet would occur, and no changes to operating schedules would occur. Because of the cleaner running fleet, and no increases in use, this alternative would result in a less-than-significant impact under CEQA.

Parallel Street Traffic Volumes and Pollutant Concentrations

The proposed project is anticipated to cause some automobiles to divert away from Van Ness Avenue and make their trip on a parallel street (e.g., Franklin Street) within the corridor, as described in Section 3.1.3.2. Increased congestion on parallel streets could increase localized pollutant concentrations. Pollutant concentrations were modeled using CALINE4 for 3,443 vehicles on Franklin Street. This volume includes project baseline traffic volumes and then considers increased traffic looking ahead to year 2035 in a "with project," or BRT scenario. The wind speed in CALINE4 was set conservatively at the lowest level allowable level to represent potential stagnant wind conditions associated with high-rise apartments and narrow streets. As shown in Table 4.10-5, the concentrations along Franklin Street would be well below the State standards after implementation of the BRT in year 2035 traffic conditions.

Table 4.10-5: Localized Operational Concentrations, 2035 with BRT

POLLUTANT	CONCENTRATION AT NEAREST SENSITIVE RECEPTOR	STATE STANDARD	SIGNIFICANT IMPACT?
CO (1-Hour)	0.5 ppm	20 ppm	No
CO (8-Hour)	0.35 ppm	9.0 ppm	No
NO_2 (1-Hour)	<0.009 ppm	0.18 ppm	No
PM_{10} (24-Hour)	14 μg/m^3	50 μg/m^3	No
PM_{10} (Annual)	2.8 μg/m^3	20 μg/m^3	No
$PM_{2.5}$ (Annual)	1.2 μg/m^3	12 μg/m^3	No

SOURCE: TAHA., 2013.

Idle Emissions

An additional analysis was undertaken to specifically address air impacts from potential increases in vehicle idling and associated air emissions (TAHA, 2013). The build alternatives, including the LPA, would convert two mixed-travel lanes to bus-only lanes (i.e., one lane each in NB and SB directions) and reduce left-turn opportunities along Van Ness Avenue. This would potentially increase vehicle idling and associated air emissions. An idle emissions analysis was completed using the CAL3QHC dispersion model at intersections that would experience the highest vehicle delay in the 2035 horizon year. This was identified as the Gough Street/Hayes Street intersection with a PM peak-hour volume of 3,954 PM vehicles and an average delay of 195 seconds per vehicle. CAL3QHC incorporates methods for estimating queue lengths and the contribution of emissions from idling vehicles. The model permits the estimation of total air pollution concentrations from both moving and idling vehicles. It is a reliable tool for predicting concentrations of inert air pollutants near signalized intersections. Because idle emissions account for a substantial portion of the total emissions at an intersection, the model is relatively insensitive to traffic speed, a parameter difficult to predict with a high degree of accuracy on congested urban roadways. The model calculates CO and PM concentrations. One-hour CO concentrations were converted into 8-hour concentrations using conversion factors established by EPA. One-hour PM concentrations were converted into 24-hour and annual concentrations using conversion factors established by EPA. Consistent with SF-CHAMP, the analysis assumed that heavy-duty vehicles represent 2 percent of vehicle volumes, and the emission rates were adjusted accordingly. As shown in Table 4.10-6, the idle emissions would be well below the State standards after implementation of the BRT in year 2035 traffic conditions.

Toxic Air Contaminants

The purpose of the proposed project is to improve transit operations along Van Ness Avenue by constructing within the ROW to allow operation of BRT. Each alternative, including the LPA, has been determined to generate minimal air quality impacts and has not been linked with any special TAC concerns. As such, no project build alternative, including the LPA, would result in any increases in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in TAC emissions of the proposed project compared to that of the No Build Alternative. In addition, updating the vehicle fleet from diesel buses to diesel hybrid buses as part of the No Build Alternative (Alternative 1) would further reduce DPM versus existing conditions.

Table 4.10-6: Idle Emissions, 2035 with BRT

POLLUTANT	SIDEWALK CONCENTRATIONS	STATE STANDARD	SIGNIFICANT IMPACT?
CO (1-Hour)	0.1 ppm	20 ppm	No
CO (8-Hour)	0.07 ppm	9.0 ppm	No
PM_{10} (24-Hour)	4 $\mu g/m^3$	50 $\mu g/m^3$	No
PM_{10} (Annual)	0.8 $\mu g/m^3$	20 $\mu g/m^3$	No
$PM_{2.5}$ (Annual)	0.3 $\mu g/m^3$	12 $\mu g/m^3$	No

SOURCE: TAHA, 2013.

Specifically regarding TACs and Van Ness Avenue, the proposed project would not increase congestion on Van Ness Avenue (see Section 3.3 of this EIS/EIR). In addition, updating the vehicle fleet from diesel buses to diesel hybrid buses as part of the No Build Alternative (Alternative 1) would further reduce DPM versus existing conditions; hence, TAC emissions would result in a less-than-significant impact along Van Ness Avenue for each alternative under CEQA.

Increased congestion on parallel streets has the potential to increase exposure to TAC emissions. An assessment was completed both for the segment with greatest incremental increases in annual average daily traffic and the highest total amount of annual average daily traffic (TAHA, 2013). The greatest incremental change in parallel street traffic between the No Build Alternative and build alternatives would be along Franklin Street north of Market Street under either center lane configured alternative (Build Alternative 3 and 4, with or without Design Option B) including the LPA. The total average daily traffic along this segment would be 29,419 vehicles in 2035 and the incremental increase of daily traffic as a result of the proposed project would be 8,612 vehicles. The BAAQMD has published screening tables for assessing mobile source $PM_{2.5}$ concentrations and cancer risk from surface streets. The screening tables indicate that, at a receptor distance of 50 feet, approximately 30,000 annual average daily vehicles would generate an annual $PM_{2.5}$ concentration of 0.147 $\mu g/m^3$. As shown in Table 4.10-7, the project-related incremental increase would be responsible for approximately 0.043 $\mu g/m^3$, or 29 percent, of the annual $PM_{2.5}$ exposure. The lifetime cancer risk associated with 30,000 annual average daily vehicles (similar to the 29,419 vehicles at this intersection) would be 3.56 persons in one million. The project-related incremental increase (approximately 29 percent of the total) would be responsible for approximately 1.0 person in one million of the increase in cancer risk. The project $PM_{2.5}$ concentration (0.043 $\mu g/m^3$) is approximately 0.4 percent of the annual $PM_{2.5}$ State standard and one-tenth (1/10) the project-level threshold (1 person) for cancer risk of 10 persons in one million.

Table 4.10-7: Toxic Air Contaminant Concentrations on Parallel Streets, 2035 with BRT

SCENARIO	CONCENTRATION AT NEAREST SENSITIVE RECEPTOR	THRESHOLD	SIGNIFICANT IMPACT?
GREATEST INCREMENTAL CHANGE IN TRAFFIC VOLUME (FRANKLIN STREET NORTH OF MARKET STREET)			
Annual $PM_{2.5}$ – Project Specific	0.043 μg/m³	12 μg/m³	No
Health Risk – Project Specific	1.0 Person	10 Persons	No
HIGHEST DAILY TRAFFIC VOLUME (FRANKLIN STREET NORTH OF GEARY STREET)			
Annual $PM_{2.5}$ – Project Specific	0.025 μg/m³	12 μg/m³	No
Health Risk – Project Specific	0.6 Person	10 Persons	No

SOURCE: TAHA, 2013.

The highest parallel street traffic volume would be 47,823 average daily annual vehicles along Franklin Street north of Geary Street under both center lane configured alternatives (Build Alternatives 3 and 4) and the LPA. The project contribution along this segment would be 4,486 annual average daily vehicles in 2035. The screening tables indicate that, at a receptor distance of 50 feet, approximately 50,000 annual average daily vehicles would generate an annual $PM_{2.5}$ concentration of 0.267 $\mu g/m^3$. The project-related incremental increase would be responsible for approximately 0.025 $\mu g/m^3$, or 9 percent, of the annual $PM_{2.5}$ exposure. The lifetime cancer risk associated with 50,000 annual average daily vehicles would be 6.49 persons in one million. The 9 percent project-related incremental increase would be responsible for approximately 0.60 person in one million of the cancer risk. The project $PM_{2.5}$ concentration (0.025 $\mu g/m^3$) would be approximately 0.2 percent of the annual $PM_{2.5}$ State standard and one-tenth (1/10) the project-level threshold for cancer risk (0.60 person) of 10 persons in one million.

Overall, the increase in $PM_{2.5}$ concentration would not be a significant percent of the State standard and the lifetime cancer risk would be less than the project-level threshold of 10 persons in one million for cancer risk. TAC emissions on parallel streets would result in a less-than-significant impact for each build alternative, including the LPA, under CEQA.

KEY FINDING

All of the build alternatives would reduce ROG, NO_X, PM_{10}, and $PM_{2.5}$ emissions compared to the No Build Alternative. Due to the reduction in automobile VMT and replacement of the bus fleet with cleaner vehicles, each build alternative would result in a beneficial impact under NEPA.

Odor Emissions

The proposed project would not include any land use or activity that typically generates adverse odors, and it would result in a less-than-significant odor impact for each alternative under CEQA.

4.10.3.3 | NEPA OPERATIONAL PHASE IMPACTS

Regional Operational Emissions

Table 4.10-3 shows the net change in emissions for each of the build alternatives compared to the 2035 No Build Alternative. Each alternative, including the No Build Alternative and LPA, would replace current electric buses with new electric buses, and replace current diesel buses with lower-emitting diesel hybrid buses.

Alternative 1: No Build (Baseline Alternative). This alternative would not include a BRT service and considers projected demographic and land use characteristics in addition to proposed traffic signal infrastructure for real-time traffic management improvements; however, the bus improvements associated with each alternative would still be implemented. These improvements include replacing the current electric buses with new electric buses, and replacing the current diesel buses with lower-emitting diesel hybrid buses.

Build Alternative 2: Side-Lane BRT with Street Parking. As indicated in Table 4.10-3, this alternative would reduce ROG, NO_X, PM_{10}, and $PM_{2.5}$ emissions compared to the No Build Alternative. Due to the reduction in automobile VMT, and replacement of the bus fleet with cleaner vehicles, Build Alternative 2 would result in a beneficial impact under NEPA.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians. As indicated in Table 4.10-3, this alternative would reduce ROG, NO_X, PM_{10}, and $PM_{2.5}$ emissions compared to the No Build Alternative. Under this alternative, the automobile VMT would be reduced, and the bus fleet would be replaced with cleaner vehicles. Build Alternative 3 (both with and without Design Option B) would result in a beneficial impact under NEPA.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median. As indicated in Table 4.10-3, this alternative would reduce ROG, NO_X, PM_{10}, and $PM_{2.5}$ emissions compared to the No Build Alternative. Under this alternative, the automobile VMT would be reduced, and the bus fleet would be replaced with cleaner vehicles. Build Alternative 4 (both with and without Design Option B) would result in a beneficial impact under NEPA.

LPA: Center-Lane BRT with Right-Side Boarding /Single Median and Limited Left Turns. The LPA, including the Vallejo Northbound Station Variant, is a refinement of center-running build alternatives, Build Alternatives 3 and 4 with Design Option B, and the net change in VMT would be similar for the LPA, the Design Variant, and the center-running alternatives (source: SF-CHAMP); therefore, the net change in operational emissions would be similar to the changes presented for Build Alternatives 3 and 4 with Design Option B in Table 4.10-4. As with Build Alternatives 3 and 4 with Design Option B, the automobile VMT would be reduced under the LPA versus the No Build Alternative (Alternative 1) and the bus fleet would be replaced with cleaner vehicles versus existing conditions. The LPA would result in a beneficial impact under NEPA.

Localized Carbon Monoxide Emissions

Because of similar vehicles to the No Build Alternative and lower VMT for autos, the build alternatives would not result in any increases in emissions, including CO and particulate matter. In addition, the build alternatives would lower overall VMT; hence, none of the alternatives would result in an adverse impact under NEPA.

The proposed project would replace each electric coach currently in the vehicle fleet with newer coaches and replace each diesel coach with a diesel hybrid coach. These diesel hybrid coaches have lower emissions when compared to their standard diesel counterparts used in existing conditions. In addition, compared to the No Build Alternative, each build alternative, including the LPA, would reduce VMT in San Francisco. Because of cleaner vehicles and lower overall VMT, the proposed project would not result in any increases in emissions, including CO and particulate matter; hence, none of the build alternatives, including the LPA, would result in an adverse impact under NEPA.

Under the No Build Alternative, the same updates to the bus fleet would occur, and no changes to operating schedules would occur. Because of the cleaner running fleet and no increases in use, this alternative would not result in an adverse impact under NEPA.

Toxic Air Contaminants

The purpose of the proposed project is to improve transit operations along Van Ness Avenue by providing exclusive lanes for a BRT service. Each alternative, including the LPA, has been determined to generate minimal air quality impacts for CAAA criteria pollutants and has not been linked with any special MSAT concerns. As such, no alternative, including the LPA, would result in an increase in traffic volumes on Van Ness Avenue, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the proposed project compared to that of the No Build Alternative. As explained in Section 4.10.3.2, while increased traffic volumes and congestion on parallel streets has the potential to increase exposure to toxic air contaminants, analysis of the parallel street with the highest traffic volumes under Build Alternatives 3 and 4, and under the LPA, shows that TAC emissions on parallel streets would be well below BAAQMD project-level and cumulative level thresholds for mobile source $PM_{2.5}$ concentrations from surface streets. In addition to this, changing the vehicle fleet from diesel buses to diesel hybrid buses would further reduce DPM versus existing conditions.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. None of the alternatives would result in an adverse TAC impact under NEPA.

DEFINITION

Transportation conformity means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant National Ambient Air Quality Standards (NAAQS).

Odor Emissions

The proposed project would not include any land use or activity that typically generates adverse odors, and none of the alternatives would result in an adverse odor impact under NEPA.

4.10.4 Avoidance, Minimization, and/or Mitigation Measures

No adverse impacts from project operation are anticipated; therefore, no minimization or mitigation measures are recommended. Construction period avoidance, minimization and/or mitigation measures are described in Section 4.15.9.

4.10.5 Transportation Conformity Impacts

Transportation conformity is required under CAA Section 176(c) (42 U.S.C. 7506(c)) to ensure that federally supported highway and transit project activities are consistent with the purpose of the SIP. Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. EPA's transportation conformity rule (40 CFR 51.390 and Part 93) establishes the criteria and procedures for determining whether transportation activities conform to the SIP. Under the criteria, transportation projects must demonstrate conformity on regional and local levels.

The proposed project was included in the regional emissions analysis completed by MTC for the conforming Transportation 2035 Plan. The design concept and scope of the proposed project have not changed significantly from what was analyzed in the Transportation 2035 Plan. This analysis found that the plan and, therefore, the individual projects contained in the plan, are conforming projects, and will have air quality impacts consistent with those identified in the SIP for achieving the NAAQS. Furthermore, FHWA determined the Transportation 2035 Plan to conform to the SIP in May 2009.

The proposed project is also included in the federal 2011 TIP. FHWA/FTA determined the TIP to conform to the SIP on December 14, 2010. The proposed project is consistent with regional conformity guidelines.

KEY FINDING

The proposed project is consistent with regional conformity guidelines.

The California Project-Level Carbon Monoxide Protocol (CO Protocol) was used to conduct a CO analysis for the proposed project. Part of the CO analysis includes the screening procedure found at Level 2 of the flow chart in Figure 3 in the CO Protocol. First, the proposed project would not significantly contribute to cold start percentages because no additional land uses are proposed that would add vehicle trips to the area. Second, the proposed project does not propose any additional land uses in the area and, as a result, would not generate any additional trips. The project would reduce regional VMT, especially vehicle trips located in and near the project corridor. Third, the proposed project would not impede the flow of traffic in the project area. The traffic study states that in 2015, the average travel speed for most of the streets in the traffic study area under the build alternatives, including the LPA, would remain approximately the same (generally ± 0.3-mph) as the No Build Alternative, and no segment would see the speed decrease by more than 0.9-mph). Fourth, the proposed project would not move traffic closer to any sensitive receptors in the region. Although Design Option Center B does not add significantly enough additional traffic volumes on Franklin/Gough to be measurable from an emissions perspective, eliminating left turns could increase traffic volumes along certain roadway segments parallel to Van Ness Avenue, such as Franklin Street. As discussed in Section 4.10.3.2 (Localized Emissions), the project would not result in a localized CO hot spot. The proposed project satisfies all of the conditions of Level 2 of the CO Protocol in order to be screened out; therefore, the proposed project would not have the potential for causing or worsening violation of the NAAQS for CO.

Qualitative particulate matter hotspot analysis is required under the EPA Transportation Conformity rule for Projects of Air Quality Concern (POAQC). Projects that are not POAQC are not required to complete a detailed particulate matter hotspot analysis. According to the EPA Transportation Conformity Guidance, the following types of projects are considered POAQC:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles (defined as greater than 125,000 Annual Average Daily Traffic (AADT) and 8 percent or more of such AADT is diesel truck traffic);
- Projects affecting intersections that are at LOS D, E, or F, with a significant number of diesel vehicles, or that that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
- Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; or
- Projects in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ or PM_{10} implementation plan or implementation plan submission, as appropriate, as sites of possible violation.

The proposed project is not considered a POAQC because it does not meet the definition of a POAQC as defined in EPA's Transportation Conformity Guidance. The proposed project would not increase the percentage of diesel vehicles on the roadway, does not involve a bus or rail terminal that significantly increases diesel vehicles, and is not identified in the SIP as a possible $PM_{2.5}$ or PM_{10} violation site. A particulate matter hotspot analysis is not required.

4.10.6 | Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures pertaining to transportation conformity are required for the proposed project.

4.10.7 | Greenhouse Gas Emissions

4.10.7.1 | GREENHOUSE GAS EMISSIONS – 2035

The largest source of GHG emissions are from automobiles. Public transportation projects generally reduce the amount of cars driving on the road by providing the public with alternative means of transportation. Less cars on the road leads to less sources of pollution. Because of the higher capacity of buses and the updated fleet associated with the proposed project, buses are able to transport higher quantities of people while producing fewer emissions than the cars they are replacing. This results in a reduction in GHG emissions. Total gross GHG emissions are shown for each build alternative in Table 4.10-8. The total gross GHG emissions under the LPA would be the same as presented for Build Alternatives 3 and 4 with Design Option B in Table 4.10-8. Table 4.10-9 shows the net difference in citywide VMT and CO_2e for each alternative. The total Citywide GHG emissions under the LPA would be the same as presented for Build Alternatives 3 and 4 with Design Option B in Table 4.10-9.

Table 4.10-8: Estimated Gross Citywide Greenhouse Gas Emissions – 2035

SCENARIO	VMT	CARBON DIOXIDE EQUIVALENT (METRIC TONS PER YEAR)
2035 Baseline	11,965,507	2,341,923
Build Alternative 2	11,891,952	2,327,527
Build Alternatives 3 and 4 without Design Option B	11,887,251	2,326,607
Build Alternatives 3 and 4 with Design Option B*	11,953,541	2,339,581

*The LPA would have the similar VMT and greenhouse gas emissions as Build Alternatives 3 and 4 with Design Option B

SOURCE: TAHA, 2013.

Table 4.10-9: Estimated Net Citywide Greenhouse Gas Emissions – 2035

SCENARIO	NET INCREASE IN VMT	CARBON DIOXIDE EQUIVALENT (METRIC TONS PER YEAR)
Baseline versus Build Alternative 2	(73,555)	(14,396)
Net Increase in GHG Emissions?		No
Baseline versus Build Alternatives 3 and 4 without Design Option B	(78,256)	(15,316)
Net Increase in GHG Emissions?		No
Baseline versus Build Alternatives 3 and 4 with Design Option B*	(11,966)	(2,342)
Net Increase in GHG Emissions?		No

*The LPA would have the similar VMT and greenhouse gas emissions as Build Alternatives 3 and 4 with Design Option B

SOURCE: TAHA, 2013.

Alternative 1: No Build (Baseline Alternative)

The No-Build Alternative would not include a BRT service; however, the bus improvements associated with each alternative would still be implemented. These improvements include replacing the current electric buses with new electric buses and replacing the current diesel buses with lower-emitting diesel hybrid buses. Because of these improvements, GHG emissions would be reduced below existing conditions. This would result in a beneficial global warming impact.

Build Alternative 2: Side-Lane BRT with Street Parking

As shown in Table 4.10-9, Build Alternative 2 would decrease automobile VMT and associated GHG emissions compared to baseline conditions by 14,396 metric tons per year. Build Alternative 2 would result in less GHG emissions than baseline conditions, and it would cause a beneficial global warming impact.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians

As shown in Table 4.10-9, Build Alternative 3 would decrease automobile VMT and associated GHG emissions compared to baseline conditions by 15,316 metric tons per year. Build Alternative 3 would result in less GHG emissions than baseline conditions, and it would cause a beneficial global warming impact.

KEY FINDING

Bus fleet improvements under all alternatives include replacing the current electric buses with new electric buses and replacing the current diesel buses with lower-emitting diesel hybrid buses. In addition, the build alternatives, including the LPA, would lower overall VMT; hence, GHG emissions would be reduced below existing conditions, resulting in a beneficial global warming impact.

Center-Lane Alternative Design Option B. As shown in Table 4.10-9, Design Option B under Build Alternative 3 would decrease automobile VMT and associated GHG emissions compared to baseline conditions by 2,342 metric tons per year. Design Option B under Build Alternative 3 would result in less GHG emissions than baseline conditions, and it would cause a beneficial global warming impact.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median

As shown in Table 4.10-9, Build Alternative 4 would decrease automobile VMT and associated GHG emissions by the same amount as Build Alternative 3, causing a beneficial global warming impact.

Center-Lane Alternative Design Option B. As shown in Table 4.10-9, Build Alternative 4 with incorporation of Design Option B automobile VMT would be the same as for Build Alternative 3. GHG emissions, displayed in Table 4.10-9, would be reduced in the Air Basin. Design Option B under Build Alternative 4 would cause a beneficial global warming impact.

LPA: Center-Lane BRT with Right-Side Boarding /Single Median and Limited Left Turns

Because the LPA, including the Vallejo Northbound Station Variant, is a refinement of center-running build alternatives, Build Alternatives 3 and 4 with Design Option B, the LPA would decrease automobile VMT and associated GHG emissions compared to baseline conditions, and this ton per year decrease would be the same as presented for Build Alternatives 3 and 4 with Design Option B in Table 4.10.9. The LPA would have a beneficial effect on global warming.

4.10.7.2 | GREENHOUSE GAS EMISSIONS – EXISTING PLUS PROJECT (2007)

Total gross GHG emissions for Existing plus Project conditions are shown in Table 4.10-10. Table 4.10-11 shows the net difference in citywide VMT and CO_2e for each alternative.

Build Alternative 2: Side-Lane BRT with Street Parking

As shown in Table 4.10-11, Build Alternative 2 would decrease automobile VMT and associated GHG emissions compared to baseline conditions by 32,894 metric tons per year. Build Alternative 2 would result in less GHG emissions than baseline conditions, and it would cause a beneficial global warming impact.

Table 4.10-10: Estimated Gross Citywide Greenhouse Gas Emissions – 2007

SCENARIO	VMT	CARBON DIOXIDE EQUIVALENT (METRIC TONS PER YEAR)
Existing Conditions	10,100,425	2,076,273
Build Alternative 2	9,940,405	2,043,378
Build Alternatives 3 and 4 without Design Option B	9,939,510	2,043,194
Build Alternatives 3 and 4 with Design Option B*	9,965,954	2,048,630

*The LPA would have the similar VMT and greenhouse gas emissions as Build Alternatives 3 and 4 with Design Option B

SOURCE: TAHA, 2013.

Table 4.10-11: Estimated Net Citywide Greenhouse Gas Emissions – 2007

SCENARIO	NET INCREASE IN VMT	CARBON DIOXIDE EQUIVALENT (METRIC TONS PER YEAR)
Existing versus Build Alternative 2	(160,020)	(32,894)
Net Increase in GHG Emissions?		No
Existing versus Build Alternatives 3 and 4 without Design Option B	(160,915)	(33,078)
Net Increase in GHG Emissions?		No
Existing versus Build Alternatives 3 and 4 with Design Option B*	(134,471)	(27,642)
Net Increase in GHG Emissions?		No

*The LPA would have the similar VMT and greenhouse gas emissions as Build Alternatives 3 and 4 with Design Option B

SOURCE: TAHA, 2013.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians

As shown in Table 4.10-11, Build Alternative 3 would decrease automobile VMT and associated GHG emissions compared to baseline conditions by 33,078 metric tons per year. Build Alternative 3 would result in less GHG emissions than baseline conditions, and it would cause a beneficial global warming impact.

Center-Lane Alternative Design Option B. As shown in Table 4.10-11, Design Option B under Build Alternative 3 would decrease automobile VMT and associated GHG emissions compared to baseline conditions by 27,642 metric tons per year. Design Option B under Build Alternative 3 would result in less GHG emissions than baseline conditions, and it would cause a beneficial global warming impact.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median

As shown in Table 4.10-11, Build Alternative 4 would decrease automobile VMT and associated GHG emissions by the same amount as Build Alternative 3, causing a beneficial global warming impact.

Center-Lane Alternative Design Option B. As shown in Table 4.10-11, Build Alternative 4 with incorporation of Design Option B automobile VMT would be the same as for Build Alternative 3. GHG emissions, displayed in Table 4.10-11, would be reduced in the Air Basin. Design Option B under Build Alternative 4 would cause a beneficial global warming impact.

LPA: Center-Lane BRT with Right-Side Boarding /Single Median and Limited Left Turns. The LPA, including the Vallejo Northbound Station Variant, is a refinement of center-running build alternatives, Build Alternatives 3 and 4 with Design Option B, and automobile VMT under the LPA would be the same as for Build Alternatives 3 and 4 with Design Option B, displayed in Table 4.10-11. Thus, the LPA would cause a reduction in GHG emissions in the Air Basin, resulting in a beneficial global warming impact.

4.10.8 | Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures pertaining to GHG emissions and global warming are required for the proposed project.

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4.11 Noise and Vibration

This section summarizes the noise and vibration regulatory setting, affected environment, environmental consequences, and measures to mitigate impacts as a result of the proposed Van Ness Avenue BRT project. Construction-phase impacts and avoidance measures are presented in Section 4.15-10. The No Build Alternative serves as the future (2035) baseline for considering net project noise impacts for the purposes of this analysis. Differences in noise impacts between Build Alternatives 3 and 4 are expected to be negligible. Accordingly, impacts along Van Ness Avenue are evaluated for Build Alternative 2 and Build Alternatives 3 and 4 combined. Noise impacts from traffic diverted onto adjacent streets are evaluated only for the worst-case build alternative and worst-case design variation, whichever condition would divert the most traffic to those streets.

The LPA included in this Final EIS/EIR is a refinement of the center running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The noise and vibration effects of the LPA, with or without the Vallejo Northbound Station Variant, are identified as part of the analysis presented for the build alternatives in this chapter. There would be no notable difference in noise and vibration impacts under the LPA compared with the impacts described for Build Alternatives 3 and 4 with Design Option B in this subsection.

4.11.1 Terminology

Noise is usually defined as sound that is undesirable, because it interferes with speech communication and hearing, or is otherwise annoying (i.e., unwanted sound). Under certain conditions, noise may cause hearing loss, interfere with human activities, and in various ways may affect people's health and well being, which is cause for an analysis of noise. Studies used by the San Francisco Department of Public Health have shown that exposure to high levels of noise, including road traffic in certain circumstances, has a causal influence on some negative health outcomes such as high blood pressure and ischemic heart disease.

Sound pressure level (Lp) can vary over an extremely large range of amplitude. Lp describes the level of noise measured at a receiver at any moment in time and is read directly from a sound-level meter. The decibel (dB) is the accepted standard unit for measuring the amplitude of sound. When describing sound and its effect on a human population, A-weighted (dBA) sound pressure levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal in a manner corresponding to the way that the human ear perceives sound. The A-weighted noise level has been found to correlate well with people's judgments of the noisiness of different sounds, and it has been used for many years as a measure of community noise. Figure 4.11-1 illustrates typical A-weighted sound pressure levels for various noise sources.

Community noise levels usually change continuously during the day. The equivalent continuous A-weighted sound pressure level (L_{eq}) is normally used to describe community noise. The L_{eq} is the equivalent steady-state A-weighted sound pressure level that would contain the same acoustical energy as the time-varying A-weighted sound pressure level during the same time interval. The maximum sound pressure level (L_{max}) is the greatest instantaneous sound pressure level observed during a single noise measurement interval. The sound exposure level (SEL) describes a receiver's cumulative noise exposure from a single noise event. It is represented by the total A-weighted sound energy during the event, normalized to a 1-second interval.

Another descriptor, the day-night average sound pressure level (L_{dn}), was developed to evaluate the total daily community noise environment. The L_{dn} is a 24-hour average sound pressure level with a 10-dB time-of-day weighting added to sound pressure levels in the nine

DEFINITIONS

DECIBEL (dB): The accepted standard unit for measuring the amplitude of sound.

SOUND PRESSURE LEVEL (L_p): The level of noise measured at a receiver at any moment in time.

A-WEIGHTED: Filtering a noise signal in a manner corresponding to the way that the human ear perceives sound.

EQUIVALENT CONTINUOUS NOISE LEVEL (L_{eq}): The steady-state A-weighted sound pressure level normally used to describe community noise. L_{eq} contains the same acoustical energy as the time-varying A-weighted sound pressure level during the same time interval, because community noise levels usually change continuously during the day.

DAY-NIGHT AVERAGE SOUND PRESSURE LEVEL (L_{dn}): A 24-hour average sound pressure level with a 10-dB time-of-day weighting added to sound pressure levels in 9 nighttime hours. This adjustment is an effort to account for the increased sensitivity to nighttime noise events.

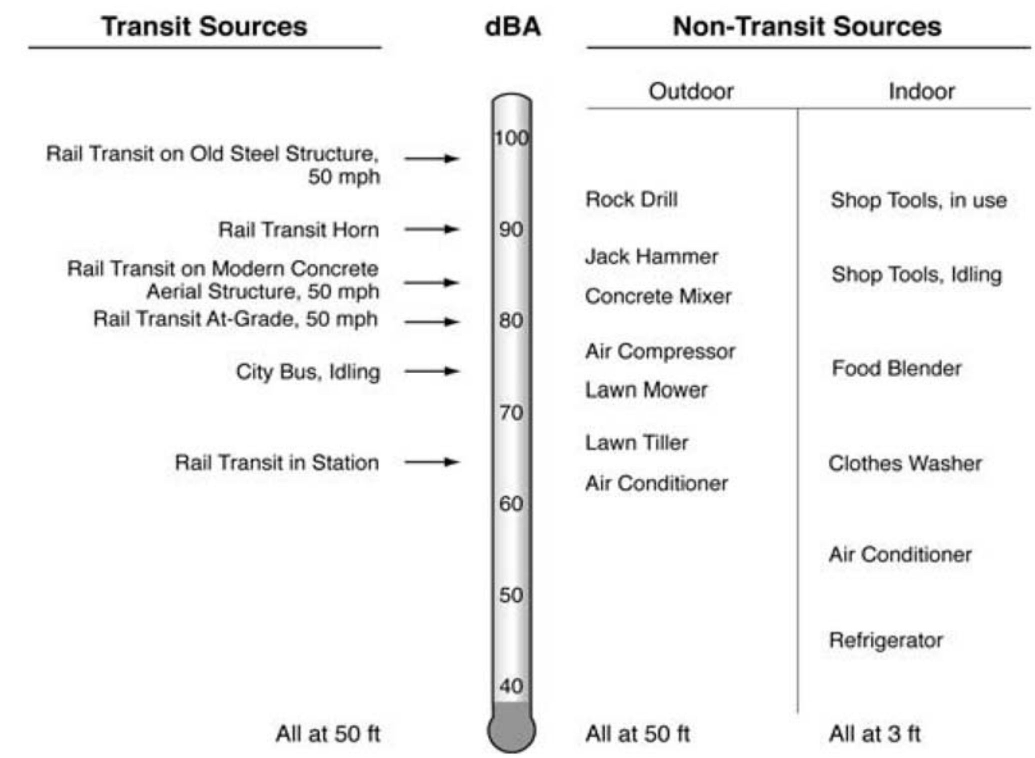
MAXIMUM SOUND PRESSURE LEVEL (L_{max}): The greatest instantaneous sound pressure level observed during a single noise measurement interval.

SOUND EXPOSURE LEVEL (SEL): A receiver's cumulative noise exposure from a single noise event.

nighttime hours from 10:00 p.m. to 7:00 a.m. This nighttime 10-dB adjustment is an effort to account for the increased sensitivity to nighttime noise events. FTA uses L_{dn} and L_{eq} to evaluate BRT noise impacts in surrounding communities.

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Displacement, in the case of a vibrating floor, is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement, and acceleration is the rate of change of the speed. The response of humans, buildings, and equipment to vibration is normally described using velocity or acceleration. In this analysis, velocity will be used in describing ground-borne vibration.

Figure 4.11-1: Typical A-Weighted Sound Levels



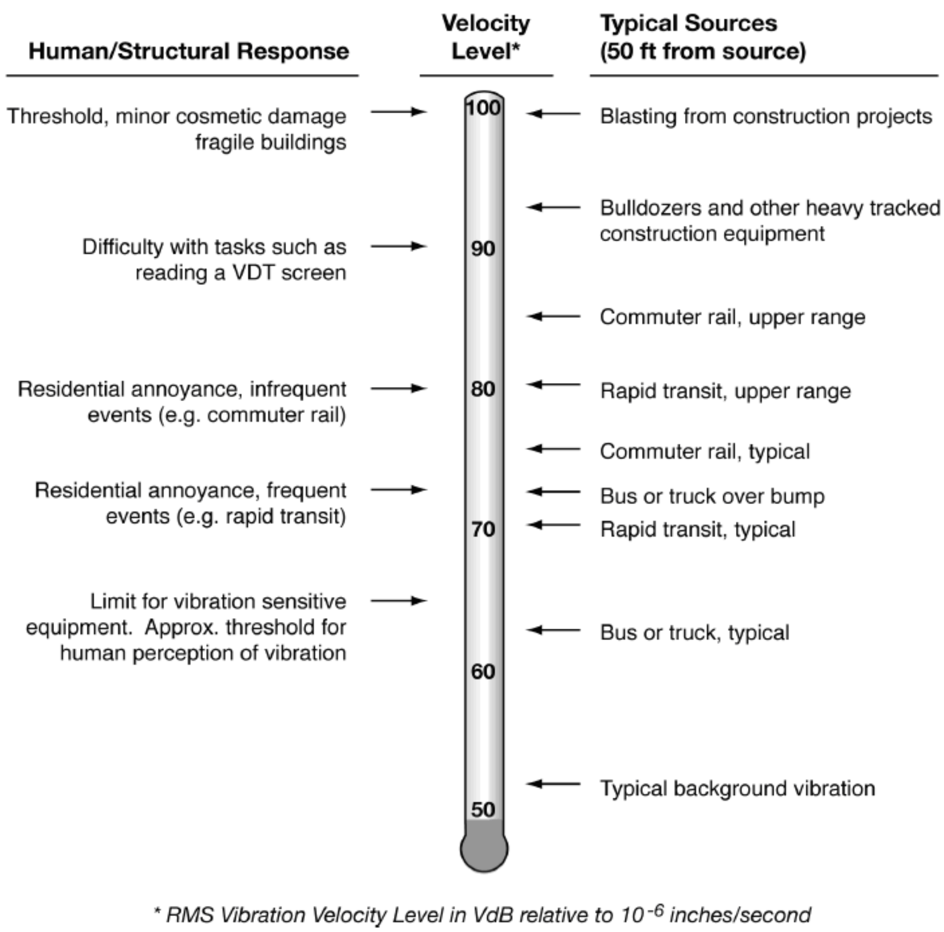
Source: FTA, 2006.

Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous peak of the vibration signal. The RMS of a signal is the average of the squared amplitude of the signal. Although PPV is appropriate for evaluating the potential for building damage, it is not suitable for evaluating human response. Because it takes some time for the human body to respond to vibration signals, RMS amplitude is more appropriate to evaluate human response to vibration than PPV. For sources such as trucks or motor vehicles, peak vibration levels are typically 6 to 14 dB higher than RMS levels. FTA uses the abbreviation "VdB" for vibration decibels to reduce the potential for confusion with sound decibel.

The RMS VdB is used to describe human annoyance criteria and impacts and uses a reference quantity of 1 micro-inch per second. Decibel notation acts to compress the range of numbers required in measuring vibration. Figure 4.11-2 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in Figure 4.11-2, the threshold of perception for human response is approximately 65 VdB; however, human response to vibration is not usually significant unless the vibration exceeds 70 VdB. Vibration tolerance limits for sensitive instruments, such as magnetic resonance imaging (MRI) or electron microscopes, could be much lower than the human vibration perception threshold.

Similar to the noise descriptors, L_{eq} and L_{max} can be used to describe the average vibration and the maximum vibration level observed during a single vibration measurement interval.

Figure 4.11-2: Typical Levels of Ground-borne Vibration



Source: FTA, 2006.

4.11.2 Human Reaction to Noise

The effects of environmental noise on people are generally undesirable. These include psychological effects, such as annoyance, and physiological effects, such as hearing impairment and sleep disturbance. Among the cognitive effects on children, reading, attention, problem solving, and memory are most influenced by noise. Prolonged exposure to high levels of noise can cause hearing impairment, although most cases have been found to be related to occupational noise exposure at levels much higher than ranges typically associated with community exposure to transportation or industrial sources. Research has correlated exposure to environmental noise with physiological changes in blood pressure, sleep, digestion, and other stress-related disorders.[89]

[89] U.S. Department of Transportation, Research and Special Programs Administration, John A. Volpe National Transportation Systems Center – Environmental Measurement and Modeling Division, DTS-34. *General Health Effects of Transportation Noise*, Final Report, June 2002.

4.11.3 Regulatory Setting

This section presents the guidelines, criteria, and regulations used to assess noise and vibration impacts associated with the proposed project. Because SFCTA, the lead agency under CEQA, is developing the proposed project in cooperation with FTA, noise and vibration impact evaluation is conducted using the criteria set forth by FTA and the City of San Francisco.

4.11.3.1 FTA NOISE IMPACT CRITERIA

The criteria in the federal *Transit Noise and Vibration Impact Assessment* guidelines (FTA, 2006) were used to assess existing ambient noise levels and future (2035) noise impacts from BRT operations. They are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. The amount that transit projects are allowed to change the overall noise environment is reduced with increasing levels of existing noise. The noise metrics applied by FTA to three categories of land use are summarized in Table 4.11-1.

Table 4.11-1: Land Use Categories and Metrics for Transit Noise Impact Criteria

LAND USE CATEGORY	NOISE METRIC, DBA	DESCRIPTION OF LAND USE CATEGORY
1	Outdoor $L_{eq}(h)$*	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)$*	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.

Note: * L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.

Source: FTA, 2006.

L_{dn} is used to characterize noise exposure for residential areas and hotels (Category 2). The maximum 1-hour L_{eq} during the period that the facility is in use is used for other noise-sensitive land uses such as school buildings and parks (Categories 1 and 3). The noise impact criteria for human annoyance are based on a comparison of the existing outdoor noise levels and the future outdoor noise levels from a proposed transit project. They incorporate activity interference caused by the transit project alone and annoyance due to the change in the noise environment caused by the project. There are two levels of impact included in the FTA criteria, as shown in Figure 4.11-3. The interpretations of these two levels of impact are summarized as follows:

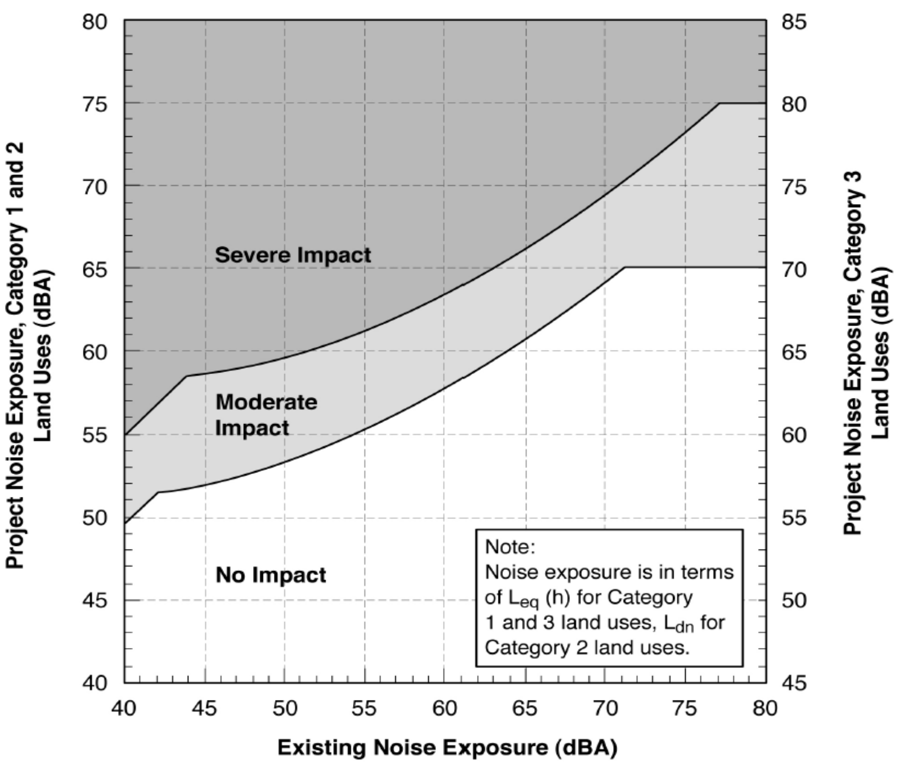
- **Severe Impact.** Project noise above the upper curve is considered to cause Severe Impact because a significant percentage of people would be highly annoyed by the new noise. This curve flattens out at 80 dB for Category 1 and 2 land use, a level associated with an unacceptable living environment.
- **Moderate Impact.** The change in the cumulative noise level is noticeable to most people, but it may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation, such as the existing level,

predicted level of increase over existing noise levels, and the types and numbers of noise-sensitive land uses affected.

The horizontal axis in Figure 4.11-3 is the existing L_{dn} or L_{eq} without any project-related noise. The vertical axis on the left side is the L_{dn} at residential land uses caused by a project, whereas the axis on the right side is the L_{eq} at school, park, and recreational land use. Figure 4.11-3 illustrates that a project L_{dn} of 61 dBA at a Category 2 receiver would be considered as a "moderate impact" if the existing L_{dn} at a selected residence is 65 dBA. If the project noise level reaches an L_{dn} of 67 dBA, the project noise level would be considered as a "severe impact" to the Category 2 receiver.

For residential land use, the noise criteria are to be applied outside the building locations at noise-sensitive areas with frequent human use, including outdoor patios, decks, pools, and play areas. If no such areas exist, the criteria should be applied near building doors and windows. For parks and other significant outdoor use, the criteria are to be applied at the property lines; however, for locations where land use activities are solely indoors, noise impact may be less significant if the outdoor-to-indoor reduction is greater than for typical buildings (approximately 25 dB with windows closed). Thus, if it can be demonstrated that there will only be indoor activities, mitigation may not be needed.

Figure 4.11-3: Noise Impact Criteria for Transit Projects



Source: FTA, 2006

4.11.3.2 | CITY NOISE IMPACT CRITERION

The Transportation Noise Section of the San Francisco General Plan Environmental Protection Element addresses transportation noise issues from a comprehensive local land use planning perspective. The plan objectives include:

- Objective 9: Reduce transportation-related noise.
- Objective 10: Minimize the impact of noise on affected areas.
- Objective 11: Promote land uses that are compatible with various transportation noise levels.

For residential land uses, it establishes the L_{dn}/CNEL range of 65 to 70 dBA as the transition between what are normally referred to as "conditionally acceptable" and "normally unacceptable" exposures.

The generally accepted threshold for a clearly perceptible sound increase from stationary objects is 5 dB. "Section 2909. Noise Limits" from the City's municipal code (San Francisco, 2008) includes a 5-dB increase threshold for stationary objects. Accordingly, if this criterion was applied to the proposed project, an impact would occur if either project-generated noise along Van Ness Avenue or increased traffic volumes on parallel facilities such as Franklin and Gough streets resulted in a 5-dB or greater noise increase. The City does not specify a threshold for evaluating transportation noise. Nonetheless, the 5-dB increase was used as another factor in evaluating the noise effects of the BRT project on Van Ness Avenue, as described in Section 4.11.5.[90]

4.11.3.3 | FTA VIBRATION IMPACT CRITERIA

DEFINITIONS

HUMAN ANNOYANCE CRITERIA: Used to assess potential impacts associated with operational vibration.

BUILDING DAMAGE CRITERIA: Used to estimate vibration impacts due to construction activities.

The criteria in the *Transit Noise and Vibration Impact Assessment* (FTA, 2006) were used to evaluate vibration impacts from project construction and BRT operations. The evaluation of vibration impacts can be divided into two categories: (1) human annoyance, and (2) building damage. Generally, human annoyance criteria are used to assess potential impacts associated with operational vibration, whereas building damage criteria are used to estimate vibration impacts due to construction activities.

Human Annoyance Criteria

The ground-borne vibration impact criteria describe human response to vibration and potential interference related to the operation of vibration sensitive equipment. The criteria for acceptable ground-borne vibration are expressed in terms of RMS velocity levels in VdB and are based on the maximum levels for a single event (L_{max}). Table 4.11-2 presents the criteria for various land use categories, as well as the frequency of events.

Table 4.11-2: Ground-Borne Vibration Impact Criteria for Human Annoyance

LAND USE CATEGORY	GROUND-BORNE VIBRATION IMPACT LEVELS (VDB RE 1 MICRO-IN/SEC)		
	FREQUENT EVENTS[1]	OCCASIONAL EVENTS[2]	INFREQUENT EVENTS[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Notes:
1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as more than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

Source: FTA, 2006.

[90] The FTA Transit Noise and Vibration Impact Assessment (FTA, 2006) methodology and thresholds are the established method for evaluating noise and vibration impacts of transit improvements such as the proposed project. No transportation noise threshold has been established by the City of San Francisco.

Sensitive receivers within the project boundary include residences, hotels, and schools. These fall under Category 2, places where people normally sleep, and Categories 1 and 3, performance spaces and institutional land uses with primarily daytime use. Because the number of proposed operations is 215 per weekday, FTA classifies the proposed service under "Frequent Events."

Building Damage Criteria

Construction activities can result in varying degrees of ground vibration, depending on the equipment and method employed. The vibration associated with typical transit construction is not likely to damage building structures, but it could cause cosmetic building damage. Normally, vibration resulting from a BRT vehicle pass-by would not cause building damage.

Vibrations generated by surface transportation and construction activities are mainly in the form of surface or Raleigh waves. Studies have shown that the vertical component of transportation-generated vibrations is the strongest, and that PPV correlates best with building damage and complaints. Table 4.11-3 summarizes the construction vibration limits shown in FTA guidelines for structures located near the ROW of a transit project.

Table 4.11-3: Construction Vibration Damage Criteria

BUILDING CATEGORY	PPV (IN/SEC)	APPROXIMATE LV*
I. Reinforced-concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Note:
* RMS velocity in decibels (VdB) re: 1 micro-inch per second.

Source: FTA, 2006.

4.11.3.4 | CITY CONSTRUCTION NOISE ORDINANCES

Construction impacts to sensitive neighborhoods, although temporary in nature, can affect occupants of nearby buildings and/or compromise building structures. The City of San Francisco has jurisdiction over the construction noise of the proposed project, which lies within the limits of the city. Noise levels during construction are regulated under Article 29 of the San Francisco Municipal Code (San Francisco, 2008). These noise restrictions are summarized as follows:

- **Daytime (7:00 a.m. to 8:00 p.m.).** Construction activities are permitted provided that operation of any powered construction equipment, regardless of age or date of acquisition, does not emit noise at a level in excess of 80 dBA when measured at a distance of 100 feet. Impact tools and equipment are exempt from this restriction if they are equipped with intake and exhaust mufflers recommended by the manufacturers thereof, and approved by the Director of Public Works.
- **Nighttime (8:00 p.m. to 7:00 a.m.).** Non-emergency construction activities are not permitted during nighttime hours if the resulting noise level is more than 5 dB in excess of the ambient noise at the nearest property line unless express permission has been granted by the Director of Public Works.

Daytime construction activities are permitted provided that operation of any powered construction equipment does not emit noise at a level in excess of 80 dBA when measured at a distance of 100 feet.

Non-emergency nighttime construction activities are not permitted if the resulting noise level is more than 5 dB in excess of the ambient noise at the nearest property line.

4.11.4 | Affected Environment

The proposed BRT follows Van Ness Avenue through the core of the north-of-Market-Street area. Van Ness Avenue is a principal arterial that provides interstate, interregional, and intraregional travel and goods movement, and forms part of US 101. The proposed BRT would be implemented along an approximately 2-mile stretch of Van Ness Avenue (including a one-block portion of South Van Ness Avenue). Characteristics of neighborhoods shift from public and commercial uses in the southern portion of the proposed alignment, mixed residential-commercial in the middle portion, to multi-family residential in the northern portion. Most of these multi-family buildings have commercial uses, such as office space or various stores, on the ground level.

The San Francisco Traffic Noise Map estimates day-night average noise levels (L_{dn}) within City limits. It focuses on noise from roadway traffic, considering vehicle volumes, types, speeds, and temporal (time of day) distributions.[91] Figure 4.11-4(a) shows that the highest sustained existing noise levels within the City (in terms of L_{dn}) tend to follow freeway and major surface street corridors. Figure 4.11-4(b) demonstrates that existing L_{dn} values along the proposed project corridor can exceed 70 dBA close to the travel lanes and typically at the nearest roadway-facing building facades; the same is true for parallel Franklin and Gough streets. In the context of land use planning in California, such levels are normally considered unacceptable for residential development. L_{dn} values exceeding 70 dBA are experienced along freeways and along the major arterials that tend to be most concentrated within the northeast portion of the City. Within the remainder of the City, only a very small proportion of residential properties distant from the freeways are exposed to noise from surface street traffic generating L_{dn} values exceeding 70 dBA.

The noise environment in the vicinity of the Van Ness Avenue corridor is comprised of automobile, truck, and bus pass-by noise with intervals of motor vehicle horn noise, as well as clatter from street-level pedestrian and commercial activities. Noise-sensitive receivers along Van Ness Avenue that may be affected by the project include single- and multi-family residences and assisted living facilities (the latter two often positioned above first-story street-side commercial uses), churches, and hotels. Along and between Franklin and Gough streets, a larger proportion of solely residential buildings are present, as well as schools, churches, hotels, and two small museums. In addition, there are several parks and playfields along Gough Street.

Noise monitoring was conducted at various sites along Van Ness Avenue to assess the existing noise conditions throughout noise-sensitive regions in the project area. These sites are shown in Figure 4.11-5. Noise measurements were taken within the project limits between August 4 and 6, 2008. The monitoring sites include noise-sensitive locations, such as residences, a concert hall, and a hotel. The primary objectives of the measurements are to evaluate the existing noise environment and determine the appropriate impact criteria per FTA guidelines.

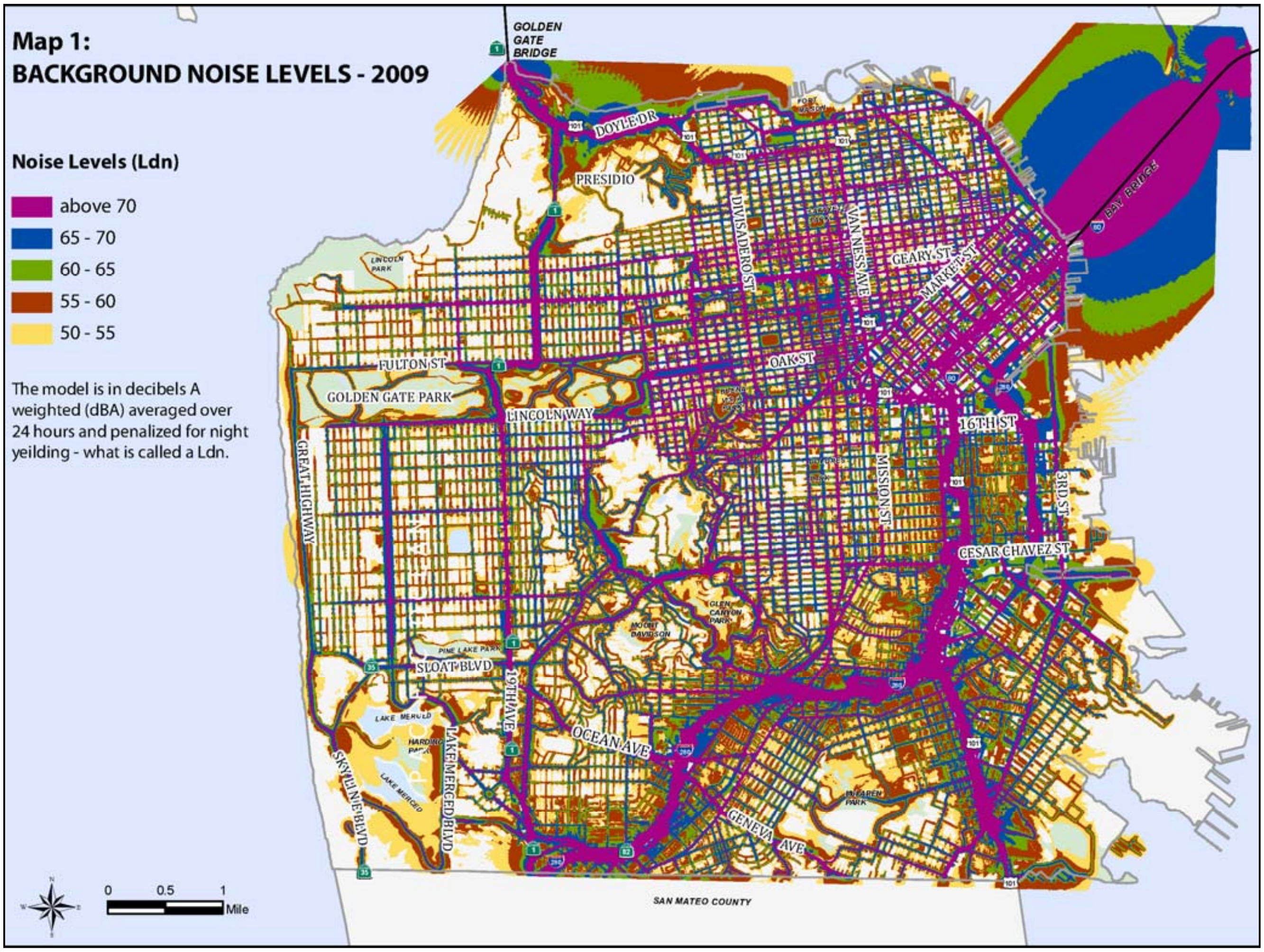
Short-term noise measurements were conducted at 10 sites for a duration of 20 minutes each, and a long-term measurement was conducted at one location for a total of 49 hours. At each short-term site, at least two measurements were performed, each at a different time of day. Multiple measurements were performed at each short-term site because only one suitable and available long-term measurement site was identified; therefore, more than one set of short-term noise measurements were needed to determine the existing noise levels accurately. L_{dn} at the long-term measurement location was calculated by using hourly measured noise levels. At short-term locations, L_{dn} levels were estimated by comparing two to three separate short-term noise-level measurements to results obtained from the long-term measurement location that was in progress concurrently. Measured noise levels were typical for a dense urban environment, with short-term L_{eq} values ranging from the mid 60s to mid 70s dBA. L_{dn} values measured at the long-term site and estimated at the short-term sites were in the 70s dBA.

No significant vibration sources exist along the project corridor. Typical automobile, truck, and bus pass-bys along local roadways would be the only perceptible vibration source.

No significant vibration sources exist along the project corridor. Typical automobile, truck, and bus pass-bys along local roadways would be the only perceptible vibration source.

[91] San Francisco Department of Public Health – Program on Health, Equity and Sustainability. "Noise Model", accessed October 31, 2012. (http://www.sfphes.org/elements/24-elements/tools/105-noise-model).

Figure 4.11-4: Background Noise Levels Modeled by the San Francisco Department of Public Health (2009)

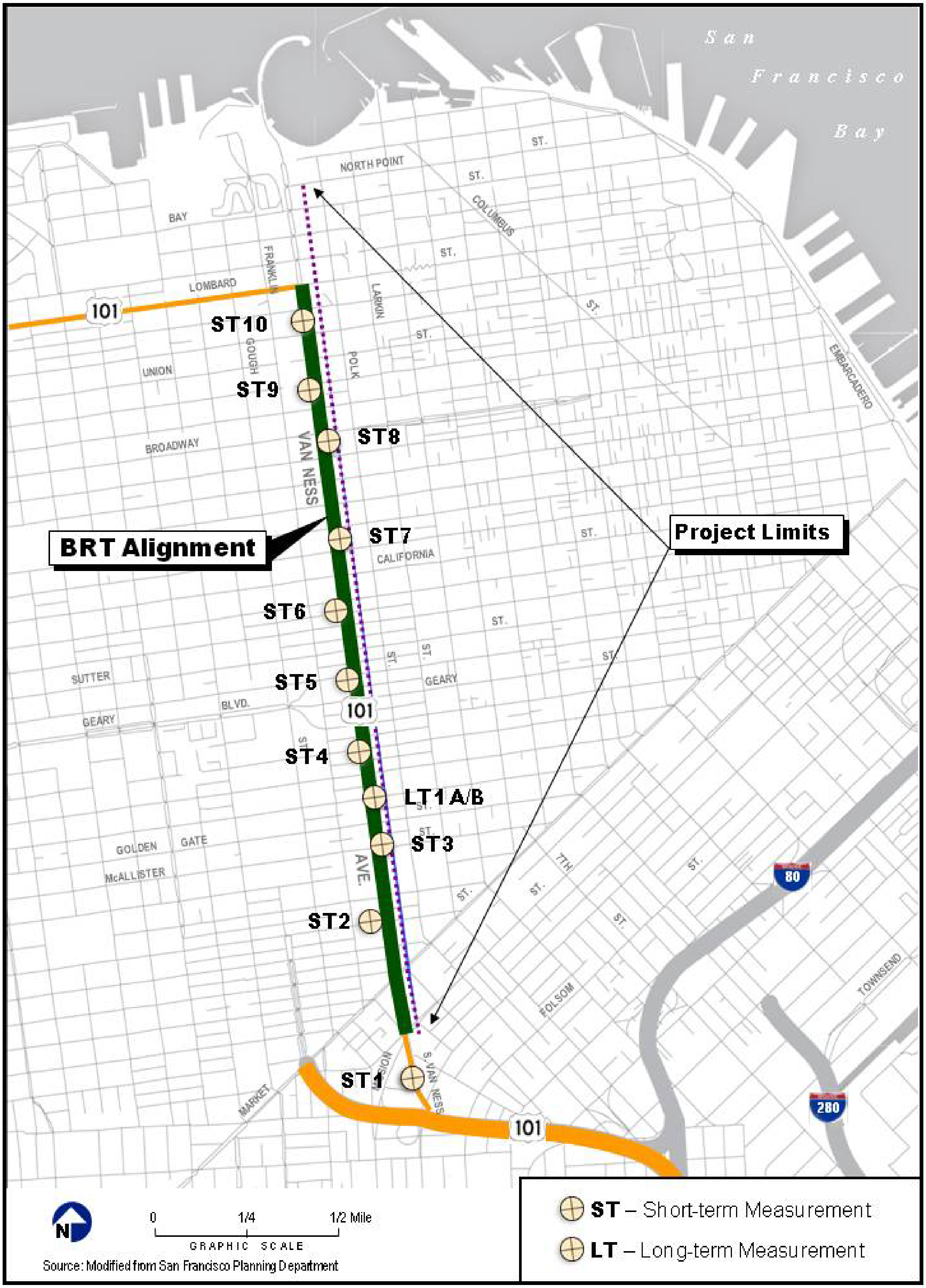


(a) Citywide View

(b) Project Corridor

Source: San Francisco DPH, 2012.

Figure 4.11-5: Noise Measurement Locations



4.11.5 Environmental Consequences

According to Section 6.6.1 of the FTA Manual for Transit Noise and Vibration Impact Assessment (FTA, 2006), "In general, it is better to measure existing noise than to compute or estimate it." Accordingly, this analysis applies a measurement-based approach used to establish baseline conditions. The *FTA Noise Impact Assessment Spreadsheet*[92] was used, consistent with the federal *Transit Noise and Vibration Impact Assessment* guidelines (FTA, 2006), to assess the contribution of BRT operations to future transportation noise levels. For the parallel streets receiving traffic diverted from Van Ness Avenue, a spreadsheet was used to predict traffic noise level increases associated with predicted changes in traffic volumes. Specifically, the spreadsheet calculated the decibel-level increases associated with ratios of traffic volumes for different analysis scenarios. Consistent with the traffic study (CHS, 2013), 2035 traffic volumes were used for purposes of assessing future operational noise impacts on Van Ness Avenue, and on key parallel routes (Franklin and Gough streets).

The build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), propose construction of a dedicated bus lane, whereas the No Build Alternative is the no-build baseline case. Build Alternative 2 would provide a dedicated bus lane in the rightmost travel lane of Van Ness Avenue in both the NB and SB directions. Build Alternatives 3 and 4 and the LPA (with or without the Vallejo Northbound Station Variant) would convert the existing landscaped median and portions of two inside traffic lanes for a dedicated bus lane.

4.11.5.1 OPERATIONAL NOISE ALONG VAN NESS AVENUE

Along Van Ness Avenue, future BRT operations would represent a new category of noise source under the project build alternatives, including the LPA; however, the elimination of two mixed-flow lanes as part of the project would reduce general automobile traffic capacity along the project corridor, tending to redirect some traffic to alternative routes. In addition, the total number of motor vehicle trips in the area is expected to decrease under the project alternatives due to the enhanced transit offered as an alternative mode of transportation to the automobile. Consistent with FTA guidelines, only the additional noise from BRT operations was considered in the analysis; this approach produced conservative impact results.

According to the proposed BRT service schedule, there would be headways of 3.5 minutes during peak hours, 5 minutes during midday hours, and 10 to 20 minutes during evening and nighttime hours. Service would begin at 6:00 a.m. and end at midnight.

The proposed future BRT vehicle fleet is expected to include some combination of diesel hybrid and electric-powered vehicles; however, to assure a conservative analysis, noise modeling was performed using FTA's diesel bus option because diesel buses would be the noisiest. Project buses were assumed to operate at the posted speed limit of 25 mph. In practice, the operating speed would vary in the vicinity of proposed passenger stations as the bus approaches and departs from a station; however, speeds would not be expected to exceed the speed limit. In addition, while BRT travel between stations would be enhanced by TSP and signal optimization, travel speeds for any given bus trip would still be affected at some intersections due to red lights.

BRT noise levels were calculated using the operation schedule, speed, and distance of the proposed project limits. Distances to the centerline of the nearest BRT lane were 17 to 122 feet (varying by receiver and alternative). The calculated noise levels were then compared to the "Moderate Impact" and "Severe Impact" criteria, established according to the ambient noise conditions. Tables 4.11-4 and 4.11-5 provide the results of the calculations at the sensitive receivers and the degree of impact. Noise impacts from Build Alternatives 3 and 4 would be same; therefore, they are presented in one table. Using FTA methodology, predicted noise impacts for the LPA, with or without the Vallejo Northbound Station Variant, are the same as those presented in Table 4.11-5 for Build Alternatives 3 and 4, with

[92] http://www.fta.dot.gov/documents/Noise_Impact_Assessment_Spreadsheet.xls.

or without Design Option B.[93] Calculation results demonstrate no anticipated noise impacts along Van Ness Avenue from the proposed BRT service.

Calculation results demonstrate no anticipated noise impacts along Van Ness Avenue from the proposed BRT service.

Predicted noise level increases were also compared with the City's 5-dB increase threshold for stationary objects. The final columns of Tables 4.11-4 and 4.11-5 show that the predicted increases remain well below that criterion. Again, the City does not specify a threshold for evaluating transportation noise; however, the 5-dB increase criterion is considered for this project as a means to address BRT noise effects at the local level.

4.11.5.2 | OPERATIONAL NOISE ON PARALLEL STREETS

Some of the traffic along Van Ness Avenue would be redistributed to alternative routes under the project alternatives, including the LPA (with or without the Vallejo Northbound Station Variant). Franklin and Gough streets are expected to attract more of the traffic redirected from Van Ness Avenue under the project alternatives than any other routes. The worst-case traffic noise levels were calculated using traffic volumes representing LOS C conditions. When peak-hour volumes exceed LOS C volumes, LOS C traffic flow represents loudest hour conditions. As traffic volumes increase such that LOS deteriorates to levels below C, travel speeds tend to decrease sufficiently to lower traffic noise levels relative to LOS C conditions.

Along segments of these two roadways paralleling Van Ness Avenue, future (2035) traffic noise levels under the build alternatives are predicted to be zero to 1.5 dB higher than future no-project noise levels. Relative to existing traffic noise levels, future project traffic noise levels would increase by zero to 2.2 dB. Typically a noise level change of 3 dB or less is not noticeable. These predicted changes are independent of distance from the indicated roadways, although the noise levels themselves would vary with distance from the roadways. These levels are below the 5-dB threshold derived from the City Noise Ordinance for fixed objects. Accordingly, no mitigation measures are required for operational noise impacts on Franklin and Gough streets.

4.11.5.3 | OPERATION VIBRATION IMPACTS

Significant vibration impacts from rubber-tire-fitted vehicles are extremely rare. Potential vibration impacts from rubber-tire-fitted vehicles, such as those used in BRT projects, can be reasonably dismissed.

Significant vibration impacts from rubber-tire-fitted vehicles are extremely rare. This is because rubber-tire-fitted vehicles are not as massive as railway vehicles. They are additionally typically well isolated by the vehicle suspension design and rubber tires, which act as a highly effective barrier to vibration transmission from the vibration-generating carriage and the main propagation medium for vibration excitation, the ground; therefore, potential vibration impact from rubber-tire-fitted vehicles, such as those used in BRT projects, can be reasonably dismissed (FTA, 2006).

4.11.6 | Avoidance, Minimization, and/or Mitigation Measures

The No Build Alternative and the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), are not expected to have adverse noise and vibration effects. Vibration impact due to BRT operation is dismissed due to the typical operational characteristics and vehicle design of BRT vehicles; however, roadway surface defects, such as pot holes, would elevate BRT pass-by noise and vibration. Thus, it is recommended that the following improvement measure is implemented:

IM-NO-1. Upkeep of roadway surface will be maintained throughout project operation to avoid increases in BRT noise and vibration levels.

[93] The FTA methodology for evaluating operational noise impacts focuses on the predicted increment to existing baseline noise levels from operational changes associated with project-specific vehicles – in this case, the proposed future introduction of BRT vehicles. No substantive differences in the noise-generating characteristics of BRT operations (e.g., speeds, headways, operational hours, and vehicles) are expected between Alternatives 3 and 4, either with or without this design option. Differences in distances from passing BRT vehicles to receivers would be negligible between Alternatives 3 and 4, and this design option would not alter the distances under either alternative.

Table 4.11-4: Operational Noise Levels for Build Alternative 2

RECEIVER NUMBER	LAND USE CATEGORY[1]	DISTANCE TO BUS LANE NB/SB, FEET	EXISTING NOISE LEVEL LDN (LEQ)[2], DBA	CRITERIA, MODERATE / SEVERE, DBA	PROJECT NOISE LEVEL, LDN (LEQ)[2], DBA	CUMULATIVE NOISE, LDN (LEQ)[2], DBA	INCREASE IN CUMULATIVE NOISE, DB	NOISE IMPACT FTA CRITERIA	NOISE IMPACT CITY CRITERION[3]
R2	2	17 / 82	75	66-73 / >73	62	75	0	No	No
R3	1	110 / 45	(70)	65-69 / >69	(56)	(70)	0	No	No
R4	3	18 / 83	(70)	70-74 / >74	(62)	(71)	1	No	No
R5	1	154 / 88	(70)	65-69 / >69	(52)	(70)	0	No	No
R6	2	28 / 93	74	66-72 / >72	59	74	0	No	No
R7	3	102 / 34	(69)	69-74 / >74	(57)	(69)	0	No	No
R8	3	19 / 84	(69)	69-74 / >74	(61)	(70)	1	No	No
R9	2	23 / 88	77	66-74 / >74	60	77	0	No	No
R10	2	96 / 30	76	66-74 / >74	59	76	0	No	No
R11	1	89 / 33	(71)	66-70 / >70	(58)	(71)	0	No	No
R12	2	21 / 84	76	66-74 / >74	61	76	0	No	No
R13	2	113 / 50	72	66-71 / >71	56	72	0	No	No
R14	3	16 / 81	(70)	70-74 / >74	(62)	(71)	1	No	No
R15	2	94 / 29	75	66-73 / >73	59	75	0	No	No
R16	2	22 / 87	77	66-74 / >74	60	77	0	No	No
R17	2	23 / 88	77	66-74 / >74	60	77	0	No	No
R18	2	93 / 28	77	66-74 / >74	59	77	0	No	No
R19	3	24 / 90	(72)	71-76 / >76	(60)	(72)	0	No	No
R20	3	91 / 26	(72)	71-76 / >76	(59)	(72)	0	No	No
R21	2	97 / 32	72	66-71 / >71	58	72	0	No	No
R22	2	28 / 94	72	66-71 / >71	59	72	0	No	No
R23	3	96 / 30	(67)	68-72 / >72	(58)	(68)	1	No	No
R24	2	23 / 88	76	66-74 / >74	60	76	0	No	No
R25	2	94 / 27	76	66-74 / >74	59	76	0	No	No
R26	3	103 / 39	(71)	71-75 / >75	(57)	(71)	0	No	No
R27	2	19 / 85	75	66-73 / >73	61	75	0	No	No
R28	2	90 / 24	75	66-73 / >73	60	75	0	No	No
R29	2	90 / 24	75	66-73 / >73	60	75	0	No	No

Notes:
1. Category 1 – Includes recording studios and concert halls; Category 2 – Includes residences and hotels; Category 3 – Includes schools, theatres, and churches.
2. Noise levels shown within parentheses represent 1-hour L_{eq}. L_{eq} is applied rather than L_{dn} for Category 1 or Category 3 land uses. The L_{eq} values provided here represent 1-hour periods corresponding to the times of future (2035) peak BRT operations.
3. The City criterion applicable to CEQA analysis is a 5-dB increase.

Table 4.11-5: Operational Noise Levels for Build Alternatives 3 and 4 and the LPA

RECEIVER NUMBER	LAND USE CATEGORY[1]	DISTANCE TO BUS CENTER LANE, FEET	EXISTING NOISE LEVEL L_{DN} (L_{EQ})[2], DBA	CRITERIA, MODERATE / SEVERE, DBA	PROJECT NOISE LEVEL, L_{DN} (L_{EQ})[2], DBA	CUMULATIVE NOISE, L_{DN} (L_{EQ})[2], DBA	INCREASE IN CUMULATIVE NOISE, DB	NOISE IMPACT FTA CRITERIA	NOISE IMPACT CITY CRITERION[3]
R2	2	47	75	66-73 / >73	58	75	0	No	No
R3	1	78	(70)	65-69 / >69	(54)	(70)	0	No	No
R4	3	50	(70)	70-74 / >74	(57)	(70)	0	No	No
R5	1	122	(70)	65-69 / >69	(51)	(70)	0	No	No
R6	2	61	74	66-72 / >72	56	74	0	No	No
R7	3	60	(69)	69-74 / >74	(55)	(69)	0	No	No
R8	3	58	(69)	69-74 / >74	(56)	(69)	0	No	No
R9	2	59	77	66-74 / >74	56	77	0	No	No
R10	2	64	76	66-74 / >74	56	76	0	No	No
R11	1	63	(71)	66-70 / >70	(56)	(71)	0	No	No
R12	2	55	76	66-74 / >74	57	76	0	No	No
R13	2	79	72	66-71 / >71	55	72	0	No	No
R14	3	51	(70)	70-74 / >74	(57)	(70)	0	No	No
R15	2	59	75	66-73 / >73	56	75	0	No	No
R16	2	53	77	66-74 / >74	57	77	0	No	No
R17	2	53	77	66-74 / >74	57	77	0	No	No
R18	2	58	77	66-74 / >74	57	77	0	No	No
R19	3	56	(72)	71-76 / >76	(56)	(72)	0	No	No
R20	3	59	(72)	71-76 / >76	(56)	(72)	0	No	No
R21	2	64	72	66-71 / >71	56	72	0	No	No
R22	2	62	72	66-71 / >71	56	72	0	No	No
R23	3	62	(67)	68-72 / >72	(56)	(67)	0	No	No
R24	2	56	76	66-74 / >74	57	76	0	No	No
R25	2	59	76	66-74 / >74	56	76	0	No	No
R26	3	69	(71)	71-75 / >75	(55)	(71)	0	No	No
R27	2	53	75	66-73 / >73	57	75	0	No	No
R28	2	55	75	66-73 / >73	57	75	0	No	No
R29	2	62	75	66-73 / >73	56	75	0	No	No

Notes:
1. Category 1 – Includes recording studios and concert halls; Category 2 – Includes residences and hotels; Category 3 – Includes schools, theatres, and churches.
2. Noise levels shown within parentheses represent 1-hour L_{eq}. L_{eq} is applied rather than L_{dn} for Category 1 or Category 3 land uses. The L_{eq} values provided here represent 1-hour periods corresponding to the times of future (2035) peak BRT operations.
3. The City criterion applicable to CEQA analysis is a 5-dB increase.
4. Operational noise levels under Build Alternatives 3 and 4 would not change with or without incorporation of the Design Option B (i.e., elimination of left turns), nor would they change for the LPA.

4.12 Energy

This section addresses the impact of the proposed project on transportation-related energy consumption. The energy analysis considers the long-term direct impacts related to energy consumption for the future horizon year 2035. Direct energy consumption includes the fuel required for passenger vehicles (i.e., automobiles, vans, and light trucks), heavy trucks (i.e., three or more axles), and transit buses. The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The energy effects of the LPA, with or without the Vallejo Northbound Station Variant, are identified as part of the analysis presented for the build alternatives in this chapter. There would be no difference in such impacts under the LPA compared with the impacts described for Build Alternatives 3 and 4 with Design Option B in this subsection.

DEFINITIONS

INDIRECT ENERGY CONSUMPTION: Energy consumed in construction and maintenance.

DIRECT ENERGY CONSUMPTION: Fuel required to operate passenger vehicles, heavy trucks, and transit buses.

4.12.1 | Regulatory Setting

This section provides an overview of the federal, state, and local regulations and polices relevant to energy usage and impact analysis associated with proposed project operation.

4.12.1.1 | NATIONAL ENVIRONMENTAL POLICY ACT [42 U.S.C. SECTION 4321 ET SEQ.]

NEPA requires the consideration of potential environmental effects, including potential effects to public utilities and energy, in the evaluation of any proposed federal agency action. NEPA also obligates federal agencies to consider the environmental consequences and costs in their projects and programs as part of the planning process. General NEPA procedures are set forth in the CEQ regulations 40 CFR 1500.

4.12.1.2 | CALIFORNIA ENVIRONMENTAL QUALITY ACT [SECTION 21000 ET SEQ.] AND CEQA GUIDELINES [SECTION 15000 ET SEQ.]

CEQA requires state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts to public utilities and energy, and to avoid or mitigate those impacts, when feasible. CEQA Guidelines call for project sponsors to analyze whether a proposed project would "encourage activities which result in the use of large amounts of fuel, water, or energy; or use fuel, water, or energy in a wasteful manner," as summarized in Chapter 6, in which case the project would be considered to have a significant energy impact.

4.12.1.3 | ENERGY MANAGEMENT FOR TRANSIT VEHICLES UNDER THE SAN FRANCISCO GENERAL PLAN

Policy 12.1 of the San Francisco General Plan sets forth guidelines for incorporating energy management practices into building, facility, and fleet maintenance and operations. This policy provides *de facto* fleet energy management practices for operating and maintaining the vehicle fleet owned and operated by the City and County of San Francisco. The practices are intended to reduce unnecessary fuel usage. This project should follow those practices.

4.12.2 | Affected Environment

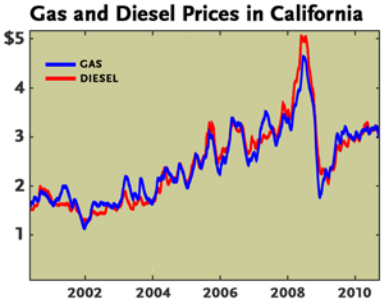
Existing transportation energy consumption in the Van Ness Avenue corridor includes the fuel required for passenger vehicles (i.e., automobiles, vans, and light trucks), heavy trucks (i.e., three or more axles), and transit buses.

Most motor vehicles in the Van Ness Avenue corridor depend on gasoline and diesel fuel. The exception is transit vehicles: More than half of Muni's transit fleet uses electrical power for operation.

A mix of natural gas, electricity, gasoline, and diesel fuel provide the energy source for transportation in the Van Ness Avenue corridor. Passenger vehicles primarily utilize gasoline as fuel, where heavy trucks primarily utilize diesel fuel. Natural gas can be used by motor vehicles (i.e., passenger and heavy truck), but it is commonly a fuel used in heating facilities and manufacturing or processing. Electricity can also be used for motor vehicles; however, most motor vehicles in the Van Ness Avenue corridor depend on gasoline and diesel fuel. The exception is transit vehicles. Trolley buses, cable cars, streetcars, and light rail vehicles, which comprise more than half of Muni's transit fleet, use electrical power for operation (FTA, 2008). Muni's electric fleet operates with power that is generated at the SFPUC Hetch Hetchy hydroelectric facility in the Sierra foothills and is distributed via a long-distance transmission system to customers in San Francisco and the Peninsula. Under City agreements, Hetch Hetchy provides power to Muni, which is transmitted to the electric fleet through Muni's traction power substations and OCS.

Existing transit service on Van Ness Avenue is provided by Muni bus lines 47 and 49, their corresponding Owl night bus services,[94] and by Golden Gate Transit bus lines 70, 80, and 93. Line 47 is comprised of 40-foot-long diesel motor coaches. Line 49 is comprised of 60-foot-long electric trolleybuses. Both bus lines originate and terminate at Muni maintenance yards located within San Francisco. The Golden Gate Transit bus fleet in the corridor operates on diesel fuel.

Gas and Diesel Prices in California



May 2000 through Sept. 2010. Source: Wolfram|Alpha.

Transit operating costs are affected by fuel prices. SFMTA is affected by market fluctuations in purchasing fuel. The petroleum fuel market is quite volatile, and it is not possible to accurately forecast fuel prices even a few months into the future. For example, diesel and gasoline fuel prices have fluctuated considerably over the past 10 years, peaking in 2008.[95] As of August 2010, diesel and gasoline prices in California average approximately $3.19 and $3.17 per gallon, respectively. In 2010, a kilowatt-hour of electricity in California costs approximately 10.97 cents per kilowatt-hour.

4.12.3 | Environmental Consequences

The following section compares estimated energy use under the different alternatives to determine whether any of the alternatives could encourage activities that would use or waste large amounts of energy.

4.12.3.1 | INDIRECT VERSUS DIRECT ENERGY CONSUMPTION

The proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would require energy to construct, operate, and maintain. Energy consumed in construction and maintenance is referred to as indirect energy usage. Construction includes that energy used by construction equipment and other activities at the worksite, in addition to the energy used to manufacture the equipment, materials, and supplies and to transport them to the worksite. Energy for maintenance includes that for day-to-day upkeep of equipment and systems, as well as the energy embedded in any replacement equipment, materials, and supplies. Indirect energy needs for construction of the proposed project would not be substantial, and indirect energy needs for maintenance would not change from the existing conditions; therefore, none of the build alternatives would have a significant effect on indirect energy consumption.

Energy consumed in the operation of transportation systems is typically referred to as direct energy consumption. This includes energy used by vehicles transporting people or goods (i.e., propulsion energy), plus energy used to operate facilities such as stations and station amenities, maintenance shops, yards, and other system elements. Over the life of a transportation project, direct energy consumption is usually the largest component of the

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94 Late night 47 and 49 services are provided by the 90 Owl.

95 Diesel and gasoline fuel prices in California in 2000 were $1.99 and $1.79 per gallon, respectively. Peak price in the last 10 years (year 2008) was $4.90 and $4.40 per gallon, respectively.

project's total energy use. Vehicle propulsion energy can amount to 60 percent of the total energy consumption related to a transportation project (Caltrans, 1983). In the current energy environment, the ongoing energy requirements of new activities, including their long-term impacts on energy supplies, are of chief concern; therefore, from an energy conservation standpoint, direct energy impacts are of greater importance than indirect energy impacts. For these reasons, the energy analysis for this environmental document focuses on direct rather than indirect energy requirements because no changes to indirect energy consumption are expected with the project, whereas the project could potentially affect direct energy consumption from the transportation sector.

4.12.3.2 | ENERGY IMPACTS

By providing dedicated lanes for transit, the proposed BRT build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would separate transit from auto traffic, thereby improving transit speeds and reliability. The frequency of existing transit service and hence transit VMT under all project build alternatives would remain the same as under the No Build Alternative; however, the improved transit performance (i.e., improved speed and reliability) and experience provided by the proposed BRT build alternatives would attract riders to the BRT service, resulting in mode shift for some drivers of motor vehicles to transit, thereby reducing the number of autos and auto VMT in San Francisco as presented in Table 4.12-1. These changes in travel behavior results in decreases in travel by less energy-efficient modes (i.e., autos) and greater travel by a more energy-efficient mode (i.e., BRT buses).

Table 4.12-1: Annual Year 2035 Countywide Energy Use for the Project Alternatives

ALTERNATIVE	ANNUAL AUTO VEHICLE MILES TRAVELED[2]	POWER CONSUMED (GALLONS OF GASOLINE)[3]	CHANGE IN FUEL CONSUMPTION (GALLONS OF GASOLINE)	ENERGY EQUIVALENT IN BTUS (MILLIONS)[4]
No Build Alternative[1]	3,828,962,240	114,868,867		14,358,608
Build Alternative 2	3,805,424,640	114,162,739	(706,128)	14,270,342
	Difference from No Build Alternative			-0.61%
Build Alternatives 3 & 4	3,803,920,320	114,117,610	(751,258)	14,264,701
	Difference from No Build Alternative			-0.65%
Build Alternatives 3 & 4 with Design Option B)[5]	3,825,133,120	114,753,994	(114,874)	14,344,249
	Difference from No Build Alternative			-0.10%

BTUs = British Thermal Units

Notes:

1 No Build Alternative forms basis for comparison for other alternatives.

2 Transit (i.e., rail and bus) vehicle miles traveled (VMT) in the county assumed to be the same under the No Build Alternative and all of the build alternatives. Project impacts only automobile VMT.

3 Autos/small trucks use gasoline. Gallons of gasoline consumed per mile of travel equals 0.03 gallons per mile.

4 BTUs in one gallon of gasoline = 125,000.

5 The LPA, with or without the Vallejo Northbound Station Variant, would have the same energy use as Build Alternatives 3 and 4 with Design Option B.

Source: U.S. Department of Energy, 2008c.

In addition to the estimated annual VMT, Table 4.12-1 shows the annual power consumption of the project alternatives in 2035. Because the proposed build alternatives do not affect the transit VMT, they are anticipated to have little to no effect on transit energy supply and consumption (i.e., electricity and diesel fuel supply). The project would also have little to no effect on heavy-truck traffic; therefore, only automobile VMT and automobile power consumption are presented. Auto/light-truck fuel usage is expressed in terms of gallons of gasoline. Energy consumption is presented in gallons of gasoline and BTUs, or British thermal units. BTU is a standard measure of energy content. A gallon of gasoline is equivalent to approximately 125,000 BTUs (U.S. Department of Energy, 2008).

KEY FINDING

Each build alternative, including the LPA, would have a minor beneficial effect on energy consumption. The potential benefit of the proposed project for energy would result from a decrease in automobile VMT countywide. The proposed project would not have an effect on electricity or diesel fuel supply.

As shown in Table 4.12-1, each build alternative would result in a slight reduction in energy consumption compared with the No Build Alternative. Build Alternatives 3 and 4 with Design Option B would also lead to a similar reduction in energy consumption compared to the No Build Alternative.

Implementation of Build Alternative 2 would reduce gasoline consumption by 706,000 gallons, which translates to approximately 0.60 percent in energy savings compared to the No Build Alternative. Build Alternatives 3 and 4 are identical in terms of their effect on energy consumption and would save 751,000 gallons of gasoline annually (energy savings of 0.65 percent). Build Alternatives 3 and 4 with Design Option B (the LPA) would save 115,000 gallons of gasoline annually. This translates to a 0.1 percent reduction in energy consumption. Implementation of Build Alternatives 3 and 4 with Design Option B (the LPA) would involve removal of the existing left-turn pockets, which would lead to automobiles traveling more miles than under the other build scenarios, leading to slightly lesser energy savings. The LPA would result in the same energy savings as Build Alternatives 3 and 4 with Design Option B. In summary, each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), would have a minor beneficial effect on energy consumption. The slight benefit of the proposed project for energy would result from a decrease in automobile VMT countywide. The proposed project would not have an effect on electricity or diesel fuel supply.

4.12.4 | Avoidance, Minimization, and/or Mitigation Measures

The proposed project would have very slight beneficial impacts on regional energy consumption; therefore, no avoidance, minimization, or mitigation measures are required.

4.13 Biological Environment

This section summarizes the regulatory setting; affected environment; environmental consequences; and measures to avoid, mitigate, or compensate for long-term, permanent impacts to biological resources as a result of the proposed project. Construction-phase impacts and avoidance measures are presented in Section 4.15.13, Construction Impacts. Documents providing background for this section include the *Van Ness Avenue Bus Rapid Transit Natural Resources Technical Memorandum* (GANDA, 2009), Article 16 Urban Forestry Ordinance of the Public Works Code and the Van Ness Area Plan (SFGOV, 2007).

Preparation of the *Van Ness Avenue Bus Rapid Transit Natural Resources Technical Memorandum* included review of the California Natural Diversity Database (CNDDB) San Francisco north 7.5-minute United States Geological Survey (USGS) topographic quadrangle map, which encompasses the project area, in addition to the United States Fish and Wildlife Service (USFWS) database of threatened and endangered species for San Francisco County (USFWS, 2008). Previous biological surveys conducted in the project vicinity were also reviewed, in addition to relevant literature searches (GANDA, 2009). Surveys of the project area by a qualified biologist were conducted on November 13, 2007, and June 10, 2009.

The LPA included in this Final EIS/EIR is a refinement of the center running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences of the proposed project with the LPA, with or without the Vallejo Northbound Station Variant, for biological resources are identified as part of the analysis presented for the build alternatives in this chapter. Because the LPA configuration is a variation of the center running alternatives in the Draft EIS/EIR, the LPA has different effects relative to tree removal and replanting opportunities presented for the build alternatives. However, the overall impact findings with the LPA fall within the range of the findings for Build Alternatives 3 and 4, as presented in this subsection.

RESOURCES

More information on federal and state environmental laws and regulations:

CLEAN WATER ACT SECTION 401
www.epa.gov/wetlands/regs/sec401.html

FEDERAL ENDANGERED SPECIES ACT OF 1973, as Amended (Public Law 93-295)
www.fws.gov/Endangered/ESA/content.html

MIGRATORY BIRD TREATY ACT
www.fws.gov/pacific/migratorybirds/mbta.htm

EXECUTIVE ORDER 13112 – INVASIVE SPECIES
www.invasivespeciesinfo.gov/laws/execorder.shtml

CALIFORNIA ENDANGERED SPECIES ACT OF 1984
www.dfg.ca.gov/habcon/cesa

PORTER-COLOGNE ACT
ceres.ca.gov/wetlands/agencies/swrcb.html

4.13.1 | Regulatory Setting

The following discussion summarizes environmental laws and regulations governing biological resources relevant to the proposed project.

4.13.1.1 | FEDERAL REGULATIONS

Clean Water Act Section 401

Section 401 of the federal CWA requires the issuance of a water quality certification or waiver thereof for all nationwide or individual permits issued by the United States Army Corps of Engineers (USACE) under Section 404 of the CWA. Issuance of water quality certification (or waiver) is considered a discretionary action, requiring review under the California Environmental Quality Act (CEQA). The RWQCB considers impacts on all waters of the U.S. and wetlands identified in the project area during the CEQA review process and issues water quality certification. Thus, Section 401 of the CWA is implemented by the San Francisco RWQCB, as discussed in Section 4.13.1.2.

Federal Endangered Species Act of 1973, as Amended (Public Law 93-295)

The Federal Endangered Species Act (FESA) of 1973 mandates as federal policy that all federal agencies should work towards conservation of species of fish, wildlife, and plants in danger of or threatened with extinction. USFWS has jurisdiction over plants, wildlife, and resident fish, while the National Oceanic and Atmospheric Administration (NOAA) Fisheries has jurisdiction over anadromous fish, marine fish, and marine mammals. Federal agencies that fund, authorize, or carry out actions that "may affect" a listed species and its habitat, must consult with USFWS and/or NOAA Fisheries according to the provisions in Section 7(a) of the FESA to ensure that the federal agencies' actions do not jeopardize the continued existence of a listed species or adversely modify critical habitat for listed species. USFWS is authorized to permit the taking of listed species "if such taking is incidental to, and not the purpose of carrying out otherwise lawful activities" [16 U.S.C. 1539 and Section 10(a)(1)(B) of FESA]. For federal actions, an incidental take may be authorized pursuant to Section 7 consultation with the issuance of a Biological Opinion by USFWS and/or NOAA Fisheries. For non-federal (i.e., state and private) actions, Section 10 of the FESA requires the issuance of an "incidental take" permit before any action that would potentially take any individual of an endangered or threatened species. The permit requires preparation and implementation of a Habitat Conservation Plan that would offset the take of listed species that may occur through specific mitigation measures.

The incidental take of birds, active nests, eggs, and nestlings without a special circumstance permit is prohibited by the Migratory Bird Treaty Act.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C., Section. 703, Supplement. I, 1989) provides protection for most birds (common and listed) by prohibiting the incidental take of birds, active nests, eggs, and nestlings without a special circumstance permit issued by USFWS. Activities that cause abandonment of a nest and/or loss of reproductive effort are also considered non-permitted take and are prohibited by the MBTA. Inactive nests are not protected by the MBTA and may be removed during the non-nesting season. Exclusionary structures (e.g., netting or plastic sheeting) may be used to discourage the construction of nests by birds within the project construction zone.

Executive Order 13112 –Invasive Species

E.O. 13122, signed in 1999, requires federal agencies to work cooperatively to prevent and control the spread of invasive plants and animals. FHWA and Caltrans have issued guidance requiring that NEPA and CEQA analysis for a proposed action include an analysis of the probability of the action to cause or promote the introduction or spread of invasive species. If analysis indicates that disturbances caused by the action have the potential to promote the introduction or spread of invasive species, then all feasible and prudent measures must be taken to minimize this likelihood.

4.13.1.2 | STATE REGULATIONS

California Endangered Species Act of 1984 (Sections 2050-2098 of the California Fish and Game Code)

The California Endangered Species Act (CESA) is intended to conserve and enhance endangered species and their habitats and requires that state agencies cannot approve any action under their jurisdiction when the action would result in the extinction of endangered and threatened species, or destroy habitat essential to their continued existence, if reasonable and prudent alternatives exist. The CESA requires that a lead agency conduct an endangered species consultation with the California Department of Fish and Wildlife (CDFW) if the proposed action could affect a state-listed species. CDFW then prepares a written finding on whether the proposed action would jeopardize the listed species or destroy essential habitat. In the case of an affirmative finding, CDFW presents alternatives to avoid jeopardy. Under Section 2081 of the California Fish and Game Code (CFGC), CDFW may authorize take of endangered, threatened, or candidate species through issuance of permits or memorandum of understanding.

Since 1978, CDFW has produced three reports that address wildlife "Species of Special Concern" in California. Many of the species included in those reports do not have federal- or state-listed or candidate status, but they are believed to be declining in abundance and/or distribution within the state. CDFW Species of Special Concern do not have any legal protection status; however, because they are considered declining species, they are usually informally protected.

Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act)

The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) is the major water quality control law for California. The Act authorizes the State to implement the provisions of the CWA. The Porter-Cologne Act establishes a regulatory program to protect the water quality of the state and the beneficial uses of state waters. Under this act, the SWRCB provides policy guidance and review for the RWQCBs, and the RWQCBs implement and enforce the provisions of the Act. Section 401 of the CWA stipulates that any action that requires a federal license or permit and that may result in a discharge of pollutants into waters of the U.S. also requires water quality certification. Locally, this program is administered by the San Francisco RWQCB and is designed to ensure that the discharge will comply with applicable federal and state effluent limitations and water quality standards. Certification applies to both construction and operation.

4.13.1.3 | TREE PROTECTION LEGISLATION

Tree Protection Legislation – Article 16 Urban Forestry Ordinance

City ordinance provides for protection of certain trees as set forth in Article 16 Urban Forestry Ordinance of the Public Works Code. The City considers "protected trees" as street trees, significant trees, and landmark trees. Removal of any of these requires a permit. Moreover, if any project activity is to occur within the tree drip line, then a Tree Protection Plan prepared by an International Society of Arborculture (ISA) certified arborist is to be submitted to the Planning Department for review and approval. Protected trees are defined as follows:

- **Landmark Trees.** Landmark Trees have the highest level of protection in the City. These trees meet criteria for age, size, shape, species, location, historical association, visual quality, or other contribution to the City's character and have been found worthy of Landmark status after Urban Forestry Council and Board of Supervisors public hearings. Temporary landmark status is also afforded to nominated trees currently undergoing the public hearing process. The SFDPW maintains the official "Landmark Tree Book" with all designated Landmark Trees in San Francisco.
- **Significant Trees.** Significant Trees are located within 10 feet of the property edge of the sidewalk and are above 20 feet in height, or have a canopy greater than 15 feet in diameter, or have a trunk diameter greater than 12 inches at breast height.
- **Street Trees.** Street Trees are trees within the public ROW. Street Trees may be maintained by either the adjacent property owner or the City.

Removal of a protected tree by a City department such as SFMTA requires approval from SFDPW, which involves posting a tree removal notice for up to 30 days. If objection to removal is received, then the removal is scheduled for a public hearing before the SFDPW Director, who will in turn issue a final decision.

Existing vegetation consists of predominately non-native ornamental trees and shrubs planted along the sidewalks and within the median strip.

4.13.2 | Affected Environment

The project corridor is wholly developed with little or no indigenous vegetation. There are no wetlands, seasonal or perennial watercourses, or riparian areas within the project area. The Van Ness Avenue corridor is considered a major storm water catch basin in San Francisco, which is discussed in Section 4.9, Hydrology and Water Quality. Existing vegetation in the corridor consists of predominately non-native ornamental trees and shrubs planted along the sidewalks and within the median strip. Most of these plantings feature ornamental species not native to California such as Eucalyptus trees, including Desert Gum *(Eucalyptus rudis),* Silver Dollar Gum *(Eucalyptus polyanthemus)*, and Beautiful Leaf Eucalyptus *(Eucalyptus calophylla)*. Other planted species include Linden *(Tilia* sp.) and London Plane Tree *(Platanus x acerifolia)*. Plantings along the median are mostly colorful, hearty plants, such as Lily of the Nile *(Agapanthus* sp.) and other ornamental varieties (SFGOV, 2007).

Planted trees and shrubs in landscaped areas can provide marginal suitable refuge for several bird species during seasonal nesting and migration periods. Several bird and raptor species are known to occur within San Francisco, including Anna's hummingbird *(Calypte anna),* house finch *(Carpodacus mexicanus),* Brewer's blackbird *(Euphagus cyanocephalus),* mourning dove *(Zenaida macroura),* American crow *(Corvus branchyrhyncos),* red-tailed hawk *(Buteo jamaicensis),* Cooper's hawk *(Accipiter cooperii)*, and peregrine falcon *(Falco peregrinus)*. The peregrine falcon is a California state endangered species known to nest on buildings in urban settings, including San Francisco. Peregrine falcons have been regularly observed perched on the California State Automobile Association (CSAA) building located at 100 Van Ness Avenue, and they have been photographed at City Hall. There is no record or evidence that peregrine falcons or other raptors have nested on these or any other buildings along Van Ness Avenue (GANDA, 2009).

A search of the CNDDB database for the San Francisco north 7.5-minute quadrangle map provided a list of 12 special-status animals. None of the animals listed are known to occur within the project corridor. Of the 12 records reported, only 2 monarch butterfly *(Danaus plexippus)* overwintering sites are known to occur within 1-mile of the project. One site at Telegraph Hill and another near Fort Mason are the nearest occurrences, but they are outside the project area. Other special-status animal records reported by the CNDDB include California red-legged frog *(Rana aurora draytonii),* western pond turtle *(Clemmys marmorata),* and American badger *(Taxidea taxus)*. All of these records are located in Golden Gate Park and are more than 1.5 miles from the project area.

One median tree, a 17-foot-tall Cork Oak *(Quercus suber),* located at the intersection of Jackson Street and Van Ness Avenue, was planted as part of an Arbor Day celebration on March 14, 2006, and was dedicated to civil rights pioneer Rosa Parks. Although this tree does not qualify as a landmark or significant tree per County ordinance, it may warrant special consideration in planning and may be a candidate for relocation in accordance with Article 16 Urban Forestry Ordinance of the Public Works Code.

KEY FINDINGS

- **The build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not affect Waters of the U.S. or require Section 401 Water Quality Certification.**
- **No native plant assemblage or biotic community would be disturbed during operation of the project or under the No Build Alternative.**
- **The removal of existing trees and shrubs is not significant because each build alternative would include replacement planting.**

4.13.3 Environmental Consequences

The project corridor does not include wetlands, water bodies, or riparian habitat; therefore, the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not affect Waters of the U.S. or require Section 401 Water Quality Certification. In addition to its own storm water management program, the City of San Francisco is required by federal, state, and local laws to implement programs that reduce the discharge of pollutants to the local storm drain system, as discussed in Section 4.9, Hydrology and Water Quality (SFPUC, 2007).

The project area has no special-status biological resources or protected habitats that could be impacted by the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), and to a lesser extent the No Build Alternative. Thus, no native plant assemblage or biotic community would be disturbed during operation of the project or under the No Build Alternative. Nonetheless, median and sidewalk vegetation along Van Ness Avenue provides habitat for nesting birds, which are protected by the MBTA. Operation of the build alternatives, including Design Option B and the LPA, would not increase disturbance to migratory birds and active bird nests during the nesting season. Similarly, operation under the No Build Alternative would not increase disturbance to migratory birds and active bird nests. Potential disturbance to migratory birds during project construction is discussed in Section 4.15.11, Construction Impacts, because project construction under all of the build alternatives, including the LPA, would result in removal of existing trees. The extent of tree removal differs under each build alternative and the LPA, and detailed information on reasons for tree removal and their condition is presented in Section 4.4, Aesthetics/Visual Resources. Section 4.4 also describes the planting opportunities under each build alternative, including the LPA. The impact from the removal of existing trees and shrubs would be alleviated under each build alternative, including the LPA, with replacement planting. Increased sidewalk and median tree plantings over existing conditions would result in long-term, beneficial effects to biological resources, with improvements growing over time as plantings mature. Although tree removal impacts of the proposed project do not result in significant biological impacts, incorporation of a median design plan previously described in Section 4.4.4 as mitigation measures M-AE-3 and M-AE-4, in addition to measures IM-BI-1 through IM-BI-2 described below, would reduce impacts from tree removal.

4.13.4 | Avoidance, Minimization, and/or Mitigation Measures

Potential disturbance to migratory birds during project construction and tree removal permitting is discussed in Section 4.15.11, Construction Impacts. To minimize impacts from removal of existing trees and landscaping, the following improvement measures and permit requirements would be incorporated into project design for each build alternative, including Design Option B and the LPA, with or without inclusion of the Vallejo Northbound Station Variant:

IM-BI-1. In compliance with local tree protection policies, mature trees shall be preserved and incorporated into the project landscape plan as feasible. Planting of replacement trees and landscaping will be incorporated into the landscape plan as feasible (also refer to M-AE-3).

IM-BI-2. Have a certified arborist complete a preconstruction tree survey to identify protected trees that could be impacted by the proposed project, and to determine the need for tree removal permits and tree protection plans under San Francisco Public Works Code requirements.

A preconstruction tree survey conducted by a certified arborist will be completed to identify protected trees that could be impacted by the proposed project and to determine the need for tree removal permits and tree protection plans.

IM-BI-3. In compliance with the Executive Order on Invasive Species, E.O. 13112, the landscaping included in the proposed project will not use species listed as noxious weeds.

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4.14 Environmental Justice

This subsection examines if project implementation would result in disproportionately high or adverse human health or environmental effects on minority or low-income populations relative to the larger area/community of comparison.

The LPA included in this Final EIS/EIR is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), as described in Chapters 2 and 10. The environmental consequences related to environmental justice under the LPA, with or without the Vallejo Northbound Station Variant, are identified as part of the analysis presented for the build alternatives in this chapter. There would be no difference in such impacts under the LPA compared with the impacts described for the build alternatives in this subsection.

4.14.1 Regulatory Setting

In response to concerns over environmental impacts in minority and low-income populations, the Executive Office of the President of the United States established a formal federal policy on environmental justice in February 1994 with Executive Order (EO) 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*). This executive order calls on federal agencies to identify and address any disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority populations and low-income populations. The general principles under EO 12898 are as follows:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations.
- Ensure the full and fair participation of all potentially affected communities in the transportation decision-making process.
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

In April 1997, the U.S. Department of Transportation (DOT) issued an Order on Environmental Justice (DOT Order 5610.2), establishing procedures for its operating administrations, including FTA, to comply with EO 12898 and to promote environmental justice principles as part of its mission. Order 5610.2 stresses the importance of addressing environmental justice concerns early in the development of a program, policy, or activity. It requires where relevant, appropriate, and practical, that information be obtained on the population served and/or affected, including information on race, color, or national origin and income level and that steps be taken to guard against disproportionately high and adverse impacts on protected populations.

Beginning with the Van Ness Avenue BRT Feasibility Study undertaken in 2006, SFCTA involved and sought input from the general public to understand transit needs in the Van Ness Avenue corridor and identify alternative BRT improvements to meet those needs. That public involvement process, which will continue through completion of the EIS/EIR and design/construction, has been all-inclusive, based on outreach to all of the affected communities, which include people of diverse incomes, ethnicities, and languages in the study area.

Impacts and benefits of transportation projects to neighborhoods and the region result from the physical placement and operation of such transportation facilities. This environmental justice analysis examines whether adverse effects across all environmental resource areas are experienced disproportionately by, and are higher for, areas with a concentration of minority and/or low-income populations.

DEFINITIONS
(AS DEFINED BY THE U.S. CENSUS 2000)

MINORITY: People of the following Census-defined races or ethnicities: Black, Asian, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander, and Hispanic.

LOW-INCOME: Households whose household income is at, or below, the U.S. Department of Health and Human Services (HHS) poverty guidelines. The HHS poverty guidelines for the 2000 U.S. Census were $8,240 for a single-person household and $2,820 for each additional household occupant.

4.14.2 | Affected Environment

For purposes of EO 12898, the U.S. DOT Order addresses persons belonging to the following focused populations:

- **Minority:** People of the following Census-defined races or ethnicities: Black, Asian, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander, and Hispanic.
- **Low-income:** Households whose household income is at, or below, the U.S. Department of Health and Human Services (HHS) poverty guidelines.

U.S. Census 2000 data were used to identify the location of minority populations and low-income populations within the Van Ness Avenue BRT study area.[96] Information was collected at the Census Block Group level, which is an aggregate of Census Blocks. Census Block Groups data were used to identify the location of minority populations, as was done for determining income levels. Because the Census Bureau must protect the privacy of individuals, all household income data is released in units no smaller than the Block Group, rather than by Block, which is the smallest geographic unit used by the Census Bureau for collecting and reporting demographic data..

The study area has a population that is socioeconomically and ethnically diverse, as summarized in Section 4.2, Community Impacts, and presented in Table 4.14-1 (majority/minority populations are highlighted in grey for emphasis). Approximately 43 percent of all study area residents are members of minority populations (i.e., non-white), compared with an approximate 56 percent minority population in the City and County of San Francisco. Figure 4.14-2 on page 4.14-9 shows the location of these block groups.

Table 4.14-1: 2000 U.S. Census Block Group Analysis

STUDY AREA LOCATION	POPULATION	% MINORITY	AVERAGE HOUSEHOLD SIZE	MEDIAN HOUSEHOLD INCOME	HHS POVERTY LINE
Census Tract 102, Block Group 1	1,316	16.4%	1.7	$99,252	$13,034
Census Tract 102, Block Group 2	1,929	14.0%	1.5	$86,639	$12,470
Census Tract 102, Block Group 3	1,043	20.6%	1.5	$61,150	$12,470
Census Tract 109, Block Group 1	1,081	26.8%	1.7	$90,711	$13,034
Census Tract 109, Block Group 2	1,754	34.4%	1.8	$66,959	$13,316
Census Tract 109, Block Group 3	1,671	27.6%	1.5	$49,214	$12,470
Census Tract 110, Block Group 1	868	48.6%	1.8	$46,875	$13,316
Census Tract 110, Block Group 2	2,095	**70.0%**	2.3	$34,081	$14,726
Census Tract 110, Block Group 3	2,066	**59.1%**	2.0	$49,063	$13,880
Census Tract 110, Block Group 1	2,241	**54.4%**	1.9	$39,792	$13,598
Census Tract 110, Block Group 2	2,280	**51.4%**	1.8	$30,148	$13,316
Census Tract 110, Block Group 3	1,038	47.1%	1.6	$44,191	$12,752
Census Tract 120, Block Group 1	1,965	44.7%	1.4	$25,696	$12,188
Census Tract 120, Block Group 2	2,007	**52.3%**	1.6	$25,524	$12,752
Census Tract 122, Block Group 1	2,641	**56.5%**	1.8	$31,674	$13,316
Census Tract 122, Block Group 2	2,082	**70.0%**	1.9	$24,811	$13,598
Census Tract 122, Block Group 3	2,312	**58.2%**	1.6	$30,426	$12,752

[96] As of August 2011, the U.S. Census Bureau has not released its income data from the 2010 census at a Block Group level.

Table 4.14-1: 2000 U.S. Census Block Group Analysis

STUDY AREA LOCATION	POPULATION	% MINORITY	AVERAGE HOUSEHOLD SIZE	MEDIAN HOUSEHOLD INCOME	HHS POVERTY LINE
Census Tract 124, Block Group 1	1,867	**65.3%**	1.8	$22,303	$13,316
Census Tract 124, Block Group 2	2,785	**75.3%**	2.0	$21,937	$13,880
Census Tract 124, Block Group 3	1,220	**50.7%**	1.5	$16,098	$12,470
Census Tract 124, Block Group 4	749	37.1%	1.3	$37,875	$11,906
Census Tract 124, Block Group 5	1,567	**53.2%**	1.7	$13,252	$13,034
Census Tract 129, Block Group 1	1,308	17.1%	1.6	$66,360	$12,752
Census Tract 129, Block Group 2	1,253	22.6%	1.6	$74,313	$12,752
Census Tract 129, Block Group 3	1,275	18.7%	1.6	$68,646	$12,752
Census Tract 129, Block Group 4	1,005	16.7%	1.5	$51,818	$12,470
Census Tract 130, Block Group 1	1,148	21.3%	1.6	$80,068	$12,752
Census Tract 130, Block Group 2	976	15.0%	1.7	$119,492	$13,034
Census Tract 131, Block Group 1	1,703	17.4%	1.5	$82,464	$12,470
Census Tract 131, Block Group 2	1,913	20.2%	1.5	$77,287	$12,470
Census Tract 131, Block Group 3	1,522	20.0%	1.6	$67,368	$12,752
Census Tract 131, Block Group 4	1,329	17.4%	1.6	$108,608	$12,752
Census Tract 151, Block Group 1	1,626	27.0%	1.4	$51,638	$12,188
Census Tract 151, Block Group 2	794	46.1%	1.4	$68,393	$12,188
Census Tract 152, Block Group 1	1,746	34.1%	1.5	$41,602	$12,470
Census Tract 155, Block Group 1	1,507	42.9%	1.4	$46,452	$12,188
Census Tract 159, Block Group 1	2,054	**58.7%**	1.9	$38,913	$13,598
Census Tract 160, Block Group 1	2,026	39.8%	1.4	$48,375	$12,188
Census Tract 161, Block Group 1	946	**93.7%**	2.4	$34,773	$15,008
Census Tract 161, Block Group 1	676	38.9%	1.5	$37,050	$12,470
Census Tract 162, Block Group 2	896	46.1%	1.7	$40,721	$13,034
Census Tract 162, Block Group 3	930	41.1%	1.8	$40,820	$13,316
Census Tract 168, Block Group 1	816	37.6%	1.6	$42,133	$12,752
Census Tract 168, Block Group 2	921	32.7%	1.6	$45,000	$12,752
Census Tract 176, Block Group 13	1,946	**64.7%**	1.8	$25,595	$13,316
Census Tract 176, Block Group 14	254	45.7%	1.6	$42,000	$12,752
Census Tract 177, Block Group 2	1,621	**66.8%**	2.7	$57,083	$15,854
Census Tract 201, Block Group 1	871	**50.4%**	1.7	$38,317	$13,034
Census Tract 201, Block Group 2	1,604	**78.2%**	2.5	$20,110	$15,290
Census Tract 201, Block Group 3	1,534	**84.4%**	2.9	$24,773	$16,418
Census Tract 202, Block Group 1	1,222	45.8%	1.9	$56,400	$13,598
Census Tract 202, Block Group 2	2,348	**54.4%**	2.0	$36,818	$13,880
Census Tract 126, Block Group 1	1,095	13.6%	1.5	$75,181	$12,470
San Francisco City and County	*776,733*	***56.4%***	*2.4*	*$55,221*	*$15,008*
California	*33,871,648*	***53.4%***	*2.9*	*$47,493*	*$16,418*

Source: U.S. Census 2000

The HHS poverty guidelines for the 2000 U.S. Census were $8,240 for a single-person household and $2,820 for each additional household occupant. Using the above federal guidance definitions, there are no Census Block Groups, as defined by the federal CEQ, [97] within the study area with a predominantly low-income population. Both San Francisco and the study area far exceed the HHS poverty threshold guidelines, with median incomes of $55,221 and $47,493, respectively. Though the median income of all the affected Block Groups exceeds the poverty level, field observations indicate a greater presence of homeless people in the southern portion of the corridor, namely near the Civic Center and Market Street vicinities (Parsons, 2011). There are several government-funded and other community resource centers in this area serving low-income and mentally ill populations. In addition, using the 2000 U.S. Census poverty thresholds, a number of Census Block Groups were identified as having a meaningfully greater proportion (i.e., more than 10 percent greater) of households with incomes below the poverty threshold than the City of San Francisco as a whole. Figure 4.14-1 on page 4.14-8 shows these low-income groups using the 2000 U.S. Census poverty thresholds.

4.14.3 | Environmental Consequences

A proposed project would result in environmental justice impacts if project implementation would create disproportionately high or adverse human health or environmental effects on minority or low-income populations relative to the larger area/community of comparison. To determine whether the proposed project would result in environmental justice impacts, the project's adverse effects on minority and low-income populations are compared to the proposed project's adverse effects on non-minority and non-low-income populations to identify any disproportionate effects.

Analysis of each environmental factor presented in Sections 3.1 through 4.15 of this EIS/EIR includes detailed discussion of the affected environment, environmental consequences, and avoidance, minimization, and mitigation measures for each project alternative. All potentially significant, adverse effects – with the exception of impacts to traffic circulation – can be minimized or mitigated through implementation of measures identified in each section. A brief summary of the impacts associated with each environmental factor with respect to environmental justice is provided below.

4.14.3.1 | LAND USE

As explained in Sections 4.1 and 4.16, no changes or adverse effects to existing land uses or planned development would occur with construction or operation of any of the proposed build alternatives, including the LPA; therefore, no related, disproportionate, adverse effects on minority and low-income populations would result.

4.14.3.2 | COMMUNITY IMPACTS

As described in Section 4.2, the construction and operation of any of the build alternatives, including the LPA, with or without the Vallejo Northbound Station Variant, would not result in changes to community character or cohesiveness or affect the daily activities or participation levels of any minority or low-income population group. The displacement of colored, on-street parking could adversely affect adjacent commercial and residential properties. Colored parking removal is distributed throughout the corridor and is not

[97] The federal Council on Environmental Quality (CEQ) provides policy guidance for implementation of NEPA. The CEQ *Environmental Justice Guidance under NEPA* (December 10, 1997) states that minority populations should be identified when either of two criteria exists:

1. The minority population of the affected area exceeds 50 percent, or
2. The population percentage of the affected area is meaningful greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

It has become acceptable in planning studies that "meaningful greater" is represented by 10 percent or greater. In the analysis conducted for the Van Ness Avenue BRT Project, Census Block Groups are compared against the San Francisco City and County-wide averages.

concentrated in a low-income or minority community; thus, the effects from changes in colored parking would not be experienced by low-income and minority groups in a disproportionately high or adverse manner.

Construction planning would minimize nighttime construction in residential areas. Such considerations would be part of the public information procedures outlined in the TMP, which would include translation of all notices and announcements in Spanish and Chinese. Notices about construction would be mailed, as well as posted along the corridor, to maximize distribution of information to potentially affected people, including minority and low-income populations.

4.14.3.3 | GROWTH

As explained in Sections 4.3, none of the proposed project build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), are expected to result in unplanned growth in the corridor or larger region. Though the project is not expected to contribute to more growth scenario, current ABAG projections do forecast a 20 percent increase in the number of households to be formed in the City and County of San Francisco between 2000 and 2035. None of the project alternatives would change this forecast rate of growth. With or without the project, the same level of population growth, new housing, and commercial developments are anticipated to occur along the Van Ness Avenue corridor area over time. Because the project alternatives are not expected to alter the rate of growth in the corridor, they would not have growth-related, disproportionately high and adverse effects on minority or low-income areas of the corridor.

4.14.3.4 | AESTHETICS/VISUAL RESOURCES

As described in Section 4.4, the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not result in substantial impacts to the visual environment or to important visual resources in the Van Ness Avenue corridor. Tree removals and new planting opportunities would be evenly spaced throughout the project study area and would not disproportionately affect minority or low-income populations. As described in Section 4.15.3, visual impacts during project construction would be temporary, and would be experienced by all resident populations and users to a proportionate and nonsubstantial degree. Visual impacts resulting from any of the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not disproportionately affect minority and low-income populations.

4.14.3.5 | CULTURAL RESOURCES

As described in Sections 4.5 and 4.15.4, no impacts to known prehistoric or historical archaeological resources are expected to occur under any of the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant). No adverse impacts to cultural resources would disproportionately affect minority and low-income populations.

4.14.3.6 | SECTION 4(F)

The Section 4(f) analysis presented in Section 4.15 concludes that there are no direct, temporary, or constructive uses of neither any of the 20 park and recreational facilities located in the vicinity of the project area nor any of the 7 historic properties located within the area of potential effect; therefore, no Section 4(f) impacts would disproportionately affect minority and low-income populations.

4.14.3.7 | UTILITIES

As described in Sections 4.6 and 4.15.5, construction and operation of any of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not result in changes to utility demand or capacity. Minority and low-income populations would not be disproportionately impacted by temporary utility service interruptions because construction work would be coordinated with the SFDPW-led CULCOP and the San Francisco Street Construction Coordination Center, and information about planned utility service interruptions would be communicated to residents and employees through the public information program implemented as part of the TMP. The public information program would involve translation of all notices and announcements in Spanish and Chinese. Notices about utility interruptions would be mailed, as well as posted along the corridor, to maximize distribution of information to potentially affected people, including minority and low-income populations. The potential for utility disruptions is evenly distributed throughout the project corridor, and it is not anticipated that minority and low-income populations would be disproportionately affected.

4.14.3.8 | GEOLOGY AND SOILS

As described in Section 4.7, the results of the project geologic assessment indicate that there are no substantial geologic hazard impacts that would not be fully addressed by design specifications, and no mitigation measures are proposed. There would be no geologic or seismic project impacts to disproportionately affect minority and low-income populations.

4.14.3.9 | HAZARDOUS MATERIALS

As explained in Sections 4.8 and 4.15.7, project operation would not result in increased usage, transport, release, or exposure of hazardous materials to people in the project corridor. Potential exposure impacts from the release of hazardous materials during project construction would be avoided or mitigated through measures as described in Section 4.15. There would not be a potential for disproportionate exposure or other impacts on minority and low-income groups from hazardous materials as a result of the proposed project.

4.14.3.10 | HYDROLOGY AND WATER QUALITY

As described in Section 4.9, none of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would substantially alter the existing drainage pattern of the area or create flooding. Each build alternative, including the LPA, would result in a slight reduction in stormwater runoff, which is a beneficial effect. The project would not affect groundwater or drinking water. Neither the potential stormwater impacts anticipated during construction nor the water quality and hydrology impacts under any build alternative would be significant and, accordingly, would not have a disproportionately high and adverse affect on minority and low-income populations.

4.14.3.11 | AIR QUALITY

As described in Section 4.10, operation of any of the project build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would decrease VMT and associated regional emissions resulting in air quality benefits. Project construction would result in localized emissions; however, these emissions would not exceed the State ambient air quality standards. Construction-related air quality impacts would be temporary and would not disproportionately impact minority and low-income groups.

4.14.3.12 | NOISE AND VIBRATION

As discussed in Section 4.11, operation of the proposed project would not result in new vibration and noise impacts in the Van Ness Avenue corridor. Project construction would result in temporary increases in noise and vibration; however, these exposure effects are expected to be minimal, and they would not disproportionately impact minority and low-income groups.

4.14.3.13 | BIOLOGICAL RESOURCES

As explained in Sections 4.13 and 4.15.11, the proposed project is located in a highly developed, urban area of San Francisco with no water bodies, wetlands, open space, protected habitats, or other special-status biological resources. Project implementation would result in removal of substantial median trees in the Van Ness Avenue corridor; however, long-term beneficial effects would result from increased vegetation and plantings in the Van Ness Avenue corridor, with benefits increasing over time as plantings mature. Tree removals and new plantings are spaced throughout the project corridor and would not disproportionately affect minority or low-income populations. Project construction would not result in significant impacts to biological resources that would in turn disproportionately affect minority and low-income populations.

4.14.3.14 | TRANSIT

Each of the proposed build alternatives, including the LPA, would result in improved transit reliability and travel time savings that would benefit all communities in the study area and citywide, including minority and low-income groups. Implementation of the proposed project would improve transit service for the transit-dependent populations within the corridor. There would be no fare increase for BRT on Van Ness Avenue.

Impacts to existing transit service during project construction would be temporary, and outreach as part of the TMP would include translation of all notices and announcements in Spanish and Chinese. Notices about construction would be mailed, as well as posted along the corridor, to maximize distribution of information to potentially affected people, including minority and low-income populations. Following project completion of any of the three build alternatives, transit benefits would be realized for all communities, including low-income and minority populations in the project study area, and for commuters residing outside the project study area.

4.14.3.15 | NONMOTORIZED TRANSPORTATION

As discussed in Section 3.4, the proposed build alternatives, including the LPA, would change the design characteristics of Van Ness Avenue, including crossing distances, median widths, and provision of corner bulbs. For the most part, these design changes would improve the overall pedestrian environment of Van Ness Avenue, resulting in beneficial effects, and would not significantly affect bicycle conditions. Adverse impacts to the pedestrian environment could include an increase in pedestrian delay at some intersections, which is the average amount of time a pedestrian must wait for the traffic signals to change to allow crossing. This impact is not considered substantial when considered in the context of the numerous project benefits to the pedestrian environment that include shorter crossing distances and installation of count-down signals and APS at all intersections.

As discussed in Sections 2.2.2 and 3.4.3.1, the LPA average spacing of the proposed BRT station locations would be approximately 1,150 feet (1,080 under the LPA with the Vallejo Northbound Station Variant), requiring an average walk of up to 570 feet (two blocks) (540 feet under the Vallejo Northbound Station Design Variant) from a location halfway between two stops; this would constitute an increase, on average, of up to approximately 240 feet of additional walking to access stops if a person had an origin or destination exactly between the proposed BRT station locations. A distance of 240 feet is less than one block along Van Ness Avenue.

Van Ness Avenue has few hills, with no grades above 10 percent. On average, the proposed project complies with the applicable 1,000- to 1,200-foot spacing guideline for light rail lines (SFMTA 2007).[98] The project team has also met with local groups and organizations that focus on accessibility issues during preparation of the Feasibility Study and Draft EIS/EIR, including the Lighthouse for the Blind and Visually Impaired, the Mayors Disability Council Physical Access Committee, and the Muni Accessibility Advisory Committee, to gather input for the BRT project. The project team has also met with senior and assisted living facilities located along the corridor to understand the unique needs of those users and to minimize the potential impact of stop consolidation.

[98] There are no MUNI stop spacing guidelines for BRT.

The proposed BRT station locations were refined based on this input and additional input from the Van Ness BRT Citizens Advisory Committee, the Mayor's Office on Disability, and accessibility coordinators at the SFDPW and SFMTA. The Van Ness Avenue BRT Project is designed to be as universally accessible as possible. The Draft EIS/EIR provides a full evaluation of the project's accessibility for all users in Section 3.4.3.1. The evaluation is based on the principles of Universal Design and recognizes that users, including the elderly and disabled, may have different concerns. Some may depend on transit to meet their need for efficient travel in the Van Ness Avenue corridor; others prefer more frequent stops to minimize walking distances. The evaluation identifies the increase in physical effort required to reach a transit stop as posing a challenge to some riders, but it also notes other benefits the project provides to improve accessibility in the corridor. For example, level or near level boarding at BRT stations would reduce the physical effort required to board transit vehicles, while curb bulbs, nose cones, pedestrian countdown signals, and accessible pedestrian signals at intersections would allow people with a greater range of physical abilities to safely cross the street.

Low-income and minority populations in the project study area would not be disproportionally affected by transit stop consolidation, and the universal accessibility has been a goal of project design as described above; however, during the public meetings conducted to obtain input on development and selection of the LPA, considerable concern was expressed by local residents regarding the lack of transit stations proposed in the vicinity of the Van Ness Avenue and Vallejo Street intersection. In response to these public comments regarding stop spacing in the vicinity of the Van Ness Avenue and Vallejo Street intersection, which has higher grades than other parts of the corridor, the LPA design was modified to include a SB station at the intersection of Vallejo Street and Van Ness Avenue. A NB transit station in this same location, referred to as the Vallejo Northbound Station Variant, is considered in this Final EIS/EIR as a design variant that could also be implemented and will be decided upon at the time of project approval.

The aforementioned benefits and impacts to nonmotorized transportation would occur throughout the Van Ness Avenue corridor and would not disproportionally affect low-income and minority communities. Impacts to nonmotorized transportation during project construction would be temporary and would not be substantial. Project construction would not involve closure of sidewalks or crosswalks. Detour signage and notifications for the general public would be part of the public information program implemented as part of the TMP.

4.14.3.16 | PARKING

Curbside parking on Van Ness Avenue would generally be preserved with the implementation of any of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), although parking spaces would be reconfigured and entirely removed on select blocks, as described in Section 3.5. Impacts from the removal of parking in the Van Ness Avenue corridor would not disproportionately affect low-income and minority communities.

4.14.3.17 | VEHICULAR TRAFFIC

Each of the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), is expected to result in potentially significant impacts to automobile traffic circulation, as explained in detail in Section 3.3, Vehicular Traffic. Vehicular traffic circulation impacts that would result from implementation of the proposed build alternatives would by nature not only affect people with cars who reside in the Van Ness Avenue corridor study area, but would also affect drivers who commute or otherwise pass through the study area.

KEY FINDING

There would be no disproportionate environmental impacts on minority or low income communities under any of the areas of analysis.

Although the traffic technical study did not include a socioeconomic profile of drivers within the corridor, because such data is not typically collected, an analysis was conducted to compare the locations of forecasted traffic-impacted intersections to the minority population areas. As illustrated in Figures 4.14-1 and 4.14-2, none of the 14 potentially significant 2035 LOS-impacted intersections are located within low-income Block Groups (either using the HHS poverty guideline or the 2000 U.S. Census poverty thresholds) and only 4 of the 14 significant 2035 LOS-impacted intersections are located within minority Block Groups in the study area. Given that only 4 of 14 LOS-impacted intersections would affect environmental justice populations in the corridor, by either traffic diversion through minority neighborhoods or affecting minority residents who may drive personal automobiles, it can be concluded that the project overall would not disproportionately impact environmental justice populations in the project area relative to traffic circulation.

Regular commuters through the project study area and residents who own or use private vehicles within the project study area would be affected more than those who occasionally pass through the corridor. As indicted in Table 4.2-5 of this EIS/EIR, nearly half of all residents within the project study area do not own private vehicles, compared with approximately 30 percent of residents within the City and County of San Francisco.

Figure 4.14-1: Low-Income Block Groups, Significant Traffic Impacts, and Colored Parking Loss within the Van Ness Avenue Corridor BRT Study Area

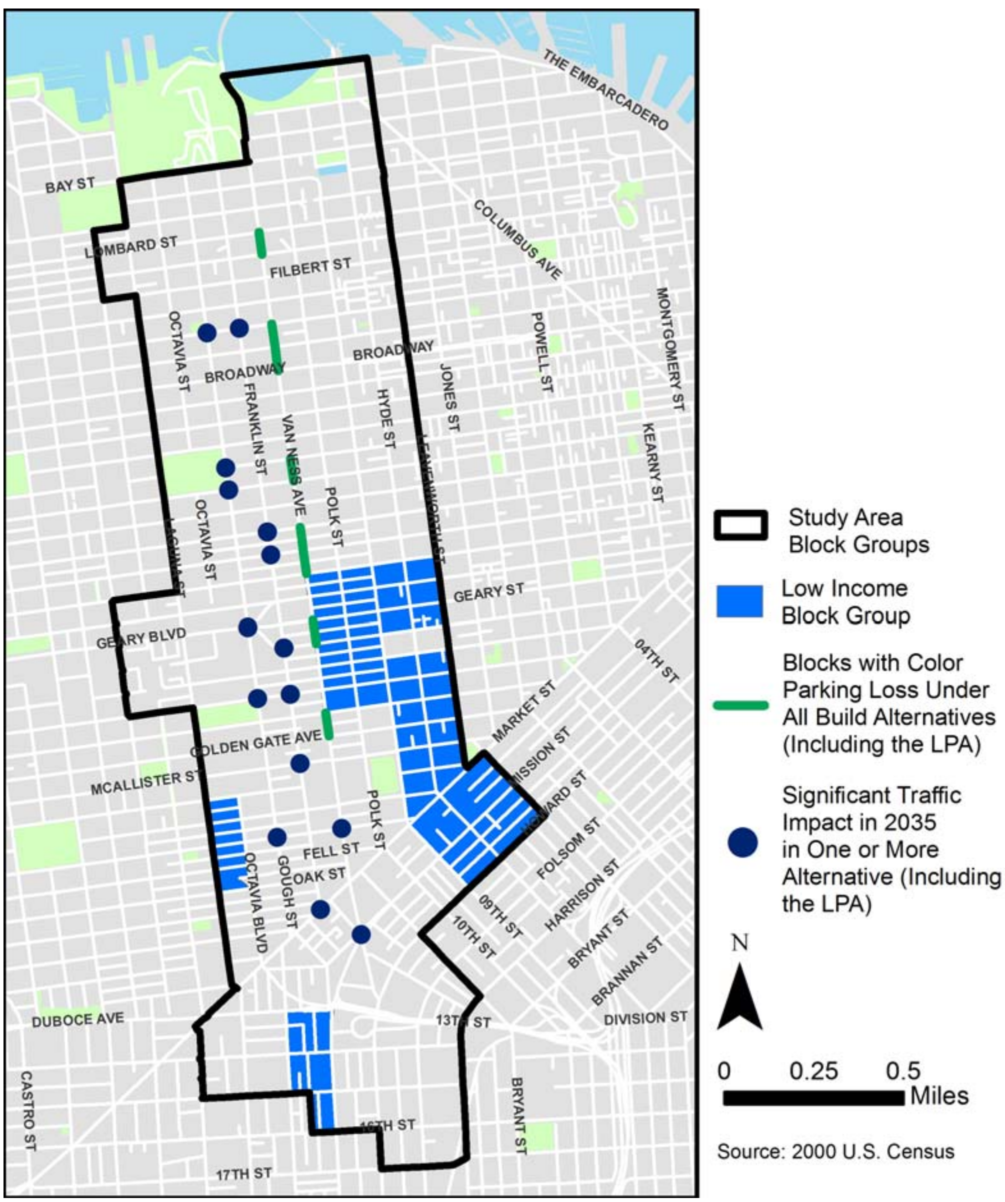
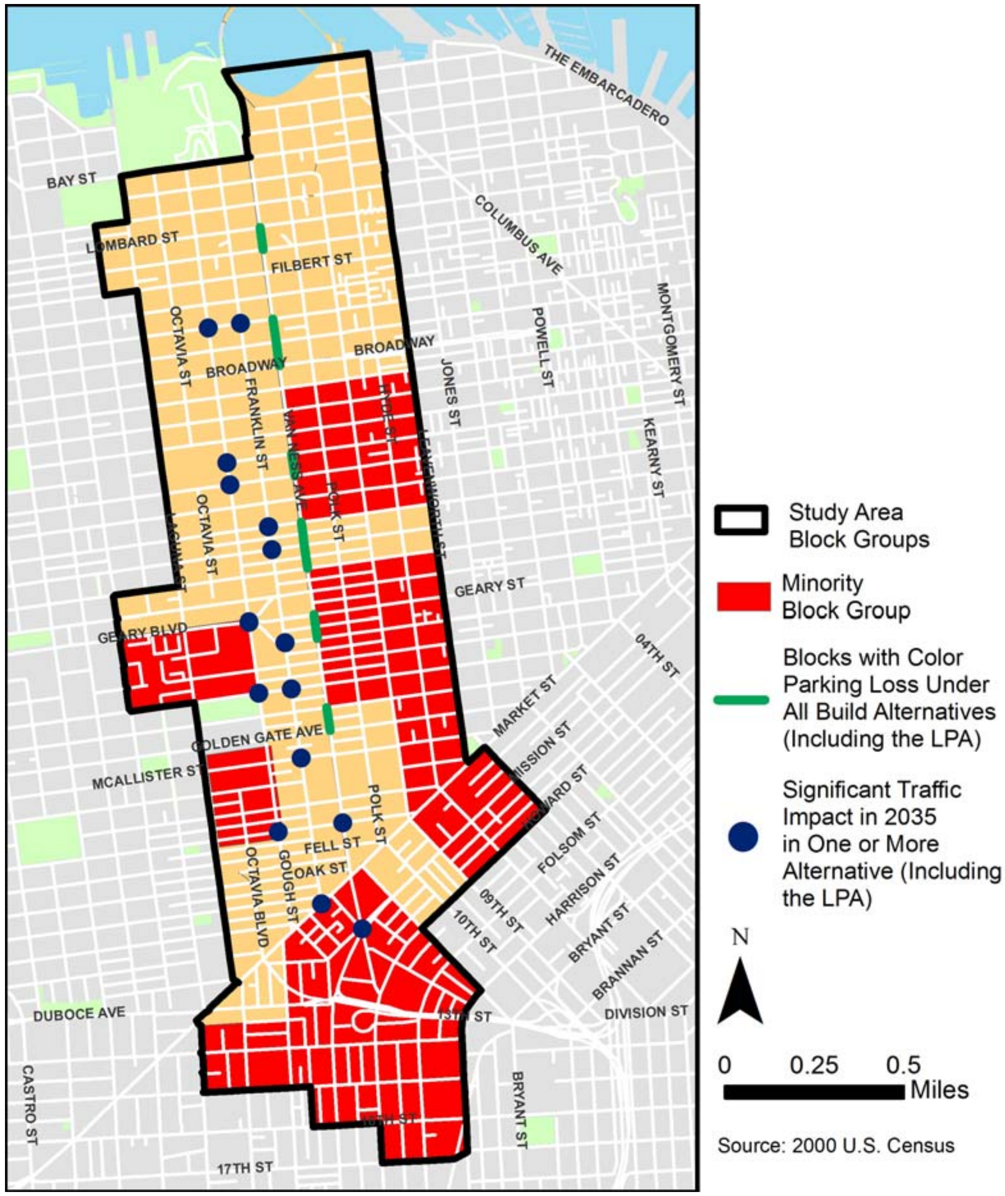


Figure 4.14-2: Minority Block Groups, Significant Traffic Impacts, and Colored Parking Loss within the Van Ness Avenue Corridor BRT Study Area



Therefore, there is a larger proportion of transit-dependent people living within the project study area compared with the City and County, and thus a larger proportion of transit-dependent people would reap the benefits of improved transit service in the Van Ness Avenue corridor. Although the project would negatively affect automobile traffic circulation, it would also enhance transit access, thereby benefiting minority groups in the corridor who do not own cars.

4.14.4 Avoidance, Minimization, and/or Mitigation Measures

As described in Section 4.15.9, construction phase impacts would be mitigated to control noise and fugitive dust. These mitigation measures would serve to ensure that there would be no disproportionate adverse effects on minority and low-income residents. Moreover, public outreach as part of the TMP described in Section 4.15 would include translation of all notices and announcements in Spanish and Chinese. Notices about construction would be mailed, as well as posted along the corridor, to maximize distribution of information to potentially affected people, including minority and low-income populations. No other avoidance, minimization, or mitigation measures are required to address environmental justice impacts. Based on the analysis of the project, the improvements proposed under any of the alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not cause disproportionately high and adverse effects on any minority or low-income populations as per EO 12898 regarding environmental justice.

As described in other sections of this EIS/EIR, implementation of any of the build alternatives and the LPA (with or without the Vallejo Northbound Station Variant) would include many benefits to low-income and minority populations, as well as the community at large, including a safer, more reliable and improved transportation system, improved mobility across the corridor, improved accessibility to jobs, and aesthetic improvements. These benefits are expected to be shared across demographic groups.

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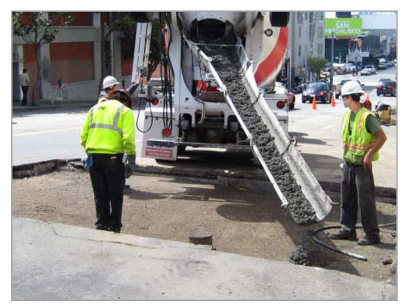
4.15 Construction Impacts



Temporary construction impacts associated with each of the build alternatives, including the LPA, for the proposed Van Ness Avenue BRT Project are described in detail in this section. Section 4.15.1 presents the construction scenario for each build alternative, including the LPA, and contains the anticipated construction stages, schedule, and work hours. The construction scenario and approach is based on the Project Construction Plan (PCP) developed for the project (Arup, 2012). The subsequent sections present the anticipated impacts and mitigation resulting from the construction scenario, including impacts of each build alternative where applicable.

Construction Plan

Construction of the proposed build alternatives, including the LPA, would occur within the existing street ROW. Construction would include the following major activities along the length of the proposed project: pavement rehabilitation as needed along the transitway, pavement resurfacing of Van Ness Avenue from curb to curb, reconstruction of curb and gutters (including curb bulbs), reconfiguration of the median, construction of BRT stations, replacement of the OCS support poles/streetlights system, replacement of traffic signal infrastructure, and associated utility relocations. BRT station construction would involve installing components such as platforms, canopies, ticket vending equipment, railings, lighting, signage, and station furniture. The manner in which construction would take place would be similar for all of the build alternatives and LPA. Following mobilization and staging activities, construction of all three build alternatives (including Design Option B and the LPA) would involve the major construction activities described in the following bullets.

- **Remove Existing Curb Bulbs and Undertake Utility Work.** Some existing curb bulbs would be removed to allow use of the curbside parking lane for mixed-flow traffic during construction. Where necessary, construction areas would be fenced at this point for public safety. During this phase, existing utilities that would interfere with construction would be removed and relocated as well (e.g., storm drains, laterals). Sewer pipeline replacement or relocation would be required for Build Alternatives 3 and 4, as discussed in Chapter 4.6, Utilities. Relocation or reconstruction of existing utilities would take into account services required at the BRT stations, reconstructed traffic signals, and replacement of the OCS support pole/streetlight network.
- **Build BRT Station/Platform Foundations.** Proposed BRT station locations would be cleared of obstructions, including demolition activities as needed, and rough-graded. Once the station areas are cleared, platform canopy foundations would be constructed, with 2.5-foot-diameter shafts drilled to approximately 5 feet bgs. Utility feeds would be installed and concrete platforms subsequently poured and finished. The above-platform features would be installed in a subsequent phase.
- **Construct Transitway.** Roadway work to construct the transitway would begin after the station foundations are complete and existing curb bulbs removed. The transitway would be paved and delineated, and the median curb and gutter work would be completed, including drainage facilities.
- **Conduct Intersection/Corner Work and OCS Support Pole/Streetlight Replacement.** Pedestrian corner bulbs would be constructed and new traffic signals installed during this phase, together with other elements proposed under the SFgo Program. The OCS pole replacement, trench work, and wiring would be undertaken at the same time as the intersection/corner work.
- **Finish BRT Stations/Platforms.** BRT station and platform elements and passenger amenities would be installed, including shelters, benches/seats, lighting, changeable

message signs (real-time arrival information), fixed signage, railings, trash receptacles, and TVMs at selected stations. Electrical and communications systems would be completed during this phase.

- **Curb-to-Curb Pavement Rehabilitation.** Curb-to-curb pavement rehabilitation under the Caltrans SHOPP project would be undertaken during this phase, as well as pavement resurfacing proposed under the BRT project.
- **Additional Infrastructure Elements.** Other key infrastructural elements would be completed, including replacement of the landscaping, as well as pavement striping and delineation. The corridor would require restriping of travel lanes and intersection approaches to allow alterations in street lane geometry and pedestrian crosswalks. New signage would be added along the corridor for transit users, motorists, pedestrians, and bicyclists. Once Phases 1 through 7 are complete, the BRT operation would be tested prior to being opened for service, including the interactive traffic signal system, communications equipment, and station facilities and equipment.

Approximate areas and depths of anticipated construction activities requiring earthwork are provided in Table 4.15-1. As shown in Table 4.15-1, traffic signal poles would require the deepest excavation, up to 16 feet bgs in an approximate 3-foot-diameter area. Additional deep excavations would include removal and replacement of the existing OCS support poles/streetlights, sewer replacement/relocation, and station canopy foundations. The remaining work would occur within 3 feet bgs.

Table 4.15-1: Anticipated Construction Areas and Excavation Depths

CONSTRUCTION ITEM	AREA	DEPTH[1] (FEET)
OCS Support Pole Replacement	3-foot-diameter excavation area, within sidewalk; located throughout project limits.	11.0
OCS Conduit Trench	2-foot-wide trench, within sidewalk; located throughout project limits.	3.0
Sewer Pipeline Relocation	6-foot-wide trench, within street; replace or relocate sewer at platform stations and at any locations where the BRT proposes the transitway or mixed traffic lanes directly over the existing sewer facility.	11.5
Traffic Signal Poles	3-foot-diameter excavation area, located at intersections throughout project limits.	16.0
Controller Cabinets	2.5-foot by 4-foot excavation area, located within the sidewalk at intersections throughout project limits.	3.0
Curb Bulbs & Sidewalk Reconstruction	Approximately 30 feet of full-width sidewalk disturbance area, located at intersections throughout project limits (varies by project alternative).	1.5
Pavement Resurfacing	Curb-to-curb resurfacing.	0.7
Pavement Reconstruction/ Rehabilitation	Spot improvements, as needed, to travel lanes and parking lanes to remedy failed pavement areas.	1.5
New Pavement	New pavement will be provided where transitways encroach over existing median. The maximum width of new pavement construction would be 14 feet at station locations where transitways would replace existing 14-foot medians.	1.5
Station Platform	Typical station platform dimensions are 9 feet to 14 feet wide by 150 feet long at platforms, Geary/O'Farrell is the longest platform area of approximately 270 feet.	1.0
Station Canopy Foundation	2.5-foot-diameter excavation area at platforms.	5.0

[1] Depth below ground surface (bgs).

Construction Approach

Principles of the project construction approach to be implemented under each build alternative include the following:

- Maintain two mixed-flow traffic lanes, which would also carry transit vehicles, in each direction (NB and SB) during peak hours, and as feasible during non-peak hours on Van Ness Avenue during project construction;
- The two mixed-flow traffic lanes would carry transit vehicles and maintain service for the 47 and 49 bus routes throughout construction.
- Assure 10-foot widths for all traffic lanes at a minimum;
- Place a physical barrier between traffic lanes and the construction zone (typically to be done by using a concrete k-rail barrier);
- Provide an appropriate buffer width between the construction zones and the adjacent traffic lanes, inclusive of the k-rail concrete barrier;
- Reduce speeds through construction work areas;
- Remove curbside parking as needed during construction of stations or the transitway; and
- Adhere to requirements and standards identified in the MUTCD and the San Francisco Blue Book, which govern temporary work zone installations.

All construction work would be conducted in compliance with obtained permits and regulations set forth by the City and Caltrans, in accordance with the SFMTA Regulations for Working in San Francisco Streets (Blue Book), the MUTCD, San Francisco Municipal Code (Noise Ordinance, Sections 2907 and 2908), and SFPUC and SFDPW BSM work orders. Construction work will conform to San Francisco Health Code Article 22B, which requires all City projects of over 0.5-acre in size to control dust from construction activities by preparing a dust plan approved by the San Francisco Department of Public Health, with the goal of minimizing visible dust and protecting sensitive receptors from dust exposure. A Transportation Management Plan (TMP) outlining methods and strategies to minimize construction activity-related traffic delay and accidents would be developed during the 30 percent project design phase and would be coordinated with other major projects in the area (e.g., Doyle Drive/Presidio Parkway and CPMC projects). The TMP is described in more detail in a subsequent section below.

Most of the work could be done during daylight hours, but some nighttime work would be required to permit temporary closures of the second traffic lane for tasks that could interfere with traffic or create safety hazards, subject to City approval with respect to noise ordinance requirements. Specific construction staging requirements would be defined during the final design phase. Construction of the LPA is anticipated to take 20 months to substantial completion based on the preferred construction approach.[99] The preferred construction approach is identified in the PCP and Project Study Report/Project Report prepared for the proposed project (Arup, 2012; Parsons, 2013). Under the preferred construction approach, construction of each build alternative, including the LPA, would occur on two three-block segments of Van Ness Avenue at the same time to reduce the overall construction schedule. Construction on three-block segments would occur simultaneously in the northern and southern ends of the corridor to stagger associated parking and traffic circulation disruption, followed by construction in the central segment. A risk analysis described in Section 9.3 accounts for potential issues that could increase the total project schedule and costs, including construction delays if simultaneous construction on three-block segments is not implemented. The preferred construction approach would involve the most intensive environmental impacts (i.e., traffic, parking, and air quality); however, at the same time, it would be the most efficient approach in terms of resource management and mobilization, and it would minimize the effect of delays at one location greatly impacting the entire

To minimize disruption to the traveling public, all efforts will be made to keep two traffic lanes open in each direction during construction. Construction activities that require closure of the on-street parking lane and/or a second traffic lane in one direction would be staged on approximately three-block segments.

[99] Substantial completion is defined by the American Institute of Architects as "the stage in the progress of the Work where the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use."

project schedule. Closure of one mixed-flow traffic lane in each direction and some on-street parking would be necessary for construction of all of the build alternatives, including the LPA. Temporary conversion of existing parking lanes to mixed-flow traffic lanes would be implemented in some cases to maintain two traffic lanes in each direction and minimize traffic impacts. These two mixed-traffic lanes would also carry transit vehicles during the construction period. In all cases, two lanes of mixed-flow traffic would generally remain open in each direction during construction, although temporary closures of an additional mixed-flow traffic lane would be required during construction tasks that could interfere with traffic or create safety hazards such as utility relocations, placement of concrete barriers, or large equipment. These closures would be planned for nighttime or off-peak traffic hours as feasible, and as in conformance with approved noise requirements. Partial closure of the sidewalk would be required under all of the build alternatives, including the LPA, for curb bulb construction work, replacement of the OCS support poles/streetlights and associated duct trenching, signal installation, and reconfiguration of underground utilities.

Construction Implementation Staging

Under the preferred construction approach, construction of each build alternative, including the LPA, would occur on multiple blocks of Van Ness Avenue throughout the corridor at the same time to reduce the overall construction schedule. Thus, multiple construction crews would be working at different locations along the corridor at one time. To minimize disruption to the traveling public, construction activities that require closure of the on-street parking lane and/or a second traffic lane in one direction would be staged on approximate three-block segments. Construction on three-block segments would occur simultaneously in the northern and southern ends of the corridor to stagger associated parking and traffic circulation disruption, followed by construction in the central segment. The three build alternatives have different street staging plans due to the nature of construction required for each, as summarized in the following paragraphs.

Build Alternative 2 Construction Staging

Under construction of Build Alternative 2, a contraflow system would likely be used during daytime construction to maintain two open traffic lanes in each direction. In other words, the direction of one of the three traffic lanes on the side of the street opposite construction activity would be reversed.

Build Alternative 2 would be constructed on one side of Van Ness Avenue at a time to accommodate open lanes of mixed-flow traffic in both NB and SB directions at all times. One traffic lane would remain open alongside the construction area, and three traffic lanes would remain open on the opposite side of the street, along with on-street parking. Under construction of Build Alternative 2, a contraflow system would likely be used during daytime construction to maintain two open traffic lanes in each direction. In other words, the direction of one of the three traffic lanes on the side of the street opposite construction activity would be reversed. Left turns along Van Ness Avenue would be eliminated in either direction within the blocks under construction as part of the contraflow system. Appropriate signage and temporary traffic signals would be used to guide drivers, augmented by flagmen as needed. The contraflow system would not be needed during nighttime construction when traffic volumes are lower. If and when a contraflow system is not in place, only one traffic lane (serving a single direction) would remain open on the same side of the street on which construction is taking place. If a contraflow system is not implemented, construction work would generally be required to be scheduled at night when traffic volumes are lower. Sidewalk closures would not be required, although partial closure of the sidewalk would be required for curb bulb construction work, replacement of the OCS support poles/ streetlights and associated duct trenching, signal installation, construction of the BRT stations, and reconfiguration of underground utilities.[100] Construction of Build Alternative 2 is anticipated to last approximately 19 months, as shown in Table 4.15-2; however, construction duration could be extended if a contraflow system is not implemented and construction activities requiring closure of a second lane in one direction would be restricted to nighttime.

[100] Partial closure of the sidewalk would be required under all of the build alternatives for curb bulb construction work, replacement of the OCS support poles/streetlights and associated duct trenching, signal installation, and reconfiguration of underground utilities.

Build Alternatives 3 and 4 (including Design Option B) Construction Staging

Construction staging for Build Alternatives 3 and 4 would be similar. Construction of the BRT stations, transitway, and medians would take place in an approximate 43-foot-wide area in the center of the roadway. Two traffic lanes would generally remain open on either side of the construction area. The parking lane on both sides of the street would be closed during the construction work to maintain two open traffic lanes in each direction. Sidewalk closures would not be required, although partial closure of the sidewalk would be required for curb bulb construction work, replacement of the OCS support poles/streetlights and associated duct trenching, signal installation, and reconfiguration of underground utilities. The intersection corner work would be primarily performed during the night to minimize impacts to pedestrian and vehicular traffic.

The construction approach for each build alternative would involve the closure of one northbound and one southbound traffic lane.

Short-term closures of an additional traffic lane may be required at times for construction tasks that could interfere with traffic or create safety hazards, reducing the number of open lanes in one direction to one. These closures would be planned for nighttime or off-peak traffic hours as feasible to avoid or reduce traffic impacts, subject to stipulated noise restrictions.

Under this construction implementation scenario, construction for Build Alternative 3 is anticipated to require 21 months, whereas construction for Build Alternative 4 is anticipated to require 14 months. Replacement of the aging sewer pipeline beneath the entire transitway alignment (see Chapter 4.6, Utilities) would be coordinated with construction of Build Alternative 3, which accounts for the longer construction duration compared to Build Alternative 4. Under Build Alternative 4, it is anticipated that the sewer pipeline would require replacement only beneath stations and not the transitway, resulting in shorter construction duration. Table 4.15-2 summarizes the preferred construction approach and schedule for each build alternative. Incorporation of Design Option B under Build Alternative 3 or 4 would not affect the construction schedule for these alternatives.

Table 4.15-2: Preferred Construction Approach and Schedule

BUILD ALTERNATIVE	CONSTRUCTION APPROACH	DURATION*
Alternative 2	Construction along a single side of the street on multiple segments, simultaneously.	19 months**
Alternative 3	Construction along both sides of the street in multiple segments, simultaneously.***	21months
Alternative 4	Construction along both sides of the street in multiple segments, simultaneously.	14 months
LPA	Construction along both sides of the street in multiple segments, simultaneously.****	20 months

*To substantial completion.

** Construction duration for Build Alternative 2 could be extended if a contraflow system is not implemented and construction activities requiring closure of a second lane in one direction would be restricted to nighttime.

***The duration for Build Alternative 3 construction would be longer than Build Alternative 4 due primarily to replacement of the sewer pipeline throughout the BRT alignment. Design Option B would not affect the construction schedule.

**** The duration for LPA construction is longer than Build Alternative 4 because it would require rebuilding of the median curb for the length of the corridor and also would require replacement of the sewer at station locations and in areas where construction of the transitway would occur directly above the sewer in its current location. Incorporation of the Vallejo Northbound Station Variant would extend construction time for the Vallejo block or segment, but it would not extend the overall project schedule under the preferred approach.

LPA Construction Staging

Construction staging for the LPA would be as described above for Build Alternatives 3 and 4, except that replacement of the aging sewer pipeline would be required at station locations and in areas where the transitway would be occur directly above the sewer in its current location. The duration for LPA construction would be longer than under Build Alternative 4 because it would require rebuilding the curb for the entire median, as well as replacement of the sewer pipeline as described above. The Build Alternative 4 design does not require rebuilding of the median curbs on blocks that are not proposed to have stations and do not currently have a left-turn pocket and also would not have locations with the transitway running directly over the sewer, meaning more linear feet of sewer would require replacement under the LPA than under Build Alternative 4. Under this construction implementation scenario, construction for the LPA (with or without the Vallejo Northbound Station Variant) is anticipated to require 20 months to substantial completion. Incorporation of the Vallejo Northbound Station Variant would extend construction time for the Vallejo block or segment, but it would not extend the overall project schedule under the preferred approach.

Construction Equipment and Laydown

The nature of the BRT construction work is conventional. A list of anticipated construction equipment includes:

- 5 cubic yards (cy) and under rubber-tired loaders
- 3 cy and under rubber-tired combination backhoe/excavator/loader
- Rubber-tired excavator
- Street-legal dump truck-style hauling units
- Motor graders similar to "CAT" 120 series sized machines
- Small "CAT" D-4 size and under dozers
- Steel drum rubber-tired self-propelled compaction equipment
- Portable air compressor, light plant, and generators sets
- Track-mounted concrete and/or asphalt laydown equipment
- Rubber-tired lifting equipment
- Rollers
- Small pneumatically driven hand tools, such as pavement breakers, and electrically operated tools, such as blowers, "skill" saw, drills
- Barrier movement machine
- Flatbed trucks for transport of materials and to display traffic control devices

These tools and equipment can be rapidly mobilized by street-legal truck and transport vehicles. The project does not require extensive foundations; therefore, vibrations are limited to normal construction impacts, with the most significant being the application of vibration from earth-compacting rollers.

Along the Van Ness Avenue corridor, several storage or "laydown" areas would be necessary for construction-related equipment, materials, vehicles, and goods to be safely stored overnight for easy access during construction activities. These areas would also be used as the contractor's staging and work areas. The selection of such sites is important strategically to reduce inefficient out-of-direction movements and to minimize time lost from transporting materials and workers from a storage area to the work area. Site access, size, security, and surrounding land uses play a role in the selection of appropriate siting locations. Construction laydown areas would be determined following final design. In the meantime, the following areas have been identified as potential equipment laydown areas to be confirmed when the project nears construction and is obtaining requirement construction permits:

- The State-owned parking lot located at South Van Ness Avenue and US 101 could be used as a primary base of operations, as well as for material and vehicle storage for the southern end of the corridor.
- A pedestrian plaza/traffic triangle located at South Van Ness Avenue and 12th Street could be used for staging on the southern portion of the corridor.
- The southwest corner of Van Ness Avenue and Filbert Street is an abandoned gas station, and the lot across from it at the northwest corner is vacant. These properties may be used for overnight material and equipment storage for northern part of corridor.

Transportation Management Plan for Construction

A TMP would be implemented leading up to and during project construction to minimize delay and inconvenience to the traveling public. The TMP will identify specific lane closures and transit operational changes; needed detours and other travel changes for drivers, transit, bicyclists, and pedestrians; and specific strategies that will be implemented to achieve those detours and other travel changes. The TMP for the project would be developed and refined during final design and will be approved by both Caltrans and SFMTA.

The proposed construction approach for each build alternative, including the LPA, includes roadway work that would require lane closures and/or detouring. The need for lane closures and short-term detour routes would be identified and included in the TMP, along with specific physical and communications measures that will be implemented to guide detours and other travel changes. The TMP would include, but not be limited to, some of the measures shown in Table 4.15-3. The TMP would include measures to ensure coordination with transit operators, emergency service providers, and neighborhood and special interest groups; consideration of construction strategies and contract incentives to ensure that construction is completed on schedule and that planned TMP measures are implemented; California Highway Patrol (CHP) and local law enforcement involvement; and development of contingency plans for unforeseen events or incidents. Various TMP elements, such as portable Changeable Message Signs and a CHP Construction Zone Enhanced Enforcement Program (COZEEP), may be utilized to alleviate and minimize delay to the traveling public.

The TMP would include a public information program and briefing for local public officials to disseminate project information and notices of upcoming traffic lane closures and detours. The public information program component of the TMP would be the plan for providing advance notice to motorists, public transportation providers, and emergency service providers with information on construction activities and durations, detours, and access issues during each stage of construction. The TMP would identify services to facilitate safe implementation of the construction project, such as increased law enforcement presence during critical construction operations, and it would include outreach to local businesses and residents with information related to the construction activities and durations, temporary closures, and detours. The TMP would include SFMTA's process for accepting and addressing complaints. This includes provision of contact information for the Project Manager, Resident Engineer, and Contractor on project signage with direction to call if there are any concerns. Complaints are logged and tracked to ensure they are addressed.

Table 4.15-3: Elements of Transportation Management Plan

ELEMENT	DESCRIPTION	OBJECTIVE
Public Information Program	Brochures, mailers, Internet, e-mails, and briefings to local public officials, transit operators, and emergency services alerting travelers, residents, businesses, and interested parties of project construction, lane closures, detours, alternative routes, changes in locations of bus stops, partial sidewalk closures, changes to on-street parking (including loading zones) identification of safety hazards. SFMTA's process for accepting and addressing complaints, including provision of contact information for the Project Manager, Resident Engineer, and Contractor on project signage with direction to call with concerns.	• Reduce congestion in work zones; • Maintain safety in work zones; • Minimize disruption to residents and businesses; and • Minimize traveler frustration. The public is interested in advance roadway information for travel planning purposes. The provision of this information would allow them to adjust travel plans accordingly and minimize vehicular congestion. The public information program provides a two-way communication tool between the local community and SFMTA to minimize disruption and promote safety.

Table 4.15-3: Elements of Transportation Management Plan

ELEMENT	DESCRIPTION	OBJECTIVE
Traveler Information Strategies	Changeable message signs and ground-mounted signs to alert traffic to potential delays and to direct traffic to alternative routes.	• Reduce congestion in work zones; • Maintain safety in work zones; and • Minimize traveler frustration. Provides motorists an advance opportunity to make a decision that would divert them away from the possible congestion. Signage will support safe travel movements.
Transit Passenger Information Strategies	Public outreach measures described above, including notices on transit vehicles, shelters, and Web sites that inform passengers of changes in bus stop locations and alternative parallel routes, and facilitate wayfinding.	• Minimize traveler frustration; • Maintain transit accessibility; and • Minimize travel delays. As with the public information program, notification of upcoming delays would allow transit passengers to adjust travel plans if necessary.
Incident Management	CHP and local law enforcement involvement and development of contingency plans in the event of an incident, unexpected construction activities such as a late lane opening or need for a second lane closure in one direction; Implementation of a Construction Zone Enhanced Enforcement Program (COZEEP) with CHP and local traffic control officer presence through the construction period.	• Reduce potential congestion in work zones; • Maintain accessibility for travelers throughout incident; • Maintain safety in work zones; and • Minimize disruption to the traveling public. This element of the plan is critical as an effective tool for incidents ranging from flat tires to vehicular collisions to public demonstrations.
Construction Strategies	▪ Use of approved lane closure charts governing acceptable periods for all planned lane closure activities ▪ Maintain two, open traffic lanes in each direction during peak hours ▪ Limit closures of a second mixed-flow traffic lane for nighttime or off-peak traffic hours ▪ Implement truck traffic restrictions ▪ Utilize parking restrictions within the construction zones ▪ Implement reduced speed zones in construction areas ▪ Consider transit operations in identifying construction segments ▪ Locate bus stops outside construction zones ▪ Reduce/consolidate bus stops in consideration of traffic impacts as appropriate ▪ Maintain curbside bus stops where buses are able to pull out of through traffic	• Maintain safety in work zones; • Reduce congestion in work zones; • Minimize traveler frustration; • Maintain transit accessibility; and • Minimize travel delays.

Table 4.15-3: Elements of Transportation Management Plan

ELEMENT	DESCRIPTION	OBJECTIVE
	▪ Designate additional parking removal to facilitate bus weaves to/from the travel lane ▪ Avoid sidewalk closures ▪ Maintain one east-west and north-south crosswalk leg open at all times at all intersections ▪ Install sufficient barricading, signage, and temporary walkways as needed to minimize impacts to pedestrians and bicyclist	
Alternative Route Strategies	Temporary signage and parking restrictions to direct drivers to alternative routes. Bicycle and pedestrian accommodations also considered.	• Minimize traveler frustration; • Maintain transit accessibility; • Minimize travel delays; and • Maintain safety in work zones. Detours provide direction to alternative routes, thus alleviating congestion in the construction zone, facilitating safe travel detours, and allowing travelers the opportunity to avoid the work area.
Contingency Planning	Strategies for handling traffic congestion in the event of unexpected construction activities such as a second lane closure in one direction.	• Reduce potential congestion in work zones; • Maintain accessibility for travelers throughout incident; • Maintain safety in work zones; and • Minimize disruption to the traveling public. During the construction phase, plans need to be in place for unexpected situations to avoid gridlock.

4.15.1 | Traffic and Transportation/Pedestrian and Bicycle Facilities

Impacts to traffic, transit, parking and the nonmotorized (i.e., pedestrians and bicyclists) transportation environment that could result during project construction are discussed in the following subsections.

4.15.1.1 | ENVIRONMENTAL CONSEQUENCES

Traffic

Traffic circulation would be impacted whenever a mixed-flow traffic lane is closed for construction activities. As described in Section 4.15.1, the construction approach for each build alternative, including the LPA, with or without the Vallejo Northbound Station Variant, would involve closure of one SB and one NB traffic lane. Because the proposed BRT project would convert one NB and SB mixed-flow traffic lane to dedicated transit use, the lane closures during construction would be similar to the completed, operational project. However, unlike the completed project, buses would continue to operate in the mixed traffic lanes during the construction period, and there would be slower overall operations due to reduced speed zones. Thus, the traffic impacts described in Chapter 3.3, Vehicular Traffic, would occur during project construction, along with some additional congestion and reduced travel speed due to construction activities. The impact of transit operations on the remaining traffic lanes would be minimized by: (1) moving bus stops out of the three-block construction segments to prevent buses stopping in the lane of traffic to load/unload; or (2) ensuring that stops were located where the bus could pull out of the traffic lane. In addition, localized congestion would occur in advance of each construction segment, where the current three lanes would merge to two, lane shifts occur, or where contraflow operations are in effect. Furthermore, traffic lanes in one direction could be reduced to one lane during short-term closures (e.g., for equipment transport or construction vehicles pulling in/out of mixed-flow traffic), or if a contraflow operation is not undertaken for construction of Build Alternative 2. This would result in additional congestion in the corridor due to the inability to move around right-turning vehicles waiting for crossing pedestrians to clear; however, this scenario would only occur during off-peak times and would not result in substantial congestion impacts.

In addition, other temporary traffic impacts would occur during construction due to short-term detours and as a result of signage stipulating reduced speeds through construction zones and encouraging drivers to use parallel streets to reduce traffic flow through construction zones. Thus, some drivers would divert to parallel routes, such as Franklin or Gough streets, during the project construction period. Short-term detours and closure of a second travel lane in one direction may be required for construction tasks that could interfere with traffic or create safety hazards, such as certain utility relocations, placement of concrete barriers or large equipment, and pavement conforms. These closures would be planned for nighttime or off-peak traffic hours as feasible to avoid or reduce traffic impacts.

KEY FINDING

Reduced road capacity and posted operating speeds could produce localized traffic congestion and slow average travel speeds (for all vehicles, including Muni buses) on Van Ness Avenue during project construction. The impact minimization measures described in Section 4.15.1.2 would be implemented to reduce these impacts during project construction.

In summary, reduced road capacity and posted operating speeds would produce localized traffic congestion and slow average travel speeds on Van Ness Avenue during project construction. The impacts would be minimized to the extent practicable through implementation of the TMP. In addition, impact minimization measures described in Chapter 3.3, Vehicular Traffic, and in Section 4.15.1.2 would lessen these impacts.

Transit

Transit operational impacts would be similar to those for the general traffic. Whenever the travel lanes are reduced or shifted, throughput capacity and operating speeds would be impacted, affecting not only private automobiles but also buses that travel the same corridor. Closures of the second travel lane in one direction would be infrequent and short-term during construction, and would only occur during off-peak or nighttime (see Section 4.15.1.1) whenever possible. Thus, service provided by Muni bus Routes 47 and 49, and GGT would be affected. Transit operational impacts would be greatest when the number of travel lanes in one direction is reduced to one because buses would be delayed by right-turning vehicles waiting for crossing pedestrians to clear.

During project construction, existing Muni bus stops would need to be closed or relocated on the three-block segments where construction is taking place. This would impact transit patrons who are accustomed to the existing Muni stops and may need to walk longer distances to board, alight, or transfer to other transit routes as a result of consolidated stops. The impact to transit patrons from consolidated stops would be similar to the bus stop consolidation impacts described in Section 3.4.3.1, Pedestrian Impacts. During construction, like operation, the average distance between bus stations would likely increase from approximately 700 feet to 1,170 feet under each of the build alternatives (1,150 feet under the LPA and 1,080 feet under the LPA with the Vallejo Northbound Station Variant). As a result, the average maximum distance from a location halfway between two stops would increase from 350 feet to 590 feet (570 feet under the LPA and 540 feet under the Vallejo Northbound Station Design Variant scenario). The increased distance between stops may be difficult to traverse for some passengers, and some passengers may initially be confused about where to locate bus stops during project construction. The stop spacing during construction, as well as with the BRT project, would remain within SFMTA standards for rapid stop spacing of between 900 and 1,300 feet. The TMP described above would include a wayfinding and transit passenger information campaign to assist transit passengers in identifying stop locations during construction, as well as assist transit passengers in understanding the new with-project stop locations.

In summary, reduced road capacity and posted operating speeds would produce localized traffic congestion and slow average travel speeds of buses on Van Ness Avenue during project construction. Impact minimization measures described in Chapter 3.3, Vehicular Traffic, and in Section 4.15.1.2 would reduce these impacts. In addition, closure and consolidation of Muni stops where construction is taking place would impact transit service, potentially resulting in adverse impacts to transit patrons who could be confused by these changes and need to walk farther distances. Impact minimization measures described in Section 4.15.1.2 would reduce, and in some cases avoid, such impacts.

The reduction in capacity by taking travel lanes and reducing posted speeds during construction would ultimately be offset by improved transit speeds and reliability provided by the BRT.

Parking

During construction of each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), temporary conversion of parking lanes to mixed-flow traffic lanes would be implemented, resulting in removal of on-street parking on both sides of Van Ness Avenue where construction is taking place. Additional curbside parking may be needed in some instances for construction equipment staging. Construction activities requiring closure of curbside parking would be staged on approximately three-block segments. Additional curbside parking may be needed in some instances for construction equipment staging; however, staging would occur inside the three-block segment. Thus, as a worst-case scenario, parking would be temporarily removed from all three blocks at one time. The amount of curbside parking on Van Ness Avenue varies and averages approximately eight spaces per block. Thus, a three-block segment could average 24 spaces, which could all be temporarily unavailable at the same time. Signage would be provided to indicate parking restrictions. As part of the TMP, a public information program would be implemented to provide advance notice of construction activities and parking restrictions to local businesses and residents. Impacts from temporary removal of colored parking spaces during project construction are discussed in Section 4.15.2, Land Use & Community Impacts.

KEY FINDING

During construction of each build alternative, temporary conversion of parking lanes to mixed-flow traffic lanes would be implemented, resulting in removal of on-street parking on both sides of Van Ness Avenue where construction is taking place. The impact minimization measures described in Section 4.15.1.2 would be implemented to reduce these impacts during project construction.

Parking for construction workers would be addressed in the TMP. The circular City-owned lot at South Van Ness and US 101 (where the on-ramp is) is anticipated to accommodate construction working parking, in addition to equipment staging (Arup, 2012).

Nonmotorized

For all of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), pedestrian traffic would be disrupted by construction work noise, vibration, dust, and air emissions of construction vehicles. Construction of Build Alternative 2 would require temporary closure of part of the sidewalk, or narrowing of the sidewalk area, to accommodate construction of BRT stations. Partial closure of the sidewalk would be required under all of the build alternatives, including the LPA, for curb bulb construction work, replacement of the OCS support poles/streetlights and associated duct trenching, signal installation, and reconfiguration of underground utilities. The intersection corner work would be primarily performed during the night to minimize impacts to pedestrian and vehicular traffic.

KEY FINDING

For all of the build alternatives, pedestrian traffic could be disrupted by construction work noise, vibration, dust, and air emissions of construction vehicles. The impact minimization measures described in Section 4.15.1.2 would be implemented to reduce these impacts during project construction.

Pedestrian and bicycling crossing movements would also be impacted under all of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), when the median and BRT stations are under construction. For safety reasons, the intersection leg located adjacent to a median or BRT station under construction may be temporarily closed. One side of an intersection would be kept open for crossing at any given time; however, this would still burden elderly and disabled pedestrians who would have to walk farther distances to use the open crosswalk leg. In cases where parking is temporarily removed, pedestrians would no longer have a buffer of parked cars between the sidewalk and travel lanes; however, other streetscape features would remain, and the sidewalks of Van Ness Avenue are wide, which alleviate this impact.

Impact minimization measures described in Section 4.15.1.2 would reduce identified impacts to pedestrians and cyclists during project construction.

4.15.1.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

All construction activity for the Van Ness Avenue BRT Project will be carried out in compliance and accordance with the California MUTCD and applicable regulations of the SFPUC and SFDPW BSM, and SFMTA Regulations for Working in San Francisco Streets Blue Book. The following additional measures will be implemented during project construction to minimize temporary impacts to traffic, transit, parking, and the nonmotorized (i.e., pedestrians and bicyclists) transportation environment:

M-TR-C1. Temporary conversion of existing parking lanes to mixed-flow traffic lanes will be implemented to generally maintain two open traffic lanes in each direction and minimize traffic impacts.

M-TR-C2. A contraflow system, including elimination of left turns in either direction along Van Ness Avenue, will be implemented during daytime construction under Build Alternative 2 to enable two lanes of mixed-flow traffic to generally remain open in each direction during construction and minimize traffic congestion on Van Ness Avenue. Appropriate signage and temporary traffic signals will be used to guide drivers, augmented by flagmen as needed.

M-TR-C3. Plan required closures of a second mixed-flow traffic lane and detours for nighttime or off-peak traffic hours, in conformance with approved noise requirements.

M-TR-C4. Maintain one east-west and north-south crosswalk leg open at all times at all intersections.

M-TR-C5. Install sufficient barricading, signage, and temporary walkways as needed to minimize impacts to pedestrians and bicyclist.

M-TR-C6. SFMTA will coordinate with GGT as part of the TMP to plan temporarily relocated transit stops as needed and minimize impacts to GGT service.

M-TR-C7. Develop and implement a TMP outlining methods and strategies to minimize construction activity-related traffic delay and inconvenience to the traveling public during the 30 percent project design phase and coordinate with other major projects in the area (e.g., Doyle Drive/Presidio Parkway and CPMC projects). The TMP will include a public information program and wayfinding to provide local businesses and residents with information related to the construction activities and durations, temporary traffic closures and detours, parking restrictions, and bus stop relocations. The public information program will be coordinated with regional agencies, such as Caltrans and Golden Gate Transit. Actions to be included in the TMP are described in mitigation measures M-CI-C1, M-CI-C3, M-CI-C4, M-CI-C5, M-CI-C6, M-CI-C7, and M-TR-6.

4.15.2 | Land Use & Community Impacts

This section assesses land use and community impacts that could result from project construction and specifies avoidance, minimization, and/or mitigation measures to address these construction-related impacts.

4.15.2.1 | ENVIRONMENTAL CONSEQUENCES

As discussed in Section 4.2.1.1, non-white, non-Hispanic residents comprise 46 percent of the study area population; this is lower than the citywide percentage. Some adverse effects to area residents, businesses, and visitors could occur on a temporary basis along the street segments under construction. Construction of each of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in impacts to traffic, circulation, parking, transit service, and the pedestrian and bicycle environment in the Van Ness Avenue corridor, as described above in Section 4.15.1. Impact minimization measures described in Section 4.15.1.2 would be implemented to reduce these impacts during project construction.

Temporary conversion of parking lanes to mixed-flow traffic lanes would be implemented during project construction, resulting in removal of on-street parking on both sides of Van Ness Avenue on the blocks where construction is taking place. This would also result in the temporary removal of colored parking spaces, including truck and passenger loading spaces. Temporary removal of colored parking spaces could adversely impact operations of adjacent land uses during construction. Similarly, partial closures of sidewalk areas during construction may result in short-term disruption to loading operations of adjacent land uses. It is not anticipated that access to businesses and other properties along Van Ness Avenue would be disrupted, although parking constraints and increased traffic would likely cause temporary inconvenience to businesses and residents.

Potential impacts from temporary disruption in utility services could result during replacement or relocation of utilities along Van Ness Avenue. Impacts from temporary disruption in utility service and associated avoidance measures are described in Section 4.15.5. Light and glare impacts to residential properties that could result from nighttime construction are addressed in Section 4.15.3.

The affected community would also be subject to noise, dust, vibration, and air emissions from construction equipment during project construction. Potential noise and vibration impacts during construction and associated mitigation measures are discussed in Section 4.15.10. Potential air quality impacts during construction and associated mitigation measures are discussed in Section 4.15.9. These impacts associated with typical construction projects can discourage or restrict pedestrian activity along the blocks under construction and reduce foot traffic, which could impact local businesses.

Land use characteristics differ along the length of the project corridor and may generally be described as civic and municipal uses in the south (Mission Street – Golden Gate Avenue), commercial/retail in the midsection (Golden Gate Avenue – Broadway Street), and primarily residential uses in the north (Broadway Street – North Point Street). To reduce construction-related impacts to adjacent land uses and the community, the unique characteristics of each area will be taken into consideration in construction planning and scheduling. Construction planning would minimize nighttime construction in residential areas and minimize daytime construction affecting retail and commercial areas. Construction scheduling and planning in the Civic Center area would take into consideration major civic and performing arts events. These considerations would be undertaken as part of the public information procedures outlined in the TMP.

KEY FINDING

Temporary removal of colored parking spaces could adversely impact operations of adjacent land uses during construction. The impact minimization measures described in Section 4.15.2.2 would be implemented to reduce these impacts during project construction.

4.15.2.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Construction phase impacts will be mitigated with special provisions to control noise and fugitive dust, discussed in Sections 4.15.10.2 and 4.15.9.2, respectively. These measures will serve to ensure that there will be no adverse effects on the community, including minority and low-income residents. Construction phase impacts related to the removal of colored parking spaces will be addressed by mitigation/improvement measure M-IM-CI-1, described in Section 4.2. Moreover, the following mitigation measures will be implemented to reduce construction-related impacts to local businesses and residents:

M-CI-C1. A TMP that includes traffic rerouting, a detour plan, and public information procedures will be developed during the design phase with participation from local agencies, other major project proponents in the area (e.g., CPMC Cathedral Hill, Hayes Two-Way Conversion, and the Geary Corridor BRT projects), local communities, business associations, and affected drivers. Early and well-publicized announcements and other public information measures will be implemented prior to and during construction to minimize confusion, inconvenience, and traffic congestion.

M-CI-C2. As part of the TMP, construction planning will minimize nighttime construction in residential areas and minimize daytime construction impacts on retail and commercial areas.

M-CI-C3. As part of the TMP, construction scheduling and planning in the Civic Center area will take into consideration major civic and performing arts events.

M-CI-C4. As part of the TMP public information program, SFMTA will coordinate with adjacent properties along Van Ness Avenue to determine the need for colored parking spaces and work to identify locations for replacement spaces or plan construction activities to minimize impacts from the loss of these spaces.

M-CI-C5. As part of the TMP public information program, SFMTA will coordinate with adjacent properties along Van Ness Avenue to ensure that pedestrian access to these properties is maintained at all times.

M-CI-C6. As part of the TMP, SFMTA's process for accepting and addressing complaints will be implemented. This includes provision of contact information for the Project Manager, Resident Engineer, and Contractor on project signage with direction to call if there are any concerns. Complaints are logged and tracked to ensure they are addressed.

M-CI-C7. As part of the TMP, adequate passenger and truck loading zones will be maintained for adjacent land uses, including maintaining access to driveways and providing adequate loading zones on the same or adjoining street block face.

4.15.3 | Visual/Aesthetics

This section presents construction phase impacts related to visual resources and aesthetics, and specifies avoidance, minimization, and/or mitigation measures required to address these construction impacts.

4.15.3.1 | ENVIRONMENTAL CONSEQUENCES

Construction of the proposed project would occur within and adjacent to the existing street ROW. Project construction activities would involve the use of a variety of equipment, stockpiling of materials, and other visual signs of construction.

Project specifications would require the project contractor to direct artificial lighting onto the worksite while working in residential areas at night to minimize "spill-over" light or glare effects.

Various TMP elements, such as portable Changeable Message Signs, detours, and other signage would be used during construction. While evidence of construction activity would be noticeable to area residents and viewer groups, such visual disruptions would be short term and are a common feature of the urban environment. Measures described in Section 4.15.3.2 would reduce aesthetic impacts from construction activities.

Some construction would be accomplished at night. Project specifications would require the project contractor to direct artificial lighting onto the worksite while working in residential areas at night to minimize "spill-over" light or glare effects. This would be a temporary degradation of the visual environment that would be restored at the completion of construction. Construction best practices described in Section 4.15.3.2 would minimize nighttime light and glare impacts.

4.15.3.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Implementation of the following construction best practices during project construction are considered improvement measures that would minimize aesthetic/visual resource impacts:

IM-AE-C1. During project construction, SFMTA will require the contractor to maintain the site in an orderly manner, removing trash and waste, and securing equipment at the close of each day's operation.

IM-AE-C2. To reduce glare and light used during nighttime construction activities, SFMTA will require the contractor to direct lighting onto the immediate area under construction only and to avoid shining lights toward residences, nighttime commercial properties, and traffic lanes.

4.15.4 | Cultural Resources

4.15.4.1 | ENVIRONMENTAL CONSEQUENCES

Though no prehistoric archaeological sites have been recorded within 0.25-mile of the project's APE, construction of any of the Van Ness BRT build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would involve some ground disturbance with the potential to unearth prehistoric sites that are heretofore unknown. As detailed in Section 4.5, Cultural Resources, of this EIS/EIR, the *Archaeological and Native American Cultural Resources Sensitivity Assessment* (ANACRSA) for the project described a few general locations that may be sensitive for the presence of prehistoric archaeological resources, particularly in areas close to former freshwater courses and coastal bay resources, primarily in or adjacent to the northernmost areas of the APE.

Likewise, while construction of any of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not affect known historical archaeological resources, the ANACRSA identified several locations where there may exist a possibility of construction activities uncovering significant historic-era features or deposits. Despite the potential for some buried archaeological resources to be located within the project APE, it is not certain that such resources would be affected or where specifically this may occur. Engineering and other logistical concerns of a modern urban environment constrain preconstruction archaeological testing.

There are no plans that construction would involve directly or physically altering, demolishing, or relocating any character-defining features of any of the historic buildings or Civic Center Historic District. The Noise and Vibration Study for this project did not identify any potentially significant adverse effects to historic properties during construction of the Van Ness Avenue BRT Project. Adverse visual effects during construction would be of temporary duration, and none would be considered a substantial adverse effect to the setting, feeling, or association of the historically significant properties in the APE.

KEY FINDING

Adverse visual effects during construction would be of temporary duration, and none would be considered a substantial adverse effect to the setting, feeling, or association of the historically significant properties in the APE.

4.15.4.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Potential impacts to archaeological resources resulting from construction activities under the No Build Alternative and each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), will be mitigated by implementing the following measures during or prior to project construction:

M-CP-C1. Focused archival research will identify specific areas within the APE that are likely to contain potentially significant remains. Methods and findings will be documented as an addendum to the 2009 survey and sensitivity assessment (Byrd *et al.,* 2013). Research will be initiated once the project's APE map is finalized identifying the major Areas of Direct Impact (i.e., the stations and sewer relocation). Many documents, maps, and drawings cover long stretches of Van Ness Avenue, while other locations may be researched if documents indicate potential sensitivity in adjacent areas.

The Addendum Survey Report will include the following:

- A contextual section that addresses the development of urban infrastructure along Van Ness Avenue, as well as widening and grading activities along the thoroughfare. This overview will provide a basis for evaluating potential resources as they relate to the history of San Francisco and to its infrastructure.
- Documentary research that identifies the types of documents available for the identified station locations: street profiles for grading, street widening maps showing demolished building sites, utility work plans, and others as appropriate. This will include researching various archives and records of public agencies in both San Francisco and Oakland (Caltrans).
- Locations apt to have historic remains present within select areas of the APE (i.e., not removed by later grading or construction).
- A cut-and-fill reconstruction of the entire APE corridor, comparing the modern versus mid-1800s ground surface elevations, to fine-tune the initial prehistoric sensitivity assessment and refine the location of high-sensitivity locations where prehistoric remains may be preserved.
- Relevant profiles and plan views of specific blocks to illustrate the methods used in analyzing available documentation.
- Summary and conclusions to provide detailed information on locations that have the potential to contain extant prehistoric archaeological and historic-era remains that might be evaluated as significant resources, if any.

Two results are possible based on documentary research:

- **No or Low Potential for Sensitive Locations.** Major Areas of Direct Impact have no potential to retain extant archaeological remains that could be evaluated as significant resources. No further work would be recommended, beyond adherence to the Inadvertent Discovery Plan (M-CP-3).
- **Potentially Sensitive Locations.** If the major Areas of Direct Impact contain locations with a moderate to high potential to retain extant historic or prehistoric archaeological remains that could be evaluated as significant resources, further work would be carried out, detailed in a Testing and Treatment Plan (see M-CP-2).

The Phase I addendum report will be submitted to the SHPO for review and concurrence prior to initiation of construction.

M-CP-C2. The Testing/Treatment plan, if required, would provide archaeological protocols to be employed immediately prior to project construction to test areas identified as potentially significant or having the potential to contain buried cultural resources. If such areas might be unavoidable, mitigation measures would be proposed.

For historic-era resources, work would initially entail detailed, focused documentary research to evaluate the potential significance of any archaeological material identified during initial research that might be preserved. Significance would be based on the data-potential of possible remains applied to accepted research designs. Two results could ensue:

- **No Potentially Significant Remains.** If no locations demonstrate the potential for significant remains, no further archaeological testing would be recommended.
- **Potentially Significant Remains.** If any locations have the potential to contain significant remains, then appropriate field methods will be proposed, including compressed testing and data-recovery efforts. Testing will be initiated immediately prior to construction, when there is access to historic ground levels. Should a site or site feature be found and evaluated as potentially significant, mitigation in the form of data recovery will take place immediately upon discovery should avoidance of the site not be possible.

If required for prehistoric resources, a Treatment Plan would identify relevant research issues for resource evaluation, and pragmatic field methods to identify, evaluate, and conduct data recovery if needed. This could include a pre-construction geoarchaeological coring program or a compressed three-phase field effort occurring prior to construction, when the ground surface is accessible.

The procedures detailed in the Treatment Plan would be finalized in consultation with the SHPO.

A Phase 2 Test/Phase 3 Mitigation report will document all testing and data-recovery excavation methods and findings.

M-CP-C3. If buried cultural resources are encountered during construction activities, pursuant to 36 CFR 800.13(b)(3), construction would be halted and the discovery area isolated and secured until a qualified professional archaeologist assesses the nature and significance of the find. Unusual, rare, or unique finds—particularly artifacts or features not found during data recovery—could require additional study. Examples of these would include the following:

- Any bone that cannot immediately be identified as non-human.
- Any types of intact features (e.g., hearths, house floors, cache pits, structural foundations).
- Artifact caches or concentrations.
- Rare or unique items (i.e., engraved or incised stone or bone, beads or ornaments, mission-era artifacts).
- Archaeological remains that are redundant with materials collected during testing or data recovery and that have minimal data potential need not be formally investigated. This could include debitage; most flaked or ground tools, with the exception of diagnostic or unique items (e.g., projectile points, crescents); shell; non-human bone; charcoal; and other plant remains.
- Diagnostic and unique artifacts unearthed during construction would be collected and their origins noted. Artifact concentrations and other features would be photographed, flotation/soils/radiocarbon samples taken (as appropriate), and locations mapped using a GPS device.

Upon discovery of deposits that may constitute a site, the agency official shall notify the SHPO and any Indian tribe that might attach religious and cultural significance to the affected property. The notification shall describe the agency official's assessment of National Register eligibility of the property and proposed actions to resolve the adverse effects (if any). The SHPO, Indian tribe, and Council shall respond within 48 hours of the notification, The agency official shall take into account their recommendations regarding National Register eligibility and proposed actions, then carry out appropriate actions. The agency official shall provide the SHPO, Indian tribe, and the Council a report of the actions when they are completed.

The above activities could be carried out quickly and efficiently, with as little delay as possible to construction work.

The methods and results of any excavations would be documented, with photographs, in an Addendum Report. Any artifacts collected would be curated along with the main collection. Samples would be processed in a lab and analyzed, or curated with the collection for future studies, at the discretion of the project proponent.

If major adjustments are made to the final project design, a qualified professional archaeologist should be consulted before work begins to determine whether additional survey, research, and/or geoarchaeological assessments are needed.

M-CP-C4. If human remains are discovered during project construction, the stipulations provided under Section 7050.5 of the State Health and Safety Code will be followed. The San Francisco County coroner would be notified as soon as is reasonably possible (CEQA Section 15064.5). There would be no further site disturbance where the remains were found, and all construction work would be halted within 100 feet of the discovery. If the remains are determined to be Native American, the coroner is responsible for contacting the California Native American Heritage Commission within 24 hours. The Commission, pursuant to California PRC Section 5097.98, would notify those persons it believes to be the most likely descendants (MLD). Treatment of the remains would be dependent on the views of the MLD.

4.15.5 | Utilities/Service Systems

This section presents construction phase impacts related to utilities and specifies any avoidance, minimization, and/or mitigation measures required to address construction impacts.

4.15.5.1 | ENVIRONMENTAL CONSEQUENCES

The proposed project could result in adverse impacts to utilities during construction if it would result in the need for expanded or additional facilities by a utility provider, or if a utility provider determines that it has inadequate capacity to serve a project's projected demand in addition to existing demand. Project demolition and construction waste would be accommodated by existing offsite landfills and recycling centers, and it would not affect landfill capacity. Construction activities would be accommodated by existing water and power facilities. Wastewater generation during construction would not exceed wastewater treatment requirements of the San Francisco RWQCB and would comply with batch discharge permits from SFPUC, as described in Section 4.15.8.2, Hydrology and Water Quality.

Coordination and planning efforts would be facilitated through the CULCOP, Street Construction Coordination Center, and Caltrans, with the focus on identifying potential conflicts and formulating strategies to avoid them, including planning utility relocations/reroutes, and other measures to avoid utility service interruptions.

The proposed project would have adverse impacts to utilities during project construction if it would damage facilities, or interfere with utility service to customers and public facilities. As discussed in Section 4.6.4, coordination with all utility providers and proponents of related projects in the project corridor would be initiated during the preliminary engineering phase of the project and carried through final design and construction phases. Coordination and planning efforts would be facilitated through the CULCOP, Street Construction Coordination Center, and Caltrans, with the focus on identifying potential conflicts and formulating strategies to avoid them, including planning utility relocations/reroutes, and other measures to avoid utility service interruptions. For example, it is known at this time that construction of the center-lane transitway under center-lane configured alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), has the potential to damage portions of the existing sewer main pipeline that are in poor condition. The project team, together with SFDPW and SFPUC, has already begun to address this issue and ensure that this pipeline would not be damaged due to project construction (see Section 4.6, Utilities). Similarly, coordination with SFDPW, Caltrans, and utility providers would avoid or minimize utility service interruption by staging construction activities and taking appropriate precautions for the protection of any unforeseen utility lines discovered during project construction. This planning and coordination process would avoid and minimize impacts to utilities during construction.

4.15.5.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Avoidance, minimization, and mitigation measures discussed in Section 4.6.4 will alleviate impacts to utilities during construction. In addition, the following typical standard specifications outline the procedures for locating, protecting, and relocating existing underground utilities and surface improvements. These specifications are included in the Van Ness Avenue BRT PCP (Arup, 2012) and will be implemented to help ensure the proper operation of work to minimize the potential for damage to utilities, injury to construction workers, and proper completion of construction work.

IM-UT-C1. Construction work involving utilities will be conducted in accordance with contract specifications, including the following requirements:

- Obtain authorization from utility provider before initiating work;

- Contact Underground Service Alert in advance of excavation work to mark-out underground utilities;
- Conduct investigations, including exploratory borings if needed, to confirm the location and type of underground utilities and service connections;
- Prepare a support plan for each utility crossing detailing the intended support method;
- Take appropriate precautions for the protection of unforeseen utility lines encountered during construction; and
- Restore or replace each utility as close as planned and work with providers to ensure its location is as good or better than found prior to removal.

4.15.6 | Geology/Soils/Seismic/Topography

This section presents construction phase impacts related to geologic and seismic hazards, and specifies avoidance, minimization, and/or mitigation measures required to address these construction impacts.

4.15.6.1 | ENVIRONMENTAL CONSEQUENCES

As described in Section 4.7.1, the corridor may be susceptible to the following geologic and seismic hazards: very strong ground shaking, liquefaction, and settlement. Design of project features under each build alternative (including Design Option B and the LPA, with or without the Vallejo Northbound Station Variant) would address liquefaction and settlement impacts. In the event of an earthquake during project construction, very strong ground shaking could result in slope instability at excavated areas. As a result, mitigation for each build alternative, including the LPA, to avoid potential slope instability impacts during project construction is specified in Section 4.15.6.2.

4.15.6.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

M-GE-C1. All cuts deeper than 5 feet must be shored (AGS, 2009a). Shoring design of open excavations must be completed in consideration of the surcharge load from nearby structures, including an examination of the potential for lateral movement of the excavation walls as a result. The following construction BMPs related to shoring and slope stability will be implemented:

- Heavy construction equipment, building materials, excavated soil, and vehicle traffic shall be kept away from the edge of excavations, generally a distance equal to or greater than the depth of the excavation.
- During wet weather, storm runoff shall be prevented from entering the excavation. Excavation sidewalls can be covered with plastic sheeting, and berms can be placed around the perimeter of the excavated areas.
- Sidewalks, slabs, pavement, and utilities adjacent to proposed excavations shall be adequately supported during construction.

DEFINITION

SHORED: In the context of excavation, this usually involves creating wooden buttresses to support the soil walls formed through digging.

4.15.7 | Hazardous Materials

Hazardous materials impacts would occur if construction workers or members of the public were exposed to hazardous materials during excavation, grading, and related construction earthwork activities; therefore, mitigation measures for each build alternative are proposed for project construction.

4.15.7.1 | ENVIRONMENTAL CONSEQUENCES

There is a potential to encounter pre-existing hazardous materials during project construction proposed under each build alternative (including Design Option B and the LPA, with or without the Vallejo Northbound Station Variant). Construction activities that would occur under the No Build Alternative could also encounter pre-existing hazardous materials, as described in Section 4.8.2.

Known potential contaminants include petroleum hydrocarbons (from gasoline and diesel fuels), ADL in median soils, and LBP in streetscape structures. There is also the potential to encounter unknown sources of contamination that are sometimes found in areas of undocumented fill, which is a risk common to construction projects. Hazardous materials impacts would occur if construction workers or members of the public were exposed to hazardous materials during excavation, grading, and related construction earthwork activities; therefore, mitigation measures for each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), to be implemented during project construction are described below.

4.15.7.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The following mitigation measures applicable to each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), will be implemented to avoid and minimize hazardous materials exposure during project construction:

M-HZ-C1. A Worker Site Health and Safety Plan will be created with the following components, in response to potential RECs identified in the Phase II review or other follow-up investigations, and results from preconstruction LBP and ADL surveys specified in Sections 4.8.3 and 4.8.4:

- A safety and health risk/hazards analysis for each site task and operation in the work plan;
- Employee training assignments;
- Personal protective equipment requirements;
- Medical surveillance requirements;
- Air monitoring, environmental sampling techniques, and instrumentation;
- Safe storage and disposal measures for encountered contaminated soil, groundwater, or debris, including temporary storage locations, labeling, and containment procedures.
- Emergency response plan; and
- Spill containment program.

M-HZ-C2. Procedures will be included in the project SWPPP to contain any possible contamination, including protection of storm drains, and to prevent any contaminated runoff or leakage either into or onto exposed ground surfaces, as specified in Section 4.15.8, Hydrology and Water Quality Construction Impacts.

M-HZ-C3. Necessary public health and safety measures will be implemented during construction.

4.15.8 | Hydrology and Water Quality

As described in Section 4.9.1, the RWQCBs implement and enforce the NPDES program to protect water quality, as specified under the CWA. The control of pollutant discharges is established through NPDES permits issued by the RWQCBs, which contain effluent limitations and standards. The NPDES Permit requires that all owners of land within the state with construction activities resulting in more than 1-acre of soil disturbance (e.g., clearing, grubbing, grading, trenching, stockpile, utility relocation, temporary haul roads), comply with the California SWRCB General Construction Permit (General Permit). An NOI to construct must be filed with the RWQCB at least 30 days prior to any soil-disturbing activities. The purpose of the permit is to ensure that the landowners: (1) eliminate or reduce non-stormwater discharges to storm drains and receiving waters; (2) develop and implement an SWPPP; (3) inspect the water pollution controls specified in the SWPPP; and (4) monitor stormwater runoff from construction sites to ensure that the BMPs specified in the SWPPP are effective.

The SWPPP includes a site map(s) showing the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography before and after construction, and drainage patterns across the site. The SWPPP must also specify BMPs that will be used to protect stormwater runoff, as well as the placement of those BMPs; a visual monitoring program; a chemical monitoring program for nonvisible pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed as an impaired water body for sediment. Measures for erosion and sediment control, construction waste handling and disposal, and post-construction erosion and sediment control must also be addressed, along with methods to eliminate or reduce non-stormwater discharges to receiving waters.

NPDES and construction wastewater discharge permits are issued from SFPUC. SFPUC has developed guidelines for water pollution prevention referred to as "Keep it on Site"[101] (SFPUC, 2009), which provides information for construction within the city and provides important regulatory agency contact information for the contractor. It also describes requirements for SWPPP development and implementation to ensure NPDES compliance with the General Permit.

4.15.8.1 | ENVIRONMENTAL CONSEQUENCES

During construction of any of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), earthwork activities would result in exposure of soil to storm runoff, potentially causing sediment to be carried offsite. In general, construction would include shallow ground disturbance, earthwork grading, and soil excavation within the existing roadway median and sidewalk areas. The DSA would be approximately 2.9 acres for Build Alternative 2; 8.1 acres for Build Alternative 3; 8.4 acres for Build Alternative 3 with Design Option B; 3.8 acres for Build Alternative 4; 3.8 acres for Build Alternative 4 with Design Option B; 5.8 acres for the LPA; and 5.9 acres for the LPA with the Vallejo Northbound Station Variant. The impacts related to such construction would be minimal because the proposed project would require nominal earthwork, and the area of soil to be disturbed would be limited.

During construction, earthwork activities can result in exposure of soil to storm runoff. If not properly managed, the runoff could increase the amount of sediment in the combined sewer system. The minimization and avoidance strategies recommended in Section 4.15.8.2 would reduce the potential for this impact to occur.

The deepest excavation work would be the installation of OCS support poles/streetlights, involving excavation of up to 16 feet bgs in an area approximately 3 feet in diameter. Other deep excavation would include removal and replacement of the existing OCS support poles/streetlights, which would involve excavation of up to 13 feet bgs in an area approximately 3 feet in diameter and replacement/relocation of a sewer line located 11 feet bgs. Most excavation and other soil disturbance during project construction would occur within 5 feet bgs and would involve construction of station platforms, controller cabinets, streetlights, and signage, in addition to utility relocation and pavement work. Dewatering is not anticipated to be necessary for this project.

Offsite oil stockpiles and onsite excavations areas would be exposed to runoff and, if not managed properly, the runoff could increase the amount of sediment in the CSS. The accumulation of sediment could result in blockage of flows, potentially resulting in increased localized ponding or flooding.

In addition, the potential for chemical releases is common at construction sites. Once spilled or released, substances such as fuels, oils, paints, and solvents could be picked up by storm runoff and released into groundwater or carried into the combined sewer system. Section 4.15.8.2 describes avoidance and mitigation measures intended to reduce the release of pollutants and sediment into the CSS and prevent violation of water quality standards and degradation of groundwater resources. These mitigation measures would be required under each proposed build alternative, including Design Option B and the LPA, with or without the Vallejo Northbound Station Variant, and under the No Build Alternative. The No Build Alternative would involve substantially less earthwork comparatively, as discussed in Section 4.15.

4.15.8.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

All of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), have potential environmental consequences due to runoff during the construction phase. The following measures are required:

KEY FINDINGS

All alternatives, including the LPA, have potential environmental consequences due to runoff during the construction phase. The following measures are required:

- **Preparation and implementation of a Stormwater Pollution Prevention Plan during project construction.**
- **Coordination with SFPUC and conformity of construction activities with "Keep it on Site" Guide.**
- **If groundwater is encountered during project excavation activities, the water will be pumped from the excavated area and contained and treated in accordance with all applicable State and federal regulations before being discharged to the existing local combined sewer system.**

[101] Visit www.sfwater.org and type "Keep it on Site" in the search box.

RESOURCE

For more information on "Keep It on Site", visit www.sfwater.org and type "Keep it on Site" in the search box.

Construction-related stormwater impacts can be mitigated throughout the project site through: (1) use of stormwater BMPs, including inlet protection devices, temporary silt fencing, soil stabilization measures, street sweeping, stabilized construction entrances, and temporary check dams; (2) conducting drilling/piling operations in accordance with guidelines set forth by the City and County of San Francisco, including the San Francisco Department of Public Health Local Oversight Program, and Caltrans Construction Site BMP Manual; (3) lining storage areas; and (4) proper and expeditious disposal of items to be removed, such as landscaping, curb bulb waste, existing bus stop shelters, and demolished OCS and signal poles. In addition, completion of an SWPPP for the NPDES General Permit is required, which will also help to identify and implement construction BMPs to reduce impacts on water quality. SFPUC has developed guidelines for water pollution prevention referred to as "Keep it on Site" (SFPUC, 2009), which provides information for construction within the City and provides important regulatory agency contact information for the contractor. It also describes requirements for SWPPP development and implementation to ensure NPDES compliance with the California State Department of Water Resources General Construction Permit. The SWPPP will address water quality impacts associated with construction activities, including identification of all drainage facilities onsite, placement of appropriate stormwater and non-stormwater pollution controls, erosion and sediment control, spill response and containment plans, inspection scheduling, maintenance, and training of all construction personnel onsite. Coordination with SFPUC and conformity of construction activities with the "Keep it on Site" guide will be necessary.

All exposed soil material should be covered, and soil stockpiles generated during construction should be properly analyzed and characterized for possible contaminants before proceeding with offsite disposal and/or onsite reuse. All construction activities should prevent the creation of potential conduits that allow or facilitate direct vertical migration of any near-surface soil contaminants into the underlying groundwater zone or otherwise enhance lateral migration of residual contaminants in the project area. During wet weather, runoff water should be prevented from entering the excavation and collected and disposed of outside the construction limits. To prevent runoff from entering the excavation, a perimeter berm may be constructed at the top of the excavated area. The sidewalls of the excavation may be covered by plastic sheeting to prevent saturation of the earth material.

If groundwater is encountered during project excavation activities, the water will be pumped from the excavated area and contained and treated in accordance with all applicable State and federal regulations before being discharged to the existing local CSS.

In summary, the following required procedures, identified as improvement measures, will be implemented to avoid adverse water quality impacts during construction:

IM-HY-C1. Preparation and implementation of an SWPPP during project construction will minimize or avoid significant impacts to water quality. Completion of an SWPPP for the NPDES General Permit will be required for construction of each build alternative and for earthwork activities under the No Build Alternative, such as the OCS support pole/ streetlight replacement and repaving activities. The SWPPP will address water quality impacts associated with construction activities, including identification of all drainage facilities onsite, placement of appropriate stormwater and non-stormwater pollution controls and BMPs, erosion and sediment control, spill response and containment plans, inspection scheduling, maintenance, and training of all construction personnel onsite.

The SWPPP will specify how construction-related stormwater impacts can be mitigated throughout the project site through:

- The appropriate treatment of overflow stormwater during construction, including inlet protection devices, temporary silt fencing, soil stabilization measures, street sweeping, stabilized construction entrances, and temporary check dams;
- Lining storage areas; and

- Proper and expeditious disposal of items to be removed, such as landscaping, curb bulb waste, existing bus stop shelters, and demolished OCS support poles/streetlights and signal poles.

IM-HY-C2. Any construction work that impacts the CSS will require coordination with SFPUC, and construction-related activities shall conform to the "Keep it on Site" guide (SFPUC, 2009).

IM-HY-C3. If groundwater is encountered during project excavation activities, the water will be pumped from the excavated area and contained and treated in accordance with all applicable State and federal regulations before being discharged to the existing local CSS. A batch discharge permit from SFPUC will be required prior to commencement of discharge to the CSS.

4.15.9 | Air Quality

The federal, state, and local governing bodies, regulations and polices relevant to air quality impacts of the proposed project are described in detail under Section 4.10.1. This also includes a description of relevant TAC and GHG regulations.

4.15.9.1 | ENVIRONMENTAL CONSEQUENCES

Methodology and Significance Criteria

The Sacramento Metropolitan Air Quality Management District's (SMAQMD) Road Construction Emissions Model (RoadMod) was utilized to quantify construction-related emissions. The assumptions and the model inputs were based on the construction details provided in the PCP.

BAAQMD's approach to the CEQA analysis of construction-related impacts is to emphasize the implementation of effective and comprehensive control measures rather than detailed quantification of emissions. Particulate matter (PM_{10} and $PM_{2.5}$) is the pollutant of greatest concern with respect to construction activities. The BAAQMD provides feasible control measures for construction emissions of particulate matter. If the appropriate construction controls are implemented, then emissions for construction activities would be considered less than significant.

According to the CEQ regulations (40 CFR §§ 1500-1508), the determination of a significant impact is a function of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (i.e., human, national), the affected region, the affected interests, and the locality. Both short- and long-term effects are relevant. Intensity refers to the severity of impact. To determine significance, the severity of the impact must be examined in terms of the type, quality, and sensitivity of the resource involved; the location of the proposed project; the duration of the effect (short- or long-term), and other considerations of context. Adverse impacts will vary with the setting of the proposed action and the surrounding area.

CEQA Construction Phase Impacts – Regional Emissions

During the construction phase of the proposed project, heavy-duty construction equipment and vehicle trips generated by construction workers traveling to and from the proposed project site may cause air quality impacts. The RoadMod estimating tool and associated model default values were used to estimate worker commute emissions. These emissions are minor compared to equipment and exhaust emissions. While fugitive dust emissions would primarily result from demolition and site preparation (e.g., grading) activities, NO_X emissions would primarily result from the use of heavy-duty construction equipment. Each of these potential sources was taken into consideration to estimate construction air quality impacts. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and the prevailing weather conditions.

Emissions from construction vehicles are summarized in Tables 4.15-4 and 4.15-5 for informational purposes. Each build alternative, including the LPA, would result in lane closures and may affect vehicle speeds on Van Ness Avenue and parallel roadways. There is a direct correlation between decreased vehicle speeds and higher pollutant emissions at low vehicle speeds (e.g., 6 to 11 mph). The construction analysis conservatively assumed that average daily traffic along Van Ness Avenue would be reduced by 5 mph during construction activity. The increased emissions resulting from traffic delays were added into the emissions caused by general construction activity. The traffic analysis prepared for the proposed project identified Van Ness Avenue between Market Street and Fell Street as having the highest average daily traffic along the corridor. To be conservative, this traffic volume was used to determine traffic delay emissions for the corridor during construction. For each alternative, including the LPA, it was assumed that traffic would be delayed for up to three blocks.

Tables 4.15-4 and 4.15-5 include onsite and offsite exhaust emissions. Onsite emissions are emissions generated by construction equipment located directly on the project site. Offsite emissions are generated by haul trucks and worker trips, both of which occur primarily away from the project site.

Alternative 1: No Build (Baseline Alternative). The No Build Alternative would include replacing the existing OCS and support poles/streetlights, traffic signal infrastructure improvements, new buses, sidewalk and street lighting improvements, pavement resurfacing, and various bus infrastructure improvements described above. These projects would undergo individual environmental review and construction emissions would be analyzed, as necessary. This alternative would have a less-than-significant impact under CEQA.

KEY FINDINGS

Under all build alternatives, including the LPA, with PM control measures construction exhaust emissions would result in a less-than-significant impact for each alternative under CEQA.

Emissions of DPM would result in a less-than-significant impact for each alternative under CEQA.

Finally, demolition and renovation of asbestos-containing materials (ACMs), NOA exposure, and odor emissions would result in a less-than-significant impact for each alternative under CEQA.

The avoidance, minimization, and mitigation measures recommended in Section 4.15.9.2 would reduce the likelihood and magnitude of these impacts.

Build Alternative 2: Side-Lane BRT with Street Parking. Table 4.15-4 shows construction exhaust emissions for informational purposes. The BAAQMD's approach to CEQA analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures for particulate matter rather than detailed quantification of emissions. Construction equipment emits exhaust pollutants such as CO and O_3 precursors. These emissions are included in the emission inventory that is the basis for regional air quality plans, and they are not expected to impede attainment or maintenance of O_3 and CO standards in the Bay Area. If all appropriate particulate matter control measures are implemented, then air pollutant emissions from construction activities would be considered a less-than-significant impact; however, without particulate matter control measures, construction activity from Build Alternative 2 would result in a significant impact under CEQA.

Table 4.15-4: Build Alternative 2 Estimated Daily Construction Emissions – Unmitigated

	POUNDS PER DAY			
CONSTRUCTION YEAR	ROG	NO_X	PM_{10}	$PM_{2.5}$
Total Maximum Exhaust Emissions	4	49	2	2

SOURCE: TAHA, 2013 (Appendix C).

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians. Table 4.15-5 shows construction exhaust emissions associated with Build Alternative 3 for informational purposes. Construction equipment emits exhaust pollutants such as CO and O_3 precursors. These emissions are included in the emission inventory that is the basis for regional air quality plans, and they are not expected to impede attainment or maintenance of O_3 and CO standards in the Bay Area; however, without particulate matter control measures, construction activity from Build Alternative 3 would result in a significant impact under CEQA.

Table 4.15-5: Build Alternative 3 Estimated Daily Construction Emissions – Unmitigated

	POUNDS PER DAY			
CONSTRUCTION YEAR	ROG	NO_X	PM_{10}	$PM_{2.5}$
Total Maximum Exhaust Emissions	4	53	2	2
Exceed Threshold?	No	Yes	No	No

SOURCE: TAHA, 2013 (Appendix C).

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median. Construction activity under Build Alternative 4 would be similar to that described under Build Alternative 3; except Build Alternative 4 has different design features due to a single median configuration that would result in a shorter construction period compared with Build Alternative 3. The construction period for Build Alternative 4 would be approximately 3 months shorter than for Build Alternative 3, resulting in less mass regional construction emissions under Build Alternative 4 compared to Build Alternative 3. Table 4.15-5 shows construction exhaust emissions associated with Build Alternative 4 for informational purposes. Construction equipment emits exhaust pollutants such as CO and O_3 precursors. These emissions are included in the emission inventory that is the basis for regional air quality plans, and they are not expected to impede attainment or maintenance of O_3 and CO standards in the Bay Area; however, without particulate matter control measures, construction activity from Build Alternative 4 would result in a significant impact under CEQA.

LPA: Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns. Construction activity under the LPA would be similar to that described under Build Alternative 3; except the LPA has different design features on blocks without stations, which would result in a construction period for the LPA approximately 1-month shorter than for Build Alternative 3. This would result in slightly less mass regional construction emissions under the LPA compared to Build Alternative 3. The BAAQMD's approach to CEQA analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures for particulate matter rather than detailed quantification of emissions. Without particulate matter control measures, construction activity from the LPA would result in a significant impact under CEQA.

In addition to regional emissions discussed above, demolition and renovation of asbestos-containing materials (ACMs), NOA exposure, and odor emissions would result in a less-than-significant impact for each alternative under CEQA.

Toxic Air Contaminants – Toxic Air Contaminant Concentrations

Construction-related activities could result in the generation of TACs, specifically diesel PM, from on-road haul trucks and off-road equipment exhaust emissions. Due to the variable nature of construction activity, the generation of TAC emissions would be temporary; especially considering the short amount of time equipment is typically located near sensitive land uses. Build Alternative 3 represents the longest construction period of each alternative, which is 17 to 21 months. Current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of health risk.

An analysis was completed to assess the potential health risk associated with construction TAC emissions, despite the difficulties described above. Onsite $PM_{2.5}$ emissions (e.g., equipment exhaust) were input into the AERMOD dispersion model approved by EPA. Anticipated TAC concentrations along Van Ness Avenue were obtained using local meteorological conditions and adjacent sensitive receptors placed on both sides of construction activity. In addition, the concentrations obtained from AERMOD were modified using a Lifetime Exposure Adjustment factor because exposure to construction emissions would be short-term and intermittent as construction activity moves along Van Ness Avenue. The results indicate that the cancer risk would be less than one person in one million at residences along Van Ness Avenue, and the annual $PM_{2.5}$ concentration would be 0.14 $\mu g/m^3$. The cancer risk would be below the 10 persons in one million threshold, and the annual $PM_{2.5}$ concentration would be 0.7 percent of the State standard, which would not be considered a significant increase in ambient concentration. Additionally, implementation of the BAAQMD Basic Construction Mitigation Measures, which are required for all project alternatives, including the LPA, would reduce TAC emissions. Construction TAC emissions would result in a less-than-significant impact for each alternative, including the LPA, under CEQA.

NEPA Construction Phase Impacts

Alternative 1: No Build (Baseline Alternative). The No Build Alternative would include replacing the existing OCS and trolley/streetlight poles, traffic signal infrastructure improvements, new buses, sidewalk and street lighting improvements, pavement resurfacing, and various bus infrastructure improvements described above. These projects would undergo individual environmental review, and construction emissions would be analyzed, as necessary. This alternative would not result in adverse construction impacts under NEPA.

Build Alternative 2: Side-Lane BRT with Street Parking. Construction activity would generate regional emissions, TAC emissions, and odors. It would also increase localized pollutant concentrations. In addition, Build Alternative 2 would comply with local regulations and fugitive dust emissions control measures to lessen potential construction-related emissions, however, construction emissions from Build Alternative 2 would be temporary and are not considered adverse under NEPA with implementation of standard control measures.

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians. Construction activity would generate regional emissions, TAC emissions, and odors. It would also increase localized pollutant concentrations. In addition, Build Alternative 3 would comply with local regulations and fugitive dust emissions control measures to lessen potential construction-related emissions; however, construction emissions from Build Alternative 3 would be temporary and are not considered adverse under NEPA with implementation of standard control measures.

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median. Construction activity would generate regional emissions, TAC emissions, and odors. It would also increase localized pollutant concentrations. In addition, Build Alternative 4 would comply with local regulations and fugitive dust emissions control measures to lessen potential construction-related emissions; however, construction emissions from Build Alternative 4 would be temporary and are not considered adverse under NEPA with implementation of standard control measures.

LPA: Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns. As a combination of design features of Build Alternatives 3 and 4, the LPA would share the same impacts with Build Alternatives 3 and 4. Construction activity would generate regional emissions, TAC emissions, and odors. It would also increase localized pollutant concentrations; however, construction emissions from the LPA would be temporary and are not considered adverse under NEPA with implementation of standard control measures.

4.15.9.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Implementation of BAAQMD control measures would reduce potential impacts from construction particulate matter emissions. The control measures would also reduce equipment exhaust emissions, including NO_X. Construction work will also conform to San Francisco

Health Code Article 22B, which requires all City projects over 0.5-acre in size to control dust from construction activities by preparing a dust plan approved by the San Francisco Department of Public Health, with the goal of minimizing visible dust and protecting sensitive receptors from dust exposure. In addition, the TMP provides a program for accepting and addressing air quality and other complaints, explained in Sections 4.15 and 4.15.2.2. This includes provision of contact information for the Project Manager, Resident Engineer, and Contractor on project signage with direction to call if there are any concerns (see mitigation measure M-CI-C6). Complaints are logged and tracked to ensure they are addressed.

M-AQ-C1. Construction contractors shall implement the BAAQMD *Basic Construction Mitigation Measures* listed in Table 4.15-6 and the applicable measures in the *Additional Construction Mitigation Measures*. This includes Measure 10 in the *Additional Construction Mitigation Measures*.

Table 4.15-6: Feasible Control Measures for Construction Emissions

Basic Construction Mitigation Measures. The following controls should be implemented at all construction sites:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material offsite shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Additional Construction Mitigation Measures. The following measures are recommended for projects with construction emissions above the threshold:

1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel.
8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
9. Minimize the idling time of diesel-powered construction equipment to 2 minutes.

Table 4.15-6: Feasible Control Measures for Construction Emissions

10. The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a projectwide fleet-average 20 percent NO_X reduction and 45 percent PM reduction compared to typical construction equipment. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.
11. Use low volatile organic compound (VOC) (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
12. Require that all construction equipment, diesel trucks, and generators be equipped with BACT for emission reductions of NO_X and PM.
13. Require all contractors to use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.

SOURCE: BAAQMD, 2010b.

M-AQ-C2. Construction contractors shall comply with BAAQMD Regulation 11 (Hazardous Pollutants) Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). The requirements for demolition activities include removal standards, reporting requirements, and mandatory monitoring and record keeping.

4.15.9.3 | IMPACTS AFTER MITIGATION

Build Alternative 2: Side-Lane BRT with Street Parking. Appropriate mitigation measures would reduce fugitive dust and equipment exhaust emissions. Table 4.15-7 shows mitigated exhaust emissions. The fugitive dust and exhaust control measures would comply with the BAAQMD policy to control construction emissions; therefore, construction activity under Build Alternative 2 would result in a less-than-significant impact under CEQA.

Table 4.15-7: Build Alternative 2 Estimated Daily Construction Emissions – Mitigated

	POUNDS PER DAY			
BUILD ALTERNATIVE 2	ROG	NO_X	PM_{10}	$PM_{2.5}$
Total Maximum Exhaust Emissions	4	37	1	1

Note:
The BAAQMD recommends implementing Measure 10 from the *Additional Construction Mitigation Measures* for a 20 percent reduction in NO_X, and a 45 percent reduction in PM_{10} and $PM_{2.5}$. The BAAQD recommends that implementation of the *Basic Construction Mitigation Measures* reduces NO_X an additional 5 percent (BAAQMD, 2010b).

SOURCE: TAHA, 2013 (Appendix C).

Build Alternative 3: Center-Lane BRT with Right-Side Boarding and Dual Medians. Table 4.15-8 shows mitigated exhaust emissions. The fugitive dust and exhaust control measures would comply with the BAAQMD policy to control construction emissions; therefore, construction activity under Build Alternative 3 would result in a less-than-significant impact under CEQA.

Table 4.15-8: Build Alternative 3 Estimated Daily Construction Emissions – Mitigated

	POUNDS PER DAY			
BUILD ALTERNATIVE 3	ROG	NO_X	PM_{10}	$PM_{2.5}$
Total Maximum Exhaust Emissions	4	40	1	1

Note:
The BAAQMD recommends implementing Measure 10 from the *Additional Construction Mitigation Measures* for a 20 percent reduction in NO_X, and a 45 percent reduction in PM_{10} and $PM_{2.5}$. The BAAQD recommends that implementation of the *Basic Construction Mitigation Measures* reduces NO_X an additional 5 percent (BAAQMD, 2010b).

SOURCE: TAHA, 2013 (Appendix C).

Build Alternative 4: Center-Lane BRT with Left-Side Boarding and Single Median. Construction activity under Build Alternative 4 would be similar to that described under Build Alternative 3; however the construction period for Build Alternative 4 would be approximately 3 months shorter than for Build Alternative 3, resulting in less mass regional construction emissions in comparison to Build Alternative 3. The fugitive dust and exhaust control measures would comply with the BAAQMD policy to control construction emissions; therefore, construction activity under Build Alternative 4 would result in a less-than-significant impact under CEQA.

LPA: Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns. Construction activity under the LPA would be similar to that described under Build Alternative 3; however, the construction period for the LPA would be approximately 1 month shorter than for Build Alternative 3, resulting in less mass regional construction emissions in comparison to Build Alternative 3. The fugitive dust and exhaust control measures would comply with the BAAQMD policy to control construction emissions; therefore, construction activity under the LPA would result in a less-than-significant impact under CEQA.

4.15.10 | Noise and Vibration

4.15.10.1 | ENVIRONMENTAL CONSEQUENCES

Construction Noise

The nature of the proposed Van Ness Avenue BRT construction work is conventional, principally modifications to the existing street/highway surfaces, new stations and concrete/asphalt travel way, curbs and gutters, utility relocations, drainage, signs, striping, and signals. Construction noise varies greatly depending on the construction process, type and condition of the equipment used, and layout of the construction site. Many of these factors are subject to the contractor's discretion. Projections of potential construction noise levels may vary from actual noise experienced during construction due to these factors.

Overall, construction noise levels are governed primarily by the noisiest pieces of equipment. The engine, which is usually diesel, is the dominant noise source for most construction equipment. Table 4.15-9 presents reference noise levels for representative pieces of construction equipment that may be used for the proposed project.

Table 4.15-9: Projected Construction Noise Emission Levels (dBA)

EQUIPMENT	TYPICAL NOISE LEVEL 50 FEET FROM SOURCE	TYPICAL NOISE LEVEL 100 FEET FROM SOURCE[1]
Backhoe	80	74
Rubber-tired Excavator	85	79
Forklift	85	79
Front Loader	85	79
Jack Hammer	88	82
Saw	76	70
Asphalt Milling Machine*	84	78
Roller	74	68
Paver	77	71
Grader	85	79
Dozer	85	79
Concrete Mixers	77	71
Dump Trucks	75	69

Notes:
1. Noise levels at 100 feet are calculated using spherical spreading from a point source.
2. Noise levels are measured in decibels (dBA)
* The noise emission of an asphalt milling machine is not identified in the FTA manual; these data are from Parsons.

Source: FTA, 2006; Parsons, 2010b.

Brief noise disturbances could also be caused by trucks transporting equipment and supplies to and from construction staging areas. The proposed staging areas are at Erie Street, Otis Street, and Filbert Street. Traffic noise from US 101 would tend to mask noise related to construction staging at the Erie Street location. Traffic near the busy intersection of Otis and Mission streets and Van Ness Avenue would tend to do the same for the Otis Street location. The proposed northern staging location is also near a major source of traffic noise – Van Ness Avenue; however, minor, intermittent noise disturbance could still occur at multi-family residences adjacent to the proposed staging site along Filbert Street.

Nighttime construction related to the proposed project would cause City noise ordinance limits to be exceeded from time to time (see Section 4.11.3, Regulatory Setting).

Construction Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used. The operation of construction equipment causes vibrations that spread through the ground and diminish in strength with traveled distance. Buildings in the vicinity of the construction site are affected by these vibrations, with resulting damage in the most severe cases.

Vibratory rollers would be the most dominant sources of overall construction vibration for this project. The vibration levels created by the normal movement of vehicles, including graders, front loaders, and backhoes, are comparable in order-of-magnitude to ground-borne vibrations created by heavy vehicles traveling on streets and highways.

Building damage can be cosmetic or structural. Fragile buildings, such as some historical structures, are generally more susceptible to damage from ground vibration. Normal buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 25 feet based on typical construction equipment vibration levels. This distance can vary substantially depending on the soil composition between vibration source and receiver.

FTA has specifically addressed four different types of buildings: Category One, reinforced-concrete, steel or timber (no plaster); Category Two, engineered concrete and masonry (no plaster); Category Three, non-engineered timber and masonry buildings; and Category Four, buildings extremely susceptible to vibration damage. Commercial type and multiple-storied structures are generally represented by Categories One and Two. Typical wood-framed residences fall under Category Three, while any structurally fragile buildings (i.e., more likely to be historical in nature) would fall under Category Four. There are buildings of historical significance within the project limits, but none have been identified as sufficiently sensitive to vibration impact to fall under Category Four.

KEY FINDINGS

Construction for all build alternatives, including the LPA, would result in ground-borne vibration and other noise impacts. Minimization and mitigation measures recommended in Section 4.15.10.2 would reduce these impacts.

Calculations were performed to determine the distances at which vibration impacts would occur according to the FTA criteria. Table 4.15-10 shows the results of those calculations classified per building category. Mitigation measures would be required if construction equipment were to operate within the distances shown in Table 4.15-10 from buildings located along the project alignment.

It is expected that ground-borne vibration from construction activities would cause only intermittent, localized intrusion along the Van Ness Avenue BRT corridor. Processes, such as earth moving with bulldozers and the use of vibratory compaction rollers, can create annoying vibration. There could be a few instances where vibratory rollers would need to operate close to wood-frame buildings such that FTA vibration thresholds for cosmetic damage could be briefly and slightly exceeded at those buildings.

Table 4.15-10: Vibration Source Levels and Building Damage Impact Distances for Construction Equipment

EQUIPMENT	PPV[1] AT 25 FEET, INCHES PER SECOND	APPROXIMATE LV[2] AT 25 FEET	IMPACT DISTANCE FOR BUILDING CATEGORY, FEET		
			I	II	III
Vibratory Roller	0.210	94	14	18	25
Loaded Trucks	0.076	86	7	10	14
Jackhammer	0.035	79	4	6	8
Small Bulldozer	0.003	58	1	1	2

Notes:
[1] Peak Particle Velocity
[2] RMS velocity in decibels (VdB), re: 1 micro-inch per second

Source: FTA, 2006.

4.15.10.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Construction impacts are of a temporary nature, and construction is a necessary part of any project. Project construction will comply with requirements in the City Noise Ordinance, Article 29 of the San Francisco Municipal Code (San Francisco, 2008); including obtaining permission from the Director of Public Works for nonemergency construction activities during nighttime hours if the resulting noise level is more than 5 dB in excess of the ambient noise at the nearest property line (see Section 4.11.3.4). The TMP provides a program for accepting and addressing noise and other complaints, explained in Sections 4.15 and 4.15.2.2. This includes provision of contact information for the Project Manager, Resident Engineer, and Contractor on project signage with direction to call if there are any concerns (see mitigation measure M-CI-C6). Complaints are logged and tracked to ensure they are addressed.

To further reduce noise and vibration impacts during construction, the following best practices, identified as improvement measures, will be implemented:

IM-NO-C1. Project construction will implement best practices in equipment noise and vibration control as feasible, including the following:

1. Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding).
2. Perform all construction in a manner that minimizes noise and vibration. Utilize construction methods or equipment that will provide the lowest level of noise and ground vibration impact.
3. Turn off idling equipment.
4. When possible, limit the use of construction equipment that creates high vibration levels, such as vibratory rollers and hammers. When such equipment must be used within 25 feet of any existing building, select equipment models that generate lower vibration levels.
5. Restrict the hours of vibration-intensive equipment or activities, such as vibratory rollers, so that annoyance to residents is minimal (e.g., limit to daytime hours as defined in the noise ordinance).

IM-NO-C2. Project construction will conduct truck loading, unloading, and hauling operations so that noise and vibration are kept to a minimum by carefully selecting routes to avoid passing through residential neighborhoods to the greatest possible extent.

IM-NO-C3. Perform independent noise and vibration monitoring in sensitive areas, as needed, to demonstrate compliance with applicable noise limits. Require contractors to modify and/or reschedule their construction activities if monitoring determines that maximum limits are exceeded at residential land uses per the City Noise Ordinance.

IM-NO-C4. The construction contractor will be required by contract specification to comply with the City noise ordinances and obtain all necessary permits, particularly in relation to nighttime construction work.

4.15.11 | Biological Environment

This section presents construction phase impacts to biological resources in the project corridor and any avoidance, minimization, and/or mitigation measures required to address construction impacts. Section 4.13.2, Biological Environment, describes biological resources present along the Van Ness Avenue corridor.

4.15.11.1 | ENVIRONMENTAL CONSEQUENCES

The project area has no special-status biological resources or protected habitats that could be impacted by the proposed build alternatives or No Build Alternative. Nonetheless, median and sidewalk vegetation along Van Ness Avenue provides habitat for nesting birds, which are protected by the MBTA. Construction of the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), could disturb migratory birds and active bird nests during the nesting season, causing nest abandonment and death of young or loss of reproductive potential at active bird nests, resulting in adverse impacts. Mitigation described below in Section 4.15.11.2 is required to avoid or minimize disturbance to any active bird nests.

Mature trees shall be preserved and incorporated into the project landscape plan where space permits.

Disturbance of protected bird nests during the breeding season will be avoided.

Mature trees shall be preserved and incorporated into the project landscape plan where space permits. Nonetheless, all of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would require removal of mature trees and potential work within tree drip lines. As described in Section 4.4.4, Visual/Aesthetics, a preconstruction tree survey would be required by a certified arborist to identify protected trees that would be potentially impacted by the proposed project and determine the need for tree removal permits and tree protection plans. Tree protection plans include BMPs to preserve the health of trees during project construction.

4.15.11.2 | AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The following mitigation measures are proposed to offset potential biological resource impacts during construction resulting from the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant):

M-BI-C1. BMPs identified in tree protection plans and tree removal permits resulting from the preconstruction tree survey will be implemented to preserve the health of trees during project construction.

M-BI-C2. Disturbance of protected bird nests during the breeding season will be avoided. Tree and shrub removal will be scheduled during the nonbreeding season (i.e., September 1 through January 31), as feasible. If tree and shrub removal are required to occur during the breeding season (i.e., February 1 through August 31), then the following measures will be implemented to avoid potential adverse effects to nesting birds:

- A qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat within 500 feet of construction activities where access is available. Exclusionary structures (e.g., netting or plastic sheeting) may be used to discourage the construction of nests by birds within the project construction zone. A preconstruction survey of all accessible nesting habitat within 500 feet of construction activities is required to occur no more than 2 weeks prior to construction.

- If preconstruction surveys conducted no more than 2 weeks prior to construction identify that protected nests are inactive or potential habitat is unoccupied during the construction period, then no further mitigation is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by protected birds or that are located outside the no-disturbance buffer for active nests may be removed.
- If active protected nests are found during preconstruction surveys, then the project proponent will create a no-disturbance buffer (acceptable in size to CDFW) around active protected bird and/or raptor nests during the breeding season, or until it is determined that all young have fledged. Typical buffers include 500 feet for raptors and 50 feet for passerine nesting birds. The size of these buffer zones and types of construction activities restricted in these areas may be further modified during consultation with CDFW, and it will be based on existing noise and human disturbance levels at the project site. Nests initiated during construction are presumed to be unaffected, and no buffer will be necessary; however the "take" (e.g., mortality, severe disturbance to) of any individual protected birds will be prohibited. Monitoring of active nests when construction activities encroach upon established buffers may be required by CDFW.

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4.16 Irreversible and Irretrievable Commitment of Resources

Uses of nonrenewable resources during the initial and continued phases of a project could be irreversible because of a commitment of resources that make removal or nonuse of the resource unlikely thereafter. Implementation of the Van Ness Avenue BRT Project would involve the use of some nonrenewable resources. Construction and operation of the proposed project would require consumption of fossil fuels, labor, and construction materials. These expenditures would be, for the most part, irrecoverable; however, they are not in short supply, and their use would not have an adverse effect upon continued availability of these resources. Moreover, the project would accommodate a greater number of transit trips into the future and provide more efficient use of fossil fuel than if these trips were to be taken in private automobiles. In addition, the project would upgrade the existing bus fleet from a mix of diesel motor coaches and electric trolleys to a mix of diesel hybrid motor coach and electric trolley BRT vehicles, which are more fuel efficient.

Any construction would also require a substantial one-time expenditure of federal and local funds. These funds have been planned and programmed, as explained in Chapter 9, Financial Analysis. The Van Ness Avenue BRT Project currently has identified between 73 percent (Build Alternatives 3 and 4) and 100 percent (Build Alternative 2) of the capital funding need for the project. For the LPA, the project currently has identified more than 85 percent of the capital funding need for the project.

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4.17 Relationship between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

The Van Ness Avenue BRT build alternatives, including the LPA with or without the Vallejo Northbound Station Variant, would each involve short-term uses of the environment during the construction period through the use of fuel and construction materials, and temporary increases in noise levels and air pollutants. These short-term effects and uses of resources would result in long-term benefits, such as improved transit travel times within the Van Ness Avenue corridor and a corresponding increase in transit ridership. In addition, travel time savings projected from proposed BRT implementation under each build alternative, including the LPA, would allow the same service frequencies to be provided using fewer buses and drivers, which would reduce existing operating costs for Muni Bus Routes 47 and 49.

Other long-term benefits to air quality, noise, and energy demand would result from an upgrade of the existing bus fleet from a mix of diesel motor coaches and electric trolleys to an approximate 50 percent split between diesel hybrid motor coach and electric trolley BRT vehicles. These improvements would contribute to the long-term livability and, therefore, productivity of the area.

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CHAPTER SUMMARY: This chapter analyzes the direct and cumulative impacts of the proposed Van Ness Avenue BRT project collectively with other reasonably foreseeable projects in the study area. Environmental factors considered include vehicular traffic, parking, and community values. Potential cumulative impacts are evaluated during both the construction and operation phases of the proposed projects. Several facility and utility upgrades would be integrated into the Van Ness Avenue BRT Project construction, such as pavement rehabilitation, SFgo signal upgrades, OCS support poles/ streetlights replacement, SFPUC sewer replacement (under Build Alternatives 3 and 4 and the LPA, with or without the Vallejo Northbound Station Variant, and other public or private utility upgrades. A partial list of other projects analyzed in this chapter includes the Presidio Parkway Project (Doyle Drive Replacement), California Pacific Medical Center, the Geary Boulevard BRT, Hayes Two-Way Street Conversion, and the Polk Street Improvement Project along with several planned residential developments. Adverse cumulative impacts are identified, as well as measures to avoid, minimize, or mitigate these impacts.

CHAPTER 5

Cumulative Impacts

5.1 Regulatory Setting

The Council on Environmental Quality (CEQ) defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7)." CEQA defines cumulative impacts as "two or more individual effects which, when considered together are considerable," and suggests that cumulative impacts may "result from individually minor but collectively significant projects taking place over a period of time" (State CEQA Guidelines Section 15355).

5.2 Methodology

Caltrans has developed guidelines for conducting cumulative impact analysis for transportation projects, consistent with NEPA/CEQ and CEQA requirements. These guidelines are applicable to FTA and FHWA projects. The cumulative impacts analysis for the proposed Van Ness Avenue BRT Project was undertaken by following the steps set forth in the Caltrans Standard Environmental Reference (SER) and the FHWA Interim Guidance: Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process (2003). This process is consistent with cumulative impact analysis guidance from EPA and the CEQ, and is as follows:

- Identify resources to be analyzed;
- Define the geographic study area for each resource;
- Describe existing conditions and historical context for each resource;
- Identify direct and indirect impacts of the proposed project;
- Identify other reasonably foreseeable actions that affect each resource;
- Assess potential cumulative impacts; and
- Report results and assess the need for mitigation.

Based on the aforementioned guidance, if the proposed project would not result in a direct or indirect impact to a resource, it would not contribute to a cumulative impact on that resource.

5.3 Reasonably Foreseeable Projects

Several facility and utility upgrades would be integrated into the Van Ness Avenue BRT Project construction.

The Van Ness Avenue BRT Project encompasses a large section of a major San Francisco thoroughfare, which is also designated as a portion of US 101. The City and County of San Francisco are consistently upgrading their infrastructure systems to meet the City's growing transportation demand and maintenance needs. As described in Chapter 2, several facility and utility upgrades would be integrated into the Van Ness Avenue BRT Project construction, such as pavement rehabilitation, SFgo signal upgrades, OCS support poles/streetlights replacement, SFPUC sewer replacement (under Build Alternatives 3 and 4), and other public or private utility upgrades.

Several transportation-related projects, a major medical center, and several housing development projects are being developed within the general vicinity of the Van Ness Avenue corridor.

In addition, several transportation-related projects and a major medical center are being developed within the general vicinity of the Van Ness Avenue corridor. Furthermore, several housing development projects have been proposed as part of the Van Ness Avenue Area Plan and Market and Octavia Better Neighborhoods Plan, as described in Section 2.7.3 of this EIS/EIR. Construction of these housing projects would likely be completed in 2013, which is before commencement of construction for the BRT project, whereas the medical center could be constructed at the same time as the Van Ness Avenue BRT Project. Table 5-1 summarizes the other reasonably foreseeable projects being implemented or that are under planning within the general vicinity of the Van Ness Avenue corridor. Figure 5-1 shows the location of these reasonably foreseeable projects.

Table 5-1: Reasonably Foreseeable Projects within General Vicinity of the Proposed Van Ness Avenue BRT Project

PROJECT/ ACTIVITY	CONSTRUCTION START/END DATES[1]	PROJECT DESCRIPTION
Doyle Drive Replacement/ Presidio Parkway	2010/2013	The Doyle Drive approach to the Golden Gate Bridge will be replaced with a new approach that provides widened traffic lanes, shoulder, and median. Additional project aspects include seismic and soil stability upgrades, and improved landscaping. Construction began almost a year earlier than planned, and the roadway will be open for traffic in early 2013.
Transbay Transit Center	2008/2017	Replacement of the existing Transbay Terminal in downtown San Francisco will include a new terminal that will accommodate the extension of Caltrain service, as well as the California High-Speed Rail Project.
California Pacific Medical Center (CPMC)	2011/2016	The CPMC Cathedral Hill Campus would expand its campus to include the entire block bounded by Van Ness Avenue, Geary, Franklin, and Post streets. The expanded campus includes a new medical center and medical offices of more than 1.5 million gross square feet (gsf).
Central Subway	2010/2019	This second phase of the Third Street Light Rail Project from Fourth and King to Jackson and Stockton streets is an underground subway project with multiple stations and tunnel openings.
Geary BRT	2014/2019	The Geary BRT project involves construction of a BRT system on Geary Boulevard from Market Street on the east to the ocean on the west with a dedicated transit lane between Van Ness and 33rd avenues.
Hayes Two-Way Street Conversion	2011/2015	Conversion of Hayes Street from Gough Street to Polk Street from a one-way to a two-way street. Phase 1 from Gough Street to Van Ness Avenue completed in 2011.

Table 5-1: Reasonably Foreseeable Projects within General Vicinity of the Proposed Van Ness Avenue BRT Project

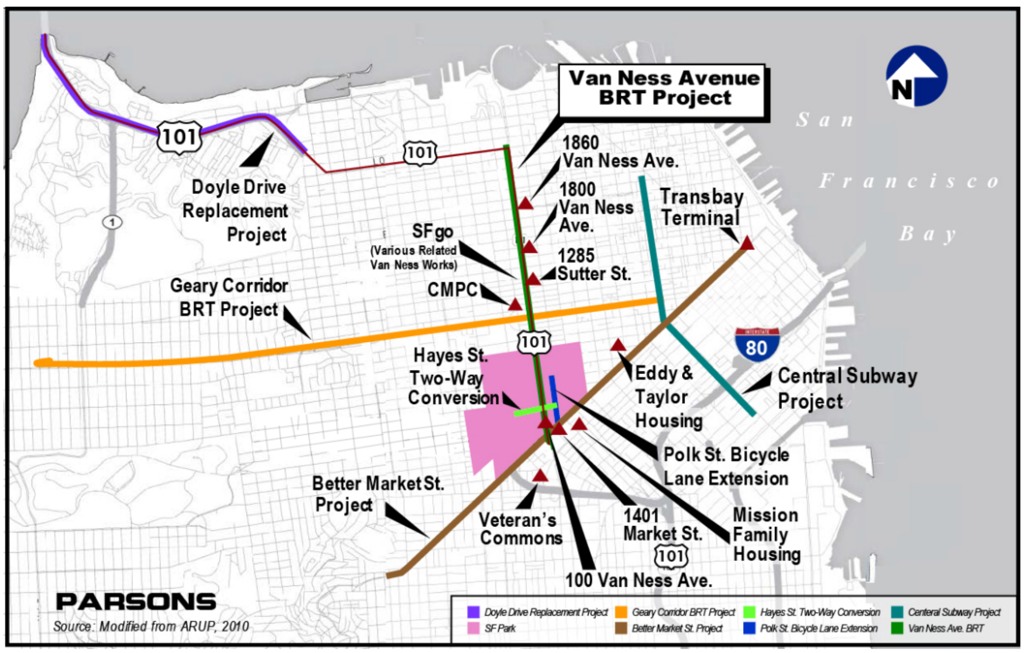
PROJECT/ ACTIVITY	CONSTRUCTION START/END DATES[1]	PROJECT DESCRIPTION
Road Repaving and Street Safety Bond Projects	Ongoing	A $248 million Road Repaving and Street Safety Bond Program to improve city infrastructure, including repaving streets, pedestrian and bicycle safety improvements, traffic flow improvements, ADA upgrades. Near-term plans include repaving of Gough, Franklin, and Polk streets, along with installation of pedestrian enhancements and bicycle amenities (Polk Street Corridor Improvement Project).
SFpark	2010/2012	Pilot test project involving installation of parking meters and sensors to use real-time parking data to implement demand-responsive pricing.
SFgo and Signal Replacement	Ongoing in coordination with Van Ness BRT	Replace traffic infrastructure to provide fiber-optic interconnect communication on Franklin and Gough streets.
Polk Street Bicycle Lane	2011/2013	Addition of NB bicycle lanes on Polk Street between McAllister and Market streets.
1860 Van Ness Avenue	Completed/ Sold	Development of a 35-unit mixed residential/commercial unit is proposed at the northeast corner of Van Ness Avenue and Washington Street. Completed and sold in 2012.
Veteran's Commons	To be completed in 2014	Redevelopment of community use into 76 studio apartments for veterans at the corner of Otis Street and Duboce Avenue.
Mission Family Housing	2012	Residential development of approximately 90 units as part of the Mission Family Housing Project at 1040 Mission Street. Completed in 2012.
Eddy and Taylor Family Apartments	2011/Unknown	Residential development of approximately 130 units as part of the Eddy and Taylor Family Apartments Project at 168-186 Eddy and Taylor streets.
Better Market Street	2016	The Better Market Street (BMS) Project is part of SFDPW's mission to transform the streetscape and improve the public's experience along the public realm. The BMS Project is expected to include improvements supported by sustainable urban design and mobility principles that facilitate promenading opportunities and an enlivened sidewalk life; reliable and efficient transit service; and a safe, comfortable, and appealing bicycle facility along its entire length.
1800 Van Ness	2011/2014	Development of a 94-unit mixed-use building with 5,000 square feet of retail on the northeast corner of Van Ness Avenue and Clay Street.
100 Van Ness	2012/Unknown	100 Van Ness is an existing 29 story office building that is currently 96% vacant. The proposal is to change the use from office to multi-family residential, renovate the interior of the building to create 399 multi-family residential units with ground floor retail, 118 parking spaces, and a 12,000 square foot rooftop resident's playground above.

Table 5-1: Reasonably Foreseeable Projects within General Vicinity of the Proposed Van Ness Avenue BRT Project

PROJECT/ ACTIVITY	CONSTRUCTION START/END DATES[1]	PROJECT DESCRIPTION
1285 Sutter Street	2012/2013	Located at the corner of Van Ness and Sutter Streets in San Francisco, this project is a 13-story apartment building with 10,000 square feet of retail space on the ground floor. The concrete-frame development includes 107 apartment units for rent, as well as two levels of underground parking.
1401 Market Street	2011/Unknown	Construction of new mixed-use building containing approximately 719 dwelling units and up to 719 parking spaces.

[1] Some projects have been completed since circulation of the Draft EIS/EIR. The status of such projects has been updated.

Figure 5-1: Locations of Reasonably Foreseeable Projects within General Vicinity of the Van Ness Avenue BRT Project



5.4 Environmental Areas with No Cumulative Impacts

The following environmental areas would not be subject to cumulative impacts, based on consideration of the nature of the proposed project, the project setting, the impact analysis findings presented in Chapters 3 and 4, and the characteristics of other reasonably foreseeable projects within the project vicinity. These environmental areas are discussed in the following subsections.

5.4.1 | Land Use

Aside from construction staging locations, construction and operation of the proposed build alternatives (including the LPA with or without the Vallejo Northbound Station Variant), including station platforms, lighting, and streetscape improvements, would occur within the existing transportation ROW, with no additional ROW required. Construction equipment and materials staging would be located on properties appropriate for this use, as permitted by the City. Potential construction staging locations for the proposed BRT project are presented in Section 4.15. The use of these properties for construction staging would be temporary and would not change existing and planned land uses.

Although a General Plan Referral would be required to permit sidewalk and grade changes, this would not change adjacent land uses. Operation of the proposed build alternatives, including the LPA, would not change existing land uses.

Existing and proposed land use plans and development trends in the project area are supportive of transit use, as summarized in Sections 4.1.1.1 and 4.1.1.3, respectively. The proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would introduce rapid transit to the Van Ness Avenue corridor, which would enhance conditions for high-density, mixed-use, transit-dependent land uses over the No Build Alternative. The build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would provide improved transit service to the major activity centers in the corridor, such as the Civic Center and planned CPMC Cathedral Hill Campus. No changes or adverse effects to existing land uses or planned development would occur under the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant); therefore, no cumulative impacts on land use are anticipated.

5.4.2 | Growth

Construction and operation of the proposed build alternatives, and the LPA (with or without the Vallejo Northbound Station Variant), would not lead to unplanned growth in the Van Ness Avenue corridor or the larger region; therefore, it would not result in growth-related impacts. The build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), and the No Build Alternative to a lesser extent, would support planned growth and the planning goals of the City. The Van Ness Avenue corridor and surrounding area is urban and built-out with sufficient infrastructure and utilities, and existing bus transit service. While the proposed build alternatives (including Design Option B and the LPA, with or without the Vallejo Northbound Station Variant), and to a lesser extent the No Build Alternative, would improve transit service and access to jobs and housing, they would not induce population growth at a level in excess of what is projected for the Bay Area and San Francisco. Implementation of the proposed build alternatives with or without Design Option B, and the LPA (with or without the Vallejo Northbound Station Variant), is not expected to generate substantial new development but would better accommodate existing and planned residential and commercial growth. Implementation of the proposed project is not anticipated to directly or indirectly induce population growth at a level in excess of what is projected for the Bay Area and San Francisco; therefore, the project would not cause cumulative impacts with regard to population growth.

KEY FINDING

Construction and operation of the proposed build alternatives would not directly or indirectly lead to unplanned growth in the Van Ness Avenue corridor or the larger region; therefore, it would not result in growth-related impacts.

5.4.3 | Visual/Aesthetics

As described in Section 4.4, the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not result in substantial impacts to the visual environment or to important visual resources in the Van Ness Avenue corridor with incorporation of minimization and mitigation measures. Measures M-AE-1 through M-AE-6 would mitigate impacts resulting from the removal of mature trees, replacement of the OCS support poles/streetlights, and changes to the visual character of Van Ness Avenue through the Civic Center Historic District and the project corridor as a whole. No other projects have been identified that would adversely affect the visual character of the Van Ness Avenue corridor, including the Civic Center Historic District; therefore, no cumulative visual impacts are anticipated.

Visual impacts during project construction would be temporary, and incorporation of improvement measures IM-AE-C1 and IM-AE-C2 would minimize the impact of nighttime light and glare. Project construction along Van Ness Avenue between Geary and Post streets could overlap with construction activities for the adjacent CPMC Cathedral Hill Project. Construction of the proposed Geary BRT Project and repaving projects on Franklin, Gough, and Polk streets would be phased to avoid overlap with construction of the Van Ness Avenue BRT Project. As specified in the Van Ness Avenue BRT PCP (Arup, 2012), the construction phasing would be coordinated with these projects to minimize construction-related impacts to sensitive receptors, including light and glare impacts, and avoid cumulative impacts.

KEY FINDINGS

- **None of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would substantially alter the existing drainage pattern of the area or create flooding. Construction of the multiple projects in the study area would not result in cumulative impacts on water quality.**
- **There are no substantial geologic hazard impacts that would not be fully addressed by design requirements. The build alternatives would not increase the risk of geologic hazards or result in any cumulative impact.**
- **No cumulative impacts due to the release of hazardous materials or other environmental risks are anticipated as a result of the proposed project in consideration with other planned projects.**
- **Implementation of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in a long-term increase in vegetation and plantings in the Van Ness Avenue corridor, which would benefit nesting birds. Construction of the proposed project would not result in impacts to biological resources that would contribute to cumulative impacts.**

5.4.4 Cultural Resources

As described in Section 4.5.4.4, no impacts to known prehistoric or historical archaeological resources are expected to occur under any of the proposed build alternatives (with or without Design Option B) or the LPA, with or without the Vallejo Northbound Station Variant. There is a low probability of impacts to buried, intact archaeological deposits because previous construction activity, including installation and later removal of trolley tracks, a major road widening, and construction of the concrete median, would have greatly disturbed the upper layers of soil where most of the planned excavation work associated with construction under Build Alternatives 3 and 4 and the LPA would occur. Under all the build alternatives, and the LPA (with or without the Vallejo Northbound Station Variant), excavation work would occur within the Van Ness Avenue ROW where the potential to uncover intact and undisturbed significant archaeological deposits is considered a low probability. No impacts to known prehistoric or historical archaeological resources would occur with the proposed project; therefore, no cumulative impacts to archaeological resources in the corridor are anticipated.

As described in Section 4.5.4.5, the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in less than significant impacts to significant historic and architectural properties. Impacts to architecturally historic resources would occur to the extent that the historical character of Van Ness Avenue would continue to evolve to reflect a more contemporary urban transportation corridor, but no cumulative impacts are anticipated that would degrade the Civic Center Historic District or other NRHP-eligible properties in the Van Ness Avenue corridor.

5.4.5 Water Quality and Hydrology

As described in Section 4.9, none of the build alternatives, or the LPA (with or without the Vallejo Northbound Station Variant), would substantially alter the existing drainage pattern of the area or create flooding. Each build alternative would result in a slight reduction in stormwater runoff, which is a beneficial effect. The build alternatives would not affect groundwater. With implementation of avoidance and mitigation measures specified in Section 4.9.4, operation of the proposed project would not result in significant and adverse water quality impacts resulting from the use of herbicides and fertilizers in landscaping.

In general, construction of any of the build alternatives (including Design Option B) and the LPA (with or without the Vallejo Northbound Station Variant) would include shallow ground disturbance, including earthwork grading and soil excavation within the existing roadway median and sidewalk areas. The impacts related to storm runoff during construction would be minimal because the proposed project would require nominal earthwork and the area of soil to be disturbed would be limited. Construction of the proposed project and other planned projects in the vicinity would all be subject to the same SWPPP and batch discharge permit requirements, and would adhere to the same SFPUC "Keep it on Site" guidelines to mitigate potential stormwater impacts during construction; therefore, construction of multiple projects in the area would not result in cumulative impacts on water quality.

5.4.6 | Geology and Soils

The results of the project geologic assessment indicate that there are no substantial geologic hazard impacts that would not be fully addressed by design requirements, and no mitigation measures are proposed. The scope of project structures proposed under the build alternatives, and the LPA (with or without the Vallejo Northbound Station Variant), is limited to that of streetscape features that would bear light loads; therefore, the risk of identified geologic hazards is low. The design of project features would meet seismic standards, and potential design features to address very strong ground shaking, liquefaction, and settlement are discussed in Section 4.7.3. Implementation of mitigation measure M-GE-C1 during project construction would ensure that open excavations are shored as needed and associated construction best practices are implemented to avoid hazards. Geologic hazards are localized, and the build alternatives, with or without Design Option B, and the LPA, with or without the Vallejo Northbound Station Variant, would not increase the risk of geologic hazards or result in any cumulative impact.

5.4.7 | Hazardous Materials

The build alternatives (including Design Option B) and the LPA (with or without the Vallejo Northbound Station Variant) could be subject to the following RECs identified in Section 4.8, Hazardous Materials:

- Five database listed LUST sites (see Table 4.8-1)
- ADL in median soils
- LBP in streetscape structures
- Undocumented fill, which could contain contamination

The aforementioned potential RECs would involve localized impacts, which would be avoided or mitigated through implementation of mitigation measures M-HZ-C1 through M-HZ-C3, as described in Section 4.15.7. No cumulative impacts due to the release of hazardous materials or other environmental risks are anticipated as a result of the proposed project in consideration with other planned projects.

5.4.8 | Biological Resources

The proposed project is located in a highly developed, urban area of San Francisco with no water bodies, wetlands, open space, protected habitats, or other special-status biological resources. Nonetheless, median and sidewalk vegetation along Van Ness Avenue provides habitat for nesting birds, which are protected by the MBTA. Project implementation would result in removal of a substantial number of median trees in the Van Ness corridor. All build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in a substantial net gain of trees in the corridor when new planting opportunities are considered. There would be a plant establishment period lasting for several years for new trees to reach maturity. This would be a period of reduced biological benefits compared with the benefits offered by mature trees and their canopies. However, long-term beneficial effects would result from overall increased vegetation and plantings in the Van Ness Avenue corridor with benefits growing over time as plantings mature. Other planned projects are not expected to result in substantial tree removal. Implementation of the build

KEY FINDING

Implementation of the build alternatives, and the LPA would result in a long-term increase in vegetation and plantings in the Van Ness Avenue corridor, which would benefit nesting birds. Construction of the proposed project would not result in impacts to biological resources that would contribute to cumulative impacts.

alternatives, with or without Design Option B, and the LPA (with or without the Vallejo Northbound Station Variant), would result in a long-term increase in vegetation and plantings in the Van Ness Avenue corridor, which would benefit nesting birds. Operation of the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not increase disturbance to migratory birds and active bird nests; however, temporary disturbance could occur during project construction. Implementation of mitigation measure M-BI-C2 under each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), as described in Section 4.15.11 would avoid disturbance of protected bird nests during the breeding season; therefore, construction of the proposed project would not result in impacts to biological resources that would contribute to cumulative impacts.

5.4.9 | Utilities

As described in Sections 4.6.3 and 4.15.5, construction and operation of any of the build alternatives (including Design Option B) and the LPA (with or without the Vallejo Northbound Station Variant) would not result in changes to utility demand and capacity. Existing power, stormwater, water, and wastewater infrastructure would be sufficient to accommodate the project during construction and operation, and the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in more energy-efficient lighting and bus vehicles.

The proposed build alternatives (including Design Option B) and the LPA (with or without the Vallejo Northbound Station Variant) involve construction of BRT facilities (i.e., transitway, station platforms, curb bulbs, center medians, landscaping and OCS support poles/streetlights) that have the potential to conflict with access by utility providers to public utilities aboveground and belowground in the Van Ness Avenue corridor. Some utilities would require relocation or modification for construction of the BRT and to maintain access for utility providers to conduct maintenance, repair, and upgrade/replacement activities. Utility relocation and modification activities would be coordinated with other projects planned in the Van Ness Avenue corridor, including the CPMC Cathedral Hill and Geary BRT projects. Coordination of all planned construction activities and permanent utility relocation and modification activities with the SFDPW-led CULCOP and the San Francisco Street Construction Coordination Center would avoid cumulative impacts to utilities access, maintenance, and provision. Implementation of mitigation measure M-UT-C1 under each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), as described in Section 4.15.5, would avoid significant cumulative impacts to utilities during construction of the proposed project and other planned projects in the vicinity.

5.4.10 | Air Quality

The proposed project is located within the San Francisco BAAB. The BAAQMD monitors air quality conditions at 23 locations throughout the Bay Area. The nearest air monitoring station to the proposed project site is the San Francisco Arkansas Street Monitoring Station, which is located approximately 1.2 miles from the intersection of Van Ness Avenue and Mission Street, and 2.8 miles from the intersection of Van Ness Avenue and Lombard Street. The air quality monitoring data from 2009-2011 shows no exceedances of State or federal standards of any criteria pollutants.

As described in Section 4.10, an air quality analysis was conducted to evaluate the potential air quality impacts of the Van Ness Avenue BRT Project relative to CEQA and NEPA (TAHA, 2013). Potential air quality impacts were analyzed for construction and operation of the project alternatives (including Design Option B). Key findings for the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), are listed below:

- With standard mitigation incorporated, construction activities would not generate significant emissions..
- Operational emissions would not exceed the BAAQMD regional significance thresholds.
- Localized CO concentrations would not exceed the State ambient air quality standards.
- None of the alternatives, including the LPA, would expose sensitive receptors to significant emissions of TACs as a result of project construction or operations.
- None of the alternatives, including the LPA, would expose people to objectionable odors.
- All of the build alternatives, including the LPA, would result in less GHG emissions than the No Build Alternative and would result in a beneficial global warming impact.
- All of the build alternatives, including the LPA, would be consistent with the BAAQMD regional air quality plans. Although the No Build Alternative would neither increase nor decrease bus service on Van Ness Avenue, bus engine technology improvements over time would reduce emissions below existing conditions.
- Each Build Alternative (including Design Option B) and the LPA would comply with regional and local transportation conformity guidelines.

By its very nature, air pollution is largely a cumulative environmental problem. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, each project contributes to cumulative air quality emissions. If a project's contribution to the cumulative impact is considerable, then the proposed project's impact on air quality would be considered significant. The BAAQMD has stated that a proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. None of the alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in a significant ROG, $PM_{2.5}$, PM_{10}, or NO_X impact during construction. According to BAAQMD guidance, each alternative is less than significant on a project basis and would not contribute to a cumulative impact.

None of the alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in a significant ROG, $PM_{2.5}$, PM_{10}, or NO_X impact during operations. According to BAAQMD guidance, each alternative is less than significant on a project basis and would not contribute to a cumulative impact. In addition, each build alternative, including the LPA, would decrease regional VMT and associated regional emissions. Each alternative, including the LPA, would improve regional air quality and would not contribute to a cumulative impact regardless of emissions associated with related projects.

Implementation of mitigation measures M-AQ-C1 and M-AQ-C2 would avoid significant, cumulative air quality impacts during construction of the proposed project and other planned projects in the vicinity.

With regard to GHG, the largest source of GHG emissions is automobiles. Transit projects such as the Van Ness Avenue BRT reduce the volume of cars by providing the public with alternative means of transportation. This results in fewer sources of air pollution and lower citywide VMT. Because of the higher capacity of buses and the updated fleet associated with the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), buses are able to transport more people per vehicle while producing fewer emissions than the cars they are replacing. This would result in an overall reduction in GHG emissions.

DEFINITION

GREENHOUSE GAS (GHG): Any of the atmospheric gases that contribute to the greenhouse effect by absorbing infrared radiation produced by solar warming of the Earth's surface. These include carbon dioxide (CO_2), methane (CO_4), nitrous oxide (NO_X), and water vapor.

TOXIC AIR CONTAMINANT (TAC): Pollutants that result in an increase in mortality, a serious illness, or pose a present or potential hazard to human health.

KEY FINDINGS

None of the alternatives would result in a significant ROG, $PM_{2.5}$, PM_{10}, or NO_X impact during construction or operation.

The largest source of GHG emissions is automobiles. Transit projects, such as the Van Ness Avenue BRT, reduce the volume of cars, which would result in an overall reduction in GHG emissions.

5.4.11 | Noise and Vibration

As described in Section 4.11, operational project-generated and cumulative noise impacts were analyzed based on the results of traffic analysis that has considered traffic generation from other related projects and foreseeable traffic growth. The analysis reveals that the noise

KEY FINDING

Operation of the BRT system would not result in significant cumulative noise and vibration impacts. Project construction noise and vibration impacts would be temporary and localized. No cumulative noise impacts are anticipated during project construction.

level along Van Ness Avenue and the parallel Franklin and Gough streets would remain below FTA and Caltrans impact criteria. This analysis considered cumulative noise (i.e., when the project noise is added to existing noise) and used diesel buses in the modeling to represent the worst-case scenario of the noisiest bus fleet, when in actuality the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would operate a less noisy fleet of diesel-electric hybrid and electric-powered vehicles than exists today. The analysis also concluded that BRT transit vehicle operational vibration impacts would be less than significant relative to the applicable (i.e., FTA) criteria; therefore, operation of the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not create significant vibration impacts. In conclusion, operation of the BRT system proposed under the build alternatives, with or without incorporation of Design Option B, and under the LPA, would not result in significant noise and vibration impacts that would be cumulatively considerable.

Construction noise and vibration impacts of the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would be temporary and localized within the construction zone. Control measures specified in Section 4.15.10 would be implemented to minimize noise and vibration disturbances at sensitive areas during construction. Project construction along Van Ness Avenue between Geary and Post streets could overlap with construction activities proposed at the adjacent CPMC Cathedral Hill project site. Construction of the proposed Geary Boulevard BRT Project and repaving along Franklin, Gough, and Polk streets as part of the Road Repaving and Street Safety Bond Program would be phased to avoid overlap with proposed project construction. As specified in the Van Ness Avenue BRT PCP (Arup, 2012), the construction phasing plan would be coordinated with these projects to minimize construction-related impacts to sensitive receptors. No cumulative noise impacts are anticipated during project construction.

5.4.12 | Nonmotorized Transportation

Impacts on the nonmotorized transportation environment, including pedestrian and bicycles, were analyzed and presented in Section 3.4 of this EIS/EIR. Van Ness Avenue is an important pedestrian corridor linking civic uses in the south part of the corridor with commercial/retail uses in the middle and residential uses in the north. Pedestrian crossing activity largely occurs in three areas: (1) Civic Center near City Hall; (2) Market Street for numerous transit connections; and (3) transit cross-corridors, such as Geary Boulevard and O'Farrell Street. Van Ness Avenue is not optimal for cycling due to the heavy vehicle volumes and conflicts with bus movements in the right-hand lane. The nearest bicycle facility is a dedicated route on Polk Street, which runs parallel to Van Ness Avenue one block east. This facility includes segments of dedicated Class II bicycle lanes (between Market and Post streets, as well as between Union and Lombard streets), and segments where vehicles and cyclists must share travel lanes (from Union to Post streets).

The proposed build alternatives including the LPA would result in different geometric design characteristics of Van Ness Avenue, including crossing distance, median widths, and corner bulb provision. For the most part, these geometric changes would improve the overall pedestrian environment of Van Ness Avenue, resulting in beneficial effects, and would not significantly affect bicycle conditions.

Impacts to the pedestrian environment could include an increase in pedestrian delay, which is the average amount of time a pedestrian must wait for the traffic signals to change to allow crossing. This impact is not considered significant because implementation of the BRT would not cause an intersection to perform with a pedestrian delay LOS of E or F or worsen pedestrian delay at an intersection that is already operating at pedestrian LOS E or F (only the Van Ness Avenue and Mission Street intersection has a current LOS of E). The impact would not be substantial when considering project benefits to the pedestrian environment that include shorter crossing distances and installation of count-down signals and APS at all intersections. In addition, under the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), delay would be reduced for pedestrians crossing Van Ness Avenue, which currently experiences the highest amount of delay of any user of Van Ness Avenue.

KEY FINDING

The proposed project would not result in cumulative impacts to nonmotorized transportation modes.

Impacts to the cycling environment may result from a reduction in width of the traffic lanes of up to approximately 1-foot. This would result in cyclists traveling with vehicles in a lane that would be up to 1-foot narrower than existing conditions. At the same time, a narrower lane may encourage cyclists to "take the lane," or occupy the traffic lane outside of the "door zone," which is a safer condition for cyclists. Either way, these changes in bicycle conditions would not be substantial and would not result in a significant impact on bicycle travel. At the same time, the Polk Street Bicycle Lane Project would close the existing gap in the NB designated Class II bicycle lane that parallels Van Ness Avenue one block to the east. This would improve bicycle conditions in most parts of the corridor. Due to this project, overall bicycle conditions in the project area will improve under the both No Build Alternative and build alternative scenarios, including the LPA, and there would be no cumulative adverse impacts to bicycle conditions with implementation of any build alternative, including the LPA (with or without the Vallejo Northbound Station Variant); therefore, the proposed project would not result in cumulative impacts to nonmotorized transportation modes.

5.5 Environmental Areas Subject to Cumulative Effects

The following environmental areas could have the potential to cause cumulative impacts, based on consideration of the nature of the proposed project, the project setting, the impact analysis findings presented in Chapters 3 and 4, and the characteristics of other reasonably foreseeable projects within the project vicinity. Detailed analysis was undertaken to determine the level of cumulative effects, as presented below.

5.5.1 | Private Vehicular Traffic

Impacts to private vehicular traffic within the Van Ness Avenue corridor network were analyzed and are presented in detail in Section 3.3 of this EIS/EIR. In determining the level of impact for each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), comparisons were made of corridor performance (i.e., measured in terms of average speed) and traffic operating characteristics of intersections (i.e., measured in terms of LOS) for the opening year (2015) and the design/horizon year (2035) against the baseline year (2007). The travel demand forecasting model used to project traffic volume for the opening and horizon years under study included trips generated by foreseeable projects. These trip volumes were used in simulating traffic speeds and delays; therefore, the results of the vehicular traffic analysis presented in Section 3.3 were derived on a cumulative basis, and no further quantitative analysis is required to address the cumulative impacts.

Impacts to private vehicular traffic were analyzed and are presented in detail in Section 3.3. The results were derived on a cumulative basis, and no further quantitative analysis is required to address the cumulative impacts.

5.5.1.1 | GEOGRAPHIC STUDY AREA FOR AUTOMOBILE VEHICULAR TRAFFIC CUMULATIVE EFFECT ANALYSIS

The study area network for vehicular traffic analysis covers the area bounded by Lombard Street to the north, Mission Street and Duboce Avenue to the south, Hyde Street to the east, and Gough Street to the west, as shown in Figure 5-2.

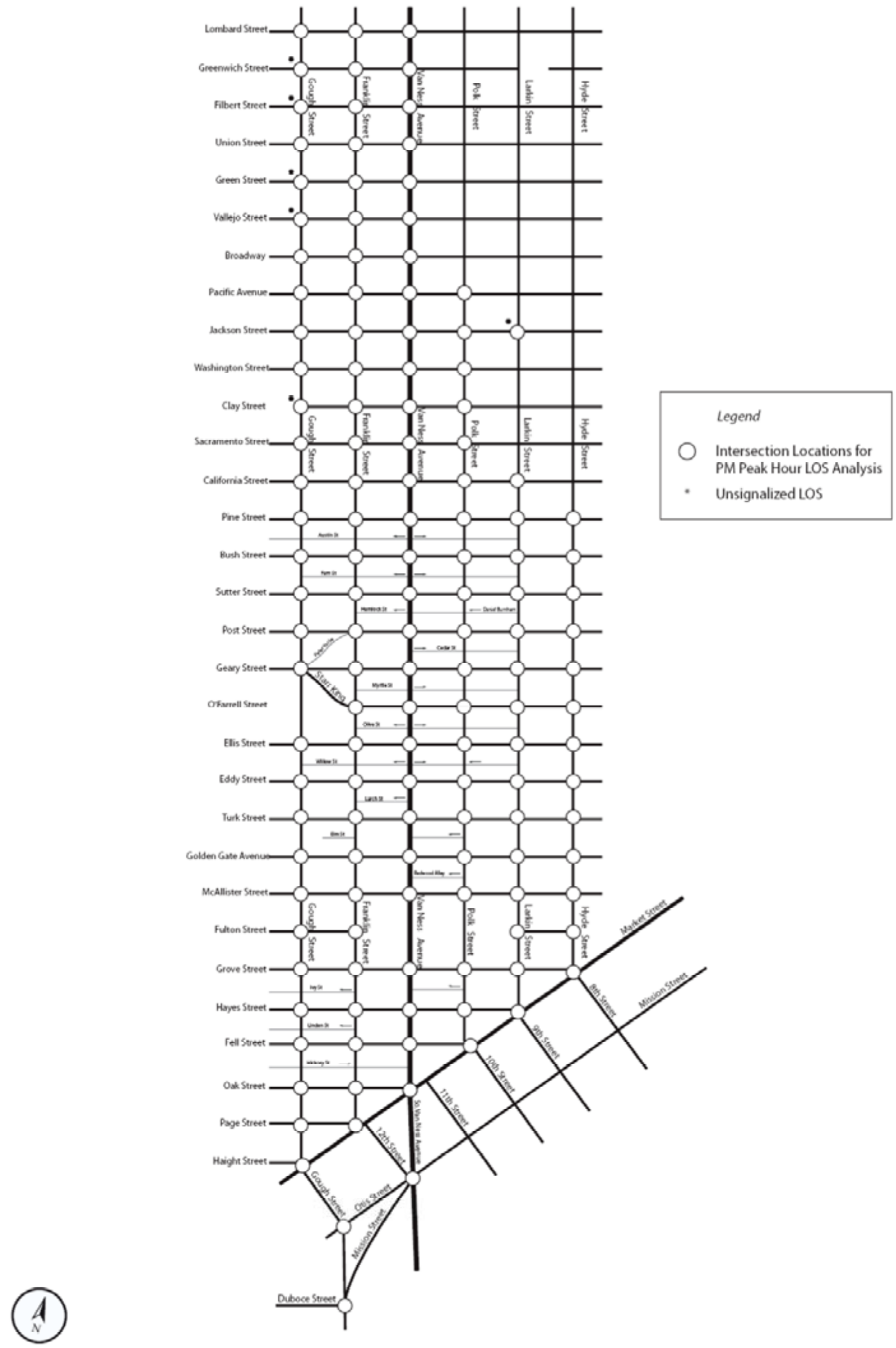
5.5.1.2 | EXISTING CONDITIONS FOR AUTOMOBILE VEHICULAR TRAFFIC

Under the 2007 existing conditions (baseline) analysis, average speeds along the north-south running streets within the study area network ranged from 7.7 mph (along Van Ness

Avenue) to 8.9 mph (along Polk Street) in the SB direction and from 9.1 mph (along Polk Street) to 10.5 mph (along Van Ness Avenue) in the NB direction.

For intersection operations under the 2007 baseline, all intersections in the study area were found to have LOS A, B, C, or D, with the exception of Gough and Green streets, where the worst performing approach, SB Gough Street, experienced LOS F.

Figure 5-2: Traffic Study Area



5.5.1.3 | DIRECT IMPACTS ON AUTOMOBILE VEHICULAR TRAFFIC

The following subsections summarize automobile vehicular traffic impacts for each project alternative and the LPA with or without the Vallejo Northbound Station Variant. Traffic conditions under the LPA with the Vallejo Northbound Station Variant would operate nearly identically to the LPA without the variant, as explained in Section 3.3.3.. Detailed methodologies, significance criteria, and analysis results are presented in Section 3.3 of this EIS/EIR.

Alternative 1: No Build (Baseline Alternative)

Year 2015. All of the study intersections are projected to operate at LOS D or better, with the exception of the following intersections: Gough/Green, Gough/Hayes, Duboce/Mission/Freeway, and South Van Ness/Mission/Otis.

Year 2035. All of the study intersections are projected to operate at LOS D or better, with the exception of the following intersections: Gough/Green, Gough/Hayes, Franklin/Pine, Franklin/O'Farrell, Van Ness/Pine, South Van Ness/Mission/Otis, and Duboce/Mission/Otis/US 101 off-ramp.

Build Alternative 2: (Side-Lane BRT with Street Parking)

Year 2015. Build Alternative 2 would cause a significant project-specific impact at the Gough/Hayes and Franklin/O'Farrell intersection. Additional intersections are expected to operate at LOS E or F; however, the contribution of project traffic is not significant based on the significance criteria from the San Francisco Planning Department's Transportation Impact Analysis Guidelines for Environmental Review. Gough/Green is the only intersection with less than significant project-specific impacts under Build Alternative 2 in the year 2015. The intersections with beneficial impacts include South Van Ness/Mission/Otis and Duboce/Mission/Otis/US 101 off-ramp.

Year 2035. Build Alternative 2 would cause a significant cumulative impact at the following intersections: Gough/Hayes, Franklin/Pine, Franklin/O'Farrell, Franklin/Eddy, and Franklin/McAllister. The intersections with less than significant cumulative impacts include Gough/Green, Gough/Clay, South Van Ness/Mission/Otis, and Duboce/Mission/Otis/US 101 off-ramp. The intersection with beneficial impacts includes Van Ness/Pine.

Build Alternatives 3 and 4: Center-Lane BRT with Right- or Left-Side Boarding and Dual or Single Medians

Year 2015. Build Alternatives 3 and 4 would cause a significant project-specific impact at the Gough/Hayes, Franklin/O'Farrell, and Mission/South Van Ness/ Otis intersections. The intersection of Gough/Green would have less than significant project-specific impacts. A beneficial impact would occur at the intersection of Duboce/Mission/Otis/US 101 off-ramp.

Year 2035. Project traffic under Build Alternatives 3 and 4 would cause a significant cumulative impact at the following intersections: Gough/Sacramento, Gough/Eddy, Gough/Hayes, Franklin/O'Farrell, Franklin/Eddy, Franklin/McAllister, Van Ness/Hayes, and South Van Ness/Mission/Otis. The intersections with less than significant cumulative impacts include Gough/Green, Franklin/Pine, Van Ness/Pine, and Duboce/Mission/Otis/ US 101 off-ramp.

Center-Lane Alternative Design Option B

Year 2015. The project traffic under Build Alternatives 3 and 4 with Design Option B would cause a significant project-specific impact at the intersections of Gough/Hayes, Franklin/O'Farrell, and Franklin/Market; a less than significant project-specific impact at the Gough/Green intersection; and a beneficial impact at the South Van Ness/Mission/Otis and Duboce/Mission/Otis/US 101 off-ramp intersections.

Horizon Year 2035. Project traffic under Build Alternatives 3 and 4 with Design Option B would cause a significant cumulative impact at the following intersections: Gough/ Sacramento, Gough/Eddy, Gough/Hayes, Franklin/O'Farrell, Franklin/Eddy, Franklin/ McAllister, Franklin/Market/Page, and South Van Ness/Mission/Otis. The intersections with less than significant cumulative impacts include Gough/Green, Gough/Clay, Franklin/ Pine, and Duboce/Mission/Otis/US 101 off-ramp. A beneficial impact would occur at the intersection of Van Ness/Pine.

LPA: Center-Lane BRT with Right-Side Boarding/ Single Median and Limited Left Turns

Year 2015. The LPA (including the Vallejo Northbound Station Variant) would have the same traffic impacts as Build Alternatives 3 and 4 with Design Option B. The LPA would cause a substantial project-specific impact at the Gough/Hayes, Franklin/O'Farrell, and Mission/South Van Ness/ Otis intersections. The intersection of Gough/Green would experience lesser project-specific impacts. A beneficial impact would occur at the intersection of Duboce/Mission/Otis/US 101 off-ramp.

Year 2035. The LPA (including the Vallejo Northbound Station Variant) would have the same traffic impacts as Build Alternatives 3 and 4 with Design Option B. Project traffic under the LPA would cause a substantial cumulative impact at the following intersections: Gough/Sacramento, Gough/Eddy, Gough/Hayes, Franklin/O'Farrell, Franklin/Eddy, Franklin/McAllister, Van Ness/Hayes, and South Van Ness/Mission/Otis. The intersections with lesser cumulative impacts include Gough/Green, Franklin/Pine, Van Ness/Pine, and Duboce/Mission/Otis/ US 101 off-ramp.

5.5.1.4 | REASONABLY FORESEEABLE ACTIONS

Several transportation-related projects have been planned and/or are undergoing construction within the general vicinity of the proposed project, as described in Section 5.3. Traffic growth factors that account for citywide demand were used as part of the vehicular traffic analysis; therefore, the operational impacts are presented on a cumulative basis.

5.5.1.5 | AUTOMOBILE VEHICULAR TRAFFIC CUMULATIVE IMPACTS

Construction Cumulative Impacts

Traffic congestion, travel delay, and access restriction attributable to construction activities of various projects within the general vicinity could be expected during the entire construction period. Construction of multiple projects within close vicinity would escalate the traffic impacts during the construction period.

Several projects are projected to undergo construction during the same period as the proposed Van Ness Avenue BRT Project, as listed in Table 5-1. Several facility and utility upgrades would also be integrated into construction of the Van Ness Avenue BRT Project, such as pavement rehabilitation, SFgo signal upgrades, OCS support poles/streetlights replacement, CPUC sewer replacement (under Build Alternatives 3 and 4, including Design Option B, and under the LPA), and other public or private utility upgrades. Traffic congestion, travel delay, and access restriction attributable to construction activities of various projects within the general vicinity of the Van Ness Avenue corridor could be expected during the entire construction period. A draft PCP has been prepared to provide detailed information, schedules, and maps on construction of the Van Ness Avenue BRT Project. Two lanes of mixed-flow traffic would generally remain open in both the NB and SB direction throughout construction of each build alternative, including the LPA; detour plans would be required during construction of certain segments of the corridor. The PCP describes potential construction scenarios for each of the alternatives and LPA, and short-term construction impacts. The PCP also takes into account potential impacts of other planned projects in the general vicinity of the Van Ness Avenue BRT Project. Construction of multiple projects within close vicinity would escalate the traffic impacts during the construction period. The impacts would be adverse, but they could be lessened by closely coordinating the projects to implement a TMP and to keep the public informed about the construction schedule and activities throughout the construction period. Mitigation measures M-TR-C1 through M-TR-C7, discussed in Section 4.15.1, would lessen significant, cumulative circulation impacts during construction of the proposed project and other planned projects in the vicinity. These impacts would be temporary and are thus considered less than significant with mitigation.

Operation Cumulative Impacts

With several projects being planned and constructed within the Van Ness Avenue corridor and its general vicinity, traffic impacts would occur at several intersections in both the no-build and build alternative scenarios, including the LPA (with or without the Vallejo Northbound Station Variant), as outlined in the traffic study conducted for this project (Section 3.3) and summarized above.

5.5.1.6 | AVOIDANCE, MINIMIZATION, OR MITIGATION MEASURES PERTAINING TO AUTOMOBILE VEHICULAR TRAFFIC

Potential mitigation measures (e.g., intersection signalization, adding right-turn lanes, adding through lanes, and use of tow-away zones) are discussed in Section 3.3.4 of this EIS/EIR. These measures could minimize traffic congestion at several intersections projected to have adverse impacts with the proposed build alternatives, including the LPA, (with or without the Vallejo Northbound Station Variant); however, not all traffic impacts would be eliminated with implementation of these mitigation measures, and ultimately, the Authority Board may find the measures to be infeasible for reasons described in Section 3.3.4.

All construction activity for the Van Ness Avenue BRT Project would be carried out in compliance and accordance with the California MUTCD. The MUTCD outlines uniform standards and specifications for all traffic control devices in California. Mitigation measures M-TR-C1 through M-TR-C7, discussed in Section 4.15.1, would lessen significant, cumulative circulation impacts during construction of the proposed project and other planned projects in the vicinity.

Potential mitigation measures could minimize traffic congestion at several intersections projected to have adverse impacts. Early and well-publicized announcements and outreach will help to minimize confusion and traffic congestion at the start of construction.

Another guiding document will be the City and County of San Francisco Regulations for Working in San Francisco Streets prepared by SFMTA. This manual, also known as the "Blue Book," sets out rules and regulations for contractors working in San Francisco streets.

A Transportation Management Plan (TMP) that includes traffic rerouting, a detour plan, and public information procedures will be developed during the design phase with participation from local agencies including Caltrans, other major project sponsors in the area (e.g., Doyle Drive, CPMC Cathedral Hill, and Geary Boulevard BRT projects), local communities, and affected travelers. Early and well-publicized announcements and outreach will help to minimize confusion and traffic congestion at the start of construction.

5.5.2 | Parking

Impacts to parking within the Van Ness Avenue corridor study area were analyzed and are presented in detail in Section 3.5 of this EIS/EIR. This section documents the potential loss of on-street parking due to implementation of the proposed project and other foreseeable projects.

5.5.2.1 | GEOGRAPHIC STUDY AREA FOR PARKING CUMULATIVE EFFECT ANALYSIS

The project study area for the parking analysis encompasses on-street parking along Van Ness Avenue between Lombard and Market streets and South Van Ness Avenue between Market and Mission streets. For the cumulative parking analysis, the vehicular traffic study area shown in Figure 5-2, which covers a larger area than would likely be affected by the proposed project, as well as other foreseeable projects, is used.

5.5.2.2 | EXISTING CONDITIONS

Van Ness Avenue and South Van Ness Avenue currently have a combined total of 442 on-street parking spaces, distributed nearly evenly throughout the corridor between the east and west sides of the street. Most of the parking spaces (i.e., 74 percent) along Van Ness Avenue are metered or non-metered, time-limited parking spaces; 5 percent are designated for freight loading (i.e., yellow curbs), 11 percent are for passenger loading (i.e., white curbs), and 10 percent are for short-term (i.e., green curbs) and disabled vehicle parking (i.e., blue curbs). Most on-street, non-colored parking spaces are metered with a 1-hour time limit between Mission and Broadway streets. Non-metered parking spaces have a 2-hour limit from Broadway to North Point streets, except for vehicles with a residential parking permit. Mid-day parking occupancy rates, which were based on a project survey conducted on December 17, 2008, between 11:00 a.m. and 3:00 p.m., were reported at 66 percent on the east side of Van Ness Avenue and 64 percent on the west side.

The number of existing on-street parking spaces along the Van Ness Avenue cross streets was not counted as part of the parking study. The existing numbers of parking spaces on nearby streets on which other foreseeable projects could impact parking and result in cumulative effects are presented below and are based on secondary data.

Based on the parking analysis presented in the Draft CPMC LRDP EIR (San Francisco Planning Department, 2010), on-street parking spaces along the streets encompassing the proposed CPMC Cathedral Hill Campus are reported as follows:

- 5 metered parking spaces and 5 metered commercial vehicle loading spaces on the south side of Post Street between Van Ness Avenue and Franklin Street.
- 6 metered parking spaces and 2 commercial vehicle loading spaces on the north side of Geary Street between Van Ness Avenue and Franklin Street.
- 5 metered parking spaces, 3 metered commercial vehicle loading spaces, and a midblock bus stop on the north side of Geary Street between Polk Street and Van Ness Avenue.
- 10 metered parking spaces on the south side of Cedar Street between Polk Street and Van Ness Avenue.
- 11 metered parking spaces on the east side of Franklin Street between Post Street and Geary Street.
- 3 metered parking spaces on the west side of Van Ness Avenue between Post Street and Geary Street.
- 2 metered loading spaces on the east side of Van Ness Avenue between Cedar Street and Geary Street.

As documented in the Draft CPMC LRDP EIR, on-street parking supply and hourly-occupancy surveys within the vicinity of the CPMC Cathedral Hill Campus were conducted for the period between 1:00 p.m. and 8:00 p.m. in April 2008. Parking occupancy rates within the CPMC study area ranging between 57 percent (at approximately 4:00 p.m.) and 77 percent (at approximately 7:00 p.m.) were reported.

On-street parking along the Hayes Street segment where the two-way conversion is proposed (i.e., between Gough and Polk streets) comprises 41 metered parking spaces on the south side, 5 of which are yellow truck loading spaces, and 28 metered parking spaces and 4 motorcycle spaces on the north side.

Approximately 70 on-street parking spaces exist along the east and west sides of Polk Street from Market to McAlister streets where a bicycle lane is proposed. In addition, there are approximately 7 motorcycle stalls available in this segment of Polk Street.

5.5.2.3 | DIRECT IMPACTS ON PARKING

As described in Section 3.5, implementation of any of the build alternatives, including the LPA, would result in both losses and gains of on-street parking spaces along the various sections of Van Ness Avenue as a result of removing and adding parking spaces based on the design of the BRT lane configurations; however, as shown in Table 5-2, there would be a total net reduction of parking spaces with the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), except Build Alternative 4 with Design Option B. Parking spaces would be removed to accommodate BRT station platforms, addition of corner bulbs, and new lane striping for exclusive right- and left-turn pockets. Parking spaces could be added as a result of bus stop consolidation or from moving existing curbside bus stop locations, restriping existing curb lanes for parking, or adding additional parking spaces through reallocation of existing parking. Parking losses and gains on a block-by-block basis are presented in Appendix B of this EIS/EIR. Tables 5-2 and 5-3 summarize the anticipated total net parking supply changes under the project alternatives and the LPA, respectively. As evident in Table 5-2, the greatest removal of parking would occur with Build Alternative 3 without incorporation of Design Option B. Moreover, the sensitivity analysis using the updated 2012 existing conditions showed the parking loss would be 100 spaces under Build Alternative 3. The LPA, which combines design features of Build Alternatives 3 and 4, would result in the greatest parking removal with a loss of 105 spaces.[92] The LPA, with incorporation of the Vallejo Northbound Station Variant, would result in a loss of 104 spaces. As explained in Section 3.5.3, no significant environmental impact from changes in parking would occur under any of the project alternatives, including the LPA, and no mitigation is required. Nonetheless, improvement measures IM-TR-1 through IM-TR-5 presented in Section 3.5.3 have been incorporated to the extent feasible in the LPA, and would continue to be applied throughout project final design to minimize removal of parking spaces. The social and economic impacts from parking removal are discussed below under Community Impacts.

KEY FINDING

There would be a total net reduction of parking spaces with all of the build alternatives except Build Alternative 4 with Design Option B.

Table 5-2: Summary of Parking Loss on Van Ness Avenue from Project Implementation

	PARKING SUPPLY			NET CHANGE +/- 1		
	M, NM, GREEN SPACE	COLORED ZONE SPACES	TOTAL SPACES	M, NM, GREEN SPACE	COLORED ZONE SPACES	TOTAL SPACES
No Build Alternative	356	86	442	-	-	-
Build Alternative 2	328	81	409	–28	–5	–33
Build Alternative 3	304	70	374	–52	–16	–68
Build Alternative 3 (Design Option B)	339	72	411	–17	–14	–31
Build Alternative 4	325	72	397	–31	–14	–45
Build Alternative 4 (Design Option B)	378	77	455	22	–9	13

1 The expected changes are approximate based on the current project engineering at the time the 2011 parking study was conducted. Exact changes in parking will be determined during project final design.
Note: M = Metered; NM: Nonmetered

92 A sensitivity analysis of changes in parking under Build Alternative 3 that applied the same methodology as that for the LPA suggests that actual parking loss under this alternative would be approximately 26 percent greater than was reported in the Draft EIS/EIR, and the parking loss would be very similar to that of the LPA. Nonetheless, it is conservatively assumed that the LPA would result in the greatest parking loss.

Table 5-3: Summary of Parking Loss on Van Ness Avenue from Project Implementation – No Build, LPA[1]

	PARKING SUPPLY			NET CHANGE +/(-)			
	METERED, NON-METERED, AND GREEN SPACES	COLORED ZONE SPACES	TOTAL SPACES	METERED, NON-METERED, AND GREEN SPACES	COLORED ZONE SPACES	TOTAL SPACES	% SPACES
Alternative 1: No Build[2]	358	98	456	-	-	-	-
LPA[3, 4]	261	90	351	-97	-8	-105	-23

[1] The expected changes are approximate based on the current project engineering. Exact changes in parking will be determined during project final design.
[2] Existing conditions were revised during the supplemental parking survey for the LPA that was completed in October 2012.
[3] The LPA is a refinement of the two center-running build alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B).
[4] The Vallejo Northbound Station Variant would result in removal of one fewer nonmetered space between Vallejo and Green streets on the east side of Van Ness Avenue.

5.5.2.4 | REASONABLY FORESEEABLE ACTIONS

The foreseeable projects within the vicinity of the Van Ness Avenue BRT Project that could result in some parking loss during construction and operation include the CPMC Cathedral Hill, Geary BRT, Hayes Street two-way conversion, and Polk Street Bicycle Lane projects. Implementation of the CPMC Cathedral Hill Project, repaving along Franklin, Gough, and Polk streets as part of the Road Repaving and Street Safety Bond Program as well as mixed-use commercial housing projects. The construction and operation of these projects would potentially increase parking demand within the vicinity of these projects. It is anticipated that in the future SFMTA's SFpark parking management project could be expanded to more meters within the Van Ness Avenue corridor beyond the existing pilot test area (on Van Ness Avenue, the pilot has only been implemented in the Civic Center between Market Street and Golden Gate Avenue), although such expansion is not planned at this time. It is likely that expanded parking management under SFpark would further improve parking conditions in the Van Ness Avenue corridor by increasing turnover of parking spaces, thereby increasing the availability of parking.

Expanded parking management under SFpark would improve parking conditions in the Van Ness Avenue corridor by increasing turnover of parking spaces, thereby increasing the availability of parking.

5.5.2.5 | PARKING CUMULATIVE IMPACTS

As explained in Section 3.5.3, ,no significant environmental impact from changes in parking would occur under any of the project alternatives, including the LPA, and no mitigation is required. Nonetheless, improvement measures IM-TR-1 through IM-TR-5 presented in Section 3.5.3 have been incorporated to the extent feasible in the LPA, and would continue to be applied throughout project final design to minimize removal of parking spaces. Based on information presented in Section 3.5.3, no cumulatively significant environmental impact from changes in parking would occur under any of the project alternatives, including the LPA (with or without the Vallejo Northbound Station Variant).

NEPA requires analysis on parking impacts that could affect socioeconomic characteristics of the area residents and businesses on a block-by-block basis. These potential impacts are discussed below under Community Impacts.

Cumulative Parking Loss during Construction

During project construction, parking within the immediate vicinity of the construction zone for each project would likely be restricted on an occasional basis. Construction of some of the projects, such as CPMC Cathedral Hill, could overlap with the Van Ness Avenue BRT Project, while construction of Geary BRT would be phased to avoid overlapping construction with the Van Ness Avenue BRT Project.

While the number of parking spaces to be affected during the simultaneous construction of other foreseeable projects is not known, it can be assumed that more parking restrictions would occur along Van Ness Avenue and nearby streets. The loss of parking spaces along each street segment during construction of the proposed project would be temporary, and depending on the demand and supply in specific areas, there could be adequate parking spaces available along adjacent streets and parking lots within the Van Ness Avenue corridor for residents, businesses, and visitors.

The loss of parking spaces along each street segment during construction of the proposed project would be temporary.

Cumulative Parking Loss during Operation

Implementation of transportation-related projects, such as the Van Ness Avenue and Geary BRT projects, the Hayes Two-way Conversion Project, and Polk Street Bicycle Lane Project, would not result in an increase in on-street parking demand and may reduce demand for parking. Implementation of the CPMC Cathedral Hill Project would increase parking demand at the site from physicians, employees, patients, and visitors. Based on the Draft EIR for the CPMC LRDP, adequate parking spaces would be provided within the campus, resulting in no additional on-street parking demand.

Implementation of the build alternatives would not increase on-street parking demand and may reduce demand for parking.
A net gain of 13 parking spaces could result if Build Alternative 4 with Design Option B is implemented.

Implementation of several of the above-mentioned foreseeable projects would result in a loss of existing on-street parking designated for general use, commercial use, and disabled parking (blue zone) use. For instance, under the LPA, the proposed project would require removal of up to 97 general parking spaces and up to 8 colored zone parking spaces. Under the LPA with the Vallejo Northbound Station Variant, up to 96 general parking spaces and up to 8 colored zone parking spaces would be removed. In contrast, a net gain of 13 parking spaces could result if Build Alternative 4 with Design Option B is implemented.

According to the Draft EIR for the CPMC LRDP, implementation of the Cathedral Hill Campus would eliminate 30 metered parking spaces, 10 commercial loading/unloading (i.e., yellow zone) parking spaces, 1 passenger loading space, and 1 disabled parking space. These on-street spaces generally serve the existing businesses on the blocks adjacent to the CPMC Cathedral Hill site. The businesses on Van Ness Avenue between Geary and Post streets have since been vacated in preparation for CPMC construction.

Implementation of the Polk Street bicycle lane would result in a loss of 12 metered parking spaces, one of which is a designated commercial loading/unloading zone. Conversion of Hayes Street to a two-way roadway from Gough to Polk streets could result in a loss of up to 36 parking spaces (estimate based on current available description of the proposed Hayes Two-Way Conversion Project). There is no information available on the number of on-street parking spaces that would be lost due to the Geary BRT Project; however, it is assumed that some spaces would be removed on Geary Boulevard near Van Ness Avenue.

5.5.2.6 | AVOIDANCE, MINIMIZATION, OR MITIGATION MEASURES PERTAINING TO LOSS OF PARKING

As discussed in Section 3.5, no significant environmental impact from changes in parking would occur under any of the project alternatives, including the LPA, and no mitigation is required. Nonetheless, improvement measures IM-TR-1 through IM-TR-5 presented in Section 3.5.3 have been incorporated to the extent feasible in the LPA, and would continue to be applied throughout project final design to minimize removal of parking spaces. The following project design principles will be applied to each build alternative:

- Replacement of on-street parking where bus stops are consolidated or moved to the center of the street;
- Addition of street parking made possible by lane restriping;
- Provision of infill spaces where they do not exist today; and
- Giving priority to retaining color painted on-street parking spaces, such as yellow freight loading zones, white passenger loading zones, green short-term parking, and blue disabled parking.

KEY FINDING

There would be a total net reduction of parking spaces with all of the build alternatives except Build Alternative 4 with Design Option B.

5.5.3 Community Impacts

In accordance with NEPA, social conditions were addressed in Section 4.2 of this EIS/EIR, along with the potential impacts as a result of project implementation. Social conditions are defined in terms of population characteristics, such as income and ethnicity; household size and composition; employment and labor force; community/neighborhood characteristics, including public services and facilities; and economic and business characteristics, within the project study area. CEQA does not include a requirement to address social or economic conditions.

5.5.3.1 GEOGRAPHIC STUDY AREA FOR COMMUNITY CUMULATIVE IMPACT ANALYSIS

The study area covers 52 census tract block groups, as shown in Figure 4.2-1. The study area used to address cumulative community impacts is the same as the network for vehicular traffic and parking impact analysis described in the earlier sections of this chapter because any potential cumulative community impacts would occur as a result of traffic congestion and loss of parking within the general vicinity of the Van Ness Avenue corridor.

5.5.3.2 EXISTING CONDITIONS

DEFINITION

For the purposes of this analysis, racial and ethnic minority groups are defined as being comprised of people categorized as Hispanic or a race other than White in 2000 U.S. Census data.

Existing socioeconomic characteristics of the study area are described in detail in Section 4.2 of this EIS/EIR. The Van Ness Avenue BRT Project study area consists of diverse socioeconomic neighborhoods and a multi-ethnic population. For the purposes of this analysis, racial and ethnic minority groups will be defined as being comprised of people categorized as Hispanic or a race other than White in 2000 U.S. Census data. Lower-income and minority residents, along with higher-income and non-minority residents, live close to the proposed project.

Approximately 46 percent of all study area residents are members of minority groups, compared to an approximate 56 percent minority population in the City and County of San Francisco as a whole. The southern portion of the study area, from Mission Street to Broadway, has a larger minority population than is found along Van Ness Avenue north of Broadway.

Low-income populations are defined as having a median household income at or below Department of Health and Human Service poverty guidelines. The percentage of low-income residents is slightly higher in the study area (i.e., 13 percent) than in the City and County of San Francisco as a whole (i.e., 11 percent). As stated earlier, there does not appear to be a disproportionate occurrence of low-income or minority populations along the project corridor; therefore, this marginally higher percentage of low-income residents is not considered disproportionate pertaining to E.O. 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations).

The Van Ness Avenue BRT Project study area consists of diverse socioeconomic neighborhoods and a multi-ethnic population. Almost half do not own a private automobile, which is significantly higher than the citywide average.

Based on 2000 U.S. Census Data, almost half of the households in the study area do not own a private automobile, which is significantly higher than the citywide average. Traffic and parking conditions within the corridor network are described in Sections 5.5.1 and 5.5.2. Existing land uses in the vicinity of Van Ness Avenue include residential, commercial/tourism, institutional, open space, and mixed uses. See a detailed description of existing land uses along the Van Ness Avenue corridor in Section 4.2, Community Impacts.

5.5.3.3 REASONABLY FORESEEABLE ACTIONS

Several transportation-related projects, as well as housing development and major medical center projects, have been planned and/or are undergoing construction within the general vicinity of the proposed project, as described in Section 5.3. In addition, the citywide BRT Network (encompassing Van Ness Avenue, Geary Boulevard, and Potrero Avenue), as well as the Muni Rapid Network is planned to be developed, as called for in the CWTP.

5.5.3.4 | DIRECT COMMUNITY IMPACTS

The NEPA-required analysis of community impacts identified impacts on traffic, transit, parking, and nonmotorized (i.e., pedestrian and bicycle) transportation would occur during project construction, as described in Section 4.15, Construction Impacts. These impacts would cause temporary inconvenience to area residents, people doing business along the Van Ness Avenue corridor, and people traveling through the corridor. The impacts would be minimized by implementing the TMP, as described in Section 4.15.2.2.

Implementation of the proposed project would not restrict area residents, businesses, and visitors from routine activities within the Van Ness Avenue corridor network, nor prevent them from participating in regular social activities or special events. No relocation of residences or businesses would occur as part of this project.

The proposed project would affect local traffic circulation due to vehicular lane reductions and turning restrictions. Impacts from vehicular traffic delay would primarily occur during evening peak travel hours when total traffic is heaviest and would be less at other times of the day and night and on weekends when shopping, dining out, entertainment, and other commercial activities often occur. Overall, impacts from automobile traffic at certain intersections along the Van Ness Avenue corridor are not anticipated to substantially affect local businesses.

The proposed project build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would require the permanent removal of on-street parking along parts of the corridor, as described in Section 3.5, Parking. The effects of removal of on-street parking are assessed by identifying locations where much or all of the parking would be removed along a block face and/or where a colored zone would be removed and could not be replaced on the same block or adjacent block. As explained in Section 3.5, street parking would generally be maintained throughout Van Ness Avenue, and the proposed build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would not require changes in parking on adjacent streets or in parking lots that serve the area. Table 4.2-8 in Section 4.2.4.2 lists the blocks where substantial street parking would be removed on one or more sides of Van Ness Avenue.

As explained in Section 3.5.2, SFMTA would give priority to retaining on-street colored parking spaces (i.e., green [short-term parking], white [passenger loading], yellow [truck loading], and blue [disabled parking]). As part of the project design, in any cases of conflicting needs for color zones, SFMTA would work to build consensus among fronting business owners and determine the best allocation of colored spaces to suit the needs of these establishments. In most cases, colored spaces would be able to be retained on the same street block or on adjacent blocks. Passenger and truck loading zones could be provided on the same side of the street, where feasible, so that crossing a street for loading would not be needed; however, specific locations were identified where provision of replacement colored spaces on an adjoining block may not be feasible or where an affected business may have special needs requiring immediately adjacent parking, such as passenger loading zones that serve elderly or infirmed people or truck loading zones that support delivery of large commercial goods. Colored parking zone adverse impacts on adjacent land uses are identified in Table 4.2-9 in Section 4.2.2.

5.5.3.5 | CUMULATIVE IMPACTS ON COMMUNITY

Construction Cumulative Impacts

Based on the location, schedule, and scope of the foreseeable projects listed in Table 5-1, the roadway segments that would likely experience impacts from construction activities on a cumulative basis are those in the vicinity of Van Ness Avenue and Geary Boulevard, when the Van Ness Avenue BRT and CPMC Cathedral Hill projects would undergo concurrent construction. The impacts would mostly be traffic, transit, parking and nonmotorized (i.e.,

The roadway segments that would likely experience impacts from construction activities on a cumulative basis are those in the vicinity of Van Ness Avenue and Geary Boulevard, when the Van Ness Avenue BRT and CPMC Cathedral Hill projects would undergo concurrent construction. To mitigate potential impacts, public roadway-related work under the CPMC project should be scheduled and completed before or after commencement of Van Ness Avenue BRT Segment 2 (Golden Gate Avenue to Washington Street) construction.

With any of the build alternatives, including the LPA, area residents and the public at large would have a better, more reliable transit system – and have more incentive to shift their mode of travel to public transit.

pedestrian and bicycle) transportation related. These impacts could be minimized by having close coordination between the two projects to develop construction schedules and phasing to avoid construction activities that could elevate the level of impacts (e.g., detouring and parking and access restrictions) to area residents and travelers. For example, public roadway-related work under the CPMC project should be scheduled and completed before or after commencement of Van Ness BRT Segment 2 (Golden Gate Avenue to Washington Street) construction.

Operation Cumulative Impacts

Implementation of the foreseeable projects, including the CPMC, Geary Boulevard BRT, Hayes Two-Way Street Conversion, and Polk Street Bicycle Lane projects, would potentially result in a reduction in general parking in the study area. Although general parking spaces are anticipated to be sufficiently available along the Van Ness Avenue corridor network, the loss of colored parking spaces, especially truck loading/unloading zones, in the vicinity of Van Ness Avenue and Geary Boulevard resulting from implementation of the CPMC, Geary BRT, and proposed Van Ness Avenue BRT projects could impact local businesses, as described in Section 4.2. For example, under the LPA the loss of two passenger loading spaces along the east side of Van Ness Avenue between O'Farrell and Geary streets could affect The Opal hotel, and the loss of four loading spaces that serve a Comfort Inn hotel on Van Ness between Greenwich and Lombard streets could affect this business as indicated in Table 4.2-9. As a trade-off, once all of the projects under planning within the general vicinity of the Van Ness Avenue corridor are completed, area residents and the public at large would have a better, more reliable transit system for daily commuting and commerce compared to the existing condition. The Van Ness Avenue BRT Project would help complete the planned citywide BRT and SFMTA Rapid Network, and would provide enhanced pedestrian amenities along the corridor, benefitting the 48 percent of households in the study area that do not own a private automobile. Furthermore, with a better and more reliable transit system, it can be anticipated that private vehicle users would have more incentive to shift their mode of travel to public transit. Project planning should also place a high priority on maintaining or increasing overall access to local businesses along Van Ness Avenue because the project area represents a major commercial corridor within San Francisco.

KEY FINDING

Cumulative impacts on community-related activities from the loss of on-street parking spaces would not be considered adverse.

In conclusion, implementation of the project and the overall BRT and SFMTA Rapid Network is consistent with the CWTP; this would benefit the transit-dependent population at large and would result in a transportation mode shift from automobiles to public transit. Cumulative impacts on community-related activities from the loss of on-street parking spaces would not be considered adverse. Implementation of impact minimization measures described below, where feasible, could reduce impacts to adjacent properties resulting from the potential cumulative loss of colored parking spaces in the study area.

5.5.3.6 | AVOIDANCE, MINIMIZATION, OR MITIGATION MEASURES PERTAINING TO CUMULATIVE COMMUNITY IMPACTS

With any of the build alternatives, including the LPA, area residents and the public at large would have a better, more reliable transit system – and have more incentive to shift their mode of travel to public transit.

To avoid escalated impacts on local circulation, parking, and environmental health of area residents, office workers, patrons, and pedestrians in the Van Ness Avenue corridor, a project construction plan should be developed to minimize overlapping construction of the CPMC Cathedral Hill and Van Ness Avenue BRT projects, and any other unforeseen projects in the corridor for which construction with the BRT project would overlap.

A TMP that includes traffic rerouting, a detour plan, and public outreach will need to be developed during the design phase with participation from local agencies, other major project proponents in the area (e.g., CPMC Cathedral Hill, Hayes Two-Way Conversion, and the Geary Corridor BRT projects), local communities, businesses associations, and affected drivers. Early and well-publicized announcements and outreach will help to minimize confusion, inconvenience, and traffic congestion at the start of construction.

As part of the project design, the SFMTA would prioritize retention of on-street colored parking spaces to minimize potential impacts to adjacent properties. Passenger and truck loading zones would be provided on the same side of the street where possible so that crossing a street for loading would be avoided. In any cases of conflicting needs for colored zones, SFMTA would work to build consensus among fronting business owners and determine the best prioritizing and location of colored spaces to suit the needs of these establishments. Cumulative impacts on community-related and business activities from the loss of colored on-street parking spaces would be mitigated through the implementation of measures M-CI-IM-1 and M-CI-IM-2, which are described in Section 4.2.4.2. M-CI-IM-1 and M-CI-IM-2 constitute mitigation measures under NEPA and improvement measures under CEQA.

5.5.4 | Public Services and Community Facilities

5.5.4.1 | AFFECTED ENVIRONMENT

Public services and community facilities were addressed in Section 4.2 of this EIS/EIR, along with the potential impacts as a result of project implementation. Public services and community facilities located within the study area – including police and fire, schools and universities, cultural facilities, hospital and medical, parks and recreational facilities, and houses of worship – are listed in Tables 4.2-5 and 4.2-6 in Section 4.2.2.

5.5.4.2 | CUMULATIVE IMPACTS ON PUBLIC SERVICES AND COMMUNITY FACILITIES

The roadway segments that would likely experience impacts from construction activities on a cumulative basis are those in the vicinity of Van Ness Avenue and Geary Boulevard, when the Van Ness Avenue BRT and CPMC Cathedral Hill projects would undergo concurrent construction. To mitigate potential impacts, public roadway-related work under the CPMC project should be scheduled and completed before or after commencement of Van Ness Avenue BRT Segment 2 (Golden Gate Avenue to Washington Street) construction.

Construction Cumulative Impacts

Based on the location, schedule, and scope of the foreseeable projects listed in Table 5-1, the roadway segments that would likely experience impacts from construction activities on a cumulative basis are those in the vicinity of Van Ness Avenue and Geary Boulevard, when the Van Ness Avenue BRT and CPMC Cathedral Hill projects would undergo concurrent construction. During construction of the proposed project, access to community facilities and government services in the study area may be adversely affected. These impacts could be minimized by having close coordination between the two projects to develop construction schedules and phasing to avoid construction activities that could elevate the level of impacts (e.g., detouring and parking and access restrictions) to public services and community facilities. For example, public roadway-related work under the CPMC project should be scheduled and completed before or after commencement of Van Ness Avenue BRT Segment 2 (Golden Gate Avenue to Washington Street) construction.

Operation Cumulative Impacts

No adverse operation cumulative impacts are identified.

5.5.4.3 | AVOIDANCE, MINIMIZATION, OR MITIGATION MEASURES PERTAINING TO CUMULATIVE PUBLIC SERVICES IMPACTS

Mitigation Measures M-CI-C1 through M-CI-C7, described in Section 4.15.2, would lessen potentially significant, cumulative impacts to community facilities and government services during construction of the proposed project and other planned projects in the vicinity.

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CHAPTER SUMMARY: This chapter summarizes how the No Build Alternative and three build alternatives, as well as the LPA (with or without the Vallejo Northbound Station Variant), could affect resources protected under Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303), which includes publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of National, State, or Local significance, or land of an historic site of National, State, or Local significance located on public or private land (49 USC 303).

CHAPTER 6

Final Section 4(f) Evaluation

This chapter provides an evaluation of the proposed project relative to Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303) and its implementing regulations, jointly codified by FHWA and FTA in March 2008 as a Final Rule at 23 CFR Part 744. Section 4(f), a law applying only to agencies within the U.S. DOT, including FTA, states it is the policy of the federal government "that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites" (49 USC 303). Section 4(f) specifies that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of National, State, or Local significance located on public or private land, only if:

- There is no prudent and feasible alternative to using that land; and
- The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

6.1 Proposed Action

SFCTA proposes, in cooperation with FTA and SFMTA, to implement BRT improvements along Van Ness Avenue in San Francisco. The Van Ness Avenue BRT is proposed in the northeastern quadrant of the City and County of San Francisco, California. Van Ness Avenue serves as US 101 through the central part of the city and is owned by Caltrans. The BRT alignment follows Van Ness Avenue/South Van Ness Avenue, a primary north-south arterial and transit spine, and extends approximately 2 miles from Mission Street at the south end to Lombard Street at the north end. Replacement of the OCS support pole/streetlight network, as part of the project, would extend from Mission Street to North Point Street.

Features common to all build alternatives, as well as the LPA (with or without the Vallejo Northbound Station Variant), for the Van Ness Avenue BRT Project include the following:

- **Dedicated bus lanes** separated from regular (mixed-flow) traffic to reduce delays and improve reliability.
- **Level or near level boarding** to decrease passenger loading time, increase service reliability, and improve access for all users.
- **Consolidated transit stops** to reduce delays due to existing stop spacing that does not meet Muni standards (stop locations and details shown in Chapter 2, Table 2-3).
- **High-quality stations,** each with an elevated platform, canopy for weather protection, comfortable seating, vehicle arrival time information, landscaping, and other amenities. Platforms would be large enough to safely and comfortably accommodate waiting

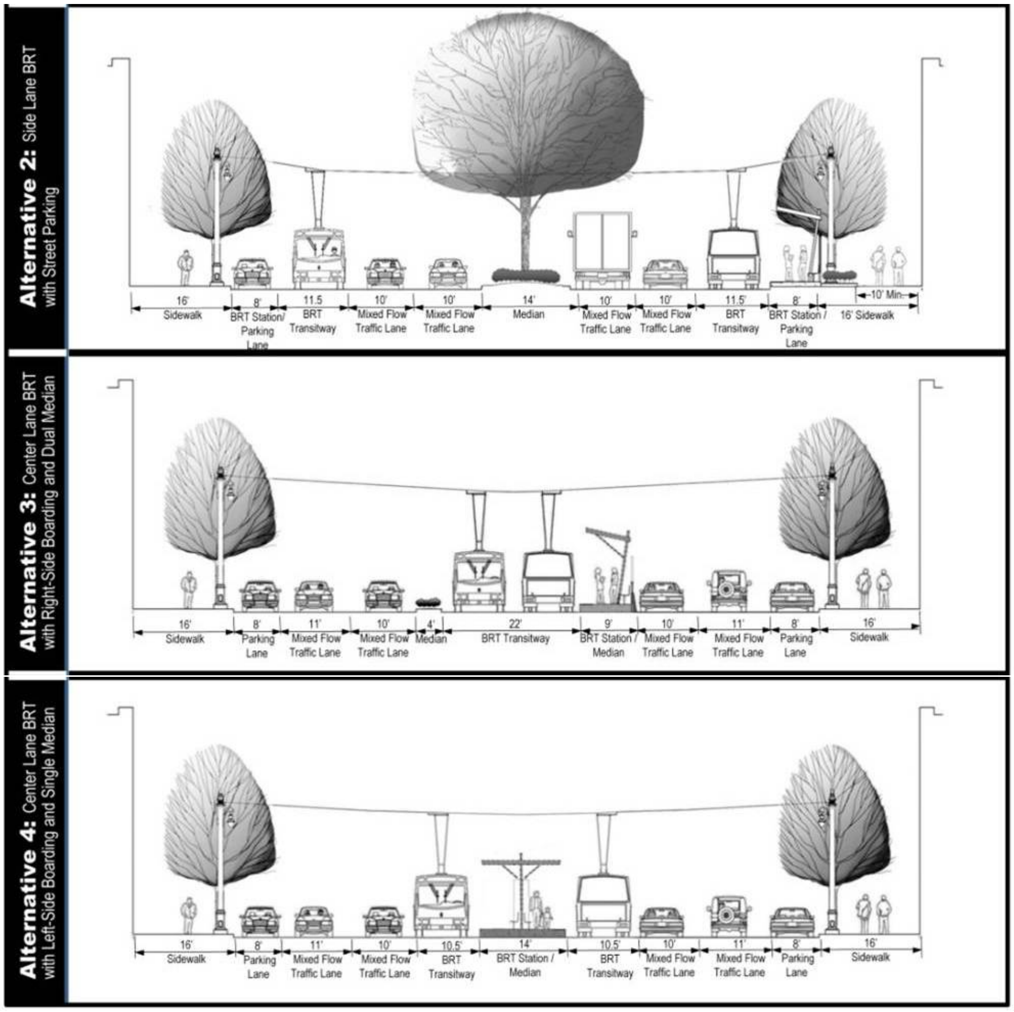
passengers, long enough to load two BRT vehicles, and designed to provide ADA accessibility.

- **Proof of Payment** allowing passengers to swipe their fare cards either on the platform before the buses arrive, or on-bus once boarded, allowing for all-door loading, and reducing passenger loading time.
- **Traffic signal optimization** using technology upgrades to allow real-time traffic management and optimal signal timing.
- **Transit Signal Priority (TSP)** to recognize bus locations and provide additional green light time for buses approaching intersections and reduce delay at red lights.
- **Fewer left-turn pocket lanes** for mixed-flow traffic by eliminating left turns at certain intersections to reduce conflicts with the BRT operation.
- **Pedestrian safety enhancements,** including enhanced median refuges, nose cones, and curb bulbs to reduce crossing distances at intersections and increase safety. Accessible pedestrian signals with crossing time countdowns would be installed at all signalized intersections in the project corridor.
- **Landscaping** of medians would promote a unified, visual concept for the Van Ness Avenue corridor. BRT stations would include landscaped planters, and landscaping would be incorporated as feasible to provide a buffer between bus patrons and adjacent auto and pedestrian traffic. In addition, the discontinuation of existing Muni bus stops and removal of bus shelters would open up additional sidewalk space at these locations. This would enhance the pedestrian environment at these locations and offer opportunities for tree planting.
- **OCS Support Pole/Streetlight Replacement** would replace and upgrade the overhead wire contact system and support poles/streetlights along Van Ness Avenue from Market Street to North Point Street to address the failing structural condition of the system. Improvements would include removal and replacement of existing poles and light fixtures. The replacement poles are proposed to be of compatible architectural design. Poles would be replaced in approximately the same locations on the sidewalk, within approximately 3 to 5 feet of the existing poles. The replacement poles would be designed to handle modern loads as required by the BRT. These poles would also provide street and sidewalk lighting. New lighting would be energy efficient, require low maintenance, and meet current lighting requirements for safety. A new duct bank would be constructed within the sidewalk area to support the streetlights and traffic signal interconnect conduits.

The three build alternatives shown in Figure 6-1, as well as the LPA, would include all of the BRT features listed above, but with differing lane configurations and associated station placement at the intersections. The three build alternatives are: Alternative 2 – Side-Lane BRT; Alternative 3 – Center-Lane BRT with Right-Side Boarding and Dual Medians; and Alternative 4 – Center-Lane BRT with Left-Side Boarding and Single Median. Chapter 2 describes each alternative in detail. A summary description of the LPA follows, and it is presented in detail in Chapter 10. Appendix A contains detailed plan drawings for each build alternative, including the LPA.

The LPA, Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns, is an optimized refinement of the two center-running build alternatives. BRT vehicles would operate alongside the median for most of the corridor, similar to Build Alternative 4, and at station locations, the BRT transitway would transition to the center of the roadway, allowing right-side loading using standard vehicles, similar to Build Alternative 3. The LPA also incorporates Design Option B, eliminating all left turns from Van Ness Avenue between Mission and Lombard streets, with the exception of the SB (two-lane) left turn at Broadway. The environmental consequences to Section 4(f) resources from the LPA (with or without the Vallejo Northbound Station Variant) fall within the range presented for Build Alternatives 3 and 4 in this chapter. Chapter 10 has details on the LPA, and Appendix A contains LPA plan drawings. See Figure 2-2 in Chapter 2 for two cross sections of the LPA, one showing a typical block with a station and the second showing a typical block without a station, and Figure 2-3 shows the Vallejo Northbound Station Variant.

Figure 6-1: Cross Sections of Build Alternatives



6.2 Section 4(f) Properties

6.2.1 | Cultural Resources

Properties that are on or eligible for the National Register of Historic Places (including historic districts, buildings, structures, objects, and certain archaeological sites) qualify for Section 4(f) protection.

Prior to conducting the Section 4(f) analysis, the process to identify and evaluate historic properties as required under Section 106 of the National Historic Preservation Act (NHPA) was completed for the proposed project, and concurrence with the agency's finding was made by the California State Historic Preservation Officer (SHPO). Seven historic properties, including one historic district, were identified within the proposed project's area of potential effects and are considered Section 4(f) resources:

- 11-35 Van Ness Avenue (Masonic Temple)
- San Francisco Civic Center Historic District
- 799 Van Ness Avenue (Wallace Estate Co. Garage)
- 945-999 Van Ness (Ernest Ingold Chevrolet Showroom)
- 1320 Van Ness Avenue (Scottish Rite Temple)

- 1699 Van Ness Avenue (Paige Motor Car Co. Building)
- 1946 Van Ness Avenue (California Oakland Motor Co. Showroom)

The Historic Property Study submitted by FTA to the California SHPO also discussed prehistoric and historical archaeological resources that might be present within the proposed project's area of potential effects (APE). Because the project APE is completely covered by contemporary urban development, any archaeological resources, should they be present, could only be encountered during subsurface excavation and not by means of field surveys. As a result, a sensitivity assessment was conducted to determine the potential for buried archaeological resources in the APE, taking into account factors affecting past human use or occupation, and the earlier evolution of land forms located in this part of San Francisco. After further consultation between FTA and the SHPO, it was agreed that the potential for encountering buried resources will be determined through focused documentary research and reconstructing the history of changes to the physical landscape, including cuts and fills to more accurately identify locations with potentially significant prehistoric remains (see Section Chapter 4, Section 4.5.2). The research may result in recommendations for subsurface testing and possible mitigation, which would only take place just prior to construction, after design plans are finalized, and only if a potentially significant resource was identified and could not be avoided.

6.2.2 Parks and Recreation Properties

There are 20 public park and recreational resources in the general project study area, as listed in Table 4.2-7 and graphically depicted in Figure 4.2-3: 10 parks, 5 recreational facilities, and 5 other public spaces. With the exception of Fort Mason at the extreme northern end of the project limits, all such facilities are one block or greater distance away from Van Ness Avenue. Fort Mason abuts Van Ness Avenue at Bay Street, but a formidable high wall separates it from the avenue and sidewalk.

6.3 Impacts on Section 4(f) Properties

The Section 4(f) "use" of a resource is defined and addressed in the FHWA/FTA Regulations at 23 CFR 774.17. A "use" is classified in one of three ways: (1) as a direct use/permanent incorporation, (2) temporary occupancy, or (3) as a constructive use. Section 4(f) uses are described in more detail below.

Direct Use. A direct use occurs when lands containing Section 4(f) resources will be permanently incorporated into a transportation facility.

Temporary Occupancy. A temporary occupancy occurs when the occupancy of the Section 4(f) resource is adverse in terms of the statute's preservation purpose (i.e., the attributes of the resource that qualify it for Section 4(f) consideration). After the occupancy, the resource must be restored to the condition in which it was prior to construction.

A temporary occupancy (e.g., right-of-entry, construction, and other temporary easements) will not constitute a use of a Section 4(f) resource when all of the following conditions are met:

- Duration (of the occupancy) must be temporary (i.e., less than the time needed for construction of the project, and there should be no change in land ownership).
- Scope of the work must be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) resource are minimal).
- There are no anticipated permanent adverse physical impacts or interferences with the protected activities, features, or attributes.
- The land being used must be fully restored (i.e., the property must be returned to a condition that is at least as good as that what existed prior to the project).

- There must be documented agreement by the official(s) with jurisdiction over the resource regarding the previously described conditions.

Constructive Use. A constructive use of a Section 4(f) resource occurs when a transportation project does not permanently incorporate land from the resource, but the proximity of the project results in adverse impacts (e.g., noise, visual, access, and/or vibration impacts) so severe that the activities, features, or attributes that qualify the resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only if the protected activities, features, or attributes of the resource are substantially diminished, meaning that the value of the resource in terms of its Section 4(f) significance will be meaningful reduced or lost. This determination is made through the following process:

- Identification of the current activities, features, or attributes of the resource that may be sensitive to proximity impacts.
- Analysis of the potential proximity impacts on the resource.
- Consultation with the appropriate officials having jurisdiction over the resource.

The FHWA/FTA Section 4(f) regulations stipulate that when a project's impacts in the vicinity of Section 4(f) resources are so severe that the resources' activities, features, attributes, or activities qualifying the property for protection under Section 4(f) are substantially impaired, then a feasible and prudent avoidance alternative must be considered by means of a Section 4(f) evaluation, even if the project does not actually intrude into the Section 4(f) property. Such impacts constitute "Constructive Use" of the property and may include these examples:

- The projected noise level increase attributable to a proposed project substantially interferes with the use and enjoyment of a resource protected by Section 4(f), such as enjoyment of a historic property where a quiet setting is a generally recognized characteristic.
- The proximity of a proposed project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. An example of substantial impairment to visual or aesthetic qualities would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or detracts from the setting of a park or historic site which derives its value in substantial part from its setting.
- A proposed project results in a restriction of access to the Section 4(f) resource, which substantially diminishes or eliminates the utility or function of the resource.

The vibration impact from operation of a proposed project would substantially impair the use of a Section 4(f) resource, such as a projected vibration level that is great enough to affect the structural integrity of a historic building or substantially diminish the utility of a historic building.

The proposed project does not require the acquisition of any Section 4(f) protected properties, so there would be no direct use/permanent incorporation of such properties.

The proposed project does not require the acquisition of any Section 4(f) protected properties, so there would be no direct use/permanent incorporation of such properties.

Construction of any of the BRT build alternatives (including Design Option B and the LPA) would occur within the existing Van Ness Avenue curb-to-curb roadway, with the exception of potential landscaping and tree replacement, OCS support poles/streetlights, pedestrian signals, and station platforms, depending on the alternative, which would involve areas near the sidewalk and in proximity to NRHP properties (i.e., Section 4(f) resources). Construction activities are not expected to require the temporary utilization of, or have adverse effects on any Section 4(f)-protected NRHP properties, as detailed in Section 4.5.4.5. Construction activities that may occur adjacent to historic resources are expected to be of short duration and would be conducted in accordance with permit conditions to protect the physical urban environment, thus limiting potential impacts during construction. Accordingly, no Section 4(f) temporary impacts are expected.

KEY FINDING

No Section 4(f) temporary impacts related to construction are expected.

Relative to potential constructive uses, while the proposed changes associated with the project build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in a slight alteration to the contemporary urban setting of Van Ness Avenue, they would not constitute a significant alteration to the setting, feeling, or atmosphere of any of the seven significant historic architectural properties in the APE (see Section 4.5.4.5).

Certainly for historic properties located in a setting where the sense of quiet represents a characteristic of its historical significance, increases in noise and vibration could have the potential of causing adverse effects and significant impacts. This is clearly not the case with the properties abutting Van Ness Avenue, a transportation facility serving as US 101 through San Francisco for almost seven decades. The Noise and Vibration Study (Parsons, 2010b) determined that application of standard mitigation measures required by the City and Caltrans would reduce construction impacts to less than significant; however, temporary increases in noise and vibration would still occur at some locations. That said, operational project-generated and cumulative traffic noise along Van Ness Avenue would remain below both FTA and Caltrans impact threshold criteria. As the existing project area's noise levels are typical for a dense urban environment, noise associated with the BRT system would not be substantially different with its implementation and would not be out of character with the urban setting. The same study also concluded that BRT transit vehicle operational vibration impacts would be less than significant relative to the applicable FTA criteria. Based on these study findings, therefore, it is expected that the project would cause no proximity impact to historic structures as a result of noise or vibration.

KEY FINDING

It is expected that the project would cause no proximity impact to historic structures as a result of vibration.

The compatibility of the proposed Van Ness Avenue BRT Project with the character of the visual setting of the affected historic resources needs also to be considered as part of the Section 4(f) constructive use analysis. As discussed in Sections 4.4.3.4 and 4.5.4.5, the compatibility of the proposed project is determined by a number of factors, including the size and proportion of the project features relative to the surrounding historic structures and character-defining features of the historic properties' architectural design, the height of the new BRT project elements and any shadows they might cast, color inconsistencies, and any important historic landscape elements that project components may obscure. Because the Van Ness Avenue BRT Project would be implemented in an already completely urbanized environment, changes to the overall visual setting would be largely inconsequential.

FTA has determined that a constructive use does not occur when compliance with the requirements of 36 CFR 800.5 for proximity impacts of the proposed action on sites listed on or eligible for the NRHP results in an agreement of "no historic properties affected" or "no adverse effect" (23 CFR 774.15 [f][1]). For the proposed Van Ness Avenue BRT Project, an assessment of the project's effects on historic and architectural resources was completed. FTA and SFCTA, in applying the Criteria of Adverse Effect, concluded that a Finding of No Adverse Effect with Conditions (for focused documentary research for archaeological resources) is appropriate for the LPA and sought concurrence from the SHPO pursuant to 36 CFR 800.5(c). Upon review of this determination, the SHPO concurred that the project would not change the NRHP eligibility status for any of the seven significant historic and architectural properties in the APE and that the proposed undertaking would have no adverse effect on these properties, or on archaeological resources with the condition that the project proponents will produce detailed documentary research and a site treatment plan, if necessary (see Section 4.5.4), to identify and protect potential buried archaeological resources (see SHPO letter dated May 17, 2013, Appendix C). Therefore, as defined in the regulations (see Section 4.5.4.2), constructive use of the Section 4(f) historic architectural properties and use of potential Section 4(f) archaeological resources would not occur.

KEY FINDING

Constructive use of the Section 4(f) historic architectural properties would not occur.

KEY FINDING

There are no direct, temporary, or constructive uses of any of the 20 park and recreational facilities located in the vicinity of the project area.

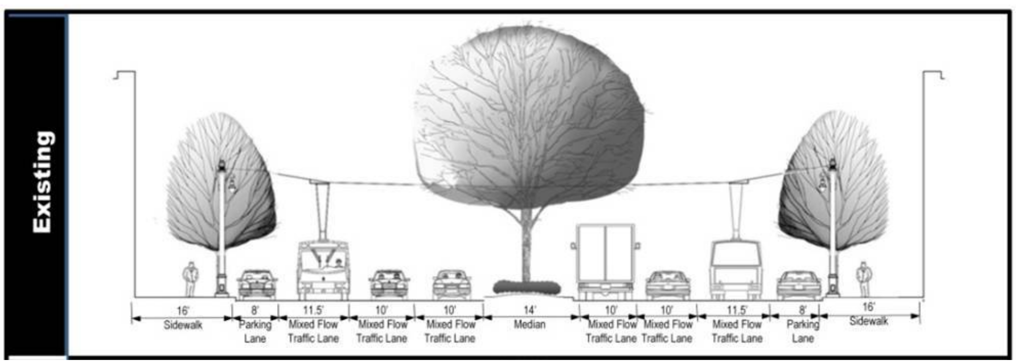
The Section 4(f) regulations (23 CFR 774.13(b)) exclude archaeological sites on or eligible for listing in the NRHP when it is concluded that the archaeological resources are important chiefly because of what may be potentially learned by means of data recovery through excavation (i.e., eligible under Criterion D, in which the property has yielded, or is likely to yield, information important in history or prehistory), rather than warranting preservation of the site in place without excavation. Should archaeological resources be inadvertently discovered during construction, a determination as to National Register-eligibility will be made. If any archaeological sites are subsequently determined to be eligible for the NRHP, and to warrant preservation in place, the SFCTA, in concert with FTA, will prepare separate Section 4(f) evaluations for such resources.

There are no direct, temporary, or constructive uses of any of the 20 park and recreational facilities located in the vicinity of the project area.

6.4 Avoidance Alternative

The No Build Alternative would include only improvements that are planned to occur regardless of whether BRT is implemented, including pavement rehabilitation and incremental replacement of the OCS and support poles/streetlights. New, low-floor buses, on-bus proof of payment, and real-time passenger information at major bus stops would result in minor improvements to transit service. Pedestrian improvements at select locations would include curb ramp upgrades, countdown signals, and accessible signals. Figure 6-2 provides a typical cross section of Van Ness Avenue as it exists today, and this would remain the same under the No Build Alternative.

Figure 6-2: No Build Alternative (Existing Conditions) Cross Section



6.5 Measures to Minimize Harm

There would be no use of known archaeological resources. Section 4.15.4.2 incorporates mitigation measures (M-CP-1 through M-CP-4) to address potential impacts to buried archaeological resources prior to and during construction. These mitigation measures stipulate there will be more detailed investigation of the potential for encountering archaeological resources through focused documentary research and that all actions are employed to protect archaeological resources that may be discovered during construction. These mitigation measures are derived from the Finding of Effect with Conditions prepared by FTA and SFCTA for the LPA (Parsons, 2013c). As discussed above, the SHPO concurred with these measures as part of the basis for the determination of No Adverse Effect with Conditions for the LPA (see Appendix C).

There would be no direct impacts to any of the seven properties listed on or eligible for the NRHP from implementation of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant). The project would not alter any historic structures. While the project would traverse the Civic Center Historic District, compliance with local ordinance requirements would ensure compatibility of the project with the features of the historic district. Station platforms would be located in the median of Van Ness Avenue in proximity to some of the identified historic properties, including individual structures within the Civic Center Historic District, as discussed in Section 4.5.4.5. As a result, the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would have some visual effect on the setting. In all such cases, however, the changes would constitute only minor visual alterations, and the historic properties would not be adversely affected under the LPA, as determined by the FTA and concurred with by the SHPO (see Section 6.3).

While the project would not have direct impacts on historic properties, the project incorporates various amenities and landscape features to enhance the experience of residents, motorists, transit riders, cyclists, and pedestrians in the Van Ness Avenue corridor and visually blends the transportation improvements into the existing urban neighborhood setting in a manner that is compatible with its context and setting.

Opportunities for harmonizing the visual effects of project elements with adjacent historic properties will continue to be developed as the design consultation process goes forward. Design elements, appropriate lighting, compatible materials, and color choices that complement and do not visually compete or clash with the nearby historic properties and are sensitive with their surroundings will be identified. Design will be guided by the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (Standards) to the extent applicable. For all design elements along Van Ness Avenue, a consulting historic architect working on behalf of SFMTA will review project plans to assure design elements are compatible with the character-defining features of the historic district in terms of massing, size, scale, and architectural features.

The U.S. Department of the Interior's Standards, codified in 36 CFR, Part 68, are, according to the agency's website, "common sense principles in non-technical language [that] were developed to help protect our nation's irreplaceable cultural resources by promoting consistent preservation practices" (http://www.nps.gov/tps/standards.htm). The Standards are a series of concepts succinctly expressed about maintaining, repairing, and replacing historic materials, as well as about designing new additions or making alterations to historic resources, including related landscape features and the building's site and environment, including adjacent or related new construction.

Following are the Standards most relevant to the Van Ness Avenue BRT Project:

- The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
- New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
- New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

In this instance, where the project will not alter historic structures but will be located in proximity to historic structures, the Standards will serve as a guide to assure that new structures are compatible with and do not radically change, obscure, damage, or destroy character-defining materials or features associated with historic properties.

For the portion of the project located in the Civic Center Historic District, San Francisco ordinance requires the project to obtain a certificate of appropriateness from the San Francisco Historic Preservation Commission (SFHPC). To grant a certificate of appropriateness, the SFHPC will require compliance with the Secretary of Interior Standards, conformity with San Francisco General Plan policies outlined in Section 4.4.1.1 of this document, and compatibility with the character-defining features of the Civic Center Historic District, as described in the San Francisco ordinance designating this district. Elements of the streetscape design of the project that would be reviewed and approved by the SFHPC include the platform boarding areas and shelters, the replacement OCS support poles/streetlights within the Civic Center Historic District/War Memorial, landscaping, and related streetscape elements. The City Hall Preservation Advisory Commission also will review the proposed design elements in the Civic Center Historic District.

6.6 Coordination

The evaluation of historic and architectural resources began with the delineation of the APE. The SHPO reviewed and concurred with the adequacy of the historic and architectural APE delineated for the project alternatives on May 10, 2010 (see Appendix D for the APE exhibit maps and Appendix C for the SHPO concurrence letter). Many of the resources in the APE have been documented by previous local reconnaissance surveys, and some are listed as "significant" or "contributory" buildings in San Francisco's "Van Ness Avenue Area Plan." According to *San Francisco Preservation Bulletin 16:* "City and County of San Francisco Planning Department CEQA Review Procedures for Historic Resources," these types of previous ratings do not qualify as an adopted local register for the purposes of CEQA, and require further review. This further review was provided by submitting an advance copy of the Van Ness Avenue BRT HRIER and accompanying evaluation forms to the staff of the Historic Preservation Commission. As part of local agency coordination, an advance draft of this report was provided to the City of San Francisco Planning Department (Historic Preservation Commission staff) for review and comment. As the project corridor, Van Ness Avenue serves as US 101 through the City of San Francisco; a copy of the HPS was also provided to Caltrans for their review and comment. The SHPO concurred with the project's historic property eligibility findings by letter dated May 10, 2010 (see above).

The analysis of effects that may occur from implementation of the LPA (see Section 4.5.4.5) led the FTA, in cooperation with the SFCTA and in consultation with the SHPO, to determine that there would be no adverse effects under Section 106 (signifying that the NRHP eligibility status would not change for any of the historic properties). By letter dated May 17, 2013, the SHPO concurred with the finding of No Adverse Effect with Conditions that the project would not change the NRHP eligibility status for any of the seven significant historic and architectural properties in the APE, or for potential archaeological sites with the condition that the project proponents will produce detailed documentary research and a site treatment plan, if necessary, to identify and protect buried archaeological resources (see Section 4.5.4).

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CHAPTER SUMMARY: This chapter of the EIS/EIR summarizes environmental impacts of the project alternatives, including the LPA, pursuant to the California Environmental Quality Act (CEQA). CEQA requires that environmental documents determine significant or potentially significant impacts. While CEQA requires that identification of the level of significance for each impact be stated in an EIR, the National Environmental Policy Act (NEPA) regulations do not require such a discussion. Additionally, CEQA, unlike NEPA, does not require a discussion of socioeconomic effects except where they would result in physical changes and states that social or economic effects shall not be treated as significant effects. Therefore, because this is a joint NEPA/CEQA environmental document, this chapter differentiates the CEQA-specific impact findings and mitigation measures to clarify the distinctions for the reader.

CHAPTER 7

California Environmental Quality Act Evaluation

7.1 The Relationship between NEPA and CEQA

This combined EIS/EIR has been prepared in accordance with NEPA and CEQA, and related environmental statutes and regulations. While CEQA requires that identification of the level of significance for each impact be stated in an EIR, NEPA regulations do not require such a discussion. Because of this difference, the CEQA significance criteria and the determinations of significant impacts have not been included in other sections of this joint NEPA/CEQA document, but rather are identified and described in this chapter.

CEQA requires identification of the level of significance for each impact—NEPA regulations do not. The other sections of this joint NEPA/CEQA analysis follow NEPA impact finding requirements. The more detailed requirements of CEQA impact analysis are identified and described in this chapter.

7.2 Significance of the Proposed Project's Impacts under CEQA

This chapter of the EIS/EIR summarizes environmental impacts of the project alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), pursuant to CEQA. The analysis is conducted following the State CEQA Guidelines contained in Title 15, California Code of Regulations (CCR), sections 15000 *et seq*.

The CEQA impact levels consist of potentially significant impact, less than significant impact with mitigation, less than significant impact, and no impact. Please refer to the following reference documents for detailed discussions regarding determination of impacts under CEQA:

- CEQA Statutes: Division 13, California PRC, Sections 21000-21178.1 (http://www.ceres.ca.gov/topic/env_law/ceqa/stat/).
- CEQA Guidance: Title 14, Chapter 3, CCR, Sections 15000 *et seq*. (http://www.ceres.ca.gov/topic/env_law/ceqa/guidelines/).
- Major Environmental Analysis Division of the San Francisco Planning Department CEQA Initial Study Checklist.

CEQA requires that environmental documents determine significant or potentially significant impacts. The CEQA significance thresholds applicable to the proposed project are qualitative and quantitative. Some impact categories lend themselves to scientific or mathematical analysis and, therefore, to quantification. For other impact categories that are more qualitative or are dependent on changes to the existing setting, a hard-and-fast threshold is not generally feasible. In these cases, the definition of significant effects from the CEQA Guidelines (Section 15382), "a substantial adverse change in physical conditions," has been applied as the significance criterion. In addition, CEQA, unlike NEPA, does not require a discussion of socioeconomic effects except where they would result in physical changes and states that social or economic effects shall not be treated as significant effects (see CEQA Guidelines Sections 15064 (f) and 15131). Section 4(f) constructive use analysis is also not required by CEQA. For this reason, socioeconomic (community impacts and environmental justice) and Section 4(f) criteria are not included in Tables 7-1 and 7-2. In addition, the project would result in no impact to mineral resources, agricultural and forest resources, or wind resources; therefore, these disciplines are not included in Tables 7-1 and 7-2. Growth impacts are addressed under Population and Housing, and are discussed in detail in Section 4.3 Growth. Wind and shadow impacts are analyzed under Aesthetics. Cumulative impacts are summarized in Table 7-2, and are discussed in detail in Chapter 5 Cumulative Impacts. Irreversible and irretrievable commitment of resources is discussed in Section 4.16.

Questions, comments, and requests for additional information regarding CEQA significance thresholds may be addressed to:

Mr. Michael Schwartz, Senior Transportation Planner
San Francisco County Transportation Authority
1455 Market St., 22nd Floor
San Francisco, CA 94103
vannessbrt@sfcta.org

7.3 Findings of Significance under CEQA

Table 7-2 provides a summary of environmental impacts and their significance, as well as associated mitigation and improvement measures recommended for implementation by the project sponsor.

A summary of the significance thresholds applied in impact analysis is provided in Table 7-1. A summary of environmental impacts that would result under each project alternative, including the LPA, is provided in Table 7-2, broken down by impact category. A determination as to the significance of the impacts and associated mitigation measures and improvement measures recommended for implementation are also identified in Table 7-2. The improvement and mitigation measures summarized in Table 7-2 would be implemented by the project sponsor. The detailed discussion of impacts and associated improvement measures and mitigation measures is provided in Chapter 3, Transportation, and Chapter 4, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures.

All potentially significant impacts that would result from any of the project alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), can be mitigated to a less-than-significant level, except those related to transportation. These impacts are discussed below. The CEQA Mandatory Findings of Significance are presented in Table 7-3.

7.4 Mitigation Measures Pursuant to CEQA Impacts

DEFINITIONS

MITIGATION MEASURES: Measures required to address a potentially significant impact to make it less than significant.

IMPROVEMENT MEASURES: Measures recommended to reduce or avoid impacts that are identified as being less than significant; are often standard or best practices.

Analysis of each environmental factor in Chapters 3, 4, and 5 of this EIS/EIR includes discussion of the affected environment, environmental consequences (including permanent/project operational impacts, construction impacts, and cumulative impacts), and avoidance, minimization, and compensation measures for each project alternative. The avoidance, minimization, and compensation measures are identified in the following two categories: "improvement measures" and "mitigation measures." Mitigation measures are measures required to address a potentially significant impact. Improvement measures are measures recommended to reduce or avoid impacts that are identified as being less than significant and are often standard or best practices. Improvement measures may also include steps taken to achieve beneficial effects beyond best practices or permits requirements.

Table 7-1. CEQA Significance Criteria

IMPACT CATEGORY	CEQA SIGNIFICANCE THRESHOLD/MEASUREMENT	SOURCE
Aesthetics	The project would have a significant impact if it would: have a substantial effect on a scenic vista, obstruct publicly accessible views, or damage scenic resources; Substantially degrade the existing visual character or the quality of a site and its surroundings, or generate obtrusive light or glare that would adversely affect day and nighttime views or substantially affect other properties. A project would have a significant effect if it would result in substantial new shadow on public open space under the jurisdiction of the Recreation and Park Commission during the period from one hour after sunrise to one hour before sunset, at any time of the year. Or if it would cast shadow so that direct sunlight was not maintained on sidewalks as defined in San Francisco Planning Code Section 146.	• State CEQA Guidelines Appendix G • San Francisco Planning Department Initial Study Checklist • San Francisco General Plan • San Francisco Planning Code, Section 146 • San Francisco Better Streets Plan
Air Quality	A significant impact would occur if the project would: violate any ambient air quality standard (NAAQS or CAAQS) or obstruct implementation of the current BAAQMD Clean Air Plan; increase the number or frequency of violations of air quality standards; contribute substantially to an existing or projected air quality violations; expose sensitive receptors to substantial pollutant concentrations or cause objectionable odors affecting a substantial number of people.	• State CEQA Guidelines Appendix G • San Francisco Planning Department Initial Study Checklist • US EPA • BAAQMD, California Environmental Quality Act Air Quality Guidelines, May 2010, and CEQA Guidelines Update, Thresholds of Significance, Appendix D, June 2, 2010.
Greenhouse Gas Emissions	A project would have a significant impact if it would generate greenhouse gas emissions that either directly or indirectly have a significant impact on the environment; or conflict with applicable plan, policy or regulation adopted for the purpose of reducing greenhouse gas emissions. Climate change plans and policies include Climate Action Team Greenhouse Gas Reduction Strategies, Attorney General Greenhouse Gas Reduction Measures, and the California Air Resources Board AB 32 Scoping Plan.	• State CEQA Guidelines Appendix G • San Francisco Planning Department Initial Study Checklist • BAAQMD, California Environmental *Quality Act Air Quality Guidelines*, May 2010. • California Air Pollution Control Officers Association, CEQA & Climate Change, January 2008 • American Public Transportation Association, *Recommended Practice for Quantifying Greenhouse Gas Emissions from Transit*, August 2009.
Biological Resources	A project would have significant impact if there were a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or if there would be a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. A significant impact would also occur if the project were to substantially conflict with any local policies or ordinances protecting biological resources, such as natural areas or policies of the Open Space/Recreation Element or with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.	• State CEQA Guidelines Appendix G • San Francisco Planning Department Initial Study Checklist

Table 7-1. CEQA Significance Criteria

IMPACT CATEGORY	CEQA SIGNIFICANCE THRESHOLD/MEASUREMENT	SOURCE
Cultural Resources	A significant impact to cultural resources would occur if the project would have a substantial, adverse change to a historic resource (an archaeological site, historic architectural structure, or historic district). A "historic resource" is defined as a resource that is listed in or determined eligible for listing in the California Register of Historic Resources; listed in or determined eligible for listing in the National Register of Historic Places; one that is included as significant in a locally adopted register such as Article 10 and 11 of the San Francisco Planning Code or California Historical Landmarks and Points of Interest publications; or one determined by the lead agency to be historically significant. A resource that is deemed significant due to its identification in a historic resource survey that meets the criteria of Public Resources Code Section 5024.1(g) would be presumed a historic resource unless a preponderance of evidence demonstrates otherwise. A "substantial adverse change" is defined as demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be materially impaired (a major change to the defining elements of historic character). A project may be found to have a significant impact on an archeological resource if it would impair or have a substantial adverse change to a resource that has been deemed a "historical resource" or a "unique archeological resource" or where it can be demonstrated that there is a potential for the resource to significantly contribute to questions of scientific or historical importance. Destruction of a unique paleontological site or geological feature or disturbance of human remains would also be considered a significant impact of a project.	• State CEQA Guidelines Appendix G, Section 21084.1 and Section 15064.5 • San Francisco Planning Department Initial Study Checklist • San Francisco Preservation Bulletin 16: City and County of San Francisco Planning Department CEQA Review Procedures for Historic Resources • Advisory Council on Historic Preservation implementing regulations • National Historic Preservation Act
Geology and Soils	A significant impact would occur if the project would expose people or structures to major geologic hazards such as rupture of a known earthquake fault, strong seismic ground-shaking, liquefaction or landslides. A significant impact would also occur if the project resulted in substantial soil erosion, loss of topsoil or a substantial change in the topography of any unique geologic or physical features or if it were located on unstable or expansive soils so that there were substantial risks to life or property.	• State CEQA Guidelines, Appendix G • San Francisco Planning Department Initial Study Checklist
Hazards and Hazardous Materials	A significant impact would occur if the project would create a potential public health hazard involving the transport, use, production, or disposal of materials which pose a hazard to people or animal or plant populations; emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school; or be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code 65962.5 or within the area in San Francisco identified pursuant to Article 20 of the S.F. Health Code (Maher Area) and, as a result, would create a significant hazard to the public or the environment. A significant impact would also occur if the project would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation.	• State CEQA Guidelines, Appendix G • San Francisco Planning Department Initial Study Checklist • City and County of San Francisco Health Code • San Francisco General Plan

Table 7-1. CEQA Significance Criteria

IMPACT CATEGORY	CEQA SIGNIFICANCE THRESHOLD/MEASUREMENT	SOURCE
Hydrology and Water Quality	A significant impact would occur if the project would violate any water quality standards or waste discharge requirements, substantially change the existing drainage patterns, create or contribute substantially to runoff water that exceeds the existing or planned stormwater system or cause substantial flooding, erosion, or siltation, or would substantially degrade water quality, or would substantially degrade or deplete ground water resources.	• State CEQA Guidelines, Appendix G • San Francisco Planning Department Initial Study Checklist • San Francisco Better Streets Plan • SFPUC Keep it on Site Guide requirements • National Pollutant Discharge Elimination System (NPDES) Permit requirements
Land Use and Planning	A significant impact would occur if the project would physically divide an established community; have a substantial adverse impact upon the existing character of the project's vicinity or conflict with any applicable land use plan, policy or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	• State CEQA Guidelines, Appendix G • San Francisco Planning Department Initial Study Checklist • San Francisco General Plan
Noise and Vibration	Significant impacts would result if people are exposed to noise or vibration levels in excess of established standards. Standards established by FTA and the City are considered. The FTA thresholds were applied to determine impacts because the FTA Transit Noise and Vibration Impact Assessment (FTA, 2006) methodology and thresholds are the established method for evaluating noise and vibration impacts of transit improvements such as the proposed project. The generally accepted threshold for a clearly perceptible sound increase from stationary objects is 5 dB. "Section 2909. Noise Limits" from the City's municipal code (San Francisco, 2008) includes a 5-dB increase threshold for stationary objects. Accordingly, if this criterion was applied to the proposed project, an impact would occur if either project-generated noise along Van Ness Avenue or increased traffic volumes on parallel facilities such as Franklin and Gough streets resulted in a 5-dB or greater noise increase. The City does not specify a threshold for evaluating transportation noise. Nonetheless, the 5-dB increase was used as another factor in evaluating the noise effects of the BRT project on Van Ness Avenue. FTA Transit Noise and Vibration Impact Assessment criteria are used to evaluate vibration impacts. Evaluation of vibration impacts can be divided into two categories: (1) human annoyance, and (2) building damage. Per human annoyance criteria, the maximum vibration level cannot exceed 72 VdB for residences/hotels and 75 VdB for school buildings. For building damage criteria, the damage thresholds vary 0.12 from 0.5 in/sec depending on building type. Violation of the City Municipal Code noise regulation would be considered a significant impact. Per the City Municipal Code, construction activities are permitted between 7am and 8pm provided that operation of any powered construction equipment, regardless of age or date of acquisition, does not emit noise at a level in excess of 80 dBA when measured at a distance of 100 feet. Impact tools and equipment are exempt from this restriction if they are equipped with intake and exhaust mufflers recommended by the manufacturers thereof, and approved by the Director of Public Works. Non-emergency construction activities are not permitted during nighttime hours (8 pm to 7 am) if construction noise is more than 5 dB in excess of the ambient noise at the nearest property line, unless permission has been granted by the Director of Public Works.	• State CEQA Guidelines, Appendix G • San Francisco Planning Department Initial Study Checklist • FTA Transit Noise and Vibration Impact Assessment • FTA Transit Noise and Vibration Impact Assessment • Clear Perception Threshold in many publications, San Francisco Municipal Codes (Article 29: Regulation of Noise) • San Francisco Municipal Codes (Article 29: Regulation of Noise)

Table 7-1. CEQA Significance Criteria

IMPACT CATEGORY	CEQA SIGNIFICANCE THRESHOLD/MEASUREMENT	SOURCE
	Additionally, the City's Municipal Code Section 2909 considers a "clear perception" threshold of a 5-db increase above ambient noise conditions from a stationary source as being potentially, clearly perceived by receptors. Thus, a 5-db increase above ambient noise conditions on the project corridor or parallel streets receiving increased traffic volumes could be considered a potentially significant impact. Again, the City's Municipal Code Section 2909 has no intended transportation project application and is considered as a frame of reference since no such threshold for a transportation project has been established by the City of San Francisco.	
Population and Housing	A significant impact would occur if the project would directly or indirectly induce substantial population growth in an area or displace substantial numbers of existing housing units or residents, requiring the construction of replacement housing elsewhere. Unlike NEPA, CEQA does not require a discussion of socioeconomic effects, except where they would result in physical changes, and states that social or economic effects shall not be treated as significant effects unless there is a physical effect.	• State CEQA Guidelines, Appendix G Sections 15064(e) and 15131 • San Francisco Planning Department Initial Study Checklist
Public Services	A significant impact would occur if the project would: conflict with established recreational, educational or religious uses; conflict with adopted plans and goals of the community; or create additional demand for public service facilities, the expansion of which would result in significant environmental impact. A significant impact would occur if acceptable service ratios, response times or other performance objectives for fire, police, schools, parks or other public facilities would not be maintained, or if the project would increase the use of public facilities such that substantial physical deterioration would occur or be accelerated.	• State CEQA Guidelines, Appendix G. • San Francisco Planning Department Initial Study Checklist
Transportation and Circulation	A potentially significant impact to traffic circulation would occur if the project conflicts with applicable plans, ordinances or policies that establish measures of effectiveness for a circulation system, including all modes of transportation and on all transportation facilities, including streets, highways, pedestrian and bicycle paths and mass transit. Vehicular Traffic: A potentially significant traffic congestion impact would occur if the project conflicts with applicable congestion management program, including level of service standards and travel demand measures, and other standards for designated roads. The operations method of the 2000 Highway Capacity Manual shall be used in the analysis of intersections, unless otherwise noted. The San Francisco Planning Department's Traffic Impact Analysis criteria for significant impact at intersections is based on intersection level of service (LOS)and is applicable to developmental projects in San Francisco. Based on the SFCTA staff input, these guideline criteria were modified to gauge significant impacts by a transportation improvement project in the City of San Francisco. The operational impact on signalized intersections is considered significant when project-related traffic causes the intersection level of service to deteriorate from LOS D or better in Baseline to LOS E or F, or from LOS E to LOS F in with Project scenario. The project may result in significant adverse impacts at intersections that operate at LOS E or F under Baseline conditions depending upon the magnitude of the project's contribution to the worsening of the average delay per vehicle. Based on the input from SFCTA staff, the significance criteria for intersections that remain at LOS E or F was defined as follows:	• State CEQA Guidelines, Appendix G. • San Francisco Planning Department Initial Study Checklist • San Francisco Traffic Impact Analysis Guidelines for Environmental Review (2002) • 2000 Highway Capacity Manual • San Francisco Blue Book, Uniform Traffic Control Devices and related SFDPW Codes governing construction in roadways. • San Francisco Better Streets Plan • San Francisco Bicycle Plan • San Francisco General Plan • San Francisco Countywide Transportation Plan • MUNI Short-Range Transit Plan • San Francisco Transit First Policy & Complete Streets Plan

Table 7-1. CEQA Significance Criteria

IMPACT CATEGORY	CEQA SIGNIFICANCE THRESHOLD/MEASUREMENT	SOURCE
	• If the project traffic is less than 5 percent of the total growth in traffic between existing conditions and with project scenarios, then the project does not have a significant impact. • If the project traffic is greater than 5 percent of the total growth in traffic between existing conditions and the with-project scenarios, then the contribution of project traffic to critical movements at that intersection is calculated. If the project traffic is less than 5 percent of the total growth in critical movement traffic between existing conditions (2007) and the with-project scenarios, then the Project does not have a significant impact. Otherwise, the project has a significant impact. A project would result in a significant impact if it would substantially change traffic circulation patterns creating an unusual safety hazard, or result in inadequate emergency access. A project would result in a significant impact if it would conflict with adopted polices and plans for public transit, bicycle and pedestrian facilities, or otherwise decrease the performance or safety of such facilities. <u>Transit:</u> Potentially significant impacts would occur if a project would conflict with transit supportive policies in the San Francisco Countywide Transportation Plan, MUNI Short-Range Transit Plan, and San Francisco Transit First Policy & Complete Streets Plan. Also, national standard guidelines for transit platform crowding of 5 square feet per person were applied (which are more than twice as strict as the San Francisco guidelines). <u>Non-Motorized Transportation:</u> Potentially significant non-motorized impacts would occur if the project conflicts with City-adopted policies regulating the design and development of the pedestrian realm or the bicycle system. City adopted policies, include the San Francisco Better Streets Plan, the San Francisco Bicycle Plan, Transit First Policy and Complete Streets policy. These policies deal with improving the safety and security of non-motorized transport modes, extending existing bicycle and pedestrian networks, but also ensuring legally-mandated accessibility requirements for public rights-of-way, as well as facilitating convenient and easy access to transit. San Francisco Transportation Impact Analysis Guidelines for Environmental Review provide the following discrete guidelines, applicable to the proposed project, to determine impacts: (i) extent of potential conflicts between bicycle and pedestrians and motor vehicles; (ii) presence of ingress and egress accessible to disabled, including curb cuts, ramps, or other on-street aids; and (iii) pedestrian crossing conditions. Regulations for Working in San Francisco Streets outline specific regulations for contractors to be in compliance to avoid any impacts during the construction phase. A project could result in a significant impact if, during the construction phase, the project did not comply with the regulations set pertaining to Sidewalk Closures (Section 5) and Bicycle Routes (Section 9). <u>Parking:</u> A project would result in a potentially significant impact if it would result in inadequate parking capacity. San Francisco does not consider parking supply as part of the permanent physical environment as defined by CEQA, and considers parking deficits to be social effects. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts	

Table 7-1. CEQA Significance Criteria

IMPACT CATEGORY	CEQA SIGNIFICANCE THRESHOLD/MEASUREMENT	SOURCE
	that could be triggered by a social impact. (CEQA Guidelines § 15131(a).) The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. Secondary environmental impacts which may result from a shortfall in parking in the vicinity of the proposed project are included and addressed in traffic assignments used in the transportation analysis, as well as in the associated air quality, noise and pedestrian safety analyses.	
Utilities and Service Systems	A significant impact would occur if the project would conflict with wastewater treatment requirements of the Bay Area Regional water Quality Control Board or require or result in the construction of new water or wastewater treatment facilities or new storm water drainage facilities the construction of which would cause significant environmental effects. A significant impact would also occur if there were not sufficient water, wastewater treatment or landfill facilities available to serve the projects needs. A significant impact would occur if the project would encourage activities which result in the use of large amounts of fuel, water or energy; or use fuel, water, or energy in a wasteful manner.	• State CEQA Guidelines, Appendix G. • San Francisco Planning Department Initial Study Checklist

When impacts were found to be potentially significant, as determined under CEQA, then mitigation measures were developed to reduce the impacts to a less than significant level. CEQA requires that each significant effect on the environment resulting from the project be identified and, to the extent feasible, mitigated. All mitigation measures and improvement measures are summarized in Table 7-2.

Table 7-2: Summary of Environmental Impacts under CEQA

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Aesthetics/ Visual Resources <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impact.</u> Less than significant impacts to aesthetics would result from temporary visual disruptions by construction activity, such as signage, soil stockpiles, and construction equipment. Nighttime construction would require artificial lighting, which would be minimized in residential areas and set up to avoid significant light and glare impacts on adjacent residential properties. *Improvement Measures:* IM-AE-C1: During project construction, SFMTA will require the contractor to maintain the site in an orderly manner, removing trash and waste, and securing equipment at the close of each day's operation. IM-AE-C2: To reduce glare and light used during nighttime construction activities, SFMTA will require the contractor to direct lighting onto the immediate area under construction only and to avoid shining lights toward residences, nighttime commercial properties, and traffic lanes.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.
Aesthetics/ Visual Resources <u>Operation</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Mitigation measures will be implemented to address impacts to visual character and scenic resources resulting from the following project features: replacement of the existing OCS support pole/streetlight network with taller network that meets current sidewalk and roadway lighting standards and can accommodate the BRT OCS loads, introduction of BRT stations and streetscape features, and reconstruction of the Van Ness Avenue median and implementation of new BRT stations adjacent to the sidewalk, which would involve removal of approximately 14 percent of existing sidewalk and median trees. *Mitigation Measures:* M-AE-1: Design sidewalk lighting to minimize glare and nighttime light intrusion on adjacent residential properties and other properties that would be sensitive to increased sidewalk lighting. M-AE-2: Design and install a replacement OCS support pole/streetlight network that (1) retains the aesthetic function of the existing network as a consistent infrastructural element along Van Ness Avenue, (2) assures a uniform architectural style, character, and color throughout the corridor that is compatible with the existing visual setting, and (3) retains the architectural style of the original OCS support pole/streetlight network. Within the Civic Center Historic District, design the OCS support pole/streetlight network to comply with the Secretary of Interior's Standards for the Treatment of Historic Properties and be compatible with the character of the historic district as described in the Civic Center Historic District designating ordinance as called for by the San Francisco Planning Code. M-AE-3: To the extent that the project alters sidewalk and median landscaping, design and implement a project landscape design plan, including tree type and planting scheme for median BRT stations and sidewalk plantings, that replaces removed landscaping and re-establishes high-quality landscaped medians and a tree-lined corridor. To the extent feasible, use single species street trees and overall design that provides a sense of identity and cohesiveness for the corridor. Place new trees close to corners, if feasible, for visibility. The project landscape design plan will require review and approval by the San Francisco Arts Commission, as well as review and approval by the SFDPW, as part of their permitting of work in the street ROW, which ensures consistency with the San Francisco Better Streets Plan. The median landscape design plan within the Civic Center Historic District will be reviewed by the San Francisco HPC and the City Hall Preservation Advisory Commission. A Certificate of Appropriateness must be obtained from the HPC for the landscape plans within the Civic Center Historic District. M-AE-4: Design and install landscaped medians so that median design promotes a unified, visual concept for the Van Ness Avenue corridor consistent with policies in the Van Ness Area Plan, Civic Center Area Plan, and San Francisco Better Streets Plan. This design goal for a unified, visual concept will be balanced with the goal of preserving existing trees; thus, new tree plantings would be in-filled around preserved trees. M-AE-5: Design and install a project BRT station and transitway design plan (including station canopies, wind turbines and other features) that is consistent with applicable City design policies in the San Francisco General Plan and San Francisco Better Streets Plan; and for project features located in the Civic Center Historic District, apply the Secretary of Interior's Standards for the Treatment of Historic Properties, Planning Code Article 10, Appendix J pertaining to the Civic Center Historic District, and other applicable guidelines, local interpretations, and bulletins concerning historic resources. Review and approval processes supporting this measure include: (1) San Francisco Art Commission	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2, except 25 percent of existing trees would be removed, all of them along the median. The same mitigation measures as Build Alternative 2 would be implemented.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2, except 15 percent of existing trees would be removed. The same mitigation measures as Build Alternative 2 would be implemented.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 4.	Same as Build Alternative 2, except 19 percent of existing trees would be removed. The same mitigation measures as Build Alternative 2 would be implemented.

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Table 7-2: Summary of Environmental Impacts under CEQA

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		approval of the station and transitway design plan as part of its review of public structures; (2) SFDPW approval of the station and transitway design plan as part of its permitting of work in the street ROW, which will include review for consistency with the San Francisco Better Streets Plan; (3) HPC approval of the portion of the station and transitway design plan located within the Civic Center Historic District as part of granting a Certificate of Appropriateness; and (4) City Hall Preservation Advisory Commission and City Planning Department advisement on design to HPC. M-AE-6: Context-sensitive design of BRT station features will be balanced with the project objective to provide a branded, cohesive identity for the proposed BRT service. The following design objectives that support planning policies described in Section 4.4.1 will be considered in BRT station design and landscaping: • Architectural integration of BRT stations with adjacent Significant and Contributory Buildings through station canopy placement, materials, color, lighting, and texture, as well as the presence of modern solar paneling and wind turbine features to harmonize project features with adjacent Significant and Contributory Buildings. • Integration of BRT stations and landscaping with existing and proposed streetscape design themes within the Civic Center Historic District. Within the Civic Center Historic District in conformance with the Secretary of Interior's Standards for the Treatment of Historic Properties and compatible with the character of the historic district as described in the Civic Center Historic District designating ordinance as called for by the San Francisco Planning Code. • Marking the intersection of Van Ness Avenue and Market Street as a visual landmark and gateway to the city in design of the Market Street BRT station.					
Aesthetics/ Visual Resources Cumulative	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.
Air Quality Construction	No impact.	Less than significant impact with mitigation. Construction activity would result in a less than significant impact under CEQA due to exceedances of nitrogen oxide (NOx) emissions. Implementation of Bay Area Air Quality Management District (BAAQMD) control measures would reduce this impact to a less than significant level. *Mitigation Measures:* M-AQ-C1: Construction contractors shall implement the BAAQMD *Basic Construction Mitigation Measures* listed in Table 4.15-4 and the applicable measures in the *Additional Construction Mitigation Measures*. This includes Measure 10 in the *Additional Construction Mitigation Measures*. M-AQ-C2: Construction contractors shall comply with BAAQMD Regulation 11 (Hazardous Pollutants) Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). The requirements for demolition activities include removal standards, reporting requirements, and mandatory monitoring and record keeping.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Air Quality Operation	Less than significant impact.	Less than significant impact. Localized carbon monoxide (CO) concentrations would result in less-than-significant impacts. An analysis of emissions from idling vehicles during peak congestion period at the most congested intersection showed idle emissions would be well below the State standards after implementation of the BRT in year 2035 traffic conditions. TAC emissions would result in a less-than-significant impact under CEQA. The project would not increase toxic air contaminant (TAC) emissions. The proposed BRT would reduce regional operational emissions, resulting in a beneficial impact .Localized CO concentrations associated with each of the alternatives would not exceed State ambient air quality standards, and all alternatives would be consistent with the BAAQMD regional air quality plans. The project would reduce the volume of cars by providing the public with alternative means of transportation, which results in lower Citywide vehicle miles traveled (VMT), reducing regional operational emissions.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.
Air Quality Cumulative	No cumulative impacts.	Less than significant impact with mitigation. Mitigation Measures M-AQ-C1 and M-AQ-C2 would avoid significant, cumulative air quality impacts during construction of the proposed project and other planned projects in the vicinity.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.

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Greenhouse Gas Emissions Operation	No impact.	No impact. The proposed project would decrease automobile VMT and associated greenhouse gas emissions compared to baseline conditions, and it would cause a beneficial global warming impact.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.
Greenhouse Gas Emissions Cumulative	No cumulative impacts.	No cumulative impacts. Transit projects, like the proposed project, reduce the volume of cars resulting in overall reduction in greenhouse gas emissions.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.
Biological Environment Construction	No impact.	Less than significant impact with mitigation. Less than significant impacts to trees and nesting birds would result from temporary construction activity the disturbance of bird nests during breeding season. Mitigation measures will avoid disturbance of protected bird nests during breeding season, and require measures to preserve tree health during construction. Mitigation measures are required to address potential impacts to trees and nesting birds during project construction. *Mitigation Measures:* M-BI-C1: Best Management Practices (BMPs) identified in tree protection plans and tree removal permits resulting from the preconstruction tree survey will be implemented to preserve the health of trees during project construction. M-BI-C2: Disturbance of protected bird nests during the breeding season will be avoided. Tree and shrub removal will be scheduled during the non-breeding season (i.e., September 1 through January 31), as feasible. If tree and shrub removal are required to occur during the breeding season (i.e., February 1 through August 31), then the following measures will be implemented to avoid potential adverse effects to nesting birds: A qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitats within 500 feet of construction activities where access is available. Exclusionary structures (e.g., netting or plastic sheeting) may be used to discourage the construction of nests by birds within the project construction zone. A preconstruction survey of all accessible nesting habitats within 500 feet of construction activities is required to occur no more than 2 weeks prior to construction. If preconstruction surveys conducted no more than 2 weeks prior to construction identify that protected nests are inactive or potential habitat is unoccupied during the construction period, then no further mitigation is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by protected birds or that are located outside the no-disturbance buffer for active nests may be removed. If active protected nests are found during preconstruction surveys, then the project proponent will create a no-disturbance buffer (acceptable in size to the California Department of Fish and Wildlife [CDFW]) around active protected bird and/or raptor nests during the breeding season, or until it is determined that all young have fledged. Typical buffers include 500 feet for raptors and 50 feet for passerine nesting birds. The size of these buffer zones and types of construction activities restricted in these areas may be further modified during consultation with CDFW, and it will be based on existing noise and human disturbance levels at the project site. Nests initiated during construction are presumed to be unaffected, and no buffer will be necessary; however the "take" (e.g., mortality, severe disturbance to) of any individual protected birds will be prohibited. Monitoring of active nests when construction activities encroach upon established buffers may be required by CDFW.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.

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Biological Environment Operation	No impact.	Less than significant impact. Less than significant impacts would result from removal of existing trees and landscaping. Build Alternative 2 would result in the removal of some median and sidewalk trees within the project limits. Replacement trees would be planted. Benefits of mature tree canopies would be reduced until new plantings mature, and replacement trees would not offer the same width canopy of many existing trees due to the OCS clearance requirements. The project would offset these impacts by planting more trees in the Van Ness corridor than currently present, resulting in less than significant impacts. *Improvement Measures:* Potential disturbance to migratory birds during project construction and tree removal is discussed in Section 4.15.11, Construction Impacts. To minimize impacts from removal of existing trees and landscaping, the following improvement measures and permit requirements would be incorporated into project design for each build alternative, including Design Option B: IM-BI-1: In compliance with local tree protection policies, mature trees shall be preserved and incorporated into the project landscape plan as feasible. Planting of replacement trees and landscaping will be incorporated into the landscape plan as feasible (also refer to mitigation measure M-AE-3, addressing aesthetic/visual impacts). IM-BI-2: A certified arborist will complete a preconstruction tree survey to identify protected trees that will be potentially impacted by the proposed project, and to determine the need for tree removal permits and tree protection plans under San Francisco Public Works Code requirements. IM-BI-3: In compliance with the Executive Order on Invasive Species, E.O. 13112, the landscaping included in the proposed project would not use species listed as noxious weeds.	Less than significant impact. Build Alternative 3 would likely result in the removal of all median trees within the project limits, Replacement trees would be planted in the median. Sidewalk trees would not be affected under this alternative. Benefits of mature tree canopies would be reduced until new plantings mature, and replacement trees would not offer the same width canopy of many existing trees due to the OCS clearance requirements. The project would offset these impacts by planting more trees in the Van Ness corridor than currently present, and implementation of Improvement Measures IM-BI-1, IM-BI-2 and IM-BI-3 listed under Build Alternative 2, resulting in less than significant impacts.	Less than significant impact. Same as Build Alternative 3.	Less than significant impact Build Alternative 4 would result in the removal of approximately 64 median trees, or 15 percent of median trees within the project limits. Sidewalk trees would not be affected. Replacement trees would be planted. Benefits of mature tree canopies would be reduced until new plantings mature, and replacement trees would not offer the same width canopy of many existing trees due to the OCS clearance requirements. The project would offset these impacts by planting more trees in the Van Ness corridor than currently present, and implementation of Improvement Measures IM-BI-1, IM-BI-2 and IM-BI-3 listed under Build Alternative 2, resulting in less than significant impacts.	Less than significant impact. Same as Build Alternative4.	Less than significant impact. The LPA would result in the removal of approximately 90 median trees, or 82 percent of median trees within the project limits. Approximately 95 new median trees would be planted. Sidewalk trees would not be affected. Replacement trees would be planted. Benefits of mature tree canopies would be reduced until new plantings mature, and replacement trees would not offer the same width canopy of many existing trees due to the OCS clearance requirements. The project would offset these impacts by planting more trees in the Van Ness corridor than currently present, and implementation of Improvement Measures IM-BI-1, IM-BI-2 and IM-BI-3 listed under Build Alternative 2, resulting in less than significant impacts.
Biological Environment Cumulative	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.
Cultural Resources Construction	No impact.	Less than significant impact with mitigation. Less than significant impacts would occur to significant historic and architectural properties. Excavation work would occur within the Van Ness Avenue ROW, where there is a low probability of uncovering significant archaeological deposits. Implementation of mitigation measures are required to address potential impacts to archaeological resources and human remains that may be encountered during project construction.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.

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		Mitigation Measures: M-CP-C1: Focused archival research will identify specific areas within the APE that are likely to contain potentially significant remains. Methods and findings will be documented as an addendum to the 2009 survey and sensitivity assessment (Byrd *et al.,* 2013). Research will be initiated once the project's APE map is finalized identifying the major Areas of Direct Impact (the stations and sewer relocation). Many documents, maps, and drawings cover long stretches of Van Ness Avenue, while other locations may be researched if documents indicate potential sensitivity in adjacent areas. The Addendum Survey Report will include the following: • A contextual section that addresses the development of urban infrastructure along Van Ness Avenue, as well as widening and grading activities along the thoroughfare. This overview will provide a basis for evaluating potential resources as they relate to the history of San Francisco and to its infrastructure. • Documentary research that identifies the types of documents available for the identified station locations: street profiles for grading, street widening maps showing demolished building sites, utility work plans, and others as appropriate. This will include researching various archives and records of public agencies in both San Francisco and Oakland (Caltrans). • Locations apt to have historic remains present within select areas of the APE (i.e., not removed by later grading or construction). • A cut-and-fill reconstruction of the entire APE corridor, comparing the modern versus mid-1800s ground surface elevations, to fine-tune the initial prehistoric sensitivity assessment and refine the location of high-sensitivity locations where prehistoric remains may be preserved. • Relevant profiles and plan views of specific blocks to illustrate the methods used in analyzing available documentation. • Summary and conclusions to provide detailed information on locations that have the potential to contain extant prehistoric archaeological and historic-era remains that might be evaluated as significant resources, if any. Two results are possible based on documentary research: • No or Low Potential for Sensitive Locations – Major Areas of Direct Impact have no potential to retain extant archaeological remains that could be evaluated as significant resources. No further work would be recommended, beyond adherence to the Inadvertent Discovery Plan (M-CP-3). • Potentially Sensitive Locations – If the major Areas of Direct Impact contain locations with a moderate to high potential to retain extant historic or prehistoric archaeological remains that could be evaluated as significant resources, further work would be carried out, detailed in a Testing and Treatment Plan (see M-CP-2). The Phase I addendum report will be submitted to the SHPO for review and concurrence prior to initiation of construction. M-CP-C2: The Testing/Treatment plan, if required, would provide archaeological protocols to be employed immediately prior to project construction to test areas identified as potentially significant or having the potential to contain buried cultural resources. If such areas might be unavoidable, mitigation measures would be proposed. For historic-era resources, work would initially entail detailed, focused documentary research to evaluate the potential significance of any archaeological material identified during initial research that might be preserved. Significance would be based on the data-potential of possible remains applied to accepted research designs. Two results could ensue: • No Potentially Significant Remains. If no locations demonstrate the potential for significant remains, no further archaeological testing would be recommended. • Potentially Significant Remains. If any locations have the potential to contain significant remains, then appropriate field methods will be proposed, including compressed testing and data-recovery efforts. Testing will be initiated immediately prior to construction, when there is access to historic ground levels. Should a site or site feature be found and evaluated as potentially significant, mitigation in the form of data recovery will take place immediately upon discovery should avoidance of the site not be possible.					

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		If required for prehistoric resources, a Treatment Plan would identify relevant research issues for resource evaluation, and pragmatic field methods to identify, evaluate, and conduct data recovery if needed. This could include a pre-construction geoarchaeological coring program or a compressed three-phase field effort occurring prior to construction, when the ground surface is accessible. The procedures detailed in the Treatment Plan would be finalized in consultation with the SHPO. A Phase 2 Test/Phase 3 Mitigation report will document all testing and data-recovery excavation methods and findings. M-CP-C3: If buried cultural resources are encountered during construction activities, pursuant to 36 CFR 800.13, construction would be halted and the discovery area isolated and secured until a qualified professional archaeologist assesses the nature and significance of the find. Unusual, rare, or unique finds—particularly artifacts or features not found during data recovery—could require additional study. Examples of these would include the following: • Any bone that cannot immediately be identified as non-human. • Any types of intact features (e.g., hearths, house floors, cache pits, structural foundations, etc.). • Artifact caches or concentrations. • Rare or unique items (i.e., engraved or incised stone or bone, beads or ornaments, mission-era artifacts). • Archaeological remains that are redundant with materials collected during testing or data recovery and that have minimal data potential need not be formally investigated. This could include debitage; most flaked or ground tools, with the exception of diagnostic or unique items (e.g., projectile points, crescents); shell; non-human bone; charcoal; and other plant remains. • Diagnostic and unique artifacts unearthed during construction would be collected and their origins noted. Artifact concentrations and other features would be photographed, flotation/soils/radiocarbon samples taken (as appropriate), and locations mapped using a GPS device. Upon discovery of deposits which may constitute a site, the agency official shall notify the State Historic Preservation Officer (SHPO) and any Indian tribe that might attach religious and cultural significance to the affected property. The notification shall describe the agency official's assessment of National Register eligibility of the property and proposed actions to resolve the adverse effects (if any). The SHPO, Indian tribe, and Advisory Council on Historic Preservation (the Council) shall respond within 48 hours of the notification. The agency official shall take into account their recommendations regarding National Register eligibility and proposed actions, and then carry out appropriate actions. The agency official shall provide the SHPO, Indian tribe, and the Council a report of the actions when they are completed. The above activities could be carried out quickly and efficiently, with as little delay as possible to construction work. The methods and results of any excavations would be documented, with photographs, in an Addendum Report. Any artifacts collected would be curated along with the main collection. Samples would be processed in a lab and analyzed, or curated with the collection for future studies, at the discretion of the project proponent. If major adjustments are made to the final project design, a qualified professional archaeologist should be consulted before work begins to determine whether additional survey, research, and/or geoarchaeological assessments are needed. M-CP-C4: If human remains are discovered during project construction, the stipulations provided under Section 7050.5 of the State Health and Safety Code will be followed. The San Francisco County coroner would be notified as soon as is reasonably possible (CEQA Section 15064.5). There would be no further site disturbance where the remains were found, and all construction work would be halted within 100 feet of the discovery. If the remains are determined to be Native American, the coroner is responsible for contacting the California Native American Heritage Commission within 24 hours. The Commission, pursuant to California Public Resources Code Section 5097.98 would notify those persons it believes to be the MLD. Treatment of the remains would be dependent on the views of the MLD.					

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Cultural Resources Operation	No impact.	Less than significant impact. Less than significant impacts would occur to significant historic and architectural properties. No impacts to archaeological resources would result during project operation. Mitigation measures M-AE-2, M-AE-3, M-AE-5, and M-AE-6, presented in Section 4.4.4, and in this table under Aesthetics/Visual Resources, ensure compatibility of the BRT project with historic elements such as the Civic Center Historic District.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.
Cultural Resources Cumulative	No cumulative impacts.	No cumulative impacts.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.
Geology/Soils/ Seismicity/ Topography Construction	No impact.	Less than significant impact with mitigation. Mitigation measures are required to avoid slope instability impacts during project construction. *Mitigation Measures:* M-GE-C1: All cuts deeper than 5 feet must be shored (AGS, 2009a). Shoring design of open excavations must be completed in consideration of the surcharge load from nearby structures, including an examination of the potential for lateral movement of the excavation walls as a result. The following construction BMPs related to shoring and slope stability will be implemented: • Heavy construction equipment, building materials, excavated soil, and vehicle traffic shall be kept away from the edge of excavations, generally a distance equal to or greater than the depth of the excavation. • During wet weather, storm runoff shall be prevented from entering the excavation. Excavation sidewalls can be covered with plastic sheeting, and berms can be placed around the perimeter of the excavated areas. • Sidewalks, slabs, pavement, and utilities adjacent to proposed excavations shall be adequately supported during construction.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Geology/Soils/ Seismicity/ Topography Operation	No impact.	No impact. The project would not result in soil erosion, and project design would avoid potential seismic hazards. There are no substantial geologic hazard impacts that would not be fully addressed by design requirements. *Improvement Measures:* IM-GE-1: Localized soil modification treatments will be performed as needed at locations where station platforms would be located in areas of fill or areas mapped as a liquefaction area. Such soil modification may include soil vibro-compaction or permeation grouting. IM-GE-2: Fill soils will be overexcavated and replaced with engineered fill as needed in areas where proposed project structures would be located in areas of fill or in liquefaction zones. IM-GE-3: Deeper foundations will be designed for station platforms and canopies located in areas of fill or areas mapped as a liquefaction area, as needed.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.	No impact. Same as Build Alternative 2.
Geology/Soils/ Seismicity/ Topography Cumulative	No cumulative impacts.	No cumulative impacts.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.	No cumulative impacts. Same as Build Alternative 2.
Hazardous Waste/ Materials Construction	No impact.	Less than significant impact with mitigation. Mitigation measures are required to avoid and minimize hazardous materials exposure during project construction. *Mitigation Measures:* M-HZ-C1: A Worker Site Health and Safety Plan will be created with the following components, in response to potential recognized environmental conditions (RECs) identified in the Phase II review or other follow-up investigations, and results from preconstruction lead-based paint (LBP) and aerially deposited lead (ADL) surveys specified in Sections 4.8.3 and 4.8.4: • A safety and health risk/hazards analysis for each site task and operation in the work plan; • Employee training assignments; • Personal protective equipment requirements;	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.

[1] The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

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ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		• Medical surveillance requirements; • Air monitoring, environmental sampling techniques, and instrumentation; • Safe storage and disposal measures for encountered contaminated soil, groundwater, or debris, including temporary storage locations, labeling, and containment procedures. • Emergency response plan; and • Spill containment program. M-HZ-C2: Procedures will be included in the project Storm Water Pollution Prevention Plan (SWPPP) to contain any possible contamination, including protection of storm drains, and to prevent any contaminated runoff or leakage either into or onto exposed ground surfaces, as specified in Section 4.15.8, Hydrology and Water Quality Construction Impacts. M-HZ-C3: Necessary public health and safety measures will be implemented during construction.					
Hazardous Waste/ Materials Operation	No impact.	Less than significant impact with mitigation. Mitigation measures are required to reduce or eliminate hazardous materials-related impacts from ADL, LBP, and nearby database listed, hazardous materials sites. *Mitigation Measures:* M-HZ-1: Phase II review, or follow-up investigation, for identified recognized environmental conditions (RECs) will be conducted prior to construction, including: • Field surveys of identified RECs to verify the physical locations of the REC sites with respect to the preferred build alternative project components and proposed construction earthwork, and observe the current conditions of the sites. • A regulatory file review for each identified REC to determine the current status of the sites and, if possible, the extent of the contamination. If the aforementioned field survey and file review reveal a likelihood of encountering contaminated soil or groundwater during project construction, then a subsurface exploration will be conducted within the areas proposed for construction earthwork activities. The subsurface investigation will be conducted within the project limits, adjacent to, or downgradient from the REC sites. If soil profiling reveals contaminant concentrations that meet the definition of hazardous materials, then the project contractor will be required to address the management of various hazardous materials and wastes in the Construction Implementation Plan, consistent with the federal and state of California requirements pertaining to hazardous materials and wastes management. M-HZ-2: Soils in landscaped medians that will be disturbed by project activities will be tested for ADL according to applicable hazardous material testing guidelines. If the soil contains extractible lead concentrations that meet the definition of hazardous materials, then a Lead Compliance Plan to be approved by Caltrans will be required prior to the start of construction or soil-disturbance activities. If lead levels present in surface soils reach concentrations in excess of the hazardous waste threshold, then onsite stabilization or disposal at a Class 1 landfill may be required, which will be specified in the Lead Compliance Plan. M-HZ-3: Paint used for traffic lane striping and on streetscape features, including the OCS support poles/streetlights, will be tested for LBP prior to demolition/removal to determine proper handling and disposal methods during project construction. If lead is detected, then appropriate procedures will be included in the Construction Implementation Plan to avoid contact with these materials or generation of dust or vapors.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.
Hazardous Waste/ Materials Cumulative	No cumulative impacts.	Less than significant impact with mitigation. Mitigation Measures M-HZ-C1 through M-HZ-C3 would avoid significant, cumulative impacts from hazardous materials exposure during construction of the proposed project and other planned projects in the vicinity.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.	Less than significant impact with mitigation. Same as Build Alternative 2.

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Water Quality and Hydrology <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impacts.</u> Compliance with permit requirements and standard best practices would avoid significant impacts to water quality during construction. *Improvement Measures:* IM-HY-C1: Preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) during project construction will minimize or avoid significant impacts to water quality. Completion of an SWPPP for the National Pollutant Discharge Elimination System (NPDES) General Permit will be required for construction of each build alternative and for earthwork activities under the No Build Alternative, such as the OCS support pole/streetlight replacement and repaving activities. The SWPPP will address water quality impacts associated with construction activities, including identification of all drainage facilities onsite, placement of appropriate stormwater and non-stormwater pollution controls, erosion and sediment control and best management practices (BMPs), spill response and containment plans, inspection scheduling, maintenance, and training of all construction personnel onsite. The SWPPP will specify how construction-related stormwater impacts can be mitigated throughout the project site through practices such as: • The appropriate treatment of overflow stormwater during construction, including inlet protection devices, temporary silt fencing, soil stabilization measures, street sweeping, stabilized construction entrances, and temporary check dams. • Lining storage areas. • Proper and expeditious disposal of items to be removed, such as landscaping, curb bulb waste, existing bus stop shelters, and demolished OCS support poles/streetlights and signal poles. IM-HY-C2: Any construction work that impacts the combined sewer system (CSS) will require coordination with the San Francisco Public Utilities Commission (SFPUC), and construction-related activities shall conform to the "Keep it on Site" guide (SFPUC, 2009). IM-HY-C3: If groundwater is encountered during project excavation activities, the water will be pumped from the excavated area and contained and treated in accordance with all applicable State and federal regulations before being discharged to the existing local CSS. A batch discharge permit from SFPUC will be required prior to commencement of discharge to the CSS.	<u>Less than significant impacts.</u> Same as Build Alternative 2.	<u>Less than significant impacts.</u> Same as Build Alternative 2.	<u>Less than significant impacts.</u> Same as Build Alternative 2.	<u>Less than significant impacts.</u> Same as Build Alternative 2.	<u>Less than significant impacts.</u> Same as Build Alternative 2.
Water Quality and Hydrology <u>Operation</u>	<u>No impact.</u>	<u>No impact.</u> The project would slightly increase pervious surface area and improve drainage and runoff water quality. *Improvement Measures:* IM-HY-1: Landscape areas provided by the project will be designed to minimize and reduce total runoff. The overuse of water and/or fertilizers on landscaped areas will be avoided. IM-HY-2: Opportunities to incorporate stormwater management tools set forth in the *San Francisco Better Streets Plan* will be investigated for implementation as project design progresses. Streetscape geometry, topography, soil type and compaction, groundwater depth, subsurface utility locations, building laterals, maintenance costs and safety, and pedestrian accessibility will be major considerations in determining the feasibility of implementing stormwater management tools. Permeable paving, infiltration planters, swales, and rain gardens will be considered. IM-HY-3: In compliance with the City Integrated Pest Management Policy (City Municipal Code, Section 300), prevention and non-chemical control methods will be employed in maintaining landscaping in the Van Ness Avenue corridor, including monitoring for pests before treating, and using the least-hazardous chemical pesticides, herbicides, and fertilizers only when needed and as a last resort. IM-HY-4: Proposed BRT stations will be equipped with trash receptacles to minimize the miscellaneous waste that may enter the storm drain system and clog storm drains or release pollutants.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Water Quality and Hydrology <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>Less than significant impact.</u> Compliance with permit requirements and standard best practices would avoid significant cumulative impacts to water quality during construction of the proposed project and other planned projects in the vicinity.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.

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Land Use Construction	No impact.	Less than Significant impact. Construction would not change land uses or displace properties. Construction planning would minimize nighttime construction in residential areas and daytime construction in retail and commercial areas, as part of the Traffic Management Plan (TMP) implementation. The temporary removal of colored parking spaces during project construction would be addressed by improvement measures IM-C-1 and IM-C-2. IM-CI-1[2]: SFMTA will coordinate with all businesses that would be affected by removal of colored parking spaces, including short-term parking, to confirm the need for truck and/or passenger loading spaces and to identify appropriate replacement parking locations to minimize the impacts to these businesses. IM-CI-2[2]: SFMTA will apply parking management tools as needed to offset any substantial impacts from the loss of on-street parking, including adjustment of residential parking permits in the residential community north of Broadway, or SFpark, which is a package of real-time tools to manage parking occupancy and turnover through pricing (appropriate in areas of high-density commercial uses that rely on high parking turnover).	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.
Land Use Operation	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.
Land Use Cumulative	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.	No cumulative impacts.
Noise and Vibration Construction	No impact.	Less than significant impacts. Increases in noise and vibration at some locations would be temporary and are thus considered a less than significant impact. Project construction would comply with the City Noise Ordinance. *Improvement Measures:* Mitigation measure M-CI-C6 presented in Section 4.15 provides a program for accepting and addressing noise and other complaints during project construction. To further reduce noise and vibration impacts during construction, the following best practices, identified as improvement measures, would be implemented: IM-NO-C1: Project construction will implement best practices in equipment noise and vibration control as feasible, including the following: • Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding). • Perform all construction in a manner that minimizes noise and vibration. Utilize construction methods or equipment that will provide the lowest level of noise and ground vibration impact. • Turn off idling equipment. • When possible, limit the use of construction equipment that creates high vibration levels, such as vibratory rollers and hammers. When such equipment must be used within 25 feet of any existing building, select equipment models that generate lower vibration levels. • Restrict the hours of vibration-intensive equipment or activities, such as vibratory rollers, so that annoyance to residents is minimal (e.g., limit to daytime hours as defined in the noise ordinance). IM-NO-C2: Project construction will conduct truck loading, unloading, and hauling operations so that noise and vibration are kept to a minimum by carefully selecting routes to avoid passing through residential neighborhoods to the greatest possible extent. IM-NO-C3: Perform independent noise and vibration monitoring in sensitive areas as needed to demonstrate compliance with applicable noise limits. Require contractors to modify and/or reschedule their construction activities if monitoring determines that maximum limits are exceeded at residential land uses per the City Noise Ordinance. IM-NO-C4: The construction contractor will be required by contract specification to comply with the City noise ordinances and obtain all necessary permits, particularly in relation to nighttime construction work.	Less than significant impacts. Same as Build Alternative 2.	Less than significant impacts. Same as Build Alternative 2.	Less than significant impacts. Same as Build Alternative 2.	Less than significant impacts. Same as Build Alternative 2.	Less than significant impacts. Same as Build Alternative 2.

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[2] M-CI-IM-1 and M-CI-IM-2 constitutes a mitigation measure under NEPA and an improvement measure under CEQA.

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Noise and Vibration <u>Operation</u>	<u>No impact.</u>	<u>No impact.</u> BRT operation would not increase noise and vibration; it would operate a less noisy fleet of diesel-electric hybrid and electric-powered vehicles than exists today. Noise levels along Van Ness Avenue and the parallel Franklin and Gough streets would remain below FTA and Caltrans impact criteria. *Improvement Measure:* IM-NO-1: Upkeep of roadway surface will be maintained throughout project operation to avoid increases in BRT noise and vibration levels.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Noise and Vibration <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>Less than significant impact.</u> Control measures IM-NO-C1 through IM-NO-C4 would be implemented to minimize noise and vibration disturbances at sensitive areas during construction. Project construction would comply with the City Noise Ordinance to avoid significant impacts during construction of the proposed project and other planned projects in the vicinity. Construction phasing would be coordinated with these projects to minimize construction-related impacts to sensitive receptors.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.	<u>Less than significant impact.</u> Same as Build Alternative 2.
Population and Housing/Growth <u>Construction</u>	<u>No impact.</u>	<u>No impact.</u> Project construction would not lead to unplanned growth in the Van Ness Avenue corridor or the larger region, nor would it displace housing.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Population and Housing/Growth <u>Operation</u>	<u>No impact.</u>	<u>No impact.</u> The project would not lead to unplanned growth in the Van Ness Avenue corridor or larger region, nor would it displace housing.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Population and Housing/Growth <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>	<u>No cumulative impacts.</u>
Public Services <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Less than significant impacts to public services would result from construction activities, such as temporary rerouting and loss of on-street parking. No sidewalk closures would be required. These impacts would cause temporary inconvenience to area residents, businesses, and people traveling through the corridor. Mitigation measures M-CI-C1 through M-CI-C7, described in Section 4.15.2 would minimize impacts to Civic Center facilities and other public services during project construction. The measures described in Section 4.15.2 include: *Mitigation Measures:* M-CI-C1: A TMP that includes traffic rerouting, a detour plan, and public information procedures will be developed during the design phase with participation from local agencies, other major project proponents in the area (e.g., CPMC Cathedral Hill, Hayes Two-Way Conversion, and the Geary Corridor BRT projects), local communities, business associations, and affected drivers. Early and well-publicized announcements and other public information measures will be implemented prior to and during construction to minimize confusion, inconvenience, and traffic congestion. M-CI-C2: As part of the TMP, construction planning will minimize nighttime construction in residential areas and minimize daytime construction impacts on retail and commercial areas. M-CI-C3: As part of the TMP, construction scheduling and planning in the Civic Center area will take into consideration major civic and performing arts events. M-CI-C4: As part of the TMP public information program, SFMTA will coordinate with adjacent properties along Van Ness Avenue to determine the need for colored parking spaces and work to identify locations for replacement spaces or plan construction activities to minimize impacts from the loss of these spaces. M-CI-C5: As part of the TMP public information program, SFMTA will coordinate with adjacent properties along Van Ness Avenue to ensure that pedestrian access to these properties is maintained at all times. M-CI-C6. As part of the TMP, SFMTA's process for accepting and addressing complaints will be implemented. This includes provision of contact information for the Project Manager, Resident Engineer, and Contractor on project signage with direction to call if there are any concerns. Complaints are logged and tracked to ensure they are addressed.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.

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		M-CI-C7. As part of the TMP, adequate passenger and truck loading zones will be maintained for adjacent land uses, including maintaining access to driveways and providing adequate loading zones on the same or adjoining street block face.					
Public Services <u>Operation</u>	<u>No impact.</u>	<u>No impact.</u> The BRT would not result in the need for new or physically altered governmental facilities and would not hinder service rations and response times. The project would benefit community facilities with improved transit access.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.	<u>No impact.</u> Same as Build Alternative 2.
Public Services <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>Less than significant impact with mitigation.</u> Mitigation Measures M-CI-C1 through M-CI-C7 would lessen potentially significant, cumulative impacts to community facilities and government services during construction of the proposed project and other planned projects in the vicinity.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.
Transportation and Circulation <u>Construction</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Circulation impacts during construction due to lane closures, short-term detours, and reduced speeds would be temporary and are considered a less than significant impact with implementation of mitigation measures. All construction activity will be carried out in compliance and accordance with the California Manual on Uniform Traffic Control Devices (MUTCD), and applicable regulations of the SFPUC and San Francisco Department of Public Works (SFDPW) Bureau of Street Use and Mapping (BSM), and SFMTA Regulations for Working in San Francisco Streets Blue Book. *Mitigation Measures:* M-TR-C1: Temporary conversion of parking lanes to mixed-flow traffic lanes will be implemented to generally maintain two open traffic lanes in each direction and minimize traffic impacts. M-TR-C2: A contraflow lane system, including elimination of left turns in either direction along Van Ness Avenue, will be implemented during daytime construction under Build Alternative 2 to enable two lanes of mixed-flow traffic to generally remain open in each direction during construction and minimize traffic congestion on Van Ness Avenue. Appropriate signage and temporary traffic signals will be used to guide drivers, augmented by flagmen as needed. M-TR-C3: Plan required closures of a second mixed-flow traffic lane and detours for nighttime or off-peak traffic hours as feasible, and as in conformance with approved noise requirements. M-TR-C4: Maintain one east-west and north-south crosswalk leg open at all times at all intersections. M-TR-C5: Install sufficient barricading, signage, and temporary walkways as needed to minimize impacts to pedestrians and bicyclists. M-TR-C6: SFMTA will coordinate with GGT as part of the Transportation Management Plan (TMP) to plan temporarily relocated transit stops as needed, and minimize impacts to GGT service. M-TR-C7: Implement a TMP to minimize delay and inconvenience to the traveling public, including a public information program and wayfinding to provide local businesses and residents with information related to the construction activities and durations, temporary traffic closures and detours, parking restrictions, and bus stop relocations.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2, except a contraflow lane system would not be required for Build Alternative 3; therefore, Mitigation Measure M-TR-C2 would not apply.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3 without Design Option B.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3with Design Option B.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3.
Transportation and Circulation <u>Operation</u>	<u>No impact.</u>	<u>Significant Impact (to traffic).</u>[3] The project would not significantly impact traffic conditions on Van Ness Avenue. Traffic congestion would occur on streets parallel to Van Ness Avenue that would receive increased traffic that has diverted from Van Ness Avenue. Traffic impact significance findings for the near-term and horizon years follow. <u>Less than significant impact (to traffic).</u> Less than significant vehicular traffic circulation impacts would result in Year 2015 at the following intersection: • Gough/Green • South Van Ness/Mission/Otis and Duboce/Mission/Otis/US 101 Off-Ramp Less than significant vehicular traffic circulation impacts would result in Year 2035 at the following intersections: • Gough/Green	<u>Significant Impact (to traffic).</u>[3] The project would not significantly impact traffic conditions on Van Ness Avenue. Traffic congestion on streets parallel to Van Ness Avenue would receive increased traffic that has diverted from Van Ness Avenue. Traffic impact significance findings for the near-term and horizon years follow, including those impacts that are less than significant and those that are significant. Mitigation	<u>Significant Impact (to traffic).</u>[3] The project would not significantly impact traffic conditions on Van Ness Avenue. Traffic congestion on streets parallel to Van Ness Avenue would receive increased traffic that has diverted from Van Ness Avenue. Also, the elimination of all but two left turn opportunities off of Van Ness Avenue will result in an increase in drivers making	<u>Significant Impact (to traffic).</u>[3] Same as Build Alternative 3 without Design Option B. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. <u>Less than Significant Impact (to traffic).</u>	<u>Significant Impact (to traffic).</u>[3] The project would not significantly impact traffic conditions on Van Ness Avenue. Traffic congestion on streets parallel to Van Ness Avenue would receive increased traffic that has diverted from Van Ness Avenue. Also, the elimination of	<u>Significant Impact (to traffic).</u>[3] Same as Build Alternative 3 without Design Option B. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. <u>Less than Significant Impact (to traffic).</u>

[1] The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

[3] These types of mitigation measures, while reducing localized traffic delays in the short term, may ultimately be found by the Authority Board to not be feasible due to policy conflicts, specifically the need to balance traffic circulation with pedestrian and transit circulation and safety. In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand. Thus, a conservative worst-case finding of significant and unavoidable impact under CEQA is assumed (see Section 3.3.4).

Table 7-2: Summary of Environmental Impacts under CEQA

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		• Gough/Clay • Mission/South Van Ness/Otis • Mission/Duboce/Otis/US 101 Off-Ramps • Van Ness/Pine Significant impact (to traffic).[3] Significant impacts that may not be mitigated would result in Year 2015 at the following intersections: • Gough/Hayes • Franklin/O'FarrellSignificant impacts that may not be mitigated would result in Year 2035 at the following intersections: • Gough/Hayes • Franklin/Pine • Franklin/O'Farrell • Franklin/Eddy • Franklin/ McAllister *Mitigation Measures* M-Traffic Management Toolbox Develop and implement a traffic management toolbox to raise public awareness of circulation changes; advise drivers of alternate routes; and pedestrian improvements. Toolbox actions will include: • Provide driver wayfinding and signage, especially to assist infrequent drivers of the corridor who may not be aware of alternate routes, such as along the Larkin/Hyde and Franklin/Gough corridors. Coordinate with Caltrans to develop the driver wayfinding and signage strategy as part of mitigation measure M-TR-C5. Continue to monitor traffic after construction and during project operation. • Public Awareness Campaign and Transportation Management Plan (TMP) during and after Project Construction. As discussed as part of mitigation measure M-TR-C7, the TMP will implement a public awareness program of wayfinding during construction and will coordinate the public information program with regional agencies, including Caltrans and GGT. Continue to monitor traffic after construction and during project operation. • Pedestrian Amenities at Additional Corridor Locations. After construction, during project operation, monitor travel in the corridor to identify additional locations for pedestrian improvements based on a combination of pedestrian and vehicle volumes, infrastructure capabilities, and collision history. Less than significant impact (to transit). No significant impacts to transit would result. While one transit line that cross Van Ness Avenue would experience increased delay, this delay would not result in significant impacts to service reliability and travel time. BRT service would substantially improve transit service on Van Ness Avenue. Less than significant impact (to nonmotorized transportation). No significant impacts to nonmotorized travel would result. While transit stop consolidation would increase the physical effort required to reach transit for some patrons relative to existing conditions, the average distances between stops are consistent with applicable Muni guidelines for rapid bus and light rail, and the project would offer pedestrian accessibility and safety benefits. The proposed project would not substantially change or degrade bicycle conditions. *Improvement Measures:* IM-NMT-1: Include comprehensive wayfinding, allowing all users to navigate to and from the correct platform. IM-NMT-4: Provide sufficient information to educate less-ambulatory passengers that board at BRT stations that they would need to exit through the front, right doors for stops outside the Van Ness Avenue corridor. Less than significant impact (to parking). No significant impacts to parking would result. Introduction of BRT stations and streetscape features, and reconstruction of the Van Ness Avenue median and implementation of new BRT stations adjacent to the sidewalk, would result in the removal of approximately 33 total parking spaces.	Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. Less than significant impact (to traffic). Less than significant vehicular traffic circulation impacts would result in Year 2015 at the following intersection: • Gough/Green • Duboce/Mission/Otis/US 101 off-ramp Less than significant vehicular traffic circulation impacts would result in Year 2035 at the following intersections: • Gough/Green • Franklin/Pine • Van Ness/Pine • Mission/Duboce/Otis/US 101 Off-Ramps Significant impact (to traffic).[2] Significant impacts that may not be mitigated to a less than significant level would result in Year 2015 at the following intersections: • Gough/Hayes • Franklin/O'Farrell • Mission/South Van Ness/Otis Significant impacts that may not be mitigated to a less than significant level would result in Year 2035 at the following intersections: • Gough/Sacramento • Gough/ Eddy • Gough/Hayes • Franklin/O'Farrell • Franklin/Eddy • Franklin/McAllister • Van Ness/Hayes • South Van Ness/Mission/Otis Less than significant impact with mitigation (to transit). A potentially significant impact to transit service could occur in year 2035 due to vehicle crowding. The following mitigation measure is required to reduce this impact to	multiple right turns in the project vicinity, causing some additional traffic on these adjacent collector streets. Traffic impact significance findings for the near-term and horizon years follow, including those impacts that are less than significant and those that are significant. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. Less than significant impact (to traffic). Less than significant vehicular traffic circulation impacts would result in Year 2015 at the following intersection: • Gough/Green • South Van Ness/Mission/Otis and Duboce/ Mission/ Otis/US 101 Off-Ramp Less than significant vehicular traffic circulation impacts would result in Year 2035 at the following intersections: • Gough/Green • Gough/Clay • Franklin/Pine • Mission/Duboce/Otis/US 101 Off-Ramps Significant impact (to traffic).[2] Significant impacts that may not be mitigated to a less than significant level will result in Year 2015 at the following intersections: • Gough/Hayes • Franklin/O'Farrell • Franklin/Market Significant impacts that may not be mitigated to a less than significant level would result in Year 2035 at the following intersections: • Gough/Sacramento • Gough/Eddy • Gough/Hayes	Same as Build Alternative 3. Significant impact.[2] Same as Build Alternative 3. Less than significant impact with mitigation (to transit). Same as Build Alternative 3 without Design Option B. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 3 without Design Option B, in addition to the following improvement measures: IM-NMT-2: For Build Alternative 4, bus vehicle design should incorporate an intuitive seating space for users requiring level boarding that is easily accessible to both the front door on the right side and the door behind the operator on the left side. IM-NMT-3: For Build Alternative 4, bus vehicle design should incorporate audible cues, such as stop announcements, of which door will open to avoid any confusion for passengers. Less than significant impact (to parking). Same as Build Alternative 2, except 45 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2	all but two left turn opportunities off of Van Ness Avenue will result in an increase in drivers making multiple right turns in the project vicinity, causing some additional traffic on these adjacent collector streets. Traffic impact significance findings for the near-term and horizon years follow, including those impacts that are less than significant and those that are significant. Mitigation Measure M-Traffic Management Toolbox under Build Alternative 2 also applies. Less than Significant Impact (to traffic). Same as Build Alternative 3 with Design Option B. Significant impact (to traffic).[2] Same as Build Alternatives 3 with Design Option B. Less than significant impact with mitigation (to transit). Same as Build Alternative 3 without Design Option B. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 4 without Design Option B. Less than significant impact (to parking). Same as Build Alternative 2, except 13 parking spaces would be removed along Van	Same as Build Alternative 3 with Design Option B. Significant impact (to traffic).[2] Same as Build Alternative 3 with Design Option B. Less than significant impact with mitigation (to transit). Same as Build Alternative 3. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 3. Less than significant impact (to parking). Same as Build Alternative 2, except 105 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.

[1] The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

[3] These types of mitigation measures, while reducing localized traffic delays in the short term, may ultimately be found by the Authority Board to not be feasible due to policy conflicts, specifically the need to balance traffic circulation with pedestrian and transit circulation and safety. In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand. Thus, a conservative worst-case finding of significant and unavoidable impact under CEQA is assumed (see Section 3.3.4).

Table 7-2: Summary of Environmental Impacts under CEQA

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
		Improvement Measures: IM-TR-1: On-street parking will be created where bus stops are consolidated or moved to the center of the street. IM-TR-2: Additional on-street parking will be provided where feasible by lane striping. IM-TR-3: Infill on-street parking spaces will be provided where they do not exist today as feasible. IM-TR-4: SFMTA will give priority to retaining color-painted on-street parking spaces, such as yellow freight zones white passenger loading zones, green short-term parking, and blue disabled parking. IM-TR-5: Blue handicapped parking spaces will be designed to provide a curb ramp behind each space.	less than significant: M-TR-1: An additional vehicle will be added to the fleet as needed to provide additional service and reduce station vehicle crowding impacts. Less than significant impact (to transit) While some transit lines that cross Van Ness Avenue would experience some increased delay, this delay would not result in significant impacts to service reliability and travel time. BRT service would substantially improve transit service on Van Ness Avenue. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 2. Less than significant impact (to parking). Same as Build Alternative 2, except 68 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.	• Franklin/O'Farrell • Franklin/Eddy • Franklin/McAllister • Franklin/Market/Page • Mission/South Van Ness/ Otis Less than significant impact with mitigation (to transit). Same as Build Alternative 3 without Design Option B. Less than significant (to transit). Same as Build Alternative 3 without Design Option B. Less than significant impact (to nonmotorized transportation). Same as Build Alternative 3 without Design Option B. Less than significant impact (to parking). Same as Build Alternative 2, except 31 parking spaces would be removed along Van Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.	would be implemented.	Ness Avenue. The same improvement measure as Build Alternative 2 would be implemented.	
Transportation and Circulation Cumulative	No cumulative impacts.	Less than significant impact with mitigation. Mitigation Measures M-TR-C1 through M-TR-C7 would lessen significant, cumulative circulation impacts during construction of the proposed project and other planned projects in the vicinity. These impacts would be temporary and are thus considered less than significant with mitigation. Cumulative circulation impacts during operation of the proposed project and other planned projects in the vicinity are accounted for in the Operations section.	Less than significant impact with mitigation. Same as Build Alternative 2, except a contraflow lane system would not be required for Build Alternative 3; therefore, Mitigation Measure M-TR-C2 would not apply.	Less than significant impact with mitigation. Same as Build Alternative 3 without Design Option B.	Less than significant impact with mitigation. Same as Build Alternative 3.	Less than significant impact with mitigation. Same as Build Alternative 3with Design Option B.	Less than significant impact with mitigation. Same as Build Alternative 3 with Design Option B.
Utilities and Service Systems Construction	No impact.	Less than significant impact. Compliance with standard procedures will minimize the potential for damage to utilities, injury to construction workers, and proper completion of construction work. *Improvement Measures:* IM-UT-C1: Construction work involving utilities will be conducted in accordance with contract specifications, including the following requirements: • Obtain authorization from utility provider before initiating work • Contact Underground Service Alert in advance of excavation work to mark-out underground utilities • Conduct investigations, including exploratory borings if needed, to confirm the location and type of underground utilities and service connections • Prepare a support plan for each utility crossing detailing the intended support method • Take appropriate precautions for the protection of unforeseen utility lines encountered during construction • Restore or replace each utility as close as planned and work with providers to ensure its location is as good or better than found prior to removal	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.	Less than significant impact. Same as Build Alternative 2.

[1] The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

[3] These types of mitigation measures, while reducing localized traffic delays in the short term, may ultimately be found by the Authority Board to not be feasible due to policy conflicts, specifically the need to balance traffic circulation with pedestrian and transit circulation and safety. In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand. Thus, a conservative worst-case finding of significant and unavoidable impact under CEQA is assumed (see Section 3.3.4).

Table 7-2: Summary of Environmental Impacts under CEQA

ENVIRONMENTAL AREA/ IMPACTS	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 2: SIDE-LANE BRT WITH STREET PARKING	BUILD ALTERNATIVE 3: CENTER-LANE BRT WITH RIGHT-SIDE BOARDING AND DUAL MEDIANS	BUILD ALTERNATIVE 3 WITH DESIGN OPTION B	BUILD ALTERNATIVE 4: CENTER-LANE BRT WITH LEFT-SIDE BOARDING AND SINGLE MEDIAN	BUILD ALTERNATIVE 4 WITH DESIGN OPTION B	LPA (COMBINES ALTERNATIVES 3 AND 4)[1]
Utilities and Service Systems <u>Operation</u>	<u>No impact.</u>	<u>Less than significant impact with mitigation.</u> Operation would not result in changes to utility demand and capacity. Some utilities would require relocation or modification for construction and to maintain access for utility providers to conduct maintenance, repair, and upgrade/replacement activities. These would result in less than significant impacts to utilities and service systems. Mitigation measures are required to avoid adverse impacts to utility systems and services. *Mitigation Measures:* M-UT-1: BRT construction will be closely coordinated with concurrent utility projects planned within the Van Ness Avenue corridor. M-UT-3: During planning and design, consideration must be given to ensure that the proposed BRT transitway and station facilities do not prevent access to the underground auxiliary water supply service (AWSS) lines. There must be adequate access for specialized trucks to park next to gate valves for maintenance. The gate valves must not be located beneath medians or station platforms. M-UT-4: In situations where utility facilities cannot be relocated, SFMTA will create a plan to accommodate temporary closure of the transitway and/or stations in coordination with utility providers to allow utility providers to perform maintenance, emergency repair, and upgrade/replacement of underground facilities that may be located beneath project features such as the BRT transitway, station platforms, or curb bulbs. Signage for BRT patrons and safety protocols for Muni operators and utility providers will be integrated into this plan.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2, except the following additional mitigation measure would also be required: M-UT-2: An inspection and evaluation of the sewer pipeline within the project limits will be undertaken to assess the condition of the pipeline and need for replacement. Coordination with SFPUC and SFDPW will continue and be tracked by Committee for Utility Liaison on Construction and Other Projects (CULCOP).	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3 without Design Option B.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3 with Design Option B.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 3.
Utilities and Service Systems <u>Cumulative</u>	<u>No cumulative impacts.</u>	<u>Less than significant impact with mitigation.</u> Mitigation Measure M-UT-C1 would avoid significant cumulative impacts to utilities during construction of the proposed project and other planned projects in the vicinity.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.	<u>Less than significant impact with mitigation.</u> Same as Build Alternative 2.

[1] The summary of impacts and mitigation for the LPA includes all impacts and mitigation that would pertain to the LPA with or without incorporation of the Vallejo Northbound Station Variant into the project design.

Table 7-3: CEQA Mandatory Findings of Significance

MANDATORY FINDINGS OF SIGNIFICANCE – WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT IMPACT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory	☐	☐	X	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	X	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	X	☐	☐	☐
NOTE: Authority cited: Section 21083, Public Resources Code; Reference: Section 21001 and 21068, Public Resources Code.				

SOURCE: San Francisco Planning Department Initial Study Checklist.

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7.5 Unavoidable Significant Effects under CEQA

Each of the proposed build alternatives, including the LPA, would result in potentially significant impacts to traffic. The project sponsor is not recommending the identified, possible mitigations for significant traffic impacts because they conflict with the City's Transit First Policy.

Each of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in significant traffic impacts, as explained in detail in Section 3.3, Vehicular Traffic. The mitigation measures identified in Section 3.3.4, while reducing localized traffic delays in the short term, may ultimately be found by the Authority Board to not be feasible due to policy conflicts, specifically the need to balance traffic circulation with pedestrian and transit circulation and safety. In addition, these engineering techniques function by increasing automobile traffic capacity and are unlikely to be effective in the long term due to the risk of induced demand. Thus, a conservative worst-case finding of significant and unavoidable impact under CEQA is assumed.

In determining the level of impact for each build alternative, including the LPA, comparisons are made of corridor performance (i.e., measured in terms of average speed) and traffic operating characteristics of intersections (i.e., measured in terms of LOS) for the near-term year (2015) and the design/horizon year (2035) against the baseline year (2007) for the traffic study area. The traffic study area for the Van Ness Avenue corridor covers the area bounded by Lombard Street to the north, Duboce Avenue (at the Mission Street/US 101 Freeway off-ramp) to the south, Hyde Street to the east, and Gough Street to the west, as shown in Figure 3.3-1 in Section 3.3.

As explained in Section 3.3, Vehicular Traffic, unavoidable, significant impacts to traffic circulation would occur under each build alternative, including the LPA (with or without the Vallejo Northbound Station Variant), based on the following thresholds:

- If the intersection LOS declines from LOS A, B, C, or D in no build to LOS E or F in the with-project scenario, then the project would cause a significant impact.
- If the intersection LOS declines from LOS E in no build to LOS F in the with-project scenario, then the project would cause a significant impact.
- If the intersection performs the same at either LOS E or F in both no-build and with-project scenarios, then the project's contribution to significant impacts (i.e., contribution calculations) are performed as follows:
  - If the project traffic is less than 5 percent of the cumulative growth in intersection traffic, then the project does not have a significant impact.

Table 7-2 lists the traffic impacts for each of the build alternatives and LPA.

The traffic impact analysis concludes that several locations would experience a "significant and unavoidable" automobile traffic delay impacts in Years 2015 and 2035.

Potential mitigation measures (e.g., intersection signalization, adding right-turn lanes, adding through lanes, and use of peak-hour tow-away zones) are discussed in Section 3.3.4 of this EIS/EIR. These measures could minimize traffic congestion at several intersections projected to be significantly impacted; however, not all traffic impacts would be eliminated with implementation of these mitigation measures. The identified, possible mitigations for significant traffic impacts may ultimately be found by decision makers at the time of project approval to not be feasible, as discussed in Section 3.3.4. While the identified mitigation measures may alleviate some traffic impacts, this benefit would come at the expense of the worsening pedestrian conditions, transit conditions, and bicycle conditions. Furthermore, rather than alleviating traffic congestion, the mitigation measures may be demand inducing. The Transit First Policy states that "Decisions regarding the use of limited public street and sidewalk space shall encourage the use of public rights-of-way by pedestrians, bicyclists, and public transit" (City Charter Article VIIIA, 115, Transit First Policy). If the decision makers find the measures infeasible, the traffic impact analysis shows that several locations would experience "significant and unavoidable" automobile traffic delay impacts by 2015 and 2035. These impacts (referred to as "significant") are summarized below, by project build alternative, including the LPA.

Build Alternative 2: Side-Lane BRT with Street Parking

Build Alternative 2 would cause a significant impact at the following two intersections by Year 2015 (representing existing plus project conditions):

- Gough/Hayes
- Franklin/O'Farrell

Build Alternative 2 would cause a significant impact at the following intersections by Year 2035:

- Gough/Hayes
- Franklin/Pine
- Franklin/O'Farrell
- Franklin/Eddy
- Franklin/ McAllister

Build Alternatives 3 and 4: Center-Lane BRT with Right- or Left-Side Boarding and Dual or Single Medians

Project traffic under Build Alternatives 3 and 4 would cause a significant impact at the following intersections by Year 2015 (representing existing plus project conditions):

- Gough/Hayes
- Franklin/O'Farrell
- South Van Ness/Mission/Otis

Project traffic under Build Alternatives 3 and 4 would cause a significant impact at the following intersections by Year 2035:

- Gough/Sacramento
- Gough/ Eddy
- Gough/Hayes
- Franklin/O'Farrell
- Franklin/Eddy
- Franklin/McAllister
- Van Ness/Hayes
- South Van Ness/Mission/Otis

Build Alternatives 3 and 4 with Design Option B

The project traffic under Build Alternatives 3 and 4 with Design Option B (elimination of left turns) would cause a significant impact at the following intersections by Year 2015 (representing existing plus project conditions):

- Gough/Hayes
- Franklin/O'Farrell
- Franklin/Market

Project traffic under Build Alternatives 3 and 4 with Design Option B would cause a significant impact at the following intersections by Year 2035:

- Gough/Sacramento
- Gough/Eddy
- Gough/Hayes
- Franklin/O'Farrell
- Franklin/Eddy
- Franklin/McAllister
- Franklin/Market
- South Van Ness/Mission/Otis

LPA

The project traffic under the LPA (with or without the Vallejo Northbound Station Variant) includes elimination of left turns presented as Design Option B, and would cause a significant impact at the following intersections by Year 2015 (representing existing plus project conditions):

- Gough/Hayes
- Franklin/O'Farrell
- Franklin/Market/Page

Project traffic under the LPA would cause a significant impact at the following intersections by Year 2035:

- Gough/Sacramento
- Gough/Eddy
- Gough/Hayes
- Franklin/O'Farrell
- Franklin/Eddy
- Franklin/McAllister
- Franklin/Market/Page
- South Van Ness/Mission/Otis

7.6 Environmentally Superior Alternative

CEQA Guidelines (Section 15126.6(e)(2)) require that an environmentally superior alternative be identified among the alternatives considered. The environmentally superior alternative is generally defined as the alternative that would result in the least adverse environmental impacts to the project site and surrounding area. If the No Build Alternative is found to be the environmentally superior alternative, the document must identify an environmentally superior alternative among the build alternatives. The environmentally superior alternative has been determined following receipt of agency, stakeholder, and public input on the impact findings in the Draft EIS/EIR, and stakeholder and agency input during the LPA selection process.

The environmentally superior alternative is the No Build Alternative because it would not result in significant impacts. The No Build Alternative would not result in significant operational traffic congestion impacts at multiple intersections.[102] The No Build Alternative would not result in adverse impacts associated with removal of mature trees. Moreover, the No Build Alternative would not result in the temporary construction impacts such as traffic detours and congestion, parking restrictions, and air quality, dust and noise disturbances that would result from the build alternatives, including the LPA. However, the No Build Alternative would not meet the project purpose and need, and thus a build alternative was selected as the LPA.

Of the Build Alternatives, including the LPA, Build Alternative 2 would be the environmentally superior alternative, for the following reasons:

- Build Alternative 2 would result in significant operational traffic congestion impacts at fewer intersections than the other build alternatives, including the LPA;
- Build Alternative 2 would require removal of notably fewer trees (particularly in the median) than the other build alternatives, including the LPA; and
- Construction of Build Alternative 2 would not trigger replacement or relocation of segments of the aging sewer pipeline, as would occur in varying degrees under the build alternatives, including the LPA.

[102] Significant operational traffic congestion impacts would occur at multiple intersections in Years 2015 and 2035 under the No Build Alternative, but at fewer intersections than any of the build alternatives, including the LPA.

While Build Alternative 2 would be the environmentally superior alternative for the aforementioned reasons, it is important to note that the all the build alternatives, including the LPA, would result in the same CEQA impact findings as summarized in Table 7-2, and would result in the same Mandatory Findings of Significance presented in Table 7-3. Each build alternative, including the LPA, would result in similar environmental benefits and impacts, and it is the degree of impact that separates Build Alternative 2 from the other build alternatives, including the LPA, as the environmentally superior alternative. After consideration of environmental impacts and the alternatives analysis process, including consideration of stakeholder, agency and public comments, Build Alternative 2 was not selected as the LPA because it would not achieve the project purpose and need to the extent the LPA (a refinement of Build Alternatives 3 and 4 with Design Option B) would achieve. Chapter 10 provides additional detail on the process and criteria for selection of the LPA.

Determination of the environmentally superior alternative does not preclude the other alternatives from being selected. The lead agency may adopt a statement of overriding considerations which expresses the agency's views on the merits of approving a project despite its significant impacts. The statement of overriding considerations provides a justification for approving a project despite its environmental impacts, including an explanation of how the trade-offs between project benefits and impacts were considered, including factors such as cost and risk analysis. Since the SFCTA has selected an LPA that has significant traffic impacts that are not mitigated, similar to the build alternatives in the Draft EIS/EIR, SFCTA's approval of the LPA will require the preparation of a Statement of Overriding Considerations.

7.7 Areas of Controversy

Primary areas of controversy raised by the public during review of the Draft EIS/EIR consist of: traffic congestion on Van Ness Avenue and diversion onto parallel streets in the project vicinity; how increased traffic congestion would affect air quality and noise in the project area; the project's effects on trees on Van Ness Avenue and the desire to preserve trees; the effects of relocating existing bus stops and stop consolidation (limiting of stops); and concern about how the project alternatives were defined and that there should be more consideration of less costly express bus alternatives.

Traffic Congestion and Diversion Impacts and Resulting Noise and Air Quality

Each of the build alternatives, including the LPA (with or without the Vallejo Northbound Station Variant), would result in significant and unavoidable vehicular traffic delay impacts at several intersections in the project vicinity, in both the near-term 2015 year and horizon 2035 year (see Sections 3.3.3 and 7.5). Concern that the project would result in increased traffic congestion was the most common topic expressed in comments received during the public review period for the Draft EIS/EIR. Much of this concern was related to increased traffic volumes on streets parallel to Van Ness Avenue that would receive diverted traffic – primarily Franklin and Gough streets. The traffic analysis presented in Chapter 3 shows that drivers would change routes, or divert, from Van Ness Avenue to use parallel streets due to the reduction of traffic lanes on Van Ness Avenue needed to accommodate the proposed BRT lanes and the elimination of left turns to facilitate transit operations. Many members of the public are concerned that the increased vehicular traffic will make these streets noisier, less pedestrian friendly, and degrade air quality.

As explained in Section 3.3.3, the proposed project would not result in significant vehicular traffic delay impacts on Van Ness Avenue; however, the project would increase congestion on some nearby streets. The traffic modeling analysis shows that in 2015, under Build Alternatives 2-4, including the LPA, approximately 105 to 450 total vehicles in both directions (2 to 7 vehicles per minute) could divert away from Van Ness Avenue and make their trip on a parallel street within the corridor during the PM Peak instead. Franklin Street would be the parallel route most frequently used during the PM peak hour, compared with Gough, Polk, Larkin, and Hyde streets. The amount of additional private vehicle traffic varies widely up and down the 2-mile stretch of corridor analyzed, but any given segment of Polk, Franklin, or Gough streets could experience an additional 50 to 250 vehicles per hour (vph), or roughly one to four additional vehicles per minute during the PM peak hour in 2015. Larkin and Hyde streets could also see an increase in traffic volume of approximately 20 to 100 vph (less than two vehicles per minute between the two streets combined during the PM peak hour).[103]

The noise analysis showed that this amount of increased vehicles on parallel streets would not result in substantial changes in ambient noise and would not result in a significant noise impact. As part of the air quality analysis, pollutant concentrations were modeled using worst-case, stagnant air conditions for the peak congestion period. The Toxic Air Contaminant (TAC) emissions on parallel streets from this diverted traffic were found to be below standards set by the BAAQMD, and less than significant under each build alternative, including the LPA. An additional analysis was undertaken to specifically address air quality effects from increases in vehicle idling, using the CAL3QHC dispersion model, at intersections that would experience the highest vehicle delay in the 2035 horizon year. The idle emissions were found to be well below the State standards after implementation of the BRT in year 2035 traffic conditions. Thus, the project would not result in significant, localized air quality emissions on parallel streets due to increased traffic congestion caused by the project.

More detail on traffic diversion and related noise and air quality impacts can be found in Appendix I, Section 2.1, Master Response #8, 9, 10, and 11.

Impacts to Existing Trees

The effect of the proposed project on existing trees is another major concern expressed in comments. There is a strong desire among the public and local agencies to preserve existing trees. The San Francisco Department of Public Works (DPW) requested that additional analysis be completed pertaining to removal of median trees, which is reflected in Sections 4.4.2.5 and 4.4.3.4 of the Final EIS/EIR. A more comprehensive Tree Removal Evaluation and Planting Opportunity Analysis was undertaken in fall 2012 to identify the maturity and health of trees in the corridor and the opportunities for preserving trees, and the parameters of new tree plantings (BMS, 2013). Emphasis was placed on preserving existing mature and healthy trees, particularly trees that DPW labeled as high priority for their biological and/or aesthetic value, such as trees located near the civic center. As explained in Section 4.4.3.4, due to the OCS clearance requirements, the median replacement trees under the LPA would be shorter and narrower than existing trees, with smaller canopies, which would not offer the same benefits of a full canopy. In addition, there would be a plant establishment period lasting several years for new trees to reach maturity, therefore causing a period of reduced benefits compared with the benefits offered by existing mature trees and their canopies.

Like Build Alternatives 3 and 4, the LPA (with or without the Vallejo Northbound Station Variant) would not affect any existing sidewalk trees; however, it would result in the removal of approximately 90 median trees. Twenty-three (23) of these trees are mature and healthy, which is approximately 82 percent of all the existing healthy and mature median trees in the corridor. This tree removal is due to the reconfiguration of existing medians to construct the

[103] The greatest increase in traffic volumes in the study area would be on Franklin Street, north of Market Street for Design Option B and the LPA. Due in large part to the reduction of left-turn pockets along Van Ness Avenue, left-turning vehicles under the Design Option B and LPA would use that segment of Franklin Street to go north, and thus would experience an increase of up to 560 vehicles in 2015 and 620 vehicles in 2035 with the implementation of the LPA. These increases in traffic volumes are significantly higher than the increases at other segments along Franklin Street (more than 3 times the average of increased volumes at other screenline intersections along the corridor), and even higher than intersections on other parallel streets (more than 5 times the increase on Gough Street). This causes operations at the intersection of Franklin and Market streets to operate at LOS F, with more than 100 seconds of delay for the left turn from Market Street onto Franklin Street in 2015 (see Section 3.3.3.2).

single-median, center-lane transitway on blocks without a station while meeting Caltrans and SFMTA standards for mixed traffic and transit lanes. In addition, trees would be removed due to the nearly complete reconstruction of existing medians on blocks with stations. Under the LPA (with or without the Vallejo Northbound Station Variant), 143 new trees would be planted along the corridor, bringing the total number of trees to 469; a net gain of 53 trees.

In conclusion, while the proposed project would result in the removal of a substantial number of existing trees, efforts were undertaken by SFCTA, SFMTA, and partnering agencies to avoid removal of tress best suited for preservation. SFCTA, SFMTA, and DPW worked closely with Caltrans staff to obtain design exception approvals from Caltrans to allow for a reduced tree planting setback and to provide narrower mixed traffic lane widths to increase the size of the median for trees deemed suitable for preservation. In addition to replacement median tree plantings, the project proponents will plant 48 additional sidewalk trees in the project corridor to help offset some of the impacts resulting from the removal of existing median trees. Increased sidewalk and median tree plantings over existing conditions would improve the visual setting, with improvements growing over time as plantings mature, resulting in long-term, beneficial effects. At the same time, however, there would be a plant establishment period lasting for several years for new trees to reach maturity. The trade-offs between increased plantings in the corridor and the loss of existing trees is discussed in detail for each build alternative, including the LPA, in Section 4.4.3.4 of this document. In addition, a summary of tree removal and planting opportunities is provided in Appendix I, Section 2.1, Master Response #7.

Transit Stop Consolidation

Members of the public expressed concerns about the removal and/or relocation of existing bus stops. The proposed project would increase the distance between stops, which would increase the physical effort required to reach transit relative to existing conditions. This may pose a burden to some bus patrons.

As described in Section 2.2.2, under the LPA, 7 NB and 5 SB (6 with implementation of the Vallejo Northbound Station Variant) existing Muni bus stops, which serve the 49 and 47 Muni lines on Van Ness Avenue in the project study area, would be removed. Under the LPA, the proposed project would have 8 NB stations (9 with the Vallejo Northbound Station Variant), and 9 SB BRT stations, instead of the 15 NB and 14 SB Muni stops in each direction currently on Van Ness Avenue in the project study area. The reason for eliminating or consolidating stops is to reduce dwell time, achieve greater reliability of service, and take better advantage of transit signal priority. Figures 2-2 and 2-3 show the locations of existing Muni bus stops and the locations of the proposed LPA stations.

The average spacing of the proposed BRT station locations under the LPA would be approximately 1,150 feet (1,080 feet under the Vallejo Northbound Station Variant), requiring an average walk of up to 570 feet (540 feet under the Vallejo Northbound Station Variant) from a location halfway between two stops. This would constitute an increase, on average, of up to 220 feet of additional walking to access stops if a person had an origin or destination half-way between the proposed BRT station locations. A distance of 220 feet is less than one block along Van Ness Avenue. On average, the proposed project complies with the applicable 1,000- to 1,200-foot spacing guideline for light rail lines and has an average spacing slightly greater than the 800- to 1,000-foot spacing guideline for bus stops (Source: SFMTA FY 2008-FY2027 Draft Short Range Transit Plan, 2007).[104] In addition to considering Muni's stop spacing guideline, the BRT station locations are based on three goals: (1) place stops as evenly spread out as possible within the project corridor; (2) consider ridership and place stations where the largest numbers of passengers board and alight; and (3) facilitate easy connections with other Muni lines, particularly other Rapid

[104] There are no SFMTA stop spacing guidelines for BRT.

network lines. The degree of slope was also considered, and stations were not proposed on blocks with grades greater than 8 percent, consistent with ADA standards.

The Van Ness Avenue BRT project is designed to be as universally accessible as possible. The Draft EIS/EIR provides a full evaluation of the impacts of the project on accessibility for all users in Section 3.4.3.1. The evaluation is based on the principles of Universal Design and recognizes that users, including the elderly and disabled, may have different concerns. Some may depend on transit to meet their need for efficient travel through the Van Ness Avenue corridor, while others may prefer more frequent stops for local access and to minimize walking distances. While the project would increase the physical effort required to reach a transit stop for some riders, it would offer accessibility benefits like level or near level boarding at BRT stations, which would reduce the physical effort required to board transit vehicles. Additional benefits would include curb bulbs, nose cones, pedestrian countdown signals, and accessible pedestrian signals at intersections that allow people with a reduced range of physical abilities to safely cross the street. The project team has met with local groups and organizations that focus on accessibility issues during preparation of the Feasibility Study and Draft EIS/EIR, including the Lighthouse for the Blind and Visually Impaired, the Mayor's Disability Council Physical Access Committee, and the Muni Accessibility Advisory Committee, to gather input for the BRT project and best address stop consolidation and other accessibly aspects of the proposed project.

Proposed BRT station locations were refined based on public and agency input into the design process. For example, in response to comments regarding wider stop spacing in the vicinity of the Van Ness Avenue and Vallejo Street intersection, which has higher grades than other parts of the corridor, the LPA includes a SB station at the intersection of Vallejo Street and Van Ness Avenue. A NB transit station in this same location, referred to as the Vallejo Northbound Station Variant, could also be implemented, and will be decided at the time of project approval. SFMTA will continue to meet with groups throughout the final design and operation phases of the project to incorporate universal design principles and will work with the community and businesses to inform patrons of upcoming changes in station locations.

See Appendix I, Section 2.1, Master Response #5 for a more detailed response to this common comment.

Definition of Project Alternatives and Limits and Consideration of Less Costly Alternatives

A number of comments received during the Draft EIS/EIR circulation questioned how the project alternatives had been defined and if an express bus service could offer similar transit benefits as the BRT for reduced cost. Many commenters also questioned how the project limits were determined.

As explained in Sections 1.1 and 1.2.1, the City has identified the Van Ness Avenue corridor in long-range planning documents as a top priority route for rapid transit treatments dating back to the mid-1990s. The existing land use and transportation characteristics of the Van Ness Avenue corridor are highly conducive to transit use and particularly well suited to BRT. Van Ness Avenue functions as the key north/south transit "spine" of the Muni network, with 32 intersecting Muni routes between Mission and Lombard streets. The avenue supports key regional destinations such as the Civic Center and Fort Mason, and the Van Ness Avenue corridor is one of the region's major employment and commercial centers. It supports one of the highest population densities of any transit corridor in San Francisco, and the percentage of households in the Van Ness Avenue corridor that do not own cars is 17 percent higher than the citywide average (SFCTA, 2009). The 2003 Proposition K Expenditure Plan and the 2004 Countywide Transportation Plan (CWTP) identify BRT on Van Ness Avenue as part of a strategic investment in a citywide network of rapid transit.

The reason that express bus service, despite its lower cost to construct, was not pursued instead of BRT is because the magnitude of expected benefits is low when compared with BRT. Rapid bus, or TPS, treatments would provide approximately half of the reduction in travel times as BRT (Van Ness Avenue BRT Feasibility Study). Without a dedicated bus lane, buses would continue to operate in mixed traffic and experience associated reliability impacts. Moreover, a peak-period-only bus lane would only provide transit travel time and reliability benefits intermittently. Van Ness Avenue transit experiences delays and reliability problems throughout the day and on weekends, and transit ridership in the corridor is strong throughout the day and not just during the peak commute periods (Van Ness BRT Feasibility Study; 2007 APC Data).

The project limits were defined based on the findings of the planning studies and supporting analysis described in Section 1.2.1, Countywide Planning Context. The northern terminus of the project limits is defined as Lombard Street because traffic patterns show a significant decrease in vehicular traffic north of Lombard Street, with significantly less transit delay than south of Lombard Street. The southern terminus of the project limits is defined as Mission/South Van Ness Avenue largely because the width of Mission Street does not allow for the same types of BRT treatments as on Van Ness Avenue. Additionally, this intersection marks the start of the corridor where the 47 and 49 routes travel along the same ROW; thus, Mission/South Van Ness Avenue was determined to be a logical southern limit of the project.

The Van Ness Avenue BRT Feasibility Study, completed by the Authority in 2006, identified the need for BRT on Van Ness Avenue and developed conceptual BRT design alternatives. The feasibility study found that several BRT configurations are possible on Van Ness Avenue and are likely to provide significant benefits.

Chapter 2 describes the scoping and screening process for the EIS/EIR. As part of the screening process, a wide range of alternatives was considered for further evaluation, including potentially lower-cost transit improvements such as Transit Preferential Streets (TPS) treatments without a dedicated lane and express buses. Alternatives were screened out of further environmental analysis if they contained a “fatal flaw” or an overall low performance in meeting the project purpose and need. Section 2.6 of the EIS/EIR includes additional information on alternatives considered and withdrawn (and the rationale for withdrawing them from consideration).

Following environmental scoping and screening, four alternatives were defined and carried forward for evaluation in the Draft EIS/EIR, including one no build alternative and three build alternatives. The LPA is a refinement of the two center-running configurations, Build Alternatives 3 and 4, and its selection process is described in Section 10.3.

Additional explanation of the definition of alternatives and cost effectiveness of BRT compared with express bus service is provided in Appendix I, Section 2.1, Master Responses #2 and #4.

CHAPTER SUMMARY: This chapter describes the public outreach and interagency consultation undertaken to develop the proposed project, beginning with the initial Feasibility Study, continuing through release of the Draft EIS/EIR and completion of this Final EIS/EIR. Public involvement is an integral component of the project development and environmental review process, and input from the public and other agencies has significantly shaped the alternatives, LPA selection, and environmental impacts studied. During the Feasibility Study undertaken in 2006, SFCTA worked closely with other agencies and sought input from the public to understand transit needs in the Van Ness Avenue corridor and identify alternative BRT improvements. Upon conclusion of the Feasibility Study, SFCTA conducted a formal NEPA/CEQA scoping process to identify the range of actions, alternatives, environmental effects, and mitigation measures to be analyzed in the EIS/EIR for the Van Ness Avenue BRT Project. During the scoping period, SFCTA gathered information from agencies and interested members of the public regarding their questions and concerns related to the proposed project. Comments received during the scoping process assisted SFCTA and FTA in their review and evaluation of possible BRT alternatives evaluated in the EIS/EIR. Other agencies and members of the public continued to provide input to SFCTA during the alternatives evaluation process and in preparation of the Draft EIS/EIR. During the Draft EIS/EIR circulation period, the Authority developed a comprehensive outreach program to obtain public and agency input. The Authority conducted additional outreach as part of the LPA selection process and completion of the Final EIS/EIR.

CHAPTER 8

Coordination and Public Participation

8.1 Interagency Consultation

SFCTA has coordinated closely with an array of local, regional, State, and Federal agencies to develop the Van Ness Avenue BRT Project.

8.1.1 | Technical Advisory Committee

Based on agency interest expressed during the project scoping period, SFCTA established the Van Ness Avenue BRT Technical Advisory Committee (TAC), composed of technical staff from primarily local participating and responsible agencies with interest in the proposed project, including:

- San Francisco Department of Public Works (SFDPW)
- San Francisco Planning Department
- Golden Gate Bridge, Highway, and Transportation District (GGBHTD)
- San Francisco Public Utilities Commission (SFPUC)
- San Francisco Municipal Transportation Agency (SFMTA)
- San Francisco Mayor's Office on Disability

Two TAC subgroups have also held meetings to focus on specific topics. One subgroup focused on topics related to the OCS support poles/streetlights replacement. The Circulation Team, another TAC subgroup consisting of staff from SFCTA and MTA, including the City traffic engineer, reviewed circulation modeling methods and preliminary results as the demand modeling and traffic simulation were ongoing. SFCTA also met separately with GGBHTD staff to discuss the integration of GGT transit operations in the BRT facility.

8.1.2 Caltrans Project Development Team

Caltrans established an interdisciplinary Project Development Team (PDT), which met periodically during development of the EIS/EIR and conceptual engineering. Topics covered by the PDT included project purpose and need; engineering designs and design exceptions; and circulation (travel demand forecasting, operations, and microsimulation). In addition, Caltrans historic preservation staff provided input into the cultural analysis.

8.1.3 FTA Quarterly Progress Review Meetings

The project team provided updates to FTA at quarterly progress review meetings and held monthly coordination calls with FTA staff starting in 2012.

8.2 Community Involvement

During preparation of the Van Ness Avenue BRT Feasibility Study, SFCTA conducted extensive outreach, including briefings to neighborhood organizations, publicity on Muni vehicles and in bus shelters, press releases, public hearings, and five public workshops.

Community involvement in development of the Van Ness Avenue BRT Project has a long history, beginning with outreach around the 2003 Proposition K Expenditure Plan reauthorization and adoption of the 2004 Countywide Transportation Plan. During preparation of the Feasibility Study (adopted by the SFCTA and SFMTA Boards in 2006), SFCTA conducted extensive outreach, including briefings to neighborhood organizations, publicity on Muni vehicles and in bus shelters, press releases, public hearings, and five public workshops at three stages of the process. The details of those workshops and comments received are included in the Feasibility Study.

Throughout the scoping period and circulation of the Draft EIS/EIR, the project team utilized a variety of public outreach strategies to identify and engage stakeholders. The stakeholder and public participation process included community meetings, key stakeholders meetings, and briefings with elected officials, as well as development and dissemination of informational materials through multilingual mailings, e-mail, flyers, a project website (http://www.sfcta.org/content/view/306/152), a project information phone line (415-593-1655), social media networks (Facebook), and media relations (press releases and press advisories). The intent of the public involvement process during circulation of the Draft EIS/EIR was to obtain input on the findings in the Draft EIS/EIR and proposed mitigation measures, as well as input on the relative benefits and impacts of the project alternatives that could inform the Locally Preferred Alternative (LPA) selection process. Following the Draft EIS/EIR circulation period, the public involvement process continued through the development and selection of a LPA. The community involvement components of the proposed project are described in greater detail in the following subsections of this chapter.

During the public meetings conducted to obtain input on development and selection of the LPA, considerable concern was expressed by local residents regarding the lack of transit stations proposed in the vicinity of the Van Ness Avenue and Vallejo Street intersection, which has higher grades than other parts of the corridor. In response to these public comments, the LPA design was modified to include a SB station at the intersection of Vallejo Street and Van Ness Avenue. A NB transit station in this same location was incorporated as a design variant in this Final EIS/EIR and could also be implemented. Referred to as the Vallejo Northbound Station Variant, implementation of this NB station would be decided at the time of project approval.

8.2.1 Public Information Meetings and Hearing

8.2.1.1 SCOPING MEETINGS

The scoping process included a comprehensive round of outreach that sought to raise awareness of the project and gather input on actions, alternatives, environmental effects, and mitigation measures to be analyzed in the environmental review process. A copy of the

NOP was sent to the State Clearinghouse and to local, regional, and State agencies on September 14, 2007. A Notice of Intent (NOI) was published in the *Federal Register* on September 24, 2007. The NOP and NOI are provided as Appendix F. The public notice effort included local newspapers; a mailing to 20,000 residential and commercial occupants of buildings along the Van Ness Avenue corridor, as well as to the outreach database of interested parties developed during the Feasibility Study; online announcements on the SFCTA and SFMTA Web sites; and an announcement poster installed at bus stops along Van Ness Avenue. The public meetings were held at the following times and places:

- Tuesday, October 2, 2007
  Holiday Inn Golden Gateway on Van Ness Avenue at Pine
  6:00 p.m. – 8:00 p.m.
- Thursday, October 4, 2007
  SFCTA offices on Van Ness Avenue at Fell
  6:00 p.m. – 8:00 p.m.

A summary of the scoping meetings is available on the Web site.

8.2.1.2 | DRAFT EIS/EIR CIRCULATION PUBLIC HEARING AND OPEN HOUSE

As part of the NEPA and CEQA process, the Draft EIS/EIR was circulated for a public review and comment period between November 4 and December 23, 2011. A public hearing was held during the circulation period. The purpose of the hearing was to give interested parties an opportunity to formally submit written or verbal comments on the proposed project and the analysis contained in the Draft EIS/EIR, though attendance was not required to submit comments, as comments could be submitted in writing through e-mail or traditional mail, and through the Van Ness Avenue BRT Project website. The public hearing was held on November 30 from 5:30 p.m. to 8:00 p.m. at the Holiday Inn, 1500 Van Ness Avenue. SFCTA provided a notice of the public hearing in compliance with NEPA and CEQA. A comprehensive effort to inform the public of the hearing was made through e-mail; direct mail postcards; print advertisements in multilingual newspapers, as well as on buses and in shelters; multilingual flyers posted throughout the corridor; presentations at community meetings; social network websites (i.e., Facebook, Twitter); and the project website. The public hearing began with an open house, with more than 15 SFCTA and SFMTA staff on hand to answer clarifying questions at stations with visual aids, followed by a formal presentation and concluding with another open house. Throughout the evening, the public was able to provide written comments, as well as verbal comments, to a court reporter that was present. More than 40 community members attended, yielding 10 written comments and 6 verbal comments. The public hearing comments received, as well as all other comments received during the circulation period, and responses to them are included in Appendix I.

8.2.1.3 | WEBINAR

The Authority held an online webinar on December 5, 2011, with a total of 19 attendees. Attendees were permitted to submit questions and discussion topics during the webinar following the presentation portion. The webinar host explained to attendees that formal comments on the Draft EIR/EIR had to be submitted via e-mail or letter, not as part of the webinar discussion, and be received no later than the close of circulation.

8.2.2 | Citizens Advisory Committee

SFCTA established the Van Ness Avenue BRT Citizens Advisory Committee (CAC), comprised of nine citizens living in or near the project area. Members of the committee were selected by SFCTA's Board of Commissioners to represent various interests of community and business stakeholders throughout the corridor. Between September 2007 and December 2012, the CAC held 25 meetings to provide community input concerning the proposed

Between September 2007 and December 2012, the CAC held 25 meetings to provide community input concerning the proposed project.

project. All CAC meetings are open to the public. They are publicized on the SFCTA Web site, as well as through mailings and e-mails to the project outreach database, which now contains more than 700 contacts.

8.2.3 | Meetings with Local Groups and Organizations

SFCTA has met with more than 35 local community and business groups during preparation of the feasibility study and during the environmental review process.

SFCTA has met with more than 35 local community and business groups during preparation of the Feasibility Study and during the environmental review process. These groups include (in alphabetical order):

- Alliance for a Better District 6
- California Pacific Medical Center
- Cathedral Hill Neighbors Association
- Chinatown Community Development Center
- City Hall Preservation Advisory Commission
- Civic Center Community Benefit District
- Cow Hollow Association
- Friends of the Urban Forest
- Galileo High School
- Geary BRT Citizens Advisory Committee
- Hayes Valley Neighborhood Association
- Japantown Better Neighborhood Plan Organizing Committee
- La Voz Latina
- Lighthouse for the Blind and Visually Impaired
- Livable City
- Lower Polk Neighbors
- Mayors Disability Council Physical Access Committee
- Middle Polk Neighborhood Association
- Mission Neighborhood Centers
- Muni Accessibility Advisory Committee
- Notre Dame Apartments
- Pacific Heights Chapter of the American Association of Retired Persons
- Pacific Heights Residents
- Polk District Merchants Association
- Rescue Muni
- Russian Hill Neighbors
- San Francisco Bicycle Coalition
- San Francisco Planning and Urban Research (SPUR)
- San Francisco Transit Riders Union (SFTRU)
- San Francisco Towers
- Sierra Club
- Tenant Associations Coalition of San Francisco
- Tenderloin Futures Collaborative
- TransForm
- Urban Forestry Council
- Van Ness Corridor Association
- Vietnamese Community Center
- WalkSF

Local merchants were also contacted through door-to-door outreach.

8.2.4 | Outreach during Draft EIS/EIR Circulation

The Draft EIS/EIR was circulated to the public and state agencies for the minimum 45-day comment period, as required by NEPA and CEQA, between November 4 and December 23, 2011. Leading up to and during this circulation period, the SFCTA and SFMTA implemented public outreach activities designed to raise awareness of the project and solicit public input on the relative benefits and impacts of the proposed alternatives, as well as the proposed measures to mitigate potential project impacts. The Authority held a public hearing on November 30, 2011, and a webinar on December 5, 2011. The public hearing, described in Section 8.2.1, provided the opportunity for attendees to submit comments on the Draft EIS/EIR, either verbally or in writing. A copy of the Draft EIS/EIR was mailed to the parties included in the document distribution list in Appendix E. In addition, the Draft EIS/EIR was made available on the project website for viewing and download, and multiple CD and hard copies were available throughout the public review period at the following locations:

- SFCTA Office
  100 Van Ness Avenue
- SFMTA Office
  1 S. Van Ness Avenue
- San Francisco Planning Department
  1660 Mission Street
- San Francisco Main Library
  100 Larkin Street
- Golden Gate Valley Branch Library
  1651 Union Street
- Marina Branch Library
  1890 Chestnut Street

Additionally, free CD copies of the Draft EIS/EIR were available upon request as noted on outreach materials and the project website.

In addition to the public hearing, the webinar, and the availability of the Draft EIS/EIR document itself, the project's outreach program to support public circulation of the Draft EIS/EIR included online and multilingual print media notices, a radius mailing, presentations to neighborhood organizations, and multilingual notifications on transit vehicles, shelters, and poles throughout the corridor to raise awareness of the project and Draft EIS/EIR availability among the local community and GGT riders and drivers, as described in greater below. In addition, the SFCTA provided an informational table at the Sunday Streets event on October 23, 2011.

8.2.4.1 | PROJECT FACT SHEETS

Project fact sheets have been used throughout the project, and an updated version describing the availability and locations of the Draft EIS/EIR, the methods for providing comment, and the LPA selection process was prepared to support public circulation of the Draft EIS/EIR. The fact sheets, including illustrative maps and visual simulations, discussed the proposed transit improvements under the four alternatives (a "no build" and three build alternatives). The team distributed the fact sheets to interested stakeholders at public meetings. The fact sheets were also made available on the website at www.vannessbrt.org.

8.2.4.2 | MAILINGS AND FLYERS

During the public circulation period, various e-mail and direct mail efforts were used to raise awareness of the project, the availability of the Draft EIS/EIR, and to invite public comment. The Notice of Availability/Notice of Completion (NOA/NOC) was posted along Van Ness Avenue in three languages (English, Spanish, and Chinese). The NOA/NOC served as a flyer containing a basic project description, announcing the availability of the Draft EIS/EIR and how to view it, the dates of the public review period, how to submit comments, and the date/time/place of the public hearing and webinar. This notice was posted in English, Spanish, and Chinese on bus shelters of Muni bus lines 47 and

49, and Golden Gate Transit Lines 10, 70, 80, 101, and 101x to reach out to transit patrons. On blocks on Van Ness Avenue within the project study area where there were not shelters, NOA/NOC posters were affixed to poles along the sidewalk. Posters containing information on the availability of the Draft EIS/EIR and the project website were also displayed on SFMTA and Golden Gate Transit buses. A postcard NOA/NOC was also mailed to properties within a 500-foot radius of Van Ness Avenue within the project limits and to properties fronting Gough and Franklin streets in the project corridor (i.e., Market Street to Lombard). This radius mailing included approximately 17,000 properties, which included various residential and commercial properties. The postcard NOA/NOC provided information on where the Draft EIS/EIR was available for review and how to obtain an electronic copy, hard copy, or CD copy of the document.

8.2.4.3 | WEBSITE, SOCIAL NETWORKING, AND MEDIA OUTREACH AND COORDINATION

The project website (www.vannessbrt.org) serves as a central point where stakeholders can obtain information about the project via the Internet. Website content includes a project overview; information about public meetings; collateral materials, such as fact sheets in English, Spanish, and Chinese; information about CAC meetings; briefings to neighborhood and other local organizations; and information about the public hearing and webinar. The Draft EIS/EIR was available for download from the website and provided a vehicle for people to submit formal comments during the public circulation period. The SFCTA also announced the availability of the Draft EIS/EIR on the agency's Facebook page and Twitter feed. Additionally, the Authority maintained a telephone informational hotline (415-593-1655), with information in English, Spanish, and Cantonese, that was advertised on project notices, informational materials, and the project website, and people could leave messages in any of those languages.

8.2.4.4 | PRESS RELEASES AND DISPLAY ADVERTISEMENTS

SFCTA put out press releases to the media and to the general public and placed display advertisements in the following publications that included Chinese and Spanish media:

- *Central City Extra:* November 2011
- *El Mensajero:* November 12, 2011 (NOA/NOC in Spanish)
- *The Examiner:* November 9, 2011
- *Marina Times:* November 2011
- *Sing Tao:* November 7, 2011 (NOA/NOC in Chinese)

8.2.5 | Outreach to Support LPA Selection

The project team conducted significant outreach pertaining to the staff recommended LPA, presenting at more than 15 public and stakeholder meetings prior to the SFCTA Board meeting on June 26, 2012, to select the LPA for inclusion in the Final EIS/EIR. Additional presentations regarding the LPA have been made since June 26, 2012, and the project team continues to perform outreach with numerous stakeholders. The project team made presentations on the staff-recommended LPA at the following public meetings and commissions:

- San Francisco Environment Commission's Policy Committee: Monday, April 30, 2012, 5:00 p.m.;
- Van Ness Avenue BRT CAC*: Tuesday, May 1, 2012, 5:30 p.m.;
- SFMTA Citizens' Advisory Council: Thursday, May 3, 2012, 5:30 p.m.;
- San Francisco Planning Commission: Thursday, May 10, 2012, 1:00 p.m.;
- SFCTA Plans and Programs Committee: Tuesday, May 15, 2012, 10:30 a.m.;
- SFMTA Board*: Tuesday, May 15, 2012, 1:00 p.m.;
- Geary BRT Citizens Advisory Committee: Thursday, May 17, 2012, 6:00 p.m.;
- SFCTA Plans and Programs Committee*: Tuesday, June 19, 2012, 10:30 a.m.; and

- Transportation Authority Board*: Tuesday, June 26, 2012.
  *Included action item on recommended LPA

The project team made LPA presentations at the following stakeholder meetings before the June 26, 2012, SFCTA Board meeting:

- Van Ness Corridor Association: Thursday, April 9, 2012, 5:30 p.m.;
- Pacific Heights Residents Association: Monday, April 30, 2012, 7:30 p.m.;
- Friends of the Urban Forest: Tuesday, May 8, 2012, 11:00 a.m.;
- Walk San Francisco: Wednesday, May 9, 2012, 4:00 p.m.;
- Japantown Better Neighborhood Plan Organizing Committee: Wednesday, May 9, 2012, 5:30 p.m.;
- Lower Polk Neighbors: Wednesday, May 9, 2012, 7:00 p.m.;
- Civic Center Community Benefits District: Thursday, May 10, 2012, 10:00 a.m.;
- San Francisco Transit Riders Union: Monday, May 14, 2012, 7:00 p.m.;
- Chinatown Community Development Center, Chinatown Transportation and Research (TRIP): Wednesday, May 16, 2012, 6:00 p.m.;
- Polk District Merchants Association: Thursday, May 17, 2012, 9:00 a.m.;
- Alliance for a Better District 6: Tuesday, June 12, 2012, 6:00 p.m.; and
- Middle Polk Neighborhood Association: Monday, June 18, 2012, 7:00 p.m.

In addition to public and stakeholder meetings, two e-mail updates translated into Spanish and Chinese that outlined the staff-recommended LPA were sent to the project e-mail list on April 27 and June 5, 2012; a postcard containing similar translated information was mailed to constituents without e-mail addresses. A media advisory sent on May 9, 2012, and a press release sent on May 14, 2012, announced consideration of the LPA at the SFMTA Board and the SFCTA Plans and Programs. Both the media advisory and the press release were sent to multilingual media organizations. Information about the staff-recommended LPA was also posted in multiple languages on the Authority's project website (www.vannessbrt.org). Information about the proposed project and public meetings continue to be featured on the Authority's Web site and social media sites.

8.2.6 | Cultural Resources Community Consultation

As part of preparation of the Historic Resources Inventory and Evaluation Report (HRIER) and Archaeological Sensitivity Study, local historic preservation groups, as well as Native American tribes, groups, and individuals, were contacted and provided the opportunity to review these reports and provide input. Additional information is provided in Section 4.5, Cultural Resources.

8.2.7 | Current and Future Public Outreach Efforts

Information about the upcoming formation of the Final Design and Construction Period CAC and TAC, in addition to briefings to neighborhood and other local organizations, is made available on the project Web site: www.vannessbrt.org.

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CHAPTER SUMMARY: This chapter documents the cost and funding plan to build and operate the Van Ness Avenue BRT Project, The primary source for capital costs in this chapter is the 2012 Small Starts Annual Update (submittal for the FY 2014 New Starts Annual Report) prepared in September 2012 by SFCTA, in addition to operating and maintenance cost estimates from SFMTA and SFDPW.

CHAPTER 9

Financial Analysis

The 2004 Countywide Transportation Plan recommended a citywide BRT network based on expected cost effectiveness of BRT relative to alternative transit improvements. FTA, which reviews and rates the project, has given the project a "high" rating for cost effectiveness since 2008 – one of only three current Small Starts projects nationwide to receive this designation and the only Small Starts project in the nation to receive a "medium-high" rating for Project Justification (Source: Fiscal Year 2014 FTA Annual Report on Funding Recommendations).

The Federal Transit Administration has given the Van Ness Avenue BRT Project a "high" rating for cost effectiveness since 2008 – one of only three current Small Starts projects nationwide to receive this designation and the only Small Starts project in the nation to receive a "medium-high" rating for Project Justification:

9.1 Capital Costs

9.1.1 | Van Ness Avenue BRT Project Capital Costs

As updated in 2012, the Van Ness Avenue BRT Project is estimated to cost between $93 million and $136 million to design and construct, depending on the build alternative selected. The LPA is estimated to cost $125.6 million. Total capital costs are in Year of Expenditure (YOE) and based on the FTA Small Starts Annual Report submitted by SFCTA and SFMTA in September 2012.[105] Capital costs for the three build alternatives (Alternatives 2, 3, and 4) are presented in Table 9-1, and include all features of the BRT described in Chapter 2 (see Table 2-2), including Design Option B for Alternatives 3 and 4. (The incremental cost for Design Option B would range from an additional $165,000 [Build Alternative 3 with Design Option B] to an additional $250,000 [Build Alternative 4 with Design Option B] more than the costs for Build Alternatives 3 and 4 without Design Option B.) Note that for separate but related projects, which are described in Chapter 2.2.1 and Section 9.1.2, the capital costs in Table 9-1 only include the incremental cost of making the project compatible with BRT (e.g., BRT vehicle enhancements beyond regular low-floor vehicle replacement, enhancements to the OCS support poles/streetlights, additional accessible pedestrian signals, pavement rehabilitation for the transitway) rather than the entire cost of the separate but related features.

The Van Ness Avenue BRT Project is estimated to cost $125.6 million for the Locally Preferred Alternative.

Table 9-1: Capital Cost Estimates for Build Alternatives

BUILD ALTERNATIVE	BRIEF DESCRIPTION	CAPITAL COST (YOE IN MILLION $)
Alternative 2	Side-Lane BRT with Street Parking	93
Alternative 3 (with Design Option B)	Center-Lane BRT with Right-Side Boarding and Dual Medians	136
Alternative 4 (with Design Option B)	Center-Lane BRT with Left-Side Boarding and Single Median	112

NOTE: Incremental costs associated with Alternative 3 with Design Option B and Alternative 4 with Design Option B are discussed in Section 9.1.1. Costs have been updated since the Draft EIS/EIR to reflect more current unit costs and inflation assumptions.

Source: FTA Small Starts submittal, 2012.

105 The Small Starts cost estimate did not incorporate the SB Vallejo Street station now included in the LPA (see Section 2.2.2.4),nor did it include the Vallejo Northbound Station Variant as part of the LPA. Construction of these stations is projected to cost approximately $500,000 per station. The up to $1 million cost increase is less than the contingency amount in the cost estimate. A revised cost estimate based on the final LPA adopted by the Authority Board at the time of certification would be included as part of the Conceptual Engineering Report and 30% design.

9.1.2 | Improvements to be Coordinated with Van Ness Avenue BRT Project

As noted above, Chapter 2.1 describes improvements to Van Ness Avenue that would be constructed in a no-build scenario, and/or would be coordinated with the Van Ness Avenue BRT Project and designed to support and enhance it. These related projects, which have funding strategies separate from the Van Ness Avenue BRT Project, are described in this section.

- **SFgo and Signal Replacement.** The SFgo and Signal Replacement Program, led by SFMTA, is a package of technology-based transportation management system tools that will be implemented on Van Ness Avenue, and in part on Franklin and Gough streets, in coordination with the BRT project. Typically, SFgo does not include signal replacement and mast arm installation, but the project on Van Ness Avenue will include these additional elements, as described in Chapter 2.1. The project is fully funded by federal Congestion Mitigation and Air Quality Improvement Program (CMAQ) funds and Prop K funds.
- **Vehicle Replacement.** As existing buses reach the end of their useful life, SFMTA is gradually converting its fleet to low-floor buses. Replacement of the 38 buses needed for operation along the Van Ness Avenue corridor (Muni Routes 47 and 49) is currently anticipated to be funded by federal FTA Section 5307/09 formula funds and Prop K funds.
- **OCS and Support Pole/Streetlight Replacement.** SFMTA, together with SFDPW and SFPUC, plans to replace the existing OCS and support poles/streetlights along Van Ness Avenue from Market Street to North Point Avenue to address the failing structural condition of the system. Funding will be split between the SFPUC and the SFMTA. Replacement of the OCS is anticipated to be funded by federal FTA Section 5309 formula funds and Prop K funds.
- **Van Ness Avenue Pavement Rehabilitation for Mixed Traffic Lanes.** SFDPW and Caltrans will repave and resurface the mixed traffic lanes of Van Ness Avenue in coordination with the BRT project. The project is anticipated to be funded through a combination of state SHOPP funds and other local funds.

9.1.3 | Budgeted/Planned Funding

The Van Ness Avenue BRT Project currently has identified more than 75% of the capital funding needed for the project.

The Van Ness Avenue BRT Project currently has identified more than 75 percent of the capital funding needed for the project LPA. Budgeted and planned funding sources for the proposed project, whose costs are discussed in section 9.1.1 above, are described below:

- **Small Starts ($74,999,999 million).** This program, which is administered by FTA, provides competitive grants for new transit projects whose total capital costs do not exceed $250 million. The maximum grant award is $74,999,999 million. SFCTA and SFMTA have requested $74,999,999 million in Small Starts funding for the project. In 2012, the project was one of three Small Starts potential projects in the nation to receive a High rating for cost effectiveness and the only Small Starts project in the nation to receive a Medium-High rating for project justification (Source: Fiscal Year 2014 FTA Annual Report on Funding Recommendations). In 2010, FTA awarded $396,000 in Small Starts funds to SFMTA to support project development engineering activities. In addition, in 2010, the Van Ness Avenue BRT Project received $15 million in Small Starts funds in FY 2011. Finally, in 2011, the Van Ness Avenue BRT Project received an additional $30 million in the FY 2012 budget, for a total of $45 million awarded to date.
- **Prop K ($20.5 million).** In November 2003, San Francisco voters approved Prop K, approving a new 30-year Expenditure Plan and extending the local half-cent transportation sales tax. The Board-adopted 2009 Proposition K Strategic Plan programs approximately $20.5 million in sales tax funds to the Van Ness Avenue BRT Project. The Authority will examine the Prop K programming during the next Strategic

Plan update to determine if more Prop K funds can be used for the Van Ness Avenue BRT Project.

- **State Highway Operations and Protection Program (SHOPP).** SHOPP funds are used by Caltrans to maintain and preserve the investment in the State Highway System and its supporting infrastructure. Projects included in the program are limited to capital improvements relative to maintenance, safety, and rehabilitation of state highways and bridges that do not add a new traffic lane to the system. As part of US 101, which is a State highway, Van Ness Avenue qualifies for these funds. Caltrans is developing cost and estimates as part of a Project Report for the Van Ness/Lombard Pavement Rehabilitation project for funds to be programmed in the 2014 SHOPP and made available in FY 2016/2017.

9.1.4 Other Potential Funding Sources

A combination of several potential funding sources, described below, could provide the remaining capital funding. Many of these sources include project readiness as one of their evaluation criteria, so the project is expected to compete more successfully for these funding sources after an LPA has been adopted and preliminary engineering and design have commenced.

- **AB 664 Net Bridge Toll Revenues.** AB 664 Net Bridge Toll Revenues are allocated to eligible transit operators, including SFMTA, to serve as matching funds for FTA formula funds programmed to capital projects that further the development of public transportation systems in the vicinity of the toll bridges. The revenues are programmed in proportion to each eligible operator's share of the FTA formula fund program. In recent years, AB 664 Net Bridge Toll Revenues have generated approximately $10 million to $12 million annually.
- **FTA Formula Funds (Section 5307 – Urban Transit Formula Funds, Section 5337 – State of Good Repair Formula Program).** SFMTA is an eligible recipient of federal transit formula funds that can be used on a variety of transit capital projects, including the Van Ness Avenue BRT. Section 5307 is the largest transit formula program, and eligible projects include capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems, including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software. Section 5337 is a new formula program, established under Moving Ahead for Progress in the 21st Century (MAP-21), dedicated to repairing and upgrading the nation's rail transit systems, along with high-intensity motor bus systems that use HOV lanes, including BRT. Section 5337 eligible projects include capital projects to maintain a system in a state of good repair, including projects to replace and rehabilitate rolling stock; track; line equipment and structures; signals and communications; power equipment and substations; passenger stations and terminals; security equipment and systems; maintenance facilities and equipment; and operational support equipment, including computer hardware and software.
- **Highway Safety Improvement Program.** SAFETEA-LU, which was signed into law on August 10, 2005, established the Highway Safety Improvement Program (HSIP) as a core Federal-aid program. That program is continued under the new federal transportation bill, MAP-21, which was signed into law on July 6, 2012. The overall purpose of this program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements. For 2012/13, Caltrans expects to apportion approximately $67 million to local agencies.
- **Impact Fees from Land Development Projects.** Many land development projects have been proposed along the Van Ness Avenue corridor. In the southern end of the Van Ness Avenue corridor, the Market and Octavia Plan calls out Van Ness Avenue BRT as an eligible recipient of development impact fees. Separately, the proposed CPMC

DEFINITION

PRIORITY DEVELOPMENT AREAS: Designated parts of the Bay Area recognized by MTC in which there is a local commitment to developing housing, amenities, and services. The proposed Van Ness Avenue BRT alignment runs through a Priority Development Area.

development at the corner of Van Ness Avenue and Geary Boulevard will serve as the hub for CPMC's future campus network. Development impact fees from the new CPMC hub could be allocated towards the Van Ness Avenue BRT Project, and negotiations between the developer and the City are underway.

- **OneBayArea Grant (OBAG).** MTC established the OBAG program in May 2012. Through OBAG, MTC will direct an estimated $38.8 million in federal transportation funds (CMAQ/Surface Transportation Program [STP]) to San Francisco over 4 years to fund streetscape projects with pedestrian/bicycle/transit improvements, street and road preservation, transit station improvements, and Congestion Management Agency planning activities. At least 70 percent of the funds must be spent on projects located in Priority Development Areas (e.g., Transit-Oriented Developments), which is applicable to the Van Ness Avenue BRT Project. This is a competitive grant program, and the Van Ness Avenue BRT project will be able to compete in the current funding cycle (FY 2013 – FY 2016) and the next funding cycle (FY 2017 – FY 2019).
- **Proposition AA Vehicle Registration Fee (VRF).** In November 2010, San Francisco voters approved a $10 increase in the fee for vehicles registered in San Francisco, with revenues dedicated to transportation improvements identified in the 30-year Expenditure Plan. Under this source, the Van Ness Avenue BRT Project would be eligible for funds under all three Expenditure Plan categories: (1) street repair and reconstruction; (2) pedestrian safety; and (3) transit reliability and mobility improvements. The VRF is expected to generate approximately $5 million annually and is administered by the SFCTA. Funds will be available for allocation starting in FY 2012/13.
- **Safe Routes to Transit (SR2T).** In March 2004, Regional Measure 2 was approved, which increased Bay Area bridge tolls by $1. Part of this additional revenue goes to the SR2T Program, which awards grants to facilitate walking and bicycling to regional transit. MTC serves as the lead public agency co-sponsor for allocating more than $20 million in total. There will be a funding cycle in 2013, with approximately $4 million available. SR2T funds may be used for safety enhancements for pedestrian/bike station access to transit stations/stops, and systemwide transit enhancements to accommodate bicyclists and pedestrians.
- **Transit Performance Initiative Funds (TPI).** In May 2012, MTC established a new TPI program, which is comprised of two programs: (1) a capital program focused on incremental investments to improve performance in major transit corridors, and (2) an incentive program to reward agencies that improve ridership and service productivity. In May, MTC approved an initial investment of TPI capital funds. MTC staff is now proposing an additional $13 million annually for FY 2012/13 – 2015/16 for a total of $52 million for future TPI capital funding cycles and $15 million annually for a total of $60 million over the same 4 fiscal years for the TPI incentive program. Funds for the latter would be distributed by formula to transit operators such as SFMTA. The Van Ness Avenue BRT Project would likely be eligible and competitive for funding under both the TPI capital and the TPI incentive programs. TPI is funded with federal STP/CMAQ funds.
- **Transit Sustainability Fee.** San Francisco is currently working on establishing the Transportation Sustainability Program (TSP), which is a revised metric for determining the impacts of a new development on the City's transportation system and associated fee program, Transportation Sustainability Fee (TSF), through which development projects can mitigate their impacts on the system. The proposed fee would supplement existing local transportation funding sources and would fund a $1.4 billion expenditure program over 20 years to directly offset impacts on the transportation system made by new development. There is $24.9 million for the Van Ness Avenue BRT Project included in the expenditure program. These funds are dependent on the pace of development in San Francisco.

9.2 Operations and Maintenance Costs

This section documents the expected operations and maintenance (O&M) costs and savings associated with the Van Ness Avenue BRT Project alternatives incurred within the corridor between Mission/Otis and Lombard streets. The proposed project would not change the cost to operate the service south of Mission Street or north of Lombard Street. O&M costs consist of two primary costs:

The build alternatives, including the LPA, would allow SFMTA to provide the same amount of service to passengers for a 16 to 32 percent lower operating cost. These operating savings could be reinvested in the corridor and used to increase the frequency of the BRT service, or they could be invested in other parts of the SFMTA system.

- **Operating Cost.** Table 9-2 shows the annual costs for SFMTA to run vehicles and provide revenue service for the No Build Alternative and build alternatives. The build alternatives would allow SFMTA to provide the same amount of service to passengers for a 16 to 32 percent lower operating cost, as shown in the table. The LPA operating cost would be similar to that of Build Alternatives 3B and 4B, with 32 percent lower operating cost compared to the No Build Alternative. This savings is due to the faster speed and shorter running times, which means maintaining the same frequency of service would require fewer vehicles operating on the corridor at any one time. These operating savings could be reinvested in the corridor and used to increase the frequency of the BRT service, or they could be invested in other parts of the SFMTA system. Note that the analysis does not take into account increased fare box revenue from increased ridership.
- **Maintenance Costs.** The build alternatives would have a modest incremental maintenance cost over and above the no-build scenario. Increased maintenance costs include repairs to potholes and patches to the runningway; additional landscaping costs to prune trees under Build Alternatives 3 and 4 due to their proximity to the OCS; additional platform cleaning and repair; and maintenance of additional TVMs required to support platform proof of payment (see Chapter 2 for a description). The LPA maintenance costs would be similar to those of Build Alternative 3B; although not the major component of runningway maintenance costs, tree pruning costs would be similar to Build Alternative 4B. Incremental costs attributed to the build alternatives are based on estimates from SFDPW and SFMTA.

The build alternatives would have a modest incremental maintenance cost over and above the no-build scenario.

Table 9-2: Annual Operating and Maintenance Costs for Proposed Service

	NO BUILD ALT.	BUILD ALT. 2	BUILD ALT. 3	BUILD ALT. 3 (WITH DESIGN OPTION B)	BUILD ALT. 4	BUILD ALT. 4 (WITH DESIGN OPTION B)
Annualized Revenue Hour Vehicle Operating Cost*	$8,300,000	$6,900,000	$6,100,000	$5,600,000	$6,100,000	$5,600,000
Other Incremental Annualized O&M Costs**	n/a	$200,000	$400,000	$400,000	$300,000	$300,000
Total	$8,300,000	$7,100,000	$6,500,000	$6,000,000	$6,400,000	$5,900,000

*Only includes costs to operate BRT between Mission and Lombard Street.
**Only includes incremental costs associated with BRT.

Overall, the estimated annual operations cost for the No Build Alternative, in current year dollars, would total approximately $8.3 million, which does not include baseline maintenance costs. As shown in Table 9-2, annualized operations and incremental maintenance costs range from $5.9 million for Build Alternative 4 with Design Option B, which is a 29 percent savings relative to the No Build Alternative, to $7.1 million for Build Alternative 2, which is a 14 percent savings relative to the No Build Alternative. Build Alternative 4 could also incur additional maintenance costs for the additional doors on the five-door vehicles (not shown in the table). For the LPA, annualized operations and incremental maintenance would cost $6 million, which is a 28 percent savings relative to the No Build Alternative. This cost savings could either be reinvested into higher bus frequencies in the corridor or invested in other parts of the system (see Chapter 3.2).

9.3 Risk Analysis

A risk analysis accounts for potential issues that could increase the total project costs, including as a result of schedule delays. FTA conducts a risk analysis of the project through its Project Management Oversight Program, summarized below:

- Due to the early stage of the project, some changes could still occur that would increase the cost of the project; however, the level of development is considered to be appropriate for a project at this stage.
- There is a risk to the schedule of the project due to the City, State, and Federal approvals required, in addition to the remaining design and engineering tasks. If the preferred construction approach of simultaneous construction on three block segments in the northern and southern portions of the corridor at a time is not implemented, the construction duration would be substantially lengthened. The longest construction duration would occur if a block-by-block construction approach was implemented. The advantage of the block-by-block approach is that traffic and parking impacts would be lessened during construction; however, the construction period would be notably longer than if three block segments were constructed at one time. Under a block-by-block approach, delays at one location would likely impact the entire project schedule, and it would be the least efficient approach in terms of resource management and mobilization. The Project Construction Plan (Arup, 2012) for the proposed project shows the following construction duration ranges, depending on the approach taken, and identifies the "preferred construction approach" planned by partnering agencies thus far and described in such documents such as the Project Study Report/Project Report and (Parsons, 2013):
  - Build Alternative 2: 19 to 57 months
  - Build Alternative 3: 21 to 69 months
  - Build Alternative 4: 14 to 47 months
  - LPA: 20 to 58 months

  The short end of the ranges reflects the durations under the preferred construction approach. The long end of the ranges reflects a block-by-block construction approach.

  Nevertheless, FTA's Annual Small Starts Review found that schedule uncertainties do not pose a major risk to implementation because potential delays are not likely to result in significant increases in costs for the project.

9.4 Financial Analysis Conclusions

In conclusion, at least 75 percent of the needed capital funding for the build alternatives has been identified. During the design phase of the project, SFCTA and SFMTA will apply for additional grants from various sources to complete the funding plan. The annual O&M costs associated with the build alternatives, including the LPA, are significantly lower than those of the No Build Alternative, with cost savings ranging from 14 to 29 percent. Operation of the Van Ness Avenue BRT Project would come from existing revenue sources for SFMTA, which include fare and parking revenues, operating grants (e.g., State Transit Assistance), traffic fees, and fines.

CHAPTER SUMMARY: This chapter presents the results of the alternatives analysis for the Van Ness Avenue BRT Project. The BRT alternatives were analyzed based on their performance in meeting the project purpose and need (see Chapter 1), as well as based on considerations of importance to multiple agency and public stakeholder groups. The performance categories and related performance measures analyzed consist of the following: transit performance; passenger experience, access and pedestrian safety; urban design/landscape; system performance; environmental and social effects; operations and maintenance; and constructability and capital cost. The purpose of the analysis is to identify and compare differences between the alternatives, including the Build and No Build Alternatives. The results of this alternatives analysis were combined with public input on the Draft EIS/EIR and agency input to inform the selection of a locally preferred alternative (LPA), which is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B) and is referred to as Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns. In addition, the performance analysis of the LPA and the Vallejo Northbound Station Variant pertaining to the project purpose and need is presented, along with the results of additional analysis undertaken to identify environmental impacts of the LPA. This chapter of the Final EIS/EIR also provides an overview of the FTA New Starts Criteria for evaluating projects that are candidates for funding and a summary of the revised project evaluation and rating for the FTA New Starts/Small Starts program based on the LPA.

CHAPTER 10

Alternatives Analysis and the Locally Preferred Alternative

10.1 Introduction and Approach

This chapter presents an analysis of the relative benefits and impacts of the Van Ness Avenue BRT alternatives, describes the framework and process for selecting the Locally Preferred Alternative (LPA), and presents the environmental impacts of the LPA relative to Build Alternatives 3 and 4 as presented in the Draft EIS/EIR; specific mitigation measures are described in Chapters 3 through 7. The BRT alternatives were analyzed based on their performance in meeting the project purpose and need, as well as based on considerations of importance to multiple agency and public stakeholder groups, including the project Technical Advisory Committee (TAC) and Citizens Advisory Committee (CAC). The purpose of the analysis was to identify and compare differences between the alternatives, including the No Build Alternative (Alternative 1). In so doing, the chapter highlights the ability of each alternative to advance the project purpose and need (Chapter 1).

The results of this alternatives analysis were combined with public input on the Draft EIS/EIR and agency input to inform the selection of a LPA, which is documented at the end of this chapter. Based on additional stakeholder input received on the project alternatives through public circulation of the Draft EIS/EIR, an LPA Report was prepared and presented to the TAC and CAC for input. The SFMTA and SFCTA boards then considered and approved selection of an LPA for inclusion in this Final EIS/EIR.

10.1.1 | Alternatives Analyzed

To identify a limited set of build alternatives to be analyzed in this EIS/EIR, SFCTA prepared an *Alternatives Screening Report* in March 2008. The alternatives analyzed in the screening report included a No Build Alternative, multiple BRT alternatives, including center-running and side-running BRT, and surface light-rail and subway alternatives. The *Alternatives Screening* report recommended the three main build alternatives analyzed in this EIS/EIR for further study in addition to the No Build Alternative (see Section 2.2 for complete descriptions of the alternatives). The LPA is a combination and refinement of the two center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B) presented in the Draft EIS/EIR.

10.2 Alternatives Analysis

10.2.1 | Indicators Based on Project Purpose and Need

The most important performance indicators analyzed in this chapter measure the ability of the alternative to advance the project purpose and need. The purpose and need statement for the Van Ness Avenue BRT project (see Chapter 1 of this EIS/EIR) supported the project scoping and alternatives screening process in 2008 and guide the development of the alternatives evaluation criteria. As the purpose and need outlines, the project is intended to address citywide transportation system development needs, as well as the specific needs of the Van Ness Avenue corridor. Accordingly, the build alternatives, including the LPA, are evaluated based on the extent to which they:

- Significantly improve transit reliability, speed, connectivity and comfort;
- Improve pedestrian comfort, amenities, and safety;
- Enhance the urban design and identity of Van Ness Avenue, creating a more livable street; and
- Accommodate safe multimodal circulation and access within the corridor.

In addition, the alternatives are evaluated on the extent to which they:

- Address expected transportation system performance;
- Counteract transit mode share loss;
- Are affordable and deliverable in the near term; and
- Improve transit cost effectiveness and operational efficiency.

10.2.2 | Additional Considerations

In addition to analyzing performance based on the project's purpose and need, the project team has analyzed how well each alternative, including the LPA, performs according to additional considerations of importance to project stakeholders. This input was obtained through project TACs and public outreach, in particular the project CAC. This greater detail provides additional insight into the differences among the four distinct alternatives (i.e., three build alternatives and the No Build Alternative) and the LPA.

10.2.3 | List of Performance Indicators

The indicators described in this section assess the performance of each alternative within eight key areas:

- Transit Performance
- Passenger Experience
- Access and Pedestrian Safety

- Urban Design and Landscape
- System Performance
- Environmental and Social Effects
- Operations and Maintenance
- Constructability and Capital Cost

Each of the eight categories includes multiple indicators, each of which are shown in Table 10-1 and presented in detail in this section. Those indicators that are directly related to the project's purpose and need, and which were used to evaluate potential alternatives in the Alternatives Screening Report, are starred. The remaining indicators capture additional considerations of importance to project stakeholders and decision makers.

Table 10-1: Performance Indicators and Definitions

INDICATOR ID *		PERFORMANCE INDICATORS	DEFINITIONS
	A	TRANSIT PERFORMANCE	
☆	A-1	Transit travel time (Part 1)	Reduction in travel time
	A-2	Transit travel time (Part 2)	Bus passing capability
☆	A-3	Reliability (passenger perspective)	Likelihood of unexpected stops
	A-4	Flexibility	Performance during special circumstances
	A-5	Vehicle operational safety	Safety of operating vehicles based on SFMTA operator's survey
☆	A-6	Attract/retain transit riders	Van Ness Avenue BRT route and SFMTA systemwide transit ridership
	A-7	Golden Gate Transit performance	Golden Gate Transit passenger travel time
	B	PASSENGER EXPERIENCE	
☆	B-1	Waiting experience (Part 1)	Platform crowding (above or below threshold)
☆	B-2	Waiting experience (Part 2)	Amount of buffer between platform and auto traffic
☆	B-3	In-vehicle experience (Part 1)	Lane weaving (number of lane transitions)
☆	B-4	In-vehicle experience (Part 2)	Vehicle crowding at maximum load point (above or below threshold)
	C	ACCESS AND PEDESTRIAN SAFETY	
☆	C-1	Pedestrian crossing experience/exposure	Average median refuge width
☆	C-2	Pedestrian crossing exposure	Average distance to cross Van Ness Avenue
	C-3	Universal design	Adherence to universal design principles
	C-4	Quality of bicycle access	Number and types of other street user movements in conflict with bicycles
	D	URBAN DESIGN/LANDSCAPE	
☆	D-1	Street identity	Consistency of median footprint
	D-2	Quality of landscape (Part 1)	Edge length to total area ratio of landscaped median
	D-3	Quantity of landscape (Part 2)	Square feet of permeable/landscaped surface area
	E	SYSTEM PERFORMANCE	
☆	E-1	Average person-delay	Average total intersection person-delay for all users of Van Ness Avenue
☆	E-2	Person throughput capacity	Average persons per lane per hour on Van Ness Avenue in the PM peak

Table 10-1: Performance Indicators and Definitions

INDICATOR ID *	PERFORMANCE INDICATORS	DEFINITIONS
☆ E-3	Accommodate automobile traffic circulation and access	Number of intersections with average automobile delay greater than 55 seconds (LOS E or F) in Year 2015
E-4	Accommodate traffic circulation and access	Number of turning restrictions
F	**ENVIRONMENTAL AND SOCIAL EFFECTS**	
F-1	Air pollutant emissions (Part 1)	Countywide air pollutant emissions
F-2	Air pollutant emissions (Part 2)	Countywide GHG emissions
F-3	Energy impact	Countywide motorized vehicle fuel consumption
F-4	Noise impacts	Number of affected sensitive receptors above significance threshold
F-5	Parking opportunities	Number of on-street parking spaces
F-6	Biological	Number of healthy existing trees preserved
G	**OPERATIONS AND MAINTENANCE**	
☆ G-1	Operations cost	Cost to operate on-street service
G-2	Maintenance cost (Part 1)	Cost to maintain vehicles
G-3	Maintenance cost (Part 2)	Cost to maintain runningway, landscaping, and amenities
G-4	Ease of access for maintenance	Number of special maintenance conditions
H	**CONSTRUCTION AND CAPITAL COSTS**	
☆ H-1	Total capital cost	Total capital construction cost
☆ H-2	Construction duration	Construction duration (months)
H-3	Construction intensity	Linear feet of utility relocation and curb rebuild
H-4	Ease of access to land uses during construction	Degree of sidewalk disruption

* Indicators that are directly related to the project's purpose and need, and which were used to evaluate potential alternatives in the Alternatives Screening Report, are identified with a star (☆).

10.2.4 | Alternatives Performance

10.2.4.1 | TRANSIT PERFORMANCE

The transit performance category is intended to capture how well each alternative improves transit performance from the perspective of the passenger as well as the operator. The following indicators have been selected to best distinguish between the alternatives in this EIS/EIR in terms of transit performance.

☆ **A-1: Transit Travel Time.** Travel time is a key measure of performance related to the project's purpose and need to significantly improve transit performance, especially relative to driving. This performance measure, described in Section 3.2, documents the percent reduction in travel time for the SFMTA BRT routes (#47 and #49) compared with existing conditions.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	DESIGN OPTION B (BUILD ALTERNATIVES 3 AND 4)
Percent reduction in travel time in Year 2015 compared with existing conditions	3%	19%	28%	28%	33%

In Year 2015, the No Build Alternative (Alternative 1) will improve travel times compared with existing conditions by 3 percent due to the expected transit enhancements such as low-floor boarding and proof of payment. Build Alternative 2 would improve travel times by 19 percent over current conditions. Build Alternative 2 would not reduce travel time as much as Build Alternatives 3 and 4 due to conflicts with automobile right-turning movements at intersections and conflicts from passenger vehicles moving to and from parking spaces along the corridor. Build Alternatives 3 and 4 would reduce travel time by 28 percent along the corridor. Incorporation of Design Option B into Build Alternatives 3 and 4 would provide the greatest reduction in travel times (33 percent relative to existing conditions) due to the removal of left-turn movements and the left-turn signal phases at those intersections along Van Ness Avenue, allowing for extended transit signal priority (TSP).

LPA Performance. The LPA performs similarly to Build Alternatives 3 and 4 with Design Option B on this indicator and would provide the greatest reduction in travel times (33 percent relative to existing conditions). The inclusion of the Vallejo Northbound Station Variant, as described in Section 2.2.2.4, could increase transit travel time by up to 15 seconds, meaning the LPA would perform similar to Build Alternatives 3 and 4, with a 28 percent reduction in transit travel time.

A-2: Bus Passing Capability. This performance indicator looks at the ability of buses to pass other vehicles that may impede the operation of the system, such as in the event of a breakdown or bus bunching.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Bus passing capability	Yes	Yes	No, except with delays	Yes

Buses would undergo significant delays and unusual operations in Build Alternative 3 in order for buses to pass each other due to the configuration of the dual medians.

With Build Alternative 4 (with or without Design Option B), buses would pass each other on the right, which would require special operator training.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternative 4 (with or without Design Option B) on this indicator; buses would be able to pass each other outside of station locations, and would need to pass each other on the right, which would require special operator training.

☆ **A-3: Likelihood of Unexpected Stops.** In addition to travel time, transit reliability is a key performance indicator and part of the project's purpose and need. This performance indicator, which is discussed in Section 3.2, considers the extent to which each alternative would improve the reliability of transit service by reducing the likelihood of unexpected stops during service. The fewer unexpected stops there are at each intersection, the greater the reliability of transit operations. Unexpected stops are defined as stops made outside of passenger loading/unloading and are due to mixed traffic and traffic signal delays.

Unexpected stops are estimated by the VISSIM microsimulation model and are shown per intersection.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	BUILD ALTERNATIVES 3 AND 4 DESIGN OPTION B
Likelihood of an unexpected stop per block	70% chance of an unexpected stop/block	50% chance of an unexpected stop/block	35% chance of an unexpected stop/block	36% chance of an unexpected stop/block	34% chance of an unexpected stop/block

Under the no-build (Alternative 1) scenario, the 47 and 49 routes would have a 70 percent chance of an unexpected stop along each block. Build Alternative 2 would reduce this chance to 50 percent along each block, and Build Alternatives 3 and 4 would reduce this further to a 36 percent chance of an unexpected stop. Design Option B would reduce Alternatives 3 and 4 to a 34 percent chance of stopping along each block.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 with Design Option B on this criterion, and would have a the lowest chance (34%) of an unexpected stop per block.

A-4: Performance during Special Circumstances. This performance indicator considers the ability to operate Muni service in the corridor in the case of special events (e.g., event at Fort Mason) or citywide emergencies during which vehicles other than the dedicated BRT vehicles may need to be used along the Van Ness Avenue corridor. The capacity of the facility to carry large flows of passengers in these situations is also considered.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Ability to handle special events/ evacuations	Any SFMTA bus can serve the corridor; medium capacity	Any SFMTA bus can serve the corridor; medium-high capacity	Any SFMTA bus can serve the corridor; high capacity	Special operating requirements; high capacity

The No Build Alternative (Alternative 1) and Alternatives 2 and 3 (including Design Option B) would provide an equivalent ability to add emergency service along the corridor, although Build Alternative 3 would have higher capacity to handle large passenger flows. Build Alternative 4 (with or without Design Option B) would have less operating flexibility due to the requirement for buses to load from the left at some stations/stops, combined with potentially high operational capacity. In the event of a high-demand situation, MTA may need to employ special operating plans, including using the reserve fleet of BRT vehicles (up to 60 total); operating right-side-door buses and only stopping at Geary/O'Farrell; or operating right-side-door buses and stopping on the curb with temporary stops. These scenarios reflect a range of passenger-handling capacities from medium to high.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternative 3 for this indicator; any SFMTA vehicle could serve the corridor during a special event, and the center lane would provide high capacity.

A-5: Vehicle Operational Safety. This performance indicator considers the relative ease of operating an alternative from the bus operators' perspective. SFMTA conducted a focus group survey with operators and took operator input on a range of issues related to the ease of operation, including conflicts with other bus vehicles and road users and unique operational characteristics.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Operator Comments	No major changes from existing service	Side-lane operation similar to existing Some conflicts with private vehicles and bicycles remain	Limited conflicts with private vehicles/ bicycles Loading similar to existing Head-on bus approaches are undesirable Design Option B would reduce conflicts with left-turning vehicles	Limited conflicts with private vehicles/ bicycles Loading different than existing Design Option B would reduce conflicts with left-turning vehicles

The No Build Alternative (Alternative 1) would share the same operational challenges as the existing condition. Build Alternative 2 would offer the operational benefits of nearly eliminating lane weaving, and it would reduce conflicts with private vehicles and bicycles relative to existing conditions; however, conflicts with automobiles would still occur because private vehicles would cross the transitway to turn right and to access on-street parking along Van Ness Avenue. Build Alternatives 3 and 4 would remove nearly all of the conflicts with private vehicles and bicycles; however, Build Alternative 3 (with or without Design Option B) would result in bus vehicles approaching each other from opposite directions without a separating buffer, creating a concern about head-on bus collisions. This was considered the greatest operational drawback from operators' perspectives, so Build Alternative 3 (with or without Design Option B) has the lowest performance on this criterion. Build Alternative 4 would require buses to load from the left at some stations/ stops and from the right at others, presenting the potential for operational complications. Concerns surrounding this issue could be minimized through enhanced technology (sensors on vehicles) and operator training. Thus, Build Alternatives 2 and 4 share similar degrees of operational complication. Incorporation of Design Option B for Alternatives 3 and 4 would further reduce conflicts with private vehicles by removing the left-hand turn lanes along Van Ness Avenue.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternative 4 with Design Option B for this indicator for most of the corridor. There would be limited conflicts with private vehicles, bicycles, and left turns. However, because the LPA would use standard loading, it would not have the operational complications associated with Build Alternative 4. The LPA would have head on approaches at (and sometimes near) station locations. Because the LPA includes a minimum 1-foot buffer between transit lanes, and a minimum of 11.5-foot-wide transit lanes, the potential safety risk of head on approaches is minimized (see Appendix A for engineering drawings of the LPA), In addition, because vehicles would be traveling at lower speeds near stations, the safety concern is further reduced.

☆ **A-6: Van Ness Avenue BRT Route and SFMTA Systemwide Ridership.** The ability to attract and maintain riders is directly related to the project's purpose and need to reverse the trend towards declining transit mode share and is reported for Routes 47 and 49 specifically, as well as for the overall SFMTA transit system, as discussed in Section 3.2. The BRT route ridership for each alternative (shown for 2015 relative to existing conditions) helps show the success in attracting various types of trips to transit, including:

- Totally new or "induced" trips that were not made before by transit or any other mode. In the case of the No Build Alternative, much of this can be attributed to population and employment growth;

- Trips that were made by another nontransit mode (i.e., driving alone, carpool, walk, or bicycle) now using the new service; and
- Existing transit trips diverted from other routes to service on the corridor due to the relative attractiveness of the BRT routes.

The SFMTA systemwide ridership for each project alternative indicates the success in attracting the first two types of trips listed above to the system as a whole.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Route and systemwide transit ridership in Year 2015 (relative to existing)	7 percent increase on BRT routes relative to existing conditions; 5 percent increase systemwide relative to existing conditions	29 percent increase on BRT routes relative to existing conditions; 6 percent increase systemwide relative to existing conditions	37 percent increase on BRT routes relative to existing conditions; 7 percent increase systemwide relative to existing conditions	37 percent increase on BRT routes relative to existing conditions; 7 percent increase systemwide relative to existing conditions

Build Alternatives 3 and 4 (with or without Design Option B) attract the most ridership due to their greater reduction in travel time. Build Alternative 2 attracts significantly more ridership on the BRT routes than the No Build Alternative.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 for this indicator, attracting the highest ridership (37 percent increase on BRT routes and 7 percent systemwide relative to existing conditions).

A-7: Golden Gate Transit Passenger Travel Time. This analysis examined the impact of the project alternatives on the travel time for Golden Gate Transit (GGT) passengers. The travel time calculations considered average total travel time (i.e., on and off the bus) per GGT passenger within San Francisco, for all routes that use Van Ness Avenue. The overall travel time per passenger reflects the increased walk access time that some GGT passengers would incur under Build Alternative 4, which would consolidate all stops on Van Ness Avenue, except for Geary/O'Farrell, and require passengers to walk additional distance to and from another station or transfer to and from the BRT routes at a GGT station (travel time estimates below assume walking). It also reflects the increased travel time for GGT buses to alternative routing along Chestnut Street between Laguna Street and Van Ness Avenue (see Section 2.2 for a full description)

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Average total travel time per passenger (in minutes) within San Francisco	13.1 minutes	11.6 minutes	10.9 minutes (10.6 minutes with Design Option B)	12.5 minutes (12.1 minutes with Design Option B)

Almost 80 percent of existing GGT Van Ness Avenue passengers use either the stops at Geary/O'Farrell or a stop that is not located on Van Ness Avenue (i.e., Civic Center, Financial District). These passengers would all benefit from the decreased travel time under any of the build alternatives, and all of the build alternatives would reduce the average total travel time for existing GGT passengers. Build Alternative 3 would reduce travel time the most due to the greatest reduction in bus travel time and the lowest walk or transfer times for GGT passengers. Travel time for Build Alternative 3 would be further reduced under Design Option B. Build Alternative 2 does not decrease bus travel time as much as Build Alternatives 3 and 4. Build Alternative 4 would increase in-vehicle travel time off the corridor from Laguna Street to Van Ness Avenue due to the rerouting of the buses along Chestnut Street. Build Alternative 4 would also increase walking or transfer time for GGT riders whose stops would be consolidated; therefore, Build Alternative 4 would not reduce the average total travel time as much as the other build alternatives. Travel time for Build Alternative 4 would be further reduced under Design Option B.

LPA Performance. The LPA performs similarly to Build Alternative 3 with Design Option B for this indicator, providing the greatest reduction in travel time for GGT passengers. The Vallejo Northbound Station Variant could cause a slight increase (up to 10 seconds, on average) in travel time for GGT passengers due to Muni buses being stopped at the NB Vallejo Street station.

10.2.4.2 | PASSENGER EXPERIENCE

In this analysis, passenger experience is considered for the in-vehicle experience, as well as the waiting experience at the station platforms. The following performance measures have been selected to best distinguish between the alternatives in terms of passenger experience.

☆ **B-1: Platform Crowding.** Platform crowding contributes to the comfort and safety of passengers at bus stops and BRT stations; therefore, it is directly related to the project's purpose and need to improve the experience for transit patrons. This analysis, which is described in Section 3.2, calculates whether the highest-demand station platform, which is at Market Street, would become overcrowded under any of the build alternatives by comparing the area (i.e., square feet) per waiting passenger to SFMTA minimum standards of 5 square feet per passenger at subway stations.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Platform crowding (square feet per passenger)	Same as existing (no platforms)	More than 13 square feet per passenger (below threshold)	More than 12 square feet per passenger (below threshold)	More than 12 square feet per passenger (below threshold)

All of the build alternatives would provide sufficient platform capacity when compared against the SFMTA threshold of 5 square feet per passenger. Design Option B would not alter platform size or result in increased ridership; therefore, it does not change the results from Build Alternative 3 or 4.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 for this indicator, and would provide sufficient platform capacity.

☆ **B-2: Amount of Buffer between Platform and Auto Traffic.** Presence of space or buffer between waiting passengers and moving traffic increases comfort and is directly related to the project's purpose and need to improve the experience for transit patrons. This analysis, which is described in Section 3.4, calculates the amount of buffer in feet.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Width of buffer in feet between platform and traffic	16 feet (8 feet from center of sidewalk plus 8-foot parking lane)	15 feet (4.5 feet from center of platform plus 10.5-foot BRT lane)	4.5 feet (4.5 feet from center of platform)	17.5 feet (7 feet from center of platform plus 10.5-foot BRT lane)

Build Alternative 2 would reduce the buffer size slightly versus existing conditions and the No Build Alternative, although there would be room to wait on the sidewalk behind the platform. Build Alternative 3 (with or without Design Option B) would reduce the size of the buffer significantly relative to existing conditions. Build Alternative 4 (with or without Design Option B) would increase the buffer zone slightly.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 for this indicator, although it would provide an additional 1-foot buffer between the station and the adjacent traffic lane, for a total of 5.5 feet of buffer between the center of the platform and traffic.

☆ **B-3: Number of Lane Transitions.** Lane weaving, which is measured by the number of lane transitions the vehicle must make along its route, detracts from the passenger in-vehicle experience by reducing the smoothness of the ride, especially for standing passengers. This analysis, which is directly related to the project's purpose and need to improve transit patron experience, identifies all lane weaves and calls out "major weaves," or those that require the horizontal movement of at least 8 feet (or an entire lane of traffic) over a short distance (e.g., pulling in and out of bus stops). "Minor weaves" are smoother transitions that passengers would still notice but are not as severe (e.g., lane transition to accommodate a left-turn pocket).

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Lane weaving (number of lane transitions)	58 major weaves	0 weaves	21 weaves (8 major plus 13 minor	6 weaves (2 major plus 4 minor)

Under the No Build Alternative (Alternative 1), buses would be required to transition as much as in the existing conditions, pulling in and out of bus stops along the length of the corridor. Build Alternative 2 would remove all lane weaving. Build Alternative 3 (with or without Design Option B) would reduce the number of weaves by more than half (to 21), as well as significantly reduce the number of "major weaves." Build Alternative 4 (with or without Design Option B) would reduce the number of weaves by 90 percent, with only 2 major weaves, which are associated with the transition to and from the dual platform alignment at the Geary/O'Farrell stop to accommodate the right-door loading of GGT vehicles.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, would have the most lane weaving of the build alternatives, with 20 minor weaves and 6 major weaves. The LPA is designed to make these transitions as smooth as possible, with a 40-mph design speed for the BRT for nearly all of the corridor.

☆ **B-4: In-Vehicle Passenger Crowding.** Comfort in the vehicles is part of the project's purpose and need, and it is also a function of crowding (load factor), which refers to the number of people on the bus relative to capacity. This analysis, which is found in Section 3.2, considers the vehicle load factor at the highest-demand points in 2015 and compares it to SFMTA's threshold for crowding, which is set at 85 percent of total vehicle capacity.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Load factor at maximum load point in Year 2015 (above or below threshold)	0.50 (Route 49 SB at McAllister); below threshold	0.71 (Route 49 SB at McAllister); below threshold	0.80 (Route 47 SB at Oak Street); below threshold	0.80 (Route 47 SB at Oak Street); below threshold

All of the project alternatives (Alternatives 1 through 4, including Design Option B) would not have crowding in excess of SFMTA's 0.85 threshold in Year 2015. It should be noted that this analysis does not take into account transit reliability, which is a major contributor to vehicle crowding (i.e., bus bunching means that people can wait significantly longer for a vehicle than is scheduled, causing a buildup of people at station locations and additional crowding; see Section 3.2). In addition, this analysis maintains bus frequencies at the no-build levels; however, if the travel time savings were to be reinvested into more frequent service at no additional operating cost, the load factors would decrease for all of the build alternatives, with the greatest reduction in the center-lane configured alternatives (Build Alternatives 3 and 4), especially with incorporation of Design Option B.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 for this indicator, and would not have crowding in excess of SFMTA's 0.85 threshold in Year 2015.

10.2.4.3 | ACCESS AND PEDESTRIAN SAFETY

All transit trips in the corridor begin and end with pedestrian or bicycle trips (cyclists can load their bicycles on the front of the bus). Providing safe and comfortable access to and from the stations and within the corridor is a key element of the project purpose and need. This performance category has four indicators that are directly related to the project purpose and need, and are described below.

☆ **C-1: Average Median Refuge Width.** Median refuges are found in crosswalks and provide a protected waiting area outside of traffic for pedestrians crossing the street if the traffic signal changes when they have not completed crossing. Medians greater than 9 feet in width allow sufficient space for detectable warning strips on both sides, as well as a waiting area in between for wheelchair users. Medians less than 5 feet may not provide sufficient space for all users and would provide poor conditions for pedestrians forced to use them. This indicator is directly related to the project's purpose and need to improve the safety and comfort of pedestrians. Analysis of median width can be found in Section 3.4.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4	BUILD ALTERNATIVE 4 (WITH DESIGN OPTION B)
Medians greater than 9 feet wide	28 (48%)	44 (76%)	3 (3%)	48 (80%)	54 (88%)
Medians between 5 and 9 feet wide	3 (5%)	2 (3%)	58 (53%)	6 (10%)	4 (9%)
Medians less than 5 feet wide	27 (47%)	12 (21%)	47 (44%)	6 (10%)	2 (3%)

Under existing conditions and with the No Build Alternative (Alternative 1), approximately half (48 percent) of the crossings have a median wider than 9 feet, with most of the remainder (47 percent) crossings having medians less than 5 feet wide. Build Alternative 2 would provide high-quality median refuges, with 76 percent of the crossings with a median that is wider than 9 feet. In contrast, under Build Alternative 3 (with or without Design Option B), 3 percent of the crossings would have a median wider than 9 feet. Build Alternative 4 would include the most intersections with medians wider than 9 feet at 80 percent (88 percent under Design Option B).

LPA Performance. With the LPA, including the Vallejo Northbound Station Variant, 41 median refuges (71 percent) would have widths between 6 and 9 feet, while 17 refuge locations (29 percent) would have medians wider than 9 feet (mostly 11 feet wide). The refuges in the LPA would all be on medians at least 6 feet wide except for the south crossing leg of the Mission/South Van Ness Avenue intersection.

☆ **C-2: Average Crossing Distance.** Long crossing distances require more time for pedestrians to cross the street, increasing time spent exposed to traffic in the intersection. The average crossing distance, measured in feet, was analyzed in Section 3.4. The crossing distance is directly related to the project's purpose and need to improve the safety and comfort of pedestrians.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 3 (WITH DESIGN OPTION B)	BUILD ALTERNATIVE 4	BUILD ALTERNATIVE 4 (WITH DESIGN OPTION B)
Average crossing distance (curb to curb)	91 feet	87 feet	90 feet	89 feet	89 feet	88 feet

The No Build Alternative (Alternative 1) would not modify the street configuration and would maintain the existing average crossing distance of 91 feet. The build alternatives all provide similar crossing distances, although Build Alternative 2 would provide the greatest number of opportunities for pedestrian curb bulbs.

LPA Performance. Average crossing distance for the LPA, including the Vallejo Northbound Station Variant, would be 90 feet.

C-3: Adherence to Universal Design Principles. This performance indicator summarizes the extent to which each project alternative advances the seven Universal Design Principles, which evaluate how accessible projects are for all potential users of the street, including those with disabilities. Universal Design is analyzed in Section 3.4.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Adherence to universal design principles (checklist)	NA (baseline)	Improves on 5 principles Neutral on 1 principle Worse on 1 principle	Improves on 2 principles Neutral on 2 principles Worse on 3 principles	Improves on 4 principles Neutral on 1 principle Worse on 2 principles

The No Build Alternative (Alternative 1) would perform similarly to existing conditions, with small enhancements to universal design through elements such as low-floor buses, pedestrian countdown signals, and implementation of APS at some, but not all, intersections. Build Alternative 2 performs strongest with respect to universal design, enhancing Principles 1, 2, 3, 5, and 7, while performing worse on Principle 6. Build Alternative 3 performs the lowest with respect to universal design, enhancing Principle 1, while performing worse on Principles 4, 5, and 6. Build Alternative 4 would enhance Principles 1, 2 (although not as much as Build Alternative 2), 5, and 7, while performing worse on Principles 4 and 6. See Section 3.4 for more details on Universal Design.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternative 3 (lowest) for this indicator, enhancing Principles 1 and 2 while performing worse on Principles 4, 5, and 6.

C-4: Bicycle Performance. This performance indicator, which is analyzed in Section 3.4, evaluates the increase or decrease in potential conflicts between bicycles and all other travelers in the corridor.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Number and types of other street user movements in conflict with bikes	Same as existing (more vehicles on Van Ness Avenue)	Similar amount of conflicts as Alternative 1	Similar amount of conflicts as Alternative 1	Similar amount of conflicts as Alternative 1

The No Build Alternative (Alternative 1) would have the same types of conflicts as existing conditions. The improvement of the bicycle facility on Polk Street, which is the designated bicycle route in the corridor (see Section 3.4 for a description of Polk Street and the proposed improvements to the facility), would create a better alternative for cyclists than traveling along Van Ness Avenue under the No Build Alternative, decreasing conflicts for riders using that street. Under the build alternatives, buses would no longer weave into the bicycle path of travel when pulling into and out of bus stops. There would be some difference in the types of conflicts under the build alternatives (e.g., riding next to parked vehicles in Build Alternatives 3 and 4 versus riding next to buses in Build Alternative 2); however, these differences were not considered appreciable enough to be considered enhancements or impacts to cyclists' experience on Van Ness Avenue; therefore, all of the project alternatives were considered to perform the same for this indicator.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 for this indicator, and would have a similar amount of conflicts as the No Build Alternative.

10.2.4.4 | URBAN DESIGN/LANDSCAPE

The purpose and need for the Van Ness Avenue BRT Project calls for a project that improves the overall design of the street. This category considers the strength of the street design from an urban and landscape design perspective. Having attractive and cohesive urban design and landscaping encourages transit usage, links transit usage to the adjacent land uses, and enhances the overall experience of using the street. The measures in this section evaluate each alternative's performance in providing a quality landscape and urban design.

☆ **D-1: Consistency of the Median Footprint.** The consistency of the median is a key measure of streetscape quality and a good assessment of how well each alternative advances the project's purpose and need to provide a strong street identity. A median that has a consistent shape or footprint from block to block has a stronger identity than a median that has varied shape and size from block to block. Performance is measured by the number of different configurations in conceptual engineering documents, as well as the number of changes between those various configurations along the corridor. The lower the number for each of these indicators means a superior performance or the more consistent the median footprint is considered to be. Conceptual drawings showing the median footprints can be found in Appendix A.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 3 (WITH DESIGN OPTION B)	BUILD ALTERNATIVE 4	BUILD ALTERNATIVE 4 (WITH DESIGN OPTION B)
Consistency of median footprint (number of different configurations)	10 configu-rations/ 23 changes	6 configu-rations/ 13 changes	9 configu-rations/ 14 changes	6 configu-rations/ 7 changes	5 configu-rations/ 7 changes	4 configu-rations/ 4 changes

The No Build Alternative (Alternative 1) would maintain the existing roadway geometry and median consistency. The current roadway geometry of the corridor has 10 configurations of the median, and there are 23 block-to-block changes. Build Alternative 3 would perform the worst, with 9 configurations and 14 changes in the median design. Build Alternative 2 would perform better, with 6 configurations and 13 changes in the median design from block to block. Build Alternative 4 would provide the most consistent footprint, and even more so with Design Option B.

LPA Performance. The LPA would have 8 different configurations and 23 block-to-block changes. The LPA is the least consistent of any of the alternatives due to the transitions from a center median similar to Build Alternative 4 outside of station locations to an alignment similar to Build Alternative 3 at station locations. The Vallejo Northbound Station Variant would add a ninth configuration, making it less consistent than the LPA without the variant.

D-2: Edge to Total Area Ratio of Landscape. Another consideration is the "edge-area ratio" of the landscape. A higher quality of landscaping can be achieved when there is less "edge" and more "area;" in other words, large landscaped sections provide more opportunities for landscaping than smaller, narrower sections; therefore, the lower the ratio, the better the alternative would perform in this analysis.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Edge-area ratio of landscape	28% edge/area ratio	22% edge/area ratio	35% edge/area ratio. Design Option B would result in even lower edge-area ratio	21% edge/area ratio. Design Option B would result in even lower edge-area ratio

The current edge area ratio of landscaping in the corridor is 28 percent. Build Alternatives 2 and 4 would improve over the existing condition with ratios of 22 percent and 21 percent, respectively, indicating the larger areas of landscaping proposed under both alternatives. Build Alternative 3 would increase the ratio due to the smaller dual medians, providing landscaping in smaller sections. Design Option B would allow for larger, fuller sections of landscaped median due to the consolidation of left turns in Alternatives 3 and 4. Build Alternative 4 with Design Option B would perform the strongest on this indicator overall.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs between Build Alternatives 3 and 4 with an approximate 33 percent edge/area ratio, because the LPA combines the dual median design of Build Alternative 3 on blocks with stations, and the single median design on blocks without stations.

D-3: Permeable/Landscape Surface Area. This analysis, which is found in Section 4.9, evaluated the net amount of permeable or landscaped surface under each alternative.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 3 (WITH DESIGN OPTION B)	BUILD ALTERNATIVE 4	BUILD ALTERNATIVE 4 (WITH DESIGN OPTION B)
Acres of permeable/ landscaped surface	0.7	1.3	0.8	0.8	1.2	1.3

The No Build Alternative (Alternative 1) reflects the current conditions with 0.7-acre of landscaping in the corridor. Build Alternatives 2 and 4 would nearly double the amount of landscaping to 1.3 and 1.2 acres, respectively (Build Alternative 4 with Design Option B would also have 1.3 acres). Build Alternative 3 would also increase the amount of permeable/landscaped surface relative to the No Build Alternative, but to a slightly lesser extent than Build Alternatives 2 and 4. Incorporation of Design Option B under Build Alternative 3 would not substantially change the landscape area.

LPA Performance. The LPA would have 0.9-acre of permeable surface, a similar amount to Build Alternative 3.

10.2.4.5 | SYSTEM PERFORMANCE

As discussed in the project's purpose and need statement (Chapter 1), a major goal of BRT is to optimize system performance. The BRT alternatives have varying effects on overall circulation, access, and mobility, as the performance of a BRT system on Van Ness Avenue will vary based on lane configuration, signal timing, and demand shifts. This performance category is intended to present those differences by comparing the following:

☆ **E-1: Average Total Intersection Person-Delay.** This is a multimodal performance indicator that looks at the average delay for all travelers along and crossing Van Ness Avenue, including people in cars, buses, and pedestrians. This is reported as average person-delay at intersections, and the project performs similarly across all alternatives.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	DESIGN OPTION B (BUILD ALTERNATIVES 3 AND 4)
Average total intersection person-delay on Van Ness Avenue in Year 2015 (seconds per person)	18 sec	18 sec	18 sec	18 sec	17 sec

In Year 2015, under the build alternatives, the decreased delay for BRT and autos traveling along Van Ness Avenue would offset any increase in delays for other auto and transit movements. Therefore, total person-delay would be the same for all of the build alternatives. Incorporation of Design Option B under Build Alternatives 3 and 4 would decrease average intersection delay by 1 second per person through the removal of left turns.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 with Design Option B for this indicator, reducing average total intersection person-delay by 1 second versus the No Build Alternative.

☆ **E-2: Lane Productivity.** By reporting the number of people (in cars and on transit) that are using each lane of Van Ness Avenue, the efficiency of use and potential capacity of the system was measured in Section 3.1. The analysis below shows the number of trips in autos and on transit in each lane during the PM peak hour in Year 2015.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Average persons per lane per hour on Van Ness Avenue in Year 2015	605 transit / 630 auto	760 transit / 675 auto	930 transit / 680 auto	930 transit / 680 auto

The No Build Alternative (Alternative 1) moves approximately 605 transit patrons and 630 people in private vehicles in each lane on Van Ness Avenue. Build Alternative 2 would increase the person throughput in each lane during the peak hour relative to the No Build Alternative. Build Alternatives 3 and 4 (with or without Design Option B) would further increase the number of people moved per lane, both in the transit lane as well as in the automobile traffic lanes.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 for this indicator, increasing the person throughput in each lane during the peak hour relative to the No Build Alternative and Build Alternative 2.

☆ **E-3: Traffic Operations/Delay.** This performance indicator, analyzed in Section 3.3, identifies the number of intersections in the auto traffic study area that experience an average delay of 55 seconds or greater (i.e., LOS E or LOS F) in year 2015. The indicator is a good approximation for the ability of each alternative to meet the project's purpose and need to accommodate safe multimodal circulation and access within the corridor.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	DESIGN OPTION B (BUILD ALTERNATIVES 3 AND 4)
Number of intersections in the traffic study area with average auto delay of 55 seconds or greater	4	3	4	4	4

The No Build Alternative (Alternative 1) is expected to have 4 intersections with delays greater than 55 seconds, caused in part by the reconfiguration of Hayes to be a two-way street (see Section 2.2 for details). All of the build alternatives would have the same or fewer intersections operating with average delays greater than 55 seconds in 2015 compared with the No Build Alternative, due to the improvement of the Mission/Otis/South Van Ness Avenue intersection (see Section 3.3).

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 with Design Option B for this indicator, and would have 4 intersections that operate at LOS E or F in Year 2015.

E-4: Number of Turning Restrictions. The inability to turn off of Van Ness Avenue reduces the number of choices for auto travelers and trucks in the corridor. The project team determined the number of left-turn restrictions proposed for automobiles on Van Ness Avenue for each alternative.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	DESIGN OPTION B (BUILD ALTERNATIVES 3 AND 4)
Number of new turn restrictions	0	6 NB / 7 SB	6 NB / 7 SB	6 NB / 7 SB	11 NB / 10 SB

Van Ness Avenue currently provides 12 NB left-turn opportunities and 11 SB left-turn opportunities. The No Build Alternative (Alternative 1) would not further restrict left-turns on Van Ness Avenue relative to existing conditions. All of the build alternatives would reduce the number of left-turn opportunities by 6 NB and 7 SB. Design Option B for Build Alternatives 3 and 4 would only permit left turns in the corridor heading NB at Lombard Street and SB at Broadway. No left- or right-turn restrictions onto Van Ness Avenue for automobiles would be implemented as part of any of the build alternatives; however, as a result of some new medians, curb bulbs, and station platforms, some cross streets could no longer accommodate the turning movements of very large trucks. Build Alternatives 2 and 4 would require restricting very large trucks from turning onto Van Ness Avenue from Hayes Street. Build Alternative 3 would require restrictions on large trucks turning at the intersections of Market Street, Hayes Street, O'Farrell Street, Geary Street, and Broadway.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 with Design Option B for this indicator, since there would only be one left turn opportunity in each direction along the corridor. Because the

LPA uses predominantly near side stations, it would not require any turning restrictions onto Van Ness Avenue. The Vallejo Northbound Station Variant would require a turning restriction preventing trucks traveling WB on Vallejo Street from turning right onto Van Ness Avenue.

10.2.4.6 | ENVIRONMENTAL AND SOCIAL EFFECTS

The project team identified the following environmental and social effects as potential distinguishing performance indicators that could be used to compare the project alternatives.

F-1: Countywide air pollutant emissions. Countywide operational emissions were estimated for the proposed BRT in Year 2035 (see Section 4.10). The emission rates, in combination with the calculated VMT, provide countywide emissions associated with each project alternative.

SAN FRANCISCO COUNTYWIDE AIR POLLUTANT EMISSIONS (POUNDS PER DAY)	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	DESIGN OPTION B (BUILD ALTERNATIVES 3 AND 4)
ROG	2,084	2,071	2,070	2,070	2,082
NO_X	7,439	7,393	7,390	7,390	7,431
PM_{10}	1,820	1,809	1,808	1,808	1,818
$PM_{2.5}$	1,372	1,363	1,363	1,363	1,370

All of the build alternatives would result in a slight (0.1-percent to 0.7-percent) reduction in citywide VMT relative to the No Build Alternative (Alternative 1). These small differences between the alternatives do not distinguish them in terms of air quality performance.

LPA Performance. The LPA, with or without the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 with Design Option B for this indicator, and is not distinguished versus the other build alternatives in terms of air quality performance.

F-2: Countywide Greenhouse Gas Emissions. Air pollutants can also be measured by GHG emissions at the countywide level in Year 2035 (see Section 4.10). GHG emissions are of emerging importance with the recent passage of Assembly Bill (AB) 32 and State Bill (SB) 375, which mandate GHG emission levels; the City's Climate Action Plan also calls for substantial reduction in GHG emissions from the transportation sector by 2050.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	DESIGN OPTION B (BUILD ALTERNATIVES 3 AND 4)
GHG emissions – countywide (metric tons per year)	3.47	3.45	3.44	3.44	3.46

These small differences between the alternatives do not distinguish them in terms of GHG emissions performance.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 with Design Option B for this indicator, and is not distinguished versus the other build alternatives in terms of GHG emissions performance.

F-3: Countywide Motorized Vehicle Fuel Consumption. Energy consumption varies among the alternatives as a function of differences in motorized fuel consumption. The calculation, which is shown in Section 4.12, is based on countywide fuel consumption by all vehicles, including buses in Year 2035.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	DESIGN OPTION B (BUILD ALTERNATIVES 3 AND 4)
Annual Motorized vehicle fuel consumption – countywide (trillions of BTUs)[1]	14.36	14.27	14.26	14.26	14.34

[1]One gallon of gasoline = 125,000 BTUs

All of the build alternatives would result in a reduction of 0.1-percent to 0.6-percent of energy consumption in Year 2035, which is the equivalent of 115,000 to 750,000 gallons of gasoline annually. These small differences between the alternatives do not distinguish them in terms of energy performance.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 with Design Option B for this indicator, and is not distinguished versus the other build alternatives in terms of energy performance.

F-4: Noise Impacts. The project team analyzed whether the project would cause increases in noise in excess of City thresholds. This analysis was conducted for Van Ness Avenue, as well as parallel streets Franklin and Gough, to determine whether additional traffic on those streets would create noise impacts. The analysis determined that noise levels would not increase audibly on Van Ness Avenue or parallel streets.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4	DESIGN OPTION B (BUILD ALTERNATIVES 3 AND 4)
Noise impacts beyond significance threshold	NA (baseline)	No impact	No impact	No impact	No impact

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternatives 3 and 4 with Design Option B for this indicator.

F-5: On-Street Parking Supply. Changes to the on-street parking supply resulting from each build alternative are reported in Section 3.5. The proposed project would require removal of on-street parking along parts of the corridor; however, new spaces would also be created through restriping, stop consolidation, and infill of spaces where they do not exist today. The resulting net number of spaces for each alternative is shown below. The project is directly related to the project's purpose and need to enhance pedestrian comfort and safety, as discussed in Section 3.4.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 3 (WITH DESIGN OPTION B)	BUILD ALTERNATIVE 4	BUILD ALTERNATIVE 4 (WITH DESIGN OPTION B)
Parking capacity (number of parking spaces)	442	409	356	411	397	455

Parking studies conducted in 2010 and 2011 identified 442 on-street parking spaces on Van Ness Avenue, all of which would be maintained under the No Build Alternative (Alternative 1). Build Alternative 2 would result in a net loss of 33 parking spaces (7 percent), Build Alternative 3 would remove 100 spaces (31 with Design Option B), and Build Alternative 4 would remove 45 spaces. With Design Option B, Build Alternative 4 would result in a net gain of 13 spaces.

LPA Performance. Based on a refined parking analysis conducted in 2012, the LPA would provide a total of 351 parking spaces, which is fewer than the build alternatives presented in the Draft EIS/EIR. Incorporation of the Vallejo Northbound Station Variant into LPA design would provide a total of 352 parking spaces. The parking impacts of the LPA, compared with other alternatives, is due in part to the inclusion of the following factors in the refined analysis, which were not part of the analysis of the other build alternatives: use of updated existing conditions data; incorporation of longer curb bulbs per the Caltrans Highway Design Manual May 2012 update; inclusion of wider BRT lanes per MTA requirements set forth in 2012; and stricter adherence to ADA design requirements such as provision of curb ramps behind handicapped spaces (which largely are not present in existing conditions). A sensitivity analysis taking into account the aforementioned factors was performed for Build Alternative 3; this analysis indicated that applying the methodology used for the LPA to the build alternatives would result in up to 32 more spaces removed for the alternatives than as presented in the table above from the Draft EIS/EIR. This would result in a similar number of on-street parking opportunities for the LPA as Build Alternative 3.

F-6: Number of Existing Trees Preserved. The overall number of trees that must be removed and replaced under each build alternative is evaluated in Section 4.4, Aesthetics/Visual Resources. Each build alternative would result in a net increase in the total number of trees along Van Ness Avenue; however, the alternatives differ in the number of trees that would need to be removed and replaced at specific locations. The number of existing trees that would remain under each alternative, identified in the table below, excludes those trees that could be pruned to clear the OCS wires under each alternative and be preserved.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Number of existing median trees preserved	102 (0 removed)	82 (20 removed)	0 (102 removed)	38 (64 removed)
Number of existing sidewalk trees preserved	314 (0 removed)	276 (38 removed)	314 (0 removed)	314 (0 removed)

Note: Revisions to figures in table are a result of the findings of the Tree Removal Evaluation and Planting Opportunity Analysis undertaken in fall 2012, presented in Section 4.4.3.4 (BMS Design Group, 2013).

The No Build Alternative (Alternative 1) would leave trees the same as in the existing conditions, with 102 trees in the median, 314 trees along the sidewalk, and no trees being added or removed. Build Alternative 2 would remove 20 median trees, including two mature and healthy trees, and it would remove 38 trees from the sidewalk, including four mature, healthy trees, to accommodate the new bus platforms. Build Alternative 3 (with or without Design Option B) would remove and replace all of the 102 trees along the median, including 28 mature, healthy trees, but it would not remove any trees from the sidewalk. Build Alternative 4 (with or without Design Option B) would remove and replace most of the trees (64) along the median, including 11 mature, healthy trees, leaving 38 trees. No trees would be removed from the sidewalk with this alternative.

LPA Performance. The number of trees the LPA, including the Vallejo Northbound Station Variant, would remove falls within the range of Build Alternatives 3 and 4. The LPA would remove 90 median trees, including 23 mature, healthy trees. Thus, the LPA would remove 12 fewer trees than Build Alternative 3 and would remove 26 more trees than Build Alternative 4. The LPA would remove 5 fewer healthy, mature trees than Build Alternative 3 and would remove 12 more healthy and mature trees than Build Alternative 4. Incorporation of the Vallejo Northbound Station Variant in the LPA design would not affect tree removal or planting opportunities under the LPA. .

10.2.4.7 OPERATIONS AND MAINTENANCE

O&M costs and level of effort are key performance indicators that indicate the sustainability of the project throughout its life.

☆ **G-1: Cost of Muni Service.** The BRT alternatives would reduce the cost of operating Routes 47 and 49, as shown in Chapter 9, because the travel time savings projected from BRT allow the same service frequencies to be provided using fewer buses and drivers. This is directly related to the project's purpose and need to improve the cost efficiency of Muni operations.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 3 (WITH DESIGN OPTION B)	BUILD ALTERNATIVE 4	BUILD ALTERNATIVE 4 (WITH DESIGN OPTION B)
Annual cost to run on-street service from Mission Street to Lombard Street	$8.3M	$6.9M	$6.1M	$5.6M	$6.1M	$5.6M

In the existing conditions and in the No Build Alternative (Alternative 1), on-street service for the segment from Mission to Lombard streets costs approximately $8.3 million to provide. Build Alternative 2 would cost approximately 17 percent less ($1.4 million) to operate annually, while Build Alternatives 3 and 4 would cost approximately 27 percent less ($2.2 million) annually. Incorporation of Design Option B into Build Alternatives 3 and 4 would result in the lowest annual operating cost, saving approximately 33 percent ($2.7 million) annually.

LPA Performance. The LPA performs similarly to Build Alternatives 3 and 4 with Design Option B for this indicator, having the greatest reduction in annual operations costs. The Vallejo Northbound Station Variant, due to a slightly slower travel time, would perform similar to Build Alternatives 3 and 4 ($6.1 million annually).

G-2: Vehicle Maintenance Cost. The BRT vehicles would incur an incremental maintenance cost relative to the existing vehicles.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Incremental life-cycle cost to maintain vehicles	NA (baseline)	$160,000	$160,000	$160,000

The incremental cost to maintain the BRT vehicles is due to the proposed fleet change under each build alternative from 40-foot standard-length motor coaches to 60-foot articulated motor coaches for the 47 route. These longer vehicles would require shuttling for maintenance due to near-term SFMTA storage constraints. Shuttling would remain in place while SFMTA expands systemwide vehicle maintenance capacities over the next 5 years. To account for the near-term nature of this expense, the analysis annualized the cost over the 25-year expected useful life of the BRT facility to create the incremental life-cycle cost. All of the build alternatives would incur the same incremental costs. Build Alternative 4 would have slightly higher maintenance costs due to the additional doors on the vehicles required to operate that alternative.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to the other build alternatives for this indicator. Due to updates to the maintenance and storage plans for the vehicles, shuttling is no longer anticipated for the vehicles, meaning the costs would be $0 for all alternatives, including the LPA, for this indicator.

G-3: BRT Transitway Maintenance Cost. The BRT transitway and street facilities would also incur maintenance costs beyond no-build levels. The elements of the transitway that would contribute to the increased maintenance costs include the transitway, station platforms, landscaping, and other amenities such as TVMs at selected stations. Chapter 9 analyzes the incremental maintenance cost of each project alternative relative to the No Build Alternative.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Annual incremental cost to maintain transitway, landscaping, and amenities	$0	$200,000	$400,000	$300,000

Build Alternative 2 would cost $200,000 more than No Build Alternative maintenance expenses to maintain the runningway, new platforms, and TVMs at selected stations. Build Alternative 3 would have the highest maintenance increment over the No Build Alternative due to the additional costs associated with maintaining the narrower landscaped medians. Build Alternative 4 would have a higher maintenance cost increment than Build Alternative 2 because of the more frequent need to prune the trees in the median to keep them from growing into the OCS wires.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performs similarly to Build Alternative 3 for this indicator, with higher incremental maintenance costs to cover the additional, narrower platforms in the center of the street.

G-4: Ease of Maintenance. The ease of maintaining and operating each project alternative is a function of the number of special conditions or service interruptions that would be required to maintain the transitway, landscaping, or utilities in the ROW. For instance, the logistics of maintaining the landscaped medians depends on the width of the median that workers can operate in safely and special conditions such as the need in some alternatives to close the bus lane in off-hours to maintain landscaping.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Ease of accessing transitway, landscaping, or utilities maintenance (number and type of special maintenance conditions)	No change	1. Platforms moved closer to OCS wires. OCS could need to be depowered to perform some platform maintenance	1. Access to transitway limited by twin planted medians 2. Landscaping would be performed on platforms with smaller widths, creating a higher chance of shutting down a transit or traffic lane or needing to depower the OCS for maintenance. 3. Bus rerouting for roadway maintenance would be more difficult (trees/platforms in way of trolley poles connecting to bus outside transitway)	1. OCS wires located near center median. OCS could need to be depowered to perform pruning/platform maintenance.

The No Build Alternative (Alternative 1) does not change the street's maintenance approach. Build Alternative 2 is not anticipated to substantially change from current conditions because the side-running lanes would not have significant additional conditions for maintenance, except for the slightly higher potential to need to depower the OCS in the event of some platform maintenance due to the sidewalk extension of the bus bulbs at station platforms; however, because the OCS wires are horizontally separated from the sidewalks, there is more room for sidewalk tree and general sidewalk maintenance outside of platform areas.

Build Alternative 3 (with or without Design Option B) would have two identified special conditions for maintenance. Maintenance of the landscaped medians and platforms would be complicated by the fact that the medians are narrower than what currently exists, which is a combination of 9–foot-wide and 4–foot-wide medians. This creates a much higher likelihood of needing to shut down a transit lane or mixed traffic lane or to depower the OCS wires for routine maintenance on the landscaped medians or the platforms. In addition, the dual-median configuration presents challenges to rerouting buses for maintenance because the trolley poles connecting to the vehicles would not be able to clear the trees and platforms along the dual medians.

Build Alternative 4 (with or without Design Option B) could also require a depowering of the OCS to maintain the landscaped median.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, would have similar ease of access as Build Alternative 4 outside of station locations. Rerouting the vehicles outside the transit lanes for blocks where maintenance is being performed would be possible, and similar to Build Alterative 4. On blocks with stations and blocks where the buses transition towards stations, ease of access would be similar to Build Alternative 3.

10.2.4.8 | CONSTRUCTION AND CAPITAL COSTS

This performance category deals with the cost and impacts associated with construction and implementation of the BRT alternatives.

☆ **H-1: Total Construction Costs.** Capital costs are presented in detail in Chapter 9 and include the total construction costs of street modifications, new stations, landscaping, and utility relocations (with center-running alternatives), as well as the incremental cost of vehicles. The Van Ness Avenue BRT Project is estimated to cost between $87 million and $130 million to design and construct, depending upon the alternative. Total capital costs are in YOE and based on the Small Starts application submitted in fall 2010. This is directly related to the project's purpose and need to deliver cost-effective improvements.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 3 (WITH DESIGN OPTION B)	BUILD ALTERNATIVE 4	BUILD ALTERNATIVE 4 (WITH DESIGN OPTION B)
Total construction cost	NA	$93 M	$136M		$112M	

The No Build Alternative (Alternative 1) would not require any additional capital costs beyond parallel projects that are currently planned (see Chapter 2 for more details). Build Alternative 2 would have the lowest capital cost, and Build Alternative 3 would have the highest capital cost (slightly higher with Design Option B).

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, would have an approximate $126 million construction cost,[106] between the costs of Build Alternatives 3 and 4.

☆ **H-2: Construction Duration.** Construction duration, measured in months and described in Section 4.15, varies between alternatives. A shorter construction period is preferential. This is directly related to the project's purpose and need to deliver improvements in the near term. The durations shown below are for the preferred construction approach (i.e., working in three-block segments in two parts of the corridor at once; see Section 2.3.1 for details).

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Construction duration (in months) using the preferred construction approach	NA	19	21	14

The No Build Alternative (Alternative 1) would not require construction. Build Alternative 3 would take the longest to construct (19 months), and Build Alternative 4 (with or without Design Option B) would result in the shortest construction duration at 14 months. This estimate is based on preliminary construction staging and phasing plans developed for this EIS/EIR.

LPA Performance. Construction of the LPA is anticipated to last 20 months until substantial completion. Incorporation of the Vallejo Northbound Station Variant could increase construction duration by up to 1 month.

H-3: Linear Feet of Utility Relocation and Curb Rebuild. Construction intensity, or the amount of disruption caused by construction activity, can be approximated by length of expected utility relocations and curb rebuild involved with the project. Fewer feet of utility relocation or curb rebuild equates to a less intense and less disruptive construction project.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Linear feet of utility relocation and curb rebuild	NA	0 feet of sewer; 6,100 feet of curb rebuild/ bulb outs	Up to 10,900 feet of sewer; 2,100 feet of curb rebuild/bulb outs	2,500 feet of sewer; 2,500 feet of curb rebuild/bulb outs

The No Build Alternative (Alternative 1) would not require construction; therefore, it would not require utility relocation. Build Alternative 2 would not require sewer reconstruction or relocation, but it would require the most curb reconstruction (6,100 linear feet). Depending on the condition of sewers, Build Alternative 3 (with or without Design Option B) could require the most reconstruction or relocation of the sewer system under Van Ness Avenue at 10,900 feet, and would require 2,100 feet of curb reconstruction. Build Alternative 4 (with or without Design Option B) would require some sewer reconstruction and some sidewalk rebuild. Build Alternative 4 would require the least amount of total linear feet of construction using this methodology.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, would involve replacement or repair of the sewer in locations where construction of the transitway above

[106] The Small Starts cost estimate discussed in Chapter 9 did not incorporate the SB Vallejo Street station now included in the LPA (see Section 2.2.2.4.), nor did it include the Vallejo Northbound Station Variant as part of the LPA. Construction of these stations is projected to cost approximately $500,000 per station. The up to $1 million cost increase is less than the contingency amount in the cost estimate. A revised cost estimate based on the final LPA adopted by the Authority Board at the time of certification would be included as part of the Conceptual Engineering Report and 30% design.

could cause damage to the existing sewer. Full analysis of the sewer condition has not been completed, so it is assumed that up to full replacement (10,900 feet) could be necessary for the LPA as under Build Alternative 3; however, it is likely that sewer replacement or relocation would be carried out only at locations where new transitway or mixed traffic lanes are proposed directly over the existing sewer facility.

H-4: Level of Sidewalk Impact. The impact of construction on adjacent land uses is approximated by the number and duration of sidewalk closures and detours that pedestrians must take to reach an adjacent land use.

	NO BUILD ALTERNATIVE (ALTERNATIVE 1)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3 (WITH OR WITHOUT DESIGN OPTION B)	BUILD ALTERNATIVE 4 (WITH OR WITHOUT DESIGN OPTION B)
Level of sidewalk impact	NA	Medium-High Impact	Low-Medium Impact	Low Impact

Based on estimates in the Construction Management Plan, Build Alternative 2 would have the highest impact to sidewalks. Build Alternative 4 (with or without Design Option B) would have the lowest impact on sidewalks.

LPA Performance. The LPA, including the Vallejo Northbound Station Variant, performance on this indicator is similar to Build Alternative 3 with Design Option B and would involve a low-medium impact.

10.3 Locally Preferred Alternative Selection

10.3.1 | Introduction

The Draft EIS/EIR was distributed and made available to the public for review and a 45-day comment period. During the review period, the project team solicited further public and agency input on the alternatives analysis, including input on the selection of an LPA, through a public hearing, webinar, and stakeholder meetings held during release of the Draft EIS/EIR. In particular, input on those performance indicators that are directly related to the project purpose and were sought. Once input was gathered from all of the parties, including comments received on the Draft EIS/EIR, the lead agency (SFCTA) and partner agency SFMTA proposed an LPA based on the project's purpose and need. An LPA Report was prepared including a summary of public and agency input, the alternatives' performance, and the recommended LPA (SFCTA, 2012). The LPA Report was presented to the SFCTA and SFMTA Boards for adoption, and was unanimously approved in summer 2012. Additional detail about the LPA selection process is provided in the following subsections.

10.3.2 | Performance Evaluation Process

As explained above in Sections 10.2.1 and 10.2.2, the purpose of alternatives analysis is to identify and compare differences between the project alternatives, including the No Build Alternative. In so doing, the ability of each alternative to advance the project purpose and need is identified. Section 10.2 documents the alternatives analysis concerning the relative benefits and impacts of the Van Ness Avenue BRT alternatives. The BRT alternatives were analyzed based on their performance in meeting the project purpose and need, as well as based on considerations of importance to multiple agency and public stakeholder groups, including the TAC and CAC. The next step involved quantifying the performance of each of the alternatives.

Memorandum of Agreement 07/08-34 stipulates that the SFCTA Board of Commissioners and the SFMTA Board of Directors must adopt the same LPA for the Van Ness Avenue BRT project. With this in mind, staff at the two agencies established a process by which they would reach a consensus decision on the LPA. First, the two agencies agreed on a method for quantifying the performance of each of the alternatives. Project staff from each agency undertook a series of exercises to score the performance of each build alternative presented in the Draft EIS/EIR. Secondly, the two agencies reviewed public and agency input on the Draft EIS/EIR findings provided through comments and stakeholder meetings on the Draft EIS/EIR. Once the above information was compiled, the two agencies formed a steering committee, comprised of the Deputy Directors of the relevant sections of each agency, to discuss the strengths and challenges of each alternative. A consensus LPA emerged that was a refinement of the center-running build alternatives. More detail on this process is provided below.

10.3.3 | Steering Committee and Agreement on Consensus Alternative

Based on the alternatives performance in Chapter 10 of the EIS/EIR, Authority and SFMTA staff attempted to perform a quantitative analysis to select the LPA. However, due to the strengths and challenges of each of the alternatives, staff was unable to reach consensus on an LPA. Thus, the two agencies formed a steering committee comprised of the following members:

SFMTA

- Director of Transit
- Director of Finance and Information Technology
- Director of Sustainable Streets
- Director of Capital Programs and Construction
- Chief Safety Officer

Authority

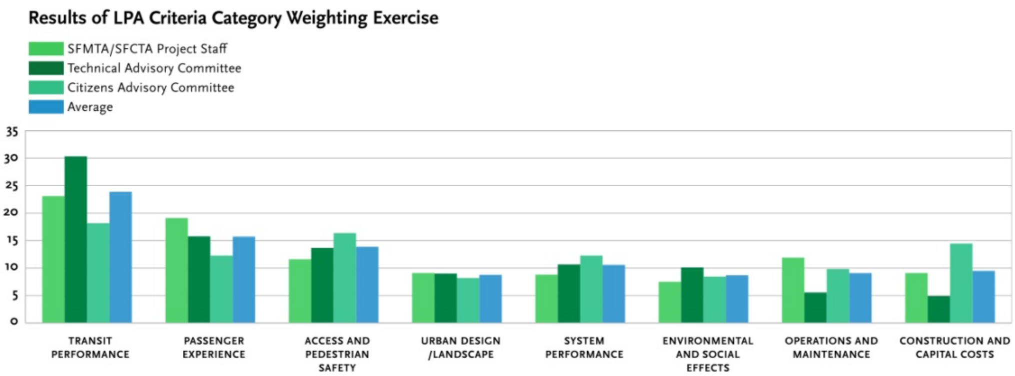
- Deputy Director for Planning
- Deputy Director for Capital Projects
- Deputy Director for Policy and Programming

The Steering Committee met four times over a 3-month period to discuss the various strengths, risks and challenges of each of the alternatives. Staff from both agencies made presentations and submitted analysis to the Steering Committee for each of the alternatives. Additional analyses included the scoring of alternatives by each staff, a risk analysis for each alternative and further refinement of costs and funding for all alternatives. A fifth steering committee meeting was held, which the Directors of the SFCTA and SFMTA attended. After this fifth and final meeting, the Directors and staff met with various agency stakeholders before making a consensus decision on the staff recommended LPA.

10.3.4 | Weighting of Criteria and Subcriteria

Alternatives performance outlined in Section 10.2 shows that each alternative performs better on some indicators than others, meaning that each had its strengths and challenges. For this reason, a series of weighting exercises were conducted with the project team, the TAC, and the CAC to get a sense of stakeholder priorities. Each person participating in the exercise was given 100 points to divide between the eight categories of performance indicators identified in Section 10.2.3. The results, shown in Figure 10-1, indicate that transit performance was by far the most important factor for all stakeholders. Passenger experience was next, followed by pedestrian safety. All of the other categories were weighted less than half the amount of transit performance on average.

Figure 10-1: Results of LPA Criteria Category Weighting Exercise



The center-running BRT alternatives (Build Alternatives 3 and 4) performed strongest on the transit performance indicators related to the project purpose and need (the starred indicators), particularly Build Alternatives 3 and 4 with Design Option B. In fact, the center-running alternatives with Design Option B showed nearly twice the travel time benefit, twice the reliability benefit, and a significantly higher increase in both BRT route and systemwide ridership versus Build Alternative 2. Given the strong weighting of transit performance as a priority of agency and public stakeholders and the strong performance of the center-running BRT alternatives, Authority and SFMTA then ran a risk analysis described below to determine what was needed to ensure a successful implementation of a center-running alternative.

10.3.5 | Risk Analysis of Center-Running Alternatives

In spite of their strong performance in the most heavily weighted evaluation criteria category (Transit Performance), both of the center-running alternatives had challenges. Two major risk areas were identified, as described in the following subsections.

10.3.5.1 | LANDSCAPING AND MEDIAN CHALLENGES FOR BUILD ALTERNATIVE 3

In the case of Build Alternative 3, the project team identified the need to rebuild the median, including removal of all existing median trees and potential impacts to underground sewer systems directly beneath the transitway, as important factors to consider. These factors associated with rebuilding the entire median increased the complexity and cost of the project and raised urban design, landscaping, and tree removal concerns among some agency and public stakeholders.

10.3.5.2 | FIVE DOOR VEHICLES CHALLENGES FOR BUILD ALTERNATIVE 4

The major risk of Build Alternative 4 related to the need to procure dual-side vehicles capable of loading passengers on the left side and right side. Currently, five-door motorcoach vehicles (3 doors on the right side and two on the left) that would be needed to operate Muni Route 47 are in operation in some North American cities. However, no five-door electric trolley coaches (that would be needed for Muni Route 49) are known to be in operation in North America at this time. This creates a procurement and cost risk because SFMTA would need to create specifications and purchase two small custom sub-fleets to support the Van Ness Avenue BRT. Moreover, the risk analysis revealed the need for higher spare ratios for both types of vehicles in order to ensure the reliability of BRT service that would utilize dedicated sub-fleets within the overall SFMTA vehicle fleet. This would result in a higher project vehicle cost and potentially add to BRT maintenance and storage needs. The higher initial capital investment and vehicle maintenance needs was analyzed as a risk to systemwide rapid network performance.

10.3.6 Staff Recommended LPA: Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns

Due to the risk factors described above, the SFMTA and Authority staff developed the staff recommended LPA which is a refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B), and is referred to as Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns. The staff recommended LPA combines features of Build Alternatives 3 and 4 in such a way that the risk factors of needing to rebuild the median under Build Alternative 3 (and associated environmental and cost impacts) and needing to procure dual-side door vehicles are reduced without compromising the ability of the project to best fulfill the established purpose and need.

Under the staff recommended LPA, BRT vehicles would run alongside a single median for most of the corridor, similar to Build Alternative 4. However, at station locations, BRT vehicles would transition to the center of the roadway, allowing for right side loading at station platforms as presented under Build Alternative 3. Figure 10-2 depicts the LPA. Figure 10-3 provides an aerial schematic of the LPA, which shows the transition between a single median and dual median configuration. The LPA would have the performance attributes of center-running BRT (e.g., faster, more reliable service), while avoiding the need to acquire left-right door vehicles and completely rebuild the median (which would likely involve removal of all median trees and complete relocation and replacement of the sewer system). The LPA incorporates Design Option B, the left-turn removal design option which would eliminate all left turns from Van Ness Avenue between Mission and Lombard streets with the exception of a SB (two-lane) left turn at Broadway Street. Incorporation of Design Option B would provide the greatest transit travel time benefits, reduce the weaving associated with the transitions buses must make between station locations and blocks without stations, and would aid with the flow of north-south traffic along Van Ness Avenue. Thus, the staff recommended LPA for the Van Ness Avenue BRT Project is termed the "Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns."

Figure 10-2: LPA Cross Sections and Station and Left-Turn Pocket Location Map

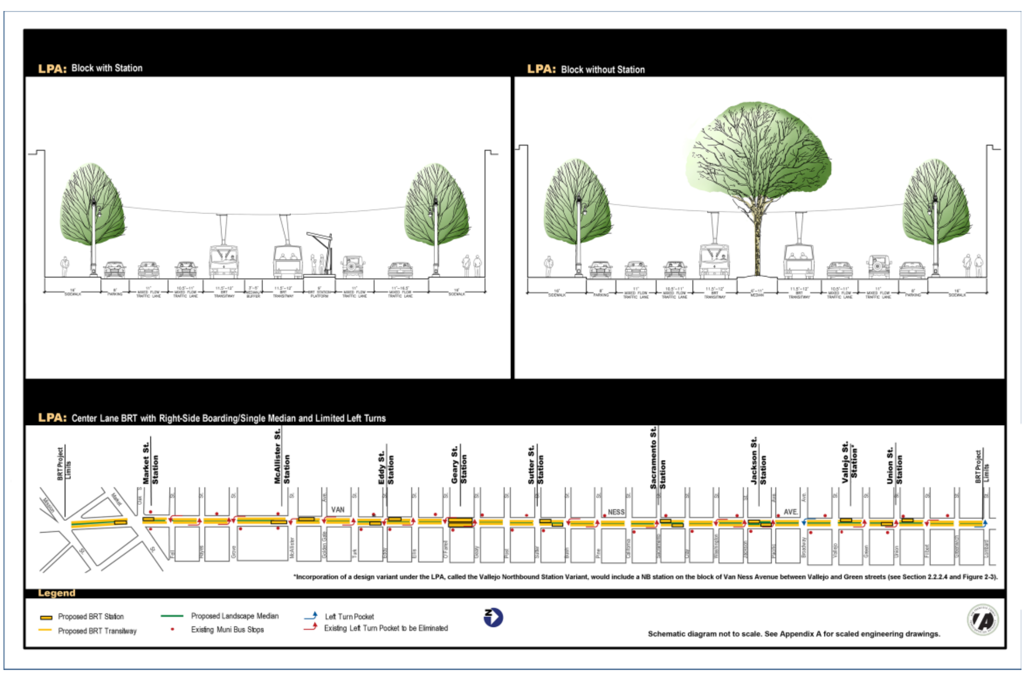
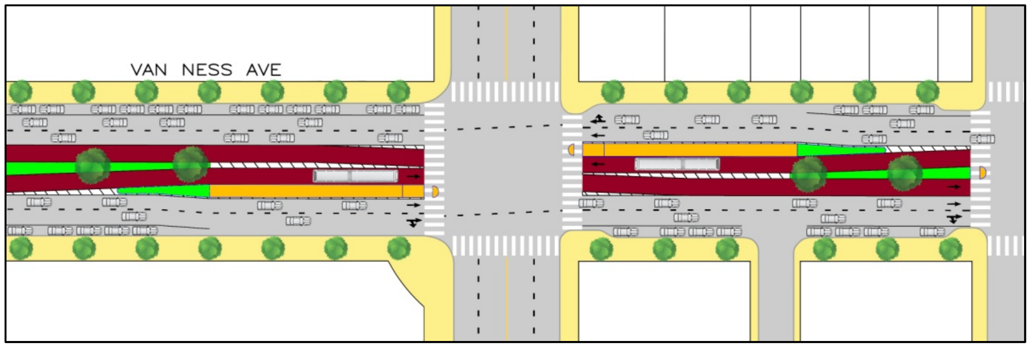


Figure 10-3: Aerial Schematic of LPA



10.3.7 | Additional Outreach in Support of Staff Recommended LPA

The project team conducted outreach surrounding the staff recommended LPA. The project team presented the staff recommended LPA at the following public meetings and commissions:

- San Francisco Environment Commission's Policy Committee: Monday, April 30, 2012, 5 p.m.
- Van Ness Avenue BRT CAC*: Tuesday, May 1, 2012, 5:30 p.m.
- SFMTA Citizens' Advisory Council: Thursday May 3, 2012, 5:30 p.m.
- San Francisco Planning Commission: Thursday, May 10, 2012, 1 p.m.
- Transportation Authority Plans and Programs Committee: Tuesday, May 15, 2012, 10:30 a.m.
- SFMTA Board*: Tuesday, May 15, 2012, 1 p.m.
- Transportation Authority Plans and Programs Committee*: Tuesday, June 19, 2012, 10:30 a.m.
- Transportation Authority Board*: Tuesday, June 26, 2012

*Action item on Staff Recommended LPA

Project staff also presented the recommended LPA at over 15 stakeholder meetings before the June 26 Authority Board action, including the following:

- Transportation Working Group: April 19, 9:30 a.m.
- Directors Working Group: April 20, 11 a.m.
- Van Ness Corridor Association: Monday, April 30, 6 p.m.
- Pacific Heights Residents Association: Monday April 30, 7:30 p.m.
- Van Ness Avenue BRT Technical Advisory Committee: Friday, May 4, 1 p.m.
- Friends of the Urban Forest: Tuesday May 8, 11 a.m.
- Japantown Better Neighborhood Plan Organizing Committee: Wednesday May 9, 6 p.m.
- Lower Polk Neighbors: Wednesday May 9, 7 p.m.
- Civic Center Community Benefit District: Thursday, May 10, 10 a.m.
- San Francisco Transit Riders Union: Monday May 14, 6 p.m.
- Chinatown Community Development Center + Chinatown Transportation and Research Improvements (TRIP): Wednesday, May 16, 6 p.m.
- Polk District Merchants Association: Thursday, May 17, 9 a.m.
- Geary Bus Rapid Transit Citizens Advisory Committee: Thursday, May 17, 5 p.m.
- Alliance for a Better District 6: Tuesday, June 12, 6 p.m.
- SFMTA Multimodal Accessibility Advisory Committee: June 16, 1 p.m.
- Middle Polk Neighborhood Association: Monday, June 18, 7 p.m.

In addition, two electronic updates translated into Cantonese and Spanish outlining the staff recommended LPA were e-mailed to the project e-mail mailing list, and a postcard containing similar translated information was mailed to constituents without e-mail addresses. Media advisories and press releases were sent to multilingual media organizations. Information about the staff recommended LPA was posted in Spanish and English on the Authority's project website, and information about the project and public hearings were featured on the Authority's social media sites, including Facebook and Twitter.

10.3.8 | Selection of LPA

On May 1, 2012, the Van Ness Avenue BRT CAC voted 6-3 to support a center lane configured BRT with right side boarding/single median and incorporation of Design Option B, the left-turn removal design option which would eliminate all left turns from Van Ness Avenue between Mission and Lombard streets with the exception of a SB (two-lane) left turn at Broadway Street, as the LPA for the Van Ness Avenue BRT Project. On May 15, 2012, the SFMTA Board of Directors voted unanimously to adopt "Center-Running Bus Rapid Transit with Right Side Boarding Platforms, Single Median and Limited Left Turns" as the LPA for the Van Ness Avenue BRT Project. On June 26, 2012, the SFCTA Board of Commissioners voted unanimously to select the "Center Lane Bus Rapid Transit with Right Side Boarding/Single Median and Limited Left Turns" as the LPA for the Van Ness Avenue BRT project, authorized the Executive Director to analyze the Staff Recommended LPA in the Final EIS/EIR, and approved the Draft Van Ness Avenue BRT LPA Report.[107]

10.4 LPA Environmental Consequences and Performance

10.4.1 | LPA Environmental Consequences

As explained above in Section 10.3.6, the LPA is a combination of design features presented under Build Alternatives 3 and 4 in the Draft EIS/EIR. All potential environmental impacts and consequences for the LPA were identified in the Draft EIS/EIR as part of the analysis presented for either Build Alternative 3 or 4 in Chapters 3 through 7. Refinement of the evaluation of the environmental impacts in Chapters 3 through 7 of the Draft EIS/EIR is shown with a line in the margin in this Final EIS/EIR.

Additional analysis was undertaken to explain the effects specifically of the LPA design for the following environmental factors: community impacts, aesthetics/visual resources, biological resources, cultural resources, utilities and public services, hydrology and water quality, transportation and circulation, and construction impacts. The analysis for these factors is discussed in the following subsections. The affected environment, environmental consequences, and any associated improvement or mitigation measures for the following remaining environmental factors are not further discussed for the LPA because the Draft EIS/EIR identified no differences in effects from either alternative for: land use, growth, geology/soils./seismic/topography, hazardous waste/materials, air quality, noise and vibration, energy, environmental justice and Section 4(f). The discussion of these topics in Chapters 3 through 7 of the Draft EIS/EIR for Build Alternatives 3 and 4 applies equally to the LPA design.

[107] A NB transit station at Vallejo Street was subsequently included as a design variant, referred to as the Vallejo Northbound Station Variant. The decision on whether to include the variant will be made at the time of project approval and will be reflected in the Record of Decision (ROD).

10.4.1.1 | TRANSPORTATION AND CIRCULATION

Nonmotorized Transportation

The environmental consequences related to nonmotorized transportation under the LPA are identified as part of the analysis presented for the build alternatives in Section 3.4, Nonmotorized Transportation. For many of the pedestrian and bicycle conditions described in this section, the LPA has identical environmental consequences to Build Alternatives 3 or 4 with Design Option B. Areas where additional analysis was needed to determine impacts of the LPA include: crosswalk conditions and crossing experience, pedestrian signals and timing, sidewalk safety, and pedestrian accessibility.

Crosswalk Conditions and Crossing Experience. Average median refuge width and crossing distances were calculated for the LPA to evaluate crosswalk conditions and crossing experience. The average median refuge width for the LPA would be 9.5 feet, or 9.6 feet with the Vallejo Northbound Station Variant, which is greater than the No Build Alternative (9.0 feet) and Build Alternative 3 with Design Option B (6.4 feet), but less than Build Alternatives 2 (11.8 feet) and 4 with Design Option B (13.4 feet). Thus, the average crossing distance under the LPA would be 89.5 feet, which on average is 1.5 feet less than existing conditions and No Build Alternative, 0.9-foot less than Build Alternative 3 with Design Option B, and 1.6 feet greater than the average crossing distance for Build Alternative 4 with Design Option B. The average median with of the LPA reflects Caltrans' new guidance in the 2012 Highway Design Manual, which effectively results in a narrower, 5-foot-wide dimension for curb bulbs on Van Ness Avenue[108] compared to the 6-foot dimension assumed for the other build alternatives in the Draft EIS/EIR. Thus, the build alternatives would have a slightly greater crossing distance if the new Caltrans standard were to be applied in a similar manner as it was applied to the LPA. Even with this standard taken into account, the LPA shortens the crossing distance over existing conditions and would provide median refuges consistently 6 feet or wider (only one refuge would be narrower than 6 feet, at Mission/South Van Ness Avenue – a result of the existing condition) compared to the No Build Alternative, which has 27 median refuges that are less than 6 feet wide. Therefore, the LPA improves the crossing experience compared with the No Build Alternative.

Pedestrian Signals and Timing. A crossing speed analysis was undertaken for the LPA to evaluate pedestrian signals and timing. The crossing speed analysis estimates how quickly pedestrians would have to cross an intersection given the allotted signal time, also known as the full walk split (Arup, 2013). City and FHWA guidelines were considered. For side street crossings, the LPA would have the same number of side street crossings meeting the City and FHWA targets as the No Build Alternative and build alternatives, and thus the same number of crossings (i.e., one, at Mission Street) that do not meet the FHWA target of 3.0 fps or slower. For Van Ness Avenue crossings, 6 intersections would meet the City target and 24 intersections would meet the FHWA target, with 5 not meeting the FHWA standard under the LPA. The LPA would have more east-west Van Ness Avenue crossings that meet the City and FHWA targets than the No Build Alternative, and conversely, fewer crossings exceeding FHWA targets; therefore, the LPA would improve existing conditions and meet required crossing speeds for pedestrians at nearly all intersections.

Sidewalk Safety. One measurement of sidewalk safety for which additional analysis was needed to determine impacts under the LPA is the presence of curbside parking as a buffer between the sidewalk and vehicular traffic. Since the LPA would result in different removal of parking than the build alternatives, removal of parking under the LPA was considered in the context of pedestrian safety. Under the LPA (with or without the Vallejo Northbound

[108] Caltrans. 2012. Highway Design Manual. May 7. (http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm#hdm). Note the standard is for a 3-foot-wide buffer between the edge of the travelway and a curb bulb. Given the design constraints along Van Ness Avenue, the standard results in a 5-foot-wide curb bulb.

Station Variant), parking would be completely removed or almost completely removed along both sides of the street on the following blocks of Van Ness Avenue:

- Between Sutter and Bush streets;
- Between Sacramento and Clay streets;
- Between Jackson and Pacific streets; and
- Between Broadway and Vallejo Street
- Between Vallejo and Green streets

The following blocks represent the only location where parking would be removed on the same side of the street for two consecutive blocks:

- Between Broadway and Vallejo Street (east and west side); and
- Between Vallejo and Green streets (east and west side).[109]

The Van Ness Avenue corridor would retain a fairly even distribution of most curbside parking throughout the corridor under the LPA, and the loss of the street parking buffer on limited blocks would not substantially change overall sidewalk safety and comfort along Van Ness Avenue. In summary, the LPA would result in improvements to sidewalk safety through the creation of curb bulbs, removal of existing bus shelters from sidewalks, and improved sidewalk lighting. Removal of a street parking buffer would occur in limited locations under the LPA, as under the build alternatives; however, most street blocks would retain a street parking buffer.

Pedestrian Accessibility. Flexibility in use was considered as part of a pedestrian accessibility analysis, which considers the ability of Van Ness Avenue to accommodate a range of physical abilities. The LPA (with or without the Vallejo Northbound Station Variant) would improve flexibility in use over existing conditions and the No Build Alternative, with provision of 30 corner bulbs in the SB direction and 34 corner bulbs in the NB direction for a total of 64 new corner bulbs on Van Ness Avenue. Additionally, the LPA would improve flexibility in use over existing conditions and the No Build Alternative with provision of 56 nose cones at intersections, providing refuge space for slower pedestrians to rest if they are unable to cross the street during one light cycle. The number of nose cones and corner bulbs provided by the LPA falls within that proposed under the build alternatives, and would substantially improve flexibility in use of pedestrian conditions on Van Ness Avenue.

Physical effort to reach bus stops is another factor in analyzing pedestrian accessibility. Thus, the average distance between BRT stops under the LPA was calculated and determined to be 1,150 feet (1,080 feet under the LPA with the Vallejo Northbound Station Variant), which falls within the applicable Muni guidelines for stop spacing for rapid bus and light rail. Grade was also considered. Van Ness Avenue has few hills, with no grades above 10 percent. The LPA, like the build alternatives, would increase the physical effort required to reach transit relative to the No Build Alternative and may pose a burden on some passengers. The proposed stop consolidation has been reviewed by multiple accessibility-focused organizations and agency staff.

Parking

A refined parking analysis was completed in October 2012 to evaluate parking impacts under the LPA. The following additional factors were considered for the LPA but not for the analysis of the build alternatives in the Draft EIS/EIR: updated existing conditions, longer curb bulbs per the Caltrans Highway Design Manual May 2012 update, wider BRT lanes per MTA requirements set forth in 2012, and current, more refined adherence to ADA design requirements such as provision of curb ramps behind handicapped spaces (which largely are not present in existing conditions). The analysis shows that the LPA would provide 351 parking spaces, a loss of 105 spaces, while the Vallejo Northbound Station

[109] For the Vallejo Northbound Station Variant, parking would be removed on both sides of the street for this two-block stretch.

variant would provide 352 parking spaces, a loss of 104 spaces. Thus, the LPA would provide fewer spaces than the build alternatives presented in the Draft EIS/EIR. A sensitivity analysis taking into account the aforementioned factors was performed, indicating that applying the methodology used for the LPA to the build alternatives would result in up to 32 more spaces removed than for the alternatives presented in the Draft EIS/EIR. For Build Alternative 3, this would mean 100 spaces removed, representing the same number of removed spaces as under the LPA. As described in Section 3.5.3, no significant environmental impact from changes in parking would occur under any of the project alternatives, including the LPA, and no mitigation is required. Nonetheless, improvement measures IM-TR-1 through IM-TR-5 presented in Section 3.5.3 have been incorporated to the extent feasible in the LPA, and would continue to be applied throughout project final design to minimize removal of parking spaces.

10.4.1.2 | COMMUNITY IMPACTS

As part of the community impact analysis, changes in parking, including colored parking, are considered. The changes in parking under the LPA are identified as part of the analysis presented for the build alternatives in Chapters 3.5 Parking and 4.2 Community Impacts; the LPA has slightly different results for parking gains and losses than the build alternatives. Nonetheless the community impact findings with the LPA (with or without the Vallejo Northbound Station Variant) are consistent with the findings for Build Alternatives 3 and 4 with Design Option B. Aside from changes in parking, there would be no other areas of the community impacts where additional analysis was needed to determine if/how the LPA may result in differing impacts than those presented for the build alternatives.

Blocks of Van Ness Avenue where substantial curbside parking would be removed under the LPA are identified in Table 4.2-8 in Section 4.2 of this EIS/EIR, and are summarized as bullets above in Section 10.4.1.1. The LPA (with or without the Vallejo Northbound Station Variant) would result in a net increase of parking in the Civic Center segment of the project corridor and would result in a percentage decrease of parking in the mixed-use commercial/ residential mid-segment of the corridor (Golden Gate Avenue – Broadway Street), slightly higher than that of the build alternatives. In the predominantly residential northern segment of the project corridor (Broadway – Lombard streets), however, the LPA would result in a notably higher reduction in parking (51 percent) compared with the build alternatives (Build Alternatives 3 and 4 with Design Option B, with differences of 12 and 14 percent, respectively). Nonetheless, as explained in Section 3.5, street parking would generally be maintained throughout Van Ness Avenue, there are only two blocks under the LPA where parking would be entirely removed on both sides of Van Ness Avenue (Broadway to Vallejo streets and Vallejo to Green streets), and only two scenarios where all parking is removed on one side of the street for two consecutive blocks (east and west side of Van Ness Avenue from Broadway to Vallejo streets and Vallejo to Green streets).[110] This area in the northern segment of the project corridor is mixed commercial and residential uses, of lower density than the corridor mid-segment.

An updated field survey was conducted in October 2012 to identify the specific commercial and residential properties that could be affected by displacement of colored parking spaces. Based on the survey, it was confirmed that in most cases colored spaces would be able to be retained on the same street block or on adjacent blocks. Passenger and truck loading zones could be provided on the same side of the street, where feasible, so that crossing a street for loading would not be needed; however, specific locations were identified where provision of replacement colored spaces on an adjoining block may be challenging or not feasible. Adverse colored parking impacts on the area's adjacent uses that could occur under the LPA are identified in Section 4.2 Community Impacts, Table 4.2-9, and are summarized in Table 10-2.

[110] For the Vallejo Northbound Station Variant, parking would be removed on both sides of the street for the two-block stretch from Broadway to Green Street.

Table 10-2: Adverse Colored-Zone Parking Impacts under the LPA[111]

VAN NESS AVENUE BLOCK	COLORED SPACE PARKING IMPACTS[1]
O'Farrell Street – Geary Street (east side)	The two passenger loading spaces serving the Opal Hotel would be displaced under the LPA. These spaces could be replaced on Geary Street or Alice B. Toklas alley.
Sutter Street to Bush Street (east side)	The one green short-term parking space and the two truck loading spaces that serve a sports bar would be displaced under the LPA. These spaces could be replaced along Fern alley.
Sutter Street to Bush Street (west side)	The five green short-term parking spaces that serve the Chevrolet dealership, an Antique store, and BevMo would be removed under the LPA; however none of these businesses currently pay for these spaces.
Sacramento Street to Clay Street (east side)	The one passenger loading space that serves the St Luke's Episcopal Church would be displaced under the LPA.
Broadway Street – Vallejo Street (west side)	The three passenger loading spaces that serve the Academy of Art University (shuttle stop) and a dental office would be displaced under the LPA.[2]
Vallejo Street to Green Street (west side)	The one short-term green parking space that serves the mini-mart and the three passenger loading spaces that serve a Swiss restaurant and a chiropractor's office would be displaced under the LPA.
Greenwich Street to Lombard Street (west side)	The one short term parking space that serves dry cleaners and the four passenger loading spaces that serve the Comfort Inn By the Bay hotel would be displaced under the LPA. The loading spaces could be relocated to Lombard Street.

[1] Colored parking spaces include green (short-term parking), white (passenger loading), yellow (truck loading), and blue (disabled parking).
[2] Build Alternatives 3 and 4 with Design Option B would result in the same potential colored parking impact.

As stated in Section 3.5.2, SFMTA would give priority to retaining on-street colored parking spaces (i.e., green [short-term parking], white [passenger loading], yellow [truck loading], and blue [disabled parking]). As part of the project design, in any cases of conflicting needs for color zones, SFMTA would work to build consensus among fronting business owners and determine the best allocation of colored spaces to suit the needs of these establishments. Implementation of mitigation measures CI-IM-1 and CI-IM-2 presented in Section 4.2.5 would be required under the LPA, including the Vallejo Northbound Station Variant, to minimize any economic impacts to adjacent properties that could result from displacement of colored parking they utilize.

10.4.1.3 | CULTURAL RESOURCES

FTA and SFCTA, in applying the "criteria of adverse effect" pursuant to the National Historic Preservation Act and implementing regulations (36 CFR 800.5(c)), determined that the LPA would not adversely affect cultural resources in the Van Ness Avenue area of potential effects (APE), and the SHPO concurred with that determination on May 17, 2013, (see Appendix C). Going from the south part of the project area to the north, the following are descriptions of effects on each of the National Register of Historic Places-eligible historic properties within the APE resulting from the LPA. Altogether, the changes introduced by the LPA would not diminish the integrity of the historic properties or the characteristics that qualify their designation National Historic Landmark or National Register properties.[112] No NRHP-eligible or listed architectural resources were identified in the block of Van Ness Avenue between Vallejo and Green streets where the Vallejo

[111] No additional color parking spaces would be removed with the implementation of the Vallejo Northbound Station Variant.
[112] The San Francisco Civic Center Historic District/War Memorial is both a National Historic Landmark and listed in the National Register.

Northbound Station Variant is under consideration. The Vallejo Northbound Station Variant is located on the block of Van Ness Avenue between Vallejo to Green streets, which is outside the Civic Center Historic District.

- **11-35 Van Ness Ave (Masonic Temple)**
  The LPA, including the Vallejo Northbound Station Variant, would include a SB BRT station platform adjacent to the center, dedicated bus lane (transitway) on Van Ness Avenue, perpendicular to this building. As with all the proposed center lane BRT with right side boarding stations, the proposed SB Market Street BRT station would be separated from adjacent land uses by two lanes of mixed-flow traffic, the parking lane, and the 16-foot-wide sidewalk. The marble and terracotta building, rectangular in form and solid in its massing, has its greatest proportion of most distinctive design features located well above the proposed station's 8-foot to 11-foot-tall canopy and adjacent wind turbine (potentially taller than the 11-foot canopy)[113], and the setting and feeling of balance reflected in the historic property would be unaffected by the placement of the new bus station platform in the Van Ness Avenue median, approximately 45 feet from the street level façade. The proposed undertaking would also replace an existing 25-foot-tall OCS support pole/streetlight with a 30-foot-tall pole. Neither the replacement OCS support pole/streetlight nor the station canopy would appreciably obstruct the views of the building from across the street. Therefore, the proposed undertaking would not change the property's NRHP eligibility status.

- **San Francisco Civic Center Historic District/War Memorial**
  The section of Van Ness Avenue between McAllister and Grove streets is dominated by civic/government buildings of historic importance that have been collectively recognized as the Civic Center Historic District. A NB BRT station is proposed adjacent to the center lane on Van Ness Avenue extending 150 feet south from the McAllister Street intersection in front of City Hall. A SB BRT station is proposed adjacent to the center lane on Van Ness Avenue extending 150 feet north from the McAllister Street intersection. These BRT stations would replace the existing curbside bus shelters on both sides of Van Ness Avenue in front of City Hall and the War Memorial Building/Opera Hall.

  The viewshed to either of the War Memorial Building/Opera Hall paired buildings on the west side of Van Ness Avenue, and City Hall on the east side, would be only slightly changed under the LPA (see Figure 4.4-8), including the Vallejo Northbound Station Variant. Given the size and scale of these historic properties from the street perspective, the removal of the existing curbside shelters and installation of a larger BRT station and platform in the median of Van Ness Avenue would be largely inconsequential to the overall monumental size of the civic structures and their respective prominent architectural features. The significant character-defining features are never out of view, and the placement of the new BRT infrastructure would not appreciably detract from the view by an observer on either side of the street. The new NB bus platform and canopy, since it would be in the median and the present curbside stops would be removed, would arguably eliminate the existing partial obstruction of each of these historic buildings created by the existing curbside bus stop canopies. (The new SB BRT station would be located in the block north of the historic district, between McAllister Street and Golden Gate Avenue.) The perspectives offered from those looking on from the immediate, curbside foreground to the east or west elevation would be more open with the LPA, and street-level views from across Van Ness Avenue to either of the large civic buildings would be only minimally affected due to the large massing and scale of the buildings relative to the new median station canopy.

[113] Incorporation of wind turbines into the proposed BRT station design is still under evaluation. The turbines are included in the visual simulations (see Figures 4 and 5) to depict a scenario of the maximum anticipated visual changes that could occur with project implementation.

There are also sixteen 25-foot-tall OCS support poles/streetlights on Van Ness Avenue between Grove and McAllister streets, some of which date back to 1914 when Muni first established a trolley line on Van Ness Avenue; these were subsequently modified and restylized in 1937 with the opening of the Golden Gate Bridge and the rebirth of the boulevard. The California SHPO agreed with FTA's finding that the OCS support poles/streetlights are not uniquely associated with the Civic Center Historic District.[114] The replacement poles for the LPA as part of the BRT system are proposed to be of compatible architectural design and would be approximately 30 feet tall. Though slightly taller than the original height, the OCS structures would not be out of character with the setting of the Civic Center Historic District, and approval of their design and implementation would require a certificate of appropriateness from the San Francisco Historic Preservation Commission (see Section 6.2).

- **799 Van Ness Avenue (Wallace Estate Co. Auto Garage)**
  At the most proximate location to this building, the LPA, including the Vallejo Northbound Station Variant, would result in the removal of an existing curbside bus shelter fronting the property and replacement with a NB 150-foot-long BRT station (platform and canopy) adjacent to the center lane on Van Ness Avenue perpendicular to this building. This is at the location of the proposed Eddy Street BRT station. (The new SB BRT station would be located in the block north of this historic property, between Eddy and Ellis streets.) As the reinforced concrete frame building's most character-defining features are its massing and industrial fenestration reflecting a symmetrical arrangement at its second- and third-floor levels, the historic property's setting, feeling and association would not be greatly diminished by implementation of the proposed BRT system changes, as they would occur at ground-level in the median on the opposite side of the street, further removed from the building than the existing bus stop canopy. The proposed undertaking would also replace the existing 25-foot-tall OCS support pole/streetlight adjacent to the building with one approximately 30 feet in height.

- **945-999 Van Ness Avenue (Ingold Chevrolet Auto Showroom)**
  With the exception of the removal of the existing SB curbside bus shelter fronting this historic property, replacement of some existing 25-foot-tall OCS support poles/ streetlights with 30-foot-tall ones, and reduction in median width/change in median landscaping, there are no physical changes anticipated under the LPA, including the Vallejo Northbound Station Variant, in front of this property located south of O'Farrell Street. The proposed BRT stations would be located north of O'Farrell Street and thus would not be on the same block as the Ingold Chevrolet Auto Showroom. Therefore, none of the building's significant character-defining features, nor its setting, feeling, or association would be altered by the proposed project.

- **1320 Van Ness Avenue (Scottish Rite Temple)**
  The LPA, including the Vallejo Northbound Station Variant, would remove the current bus shelter directly in front of this building. The proposed NB and SB Sutter Street BRT stations would be located on the block of Van Ness Avenue north of Sutter Street, in the median, with the SB station being perpendicular to the Scottish Rite Temple (see Figure 4.4-9). This symmetrical steel-frame reinforced concrete building rests on a smooth granite base. The upper stories of the building are dominated by seven two-story arched window insertions. The fourth story is demarcated by a narrow course of windows, separated by eight embossed panels and a highly designed cornice. Because the greatest proportion of significant character-defining features are located well above the height of the proposed station canopy and wind turbine in the median of Van Ness Avenue, the visual character of the historic property to the observer would only be slightly diminished by placement of a BRT station in the street median, and the property's setting and feeling as a result would be minimally altered. In addition, the

[114] Nor do the poles located throughout the greater Van Ness Avenue corridor constitute a National Register-eligible property in and of themselves due to major compromises in their overall integrity.

proposed project would replace an existing 25-foot-tall OCS support pole/streetlight adjacent to the building with a 30-foot-tall pole.

- **1699 Van Ness Avenue (Paige Motor Car Co. Auto Showroom)**
  The proposed Sacramento Street BRT stations would be located on the block of Van Ness Avenue north of Sacramento Street; thus, no BRT stations would be located in the median perpendicular to this property. The LPA, including the Vallejo Northbound Station Variant, would replace the existing 4-foot-wide, unlandscaped left-turn pocket median with a tapering (to the north) 11-foot-wide landscaped median and would replace the adjacent existing 25-foot-tall OCS support pole/streetlight with a 30-foot-tall pole, therefore changing the street setting. This minor change with the LPA would not influence the property's NRHP eligibility status. Therefore, it has been determined the LPA would cause No Adverse Effect to this property.

- **1946 Van Ness Avenue (California Oakland Motor Co.)**
  The Jackson Street BRT stations would be located on the block of Van Ness Avenue north of Jackson Street; thus, no BRT stations would be located in the median perpendicular to the California Oakland Motor Co. property. The LPA, including the Vallejo Northbound Station Variant, would replace the existing 4-foot-wide, unlandscaped left-turn pocket median with a tapering (to the north) 11-foot-wide landscaped median and would replace the adjacent existing 25-foot-tall OCS support pole/streetlight with a 30-foot-tall pole, therefore changing the front street setting.

10.4.1.4 | AESTHETICS/VISUAL RESOURCES

The environmental consequences related to visual resources under the LPA (with or without the Vallejo Northbound Station Variant) are identified as part of the analysis presented for the build alternatives in Section 4.4 Aesthetics/Visual Resources. Because the LPA configuration is a variation of the configurations analyzed for the center-running alternatives in the Draft EIS/EIR, the LPA has different tree removal impacts and replanting opportunities than presented for the build alternatives, but the overall impact findings with the LPA (with or without the Vallejo Northbound Station Variant) are consistent with the findings for Build Alternatives 3 and 4, as presented in Section 4.4 /Visual Resources. For other aspects of impact analysis for visual resources (beside tree removal/replanting), the LPA (with or without the Vallejo Northbound Station Variant) would result in identical environmental consequences as Build Alternatives 3 or 4.

A comprehensive Tree Removal Evaluation and Planting Opportunity Analysis was undertaken in fall 2012 to identify the maturity and health of trees in the corridor and therefore better understand the impacts of tree removal and the opportunities for preserving trees, and the parameters of new tree plantings (BMS Design Group, 2013). This analysis was undertaken for all of the build alternatives, including the LPA, and is presented in Section 4.4.3.4. The analysis concludes that the LPA would require the removal of 90 median trees and is anticipated to increase the total number of trees in the project corridor, relative to existing conditions, by 53 trees. The LPA would result in the removal of approximately 23 trees that are mature and of healthy condition, which is approximately 82 percent of existing healthy and mature, median trees in the corridor. Incorporation of the Vallejo Northbound Station Variant into the LPA design would not affect tree removal or planting opportunities under the LPA.

The effects of tree removal and planting opportunities under the LPA fall within the range of tree removal and planting opportunities identified for Build Alternatives 3 and 4 in the Draft EIS/EIR. As under Build Alternative 4, removal of existing trees under the LPA would primarily occur at station locations. In addition, the LPA would require reconstruction of areas north and south of stations to accommodate the transition between dual and single medians. Thus, the LPA would result in the removal of more trees than Build Alternative 4. As under Build Alternative 4, reconstruction of the existing median to accommodate BRT stations would be most noticeable along the blocks of Van Ness Avenue that feature high-quality landscaped medians with mature trees, identified in Section 4.4.2.5 in Table 4.4-1. Overall, the LPA would preserve all trees on 1 out of the 10 blocks and would remove all trees on 4 blocks. One or more trees would be preserved on the remaining 5 blocks. Table 10-3 reports the tree removal and planting opportunity under the LPA on those blocks featuring high-quality landscaped medians and mature tree canopies.

Table 10-3: LPA – Project Impact on High-Quality Landscaped Medians Featuring Mature Tree Canopies

VAN NESS AVENUE BLOCK	EXISTING TREES	TREE REMOVAL & PLANTING OPPORUNITY	NET TREE GAIN/LOSS
Hayes – Grove streets	2	All trees preserved and 7 trees planted.	+5
Grove – McAllister streets	6	2 out of 6 trees preserved and 6 trees planted.	+2
McAllister Street – Golden Gate Avenue	6	No existing trees preserved and no trees planted.	-6
Turk – Eddy streets	4	No existing trees preserved and no trees planted.	-4
Ellis – O'Farrell streets	4	2 out of 4 existing trees preserved and 4 trees planted.	+2
Sutter – Bush streets	4	No existing trees preserved and no trees planted.	-4
Pine – California streets	4	1 out of 4 trees preserved and 3 trees planted.	0
Sacramento – Clay streets	6	No trees preserved and no trees planted.	-6
Pacific - Broadway streets	5	No trees preserved and 2 trees planted.	-3
Union – Filbert streets	6	No trees preserved and 1 tree planted.	-5

A BRT station would be located on 6 of these 10 street blocks (Grove to McAllister streets, McAllister to Golden Gate streets, Turk to Eddy streets, Sutter to Bush streets, Sacramento to Clay streets, and Union to Filbert streets), which would require approximately 150 feet of the existing median (i.e., approximately half the block) to be converted to a BRT station platform. Trees and landscaping along the other half of the block would be preserved, although some trees would need to be pruned to provide clearance for the replacement OCS. In addition, the station platforms would extend the length of the block between O'Farrell and Geary streets, preventing tree planting on this block.

Tree removal under the LPA, like Build Alternatives 3 and 4, would result in a notable, adverse change in the visual quality of the project corridor until new tree plantings mature. Impacts resulting from the removal of some existing median landscape and trees under the LPA would be reduced with implementation of a median design plan, as described in mitigation measures M-AE-3 and M-AE-4 in Section 4.4.4.

10.4.1.5 | HYDROLOGY AND WATER QUALITY

The environmental consequences related to hydrology and water quality under the LPA are identified as part of the analysis presented for the build alternatives in Section 4.9 Hydrology and Water Quality. Since the LPA configuration is a variation of the configurations analyzed for the center-running alternatives in the Draft EIS/EIR, the LPA has slightly different results for the total disturbed soil area and pervious surface area; however, the overall impact findings with the LPA are consistent with the findings for Build Alternatives 3 and 4.

The LPA would result in a net increase of approximately 0.2-acre pervious surface area. This would be slightly higher for the Vallejo Northbound Station Variant; however, the net increase remains 0.2-acre. This figure compares to the net increase of approximately 0.8-acre pervious surface area under Build Alternative 3 with Design Option B, and approximately 1.3 acres under Build Alternative 4 with Design Option B.

Therefore, the LPA (including the Vallejo Northbound Station Variant), like the build alternatives, would result in a marginal increase of pervious surface area throughout the project limits over the existing condition. The increase in pervious surface area is primarily due to the establishment of landscaped medians where existing medians are impervious surface (e.g., left-turn pocket locations that are filled in with new planted median). In addition, the LPA presents an opportunity to reduce storm flows into the CSS and improve groundwater recharge through *Better Streets Plan* concepts; however, at this stage of design, it is unclear which concepts are feasible. Stormwater BMPs would be incorporated into project final design and operations to the maximum extent practicable to avoid water quality impacts. Overall, the LPA would result in permanent, beneficial impacts to storm drainage facilities and hydrology along Van Ness Avenue. Implementation of improvement measures IM-HY-1 through IM-HY-4 presented in Section 4.9.4 would avoid adverse impacts to stormwater quality and facilities.

Construction of the LPA would result in the same water quality impacts as the build alternatives. The total DSA for the LPA would be approximately 5.8 acres (5.9 acres for the Vallejo Northbound Station Variant), compared with the DSA of 8.4 acres for Build Alternative 3 with Design Option B and 3.8 acres for Build Alternative 4 with Design Option B. The impacts related to such construction would be minimal because the proposed project would require nominal earthwork, and the area of soil to be disturbed would be limited. Improvement measures IM-HY-C1 through IM-HY-C3 specified in Section 4.15.8.2 would be implemented under the LPA to minimize potential water quality and hydrology impacts during construction.

10.4.1.6 | UTILITIES AND PUBLIC SERVICES

The environmental consequences related to utilities under the LPA are identified as part of the analysis presented for the build alternatives in Section 4.6 Utilities. Since the LPA configuration is a variation of the configurations analyzed for the center-running alternatives in the Draft EIS/EIR, the LPA has slightly different implications to utilities (namely sewer) than as described for Build Alternatives 3 and 4. Nonetheless, the overall impact findings for the LPA are consistent with the findings for Build Alternatives 3 and 4, as presented in Section 4.6.3.

Under the LPA (including the Vallejo Northbound Station Variant), replacement of the aging sewer pipeline would be required at station locations and in areas where the transitway would cause direct load (weight) on the sewer. An inspection of the sewer pipeline was performed in spring 2012. Based on preliminary results, 14 segments on 7 blocks are in poor condition and need to be replaced regardless of whether the Van Ness Avenue BRT Project is implemented. An additional 16 segments on 13 blocks need to be repaired. Even though the entire analysis of the sewer pipeline is still in progress, it can be assumed based on available data that adverse impacts to the sewer would result from the LPA that are comparable to Build Alternatives 3 and 4. For the segments where the inspection revealed that the sewer is deteriorated to the point at which construction of the BRT lane could damage it, the SFPUC and SFMTA would coordinate to accelerate planned replacement, rehabilitation, or relocation of the sewer main as needed.

Thus, under the LPA, replacement of the sewer pipeline is assumed at station locations and in areas where the transitway would cause direct load (weight) on the sewer. This would ensure that construction of the BRT transitway would not damage the sewer pipeline and would minimize the likelihood that the new pavement constructed for the transitway would need to be excavated for future pipeline repair work per the goals of the City's Five-Year Plan and Streets under Excavation Moratorium. This relocation and replacement of the sewer pipeline is accounted for in the project construction schedule presented in Sections 2.6 and 4.15. Since the project has not completed a load (weight) analysis, there currently is no estimate for lengthening the construction duration to include replacement of sewer pipeline under the LPA, but it can be assumed the construction duration will fall between the full sewer replacement indentified for Build Alternative 3 and the partial sewer replacement identified for Build Alternative. 4.[115] A more refined definition of the sewer replacement work and its timeline will be part of 30% design work.

10.4.2 | Summary of LPA Performance against Purpose and Need

The LPA performance, including the Vallejo Northbound Station Variant, falls within the range of Build Alternatives 2 through 4, with the exception of parking supply. Table 10-4 below lists 16 performance indicators which are most closely tied to the project purpose and need. The LPA performance is ranked among the project alternatives in its ability to meet the project purpose and need. Six of the criteria do not differentiate the alternatives, and are listed as "N/A" in Table 10-4. Of the remaining 10 criteria, the LPA ranks 1st (or tied for 1st) on six.[116]

Table 10-4: LPA Performance Summary Against Purpose and Need Evaluation

INDICATOR #	EVALUATION CRITERIA	RANK[1]
A-1	Transit Travel Time	1st (T)[2]
A-3	Reliability (Likelihood of Unexpected Stops)	1st (T)
A-6	Ridership (Van Ness Avenue BRT and Systemwide)	1st (T)
B-1	Platform Crowding	n/a[3]
B-2	Amount of Buffer between Platform and Auto Traffic	4th
B-3	Number of Lane Transitions	4th
B-4	In Vehicles Passenger Crowding	n/a
C-1	Average Median Refuge Width	1st (T)
C-2	Average Crossing Distance	n/a
D-1	Consistency of Median Footprint	4th (T)
E-1	Average Total Intersection Person-Delay	n/a
E-2	Lane Productivity	1st (T)
E-3	Traffic Operations Delay	n/a
G-1	Cost of Muni Service	1st (T)
H-1	Total Construction Cost (build alternatives only)	3rd
H-2	Construction Duration	n/a

1. Rank includes the No Build Alternative, the 3 build alternatives in the Draft EIS/EIR, and the LPA, for a total of 5, with the highest performing alternative ranked 1 and the lowest performing ranked 5.

2. (T) indicates tie.

3. An indication of "n/a" signifies a criterion where no significant difference was demonstrated between the alternatives.

115 As described in Section 4.6.3, complete relocation and replacement of the sewer pipeline within the project area is assumed under Build Alternative 3 (including Design Option B), and relocation and replacement of the sewer pipeline approximately between Geary and O'Farrell streets is assumed under Build Alternative 4 (including Design Option B). For estimating the sewer replacement cost for the LPA, it is assumed that up to full replacement (10,900 feet) could be necessary as under Build Alternative 3 (see Section 10.2.4.8); however, it is likely that sewer replacement or relocation would be carried out only at locations where new transitway or mixed traffic lanes are proposed directly over the existing sewer facility.

116 The Vallejo Northbound Station Variant would perform slightly lower than the LPA on indicators A-1, A-3, D-1, G-1, and H-1.

10.5 Small Starts Evaluation Process

This section describes how the Van Ness Avenue BRT Project is evaluated and rated by the FTA as part of a standardized federal decision making process through which projects will be recommended for Section 5309 New or Small Starts, with cost under $250 million.

The FTA has developed a consistent set of information that it requests from project sponsors and then reviews to first determine if a project will be approved into the Section 5309 "pipeline;" the pipeline refers to the set of projects that have been reviewed by FTA and determined to achieve established criteria and other requirements, and are therefore eligible for future federal funding.

As projects are further developed through environmental review and design, updated information is provided to the FTA at key decision points or if significant changes are made to the project. Ultimately, a grant agreement is executed between the FTA and the project sponsor, providing Section 5309 funds for the project's implementation.

Ratings for projects in the New or Small Starts pipelines are reported each year to Congress, which approves all grant agreements, and are also disclosed in the environmental documents prepared for the projects. These ratings help inform reviewers of environmental documents of the likely receipt of future federal funds.

The Van Ness Avenue BRT Project was approved into the Small Starts pipeline in December 2008. The following sections summarize FTA's revised rating for the LPA.

10.5.1 | Current Rating

FTA's rating is divided into two basic categories: project justification and local financial commitment. Additionally, FTA considers the overall technical capacity of the Authority and SFMTA to manage the design, construction, and eventual operation of the project. FTA's most recent overall evaluation and rating of the Van Ness Avenue BRT is "Medium-High" (Annual Report on Funding Recommendations, Fiscal Year 2014 Capital Investment and Paul S. Sarbanes Transit in Parks Programs, released February 2012).

10.5.2 | Project Justification

For Small Starts projects, project justification is evaluated based on the following three criteria, which are all weighted equally:

- Cost effectiveness, measured in terms of the cost of providing each hour of travel time savings;
- Land use in the corridor served by the project; and
- Economic development associated with the project, generally considered in terms of transit supportive plans and policies and how well they have performed.

FTA's most recent evaluation and rating of the Van Ness Avenue BRT is "Medium-High" for "project justification" (Annual Report on Funding Recommendations, Fiscal Year 2014 Capital Investment and Paul S. Sarbanes Transit in Parks Programs, released February 2012). This project justification rating is comprised of the following factor ratings:

- Cost effectiveness, rated as "High"
- Land use, rated as "High"
- Economic development, rated as "High"

10.5.3 | Local Financial Commitment

FTA assigns a summary local financial commitment rating of *High, Medium-High, Medium, Medium-Low or Low* to each project following consideration of individual ratings applied to the following measures for local financial commitment:

1. Share of non-Section 5309 New Starts funding;
2. Stability and reliability of the proposed project's capital finance plan, including the following factors:
   - Current capital condition;
   - Commitment of capital funds; and
   - Reasonable capital planning assumptions and cost estimates and sufficient capital funding capacity.
3. Stability and reliability of the proposed project's operating finance plan, including the following factors:
   - Current operating financial condition;
   - Commitment of operations and maintenance (O&M) funds; and
   - Reasonable operations planning assumptions and cost estimates and sufficient O&M funding capacity.

These ratings are based on an analysis of the financial plans and documentation submitted to FTA by local agencies. FTA's evaluation takes into account the stage of project development, particularly when considering the stability and reliability of the capital and operating finance plans. Expectations for firm commitments of non-Federal funding sources become increasingly higher as projects progress further through development (preliminary engineering, followed by final design), and are rated accordingly.

FTA's most recent evaluation and rating of the Van Ness Avenue BRT project justification is "Medium" for "Local Financial Commitment" (Annual Report on Funding Recommendations, Fiscal Year 2014 Capital Investment and Paul S. Sarbanes Transit in Parks Programs, released February 2012).

10.5.4 | Summary

The Van Ness Avenue BRT has received FTA's highest cost-effectiveness rating,. It is the only Small Starts Project in the country to receive a "medium-high" rating for project justification.

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CHAPTER 11

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Appendix A

Plan Drawings of the Build Alternatives

and LPA

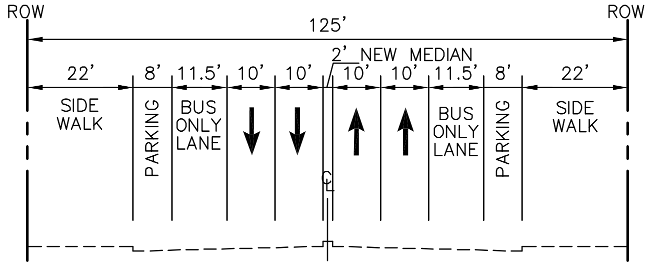
Van Ness Avenue Bus Rapid Transit

04-SF-101-PM T4.71/6.71
EA: 3A270

CONCEPTUAL ENGINEERING STUDIES

Prepared for:
San Francisco Transportation Authority
100 Van Ness Avenue 26th Floor
San Francisco, CA 94102

Prepared by:
PARSONS
50 Fremont Street, Suite 1500
San Francisco, CA 94105



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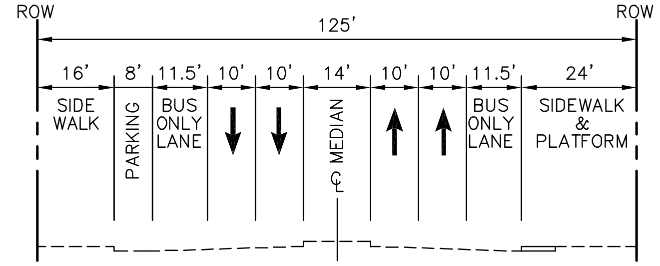

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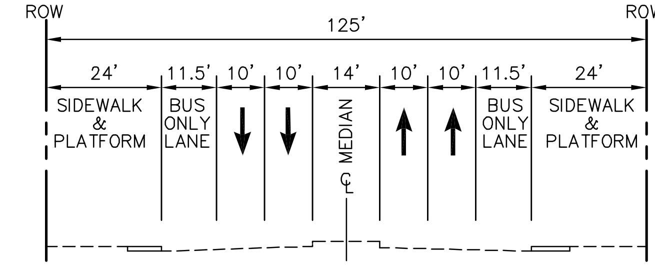

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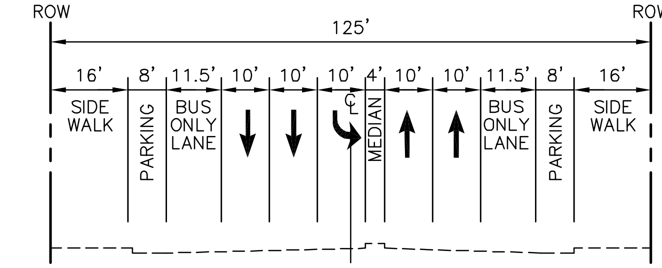

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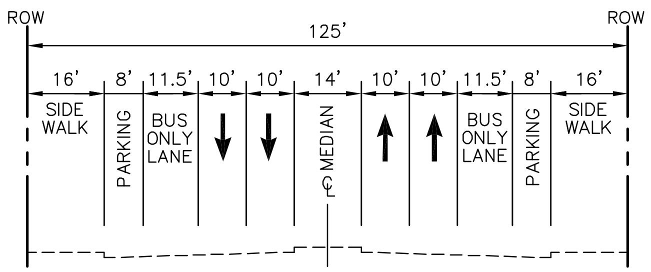

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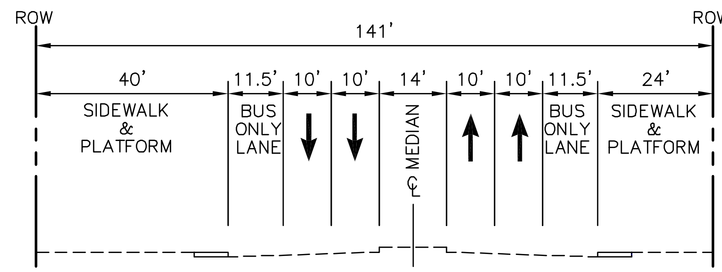

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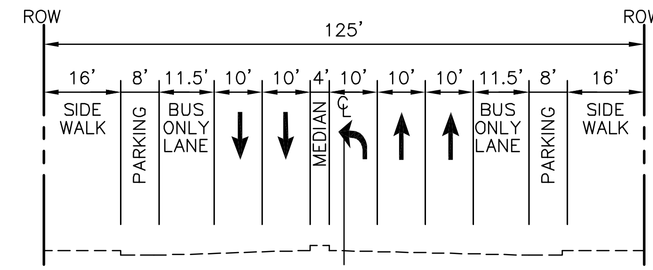

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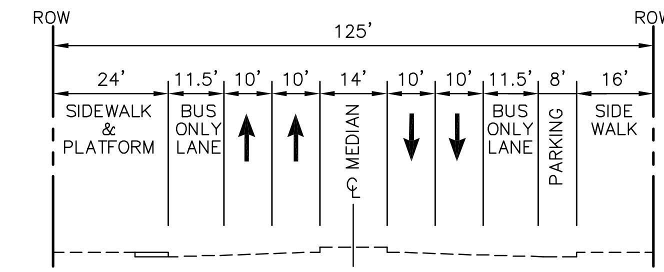

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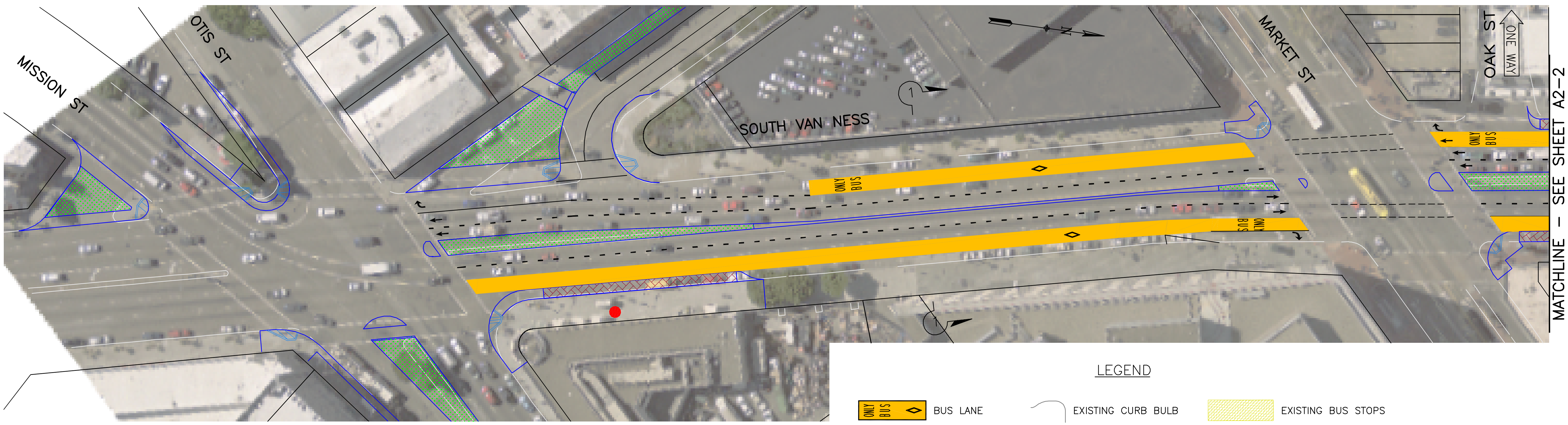

PLAN

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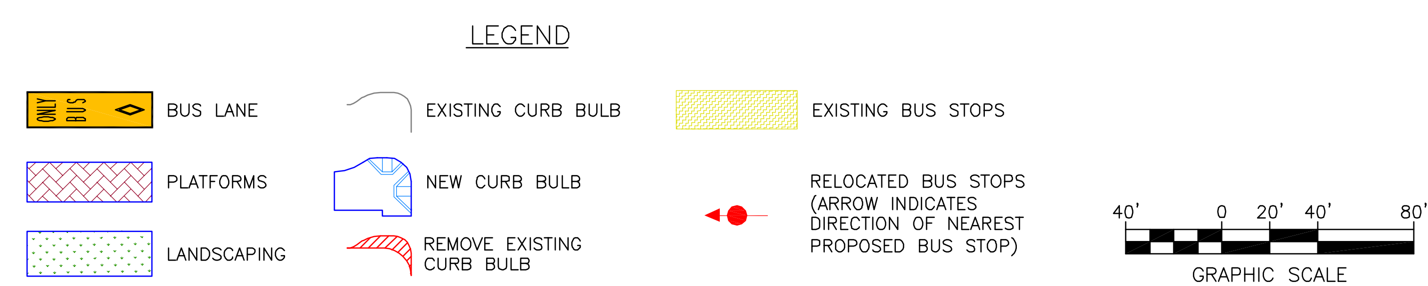

NO.	DATE	DESCRIPTION	BY	APP.
A	12/1/08			

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CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

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CHECKED: KF DATE: 12/08	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:		FILE NO.
			REV. NO. A

Van Ness Avenue
Bus Rapid Transit Study

Alternative 2:
Side Lane BRT

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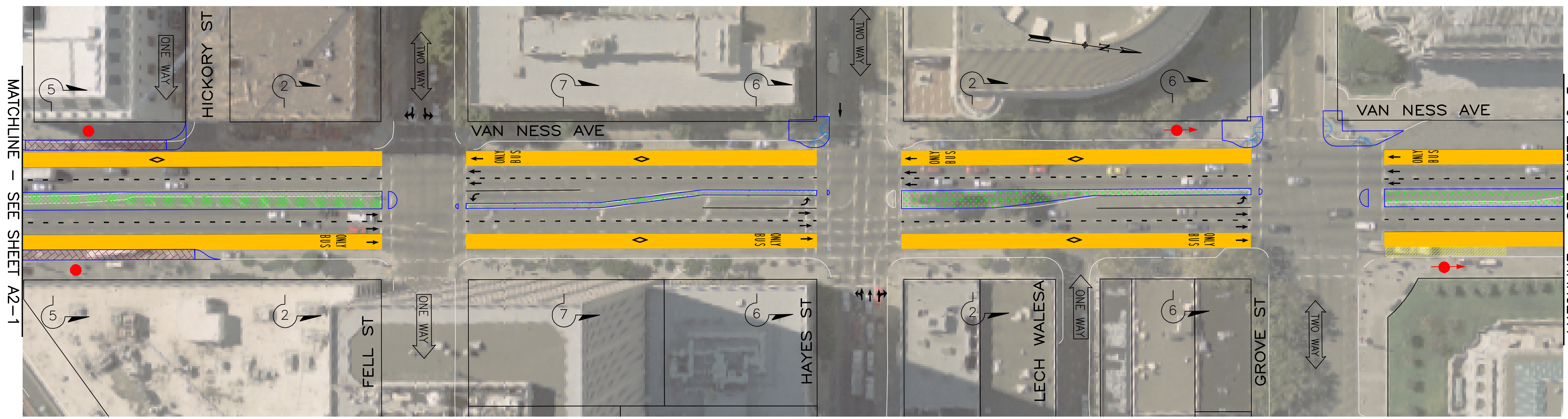

PLAN
SCALE: 1"=80'

40' 0 20' 40' 80'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
B	5/22/09			
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

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CHECKED: KF	DATE: 5/09

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET OF SHEETS: 2 OF 9

Van Ness Avenue Bus Rapid Transit Study
Alternative 2: Side Lane BRT

CONTRACT NO.
DRAWING NO. A2-2
FILE NO.
REV. NO. A

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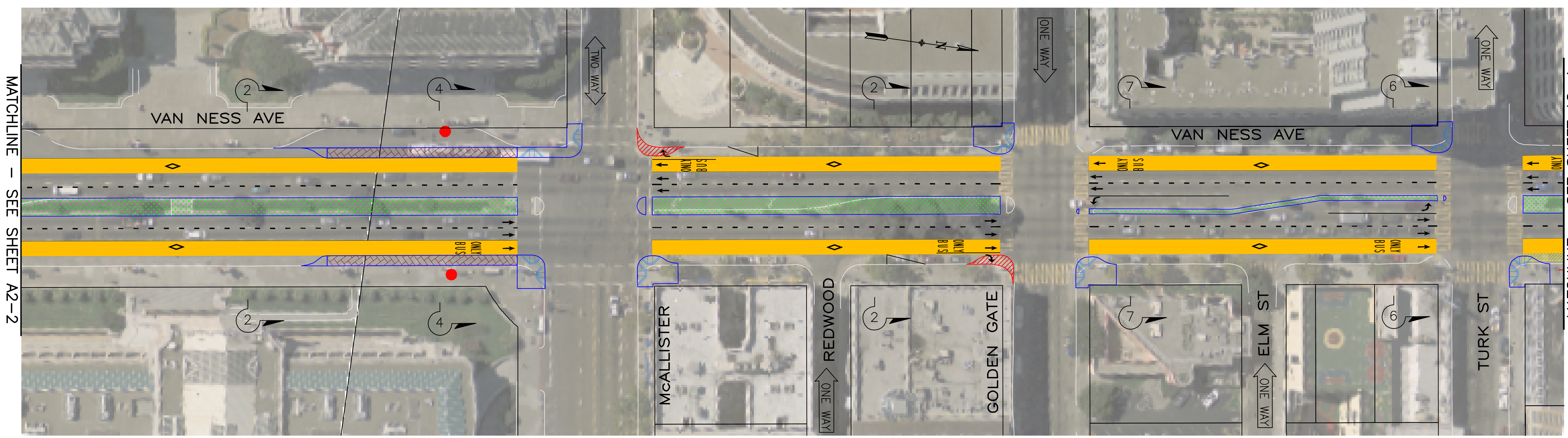

PLAN

SCALE: 1"=80'

40' 0 20' 40' 80'

GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

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APPROVED
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DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

SHEET OF SHEETS 3 OF 9

Van Ness Avenue Bus Rapid Transit Study

Alternative 2: Side Lane BRT

CONTRACT NO.
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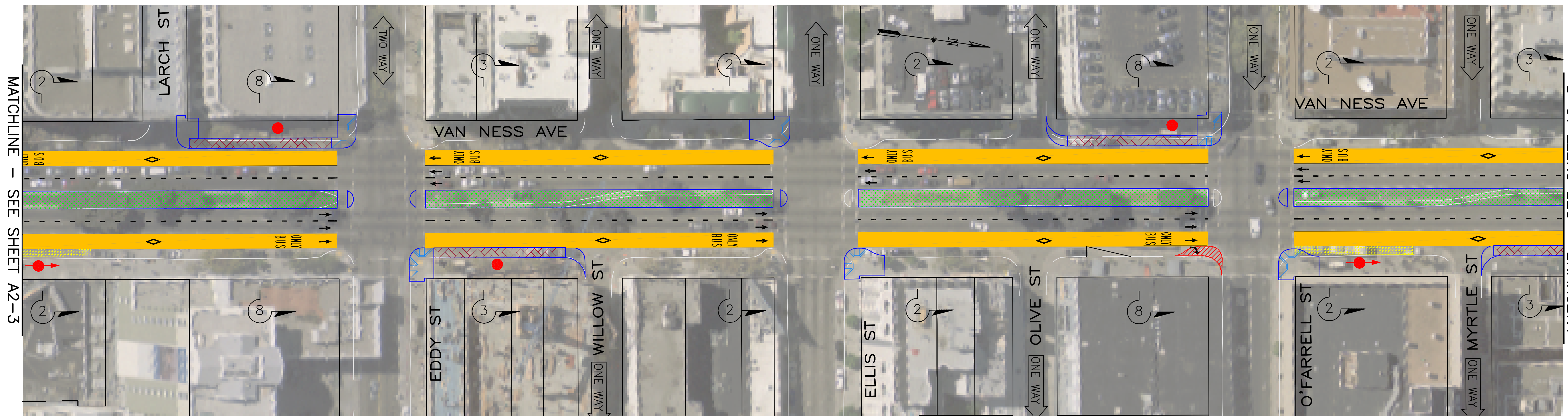

PLAN
SCALE: 1"=80'

40' 0 20' 40' 80'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
A	12/1/08			

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CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

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APPROVED
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DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET 4 OF 9 SHEETS

Van Ness Avenue
Bus Rapid Transit Study

Alternative 2:
Side Lane BRT

CONTRACT NO.
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FILE NO.
REV. NO. A

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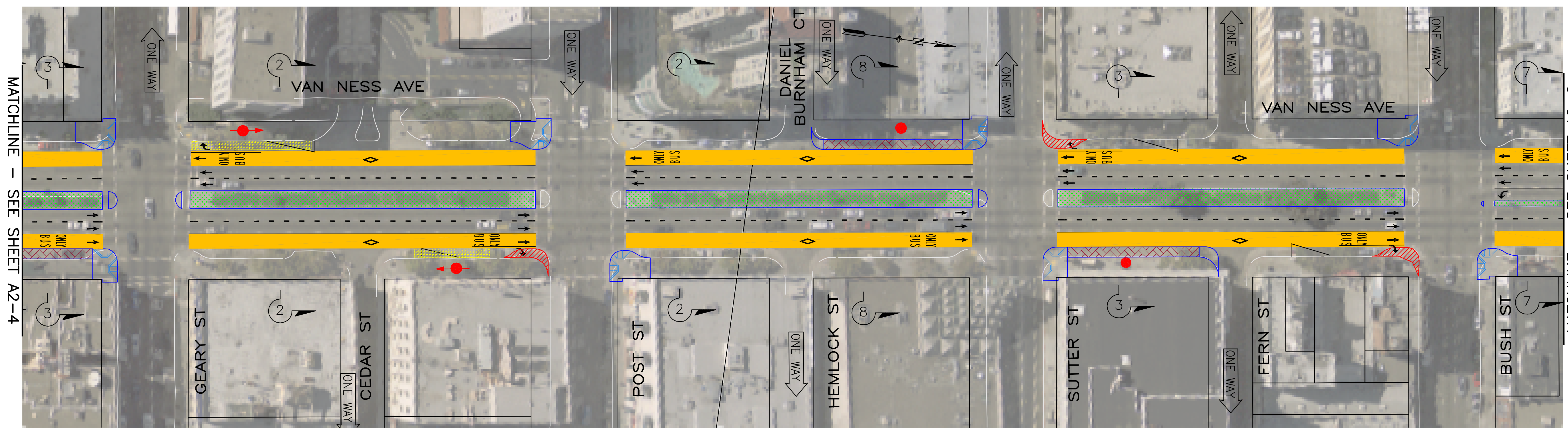

PLAN
SCALE: 1"=80'

NO.	DATE	DESCRIPTION	BY	APP.
A	12/1/08			

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CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

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APPROVED
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DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET 5 OF 9 SHEETS

Van Ness Avenue Bus Rapid Transit Study

Alternative 2: Side Lane BRT

CONTRACT NO.
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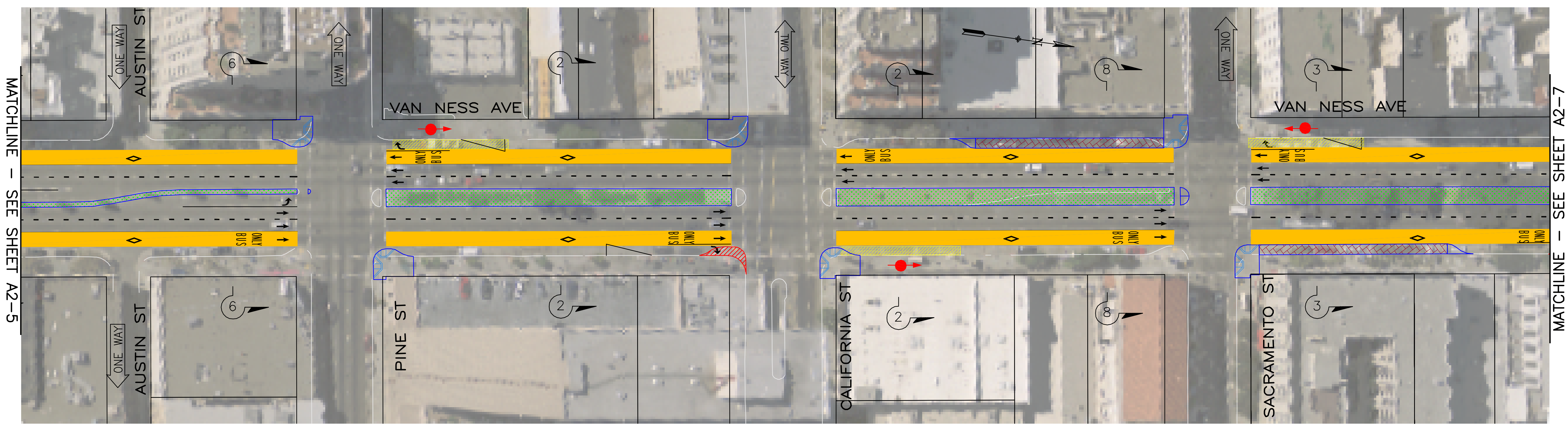

PLAN

SCALE: 1"=80'

40' 0 20' 40' 80'

GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR–5458.2 REV "4"

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DRAWN: AM	DATE: 12/08
CHECKED: KF	DATE: 12/08

APPROVED

SECTION ENGINEER DATE:

DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

SHEET OF SHEETS 6 OF 9

Van Ness Avenue Bus Rapid Transit Study

Alternative 2: Side Lane BRT

CONTRACT NO.

DRAWING NO. A2–6

FILE NO.

REV. NO. A

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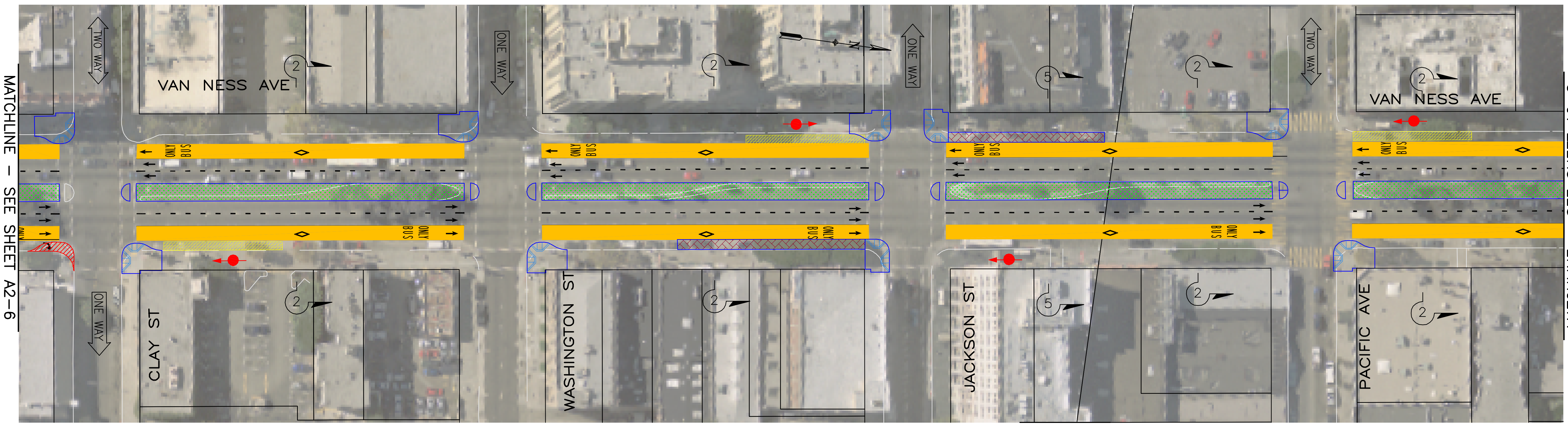

PLAN
SCALE: 1"=80'

40' 0 20' 40' 80'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

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APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET OF SHEETS: 7 OF 9

Van Ness Avenue
Bus Rapid Transit Study

Alternative 2:
Side Lane BRT

CONTRACT NO.
DRAWING NO. A2-7
FILE NO.
REV. NO. A

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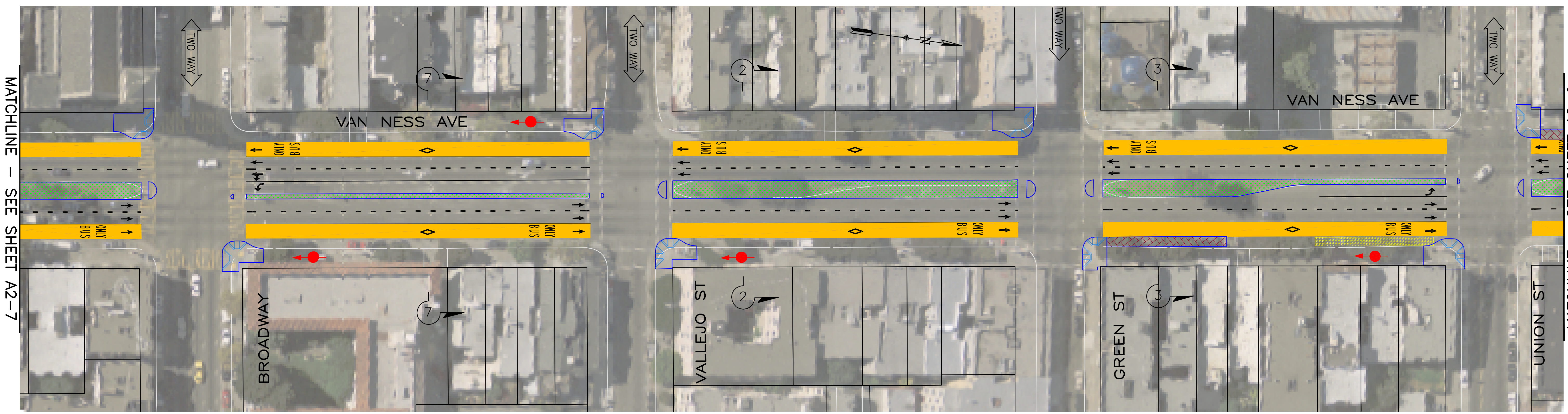

PLAN
SCALE: 1"=80'

40' 0 20' 40' 80'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

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Van Ness Avenue
Bus Rapid Transit Study

Alternative 2:
Side Lane BRT

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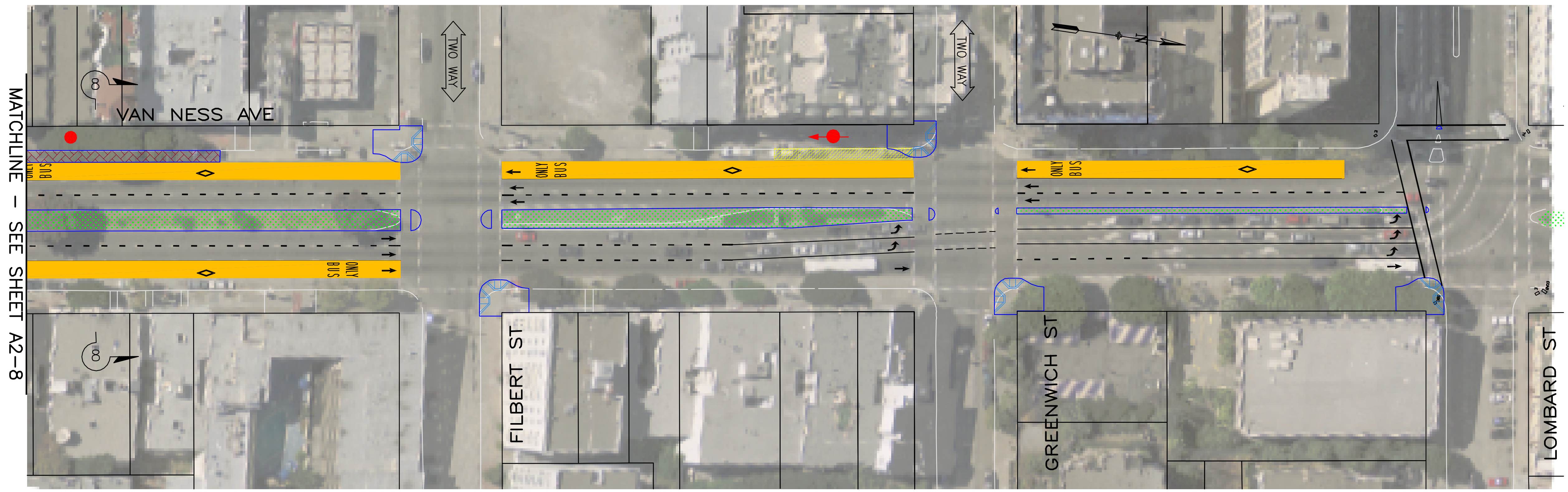

PLAN

SCALE: 1"=80'

40' 0 20' 40' 80'

GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

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DRAWN: AM DATE: 12/08
CHECKED: KF DATE: 12/08

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

SHEET OF SHEETS: 9 OF 9

Van Ness Avenue
Bus Rapid Transit Study

Alternative 2:
Side Lane BRT

CONTRACT NO.
DRAWING NO. A2–9
FILE NO.
REV. NO. A

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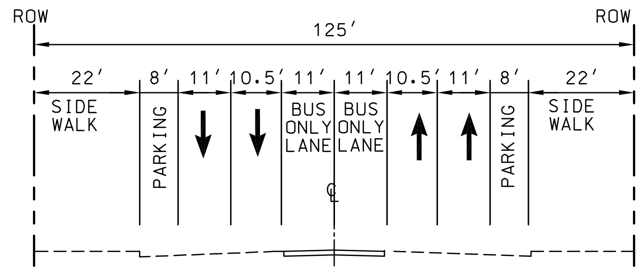
Appendix A continued

Plan Drawings of Build Alternative 3



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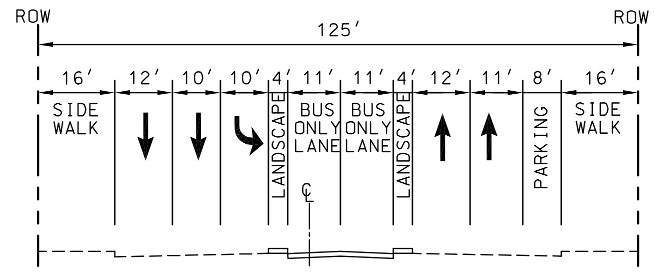

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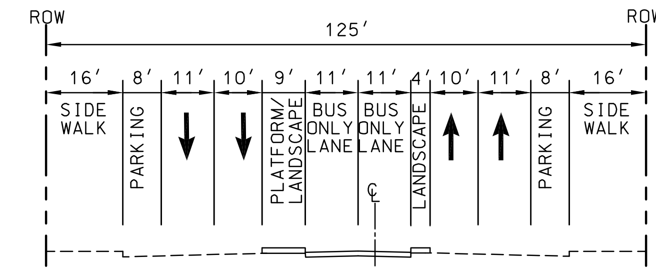

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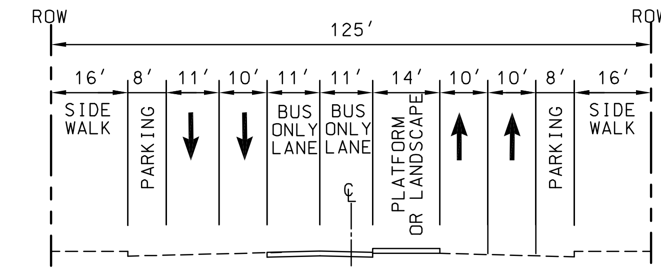

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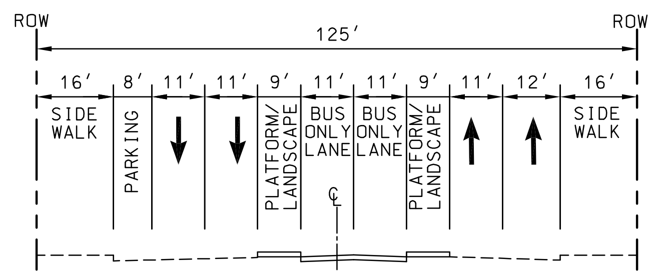

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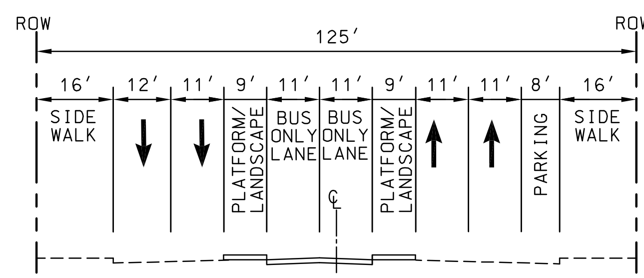

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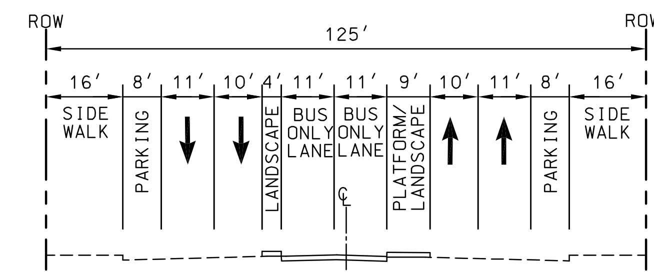

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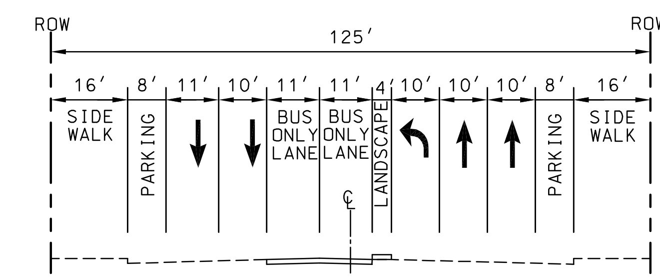

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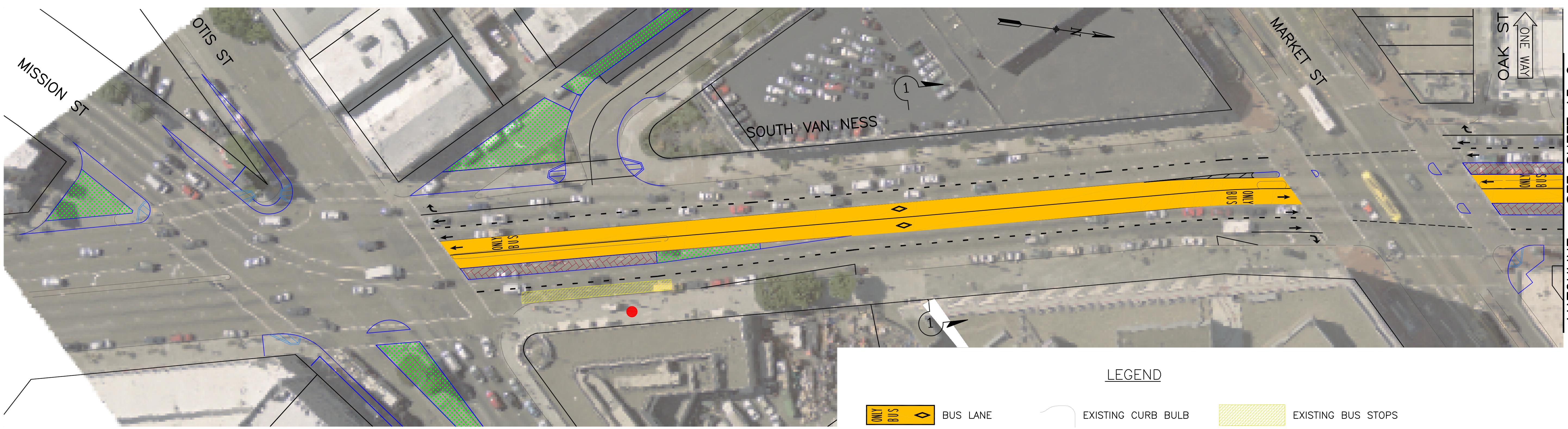

MATCHLINE – SEE SHEET A3–2

PLAN

SCALE: 1"=80'

LEGEND

BUS LANE

EXISTING CURB BULB

EXISTING BUS STOPS

PLATFORMS

NEW CURB BULB

RELOCATED BUS STOPS (ARROW INDICATES DIRECTION OF NEAREST PROPOSED BUS STOP)

LANDSCAPING

REMOVE EXISTING CURB BULB

40' 0 20' 40' 80'

GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
D	10/15/12			
C	5/22/09			
B	3/27/09			
A	12/1/08			

TABLE OF REVISIONS

CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

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DRAWN: EL DATE: 5/09

CHECKED: KF DATE: 5/09

APPROVED

SECTION ENGINEER DATE:

DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

SHEET OF SHEETS: 1 OF 9

Van Ness Avenue
Bus Rapid Transit Study

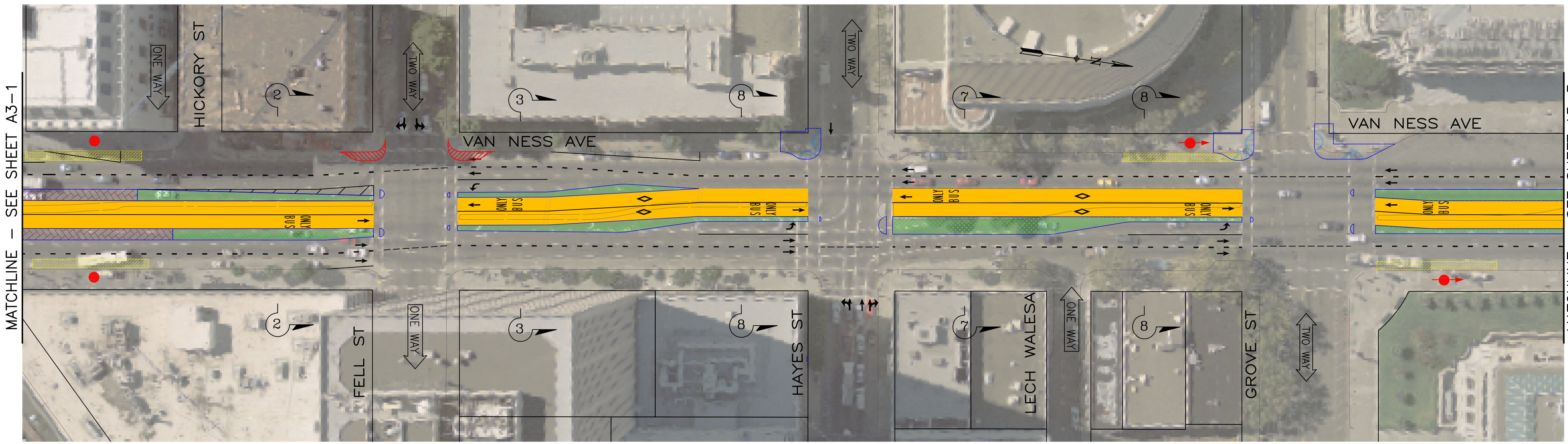
Alternative 3: Center Lanes
with Side Median BRT

CONTRACT NO.

DRAWING NO. A3–1

FILE NO.

REV. NO. A



PLAN
SCALE: 1"=80'

40 0 20 40 80
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
D	10/15/12			
C	5/22/09			
B	3/27/09			
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED:	DATE:
EL	5/09
DRAWN:	DATE:
EL	5/09
CHECKED:	DATE:
KF	5/09

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET OF SHEETS: 2 OF 9

Van Ness Avenue Bus Rapid Transit Study

Alternative 3: Center Lanes with Side Median BRT

CONTRACT NO.
DRAWING NO. A3-2
FILE NO.
REV. NO. A

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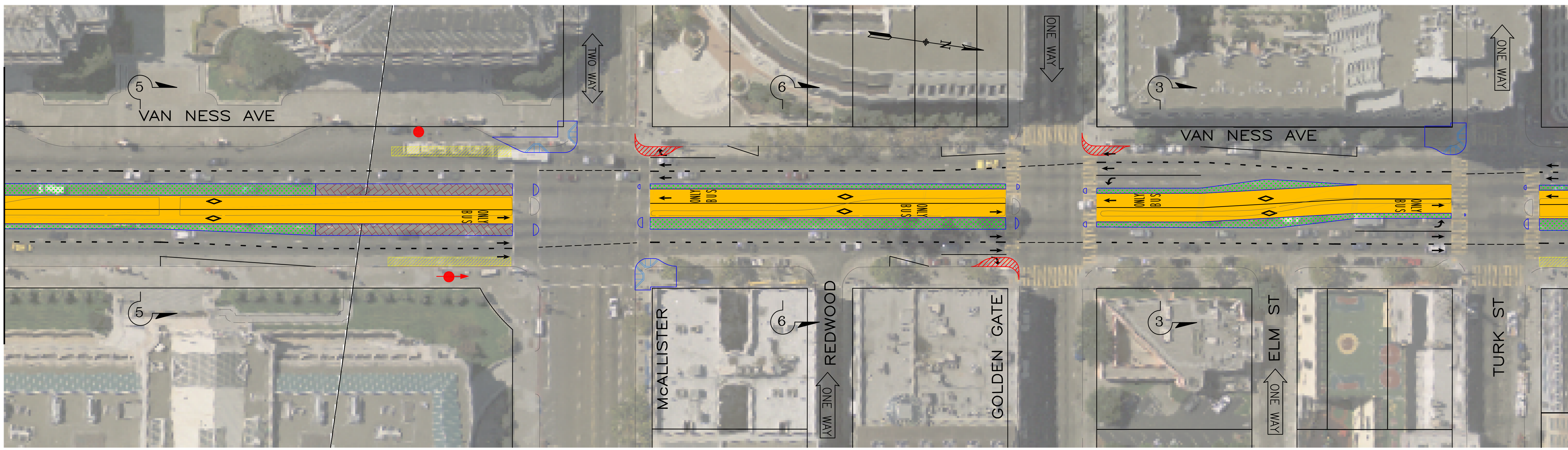
Use Pentables, Van Ness BW.ctb or Van Ness CLR.ctb

MATCHLINE – SEE SHEET A3-2



MATCHLINE – SEE SHEET A3-4

PLAN
SCALE: 1"=80'

40 0 20 40 80
GRAPHIC SCALE

Use Pentables, Van Ness BW.ctb or Van Ness CLR.ctb

Oct 15, 2012 – 2:18pm C:\Users\p0043080\appdata\local\temp\AcPublish_7420\904-CV-Alt 3.dwg

NO.	DATE	DESCRIPTION	BY	APP.
D	10/15/12			
C	5/22/09			
B	3/27/09			
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED:	DATE:
EL	5/09
DRAWN:	DATE:
EL	5/09
CHECKED:	DATE:
KF	5/09

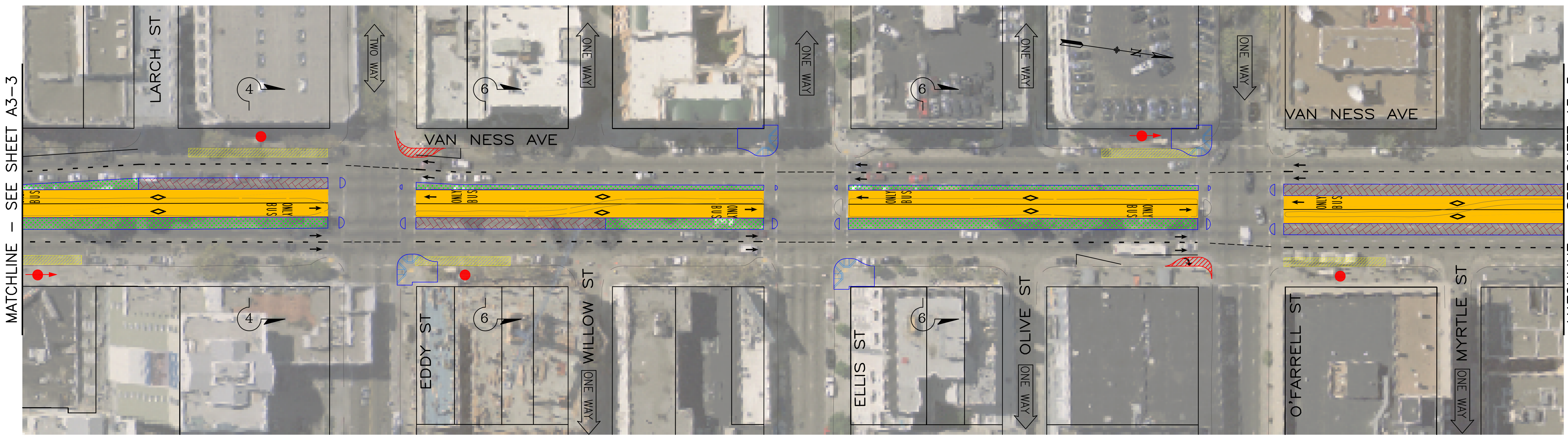
APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET OF SHEETS: 3 OF 9

Van Ness Avenue Bus Rapid Transit Study

Alternative 3: Center Lanes with Side Median BRT

CONTRACT NO.
DRAWING NO. A3-3
FILE NO.
REV. NO. A



PLAN

SCALE: 1"=80'

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GRAPHIC SCALE

Use Pentables, Van Ness BW.ctb or Van Ness CLR.ctb

Oct 15, 2012 - 2:19pm C:\Users\p0043080\appdata\local\temp\AcPublish_7420\904-CV-Alt 3.dwg

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C	5/22/09			
B	3/27/09			
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED: EL	DATE: 5/09
DRAWN: EL	DATE: 5/09
CHECKED: KF	DATE: 5/09

APPROVED

SECTION ENGINEER — DATE:

DEP. DIRECTOR AND CITY TRAFFIC ENGINEER — DATE:

SCALE: 1"=80'

SHEET 4 OF 9 SHEETS

Van Ness Avenue
Bus Rapid Transit Study

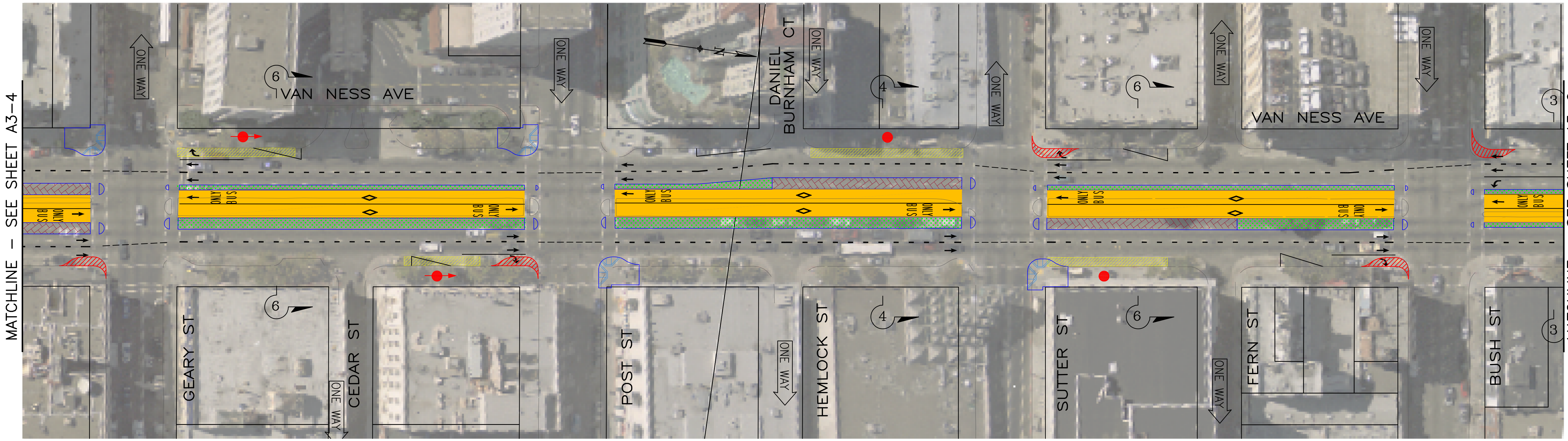
Alternative 3: Center Lanes
with Side Median BRT

CONTRACT NO.

DRAWING NO. A3-4

FILE NO.

REV. NO. A



PLAN
SCALE: 1"=80'

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GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
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C	5/22/09			
B	3/27/09			
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TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

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CHECKED:	DATE:
KF	5/09

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET OF SHEETS: 5 OF 9

Van Ness Avenue Bus Rapid Transit Study

Alternative 3: Center Lanes with Side Median BRT

CONTRACT NO.
DRAWING NO. A3-5
FILE NO.
REV. NO. A

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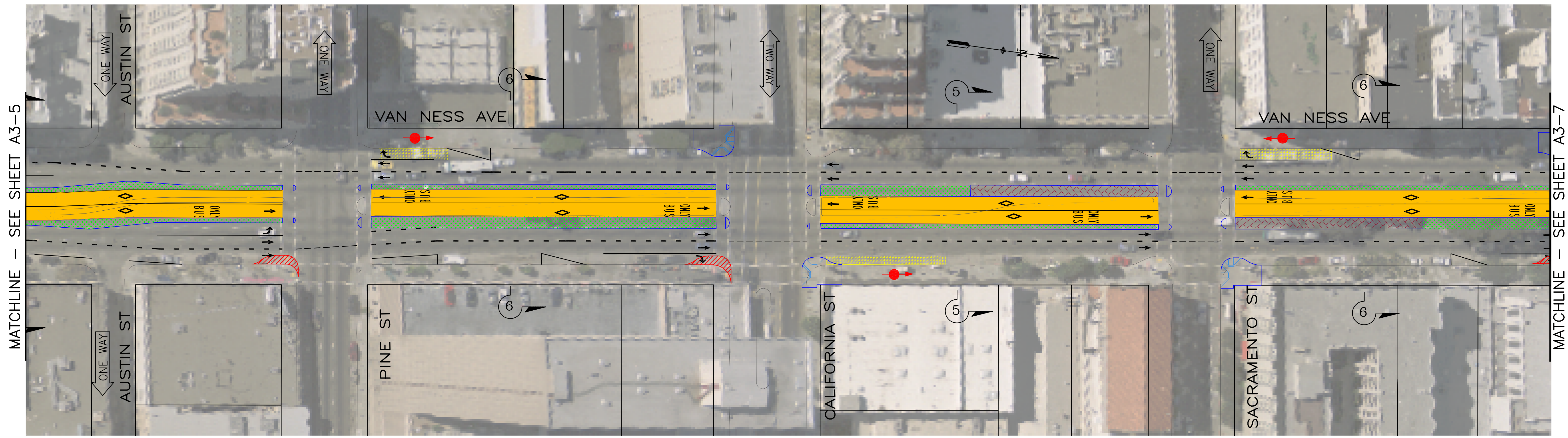

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GRAPHIC SCALE

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B	3/27/09			
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

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DRAWN: EL	DATE: 5/09	SECTION ENGINEER DATE:	SHEET OF SHEETS 6 OF 9
CHECKED: KF	DATE: 5/09	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:	

Van Ness Avenue
Bus Rapid Transit Study

Alternative 3: Center Lanes
with Side Median BRT

CONTRACT NO.
DRAWING NO. A3–6
FILE NO.
REV. NO. A

Use Pentables, Van Ness BW.ctb or Van Ness CLR.ctb

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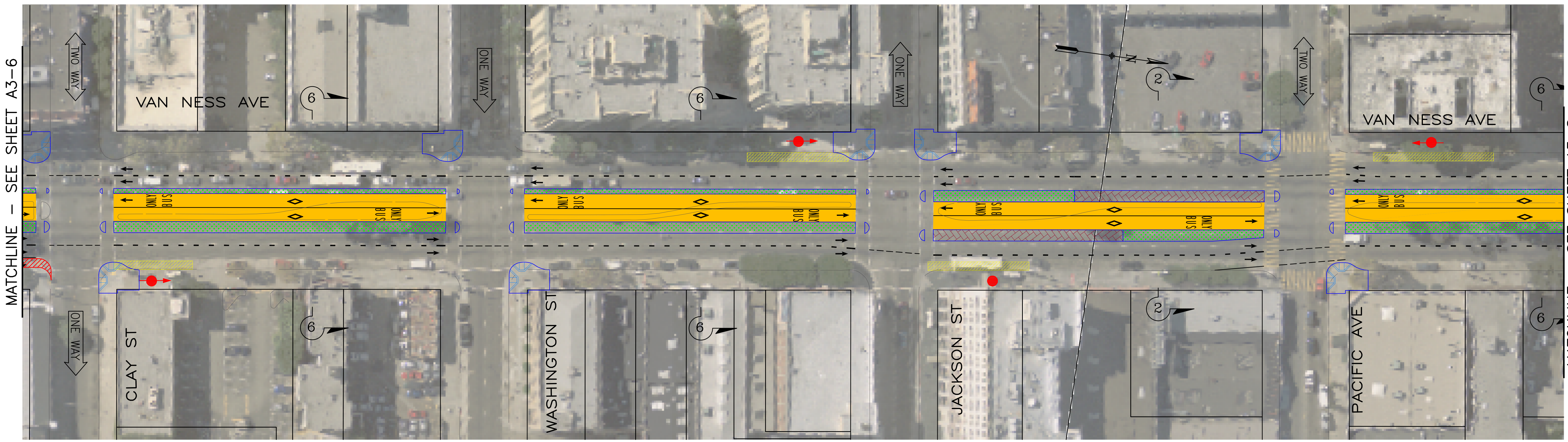

PLAN
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GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
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C	5/22/09			
B	3/27/09			
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

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DRAWN:	DATE:
EL	5/09
CHECKED:	DATE:
KF	5/09

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET OF SHEETS 7 OF 9

Van Ness Avenue
Bus Rapid Transit Study

Alternative 3: Center Lanes
with Side Median BRT

CONTRACT NO.
DRAWING NO. A3-7
FILE NO.
REV. NO. A

Use Pentables, Van Ness BW.ctb or Van Ness CLR.ctb

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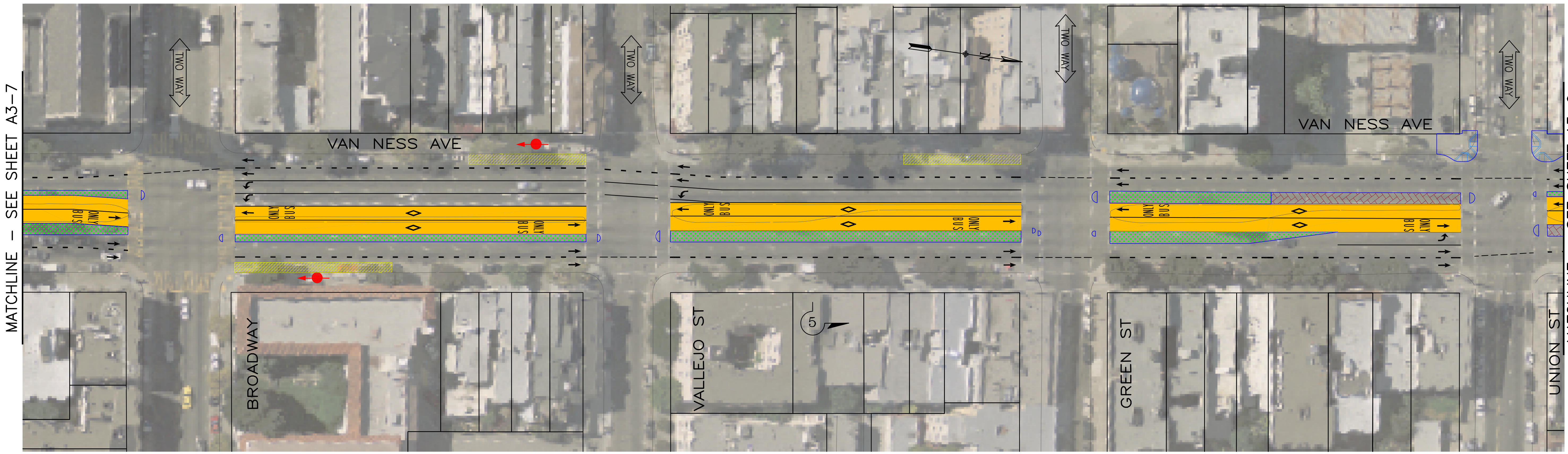

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GRAPHIC SCALE

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C	5/22/09			
B	3/27/09			
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED: TJW DATE: 10/12
DRAWN: TJW DATE: 10/12
CHECKED: KF DATE: 10/12

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET 8 OF 9 SHEETS

Van Ness Avenue
Bus Rapid Transit Study

Alternative 3: Center Lanes
with Side Median BRT

CONTRACT NO.
DRAWING NO. A3-8
FILE NO.
REV. NO. A

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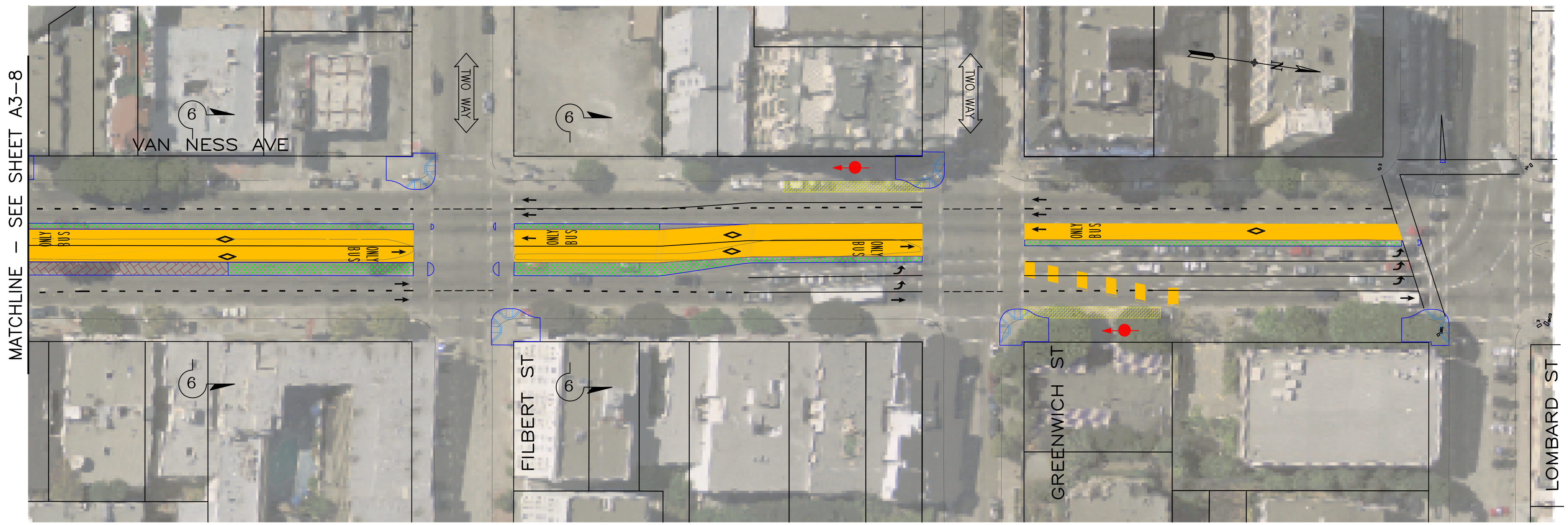

PLAN

SCALE: 1"=80'

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GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
D	10/15/12			
C	5/22/09			
B	3/27/09			
A	12/1/08			

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED: EL	DATE: 5/09	APPROVED	SCALE: 1"=80'
DRAWN: EL	DATE: 5/09	SECTION ENGINEER DATE:	SHEET OF SHEETS 9 OF 9
CHECKED: KF	DATE: 5/09	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:	

Van Ness Avenue
Bus Rapid Transit Study

Alternative 3: Center Lanes
with Side Median BRT

CONTRACT NO.

DRAWING NO. A3–9

FILE NO.

REV. NO. A

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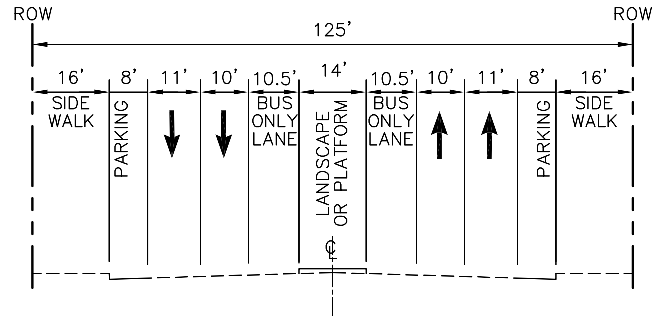
Appendix A continued

Plan Drawings of Build Alternative 4



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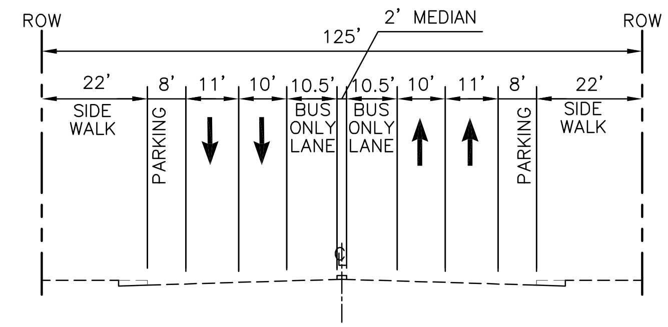

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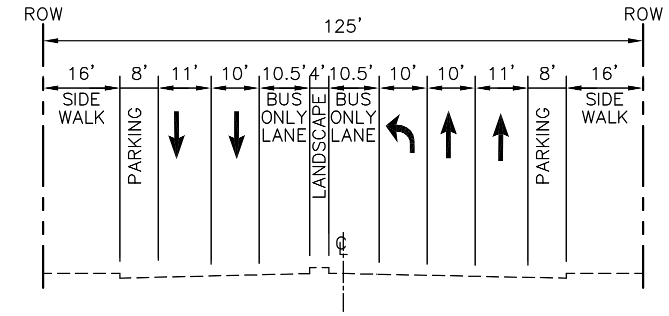

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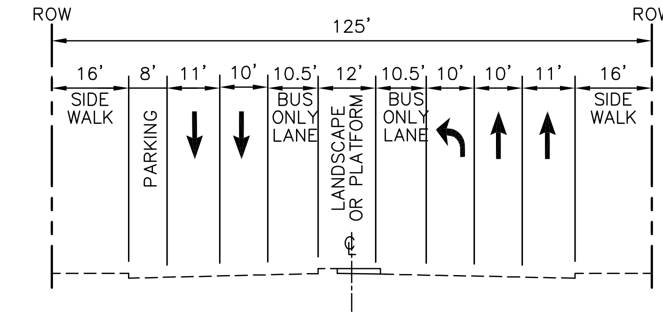

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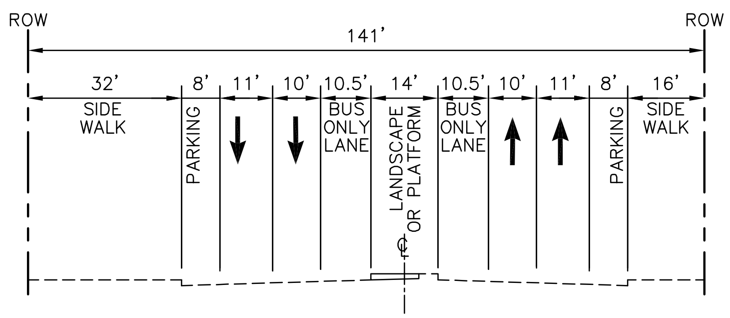

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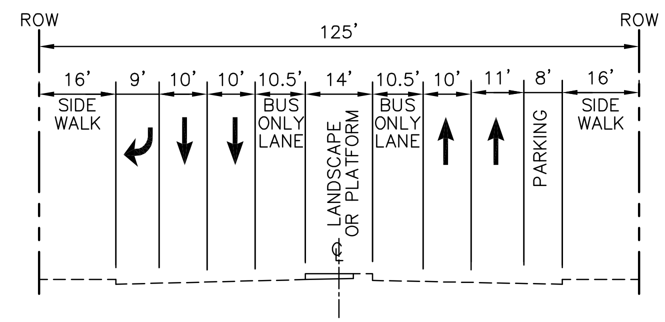

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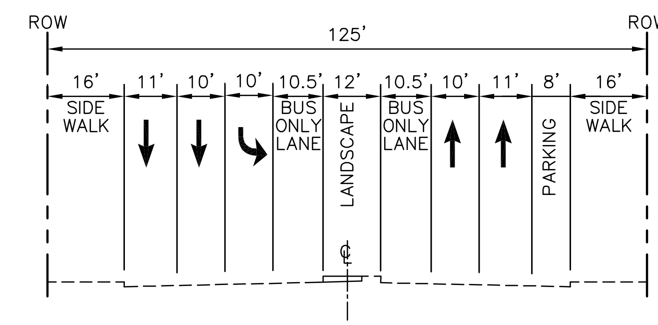

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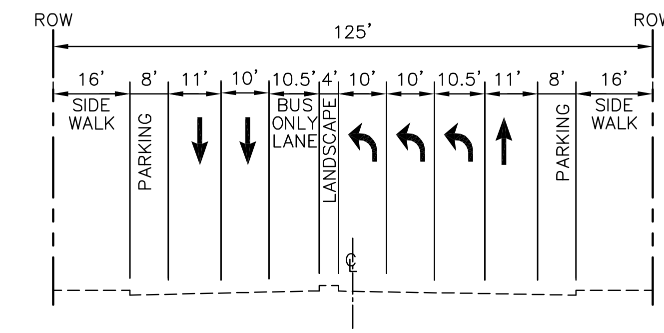

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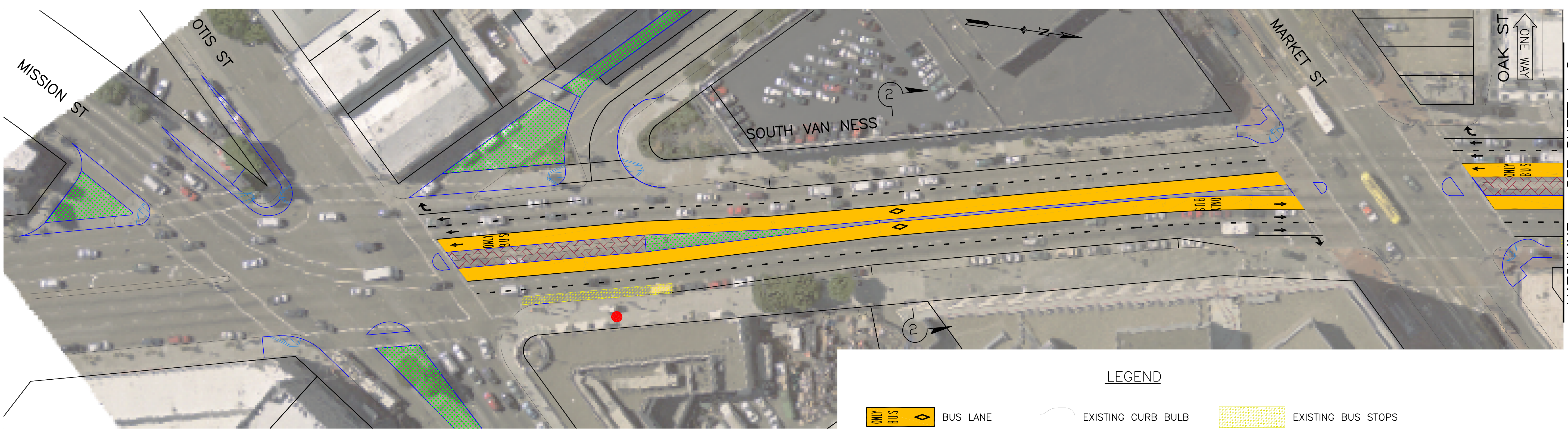

LEGEND

BUS LANE

PLATFORMS

LANDSCAPING

EXISTING CURB BULB

NEW CURB BULB

REMOVE EXISTING CURB BULB

EXISTING BUS STOPS

RELOCATED BUS STOPS (ARROW INDICATES DIRECTION OF NEAREST PROPOSED BUS STOP)

40 0 20 40 80

GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.
C	10/15/12			
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A	12/11/08			

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DESIGNED: RMB DATE: 5/09
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APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET 1 OF 9 SHEETS

Van Ness Avenue Bus Rapid Transit Study

Alternative 4: Center Lane BRT With Left Side Loading/Center Median

CONTRACT NO.
DRAWING NO. A4-1
FILE NO.
REV. NO. A

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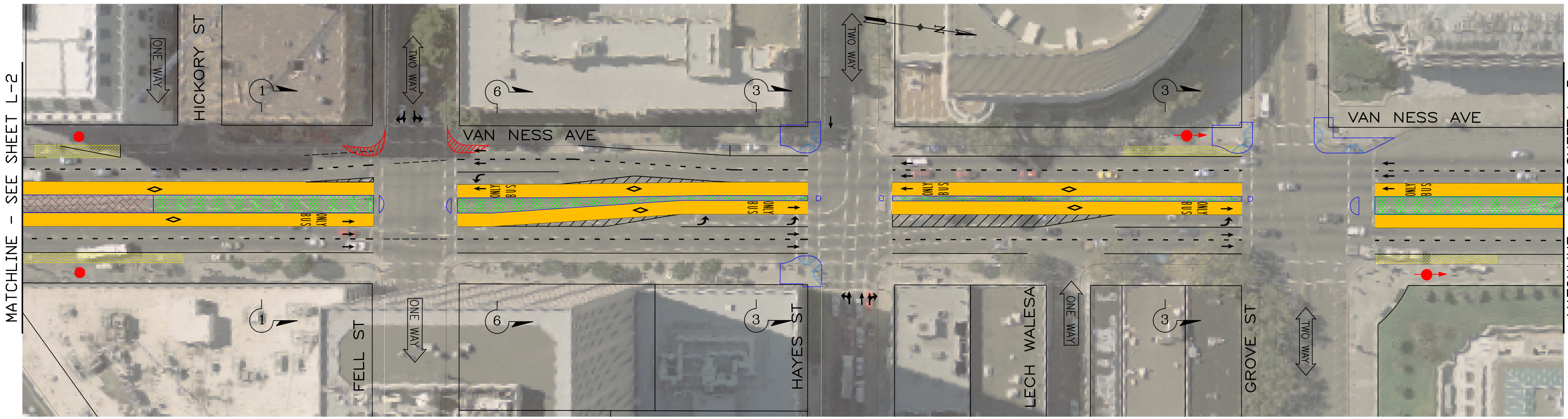

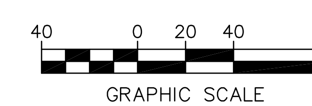

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TABLE OF REVISIONS
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CHECKED: KF	DATE: 05/09	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

SHEET OF SHEETS: 2 OF 9

Van Ness Avenue
Bus Rapid Transit Study

Alternative 4: Center Lane BRT
With Left Side Loading/Center Median

CONTRACT NO.
DRAWING NO. A4-2
FILE NO.
REV. NO. A

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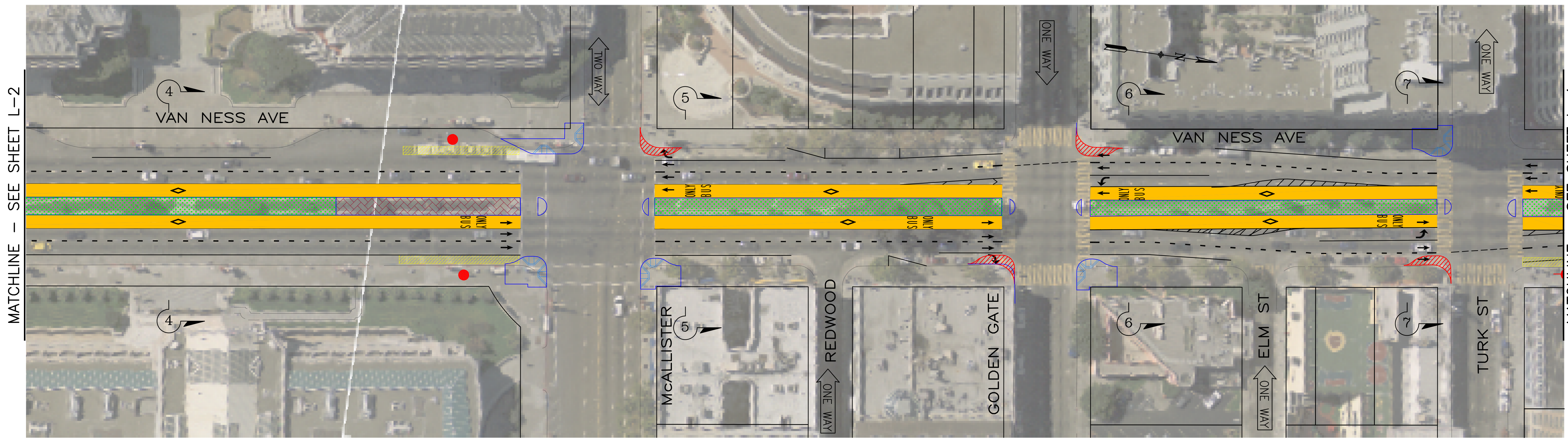

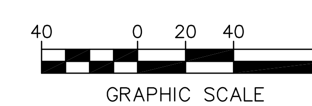

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A	12/11/08			

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APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET 3 OF 9 SHEETS

Van Ness Avenue Bus Rapid Transit Study

Alternative 4: Center Lane BRT With Left Side Loading/Center Median

CONTRACT NO.
DRAWING NO. A4-3
FILE NO.
REV. NO. A

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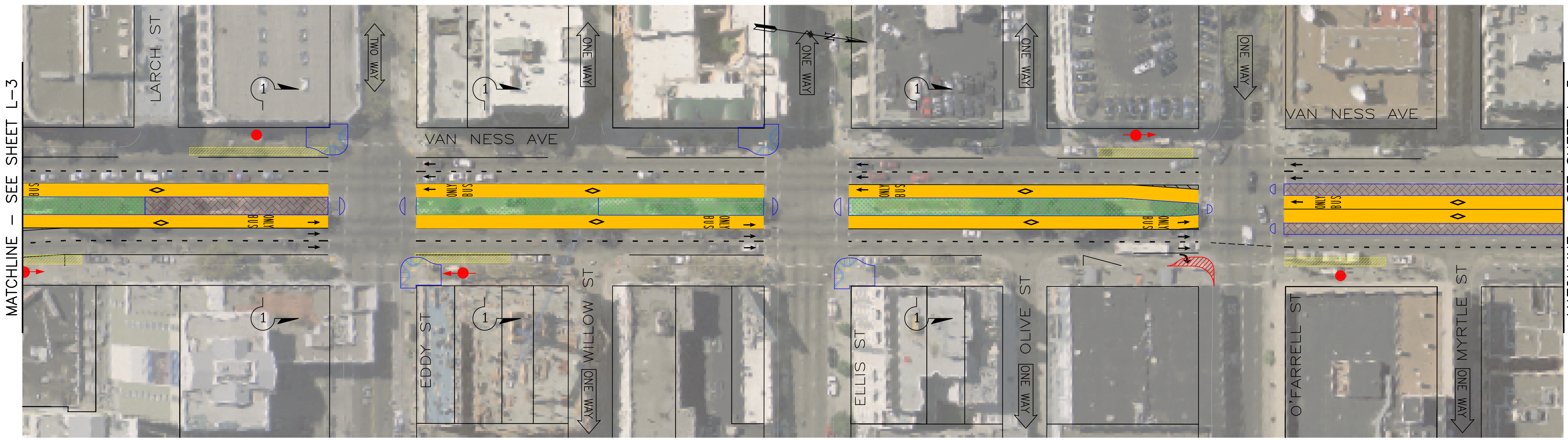

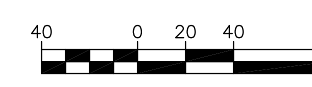

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A	12/11/08			

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DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

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SHEET OF SHEETS: 4 OF 9

Van Ness Avenue Bus Rapid Transit Study

Alternative 4: Center Lane BRT With Left Side Loading/Center Median

CONTRACT NO.
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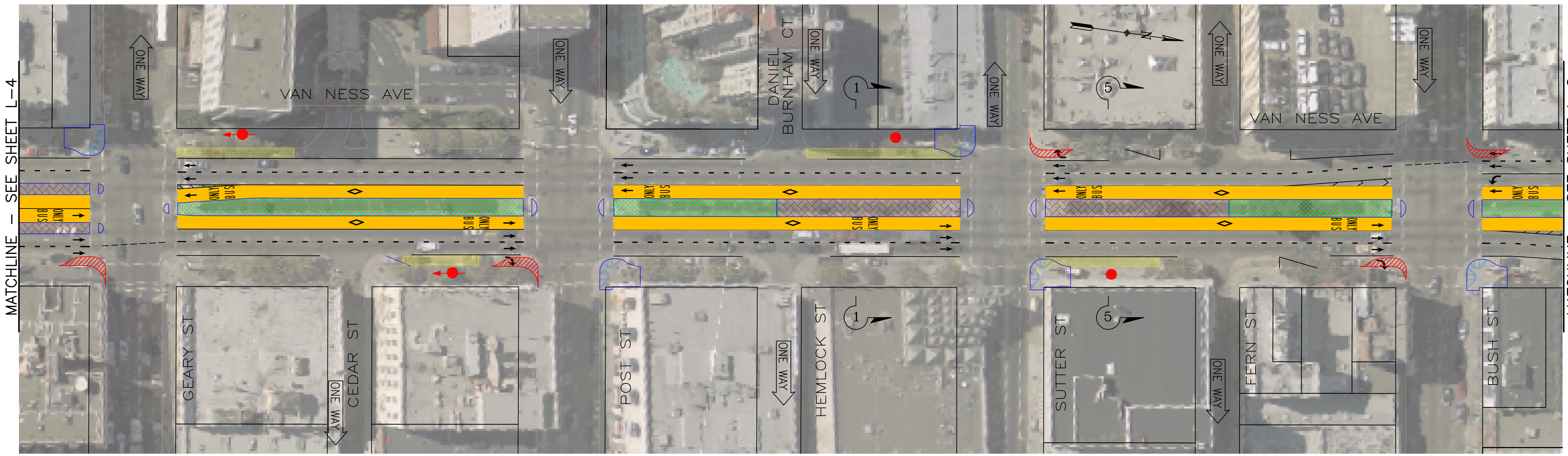

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B	5/22/09			
A	12/11/08			

TABLE OF REVISIONS
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REFERENCE INFORMATION & FILE NO. OF SURVEYS

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APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET 5 OF 9 SHEETS

Van Ness Avenue
Bus Rapid Transit Study

Alternative 4: Center Lane BRT
With Left Side Loading/Center Median

CONTRACT NO.
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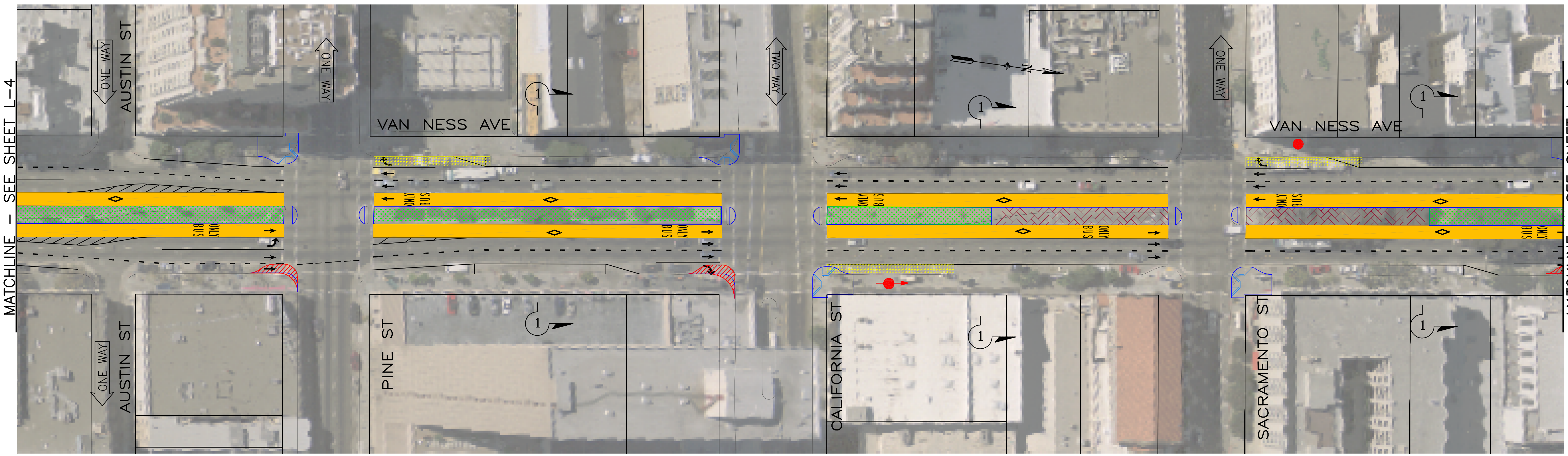
FILE NO.
REV. NO. A



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B	5/22/09			
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TABLE OF REVISIONS
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REFERENCE INFORMATION & FILE NO. OF SURVEYS

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CHECKED: KF	DATE: 12/08	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:	

Van Ness Avenue
Bus Rapid Transit Study

Alternative 4: Center Lane BRT
With Left Side Loading/Center Median

CONTRACT NO.

DRAWING NO. A4–6

FILE NO.

REV. NO. A

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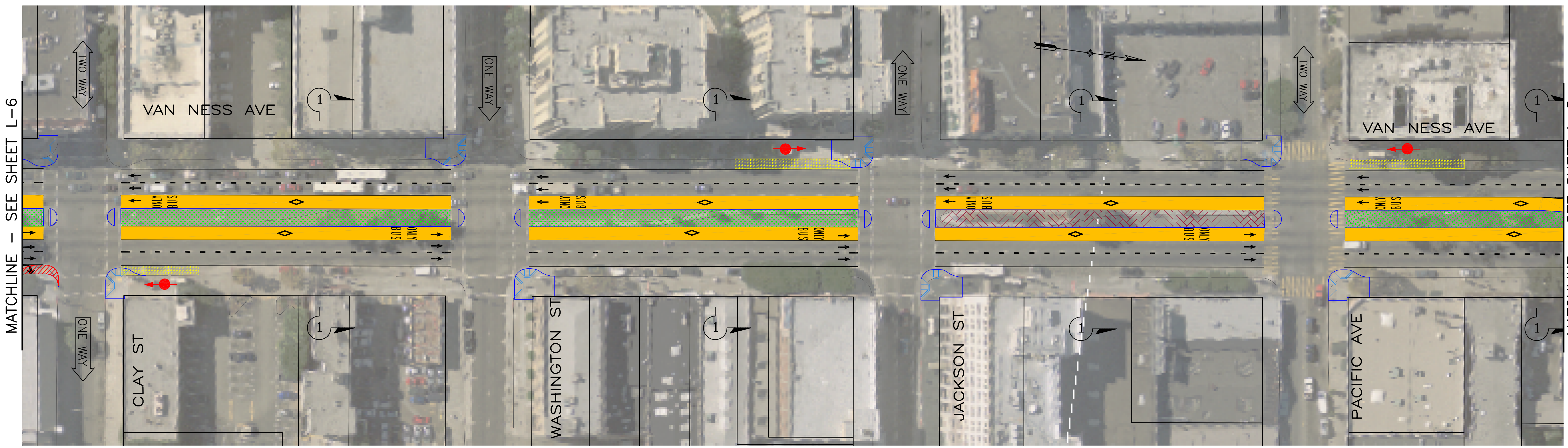

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TABLE OF REVISIONS
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SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET 7 OF 9 SHEETS

Van Ness Avenue
Bus Rapid Transit Study

Alternative 4: Center Lane BRT
With Left Side Loading/Center Median

CONTRACT NO.
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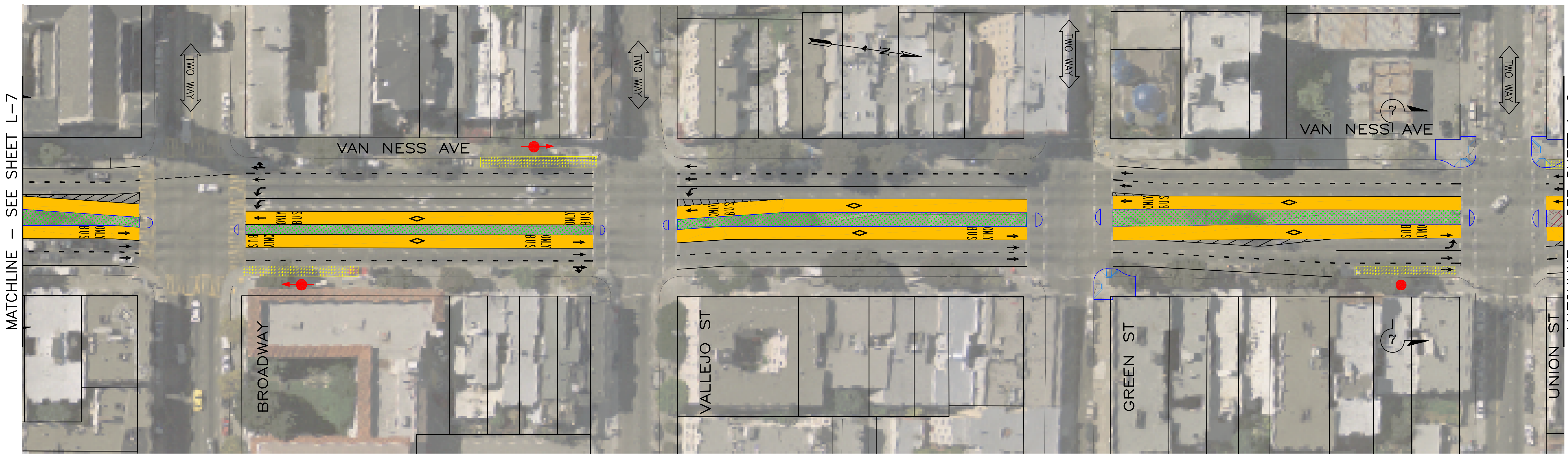

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CHECKED: KF	DATE: 10/12

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SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET 8 OF 9 SHEETS

Van Ness Avenue Bus Rapid Transit Study

Alternative 4: Center Lane BRT With Left Side Loading/Center Median

CONTRACT NO.
DRAWING NO. A4-8
FILE NO.
REV. NO. A

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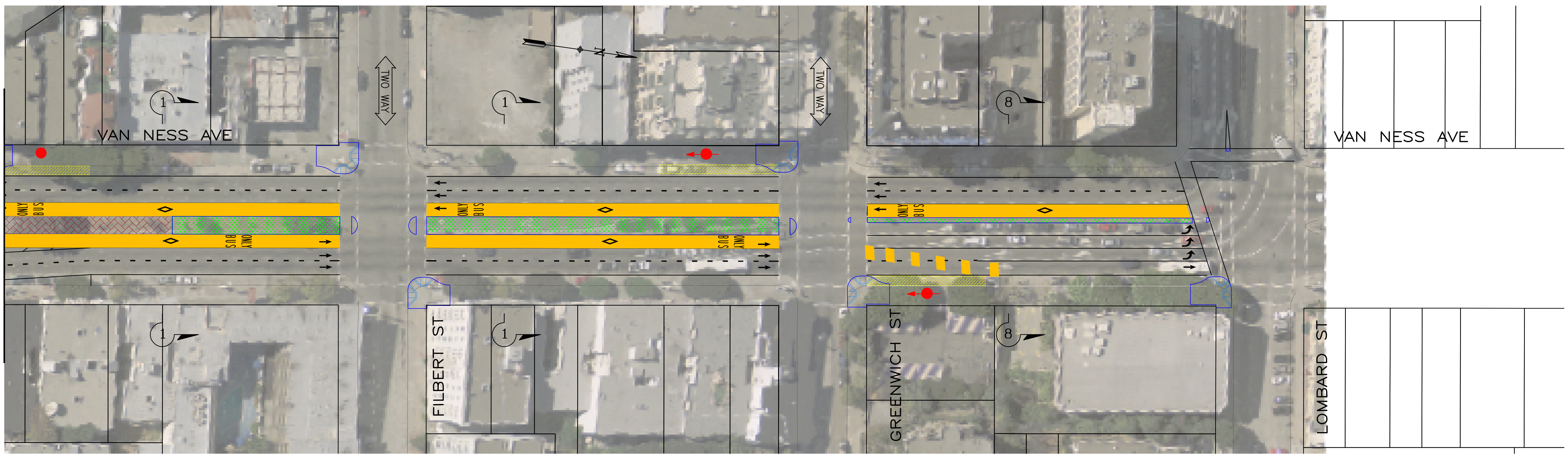
MATCHLINE – SEE SHEET L-8



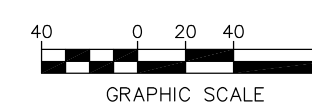


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TABLE OF REVISIONS
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SUPERCEDES STR-5458.2 REV "4"

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DRAWN: RMB	DATE: 03/10	SECTION ENGINEER DATE:	SHEET OF SHEETS 9 OF 9
CHECKED: KF	DATE: 03/10	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:	

Van Ness Avenue
Bus Rapid Transit Study

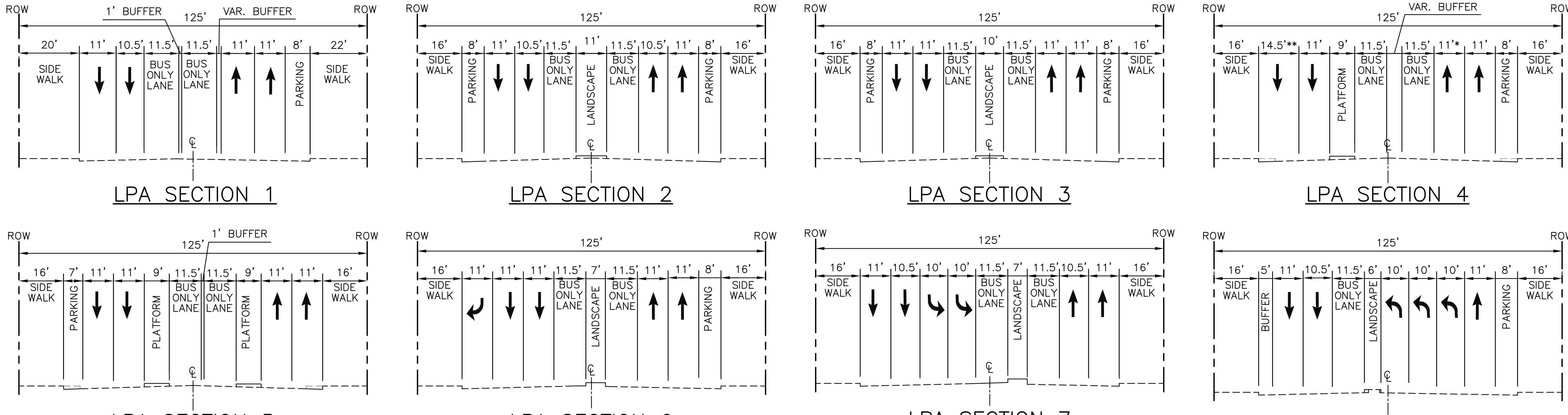
Alternative 4: Center Lane BRT
With Left Side Loading/Center Median

CONTRACT NO.
DRAWING NO. A4-9
FILE NO.
REV. NO. A

Oct 15, 2012 – 2:27pm C:\Users\p0043080\appdata\local\temp\AcPublish_7420\904-CV-Alt 4.dwg

Appendix A continued

Plan Drawings of the LPA



LPA SECTION 1

LPA SECTION 2

LPA SECTION 3

LPA SECTION 4

LPA SECTION 5

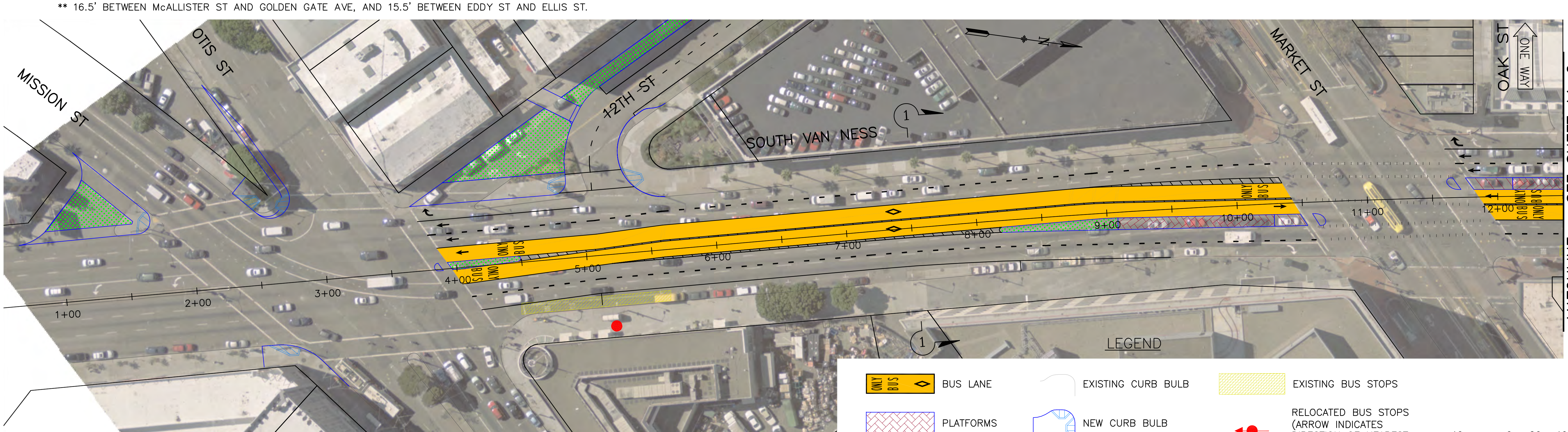
LPA SECTION 6

LPA SECTION 7

LPA SECTION 8

* 10.5' BETWEEN McALLISTER ST AND GOLDEN GATE AVE, AND BETWEEN EDDY ST AND ELLIS ST.

** 16.5' BETWEEN McALLISTER ST AND GOLDEN GATE AVE, AND 15.5' BETWEEN EDDY ST AND ELLIS ST.



LEGEND

BUS LANE	EXISTING CURB BULB
PLATFORMS	NEW CURB BULB
LANDSCAPING	REMOVE EXISTING CURB BULB
EXISTING BUS STOPS	RELOCATED BUS STOPS (ARROW INDICATES DIRECTION OF NEAREST PROPOSED BUS STOP)
STRIPED BUFFER	

40 0 20 40 80

GRAPHIC SCALE

Mar 27, 2013 – 5:42pm R:\646904 Van Ness\Drawings\Civil\904-CV-Alt 1.dwg

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS

CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED: TJW	DATE: 03/13
DRAWN: TJW	DATE: 03/13
CHECKED: KF	DATE: 03/13

APPROVED

SECTION ENGINEER DATE:

DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

SHEET OF SHEETS 1 OF 9

Van Ness Avenue Bus Rapid Transit Study

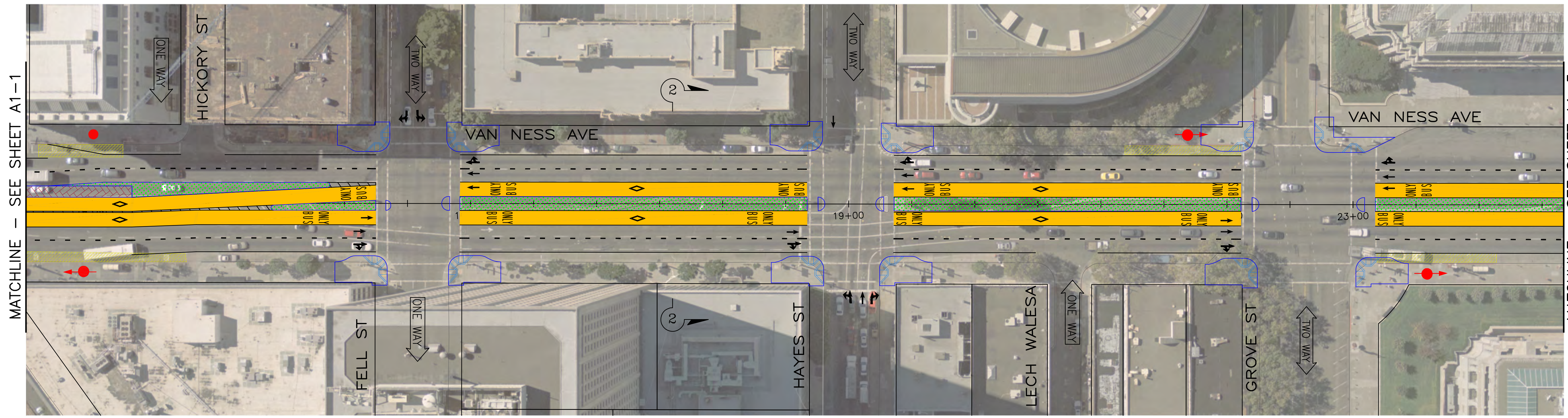
LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

CONTRACT NO.

DRAWING NO. A1–1

FILE NO.

REV. NO.



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GRAPHIC SCALE

Mar 27, 2013 – 5:22pm R:\646904 Van Ness\Drawings\Civil\904–CV–Alt 1.dwg

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR–5458.2 REV "4"

DESIGNED: TJW	DATE: 03/13	APPROVED
DRAWN: TJW	DATE: 03/13	SECTION ENGINEER DATE:
CHECKED: KF	DATE: 03/13	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

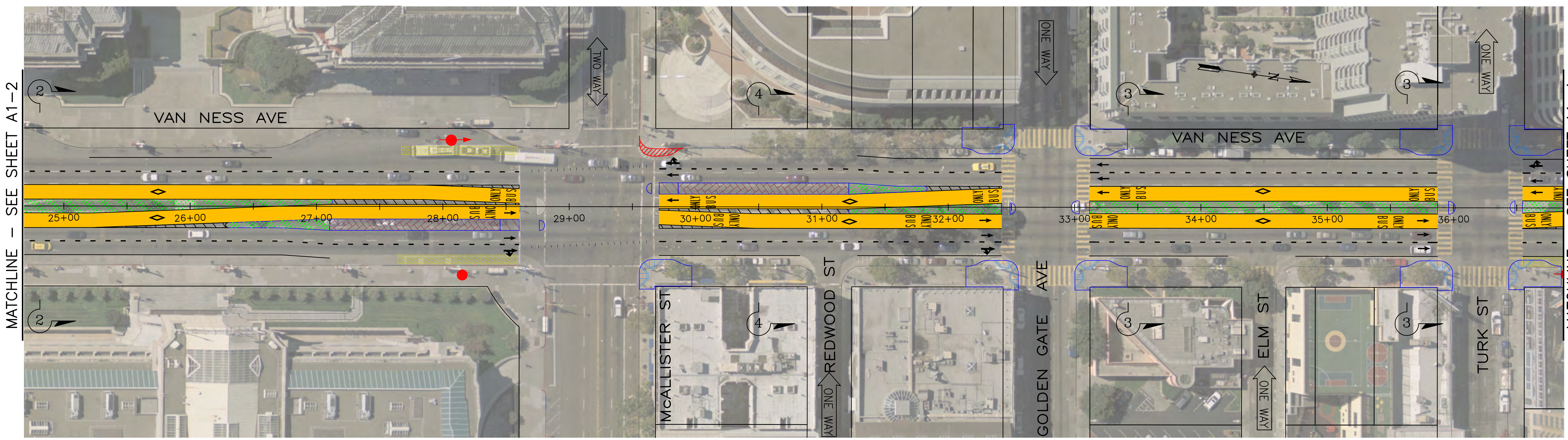
SCALE: 1"=80'

SHEET OF SHEETS: 2 OF 9

Van Ness Avenue
Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

CONTRACT NO.
DRAWING NO. A1–2
FILE NO.
REV. NO.



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GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED:	DATE:
TJW	03/13
DRAWN:	DATE:
TJW	03/13
CHECKED:	DATE:
KF	03/13

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

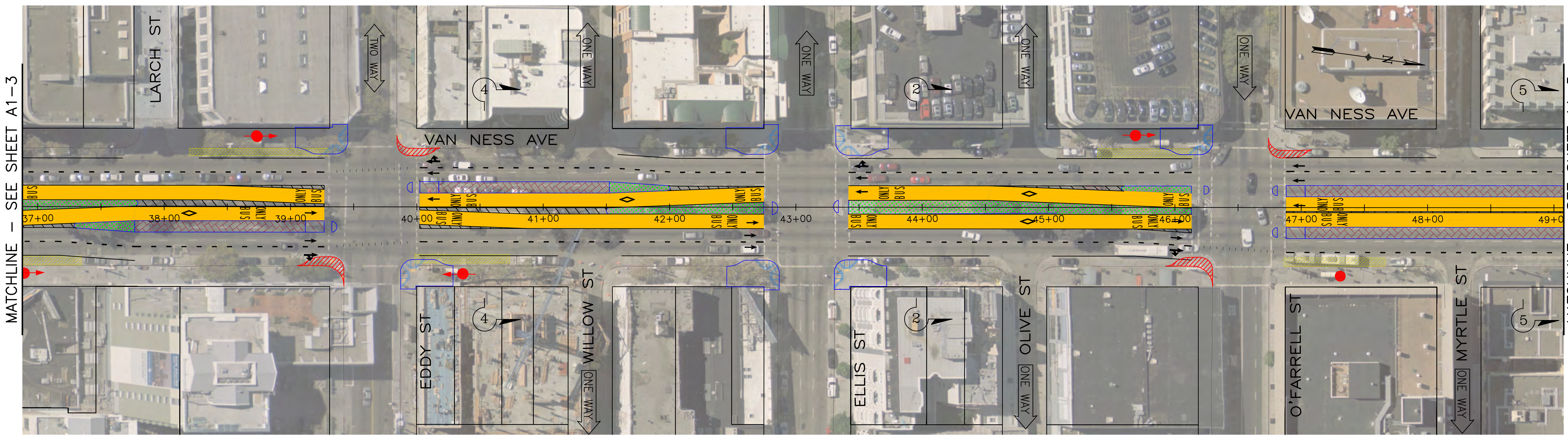
SCALE: 1"=80'
SHEET OF SHEETS: 3 OF 9

Van Ness Avenue Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

CONTRACT NO.
DRAWING NO. A1–3
FILE NO.
REV. NO.

Mar 27, 2013 – 5:45pm R:\646904 Van Ness\Drawings\Civil\904-CV-Alt 1.dwg



40 0 20 40 80

GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR–5458.2 REV "4"

DESIGNED: TJW DATE: 03/13
DRAWN: TJW DATE: 03/13
CHECKED: KF DATE: 03/13

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

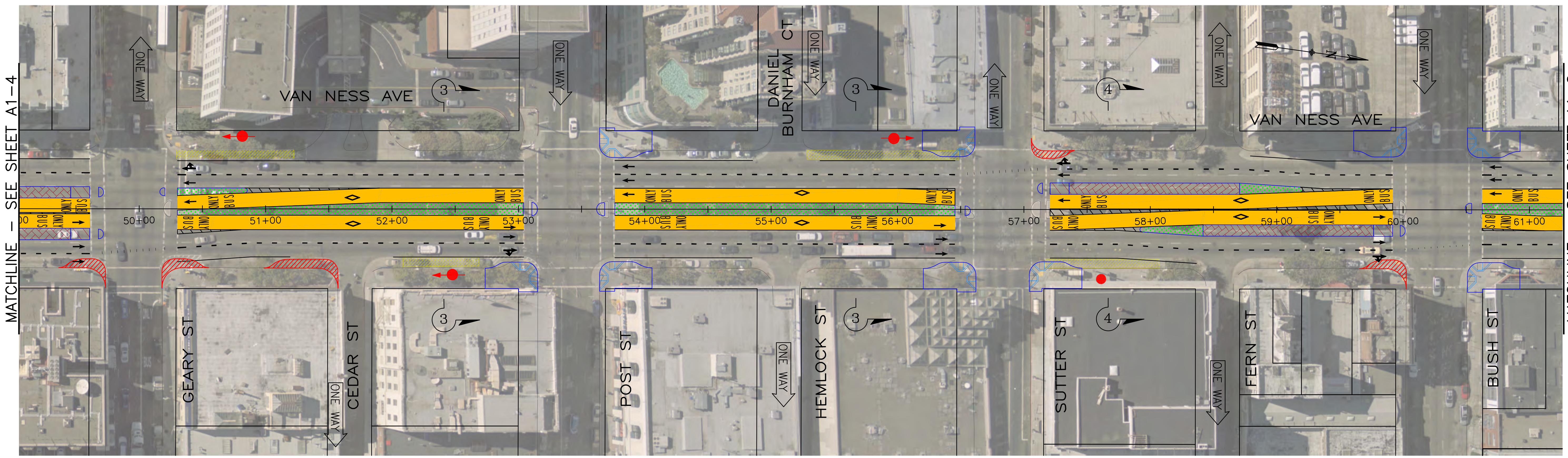
SHEET OF SHEETS: 4 OF 9

Van Ness Avenue
Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

CONTRACT NO.
DRAWING NO. A1–4
FILE NO.
REV. NO.

Mar 27, 2013 – 2:24pm R:\646904 Van Ness\Drawings\Civil\904–CV–Alt 1.dwg



40 0 20 40 80

GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED:	DATE:
TJW	03/13
DRAWN:	DATE:
TJW	03/13
CHECKED:	DATE:
KF	03/13

APPROVED

SECTION ENGINEER DATE:

DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

SHEET OF SHEETS: 5 OF 9

Van Ness Avenue
Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

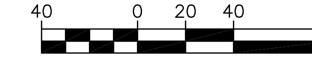
CONTRACT NO.

DRAWING NO. A1-5

FILE NO.

REV. NO.

Mar 27, 2013 - 2:27pm R:\646904 Van Ness\Drawings\Civil\904-CV-Alt 1.dwg



NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR–5458.2 REV "4"

DESIGNED: TJW DATE: 03/13
DRAWN: TJW DATE: 03/13
CHECKED: KF DATE: 03/13

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'
SHEET OF SHEETS 6 OF 9

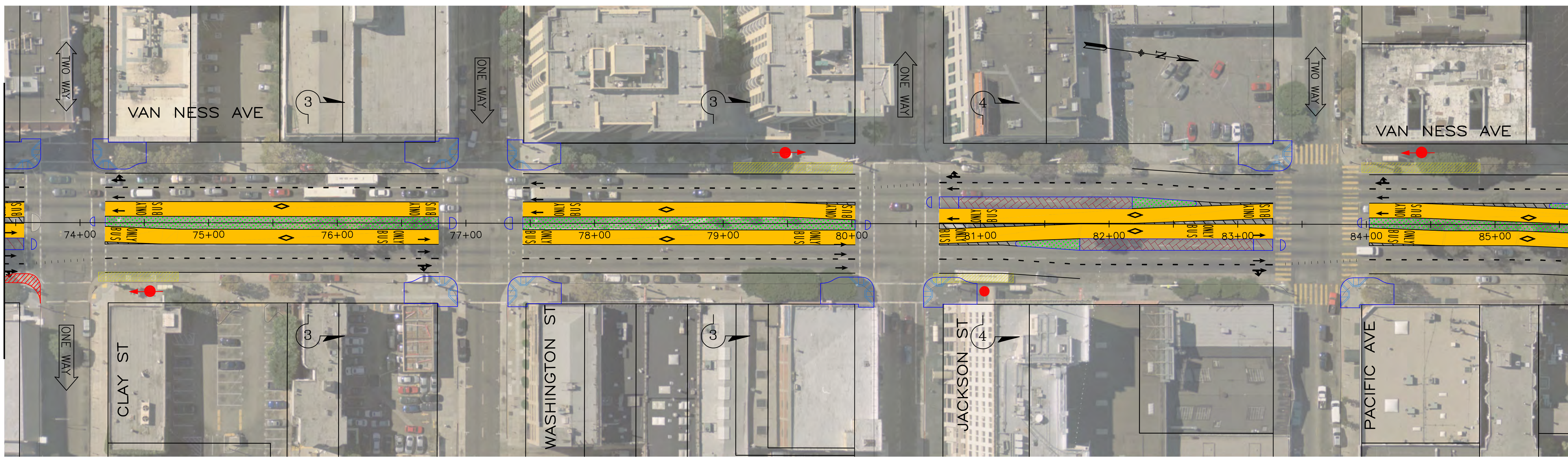
Van Ness Avenue
Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

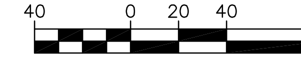
CONTRACT NO.
DRAWING NO. A1–6
FILE NO.
REV. NO.

Mar 27, 2013 – 2:28pm R:\646904 Van Ness\Drawings\Civil\904–CV–Alt 1.dwg

MATCHLINE – SEE SHEET A1–6



MATCHLINE – SEE SHEET A1–8



Mar 27, 2013 – 2:30pm R:\646904 Van Ness\Drawings\Civil\904-CV-Alt 1.dwg

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED: TJW DATE: 03/13
DRAWN: TJW DATE: 03/13
CHECKED: KF DATE: 03/13

APPROVED
SECTION ENGINEER DATE:
DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

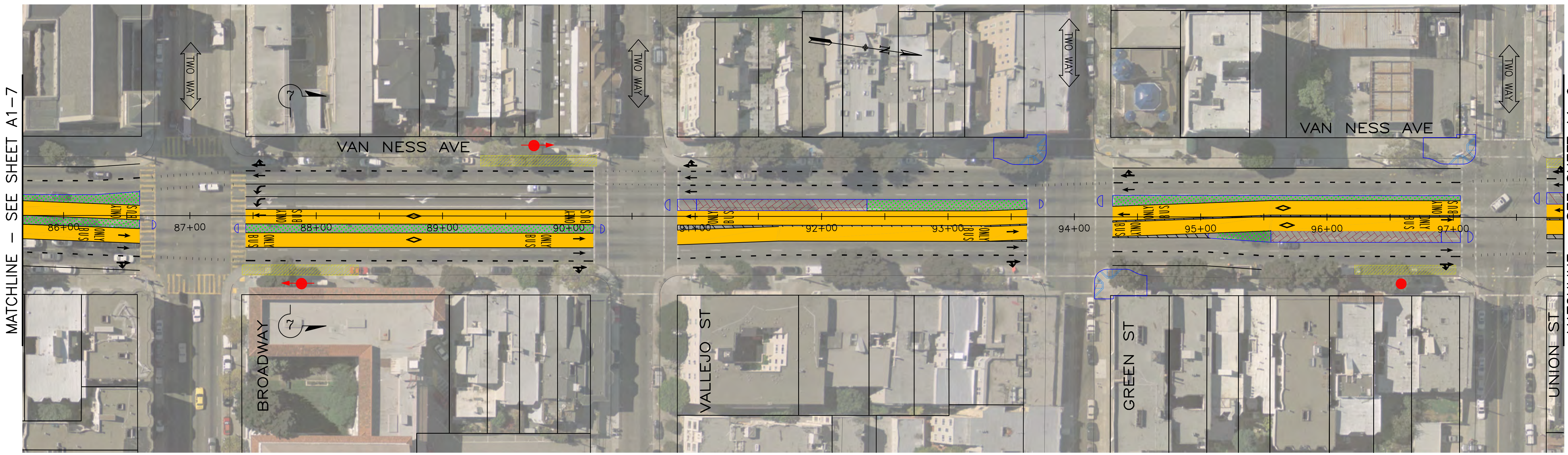
SCALE: 1"=80'
SHEET OF SHEETS: 7 OF 9

Van Ness Avenue Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

CONTRACT NO.
DRAWING NO. A1–7
FILE NO.
REV. NO.

Mar 27, 2013 – 2:32pm R:\646904 Van Ness\Drawings\Civil\904-CV-Alt 1.dwg



40 0 20 40 80
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

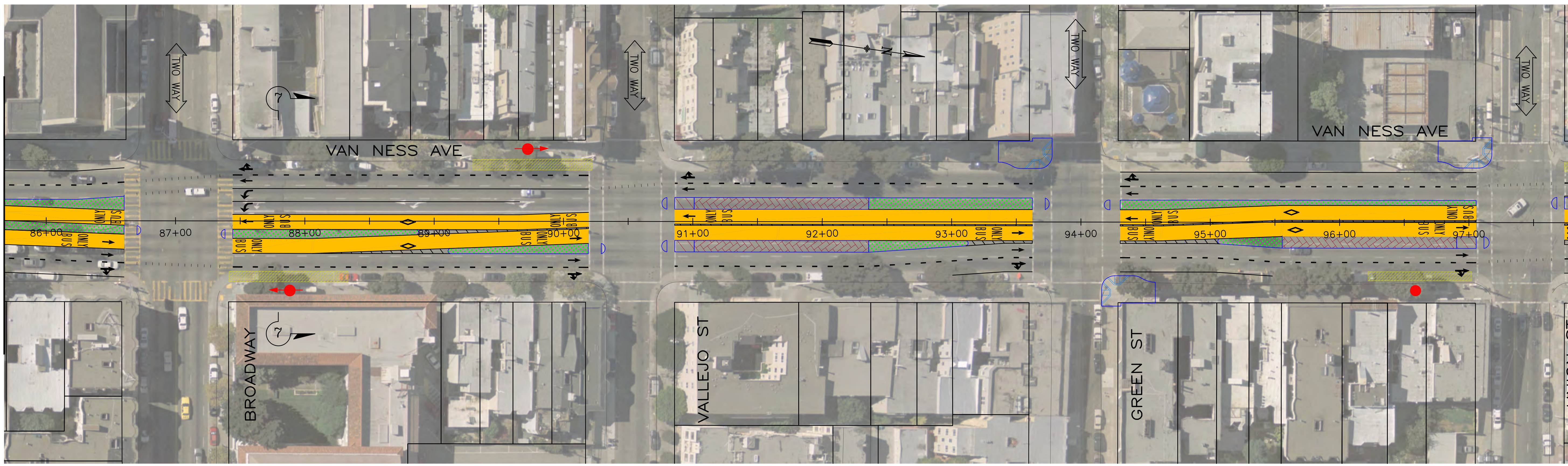
SUPERCEDES STR–5458.2 REV "4"

DESIGNED: TJW	DATE: 03/13	APPROVED	SCALE: 1"=80'	CONTRACT NO.
DRAWN: TJW	DATE: 03/13	SECTION ENGINEER DATE:	SHEET OF SHEETS 8 OF 9	DRAWING NO. A1–8
CHECKED: KF	DATE: 03/13	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:		FILE NO.
				REV. NO.

Van Ness Avenue
Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

MATCHLINE – SEE SHEET A1-7



MATCHLINE – SEE SHEET A1-9

40 0 20 40 80

GRAPHIC SCALE

Mar 27, 2013 – 2:39pm R:\646904 Van Ness\Drawings\Civil\904-CV-Alt 1.dwg

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED: TJW	DATE: 03/13	
DRAWN: TJW	DATE: 03/13	
CHECKED: KF	DATE: 03/13	

APPROVED

SECTION ENGINEER DATE:

DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:

SCALE: 1"=80'

SHEET OF SHEETS: 8 OF 9

Van Ness Avenue
Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

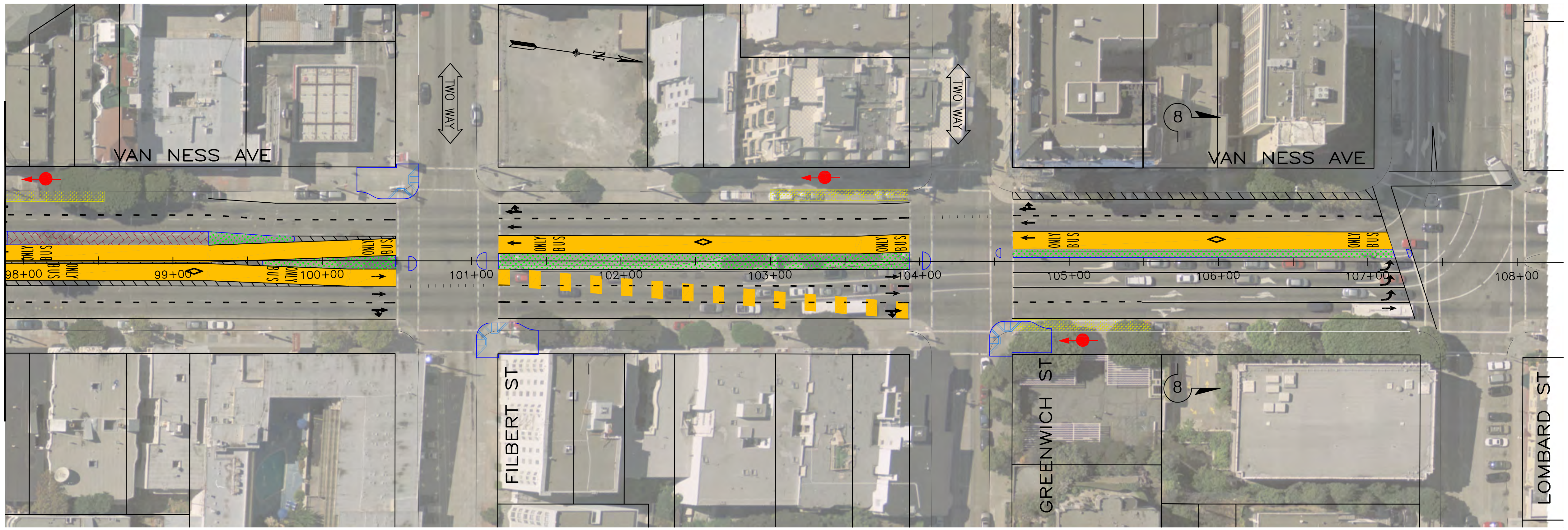
CONTRACT NO.

DRAWING NO. A1-8B

FILE NO.

REV. NO.

MATCHLINE - SEE SHEET A1-8



40 0 20 40 80
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

DESIGNED:	DATE:	APPROVED	SCALE:
TJW	03/13	SECTION ENGINEER DATE:	1"=80'
DRAWN:	DATE:		SHEET OF SHEETS
TJW	03/13	DEP. DIRECTOR AND CITY TRAFFIC ENGINEER DATE:	9 OF 9
CHECKED:	DATE:		
KF	03/13		

Van Ness Avenue
Bus Rapid Transit Study

LPA Alternative: Center Lane BRT with Right Side Boarding/Single Median and Limited Left Turns

CONTRACT NO.
DRAWING NO. A1-9
FILE NO.
REV. NO.

Mar 27, 2013 - 2:36pm R:\646904 Van Ness\Drawings\Civil\904-CV-Alt 1.dwg

Appendix B

Changes in Parking

CHANGES IN PARKING THAT WOULD RESULT UNDER EACH BUILD ALTERNATIVE FOR THE VAN NESS AVENUE BRT PROJECT

		Parking Spaces East Side of Van Ness															
		Existing Conditions	Build Alternative 2			Build Alternative 3			Build Alternative 3 with Design Option B			Build Alternative 4			Build Alternative 4 with Design Option B		
FROM	TO		Remove	Add	Net	Remove	Add	Net	Remove	Add	Net	Remove	Add	Net	Remove	Add	Net
Mission	Market	15	4		11	7		8	7		8	7		8	7		8
Market	Fell	6	1		5	6		0	6		0		7	13		7	13
Fell	Hayes	0		11	11		11	11		11	11		11	11		11	11
Hayes	Grove	6		3	9		3	9		3	9		3	9		3	9
Grove	McAllister	14	4	5	15	6	4	12	6	4	12		8	22		8	22
McAllister[1]	Golden Gate[1]	9	4		5	4		5	4		5	4		5	4		5
Golden Gate	Turk	10	1		9			10			10	9		1	1		9
Turk	Eddy	8		3	11		4	12		4	12		1	9		4	12
Eddy	Ellis	6	2		4		2	8		2	8		2	8		2	8
Ellis	O'Farrell	8	3		5	3		5	3		5	3		5	3		5
O'Farrell	Geary	6	5	3	4		3	9		3	9		3	9		3	9
Geary	Post	6	2		4	2		4	2		4	3		3	3		3
Post	Sutter	10	1		9	1		9	1		9	1		9	1		9
Sutter	Bush	5	4		1	3	4	6	3	4	6	3	4	6	3	4	6
Bush	Pine	9			9	6		3			9	8		1	1		8
Pine	California	6	2		4	2		4	2		4	1		5	1		5
California	Sacramento	5		4	9		4	9		4	9		4	9		4	9
Sacramento	Clay	11	8		3	4		7	4		7	4		7	4		7
Clay	Washington	4		2	6		2	6		2	6		2	6		2	6
Washington	Jackson	12	8		4	1		11	1		11	1		11	1		11
Jackson	Pacific	5		3	8	5		0	5		0		3	8		3	8
Pacific	Broadway	11	1		10	2		9	2		9	2		9	2		9
Broadway	Vallejo	8	1	3	10	8		0	8		0	8		0	8		0
Vallejo	Green	7	1	3	9			7			7			7			7
Green	Union	7	4	4	7	7		0		3	10	6		1		3	10
Union	Filbert	8			8			8			8	3		5	3		5
Filbert	Greenwich	5	1		4	1		4	1		4	1		4	1		4
Greenwich	Lombard	8	1	2	9	1	2	9	1	2	9	1	2	9	1	2	9
Total - Mission to Lombard		215	58	46	203	69	39	185	56	42	201	65	50	200	44	56	227
Total - ALL		215		-12	203		-30	185		-14	201		-15	200		12	227

		Parking Spaces West Side of Van Ness															
		Existing Conditions	Build Alternative 2			Build Alternative 3			Build Alternative 3 with Design Option B			Build Alternative 4			Build Alternative 4 with Design Option B		
FROM	TO		Remove	Add	Net	Remove	Add	Net	Remove	Add	Net	Remove	Add	Net	Remove	Add	Net
Market	Mission	11			11			11			11			11			11
Fell	Market	3		1	4		1	4		1	4		1	4		1	4
Hayes	Fell	11			11	8		3	1		10	9		2	1		10
Grove	Hayes	7		4	11		4	11		4	11		4	11		4	11
McAllister	Grove	16	4	3	15		6	22		6	22		6	22		6	22
Golden Gate	McAllister	12	4		8	5		7	3		9	7		5	3		9
Turk	Golden Gate	10	1	2	11	8		2	1		9	9		1	1		9
Eddy	Turk	5			5	4		1	4		1		4	9		4	9
Ellis	Eddy	10	2		8	2		8	2		8	1		9	1		9
O'Farrell	Ellis	6	2		4		2	8		2	8		1	7		1	7
Geary	O'Farrell	8	1	3	10	8		0	8		0	8		0	8		0
Post	Geary	3			3			3			3		3	6		3	6
Sutter	Post	5			5	3		2	3		2		5	10		5	10
Bush	Sutter	9	5		4	5		4	5		4	7		2	5		4
Pine	Bush	10	1		9	5		5			10	10		0	1		9
California	Pine	5	1		4	1		4	1		4	1		4	1		4
Sacramento	California	10	7		3			10			10			10			10
Clay	Sacramento	5	1		4	1		4	1		4	1		4	1		4
Washington	Clay	9			9			9			9			9			9
Jackson	Washington	7		5	12	1	6	12	1	6	12	1	6	12	1	6	12
Pacific	Jackson	9	6		3	1		8	1		8	1		8	1		8
Broadway	Pacific	7		3	10	2	4	9	2	4	9	3	4	8	3	4	8
Vallejo	Broadway	8	1		7	8		0	8		0	8		0	8		0
Green	Vallejo	11	1		10	2		9	2		9	1		10	1		10
Union	Green	7			7	2		5	2		5	2		5	2		5
Filbert	Union	7	6		1		4	11		4	11		4	11		4	11
Greenwich	Filbert	7	1	2	8	1	2	8	1	2	8	1	2	8	1	2	8
Lombard	Greenwich	9			9			9			9			9			9
Total - Mission to Lombard		227	44	23	206	67	29	189	46	29	210	70	40	197	39	40	228
Total - ALL		227		-21	206		-38	189		-17	210		-30	197		1	228
				69													

additional spaces due to relocated bus stop

additional spaces due to re-striping #REF!

10-Jan-11

		Parking Spaces East Side of Van Ness						
		Existing Conditions		LPA			LPA with Vallejo Northbound Station Variant	
FROM	TO		Remove	Add	Net	Remove	Add	Net
Mission	Market	16			16			16
Market	Fell	6			6			6
Fell	Hayes	0		11	11		11	11
Hayes	Grove	5		3	8		3	8
Grove	McAllister	15			15			15
McAllister[1]	Golden Gate[1]	9	1		8	1		8
Golden Gate	Turk	11	2		9	2		9
Turk	Eddy	8	6		2	6		2
Eddy	Ellis	6		1	7		1	7
Ellis	O'Farrell	8	1		7	1		7
O'Farrell	Geary	5	5		0	5		0
Geary	Post	6	1		5	1		5
Post	Sutter	10	2		8	2		8
Sutter	Bush	5	4		1	4		1
Bush	Pine	9	2		7	2		7
Pine	California	6			6			6
California	Sacramento	5		3	8		3	8
Sacramento	Clay	11	10		1	10		1
Clay	Washington	4		3	7		3	7
Washington	Jackson	12	2		10	2		10
Jackson	Pacific	5	4		1	4		1
Pacific	Broadway	11	7		4	7		4
Broadway	Vallejo	9	9		0	9		0
Vallejo	Green	8	8		0	7		1
Green	Union	9	6		3	6		3
Union	Filbert	9			9			9
Filbert	Greenwich	8	1		7	1		7
Greenwich	Lombard	9		1	10		1	10
Total - Mission to Lombard		225	71	22	176	70	22	
Total - ALL				-49	176		-48	177

		Parking Spaces West Side of Van Ness						
		Existing Conditions		LPA			LPA with Vallejo Northbound Station Variant	
FROM	TO		Remove	Add	Net	Remove	Add	Net
Market	Mission	11	11		0	11		0
Fell	Market	4		2	6		2	6
Hayes	Fell	11	1		10	1		10
Grove	Hayes	7		4	11		4	11
McAllister	Grove	18		3	21		3	21
Golden Gate	McAllister	12	10		2	10		2
Turk	Golden Gate	11			11			11
Eddy	Turk	5		3	8		3	8
Ellis	Eddy	10	8		2	8		2
O'Farrell	Ellis	6		2	8		2	8
Geary	O'Farrell	10			10			10
Post	Geary	3		2	5		2	5
Sutter	Post	5		3	8		3	8
Bush	Sutter	9	8		1	8		1
Pine	Bush	10	2		8	2		8
California	Pine	5	1		4	1		4
Sacramento	California	10		1	11		1	11
Clay	Sacramento	5	4		1	4		1
Washington	Clay	7			7			7
Jackson	Washington	7		4	11		4	11
Pacific	Jackson	9	8		1	8		1
Broadway	Pacific	7		2	9		2	9
Vallejo	Broadway	9	9		0	9		0
Green	Vallejo	9	9		0	9		0
Union	Green	9	1		8	1		8
Filbert	Union	6	3		3	3		3
Greenwich	Filbert	8		1	9		1	9
Lombard	Greenwich	8	8		0	8		0
Total - Mission to Lombard		231	83	27	175	83	27	175
Total - ALL				-56	175		-56	175
				49				

additional spaces due to relocated bus stop

additional spaces due to re-striping

17-Oct-12

11-Apr-13

NOTE: Existing conditions were revised during the supplemental parking survey for the LPA that was completed in October 2012.

Appendix C

State Historic Preservation Officer Letter of Concurrence

STATE OF CALIFORNIA – THE RESOURCES AGENCY EDMUND G. BROWN, JR., *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

May 17, 2013

Reply To: FTA100405A

Leslie Rogers
Regional Administrator
Federal Transit Administration
201 Mission Street, Suite 1650
San Francisco, CA 94105-1839

Re: Section 106 Revised Finding of Effect for the Van Ness Avenue Bus Rapid Transit (BRT) Project, City and County of San Francisco, CA

Dear Mr. Rogers:

Thank you for your letter of April 22, 2013 continuing consultation for the above referenced undertaking in order to comply with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulation at 36 CFR Part 800. You are requesting that I review the revised Finding of Effect (FOE) and concur with your determination of "No Adverse Effect."

As I presently understand it, the undertaking extends 2.2 miles along Van Ness Avenue from Mission Street to North Point Street. Activities associated with the project include reconfiguring the existing roadway to provide for dedicated bus lanes and transit platforms, and lighting and landscaping improvements within the streetscape. The majority of the improvements occur within the existing curb-to-curb pavement. The Locally Preferred Alternative (LPA) was selected; BRT vehicles would operate alongside the median for most of the corridor. At station locations, the BRT runningway would transition to the center of the roadway, providing the greatest travel time benefits for transit.

The Revised FOE has been modified to reflect my comments in the letter of December 19, 2012 and the subsequent conference call on January 29, 2013, specifically regarding the issue of assessing project effects on potentially sensitive archaeological resources within the project's Area of Potential Effect (APE). As stated in your letter and in the Revised FOE, the FTA has committed to a systematic approach for gathering information to further identify and evaluate potential prehistoric and historic-era archaeological sites that may be within the APE and impacted by the project. FTA has also committed to consultation with my office regarding the results of these investigations and as more specific construction parameters are developed in later design phases. Any potential subsurface testing and mitigation will take place just prior to construction. The Revised FOE also includes an inadvertent discovery plan.

My office provided comments on the Revised FOE on May 9, 2013, and those changes were subsequently incorporated into the document. The current FOE, dated May, 2013, was submitted to my office on May 15, 2013.

Additionally, the Locally Preferred Alternative (LPA) has been revised to include an additional southbound transit station located at Van Ness Avenue and Vallejo Street and the option of a northbound station at this intersection. No historic properties have been identified in this portion of the APE, per the Historic Property Survey conducted for the project in 2010.

FTA has determined that the undertaking as described will have no adverse effect to historic properties. With the incorporation of the revisions described above, I concur with this determination.

Thank you for considering historic properties in your planning process. If you have any questions, please contact Kathleen Forrest of my staff at (916) 445-7022 or e-mail at kathleen.forrest@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.

Carol Roland-Nawi, PhD
State Historic Preservation Officer

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

10 May 2010

Reply To: FTA100405A

Leslie Rodgers
Regional Administrator
Federal Transit Administration
201 Mission Street, Suite 1650
San Francisco, CA 94105-1839

Re: Section 106 Consultation for the Van Ness Avenue Rapid Bus Transit Project, San Francisco City and County, CA

Dear Mr. Rogers:

Thank you for your letter of 31 March 2010 initiating consultation for the Federal Transit Authority (FTA) for the above referenced undertaking in order to comply with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulation at 36 CFR Part 800. You are requesting at this time that I concur with the determination of the Area of Potential Effect (APE) and determination of eligibility for the historic properties within the APE.

As I presently understand it, the proposed undertaking consists of reconfiguring the existing roadway along 2.2 miles of Van Ness Avenue to provide for dedicated bus lanes and transit platforms, and lighting and landscaping improvements within the streetscape. The majority of the improvements occur within the existing curb-to-curb pavement.

The project APE was defined as the areas that could directly or indirectly be affected and is depicted in Attachment 1 of the Historic Property Survey. I find this satisfactory pursuant to 36 CFR 800.4(1).

Within the APE, there were three historic properties previously identified:

- San Francisco Civic Center Historic District/War Memorial Building, listed on the NRHP and a NHL.
- 11-35 Van Ness Avenue, Masonic Temple, determined eligible for listing in the NRHP.
- 1699 Van Ness Avenue (Paige Motor Car Company Building); listed in the NRHP.

In addition to the three previously identified historic properties, FTA determined four additional properties were eligible for inclusion in the National Register of Historic Places (NRHP):

- 799 Van Ness Avenue, automobile garage, eligible under Criteria A and C at the local level
- 945-999 Van Ness Avenue, automobile showroom, eligible A and C at the local level
- 1320 Van Ness Avenue, Scottish Rite Temple, eligible A and C at the local level
- 1946 Van Ness Avenue, Oakland Motor Auto Company Showroom, eligible A and C at the local level

I concur with the determinations for the above referenced properties. The remained 23 properties identified by FTA were determined ineligible for inclusion in the NRHP. I also concur with the determinations of ineligibility.

Thank your for considering historic properties in your planning process and I look forward to continuing consultation on this project. If you have any questions, please contact Amanda Blosser of my staff at (916) 654-7372 or e-mail at ablosser@parks.ca.gov.

Sincerely,

Susan K Stratton for

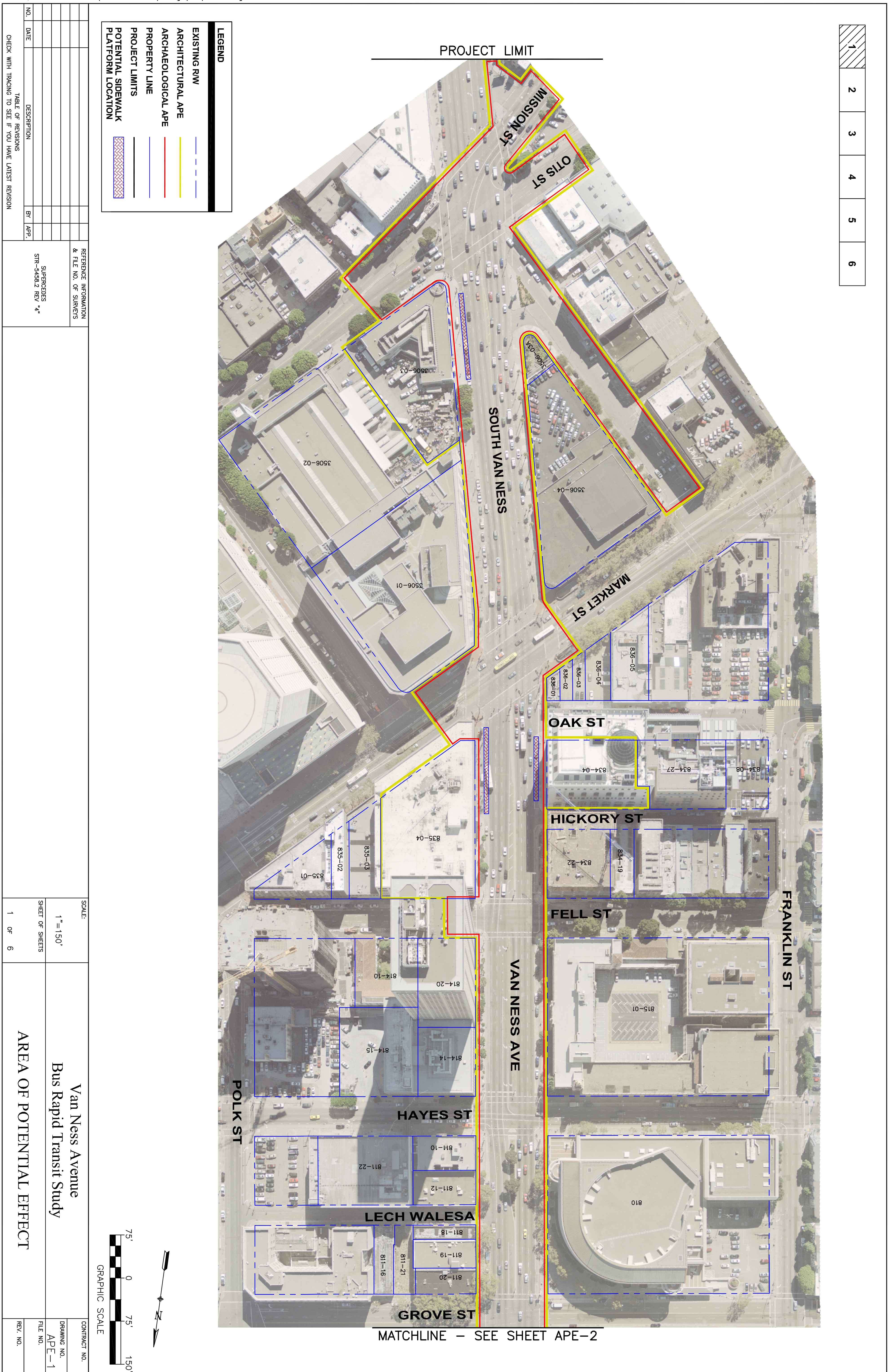
Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

MWD:ab

Appendix D

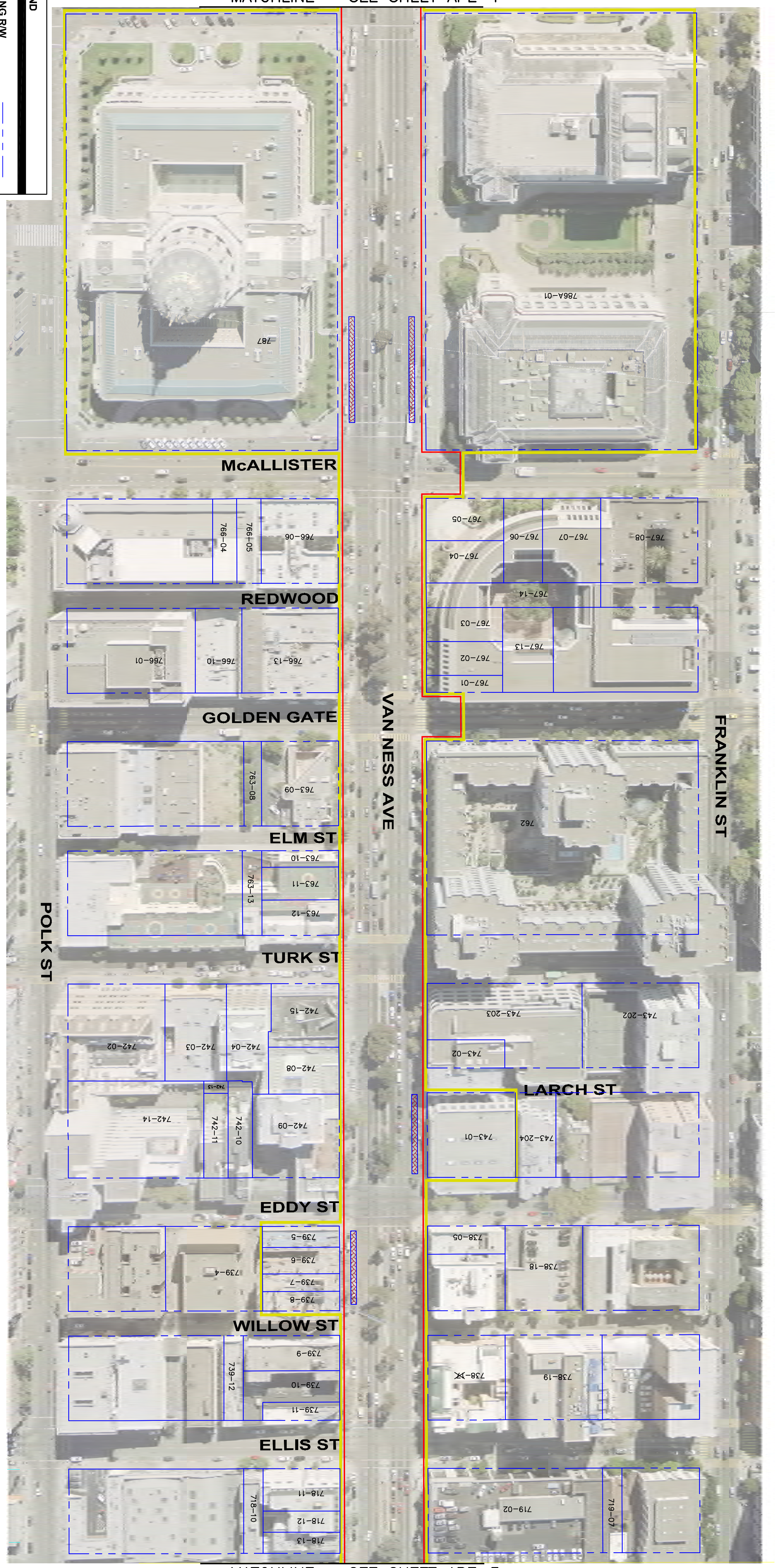
Area of Potential Effect Maps

Feb 16, 2009 – 11:08am R:\646904 Van Ness\Drawings\Civil\904-APE.dwg



Feb 16, 2009 – 11:06am R:\646904 Van Ness\Drawings\Civil\904-APE.dwg

MATCHLINE – SEE SHEET APE-1



MATCHLINE – SEE SHEET APE-3

LEGEND

EXISTING R/W
ARCHITECTURAL APE
ARCHAEOLOGICAL APE
PROPERTY LINE
PROJECT LIMITS
POTENTIAL SIDEWALK PLATFORM LOCATION

GRAPHIC SCALE

75' 0 75' 150'

N

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS

CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

SCALE: 1"=150'

SHEET OF SHEETS: 2 OF 6

Van Ness Avenue
Bus Rapid Transit Study

AREA OF POTENTIAL EFFECT

CONTRACT NO.

DRAWING NO. APE-2

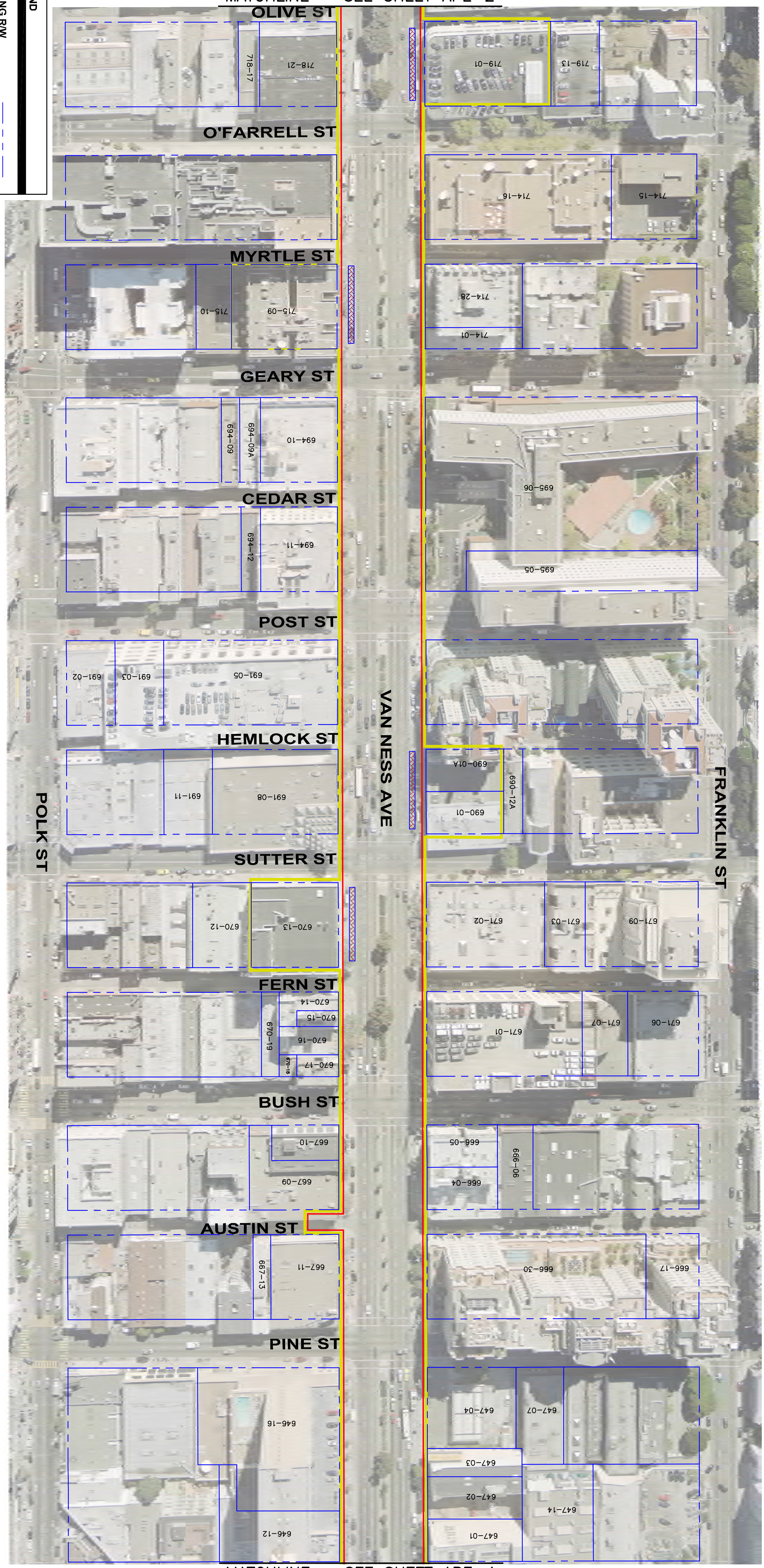
FILE NO.

REV. NO.

1 2 3 4 5 6

Feb 16, 2009 – 11:03am R:\646904 Van Ness\Drawings\Civil\904–APE.dwg

MATCHLINE – SEE SHEET APE–2



MATCHLINE – SEE SHEET APE–4

LEGEND

- EXISTING R/W
- ARCHITECTURAL APE
- ARCHAEOLOGICAL APE
- PROPERTY LINE
- PROJECT LIMITS
- POTENTIAL SIDEWALK PLATFORM LOCATION

GRAPHIC SCALE

75' 0 75' 150'

N

1
2
3
4
5
6

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS

CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR–5458.2 REV "4"

SCALE: 1"=150'

SHEET OF SHEETS: 3 OF 6

Van Ness Avenue

Bus Rapid Transit Study

AREA OF POTENTIAL EFFECT

CONTRACT NO.

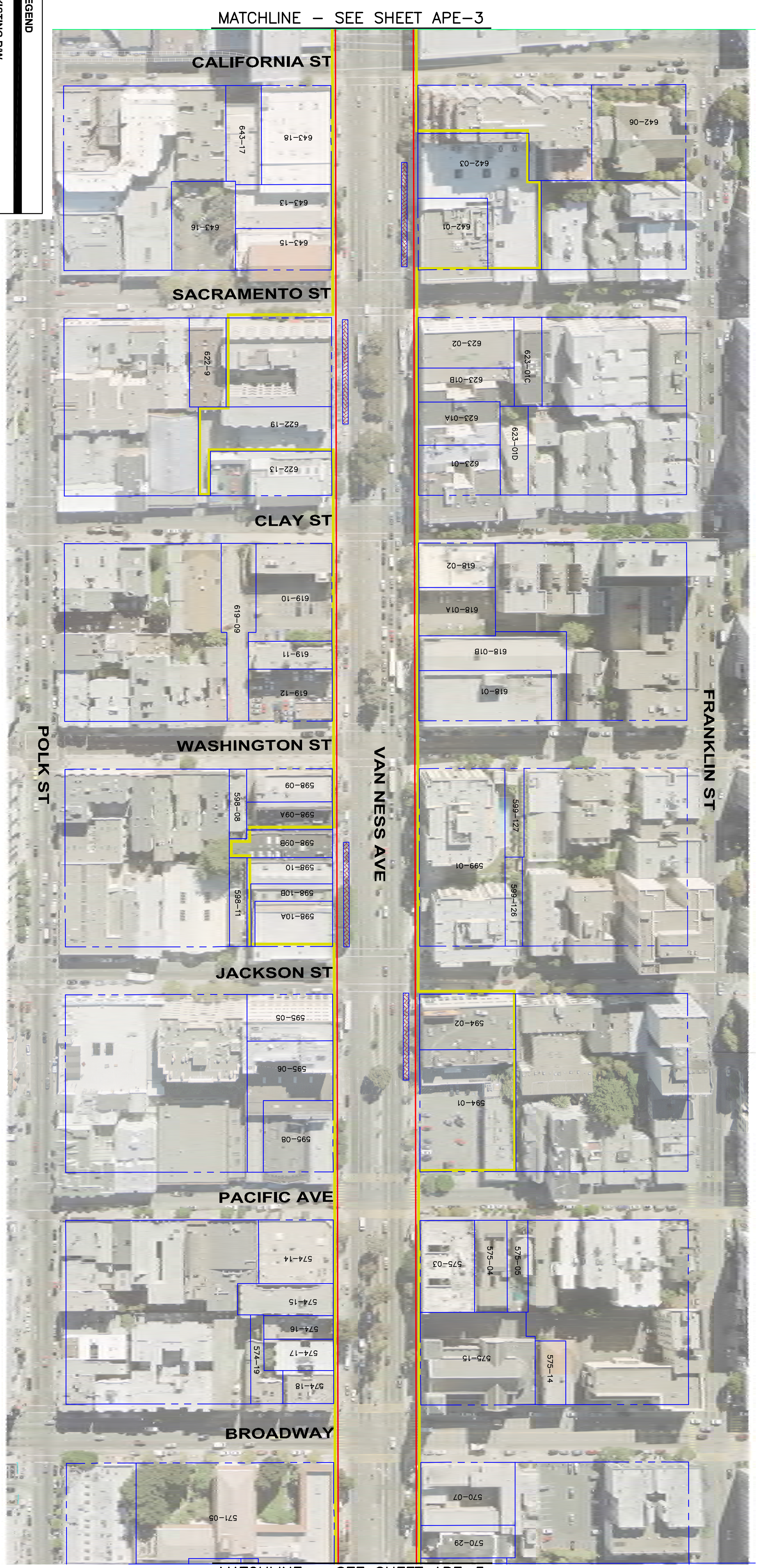
DRAWING NO. APE–3

FILE NO.

REV. NO.

Feb 16, 2009 – 11:00am R:\646904 Van Ness\Drawings\Civil\904–APE.dwg

MATCHLINE – SEE SHEET APE–3



MATCHLINE – SEE SHEET APE–5

LEGEND

- EXISTING R/W
- ARCHITECTURAL APE
- ARCHAEOLOGICAL APE
- PROPERTY LINE
- PROJECT LIMITS
- POTENTIAL SIDEWALK PLATFORM LOCATION

GRAPHIC SCALE: 75' 0 75' 150'

N

1	2	3	4	5	6

NO.	DATE	DESCRIPTION	BY	APP.
		TABLE OF REVISIONS		

CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR–5458.2 REV "4"

SCALE: 1"=150'

SHEET OF SHEETS: 4 OF 6

Van Ness Avenue Bus Rapid Transit Study

AREA OF POTENTIAL EFFECT

CONTRACT NO.

DRAWING NO. APE–4

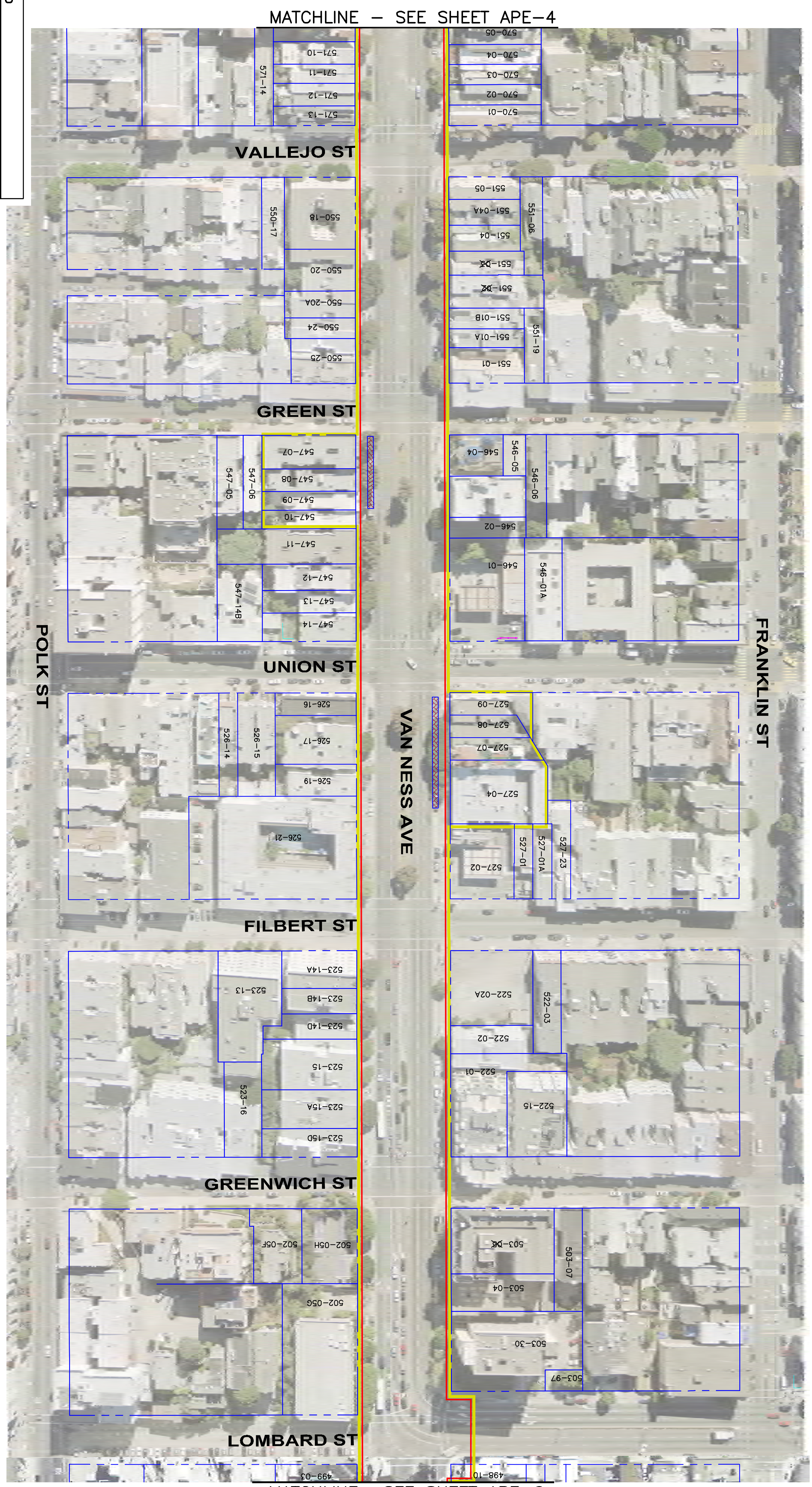
FILE NO.

REV. NO.

Feb 16, 2009 – 10:58am R:\646904 Van Ness\Drawings\Civil\904-APE.dwg

LEGEND

- EXISTING R/W
- ARCHITECTURAL APE
- ARCHAEOLOGICAL APE
- PROPERTY LINE
- PROJECT LIMITS
- POTENTIAL SIDEWALK PLATFORM LOCATION



GRAPHIC SCALE
75' 0 75' 150'

1	2	3	4	5	6

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS
SUPERCEDES STR-5458.2 REV "4"

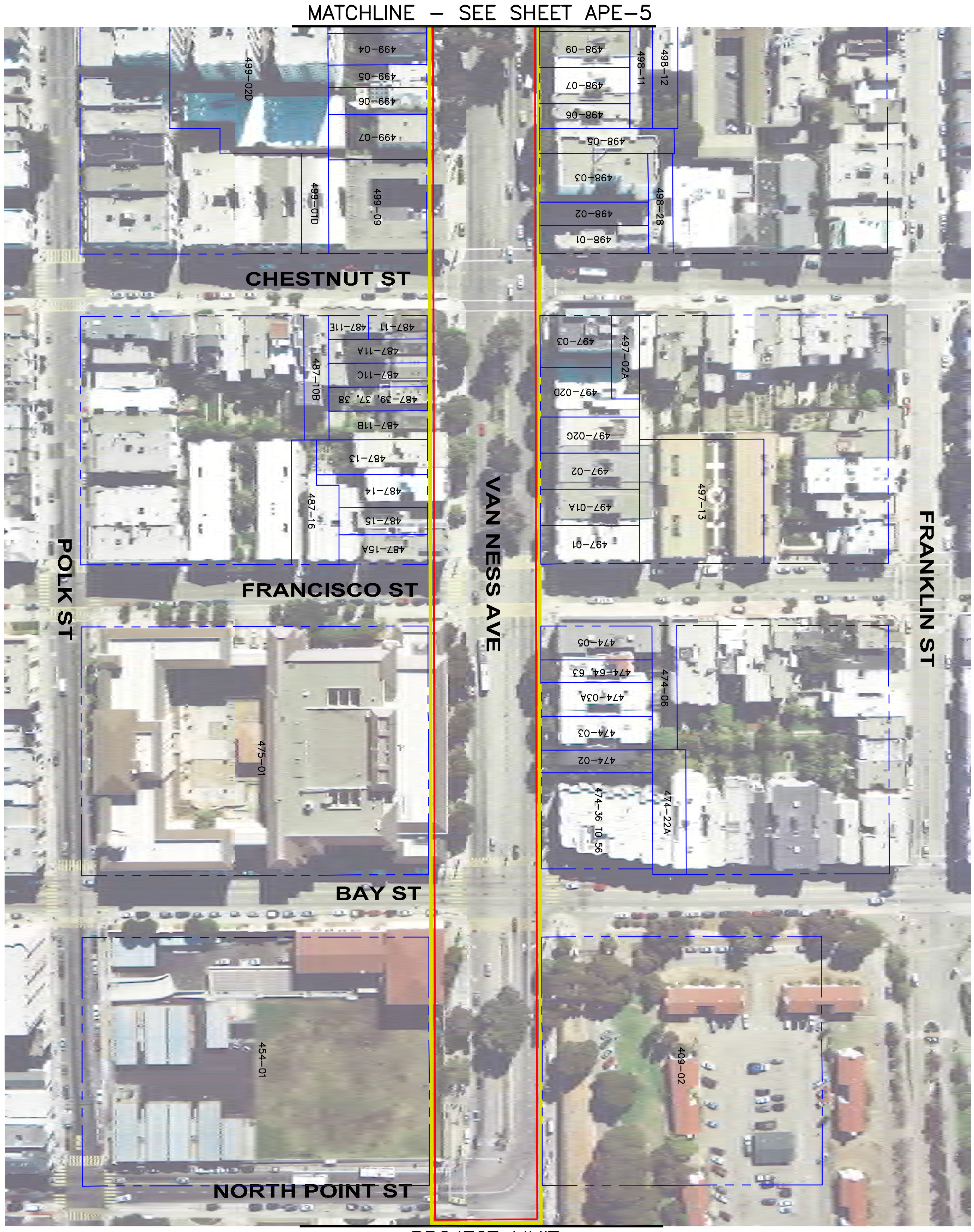
SCALE: 1"=150'
SHEET OF SHEETS 5 OF 6

Van Ness Avenue
Bus Rapid Transit Study
AREA OF POTENTIAL EFFECT

CONTRACT NO.
DRAWING NO. APE-5
FILE NO.
REV. NO.

LEGEND

- EXISTING R/W
- ARCHITECTURAL APE
- ARCHAEOLOGICAL APE
- PROPERTY LINE
- PROJECT LIMITS
- POTENTIAL SIDEWALK PLATFORM LOCATION



GRAPHIC SCALE 75' 0 75' 150'

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS

CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

SUPERCEDES STR-5458.2 REV "4"

SCALE: 1"=150'

SHEET OF SHEETS 6 OF 6

Van Ness Avenue Bus Rapid Transit Study

AREA OF POTENTIAL EFFECT

CONTRACT NO.

DRAWING NO. APE-6

FILE NO.

REV. NO.

Sheet index: 1 2 3 4 5 6

Appendix E

Distribution List

Appendix E Distribution List

The Distribution List for the Draft EIS/EIR is provided below. A CD or hard copy of the Final EIS/EIR was sent to each party included in this Distribution List. Additionally, a CD of the Final EIS/EIR was sent to everyone who commented on the Draft EIS/EIR and provided a mailing address. An email with a link to the Final EIS/EIR digital file was sent to commenters who provided an email address but did not provide a physical mailing address.

Table E-1: Agency and Elected Officials Distribution List

ELECTED OFFICIALS	
U.S. SENATE	
The Honorable Barbara Boxer U.S. Senate 1700 Montgomery Street, Suite 240 San Francisco, CA 94111	The Honorable Dianne Feinstein U.S. Senate One Post Street, Suite 2450 San Francisco, CA 94104
U.S. HOUSE OF REPRESENTATIVES	
The Honorable Nancy Pelosi U.S. House of Representatives, District 12 907th Street, Suite 2-800 San Francisco, CA 94103	
CALIFORNIA STATE SENATE	
The Honorable Mark Leno California State Senate, District 11 455 Golden Gate Avenue, Suite 14800 San Francisco, CA 94102	The Honorable Leland Yee California State Senate, District 8 455 Golden Gate Avenue, Suite 14200 San Francisco, CA 94102
CALIFORNIA STATE ASSEMBLY	
Assembly Member Tom Ammiano California State Assembly, District 17 455 Golden Gate Avenue, Suite 14300 San Francisco, CA 94102	Assembly Member Phil Ting California State Assembly, District 19 455 Golden Gate Avenue, Suite 14600 San Francisco, CA 94102
COUNTY OF BOARD OF SUPERVISORS	
Board of Supervisors City and County of San Francisco City Hall, Room 244 1 Dr. Carlton B. Goodlett Place San Francisco, CA 94102-4689	
FEDERAL AGENCIES	
Federal Emergency Management Agency Attn: Regional Director 1111 Broadway, Suite 1200 Oakland, CA 94607 Federal Transit Administration Elizabeth Patel 1200 New Jersey Avenue Washington DC, 20590 Federal Transit Administration, Region IX* Ray Sukys 201 Mission Street, Suite 1650 San Francisco, CA 94105 National Park Service Attn: Frank Dean Golden Gate National Recreation Area Fort Mason, Building 201 San Francisco, CA 94123	Office of Environmental Policy & Compliance U.S. Department of Interior Main Interior Building, MS 2462 1849 C Street, NW Washington, D.C. 20240 U.S. Environmental Protection Agency Office of Federal Activities Ariel Rios Building Susan Bromm1200 Pennsylvania Avenue, NW Washington, D.C. 20460 U.S. Environmental Protection Agency, Region 9 Jared Blumenfeld, Administrator 75 Hawthorne Street San Francisco, CA 94105

Table E-1: Agency and Elected Officials Distribution List

STATE AGENCIES

California Air Resources Board
Attn: Tom Cackette
P.O. Box 2815
1001 I Street
Sacramento, CA 95812

California Department of Conservation
Attn: Mark Nechodom801 K Street, MS 2401
Sacramento, CA 95814

California Department of Fish & Wildlife
Attn: Chuck Armor
1416 Ninth Street
Sacramento, CA 95814

California Department of Transportation
Office of Transportation Planning - B
Attn: Tim Sable, IGR CEQA Branch
P.O. Box 23660
Oakland, CA 94623-0660

California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

California Public Utilities Commission
Attn: Michael Peevey
505 Van Ness Avenue
San Francisco, CA 94102

Caltrans Transportation Library
111 Grand Avenue, Room 12-639
Oakland, CA 94612

Native American Heritage Commission
Attn: Cynthia Gomez915 Capitol Mall, Room 364
Sacramento, CA 95814

Office of Historic Preservation
California Department of Parks and Recreation
Attn: Carol Roland-Nawi, SHPO
P.O. Box 942896
Sacramento, CA 94296-0001

Regional Water Quality Control Board
Attn: Judy Huang
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

State Office of Intergovernmental Management
State Clearinghouse
1400 Tenth Street, Room 121
P.O. Box 3044
Sacramento, CA 95812-3044

REGIONAL AND LOCAL AGENCIES

Association of Bay Area Governments
Attn: Susan Ryder
PO Box 2050
Oakland, CA 94604-2050

Bay Area Air Quality Management District
Planning Department
Attn: Jack Broadbent
939 Ellis Street
San Francisco, CA 94109

Bay Area Rapid Transit District (BART)
Attn: Val Menotti
300 Lakeside Drive, 16th Floor
Oakland, CA 94612

Division of Fire Prevention & Investigation
Attn: Bill Mitchell, Captain
1660 Mission Street, 2nd Floor
San Francisco, CA 94103

City Hall Preservation Advisory Committee
Ellen Schumer, Chair
City Hall, Room 008
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

Committee for Utility Liaison on Construction and Other Projects (CULCOP)
Department of Public Works
1155 Market Street, 3rd Floor
San Francisco, CA 94103

Regional Water Quality Control Board
San Francisco Bay Region
Attn: Melinda Wong
1515 Clay Street, Suite 1400
Oakland, CA 94612

San Francisco Arts Commission
Civic Design Review
Attn: Vicky Knoop
25 Van Ness Avenue, Suite 345
San Francisco, CA 94102

San Francisco Fire Department
Attn: Thomas Harvey, Fire Marshall
698 Second Street, Room 109
San Francisco, CA 94107-2015

San Francisco Historic Preservation Commission
Planning Department
Attn: Margaret Yuen
1650 Mission Street, Suite 400
San Francisco, CA 94103

San Francisco Mayors Office on Disability
Attn: Joanna Fraguli
401 Van Ness Avenue, Room 300
San Francisco, CA 94102

San Francisco Municipal Transportation Agency
Attn: Paul Bignardi
1 South Van Ness Ave. 7rdFloor
San Francisco, CA 94102

Table E-1: Agency and Elected Officials Distribution List

Department of Public Works
City and County of San Francisco
Attn: Brian Gatter
1 Dr. Carlton B. Goodlett Place
City Hall, Room 348
San Francisco, CA 94102

Golden Gate Bridge, Highway and Transportation District
Attn: Ms. Barbara Vincent
1011 Andersen Drive
San Rafael, CA 94901

Japantown Better Neighborhood Plan (BNP) Organizing Committee
San Francisco Planning Department
Paul Lord
1650 Mission Street, Suite 400
San Francisco, CA 94103

Mayor's office of Economic and Workforce Development
Todd Rufo City Hall, Room 448
1 Dr Carlton B Goodlett Place
San Francisco, CA 94102

Metropolitan Transportation Commission
Attn: Craig Goldblatt
101 8th Street
Oakland, CA 94607

Muni Accessibility Advisory Committee (MAAC)
One South Van Ness Avenue, 7th floor
San Francisco CA 94103-1267

Physical Access Committee
401 Van Ness Avenue, Room 300
San Francisco, CA 94102

San Francisco Planning Commission
Attn: Rodney Fong– President
1650 Mission Street, Suite 400
San Francisco, CA 94103

San Francisco Planning Department,
Environmental Planning
Attn: Viktoriya Wise
1650 Mission Street, Suite 400
San Francisco, CA 94103

San Francisco Public Utilities Commission
Attn: Marla Jurosek
1145 Market Street. 5TH Floor
San Francisco, CA 94103

Office of Community Investment and Infrastructure
Attn: Amy Cohen
Yerba Buena Center
One South Van Ness Avenue, 5th Floor
San Francisco, CA 94102

San Francisco Urban Forestry Council
Attn: Mei Ling Hui
11 Grove Street
San Francisco, CA 94102

SF Department of Public Health
Attn: Stephanie Cushing
1380 Howard St., Suite 210,
San Francisco, CA 94102

SF Department of the Environment
Melanie Nutter, Executive Director
11 Grove Street,
San Francisco, CA 94102

*Copies were also sent to the FTA Region IX Office in Los Angeles, CA.

Table E-2: Stakeholder/Interested Organization/Individuals Distribution List

AGENCY/STAKEHOLDER/PARTY/INDIVIDUALS
Alliance for a Better District 6 P.O. Box 420782 San Francisco, 94142
The Avenue Assisted Living 1035 Van Ness Avenue San Francisco, 94109
Cathedral Hill Neighbors Association 1450 Sutter Street, PMB 309 San Francisco, CA 94109
Civic Center Stakeholder Group 163 Prospect Avenue San Francisco, CA 94110
Coalition for San Francisco Neighborhoods PO Box 320098 San Francisco, CA 94132
Cow Hollow Association P.O. Box 471136 San Francisco, CA 94147
Daniel Burnham Court 1 Daniel Burnham Ct San Francisco, CA 94109
Friends of Lafayette Park info@friendsoflafayettepark.org
Fox Plaza Tenants Association 1390 Market Street, Suite 107 San Francisco, CA 94102
Galileo Academy of Science and Technology 1150 Francisco Street San Francisco, CA 94109
Golden Gate Valley Neighborhood Association P.O. Box 9086 San Francisco, CA 94102
Gough Street Property Owners Association 2523 Gough Street San Francisco, CA 94123
Hayes Valley Neighborhood Association 300 Buchanan Street, #503 San Francisco, CA 94102
Lighthouse for the Blind and the Visually Impaired 214 Van Ness Avenue San Francisco, CA 94102
Livable City 995 Market Street, Suite 1450 San Francisco, CA 94103
Lower Polk Neighbors 1735 Van Ness Ave., #501 San Francisco, CA 94109
Marina Community Association 1517 North Point Street, Box # 531 San Francisco, CA 94123
Marina Merchants Association P.O. Box 471115 San Francisco, CA 94147
Middle Polk Neighbors P.O. Box 640918, San Francisco, CA 94164
North of Market Tenderloin Community Benefit District 134 Golden Gate Avenue, Suite A San Francisco, CA 94102
Pacific Heights Residents Association 2585 Pacific Avenue San Francisco, CA 94115
Opera Plaza Homeowners Association 601 Van Ness Avenue San Francisco, CA 94102
Pacific Professional Building Association 2100 Webster St # 120 San Francisco, CA 94115
Polk District Merchants Association 1563 Polk Street San Francisco, CA 94109
Presidio Heights Association of Neighbors P.O. Box 29503 San Francisco, CA 94129
ReLISTO 1318 Hayes Street San Francisco, CA 94117
Rescue Muni board@rescuemuni.org
Russian Hill Neighbors 1819 Polk Street, #221 San Francisco, CA 94109
San Francisco Ballet Chris Hellman Center for Dance 455 Franklin Street San Francisco, CA 94102
San Francisco Opera 301 Van Ness Avenue San Francisco, CA 94102
San Francisco Towers 1661 Pine Street San Francisco, CA 94109
San Francisco Architectural Heritage 2007 Franklin Street San Francisco, CA 94109
San Francisco Bicycle Coalition 833 Market Street, 10th Floor San Francisco, CA 94103
San Francisco Chamber of Commerce 235 Montgomery Street, 12th Floor San Francisco, CA 94104
San Francisco Planning + Urban Research Attn: Gabriel Metcalf, Executive Director 654 Mission Street San Francisco, CA 94105

Table E-2: Stakeholder/Interested Organization/Individuals Distribution List

Senior Action Network 1360 Mission St Suite 400 San Francisco, CA 94103	TRANSDEF P.O. Box 151439 San Francisco, CA 94915
SF Transit Riders Union P.O. Box 193141 San Francisco CA 94119	Union Street Merchants Association 1686 Union Street, Suite 214 San Francisco, CA 94123
Symphony Towers Homeowners Association 750 Van Ness Avenue San Francisco, CA 94102	Urban Forestry Council 11 Grove Street San Francisco, CA 94102
	Walk SF 995 Market Street, Suite 1450 San Francisco, CA 94103

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Appendix F

Notice of Intent and Notice of Preparation

the FAA has decided to designate EWR as an IATA Level 2 Schedules Facilitated Airport for the summer 2008 scheduling season. The FAA understands EWR is currently Level 2 for certain international passenger terminal facilities, and this notice does not replace that schedule facilitation process done at the local airport level.

The FAA intends to work with carriers to review operations, particularly during the morning hours of 7 a.m. to 10 a.m. and afternoon and evening hours from 2 p.m. to 10 p.m. local time. The FAA is considering options to further address congestion and improve operational performance at EWR, including the timing of flights at the airport, and their impact on the airport's operation.

DATES: Schedules must be submitted no later than October 11, 2007.

ADDRESSES: Schedules may be submitted by mail to Slot Administration Office, AGC–240, Office of the Chief Counsel, 800 Independence Ave., SW., Washington, DC 20591; facsimile: 202–267–7277; ARINC: DCAYAXD; or by e-mail to: *7–AWA-slotadmin@faa.gov*.

FOR FURTHER INFORMATION CONTACT: Komal Jain, Regulations Division, Office of the Chief Counsel, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone number: 202–267–3073.

Issued in Washington, DC, on September 19th, 2007.

James W. Whitlow,

Deputy Chief Counsel.

[FR Doc. 07–4711 Filed 9–19–07; 2:26 pm]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Environmental Impact Statement: Proposed Dickson Southwest Bypass from US–70 to State Route 46 and/or Interstate 40, Dickson County, TN

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of intent.

SUMMARY: The Federal Highway Administration (FHWA) is issuing this notice to advise the public that an Environmental Impact Statement (EIS) will be prepared for a proposed transportation project in Dickson County, Tennessee.

FOR FURTHER INFORMATION CONTACT: Ms. Laurie S. Leffler, Assistant Division Administrator, Federal Highway Administration—Tennessee Division Office, 640 Grassmere Park Road, Suite 112, Nashville, TN 37211, or by phone at 615–781–5770.

SUPPLEMENTARY INFORMATION: The FHWA in cooperation with the Tennessee Department of Transportation will prepare an Environmental Impact Statement (EIS) on a proposal to construct a bypass around the southwest side of the City of Dickson, for a distance of approximately 10 miles.

Alternatives to be considered include: (1) No-build; (2) a Transportation System Management (TSM) alternative (3) one or more build alternatives that could include constructing a roadway on a new location, upgrading existing US–70 and State Route 46, or a combination of both, and (4) other alternatives that may arise from public input. Public scoping meetings will be held for the project corridor. As part of the scoping process, federal, state, and local agencies and officials; private organizations; citizens; and interest groups will have an opportunity to identify issues of concern and provide input on the purpose and need for the project, range of alternatives, methodology, and the development of the Environmental Impact Statement. A Coordination Plan will be developed to include the public in the project development process. This plan will utilize the following outreach efforts to provide information and solicit input: Newsletters, an internet website, e-mail and direct mail, informational meetings and briefings, public hearings, and other efforts as necessary and appropriate. A public hearing will be held upon completion of the Draft Environmental Impact Statement and public notice will be given of the time and place of the hearing. The Draft EIS will be available for public and agency review and comment prior to the public hearings.

To ensure that the full range of issues related to this proposed action are identified and taken into account, comments and suggestions are invited from all interested parties. Comments and questions concerning the proposed action should be directed to the FHWA contact person identified above at the address provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this proposed program).

Issued on: September 18, 2007.

Laurie S. Leffler,

Assistant Division Administrator, Nashville, TN.

[FR Doc. E7–18796 Filed 9–21–07; 8:45 am]

BILLING CODE 4910–22–P

DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

Preparation of an Environmental Impact Statement for the Van Ness Avenue Bus Rapid Transit Project in San Francisco, CA

AGENCY: Federal Transit Administration (FTA), Department of Transportation (DOT).

ACTION: Notice of Intent (NOI) to prepare Environmental Impact Statement (EIS).

SUMMARY: Pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA), the Council of Environmental Quality Regulations (40 CFR part 1505.6), and the California Environmental Quality Act (CEQA) Section 151710, the Federal Transit Administration (FTA), in cooperation with the San Francisco County Transportation Authority (SFCTA), will prepare a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Van Ness Avenue Bus Rapid Transit (BRT) Project, an approximately two-mile transit improvement along Van Ness Avenue through the City and County of San Francisco, California. The Project would create dedicated bus lanes from approximately South Van Ness Avenue and Mission Street (south end) to Van Ness Avenue and Lombard Street (north end). The project would also establish high capacity stations with passenger amenities and low-level boarding platforms; real time bus arrival information systems; proof-of-payment fare verification; transit signal priority; and modern, high-capacity, low-floor, multi-door buses.

The EIS/EIR will evaluate the following alternatives: (1) No-Project/Baseline Alternative; (2) Van Ness Avenue BRT Project, which will include design options for the configuration of the BRT transitway and stations; and (3) any additional reasonable alternatives that emerge from the study process. The EIS will be prepared in accordance with FTA regulations (23 CFR 771 *et seq.*) implementing the National Environmental Policy Act (NEPA) as well as provisions of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU). The EIR will be prepared in accordance with the

California Environmental Quality Act (California Code of Regulation, Title 14, Chapter 3). As part of the EIS/EIR process, an evaluation of potential transit improvement alternatives will be completed (''alternatives analysis'') in accordance with 23 CFR Part 450 and inform the development of project alternatives.

Previous studies and documents relevant to this action include the recently completed Van Ness Avenue BRT Feasibility Study (December 2006); 2005 Prop K Strategic Plan (March 2005); 2004 San Francisco Countywide Transportation Plan (adopted July 20, 2004), and the New Transportation Expenditure Plan for San Francisco (Proposition K, approved November 4, 2003). These documents describe the planning and funding for transportation improvements in San Francisco, including BRT in major bus corridors. These documents can be downloaded at the Web site *www.sfcta.org*, or requested from the Authority.

EIS/EIR preparation will be initiated through a formal NEPA scoping process, which solicits input on issues and potential project impacts to consider in the environmental studies. Scoping will be accomplished through meetings and correspondence with interested persons, organizations, the general public, and Federal, State, and local agencies. Letters describing the proposed action and soliciting comments have been sent to the appropriate Federal, State, and local agencies, and to private organizations and individuals. Comments on issues and impacts to be considered in preparation of the EIS/EIR will be recorded in the project information database.

DATES: *Comment Due Date:* Written comments on the scope of alternatives and impacts to be considered must be postmarked no later than October 18, 2007 and should be sent to SFTA at the contact address below.

NEPA Scoping Meeting Date: The public scoping meetings will be held on October 2, 2007 at the Holiday Inn Golden Gateway, 1500 Van Ness Avenue, San Francisco, CA, from 6 p.m. to 8 p.m. The meeting agenda will include opportunities to speak with project staff, viewing of information on the project, a brief presentation of the project purpose and alternatives, and opportunity for meeting participants to comment on issues of interest. The open house will resume after the presentation and comment period. Project staff will be present to receive formal agency and public input regarding the scope of the environmental studies, key issues, and other suggestions. The meeting room is accessible to persons with disabilities. Any individual with a disability who requires special assistance, such as a sign language interpreter, or any individual who requires English language interpretation should contact the SFCTA at 415–593–1423 at least 48 hours in advance of the meeting in order for the SFCTA to make necessary arrangements.

ADDRESSES: The scoping meeting will be held at the locations identified in the NEPA Scoping Meeting Date section above. Written comments should be sent to: Rachel Hiatt, Senior Transportation Planner, San Francisco County Transportation Authority; 100 Van Ness Avenue, 26th Floor; San Francisco, CA 94612. Phone: 415–522–4809 or *Rachel.Hiatt@sfcta.org.* To be added to the mailing list for the Van Ness Avenue BRT Project, contact Ms. Hiatt at the address listed above. Persons with special needs should leave a message at the phone number above.

FOR FURTHER INFORMATION CONTACT: Donna Turchie, Federal Transit Administration, Office of Planning and Program Development; 201 Mission Street, Suite 1650; San Francisco, CA 94105. Phone: 415–744–2737 or *Donna.Turchie@dot.gov.* Additional information on the Van Ness Avenue BRT Project can be found on the project Web site at: *http://www.vannessbrt.org/* and by contacting Rachel Hiatt at the SFCTA.

SUPPLEMENTARY INFORMATION:

I. Project Background

The proposed project would be located in a key north-south transportation corridor in the heart of the City and County of San Francisco. Van Ness Avenue is an important roadway and transit route serving high density commercial, residential, and civic/institutional areas along its length from the U.S. and State Highway Route 101 freeway on the south to San Francisco Bay on the north. It is an at-grade continuation of U.S. and State Highway Route 101 from the freeway to Lombard Street, which continues west to Doyle Drive and the Golden Gate Bridge. The roadway serves as a major thoroughfare for local traffic as well as through traffic, carrying over 50,000 people in cars per day and about 4000 people in vehicles during the pm peak hour. Transit service is provided by Muni routes 47 and 49, and by Golden Gate Transit (based in Marin County), which operates commute service and limited all-day service into San Francisco on Van Ness Avenue. About 43,000 passengers use Muni Routes 47 and 49 and the Golden Gate Transit Van Ness routes daily, with approximately 15,000 passengers riding daily within the Van Ness Avenue segment of service. A number of major east-west transit routes cross Van Ness Avenue and generate major bus-to-bus and bus-to-rail transfers with Van Ness Avenue services, including the muni Metro lines and the Muni lines 38 (Geary) and 38L (Geary Limited).

Traffic congestion in mix-flow traffic lanes and transit overcrowding result in poor transit service reliability and low average bus speeds, currently just 5 to 7 miles per hour during commute periods. Bus reliability is poor, with high variation in headways and bus bunching. Transit mode shares are low relative to the potential transit market along this corridor, where housing densities within one-quarter mile of Van Ness Avenue average over 90 units per acre, where 46% of households do not own a car (relative to 29% citywide), and where the city expects to add about 3,800 new housing units and 8,500 new jobs by 2025.

Van Ness Avenue has been identified as a high priority transit improvement corridor in a number of planning studies and funding actions by the City. The Authority's Four Corridors Plan (1995) and Muni's Vision for Rapid Transit (2000) identified Van Ness as a priority corridor for rapid transit improvements. Along with two other key transit corridors, Van Ness Avenue was designated for BRT improvements in the New Expenditure Plan for San Francisco, approved by voters as Proposition K, the reauthorization of the City's ½ cent transportation sales tax measure, in November 2003. The Expenditure Plan is the investment component of the 2004 San Francisco Countywide Transportation Plan, which sets forth the city's ''blueprint to guide the development of transportation funding priorities and policy'' with a key objective being the promotion and implementation of San Francisco's transit first policy through the development of a network of fast, reliable transit including bus rapid transit. The Van Ness Avenue BRT Feasibility Study was initiated in 2004, completed in 2006, and evaluated the feasibility of four alternative BRT configurations on Van Ness Avenue. Four BRT alternatives were developed and compared with a No Project scenario, in conjunction with a comprehensive public and agency participation program. The Feasibility Study found that all four BRT configurations are feasible on Van Ness and recommended an environmental analysis to identify a preferred alternative. The alternatives form the foundation for the BRT improvements to be evaluated in the proposed project EIS/EIR.

II. Purpose and Need

The City and County of San Francisco adopted as part of the 2004 Countywide Transportation Plan and its investment component, the New Expenditure Plan for San Francisco, a bus rapid transit strategy for expanding rapid transit service in San Francisco. The BRT network is intended to address the following purpose:

1. Support the city's growth and development needs
2. Better serve existing transit riders and stem and reverse the trend toward transit mode share loss
3. Improve the operational efficiency and cost effectiveness of the transportation system.

A BRT network can meet those goals by:—

• Improving transit levels of service cost effectively.
• Strengthening rapid transit services
• Raising the cost effectiveness of Muni service and operational efficiency of transit preferential streets
• Contributing to livability of BRT corridors

Specific Van Ness BRT project purpose and need statements linked to these goals were subsequently established to guide the development of a BRT project for the Van Ness Avenue corridor. They guided preparation of the Van Ness Avenue BRT Feasibility Study (2005–2006), and include:

• *Close the performance gap between transit and automobile travel on Van Ness Avenue.* For transit, this means reducing travel time (including wait time); significantly increasing reliability and reducing bunching; reducing crowding; and improving connectivity and safety.

• *Raise the operational efficiency of Van Ness Avenue.* San Francisco has limited roadway capacity and no space to expand the network. It is also difficult in many areas to travel by auto given the obstacles—limited capacity and resulting congestion on key roadway segments. It is city policy to encourage travel by higher capacity modes to expand the transportation network's carrying capacity and use it more efficiently. BRT offers a means to expand the overall capacity of Van Ness Avenue. However, transit buses must be separated from the existing traffic and pedestrian congestion and other impediments to efficient, fast travel.

Transit infrastructure improvements would allow Muni to operate buses more efficiently and improve the productivity of buses by enabling each bus to complete more runs per hour. Frequent stops and starts and slowed, sometimes uneven, operations in congested conditions increase the wear and tear on buses and also fuel consumption. Improving average bus speeds would lead to more efficient operations and allow Muni to serve more passengers at a lower cost per passenger.

• *Raise the level of amenities and urban design of Van Ness Avenue.* Van Ness Avenue is currently not an appealing urban environment for pedestrians. The Van Ness Avenue BRT Project incorporates elements that enhance the urban design and identity of Van Ness Avenue, especially at major transit nodes such as Mission Street and South Van Ness, Market Street, and Geary and O'Farrell streets. Transit capital improvements properly done and integrated with other design initiatives would make the street more livable and attractive for residents and commercial and institutional uses along its length. The BRT on Van Ness Avenue Project would incorporate pedestrian safety and urban design features and help transform Van ness Avenue into a ''signature Preferential Transit Street and distinctive gateway into San Francisco.''

• *Accommodate future mobility needs.* This need is linked to the continuing growth in the San Francisco and the region. More housing and more households now exist than in 2000 and they are projected to continue growing, with population increasing almost 20 percent by 2030 (Association of Bay Area Governments, *Projections 2005;* San Francisco's 2000 population was 776,733; 2030 population is projected to be 924,600). Employment is forecast to grown by 29 percent during the same period, to 829,090 jobs available by 2030 (ABAG). Along the Van Ness Avenue corridor itself, over 3,800 new housing units and 8,500 new jobs are anticipated. Transit priority and other congestion management measures offer an important way to accommodate the resulting growth in travel demand, which will be focused on the major transportation corridors in the city. Van Ness Avenue is one of these critical corridors.

III. Alternatives

Alternatives to be reviewed in the include a (1) No-Project/Baseline Alternative, which would encompass low cost improvements to corridor bus services, such as bus stop amenities and limited transit signal priority; (2) Van Ness Avenue BRT Project, which would provide a full complement of BRT improvements in two or more cross-sectional configurations for Van Ness Avenue between approximately Mission Street and Lombard Street; and (3) any other service, alignment or cross-sectional alternatives that emerge from the scoping and alternatives analysis processes.

The No-Project Alternative assumes a 2030 condition of land use and transportation capital and service improvements that are programmed or planned to be implemented by the San Francisco Municipal Transportation Agency (MTA, which includes San Francisco Muni and the Department of Parking and Traffic) and other transit providers in the study area (e.g. Golden Gate Transit, Caltrain, the commuter rail service between San Francisco and San Jose, and the Bay Area Rapid Transit District, or BART, a regional rail service provider). For transit, these include upgraded bus stops and passenger information/communication systems. Other transportation system improvements, such roadway traffic management measures, street lighting upgrades, and street resurfacing/landscaping projects that would be the responsibility of the San Francisco Department of Public Works (DPW), the Public Utilities Commission (PUC), or the California State Department of Transportation (Caltrans), will be included in the 2030 No-Project network. This network will also form the background network for the build alternatives.

The Van Ness Avenue BRT Project would include, among other features, dedicated transit lanes within the existing Van Ness Avenue right-of-way; sheltered, low-platform passenger stations with real time bus arrival passenger information signs, lighting, and wayfinding; self-service fare vending on station platforms and on-board proof-of-payment verification; and advanced transit traffic signal priority and traffic management systems to reduce bus delays at signalized intersections yet maintain acceptable traffic flow. Passenger stations would be spaced on average every 940 feet with local bus service one block to the east. BRT transitway and stations improvements would be made entirely within existing public rights-of-way; improvements outside of existing public rights of way are not anticipated with the *possible* exception of required improvements to existing Muni bus storage and maintenance facilities and to off-alignment intersections and parking facilities for mitigation of project impacts. Variations in the cross-section for the BRT transitway and the locations of stations are anticipated and would comprise design options for the basic BRT alignment. A two-way transitway either in the median of Van Ness Avenue or along the outside curbs (one northbound BRT lane along the east curb/parking lane; one southbound BRT lane along the west curb/parking lane) and, correspondingly, stations in the median or as extensions of the sidewalk were considered in the Van Ness Avenue BRT Feasibility Study and warrant further evaluation as part of the EIS/EIR and alternatives analysis.

The SFCTA in association with Muni will evaluate the procurement of modern low-floor high-capacity vehicles that would be assigned to the BRT service and have added features, such as two-sided multidoor access, passenger station docking assist, and other amenities. Streetscape improvements, such as enhanced landscaping and pedestrian access along Van Ness Avenue, are also included in the proposed BRT project.

IV. Probable Effects

FTA and SFCTA will evaluate the transportation, environmental, social, and economic impact of each alternative. Effects of the Van Ness Avenue BRT Project will be compared to the No Project/Baseline. The overall benefits of the Van Ness Avenue BRT Project, including on transit speeds and reliability, new riders, and transportation system user benefits, will be relative to the No Project/Baseline Alternative. The Van Ness Avenue BRT Project Alternative is expected to improve transit speeds and increase transit reliability; increase bus transit ridership; improve access and mobility for San Francisco residents, many of whom are highly dependent on transit; and provide competitive transit access to major employment and activity centers relative to the No Project/Baseline Alternative.

Increased congestion and worsening conditions for transit service along Van Ness Avenue are expected without a significant improvement. The No Project/Baseline Alternatives would not eliminate the main impediments to efficient and effective service in the corridor—auto/transit conflicts in mixed-flow lanes. The Van Ness Avenue BRT Project may affect the following areas: Traffic operations; parking; local access and circulation; visual and aesthetic effects; historic and cultural resources; disturbance of pre-existing hazardous wastes; and temporary construction-phase impacts. Impacts of the Van Ness Avenue BRT Project will be evaluated for both the construction period and for the long-term period of operation. Mitigation measures will be identified and evaluated for avoiding and reducing adverse effects.

To ensure all significant issues related to the proposed project are identified and addressed in the ESI/EIR and alternatives analysis, comments and suggestions are invited from all interested parties. Comments, suggestions, and questions concerning the proposed action should be directed to the contacts listed above.

V. FTA Procedures

In accordance with the FTA policy, all Federal laws, regulations and executive orders affecting project development, including but not limited to the regulations of the Council on Environmental Quality and FTA implementing NEPA (40 CFR parts 1500–1508 and 23 CFR part 771); the conformity requirements of the Clean Air Act; section 4040 of the Clean Water Act; Executive Order 12898 regarding environmental justice; the National Historic Preservation Act; the Endangered Species Act; and section 4(f) of the Department of Transportation Act, will be addressed to the maximum extent practicable during the NEPA process. Prior transportation planning studies may be pertinent to establishing the purpose and need for the proposed action and the range of alternatives to be evaluated in detail in the EIS/EIR. The Draft EIS/EIR will be prepared simultaneously with conceptual engineering for the alternatives, including bus stop and alignment options. The Draft EIS/EIR process will address the potential use of Federal funds for the proposed action, as well as assessing social, economic, and environmental impacts of the proposed Van Ness Avenue BRT Project. The Project will be refined to minimize and mitigate any adverse impacts.

After publication, the Draft EIS/EIR will be available for public and agency review and comment, and a public hearing will be held. Based on the Draft EIS/EIR and comments received, the San Francisco County Transportation Authority Board will select a locally preferred alternative (LPA) for further assessment in the Final EIS/EIR, which will be based on further engineering of the LPA and other remaining alternatives. SFCTA intends to request FTA approval to enter Project Development and secure funding under the Small Starts program prior to initiating further engineering (e.g., preliminary engineering) and preparing the Final EIS/EIR.

Issued on September 19, 2007.

Leslie T. Rogers,

Regional Administrator.

[FR Doc. 07–4713 Filed 9–21–07; 8:45 am]

BILLING CODE 4910–57–M

DEPARTMENT OF TRANSPORTATION

Surface Transportation Board

[STB Docket No. AB–43 (Sub-No. 180X)]

Illinois Central Railroad Company—Abandonment Exemption—in Adams County, MS

Illinois Central Railroad Company (ICR) has filed a notice of exemption under 49 CFR Part 1152 Subpart F—*Exempt Abandonments* to abandon approximately 0.46 miles of rail line, between milepost 148.67 and milepost 148.21, in Natchez, Adams County, MS. The line traverses United States Postal Service Zip Code 39120.

ICR has certified that: (1) No local traffic has moved over the line for at least 2 years; (2) there is no overhead traffic on the line to be rerouted; (3) no formal complaint filed by a user of rail service on the line (or by a state or local government entity acting on behalf of such user) regarding cessation of service over the line either is pending with the Surface Transportation Board or with any U.S. District Court or has been decided in favor of complainant within the 2-year period; and (4) the requirements at 49 CFR 1105.7 (environmental report), 49 CFR 1105.8 (historic report), 49 CFR 1105.11 (transmittal letter), 49 CFR 1105.12 (newspaper publication), and 49 CFR 1152.50(d)(1) (notice to governmental agencies) have been met.

As a condition to this exemption, any employee adversely affected by the abandonment shall be protected under *Oregon Short Line R. Co.—Abandonment—Goshen,* 360 I.C.C. 91 (1979). To address whether this condition adequately protects affected employees, a petition for partial revocation under 49 U.S.C. 10502(d) must be filed.

September 13, 2007

SUBJECT: NOTICE OF PREPARATION/NOTICE THAT AN EIR IS REQUIRED
Van Ness Avenue Bus Rapid Transit (BRT) Project
Environmental Impact Statement/Environmental Impact Report (EIS/EIR)

The San Francisco County Transportation Authority (SFCTA) and Federal Transit Administration (FTA), as joint lead agencies, will prepare an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) and an Environmental Impact Report (EIR) in accordance with the California Environmental Quality Act (CEQA) for the following proposed project:

PROJECT TITLE: Van Ness Avenue Bus Rapid Transit (BRT)

The Authority requests the views of your agency on the scope and content of the environmental information relevant to your agency's jurisdictional or regulatory responsibilities. If your agency is a responsible agency or trustee agency as defined by State California Environmental Quality Act (CEQA) Guidelines (Sections 15381 and 15386), your agency will need to use the EIS/EIR prepared for this project when considering your permit or other approval for the project. If your agency is not a responsible or trustee agency as defined by CEQA guidelines, or if you are an interested individual or organization, we would still appreciate your views on the scope of the environmental document for this project.

The project description, location, and probable environmental effects are described herein, along with dates, times, and locations of project scoping meetings. The project has the potential to have a significant effect on the environment, and therefore an EIS/EIR is required pursuant to State CEQA Guidelines 15060(d). No initial study has been prepared. Due to the time limits mandated by state law, your response must be sent at the earliest possible date, but no later than 30 days after the receipt of this notice, or October 18, whichever is later. Please send your responses no later than October 18, 2007 to **Rachel Hiatt, Senior Transportation Planner; San Francisco County Transportation Authority; 100 Van Ness Avenue, 26th Floor; San Francisco, CA 94102.** Phone: (415) 522-4809. Fax: (415) 522-4829. E-mail: Rachel.Hiatt@sfcta.org. Please include the name of an appropriate contact person in your agency for continued EIS/EIR coordination.

BACKGROUND/PROJECT DESCRIPTION

The proposed project would be located in a key north-south transportation corridor in the heart of the City and County of San Francisco. Van Ness Avenue is an important roadway and transit route serving high density commercial, residential, and civic/institutional areas along its length from the U.S. and State Highway Route 101 freeway on the south to San Francisco Bay on the north. It is an at-grade continuation of U.S. and State Highway Route 101 from the freeway to Lombard Street, which continues west to Doyle Drive and the Golden Gate Bridge. The roadway serves as a major thoroughfare for local traffic as well as through traffic, carrying over 50,000 people in cars per day and about 4000 people in vehicles during the pm peak hour. Transit service is provided by Muni routes 47 and 49, and by Golden Gate Transit (based in Marin County), which operates commute service and limited all-day service into San Francisco on Van Ness Avenue. About 43,000 passengers use Muni Routes 47 and 49 and the Golden Gate Transit Van Ness routes daily, with approximately 15,000 passengers riding daily within the Van Ness Avenue segment of service. A number of major east-west transit routes cross Van Ness Avenue and generate major bus-to-bus and bus-to-rail transfers with Van Ness Avenue services, including the Muni Metro lines and the Muni lines 38 (Geary) and 38L (Geary Limited).

Traffic congestion in mixed-flow traffic lanes and transit overcrowding result in poor transit service reliability and low average bus speeds, currently just 5 to 7 miles per hour during commute periods. Bus reliability is poor, with high variation in headways and bus bunching. Transit mode shares are low relative to the potential transit market along this corridor, where housing densities within one-quarter mile of Van Ness Avenue average over 90 units per acre, where 46% of households do not own a car (relative to 29% citywide), and where the city expects to add about 3,800 new housing units and 8,500 new jobs by 2025.

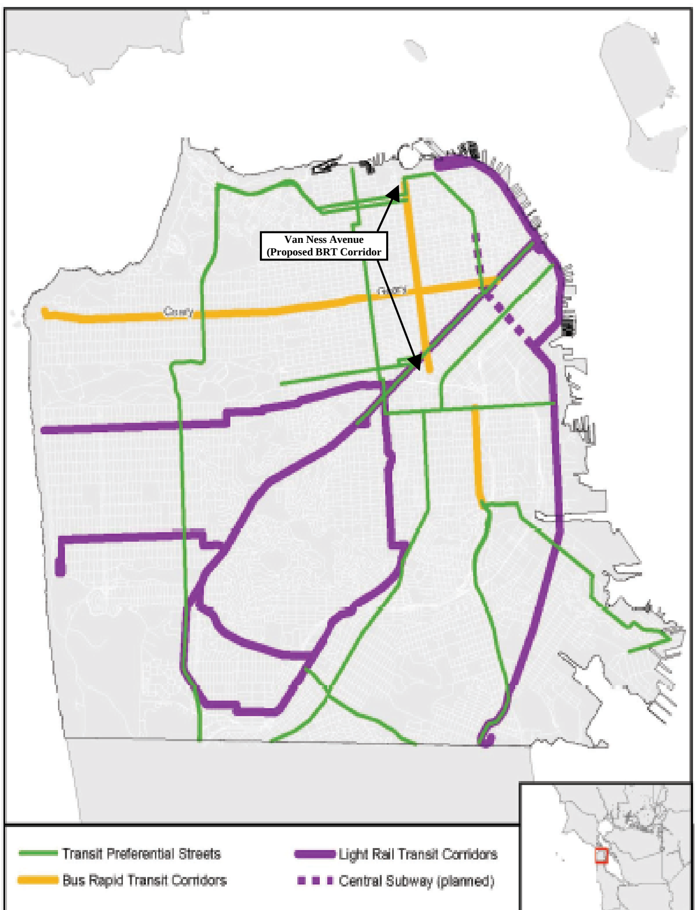


Figure 1 - Project Location in City and County of San Francisco and Transit Priority Network

Van Ness Avenue has been identified as a high priority transit improvement corridor in a number of planning studies and funding actions by the City. The Authority's Four Corridors Plan (1995) and Muni's Vision for Rapid Transit (2000) identified Van Ness as a priority corridor for rapid transit improvements. Along with two other key transit corridors, Van Ness Avenue was designated for BRT improvements in the New Expenditure Plan for San Francisco, approved by voters as Proposition K, the reauthorization of the City's ½ cent transportation sales tax measure, in November 2003. The Expenditure Plan is the investment component of the 2004 San Francisco Countywide Transportation Plan, which sets forth the city's "blueprint to guide the development of transportation funding priorities and policy" with a key objective being the promotion and implementation of San Francisco's transit first policy through the development of a network of fast, reliable transit including bus rapid transit..

The Van Ness Avenue BRT Feasibility Study was initiated in 2004, completed in 2006, and evaluated the feasibility of four alternative BRT configurations on Van Ness Avenue. Four BRT alternatives were developed and compared with a No Project scenario, in conjunction with a comprehensive public and agency participation program. The Feasibility Study found that all four BRT configurations are feasible on Van Ness and recommended an environmental analysis to identify a preferred configuration. The alternatives form the foundation for the BRT improvements to be evaluated in the proposed project EIS/EIR.

Previous studies and documents relevant to this action include the recently completed *Van Ness Avenue BRT Feasibility Study* (December 2006); *2005 Prop K Strategic Plan* (March 2005); *2004 San Francisco Countywide Transportation Plan* (adopted July 20, 2004), and the *New Transportation Expenditure Plan for San Francisco* (Proposition K, approved November 4, 2003). These documents describe the planning and funding for transportation improvements in San Francisco, including BRT in major bus corridors.

EIS/EIR preparation will be initiated through a formal CEQA/NEPA scoping process, which solicits input on the range of alternative to be analyzed and potential project impacts to consider in the environmental studies. Scoping will be accomplished through meetings and correspondence with interested persons, organizations, the general public, and federal, state, and local agencies, including public scoping meetings to be held on:

Tuesday October 2nd
Holiday Inn Golden Gateway – Crystal Room
1500 Van Ness Avenue (at Pine)
6-8 pm

Thursday October 4th
San Francisco County Transportation Authority
100 Van Ness Avenue, 26th Floor (at Fell)
6-8 pm

An agency scoping meeting will be held on:

Thursday October 4th
San Francisco County Transportation Authority
100 Van Ness Avenue, 26th Floor (at Fell)
1-3 pm

Comments on issues and impacts to be considered in preparation of the EIS/EIR will be recorded.

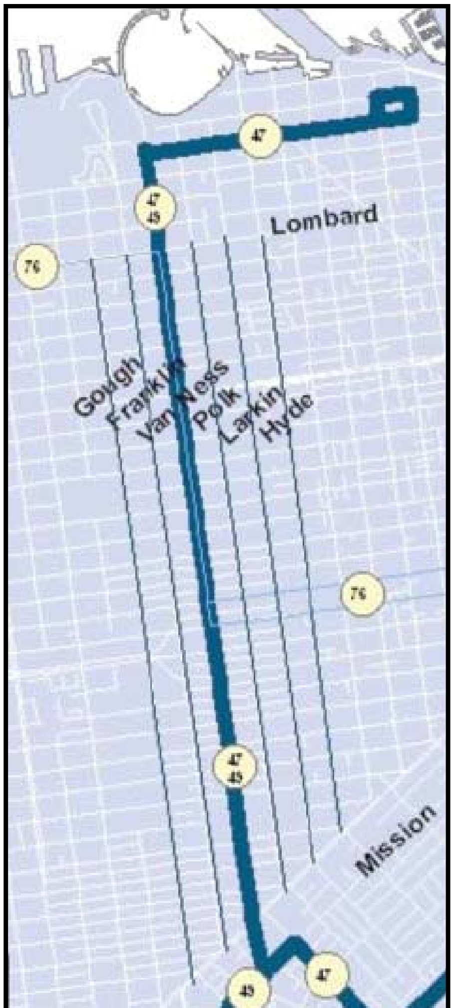


Figure 2 Study Area

Purpose of and Need for the Project

The San Francisco County Transportation Authority adopted as part of the 2004 Countywide Transportation Plan and its investment component, the New Expenditure Plan for San Francisco, a BRT strategy for expanding rapid transit service in San Francisco. The BRT network is intended to address the following purpose:

1. Support the city's growth and development needs
2. Better serve existing transit riders and stem and reverse the trend toward transit mode share loss
3. Improve the operational efficiency and cost effectiveness of the transportation system.

A BRT network can meet those goals by:—

- Improving transit levels of service cost effectively;
- Strengthening rapid transit services;
- Raising the cost effectiveness of Muni service and operational efficiency of transit preferential streets; and
- Contributing to livability of BRT corridors.

The Project and Project Alternatives

Alternatives to be reviewed in the EIS/EIR include a (1) combined No-Project Systems Management / Baseline Alternative, which would propose improvements to corridor bus services, such as fare prepayment / proof of payment and limited transit signal priority; (3) Van Ness Avenue BRT Project, which would expand upon the No Project/TSM/Baseline to provide a full complement of BRT improvements in two or more cross-sectional configurations for Van Ness Avenue between approximately Mission Street and Lombard Street; and (4) any other service, alignment or cross-sectional alternatives that emerge from the scoping and alternatives analysis processes.

The No-Project/TSM/Baseline Alternative assumes a 2030 condition of land use and transit capital and service improvements that are programmed or planned to be implemented by the San Francisco Municipal Transportation Agency (MTA, which includes San Francisco Muni and the Department of Parking and Traffic) and other transit providers in the study area (e.g., Golden Gate Transit, Caltrain, the commuter rail service between San Francisco and San Jose, and the Bay Area Rapid Transit District, or BART, a regional rail service provider). For transit, these include upgraded bus stops and passenger information/communication systems. Other transportation system improvements, such roadway traffic management measures, street lighting upgrades, and street resurfacing/landscaping projects that would be the responsibility of the San Francisco Department of Public Works (DPW), the Public Utilities Commission (PUC), or the California State Department of Transportation (Caltrans), will be included in the 2030 No-Project network. This network will also form the background network for the build alternatives.

No Project/TSM/Baseline Alternative would provide additional expected, low capital cost service enhancements, but not dedicated transit lanes. Low cost improvements would include such elements as modern traffic signals with the capability of providing transit signal priority and upgraded bus stops and passenger information/communication systems.

The Van Ness Avenue BRT Project would include, among other features:

- Dedicated transit lanes within the existing Van Ness Avenue right-of-way;
- Sheltered, low-platform passenger stations with real-time bus arrival passenger information signs, lighting, and fare ticketing machines;
- Off-vehicle self-service fare vending and on-board proof-of-payment verification; and
- Advanced transit traffic signal priority and traffic management systems to reduce bus delays at signalized intersections yet maintain acceptable traffic flow.

Passenger stations would be spaced on average every 940 feet with local bus service one block to the east. BRT transitway and station improvements would be made entirely within existing public rights-of-way; improvements outside of existing public-rights of way are not anticipated with the possible exception of required improvements to existing Muni bus storage and maintenance facilities and to off-alignment intersections for mitigation of project impacts. Variations in the cross-section for the BRT transitway and the locations of stations are anticipated and would comprise design options for the basic BRT alignment. A two-way transitway either in the median of Van Ness Avenue or along the outside curbs (one northbound BRT lane along the east curb/parking lane; one southbound BRT lane along the west curb/parking lane) and, correspondingly, stations in the median or as extensions of the sidewalk were considered in the Van Ness Avenue BRT Feasibility Study and warrant further evaluation as part of the EIS/EIR and alternatives analysis.

The Authority, in association with SFMTA, will evaluate the procurement of modern low-floor high-capacity vehicles that would be assigned to the BRT service and have added features, such as two-sided, multidoor access, passenger station docking assist, and other amenities. Streetscape improvements, such as enhanced landscaping and pedestrian access along Van Ness Avenue, are also included in the proposed BRT project.

THE EIS/EIR PROCESS AND THE ROLE OF PARTICIPATING AGENCIES AND THE PUBLIC

The purpose of the EIS/EIR process is to explore in a public setting potentially significant effects of implementing the proposed action and alternatives on the physical, human, and natural environment. Areas of investigation include, but are not limited to, land use, development potential, land acquisition and displacements, historic resources, visual and aesthetic qualities, air quality, noise and vibration, energy use, safety and security, and ecosystems, including threatened and endangered species. Measures to avoid, minimize, or mitigate any significant adverse impacts will be identified.

Regulations implementing NEPA and CEQA, as well as provisions of the recently enacted Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), call for public involvement in the EIS/EIR process. Section 6002 of SAFETEA-LU requires that FTA and the Authority do the following: (1) extend an invitation to other Federal and non-Federal agencies and Indian tribes that may have an interest in the proposed project to become “participating agencies,” (2) provide an opportunity for involvement by participating agencies and the public in helping to define the purpose and need for a proposed project, as well as the range of alternatives for consideration in the impact statement, and (3) establish a plan for coordinating public and agency participation in and comment on the environmental review process. An invitation to become a participating agency, with the scoping information packet appended, will be extended to other Federal and non-Federal agencies and Indian tribes that may have an interest in the proposed project. It is possible that we may not be able to identify all Federal and non-Federal agencies and Indian tribes that may have such an interest. Any Federal or non-Federal agency or Indian tribe interested in the proposed project that does not receive an invitation to become a participating agency should notify at the earliest opportunity Rachel Hiatt at the contact numbers identified above.

A comprehensive public and agency involvement program is under development. The program includes a project Web site (www.vannessbrt.org); outreach to local and county officials and community and civic groups; a public scoping process to define the issues of concern among all parties interested in the project; establishment of a citizens advisory committee and organizing periodic meetings with that committee; a public hearing on release of the draft EIS/EIR; and development and distribution of project Fact Sheets.

The purpose of and need for the proposed project has been preliminarily identified in this notice. We invite the public and participating agencies to consider the preliminary statement of purpose of and need for the proposed project, as well as the alternatives proposed for consideration. Suggestions for modifications to the statement of purpose of and need for the proposed project and any other alternatives that meet the purpose of and need for the proposed project are welcomed and will be given serious consideration. Comments on potentially significant environmental impacts that may be associated with the proposed project and alternatives are also welcomed. There will be additional opportunities to participate in the scoping process at the public meetings announced below.

In accordance with 23 CFR 771.105(a) and 771.133 and with CEQA and the implementing regulations, FTA and SFCTA will comply with all Federal and state environmental laws, regulations, and federal executive orders applicable to the proposed project during the environmental review process to the maximum extent practicable. These requirements include, but are not limited to, the regulations of the Council on Environmental Quality and FTA implementing NEPA (40 CFR parts 1500-1508, and 23 CFR Part 771), the project-level air quality conformity regulation of the U.S. Environmental Protection Agency (EPA) (40 CFR part 93), the Section 404(b)(1) guidelines of EPA (40 CFR part 230), the regulation implementing Section 106 of the National Historic Preservation Act (36 CFR Part 800), the regulation implementing section 7 of the Endangered Species Act (50 CFR part 402), Section 4(f) of the DOT Act (23 CFR 771.135), federal Executive Orders 12898 on environmental justice, 11988 on floodplain management, and 11990 on wetlands, and the CEQA laws and regulations.

The Authority intends to request FTA approval to enter Project Development and secure funding under the Small Starts program (SAFETEA-LU amended 49 U.S.C. 5309) prior to initiating further engineering (e.g., preliminary engineering) and preparing the Final EIS/EIR.

To ensure that the full range of issues related to this proposed action will be addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comments or questions concerning this proposed action and the EIS/EIR should be directed to Rachel Hiatt, as noted above.

INITIATION OF STUDIES/SCOPING MEETINGS

To assure public involvement at the initiation of studies on this project, public scoping meetings are scheduled as follows:

October 2, 2007 **Holiday Inn Golden Gateway** **Crystal Room** **1500 Van Ness Avenue** **San Francisco, CA** **6 p.m. to 8 p.m.**	**October 4, 2007** **San Francisco County Transportation Authority** **100 Van Ness Avenue, 26th Floor** **San Francisco, CA** **6 p.m. to 8 p.m.**

The first 30 minutes of the meeting will be an open house and a viewing of exhibits. A brief presentation of the project purpose and alternatives will follow, with meeting participants provided the opportunity to comment on issues of interest. The open house will resume after the presentation and comment period. Project staff will be present to receive formal public input regarding the scope of the environmental studies, key issues, and other suggestions. Opportunities will be offered during the scoping meeting for comments to be provided either orally or in writing during the entire scoping comment period.

The meeting room is accessible to persons with disabilities. Any individual with a disability who requires special assistance, such as a sign language interpreter, or any individual who requires English language interpretation should contact the Authority at 415-522-4809 at least 48 hours in advance of the meeting in order for the Authority to make necessary arrangements.

An agency scoping meeting will also be held:

October 4, 2007 **San Francisco County Transportation Authority** **100 Van Ness Avenue, 26th Floor** **San Francisco, CA** **1 p.m. to 3 p.m.**

ADDRESSES/CONTACT LIST/FURTHER INFORMATION

Written comments during scoping or on the proposed project in general should be sent to: Rachel Hiatt, Senior Transportation Planner, San Francisco County Transportation Authority; 100 Van Ness Avenue, 26th Floor; San Francisco, CA 94102. Phone: 415-593-1423 or (e-

Appendix G

Notice of Completion and Notice of Availability for the Draft EIS/EIR

SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY

NOTICE OF AVAILABILITY/NOTICE OF COMPLETION FOR THE VAN NESS AVENUE BUS RAPID TRANSIT PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT

In compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) Section 15087, the Federal Transit Administration (FTA) and the San Francisco County Transportation Authority (SFCTA or Authority), in cooperation with the San Francisco Municipal Transportation Agency (SFMTA), have prepared a joint Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Van Ness Avenue Bus Rapid Transit (BRT) Project. This Draft EIS/EIR has been prepared pursuant to the requirements of both NEPA and CEQA. Both laws require that projects with a potential for significant adverse environmental effects be reviewed in an EIS and EIR, respectively. This Notice of Availability/Notice of Completion serves as a notice to the public regarding the availability of this environmental document, and it seeks public opinion and comment on the findings in the Draft EIS/EIR. FTA is the lead agency for the purposes of NEPA, and the Authority is the lead agency for the purposes of CEQA.

PROJECT LOCATION

The Van Ness Avenue BRT is proposed in the northeastern quadrant of the City and County of San Francisco, California. Van Ness Avenue is a primary north-south transit corridor in San Francisco. The proposed BRT alignment follows Van Ness Avenue (and one block of South Van Ness Avenue), a north-south primary arterial, and extends approximately 2 miles from Mission Street to Lombard Street. Replacement of the overhead contact system (OCS) support pole/ streetlight network, as part of the project, would extend from Mission Street to North Point Street, approximately 4 blocks beyond the BRT runningway northern limit. A location map is attached.

PROJECT DESCRIPTION

BRT is intended as an affordable approach to creating rapid transit along San Francisco's major north-south transit route. Three build alternatives, one design option, and a no build (no action) alternative are analyzed in the Draft EIS/EIR. Under each build alternative, two mixed-flow traffic lanes (one southbound [SB] and one northbound [NB]) would be converted into two dedicated transit lanes (one SB and one NB). The build alternatives would occur entirely within the existing street right-of-way. The Van Ness Avenue BRT Project would incorporate the following features:

- **Dedicated bus lanes** separated from regular (mixed-flow) traffic to reduce delays due to congestion.
- **Level boarding** to decrease passenger loading time, increase service reliability, and improve access for all users.

- **Consolidated transit stops** to reduce delays due to existing stop spacing that does not meet Muni standards.
- **High-quality stations**, each with an elevated platform, canopy for weather protection, comfortable seating, vehicle arrival time information, landscaping, and other amenities. Platforms would be large enough to safely and comfortably accommodate waiting passengers, long enough to load two BRT vehicles, and would provide Americans with Disabilities Act (ADA) accessibility.
- **Platform Proof of Payment** to allow passengers to swipe their fare cards before the buses arrive, reducing passenger loading time.
- **Traffic signal optimization** using technology upgrades to allow real-time traffic management and optimal signal timing.
- **Transit Signal Priority (TSP)** to recognize bus locations and provide additional green light time for buses approaching intersections to reduce delay at red lights.
- **Pedestrian safety enhancements,** including enhanced median refuges, nose cones, curb bulbs to reduce crossing distances at intersections, and accessible pedestrian signals with crossing time countdowns.
- **Removal of left-turn pocket lanes** (as a design option) for mixed-flow traffic at certain intersections to reduce conflicts with the BRT operation.

The BRT build alternatives also include full replacement of the existing OCS support pole/ streetlight network between Mission Street and North Point Street. The OCS provides overhead electrical energy for the existing SFMTA, or Muni, operated trolley buses, and the replacement OCS would serve the proposed BRT vehicles.

PROJECT PURPOSE AND NEED

The Van Ness Avenue BRT Project is intended to improve the safety and operational efficiency of Van Ness Avenue to:

- Significantly improve transit reliability, speed, connectivity, and comfort.
- Improve pedestrian comfort, amenities, and safety.
- Enhance the urban design and identity of Van Ness Avenue.
- Create a more livable and attractive street for residential, commercial, and other activities.
- Accommodate safe multimodal circulation and access within the corridor.
- Existing transit services in the corridor, two Muni transit lines (49 and 47) and three Golden Gate regional bus routes, suffer from poor performance in terms of speed and reliability. A key need for transit service on Van Ness Avenue is to close the performance gap, in ridership and in travel time, between transit and automobile travel. Attainment of these transit improvement objectives must be balanced with the need to accommodate mixed traffic, pedestrian, bicycle and goods circulation, and access within the corridor, as well as maintain on-street parking for loading/unloading and drop-off access.

ENVIRONMENTAL IMPACTS

The Draft EIS/EIR evaluates the environmental effects that would result from each project alternative and the design option. The Draft EIS/EIR identifies measures to avoid, minimize, and mitigate environmental impacts pursuant to NEPA and CEQA. Potentially significant and unavoidable impacts to traffic circulation are identified to occur with implementation of each build alternative. All other environmental effects are considered less than significant or less than significant with incorporation of impact avoidance, minimization, or mitigation measures.

PUBLIC REVIEW AND COMMENT PERIOD

The Draft EIS/EIR is being made available to the public for a 45-day comment period ending on December 19, 2011. During this review period, the project team is soliciting further public and agency input on the findings of the environmental impact analysis and alternatives analysis, including input on the selection of a Locally Preferred Alternative (LPA). Once input has been gathered from all of the parties, including comments received on the Draft EIS/EIR, SFCTA and SFMTA will propose an LPA in an LPA Report. The LPA Report will be presented to the SFCTA and SFMTA Boards for adoption before completion of the Final EIS/EIR.

Agencies and members of the public may submit comments on the Draft EIS/EIR and project alternatives via e-mail or letter to:

Van Ness BRT EIS/EIR
Attn: Ms. Rachel Hiatt
San Francisco County Transportation Authority
100 Van Ness Avenue, 26th Floor
San Francisco, CA 94102
vannessbrt@sfcta.org

For a list of upcoming events, visit the project Web site at www.vannessbrt.org. Comments may also be given verbally to the court reporter at the public hearing or via email during the webinar, which will be held at the following times and locations:

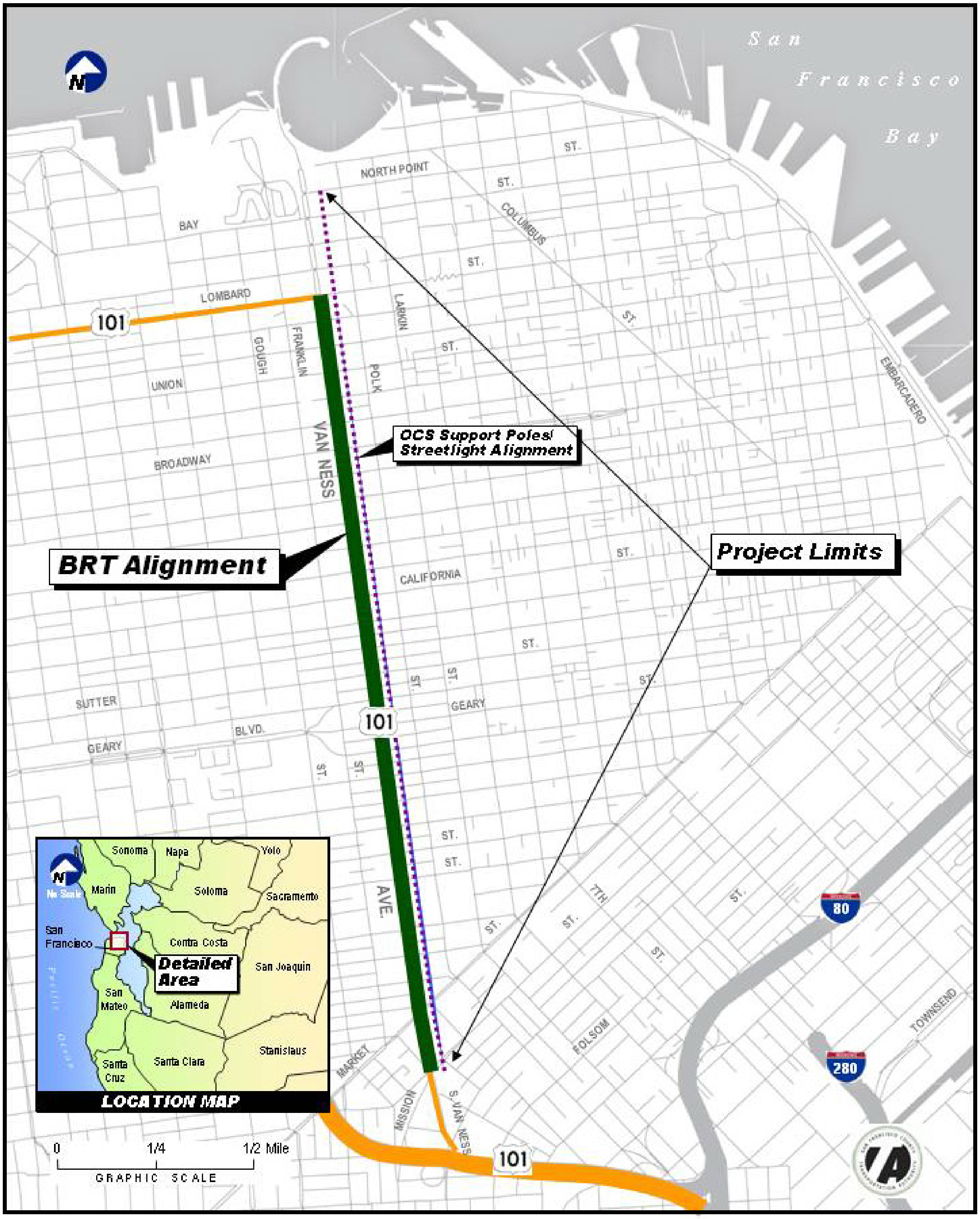
- Public Hearing on November 30, 2011, Holiday Inn-Golden Gateway, 1500 Van Ness Avenue.
- Webinar on December 5, 2011, www.vannessbrt.org.

Buildings used for the public hearings are accessible to persons with disabilities. Any individual who requires special accommodations, such as a sign language interpreter, accessible seating, or documentation in alternative formats, is requested to contact Ms. Rachel Hiatt at vannessbrt@sfcta.org or (415) 593-1655.

WAYS TO OBTAIN THE DRAFT EIS/EIR

The Draft EIS/EIR is available at www.vannessbrt.org. CDs and hard copies of the Draft EIS/EIR are available at the San Francisco public libraries listed below, and they also may be requested from the Authority at the address shown above:

Main Library Branch 100 Larkin Street	SFMTA Main Office 1 South Van Ness Avenue	Planning Information Center 1660 Mission Street, 1st Floor	Marina Branch Library 1890 Chestnut Street	Golden Gate Valley Branch Library 1651 Union Street


San Francisco Bay
BRT Alignment
OCS Support Poles/ Streetlight Alignment
Project Limits
VAN NESS AVE.
LOMBARD
NORTH POINT
BAY
COLUMBUS
UNION
BROADWAY
CALIFORNIA
SUTTER
GEARY BLVD.
GEARY
FRANKLIN
GOUGH
POLK
LARKIN
EMBARCADERO
MARKET
MISSION
S. VAN NESS
FOLSOM
7TH
TOWNSEND
101
80
280
Sonoma
Napa
Yolo
Marin
Solano
Sacramento
San Francisco
Contra Costa
San Joaquin
Detailed Area
San Mateo
Alameda
Santa Cruz
Santa Clara
Stanislaus
LOCATION MAP
0
1/4
1/2 Mile
GRAPHIC SCALE

Appendix H

List of Preparers

Appendix H List of Preparers

Agency Staff

SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY

Tilly Chang – Deputy Director for Planning

Colin Dental-Post – Transportation Planner

Rachel Hiatt – Senior Transportation Planner

Bob Masys – Administrative Engineer

Stephen Newhouse – Intern

Elizabeth Sall – Deputy Director for Technology Services

Michael Schwartz – Senior Transportation Planner - and Van Ness BRT Staff Lead for Planning and Environmental Review

Bridget Smith – Senior Graphic Designer

Ben Stupka – Principle Transportation Planner

Shari Tavafrashti – Principal Engineer

FEDERAL TRANSIT ADMINISTRATION

Raymond Sukys – Director of Planning and Program Development

Alexander Smith – Community Planner

Debra G. Jones – Environmental Protection Specialist

SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY

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Greg King – Principal Planner

Anne Kochaon – Principal Planner

Liz Koos – Senior Technical Editor

Brynna McNulty – Principal Planner and Deputy Manager for EIS/EIR

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Betty Chau – Outreach Specialist

CHAUDHARY AND ASSOCIATES

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PTV

Jim Dale – Traffic Simulation

HORTSCIENCE

Jim Clark – Vice President

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