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

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.

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

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.

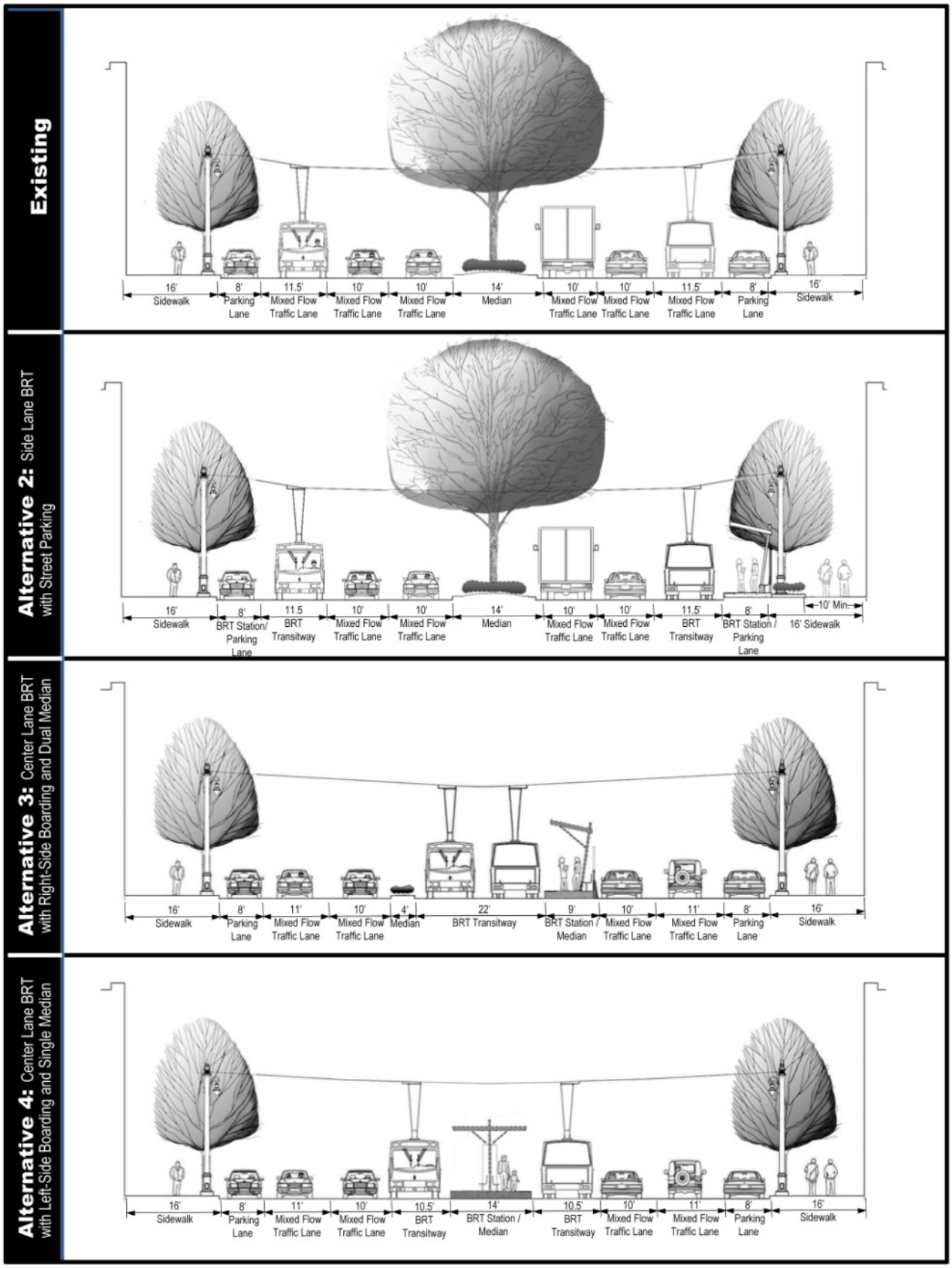

Figure 2-1. Typical Cross Sections of Build Alternatives 2-4

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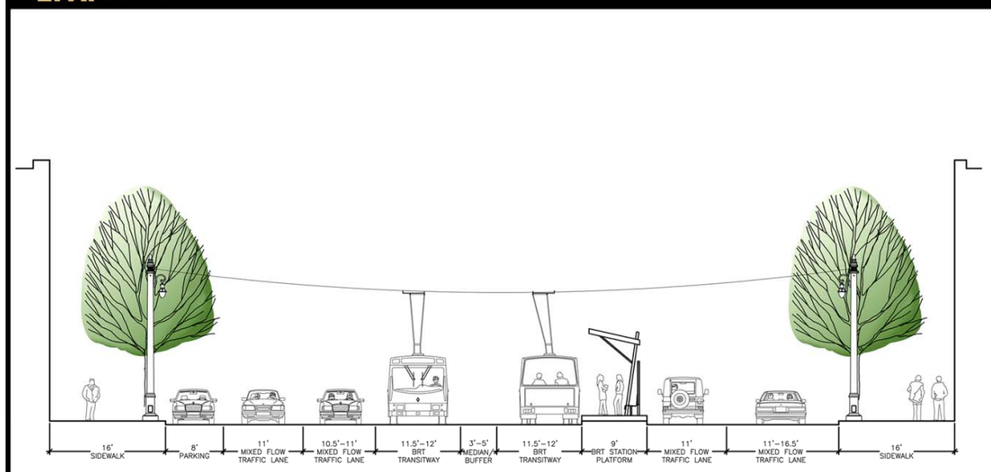
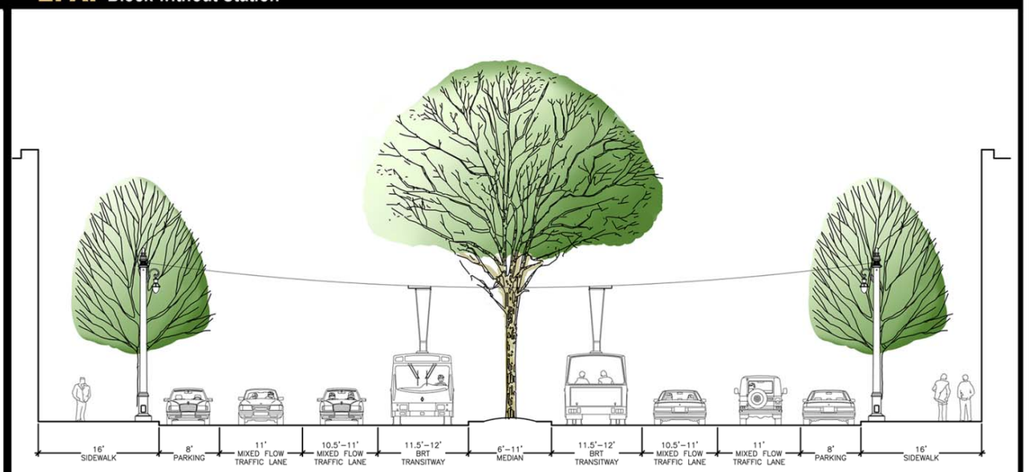
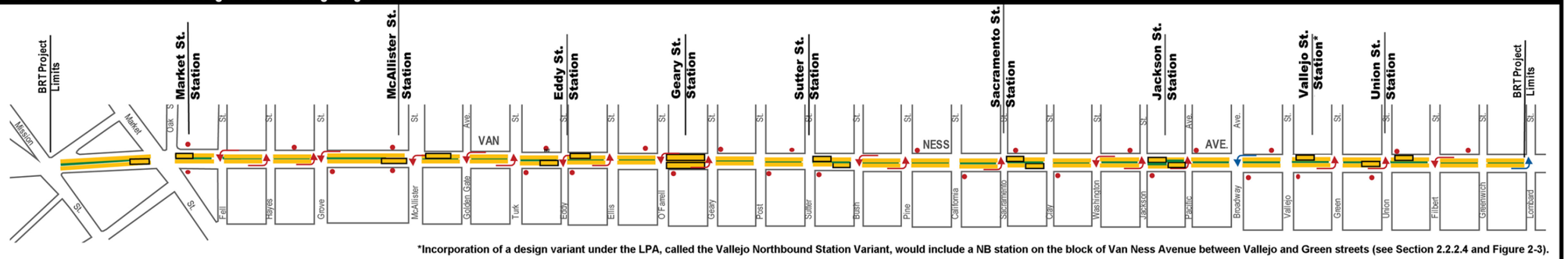
LPA: Block with Station



LPA: Block without Station



LPA: Center Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns



*Incorporation of a design variant under the LPA, called the Vallejo Northbound Station Variant, would include a NB station on the block of Van Ness Avenue between Vallejo and Green streets (see Section 2.2.2.4 and Figure 2-3).

Legend

- Proposed BRT Station
- Proposed BRT Transitway
- Proposed Landscape Median
- Existing Muni Bus Stops
- Left Turn Pocket
- Existing Left Turn Pocket to be Eliminated

Schematic diagram not to scale. See Appendix A for scaled engineering drawings.

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

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Figure 2-2
BRT Station and Left-Turn Pocket Locations for Proposed Build Alternatives

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

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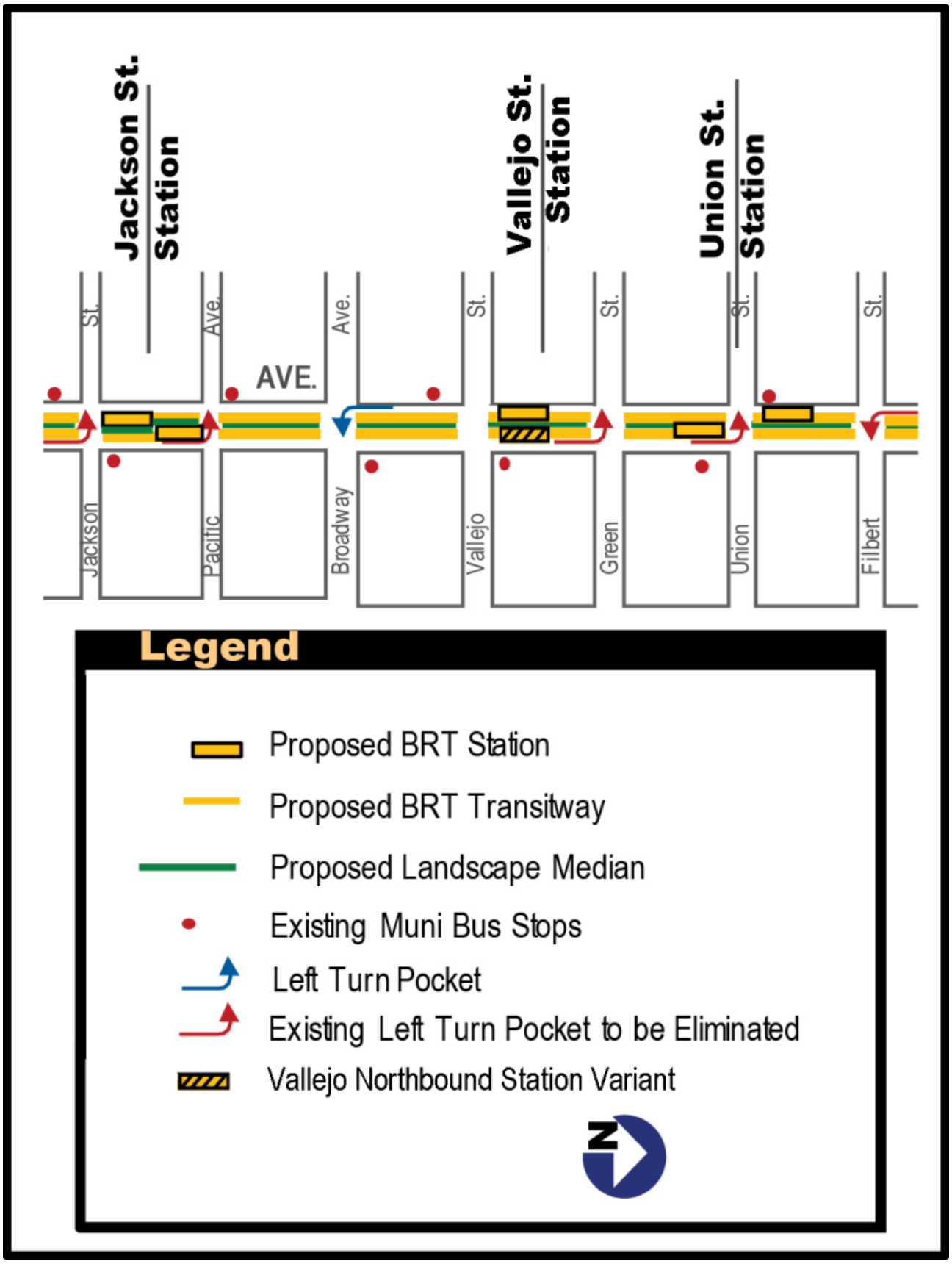

Figure 2-4. Vallejo Northbound Station Variant

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.
- **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

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.

[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 S treet	X							X				X
Clay Street						X				X		
Washington S treet			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.

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, 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.

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.

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.

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

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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