San Francisco County Transportation Authority

Van Ness BRT Environmental Review

Analysis of NMT Impacts

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Executive Summary

Introduction

Bus Rapid Transit (BRT) is proposed along Van Ness Avenue from Lombard Street to Mission Street, spanning 2.2 miles and 29 signalized intersections (known as the "Corridor"). Three build alternatives considered in the Draft EIS/EIR included one side-running alignment (Alternative 2) and two center-lane alignments (Alternatives 3 and 4) as well as a 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 Locally Preferred Alternative (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 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.

Implementation of BRT will affect the non-motorized transportation (NMT) environment – for the Van Ness Corridor. NMT connotes the pedestrian and biking environment. Pedestrian safety and the urban design quality of the street are explicitly noted as principal elements of the purpose and need statement for Van Ness Avenue Bus Rapid Transit (BRT) Project.

This report assesses NMT impacts that would be generated by the build alternatives compared to Alternative 1, the No-Build alternative. 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. NMT impacts are categorized into standard Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) classifications.

Existing Corridor Pedestrian Conditions

Van Ness Avenue is an important pedestrian corridor linking civic uses in the south part of the corridor with commercial/retail uses in the middle to residential uses in the north. Pedestrian crossing activity largely occurs in three areas: (i) Civic Center near City Hall; (ii) Market Street due to numerous transit connections; and (iii) transit cross-corridors such as Geary Boulevard and O'Farrell Street in the middle of the corridor. Key existing pedestrian conditions are as follows:

- **Walking Mode Share** - Pedestrian trips make up 26% of total trips to, from, and within the Van Ness Avenue corridor on a daily basis, exceeding the citywide average of 18%. Since every transit trip begins and ends as a pedestrian trip, altogether up to 46% of trips to, from, or within the corridor include a walking or bicycling component, indicating

the importance of non-motorized travel in the area along Van Ness Avenue.

- **Crossing Distance across Van Ness Avenue** - Average crossing distance is 90 feet, requiring the crossing of a minimum of six lanes of traffic. The most common crossing distance across Van Ness Avenue is 93 ft, but corner bulbs at many crossings reduce that distance. In addition, wider median refuges at some crossings reduce the distance pedestrians must cross during one light cycle, improving pedestrian safety at those locations.
- **Sidewalk Width** - Sidewalks, at 16 ft on both sides of the street for most of the corridor, exceed the City's standard of 15 ft for a sidewalk along a commercial thoroughfare (source: Better Street Plan, 2010). Sidewalks are usually buffered from traffic by parking and/or landscaping.
- **Pedestrian Signals** - Eighteen of the 29 signalized intersections are equipped with pedestrian countdown signals for at least one crossing. At the 11 crossings without a pedestrian signal, pedestrians can be caught mid-crossing when the light turns yellow with as little as 4 seconds to reach a curb or refuge – indicating the strong need for pedestrian signals at these crossings. Currently, five intersections are equipped with Accessible Pedestrian Signals (APS), which use non-visual cues to indicate when safe crossings can be made.
- **Pedestrian Timings** - Pedestrian signal timing is slightly worse than City and national standards for crossing speeds at all but one intersection with a pedestrian signal, and at 40% of intersections without a pedestrian signal.
- **Pedestrian Delay** - Pedestrians experience twice as much delay at intersections than do vehicle occupants, especially waiting to cross Van Ness Avenue. Pedestrian delay crossing Van Ness Avenue rates a Level of Service (LOS) D on average based on delay thresholds from the Transportation Research Board's 2000 Highway Capacity Manual (HCM). Delay is worst at the Mission and South Van Ness intersection, which rates a LOS E with 40 to 60 seconds of average delay and a high likelihood of noncompliance with signals.
- **Crosswalk Density** - Pedestrians have sufficient maneuvering space in crosswalks, even at the busiest crossings.
- **Major Collision Locations** - Major collision locations coincide with heavy pedestrian volumes at Market Street, in the Civic Center area, and major transit cross-corridors. Of intersections where pedestrian counts were conducted, the Broadway, Geary, and O'Farrell intersections had the highest rate of collisions per peak hour crossing, indicating the highest risk.
- **Universal Design Principles** - Sidewalks along Van Ness Avenue generally meet Universal Design Principles of equitable access for all users, but street crossings are less accessible and have lower tolerance for

error due to long crossings lengths, few Accessible Pedestrian Signals (APS), and short crossing times at some intersections.[1] Bus stops are easily accessible physically but do not provide information in a variety of formats.

Existing Corridor Bicycle Conditions

Van Ness Avenue is not a popular cycling route due to heavy vehicle volumes and the absence of a bicycle lane. Bicycle travel also conflicts with bus movements in the right hand lane. The bicycle facility in the corridor vicinity is a Class II/III dedicated facility on Polk Street, which runs parallel to Van Ness Avenue one block east. This facility includes segments of dedicated bicycle lanes (between Market and Post as well as between Union and Lombard, respectively), as well as segments where vehicles and cyclists must share travel lanes (from Union to Post).

Bicycle-related collisions are much less common than pedestrian-related ones, due to the lower volume of bicycle trips on the corridor. Bicycle-related collisions have typically occurred in the southern end of the corridor between Mission Street and Civic Center, an area where several designated bicycle routes cross Van Ness Avenue.

Van Ness Avenue has some U-shaped bicycle parking facilities, and field surveys indicate informal use of trees, posts, and news racks for bike parking.

Alternatives Definition

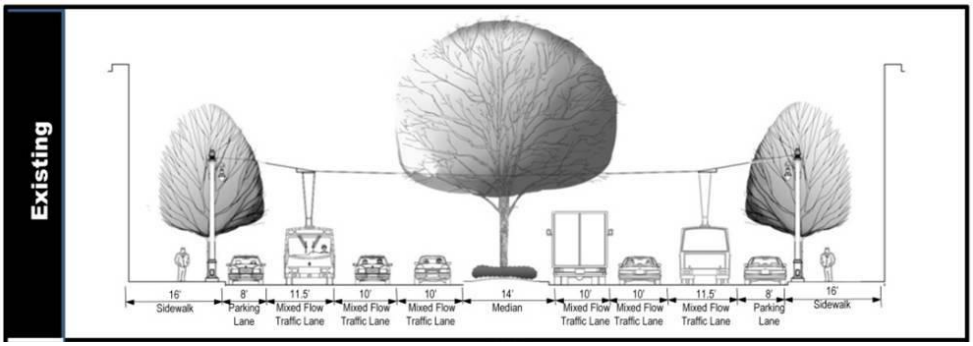
One No Build alternative, three build alternatives (considered in the Draft EIS/EIR), and the LPA are proposed for consideration. Alternative 1, the No-Build alternative, would not include a BRT services and instead assumes the existing roadway and transit services in the corridor would continue and be supplemented by funded improvement projects planned within the near-term horizon year of 2015. The three build alternatives propose BRT operating along a dedicated transit lane, or transitway, along the corridor either in the side lane adjacent to curbside parking (Alternative 2) or in the center lanes with either dual right-side loading platforms (Alternative 3) or with a single, center left-side loading platform (Alternative 4). A design option is also proposed for alternatives with center lane BRT in which all northbound left turns and all but one southbound left turn (at Broadway Street) would be eliminated (denoted as Alternative 3B and 4B, respectively). The LPA is a center-lane BRT with right-side boarding/single median and limited left turns. A northbound station at Vallejo Street is also included as a design variant and referred to as the Vallejo Northbound Station Variant.

Alternatives are briefly defined in the table and shown in the figures below:

[1] The Universal Design Principle of "tolerance for error" refers to the capacity for the design of a facility to minimize hazards and the adverse consequences of accidental or unintended actions.

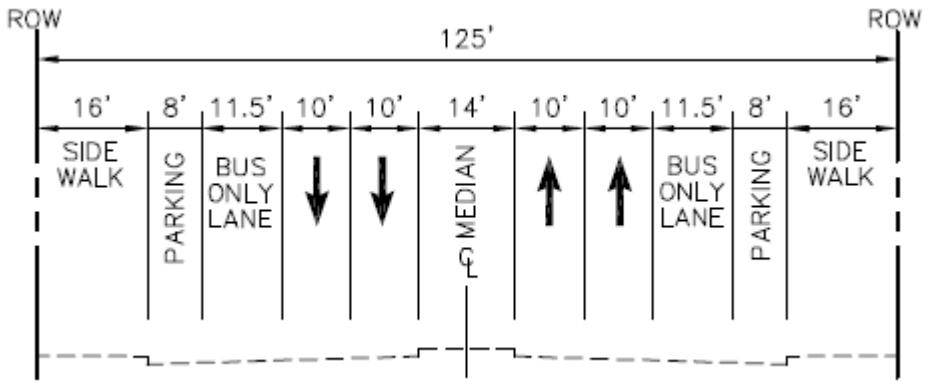
Table ES-1 – Definition of Alternatives

Alter-native	BRT Operations/ Transit Lane Location	Typical Van Ness Street Configuration (from West Curb to East Curb)
1	No BRT or transit lane proposed	West curb, SB curbside parking lane, three SB traffic lanes, the center median, three NB traffic lanes, NB parking lane, and east curb
2	BRT operates in side lanes adjacent to parallel parking	West curb, SB parking lane, SB BRT lane, two SB traffic lanes, center median, two NB traffic lanes, NB BRT lane, NB parking lane, and east curb
3	BRT operates in center lanes separated from mixed flow traffic by dual medians on the outside of the BRT lanes	West curb, SB parking lane, two SB traffic lanes, SB median/platform, SB BRT lane, NB BRT lane, NB median/platform, two NB traffic lanes, NB parking lane, and east curb
3B	Same as 3, except left turn pockets eliminated except at Broadway (SB)	Same as 3
4	BRT operates in center lanes with left side platforms	West curb, SB parking lane, two SB traffic lanes, SB BRT lane, center median (including platforms), NB BRT lane, two NB traffic lanes, NB parking lane, and east curb
4B	Same as 4, except left turn pockets eliminated except at Broadway (SB)	Same as 4
LPA	BRT operates in center lanes alongside the median; at station locations, the BRT has right-side loading.	Block without Station: Same as Alt. 4 Block with Station: Similar to Alt. 3, except a narrow stripped buffer separates the two bus lanes. A stripped buffer also separates the opposite bus lane (i.e., the one without a station at that location) from general traffic lanes.
LPA Vallejo NB Station Variant	Same as LPA	Block without Station: Same as LPA Block with Station: Same as LPA



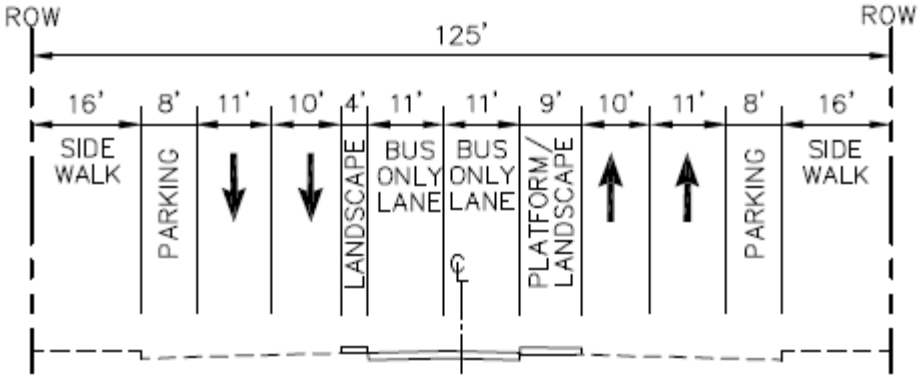
Source: SFCTA, 2010.

Figure ES-1 Typical Van Ness Cross-Section: Alternative 1 (No Build)



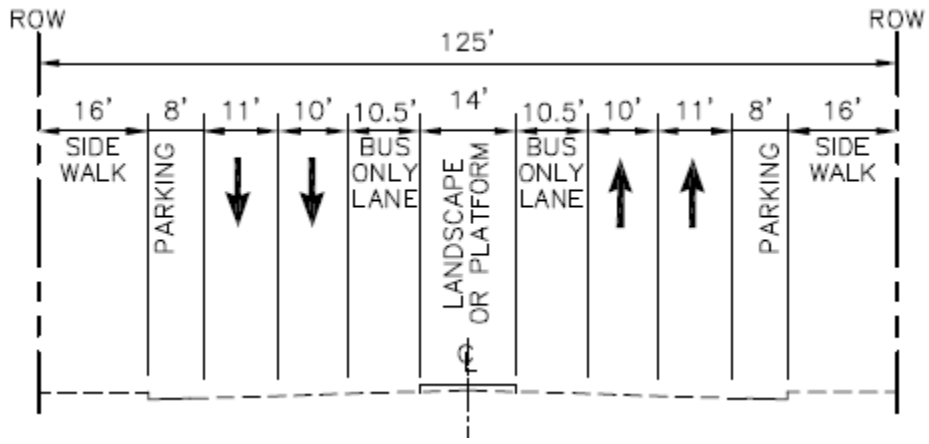
Source: SFCTA, 2010.

Figure ES-2 Typical Van Ness Cross-Section: Alternative 2



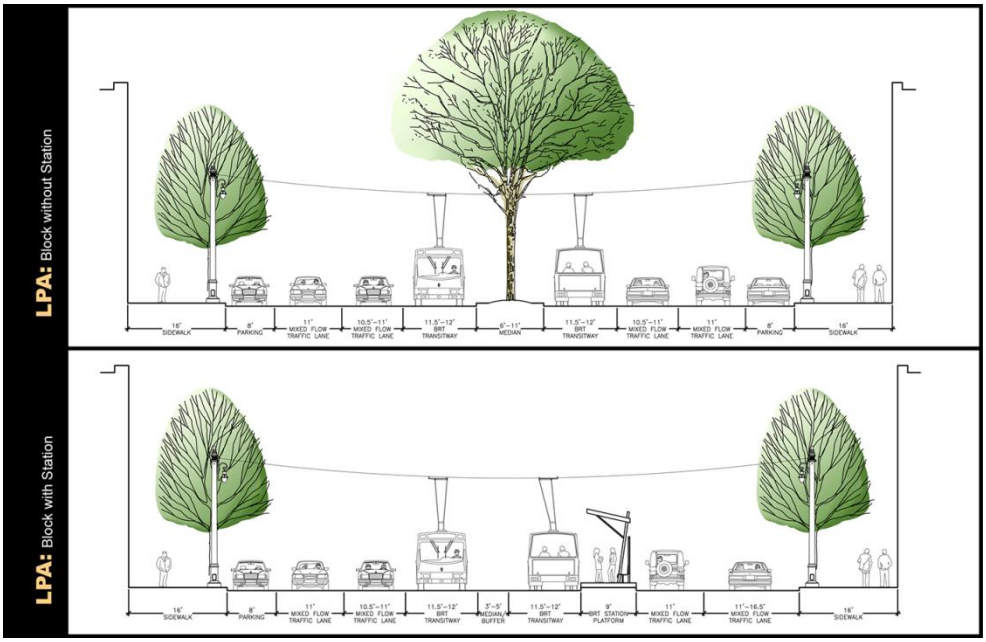
Source: SFCTA, 2010.

Figure ES-3 – Typical Van Ness Cross-Section: Alternative 3



Source: SFCTA, 2010.

Figure ES-4 - Typical Van Ness Cross-Section: Alternative 4



Source: SFCTA, 2012.

Figure ES-5 – Typical Van Ness Cross-Section: LPA (Blocks with and without Stations)

Other key geometric characteristics of the alternatives are defined below:

Table ES-2 – Summary of Key Geometric Characteristics of the No-Build (Alternative 1) and Build Alternatives

Alter-native	Avg. Curb-to-Curb Crossing Distance (ft)	Avg. Median Refuge Width (ft) *	Total Corner Bulbs	# of Intersections with Accessible Pedestrian Signals (APS)
1	91.1	9.0	29	N/A **
2	86.4	11.8	73	29
3	89.5	6.0	51	29
3B	88.7	6.4	59	29
4	88.8	12.8	59	29
4B	87.6	13.4	70	29
LPA	89.4	9.4	64	29
LPA Vallejo NB Station Variant	89.4	9.6	64	29

Source: SFCTA, 2010.

Notes:
* The average median refuge width for Alternatives 3 and 3B would include both the NB and SB medians.
** APS is currently installed at 5 intersections. By 2015, APS would likely be installed at some additional signalized intersections in the project corridor as part of SFgo for the No-Build alternative.

The following elements would be common to all build alternatives:

- Crosswalk width at a particular corridor location (for crosswalks across Van Ness as well as side streets);
- Sidewalk width along the corridor;
- Side street crossing distance at a particular corridor location;
- Implementation of the Polk Street Contraflow Bicycle Lane; and
- Implementation of the North Point Street Bicycle Lane.

Impacts Analysis Methodology

The impact analysis for non-motorized transportation covers pedestrians and bicyclists. The impact analysis compares each build alternative relative to the No-Build (Alternative 1).

A build alternative is considered to have an impact on pedestrians or bicyclists if it performs worse than Alternative 1 in terms of crossing safety, travel safety along Van Ness Avenue, or pedestrian accessibility. In some cases, a build alternative may improve conditions compared to Alternative 1, in which case a beneficial impact is identified. If a build alternative performs the same as Alternative 1, it is considered to have no impact. In summary, NMT impacts are categorized into standard Environmental Impact Report/Environmental Impact Statement (EIR/EIS) classifications:

- Beneficial impact (alternative will improve conditions)

- No impact (no change or difference from Alternative 1)
- Less than significant impact (no mitigation required)
- Potentially significant impact (mitigation measures will reduce to less than significant)
- Significant and unavoidable impact (remains significant after mitigation)

For the pedestrian realm, crossing safety characteristics include crossing distance, crossing speed, pedestrian delay, presence of median nose cones, presence of corner bulbs, provision of pedestrian signals, pedestrian crowding, and volume of vehicle right turns. Standards exist for crossing speed, pedestrian delay, and pedestrian crowding as follows:

- Crossing time is a function of crossing distance and the time a signal allows for the crossing. The analysis compares how fast pedestrians including wheelchair users would need to cross a street against federal (the Federal Highway Association's Manual on Uniform Traffic Control Devices or MUTCD) and City standards.
- Pedestrian delay measures the time pedestrians must wait at a signal to cross. A long wait time encourages non-compliance with the pedestrian signal and raises the risk of a collision with a vehicle. The analysis compares the computed average pedestrian delay with the Transportation Research Board's Highway Capacity Manual (HCM) thresholds for Level of Service (LOS).
- Pedestrian crowding compares crosswalk dimensions with pedestrian volume. This analysis also uses HCM standards.

The City does not have standards for other characteristics influencing crossing safety, but has nevertheless included them to qualitatively inform the impact analysis.

Along Van Ness Avenue, sidewalk safety is influenced by many factors. Standards for how these characteristics affect pedestrians do not generally exist, so this analysis is qualitative.

Pedestrian accessibility is informed by the Universal Design evaluation performed for the existing condition. The seven principles of Universal Design: equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use.

The bicycle impact analysis considers the width of the right-most travel lane adjacent to parking or the curb, speed of adjacent traffic (in the right-most travel lane and other travel lanes), and volume of vehicle right turns. Speed of adjacent traffic and right turn volume are also used in the discussion of pedestrian impacts.

In summary, the Authority has evaluated the alternatives against applicable guidance or standards. For some characteristics defined above, an examination of environmental documents written recently about similar transit projects yielded a

general lack of measures, standards, or thresholds to determine impact.[2] For these characteristics the Authority has exercised professional judgement to evaluate impacts.

NMT Impact Summary

The table below summarizes the NMT impacts as described in the preceding sections, and noted with the following convention:

- Beneficial impacts are noted with a "B" and are shaded green.
- Alternatives with no impacts are noted with "NI" and are not shaded.
- Less than significant adverse impacts are noted with "LTS" and are shaded yellow.
- Potentially significant adverse impacts prior to any mitigation are noted with "PSI" and are shaded pink.

No additional types of impacts were identified in this analysis.

[2] Referenced projects include: (i) San Francisco Metropolitan Transportation Authority (SFMTA)'s Third Street Light Rail Project; (ii) Alameda-Contra Costa Transit District (AC Transit)'s East Bay Bus Rapid Transit Project; (iii) Los Angeles Metropolitan Transportation Authority (LAMTA)'s Wilshire Bus Rapid Transit Project; (iv) LAMTA's Eastside Corridor (Gold Line); and (v) LAMTA's Exposition Corridor Transit Project (Expo Line).

Table ES-3 Summary Table of Impacts

Measure	Alt. 2	Alt. 3	Alt. 3B	Alt. 4	Alt. 4B	LPA	LPA Vallejo NB Station Variant
Pedestrian Crossing Safety							
Crossing Distance including Median Refuges	B	LTS	LTS	B	B	B	B
Crossing Speed – Side Street	NI	LTS	LTS	LTS	LTS	LTS	LTS
Crossing Speed – Van Ness Avenue	B	B	B	B	B	B	B
Nose Cone Provision	B	B	B	B	B	B	B
Corner Bulbs	B	B	B	B	B	B	B
Pedestrian Signals	B	B	B	B	B	B	B
Pedestrian Delay	LTS	LTS	B	LTS	B	B	B
Pedestrian Crowding	NI	NI	NI	NI	NI	NI	NI
Vehicle Right Turn Volume	B	B	B	B	B	B	B
Sidewalk Safety Along Van Ness Avenue							
Sidewalk Safety	B	B	B	B	B	B	B
Pedestrian Accessibility							
Equitable Use	B	B	B	B	B	B	B
Flexibility in Use	B	B	B	B	B	B	B
Simple and Intuitive Use	NI	LTS	LTS	LTS	LTS	LTS	LTS
Perceptible Information	B	LTS	LTS	LTS	LTS	LTS	LTS
Tolerance for Error	B	LTS	LTS	B	B	LTS	LTS
Low Physical Effort	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Size and Space for Approach and Use	LTS	LTS	LTS	B	B	LTS	LTS
Bicycle Safety							
Width of Travel Lane Used by Cyclists	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Vehicle Right Turn Volume	B	B	B	B	B	B	B
Speed of Adjacent Traffic	NI	NI	NI	NI	NI	NI	NI
Bicycle Volumes	NI	NI	NI	NI	NI	NI	NI
Bicycle Safety and Comfort	NI	NI	NI	NI	NI	NI	NI
Bicycle Delay	NI	NI	NI	NI	NI	NI	NI

In conclusion, although geometric design characteristics of the corridor, including crossing distance, median widths, and corner bulb provision differ among the alternatives and the No-Build (Alternative 1), these changes for the most part would not generate significant impacts on pedestrians or bicyclists when comparing build alternatives to the No-Build. In fact, the build alternatives would enhance the existing pedestrian and walking environment by:

- Shortening crossing distances with corner bulbs;
- Enhancing the median waiting experience by providing median nose cones at each intersection leg; and

- Providing a safer crossing experience by implementing Accessible Pedestrian Signals (APS) at all intersections;
- Decreasing the walking speed required to cross during the full walk split time; and
- Reducing the volume of right turns at particular locations.

However, some pedestrian and bicycle impacts would be generated from the build alternatives. For instance, the amount of pedestrian delay, and the width of the travel lane used by bicyclists would perform worse from a pedestrian and bicyclist safety and comfort perspective than the No-Build (Alternative 1). These impacts, however, would be less than significant. Therefore, the potential impact categories investigated would result in a less than significant impact (LTS), no impact (NI), or beneficial impact (B).

Since there would be no potentially significant impacts, no mitigation measures are recommended.

1 Introduction

Bus Rapid Transit (BRT) is proposed along Van Ness Avenue from Lombard Street to Mission Street, spanning 2.2 miles and 29 signalized intersections (known as the "Corridor"). Three build alternatives considered in the Draft EIS/EIR included one side-running alignment (Alternative 2) and two center-lane alignments (Alternatives 3 and 4) as well as a 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 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.

Implementation of BRT will affect the non-motorized transportation (NMT) environment – for the Van Ness Corridor. NMT connotes the pedestrian and biking environment. Pedestrian safety and the urban design quality of the street are explicitly noted as principal elements of the purpose and need statement for Van Ness Avenue Bus Rapid Transit (BRT) Project.

This report assesses NMT impacts that would be generated by the build alternatives compared to Alternative 1, the No-Build alternative. 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. However, NMT conditions would be improved with curb ramps and countdown signals. NMT impacts are categorized into standard Environmental Impact Report/Environmental Impact Statement (EIR/EIS) classifications.

- Beneficial impact (alternative will improve conditions)
- No impact (no change or difference from Alternative 1)
- Less than significant impact (no mitigation required)
- Potentially significant impact (mitigation measures will be reduced to less than significant)
- Significant and unavoidable impact (remains significant after mitigation)

If needed, mitigations are recommended.

This report is organized into seven sections:

- Relevant Plans and Policies
- Existing Corridor Non-motorized Travel Demand

- Existing Corridor Pedestrian Conditions
- Existing Corridor Bicycle Conditions
- Definition of Alternatives
- NMT Impacts Analysis of Build Alternatives vs. No Build (Alternative 1)
- NMT Impacts Summary

2 Relevant Plans and Policies

Several citywide and project plans are underway detailing efforts to improve the pedestrian and bicycle environment along Van Ness Avenue. These plans are summarized below.

2.1 San Francisco Better Streets Plan

The Better Streets Plan provides a blueprint for the future of San Francisco's pedestrian environment. This citywide policy document describes the City's vision, provides design guidelines, and identifies next steps toward creating an improved pedestrian realm in San Francisco. The Plan follows from the Better Streets Policy, which describes the varied roles that the city's streets should play.

Major themes and ideas include:

- Distinctive, unified streetscape design;
- Space for public life;
- Enhanced pedestrian safety;
- Improved street ecology;
- Universal design;
- Integrating pedestrians with transit;
- Creative use of parking lanes;
- Traffic calming to reduce speeding and enhance pedestrian safety;
- Pedestrian-priority designs; and
- Extensive greening of street space.

Source: San Francisco Better Streets Plan, Final Draft Release Packet, July 2010.

Figure 1 - SF Better Streets Plan, Examples of Desired Elements

The Better Streets Plan sets broad guidelines, but does not seek to prioritize or create a project list of street improvement projects. It also does not give specific engineering guidance on a number of technical topics.

The plan identifies a variety of next steps to implement the vision of better streets, including:

- Building demonstration (pilot) projects;
- Improving the coordination and delivery of streets;
- Developing a framework for implementation and prioritization of street improvement projects; and
- Developing additional technical guidance on a number of topics including: the urban forest, stormwater management, street lighting, street furniture, and roadway design.

2.2 SFgo

The SFgo program led by the San Francisco Municipal Transportation Authority (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 pre-emption;
- Disseminate real-time traveler and parking information;
- Manage special events;
- Enhance operations and maintenance.

The SFgo Program is comprised of many projects that would be implemented throughout the City, including the Van Ness Avenue corridor. The following signal infrastructure elements of SFgo are planned for implementation in the Van Ness corridor by 2015:

- **Traffic Signal Replacement** - Existing traffic signal heads and poles will upgraded to mast armed poles (arched to hang over traffic lanes) and new signal heads at all intersections along Van Ness Avenue.
- **Pedestrian Countdown Signals** - As part of SFgo, pedestrian countdown signals would 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 right of way.
- **Accessible Pedestrian Signals (APS)** – 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. By 2015, APS would likely be installed at some additional signalized intersections in the project corridor as part of SFgo.

- **Curb Ramp Upgrades** - SFgo would install curb ramps that meet current City standards and Americans with Disabilities Act (ADA) requirements at all intersections along Van Ness Avenue to provide access by people in wheelchairs as well as providing easier travel for those with strollers, carts, and the like.

2.3 San Francisco Bicycle Plan

The San Francisco Bicycle Plan includes the policies and components of an enhanced bicycle program. The goals and objectives reflect the city's commitment to expanding the role and importance of bicycle transportation in San Francisco. The Plan presents a framework for the city to provide a safe and attractive environment needed to promote bicycling. The Plan includes 81 recommended action items to guide the city in becoming more bicycle-friendly.

The Bicycle Plan includes 60 near-term bicycle network improvement projects. Design options have been developed for these, with construction anticipated within five years of completing an environmental review and Plan approval. Long-term bicycle route improvement projects have also been identified along the existing network, or are proposed as potential additions to the network.

Specific plan goals include:

- Making bicycling an integral part of daily life in San Francisco;
- Increasing safe bicycle use;
- Refining and expanding the existing bicycle route network;
- Ensuring plentiful, high quality bicycle parking;
- Expanding bicycle access to transit and bridges;
- Educating the public about bicycle safety;
- Improving bicycle safety through targeted enforcement;
- Promoting and encouraging safe bicycling;
- Adopting bicycle-friendly practices and policies; and
- Prioritizing and increasing bicycle funding.

Specific to the Van Ness Corridor, two projects have been identified:

- Extending bicycle lanes on Polk Street between Market and Grove Streets; and
- Providing bicycle lanes on North Point Street between The Embarcadero and Van Ness Avenue.

2.4 Van Ness Avenue Area Plan

The City adopted the Van Ness Avenue Area Plan in 1986 and created a Van Ness Avenue Special Use District of the Planning Code in 1988 to implement the plan. The plan is intended to promote Van Ness Avenue as the city's most prominent north-south boulevard, lined with high-density mixed-use development and including design features that support a transit-served pedestrian promenade. The Van Ness Avenue Area Plan identifies the following relevant streetscape objectives and corresponding policies:

- Objective 8. Create an attractive street and sidewalk space that contributes to the transformation of Van Ness Avenue into a residential boulevard.
    - Policies 8.1 through 8.4 support landscaping and tree plantings as well as maintaining existing sidewalk space abutting major renovation or new development projects.
    - Policies 8.5 through 8.7 support maintaining existing sidewalk widths and providing uniform aesthetic sidewalk treatments.
    - Policies 8.8 through 8.10 support a uniform architectural style in the design of streetlights and poles, clustering of newspaper racks at specific corner locations, and provision of attractive street furniture at convenient locations along Van Ness Avenue.

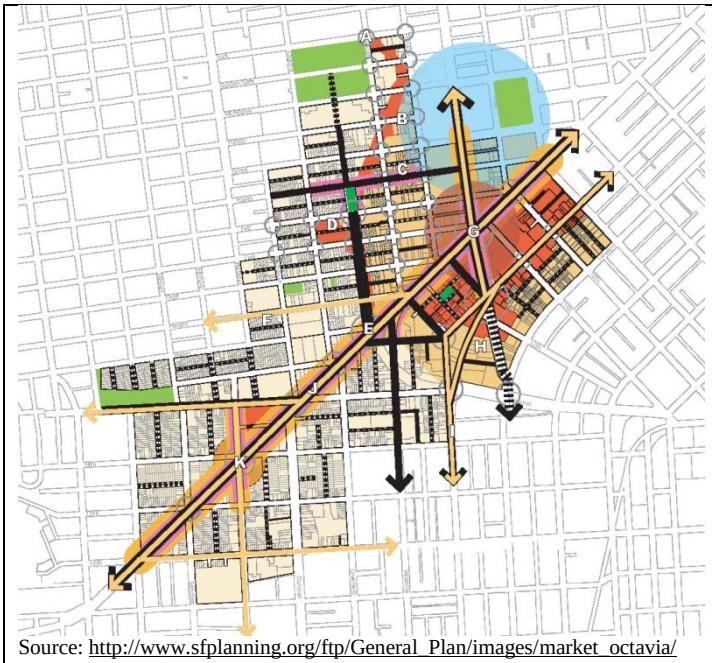
The Van Ness Avenue Area Plan identifies the following relevant transportation objectives and corresponding policies:

- Objective 9. Provide safe and efficient movement among all users on Van Ness Avenue.
    - Policies 9.1 through 9.4 support transit service, including reducing conflicts between transit vehicles and other moving and parked vehicles.
    - Policies 9.5 through 9.8 support auto circulation, including provision of parking access from minor east-west streets and prohibitions on new parking access on Van Ness Avenue.
    - Policies 9.10 through 9.12 include measures to enhance pedestrian circulation.
    - Policy 9.13 discourages freight loading facilities on Van Ness Avenue.

2.5 Market and Octavia Area Plan

The Market and Octavia Area Plan guides the future development of the Market and Octavia area. The area plan focuses on improving and creating new opportunities for non-motorized travel through infill redevelopment, dense new housing development, and civic and open spaces that provide attractive outdoor shared places.

The plan specifically promotes high density housing near transit to encourage more pedestrian and bicycle traffic.



Source: http://www.sfplanning.org/ftp/General_Plan/images/market_octavia/MO_Figure2.pdf

Figure 2 - Market and Octavia Area Plan Project Area

2.6 San Francisco Countywide Transportation Plan

The San Francisco Countywide Transportation Plan, adopted by the Transportation Authority Board in July, 2004, is the blueprint for San Francisco's transportation system development and investment over the next 30 years. It examines the state of San Francisco's current transportation infrastructure while considering future needs and opportunities for improving the system. Issues the plan considers include:

- System performance;
- Connectivity, safety, and amenities;
- Strategies for transportation development; and
- Prioritizing investments that serve key land use goals.

The plan forecasts that the share of trips made by transit in the Van Ness Avenue corridor will decline in the future unless measures are taken to increase its competitiveness relative to the car. The plan identifies the Van Ness BRT project study area as a major gap in the City's rapid transit network. The plan goes on to further identify BRT implementation and improvements on Van Ness as a priority for enhancing the regional transportation network.

2.7 Tenderloin – Little Saigon Neighborhood Transportation Study

The Tenderloin – Little Saigon Neighborhood Transportation Study, led by the San Francisco County Transportation Authority (SFCTA), identifies the community's high priority transportation needs and develops conceptual designs and strategies for transportation improvements to the Tenderloin and Little Saigon neighborhoods.

The community's top priorities for improvement are divided into four categories: pedestrian safety, slower traffic, transit reliability and access, and streetscape. The SFCTA has identified specific projects based on priorities developed from the study. While none of the projects are along Van Ness Avenue, many projects are along cross streets that bisect Van Ness Avenue including McAllister, Eddy and Ellis Streets.

3 Corridor NMT Demand

3.1 Corridor-Wide Non-Motorized Travel

Walking and bicycling are important modes of travel in San Francisco for all kinds of trips. On a daily basis, pedestrian and bicycle trips make up 18% of all trips in the City – and this doesn't count the pedestrian trips that start or end a transit trip.[3]

Van Ness Avenue between Lombard and Mission Streets has dense development, mixed uses, short block lengths, gentle grades, short distances between destinations, and frequent transit service, both along Van Ness Avenue and on connecting cross streets (such as Market, Geary, O'Farrell, California, and Stockton Streets). These factors combine to generate significant pedestrian traffic throughout the corridor.

Pedestrian and bicycle trips represent 26% of all trips made to, from, and within the Van Ness Avenue corridor. This rate exceeds the 18% rate for the city as a whole. Neither of these figures accounts for walking to reach transit, which is the primary mode for 20% of trips in the corridor and 17% citywide. Altogether, up to 46% of trips to, from, or within the corridor include a walking or bicycling component, indicating the importance of non-motorized travel in the area along Van Ness Avenue.

3.2 Key Pedestrian Activity Nodes

Table 1 presents pedestrian activity at select intersections along Van Ness Avenue during the PM peak hour. The highest volumes of pedestrian crossings are in the Civic Center area from Grove Street to Market Street. Moderate activity is observed between California and O'Farrell Streets, while lower activity intersections are located north of Sacramento Street, coinciding with largely residential areas.

Figure 3 - The Civic Center Area Sees Relatively High Volumes of Pedestrians Crossing Van Ness Avenue

[3] Source: SF-CHAMP Travel Demand Forecasting Model

Table 1 - Hourly Pedestrian Crossing Volumes at Various Locations on Van Ness Avenue

Intersection	Date/Time Period of Survey			Hourly Pedestrian Volume
	Year	Month	Period	
Union	2008	6	PM Peak Hour	440
Broadway	2008	6	PM Peak Hour	282
Sacramento	2008	6	PM Peak Hour	644
California	2008	6	PM Peak Hour	918
Geary	2008	6	PM Peak Hour	1,136
O'Farrell	2008	7	PM Peak Hour	1,018
Golden Gate	2007	8	PM Peak Hour	968
Grove	2008	6	PM Peak Hour	1,498
Oak	2008	6	PM Peak Hour	696
Market	2008	7	PM Peak Hour	1,826
Mission	2008	7	PM Peak Hour	842

Source: Volumes from 7/2008 surveys and VISSIM model estimates.

3.3 Bicycle Activity

Relatively few bicyclists use Van Ness Avenue for travel in the corridor. The street is not an attractive route for most cyclists due to high traffic volumes and relatively fast-moving traffic. Although some cyclists choose to use Van Ness Avenue, there is no accurate accounting of the bicycle trip volumes on the street. The San Francisco 2009 Bicycle Count Report does not include any data for Van Ness Avenue locations or intersections.

Figure 4 - High Pedestrian Activity Occurs at Geary Street due to Transfers from Several Bus Lines

Polk Street, which runs parallel to Van Ness Avenue one block east, has a dedicated Class II/III facility. This facility includes segments of dedicated bicycle lanes (between Market and Post as well as between Union and Lombard, respectively), as well as segments where vehicles and cyclists must share travel lanes (from Union to Post). Cyclists tend to avoid Van Ness Avenue and use Polk Street as the primary north-south bike route in the corridor.

4 Existing Corridor Pedestrian Conditions

Existing pedestrian sidewalk and street crossing conditions, as of March 2010, are reviewed in this section.

4.1 Prevailing Sidewalk Conditions

Sidewalk conditions are measured by:

- Sidewalk width
- Buffer from traffic

Along the majority of Van Ness Avenue, the sidewalk is 16 ft wide on both sides of the street. On South Van Ness Avenue between Market and Mission Streets, the sidewalk is 22 ft wide on both sides. According to the Better Streets Plan, Van Ness Avenue sidewalks should be a minimum of 15 ft wide.

Figure 5 – Van Ness Sidewalks Are Typically 16 ft Wide

Effective sidewalk width, however, is sometimes reduced due to various elements such as:

- Street furniture including bicycle racks, trash receptacles, light and sign posts, OCS support poles/streetlights, and mailboxes;
- Landscaping and trees;
- Bus shelters and passenger waiting areas;
- Traffic signal cabinets;
- Parking meters; and
- Advertising panels.

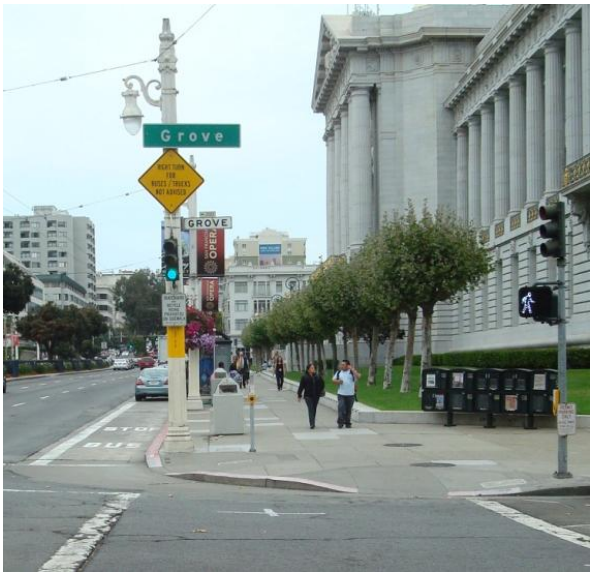


Figure 6 - Curbside Parking, Landscaping, and Street Furniture Can Serve to Buffer Pedestrians from Van Ness Traffic

Curbside parking is permitted on most blocks along Van Ness Avenue and buffers the sidewalk and pedestrians from fast-moving traffic. A buffer, whether landscaping or curbside parking, can

significantly improve the sidewalk environment and the perception of safety and comfort by pedestrians. Nearly all blocks of Van Ness Avenue between Lombard and Mission Streets, in both the northbound (NB) and southbound (SB) directions, permit some degree of curbside parking (with 8 foot wide parking lanes). The only blocks that do not permit curbside parking along their entire length are:

- Fell Street to Hayes Street (NB)
- Hayes Street to Grove Street (NB)
- McAllister Street to Golden Gate Avenue (NB)

Recent Van Ness Avenue streetscape improvements including the Greater Streets Program have enhanced the sidewalk environment by installing new landscaping planters along the sidewalk between Market and McAllister Streets and additional pedestrian-scale lighting, and removing sign clutter. The planters provide additional buffer between pedestrians and traffic, although these also reduce the effective sidewalk width.

4.2 Existing Crossing Conditions

Pedestrian crossing conditions are measured by:

- Crossing distance and speed
- Refuge availability and width
- Crossing visibility, supported by crosswalks, corner bulbs, and refuges
- Delay
- Crowding
- Collision rates

4.2.1 Crossing Distance

The longer the distance needed to cross an intersection, the longer the signal time that is required and the more likely pedestrians cannot complete crossings in one signal cycle. The most common cross section of Van Ness Avenue is 93 ft wide - the average

Figure 7 - Typical Crossing Distance on Van Ness Avenue is 93 ft

crossing distance across Van Ness Avenue is a bit less at 90 ft (the north and south legs of corridor intersections).

Four locations have crossing distances wider than 93 ft across Van Ness Avenue: (i) the south crossing of Van Ness Avenue at Mission Street (over 120 ft); (ii) the north crossing of Van Ness Avenue at Mission Street (over 120 ft); (iii) the south crossing of Van Ness Avenue at Market Street (over 100 ft); and (iv) the north crossing of Van Ness Avenue at Market Street (over 110 ft). The angled configuration of these intersections creates longer than normal crossing distances.

Typical crossing distances of side streets along the corridor (the west and east legs of corridor intersections) is between 38 and 50 ft long. Crossing distance is significantly longer in locations with multiple legs such as the west leg of the Mission Street crossing, which includes both the Duboce and Otis legs. Crossings along the east and west legs at Market Street, Broadway, and Lombard are longer than normal.

Corner bulbs (also known as bulbouts or curb extensions) extend the sidewalk into the intersection and reduce effective curb-to-curb crossing width. Corner bulbs help slower-moving pedestrians finish crossing within one phase of the traffic light cycle.

Figure 8 – Twenty-Nine Corner Bulbs Have Been Installed along Van Ness Avenue

Additionally, corner bulbs increase pedestrian visibility, create a larger pedestrian queuing area, provide additional space for curb ramps (discussed below), produce traffic calming impacts by visually and physically narrowing the street, and provide landscaping opportunities. Corner bulbs, however, may reduce maneuverability for large trucks and buses.

Typical corner bulbs on Van Ness Avenue extend 7 ft into the street and reduce crossing distance to 86 ft at 17 locations (as discussed below). Corner bulbs were first installed at eight intersections in the corridor in September 2000. Two years later, a second phase installed corner bulbs at nine additional intersections.

Table 2 – List of Intersections with Corner Bulbs

Intersection	SB Near Side	SB Far Side	NB Far Side	NB Near Side
Lombard				
Greenwich				
Filbert				
Union				
Green				
Vallejo				
Broadway				
Pacific				
Jackson				
Washington				
Clay	X			X
Sacramento		X		X
California	X			X
Pine				X
Bush	X			X
Sutter	X			X
Post	X			X
Geary			X	X
O'Farrell	X			X
Ellis	X			X
Eddy	X			X
Turk				X
Golden Gate	X			X
McAllister	X			
Grove				X
Hayes	X			
Fell	X	X		
Market				
Totals	12	2	1	14

Source: Van Ness Avenue Topographic Maps, 2009.

4.2.2 Median Refuges and Nose Cones

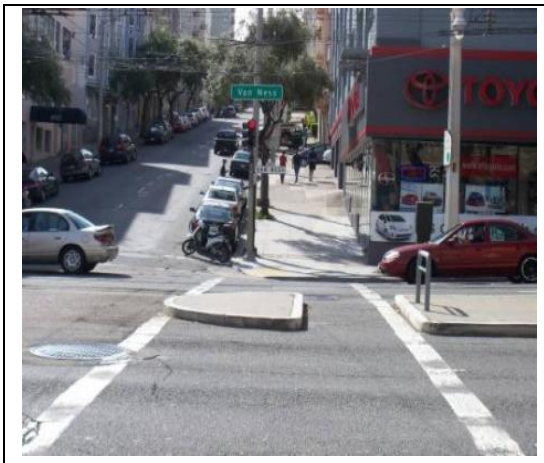


Figure 9 – Nose Cones Provide a Pedestrian and ADA Refuge when Crossing Van Ness Avenue

Median refuges are useful for pedestrians unable to cross Van Ness Avenue within the given cycle time. They provide a physical barrier from traffic, creating a protected space to wait for a pedestrian signal to finish crossing the street. A refuge consists of a median extension or nose cone extending into the crosswalk with ramps or a level cut-through for ADA access. Fourteen Van Ness Avenue intersections, detailed in Table 3, are equipped with at least one nose cone, with three intersections having nose cones for both the north and south crosswalks. Each median refuge is 14 ft wide and located where no left turn pocket exists. All other crossings have a median, ranging in width from 4 ft to 14 ft, which does not extend across the crosswalk. These medians may provide a space for pedestrians to stand, but do not provide the protective nose cone that creates a true refuge.

Table 3 - Intersections with Nose Cones

Intersection	South Leg	North Leg
Hayes		X
McAllister	X	
Golden Gate	X	
Turk		X
Ellis		X
O'Farrell	X	
Geary		X
Post	X	X
Sutter	X	X
Bush	X	
Pine		X
California	X	X
Sacramento		X
Clay	X	
Total	8	9

Source: SFMTA Striping Plans, 3/2004 and Topographic Maps 2009.

4.2.3 Crosswalks

Marked crosswalks are present on all four sides of every signalized intersection along Van Ness Avenue from Mission Street to Lombard Street. Crosswalk width across Van Ness Avenue (the north and south legs of the intersection) vary considerably, from 10 ft at the Fell, Golden Gate, Post, Bush, Pine, and Lombard Street intersections to 22 ft at McAllister Street and 24 ft at Market Street. Typical widths are between 12 and 15 ft across Van Ness Avenue.

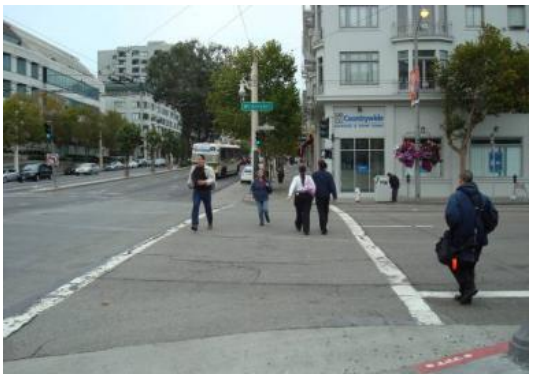


Figure 10 - Standard Crosswalk

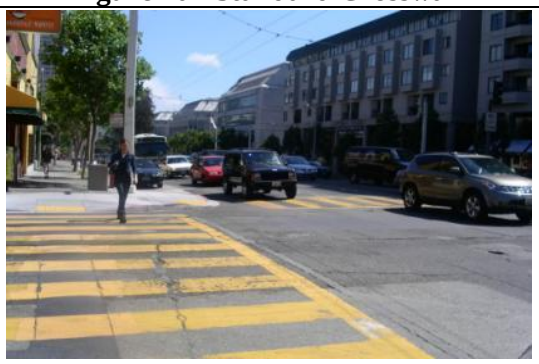


Figure 11 – Ladder Crosswalk

Crosswalks running parallel to Van Ness Avenue (on the west and east legs of the intersection) are on average 16 ft wide, which corresponds with adjoining sidewalk widths.

Two types of crosswalks are used along Van Ness Avenue – traditional parallel line crosswalks and high-visibility ladder crosswalks. Ladder crosswalks are located at Golden Gate, Turk, Pacific, and Broadway; all other intersections employ traditional parallel line crosswalks.

Each street corner along Van Ness Avenue has at least one curb ramp, allowing access by people in wheelchairs as well as providing easier travel for those with strollers, carts, and the like. However, many ramps have not yet been upgraded to current City standards, which include the installation of tactile domes for easy identification by visually impaired pedestrians. Many intersections also have only one ramp, which necessitates more maneuvering of a wheelchair to cross the street, places users closer to moving traffic, and can be disorienting to visually impaired pedestrians. See more under the analysis of Universal Design, below.

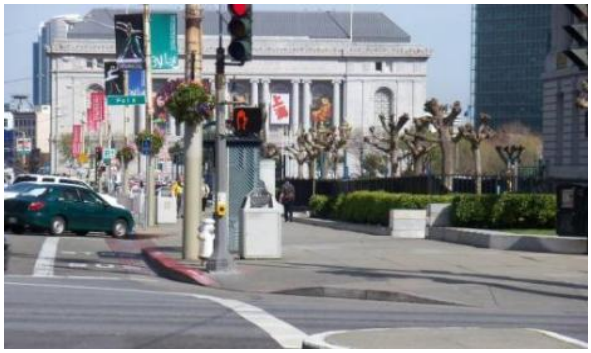


Figure 12 - Curb Ramps Are Provided along the Entire Van Ness Avenue Corridor

Figure 13 – Tactile Domes Are Installed on Some Curb Ramps

4.2.4 Pedestrian Signals

Pedestrian countdown signals, which visually display the remaining seconds to cross the street, improve safety for crossing pedestrians. This is especially important on Van Ness Avenue due to the relatively long crossing distances.

Figure 14 - Eighteen Intersections along Van Ness Avenue Are Equipped with Countdown Signals

As of March 2010, of the 29 signalized intersections along Van Ness Avenue between Lombard and Mission Streets, 15 intersections have pedestrian signals on all crossing legs, 3 have them on some legs, while 11 intersections have no pedestrian signals of any kind. All pedestrian signals on Van Ness Avenue are complemented by countdown signals. At crossings without a pedestrian signal, pedestrians can be caught mid-crossing when the light turns yellow with as little as 4 seconds to reach a curb or refuge – indicating the strong need for pedestrian signals at these crossings.

Intersections with pedestrian signals on at least one leg include:

- Fell Street (lacking on west/east legs of intersection)
- Hayes Street (lacking on west/east legs of intersection)
- Golden Gate Avenue (lacking on west leg of intersection)

Intersections without pedestrian signals on any legs include:

- Eddy Street
- Ellis Street
- Post Street
- Sutter Street
- California Street
- Sacramento Street
- Clay Street
- Vallejo Street
- Green Street
- Filbert Street
- Greenwich Street

Figure 15 - Five Intersections Are Equipped with APS

Under SFgo, plans call for the installation of pedestrian countdown signals on all legs of every intersection in the Van Ness corridor by 2015.

Another type of pedestrian signal is the Accessible Pedestrian Signal (APS). APS is a pedestrian pushbutton that communicates when to cross the street in a non-visual manner, such as audible tones, speech messages, and vibrating surfaces. According to the SFMTA's Accessible Pedestrian Signals inventory, five intersections along Van Ness Avenue are equipped with APS on all crossing legs – Market, Fell, Hayes, Grove, and McAllister Streets. A request has also been placed to install APS at the Union Street intersection. Under SFgo, plans call for the installation of additional APS on corridor intersections (although the exact location for new signals has yet to be decided at this time).

4.2.5 Signal Timing

Pedestrian signal timing is slightly worse than City and national standards for crossing speeds at all but one intersection with a pedestrian signal, and at 40% of intersections without a pedestrian signal.

The adequacy of pedestrian crossing time is assessed in several ways. First, signals must be timed so that pedestrians can cross the entire street in the time provided by the "walk" signal time combined with the "flashing don't walk" signal, yellow, and any all-red time before the green signal for opposing traffic begins (this time is referred to as the "walk split"). The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) recommends that pedestrian signals be timed so that the amount of crossing time from those sources be adequate for a pedestrian or wheelchair user starting 6.0 ft back from the curb face to complete the crossing at 3.0 ft per second (fps). The

City of San Francisco seeks to provide enough time for a pedestrian moving at 2.5 fps, where possible.

In addition, guidelines call for pedestrian timing to allow any pedestrian who begins crossing during the "walk" signal to be able to complete the crossing within the combined "flashing don't walk", yellow, and all-red time (this is referred to as the "pedestrian clearance time"). The MUTCD recommends that pedestrian signals be timed so that a pedestrian leaving the curb at the end of the "walk" signal and travelling at 3.5 fps reaches the opposite curb before a green signal is given to opposing traffic.

Table 4 displays the walk speeds required to cross at intersections or reach a median refuge along Van Ness Avenue when signal cycles are shortest (outside rush periods). "Walk splits" are slightly worse than standards at 40% of Van Ness Avenue crossings, ranging from 3.1 to 3.6 fps, more than the standard 3.0 fps.

At intersections with a pedestrian signal, the City can apply standards to the adequacy of the "pedestrian clearance time." Only one crossing along Van Ness Avenue meets the City standard for pedestrian clearance. However, most crossings exceed the minimum "walk" phase interval of 7.0 seconds, so pedestrian clearance guidelines likely could be met for some crossings by simply reducing the "walk" phase length and increasing the "flashing don't walk" phase length. Overall, pedestrian clearance times hover slightly above the 3.5 fps standard, ranging from 3.5 to 5.0 fps to cross Mission Street.

At crossings with no pedestrian signal, the vehicular yellow light phase is the only indication that the crossing phase is about to end. The clearance time for pedestrians is effectively only 3.5 to 4.5 seconds. Walking speeds to finish this crossing before opposing traffic receives a green signal are up to 21.8 fps, more than six times the FHWA guideline speed for a pedestrian signal clearance phase. This reinforces the importance of a pedestrian signal to provide information to pedestrians on the amount of time remaining to safety cross the street.

Table 4 - Minimum Walk Speed Required at Intersection Crossings (fps)

	Crossing Side Street		Crossing Van Ness	
Intersection	**Speed to Cross During Clearance Phase**	**Speed to Cross During Full Walk Split**	**Speed to Cross During Clearance Phase**	**Speed to Cross During Full Walk Split**
Lombard	**3.8**	1.9	**3.9**	**2.7**
Greenwich	*	0.8	*	**3.1**
Filbert	*	0.8	*	**3.1**
Union	**3.7**	1.0	*	**3.1**
Green	*	0.7	*	**3.1**
Vallejo	*	0.9	*	**3.1**
Broadway	**3.6**	1.8	**3.7**	**3.2**
Pacific	**3.8**	0.9	**4.0**	**3.1**
Jackson	**4.0**	0.9	**4.0**	**3.1**
Washington	*	1.0	*	**3.2**
Clay	*	1.0	*	**3.0**
Sacramento	*	1.0	*	**2.7**
California	*	1.5	*	1.6

Intersection	Crossing Side Street		Crossing Van Ness	
	Speed to Cross During Clearance Phase	Speed to Cross During Full Walk Split	Speed to Cross During Clearance Phase	Speed to Cross During Full Walk Split
Pine	**3.7**	1.8	**3.6**	**3.0**
Bush	**3.8**	1.8	**3.9**	**3.0**
Sutter	*	1.1	*	1.6
Post	*	1.2	*	1.5
Geary	**4.0**	1.6	**3.9**	**3.0**
O'Farrell	**3.7**	1.5	**3.9**	**3.0**
Ellis	*	1.1	*	**3.0**
Eddy	*	1.1	*	**3.0**
Turk	**3.7**	1.5	**3.6**	**3.0**
Golden Gate	**3.7**	1.6	**3.9**	**2.9**
McAllister	**3.9**	2.4	**3.4**	**2.8**
Grove	**4.3**	1.9	**3.7**	**3.1**
Hayes	**3.7**	1.5	*	**3.4**
Fell	**3.7**	1.5	*	**2.7**
Market	**4.4**	**2.7**	**3.9**	**2.9**
Mission	**5.0**	**3.1**	**4.0**	**3.6**

Source: SFMTA and 2009 Manual on Uniform Traffic Control Devices, Federal Highway Administration

Notes:
1. Values in **red** do not meet the FHWA guideline maximum walking speed of 3.5 fps for the clearance phase or 3.0 fps for the full pedestrian split.
2. Values in **bold** meet FHWA guideline but do not meet the City maximum target walking speed of 2.5 fps for full pedestrian split.
3. * Crossing has no pedestrian signals and therefore the pedestrian clearance phase guideline does not apply.
4. Where crossing lengths or signal timings differ between parallel crossing movements at an intersection, the speeds shown are for the worst case (fastest speed) crosswalk.

4.2.6 Pedestrian Delay

Pedestrians typically experience twice as much delay at traffic signals along Van Ness Avenue than do vehicle occupants, reducing the efficiency of walking as a travel mode. Delay reflects the average amount of time an approaching pedestrian must wait before crossing the street. VISSIM simulation results show pedestrian delay averages 30 seconds across all crossings at all intersections, which exceeds the average intersection delay of 15 seconds for vehicles. Pedestrians must typically wait longer to proceed across Van Ness Avenue, with delays averaging 33 seconds, than to traverse cross streets in the corridor, where delays average just 21 seconds. Delays at some crossings are much greater than average; the longest mean wait time is 52 seconds crossing Mission Street at South Van Ness Avenue. By comparison, the longest delay for vehicles at a single intersection approach is 35 seconds, also at Mission Street and South Van Ness Avenue.

Delay represents one way to evaluate “Level of Service” (LOS) for pedestrians. As wait times increase, pedestrians are also more likely to disregard a traffic signal, potentially increasing the probability of collisions. Table 5 shows the

pedestrian delay LOS thresholds as well as the likelihood of pedestrian noncompliance provided in the Transportation Research Board (TRB)'s 2000 *Highway Capacity Manual (HCM)*.

Using these thresholds, the average delay at all intersections along Van Ness Avenue, shown in Table 6, rates LOS of C. However, delays for pedestrians crossing Van Ness Avenue average LOS D, with between 30 to 40 seconds of delay and a moderate to high likelihood of noncompliance with signals. Pedestrians crossing Mission Street at South Van Ness fare even worse, with delays between 40 to 60 seconds and a high probability of noncompliance.

Table 5 – Pedestrian Delay LOS Thresholds for Signalized Intersections

LOS	Average Delay (sec.)	Likelihood of Non-Compliance
A	≤ 10.0	Low
B	10.1 - 20.0	
C	20.1 - 30.0	Moderate
D	30.1 - 40.0	
E	40.1 - 60.0	High
F	> 60.0	Very High

Source: Highway Capacity Manual (HCM), Transportation Research Board (TRB)

Table 6 – Pedestrian Delay LOS at Intersections

Intersection	Delay LOS Crossing Van Ness	Delay LOS Crossing Side Street	Average Delay LOS
Clay	C	B	C
Sacramento	C	B	C
California	C	B	C
Pine	D	C	C
Bush	D	C	C
Sutter	D	B	C
Post	C	B	C
Geary	D	B	C
O'Farrell	D	B	C
Ellis	C	B	C
Eddy	C	B	C
Turk	D	B	C
Golden Gate	D	B	C
McAllister	D	B	C
Grove	D	B	C
Hayes	D	C	C
Fell	D	B	C
Market	D	C	C
Mission	D	E	E
Average	D	C	C

Source: VISSIM simulation, Highway Capacity Manual (HCM)

4.3 Pedestrian Crowding

Pedestrians do not experience crowding in Van Ness Avenue crosswalks. Crosswalk density is a measure of the "maneuvering area" provided for each pedestrian crossing the street, indicating the level of crowding, and is a function of pedestrian volumes, crosswalk dimensions, green time, and expected walking speeds. Table 7 shows the Highway Capacity Manual (HCM) pedestrian crowding LOS thresholds.

Table 7 – Pedestrian Crowding LOS Thresholds

LOS	Maneuvering Area (ft^2) per Person
A	> 60
B	40 - 60
C	24 - 40
D	15 - 24
E	8 - 15
F	≤ 8

Source: Highway Capacity Manual (HCM), Transportation Research Board (TRB)

Table 8 displays the LOS calculated using the HCM method for the five intersections along Van Ness Avenue with the highest recorded pedestrian count volumes. There are two key assumptions: pedestrian volumes at each intersection are evenly distributed across all four crossings, and pedestrians arrive evenly spaced at intersections, rather than in platoons due to upstream traffic signals. Where crosswalk dimensions differ, the LOS rating reflects the crossing with the lowest score. Given these assumptions, crosswalk density does not appear to be a significant issue. All crossings have an LOS of A except at Grove Street, which receives an LOS of C due to a relatively long and narrow crosswalk on the south side of the intersection and a shorter pedestrian green time than at other crossings.

Table 8 – Pedestrian Crowding LOS at Intersections

Intersection	Density LOS Crossing Van Ness	Density LOS Crossing Side Street
Geary	A	A
O'Farrell	A	A
Golden Gate	A	A
Grove	C	A
Market	A	A

Source: VISSIM simulation, HCM

4.3.1 Pedestrian Collisions

Collision information is collected in a database called the California Statewide Integrated Traffic Records System *(SWITRS*). According to SWITRS, from 2003 to 2008, a total of 52 pedestrian-related collisions occurred along Van Ness Avenue and South Van Ness Avenue from Lombard Street to Mission Street, with 11 of these involving serious pedestrian injuries. Table 9 and Figure 16 below indicate that the largest concentrations of collisions involving pedestrians occurred in the busiest pedestrian crossing areas, particularly the Civic Center area, around Market Street, and near the Geary and O'Farrell Street transit corridors. The intersection of Van Ness Avenue and O'Farrell Street experienced the greatest number of incidents involving serious injuries of all intersections in

the project study area. Residential areas to the north between California and Lombard Streets each experienced 1-2 collisions over six-year 2003-08 period.

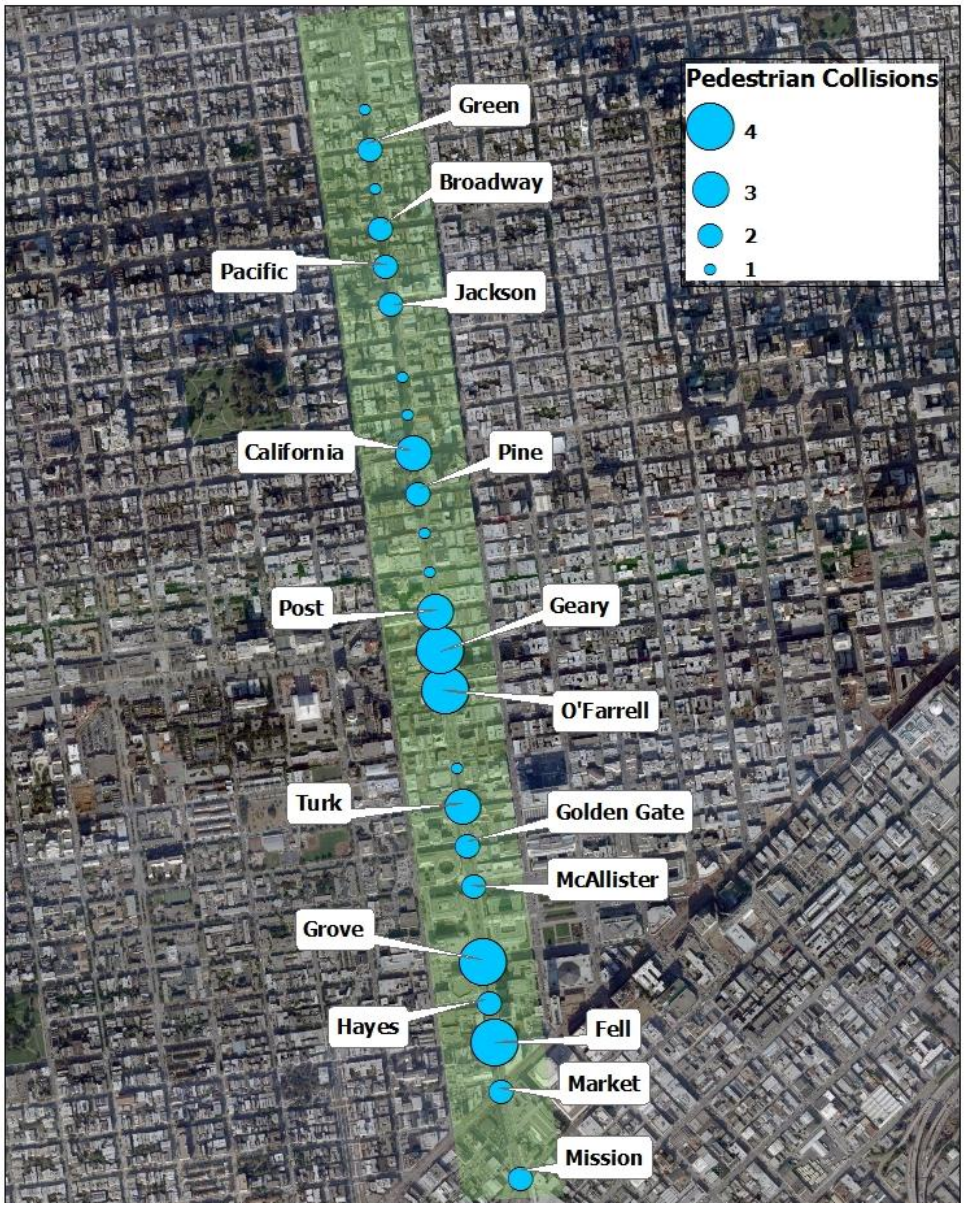
Assessing the number of pedestrian collisions by the volume of pedestrians exposed to collision risk highlights intersections that are least safe. Table 9 uses peak hour pedestrian crossings at selected intersections as the measure of exposure. Of locations where counts were conducted, pedestrians crossing at the intersections of Broadway, O'Farrell, Geary, and California Streets had the highest risk of collision.

The cause of many pedestrian-vehicle collisions is difficult to determine because pedestrians were assigned fault in nearly half of all cases and the most common infraction was an unspecified "pedestrian violation." Drivers were at fault in 40% of collisions, most commonly for failing to yield right-of-way to pedestrians while executing a left turn. Drivers and pedestrians were also each cited in several cases for failing to obey traffic signs and signals.

Table 9 - Pedestrian Collisions by Location

Intersection	# of Pedestrian Collisions	# of Pedestrian Collisions Involving Serious Injury	# Pedestrian Collisions per 1,000 Peak Hour Crossings
Mission	2		2.4
Market	2		1.1
Fell	4		
Hayes	2	1	
Grove	4	1	2.7
McAllister	2		
Golden Gate	2		2.1
Turk	3		
Eddy	1		
Ellis			
O'Farrell	4	3	3.9
Geary	4		3.5
Post	3		
Sutter	1		
Bush	1		
Pine	2	1	
California	3		3.3
Sacramento	1		1.6
Clay	1		
Washington			
Jackson	2	1	
Pacific	2	1	
Broadway	2	1	7.1
Vallejo	1	1	
Green	2	1	
Union	1		2.3
Filbert			
Greenwich			
Lombard			
Total	52	11	

Source: SWITRS, 2003-08 and pedestrian counts.



Source: SWITRS, 2003-08.

Figure 16 - Pedestrian Collision Locations on Corridor

4.4 Universal Design Evaluation

Universal Design is the design of facilities and environments that are broadly and easily accessible to all people and do not require separated or specialized facilities. Ron Mace et al. at North Carolina State University developed a list of seven Universal Design Principles that can be used to evaluate facilities and determine how accessible they are to a wide range of users. For the Van Ness BRT project, these principles are used both to evaluate the existing conditions and to compare the ease of use of various build alternatives for a variety of people.

Each alternative is ranked according to how well it satisfies each principle, relative to the other alternatives. A review of existing pedestrian conditions and access to transit along Van Ness Avenue is presented below, in terms of its adherence to Universal Design Principles.

4.4.1 Principle 1: Equitable Use

Pedestrians are not segregated either in their use of the sidewalk and street crossings or in their access to transit stops. As noted previously, curb ramps at all corners allow universal access to the sidewalk and to crosswalks, although access is more difficult at corners with only one ramp. Furthermore, not all ramps meet current standards. Median refuges, where provided, include a level cut-through for wheelchair access. Most traffic signals along Van Ness Avenue do not provide for equitable use by people with visual impairments because they do not have APS systems. Bus stops are located on the sidewalk with no grade change and are accessed in the same manner by all transit users. There is no separate waiting area for passengers with disabilities.

4.4.2 Principle 2: Flexibility in Use

Sidewalks along Van Ness Avenue accommodate a range of physical abilities and speeds, but street crossings do not provide as much flexibility. Especially when crossing Van Ness Avenue, distances are long, many crosswalks lack a median refuge, and signal timing typically does not accommodate a slower walking speed of 2.5 fps, as suggested by City guidelines. Median refuges with railings, provided on some intersection crossings, allow slower pedestrians to rest before completing the street crossing during the following light cycle. Bus stops are not designed for activities other than waiting, and are inherently flexible in use.

4.4.3 Principle 3: Simple and Intuitive Use

The arrangement of pedestrian facilities along Van Ness Avenue is generally standard and intuitive, but locations where a single curb ramp angles toward the middle of the intersection are more disorienting to pedestrians with visual impairments, for whom curb ramps help provide orientation for a street crossing. Bus stops are in typical locations along the curb at street corners and are arranged in a conventional format; these are consistent with user expectations. Passengers know to wait on the sidewalk near the bus stop sign or bus shelter.

4.4.4 Principle 4: Perceptible Information

The arrangement of pedestrian facilities along Van Ness Avenue is generally standard and intuitive. However, locations where a single curb ramp angles toward the middle of the intersection are more disorienting to pedestrians with visual impairments. For such users, curb ramps help provide orientation for a street crossing. Bus stops are in typical locations along the curb at street corners and of a conventional format, and so are consistent with user expectations.

However, bus stop signage and line information is provided only in a visual format and is not accessible to people with limited sight.

4.4.5 Principle 5: Tolerance for Error

Sidewalks are wide along Van Ness Avenue and buffered from moving traffic, providing significant tolerance for error. Street crossings provide less tolerance because of traffic speeds and heavy volumes, especially where crossings are long and refuges are not provided. Accessing a bus stop from the sidewalk requires minimal risk if the passenger is on the same side of the street as the stop. Reaching a bus stop on the other side of the street, however, requires crossing at least six lanes of traffic on Van Ness Avenue, entailing more risk. There is a significant tolerance for error while at a bus stop, as the average sidewalk width is 16 ft, only allowing traffic on one side of the waiting area.

One factor that may contribute to tolerance for error is the number of times a pedestrian is required to venture into traffic during a given trip. Each of these ventures introduces the possibility of collision with a motor vehicle. At intersections without a median refuge along Van Ness Avenue, pedestrians accessing transit stops are currently required to venture across traffic only once to complete a round trip. In one travel direction, the bus stop is on the near-side of the street, while the stop for the other direction is on the opposite side and requires a crossing. Where a median refuge is present, two individual traffic ventures are required to reach a bus stop on the opposite side: one to reach the median, and a second to reach the far curb. However, increasing the number of individual ventures into traffic may not reduce overall pedestrian safety if the length of individual crossings is reduced. For example, installing a median with a refuge area increases the number of ventures, but also increases safety by reducing the distance a pedestrian must cross during one light cycle.

4.4.6 Principle 6: Low Physical Effort

Van Ness Avenue has few hills and has no grades above 10%, while bus stops are located approximately every 700 ft. Thus, relatively low levels of physical effort are required to reach a transit stop. No significant effort is required to access a bus stop because they are level with the sidewalk. Bus stops are also equipped with benches, allowing riders to sit and rest when they arrive.

4.4.7 Principle 7: Size and Space for Approach and Use

The 16-foot sidewalks and bus stops along Van Ness Avenue provide adequate space to maneuver wheelchairs and other assistive devices. Visually locating a bus stop along Van Ness Avenue may be challenging because streetscape elements often obstruct a clear line-of-sight and bus stop elements, such as shelters and signs, are small relative to other structures on the street

5 Existing Corridor Cycle Conditions

5.1 Bicycle Facilities in the Van Ness Avenue Corridor

The City and County of San Francisco boasts a robust bicycle route network that, as of March 2010, consists of 23 miles of Class I facilities, 45 miles of Class II facilities and 132 miles of designated bicycle routes (this includes wide curb lanes on 53 miles of street and sharrows or shared bike/car paths on 23 miles of street), respectively.

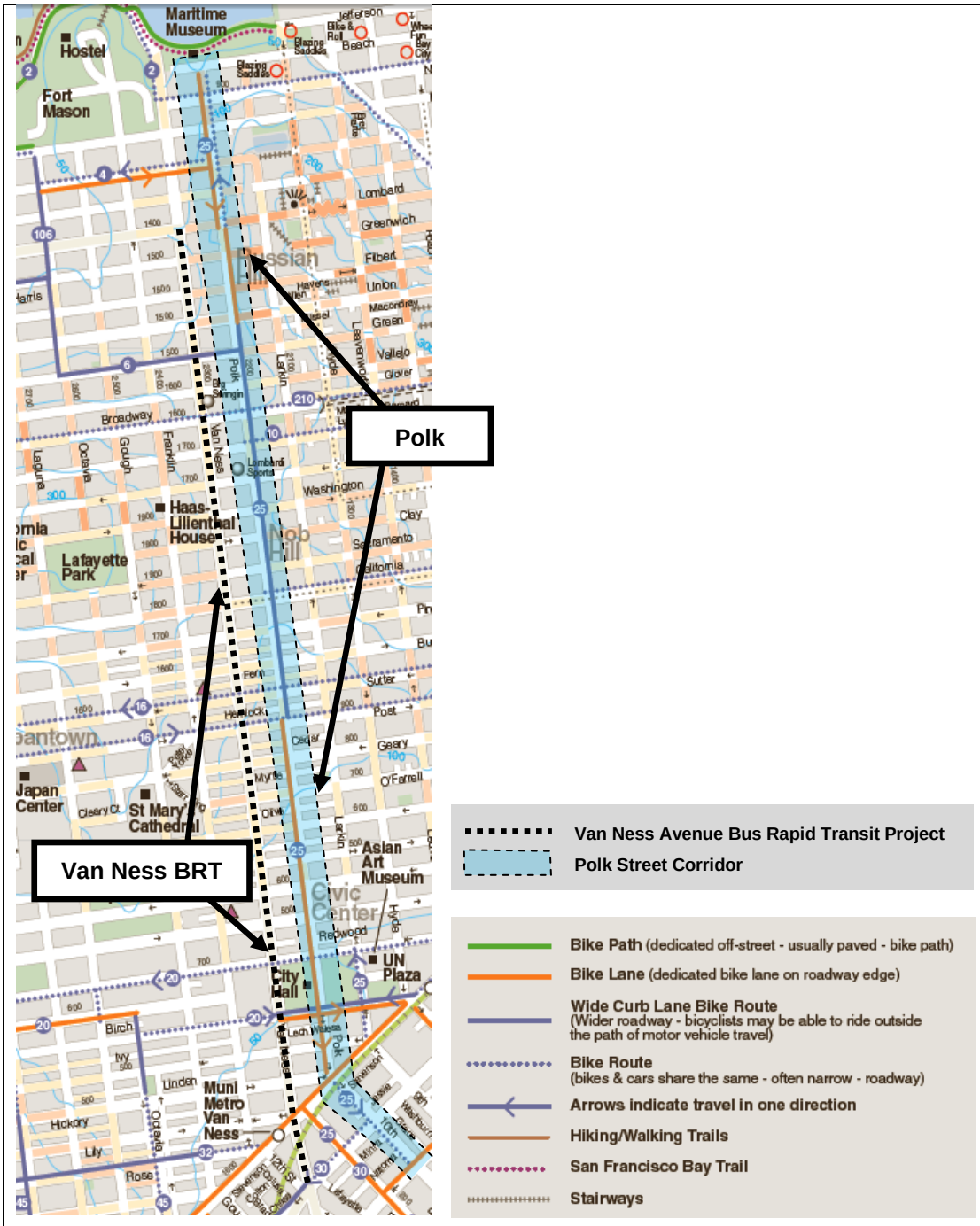
Van Ness Avenue is not a designated bicycle route - there are no bike lanes or sharrows existing on or planned for Van Ness Avenue. Van Ness Avenue is not designated as an official bicycle route by the City, in part because it is classified as a state highway (U.S. 101), but also due to heavy traffic volumes and narrow travel lanes that discourage cycling. Bicycle travel is encouraged along smaller parallel streets.

The dedicated bicycle facility in the Van Ness Avenue corridor is on Polk Street, a Class II/III facility. Polk Street operates as a Class II facility between Market and O'Farrell Streets, a Class III facility between O'Farrell and Union Streets, and a Class II facility between Union and Beach Streets. Polk Street is a two-way designated bicycle route north of Grove Street, but is only one-way SB from Grove Street to Market Street. The San Francisco Bicycle Plan includes a proposal to make Polk Street two-way for bicycles along this section with implementation anticipated after the Plan receives environmental clearance.

Several designated bicycle routes intersect with Van Ness Avenue between Lombard and Mission Streets, including those on: Green, Broadway, Sutter, Post, McAllister, Grove, and Market Streets.

5.2 Bicycle Conditions on Van Ness Avenue

Due to heavy traffic, relatively high speeds, and conflicts with buses and other vehicles, Van Ness Avenue is not the preferred bicycle route in the corridor. The absence of bicycle lanes, the presence of parallel parking, and the fact that lane widths are too narrow for both a motor vehicle and a bicycle leave no safe space for bicyclists to travel outside the flow of traffic. Buses travelling in the outside lane typically travel faster than bicycles, but pull to the right and stop frequently to serve stops along the curb. This causes conflicts with cyclists also using the right lane. As a result, bicyclists who do not feel safe or comfortable riding in heavy traffic either use the sidewalk or avoid the street entirely. As noted above, Polk Street provides a parallel corridor with more attractive facilities and conditions for bicyclists. Figure 17 shows the Polk Street facilities and its location approximate to Van Ness Avenue to the west.



Source: San Francisco Bike Map, 2009.

Figure 17 - Designated Bicycle Route Network around Van Ness Avenue

Designated bicycle parking facilities include garages with bicycle parking, bicycle lockers, bike stations, and bicycle racks. According to the 2009 San Francisco Bicycle Map, one garage with bicycle parking exists on the Van Ness Avenue corridor, at One South Van Ness Avenue. Several such garages exist on Polk, Grove, as well as further north around the Bush and Hyde intersection. Van Ness Avenue has approximately 19 U-shaped, 2-bike capacity bike racks installed

principally around commercial destinations. Bicyclists also use trees, news racks and poles as informal bicycle parking. Figure 18 shows these facilities.

Source: San Francisco Bike Map, 2009.

Figure 18 - Designated San Francisco Bicycle Parking Facilities

5.3 Bicycle Collisions

According to SWITRS, from 2003 to 2008, a total of 28 bicycle-related collisions occurred along Van Ness Avenue and South Van Ness Avenue from Lombard Street to Mission Street. Three of these collisions involved serious injuries to the cyclist. Note that bicycle collisions are generally under-reported, so the numbers of collisions are likely higher in reality (source: Highway Safety Research Center).

Table 10 and Figure 20 show that most collisions involving bicyclists occurred primarily in the Civic Center area between Fell and McAllister Streets, as well as at Mission Street. As these streets are designated bicycle routes, bicyclist volumes are likely higher through this area. Some collisions have also occurred north of Civic Center.

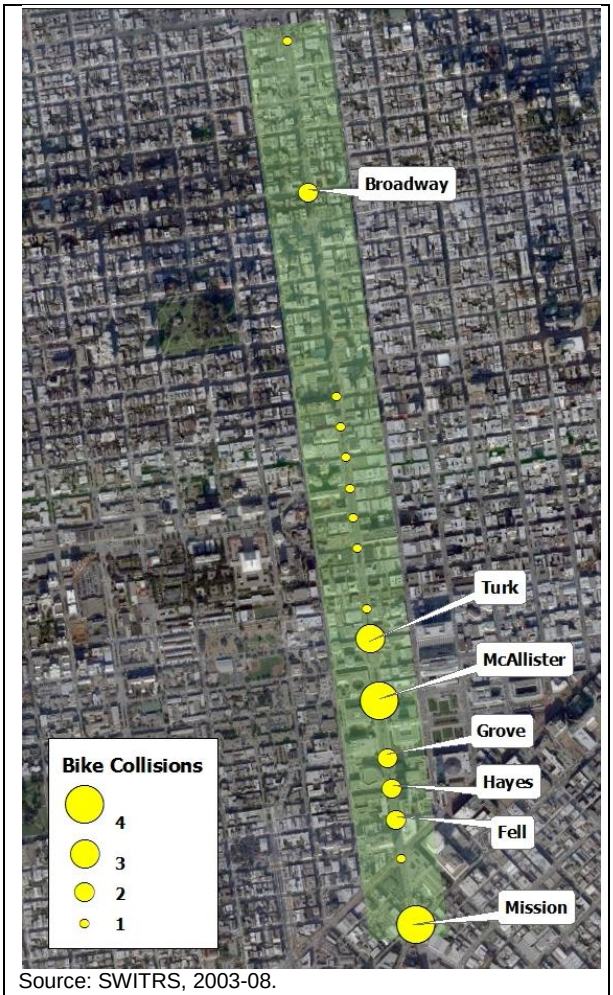
Figure 19 - Examples of Bicycle Parking on Van Ness Avenue

The most common type of collision between motor vehicles and bicycles involved a conflict between a motorist turning left or right and a bicyclist proceeding straight. Fault was assigned to the driver in just over half of collisions with bicyclists, with turning violations including failure to yield right-of-way the most frequent infractions. Several collisions involved motorists failing to obey traffic signals. The bicyclist was at fault in 30% of cases; violations included improper passing, failure to obey traffic signals, and riding the wrong way.

Table 10 – Bicycle Collisions by Location

Intersection	# of Bike Collisions	# of Bike Collisions involving Serious Injury
Mission	4	
Market	1	
Fell	2	
Hayes	2	1
Grove	2	
McAllister	4	1
Golden Gate		
Turk	3	
Eddy	1	1
Ellis		
O'Farrell	1	
Geary	1	
Post	1	
Sutter	1	
Bush	1	
Pine	1	
California		
Sacramento		
Clay		
Washington		
Jackson		
Pacific		
Broadway	2	
Vallejo		
Green		
Union		
Filbert		
Greenwich	1	
Lombard		
Total	28	3

Source: SWITRS, 2003-08.



Source: SWITRS, 2003-08.

Figure 20 – Bicycle Collision Locations on Van Ness Avenue

6 Alternatives Definition

This section defines Alternative 1, the No-Build alternative, as well as the Van Ness BRT build alternatives. Additionally, this section identifies common elements to all alternatives (including the No-Build and build alternatives) and presents forecasted pedestrian volumes by alternative.

6.1 Elements Common to All Alternatives

6.1.1 Pedestrian Elements

Pedestrian elements that are common to all alternatives would include:

- **Crosswalk Width at a Particular Location** - While crosswalk width may vary by location, crosswalk width for the No-Build and build alternatives would not vary from today's conditions at a particular location. Thus, the 10-foot wide crosswalks at the Fell intersection today would also be 10 ft wide for all future alternatives and the No-Build. Please refer to Section 4.2.3 for additional information on existing crosswalk width.
- **Side Street Crossing Distance at a Particular Location** – Geometric changes to the corridor to accommodate dedicated BRT lanes along the side or in the center median would not alter the crossing distance of the side streets at a particular location. Thus today's 45-foot long crossing of Hayes Street would also be 45 ft long for all future alternatives and the No Build.
- **Sidewalk Width at Mid-Block Locations** – Sidewalk width would not change for any of the future build alternatives or the No-Build.
- **Accessible Curb Ramps with Tactile Domes at all Intersections** – SFgo would install curb ramps with tactile domes that meet current City standards and Americans with Disabilities Act (ADA) requirements at all intersections along Van Ness Avenue to provide access by people in wheelchairs as well as providing easier travel for those with strollers, carts, and the like.
- **Pedestrian Countdown Signals at All Intersections** – As part of SFgo, pedestrian countdown signals would be installed on all crosswalk legs at all signalized intersections along Van Ness Avenue.
- **Street Pole / Streetlight Replacement** – The SFMTA, together the San Francisco Department of Public Works (SFDPW) and San Francisco Public Utilities Commission (SFPUC), plans to replace the existing overhead wire contact system and supporting poles / streetlights along Van Ness Avenue from Market Street to North Point Avenue. The new poles would provide enhanced street and sidewalk lighting.

6.1.2 Bicycle Elements

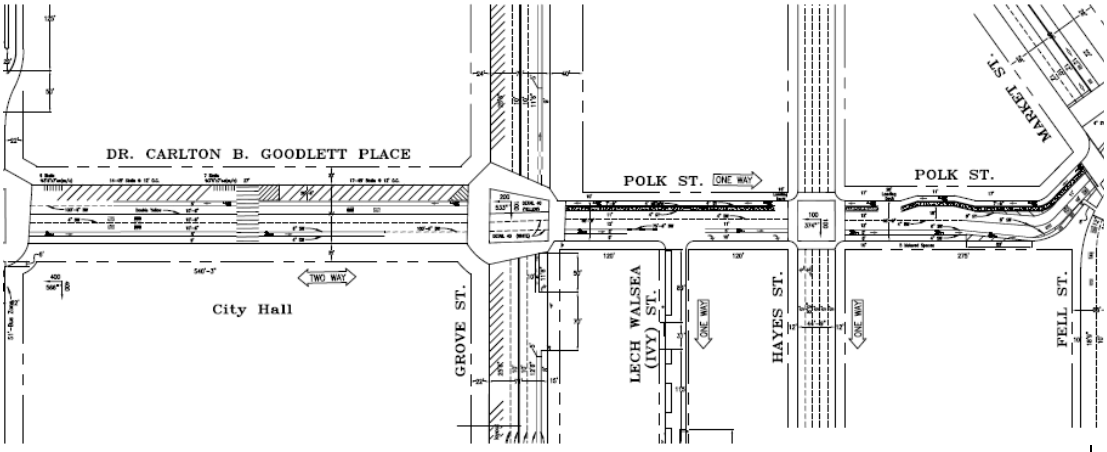
Pavement rehabilitation (spot improvements) along Van Ness Avenue roadway would enhance cycling conditions for all alternatives. In addition by 2015, the Polk Street Contraflow Bicycle Lane would be in place. Currently, Polk Street operates one-way SB between Grove and Market Streets, and two-way between Grove and McAllister Streets. This project would involve:

- Relocating a portion of the existing NB Bicycle Route #25 from Market, Larkin, and McAllister Streets onto Polk Street;
- Implementing a Class II bicycle lane in the NB direction on Polk Street between Market Street and McAllister Street;
- Operating a portion of the Market to McAllister segment as contraflow to allow NB bike travel on a one-way SB street; and
- Accommodating a Class II bicycle lane between Grove and McAllister Streets, by narrowing existing travel lanes and converting angled parking on the east side of Polk Street from front pull-in to back-in spaces.

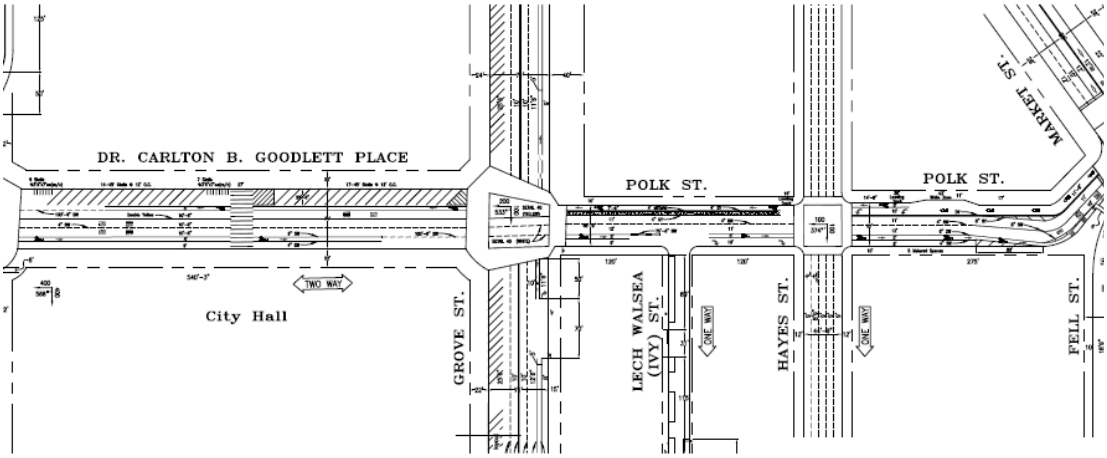
The Grove to Market segment includes two design options (shown in Figure 21):

- **Option 1** – This option would implement a bicycle lane physically separated by a concrete median. Eleven metered parking spaces and one metered loading space would be removed.
- **Option 2** – This option would convert a segment of Polk Street between Market and Hayes to two-way operation. A NB travel lane would be added on Polk Street between Market and Hayes. Option 2 would add bicycle sharrows to the new NB travel lane between Market and Hayes, while removing 12 metered parking spaces.

Option 1: Polk Street Contraflow Bicycle Lane



Option 2: Polk Street Contraflow Bicycle Lane



Source: San Francisco Bike Plan EIR, San Francisco Municipal Transportation Authority (SFMTA), 2010.

Figure 21 - Polk Street Contraflow Bicycle Lane Options

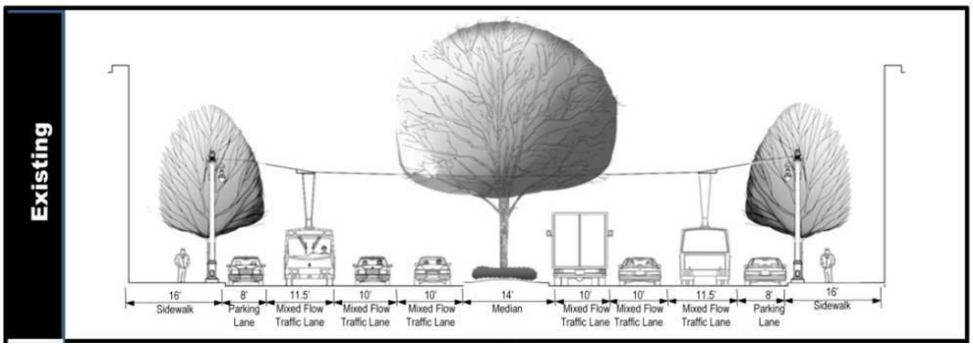
6.2 Alternative 1: No-Build (Baseline Alternative)

Alternative 1, the No-Build alternative, would not include a BRT service and instead assumes the existing roadway and transit services in the 2.2 mile Van Ness Avenue corridor would continue and be supplemented by funded improvement projects planned to occur within the near-term horizon year of 2015. Alternative 1 would have the same physical configuration as today's Van Ness Avenue (as of March 2010), as documented in Sections 4 and 5. No-Build crossing distances, median widths, sidewalk widths, crosswalk dimensions, and signal location and provision would be the same as today.

The typical curb-to-curb street configuration would include: the SB curbside parking lane, three SB traffic lanes, the center median, three NB traffic lanes, and the NB parking lane. This configuration is shown in Figure 22.

Existing parallel parking would be maintained. Muni buses would continue to serve curbside stations. All permitted turning movements would be maintained. Although several streetscape enhancement plans are in the works on the corridor as noted in Section 6.1.1, basic sidewalk, crossing, and median configurations would not change. Other key design elements would be as follows:

- **Pedestrian Crossing Distance across Van Ness** - The average curb-to-curb pedestrian crossing distance across Van Ness Avenue would be 91.1 ft, with an average crossing distance of 41.0 ft between the curb and the center median. Intersections with longer crossing distances would include the Mission and Market Street intersections with Van Ness, as crossings are angled, rather than perpendicular to the curb.
- **Median Width** - The center median width would typically be 14.0 ft wide. Where left turns are permitted, median width would be reduced to 4.0 ft. Median refuge width would be an average of 9.0 ft wide.
- **Sidewalk Width** – Typical sidewalk width would be 16.0 ft wide on both sides of the street, with slightly wider sidewalks near City Hall, as well as south of Market Street.
- **Corner Bulbs** – Alternative 1 would have 14 corner bulbs in the SB direction and 15 corner bulbs in the NB direction to shorten crossing distances.
- **Accessible Pedestrian Signals** (APS) - APS at Market, Fell, Hayes, Grove, and McAllister Streets would remain in operation. In addition, APS would likely be installed at high priority intersections (i.e., those with high pedestrian volumes, collision rates, and/or bus stop locations).



Source: SFCTA, 2010.

Figure 22 - Typical Van Ness Cross-Section: Alternative 1 (No-Build)

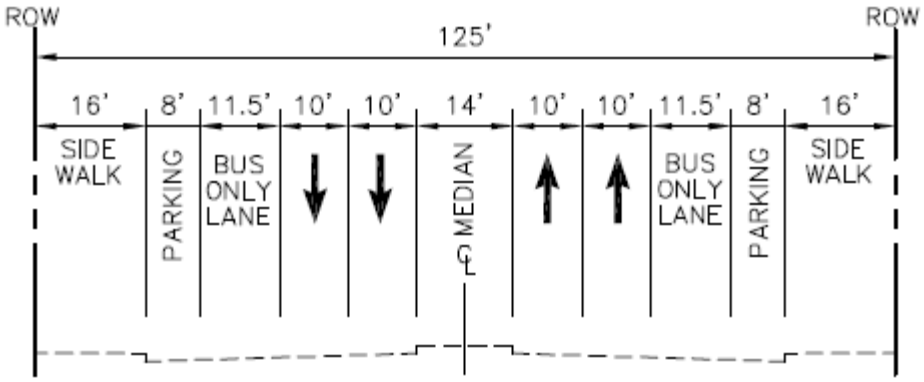
6.3 Build Alternative 2: Side Lane BRT with Street Parking)

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 to Lombard Street in northbound and southbound directions. BRT stations would be located within the curbside parking area as a corner bulb, eliminating the need for buses to exit the transitway to pick up passengers. 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. Existing curbside parking would mostly be retained, although parking would be eliminated wherever right turns are allowed. Curbside stations would be located at: Mission, Market, McAllister, Eddy, O'Farrell (SB), Geary (NB), Sutter, Sacramento, Jackson, Green (NB), and Union (SB) Streets.

The typical curb-to-curb street configuration for Alternative 2, as shown in Figure 23, would include: the SB parking lane, the SB BRT lane, two SB traffic lanes, the center median, two NB traffic lanes, the NB BRT lane, and the NB parking lane. Other key design elements would be as follows:

- **Pedestrian Crossing Distance across Van Ness** - Average curb-to-curb pedestrian crossing distance across Van Ness Avenue would be 86.4 ft, with an average crossing distance of 37.3 ft between the curb and the center median. Intersections with longer pedestrian crossing distances would include the Mission and Market Street intersections with Van Ness Avenue, as crossings are angled, rather than perpendicular. Corner bulbs as well as station platforms would reduce the overall crossing distance.
- **Median Width** - Center median widths would vary between 4.0 and 14.0 ft wide, depending on left turns, with an average median width of 11.8 ft.

- **Sidewalk Width** - Sidewalk widths would typically be 16.0 ft wide on both sides of the street, with slightly wider sidewalks near City Hall, as well as south of Market Street.
- **Corner Bulbs** –Alternative 2 would have 39 corner bulbs in the SB direction and 34 corner bulbs in the NB direction to shorten pedestrian crossing distances.
- **Accessible Pedestrian Signals (APS)** - New APS would be installed at all intersections to improve crossing and station access; this would be common across all build alternatives.



Source: SFCTA, 2010.

Figure 23 - Typical Van Ness Cross-Section: Alternative 2

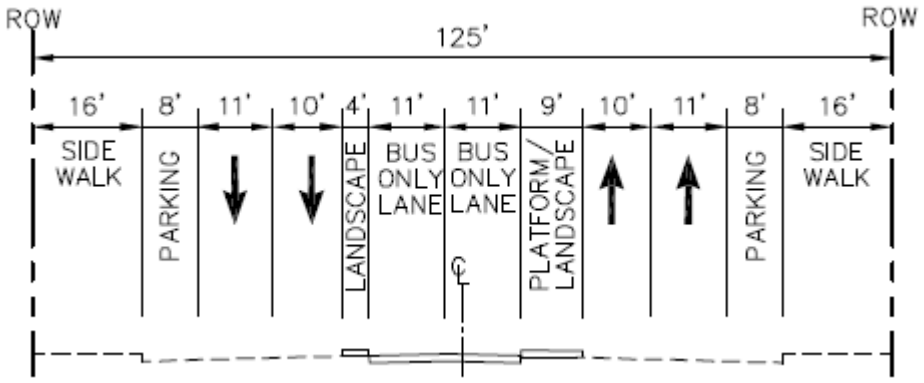
6.4 Build Alternative 3: Center Lane BRT with Right-Side Boarding and Dual Medians

6.4.1 Alternative 3 Description

Build Alternative 3 would provide a transitway comprised of two side-by-side, dedicated bus lanes located in the center of the roadway, inside two medians. The transitway would be separated from mixed flow traffic by a 4 ft wide median and a 9 ft wide median. BRT stations would be located on the 9 ft median, allowing right-side boarding. The typical curb-to-curb street configuration for Alternative 3, as shown in Figure 24, would include: the SB parking lane, two SB traffic lanes, the SB median/platform, the SB BRT lane, the NB BRT lane, the NB median/platform, two NB traffic lanes, and the NB parking lane. With BRT operating in center lanes and curbside bus stops would be removed.

Dual medians on the outside of the BRT lanes would substantially shorten the curb-to-median pedestrian crossing distance, providing dual refuges for pedestrians unable to cross Van Ness within a single pedestrian cycle. Right-side

median stations would be located at: Mission (NB), Market, McAllister, Eddy, O'Farrell-Geary (block-long for both directions), Sutter, Sacramento, Jackson (NB), Pacific (SB), and Union Streets.



Source: SFCTA, 2010.

Figure 24 – Typical Van Ness Cross-Section: Alternative 3

Alternative 3 would permit left turns at: Hayes (NB), Grove (NB), Golden Gate (SB), Turk (NB), Pine (NB), Broadway (SB), Union (NB), Greenwich (NB), and Lombard (NB) Streets. To accommodate left turns, dual medians would be narrowed and BRT lanes would be forced to weave within a given block and sometimes across an intersection, while curbside parking would be removed. Other key design elements would be as follows:

- **Pedestrian Crossing Distance across Van Ness** - The average curb-to-curb pedestrian crossing distance across Van Ness Avenue would be 89.5 ft, including the crossing of two BRT lanes and the outside dual medians. The average pedestrian crossing distance between the curb and either the SB or NB median would be 28.2 ft. Intersections with longer pedestrian crossing distances would include the Mission and Market Street intersections with Van Ness Avenue, as crossings are angled, rather than perpendicular. Corner bulbs, in addition to the dual medians would serve to significantly reduce the average curb-to-median crossing distance as well as the overall curb-to-curb crossing distance.

- **Median Width** - Each median would be up to 9.0 ft wide, with a maximum total median width of 13 ft divided between the two. Average width of a median would be 6.0 ft wide. In some cases, when the BRT lanes weave to accommodate a left turn pocket, only one median would be provided on the opposite side of the street. For example at Grove, a NB left turn pocket would be provided. The BRT lanes would be shifted to the west to accommodate the pocket; consequently, there would be no median west of the BRT lanes, with only one 4-foot median to the east of the BRT lanes accommodated.

- **Sidewalk Width** - Sidewalk widths would typically be 16.0 ft wide on both sides of the street, with slightly wider sidewalks near City Hall, as well as south of Market Street.
- **Corner Bulbs** – Alternative 3 would have 25 corner bulbs in the SB direction and 26 corner bulbs in the NB direction to shorten pedestrian crossing distances.
- **Accessible Pedestrian Signals (APS) -** New APS would be installed at all intersections to improve crossing and station access; this would be common across all build alternatives.

6.4.2 Center Lane Alternative Design Option B

A design option ("B") for center lane BRT alternatives, has been developed in which all northbound left turns and all but one southbound left turn (at Broadway Street) would be eliminated. Eliminating left turn pockets would have several potential benefits – parking could be retained on the block, corner bulbs could be built to improve the pedestrian crossing experience, and bus operations would be unhindered by left turn movements and signal phases. Furthermore, weaving of the BRT lanes to accommodate left turn pockets would be eliminated, creating a more uniform and predictable configuration for the bus and travel lanes, as well as for the pedestrian crossing experience.

Key differences between Alternative 3 and 3B would include the following:

- **Pedestrian Crossing Distance across Van Ness** - The average curb-to-curb crossing distance across Van Ness Avenue would be 88.7 ft, which would include crossing two BRT lanes and the outside dual medians. The average crossing distance between the curb and either the SB or NB median would be 27.4 ft. This distance would be slightly shorter than that for Alternative 3A due to the installation of new corner bulbs where left turn pockets previously existed.
- **Median Width** - The SB median would typically 4.0 ft wide, except at station platform locations, while the NB median would usually be 9.0 ft. Average width of a median would be 6.4 ft wide, slightly wider than that for Alternative 3. As left turn pockets would be eliminated except at Broadway and weaving would be minimized, the median width would be more consistent than that for Alternative 3.
- **Corner Bulbs** – Alternative 3B has 31 corner bulbs in the SB direction and 28 corner bulbs in the NB direction to shorten pedestrian crossing distances.

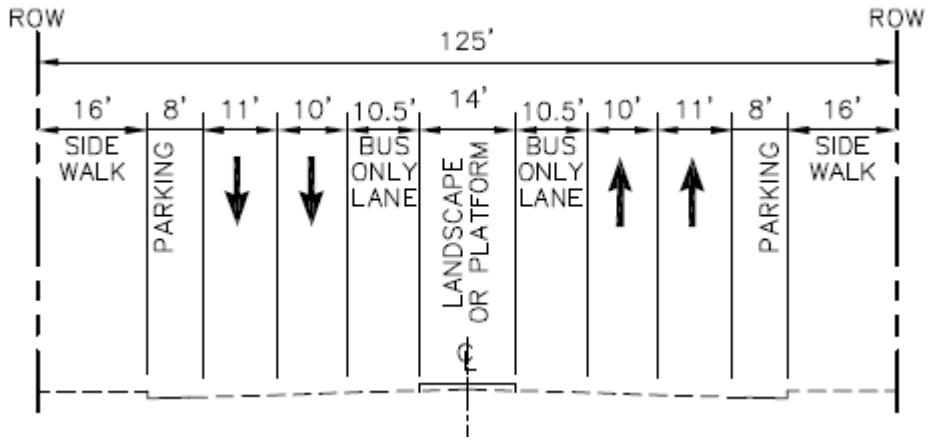
6.5 Alternative 4: Center Lane BRT with Left-Side Boarding and Single Median

6.5.1 Alternative 4 Description

Build Alternative 4 would provide a transitway in the center of the roadway comprised of a single, 14 ft median flanked by dedicated northbound and southbound bus lanes. Station platforms would be located on the single center median, requiring left-side passenger boarding and alighting. All stations would be of this single median design, with the exception of BRT stations proposed at Geary/O'Farrell, which would utilize a dual median configuration similar to that proposed under Alternative 3, in order to accommodate Golden Gate Transit buses that are strictly right-side boarding. Alternative 4 would require special dual-side door buses for both left-side and conventional right-side boarding. Platforms would be shared by SB and NB BRT and could be as long as one block in length.

The typical curb-to-curb street configuration for Alternative 4 as shown in Figure 25 would include: the SB parking lane, two SB traffic lanes, the SB BRT lane, the center median (including platforms), the NB BRT lane, two NB traffic lanes, and the NB parking lane. BRT lanes would not be physically separated from adjacent mixed flow lanes, although pavement coloring, rumble strips, or a small vertical separation (a few inches) could be used to differentiate the lanes for drivers.

Similar to Alternative 3, existing curbside bus stops and loading areas would be removed as BRT operates in the center lanes. Left-side platforms would be located at: Mission, Market, McAllister, Eddy, O'Farrell-Geary (block-long), Sutter, Sacramento, Jackson-Pacific (block-long), and Union Streets.



Source: SFCTA, 2010.

Figure 25 - Typical Van Ness Cross-Section: Alternative 4

Alternative 4 would permit left turns at: Hayes (NB), Grove (NB), Golden Gate (SB), Turk (NB), Bush (SB), Pine, (NB), Broadway (SB), Union (NB), and Lombard (NB). To accommodate left turn pockets, two designs are proposed: (i)

narrowing median width from 14.0 ft to 4.0 ft to retain curbside parking; or (ii) shifting the two mixed flow traffic lanes towards the curb to retain a median width of 14.0 ft, which eliminates some curbside parking. The former design is proposed for left turn pockets at Hayes, Grove, and Lombard Streets. Other key design elements would be as follows:

- **Pedestrian Crossing Distance across Van Ness** - The average curb-to-curb pedestrian crossing distance across Van Ness Avenue would be 88.8 ft, which would include crossing two BRT lanes and the center median. The average pedestrian crossing distance between the curb and the center median would be 38.0 ft. Intersections with longer crossing distances would include the Mission and Market Street intersections at Van Ness Avenue, as crossings are angled, rather than perpendicular.
- **Median Width** – Median width would vary from 4.0 to 14.0 ft depending on left turn pockets and co-location with platforms. Average median width would be 12.8 ft.
- **Sidewalk Width** - Sidewalk widths would typically be 16.0 ft wide on both sides of the street, with slightly wider sidewalks near City Hall, as well as south of Market Street.
- **Corner Bulbs** – Alternative 4 would have 29 corner bulbs in the SB direction and 30 corner bulbs in the NB direction to shorten crossing distances.
- **Accessible Pedestrian Signals (APS)** - New APS would be installed at all intersections to improve crossing and station access. This would be common across all build alternatives.

6.5.2 Center Lane Alternative Design Option B

As mentioned earlier, a design option ("B") for center lane BRT alternatives, has been developed in which all northbound and all but one southbound left turn (at Broadway Street) would be eliminated. As noted earlier, eliminating left turn pockets would have several potential benefits for traffic and BRT operations, as well as for pedestrian safety and comfort.

Key differences between Alternative 3 and 3B would include the following:

- **Pedestrian Crossing Distance across Van Ness** - The average curb-to-curb pedestrian crossing distance across Van Ness Avenue would be 87.6 ft, which would include crossing two BRT lanes and the center median. The average pedestrian crossing distance between the curb and the center median would be 37.1 ft. This is shortened slightly compared to Alternative 4 due to installation of new corner bulbs where left turn pockets previously existed.
- **Median Width** – The elimination of left turn pockets at all intersections in the corridor except at Broadway would allow a consistent median width of 14.0 ft to be maintained at all locations around Geary and O'Farrell.

Average median width would be 13.4 ft, slightly wider than that of Alternative 4.

- **Corner Bulbs** – Alternative 4B would have 35 corner bulbs in the SB direction and 35 corner bulbs in the NB direction to shorten crossing distances.

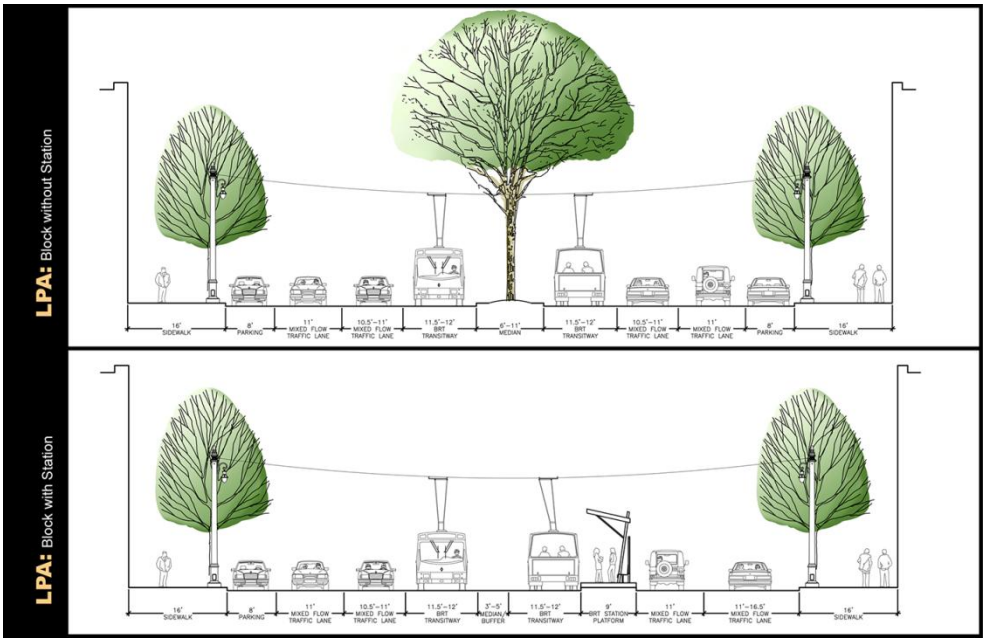
6.5.3 LPA Description

The LPA would provide a center-lane BRT with right-side boarding/single median and limited left turns. All station are right-side loading and located at the near-side, meaning prior to crossing an intersection. The typical LPA configurations would be as follows:

- **Blocks with Full-Block Stations** – The O'Farrell-Geary block would contain dual full-block stations for both NB and SB operations. In this block, the LPA would be configured similar to Alternative 3 and provide a transitway comprised of two side-by-side, dedicated bus lanes located in the center of the roadway. These lanes would be flanked by 9 ft station platforms for right-side loading that separate the bus lanes from general traffic lanes.
- **Blocks with One Half-Block Stations** – For blocks containing a single half-block station, the configuration would have elements of both Alternatives 3 and 4. For instance, for a single half-block SB station, the SB bus lane would be separated from general traffic lanes with a 9 ft station platform, and a combination of tapered raised median and striped buffer zone. The SB and NB bus lanes would be separated by a combination of tapered raised median and striped buffer zone as well. In some cases, the NB bus lane would also be separated from general traffic lanes with a short striped buffer zone. The configuration for a single half-block NB station would have similar to that described above. Blocks with one half-block station would be located at the following intersections: Market (NB/SB), McAllister (NB/SB), Eddy (NB/SB), Vallejo (SB), and Union (NB/SB). This typical configuration is shown in **Error! Reference source not found.**.
- **Blocks with Two Half-Block Stations** – For blocks containing two half-block stations, the configuration would be more akin to Alternative 3. For blocks containing two stations (one NB and one SB), the NB and SB bus lanes would be separated from general traffic lanes with a combined 9 ft station platform, and tapered raised median and striped buffer. In some cases at the mouth of the intersection, the NB and SB bus lanes would be separated by a narrow, tapered striped buffer. Blocks with two half-block stations would include the Sutter-Bush, Sacramento-Clay, and Jackson-Pacific blocks. This typical configuration is shown in **Error! Reference source not found.**.
- **Blocks without Stations** – For blocks without stations, the configuration would be similar to Alternative 4, with an 11 ft median flanked by

dedicated northbound and southbound bus lanes (typically 11.5 ft). The typical curb-to-curb street configuration for blocks without stations is shown in **Error! Reference source not found.** and would include: the SB parking lane, two SB traffic lanes, the SB BRT lane, the center median, the NB BRT lane, two NB traffic lanes, and the NB parking lane.

In summary, right-side median stations would be located at: Market, McAllister, Eddy, O'Farrell-Geary (block-long for both directions), Sutter (SB), Bush (NB), Sacramento (SB), Clay (NB), Jackson (SB), Pacific (NB), Vallejo (SB), and Union Streets.



Source: SFCTA, 2012.

Figure 26– Typical Van Ness Cross-Section: LPA (Blocks with and without Stations)

The LPA would permit left turns at Broadway Street, southbound only. As noted earlier, eliminating left turn pockets would have several potential benefits for traffic and BRT operations, as well as for pedestrian safety and comfort.

Other key design elements would be as follows:

- **Pedestrian Crossing Distance across Van Ness** - The average curb-to-curb pedestrian crossing distance across Van Ness Avenue would be 89.4 ft, which would include crossing two BRT lanes and the medians. The average pedestrian crossing distance between the curb and either the SB or NB median or the center median would be 39.2 ft. Intersections with longer pedestrian crossing distances would include the Mission and Market Street intersections with Van Ness Avenue, as crossings are angled, rather than perpendicular. Corner bulbs, in addition to the dual

medians would serve to significantly reduce the average curb-to-median crossing distance as well as the overall curb-to-curb crossing distance.

- **Median Width** – Combined median width would vary from 4.0 to 18.0 ft depending on the presence of a station platform. The average median width would be 9.4 ft. The typical width of a station platform would be 9.0 ft (between O'Farrell and Geary, which has two block-long platforms, the combined median width is 18.0 ft). The typical width of the median in blocks without stations would be 11.0 ft.
- **Sidewalk Width** - Sidewalk widths would typically be 16.0 ft wide on both sides of the street, with slightly wider sidewalks near City Hall, as well as south of Market Street.
- **Corner Bulbs** – The LPA would have 34 corner bulbs in the SB direction and 30 corner bulbs in the NB direction to shorten crossing distances.
- **Accessible Pedestrian Signals (APS)** - New APS would be installed at all intersections to improve crossing and station access. This would be common across all build alternatives.

6.5.4 LPA Vallejo Northbound Station Variant

A variant of the LPA has been developed in which an additional NB Vallejo Station has been added to respond to concerns over station access. The LPA Vallejo NB Station Variant would have nearly the same configuration as the LPA, except between Broadway and Green, to account for the new NB station at Vallejo. The principal differences between the LPA Vallejo NB Station Variant and the LPA would be as follows:

- **Additional NB Far-Side Station** - For the LPA, all station would be right-side loading and located at the near-side, meaning prior to crossing an intersection. The LPA Vallejo NB Station Variant would include an additional NB station at Vallejo; this station would be located at the far-side of the intersection (meaning it would be located after crossing the intersection, on the north side of the street).
- **Pedestrian Crossing Distance across Van Ness** - The average curb-to-curb pedestrian crossing distance across Van Ness Avenue would be the same as the LPA (89.4 ft, which would include crossing two BRT lanes and the medians). The average pedestrian crossing distance between the curb and either the SB or NB median or the center median would be 39.0 ft due to the additional median at Vallejo Street, about 0.2 ft shorter on average than the LPA.
- **Median Width** – Combined median width would vary from 4.0 to 18.0 ft depending on the presence of a station platform – same as the LPA. The average median width would be 9.6 ft, 0.2 ft longer on average than the LPA. The typical width of a station platform would be 9.0 ft (between O'Farrell and Geary, which has two block-long platforms, the combined

median width is 18.0 ft). The typical width of the median in blocks without stations would be 11.0 ft.

- **Sidewalk Width** - Sidewalk widths would typically be 16.0 ft wide on both sides of the street, with slightly wider sidewalks near City Hall, as well as south of Market Street – same as the LPA.
- **Corner Bulbs** – This variant would have 34 corner bulbs in the SB direction and 30 corner bulbs in the NB direction to shorten crossing distances – same as the LPA.
- **Accessible Pedestrian Signals (APS)** - New APS would be installed at all intersections to improve crossing and station access. This would be common across all build alternatives.

6.6 Pedestrian Crossing Volumes

Corridor pedestrian crossing forecasts are presented in Table 11 for various alternatives. The No-Build pedestrian volumes would be nearly the same as that of the build alternatives. Pedestrian volumes would be heaviest between Market and Grove Streets, which today also shows the heaviest crossing volumes.

Table 11 - Forecast Hourly Pedestrian Volumes

Intersection	Alternative 1 (No-Build)	Build Alternatives (Alts. 2, 3A, 3B, 4A, 4B, LPA & LPA Vallejo NB Station Variant)	% Growth
Union	440	438	-0.5%
Clay	945	945	0.0%
Broadway	282	282	0.0%
Sacramento	644	641	-0.4%
California	918	918	0.0%
Pine	560	560	0.0%
Bush	560	560	0.0%
Sutter	575	575	0.0%
Post	600	600	0.0%
Geary	1,136	1,136	0.0%
O'Farrell	1,018	1,018	0.0%
Ellis	1,122	1,121	-0.2%
Eddy	1,122	1,121	-0.2%
Turk	1,122	1,121	-0.2%
Golden Gate	1,160	1,158	-0.2%
McAllister	1,197	1,195	-0.2%
Grove	1,868	1,867	0.0%
Hayes	673	672	-0.2%
Fell	1,347	1,345	-0.2%
Oak	868	867	-0.2%
Market	2,277	2,276	-0.1%

Mission	880	875	-0.1%
Duboce	1060	1,063	0.2%

Source: SFCTA, 2010/2012.

6.7 Expected Bicycle Volumes

At present, relatively few bicyclists use Van Ness Avenue for travel, as the dedicated bicycle facility is on Polk Street, one block to the east. Bicycle volumes would likely continue to be light in the future, whether or not BRT is implemented on Van Ness. Therefore, no significant increase in bicycle volumes would be expected for the No-Build or build alternatives when compared to today.

7 Impacts Analysis

This section identifies potential NMT impacts of the Van Ness BRT build alternatives relative to the No-Build (Alternative 1). First, this section describes the methodology for estimating impacts (Section 7.1), and then describes the potential impacts to pedestrians (Section 7.2) and potential impacts to bicyclists (Section 7.3).

7.1 Methodology

The impact analysis for non-motorized transportation covers pedestrians and bicyclists. The impact analysis compares each build alternative relative to the No-Build (Alternative 1).

A build alternative is considered to have an impact on pedestrians or bicyclists if it performs worse than Alternative 1 in terms of crossing safety, travel safety along Van Ness Avenue, or pedestrian accessibility. In some cases, a build alternative may improve conditions compared to Alternative 1, in which case a beneficial impact is identified. If a build alternative performs the same as Alternative 1, it is considered to have no impact. In summary, NMT impacts are categorized into standard EIR/EIS classifications:

- Beneficial impact (alternative will improve conditions)
- No impact (no change or difference from the No-Build (Alternative 1)
- Less than significant impact (no mitigation required)
- Potentially significant impact (mitigation measures are required to reduce the impact to a level that is less than significant)
- Significant and unavoidable impact (remains significant after mitigation)

For the pedestrian realm, crossing safety characteristics include crossing distance, crossing speed, pedestrian delay, presence of median nose cones, presence of corner bulbs, provision of pedestrian signals, pedestrian crowding, and volume of vehicle right turns.

As described in Section 4, which presents existing pedestrian conditions, standards exist for crossing speed, pedestrian delay, and pedestrian crowding as follows:

- Crossing time is a function of crossing distance and the time a signal allows for the crossing. The analysis compares how fast pedestrians or wheelchair users would need to cross a street against federal (MUTCD) and City standards.
- Pedestrian delay measures the time pedestrians must wait at a signal to cross. A long wait time encourages non-compliance with the pedestrian signal and raises the risk of a collision with a vehicle. The analysis

compares the computed average pedestrian delay with the TRB's Highway Capacity Manual (HCM) thresholds for Level of Service (LOS).

- Pedestrian crowding compares crosswalk dimensions with pedestrian volume. This analysis also uses HCM standards.

The City does not have standards for other characteristics influencing crossing safety, but has nevertheless included them to qualitatively inform the impact analysis.

Along Van Ness Avenue, sidewalk safety is influenced by many factors. Standards for how these characteristics affect pedestrians do not generally exist, so this analysis is qualitative.

Pedestrian accessibility is informed by the Universal Design evaluation performed for the existing condition. The seven principles of Universal Design described earlier are: equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use.

The bicycle impact analysis considers the width of the right-most travel lane adjacent to parking or the curb, speed of adjacent traffic (in the right-most travel lane and other travel lanes), volume of vehicle right turns, bicycle safety and comfort, as well as bicycle delay.

All characteristics analyzed in this section are described in the preceding Existing Conditions sections. The following sub-sections present information to highlight differences between the build alternatives and the No-Build (Alternative 1). More details about the build alternatives are provided in the Appendix.

The Authority has evaluated the alternatives against applicable guidance or standards. For some characteristics defined above, an examination of environmental documents written recently about similar transit projects yielded a general lack of measures, standards, or thresholds to determine impact. For these characteristics the Authority has exercised professional judgement to evaluate impacts.

7.2 Pedestrian Impacts

Potential pedestrian impacts of the build alternatives relative to Alternative 1 (No-Build) are identified in this section. This section is organized into the following subsections:

- Pedestrian Crossing Safety;
- Sidewalk Safety along Van Ness Avenue; and
- Pedestrian Accessibility.

7.2.1 Pedestrian Crossing Safety

Crossing safety is analyzed in terms of:

- Crossing distance, including median refuges;
- Crossing speed;
- Presence of median nose cones;
- Presence of corner bulbs;
- Provision of pedestrian signals;
- Pedestrian delay (time spent waiting to cross an intersection);
- Pedestrian crowding (references crosswalk width and pedestrian volume); and
- Vehicle right turn volume.

7.2.1.1 Crossing Distance including Median Refuges

Crossing distances vary by build alternative due to design differences in lane configuration and median location. Table 12 and Figure 27 show the average curb-to-curb and curb-to-median pedestrian crossing distances for each build alternative.

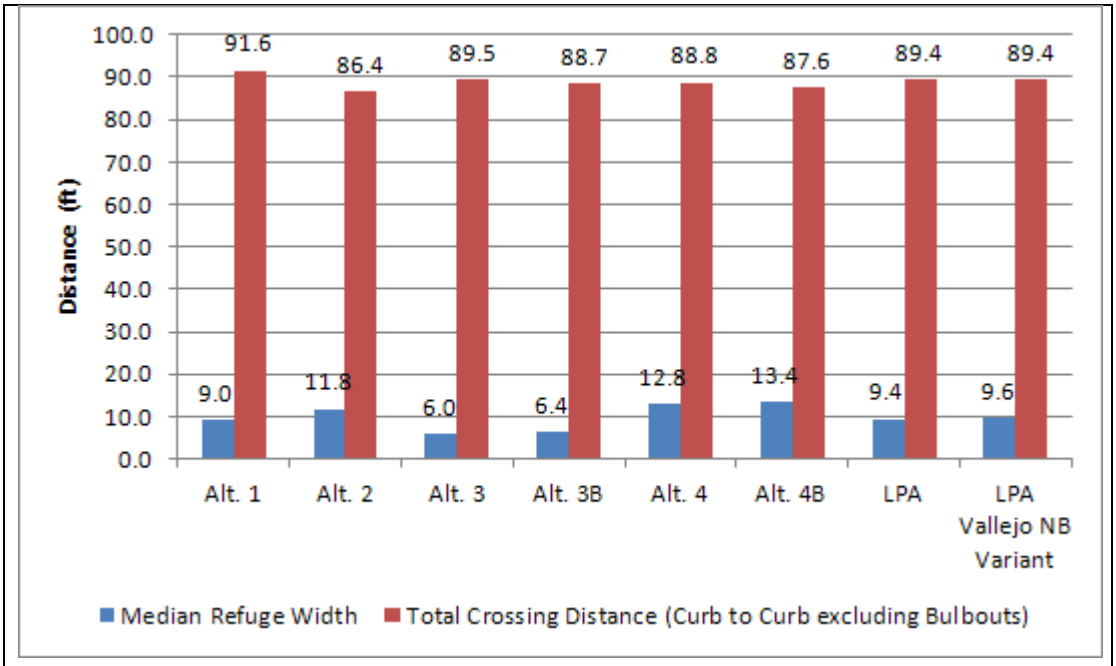
Overall, Alternative 1 would have the longest curb-to-curb pedestrian crossing distance, while Alternative 2 would have the shortest distances. Alternatives 4/4B would have the widest medians, while Alternatives 3/3B would have the narrowest medians.

Table 12 - Average Crossing Distances by Alternative (ft)

Alternative	Avg. Median Refuge Width	Avg. Crossing Distance (Curb-to-Curb)
1	9.0	91.1
2	11.8	86.4
3	6.0	89.5
3B	6.4	88.7
4	12.8	88.8
4B	13.4	87.6
LPA	9.4	89.4
LPA Vallejo NB Station Variant	9.6	89.4

Source: SFCTA, 2010/2012.

Note: The average median refuge width for Alternatives 3/3B includes both the NB and SB medians. That for the LPA and LPA Vallejo NB Station Variant includes both the NB and SB medians as well as the center median.



Source: SFCTA, 2010/2012.

Figure 27 - Average Median Width and Curb-to-Curb Crossing Distance (ft)

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better than Alternative 1 in terms of median width and curb-to-curb crossing distance as shown in Table 12 above. The median refuge width would increase by 2.8 ft compared to Alternative 1. Overall the average curb-to-curb crossing distance in Alternative 2 would be 4.7 ft less than that of Alternative 1. ***Compared to Alternative 1, Alternative 2 would have a beneficial impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform worse than Alternative 1 in terms of median refuge width, but better in terms of curb-to-curb crossing distance as shown in Table 12 above. Alternative 3 proposes dual BRT lanes with outer medians separating mixed flow traffic from the BRT lanes. The average median refuge width would decrease by 3.0 ft from Alternative 1, while curb-to-curb crossing distance in Alternative 3 would decrease by 1.6 ft from Alternative 1. Alternative 3B would perform similarly. ***Compared to Alternative 1, Alternatives 3 and 3B would have a less than significant impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform better than Alternative 1 in terms of median width and curb-to-curb crossing distance as shown in Table 12 above. The median refuge width increases by 3.8 ft over Alternative 1, while the average curb-to-curb crossing distance would be 2.3 ft less than that of Alternative 1. Alternative 4B would perform similarly. ***Compared to the Alternative 1, Alternatives 4 and 4B would have a beneficial impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA, with or without the Vallejo variant, would perform better than Alternative 1 in terms of median width and curb-to-curb crossing distance as shown in Table 12

above. The median refuge width increases by 0.4 ft for the LPA and 0.6 ft for the LPA Vallejo NB Station Variant over Alternative 1, while the average curb-to-curb crossing distance would be 1.7 ft less than that of Alternative 1. The LPA Vallejo NB Station Variant would perform similarly. ***Compared to the Alternative 1, the LPA and LPA Vallejo NB Station Variant would have a beneficial impact.***

7.2.1.2 Crossing Speed

A crossing speed analysis is undertaken to estimate how quickly pedestrians would have to cross an intersection given the allotted signal time (also known as the full walk split). Crossing speeds are estimated for each alternative for two conditions, crossing Van Ness Avenue and crossing side streets along Van Ness Avenue, and are presented in Table A8 in Appendix A. To compare average crossing speed performance among alternatives, the number of intersections meeting FHWA (3.0 fps for full walk split) and City (2.5 fps for full walk split) targets, respectively, is identified and compared to the No-Build (Alternative 1).

Side Street Crossing Condition

Table 13 shows the number of side street crossings (alongside Van Ness in the N-S direction) that would meet the FHWA and City targets for each alternative. In addition, the percent difference in speed between non-FHWA compliant intersections (i.e., those requiring speeds in excess of 3.0 fps) and the FHWA target of 3.0 fps is calculated for each alternative. In essence, this percentage indicates how much faster a person would need to walk than the target speed of 3.0 fps to cross the intersection in the allotted signal time. Overall, all build alternatives would have the same number of side street crossings meeting the City and FHWA targets as the No-Build (Alternative 1) and thus the same number of crossings (one, at Mission Street) that exceed the FHWA target of 3.0 fps.

Table 13 – # of Side Street Crossings Meeting City and FHWA Walking Speed Targets during Full Walk Split (fps)

Measure	Alt. 1	Alt. 2	Alt. 3	Alt. 3B	Alt. 4	Alt. 4B	LPA	LPA NB Variant
# of Crossings Meeting City Target of 2.5 fps for Full Walk Split	27	27	27	27	27	27	27	27
# of Crossings Meeting FHWA Guideline of 3.0 fps for Full Walk Split	28	28	28	28	28	28	28	28
# of Crossings Exceeding FHWA Guideline of 3.0 fps for Full Walk Split	1	1	1	1	1	1	1	1
% Speed Differential vs. FHWA Guideline (for non-FHWA Compliant Crossings Only (i.e., those requiring speeds in excess of 3.0 fps))	35%	38%	53%	53%	53%	53%	53%	53%

Source: SFCTA, 2010/2012.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform equal to Alternative 1 in terms of the number of crossings meeting City and FHWA targets, as well as the percentage speed differential for non-FHWA compliant crossings. ***Overall, Alternative 2 would have no impact***.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform equal to Alternative 1 in terms of the number of crossings meeting City and FHWA targets. For the sole non-FHWA compliant crossing, Alternative 3 would perform worse in terms of percentage speed differential. Alternative 3B would perform similarly. ***Overall, Alternatives 3 and 3B would be roughly equal in performance to Alternative 1 and would therefore be considered to have a less than significant impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform equal to Alternative 1 in terms of the number of crossings meeting City and FHWA targets. For the sole non-FHWA compliant crossing, Alternative 4 would perform worse in terms of percentage speed. Alternative 4B would perform similarly. ***Overall, Alternatives 4 and 4B would be roughly equal in performance to Alternative 1 and would therefore be considered to have a less than significant impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA would perform equal to Alternative 1 in terms of the number of crossings meeting City and FHWA targets. For the sole non-FHWA compliant crossing, LPA would perform worse in terms of percentage speed. The LPA Vallejo NB Station Variant would perform similarly. ***Overall, the LPA and LPA Vallejo NB Station Variant would be roughly equal in performance to Alternative 1 and would therefore be considered to have a less than significant impact.***

Van Ness Avenue Crossing Condition

Table 14 shows the number of Van Ness street crossings (i.e., across Van Ness in the E-W direction) that would meet the FHWA and City targets for each alternative. In addition, the percent difference in speed between non-FHWA compliant intersections (i.e., those requiring speeds in excess of 3.0 fps) and the FHWA target of 3.0 fps is calculated for each alternative. Overall, all build alternatives would have more crossings that meet the City and FHWA targets than the No-Build (Alternative 1). At the same time, build alternatives would have fewer crossings exceeding FHWA targets than the No-Build.

Table 14 – # of Van Ness Crossings Meeting City and FHWA Walking Speed Targets during Full Walk Split (fps)

Measure	Alt. 1	Alt. 2	Alt. 3	Alt. 3B	Alt. 4	Alt. 4B	LPA	LPA NB Variant
# of Crossings Meeting City Target of 2.5 fps for Full Walk Split	3	14	8	8	8	8	6	6
# of Crossings Meeting FHWA Guideline of 3.0 fps for Full Walk Split	21	27	25	25	25	25	24	24
# of Crossings Exceeding FHWA Guideline of 3.0 fps for Full Walk Split	8	2	4	4	4	4	5	5
% Speed Differential vs. FHWA Guideline (for non-FHWA Compliant Crossings Only (i.e., those requiring speeds in excess of 3.0 fps))	38%	37%	30%	30%	30%	30%	34%	34%

Source: SFCTA, 2010/2012.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better than Alternative 1 in terms of the number of crossings meeting City and FHWA targets and slightly better in terms of percentage speed differential for non-FHWA compliant crossings (for Alternative 2 there would be two such crossings). ***Overall, Alternative 2 would have a beneficial impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform better than Alternative 1 in terms of the number of crossings meeting City and FHWA targets and percentage speed differential for non-FHWA compliant crossings (for Alternative 3 there would be four such crossings). Alternative 3B would perform similarly. ***Overall, Alternatives 3 and 3B would have a beneficial impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform better than Alternative 1 in terms of the number of crossings meeting City and FHWA targets and percentage speed differential for non-FHWA compliant crossings (for Alternative 4 there would be four such crossings). Alternative 4B would perform similarly. ***Overall, Alternatives 4 and 4B would have a beneficial impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): LPA would perform better than Alternative 1 in terms of the number of crossings meeting City and FHWA targets and percentage speed differential for non-FHWA compliant crossings (for the LPA there would be five such crossings). The LPA Vallejo NB Station Variant would perform similarly. ***Overall, the LPA and the LPA Vallejo NB Station Variant would have a beneficial impact.***

7.2.1.3 Nose Cone Provision

Median refuges provide a physical barrier from traffic, creating a protected waiting area in the median. Median refuges equipped with nose cones provide additional protection from turning and on-coming vehicles. At present, 14 intersections on Van Ness are equipped with median nose cones, with a total of 17 nose cones on the north and/or south legs of these intersections. Table 15 presents the number of nose cones that would be provided to facilitate crossing Van Ness Avenue under each alternative.

Nose cones for the build alternatives would range from 4.0 to 14.0 ft in diameter. All build alternatives would have more nose cones and intersections with nose cones than the No-Build (Alternative 1). The LPA and the LPA Vallejo NB Station Variant would provide the most nose cones along the corridor (including cones on both south and north legs of an intersection), and along with Alternative 2 provide the most intersections equipped with a nose cone.

Table 15 – Number of Nose Cones along Van Ness Avenue Corridor

Alternative	# of Intersections with Nose Cone	# of Nose Cones on South Leg	# of Nose Cones on North Leg	Total # of Nose Cones
1	14	8	9	17
2	29	28	27	55
3	26	26	26	52
3B	26	26	26	52
4	28	27	27	54
4B	28	27	27	54
LPA	29	28	28	56
LPA Vallejo NB Station Variant	29	28	28	56

Source: SFCTA, 2010/2012.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better in terms of nose cone provision than Alternative 1 in all categories in Table 15. ***Therefore, Alternative 2 would have a beneficial impact***.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform better in terms of nose cone provision than Alternative 1 in all categories in Table 15. Alternative 3B would perform similarly. ***Therefore, Alternatives 3 and 3B would have a beneficial impact***.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform better in terms of nose cone provision than Alternative 1 in all categories in Table 15. Alternative 4B would perform similarly. ***Therefore, Alternative 4 and 4B would have a beneficial impact***.

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): LPA would perform better in terms of nose cone provision than Alternative 1 in all categories in Table 15. The LPA Vallejo NB Station Variant would perform similarly. ***Therefore, the LPA and the LPA Vallejo NB Station Variant would have a beneficial impact***.

7.2.1.4 Corner Bulb

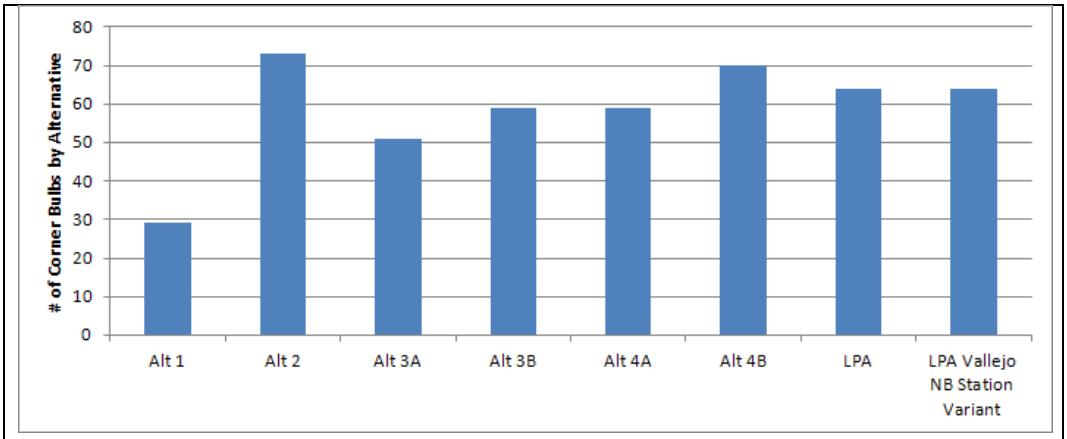
Corner bulbs extend the sidewalk into the intersection and reduce the pedestrian crossing distance, curb-to-curb. They help slower-moving pedestrians finish crossing within one phase of the traffic light cycle. In addition to reducing crossing distance, they create a larger queuing area for pedestrians.

Table 16 – Number of Corner Bulbs by Alternative along Van Ness Avenue Corridor

Alternative	Corner Bulbs in SB Direction	Corner Bulbs in NB Direction	Total Corner Bulbs
1	14	15	29
2	39	34	73
3	25	26	51
3B	31	28	59
4	29	30	59
4B	35	35	70
LPA	30	34	64
LPA Vallejo NB Station Variant	30	34	64

Source: SFCTA, 2010/2012.

Table 16 presents the total number of corner bulbs that would be provided by each alternative in both directions of travel. All build alternatives would have significantly more corner bulbs than Alternative 1, with Alternative 2 having the most at 73. Figure 28 compares the total number of corner bulbs by alternative.



Source: SFCTA, 2010/2012.

Figure 28 - Number of Corner Bulbs by Alternative

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better in terms of corner bulb provision than Alternative 1 in all categories in Table 16. Overall Alternative 2 would provide 44 more corner bulbs in total than Alternative 1. ***Therefore, Alternative 2 would have a beneficial impact***.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform better in terms of corner bulb provision than Alternative 1 in all categories in Table 16. Alternative 3 would provide 22 more corner bulbs in total than Alternative 1. Alternative 3B would perform similarly to Alternative 3, by

providing 30 more corner bulbs than Alternative 1. ***Therefore, Alternatives 3 and 3B would have a beneficial impact***.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform better in terms of corner bulb provision than Alternative 1 in all categories in Table 16. Alternative 4 would provide 30 more corner bulbs in total than Alternative 1. Alternative 4B would perform similarly to Alternative 4, by providing 41 more corner bulbs than Alternative 1. ***Therefore, Alternatives 4 and 4B would have a beneficial impact***.

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA would perform better in terms of corner bulb provision than Alternative 1 in all categories in Table 16. The LPA would provide 35 more corner bulbs in total than Alternative 1. The LPA Vallejo NB Station Variant Alternative 4B would perform similarly to Alternative 4, by providing 41 more corner bulbs than Alternative 1. ***Therefore, the LPA and the LPA/LPA Vallejo NB Station Variant would have a beneficial impact***.

7.2.1.5 Pedestrian Signals

Pedestrian countdown signals visually display the remaining time given to cross the street. These signals provide pedestrians with information for them to estimate if they can safely complete the crossing without having to wait in the median. At present, select intersections on the corridor are equipped with pedestrian signals - three intersections have pedestrian signals on some crossing legs, while 11 intersections have no pedestrian signals on any crossing leg. All other intersections have pedestrian signals on all legs. Regardless of alternative, all 29 signalized corridor intersections would be equipped with pedestrian countdown signals on all legs.

Separately, Accessible Pedestrian Signals (APS) use non-visual cues to indicate when safe crossings can be made. APS are currently installed at five intersections along the corridor, with a sixth APS planned at Union Street. APS is installed on all legs of these intersections. APS would likely be installed at some additional signalized intersections for the No-Build (Alternative 1), but not at all signalized intersections. For all build alternatives, APS would be installed at all signalized intersections in the project corridor. Table 17 presents the proposed pedestrian signal and APS provision plans.

Table 17 - Proposed Pedestrian Signal and APS Provision on Van Ness Avenue

	# of Intersections			
Alternative	**With Pedestrian Signals On All Legs**	**With Pedestrian Signals on Some Legs**	**Without Pedestrian Signals**	**With APS on All Legs**
1	29	0	0	N/A *
Build Alternatives (2, 3, 3B, 4, 4B, LPA & LPA Vallejo NB Station Variant)	29	0	0	29

Source: SFCTA, 2010/2012.

Note: * APS would likely be installed at some additional signalized intersections (but not all) compared to today in the project corridor as part of SFgo. At present, five intersections on the corridor are APS-equipped.

Each of the build alternatives would perform better than Alternative 1 because more intersections would be equipped with APS.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better than Alternative 1 by providing APS at all intersections. ***Therefore, Alternative 2 would have a beneficial impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform better than Alternative 1 by providing APS at all intersections. Alternative 3B would perform similarly. ***Therefore, Alternatives 3 and 3B would have a beneficial impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform better than Alternative 1 by providing APS at all intersections. Alternative 4B would perform similarly. ***Therefore, Alternatives 4 and 4B would have a beneficial impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA would perform better than Alternative 1 by providing APS at all intersections. The LPA Vallejo NB Station Variant would perform similarly. ***Therefore, the LPA and the LPA Vallejo NB Station Variant would have a beneficial impact.***

7.2.1.6 Pedestrian Delay

Pedestrian delay is measured by how much time people must wait before receiving a green signal to cross a street. It is expressed in terms of a Level of Service (LOS) defined by the TRB's 2000 *Highway Capacity Manual* (HCM) as described in the Existing Conditions section. An alternative would be considered to have an impact if it causes an intersection to perform with a pedestrian delay LOS of E or F or worsens pedestrian delay by more than 5 percent at an intersection that is already operating at pedestrian LOS E or F.

Table 18 shows how build alternatives would compare to the No-Build (Alternative 1) in average pedestrian delay and LOS. Pedestrian delay calculations are not available for the ten northernmost intersections in the study corridor. Of the intersections where data is available, only one intersection – Mission Street – currently operates at pedestrian LOS E. Overall, the build alternatives would not increase pedestrian delay by more than 5 percent at any intersection to LOS E or F and would not increase pedestrian delay at Mission Street to LOS F.

Table 18 – Pedestrian and Vehicle Passenger Delay

	Existing Condition (2007)		Alternative 1		Alternative 2		Alternative 3 / 4		Alternative 3B / 4B / LPA / LPA NB Variant	
Intersection	**Avg. Ped. Delay**	**LOS**	**Avg. Ped. Delay**	**LOS**	**Avg. Ped. Delay**	**LOS**	**Avg. Ped. Delay**	**LOS**	**Avg. Ped. Delay**	**LOS**
Duboce (on Mission)	24.4	C	36.3	D	26.3	C	26.3	C	26.6	C
Mission	44.4	E	44.7	E	46.6	E	46.1	E	43.5	E
Market	28.9	C	33.1	D	35.1	D	35.0	D	35.2	D
Fell	24.7	C	23.5	C	28.4	C	29.5	C	27.7	C
Hayes	24.4	C	29.0	C	30.1	D	29.5	C	30.3	D
Grove	28.2	C	32.1	D	33.8	D	30.8	D	30.8	D
McAllister	24.0	C	26.0	C	26.6	C	28.1	C	26.9	C
Golden Gate	22.9	C	23.7	C	32.0	D	29.6	C	26.4	C
Turk	22.7	C	24.0	C	26.0	C	23.8	C	26.1	C
Eddy	21.7	C	21.6	C	26.6	C	27.0	C	25.2	C
Ellis	22.1	C	21.0	C	21.8	C	21.5	C	23.0	C
O'Farrell	21.7	C	23.8	C	26.1	C	24.1	C	24.2	C
Geary	21.4	C	24.3	C	25.8	C	25.5	C	25.6	C
Post	22.0	C	26.4	C	26.6	C	28.8	C	26.3	C
Sutter	23.0	C	25.6	C	26.9	C	26.9	C	25.9	C
Bush	25.7	C	29.8	C	35.1	D	29.8	C	36.3	D
Pine	28.6	C	32.5	D	31.7	D	28.3	C	32.6	D
California	22.3	C	24.5	C	26.7	C	27.2	C	26.0	C
Sacramento	22.6	C	24.7	C	27.4	C	28.1	C	30.2	D
Clay	21.7	C	23.1	C	26.1	C	25.5	C	23.8	C
Washington	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jackson	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pacific	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Broadway	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Vallejo	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Green	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Union	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Filbert	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Greenwich	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lombard	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total Intersections by LOS										
LOS A	0		0		0		0		0	
LOS B	0		0		0		0		0	
LOS C	19		15		13		13		17	
LOS D	0		4		6		6		2	
LOS E	1		1		1		1		1	
LOS F	0		0		0		0		0	

Source: SFCTA, 2010/2012.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform slightly worse than Alternative 1 as it would have two more intersections operating with pedestrian LOS D. However, Alternative 2 would not increase the delay by more than 5 percent to LOS E or F for any intersection, and pedestrian delay at Mission Street would remain at LOS E. ***Therefore, Alternative 2 would be considered to have a less than significant impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform slightly worse than Alternative 1 as it would have two more intersections operating with pedestrian LOS D. However, Alternative 3 would not increase the delay by more than 5 percent to LOS E or F for any intersection, and pedestrian delay at Mission Street would remain at LOS E. ***Therefore, Alternative 3 would be considered to have a less than significant impact.***

Alternative 3B would perform better than Alternative 1 since it would have two fewer intersections operating with pedestrian LOS D (delay at these intersections would not increase by more than 5 percent), and pedestrian delay at Mission Street would remain at LOS E. ***Therefore, Alternative 3B would have a beneficial impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform slightly worse than Alternative 1 as it would have two more intersections operating with pedestrian LOS D. However, Alternative 4 would not increase the delay by more than 5 percent to LOS E or F for any intersection, and pedestrian delay at Mission Street would remain at LOS E. ***Therefore, Alternative 4 would be considered to have a less than significant impact.***

Alternative 4B would better than Alternative 1 since it would have two fewer intersections operating with pedestrian LOS D (delay at these intersections would not increase by more than 5 percent) and pedestrian delay at Mission Street would remain at LOS E. ***Therefore, Alternative 4B would have a beneficial impact.***

LPA/LPA Vallejo NB Station Variant would better than Alternative 1 since it would have two fewer intersections operating with pedestrian LOS D (delay at these intersections would not increase by more than 5 percent) and pedestrian delay at Mission Street would remain at LOS E. ***Therefore, the LPA and the LPA Vallejo NB Station Variant would have a beneficial impact.***

7.2.1.7 Pedestrian Crowding

Pedestrian crowding is measured in terms of the "maneuvering area" provided for each pedestrian crossing the street, and is a function of pedestrian volumes, crosswalk dimensions (length and width), time allowed for crossing, and expected walking speeds. Performance is expressed in terms of LOS, as defined in the 2000 HCM and described in more detail in the Existing Conditions section.

According to the HCM, an intersection performs at LOS A when it provides a maneuvering area of at least 60 square feet per person in the crosswalk. The LOS calculation is performed separately for crossings of side streets and crossings of Van Ness Avenue. Where crosswalk dimensions may differ between the north and

south sides of a side street, or the east and west sides of Van Ness Avenue, the more conservative / worst case dimension was used for the calculation. The five intersections chosen for study, including Van Ness Avenue at Golden Gate, McAllister, Grove, Fell, and Market, have the highest projected pedestrian crossing volumes with the build alternatives.

Table 19 shows the pedestrian crowding LOS for each alternative by intersection.

Table 19 - Pedestrian Crowding Level of Service at Busiest Intersections

Alternative	Golden Gate	McAllister	Grove	Fell	Market
1	A	A	A	A	A
2	A	A	A	A	A
3	A	A	A	A	A
3B	A	A	A	A	A
4	A	A	A	A	A
4B	A	A	A	A	A
LPA	A	A	A	A	A
LPA Vallejo NB Station Variant	A	A	A	A	A

Source: SFCTA, 2010/2012.

For the five busiest intersections along Van Ness Avenue, each build alternative would perform equal to Alternative 1 in terms of pedestrian crowding LOS. All crosswalks would provide at least 60 square feet of maneuvering area for crossing pedestrians, resulting in a LOS of A for each intersection under each alternative.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform equal to Alternative 1 in terms of pedestrian crowding. ***Therefore, Alternative 2 would have no impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform equal to Alternative 1 in terms of pedestrian crowding. Alternative 3B would perform similarly. ***Therefore, Alternatives 3 and 3B would have no impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform equal to Alternative 1 in terms of pedestrian crowding. Alternative 4B would perform similarly. ***Therefore, Alternatives 4 and 4B would have no impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA would perform equal to Alternative 1 in terms of pedestrian crowding. The LPA Vallejo NB Station Variant would perform similarly. ***Therefore, the LPA and the LPA Vallejo NB Station Variant would have no impact.***

7.2.1.8 Vehicle Right Turn Volume

The number of vehicular right turns affects pedestrians crossing Van Ness Avenue and side streets. Locations with heavy right turn volumes have higher rates of conflicts between vehicles and pedestrians or bicyclists, possibly increasing the number of conflicts. Table 20 and Figure 29 show the number of locations with right turns, grouped by hourly right turn volume. Right turns in this case include

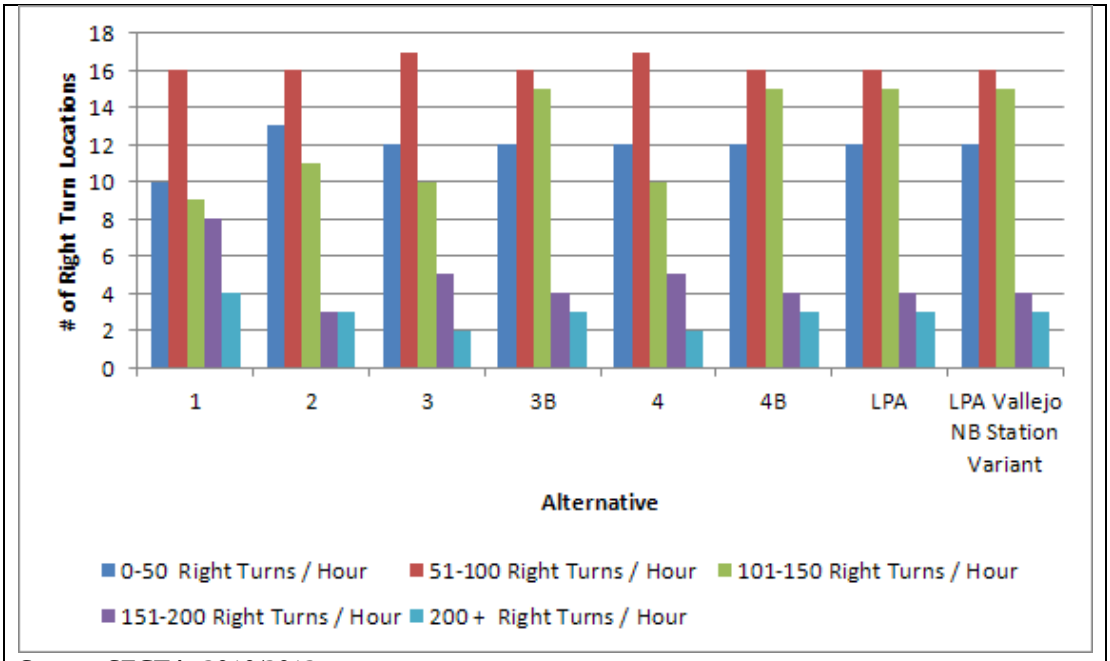
vehicles turning from side streets onto Van Ness Avenue and vehicles turning from Van Ness Avenue onto side streets. Alternatives with fewer high-volume turning locations and more low-volume locations would be considered to perform better and be safer for pedestrian crossings as well as bicycle travel.

Table 20 - Right Turn Locations by Hourly Volume

	Number of Right Turn Locations by Hourly Volume				
Alternative	0-50 Right Turns / Hour	51-100 Right Turns / Hour	101-150 Right Turns / Hour	151-200 Right Turns / Hour	200 + Right Turns / Hour
1	10	16	9	8	4
2	13	16	11	3	3
3	12	17	10	5	2
3B	12	16	15	4	3
4	12	17	10	5	2
4B	12	16	15	4	3
LPA	12	16	15	4	3
LPA Vallejo NB Station Variant	12	16	15	4	3

Source: SFCTA, 2010/2012.

Note: Total number of right turn locations varies slightly by alternative due to different intersection geometry.



Source: SFCTA, 2010/2012.

Figure 29 - Number of Right Turn Locations by Hourly Volume

Overall, all of the build alternatives (2, 3, 3B, 4, 4B, LPA and the LPA Vallejo NB Station Variant) would perform better than Alternative 1. The build alternatives would generally have fewer high-volume locations (with over 150 right turn movements per hour), with more lower-volume locations (with 150 or fewer right turn movements per hour). Therefore, all of the build alternatives would be considered to have a beneficial impact compared to Alternative 1.

Alternative 2 vs. Alternative 1 (No-Build): ***Alternative 2 would perform better than Alternative 1 and would have a beneficial impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): ***Alternative 3 would perform better than Alternative 1 and would have a beneficial impact. As Alternative 3B performs similarly, Alternative 3B would also have a beneficial impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): ***Alternative 4 would perform better than Alternative 1 and would have a beneficial impact. As Alternative 4B performs similarly, Alternative 4B would also have a beneficial impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): ***The LPA would perform better than Alternative 1 and would have a beneficial impact. As the LPA Vallejo NB Station Variant performs similarly, the LPA Vallejo NB Station Variant would also have a beneficial impact.***

7.2.2 Sidewalk Safety Along Van Ness Avenue

7.2.2.1 Overall Discussion of Sidewalk Safety

This section discusses pedestrian sidewalk safety along Van Ness Avenue. Pedestrian sidewalk safety, or the perception of safety, is influenced by many factors including the width of the sidewalk, the level of pedestrian activity on the sidewalk, the amount of space between moving traffic on the roadway and pedestrians, and the presence of objects that help buffer roadway activity from pedestrians on the sidewalk. The effects of removing parking spaces, which in some cases reduces the amount of space between traffic and the sidewalk, is discussed in Section 3.5, Parking. Similarly, the distinction between sidewalk width and effective sidewalk width is discussed in the Universal Design section below.

Overall, standards have not been established to measure how these various factors influence sidewalk safety. Therefore, this section provides a general assessment of sidewalk safety by alternative. Key findings are as follows:

- Under the build alternatives, including the LPA, the average sidewalk width of 16 feet would remain the same throughout Van Ness Avenue.
- Replacement of the OCS support pole/streetlight network under the build alternatives, including the LPA, would result in improved pedestrian lighting, which would improve sidewalk safety.

- Existing bus stop shelters and signage would be removed from the sidewalk because proposed BRT stations would be located on curb extensions or in the median, and they would not take up sidewalk space as do existing bus shelters. This would open up sidewalk space over conditions in the No Build Alternative.
- Moreover, curb bulbs proposed under the build alternatives, including the LPA, would create additional sidewalk space available to pedestrians compared to the No Build Alternative condition.
- Streetscape features, such as curbside parking, sidewalk trees, landscaped planters, newspaper racks, and bicycle racks, would continue to serve as a buffer between the sidewalk and vehicular traffic throughout most of the corridor.
- Each build alternative, including the LPA, would result in the removal of curbside parking along some blocks of Van Ness Avenue. Parking would be completely removed, or nearly completely removed along both sides of the block on the following blocks of Van Ness Avenue:
    - Between Sutter and Bush streets under the LPA;
    - Between Bush and Pine streets under Build Alternative 4 without Design Option B;
    - Between Sacramento and Clay streets under the LPA;
    - Between Jackson and Pacific streets under the LPA;
    - Between Broadway and Vallejo Street under Build Alternatives 3 and 4, with or without Design Option B, and the LPA; and
    - Between Vallejo and Green streets under the LPA, including with the Vallejo Northbound Station Variant.
- Parking would be removed on the same side of the street for two consecutive blocks in the blocks identified below.
    - Between Market and Fell streets under Build Alternative 3 with or without Design Option B (west side);
    - Between Fell and Hayes streets under Build Alternative 3 without Design Option B, and under Build Alternative 4 without Design Option B (west side);
    - Between Broadway and Vallejo Street under Build Alternatives 3 (east and west sides) and 4 (east and west sides), with or without Design Option B, and the LPA (east and west sides); and
    - Between Vallejo and Green streets under the LPA (east and west sides).

  For these blocks in the Civic Center, curbside planters would be placed between the sidewalk and street, serving as a buffer between the sidewalk

and vehicular traffic. Under the LPA, the project proposes to implement an approximate 2-foot-wide buffer, possibly in the form of planters, on the blocks between Geary and O'Farrell streets and Broadway and Green Street on both sides of the street due to the lack of a buffer provided by a parking lane or planters on those blocks.

Thus, the Van Ness Avenue corridor would retain a fairly even distribution of most curbside parking throughout the corridor under all of the build alternatives, including the LPA, and the loss of the street parking buffer on limited blocks under the build alternatives, including the LPA, would not substantially change overall sidewalk safety and comfort along Van Ness Avenue.

7.2.2.2 Build Alternatives vs. Alternative 1

In summary, each of the build alternatives (including Design Option B) and the LPA would result in improvements to sidewalk safety through the creation of curb bulbs, removal of existing bus shelters from sidewalks, and improved sidewalk lighting. Removal of a street parking buffer would occur in limited locations under the build alternatives, including the LPA; however, most street blocks would retain a street parking buffer.

Alternative 1, the No-Build Alternative, would not change sidewalk conditions along Van Ness Avenue from what they are now, with the exception of improved sidewalk lighting that would occur with replacement of the OCS support pole/streetlight network. New lighting would meet current lighting requirements for safety and would improve. Street furniture, sidewalk width, and street parking spaces would remain.

Alternative 2, by virtue of the side BRT lanes and stations, would increase the effective amount of sidewalk space available to pedestrians compared to the No-Build Alternative. The average sidewalk width of 16 feet would remain the same throughout the Van Ness corridor, and parking would generally remain, however, existing bus stop furniture would be moved off of the sidewalk onto corner bulbs, closer to the roadway. Thus the corner bulbs would serve bus stop functions as well as improve sidewalk conditions for through pedestrians, while other street furniture is retained on the sidewalk.

Alternative 3 would also not change the average sidewalk width of 16 ft, however bus stop furniture would be moved off of the sidewalk and onto the median bus stations, allowing greater pedestrian movement along the sidewalk. This alternative also would slightly reduce parking along the corridor. Compared to the No-Build alternative, roadway traffic would be brought closer to the sidewalk in several additional locations, although this would not substantially change overall sidewalk safety and comfort along Van Ness Avenue. There are no plans to reduce the typical street furniture such as street trees, benches, newsstands, and the like. Alternative 3B would be the same as Alternative 3.

Alternative 4 would maintain the average sidewalk width of 16 feet. Like Alternative 3, Alternative 4 calls for the relocation of bus stop furniture to the median bus stations. Alternative 4 would also retain other street furniture and maintain a similar amount of parking as the No-Build Alternative. Alternative 4B would be the same as Alternative 4.

The LPA would maintain the average sidewalk width of 16 feet. Like Alternatives 3 and 4, the LPA calls for the relocation of bus stop furniture to the median bus stations. Similar to Alternative 3, the LPA would slightly reduce parking along the corridor. Compared to the No-Build alternative, roadway traffic would be brought closer to the sidewalk in several additional locations, although this would not substantially change overall sidewalk safety and comfort along Van Ness Avenue. There are no plans to reduce the typical street furniture such as street trees, benches, newsstands, and the like. The LPA Vallejo NB Station Variant would be the same as Alternative 3.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better than Alternative 1 in terms of sidewalk safety. ***Therefore compared to Alternative 1, Alternative 2 would have a beneficial impact***.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform better than Alternative 1 in terms of sidewalk safety. Although some parking spaces would be reduced, the overall sidewalk safety and comfort along Van Ness Avenue would not substantially change due to the presence of other street furniture in those locations and throughout the corridor, as well as other noted enhancements such as creation of curb bulbs and enhanced sidewalk lighting. Alternative 3B performs similarly. ***Therefore compared to Alternative 1, Alternatives 3 and 3B would have a beneficial impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform better than Alternative 1 in terms of sidewalk safety. Alternative 4B performs similarly. ***Therefore compared to Alternative 1, Alternatives 4 and 4B would have a beneficial impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA would perform better than Alternative 1 in terms of sidewalk safety. Although some parking spaces would be reduced, the overall sidewalk safety and comfort along Van Ness Avenue would not substantially change due to the presence of other street furniture in those locations and throughout the corridor, as well as other noted enhancements such as creation of curb bulbs and enhanced sidewalk lighting. The LPA Vallejo NB Station Variant performs similarly. ***Therefore compared to Alternative 1, the LPA and the LPA Vallejo NB Station Variant would have a beneficial impact.***

7.2.3 Pedestrian Accessibility

Pedestrian accessibility is evaluated by application of the Universal Design principles. Pedestrian accessibility is analyzed through the lens of the Universal Design evaluation, which has seven principles:

- Equitable use
- Flexibility in use
- Simple and intuitive use
- Perceptible information
- Tolerance for error
- Low physical effort
- Size and space for approach and use

This analysis reviews the extent to which each alternative meets the needs of all users, while recognizing that different users may have different concerns. Some may be more interested in faster transit service through the corridor, while others prefer more frequent transit stops; therefore, the performance of each alternative is evaluated qualitatively with a description of the advantages and disadvantages if offers to users of different preferences.

7.2.3.1 Equitable Use

Each of the build alternatives, including the LPA, would benefit wheelchair users by installing raised station platforms to allow level or near level boarding. Wheelchair users would be able to roll directly onto the bus, entering just as other riders do, with all of the build alternatives, including the LPA. Under the No Build Alternative, new buses planned for the corridor by 2015 would ease vehicle access for most passengers by providing low-floor boarding; however, these buses would not provide level boarding so wheelchair users would continue to use a separate wheelchair lift or ramp to enter and exit buses.

Transit stations under the No Build Alternative would be accessed in the same manner by all persons, as bus stops would remain as they currently exist. Under Build Alternative 2, BRT stations would be located on sidewalk extensions that would be accessed by a short ramp from the sidewalk and would be accessible to all persons. Steps would provide an additional means for ambulatory customers to reach the platform, resulting in differing platform access routes. Under Build Alternatives 3 and 4 and the LPA, center-lane BRT stations would be located on raised platforms accessed by a short ramp from the crosswalk. Transit waiting areas are shared between all users under each build alternative, including the LPA.

Sidewalk accessibility under the No Build Alternative would improve through implementation of the following SFgo initiatives: upgrade of curb ramps at all intersections along Van Ness Avenue to allow universal access to the sidewalk and to crosswalks, including access by people in wheelchairs and those with visual impairments through tactile domes; installation of APS at some signalized intersections to ease street crossings and transit access for pedestrians with limited vision; and installation of pedestrian countdown signals on all crosswalk legs at all signalized intersections along Van Ness Avenue. The build alternatives, including the LPA, would include the same aforementioned improvements to sidewalk accessibility, but to a greater extent than under the No Build Alternative

because APS would be installed at all signalized intersections and curb bulbs would be installed at most signalized intersections to improve visibility between motorists and pedestrians, shorten the crossing distance across Van Ness Avenue, and reduce the speed of right-turning traffic. In addition, the removal of existing bus stops from the sidewalk, as proposed under the build alternatives, would open up additional sidewalk space.

In summary, all of the build alternatives, including the LPA, would result in overall improvements to Equitable Use on Van Ness Avenue in comparison to the No Build Alternative.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better than Alternative 1 for equitable use.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would perform better than Alternative 1 for equitable use.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would perform better than Alternative 1 for equitable use.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would perform better than Alternative 1 for equitable use.

7.2.3.2 Flexibility in Use

The No Build Alternative would not change Flexibility in Use characteristics of Van Ness Avenue. There would be no significant difference in Flexibility in Use of the BRT system between the build alternatives; however, the BRT build alternatives, including the LPA, improve pedestrian street crossings along Van Ness Avenue to accommodate a greater range of physical abilities.

- **Average Crossing Distance** - As presented in Table 12, under the No Build Alternative, the average crossing distance of Van Ness Avenue would remain approximately 91 feet. This distance is reduced by an average of nearly 5 feet under Alternative 2, an average of approximately 1-foot under Alternative 3, an average of approximately 2 feet under Alternative 4 with incorporation of corner bulbs, and an average of 2.2 feet under the LPA. All of the build alternatives, including the LPA, would reduce the crossing distances to median refuges through construction of corner bulbs, making it easier for slower pedestrians to reach a resting area if they are unable to cross the street during one light cycle.
- **Average Distance to a Refuge** – Based on Appendix A tables, the average distance to a refuge would remain 41 feet under the No Build Alternative and decrease to between 37 and 38 feet under Alternatives 2 and 4 (39 feet with the LPA). Alternative 3 (including Design Option B) has two narrower medians at each intersection rather than a single wide median under other build alternatives; as a result, distances to the nearest median are shorter, averaging 27 to 28 feet, but there is less refuge space at each median. If the 4-foot medians in Alternative 3 are considered less than

standard from a Universal Design standpoint, then the average distance to the larger, 9-foot refuge in Alternative 3 (and the stations in the LPA) would be similar to the distance under Alternatives 2 and 4; however, the distance to the 9-foot refuge (or station location for the LPA) from the curb would be different depending on the direction of crossing, because the median (or station location) configuration changes throughout the alignment. For example, the 9-foot refuge is located closer to the east curb when it provides a NB station and closer to the west curb when it provides a SB station. Thus, under Alternative 3 (and at station locations under the LPA), people would need to travel a longer distance to reach a refuge at some intersections in comparison to Alternatives 3 and 4 and the No Build Alternative.

- **Corner Bulbs** - Table 16 presents the number of corner bulbs to be provided under all of the build alternatives. The LPA would provide 30 corner bulbs in the SB direction and 34 corner bulbs in the NB direction for a total of 64 corner bulbs.
- **Median Nose Cones** - All of the build alternatives, including the LPA, would include the installation of median nose cones at intersections, providing refuge space for slower pedestrians to rest if they are unable to cross the street during one light cycle. As detailed in Table 15, the build alternatives would provide between 52 and 55 median nose cones (56 for the LPA), with one at nearly every crossing, compared with 17 under the No Build Alternative. The LPA would provide median nose cones at all 29 intersections,, with 28 median nose cones on a south leg of an intersection and 28 median nose cones on a north leg of an intersection for a total of 56 median nose cones.
- **Walking Speeds** - As presented in Table 14, under Alternative 2, an additional 11 Van Ness Avenue intersections would meet the City's standard for walking speed of 2.5 fps at a crossing, while an additional 5 intersections would meet this standard under Alternatives 3 and 4 (including Design Option B). Under the LPA, an additional 3 intersections would meet this standard compared to the No Build Alternative. Under each build alternative, all of the intersections would meet the FHWA guidelines for a walking speed of 3 fps or less, with the exception of crossing Van Ness Avenue at Lombard and Mission streets, and crossing Mission Street at South Van Ness Avenue. For Alternatives 3 and 4 (including Design Option B and the LPA), crossing Van Ness Avenue at Jackson Street and Broadway would also require speeds slightly above this threshold (3.1 and 3.2 fps, respectively). The build alternatives, including the LPA, would also require a 3.2-fps speed crossing Van Ness Avenue at Filbert Street. Overall, the build alternatives would provide a significant improvement over the No Build Alternative, which has 9 intersections in the study that exceed the FHWA guidelines.

All of the build alternatives (including Design Option B and the LPA) would improve Flexibility in Use relative to the No Build Alternative.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better than Alternative 1 for flexibility in use.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would perform better than Alternative 1 for flexibility in use.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would perform better than Alternative 1 for flexibility in use.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would perform better than Alternative 1 for flexibility in use.

7.2.3.3 Simple and Intuitive Use

Under the No Build Alternative, the arrangement of pedestrian facilities on Van Ness Avenue would continue to be generally simple and intuitive, and it would improve through the provision of SFgo initiatives, including upgrade of curb ramps to remove ramps that point toward the middle of the intersection and installation of tactile domes, installation of APS at some signalized intersections, and installation of pedestrian countdown signals on all crosswalk legs at all signalized intersections.

Another change in Simple and Intuitive Use that would occur under the build alternatives is clear differentiation of space between pedestrian areas and transit waiting areas. This arrangement is likely to be more intuitive than under the No Build Alternative, where passengers would continue to wait on the sidewalk near the bus stop. Under Alternatives 3 and 4 and the LPA, locating and accessing transit stops may be more difficult for some users than under Alternative 2 and the Alternative because the center-lane BRT stations would not be typical.

Passengers would need to perceive that these BRT stations are located in the center of the street. Alternative 4 may be particularly challenging because users would need to determine the direction the bus platform serves because similar looking platforms would serve NB only, SB only, or both NB and SB bus service at different locations. Under Alternatives 3 and 4 and the LPA, passengers would also disembark buses on a platform with traffic on both sides, which may be disorienting. Alternative 3 and the LPA may be particularly challenging because the platform is relatively narrow. These challenges could also be mitigated or minimized with a comprehensive wayfinding system that would allow all users to navigate to and from the correct platform. Moreover, median transit stops are not without precedent. Many existing Muni light rail and bus stops are located at center islands, including the light rail stations on the T-Third, Market Street, 19th Avenue, and the Embarcadero.

The low-floor buses and raised platforms to be used in all of the build alternatives would allow wheelchairs to roll directly on and off the bus at BRT stations along Van Ness Avenue, providing easier access to most patrons at all stops within the BRT corridor. Outside the BRT corridor, wheelchair users would board and exit through the front right door, which would deploy a ramp. Wheelchair users would

be able to board and exit through the same door under Alternatives 2 and 3 (including Design Option B) and the LPA. Under Alternative 4, all passengers, including wheelchair users, would board and exit from the left-side doors within the BRT corridor; these doors are located behind the driver. Under Alternative 4 (including Design Option B), wheelchair users that board within the BRT corridor to travel to a destination outside the corridor would need to negotiate to the opposite side of the bus (and vice-versa). Moreover, they would also need to make their way to the front of the bus to exit from the right-side front door outside the BRT corridor (and vice-versa).

For Alternative 4, bus design should incorporate an intuitive seating space for users requiring level boarding that is easily accessible to both the front door on the right side and the door behind the operator on the left side. In addition, stop announcements of which door will open could be used to help clarify confusion for passengers. As part of project implementation, sufficient information would be provided to inform ambulatory passengers that board at BRT stations that they would need to exit through the front, right doors for stops outside the Van Ness Avenue corridor.

In summary, the arrangement of pedestrian facilities along Van Ness Avenue will remain generally standard and intuitive under all of the build alternatives (including Design Option B) and the LPA. Alternatives 3 and 4 and the LPA may provide slightly less intuitive transit access than Alternative 2 and the No Build Alternative. Simple and Intuitive Use could be optimized through the following design measures:

- Comprehensive wayfinding system allowing all users to navigate to and from the correct platform;
- For Alternative 4, bus vehicle design should incorporate an intuitive seating space for users requiring level boarding that is easily accessible to both the front door on the right side and the door behind the operator on the left side;
- For Alternative 4, stop announcements of which door will open could be used to help clarify any confusion for passengers.
- Sufficient information should be provided to inform less ambulatory passengers that board at BRT stations that they would need to exit through the front, right doors for stops outside the Van Ness Avenue corridor.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform similar to Alternative 1 for simple and intuitive use and therefore would have no impact in terms of simple and intuitive use.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would be considered to have a less than significant impact compared to Alternative 1 in terms of simple and intuitive use.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would be considered to have a less than significant impact compared to Alternative 1 in terms of simple and intuitive use.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would be considered to have a less than significant impact compared to Alternative 1 in terms of simple and intuitive use.

7.2.3.4 Perceptible Information

Under the No Build Alternative, the arrangement of pedestrian facilities would remain generally standard and intuitive, and improvements with the SFgo initiatives would include upgrade of curb ramps to remove all existing, disorienting curb ramps that angle toward the middle of intersections and replace them with curb ramps angled toward crosswalks at all intersections; installation of APS at some signalized intersections to ease street crossings and transit access for pedestrians with limited vision; and installation of pedestrian countdown signals on all crosswalk legs at all signalized intersections along Van Ness Avenue. The build alternatives, including the LPA, would include the same improvements, but to a greater extent than under the No Build Alternative because APS would be installed at all signalized intersections, and curb bulbs would be installed at most signalized intersections.

Under the center-lane configured BRT alternatives (Alternatives 3 and 4, including Design Option B, and the LPA), it may be more difficult for some users to perceive how to access the BRT stations, because the route from the sidewalk to the platform is less clear and direct than to a platform that is on the sidewalk or on a curb extension. Center-lane located BRT stations may be more difficult for some users to reach because they would require crossing a portion of the street, then turning up a ramp to enter the platform. To maximize perceptible information, all proposed BRT platforms should include ample wayfinding and nonvisual detection. Nonvisual detections, such as audible sounds or changes in pavement feel, could help improve nonvisual perception of the station location for center-lane configured alternatives.

Visual identification of transit stops would improve under the proposed project due to upgraded shelters, platforms, lighting, and signage. BRT alternatives with center-lane located stations (Alternatives 3 and 4 and the LPA) would likely be the easiest to identify because their location in the center of the street improves the line of sight to stations and lends additional visual prominence relative to stations on the side of the street; however, as noted in the “Simple and Intuitive” section above, under Alternative 4, the direction of bus travel at a given platform could be more difficult to perceive for some users.

In summary, Alternatives 3 and 4 (including Design Option B), and the LPA, may provide less perceptible information for transit station access than the No Build Alternative. Alternative 2 would provide more perceptible information than the No Build Alternative.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better than Alternative 1 and would have a beneficial impact in terms of perceptible information.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would be considered to have a less than significant impact compared to Alternative 1 in terms of perceptible information.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would be considered to have a less than significant impact compared to Alternative 1 in terms of perceptible information.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would be considered to have a less than significant impact compared to Alternative 1 in terms of perceptible information.

7.2.3.5 Tolerance for Error

Under the No Build Alternative, sidewalks would remain buffered from moving traffic by street parking, which provides significant tolerance for error, and street crossings would remain long, providing less tolerance. Bus patrons would continue to access bus stops from the sidewalk, which requires minimal risk.

Bus patrons would continue to access the BRT stations from the sidewalk under Alternative 2, offering minimal risk. Sidewalks would generally remain buffered from moving traffic by street parking, although some parking spaces would be removed in comparison to the No Build Alternative, as discussed in the sidewalk safety section, above. Under Alternative 2, street crossing distances would be shortened through provision of curb bulbs, and median refuges would be improved with protective nose cones and level cut-through for wheelchair access. These two aforementioned features would increase Tolerance for Error over the No Build Alternative.

The Tolerance for Error is less for accessing the BRT stations in the center-lane alternatives, including the LPA, relative to the No Build Alternative and Alternative 2 because users must cross a portion of the street before accessing the platform. Under Alternative 3 and the LPA, stations have the least Tolerance for Error because the platforms are the most narrow (approximately 9 feet in width) and because they have moving traffic on both sides: mixed-flow traffic on one side and bus lane traffic on the other side. Alternative 4 offers a greater Tolerance for Error for waiting passengers because the platforms are wider (approximately 14 feet), allowing passengers to wait farther from moving traffic.

Under Alternatives 3 and 4 and the LPA, sidewalks would generally remain buffered from moving traffic by street parking; however, some additional parking spaces would be removed in comparison to the No Build Alternative, including cases where an entire street block or one side of a street block would lose street parking (see the sidewalk safety section, above). Under Alternatives 3 and 4 and the LPA, street crossing distances would be shortened through provision of curb

bulbs and median refuges would be improved with protective nose cones and level cut-through for wheelchair access, which would increase Tolerance for Error.

In summary, Alternatives 2 and 4 (including Design Option B) would increase Tolerance for Error relative to the No Build Alternative with improved street crossings, but Build Alternative 3 (including Design Option B) and the LPA would decrease tolerance for error because of its narrower platforms located between traffic lanes.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform better than Alternative 1 and would have a beneficial impact in terms of tolerance for error.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would be considered to have a less than significant impact compared to Alternative 1 in terms of tolerance for error.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would perform better than Alternative 1 and would have a beneficial impact in terms of tolerance for error.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would be considered to have a less than significant impact compared to Alternative 1 in terms of tolerance for error..

7.2.3.6 Low Physical Effort

The physical effort required to reach bus stops would not change under the No Build Alternative. The build alternatives, including the LPA, would all require increased physical effort for some passengers to reach BRT stations because the number of bus stops in each direction between Mission and Lombard streets would be reduced from 15 NB and 8 SB in the No Build Alternative to 9 NB (8 for the LPA, and 9 for the LPA with the Vallejo Northbound Station Variant) and 8 SB (9 for the LPA and also with the Vallejo Northbound Station Variant) in the build alternatives; therefore, the average distance between bus stations would increase from approximately 700 feet under the No Build Alternative to 1,170 feet in each of the build alternatives (1,150 feet under the LPA and 1,080 feet under the LPA with the Vallejo Northbound Station Variant).

As a result, the average maximum distance from a location halfway between two stops would increase from 350 feet to 590 feet (570 feet under the LPA and 540 feet under the Vallejo Northbound Station Design Variant scenario). In addition, some GGT passengers would need to walk farther under the build alternatives due to stop elimination. Van Ness Avenue has few hills and only one block with an average slope steeper than 8 percent (Pacific Avenue to Broadway), which is the maximum permitted slope for an ADA-compliant ramp, although there may be some portions of other blocks that exceed this slope.

Nevertheless, the increased distance between stops may be difficult to traverse for some passengers, such as elderly or disabled patrons. Under the LPA, the only

stop spacing greater than 4 blocks occurs between Market and McAllister streets. In this area, grades are less than 1.5 percent. In all of the project alternatives, low-floor buses would decrease the physical effort required to board a transit vehicle, although their interior configurations may require stepping up to reach some seats once onboard.

In summary, due to the increased distance between stops, all of the build alternatives (including Design Option B) and the LPA would increase the physical effort required to reach transit relative to the No Build Alternative and may pose a burden on some passengers, although this impact would be considered a less than significant impact compared to the No-Build Alternative.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would be considered to have a less than significant impact compared to Alternative 1 in terms of low physical effort.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would be considered to have a less than significant impact compared to Alternative 1 in terms of low physical effort.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would be considered to have a less than significant impact compared to Alternative 1 in terms of low physical effort.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would be considered to have a less than significant impact compared to Alternative 1 in terms of low physical effort.

7.2.3.7 Size and Space for Approach and Use

Transit platforms under all of the build alternatives, including the LPA, are designed to provide adequate space for wheelchairs and other assistive devices. The existing sidewalks under the No Build Alternative and the approximate 14-foot-wide BRT station platforms under Alternative 4 would provide the largest space for approach and use. Alternatives 2 and 3 and the LPA would provide somewhat narrower station platforms (approximately 9 feet wide) that would slightly reduce Size and Space for Approach and Use compared with the No Build Alternative, although Alternative 2 would allow for the patron waiting area to spill onto the adjacent sidewalk.

As noted under Perceptible Information, BRT alternatives with center-lane-located stations (Alternatives 3 and 4) improve the line of sight to stations.

In summary, Alternative 4 (including Design Option B) would improve Size and Space for Approach and Use in comparison to the No Build Alternative due to the large platform size. Alternatives 2 and 3 (including Design Option B) and the LPA would reduce Size and Space for Approach and Use in comparison to the No Build Alternative because the 9-foot platforms would provide less room than the No Build Alternative condition.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would be considered to have a less than significant impact compared to Alternative 1 in terms of size and space for approach and use.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would be considered to have a less than significant impact compared to Alternative 1 in terms of size and space for approach and use.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would perform better than Alternative 1 and would have a beneficial impact in terms of size and space for approach and use.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would be considered to have a less than significant impact compared to Alternative 1 in terms of size and space for approach and use.

7.3 Bicycle Impacts

As described in the Methodology section above, bicycle impacts are analyzed according to the following characteristics:

- Width of travel lane used by cyclists;
- Vehicle right turn volume;
- Speed of adjacent traffic;
- Bicycle volumes;
- Bicycle safety and comfort; and
- Bicycle delay.

Potential impacts of the build alternatives are discussed relative to the No-Build (Alternative 1).

7.3.1 Width of Travel Lane Used by Cyclists

Bicyclists using Van Ness Avenue must share travel lanes with automobiles, as no designated bicycle lanes exist on the corridor. Bicyclists typically would use the right-most travel lane adjacent to curbside parking (or adjacent to the curb where parking is not permitted). In the case of Alternative 2, bikes would use the travel lane adjacent to the BRT lane. Sharing the travel lane with automobiles increases the chances of a conflict between bicycles and automobiles. The narrower the travel lane, the more likely it is that a conflict could occur, whereas a wider travel lane may reduce the potential for a conflict. A wider travel lane may also increase cyclist perception of comfort and safety. On the other hand, with any of the average lane widths under consideration, it can also be argued that there is insufficient width to expect bicyclists to create their own safe travel zone. Rather, bicyclists riding along with moving traffic in a narrow lane would be expected to "take the lane" as allowed by motor vehicle law whenever they feel it is warranted for safety, particularly when riding adjacent to a parking lane to avoid being hit by opening car doors.

Table 21 shows the width of the right-most travel lane adjacent to parking lane.

Table 21 – Width of Travel Lane Used by Bicycles (ft)

Alternative	SB Lane	NB Lane	Avg. Lane Width
1	11.4	11.4	11.4
2	10.0	10.0	10.0
3	11.1	11.0	11.1
3B	11.1	11.1	11.1
4	10.8	10.8	10.8
4B	10.9	10.9	10.9
LPA	11.0	11.0	11.0
LPA Vallejo NB Station Variant	11.0	11.0	11.0

Source: SFCTA, 2010/2012.

Alternative 1 would have the widest lanes, while Alternative 2 would have the narrowest lane, about 1.4 ft narrower than Alternative 1.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform worse than Alternative 1 in terms of average adjacent lane width. The average lane width for Alternative 2 would be 1.4 ft narrower than Alternative 1. While this difference in lane width would be noticeable compared to the No-Build Alternative, it is due to the fact that bicyclists would ride in the lane adjacent to the BRT lane rather than the right-most lane adjacent to curbside parking. This would effectively remove bicyclists from the zone of opening car doors, but would place bicyclists between auto and bus traffic. Overall, this situation would not alter the nature of the travel lane and its expected use by bicyclists – that bicyclists would "take the lane," whether it to avoid parked cars or moving buses. In addition, as described in the Existing Conditions section and the description of alternatives, alternate designated bicycle routes parallel Van Ness Avenue. ***Therefore, Alternative 2 would be considered to have a less than significant impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): Alternative 3 would perform slightly worse than Alternative 1 in terms of adjacent lane width. For Alternative 3, the northbound lane would be narrower by 0.3 ft on average (3.6 inches, or less than 3 percent difference). This difference would be imperceptible. In addition, this difference would not alter the nature of the travel lane and its expected use by bicyclists since it would be narrow to begin with. In addition, as described in the Existing Conditions section and the description of alternatives, alternate designated bicycle routes parallel Van Ness Avenue. Alternative 3B would perform similarly. ***Therefore, Alternatives 3 and 3B would be considered to have a less than significant impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): Alternative 4 would perform worse than Alternative 1 as it would have adjacent lanes for cyclists that would be narrower by 0.6 ft on average (7.2 inches, or approximately 5 percent difference). The discussion of Alternative 4/4B is the same as for Alternative 3/3B. ***Therefore, Alternatives 4 and 4B would be considered to have a less than significant impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA would perform worse than Alternative 1 as it would have adjacent lanes for cyclists that would be narrower by 0.4 ft on average (4.8 inches, or approximately 3.5 percent difference). The discussion of the LPA/LPA Vallejo NB Station Variant is the same as for Alternative 3/3B and Alternative 4/4B. ***Therefore, the LTA and the LPA Vallejo NB Station Variant would be considered to have a less than significant impact.***

7.3.2 Vehicle Right Turn Volume

The number of vehicular right turns affects bicyclists travelling along Van Ness Avenue. Intersections with heavy right turn volumes may have increased chances of vehicular incidents with pedestrians or bicyclists. Table 22 below is a duplicate of the table in Section 7.2.1.8 and shows the number of locations with right turns, grouped by hourly volume. Locations with right turns include vehicles turning from side streets onto Van Ness Avenue and vehicles turning from Van Ness Avenue onto side streets. Alternatives with fewer high-volume turn locations and more low-volume locations are considered to perform better and be safer for bicyclists.

Table 22 – Number of Right Turn Locations by Hourly Volume

	Number of Right Turn Locations by Hourly Volume				
Alternative	0-50 Right Turns / Hour	51-100 Right Turns / Hour	101-150 Right Turns / Hour	151-200 Right Turns / Hour	200 + Right Turns / Hour
1	10	16	9	8	4
2	13	16	11	3	3
3	12	17	10	5	2
3B	12	16	15	4	3
4	12	17	10	5	2
4B	12	16	15	4	3
LPA	12	16	15	4	3
LPA Vallejo NB Station Variant	12	16	15	4	3

Source: SFCTA, 2010/2012.

Note: Total number of right turn locations varies slightly by alternative due to different intersection geometry.

Overall, all of the build alternatives (2, 3, 3B, 4, 4B) would perform better than Alternative 1. The build alternatives generally would have fewer high-volume locations (with over 150 right turn movements per hour), with more lower-volume locations (with 150 or fewer right turn movements per hour). Therefore, all of the build alternatives would be considered to have a beneficial impact compared to Alternative 1.

Alternative 2 vs. Alternative 1 (No-Build): ***Alternative 2 would perform better than Alternative 1 and would have a beneficial impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): ***Alternative 3 would perform better than Alternative 1 and would have a beneficial impact. Alternative 3B would perform similarly and would have a beneficial impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): ***Alternative 4 performs better than Alternative 1 and would have a beneficial impact. Alternative 4B would perform similarly and would have a beneficial impact.***

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): ***The LTA would perform better than Alternative 1 and would have a beneficial impact. The LTA Vallejo NB Station Variant would perform similarly and would have a beneficial impact.***

7.3.3 Speed of Adjacent Traffic

Speed of adjacent, motorized traffic can affect the safety and comfort of bicycle users along Van Ness Avenue. Automobile speed along Van Ness Avenue would be similar under the No Build Alternative and the build alternatives. In addition, the speed limit would remain the same (25 mph) for all of the alternatives, including the No Build Alternative, meaning that there would be no regulatory change that would impact vehicle speeds. Finally, the coordination of signal timing along Van Ness Avenue with the implementation of TSP would mean that vehicles would travel at a more consistent speed, leading to less accelerating and braking. For these reasons, there would be no impact on bicyclists with the implementation of BRT with respect to the speed of adjacent vehicles.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform equal to Alternative 1for speed of adjacent traffic and would therefore have no impact.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would perform equal to Alternative 1for speed of adjacent traffic and would therefore have no impact.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would perform equal to Alternative 1for speed of adjacent traffic and would therefore have no impact.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would perform equal to Alternative 1for speed of adjacent traffic and would therefore have no impact.

7.3.4 Bicycle Volumes

At present, relatively few bicyclists use Van Ness Avenue for travel because a dedicated bicycle facility is on Polk Street, which is located one block to the east. Bicycle volumes on Van Ness Avenue would likely continue at a similar level in the future when compared with the rest of the bicycling network, whether or not one of the BRT build alternatives is implemented.

Alternative 2 vs. Alternative 1 (No-Build): Alternative 2 would perform equal to Alternative 1 in terms of bicycle volumes and would therefore have no impact.

Alternative 3/3B vs. Alternative 1 (No-Build): Alternatives 3/3B would perform equal to Alternative 1 in terms of bicycle volumes and would therefore have no impact.

Alternative 4/4B vs. Alternative 1 (No-Build): Alternatives 4/4B would perform equal to Alternative 1 in terms of bicycle volumes and would therefore have no impact.

LTA/LTA Vallejo NB Station Variant vs. Alternative 1 (No-Build): The LPA and the LPA Vallejo NB Station Variant would perform equal to Alternative 1 in terms of bicycle volumes and would therefore have no impact.

7.3.5 Bicycle Safety and Comfort

All of the build alternatives would no longer have buses weaving into and out of the lane of traffic, reducing some of the conflicts between cyclists and buses.

The presence of parked cars to the right of bicycles creates the possibility of bicyclists getting "doored". For Alternatives 1, 3, 4, and the LPA, bicyclists would ride next to parked cars. For Alternative 2, bicyclists would ride in the mixed traffic lane next to the bus lane, so they would not experience the same hazard. However, in Alternative 2, bicyclists would be riding between two sets of moving vehicles, autos to their left and buses to their right. This would also mean that bicyclists would have to cross the bus lane in order to turn right, something that would not be necessary in Alternatives 1, 3, 4, and the LPA.

Alternative 2 vs. Alternative 1 (No-Build): ***Alternative 2 would perform equal to Alternative 1 for bicycle comfort and would therefore have no impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): ***Alternative 3 would perform equal to Alternative 1 for bicycle comfort and would therefore have no impact. Alternative 3B would perform similarly and would therefore have no impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): ***Alternative 4 would perform equal to Alternative 1 for bicycle comfort and would therefore have no impact. Alternative 4B would perform similarly and would therefore have no impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): ***The LPA would perform equal to Alternative 1 for bicycle comfort and would therefore have no impact. The LPA Vallejo NB Station Variant would perform similarly and would therefore have no impact.***

7.3.6 Bicycle Delay

Transit signal priority to speed transit along Van Ness Avenue would improve vehicle and bicycle travel speeds (in the north-south direction), while reducing vehicle and bicycle travel speeds crossing Van Ness Avenue (in the east-west direction). This would result in reduced delays along Van Ness Avenue for

bicycles, and increase delay for bicycles crossing Van Ness Avenue. Alternatives 3 and 4 would show the largest changes versus Alternative 1. Overall, there would be no impact from any of the build alternatives.

Alternative 2 vs. Alternative 1 (No-Build): ***Alternative 2 would perform equal to Alternative 1 for bicycle delay and therefore would have no impact.***

Alternative 3/3B vs. Alternative 1 (No-Build): ***Alternative 3 would perform equal to Alternative 1 for bicycle delay and therefore would have no impact. Alternative 3B performs similarly and therefore would have no impact.***

Alternative 4/4B vs. Alternative 1 (No-Build): ***Alternative 4 would perform equal to Alternative 1 for bicycle delay and therefore would have no impact. Alternative 4B performs similarly and therefore would have no impact.***

LPA/LPA Vallejo NB Station Variant vs. Alternative 1 (No-Build): ***The LPA would perform equal to Alternative 1 for bicycle delay and therefore would have no impact. The LPA Vallejo NB Station Variant performs similarly and therefore would have no impact.***

8 NMT Impact Summary

8.1 Impacts of the Build Alternatives

Table 23 below summarizes the NMT impacts as described in the preceding sections, and noted with the following convention:

- Beneficial impacts are noted with a "B" and are shaded green.
- Alternatives with no impacts are noted with "NI" and are not shaded.
- Less than significant impacts are noted with "LTS" and are shaded yellow.
- Potentially significant impacts prior to mitigation are noted with "PSI" and are shaded pink.

No additional types of impacts are identified in this chapter.

Table 23 – Summary Table of Impacts

Measure	Alt. 2	Alt. 3	Alt. 3B	Alt. 4	Alt. 4B	LPA	LPA Vallejo NB Station Variant
Pedestrian Crossing Safety							
Crossing Distance including Median Refuges	B	LTS	LTS	B	B	B	B
Crossing Speed – Side Street	NI	LTS	LTS	LTS	LTS	LTS	LTS
Crossing Speed – Van Ness Avenue	B	B	B	B	B	B	B
Nose Cone Provision	B	B	B	B	B	B	B
Corner Bulbs	B	B	B	B	B	B	B
Pedestrian Signals	B	B	B	B	B	B	B
Pedestrian Delay	LTS	LTS	B	LTS	B	B	B
Pedestrian Crowding	NI	NI	NI	NI	NI	NI	NI
Vehicle Right Turn Volume	B	B	B	B	B	B	B
Sidewalk Safety Along Van Ness Avenue							
Sidewalk Safety	B	B	B	B	B	B	B
Pedestrian Accessibility							
Equitable Use	B	B	B	B	B	B	B
Flexibility in Use	B	B	B	B	B	B	B
Simple and Intuitive Use	NI	LTS	LTS	LTS	LTS	LTS	LTS
Perceptible Information	B	LTS	LTS	LTS	LTS	LTS	LTS
Tolerance for Error	B	LTS	LTS	B	B	LTS	LTS
Low Physical Effort	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Size and Space for Approach and Use	LTS	LTS	LTS	B	B	LTS	LTS
Bicycle Safety							
Width of Travel Lane Used by Cyclists	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Vehicle Right Turn Volume	B	B	B	B	B	B	B
Speed of Adjacent Traffic	NI	NI	NI	NI	NI	NI	NI
Bicycle Volumes	NI	NI	NI	NI	NI	NI	NI
Bicycle Safety and Comfort	NI	NI	NI	NI	NI	NI	NI
Bicycle Delay	NI	NI	NI	NI	NI	NI	NI

In conclusion, although geometric design characteristics of the corridor, including crossing distance, median widths, and corner bulb provision differ among the alternatives and the No-Build (Alternative 1), these changes for the most part would not generate significant impacts on pedestrians or bicyclists when comparing build alternatives to the No-Build. In fact, the build alternatives would enhance the existing pedestrian and walking environment by:

- Shortening crossing distances with corner bulbs;
- Enhancing the median waiting experience by providing median nose cones at each intersection leg; and

- Providing a safer crossing experience by implementing Accessible Pedestrian Signals (APS) at all intersections;
- Decreasing the walking speed required to cross during the full walk split time; and
- Reducing the volume of right turns at particular locations.

However, some pedestrian and bicycle impacts would be generated from the build alternatives. For instance, the amount of pedestrian delay, and the width of the travel lane used by bicyclists would perform worse from a pedestrian and bicyclist safety and comfort perspective than the No-Build (Alternative 1). These impacts, however, would be less than significant. Therefore, the potential impact categories investigated would result in a less than significant impact (LTS), no impact (NI), or beneficial impact (B).

Since there would be no potentially significant impacts, no mitigation measures are recommended.

Appendix A

Additional Data Tables Used in NMT Analysis of No Build Alternative and Build Alternatives

A1 Appendix Overview

This appendix presents more detailed data tables for the information and analysis contained in the main NMT Impacts Analysis. Data tables are organized by the following subjects by alternative:

- Pedestrian Impacts
    - Crossing Safety and Comfort
        - Average Crossing Distance across Van Ness Avenue (ft)
        - Median Nose Cone Provision across Van Ness Avenue
        - Corner Bulb Provision along Van Ness Avenue
        - Pedestrian Signal Provision along Van Ness Avenue (including both conventional pedestrian signals and Accessible Pedestrian Signals (APS))
        - Pedestrian Crowding across Van Ness Avenue and Side Streets
        - Vehicle Right Turn Volumes along Van Ness Avenue
- Bicycle Impacts
    - Bicycle Safety and Comfort
        - Width of Travel Lane Used by Bicyclists

A2 Pedestrian Impacts

A2.1 Crossing Safety and Comfort

A2.1.1 Average Crossing Distance across Van Ness Avenue

Table A1 - Average Crossing Distance across Van Ness Avenue: Existing Conditions / Alternative 1 – No-Built (ft)

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb-to-Median)	NB Crossing Distance (Curb–to-Median)	Median Width	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width (Both Sides)	Street ROW Width	Avg. Distance (Curb-to-Median)	South Crosswalk Width	North Crosswalk Width	West Crosswalk Width	East Crosswalk Width
Mission	South	62.5	64.0	4.0	130.5	-	130.5	63.3	11.5	13.5	13.5	14.0
Mission	North	51.5	65.5	4.0	121.0	-	121.0	58.5				
Market	South	43.5	53.0	7.5	104.0	-	104.0	48.3	24.0	18.0	24.0	24.0
Market	North	54.0	53.0	7.0	114.0	-	114.0	53.5				
Fell	South	34.0	39.5	14.0	87.5	5.5	93.0	36.8	10.0	10.0	16.0	16.0
Fell	North	42.5	40.0	4.0	86.5	6.5	93.0	41.3				
Hayes	South	39.0	50.0	4.0	93.0	-	93.0	44.5	12.0	12.0	16.0	16.0
Hayes	North	32.0	33.0	14.0	79.0	14.0	93.0	32.5				
Grove	South	39.5	41.0	4.0	84.5	8.5	93.0	40.3	15.0	22.0	16.0	16.0
Grove	North	49.5	39.5	4.0	93.0	-	93.0	44.5				
McAllister	South	39.5	39.5	14.0	93.0	-	93.0	39.5	22.0	12.0	16.0	16.0
McAllister	North	42.5	39.5	4.0	86.0	7.0	93.0	41.0				
Golden Gate	South	39.5	31.5	14.0	85.0	8.0	93.0	36.0	10.0	10.0	16.0	16.0
Golden Gate	North	41.5	39.5	4.0	85.0	8.0	93.0	41.0				
Turk	South	39.5	42.0	4.0	85.5	7.5	93.0	41.0	12.0	12.0	16.0	16.0
Turk	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Eddy	South	39.5	32.5	14.0	86.0	7.0	93.0	36.0	12.0	12.0	16.0	16.0
Eddy	North	42.5	39.5	4.0	86.0	7.0	93.0	41.0				
Ellis	South	39.5	42.0	4.0	85.5	7.5	93.0	41.0	12.0	12.0	16.0	16.0
Ellis	North	32.5	39.5	14.0	86.0	7.0	93.0	36.0				
O'Farrell	South	39.5	32.5	14.0	86.0	7.0	93.0	36.0	12.0	12.0	16.0	16.0
O'Farrell	North	42.5	39.5	4.0	86.0	7.0	93.0	41.0				
Geary	South	39.5	42.5	4.0	86.0	7.0	93.0	41.0	12.0	12.0	16.0	16.0
Geary	North	39.5	32.5	14.0	86.0	7.0	93.0	36.0				
Post	South	39.5	32.5	14.0	86.0	7.0	93.0	36.0	10.0	10.0	16.0	16.0
Post	North	32.5	39.5	14.0	86.0	7.0	93.0	36.0				

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb-to-Median)	NB Crossing Distance (Curb–to-Median)	Median Width	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width (Both Sides)	Street ROW Width	Avg. Distance (Curb-to-Median)	South Crosswalk Width	North Crosswalk Width	West Crosswalk Width	East Crosswalk Width
Sutter	South	39.5	32.5	14.0	86.0	7.0	93.0	36.0	12.0	12.0	16.0	16.0
Sutter	North	31.0	39.5	14.0	84.5	8.5	93.0	36.0				
Bush	South	39.5	32.5	14.0	86.0	7.0	93.0	36.0	10.0	10.0	16.0	16.0
Bush	North	42.0	39.5	4.0	85.5	7.5	93.0	40.8				
Pine	South	39.5	42.5	4.0	86.0	7.0	93.0	41.0	10.0	10.0	16.0	16.0
Pine	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
California	South	39.5	32.5	14.0	86.0	7.0	93.0	36.0	12.0	12.0	16.0	16.0
California	North	32.0	39.5	14.0	85.5	7.5	93.0	36.0				
Sacramento	South	32.5	42.5	4.0	79.0	14.0	93.0	37.5	15.0	11.0	16.0	16.0
Sacramento	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Clay	South	39.5	32.5	14.0	86.0	7.0	93.0	36.0	15.0	15.0	16.0	16.0
Clay	North	42.5	39.5	4.0	86.0	7.0	93.0	41.0				
Washington	South	39.5	39.5	14.0	93.0	-	93.0	39.5	12.0	12.0	16.0	16.0
Washington	North	49.5	39.5	4.0	93.0	-	93.0	44.5				
Jackson	South	39.5	49.5	4.0	93.0	-	93.0	44.5	15.0	15.0	16.0	16.0
Jackson	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Pacific	South	39.5	49.5	4.0	93.0	-	93.0	44.5	12.0	12.0	16.0	16.0
Pacific	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Broadway	South	39.5	39.5	14.0	93.0	-	93.0	39.5	11.0	11.0	16.0	16.0
Broadway	North	49.5	39.5	4.0	93.0	-	93.0	44.5				
Vallejo	South	49.5	39.5	4.0	93.0	-	93.0	44.5	12.0	12.0	16.0	16.0
Vallejo	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Green	South	39.5	49.5	4.0	93.0	-	93.0	44.5	15.0	15.0	16.0	16.0
Green	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Union	South	39.5	49.5	4.0	93.0	-	93.0	44.5	12.0	12.0	12.0	12.0
Union	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Filbert	South	39.5	39.5	14.0	93.0	-	93.0	39.5	15.0	15.0	15.0	15.0
Filbert	North	49.5	39.5	4.0	93.0	-	93.0	44.5				
Greenwich	South	39.5	45.0	8.5	93.0	-	93.0	42.3	15.0	15.0	15.0	15.0
Greenwich	North	39.5	49.5	4.0	93.0	-	93.0	44.5				
Lombard	South	39.5	49.5	4.0	93.0	-	93.0	44.5	10.0	10.0	14.0	10.0
Lombard	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
	Avg.	***40.8***	***41.2***	***9.0***	***91.1***	***3.6***	***94.7***	***41.0***	***13.0***	***12.6***	***15.9***	***15.8***

Source: Topographic Maps, 2009 and SFMTA Traffic Striping Plans, March 2004.

Table A2 - Average Crossing Distance across Van Ness Avenue: Alternative 2 (ft)

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width	Total Crossing Distance (Curb-to-Curb)	Curb Extension or Platform Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Mission	South	65.0	64.0	4.0	133.0	-	133.0	64.5	11.5	13.5	13.5	14.0
Mission	North	43.0	58.0	14.0	115.0	6.0	121.0	50.5				
Market	South	41.0	48.0	9.0	98.0	6.0	104.0	44.5	24.0	18.0	24.0	24.0
Market	North	48.5	41.5	18.0	108.0	6.0	114.0	45.0				
Fell	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Fell	North	43.5	39.5	4.0	87.0	6.0	93.0	41.5				
Hayes	South	33.5	49.5	4.0	87.0	6.0	93.0	41.5	12.0	12.0	16.0	16.0
Hayes	North	33.5	39.5	14.0	87.0	6.0	93.0	36.5				
Grove	South	33.5	43.5	4.0	81.0	12.0	93.0	38.5	15.0	22.0	16.0	16.0
Grove	North	33.5	31.5	14.0	79.0	14.0	93.0	32.5				
McAllister	South	31.5	31.5	14.0	77.0	16.0	93.0	31.5	22.0	12.0	16.0	16.0
McAllister	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Golden Gate	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Golden Gate	North	43.5	33.5	4.0	81.0	12.0	93.0	38.5				
Turk	South	33.5	43.5	4.0	81.0	12.0	93.0	38.5	12.0	12.0	16.0	16.0
Turk	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Eddy	South	31.5	33.5	14.0	79.0	14.0	93.0	32.5	12.0	12.0	16.0	16.0
Eddy	North	33.5	31.5	14.0	79.0	14.0	93.0	32.5				
Ellis	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Ellis	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
O'Farrell	South	31.5	39.5	14.0	85.0	8.0	93.0	35.5	12.0	12.0	16.0	16.0
O'Farrell	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Geary	South	33.5	31.5	14.0	79.0	14.0	93.0	32.5	12.0	12.0	16.0	16.0
Geary	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Post	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Post	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Sutter	South	31.5	33.5	14.0	79.0	14.0	93.0	32.5	12.0	12.0	16.0	16.0
Sutter	North	39.5	31.5	14.0	85.0	8.0	93.0	35.5				
Bush	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Bush	North	43.5	33.5	4.0	81.0	12.0	93.0	38.5				
Pine	South	33.5	43.5	4.0	81.0	12.0	93.0	38.5	10.0	10.0	16.0	16.0
Pine	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
California	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
California	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Sacramento	South	31.5	33.5	14.0	79.0	14.0	93.0	32.5	15.0	11.0	16.0	16.0

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width	Total Crossing Distance (Curb-to-Curb)	Curb Extension or Platform Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Sacramento	North	31.5	31.5	14.0	77.0	16.0	93.0	31.5				
Clay	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	16.0	16.0
Clay	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Washington	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Washington	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Jackson	South	33.5	31.5	14.0	79.0	14.0	93.0	32.5	15.0	15.0	16.0	16.0
Jackson	North	31.5	39.5	14.0	85.0	8.0	93.0	35.5				
Pacific	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Pacific	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Broadway	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	11.0	11.0	16.0	16.0
Broadway	North	49.5	33.5	4.0	87.0	6.0	93.0	41.5				
Vallejo	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Vallejo	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Green	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	16.0	16.0
Green	North	39.5	31.5	14.0	85.0	8.0	93.0	35.5				
Union	South	39.5	43.5	4.0	87.0	6.0	93.0	41.5	12.0	12.0	12.0	12.0
Union	North	31.5	39.5	14.0	85.0	8.0	93.0	35.5				
Filbert	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	15.0	15.0
Filbert	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Greenwich	South	33.5	45.0	8.5	87.0	6.0	93.0	39.3	15.0	15.0	15.0	15.0
Greenwich	North	39.5	43.5	4.0	87.0	6.0	93.0	41.5				
Lombard	South	46.5	44.5	4.0	95.0	6.0	101.0	45.5	10.0	10.0	14.0	10.0
Lombard	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
	Avg.	***36.7***	***37.9***	***11.8***	***86.4***	***8.4***	***94.9***	***37.3***	***13.0***	***12.6***	***15.9***	***15.8***

Source: SFCTA, 2010.

Table A3 - Average Crossing Distance across Van Ness Avenue: Alternative 3 (ft)

Cross Street with Van Ness	Leg of Inter-section	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	SB Median Width (inc. Plat-forms)	Median BRT Lane Width	NB Median Width (inc. Plat-forms)	Total Cross-ing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Mission	South	65.0	64.0	2.0	-	2.0	133.0	-	133.0	64.5	11.5	13.5	13.5	14.0
Mission	North	39.0	46.0	-	25.0	11.0	121.0	-	121.0	42.5				
Market	South	28.5	39.0	5.5	25.0	-	98.0	6.0	104.0	33.8	24.0	18.0	24.0	24.0
Market	North	37.0	22.5	11.5	26.0	11.0	108.0	6.0	114.0	29.8				
Fell	South	30.0	25.5	9.0	22.0	6.5	93.0	-	93.0	27.8	10.0	10.0	16.0	16.0
Fell	North	29.0	29.0	6.5	22.0	6.5	93.0	-	93.0	29.0				
Hayes	South	23.0	38.0	-	22.0	4.0	87.0	6.0	93.0	30.5	12.0	12.0	16.0	16.0
Hayes	North	23.0	28.0	-	22.0	14.0	87.0	6.0	93.0	25.5				
Grove	South	23.0	32.0	-	22.0	4.0	81.0	12.0	93.0	27.5	15.0	22.0	16.0	16.0
Grove	North	23.0	29.5	6.0	22.0	6.5	87.0	6.0	93.0	26.3				
McAllister	South	22.0	25.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	22.0	12.0	16.0	16.0
McAllister	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Golden Gate	South	29.0	29.0	4.0	22.0	9.0	93.0	-	93.0	29.0	10.0	10.0	16.0	16.0
Golden Gate	North	32.0	31.0	4.0	22.0	4.0	93.0	-	93.0	31.5				
Turk	South	23.0	32.0	-	22.0	4.0	81.0	12.0	93.0	27.5	12.0	12.0	16.0	16.0
Turk	North	29.0	29.0	4.0	22.0	9.0	93.0	-	93.0	29.0				
Eddy	South	23.0	24.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	12.0	12.0	16.0	16.0
Eddy	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Ellis	South	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0	12.0	12.0	16.0	16.0
Ellis	North	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0				
O'Farrell	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	12.0	12.0	16.0	16.0
O'Farrell	North	23.0	24.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5				
Geary	South	23.0	24.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	12.0	12.0	16.0	16.0
Geary	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Post	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	10.0	10.0	16.0	16.0
Post	North	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0				
Sutter	South	23.0	24.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	12.0	12.0	16.0	16.0
Sutter	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Bush	South	29.0	29.0	4.0	22.0	9.0	93.0	-	93.0	29.0	10.0	10.0	16.0	16.0
Bush	North	32.0	31.0	4.0	22.0	4.0	93.0	-	93.0	31.5				
Pine	South	31.0	32.0	4.0	22.0	4.0	93.0	-	93.0	31.5	10.0	10.0	16.0	16.0
Pine	North	29.0	29.0	4.0	22.0	9.0	93.0	-	93.0	29.0				
California	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	12.0	12.0	16.0	16.0
California	North	23.0	23.0	9.0	22.0	4.0	81.0	12.0	93.0	23.0				
Sacramento	South	23.0	23.0	9.0	22.0	4.0	81.0	12.0	93.0	23.0	15.0	11.0	16.0	16.0

Cross Street with Van Ness	Leg of Inter-section	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	SB Median Width (inc. Plat-forms)	Median BRT Lane Width	NB Median Width (inc. Plat-forms)	Total Cross-ing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Sacramento	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Clay	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	15.0	15.0	16.0	16.0
Clay	North	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0				
Washington	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	12.0	12.0	16.0	16.0
Washington	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Jackson	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	15.0	15.0	16.0	16.0
Jackson	North	23.0	22.0	9.0	24.0	9.0	87.0	6.0	93.0	22.5				
Pacific	South	24.0	26.0	9.0	22.0	6.0	87.0	6.0	93.0	25.0	12.0	12.0	16.0	16.0
Pacific	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Broadway	South	29.0	29.0	4.0	22.0	9.0	93.0	-	93.0	29.0	11.0	11.0	16.0	16.0
Broadway	North	32.0	31.0	4.0	22.0	4.0	93.0	-	93.0	31.5				
Vallejo	South	32.0	25.0	4.0	22.0	4.0	87.0	6.0	93.0	28.5	12.0	12.0	16.0	16.0
Vallejo	North	29.0	23.0	9.0	22.0	4.0	87.0	6.0	93.0	26.0				
Green	South	29.0	23.0	9.0	22.0	4.0	87.0	6.0	93.0	26.0	15.0	15.0	16.0	16.0
Green	North	29.0	23.0	9.0	22.0	4.0	87.0	6.0	93.0	26.0				
Union	South	23.0	33.0	9.0	22.0	-	87.0	6.0	93.0	28.0	12.0	12.0	12.0	12.0
Union	North	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Filbert	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	15.0	15.0	15.0	15.0
Filbert	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Greenwich	South	23.0	38.0	-	22.0	4.0	87.0	6.0	93.0	30.5	15.0	15.0	15.0	15.0
Greenwich	North	29.0	43.0	-	11.0	4.0	87.0	6.0	93.0	36.0				
Lombard	South	34.5	45.0	-	11.5	4.0	95.0	6.0	101.0	39.8	10.0	10.0	14.0	10.0
Lombard	North	39.5	39.5	7.0	-	7.0	93.0	-	93.0	39.5				
	Avg.	***27.6***	***28.8***	***4.9***	***21.1***	***7.1***	***89.5***	***5.4***	***94.9***	***28.2***	***13.0***	***12.6***	***15.9***	***15.8***

Source: SFCTA, 2010.

Table A4 - Average Crossing Distance across Van Ness Avenue: Alternative 3B (ft)

Cross Street with Van Ness	Leg of Inter-section	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	SB Median Width (inc. Plat-forms)	Median BRT Lane Width	NB Median Width (inc. Plat-forms)	Total Cross-ing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Mission	South	65.0	64.0	2.0	-	2.0	133.0	-	133.0	64.5	11.5	13.5	13.5	14.0
Mission	North	39.0	46.0	-	25.0	11.0	121.0	-	121.0	42.5				
Market	South	28.5	39.0	5.5	25.0	-	98.0	6.0	104.0	33.8	24.0	18.0	24.0	24.0
Market	North	37.0	22.5	11.5	26.0	11.0	108.0	6.0	114.0	29.8				
Fell	South	24.0	23.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	10.0	10.0	16.0	16.0
Fell	North	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Hayes	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	12.0	12.0	16.0	16.0
Hayes	North	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Grove	South	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0	15.0	22.0	16.0	16.0
Grove	North	23.0	29.5	6.0	22.0	6.5	87.0	6.0	93.0	26.3				
McAllister	South	22.0	25.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	22.0	12.0	16.0	16.0
McAllister	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Golden Gate	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	10.0	10.0	16.0	16.0
Golden Gate	North	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Turk	South	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0	12.0	12.0	16.0	16.0
Turk	North	29.0	29.0	4.0	22.0	9.0	93.0	-	93.0	29.0				
Eddy	South	23.0	24.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	12.0	12.0	16.0	16.0
Eddy	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Ellis	South	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0	12.0	12.0	16.0	16.0
Ellis	North	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0				
O'Farrell	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	12.0	12.0	16.0	16.0
O'Farrell	North	23.0	24.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5				
Geary	South	23.0	24.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	12.0	12.0	16.0	16.0
Geary	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Post	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	10.0	10.0	16.0	16.0
Post	North	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0				
Sutter	South	23.0	24.0	9.0	22.0	9.0	87.0	6.0	93.0	23.5	12.0	12.0	16.0	16.0
Sutter	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Bush	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	10.0	10.0	16.0	16.0
Bush	North	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Pine	South	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	10.0	10.0	16.0	16.0
Pine	North	29.0	29.0	4.0	22.0	9.0	93.0	-	93.0	29.0				
California	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	12.0	12.0	16.0	16.0
California	North	23.0	23.0	9.0	22.0	4.0	81.0	12.0	93.0	23.0				
Sacramento	South	23.0	23.0	9.0	22.0	4.0	81.0	12.0	93.0	23.0	15.0	11.0	16.0	16.0

Cross Street with Van Ness	Leg of Inter-section	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	SB Median Width (inc. Plat-forms)	Median BRT Lane Width	NB Median Width (inc. Plat-forms)	Total Cross-ing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Sacramento	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Clay	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	15.0	15.0	16.0	16.0
Clay	North	23.0	23.0	4.0	22.0	9.0	81.0	12.0	93.0	23.0				
Washington	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	12.0	12.0	16.0	16.0
Washington	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Jackson	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	15.0	15.0	16.0	16.0
Jackson	North	23.0	22.0	9.0	24.0	9.0	87.0	6.0	93.0	22.5				
Pacific	South	24.0	26.0	9.0	22.0	6.0	87.0	6.0	93.0	25.0	12.0	12.0	16.0	16.0
Pacific	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Broadway	South	29.0	29.0	4.0	22.0	9.0	93.0	-	93.0	29.0	11.0	11.0	16.0	16.0
Broadway	North	32.0	31.0	4.0	22.0	4.0	93.0	-	93.0	31.5				
Vallejo	South	32.0	25.0	4.0	22.0	4.0	87.0	6.0	93.0	28.5	12.0	12.0	16.0	16.0
Vallejo	North	29.0	23.0	9.0	22.0	4.0	87.0	6.0	93.0	26.0				
Green	South	29.0	23.0	9.0	22.0	4.0	87.0	6.0	93.0	26.0	15.0	15.0	16.0	16.0
Green	North	29.0	23.0	9.0	22.0	4.0	87.0	6.0	93.0	26.0				
Union	South	23.0	23.0	9.0	22.0	4.0	81.0	12.0	93.0	23.0	12.0	12.0	12.0	12.0
Union	North	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Filbert	South	23.0	29.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0	15.0	15.0	15.0	15.0
Filbert	North	29.0	23.0	4.0	22.0	9.0	87.0	6.0	93.0	26.0				
Greenwich	South	23.0	38.0	-	22.0	4.0	87.0	6.0	93.0	30.5	15.0	15.0	15.0	15.0
Greenwich	North	29.0	43.0	-	11.0	4.0	87.0	6.0	93.0	36.0				
Lombard	South	34.5	45.0	-	11.5	4.0	95.0	6.0	101.0	39.8	10.0	10.0	14.0	10.0
Lombard	North	39.5	39.5	7.0	-	7.0	93.0	-	93.0	39.5				
	Avg.	***26.8***	***27.9***	***5.1***	***21.1***	***7.7***	***88.7***	***6.2***	***94.9***	***27.4***	***13.0***	***12.6***	***15.9***	***15.8***

Source: SFCTA, 2010.

Table A5 - Average Crossing Distance across Van Ness Avenue: Alternative 4 (ft)

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width (includes Platforms)	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Mission	South	65.0	64.0	4.0	133.0	-	133.0	64.5	11.5	13.5	13.5	14.0
Mission	North	47.0	58.5	15.5	121.0	-	121.0	52.8				
Market	South	39.5	48.0	10.5	98.0	6.0	104.0	43.8	24.0	18.0	24.0	24.0
Market	North	48.0	42.5	17.5	108.0	6.0	114.0	45.3				
Fell	South	39.5	39.5	14.0	93.0	-	93.0	39.5	10.0	10.0	16.0	16.0
Fell	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Hayes	South	33.5	43.5	4.0	81.0	12.0	93.0	38.5	12.0	12.0	16.0	16.0
Hayes	North	33.5	49.5	4.0	87.0	6.0	93.0	41.5				
Grove	South	33.5	43.5	4.0	81.0	12.0	93.0	38.5	15.0	22.0	16.0	16.0
Grove	North	33.5	39.5	14.0	87.0	6.0	93.0	36.5				
McAllister	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	22.0	12.0	16.0	16.0
McAllister	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Golden Gate	South	39.5	39.5	14.0	93.0	-	93.0	39.5	10.0	10.0	16.0	16.0
Golden Gate	North	41.5	33.5	12.0	87.0	6.0	93.0	37.5				
Turk	South	33.5	41.5	12.0	87.0	6.0	93.0	37.5	12.0	12.0	16.0	16.0
Turk	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
Eddy	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Eddy	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Ellis	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Ellis	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
O'Farrell	South	39.5	45.5	8.0	93.0	-	93.0	42.5	12.0	12.0	16.0	16.0
O'Farrell*	North	34.0	35.0	9.0	87.0	6.0	93.0	34.5				
Geary*	South	34.0	35.0	9.0	87.0	6.0	93.0	34.5	12.0	12.0	16.0	16.0
Geary	North	39.5	39.0	8.5	87.0	6.0	93.0	39.3				
Post	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Post	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Sutter	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Sutter	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Bush	South	39.5	39.5	14.0	93.0	-	93.0	39.5	10.0	10.0	16.0	16.0
Bush	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Pine	South	33.5	41.5	12.0	87.0	6.0	93.0	37.5	10.0	10.0	16.0	16.0
Pine	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
California	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
California	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Sacramento	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	15.0	11.0	16.0	16.0
Sacramento	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width (includes Platforms)	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Clay	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	16.0	16.0
Clay	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Washington	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Washington	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Jackson	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	16.0	16.0
Jackson	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Pacific	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Pacific	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Broadway	South	39.5	39.5	14.0	93.0	-	93.0	39.5	11.0	11.0	16.0	16.0
Broadway	North	41.5	33.5	12.0	87.0	6.0	93.0	37.5				
Vallejo	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Vallejo	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Green	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	16.0	16.0
Green	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Union	South	33.5	41.5	12.0	87.0	6.0	93.0	37.5	12.0	12.0	12.0	12.0
Union	North	33.5	39.5	14.0	87.0	6.0	93.0	36.5				
Filbert	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	15.0	15.0
Filbert	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Greenwich	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	15.0	15.0
Greenwich	North	39.5	43.5	4.0	87.0	6.0	93.0	41.5				
Lombard	South	45.5	45.0	4.5	95.0	6.0	101.0	45.3	10.0	10.0	14.0	10.0
Lombard	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
	Avg.	***37.3***	***38.8***	***12.8***	***88.8***	***6.1***	***94.9***	***38.0***	***13.0***	***12.6***	***15.9***	***15.8***

Source: SFCTA, 2010.

Notes: * configuration at this location is similar to Alternative 3 with two right-side boarding platforms instead of a single, left-side boarding center platform.

Table A6 - Average Crossing Distance across Van Ness Avenue: Alternative 4B (ft)

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width (includes Platforms)	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Mission	South	65.0	64.0	4.0	133.0	-	133.0	64.5	11.5	13.5	13.5	14.0
Mission	North	47.0	58.5	15.5	121.0	-	121.0	52.8				
Market	South	39.5	48.0	10.5	98.0	6.0	104.0	43.8	24.0	18.0	24.0	24.0
Market	North	48.0	42.5	17.5	108.0	6.0	114.0	45.3				
Fell	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Fell	North	33.5	39.5	14.0	87.0	6.0	93.0	36.5				
Hayes	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Hayes	North	33.5	39.5	14.0	87.0	6.0	93.0	36.5				
Grove	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	15.0	22.0	16.0	16.0
Grove	North	33.5	39.5	14.0	87.0	6.0	93.0	36.5				
McAllister	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	22.0	12.0	16.0	16.0
McAllister	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Golden Gate	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Golden Gate	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Turk	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Turk	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Eddy	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Eddy	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Ellis	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Ellis	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
O'Farrell	South	39.5	45.5	8.0	93.0	-	93.0	42.5	12.0	12.0	16.0	16.0
O'Farrell*	North	34.0	35.0	9.0	87.0	6.0	93.0	34.5				
Geary*	South	34.0	35.0	9.0	87.0	6.0	93.0	34.5	12.0	12.0	16.0	16.0
Geary	North	39.5	39.0	8.5	87.0	6.0	93.0	39.3				
Post	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Post	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Sutter	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	12.0	12.0	16.0	16.0
Sutter	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Bush	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	10.0	10.0	16.0	16.0
Bush	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Pine	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	10.0	10.0	16.0	16.0
Pine	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
California	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
California	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Sacramento	South	33.5	33.5	14.0	81.0	12.0	93.0	33.5	15.0	11.0	16.0	16.0

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width (includes Platforms)	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Sacramento	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Clay	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	16.0	16.0
Clay	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Washington	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Washington	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Jackson	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	16.0	16.0
Jackson	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Pacific	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Pacific	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Broadway	South	39.5	39.5	14.0	93.0	-	93.0	39.5	11.0	11.0	16.0	16.0
Broadway	North	41.5	33.5	12.0	87.0	6.0	93.0	37.5				
Vallejo	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	16.0	16.0
Vallejo	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Green	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	16.0	16.0
Green	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Union	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	12.0	12.0	12.0	12.0
Union	North	33.5	33.5	14.0	81.0	12.0	93.0	33.5				
Filbert	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	15.0	15.0
Filbert	North	39.5	33.5	14.0	87.0	6.0	93.0	36.5				
Greenwich	South	33.5	39.5	14.0	87.0	6.0	93.0	36.5	15.0	15.0	15.0	15.0
Greenwich	North	39.5	43.5	4.0	87.0	6.0	93.0	41.5				
Lombard	South	45.5	45.0	4.5	95.0	6.0	101.0	45.3	10.0	10.0	14.0	10.0
Lombard	North	39.5	39.5	14.0	93.0	-	93.0	39.5				
	Avg.	***36.6***	***37.6***	***13.4***	***87.6***	***7.2***	***94.9***	***37.1***	***13.0***	***12.6***	***15.9***	***15.8***

Source: SFCTA, 2010.

Notes: * configuration at this location is similar to Alternative 3 with two right-side boarding platforms instead of a single, left-side boarding center platform.

Table A7 - Average Crossing Distance across Van Ness Avenue: LPA (ft)

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width (includes Platforms)	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Mission	South	65.0	64.0	4.0	133.0	0.0	133.0	64.5	11.5	13.5	13.5	14.0
Mission	North	55.5	65.5	7.0	128.0	0.0	128.0	60.5				
Market	South	64.8	28.7	10.5	104.0	0.0	104.0	46.8	24.0	18.0	24.0	24.0
Market	North	40.5	62.5	11.0	114.0	0.0	114.0	51.5				
Fell	South	39.0	36.0	8.0	83.0	10.0	93.0	37.5	10.0	10.0	16.0	16.0
Fell	North	36.0	36.0	11.0	83.0	10.0	93.0	36.0				
Hayes	South	36.0	36.0	11.0	83.0	10.0	93.0	36.0	12.0	12.0	16.0	16.0
Hayes	North	36.0	36.0	11.0	83.0	10.0	93.0	36.0				
Grove	South	36.0	36.0	11.0	83.0	10.0	93.0	36.0	15.0	22.0	16.0	16.0
Grove	North	36.0	36.0	11.0	83.0	10.0	93.0	36.0				
McAllister	South	56.5	27.5	9.0	93.0	0.0	93.0	42.0	22.0	12.0	16.0	16.0
McAllister	North	27.5	51.5	9.0	88.0	5.0	93.0	39.5				
Golden Gate	South	38.5	36.0	8.5	83.0	10.0	93.0	37.3	10.0	10.0	16.0	16.0
Golden Gate	North	36.5	36.5	10.0	83.0	10.0	93.0	36.5				
Turk	South	36.5	36.5	10.0	83.0	10.0	93.0	36.5	12.0	12.0	16.0	16.0
Turk	North	36.1	37.3	9.6	83.0	10.0	93.0	36.7				
Eddy	South	52.0	27.0	9.0	88.0	5.0	93.0	39.5	12.0	12.0	16.0	16.0
Eddy	North	26.5	52.5	9.0	88.0	5.0	93.0	39.5				
Ellis	South	37.5	36.0	9.5	83.0	10.0	93.0	36.8	12.0	12.0	16.0	16.0
Ellis	North	36.0	36.0	11.0	83.0	10.0	93.0	36.0				
O'Farrell	South	24.5	52.5	5.0	88.0	5.0	93.0	38.5	12.0	12.0	16.0	16.0
O'Farrell*	North	29.0	22.0	18.0	93.0	0.0	93.0	25.5				
Geary*	South	29.0	22.0	18.0	93.0	0.0	93.0	25.5	12.0	12.0	16.0	16.0
Geary	North	30.0	54.0	6.0	90.0	0.0	90.0	42.0				
Post	South	41.5	36.5	10.0	88.0	5.0	93.0	39.0	10.0	10.0	16.0	16.0
Post	North	36.0	36.5	10.0	82.5	10.5	93.0	36.3				
Sutter	South	38.0	36.5	8.5	83.0	10.0	93.0	37.3	12.0	12.0	16.0	16.0
Sutter	North	25.5	53.5	9.0	88.0	5.0	93.0	39.5				
Bush	South	53.5	25.5	9.0	88.0	5.0	93.0	39.5	10.0	10.0	16.0	16.0
Bush	North	36.5	38.5	8.0	83.0	10.0	93.0	37.5				
Pine	South	36.5	36.5	10.0	83.0	10.0	93.0	36.5	10.0	10.0	16.0	16.0
Pine	North	44.5	36.5	7.0	88.0	5.0	93.0	40.5				
California	South	36.5	36.5	10.0	83.0	10.0	93.0	36.5	12.0	12.0	16.0	16.0
California	North	37.0	37.0	9.0	83.0	10.0	93.0	37.0				
Sacramento	South	43.0	37.0	8.0	88.0	5.0	93.0	40.0	15.0	11.0	16.0	16.0

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width (includes Platforms)	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Sacramento	North	25.5	53.5	9.0	88.0	5.0	93.0	39.5				
Clay	South	53.5	25.5	9.0	88.0	5.0	93.0	39.5	15.0	15.0	16.0	16.0
Clay	North	36.5	38.8	7.7	83.0	10.0	93.0	37.7				
Washington	South	36.5	36.5	10.0	83.0	10.0	93.0	36.5	12.0	12.0	16.0	16.0
Washington	North	36.5	36.5	10.0	83.0	10.0	93.0	36.5				
Jackson	South	43.5	36.5	8.0	88.0	5.0	93.0	40.0	15.0	15.0	16.0	16.0
Jackson	North	25.5	53.5	9.0	88.0	5.0	93.0	39.5				
Pacific	South	52.5	26.5	9.0	88.0	5.0	93.0	39.5	12.0	12.0	16.0	16.0
Pacific	North	41.5	38.5	8.0	88.0	5.0	93.0	40.0				
Broadway	South	27.0	48.5	10.5	93.0	0.0	93.0	37.8	11.0	11.0	16.0	16.0
Broadway	North	53.0	33.0	7.0	93.0	0.0	93.0	43.0				
Vallejo	South	53.0	33.0	7.0	93.0	0.0	93.0	43.0	12.0	12.0	16.0	16.0
Vallejo	North	33.0	47.0	9.0	93.0	0.0	93.0	40.0				
Green	South	27.5	52.8	7.7	88.0	5.0	93.0	40.2	15.0	15.0	16.0	16.0
Green	North	29.5	49.7	8.8	88.0	5.0	93.0	39.6				
Union	South	24.5	26.5	13.0	88.0	5.0	93.0	25.5	12.0	12.0	12.0	12.0
Union	North	27.3	52.5	8.7	88.5	4.5	93.0	39.9				
Filbert	South	37.8	41.2	9.0	88.0	5.0	93.0	39.5	15.0	15.0	15.0	15.0
Filbert	North	41.5	36.0	10.5	88.0	5.0	93.0	38.8				
Greenwich	South	40.5	41.0	11.5	93.0	0.0	93.0	40.8	15.0	15.0	15.0	15.0
Greenwich	North	37.5	42.5	6.0	86.0	7.0	93.0	40.0				
Lombard	South	44.1	51.9	6.2	102.2	0.0	102.2	48.0	10.0	10.0	14.0	10.0
Lombard	North	39.5	39.5	14.0	93.0	0.0	93.0	39.5				
	Avg.	***38.6***	***39.9***	***9.4***	***89.4***	***5.6***	***94.9***	***39.2***	***13.0***	***12.6***	***15.9***	***15.8***

Source: SFCTA, 2012.

Table A7 - Average Crossing Distance across Van Ness Avenue: LPA Vallejo Northbound Station Variant (ft)

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width (includes Platforms)	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Mission	South	65.0	64.0	4.0	133.0	0.0	133.0	64.5	11.5	13.5	13.5	14.0
Mission	North	55.5	65.5	7.0	128.0	0.0	128.0	60.5				
Market	South	64.8	28.7	10.5	104.0	0.0	104.0	46.8	24.0	18.0	24.0	24.0
Market	North	40.5	62.5	11.0	114.0	0.0	114.0	51.5				
Fell	South	39.0	36.0	8.0	83.0	10.0	93.0	37.5	10.0	10.0	16.0	16.0
Fell	North	36.0	36.0	11.0	83.0	10.0	93.0	36.0				
Hayes	South	36.0	36.0	11.0	83.0	10.0	93.0	36.0	12.0	12.0	16.0	16.0
Hayes	North	36.0	36.0	11.0	83.0	10.0	93.0	36.0				
Grove	South	36.0	36.0	11.0	83.0	10.0	93.0	36.0	15.0	22.0	16.0	16.0
Grove	North	36.0	36.0	11.0	83.0	10.0	93.0	36.0				
McAllister	South	56.5	27.5	9.0	93.0	0.0	93.0	42.0	22.0	12.0	16.0	16.0
McAllister	North	27.5	51.5	9.0	88.0	5.0	93.0	39.5				
Golden Gate	South	38.5	36.0	8.5	83.0	10.0	93.0	37.3	10.0	10.0	16.0	16.0
Golden Gate	North	36.5	36.5	10.0	83.0	10.0	93.0	36.5				
Turk	South	36.5	36.5	10.0	83.0	10.0	93.0	36.5	12.0	12.0	16.0	16.0
Turk	North	36.1	37.3	9.6	83.0	10.0	93.0	36.7				
Eddy	South	52.0	27.0	9.0	88.0	5.0	93.0	39.5	12.0	12.0	16.0	16.0
Eddy	North	26.5	52.5	9.0	88.0	5.0	93.0	39.5				
Ellis	South	37.5	36.0	9.5	83.0	10.0	93.0	36.8	12.0	12.0	16.0	16.0
Ellis	North	36.0	36.0	11.0	83.0	10.0	93.0	36.0				
O'Farrell	South	24.5	52.5	5.0	88.0	5.0	93.0	38.5	12.0	12.0	16.0	16.0
O'Farrell*	North	29.0	22.0	18.0	93.0	0.0	93.0	25.5				
Geary*	South	29.0	22.0	18.0	93.0	0.0	93.0	25.5	12.0	12.0	16.0	16.0
Geary	North	30.0	54.0	6.0	90.0	0.0	90.0	42.0				
Post	South	41.5	36.5	10.0	88.0	5.0	93.0	39.0	10.0	10.0	16.0	16.0
Post	North	36.0	36.5	10.0	82.5	10.5	93.0	36.3				
Sutter	South	38.0	36.5	8.5	83.0	10.0	93.0	37.3	12.0	12.0	16.0	16.0
Sutter	North	25.5	53.5	9.0	88.0	5.0	93.0	39.5				
Bush	South	53.5	25.5	9.0	88.0	5.0	93.0	39.5	10.0	10.0	16.0	16.0
Bush	North	36.5	38.5	8.0	83.0	10.0	93.0	37.5				
Pine	South	36.5	36.5	10.0	83.0	10.0	93.0	36.5	10.0	10.0	16.0	16.0
Pine	North	44.5	36.5	7.0	88.0	5.0	93.0	40.5				
California	South	36.5	36.5	10.0	83.0	10.0	93.0	36.5	12.0	12.0	16.0	16.0
California	North	37.0	37.0	9.0	83.0	10.0	93.0	37.0				
Sacramento	South	43.0	37.0	8.0	88.0	5.0	93.0	40.0	15.0	11.0	16.0	16.0

Cross Street with Van Ness	Leg of Intersection	SB Crossing Distance (Curb to Median)	NB Crossing Distance (Curb to Median)	Median Width (includes Platforms)	Total Crossing Distance (Curb-to-Curb)	Curb Extension Width	Street ROW Width	Avg. Distance (Curb-to-Median)	South Cross-walk Width	North Cross-walk Width	West Cross-walk Width	East Cross-walk Width
Sacramento	North	25.5	53.5	9.0	88.0	5.0	93.0	39.5				
Clay	South	53.5	25.5	9.0	88.0	5.0	93.0	39.5	15.0	15.0	16.0	16.0
Clay	North	36.5	38.8	7.7	83.0	10.0	93.0	37.7				
Washington	South	36.5	36.5	10.0	83.0	10.0	93.0	36.5	12.0	12.0	16.0	16.0
Washington	North	36.5	36.5	10.0	83.0	10.0	93.0	36.5				
Jackson	South	43.5	36.5	8.0	88.0	5.0	93.0	40.0	15.0	15.0	16.0	16.0
Jackson	North	25.5	53.5	9.0	88.0	5.0	93.0	39.5				
Pacific	South	52.5	26.5	9.0	88.0	5.0	93.0	39.5	12.0	12.0	16.0	16.0
Pacific	North	41.5	38.5	8.0	88.0	5.0	93.0	40.0				
Broadway	South	27.0	48.5	10.5	93.0	0.0	93.0	37.8	11.0	11.0	16.0	16.0
Broadway	North	53.0	33.5	7.0	93.5	0.0	93.5	43.3				
Vallejo	South	63.5	21.5	8.0	93.0	0.0	93.0	42.5	12.0	12.0	16.0	16.0
Vallejo	North	28.0	23.0	18.0	93.0	0.0	93.0	25.5				
Green	South	23.0	56.0	9.0	88.0	5.0	93.0	39.5	15.0	15.0	16.0	16.0
Green	North	29.5	51.0	7.5	88.0	5.0	93.0	40.3				
Union	South	24.5	26.5	13.0	88.0	5.0	93.0	25.5	12.0	12.0	12.0	12.0
Union	North	27.3	52.5	8.7	88.5	4.5	93.0	39.9				
Filbert	South	37.8	41.2	9.0	88.0	5.0	93.0	39.5	15.0	15.0	15.0	15.0
Filbert	North	41.5	36.0	10.5	88.0	5.0	93.0	38.8				
Greenwich	South	40.5	41.0	11.5	93.0	0.0	93.0	40.8	15.0	15.0	15.0	15.0
Greenwich	North	37.5	42.5	6.0	86.0	7.0	93.0	40.0				
Lombard	South	44.1	51.9	6.2	102.2	0.0	102.2	48.0	10.0	10.0	14.0	10.0
Lombard	North	39.5	39.5	14.0	93.0	0.0	93.0	39.5				
	Avg.	***38.6***	***39.4***	***9.6***	***89.4***	***5.6***	***95.0***	***39.0***	***13.0***	***12.6***	***15.9***	***15.8***

Source: SFCTA, 2012.

A2.1.2 Average Curb-to-Curb and Curb-to-Median Crossing Distance

Table A8 – Average Curb-to-Curb and Curb-to-Median Crossing Distances across Van Ness Avenue (ft)

		Avg. Curb-to-Curb Crossing Distance at Intersection								Avg. Curb-to-Median Crossing Distance at Intersection							
Cross Street with Van Ness	Leg of Inter-section	Alt 1	Δ (Alt. 2 – Alt. 1)	Δ (Alt. 3 – Alt 1)	Δ (Alt. 3B – Alt 1)	Δ (Alt. 4A - ALT 1)	Δ (Alt. 4B - ALT 1)	Δ (LPA – ALT 1)	Δ (LPA Vallejo NB Station Variant – ALT 1)	ALT 1	Δ (Alt. 2 - ALT 1)	Δ (Alt. 3A - ALT 1)	Δ (Alt. 3B - ALT 1)	Δ (Alt. 4A - ALT 1)	Δ (Al. 4B - ALT 1)	Δ (LPA – ALT 1)	Δ (LPA Vallejo NB Station Variant – ALT 1)
Mission	South	130.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	63.3	1.3	1.3	1.3	1.3	1.3
Mission	North	121.0	(6.0)	0.0	0.0	0.0	0.0	7.0	7.0	7.0	7.0	58.5	(8.0)	(16.0)	(16.0)	2.0	2.0
Market	South	104.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	0.0	0.0	0.0	0.0	48.3	(3.8)	(14.5)	(14.5)	(1.5)	(1.5)
Market	North	114.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	0.0	0.0	0.0	0.0	53.5	(8.5)	(23.8)	(23.8)	(2.0)	(2.0)
Fell	South	87.5	(0.5)	5.5	(0.5)	5.5	(0.5)	(4.5)	(4.5)	(4.5)	(4.5)	36.8	(0.3)	(9.0)	(13.3)	0.8	0.8
Fell	North	86.5	0.5	6.5	0.5	6.5	0.5	(3.5)	(3.5)	(3.5)	(3.5)	41.3	0.3	(12.3)	(15.3)	(5.3)	(5.3)
Hayes	South	93.0	(6.0)	(6.0)	(6.0)	(12.0)	(12.0)	(10.0)	(10.0)	(10.0)	(10.0)	44.5	(3.0)	(14.0)	(18.5)	(8.5)	(8.5)
Hayes	North	79.0	8.0	8.0	8.0	8.0	8.0	4.0	4.0	4.0	4.0	32.5	4.0	(7.0)	(6.5)	3.5	3.5
Grove	South	84.5	(3.5)	(3.5)	(3.5)	(3.5)	(3.5)	(1.5)	(1.5)	(1.5)	(1.5)	40.3	(1.8)	(12.8)	(17.3)	(4.3)	(4.3)
Grove	North	93.0	(14.0)	(6.0)	(6.0)	(6.0)	(6.0)	(10.0)	(10.0)	(10.0)	(10.0)	44.5	(12.0)	(18.3)	(18.3)	(8.5)	(8.5)
McAllister	South	93.0	(16.0)	(6.0)	(6.0)	(12.0)	(12.0)	(0.0)	(0.0)	(0.0)	(0.0)	39.5	(8.0)	(16.0)	(16.0)	2.5	2.5
McAllister	North	86.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	41.0	(4.5)	(15.0)	(15.0)	(1.5)	(1.5)
Golden Gate	South	86.0	1.0	7.0	1.0	7.0	1.0	(3.0)	(3.0)	(3.0)	(3.0)	36.0	0.5	(7.0)	(10.0)	1.3	1.3
Golden Gate	North	86.0	(5.0)	7.0	1.0	1.0	(5.0)	(3.0)	(3.0)	(3.0)	(3.0)	41.0	(2.5)	(9.5)	(15.0)	(4.5)	(4.5)
Turk	South	86.0	(5.0)	(5.0)	(5.0)	1.0	(5.0)	(3.0)	(3.0)	(3.0)	(3.0)	41.0	(2.5)	(13.5)	(18.0)	(4.5)	(4.5)
Turk	North	93.0	(6.0)	0.0	0.0	0.0	(6.0)	(10.0)	(10.0)	(10.0)	(10.0)	39.5	(3.0)	(10.5)	(10.5)	(2.8)	(2.8)
Eddy	South	86.0	(7.0)	1.0	1.0	(5.0)	(5.0)	2.0	2.0	2.0	2.0	36.0	(3.5)	(12.5)	(12.5)	3.5	3.5
Eddy	North	86.0	(7.0)	1.0	1.0	(5.0)	(5.0)	2.0	2.0	2.0	2.0	41.0	(8.5)	(15.0)	(15.0)	(1.5)	(1.5)
Ellis	South	86.0	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	(3.0)	(3.0)	(3.0)	(3.0)	41.0	(7.5)	(18.0)	(18.0)	(4.3)	(4.3)
Ellis	North	86.0	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	(3.0)	(3.0)	(3.0)	(3.0)	36.0	(2.5)	(13.0)	(13.0)	0.0	0.0
O'Farrell	South	86.0	(1.0)	1.0	1.0	7.0	7.0	2.0	2.0	2.0	2.0	36.0	(0.5)	(10.0)	(10.0)	2.5	2.5
O'Farrell	North	86.0	(5.0)	1.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	41.0	(7.5)	(17.5)	(17.5)	(15.5)	(15.5)
Geary	South	86.0	(7.0)	1.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	41.0	(8.5)	(17.5)	(17.5)	(15.5)	(15.5)
Geary	North	86.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0	4.0	4.0	36.0	0.5	(10.0)	(10.0)	6.0	6.0
Post	South	86.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	36.0	0.5	(10.0)	(10.0)	3.0	3.0
Post	North	86.0	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	(3.5)	(3.5)	(3.5)	(3.5)	36.0	(2.5)	(13.0)	(13.0)	0.3	0.3
Sutter	South	86.0	(7.0)	1.0	1.0	(5.0)	(5.0)	(3.0)	(3.0)	(3.0)	(3.0)	36.0	(3.5)	(12.5)	(12.5)	1.3	1.3
Sutter	North	86.0	(1.0)	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	36.0	(0.5)	(10.0)	(10.0)	3.5	3.5
Bush	South	86.0	1.0	7.0	1.0	7.0	1.0	2.0	2.0	2.0	2.0	36.0	0.5	(7.0)	(10.0)	3.5	3.5
Bush	North	85.5	(4.5)	7.5	1.5	1.5	(4.5)	(2.5)	(2.5)	(2.5)	(2.5)	40.8	(2.3)	(9.3)	(14.8)	(3.3)	(3.3)
Pine	South	86.0	(5.0)	7.0	1.0	1.0	(5.0)	(3.0)	(3.0)	(3.0)	(3.0)	41.0	(2.5)	(9.5)	(15.0)	(4.5)	(4.5)
Pine	North	93.0	(6.0)	0.0	0.0	0.0	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	39.5	(3.0)	(10.5)	(10.5)	1.0	1.0
California	South	86.0	1.0	1.0	1.0	1.0	1.0	(3.0)	(3.0)	(3.0)	(3.0)	36.0	0.5	(10.0)	(10.0)	0.5	0.5
California	North	86.0	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	(3.0)	(3.0)	(3.0)	(3.0)	36.0	(2.5)	(13.0)	(13.0)	1.0	1.0
Sacramento	South	79.0	0.0	2.0	2.0	2.0	2.0	9.0	9.0	9.0	9.0	37.5	(5.0)	(14.5)	(14.5)	2.5	2.5
Sacramento	North	93.0	(16.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	39.5	(8.0)	(13.5)	(13.5)	0.0	0.0
Clay	South	86.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	36.0	0.5	(10.0)	(10.0)	3.5	3.5
Clay	North	86.0	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	(3.0)	(3.0)	(3.0)	(3.0)	41.0	(7.5)	(18.0)	(18.0)	(3.4)	(3.4)
Washington	South	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(10.0)	(10.0)	(10.0)	(10.0)	39.5	(3.0)	(13.5)	(13.5)	(3.0)	(3.0)

		Avg. Curb-to-Curb Crossing Distance at Intersection								Avg. Curb-to-Median Crossing Distance at Intersection							
Cross Street with Van Ness	**Leg of Inter-section**	**Alt 1**	**Δ (Alt. 2 – Alt. 1)**	**Δ (Alt. 3 – Alt 1)**	**Δ (Alt. 3B – Alt 1)**	**Δ (Alt. 4A - ALT 1)**	**Δ (Alt. 4B - ALT 1)**	**Δ (LPA – ALT 1)**	**Δ (LPA Vallejo NB Station Variant – ALT 1)**	**ALT 1**	**Δ (Alt. 2 - ALT 1)**	**Δ (Alt. 3A - ALT 1)**	**Δ (Alt. 3B - ALT 1)**	**Δ (Alt. 4A - ALT 1)**	**Δ (Al. 4B - ALT 1)**	**Δ (LPA – ALT 1)**	**Δ (LPA Vallejo NB Station Variant – ALT 1)**
Washington	North	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(10.0)	(10.0)	(10.0)	(10.0)	44.5	(8.0)	(18.5)	(18.5)	(8.0)	(8.0)
Jackson	South	93.0	(14.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	44.5	(12.0)	(18.5)	(18.5)	(4.5)	(4.5)
Jackson	North	93.0	(8.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	39.5	(4.0)	(17.0)	(17.0)	0.0	0.0
Pacific	South	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	44.5	(8.0)	(19.5)	(19.5)	(5.0)	(5.0)
Pacific	North	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	39.5	(3.0)	(13.5)	(13.5)	0.5	0.5
Broadway	South	93.0	(6.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.5	(3.0)	(10.5)	(10.5)	(1.8)	(1.8)
Broadway	North	93.0	(6.0)	0.0	0.0	(6.0)	(6.0)	0.0	0.5	0.0	0.5	44.5	(3.0)	(13.0)	(13.0)	(1.5)	(1.3)
Vallejo	South	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	0.0	0.0	0.0	0.0	44.5	(8.0)	(16.0)	(16.0)	(1.5)	(2.0)
Vallejo	North	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	0.0	0.0	0.0	0.0	39.5	(3.0)	(13.5)	(13.5)	0.5	(14.0)
Green	South	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	44.5	(8.0)	(18.5)	(18.5)	(4.4)	(5.0)
Green	North	93.0	(8.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	39.5	(4.0)	(13.5)	(13.5)	0.1	0.8
Union	South	93.0	(6.0)	(6.0)	(12.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	44.5	(3.0)	(16.5)	(21.5)	(19.0)	(19.0)
Union	North	93.0	(8.0)	(6.0)	(6.0)	(6.0)	(12.0)	(4.5)	(4.5)	(4.5)	(4.5)	39.5	(4.0)	(13.5)	(13.5)	0.4	0.4
Filbert	South	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	39.5	(3.0)	(13.5)	(13.5)	0.0	0.0
Filbert	North	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.0)	(5.0)	(5.0)	(5.0)	44.5	(8.0)	(18.5)	(18.5)	(5.8)	(5.8)
Greenwich	South	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	0.0	0.0	0.0	0.0	42.3	(3.0)	(11.8)	(11.8)	(1.5)	(1.5)
Greenwich	North	93.0	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(7.0)	(7.0)	(7.0)	(7.0)	44.5	(3.0)	(8.5)	(8.5)	(4.5)	(4.5)
Lombard	South	123.0	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)	(20.8)	(20.8)	(20.8)	(20.8)	59.5	(14.0)	(19.8)	(19.8)	(11.5)	(11.5)
Lombard	North	93.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.5	0.0	0.0	0.0	0.0	0.0
	Avg.	**91.6**	**(5.1)**	**(2.1)**	**(2.9)**	**(2.8)**	**(4.0)**	**(2.2)**	**(2.2)**	**(2.2)**	**(2.2)**	**41.3**	**(4.0)**	**(13.1)**	**(13.9)**	**(2.0)**	**(2.3)**

Source: SFCTA, 2010/2012.

A2.1.3 Pedestrian Crossing Speeds

Table A9 – Average Pedestrian Crossing Speeds by Alternative

	Speed to Cross during Full Walk Split (fps)															
	Crossing Side Street								Crossing Van Ness Avenue							
Street	Alt 1	Alt 2	Alt 3	Alt 3B	Alt 4	Alt 4B	LPA	LPA Vallejo NB Station Variant	Alt 1	Alt 2	Alt 3	Alt 3B	Alt 4	Alt 4B	LPA	LPA Vallejo NB Station Variant
Lombard	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	4.2	3.3	3.3	3.3	3.3	3.3	3.5	3.5
Greenwich	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	2.8	2.6	2.6	2.6	2.6	2.6	2.8	2.8
Filbert	0.7	0.9	0.8	0.8	0.8	0.8	0.8	0.8	3.8	2.4	3.0	3.0	3.0	3.0	3.0 [A]	3.0 [A]
Union	1.0	1.0	1.1	0.9	1.1	0.9	0.9	0.9	3.1	2.8	2.9	2.9	2.9	2.9	3.0	3.0
Green	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	3.2	2.6	2.7	2.7	2.7	2.7	2.8	2.8
Vallejo	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	2.8	2.7	2.8	2.8	2.8	2.8	3.0	3.0
Broadway	1.5	1.5	1.6	1.7	1.6	1.7	1.7	1.7	3.2	2.9	3.2	3.2	3.2	3.2	3.2	3.2
Pacific	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	2.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Jackson	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	3.3	2.9	3.1	3.1	3.1	3.1	3.1	3.1
Washington	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	3.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7
Clay	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	2.8	2.4	2.8	2.8	2.8	2.8	2.8	2.8
Sacramento	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	2.7	2.2	2.4	2.4	2.4	2.4	2.4	2.4
California	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.2	2.4	2.8	2.8	2.8	2.8	2.8	2.8
Pine	1.2	1.2	1.3	1.0	1.3	1.0	1.0	1.0	2.7	2.5	2.8	2.8	2.8	2.6	2.6	2.6
Bush	1.4	1.4	1.5	1.0	1.5	1.0	1.0	1.0	2.7	2.5	2.7	2.5	2.7	2.5	2.5	2.5
Sutter	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.3	2.4	2.4	2.4	2.4	2.4	2.4
Post	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	2.3	2.4	2.4	2.4	2.4	2.4	2.5	2.5
Geary	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.7	2.3	2.4	2.4	2.4	2.4	2.5	2.5
O'Farrell	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.6	2.3	2.3	2.3	2.4	2.4	2.4	2.4
Ellis	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	2.8	2.3	2.6	2.6	2.6	2.6	2.7	2.7
Eddy	0.9	1.1	1.0	1.0	1.0	1.0	1.0	1.0	2.6	2.0	2.3	2.3	2.1	2.1	2.3	2.3
Turk	1.2	1.1	1.1	0.9	1.1	0.9	0.9	0.9	2.8	2.8	3.0	3.0	3.0	2.8	2.7	2.7
Golden Gate	1.2	1.2	1.2	1.0	1.2	1.0	1.0	1.0	2.6	2.7	2.9	2.7	2.9	2.7	2.6	2.6
McAllister	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.8	2.4	2.6	2.6	2.6	2.6	2.7	2.7
Grove	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	2.8	2.5	2.7	2.7	2.7	2.7	2.6	2.6
Hayes	1.2	1.2	1.2	0.9	1.2	0.9	0.9	0.9	2.7	2.5	2.7	2.7	2.7	2.7	2.5	2.5
Fell	1.2	1.2	1.2	1.0	1.2	1.0	1.0	1.0	2.8	2.7	2.8	2.7	2.8	2.7	2.5	2.5
Market	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.9	2.4	2.4	2.4	2.4	2.4	2.6	2.6
Mission	4.0	4.2	4.6	4.6	4.6	4.6	4.6	4.6	3.4	3.5	3.7	3.7	3.7	3.7	3.8	3.8
# of Crossings Meeting City Target of 2.5 fps for Full Walk Split	27	27	27	27	27	27	27	27	3	14	8	8	8	8	6	6
# of Crossings Meeting FHWA Guideline of 3.0 fps for Full Walk Split	28	28	28	28	28	28	28	28	21	27	25	25	25	25	24	24
# of Crossings Exceeding FHWA Guideline of 3.0 fps for Full Walk Split	1	1	1	1	1	1	1	1	8	2	4	4	4	4	5	5
% Speed Differential vs. FHWA Guideline (for non-FHWA Compliant Crossings Only)	35%	38%	53%	53%	53%	53%	53%	53%	50%	37%	30%	30%	30%	30%	34%	34%

Source: SFCTA, 2010/2012.

Note: [A] Average pedestrian crossing speed is 3.03 fps, which exceeds the FHWA guideline of 3.0 fps for the full walk split.

A2.1.4 Nose Cone Provision across Van Ness Avenue

Table A10 – Nose Cone Provision across Van Ness Avenue by Alternative

	Alternative 1		Alternative 2		Alternative 3 / 3B		Alternative 4 / 4B		LPA		LPA Vallejo Northbound Station Variant	
Intersection	South Leg	North Leg	South Leg	North Leg	South Leg	North Leg	South Leg	North Leg	South Leg	North Leg	South Leg	North Leg
Mission				X				X		X		X
Market			X	X	X	X	X	X	X	X	X	X
Fell			X	X	X	X	X	X	X	X	X	X
Hayes		X	X	X	X	X	X	X	X	X	X	X
Grove			X	X	X	X	X	X	X	X	X	X
McAllister	X		X	X	X	X	X	X	X	X	X	X
Golden Gate	X		X		X	X	X	X	X	X	X	X
Turk		X	X	X	X	X	X	X	X	X	X	X
Eddy			X	X	X	X	X	X	X	X	X	X
Ellis		X	X	X	X	X	X	X	X	X	X	X
O'Farrell	X		X	X	X	X	X	X	X	X	X	X
Geary		X	X	X	X	X	X	X	X	X	X	X
Post	X	X	X	X	X	X	X	X	X	X	X	X
Sutter	X	X	X	X	X	X	X	X	X	X	X	X
Bush	X		X	X	X	X	X	X	X	X	X	X
Pine		X	X	X	X	X	X	X	X	X	X	X
California	X	X	X	X	X	X	X	X	X	X	X	X
Sacramento		X	X	X	X	X	X	X	X	X	X	X
Clay	X		X	X	X	X	X	X	X	X	X	X
Washington			X	X	X	X	X	X	X	X	X	X
Jackson			X	X	X	X	X	X	X	X	X	X
Pacific			X	X	X	X	X	X	X	X	X	X
Broadway			X	X	X	X	X	X	X	X	X	X
Vallejo			X	X	X	X	X	X	X	X	X	X
Green			X	X	X	X	X	X	X	X	X	X
Union			X	X	X	X	X	X	X	X	X	X
Filbert			X	X	X	X	X	X	X	X	X	X
Greenwich			X	X			X		X	X	X	X
Lombard			X						X		X	
Total	8	9	28	27	26	26	27	27	28	28	28	28

Source: SFCTA, 2010.

A2.1.5 Corner Bulb Provision along Van Ness Avenue

Table A11 – Corner Bulb Provision along Van Ness Avenue (Southbound Side)

	NB Far Side								NB Near Side							
Intersection	**Alt 1**	**Alt 2***	**Alt 3A ****	**Alt 3B ****	**Alt 4A**	**Alt 4B**	**LPA**	**LPA Vallejo Northbound Station Variant**	**Alt 1**	**Alt 2***	**Alt 3A ****	**Alt 3B ****	**Alt 4A**	**Alt 4B**	**LPA**	**LPA Vallejo Northbound Station Variant**
Market										X	X	X	X	X		
Fell	X	X		X		X	X	X	X	X		X		X	X	X
Hayes	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
Grove		X	X	X	X	X	X	X		X	X	X	X	X	X	X
McAllister	X									X	X	X	X	X	X	X
Golden Gate	X	X		X		X	X	X		X		X		X	X	X
Turk							X	X		X	X	X	X	X	X	X
Eddy	X	X			X	X				X			X	X	X	X
Ellis	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
O'Farrell	X	X								X	X	X			X	X
Geary										X						
Post	X	X	X	X	X	X	X	X		X	X	X	X	X		
Sutter	X									X			X	X	X	X
Bush	X	X		X		X	X	X		X		X		X	X	X
Pine										X			X	X	X	X
California	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
Sacramento									X	X	X	X	X	X		
Clay	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
Washington							X	X		X	X	X	X	X	X	X
Jackson		X	X	X						X	X	X	X	X		
Pacific										X	X	X	X	X	X	X
Broadway										X						
Vallejo										X			X	X		
Green										X			X	X	X	X
Union		X	X	X	X	X					X	X	X	X	X	X
Filbert										X	X	X	X	X	X	X
Greenwich										X	X	X	X	X		
Lombard																
Total	12	13	8	11	8	11	11	11	2	26	17	20	21	24	19	19

Source: SFCTA, 2010/2012.

Notes:
* Incorporates southbound left turn at Fell.
** Incorporates dual platform at O'Farrell and Geary.

Table A11 – Corner Bulb Provision along Van Ness Avenue (Northbound Side)

	NB Far Side								NB Near Side							
Intersection	Alt 1	Alt 2*	Alt 3A **	Alt 3B **	Alt 4A	Alt 4B	LPA	LPA Vallejo Northbound Station Variant	Alt 1	Alt 2*	Alt 3A **	Alt 3B **	Alt 4A	Alt 4B	LPA	LPA Vallejo Northbound Station Variant
Market		X			X	X										
Fell							X	X							X	X
Hayes							X	X					X	X	X	X
Grove							X	X	X	X	X	X	X	X	X	X
McAllister		X	X	X	X	X	X	X		X			X	X		
Golden Gate		X			X	X	X	X	X						X	X
Turk		X				X	X	X	X	X	X	X		X	X	X
Eddy		X	X	X	X	X	X	X	X	X	X	X	X	X		
Ellis		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
O'Farrell		X	X	X	X	X			X							
Geary	X	X	X	X	X	X			X	X	X	X	X	X		
Post		X	X	X	X	X	X	X	X						X	X
Sutter		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bush		X			X	X	X	X	X							
Pine		X				X	X	X	X	X		X		X	X	X
California		X	X	X	X	X	X	X	X						X	X
Sacramento		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Clay		X	X	X	X	X			X							
Washington		X	X	X	X	X	X	X							X	X
Jackson					X	X	X	X		X					X	X
Pacific		X	X	X	X	X	X	X								
Broadway		X			X	X										
Vallejo		X	X	X	X	X					X	X				
Green		X	X	X	X	X	X	X			X	X				
Union						X				X		X				
Filbert		X	X	X	X	X	X	X								
Greenwich		X	X	X	X	X	X	X								
Lombard										X	X	X	X	X	X	X
Total	1	22	16	16	21	24	20	20	14	12	10	12	9	11	14	14

Source: SFCTA, 2010/2012.

Notes:
* Incorporates southbound left turn at Fell.
** Incorporates dual platform at O'Farrell and Geary.

A2.1.6 Pedestrian Signal Provision along Van Ness Avenue

Table A12 – Provision of Accessible Pedestrian Signals

Provision of Accessible Pedestrian Signals (APS)						
Intersection	**Alt. 1**	**Alt. 2**	**Alt. 3/3B**	**Alt. 4/4B**	**LPA**	**LPA Vallejo NB Station Variant**
Mission		X	X	X	X	X
Market	X	X	X	X	X	X
Fell	X	X	X	X	X	X
Hayes	X	X	X	X	X	X
Grove	X	X	X	X	X	X
McAllister	X	X	X	X	X	X
Golden Gate						
Turk						
Eddy		X	X	X	X	X
Ellis						
O'Farrell		X	X	X	X	X
Geary		X	X	X	X	X
Post						
Sutter		X	X	X	X	X
Bush						
Pine						
California						
Sacramento		X	X	X	X	X
Clay						
Washington						
Jackson		X	X	X	X	X
Pacific			X	X	X	X
Broadway						
Vallejo						
Green		X				
Union	X	X	X	X	X	X
Filbert						
Greenwich						
Lombard						
Totals	6 *	14	14	14	14	14

Source: SFCTA, 2010.

Note: * APS would likely be installed at some additional signalized intersections in the project corridor as part of SFgo.

A2.1.7 Pedestrian Crowding across Van Ness Avenue and Side Streets

Table A13- Pedestrian Crowding LOS across Van Ness Avenue and Side Streets

North-South Movement (Crossing Side Street)																
	Alt. 1		Alt. 2		Alt. 3		Alt. 3B		Alt. 4		Alt. 4B		LPA		LPA Vallejo NB Station Variant	
Inter-section	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS
Golden Gate	98.5	A	102.1	A	98.7	A	135.0	A	98.7	A	135.0	A	135.0	A	135.0	A
McAllister	121.5	A	142.3	A	151.0	A	151.0	A	151.0	A	151.0	A	151.0	A	151.0	A
Grove	77.6	A	119.2	A	92.5	A	92.5	A	92.5	A	92.5	A	92.5	A	92.5	A
Fell	83.0	A	77.6	A	74.9	A	107.5	A	74.9	A	107.5	A	107.5	A	107.5	A
Market	102.7	A	85.9	A	85.9	A	85.9	A	85.9	A	85.9	A	85.9	A	85.9	A
East-West Movement (Crossing Van Ness Avenue)																
	Alt. 1		Alt. 2		Alt. 3		Alt. 3B		Alt. 4		Alt. 4B		LPA		LPA Vallejo NB Station Variant	
Inter-section	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS	Circulation Area / Ped (sqft / ped)	Density LOS
Golden Gate	122.3	A	118.3	A	114.0	A	116.4	A	116.4	A	118.3	A	117.7	A	117.7	A
McAllister	117.7	A	137.1	A	123.3	A	123.3	A	125.0	A	125.0	A	122.2	A	122.2	A
Grove	67.4	A	67.9	A	64.5	A	64.5	A	64.5	A	64.5	A	64.3	A	64.3	A
Fell	91.8	A	101.8	A	100.0	A	101.8	A	100.0	A	101.8	A	102.7	A	102.7	A
Market	114.8	A	140.5	A	140.5	A	140.5	A	140.5	A	140.5	A	137.7	A	137.7	A

Source: SFCTA, 2010/2012.

A2.1.8 Vehicle Right Turn Volumes along Van Ness Avenue

Table A14 - Right Turn Volumes along Van Ness Avenue

Intersection @ Van Ness (Except where noted)	Movement (From-To Relative to Intersection)		Right Turn Volumes (All Vehicles)					
			Alt. 1	Alt. 2	Alt. 3A / 4A	Alt. 3B / 4B	LPA	LPA Vallejo Northbound Station Variant
Clay	N-W		61	139	139	140	140	140
Clay	W-S		52	36	42	37	37	37
Sacramento	E-N		120	84	88	83	83	83
Sacramento	N-W		75	92	90	131	131	131
California	E-N		106	83	78	78	78	78
California	N-W		0	67	64	109	109	109
California	W-S		141	110	108	98	98	98
Pine	E-N		183	131	129	122	122	122
Pine	N-W		171	182	168	207	207	207
Bush	W-S		109	78	81	79	79	79
Sutter	E-N		107	76	79	51	51	51
Sutter	N-W		98	75	75	97	97	97
Post	W-S		104	73	75	69	69	69
Geary	E-N		161	118	121	108	108	108
Geary	N-W		215	141	158	150	150	150
O'Farrell	W-S		158	117	116	111	111	111
Ellis	E-N		133	103	102	90	90	90
Ellis	N-W		75	184	197	194	194	194
Eddy	E-N		26	18	20	21	21	21
Eddy	N-W		71	50	53	67	67	67
Eddy	W-S		93	75	75	63	63	63
Turk	E-N		63	50	49	50	50	50
Turk	N-W		45	0	69	72	72	72
Turk	E-NE		0	69	0	0	0	0
Golden	W-S		156	113	112	101	101	101
McAllister	E-N		166	123	124	91	91	91
McAllister	N-W		39	29	29	72	72	72
McAllister	W-S		66	49	51	37	37	37
Grove	E-N		27	22	23	11	11	11
Grove	N-W		37	53	53	123	123	123

Intersection @ Van Ness (Except where noted)	Movement (From-To Relative to Intersection)		Right Turn Volumes (All Vehicles)					
			Alt. 1	Alt. 2	Alt. 3A / 4A	Alt. 3B / 4B	LPA	LPA Vallejo Northbound Station Variant
Grove	W-S		51	38	36	24	24	24
Hayes	E-N		274	208	212	153	153	153
Hayes	N-W		84	79	82	119	119	119
Hayes	W-S		54	42	41	36	36	36
Fell	N-W		48	37	34	38	38	38
Fell	W-S		36	28	29	27	27	27
Market	NE-N		37	27	29	27	27	27
Market	N-SW		149	0	0	171	171	171
Market	S-NE		0	0	0	119	119	119
Market	SW-S		48	34	37	35	35	35
Mission	NE-N		199	104	118	123	123	123
Mission	N-SW		124	108	0	108	108	108
Mission	S-NE		0	0	0	57	57	57
Mission	SW-S		88	84	0	0	0	0
Mission	NW-SW		81	0	0	0	0	0
McCoppin (on Otis)	W-S		100	95	98	97	97	97
McCoppin (on Otis)	NE-W		188	191	184	186	186	186
McCoppin (on Otis)	NW-S		795	812	814	394	394	394
McCoppin (on Otis)	NW-W		69	71	74	74	74	74
Duboce (on Mission)	E-N		0	0	107	111	111	111
Duboce (on Mission)	N-W		245	245	165	121	121	121
Duboce (on Mission)	W-S		37	38	38	39	39	39
Duboce (on Mission)	NE-W		0	0	82	82	82	82

Source: SCTA, 2010/2012.

A3 Bicycle Impacts

A3.1 Bicycle Safety and Comfort (Width of Travel Lane Used by Bicycles)

Table A15 – Width of Travel Lane Used by Bicycles (in SB and NB Directions)

		Alt 1.		Alt. 2*		Alt. 3		Alt. 3B		Alt. 4		Alt. 4B		LPA		LPA Vallejo NB Station Variant	
From	To	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
Mission	Market	11	11	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Market	Fell	11	11	10	10	11	12	11	12	11	11	11	11	11	11	11	11
Fell	Hayes	11	10	10	10	11	10	11	11	11	11	11	11	11	11	11	11
Hayes	Grove	11.5	11.5	10	10	11	10	11	11	11	11	11	11	11	11	11	11
Grove	McAllister	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
McAllister	Golden Gate	11.5	11.5	10	10	11	11	11	11	10	11	11	11	11	11	11	11
Golden Gate	Turk	11.5	11.5	10	10	10	11	11	11	10	10	10	10	11	11	11	11
Turk	Eddy	11.5	11.5	10	10	12	11	12	11	11	11	11	11	11	11	11	11
Eddy	Ellis	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Ellis	O'Farrell	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
O'Farrell	Geary	11.5	11.5	10	10	12	11	12	11	11	11	11	11	11	11	11	11
Geary	Post	11.5	11.5	10	10	11	11	11	11	10	11	10	11	13	11	13	11
Post	Sutter	11.5	11.5	10	10	12	11	12	11	11	11	11	11	11	11	11	11
Sutter	Bush	11.5	11.5	10	10	11	11	11	11	10	11	10	11	11	11	11	11
Bush	Pine	11.5	11.5	10	10	12	11	11	11	10	10	10	10	11	11	11	11
Pine	California	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
California	Sacramento	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Sacramento	Clay	11.5	11.5	10	10	11	11	11	11	11	10	11	10	11	11	11	11
Clay	Washington	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Washington	Jackson	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Jackson	Pacific	11.5	11.5	10	10	11	12	11	12	11	11	11	11	11	11	11	11
Pacific	Broadway	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Broadway	Vallejo	11.5	11.5	10	10	12	11	12	11	11	11	11	11	10	11	10	11
Vallejo	Green	11	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Green	Union	11	11.5	10	10	11	12	11	12	10	10	11	11	11	11	11	11
Union	Filbert	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Filbert	Greenwich	11.5	11.5	10	10	11	11	11	11	11	11	11	11	11	11	11	11
Greenwich	Lombard	11	11.5	10	10	11	11	11	11	11	10.5	11	10.5	11	11	11	11
	Average	***11.4***	***11.4***	***10.0***	***10.0***	***11.1***	***11.0***	***11.1***	***11.1***	***10.8***	***10.8***	***10.9***	***10.9***	***11.0***	***11.0***	***11.0***	***11.0***

Source: SFCTA, 2010/2012.
Note: * Alternative 2 lane width is for the lane adjacent to the BRT lane. Lane width for all other alternatives is the width of the lane adjacent to parking.