SAN FRANCISCO
PLANNING DEPARTMENT

TRANSIT EFFECTIVENESS PROJECT
Final Environmental Impact Report

Volume 4 – Appendices

City and County of San Francisco Planning Department
Case No. 2011.0558E

State Clearinghouse No. 2011112030

Draft EIR Publication Date: July 10, 2013
Draft EIR Public Hearing Date: August 15, 2013
Draft EIR Public Review Period: July 11, 2013 – September 17, 2013
Final EIR Certification Hearing Date: March 27, 2014

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Changes from the DEIR text are indicated by a dot (●) in the left margin.

FINAL ENVIRONMENTAL IMPACT REPORT
TRANSIT EFFECTIVENESS PROJECT
PLANNING DEPARTMENT CASE NO. 2011.0558E

TABLE OF CONTENTS

VOLUME 1A – CHAPTERS 1 to 3

- Supplemental Service Variants for the Transit Effectiveness Project EIR, Memorandum to the San Francisco Planning Commission, March 13, 2014
- Additional Service Variant and Errata for the Transit Effectiveness Project EIR, Memorandum to the San Francisco Planning Commission, March 27, 2014

LIST OF TABLES

Volume 1A

Volume 1B

Volume 2

LIST OF FIGURES

Volume 1A

Volume 1B

Volume 2

VOLUME 3 – RESPONSES TO COMMENTS ATTACHMENTS

VOLUME 4 – APPENDICES

Appendices (included on enclosed CD)

APPENDIX 1
NOTICE OF PREPARATION OF AN EIR
AND
NOTICE OF PUBLIC SCOPING MEETINGS

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Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meetings

Date:	November 9, 2011
Case No.:	**2011.0558E**
Project Title:	**Transit Effectiveness Project**
Zoning:	Citywide – N/A
Block/Lot:	Citywide – N/A
Lot Size:	Citywide – N/A
Project Sponsor:	San Francisco Municipal Transit Agency (SFMTA) Julie Kirschbaum, Program Manager
Lead Agency:	San Francisco Planning Department
Staff Contact:	Debra Dwyer – (415) 575-9031 Debra.Dwyer@sfgov.org

Please be advised this Notice of Preparation of an Environmental Impact Report (NOP) is available to download in English, Spanish and Chinese languages from the following Web page, http://tepeir.sfplanning.org. In order to continue to receive notices related to the environmental review for this project, you must contact the staff person listed above and provide your name and mailing address. To request that a copy of the document be mailed to you in either Spanish or Chinese, please contact (415) 558-6378.

Information about the Transit Effectiveness Project may also be found at SFMTA's Web site at http://sfmta.com/cms.mtep/tep. To review the draft TEP Implementation Strategy, please visit this page: http://www.sfmta.com/cms/mtep/documents/TEP%20Implementation%20Strategy%20Draft,%20April%205,%202011.pdf.

PROJECT OVERVIEW

In an effort to make Muni service more convenient, reliable and attractive to existing and potential customers, the San Francisco Municipal Transportation Agency (SFMTA) and the San Francisco Office of the Controller have launched a detailed analysis of existing travel patterns and a comprehensive review of service options. The resultant Transit Effectiveness Project (TEP) represents the first major evaluation of transit service provision in San Francisco since the late 1970s. Although the TEP is called the Transit Effectiveness Project, the TEP is a program within SFMTA that is comprised of

individual projects or categories of projects proposed for the Muni System. During its initial planning phase, the TEP evaluated all aspects of Muni to develop recommendations that would identify opportunities to improve SFMTA's service delivery, promote on-going SFMTA efforts that are supportive of the TEP goals, realign the agency's capital program to emphasize state of good repair, and identify a set of physical improvements to enhance safety and reliability and to get people to their destinations more quickly. The SMFTA developed a set of preliminary recommendations for the TEP in 2008. These recommendations have since been refined and expanded. Some of the original recommendations for service changes have been implemented to address budget shortfalls, and were analyzed under a separate environmental review. In April 2011, MTA published the TEP Implementation Strategy, which set forth the physical changes that are the focus of the TEP program of projects described more fully below.

ENVIRONMENTAL REVIEW PROCESS

The San Francisco Planning Department serves as the Lead Agency and will prepare an environmental impact report (EIR) to evaluate the environmental effects of the proposed TEP Program. The EIR for the TEP will include program-level analyses, as defined in the California Environmental Quality Act (CEQA) Guidelines, Section 15168, as well as project-level analyses for certain components of the TEP. Therefore, the analysis will address the broad environmental effects of the program as a whole as well as project-level impacts of some of the individual proposals, and overlapping effects and cumulative effects of the program as a whole.

The San Francisco Planning Department is holding two **PUBLIC SCOPING MEETINGS**, at the following location, dates, and times:

> One South Van Ness Avenue, 2nd Floor Atrium (at the corner of Van Ness Avenue and Market Street) on Tuesday and Wednesday, December 6 and 7, 2011, starting at 6:30 PM. Translation services in Spanish and Chinese will be provided at these meetings. American Sign Language interpreters, sound enhancement systems and/or language translators are available upon request by contacting Lulu Hwang at 415-558-6318 at least 72 hours prior to the meeting when the service is needed.

The purpose of these scoping meetings is to assist the San Francisco Planning Department in reviewing the proposed scope and content of the environmental impact analysis, summarized in this Notice of Preparation (NOP), and the information to be contained in the EIR for the TEP. The public will have the opportunity to comment and offer testimony for consideration at these two scoping meetings. Translation services in Spanish and Chinese will be provided at these meetings. Written comment will also be accepted at these public scoping meetings and by the San Francisco Planning Department until 5:00 PM on **December 9, 2011.**

An Initial Study (IS) will be conducted for the proposed projects to focus the environmental topics to be addressed in the draft Environmental Impact Report (DEIR). Upon publication of the IS, there will be a 30-day public review period, during which public comments on the IS will be accepted by the Planning Department. Subsequently, a DEIR will be published, and there will be a 45-day public review period during which public comments on the DEIR will be accepted by the Planning Department. In addition, there will be a hearing on the DEIR before the San Francisco Planning Commission during the DEIR public review period. Following that, the Planning Department will respond to all comments on environmental issues received on the DEIR and prepare a Comments and Responses (C&R) document. Once the C&R document has been issued, the Planning Commission will consider certification of the EIR for the TEP.

PROJECT DESCRIPTION

TRANSIT EFFECTIVENESS PROJECT

The TEP is a program of projects that includes a series of transit service improvements and concurrent necessary transit capital investments designed to improve safety and service reliability and to reduce transit travel time. The TEP is comprised of four components: service policy framework, service improvements, service-related capital projects, and transit travel time reduction proposals, each of which are described in this document.

SERVICE POLICY FRAMEWORK

The TEP proposes a new Service Policy Framework (Policy Framework) to replace existing service standards that traditionally have been published in SFMTA's Short Range Transit Plan. The Policy Framework clarifies how investments should be made

to the Muni system and establishes guidelines for minimum service levels, crowding, stop spacing and service performance. The Policy Framework defines the transit network and organizes Muni services into four distinct service types and levels of transit priority infrastructure:

- **Rapid Network:** These frequent, heavily-used bus routes and rail lines make up the backbone of the Muni system and would be high priorities for service and customer amenity enhancements.
- **Local Network:** These essential bus routes complement and connect to the Rapid Network, allowing customers to get to most destinations in San Francisco with no more than one transfer.
- **Community Connectors:** This category includes lightly-used bus routes that circulate through San Francisco's hillside residential neighborhoods and fill in gaps in coverage to connect customers to key transit hubs.
- **Specialized Services:** These routes are tailored to serve a particular market at limited times of day, and include express routes, commuter connections to BART and Caltrain stations, and ballgame service.

As part of the Policy Framework, stop spacing and frequency guidelines are being evaluated, as are policies relating to transit priority on city streets. TEP policies are being defined in the following key areas:

- Network Definition – whether a route is classified as Rapid, Local, Community Connector or Specialized Services.
- Service Frequency – how frequently the bus arrives by time of day.
- Span of Service – the range of hours over which services are operated, for example, 6 a.m. to 10 p.m.
- Stop Spacing Guidelines – minimum and maximum distance between stops to reflect the block spacing by neighborhood.
- Maximum Loads – the largest number of passengers simultaneously riding a transit vehicle during service.
- Passengers per Revenue Hour – the number of passengers on board per hour of scheduled service.

SERVICE IMPROVEMENTS

A comprehensive evaluation of transit service was performed by SFMTA staff with supportive data analysis and market research to inform decision-making for a network restructuring. Studies were performed on route and line performance, travel time, reliability, and ridership. This information was incorporated with data on existing and future travel patterns within the City and the region and findings on customer preferences and needs to develop a set of transit service improvement proposals. Initial proposals were vetted through dozens of community meetings with critical stakeholders and elected officials. The final proposals reflect this input. Proposed TEP service improvements include:

- Creation of new routes, redesign of routes, or addition of service to new streets.
- Elimination of unproductive existing routes or route segments.
- Vehicle type changes.
- Frequency and span of service changes.
- Changes to mix of local/limited/express service.
- Other changes, such as new express service stops, expansion of limited service on weekends, and expansion of other service on weekends such as the addition of a day of service.

A summary of the proposed TEP service improvements is provided in Table 1, below. No service changes are proposed for Muni lines that are not listed in Table 1. Service on those lines is expected to remain as under existing conditions.

Table 1 - Proposed TEP Service Improvements

Transit Line	New Route	Route Elimination	Change to Route Alignment	Change to Frequency	Change to Vehicle Type	Other Changes*
E Embarcadero	X					
F Market-Wharves				X		
J Church				X		
K-T Ingleside-Third				X		
L Taraval				X		

Transit Line	New Route	Route Elimination	Change to Route Alignment	Change to Frequency	Change to Vehicle Type	Other Changes*
M Oceanview				X		
N Judah				X		
1AX California Express				X		X
1BX California Express				X		X
2 Clement				X		X
3 Jackson		X				
5 Fulton/ 5L Fulton Limited	X			X		X
6 Parnassus			X	X		
8X Bayshore Express (formerly 9X)			X	X		
8AX Bayshore Express (formerly 9BX)				X		
8BX Bayshore Express			X	X		
9 San Bruno				X		
9L San Bruno Limited				X		
10 Townsend			X	X		
11 Downtown Connector	X					
12 Folsom-Pacific		X				
14 Mission					X	
14L Mission Limited				X	X	X
16X Noriega Express			X			
17 Parkmerced			X	X		
18 46th Avenue			X	X		

Transit Line	New Route	Route Elimination	Change to Route Alignment	Change to Frequency	Change to Vehicle Type	Other Changes*
19 Polk			X			
21 Hayes				X		
22 Fillmore			X	X		
23 Monterey			X			
24 Divisadero				X		
27 Folsom			X	X		
28 19th Avenue			X	X		
28L 19th Avenue Limited			X	X		X
29 Sunset			X	X		
30 Stockton				X	X	
30X Marina Express				X		
31 Balboa				X		
31AX Balboa Express						X
31BX Balboa Express						X
32 Roosevelt	X				X	
33 Stanyan			X			
35 Eureka			X	X	X	
36 Teresita			X	X	X	
37 Corbett			X	X	X	
38L Geary Limited				X		X
38AX Geary Express						X
38BX Geary Express						X

Transit Line	New Route	Route Elimination	Change to Route Alignment	Change to Frequency	Change to Vehicle Type	Other Changes*
39 Coit					X	
41 Union				X		
43 Masonic			X	X		
44 O'Shaughnessy				X		
47 Van Ness			X	X		
48 Quintara-24th Street			X	X		
49L Van Ness-Mission Limited				X		X
52 Excelsior			X	X		
54 Felton			X	X		
56 Rutland			X	X	X	
58 24th Street	X					
66 Quintara					X	
71/71L Haight-Noriega				X		X
76 Marin Headlands (Sundays Only)			X	X		X
88 BART Shuttle				X		
91 Owl A			X			
91 Owl B			X			
108 Treasure Island				X		

Note:
* "Other Changes" includes miscellaneous service improvements such as new express service stops, and expanding limited-stop service to Sundays, and the addition of a day of service for a route.

SERVICE-RELATED CAPITAL PROJECTS

While some service improvements can be implemented with relatively little capital investment, other changes require associated infrastructure improvements. Three categories of projects are proposed to support service improvements: overhead wire expansion, transfer and terminal point improvements, and systemwide capital infrastructure. TEP capital projects to support service improvements are shown on Figure 1 on p. 10, and are presented in Table 2 on pp.12-13.

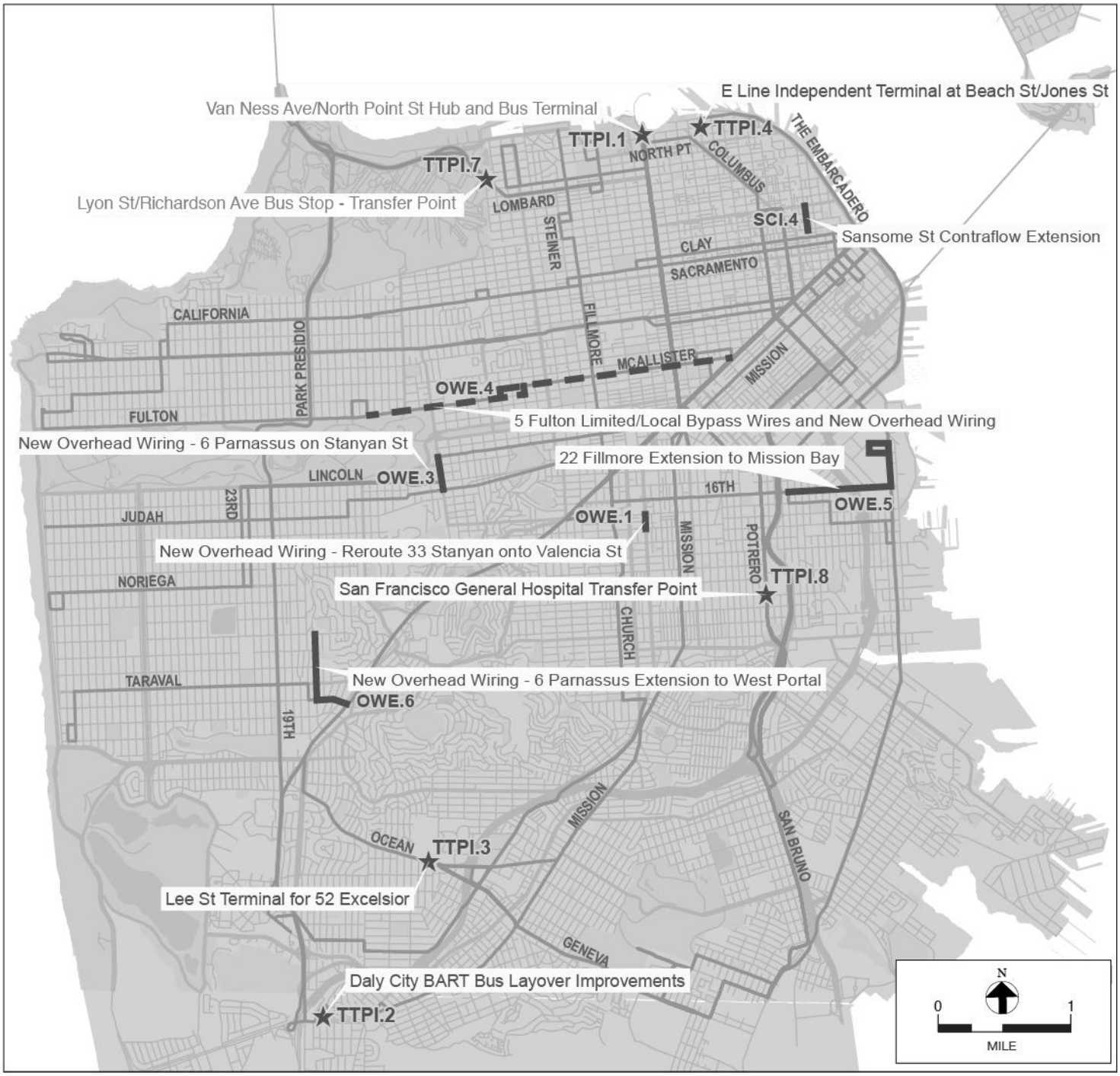
TEP capital projects are split into two categories: project level and program level. The designs for the project-level capital projects have been refined such that they may be presented for public input and analyzed at a project level. Designs of the program-level capital projects are expected to be developed at a later date and would require subsequent environmental review. However, should adequate information for analysis of a program-level capital project become available during this environmental review process, then that capital project may be analyzed at a project level.

Overhead Wire Expansion (OWE)

Overhead Wire Expansion (OWE) would include investments in the overhead wire system that would result in the installation of additional overhead wires for electric trolleys. OWE projects would allow Muni to utilize electric trolleys on additional streets and would allow trolleys to pass one another on existing trolley lines. This would improve service on the system's busiest corridors, increase transit access, and provide more reliable and streamlined service. Additionally, these investments would accommodate planned service improvements and improve terminal operations.

Terminal and Transfer Point Improvements (TTPI)

Terminals and transfer points are stops that accommodate substantial customer interchanges and/or transit vehicle layovers. Some of the TEP route changes would require additional buses to layover and/or customers to transfer at new locations. The TEP proposes six Terminal and Transfer Point Improvements (TTPI). Capital investments associated with TTPI would include new switches and overhead work, expanded areas for bus layovers, on-street parking reconfiguration, and new operator restrooms.



SOURCE: SFMTA, Turnstone Consulting

Legend

TTPI: Terminal and Transfer Point Investments (★)

SCI: Systemwide Capital Improvements (▬)

OWE: Overhead Wire Expansion (▬ *)

*▬ ▬ indicates location to be determined

Muni Rapid Network (▬)

Note: The specific locations for OWE.2 Bypass Wires at Various Terminal Locations and SCI.1 Accessible Rail Platforms are still being considered by SFMTA staff, and cannot be accurately mapped at this time.

TRANSIT EFFECTIVENESS PROJECT

FIGURE 1 - PROPOSED TEP CAPITAL PROJECTS

Systemwide Capital Improvements (SCI)

Systemwide Capital Improvements (SCI) would include new accessible rail platforms to improve system accessibility across the rail network and a "transit-commercial" contraflow[1] lane on Sansome Street to optimize bus routing.

Table 2 - Proposed TEP Capital Projects to Support Service Improvements

TEP Ref #	Project Name	Project Description
OWE.1	New Overhead Wiring – Reroute 33 Stanyan on to Valencia Street	Construct new overhead wire to allow the 33 Stanyan to be rerouted on to Valencia Street between 16th and 18th Streets. This would reduce friction with Mission Street buses to improve the reliability of Mission Street transit services and would improve connections to the 22 Fillmore at the 16th Street BART Station.
OWE.2	Bypass Wires at Various Terminal Locations	Install bypass wires to improve terminal operations where multiple trolley routes share a terminal. This would allow buses to pass each other. These could be located at: Fourth and Townsend Streets, Lyon and Union Streets, and Presidio and Sacramento Streets.
OWE.3	New Overhead Wiring – 6 Parnassus on Stanyan Street	New overhead wires from Haight Street to Parnassus Avenue (0.3 mile) that would allow the 6 Parnassus to operate on the full length of Haight Street. This would increase service on the busiest portion of Haight Street west of Masonic Avenue.
OWE.4	5 Fulton Limited/Local Bypass Wires and New Overhead Wiring	Install bypass wires at strategic locations between Sixth Avenue/Fulton Street and Market Street/McAllister streets, to allow for introduction of a 5L Fulton Limited trolley coach service alongside the 5 Fulton (local) trolley coach service, allowing both services to run concurrently on Fulton Street with electric trolley vehicles. New overhead wires on Fulton Street from Central Avenue to Baker Street and Baker Street from Fulton Street to McAllister Street that would allow the 5 Fulton to avoid congestion and commercial loading on Central Avenue.[2]
OWE.5	22 Fillmore Extension to Mission Bay	New overhead wire on 16th Street between Connecticut Street and Third Street and parts of the UCSF Campus that would provide connections to Mission Bay, including the new UCSF campus and hospital, residential projects, and research facilities. The 33 Stanyan would be re-routed from Potrero Avenue to cover 22 Fillmore service on 18th Street.
OWE.6	New Overhead Wiring – 6 Parnassus Extension to West Portal Station	This project would provide a direct connection for customers on the west side of Twin Peaks and existing customers in the western portions of the Haight and Cole Valley to Muni Metro service at West Portal Station.

[1] In this instance, contraflow refers to the reversal of a lane of traffic from what was previously a one-way street, such that transit and commercial vehicles can now travel both ways on the street. A portion of Sansome Street, from Market Street to Washington Street, currently operates contraflow.

[2] The new overhead wires support TTRP proposal TTRP.5 for the 5 Fulton and 5L.

TEP Ref #	Project Name	Project Description
SCI.1	Accessible Rail Platforms	Build accessible platforms to expand the number of accessible stops along the surface portions of the light rail system. This would allow people with mobility impairments to better utilize the light rail system.
SCI.4	Sansome Street Contraflow Extension	Extend southbound "transit-commercial" contraflow lane north three blocks on Sansome Street to Broadway using paint, signage, and signal modifications from Broadway to Clay Street. This project is related to the 10 Townsend service change.
TTPI.1	Van Ness Avenue & North Point Street Hub & Terminal	Build enhanced terminal facilities to accommodate proposed route changes, including the 11 Downtown Connector, 28L 19th Avenue Limited, 30 Stockton, 47 Van Ness and 49L Van Ness-Mission Limited. Components include street geometry changes to accommodate transit vehicle movements and to provide adequate on-street layover space.
TTPI.2	Daly City BART Bus Layover Improvements	Expand and reconfigure SFMTA stop and bus layover facilities at the Daly City BART Station to accommodate Muni bus layovers.
TTPI.3	Lee Street Terminal for 52 Excelsior	Create on-street terminal space on newly-planned Lee Street near Phelan Avenue, which is needed to accommodate extending the 52 Excelsior to the City College area to improve customer transfers to BART, and provide additional access to City College.
TTPI.4	E Line Independent Terminal at Jones Stret/Beach Street	Create one block of new track and overhead, switches and boarding island to facilitate independent movement of E and F lines at northern terminus.
TTPI.7	Lyon Street/Richardson Avenue Bus Stop – Transfer Point	Improve transfer point at Lyon Street and Richardson Avenue for the SFMTA's 28L 19th Avenue Limited and Golden Gate Transit (GGT) services. This project would replace the transfer currently at the Golden Gate Bridge toll plaza, which the 28L 19th Avenue Limited would no longer serve. 28 19th Avenue (local service) customers would continue to transfer at the Golden Gate Bridge.
TTPI.8	San Francisco General Hospital Transfer Point	Design and implement new transfer hub between 23rd and 24th streets and Potrero Avenue to make transferring between Routes 9/9L San Bruno/Limited, 10 Townsend, 19 Polk, 48 Quintara-24th Street and 58 24th Street more convenient.

TRAVEL TIME REDUCTION PROPOSALS

The Travel Time Reduction Proposals (TTRP) would implement treatments to reduce delays on the Rapid Network and make transit more appealing for customers. The TTRP draw upon a toolkit of treatments described in more detail below that were designed to reduce transit delay. By applying targeted methods customized to each transit corridor, TTRP are forecasted to reduce travel times by 5 to 25 percent, depending on the corridor segment. When combined with other on-going SFMTA programs and policy changes, such as transit signal priority and all-door boarding, the estimated travel time savings are forecasted to range from 10 to 30 percent.

Transit Preferential Streets Toolkit

The SFMTA developed a Transit Preferential Streets (TPS) toolkit of roadway and traffic engineering changes to be applied along transit corridors to reduce transit travel time. Although the treatments or changes in the TPS toolkit are individually utilized by SFMTA as a matter of routine operations, the TTRP projects below apply the TPS toolkit on the Rapid Network corridors to realize transit travel time savings. The proposed TTRP use a mix of the tools based on the needs of the individual corridor to reduce travel time and increase transit service efficiency.

Transit Stop Changes

Transit Stop Changes would include modifying the spacing between adjacent transit stops, changing the location of a stop, converting a flag stop to a bus zone, or modifying the length of a stop to increase maneuvering space for transit vehicles. Increasing the stop spacing between transit stops would reduce the number of times a transit vehicle needs to stop in order to let passengers board and alight, and would thus improve average travel times. The location of a transit stop could be changed, either by swapping its position relative to the traffic signal (i.e., near side or far side of an intersection), or by moving it to a different intersection. Shifting a transit stop to the far side of an intersection can reduce signal delay, and shifting a transit stop to the near side of an intersection can reduce delay from STOP signs (so that transit vehicles do not have to stop twice at an intersection, once at the STOP sign and then again after passing through the intersection). Transit stops may be installed where they do not currently exist to improve service for customers and provide better visibility for transit operators of waiting customers. Extending the length of a transit stop to accommodate longer or multiple transit vehicles improves the ability of transit vehicles to maneuver in and out of stops. Modifications to transit stop zones may result in the removal of on-street parking spaces. Additionally, the type of use allowed at curbs, such as loading or on-street parking, could be altered to reduce conflicts or potential delays near transit zones.

Replacing STOP Signs with Signals or Other Measures

STOP signs require all vehicles to stop at an intersection. Replacing a STOP sign with traffic signals, traffic circles or other measures would eliminate the need for Muni to stop at intersections.

Transit Bulbs and Boarding Islands

Installing a transit bulb is an engineering measure that extends the sidewalk and curb into the street at transit stops so that buses do not have to exit and re-enter their lane of travel after a stop. It also creates more space on the sidewalk for waiting passengers. The insertion of transit bulbs may result in the removal of on-street parking spaces. Similar to transit bulbs, boarding islands provide a dedicated waiting space for customers located between travel lanes. Buses stopping at transit bulbs and boarding islands have reduced dwell delay since the bus does not need to pull into or out of vehicular traffic and waiting customers have a shorter distance to walk to access the vehicle. In addition, transit islands allow buses to avoid delays caused by right-turning cars waiting for pedestrians and parking maneuvers.

Traffic Striping Changes

Dedicated transit-only lanes, turn pockets, and queue jumps are the type of traffic changes that may be considered for reducing transit travel time. These striping changes allow transit vehicles to move around stopped vehicles at intersections or between intersections. Dedicated transit-only lanes provide an exclusive right-of-way for transit vehicles, allowing relatively unfettered travel along a block, unencumbered by general traffic congestion. Turn pockets allow left- or right-turning vehicles at an intersection to queue in a lane separate from the traffic lane used by transit, thus reducing transit delay. Queue-jump configurations provide an additional travel lane restricted to transit vehicles for a short distance on the approach to a signalized intersection. This additional transit-only lane allows transit vehicles to progress to the front of the queue, reducing the delay caused by the signal and improving the operational efficiency of the transit system. The insertion of turn pockets or queue jumps may result in the removal of on-street parking spaces.

Pedestrian Improvements

The TPS toolkit includes treatments to improve pedestrian safety and access to transit such as upgrading crosswalks, constructing pedestrian refuge islands,[3] and constructing pedestrian bulbs at transit zones. In some instances, pedestrian improvements can also improve transit travel times. For example, curb extensions to shorten crossing distances can increase signal time for bus movements. The addition of pedestrian improvements may result in the removal of on-street parking spaces.

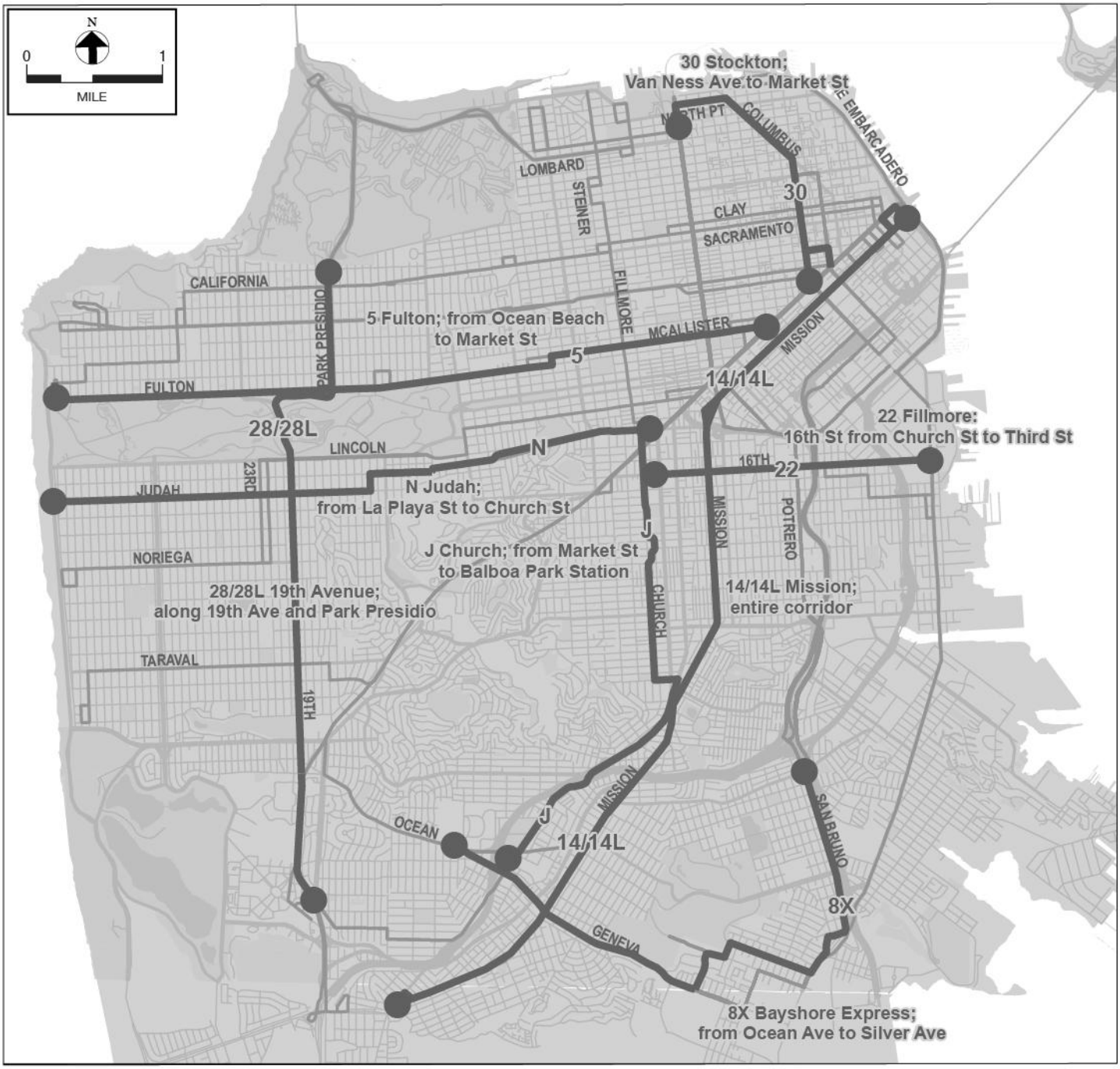
For each of the TTRP corridor segments, general application of traffic engineering changes from the travel time reduction toolkit would be proposed. The combination of tools utilized would be based upon the needs of each individual TTRP project to reduce travel time and increase transit service efficiency.

A range of TTRP treatments is being considered for each corridor segment. The range of TTRP treatments being analyzed would be bracketed by: 1) a moderate set of treatments; and 2) an expanded set of treatments from the Transit Preferential Streets toolkit. The difference between them would be that the expanded alternative may have a greater potential to trigger physical environmental effects such as substantial changes to traffic, bicycle, or pedestrian circulation or similar impacts, whereas the moderate alternative is expected to have fewer physical environmental effects. The TEP public outreach process and further design work would inform the ultimate design of each TTRP corridor segment before implementation.

The selected corridors for the TTRP are split into two categories: project level and program level.[4] The TTRP project- and program-level corridors are shown on Figure 2 on p. 17 and Figure 3 on p. 19, respectively. The designs for the project-level TTRPs have been refined such that they can be presented for public input and analyzed at a project level. Designs of the program-level TTRP proposals are expected to be developed at a later date and would require subsequent environmental review.

[3] A refuge island, or pedestrian island, is a section of raised pavement or sidewalk that is completely surrounded by asphalt to provide pedestrians a safe place to stop before finishing crossing a roadway.

[4] Some routes or route segments were excluded from the TTRP because these projects, such as the Geary and Van Ness Bus Rapid Transit (BRT), Central Subway, and the Better Market Street projects, are already underway and have or are receiving independent environmental clearance.



SOURCE: SFMTA, Turnstone Consulting

Legend

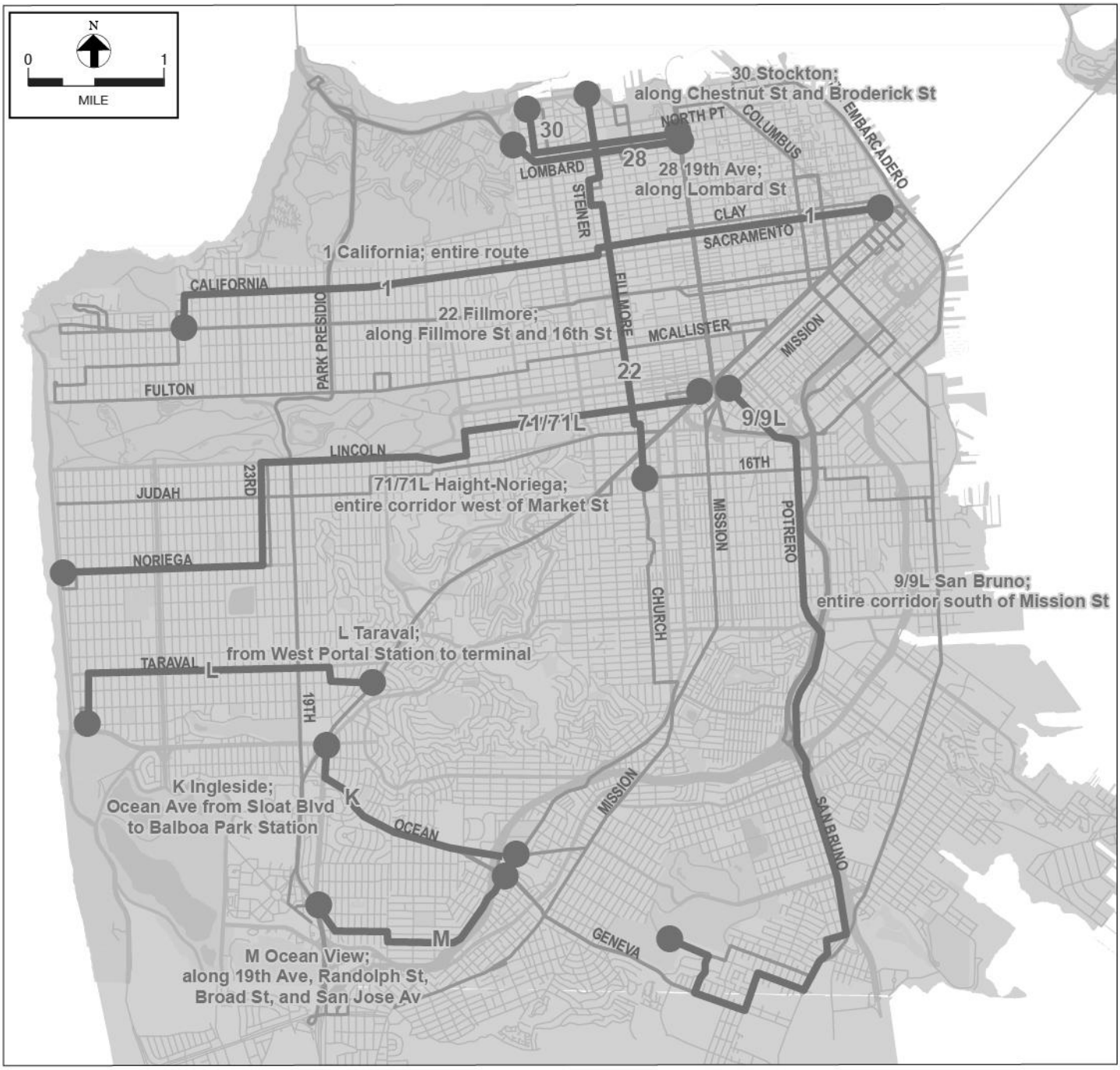
TTRP: Travel Time Reduction Proposals

Proposed Segments (▬)

Segment Endpoints (●)

Muni Rapid Network (▬)

FIGURE 2 - TEP PROJECT-LEVEL TTRP CORRIDORS



SOURCE: SFMTA, Turnstone Consulting

Legend

TTRP: Travel Time Reduction Proposals

Proposed Segments (▬)

Segment Endpoints (●)

Muni Rapid Network (———)

TRANSIT EFFECTIVENESS PROJECT

FIGURE 3 - TEP PROGRAM-LEVEL TTRP CORRIDORS

However, should adequate information for analysis of a program-level TTRP become available during this environmental review process, then that TTRP proposal may be analyzed at a project level.

Summary descriptions of the TTRP proposals are provided in Table 3, below, and Table 4, on p. 23.

Table 3 – TEP TTRP Project-level Proposals

Project Name (Affected Routes)	Project Description
TTRP.5: 5 Fulton – Market Street to Ocean Beach (5 Fulton)	La Playa Street from Cabrillo Street to Fulton Street, Fulton Street from La Playa Street to Central Avenue or Baker Street, Central Avenue from Fulton Street to McAllister Street, Baker Street from Fulton Street to McAllister Street, and McAllister Street from Central Avenue to Market Street.
TTRP.8X: 8X Bayshore Express – Silver Avenue to City College (8X/AX/BX Bayshore Express, 9 San Bruno, 9L San Bruno Limited)	Geneva Avenue from Ocean Avenue to Santos Street, Santos Street from Geneva Avenue to Sunnydale Avenue, Sunnydale Avenue from Santos Street to Hahn Street, Hahn Street from Sunnydale Avenue to Visitacion Avenue, Visitacion Avenue from Hahn Street to Bayshore Boulevard, Bayshore Boulevard from Visitacion Avenue to Arleta Avenue, San Bruno Avenue from Arleta Avenue to Silver Avenue, and Silver Avenue from San Bruno Avenue to Bayshore Boulevard. Bicycle lanes on Geneva Avenue would be included as part of this proposal.
TTRP.14: 14 Mission (14 Mission, 14L Mission Limited, 49 Van Ness-Mission)	Main Street from Mission Street to Market Street, Market Street from Main Street to Steuart Street, Steuart Street from Market Street to Mission Street, Mission Street from Steuart Street to San Jose Avenue in Daly City, and Otis Street from South Van Ness Avenue to 13th Street.
TTRP.22_1: 22 Fillmore – 16th Street (22 Fillmore)	16th Street from Church Street to Third Street. Bicycle lanes on 17th Street between Kansas and Mississippi Streets would be included as part of this proposal.
TTRP.28_1: 28 19th Ave – Richmond to Parkmerced (28 19th Avenue and 28L 19th Avenue Limited, M Ocean View)	Park Presidio Boulevard from Lake Street to Fulton Street, Park Presidio Bypass from Fulton Street to Crossover Drive, Crossover Drive from Park Presidio Bypass to Lincoln Way, and 19th Avenue from Lincoln Way to Junipero Serra Boulevard.
TTRP.30_1: 30 Stockton – Van Ness Avenue to Market Street (8X Bayshore Express, 30 Stockton, and 45 Union-Stockton)	Van Ness Avenue from Chestnut Street to North Point Street, North Point Street from Van Ness Avenue to Columbus Avenue, Columbus Avenue from North Point Street to Stockton Street, Stockton Street from Columbus Avenue to Market Street, Sutter Street from Stockton Street to Kearny Street, and Kearny Street from Sutter Street to Market Street.
TTRP.J: J Church –Church Street/Duboce Avenue intersection to Balboa Park (J Church)	Church Street from Duboce Avenue to 30th Street, 30th Street from Church Street to San Jose Avenue, and San Jose Avenue from 30th Street to Balboa Park Station.
TTRP.N: N Judah – Church Street/Duboce Avenue intersection to Ocean Beach (N Judah)	Judah Street from La Playa Street to Ninth Avenue, Ninth Avenue from Judah Street to Irving Street, Irving Street from Ninth Avenue to Arguello Boulevard, Carl Street from Arguello Boulevard to Clayton Street, and Duboce Avenue from Scott Street to Church Street.

Table 4 – TEP TTRP Program-level Proposals

Project Name (Affected Routes)	Project Description
TTRP.1: 1 California (1 California)	32nd Avenue from California Street to Geary Boulevard, Geary Boulevard from 32nd Avenue to 33rd Avenue, 33rd Avenue from Geary Boulevard to Clement Street, Clement Street from 33rd Avenue to 32nd Avenue, California Street from 32nd Avenue to Steiner St, Steiner Street from California Street to Sacramento Street, Sacramento Street from Steiner Street to Drumm Street, Gough Street from California Street to Clay Street, and Clay Street from Gough Street to Drumm Street.
TTRP.9: 9_1 San Bruno – Market Street to Silver Avenue (9 San Bruno, and 9L San Bruno Limited)	11th Street from Mission Street to Bryant Street, Division Street from Bryant Street to Potrero Avenue, Potrero Avenue from Division Street to Bayshore Boulevard, and Bayshore Boulevard from Jerrold Avenue to Silver Avenue.
TTRP.9: 9_2 San Bruno – Visitacion Avenue to Sunnydale Avenue (9 San Bruno, and 9L San Bruno Limited)	Bayshore Boulevard from Visitacion Avenue to Sunnydale Avenue, Sunnydale Avenue from Bayshore Boulevard to Schwerin Street, Schwerin Street from Sunnydale Avenue to Geneva Avenue, Geneva Avenue from Schwerin Street to Santos Street, Santos Street from Geneva Avenue to Sunnydale Avenue, and Sunnydale Avenue from Santos Street to 2055 Sunnydale Avenue.
TTRP.22_2: 22 Fillmore – Fillmore Street (22 Fillmore)	Fillmore Street from Marina Boulevard to Hermann Street, Hermann Street from Fillmore Street to Church Street, and Church Street from Hermann Street to 16th Street.
TTRP.28_2: 28 19th Ave – Lombard Street (28 19th Avenue)	Richardson Avenue from Lyon Street to Broderick Street, and Lombard Street from Broderick Street to Van Ness Avenue.
TTRP.30_2: 30 Stockton – Chestnut Street (30 Stockton and 30X Marina Express)	Broderick Street from Chestnut Street to Jefferson Street, Jefferson Street from Broderick Street to Divisadero Street, Divisadero Street from Jefferson Street to Chestnut Street, and Chestnut Street from Van Ness Avenue to Broderick Street.
TTRP.71: 71 Haight-Noriega – Great Highway to Market Street (6 Parnassus, 71 Haight-Noriega, 71L Haight-Noriega Limited)	Lower Great Highway from Noriega Street to Ortega Street, Ortega Street from 48th Avenue to 47th Avenue, 47th Avenue from Ortega Street to Noriega Street, Noriega Street from 48th Avenue to 22nd Avenue, 23rd Avenue from Noriega Street to Lincoln Way, 22nd Avenue from Noriega Street to Lincoln Way, Lincoln Way from 23rd Avenue to Arguello Boulevard, Frederick Street from Arguello Boulevard to Stanyan Street, Stanyan Street from Frederick Street to Haight Street, and Haight Street from Stanyan Street to Market Street
TTRP.K: K Ingleside – Ocean Avenue (K Ingleside)	Ocean Avenue from Junipero Serra Boulevard to San Jose Avenue.
TTRP.L: L Taraval – SF Zoo to West Portal Station (L Taraval)	47th Avenue from Vicente Street to Wawona Street, Wawona Street from 47th Avenue to 46th Avenue, Vicente Street from 47th Avenue to 46th Avenue, 46th Avenue from Wawona Street to Taraval Street, Taraval Street from 46th Avenue to 15th Avenue, 15th Avenue from Taraval Street to Ulloa Street, and Ulloa Street from 15th Avenue to West Portal Station.
TTRP.M: M Ocean View – West Portal Station to Balboa Park Station (M Ocean View)	19th Avenue from Junipero Serra Boulevard to Randolph Street, Randolph Street from 19th Avenue to Orizaba Avenue, Orizaba Avenue from Randolph Street to Broad Street, Broad Street from Orizaba Avenue to San Jose Avenue, and San Jose Avenue from Broad Street to Geneva Avenue.

APPROVALS REQUIRED

It is anticipated that the proposed TEP program of projects may require the following actions under existing regulations and ordinances, although approvals may vary depending on the specific project being considered:

Actions by the San Francisco Municipal Transportation Agency Board of Directors

- Approval of the Transit Effectiveness Project and approval to implement changes to each transit line and related construction.

Actions by the San Francisco Board of Supervisors

- May consider and reject route abandonments.

PROJECT SCHEDULE

It is anticipated that implementation of the TTRP would be phased between FY 2014 and FY2019, subject to funding availability. The service improvements are proposed to be implemented in two phases, pending resource availability in fiscal year (FY) 2014 and FY 2016. Overhead wire expansion would occur throughout the TEP implementation timeframe. TTPI are proposed to occur before FY 2016. Systemwide capital improvements would occur between FY 2014 and FY 2015.

POTENTIAL ENVIRONMENTAL ISSUES

The TEP program of projects could result in potentially significant environmental effects. An Initial Study will be prepared pursuant to *CEQA Guidelines* Section 15063 to identify any environmental effects determined not to be significant and to focus preparation of an EIR on those topics determined to be potentially significant. As required by CEQA, the EIR will examine those effects, identify mitigation measures, and analyze whether identified mitigation measures would reduce the environmental effect to a less-than-significant level. The EIR will include an analysis of alternatives to the program of projects, including a No Project Alternative.

CEQA allows different portions of a phased project, such as the TEP, to be analyzed at either a program level or a project level, depending on the extent of details that are known about a particular portion or phase of a project at the time the environmental

review is conducted. A program-level analysis is useful in certain cases, because it provides the opportunity to evaluate the overall impacts of a proposed project, program, or plan for an area larger than is generally practical or appropriate for an individual site-specific project. It allows an agency to consider policy implications of area-wide mitigation measures earlier than with specific development proposals and provides an analysis of cumulative impacts on an area-wide basis. Portions of a proposed project for which detailed development plans are available at the time environmental review is prepared are analyzed at the project level whereas portions of a project for which less detail is known at the time the environmental review documents are prepared may be analyzed at the program level. For program-level components, further environmental review may be required at a later time when more refined information becomes available.

The service policy framework will be analyzed at a program level as a policy document that would guide the implementation and operation of the TEP program of projects. Enough detail is known regarding the TEP service improvements such that they will be evaluated at a project level for the purposes of CEQA. For some of the capital projects and TTRP proposals, design details have been developed and refined such that they will be analyzed a project level. However, the remaining capital projects and TTRP proposals will be reviewed at a program level. Subsequent project-level environmental review would be required for those capital projects and TTRP proposals once further design development and refinement occur and the designs have been finalized.

The comments received during the public scoping process will be considered during preparation of the Initial Study and EIR. Analyses will include evaluation of environmental impacts related to land use and land use planning, aesthetics, population and housing, cultural and paleontological resources, transportation and circulation, noise, air quality, greenhouse gas emissions, wind and shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral and energy resources, and agricultural and forest resources. The environmental issues to be addressed are described briefly below.

LAND USE AND LAND USE PLANNING

The topic of Land Use and Land Use Planning will describe overall existing land uses and the potential land use conflicts and impacts to land use character in the vicinity of the proposed projects.

AESTHETICS

The topic of Aesthetics will include analysis of the proposed projects' potential impacts on existing scenic vistas and resources, public views, existing visual character or quality, as well as potential adverse effects from light and glare.

POPULATION AND HOUSING

The topic of Population and Housing will include analysis of the proposed projects' potential impacts related to population, employment, and housing.

CULTURAL AND PALEONTOLOGICAL RESOURCES

The topic of Cultural and Paleontological Resources will include analysis of the proposed projects' potential impacts on historic architectural resources and other off-site historic architectural resources. In addition, this topic will include evaluation of potential impacts to both prehistoric and historic archaeological and paleontological resources as a result of proposed construction activities.

TRANSPORTATION AND CIRCULATION

The topic of Transportation and Circulation will include analysis of the proposed projects' potential impacts on public transit, circulation, and intersection operations, and will qualitatively analyze impacts on pedestrian and bicycle conditions, emergency vehicle access and on-street loading. The EIR will also discuss short-term, construction-related transportation impacts. The City and County of San Francisco does not consider parking supply as part of the permanent physical environment and, therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. However, any secondary environmental effects of the proposed projects related to parking will be included in the analysis. For informational purposes, the EIR will present a parking analysis to inform the public and the decision-makers of

any changes to parking conditions that could occur as a result of implementing the proposed projects.

NOISE

The topic of Noise will include analysis of noise compatibility standards for land uses, and discuss both the long-term operational impacts of noise and groundborne vibration based on typical Muni vehicle types, and short-term construction-related noise impacts on nearby receptors.

AIR QUALITY

The topic of Air Quality will include analysis of consistency with applicable air quality plans and standards, identification of elements of the proposed projects that could have potential air quality impacts, and evaluation of these impacts during construction and operations in accordance with current Bay Area Air Quality Management District CEQA Air Quality Guidelines.

GREENHOUSE GAS EMISSIONS

The topic of Greenhouse Gas Emissions will include analysis of the proposed projects' compliance with the City's Greenhouse Gas Reduction Strategy to determine impacts related to greenhouse gas emissions.

WIND AND SHADOW

The topic of Wind and Shadow will include evaluation of potential wind and shadow impacts on nearby sidewalks, parks, and open spaces, including those that are privately owned but publicly accessible, those under the jurisdiction of the Recreation and Park Commission, and those owned by other public agencies.

RECREATION

The topic of Recreation will include analysis of whether existing parks and open space would be affected by the proposed projects.

UTILITIES AND SERVICE SYSTEMS

The topic of Utilities and Service Systems will include analysis of the adequacy of water and sewer infrastructure to provide both potable water and sewage treatment, and will discuss disposal of solid waste that may be generated by the proposed projects. This topic will also include an assessment of whether the proposed program of projects would require the construction of new water, wastewater treatment, and/or stormwater drainage facilities, and if so, whether that construction could cause adverse environmental effects.

PUBLIC SERVICES

The topic of Public Services will include analysis of whether existing public services (e.g. schools, police and fire protection, etc.) would be affected by the proposed projects. The analysis will determine whether project implementation would result in an inability of service providers to maintain adequate levels of service (e.g. fire and police department response times), and/or in a need for new or expanded facilities, thereby resulting in significant environmental impacts related to public services.

BIOLOGICAL RESOURCES

The topic of Biological Resources will include analysis of any substantial adverse effect on important biological resources or habitats, such as trees or the movement of any native resident or migratory bird species. This topic will also include evaluation of whether the proposed projects would conflict with any local policies or regional, state or federal conservation plans.

GEOLOGY AND SOILS

The topic of Geology and Soils will include discussion regarding the geotechnical feasibility and any other geotechnical considerations related to implementation of the proposed projects. Potential substantial adverse effects from rupture of a known earthquake fault, strong seismic groundshaking, seismic-related ground failure or landslides, soil erosion, soil stability, and risks to life or property related to the proposed projects will also be discussed.

HYDROLOGY AND WATER QUALITY

Physical improvements included in the proposed projects may require excavation and disturbance of soils within areas draining to the combined sewer system or areas draining to the few separated storm sewer systems in the City. Procedures for addressing potential erosion and impacts on stormwater runoff in both types of areas will be described.

HAZARDS AND HAZARDOUS MATERIALS

The potential to encounter hazardous materials in soils or groundwater during construction of proposed improvements, including lead and other metals and petroleum hydrocarbons, is present along most roadways in the City. Some features in the proposed projects would require excavation and soil management and the potential effects of such activities will be discussed.

MINERAL AND ENERGY RESOURCES

The topic of Mineral and Energy Resources will include analysis of potential projects' impacts on existing mineral and energy resources.

AGRICULTURAL AND FOREST RESOURCES

The topic of Agricultural and Forest Resources will include analysis of potential projects' impacts on existing agricultural and forest resources on sites adjacent to capital project or Muni routes and corridors proposed to be changed.

OTHER ISSUES

Other topics required by CEQA, including growth-inducing impacts; significant unavoidable impacts, significant irreversible impacts; any known controversy associated with environmental effects, mitigation, or alternatives; and issues to be resolved by the decision-makers, will also be evaluated.

FINDING

This TEP program of projects may have a significant effect on the environment, and an Environmental Impact Report is required. This determination is based upon the criteria of the State *CEQA Guidelines*, Section15064 (Determining Significant Effect), and 15065 (Mandatory Findings of Significance). The purpose of the EIR is to provide information about potential significant physical environmental effects of the proposed projects, to identify possible ways to minimize the significant effects, and to describe and analyze possible alternatives to the TEP Program Preparation of an NOP and an EIR does not indicate a decision by the City to approve or disapprove the proposed projects. Prior to making any such decision, the decision-makers must review and consider the information contained in the EIR.

PUBLIC SCOPING PROCESS

Two public scoping meetings will be held to solicit input regarding the scope of the environmental analysis for the TEP program of projects. The scoping meetings will occur on Tuesday, December 6, 2011, and Wednesday, December 7, 2011 starting at 6:30 pm at the following location: One South Van Ness Avenue, 2nd Floor Atrium (corner of Market Street and South Van Ness Avenue). Translation services in Chinese and Spanish will be provided at these two meetings. American Sign Language interpreters, sound enhancement systems and/or language translators are available upon request by contacting Lulu Hwang at 415-558-6318 at least 72 hours prior to the meeting when the service is needed.

Written comments regarding the scope of the environmental analysis will be accepted at the San Francisco Planning Department until 5:00 p.m. on December 9, 2011. Written comments should be sent to Bill Wycko, Environmental Review Officer, San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA 94103. If you work for a Responsible Agency, we need to know the views of your agency regarding the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR when considering a permit or other approval for this project. Please include the name of a contact person in your agency.

November 7, 2011
Date

Bill Wycko
Environmental Review Officer

APPENDIX 2
INITIAL STUDY AND SERVICE IMPROVEMENT MAPS

SAN FRANCISCO
PLANNING DEPARTMENT

TRANSIT EFFECTIVENESS PROJECT
INITIAL STUDY

City and County of San Francisco Planning Department
Case No. 2011.0558E

State Clearinghouse No. 2011112030

Initial Study Publication Date: January 23, 2013

Initial Study Public Comment Period: January 24, 2013 through February 22, 2013

Written comments should be sent to:

Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

SAN FRANCISCO
PLANNING DEPARTMENT

Notice of Availability of an Initial Study

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Date:	January 23, 2013
Case No.:	2011.0558E
Project Title:	Transit Effectiveness Project
State Clearinghouse No.	2011112030
Zoning:	Various
Block/Lot:	Citywide
Project Sponsor:	Sean Kennedy, San Francisco Municipal Transportation Agency (SFMTA) 415-701-4717, Sean.Kennedy@sfmta.com
Lead Agency:	San Francisco Planning Department
Staff Contact:	Debra Dwyer – (415) 575-9031, Debra.Dwyer@sfgov.org

This notice is to inform you of the availability of the Initial Study for the Transit Effectiveness Project (TEP). The Planning Department previously determined that the proposed project could have a significant impact on the environment and required that an Environmental Impact Report (EIR) be prepared. An Initial Study has now been prepared to provide more detailed information regarding the impacts of the proposed project and to identify the environmental issues to be considered in the Draft EIR. The Initial Study is either attached or is available upon request from **Debra Dwyer**, by phone at **(415) 575-9031**, by email at **Debra.Dwyer@sfgov.org**, or at the above address. The Initial Study may also be viewed on-line at **http://tepeir.sfplanning.org.** Referenced materials are available for review at the Planning Department's office at 1650 Mission Street, Suite 400, San Francisco, California.

PROJECT DESCRIPTION

The San Francisco Municipal Transportation Agency (SFMTA), in partnership with the San Francisco Office of the Controller, is proposing to implement the Transit Effectiveness Project (TEP) which represents the first holistic review of the Muni network and service delivery since the 1970s. The TEP objectives are to reduce transit travel time and improve transit customer experiences, service reliability, and transit service effectiveness and efficiency. The SFMTA has developed the Service Policy Framework which sets forth transit service delivery objectives and actions to meet them and supports the SFMTA Strategic Plan goals. Implementation of the TEP would be guided by the Service Policy Framework which would help determine how investments should be made to the system. The TEP includes Service Improvements, Service-related Capital Improvements, and transit Travel Time Reduction Proposals (TTRPs).

Service Improvements include the creation of new routes, the change in the alignment of some existing routes, the elimination of underused routes or route segments, the change to headways and hours of service, and the change to the mix of local/limited/express service on several routes. The proposed Service Improvements are based on a comprehensive evaluation of the overall transit network and public input from community meetings. Some of the Service Improvements would be supported by Service-related Capital Improvements.

Service-related Capital Improvements would include the following: a) Transfer and Terminal Point Improvements (TTPIs), which include the installation of overhead wiring and poles; new switches; bypass rails; and/or transit bulbs; the expansion of transit zones; and the modification of sidewalks at stops to accommodate substantial passenger interchanges and/or that provide transit vehicle layovers; b) Overhead Wire Expansion (OWE) capital improvements support service route changes for electric trolley routes and provide bypass wires to allow trolley coaches to pass one another on existing routes. c) Systemwide Capital Infrastructure (SCI) projects include the installation of new accessible platforms to improve system accessibility across the light rail network and extension of an existing "transit-commercial" contraflow lane on Sansome Street from Washington Street to Broadway.

The TTRPs would implement roadway and transit stop changes to reduce delays on the most heavily used routes that make up the backbone of the Muni system, which is referred to as the Rapid Network. The SFMTA has identified a set of 18 standard roadway and traffic engineering elements that can be used to reduce transit travel time along a transit corridor. These elements include adding transit bulbs/boarding islands; transit stop changes including moving, adding, or eliminating stops; the addition of turn lanes, turn restrictions, and transit-only lanes; pedestrian improvements such as curb extensions and other crosswalk treatments; and the removal of stop signs and installation of traffic signals or other traffic calming measures at intersections. Collectively, these tools or elements are called the Transit Preferential Streets Toolkit (TPS Toolkit). The TPS Toolkit elements are proposed to be applied to 17 transit corridors with proposed TTRPs.

A Notice of Preparation of an EIR and Public Scoping Meetings was issued on November 9, 2011, and two public scoping meetings were held on December 6 and 7, 2011. The Planning Department has determined that preparation of an Initial Study would be appropriate to focus the scope of the EIR. Preparation of an Initial Study or EIR does not indicate a decision by the City to approve or disapprove the project.

Further comments concerning the scope of the EIR are welcomed, based on the content of the Initial Study. In order for your concerns to be considered fully, please submit your comments by 5 p.m. on February 22, 2013. Please send written comments on the information and anlasis presented in the Initial Study to Bill Wycko, Environmental Review Officer, San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103 or Debra.Dwyer@sfgov.org.

If you work for a Responsible or Trustee Agency, we need to hear from you if you have any comments on the Initial Study, particularly any information that is relevant to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR when considering a permit or other approval for this project. We will also need the name of the contact person for your agency. If you have questions concerning environmental review of the proposed project, please contact Debra Dwyer at (415) 575-9031 or Debra.Dwyer@sfgov.org.

INITIAL STUDY
TRANSIT EFFECTIVENESS PROJECT
PLANNING DEPARTMENT CASE NO. 2011.0558E

LIST OF TABLES

LIST OF FIGURES

List of Acronyms and Abbreviations

Acronym or Abbreviation	Definition
ADRP	archeological data recovery plan
AMP	Archeological monitoring program
AQTR	Air Quality Technical Report
ARB	California Air Resources Board
B20	20 percent biodiesel blend
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BCDC	Bay Conservation and Development Commission
bgs	below ground surface
BMPs	Best Management Practices
BRT	Bus Rapid Transit
Caltrans	California Department of Transportation
CAS	Climate Action Strategies
CFG Code	California Fish and Game Code
CEQA	California Environmental Quality Act
CH4	methane
CCSF	City College of San Francisco
CO2	carbon dioxide
CO2E	carbon dioxide-equivalent measures
CRHR	California Register of Historical Resources
CSO	combined sewer overflow
CTCDC	California Traffic Control Devices Committee
CUPA	Certified Unified Program Agency
DPH	San Francisco Department of Public Health
DPW	San Francisco Department of Public Works
DTSC	California Department of Toxic Substances Control
ERO	Environmental Review Officer
FARR	Final Archeological Resources Report

Acronym or Abbreviation	Definition
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps
FY	fiscal year
GHGs	greenhouse gases
HRER	Historic Resource Evaluation Response
LID	low-impact design
LRV	light rail vehicle
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendant
MMTCO2E	million metric tons of CO2E
MSDS	Materials Safety Data Sheet
Muni	San Francisco Municipal Railway
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NOP	Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping
NPDES	National Pollution Discharge Elimination System
NRHP	National Register of Historic Places
NWIC	California Archaeological Site Survey Northwest Information Center
OHP	Office of Historic Preservation
OPR	Office of Planning and Research
OWE	Overhead Wire Expansion
PAR	Preliminary Archaeological Review Checklist
PDF	Portable Document Format
PDR	paleontological discovery report
POP	Proof of Payment Group in the Security Operations Unit of SFMTA

Acronym or Abbreviation	Definition
PRMMP	Paleontological Resources Monitoring and Mitigation Program
RPD	San Francisco Recreation and Park Department
RTPs	regional transportation plans
SCI	Systemwide Capital Infrastructure
SEIR	Subsequent Environmental Impact Report
SFFD	San Francisco Fire Department
SFHA	Special Flood Hazard Area
SFMTA	San Francisco Municipal Transportation Agency
SFPD	San Francisco Police Department
SFPUC	San Francisco Public Utilities Commission
SFUSD	San Francisco Unified School District
SoMa	South of Market Area
TDM	Travel Demand Management
TEP	Transit Effectiveness Project
TIS	Transportation Impact Study
TPS	Transit Preferential Streets
TSP	Transit Signal Priority
TTPI	Terminal and Transfer Point Improvements
TTRP	Travel Time Reduction Proposals
UCSF	University of California, San Francisco
UST	Underground storage tank

GLOSSARY

Term	Definition
Alignment	The ground plan of a roadway, rail line, transit route, or other facility, showing the alignment or direction as distinguished from a profile, which shows the vertical element.
All Way Stop	An intersection for which every approach is controlled by stop signs.
All-door boarding	When passenger boarding is permitted at multiple doors and not just the front door of the transit vehicle.
a.m. peak	The morning commute period in which the greatest movement of passengers occurs, generally from home to work or school; the portion of the morning service period where the greatest level of ridership is experienced and service provided, generally between 7 a.m. and 9 a.m.
Biodiesel fuel	Biodiesel refers to a vegetable oil- or animal fat-based diesel fuel. Biodiesel is typically made by chemically reacting lipids (e.g., vegetable oil, animal fat (tallow) with an alcohol producing fatty acid esters. Biodiesel is meant to be used in standard diesel engines and is thus distinct from the vegetable and waste oils used to fuel *converted* diesel engines. Biodiesel can be used alone, or blended with petrodiesel.
Boarding and alighting	To get on and off a transit vehicle.
Bypass lane	A lane that allows transit vehicles to bypass general traffic congestion approaching an intersection. Applications at signalized intersections may include an exclusive traffic signal phase to allow transit vehicles to move through the intersection ahead of general traffic. See also “queue jump.”
Bypass wires	Overhead wires used by a trolley coach to bypass a second trolley coach.

Term	Definition
California Traffic Control Devices Committee (CTCDC)	This committee advises the California Department of Transportation (Caltrans) about standards and polices for official traffic control devices in California. Through this committee, Caltrans fulfills its obligation to consult with local agencies and the public, before adopting rules and regulations prescribing uniform standards and specifications for all official traffic control devices used in California.
Capital improvement project	A project that requires changes to physical infrastructure.
Capital infrastructure	Physical structures or devices that provide long-term support to the operation of transit service.
Capital investment	One-time change to physical infrastructure for improvement, either to replace worn out infrastructure or to add new infrastructure. Contrasts with operating investments and expenses, which are on-going.
Center lane	A travel lane located in the middle of the roadway, beyond the curb lane and, in roadways with two or more travel lanes in each direction, the innermost lane.
Community Connector Van Service	Community Connector service provided by smaller vehicles such as vans or shuttle buses.
Community Connectors	Low-ridership bus routes that circulate through San Francisco's hillside residential neighborhoods and fill in gaps in coverage to connect customers to the core network.
Contraflow lane	A lane in which restricted traffic flows in the opposite direction of the adjacent lanes, limited to certain vehicle types such as transit or carpool vehicles.
Corridor	A broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of parallel streets and highways and many transit lines and routes.
Couplet	A pair of parallel streets that operate one-way in opposite directions.

Term	Definition
Crosswalk	Legally designated location for pedestrians to cross from one side of a roadway to the other. Present at all intersections that intersect at approximately right angles; may be marked or unmarked.
Curb cut	Location where the sidewalk curb is depressed to the level of the roadway for a curb ramp, driveway, or other feature.
Curb lane	The lane of traffic closest to the curb, which may or may not have parking adjacent to it. (Opposite of center lane).
Curb ramp	Location where the curb is depressed to the level of the roadway to provide a flush transition from the sidewalk to the roadway to enable accessible street crossing or movement.
Curbside	The side nearest to the curb; in a divided 4-lane road, the curbside lane is the right lane.
Customer	A person who rides a transportation vehicle, excluding the driver.
Dedicated turn lane	A lane from which a vehicle is required to turn left or right.
Diesel hybrid-electric motor coaches	Diesel hybrid-electric buses or motor coaches are electric buses that get their electricity from a small diesel engine. The diesel engine powers a generator that, together with traction batteries that store the energy, supplies the necessary electrical energy to move the bus through the streets of San Francisco. A diesel hybrid-electric bus can also recover and store braking energy. This increases the vehicle's fuel economy and brake life.
Duct bank	A conduit, typically installed underground, used to run power supply and other wired infrastructure from one point to another.
Dwell time	The time when a bus is stopped to load and unload customers at a transit zone.

Term	Definition
Expanded alternative	The Expanded Alternative for the TTRP corridors employs TPS Toolkit elements that may have a greater potential to trigger additional physical environmental effects, such as substantial changes to traffic, bicycle, or pedestrian circulation or similar impacts, whereas the Moderate Alternative is expected to have fewer physical environmental effects due to the nature of the TPS Toolkit elements chosen for each TTRP corridor.
Express service	Service operated non-stop over a portion of an arterial in conjunction with other local services. The need for such service arises where customer demand between points on a corridor is high enough to separate demand and support dedicated express trips.
Farside of intersection	The second or furthest side of the intersection encountered when passing through. Contrasts with nearside of intersection.
Flag stop	A transit stop where the bus or LRV stops within a traffic lane without a designated curbside transit zone, often adjacent to parked vehicles. Often marked with a sign or painted marking noting the transit route.
Frequency of service	The amount of time scheduled between consecutive buses or trains on a given route segment; in other words, how often the bus or train comes (also known as Headway)
Headway	The scheduled time interval between any two revenue transit vehicles operating in the same direction on a route.
Implementation schedule	The planned dates and durations of time during which the proposed project would be carried out.
Inbound direction	Unless otherwise defined, inbound means headed toward Embarcadero Station or Downtown. It is the opposite of outbound direction. Routes that do not go to the Embarcadero Station or Downtown or serve Embarcadero / Downtown mid-route have explicit definitions for inbound and outbound (e.g. 22 Fillmore is defined as heading inbound to the Marina and outbound to Potrero Hill; the F Market & Wharves is defined as heading inbound to Fisherman's wharf and outbound to Castro).

Term	Definition
Key Stop	Light Rail Transit Service stops that include high floor boarding platforms for accessibility.
Lane modifications	Lane modification proposals would change the configuration of travel and parking lanes within the existing right-of-way, typically with striping and signage. Proposed lane modifications include creating transit-only lanes, creating transit queue jump/bypass lanes, creating dedicated turn lanes, and widening mixed-flow lanes by reducing the number of mixed-flow lanes. *[see IS, pp. 41-46.]*
Layover	A layover is a period of time included in the schedule at the end of a trip that typically takes place at a transit terminus. It serves two major functions: recovery time for the schedule to ensure on-time departure for the next trip and, in some systems, operator rest or break time between trips. Layover time is often determined by labor agreement, requiring "off-duty" time after a certain amount of driving time.
Light rail vehicle (LRV)	Light rail vehicles are a form of urban rail public transportation that generally has a lower capacity and lower speed than heavy rail and metro systems, but higher capacity and higher speed than traditional street-running tram systems. The SFMTA's fleet of 151 Breda light rail vehicles (LRV), are used in the operation of the six Muni Metro Lines (J, K, L, M, N and T). The vehicles operate in conditions which range from level boarding and exclusive right-of-way in the Muni Metro Subway segments, to high-floor semi-dedicated right-of-way segments on some surface segments, to low-floor, mixed-flow operation on a variety of streets and street types. LRVs provide an efficient, high capacity means of transporting large numbers of passengers.
Limited Service or Limited Stop Service	Faster train or bus service where designated vehicles stop only at transfer points or major activity centers, usually about every 1/3 to 1/2 mile. Limited stop service is usually provided on major trunk lines operating during a certain part of the day or in a specified area in addition to local service that makes all stops. As opposed to express service, there is not usually a significant stretch of non-stop operation.

Term	Definition
Local Network	Bus routes that complement and connect to the Rapid Network to create the core network, allowing customers to get to most destinations in San Francisco with no more than one transfer.
Local service	A type of operation that involves frequent stops and consequent longer travel times, the purpose of which is to deliver and pick up transit customers as close to their destinations or origins as possible.
Midblock Stop	A transit stop where customers may alight or board that is not at an intersection of two streets.
Moderate alternative	The TTRP proposals with the more limited TPS Toolkit elements that are expected to have fewer physical environmental effects than those of the Expanded alternative TTRP corridor proposals due to the nature of the TPS Toolkit elements chosen.
Motor coach	A bus powered by a diesel engine that can typically utilize biodiesel fuel as an energy source.
Nearside of Intersection	The first or nearest side of intersection encountered when passing through. Contrasts with farside of intersection.
Network	The configuration of streets or transit routes and stops that constitutes the total transportation system.
Network enhancements	Changes to the transit network which will improve reliability and efficiency. For example, providing transit signal priority.
Network restructuring	Changes made to the network after evaluation to improve reliability and efficiency, including creation of new routes, changes to route alignment, elimination of underutilized existing routes or route segments, changes to the frequency and hours of transit service, changes to transit vehicle type on specific routes, changes to mix of local/limited/express services on specific routes.
Operational improvements	Changes made to procedures and transit operations that do not result in changes to infrastructure.
Optimizing transit stop	Locating the transit stop on one side or the other of an intersection for greater efficiency. *[See IS, p. 31.]*

Term	Definition
Outbound direction	Unless otherwise defined, outbound means headed away from Downtown or Embarcadero Station. This is the opposite of inbound direction. Routes that do not go to Downtown or Embarcadero Station have explicit definitions for inbound and outbound (e.g. 22 Fillmore is defined as heading inbound to the Marina and outbound to Potrero Hill)
Overhead wires	Wires suspended over streets and rail tracks to provide electric power to trolley coaches and LRVs.
Owl Service	Service that operates during the late night/early morning hours or all night service, usually between 1:00 a.m. and 6:00 a.m.
Paratransit	Transportation service for individuals with disabilities who are unable to use fixed-route transit service. The service must be comparable to the fixed-route service and is required by the Federal Americans with Disabilities Act.
Parking restriction	Where the ability to park is limited in duration, type of vehicle, type of use, type of driver, or is forbidden.
Peak period	The hours in the morning or evening when most commuters are commuting and the travel system carries the largest number of passengers (transit) or vehicles (traffic). The morning peak period is generally between 7 a.m. and 9 a.m. and the evening peak period is generally between 4 p.m. and 6 p.m., although these hours may change over time. If not specified, evening commute hours are usually meant.
Pedestrian bulb	A sidewalk extension at a non-transit stop that improves pedestrian visibility and minimizes pedestrian exposure to vehicular traffic.
Pedestrian refuge island	Raised median installed in the center of a roadway that provides a safe place for pedestrians to stop while crossing a street.
Platform	Area of pavement raised above a road or railbed where passengers can board or alight from transit vehicles.
Platform Display System	LED (light-emitting diode) electronic display panels on platforms in Metro stations.

Term	Definition
p.m. peak	The afternoon commute period in which the greatest movement of transit passengers occurs, generally from work or school to home; the portion of the afternoon service period where the greatest level of ridership is experienced and service provided, generally between 4 p.m. and 6 p.m.
Project variant	Several options or "project variants" are under consideration by the SFMTA to allow for flexibility in the phasing and implementation of the TEP. Proposed Service Improvement variants would modify portions of routes or change the type of vehicle used on routes. TTRP variants would modify the locations of one or more TPS Toolkit elements along the corridor. For areas where more than one variant is proposed, only one variant would be implemented.
Protected turn	At signalized intersections, where traffic from a dedicated turn lane is shown green arrow to indicate when vehicles may safely complete that turn while being protected from conflicting vehicles and pedestrians.
Queue jump	A type of roadway geometry and striping that allows transit vehicles to move around vehicles stopped at an intersection, could be combined with a special signal phase to allow transit vehicles to proceed through the intersection in advance of general traffic. See also "bypass lane."
Rapid Network	Frequent, heavily used bus routes and rail lines that make up the backbone of the Muni system.
Real-Time arrival Signage	LED panels in transit shelters that provide next arrival and emergency messaging; however, these units are also sparingly used to advise customers of service and event-related information and other topics of importance, such as major issues and public input opportunities.
Right-of-way	A right-of-way is a strip of land that is granted, through an easement or other mechanism, for transportation purposes, such as for a pedestrian path, sidewalk, driveway, rail line or highway.

Term	Definition
Route	A specified path taken by a transit vehicle usually designated by a number or a name, along which customers are picked up or discharged.
Service Improvements	Network restructuring that includes the creation of new routes, changes to route alignment, elimination of underutilized existing routes or route segments, changes to the frequency and hours of transit service, changes to transit vehicle type on specific routes, changes to mix of local/limited/express services on specific routes.
Service management	Improving service delivery on Muni by vehicle and infrastructure maintenance, operator availability, supervision, and traffic management. *[See IS, p. 1, and described in April 2011 Draft Implementation Strategy, pp. 1-4].*
Service Policy Framework	An outline of policies and action items for implementing future transit service changes, including changes proposed as part of the TEP.
Service reliability	How often transit vehicles meet planned schedules of stops.
Service-related Capital Improvements	Physical improvements to the transit system that support, or are in some cases necessary, to implement the TEP Service Improvements, including Terminal and Transfer Point Improvements (TTPI), Overhead wire expansions (OWE), and Systemwide Capital Infrastructure (SCI).
Sidewalk widening	Where the width of the pedestrian right-of-way is increased at the expense of a street or other transportation right-of-way.
Span of Service	The span of hours over which service is operated (e.g., 6 a.m. to 10 p.m). Service span often varies by weekday, Saturday, or Sunday.
State of Good Repair	Federal Transportation Agency (FTA) defined program that seeks to improve the condition of transit capital assets in order to improve transit performance and reliability.

Term	Definition
State of Good Repair Investment	An SFMTA project that replaces or rehabilitates transportation capital assets in order to improve the condition of capital assets and improve system performance and reliability.
Stop spacing	The distance between consecutive transit stops. If a bus stop occurs on every block, the stop spacing is every block.
Supplemental service	Service provided that is not daily or weekly. Examples of supplemental service include bus service for professional sports games, or school-day only services for middle schools and high schools. [See http://www.sfmta.com/cms/mroutes/SupplementalService.htm]
Switches	A switch is a mechanical installation enabling LRVs or Trolley Coaches to be guided from one track or set of overhead wires to another, such as at a railway junction or where a spur or siding branches off.
Terminal	The point where a transit route starts or ends, where vehicles stop, turn or reverse, and wait before departing on their return journeys.
Tow-away Zone	A lane in which private vehicles, if stopped or parked, can be removed and the owners fined.
Traffic calming measure	Roadway devices or practices that encourage drivers to proceed slowly through the use of visual or actual roadway narrowings, horizontal or vertical shifts in the roadway, or other features.
Traffic circle	Generally circular raised areas in the center of an intersection that force vehicles to go slowly around them, provide space for landscaping, and slow traffic by visually narrow the roadway.
Traffic Control Device	These include markings, signs, and signal devices used to inform, guide and control the orderly, uniform and efficient movement of all roadway users.
Transfer	A point or location where two or more transit routes come together at the same time to allow passengers to efficiently connect between intersecting transit routes. A short layover may be provided at timed transfer points to enhance the connection.

Term	Definition
Transit boarding island	Raised area with a transit stop within the roadway that provides a safe place for customers to board and alight, allowing transit vehicles to use center lanes without having to pull over to the side of the roadway for customers to board
Transit bulb	Curb extension at a transit stop designated for passengers to wait for, board to and alight from transit vehicles. A transit bulb allows transit vehicles to board and alight passengers without pulling in and out of traffic.
Transit service efficiency	A measure of how quickly transit trips are completed, how many transit rides are offered, and the cost to provide transit rides.
Transit signal priority	A name for various techniques to speed up transit at intersections with traffic signals. Transit vehicles signal their impending arrival via radio systems and, on their arrival at the intersection, receive green lights.
Transit stop	Where transit vehicles cease movement to permit customers to alight and board.
Transit stop changes	Transit stop changes adjust the size, location, or type of a transit stop. Transit stop changes reduce travel time by changing the distance between stops, making boarding and alighting easier for customers, reducing transit dwell time, and/or reducing the time it takes for a transit vehicle to move in and out of traffic. *[See IS, pp. 30-40.]*
Transit travel time	A measure of the amount of time for transit vehicles to move between two points along a transit route.
Transit Travel Time Reduction Proposals (TTRP)	The transit corridors along which TPS Toolkit elements are proposed to be applied are 17 of the Rapid Network Corridors.
Transit vehicle	A vehicle used for public mass transit, including Cable Cars, LRVs, Motor Coaches, Hybrid electric/diesel motor coaches, Streetcars, and Trolley Coaches.

Term	Definition
Transit zone	A zone along a curb where no vehicles aside from transit vehicles may stop or park, and where the transit vehicle allows passengers to board and alight. A transit zone allows room for a transit vehicle to approach a curb for customer boarding and alighting.
Transit-only lane	A travel lane that is dedicated for the exclusive use of transit vehicles.
Travel lane	The right of way in which a vehicle may travel.
Trolley coach	Trolley buses (also known as "trolley coaches" or "trackless trolleys") are rubber-tired vehicles with motors powered by electricity from overhead wires. "Trolley" refers to the trolley poles on the roof of the bus that are used to transmit the electricity from the overhead wires. Thus, "Electric trolley bus" is a redundant term, but must be used occasionally to differentiate real trolley buses from the faux trolley cars and cable cars that are actually small buses.
Turn lane	A secondary lane from which a turn may be made. Contrast with a no-turn lane.
Turn pocket	A short zone carved out of a lane or curb parking, permitting vehicles to make a turn at a given intersection. Most often used to prevent turning vehicles from blocking non-turning vehicles.
Turn Restrictions	Signs limiting vehicles from turning, which reduces the blockage of transit vehicles and other traffic. Turn restrictions can be part-time or full-time. *[IS, p. 46.]*
Wayfinding signage	Directional signage located on the sidewalk, used to help pedestrians orient themselves and locate nearby destinations

A. PROJECT DESCRIPTION

A.1 INTRODUCTION

The San Francisco Municipal Transportation Agency (the SFMTA), in partnership with the San Francisco Office of the Controller (Controller's Office), is proposing to implement the Transit Effectiveness Project (TEP). The objectives of the TEP are to improve service reliability, reduce transit travel time, improve transit customer experiences, and improve transit service effectiveness and efficiency. The TEP is comprised of a group of proposals to assure a coordinated and efficient approach to delivering transit improvements. The SFMTA is the project sponsor for the TEP. Implementation of the TEP would be guided by the proposed Service Policy Framework, which would establish objectives and actions for implementing transit service in San Francisco.

A.1.1 Project Background

Starting in 2006, the SFMTA and the Controller's Office[1] undertook a detailed evaluation of the existing San Francisco Municipal Railway (Muni) system to identify ways to improve service, attract more passengers, and increase efficiency. During the initial planning phase, from October 2006 to November 2007, the SFMTA collected and analyzed extensive data, including market research on customer preferences and priorities for Muni service, changing travel patterns within the City and through the region, and route-by-route ridership data. Based on this technical research, best practices from other cities, and input from community stakeholders, policy-makers and SFMTA employees, the SFMTA developed a set of preliminary recommendations to improve transit service reliability, improve transit travel times, and update the transit network to better reflect changing travel patterns. In 2008, the SFMTA conducted extensive outreach efforts to solicit public input on the proposed TEP changes, and subsequently used this input to refine and develop a set of draft TEP recommendations.[2] The SFMTA Board of Directors (SFMTA Board) endorsed

[1] The TEP is a partnership between the SFMTA, the San Francisco agency that oversees the Muni transit system, and the Controller's Office, which helps City departments evaluate the effectiveness of their services.

[2] As part of the public participation process, in the spring of 2008 the SFMTA presented its draft recommendations to a broad cross-section of stakeholders through a series of 11 citywide workshops and over 100 stakeholder briefings. San Francisco Municipal Transportation Agency, online at http://www.sfmta.com/cms/mtep/teppast.htm, accessed March 13, 2012.

the draft TEP recommendations for purposes of environmental review in October 2008.

In April of 2009, the SFMTA Board declared a fiscal emergency. To address this issue, the SFMTA Board approved an amended 2009-2010 Operating Budget and related actions, which were statutorily exempt from environmental review under the California Environmental Quality Act (CEQA) § 21080.32.[3] The service changes associated with the budget deficit were implemented on December 5, 2009, with an additional series of service changes made on May 8, 2010. Service changes implemented in December 2009 and May 2010 included the elimination of some routes and changes to the route alignment, vehicle type, frequency, or hours of service for others. On September 4, 2010, approximately 60 percent of the service eliminated in May 2010 was restored, focusing primarily on evening and owl service frequencies and the last scheduled trips for evening services. Some of the service changes implemented in 2009 and 2010 to address the fiscal emergency were informed by and reflected in the 2008 draft TEP recommendations.

Based upon the events in 2009 and 2010 described above, the TEP proposals currently under environmental review reflect an update to the 2008 draft TEP recommendations. In addition, certain proposals that were initially associated with the TEP may have independent utility and/or may not be subject to CEQA, and thus could be implemented independently, and, in some cases, prior to the completion of the TEP environmental review. These proposals would be environmentally assessed separately by the San Francisco Planning Department, if required. For purposes of environmental review, such proposals will not be further considered as components of the TEP.

In April 2011, the SFMTA published a discussion draft of the *TEP Implementation Strategy* (draft *Implementation Strategy*),[4] which outlines project priorities, funding needs, and a preliminary implementation schedule for the draft TEP recommendations. The draft *Implementation Strategy* builds on the recommendations developed during the initial planning phase and reflects an update

[3] San Francisco Planning Department, 2009 and 2010. Statutory exemptions for SFMTA Fiscal Emergency. These documents are available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of case files 2009.0310E and 2010.0060E.

[4] SFMTA, Transit Effectiveness Project (TEP) Implementation Strategy (discussion draft), April 5, 2011. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of case file 2011.0558E.

to the 2008 draft recommendations to account for the budget-related Muni service changes that occurred in 2009 and 2010. It also sets forth the physical changes that are the focus of the proposals analyzed in this Initial Study. Since publication of the draft *Implementation Strategy*,[5] the SFMTA has been developing the details of the proposals that comprise the TEP. These proposals are the subject of the remainder of this chapter and constitute the description of the proposed project.

A.1.2 Overview of the Analysis

The environmental analysis of the TEP is unique and challenging in that the project is not a typical land use development proposal located on a single parcel or within a small geographic area with a relatively limited set of features. Nor is it a transportation proposal that spans a single travel corridor. The TEP spans most of the City and represents a program comprised of a group of varied projects. Closely related to the TEP is the SFMTA's transit Service Policy Framework (Policy Framework) which is intended to guide the TEP and other future transit improvement proposals. Additionally, the proposals comprising the TEP have been developed at two levels of detail to allow for phased project implementation commensurate with the resources available to the SFMTA. As such, it is useful to set forth a framework that allows for a clear project definition and an organized and logical environmental review analysis.

The components being reviewed consist of the Service Policy Framework, which establishes transit service delivery objectives and identifies actions that will be taken to fulfill these objectives throughout the City; and the TEP, a program comprised of the following distinct groups of proposals that are described in more detail in Section A.3: a) Service Improvements reflecting a transit service plan for Muni; b) 12 Service-related Capital Improvements; and c) Transit Travel Time Reduction Proposals (TTRPs) for 17 Rapid Network corridors. Details have been developed for the transit service plan referred to collectively as the Service Improvements, for seven of the Service-related Capital Improvements, and for eight of the TTRPs. For the remaining five Service-related Capital Improvements, the SFMTA has set forth conceptual designs. For the remaining nine TTRPs, the SFMTA has identified a Transit Preferential Streets (TPS) Toolkit of traffic engineering changes that would reduce transit travel time. However, the locations where the specific TPS Toolkit elements

[5] The *TEP Implementation Strategy* (discussion draft) will be updated periodically as the project moves forward to reflect evolving funding scenarios and project refinements.

would be implemented to improve Muni service along these nine TTRPs have not yet been identified.

The TEP projects would be implemented based on funding source and resource availability. It is anticipated that Service Improvements would be rolled out with the first group implemented in Fiscal Year 2015 and the second group in a subsequent phase. The first group of Service-related Capital Improvements would also be constructed in Fiscal year 2015. The TTRPs would be constructed in groups, the TTRP.14 and TTRP.30, constructed in Fiscal year 2014 and the TTRP.N and TTRP.8X in Fiscal Year 2015. The TTRP.J is planned for Fiscal year 2016 and the remaining three project-level TTRPs – TTRP.5, TTRP.22_1, and TTRP.28_1 – are all planned for implementation in Fiscal Year 2017. This implementation schedule is subject to change as specific funding sources and resources are identified.

CEQA allows different elements of phased projects, such as the TEP, to be analyzed at either a program-level (a more conceptual level) or a project-level (a more specific level) of analysis, depending on the extent of the details known about a particular element or phase of a project at the time environmental review is conducted (*CEQA Guidelines*, §15168). In addition, program-level review is appropriate for the environmental review of the issuance of rules, plans, or other general criteria to govern the conduct of a continuing program, such as the role of the Service Policy Framework for the TEP. Since this environmental review includes a Service Policy Framework as well as detailed and conceptual TEP proposals, this environmental review draws on both levels of analysis to assess the physical environmental effects of the proposed project. Specifically, the Service Policy Framework, the five Service-related Capital Improvements and the TPS Toolkit on the nine TTRPs noted above will be analyzed at a program level. The remainder of the TEP proposals will receive project-level clearance.

In accordance with *CEQA Guidelines,* §15003(h), this Initial Study evaluates the combined effects of individual TEP program components, as well as the cumulative effects of the TEP in combination with other reasonably foreseeable projects that would occur within the analysis year of 2035, the time frame in which cumulative impacts will be analyzed (*CEQA Guidelines*, §15130). This approach provides decision-makers with the opportunity to evaluate the overall impacts of the TEP on an area-wide basis and to consider the broad policy alternatives and program-wide mitigation measures (*CEQA Guidelines*, §15168 (b)).

A.1.3 Relationship to Other Projects

The TEP is a specific set of projects that aim to achieve broad outcomes for the City's transit system. The SFMTA is also pursuing other projects and programs that would support transit system improvements. These include major capital initiatives such as the construction of the Central Subway; state of good repair investments; operational improvements such as systemwide all-door boarding policies, enforcement of transit-only lanes, and service management; and traffic signal priority network enhancements for transit. These projects are not part of the TEP and are not being analyzed as part of the environmental review for the TEP. Rather they are ongoing independent SFMTA initiatives that are underway to improve Muni service, and would be in place to complement implementation of the TEP.

The SFMTA is continuing to enhance the existing transit network to make transit more readily identifiable and easy to use. These enhancements include colorizing existing transit-only lanes, adding and upgrading bus shelters, installing real-time arrival signage, and fare pre-payment on Muni corridors.

Transit Signal Priority (TSP) is an ongoing Muni program to reduce transit travel time and improve transit reliability. TSP requires coordination between bus equipment, traffic signal hardware and the Muni radio operations to turn or hold the traffic signal green as a transit vehicle approaches an intersection. The SFMTA currently has transit signal priority at 150 intersections and is working to expand transit signal priority to 600 intersections in the next three years. This signal priority expansion will rely on wireless communications between an on-board radio and a computer in the traffic signal. This program is integral to the implementation of a number of programs, such as SF*go*[6] and the Radio Communications Systems and Computer Aided Dispatch Replacement project.[7]

The City and County of San Francisco adopted the *Transit First* policy in 1973. Since the mid-1970s, traffic engineering treatments have been applied at specific locations throughout the transit system under the Transit Preferential Streets (TPS) Program to

[6] SF*go* is the City's Integrated Transportation Management System led by the SFMTA. The system includes signals that respond to the actual volume of traffic on a roadway, and real-time information on travel conditions and improved coordination between all modes.

[7] Radio Communications Systems and CAD Replacement project would upgrade Muni's antiquated radio communications system for both revenue and non-revenue fleets with a modern radio and data communications system that can carry data traffic generated by "smart" vehicle applications such as Automatic Passenger Counters, Vehicle Health Monitors, Automatic Vehicle Location data, and Closed Circuit TV.

support this policy. These treatments have included standalone projects, such as the installation of transit-only lanes on the Mission Street corridor in the Downtown area, as well as the incorporation of treatments into larger projects, such as transit bulb installation in the Divisadero Great Streets project. For the purposes of this environmental review, some of these treatments have been designated as the elements that form the TPS Toolkit with the intent of applying them to the 17 TTRPs in order to reduce transit travel time. The environmental review for the Policy Framework and the TEP will assess the impacts of implementing the TPS Toolkit on these transit corridors at a project level as well as at a program level, depending on the availability of details for each corridor. The SFMTA anticipates continuing to implement the traffic engineering treatments that comprise the TPS Toolkit, as well as other traffic engineering solutions, on a Citywide basis independent of the TEP and as part of its routine operations to provide Muni service. It is expected that any such implementation not explicitly included in the TEP proposals would be considered its own project and would be subject to separate environmental review.

The TEP project-level Service Improvements and project-level TTRPs are being planned and coordinated with other ongoing projects, which are undergoing or have completed their own respective design refinement and environmental review process, including the Better Streets Plan, the Better Market Street project, the Western South of Market (SoMa) Community Plan, the Balboa Park Station Pedestrian and Bicycle Connection Project, the Tenderloin-Little Saigon Community Transportation Study, the Two-way Haight Street project, and four major transit projects: the Van Ness Corridor and Geary Corridor Bus Rapid Transit (BRT) projects, the Transit Center District Plan, and the Central Subway project. As stated above, although these projects are being evaluated under separate environmental review processes, they are being included in the cumulative analysis for the TEP.

A.2 PROJECT LOCATION

The TEP project area includes locations throughout the 49-square-mile City and County of San Francisco. Figures 1a–d show the existing Muni transit routes by City quadrant (northeast, southeast, northwest, and southwest, respectively). The existing Muni system is located within the public right-of-way, with the exception of a small portion of the J Church line that runs within a private right-of-way in Dolores Park. The various TEP components would be implemented on public land and within the public right-of-way throughout the City, which are largely under the jurisdiction of

TRANSIT EFFECTIVENESS PROJECT

FIGURE 1a - PROJECT LOCATION (NORTHEAST QUADRANT)

TRANSIT EFFECTIVENESS PROJECT

FIGURE 1b - PROJECT LOCATION (SOUTHEAST QUADRANT)

TRANSIT EFFECTIVENESS PROJECT

FIGURE 1c - PROJECT LOCATION (NORTHWEST QUADRANT)

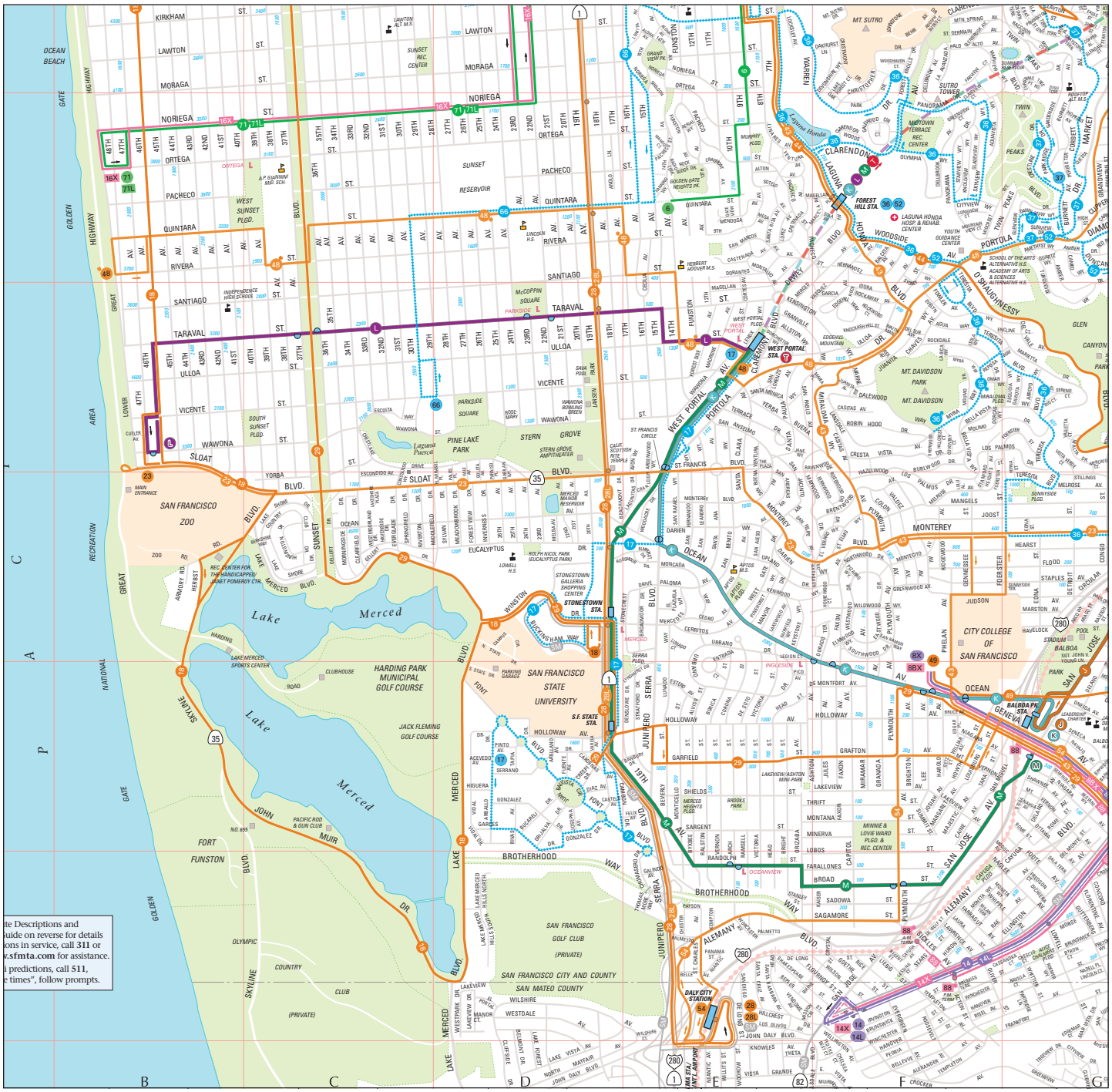


FIGURE 1d - PROJECT LOCATION (SOUTHWEST QUADRANT)

the San Francisco Department of Public Works (DPW) and the SFMTA. DPW maintains authority over regulations regarding the excavation in the right-of-way, street design, and the official grade of streets within the City. Section 8A.102 of the San Francisco Charter grants the SFMTA the exclusive authority to adopt regulations that control the flow and direction of motor vehicle, bicycle and pedestrian traffic and to design, select, locate, install, operate, maintain and remove all official traffic control devices, signs, roadway features and pavement markings that control the flow of traffic with respect to streets and highways within City jurisdiction.

A.3 PROJECT OVERVIEW

Although the proposed project is called the Transit Effectiveness Project, the TEP is a program developed by the SFMTA that is comprised of a number of individual projects or categories of projects proposed for the Muni transit system. As a result of the research, outreach, and planning for the TEP, the SFMTA has developed a Policy Framework. The TEP program includes a series of transit service improvements and concurrent necessary transit capital investments and is comprised of the following components: the Service Improvements, Service-related Capital Improvements, and TTRPs. Each of these components is described below.

A.3.1 Service Policy Framework

The SFMTA proposes a transit Service Policy Framework (Policy Framework), which sets forth transit service delivery objectives, identifies actions needed to fulfill these objectives, and supports the SFMTA Strategic Plan goals. The Policy Framework is informed by the key findings from the TEP existing conditions analysis and community outreach. It is intended to guide the planning and implementation of the TEP, and to guide future Muni plans and programs. Its objectives include the effective allocation of transit resources, the efficient delivery of service, the improvement of service reliability and reduction in transit travel time, and an improvement in customer service. A variety of actions are identified to implement these objectives.

The Policy Framework defines the transit network and proposes to organize Muni transit service into the following four distinct service types and levels of transit priority infrastructure.

- Rapid Network: These frequent, heavily used bus routes and rail lines make up the backbone of the Muni system and would be high priorities for service and customer amenity enhancements.

- Local Network: These bus routes complement and connect to the Rapid Network to create the core network, allowing passengers to get to most destinations in San Francisco with no more than one transfer.

- Community Connectors: This category includes lightly-used bus routes that circulate through San Francisco's hillside residential neighborhoods to fill in gaps in coverage and connect passengers to the core network.

- Specialized Services: These routes augment all-day service to address focused transit needs. They include commuter express routes, and connections to Bay Area Rapid Transit (BART) and Caltrain stations, and special weekend football service.

A.3.2 Service Improvements

As part of the TEP development, the SFMTA conducted a comprehensive evaluation of transit service to assess network restructuring that examined route and line performance, travel time, reliability, and ridership throughout the Muni system. Staff then developed a set of transit Service Improvement proposals that were vetted through dozens of community meetings with critical stakeholders and policy makers.[8] As a result of this process, a final set of Service Improvements was developed. These proposed Service Improvements include the following:

- Creation of new routes.

- Changes to route alignment.

- Elimination of underutilized existing routes or route segments.

- Changes to the frequency and hours of transit service.

- Changes to transit vehicle type on specific routes.

- Changes to mix of local/limited/express services on specific routes.

[8] Information on the TEP public outreach process is available from the SFMTA on online at www.sftep.com, accessed December 24, 2012.

- Other changes, such as new express service stops, expansion of limited service on weekends, and expansion of other service on weekends such as an additional day of service.

All Service Improvements will be analyzed at a project level.

A.3.2.1 Service-Related Variants

Several "project variants" are under consideration by the SFMTA to allow for flexibility in the phasing and implementation of the TEP. Proposed service improvement variants would modify portions of routes or change the type of vehicle used on routes. Service-related variants are being considered for the following routes: 2 Clement, 5 Fulton, 11 Downtown Connector, 14 Mission, 14L Mission Limited, 16X Noriega Express, 22 Fillmore, 27 Bryant, 32 Roosevelt, 33 Stanyan, 49L Van Ness-Mission Limited, and 71L Haight-Noriega Limited. The proposed variants are described in detail in Table 7 on p. 70 below. All variants for the Service Improvements are being analyzed at a project-level.

A.3.3 Service-Related Capital Improvements

Many of the Service Improvements can be implemented without capital changes. However, some of the proposals are dependent on or would be enhanced by Service-related Capital Improvements. These projects fall into three categories:

- Terminal and Transfer Point Improvements (TTPI). Transfer and terminal points are stops that accommodate substantial passenger interchanges and/or transit vehicle layovers. Some of the TEP route changes would require passengers to transfer at new locations and/or additional buses to layover at existing sites. The TEP proposes four TTPI projects. The TTPI projects would include some or all of the following: the installation of new switches, bypass rails, transit bulbs, and overhead wiring and poles and associated underground wiring; the expansion of transit zones for bus layovers; the reconfiguration or elimination of on-street parking; and possible sidewalk modifications.

- Overhead Wire Expansion (OWE). OWE projects would include the installation of additional overhead wires and related infrastructure (e.g., support poles up to 30-feet in height, conduit, and duct banks[9]) for certain electric trolley coach

[9] A duct bank refers to underground electrical wiring in groups of conduits.

routes. OWE projects would support service route changes by allowing Muni to use electric trolley coaches on additional streets and would make it possible for trolley coaches to pass one another on existing trolley coach routes.

- Systemwide Capital Infrastructure (SCI). The two SCI projects would include the installation of new accessible platforms to improve system accessibility across the light rail network and the extension of an existing "transit-commercial" contraflow[10] lane on Sansome Street to optimize bus routing and reduce transit travel time. Typical dimensions of an accessible surface platform are 60 inches by 90 inches. The heights of the platforms would vary by location, but would not exceed three and one-half feet from the ground surface or six and one-half feet in total height including the height of the three-foot-high open railing.

The Service-related Capital Improvements also include two levels of analysis: program level and project level. Capital projects for which specific designs and locations have not yet been developed are evaluated at a program-level. Capital projects with sufficiently detailed designs are analyzed at a project level. Table 1 lists the Service-related Capital Improvements with their anticipated level of environmental review. Figure 2 shows the locations of improvements that are analyzed at a program and project level.

A.3.4 Travel Time Reduction Proposals

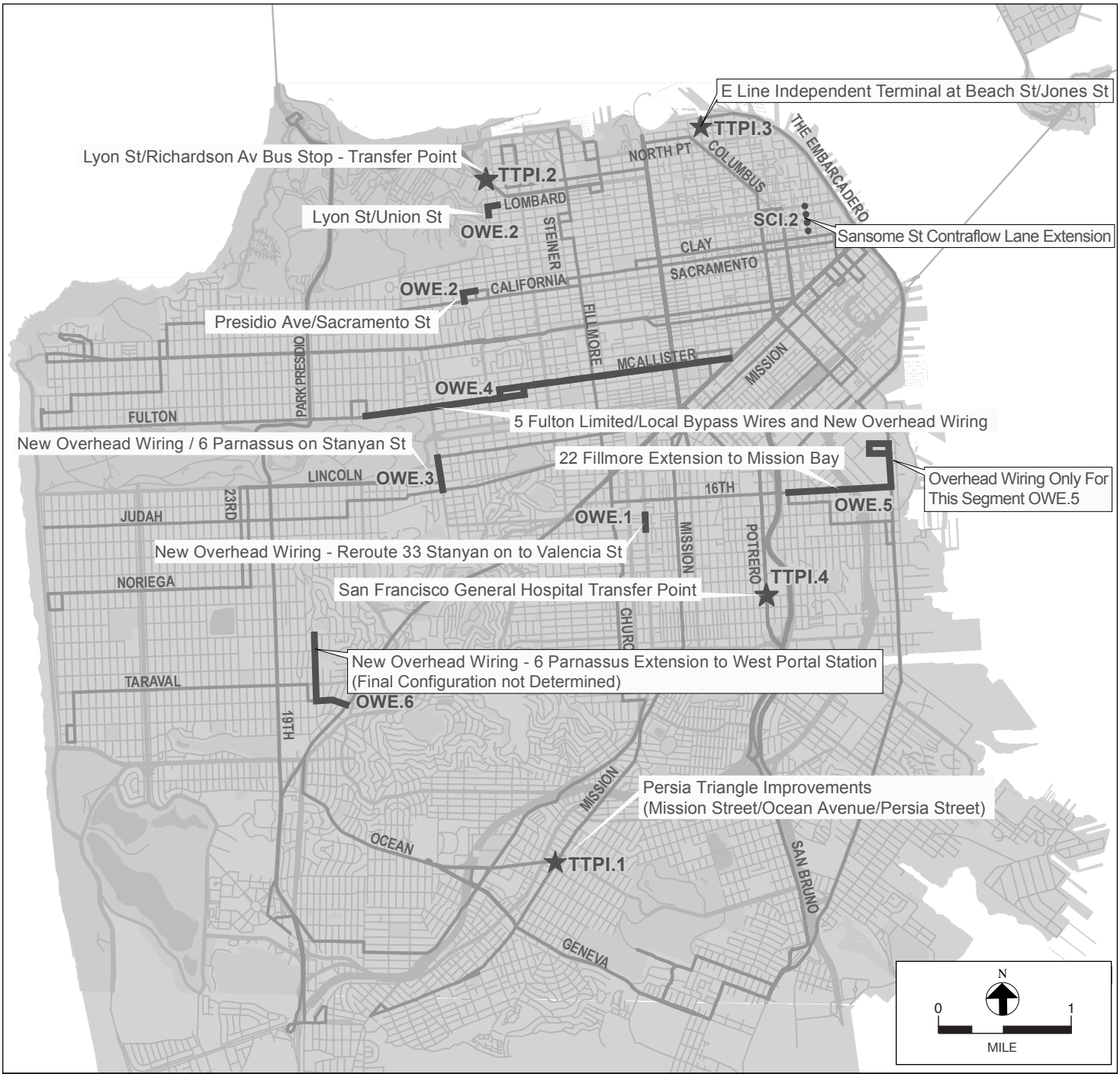
Research conducted by the SFMTA during the initial planning phase of the TEP identified the following as major causes of transit delay: intersection congestion, traffic congestion on roadways, narrow mixed-flow lanes, and closely spaced transit

[10] In this instance, contraflow refers to the reversal of a lane of traffic from what was previously a one-way street. Transit-commercial refers to the fact that transit and commercial vehicles would be the only vehicles that would travel both ways on the street following implementation of the project. A portion of Sansome Street, from Market Street to Washington Street, currently operates as transit-commercial contraflow lane.

Table 1: Service-related Capital Improvement Projects

Program Level	Project Location/Type
Terminal and Transfer Point Improvements	
TTPI.2	Lyon Street/Richardson Avenue Bus Stop/Transfer Point
TTPI.3	E Line Independent Terminal at Beach Street/Jones Street
TTPI.4	San Francisco General Hospital Transfer Point
Overhead Wire Expansion	
OWE.6	New Overhead Wiring – 6 Parnassus Extension to West Portal Station
Systemwide Capital Infrastructure Project	
SCI.1	Accessible Platforms

Project Level	Project Location/Type
Terminal and Transfer Point Improvements	
TTPI.1	Persia Triangle Improvements (Mission Street/Ocean Avenue/Persia Street)
Overhead Wire Expansion Projects	
OWE.1	New Overhead Wiring – Reroute 33 Stanyan on to Valencia Street
OWE.2	Bypass Wires at Various Terminal Locations Lyon and Union streets (Routes 41 Union and 45 Union-Stockton) Presidio Avenue and Sacramento Street (Routes 1 California and 2 Clement)
OWE.3	New Overhead Wiring – 6 Parnassus on Stanyan Street
OWE.4	5 Fulton Limited/Local Bypass Wires
OWE.5	22 Fillmore Extension to Mission Bay
Systemwide Capital Infrastructure	
SCI.2	Sansome Contraflow Lane Extension



SOURCE: SFMTA, Turnstone Consulting

Legend

TTPI: Terminal and Transfer Point Improvements (★)

SCI: Systemwide Capital Infrastructure (•••••••)

OWE: Overhead Wire Expansion (▬▬)

Muni Rapid Network (——)

Note: The specific locations for the program-level SCI.1 Accessible Rail Platforms have not yet been determined.

stops.[11] Other sources of transit delay identified in the research were associated with dwell time,[12] traffic signals, and transit zone operational delays (i.e., the time for transit vehicles to pull into a stop or merge back into traffic after a stop). The SFMTA has identified a set of 18 standard traffic engineering elements that address these issues and can reduce transit travel time when applied to streets along a transit corridor. As described above, a number of these elements have already been applied by the SFMTA as part of its ongoing TPS Program and would continue to be used on segments of the Muni system for projects other than those included in the TEP. These elements are collectively referred to as the TPS Toolkit.

Through the initial planning, research, and outreach phase of the TEP, the SFMTA has determined which frequently and heavily used bus routes and rail lines make up the backbone of the Muni system and has designated these as the Rapid Network. The Rapid Network has been identified as high priority for transit service. In addition, it has been determined that implementation of the TPS Toolkit elements would be of particular benefit along these routes to improve reliability and reduce travel time. Application of the TPS Toolkit on the Rapid Network, would support their role as transit priority corridors. The transit corridors along which TPS Toolkit elements would be applied as part of the TEP are 17 of the Rapid Network Corridors. These 17 proposed TEP projects are referred to as transit TTRPs. Using the TPS Toolkit, the SFMTA has developed eight specific corridor designs being analyzed at a project level in this environmental review. In addition, the TPS Toolkit will be used to develop nine designs for the program-level TTRPs pending further development and public outreach. The TTRPs are named for the route/line using the corridor, for example, TTRP.J for the J Church line, TTRP.8X for the 8X Bayshore Express route, and TTRP.14 for the 14 Mission route.

The segments of the Rapid Network that are not being considered for TTRP improvements include: Market Street, Muni Metro subway tunnel, West Portal Avenue; Junipero Serra Boulevard; The Embarcadero (including Jefferson, Jones and Beach streets), Third Street, Fourth Street, Van Ness Avenue, Townsend Street and Geary Boulevard. Travel time reduction strategies have already been implemented on these segments (e.g., Third Street light rail project) or they are part

[11] San Francisco Municipal Transportation Agency (December, 2008). San Francisco Transit Effectiveness Project: Service evaluation (pp. 42-43). A copy of this document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of case file 2011.0558E.

[12] Dwell time is the time a transit vehicle waits at a transit stop while customers board and alight.

of other transportation studies that will address transit delay and reliability challenges (e.g., Van Ness BRT).

The TPS Toolkit elements are grouped into five categories based on the types of roadway changes involved: transit stop changes, lane modifications, parking and turn restrictions, traffic signal and stop sign changes, and pedestrian improvements. A list of the TPS Toolkit elements is presented by category in Table 2 and described in detail beginning on p. 30.

Each of the proposed TTRPs would include a different combination of the TPS Toolkit elements applied along its length, based on the needs of the individual corridor, in order to reduce transit travel time and increase transit service efficiency.

Eight of the 17 TTRPs have been studied by the SFMTA in sufficient detail such that the specific TPS Toolkit elements and their locations along the corridors have been developed; therefore, the design details to conduct project-level analysis are known. The project-level TTRPs are described in detail in Section A.5.3, beginning on p.114. The remaining nine TTRPs have been designated for improvements, but the site-specific placement of the TPS Toolkit elements on these nine corridors has not been identified. In the future, the combinations and locations of TPS Toolkit elements that are appropriate to each corridor would be determined and specific designs would be developed. For this reason, these nine TTRPs will be analyzed at a program level in this environmental review unless the specific locations of the TPS Toolkit elements along the corridors are not needed to evaluate a particular CEQA topic. In such cases, the program-level TTRP may be cleared at a project-level for that specific topic. Subsequent environmental review may be required in the future for the TTRPs analyzed at a program level, once site-specific designs have been developed.

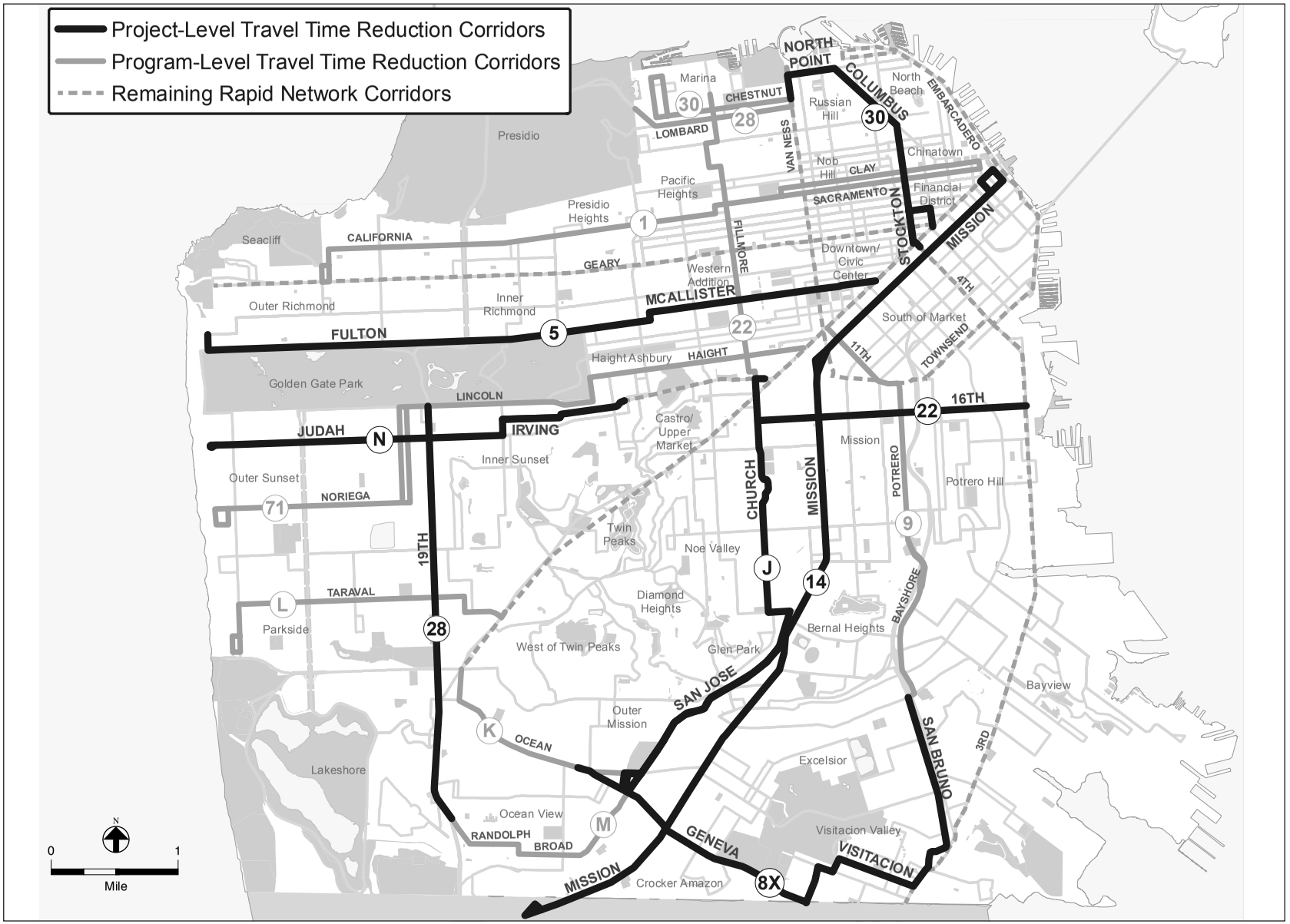
The transit corridors for which TTRPs are proposed, both project-level and program-level, are shown on Figure 3 on p. 20 and listed in Table 3 on pp. 21-22. Table 3 lists the level of environmental review analysis for each corridor.

A.4 DESCRIPTION OF PROGRAM-LEVEL COMPONENTS

Program-level environmental review is used in connection with the issuance of rules, plans, or other general criteria to govern the conduct of a continuing program. Therefore, program-level review is appropriate for the Policy Framework. Program-level review is also used in environmental analyses for a series of actions,

Table 2: Transit Preferential Streets Toolkit

Description of Toolkit Categories	Toolkit Elements
Transit Stop Changes: Transit stop changes adjust the size, location, or type of a transit stop. Transit stop changes reduce travel time by changing the distance between stops, making boarding and alighting easier for passengers, reducing transit dwell time, and/or reducing the time it takes for a transit vehicle to move in and out of traffic.	1. Remove or Consolidate Transit Stops. 2. Optimize Transit Stop Locations at Intersections. 3. Install Transit Bulbs. 4. Install Transit Boarding Islands. 5. Optimize Transit Stop Lengths. 6. Convert Flag Stops to Transit Zones.
Lane Modifications: Lane modifications change the roadway striping. These tools are proposed to separate transit vehicles from vehicle congestion, enhance safety by widening existing travel lanes, or improve transit speed and reliability by improving traffic flow. These changes are generally implemented by modifying an existing travel lane or by removing a parking lane.	7. Establish Transit-Only Lanes. 8. Establish Transit Queue Jump/Bypass Lanes. 9. Establish Dedicated Turn Lanes. 10. Widen Travel Lanes through Lane Reductions.
Parking and Turn Restrictions: Parking and turn measures are primarily legislative changes and enacted by signage, striping and parking restrictions. In some cases, they could also include roadway striping changes. Turn restrictions and tow-away zones are proposed to reduce travel delay caused by turning vehicles and to increase the number of travel lanes or the width of travel lanes on a street for some or all times of day.	11. Implement Turn Restrictions. 12. Widen Travel Lanes through Parking Restrictions.
Traffic Signal and Stop Sign Changes: Intersections are typically controlled by yield signs, stop signs signs and traffic signals. Signalizing an intersection or removing the stop sign(s) on the street with transit would reduce delay from stop signs. Traffic calming measures could be added to intersections with Stop sign removals to help pedestrians cross the street.	13. Install Traffic Signals at Uncontrolled and Two-way Stop-controlled Intersections. 14. Install Traffic Signals at All-way Stop-Controlled Intersections. 15. Replace All-way Stop-controls with Traffic Calming Measures at Intersections
Pedestrian Improvements: Pedestrian improvements enhance access to transit, and enable transit to move with less delay and more reliability through a corridor.	16. Install Pedestrian Refuge Islands. 17. Install Pedestrian Bulbs. 18. Widen Sidewalks.



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 3 - PROPOSED PROGRAM-AND PROJECT-LEVEL TTRP RAPID NETWORK CORRIDORS

Table 3: TEP Travel Time Reduction Proposals for the Rapid Network Corridors

TEP Reference No.	Affected Routes: Corridor Description
Program Level *	
TTRP.1	1 California: along Drumm, Sacramento, Steiner, and California streets, 32nd Avenue and Geary Boulevard (outbound), and along Geary Boulevard, 33rd Avenue, Clement Street, 32nd Avenue, California, Steiner, Sacramento, Gough and Clay streets (inbound), from the intersection of Geary Boulevard and 33rd Avenue to the intersection of Clay and Drumm streets.
TTRP.9	9 San Bruno/9L San Bruno Limited, along the following streets in two segments: Segment 1 - along 11th Street, Division Street, Potrero Avenue, Bayshore Boulevard, and Silver and San Bruno avenues. This part of the corridor extends from the intersection of Market and 11th streets to the intersection of San Bruno and Silver avenues. Segment 2 - Bayshore Boulevard, Sunnydale Avenue, Schwerin Street, Geneva Avenue, Santos Street and Sunnydale Avenue. This part of the corridor extends from the intersection of Visitacíon Avenue and Bayshore Boulevard to the existing terminus at 2070 Sunnydale Avenue, adjacent to the Gleneagles Golf Course in McLaren Park.
TTRP.22_2	22 Fillmore: along Church, Hermann, and Fillmore streets, Broadway, and Steiner, Union, and Fillmore streets, from the intersection of 16th and Church streets to the intersection of Bay and Fillmore streets.
TTRP.28_2	28L 19th Avenue Limited: along Van Ness Avenue, Lombard Street and Richardson Avenue from Beach Street and Van Ness Avenue intersection to Lyon Street and Richardson Avenue (US 101 N) intersection.
TTRP.30_2	30 Stockton: along Chestnut, Broderick, Divisadero and Jefferson streets, from the intersection of Van Ness Avenue and Chestnut Street to the intersection of Jefferson/Broderick streets.
TTRP.71	71L Haight-Noriega Limited and the 6 Parnassus: along Ortega Street, 47th Avenue, Noriega Street, 22nd Avenue, Lincoln Way, Frederick, Stanyan, and Haight streets (inbound), and along Haight, Stanyan, and Frederick streets, Lincoln Way, 23rd Avenue, Noriega Street, the Great Highway and Ortega Street (outbound), from the intersection of Ortega Street/48th Avenue to the intersection of Market/Gough streets.
TTRP.K	K Ingleside: along Junipero Serra Boulevard and Ocean Avenue, from the intersection of Ocean Avenue and San Jose Avenue and Oneida Street (Balboa Park Station) to the intersection of Sloat/Junipero Serra boulevards.
TTRP.L	L Taraval: along Ulloa Street, 15th Avenue, Taraval Street, 46th Avenue, Vicente Street, 47th Avenue, Wawona Street and 46th Avenue, from West Portal Avenue and Ulloa Street intersection (West Portal Station) to Wawona and 47th Avenue intersection.
TTRP.M	M Ocean View: along 19th Avenue, Parkmerced local streets, 19th Avenue, Randolph Street, Orizaba Avenue, Broad Street and San Jose Avenue, from and the intersection of 19th and Holloway avenues to the intersection of Geneva and San Jose avenues (Balboa Park Station).

TEP Reference No.	Affected Routes: Corridor Description
Project Level	
TTRP.5	5 Fulton/5L Fulton Limited: along La Playa Street, Fulton Street, Central Avenue, and McAllister Street, from La Playa/Cabrillo streets intersection to Market/McAllister streets intersection.
TTRP.8X	8X Bayshore Express: along Geneva Avenue, Santos Street, Sunnydale Avenue, Hahn Street, Visitacíon Avenue, Bayshore Boulevard, and San Bruno Avenue from the intersection of Ocean/ Silver avenues to Silver/San Bruno avenues.
TTRP.14	14 Mission/14L Mission Limited: inbound along Mission Street, Main Street, Market Street and Steuart Street and outbound along Steuart Street, Mission Street, Otis Street, Mission Street, Flournoy Street, San Jose Avenue, and John Daly Boulevard, from the intersection of Steuart/ Mission streets to Daly City BART Station.
TTRP.22_1	22 Fillmore: along 16th Street from the intersection of Church/16th streets to the intersection of Third/ 16th streets.
TTRP.28_1	28 19th Avenue/28L 19th Avenue Limited: along 19th Avenue from Lincoln Way and 19th Avenue intersection to Junipero Serra Boulevard and 19th Avenue intersection.
TTRP.30_1	8X Express, 30 Stockton and 45 Union: along Van Ness Avenue, North Point Street, Columbus Avenue, then along Stockton Street (inbound) and Sutter Street and Kearny Street (outbound), from Van Ness Avenue and Chestnut Street intersection to the intersection of Market/ Stockton streets (inbound) and the intersection of Market/ Kearny streets (outbound).
TTRP.J	J Church: along Church Street, right-of-way, Church Street, 30th Street and San Jose Avenue, from Church Street and Duboce Avenue intersection to Geneva/San Jose avenues intersection [Balboa Park Station (Muni Metro and BART)].
TTRP.N	N Judah: along Judah Street, Ninth Avenue, Irving Street, Arguello Boulevard, and Carl Street, from the intersection of La Playa/ Judah streets to the intersection of Carl/Cole streets.

Note

* The nine TTRPs listed as "Program Level" in this table will be analyzed at a program level in the Initial Study unless the specific locations of the TPS Toolkit elements along the corridors are not needed to evaluate a particular CEQA topic, in which case the program-level TTRPs may be cleared at a project-level for that specific topic.

including phased projects like the TEP, that can be characterized as one large project because they are logically related geographically or in a chain of contemplated actions (*CEQA Guidelines*, §15168(a)). Certain components of the TEP such as some of the Service-related Capital Improvements and TTRPs for which the specific designs have not yet been developed in detail are generally analyzed in this environmental review at a program level. However, for a number of CEQA topics, sufficient level of detail is available to perform a thorough environmental review assessment. For these topics (e.g., Land Use and Land Use Planning, Population and Housing, Aesthetics, and Wind and Shadow among others), the Policy Framework and the entirety of the TEP are reviewed at a project level such that

additional environmental review for these topics may not be necessary in the future. A summary of the topics for which this has been determined to be the case is provided following the analysis in this Initial Study.

Each of the program-level components is described below.

A.4.1 Policy Framework

A.4.1.1 Introduction

The Policy Framework is a policy document that consists of objectives and actions to enable the SFMTA to effectively allocate transit resources, efficiently deliver service, improve service reliability, reduce transit travel time, and improve customer service. As such, the Policy Framework would not result in direct physical changes to the environment. It was reviewed to identify which objectives and actions would have the potential to indirectly affect the physical environment. Specific capital and service-related improvement projects developed to fulfill the objectives of the Policy Framework or to further the actions identified in the Policy Framework could result in physical environmental effects. Therefore, potential indirect effects of the Policy Framework would be represented by the impacts identified for TEP capital and service-related projects. With respect to the TEP, the methodology for assessing the indirect impacts of the Policy Framework includes the review of the physical impacts of the Service Improvements, Service-related Capital Improvements, and TTRPs. These TEP components are representative of projects that would be carried out to implement the objectives and actions of the Policy Framework and are analyzed in this environmental review. However, the Policy Framework may result in other future projects to improve transit service besides the TEP. Any other SFMTA projects resulting from the Policy Framework would be subject to their own environmental review, as applicable under CEQA. While these future SFMTA projects would be subject to a future environmental review process, the analysis of the TEP sets forth the type and severity of indirect physical environmental effects that could occur as a result of the Policy Framework.

A.4.1.2 Policy Framework

The Transit Effectiveness Project represents the first opportunity to holistically review the Muni network and service delivery since the 1970s. This review focused on extensive data collection and analysis, evaluation of best practices from other transit systems in North America and extensive outreach to Muni customers and other

stakeholders. Out of this work emerged a new approach to designing and delivering Muni service to better align with San Francisco's Transit First Policy and the SFMTA's strategic goals. The Policy Framework sets forth transit service delivery objectives that support SFMTA Strategic Plan goals and identifies actions that will be taken to fulfill these objectives. This Policy Framework is informed by the key findings from the TEP existing conditions analysis and community outreach and is intended to guide the planning and implementation of the TEP, as well as future Muni plans and programs. As such, the objectives are designed to support SFMTA Strategic Plan[13] goals including Goal 2: Make transit, walking, bicycling, taxi, ridesharing and car sharing the most attractive and preferred means of travel, and Goal 3: Improve the environment and quality of life in San Francisco. The Policy Framework's objectives and recommended actions are set forth below.

A. Objective: Allocate transit resources effectively, while maintaining citywide coverage

Creating a tiered-service system of Muni routes will establish a foundation for allocating transit resources and transit management practices. The tiered-service system will guide the type of capital improvements and operating dollars to be delivered by transit corridor or route. It will also serve to inform existing and new customers about the level of service provided by the transit system, set expectations for service delivery by classification and help to inform customer route choices. The tiered-service system will preserve San Francisco's long and rich history of providing equitable public transit options for residents, employees and visitors to travel to a broad range of destinations and will maximize the effectiveness of scarce resources.

> Action A.1: Continue to provide strong geographic coverage by ensuring that all residents are within a quarter mile of transit and that most trips can be made with no more than one transfer.
>
> Action A.2: Define a tiered-service network that will be aligned with service improvements and capital investment expectations. Routes will be assigned to tiers based on existing performance but may be reclassified as usage and travel patterns change.

[13] San Francisco Municipal Transit Agency, *SFMTA Strategic Plan. FY2013-FY2018* January 3, 2012, Available online at www.sfmta.com/cms/rstrategic/StrategicPlan.htm, accessed on December 17, 2012.

- Rapid Network: These frequent, heavily used bus routes and rail lines make up the backbone of the Muni system and would be high priorities for service and customer amenity enhancements.

- Local Network: These bus routes complement and connect to the Rapid Network to create the core network, allowing passengers to get to most destinations in San Francisco with no more than one transfer.

- Community Connectors: This category includes lightly-used bus routes that circulate through San Francisco's hillside residential neighborhoods to fill in gaps in coverage and connect passengers to the core network.

- Specialized Services: These routes augment all-day service to address focused transit needs. They include commuter express routes, and connections to BART and Caltrain stations, and special weekend football service.

Action A.3: Revise service standards and policies to integrate the tiered-service network concept and include frequency and span of service, customer stop amenities, stop spacing and transit preferential infrastructure. These standards and policies must address how service is distributed across the transit system and must ensure that the manner of the distribution affords all users access to these assets, regardless of race, color, national origin or low-income status.

Action A.4: Better inform customers about relative service levels by incorporating the tiered-service strategy into customer service information such as system maps, transit stop and vehicle signage.

B. Objective: Deliver efficient transit service

Measuring the efficiency of the service by tier classification and assigning resources to best fit the customer demands will ensure that service continues to improve and quality transit is consistently delivered.

Action B.1: Use service performance standards to provide a quantitative assessment of the quality and productivity of the service.

Action B.2: Use right-of-way performance standards to provide a quantitative assessment of the physical performance of streets where transit operates and

to help prioritize traffic operation changes and capital investments to improve transit reliability and travel time.

Action B.3: Develop and implement an annual qualitative and quantitative evaluation process that measures performance for routes within a given service tier and develop strategies to enhance top performers and strengthen low performers. As part of this process consider the need to re-classify routes to respond to changing customer patterns or service demand.

Action B.4: Align transit vehicle capacity with route demand and roadway geometric constraints. Assess customer demand and assign vehicles by tier level and by priority and demand within those tiers to minimize crowding. Consider larger vehicles on a route if they can meet demand at equal or lower operating costs while still maintaining minimum policy frequencies.

C. Objective: Improve transit service reliability and reduce transit travel time

Providing reliable transit service depends on operator availability, well designed schedules, infrastructure in a state of good repair, strong supervision and transit priority on city streets. Providing quick transit service depends on reducing exposure to auto congestion and delays at intersections, maximizing protective right-of-ways, speeding up boarding time and optimizing stop spacing. These improvements limit delay for transit vehicles while traveling and at transit stops.

Action C.1: Implement SFMTA's Strategic Plan actions as they relate to systemwide reliability initiatives such as dynamic supervision and vehicle replacement.

Action C2: Give transit the highest priority when evaluating multimodal tradeoffs on the Rapid Network and avoid strategies that reduce transit reliability and/or transit travel times.

Action C.3: Implement transportation network changes that reduce transit exposure to automobile congestion with traffic engineering tools including, but not limited to lane modifications, traffic signal and stop sign changes, transit stop changes, and parking and turn restrictions.

Action C.4: Enhance transit supportive infrastructure such as transit bulbs, pedestrian crossing paths, and accessible platforms at light rail stops that will provide efficient and safe passenger boarding and reduce delay.

Action C.5: Review existing stop spacing standards that optimize access to the system while minimizing travel time delay. Standards take into consideration street and sidewalk grades, adjacent land-use, neighborhood street grid distances as well as mode of travel (e.g., bus or rail).

D. Objective: Improve customer experience

Delivering high quality service, including appropriate frequency, span of service, and stop amenities, will improve the customer experience of Muni.

Action D.1: Apply frequency and crowding standards by tier level to maximize passenger comfort and establishing minimum service level expectations for each classification.

Action D.2: Apply span of service (hours of day) standards by tier level to provide minimum hours of service for each classification.

Action D.3: Apply stop amenities that result in an informed transit experience and improve customer access to transit. Stop amenity standards will include minimum levels of amenities by tier for installation of shelters, maps, stop Identification Numbers, real time arrival displays and bicycle connectivity enhancements.

Action D.4: Integrate Muni service with the regional transit system to facilitate a seamless customer experience through convenient transfers and integrated Clipper fare media.

A.4.2 Program-Level Service-Related Capital Improvements

Program-level Service-related Capital Improvements include three TTPI projects (TTPI.2, TTPI.3, and TTPI.4), one OWE project (OWE.6), and one SCI project (SCI.1), described below in Table 4. While the general location and description of the Service-related Capital Improvements are known, the specific designs are not. Therefore, a general description of the projects and potential construction requirements is provided. As explained above for the program-level TTRPs in Section A.3.4, on p. 14, when the specific locations and designs are not needed to evaluate a particular CEQA topic, the program-level Service-related Capital Improvements may be cleared at a project level for that topic.

Table 4: Description of Program-Level Service-related Capital Improvements

TEP Reference No.	Project Name	Project Description
Terminal and Transfer Point Improvements		
TTPI.2	Lyon Street / Richardson Avenue Bus Stop – Transfer Point	This project would install a bus stop/transfer point at Lyon Street and Richardson Avenue to facilitate connections between the Rapid Network 28L 19th Avenue Limited and regional transit service provided by Golden Gate Transit. The new transfer point would replace the 28L 19th Avenue Limited transfer point currently located at the Golden Gate Bridge toll plaza, which would no longer be served by the 28L with implementation of the TEP. The 28 19th Avenue (local service) customers would continue to transfer at the Golden Gate Bridge toll plaza. Potential improvements may include changes to pedestrian access and the construction of a transit bulb.
TTPI.3	E Embarcadero Line Independent Terminal at Jones Street/Beach Street Reconfigured F Market & Wharves terminal to facilitate E Embarcadero operation	This project would involve development of a new independent terminal stop for the E Embarcadero Line at the north end of the route near Jones and Beach streets. A separate stop would facilitate independent movements of E Embarcadero and F Market & Wharves streetcars at its northern terminus, which would improve reliability for both routes by allowing for independent terminal departures and preventing trains on one route from getting delayed behind trains from the other route. Development of the new terminal would require the installation of new bypass rails, track work turnouts, track switches, and overhead wires and poles, and possibly sidewalk modifications.
TTPI.4	San Francisco General Hospital Transfer Point	This project would design and implement a new transfer hub in the vicinity of San Francisco General Hospital on Potrero Avenue between 23rd and 24th streets. The proposed transfer point improvements would facilitate transfers between Routes 9 San Bruno Local/9L San Bruno Limited, 10 Townsend, 19 Polk, 48 Quintara-24th Street and the proposed new 58 24th Street. Improvements may include rerouting bus service on several lines to a shared transit stop, parking removal to accommodate longer transit zones, and the construction of transit bulbs.
Overhead Wire Expansion Project		
OWE.6	New Overhead Wiring – 6 Parnassus Extension to West Portal Station	This project would provide a direct connection to Muni Metro light rail service at the West Portal Station for customers on the west side of Twin Peaks and in the western portions of the Haight and Cole Valley neighborhoods. The 6 Parnassus currently terminates at 14th Avenue and Quintara Street. Construction of two-way overhead wiring would extend the 6 Parnassus from the existing terminal to the West Portal Station via 14th Avenue and Taraval Street, looping into the station along one-way overhead wiring on nearby streets. Construction of overhead wiring and overhead infrastructure (e.g., pole foundations and duct banks) would be required. A terminal near the West Portal Station would also have to be established.

TEP Reference No.	Project Name	Project Description
Systemwide Capital Infrastructure		
SCI.1	Accessible Platforms	This project would include the construction of additional accessible platforms along the surface portions of the light rail system to expand the number of accessible stops, which would reduce the distance between accessible platforms and allow Muni customers with mobility impairments to better utilize the light rail system. Accessible platforms could be standalone structures or integrated into low level boarding platforms. In both instances, a ramp would lead to an elevated platform with Americans with Disabilities Act-compliant tactile warning surfaces along the edge of the elevated section to identify the raised curb for people with visual impairments. Factors such as roadway width and grade, driveways, and community preference would dictate the final design. The typical dimensions of an accessible surface platform are 60 inches by 90 inches, including 24 inches of detectable warning at the platform edge. Ramps have a minimum width of 48 inches with the length dependent on the roadway grade. The height of platforms varies by location but in general the platform is approximately three and one half feet tall with an additional height of three feet for the open railing. A technical study would be required to determine the total number and locations of additional platforms.

A.4.3 Program-Level Travel Time Reduction Proposals

As previously described on pp. 17-19, the SFMTA has identified a set of 18 traffic engineering changes, referred to as the TPS Toolkit elements, which are comprised of elements that it routinely uses elsewhere in the City in order to facilitate transit service. A number of these elements have already been applied by the SFMTA as part of its ongoing TPS program for other projects, such as the installation of transit-only lanes on the Mission Street corridor in the Downtown area, as well as the incorporation of treatments into larger projects, such as transit bulb installation in the Divisadero Great Streets project. Elements of the TPS Toolkit would be implemented as part of the 17 TTRPs planned for the Rapid Network. The TTRPs are comprised of combinations of TPS Toolkit elements that would improve transit travel times by minimizing sources of transit delay such as traffic congestion, unnecessary stops at intersections, closely-spaced transit stops, and slow boarding times. The TEP project-level and program-level TTRPs are all on the Rapid Network.

A.4.3.1 Description of TPS Toolkit Elements [14]

TPS Toolkit elements that would be applied to the TTRPs are described in detail below. Each of the 18 TPS Toolkit elements has been grouped in one of five categories: transit stop changes, lane modifications, parking and turn restrictions, traffic signal and stop sign changes, and pedestrian improvements. In some instances, the implementation of TPS Toolkit elements would result in parking or loading removal or the creation of parking or loading spaces. Parking and loading removal or the creation of parking or loading spaces could result in the related removal or installation of parking meters, street signs, or curb paint, which would be completed in accordance with standard procedures for street work within the City. Other physical changes, such as striping changes (paint application and removal), lane color changes (through paint application), curb ramp installations or relocations, and signage modifications may be necessary to install these elements. While the TPS Toolkit elements are program-level components of the TEP, in some cases the specific locations of the TPS Toolkit elements along corridors are not needed to evaluate a particular CEQA topic. In these cases, the program-level TPS Toolkit elements may be cleared at a project-level for that specific topic.

Transit Stop Changes

Proposed transit stop changes include removing or consolidating transit stops, optimizing transit stop locations at intersections, installing transit bulbs or transit boarding islands, optimizing transit stop lengths and converting flag stops to bus zones.[15] Each of these elements is described in detail below.

1. Remove or Consolidate Transit Stops. Removing closely spaced transit stops can decrease transit travel times by reducing the frequency that transit vehicles must stop to pick-up and drop-off passengers. As described on p. 27, existing stop-spacing standards would be reassessed as part of the actions identified in the Policy Framework. Consolidating transit stops involves removing two consecutive transit

[14] Unless noted otherwise, descriptions of the Transit Preferential Streets Toolkit Elements are based on the following report: *Travel Time Reduction Proposals: Transit Preferential Toolkit*, December 6, 2012, prepared by SFMTA Transportation Engineering. A copy of this document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of case file 2011.0558E.

[15] A flag stop is a bus stop without a designated curbside bus zone. A bus zone is a striped, signed curbside bus stop where vehicle parking is prohibited. Zones vary in length depending on the type and number of buses serving the stop.

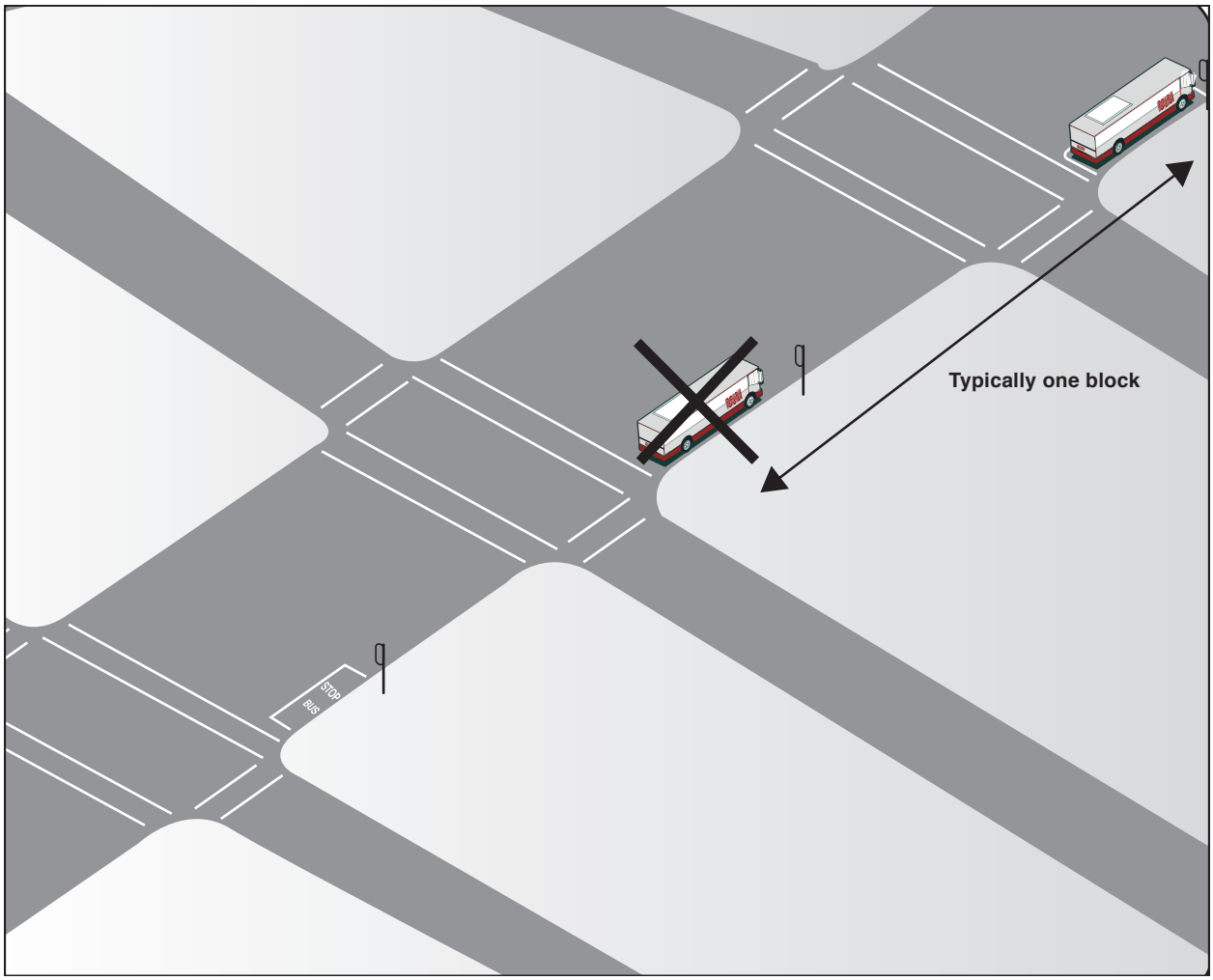
stops along a transit route and establishing a new transit stop at an intermediate location (see Figure 4a).

When selecting stop locations to be consolidated or removed, street grades and surrounding land uses, transfers to intersecting routes, volume of boardings and alightings at the transit stop, along with distances between stops are considered. Removing or consolidating stops with existing transit zones may result in the availability of additional curb space that could be used for new on-street parking, bicycle parking, parklets, or parking restrictions at intersection approaches to improve pedestrian visibility and sight distance. The City installs accessible curb ramps that eliminate the curb step-up and provide access for persons in wheelchairs or with other mobility impairments at many intersections in the City. Should a new or relocated stop be constructed adjacent to an inaccessible sidewalk, a curb ramp would also be constructed. Construction of curb ramps could include excavation in those areas of up to two feet below ground surface (bgs).

2. Optimize Transit Stop Locations at Intersections. Optimizing transit stop locations at intersections can decrease transit travel times by reducing the number of times transit vehicles stop at intersections. Figure 4b shows how optimizing transit stop locations at intersections would be applied in the case of a traffic signal-controlled intersection.

At stop sign-controlled intersections,[16] it is generally recommended that transit stops be located on the nearside of the intersection to enable transit vehicles to conduct customer pick-up and drop-off while stopped at the stop sign, rather than needing to stop a second time to conduct customer pick-up and drop-off on the farside of the intersection. At traffic signal-controlled intersections, it is generally recommended that transit stops be located on the farside of the intersection to allow transit vehicles to take advantage of existing and planned transit signal priority improvements that could allow traffic signals to be programmed to hold green signals for approaching transit vehicles.

[16] Intersections could be signalized where all approaches are controlled by a traffic signal, stop-controlled where either all approaches have a stop sign or two of the approaches have a stop sign, yield-controlled where one or more approach yields the right-of-way to the other approaches, or uncontrolled where traffic generally does not need to stop.



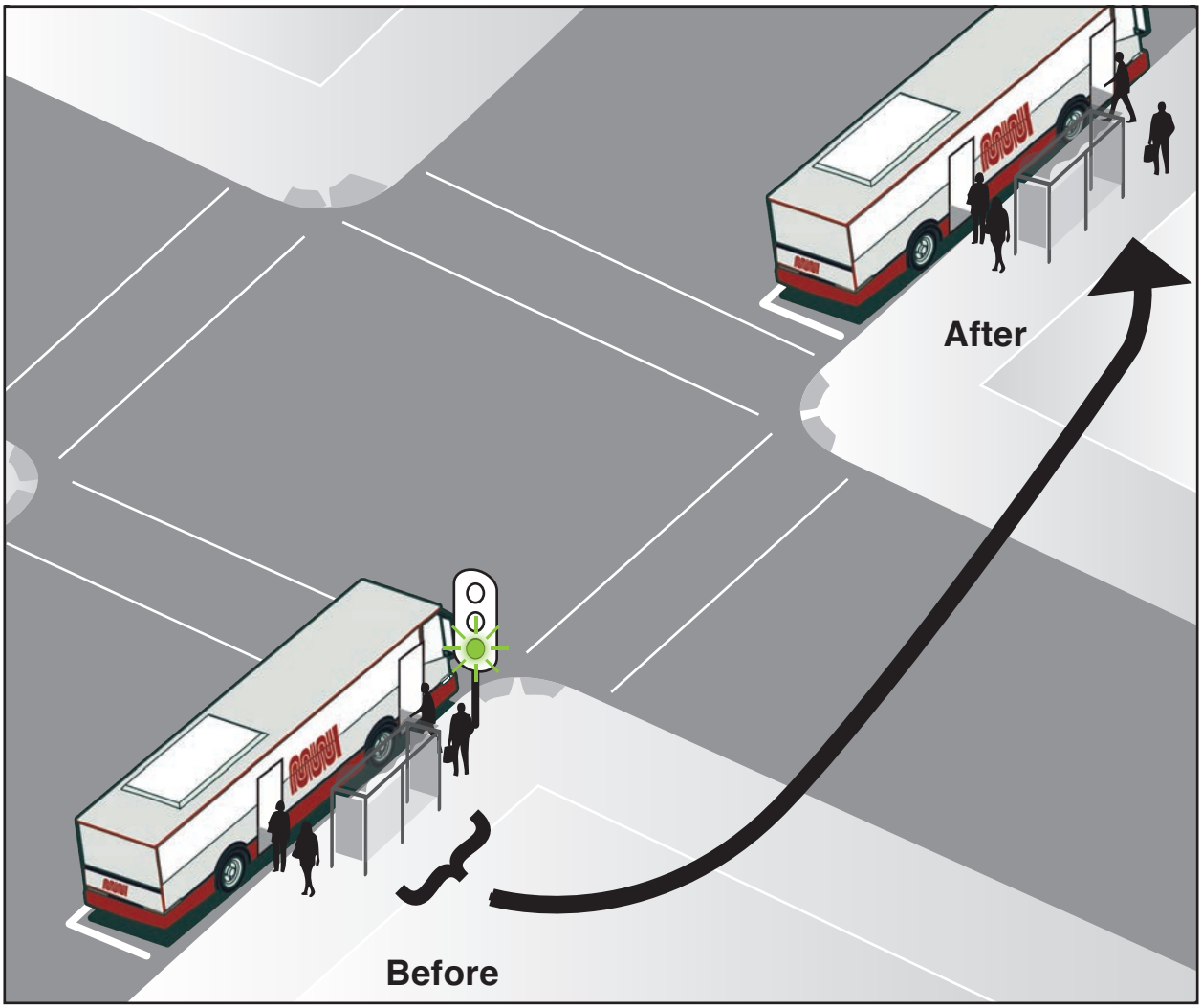
Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Remove or Consolidate Transit Stops. Removing closely spaced transit stops can decrease transit travel times by reducing the frequency that transit vehicles must stop to pick up and drop off passengers. Consolidating transit stops involves removing two adjacent transit stops and establishing a new transit stop at an intermediate location. Removing or consolidating stops with existing transit zones may result in the availability of additional curb space that could be used for new on-street parking, bicycle parking, parklets, or parking restrictions at intersection approaches to improve pedestrian visibility and sight distance.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4a - REMOVE OR CONSOLIDATE TRANSIT STOPS



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Optimize Transit Stop Locations at Intersections. Optimizing transit stop locations at intersections can decrease transit travel times by reducing the number of times transit vehicles stop at intersections. At stop sign-controlled intersections, it is generally recommended that transit stops be located on the nearside of the intersection to enable transit vehicles to pick-up and drop-off passengers while stopped at the stop sign, rather than needing to stop a second time to conduct passenger pick-up and drop-off on the farside of the intersection. At traffic signal-controlled intersections, it is generally recommended that transit stops be located on the farside of the intersection, as depicted above, to allow transit vehicles to take advantage of existing and planned transit signal priority improvements that could allow traffic signals to hold green signals for approaching transit vehicles.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

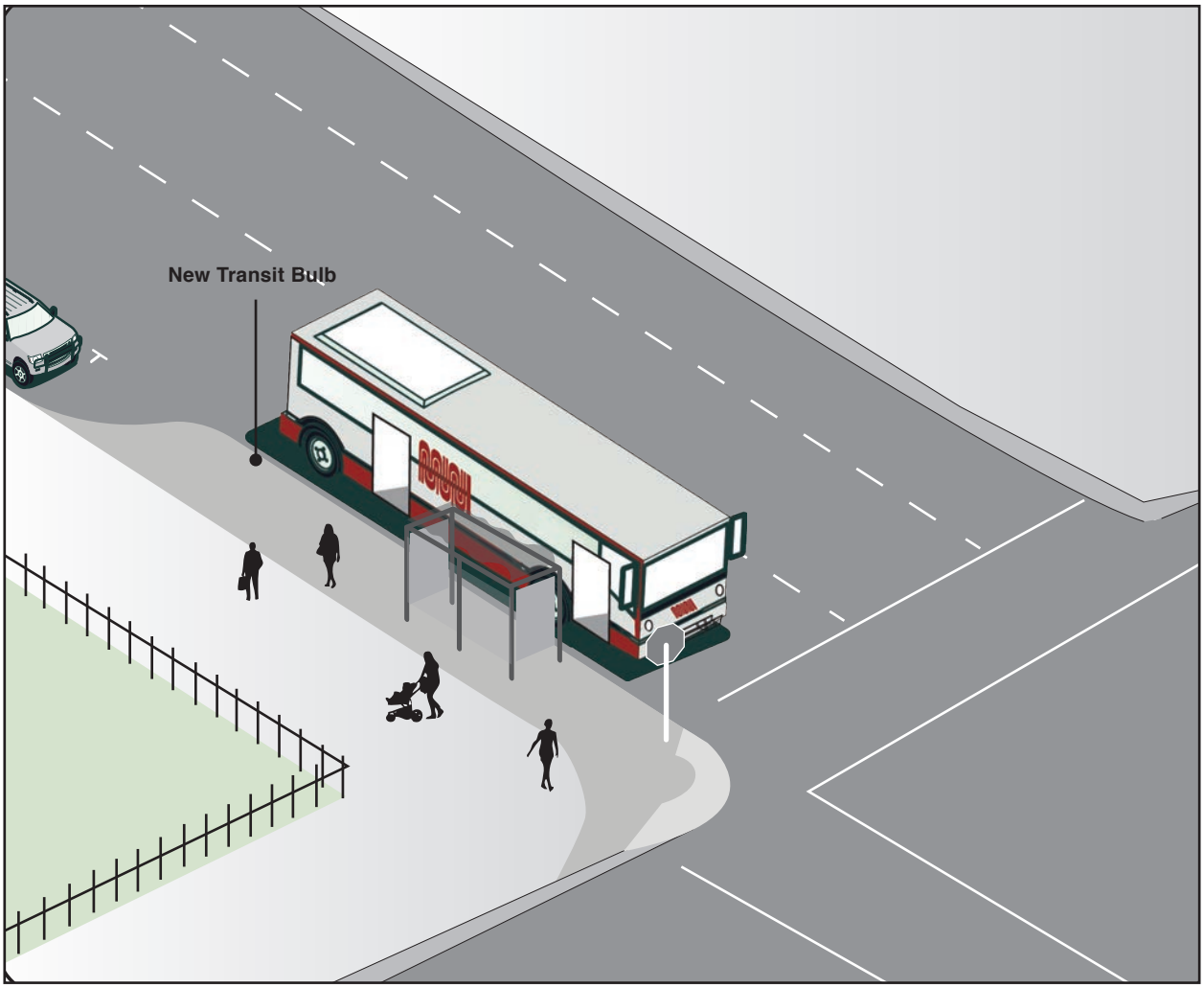
TRANSIT EFFECTIVENESS PROJECT

FIGURE 4b - OPTIMIZE TRANSIT STOP LOCATIONS AT INTERSECTIONS

Relocating transit stops from the nearside to the farside of an intersection or vice versa could require removing curbside parking from the new stop location; in most cases, some or all of the parking could be replaced at the former stop location. In addition, the City has installed accessible curb ramps at many intersections. Should a relocated stop be built adjacent to an inaccessible sidewalk, a curb ramp would also need to be constructed. Construction of curb ramps could include excavation in those areas of up to two feet bgs.

3. Install Transit Bulbs. Transit bulbs are sidewalk extensions at the location of a transit stop, typically about the same width as the adjoining parking lane. Transit bulbs can reduce transit travel times on bus routes by eliminating the need for buses to exit and re-enter the flow of traffic to access curbside transit stops. Transit bulbs can reduce transit travel times on rail lines by providing a place for boarding passengers to wait directly adjacent to a stopped light rail vehicle (LRV), thereby eliminating the time needed for passengers to walk from the curb across a parking lane to the LRV. Figure 4c shows an example of a transit bulb that is the entire length of a transit vehicle. Transit bulbs also provide added space for customer amenities, such as shelters. Additionally, transit bulbs can improve pedestrian safety by shortening the street crossing distance, improving the visibility of pedestrians, reducing the speed of turning traffic and reducing sidewalk crowding at transit stop locations (refer also to the discussion of pedestrian bulbs on p. 56). Where physical limitations exist, transit bulbs could be designed to facilitate boarding and alighting from the front door only (rear door boarding and alighting along the street would still be available).

Transit bulbs would typically be approximately six feet wide and would range in length from 35 to 65 feet (one bus) to 80 to 130 feet (two buses) with an additional transition area of approximately 20 feet, depending on the location. Along light rail lines, transit bulbs would be up to 18 feet wide to enable passengers to board the train directly from the transit bulb on streets with wider parking lanes. In many locations, installation of transit bulbs may require subsurface construction to relocate catch basins and storm sewers that capture and direct storm water runoff into the combined sewer or stormwater system. Catch basins are usually located at or near street corners. In most instances, transit bulbs would be built at existing transit zones and would not require removing additional parking. In some instances, parking would need to be removed. Transit bulbs may require that a curb ramp be rebuilt, or in



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Install Transit Bulbs. Transit bulbs are sidewalk extensions at the location of a transit stop, typically about the same width as the adjoining parking lane. They can reduce transit travel times on bus routes by eliminating the need for buses to exit and re-enter the flow of traffic to access curbside transit stops and on rail lines by providing a place for boarding passengers to wait directly adjacent to a stopped light rail vehicle (LRV), thereby eliminating the time needed for passengers to walk from the curb across a parking lane to the LRV. Transit bulbs also provide added space for customer amenities such as shelters, improve pedestrian safety by shortening the street crossing distance, and reduce the speed of turning traffic, as well as reducing sidewalk crowding at transit stop locations.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

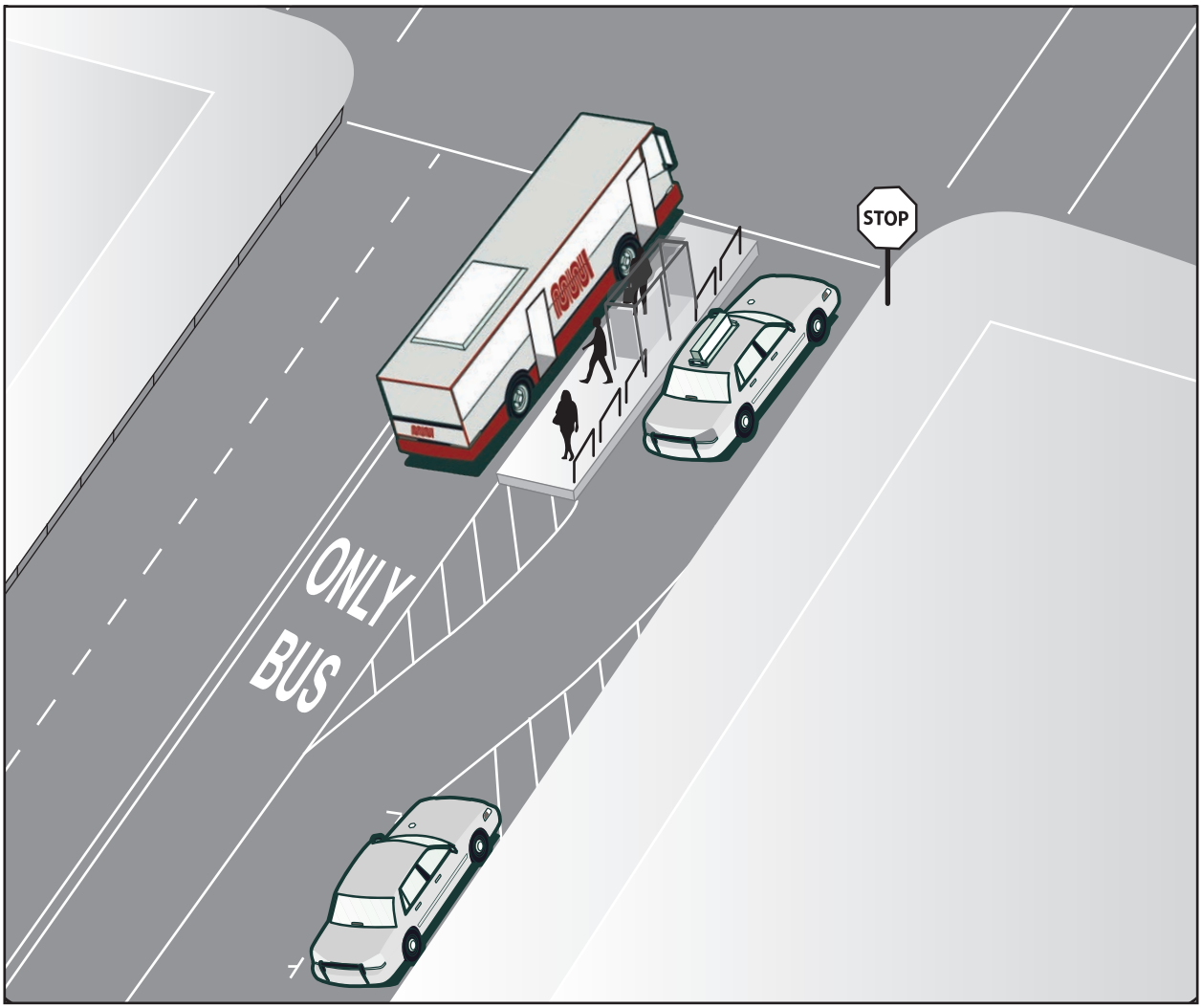
FIGURE 4c - INSTALL TRANSIT BULBS

places where none exists, a curb ramp may be added. Construction of curb ramps and other utility relocation, as well as the installation of the concrete base for the transit bulb could include excavation of up to two feet bgs.

4. Install Transit Boarding Islands. Transit boarding islands are raised islands within the street that allow transit vehicles to use a center lane within the roadway to pick up and drop off passengers at transit stops. As shown in Figure 4d, transit boarding islands can reduce transit travel times on bus routes by eliminating the need for buses to exit and re-enter the flow of traffic to access curbside transit stops. Transit boarding islands also allow the bus to avoid the curb lane, which is generally slower as a result of parking maneuvers, right turns and illegal double parking. Transit boarding islands can reduce transit travel times on rail lines that operate on fixed guideways in the center of the street by providing a place for boarding passengers to wait directly adjacent to a stopped LRV, thereby eliminating the time needed for passengers to walk from the curb to the LRV.

New transit boarding islands would require curb ramps. Boarding islands are typically up to nine feet in width and vary in length depending on the vehicles using the island. A transit island anticipated to be used by two buses would typically be 80 to 130 feet long and a minimum of eight feet wide to allow for wheelchair lift deployment. A transit island that serves LRVs is typically 80 to 160 feet long. In most instances, boarding islands would be built at existing transit zones and would require the removal of parking to accommodate shifting mixed-flow lanes into the parking lane to accommodate the boarding island. In some instances, parking would not need to be removed as part of constructing a transit boarding island. Curb ramps may be needed to provide access to boarding islands. Construction of curb ramps and any ancillary utility relocation, as well as the installation of the concrete base for the transit island could include excavation of up to two feet bgs.

5. Optimize Transit Stop Lengths. Optimizing transit stop lengths can reduce transit travel times by providing space for all doors of a transit vehicle to align with the curb or boarding island or by providing space for multiple buses to pick-up and drop-off passengers at a bus stop concurrently (see Figure 4e). Most transit stops are designed to accommodate the arrival and departure of one bus at a time; however, where transit stops serve multiple bus routes and/or bus routes with frequent service, transit stops would be designed to accommodate multiple buses at the same time, thereby reducing the delay associated with a second bus waiting to access a transit stop to pick up and drop off passengers.



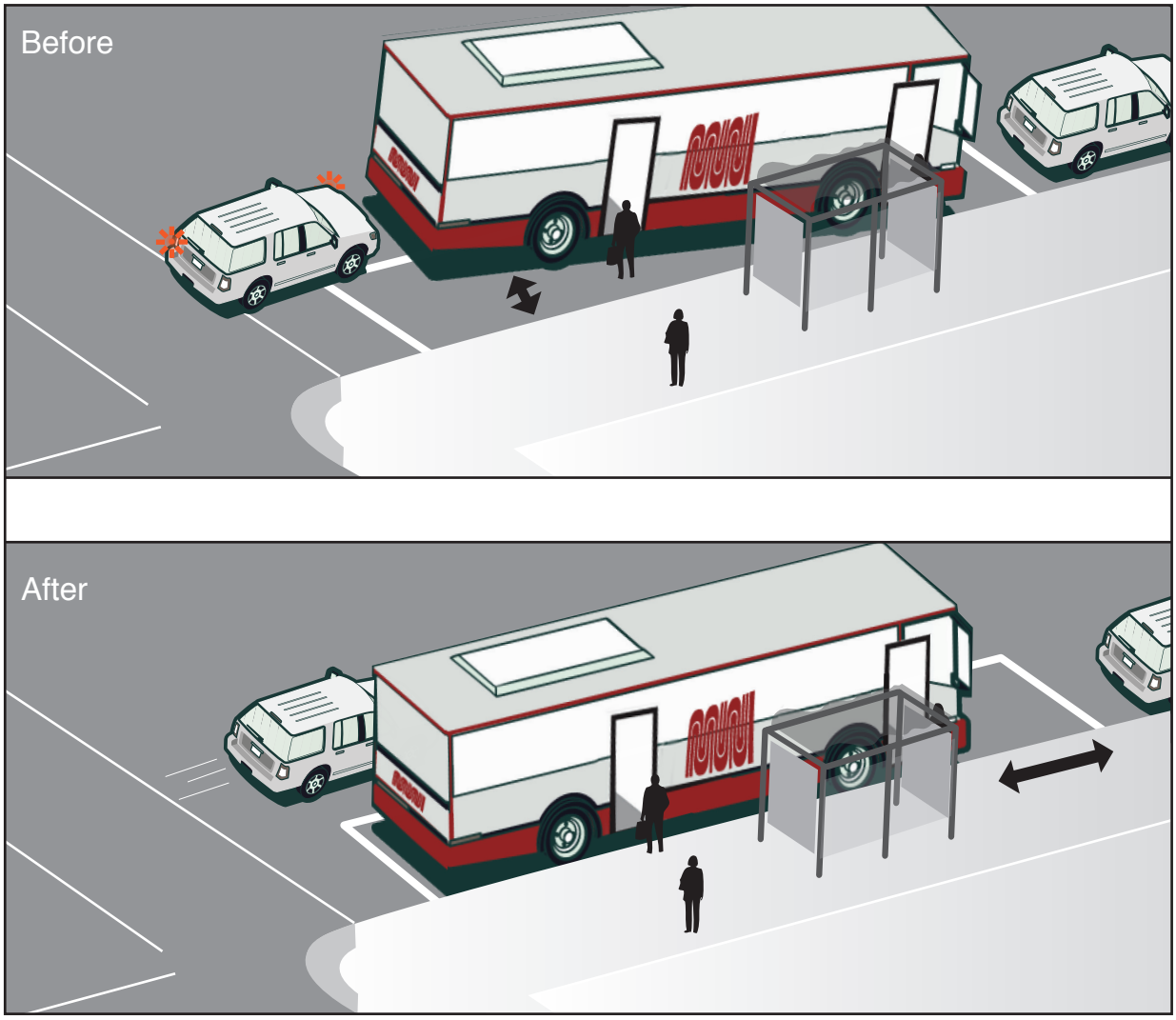
Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Install Transit Boarding Islands. Transit boarding islands are raised islands within the street that allow transit vehicles to use a center lane within the roadway to pick-up and drop-off passengers at transit stops. They can reduce transit travel times on bus routes by eliminating the need for buses to exit and re-enter the flow of traffic to access curbside transit stops. Transit boarding islands also allow the bus to avoid the curb lane, which is generally slower as a result of parking maneuvers, right turns and illegal double parking. Transit boarding islands can reduce transit travel times on rail lines that operate on fixed guideways in the center of the street by providing a place for boarding passengers to wait directly adjacent to a stopped light rail vehicle (LRV), thereby eliminating the time needed for passengers to walk from the curb to the LRV.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4d - INSTALL TRANSIT BOARDING ISLANDS



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Optimize Transit Stop Lengths. Optimizing transit stop lengths can reduce transit travel times by providing space for all doors of a transit vehicle to align with the curb or boarding island or by providing space for multiple buses to pick up and drop off passengers at a bus stop concurrently. Most transit stops are designed to accommodate the arrival and departure of one bus at a time; however, where transit stops serve multiple bus routes and/or bus routes with frequent service, transit stops would be designed to accommodate multiple buses at the same time, thereby reducing the delay associated with a second bus waiting to access a transit stop to pick-up and drop-off passengers.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

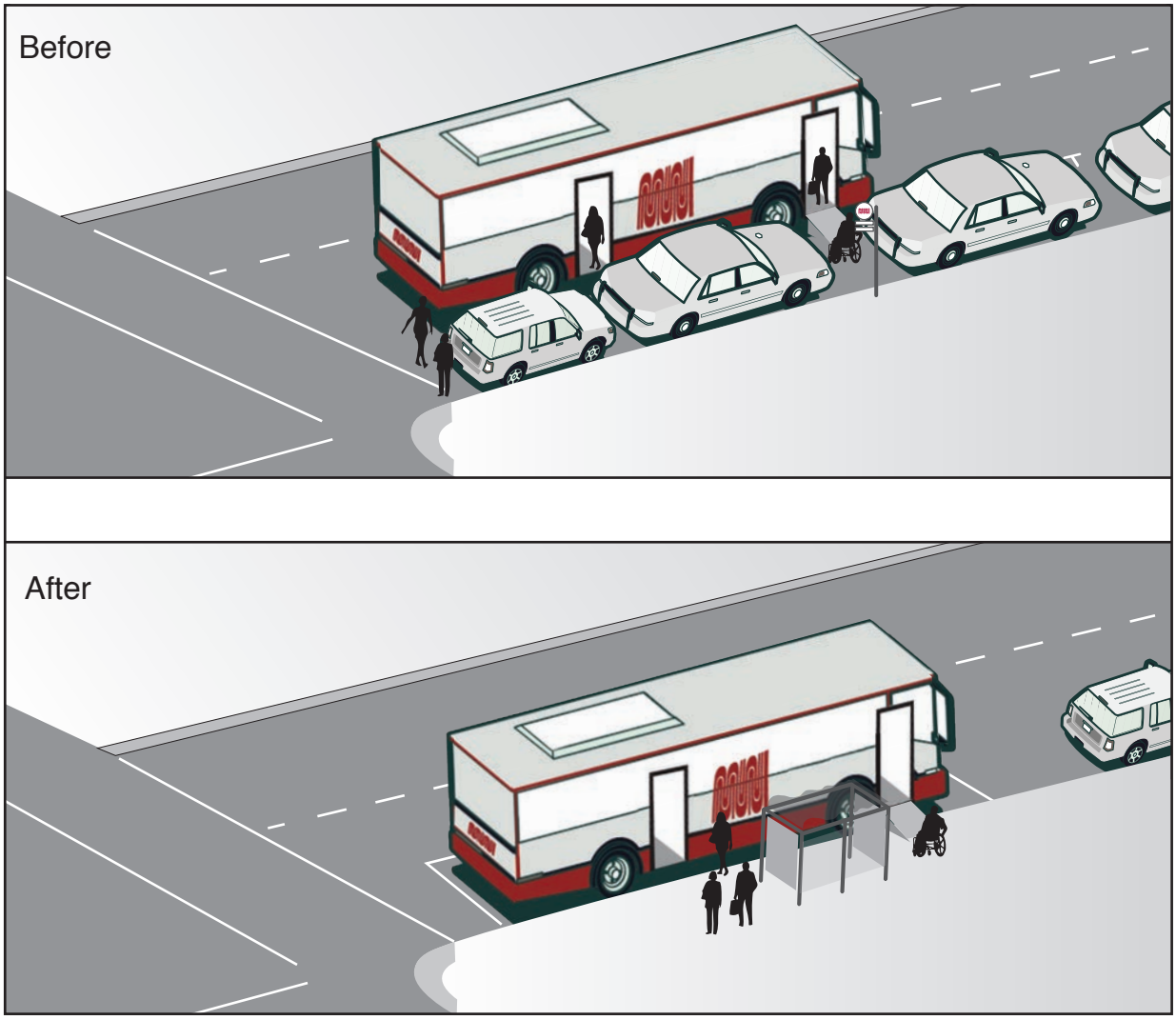
TRANSIT EFFECTIVENESS PROJECT

FIGURE 4e - OPTIMIZE TRANSIT STOP LENGTHS

Optimal transit stop length depends on multiple factors, including service frequency, number of boardings and alightings, vehicle type and location of stop. Transit stops are generally 80 to 165 feet in length at farside stops, 100 to 185 feet in length at nearside stops, and 140 to 210 feet in length at mid-block stops, depending on the type and frequency of buses the transit stop serves. These transit stops may be longer than 210 feet at transit stops with very frequent service and/or multiple routes. In addition, transit stops located at the farside of intersections where buses make right turns are designed to be 135 to 220 feet in length to allow buses to straighten out after completing the turn. Where existing transit stops are lengthened, any parking in the extended transit zone would be eliminated. Optimizing transit stop lengths may require that a curb ramp be rebuilt, or, in places where none exists, that a curb ramp be added. Installation of striping for new transit zones and signage or parking meter additions/removals would likely be the extent of required physical changes necessary to extend the transit zone. Therefore, no excavation is anticipated for the implementation of this element.

6. Convert Flag Stops to Transit Zones. A flag stop (also referred to as a pole stop) is defined as a transit stop without a designated curbside zone and where parking is not restricted. Some flag stops are located on streets without parking, in which case the bus can either stop in the mixed-flow lane or pull over to the curb. At flag stops adjacent to on-street parking, all passengers, including wheelchair users, must board and exit buses in the street since the bus cannot pull to the curb.

Converting flag stops adjacent to an existing parking lane into a transit zone can reduce transit travel times by allowing passengers to be picked up and dropped off at the curb adjacent to the sidewalk instead of in the street. Figure 4f illustrates the difference between how buses serve passengers at flag stops and transit zones. Transit zones also provide bus operators with a clear line-of-sight to see waiting passengers and to pull alongside the curb, improving transit accessibility and customer convenience. Existing parking located at a new transit zone would need to be eliminated. In addition, as described above, the City has constructed accessible curb ramps at many intersections. Should the conversion of a flag stop to a transit zone occur adjacent to an inaccessible sidewalk, a curb ramp would need to be constructed. Construction of curb ramps and any ancillary utility relocation could include excavation of up to two feet bgs.



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Convert Flag Stops to Transit Zones. A flag stop (also referred to as a pole stop) is a transit stop without a designated curbside zone and where parking is not restricted. Some flag stops are located on streets without parking, in which case the bus can either stop in the mixed-flow lane or pull over to the curb. At flag stops adjacent to on-street parking, all passengers, including wheelchair users, must board and exit buses in the street since the bus cannot pull to the curb. Converting flag stops to transit zones can reduce transit travel times by allowing passengers to be picked up and dropped off at the curb adjacent to the sidewalk instead of in the street.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4f - CONVERT FLAG STOPS TO TRANSIT ZONES

Lane Modifications

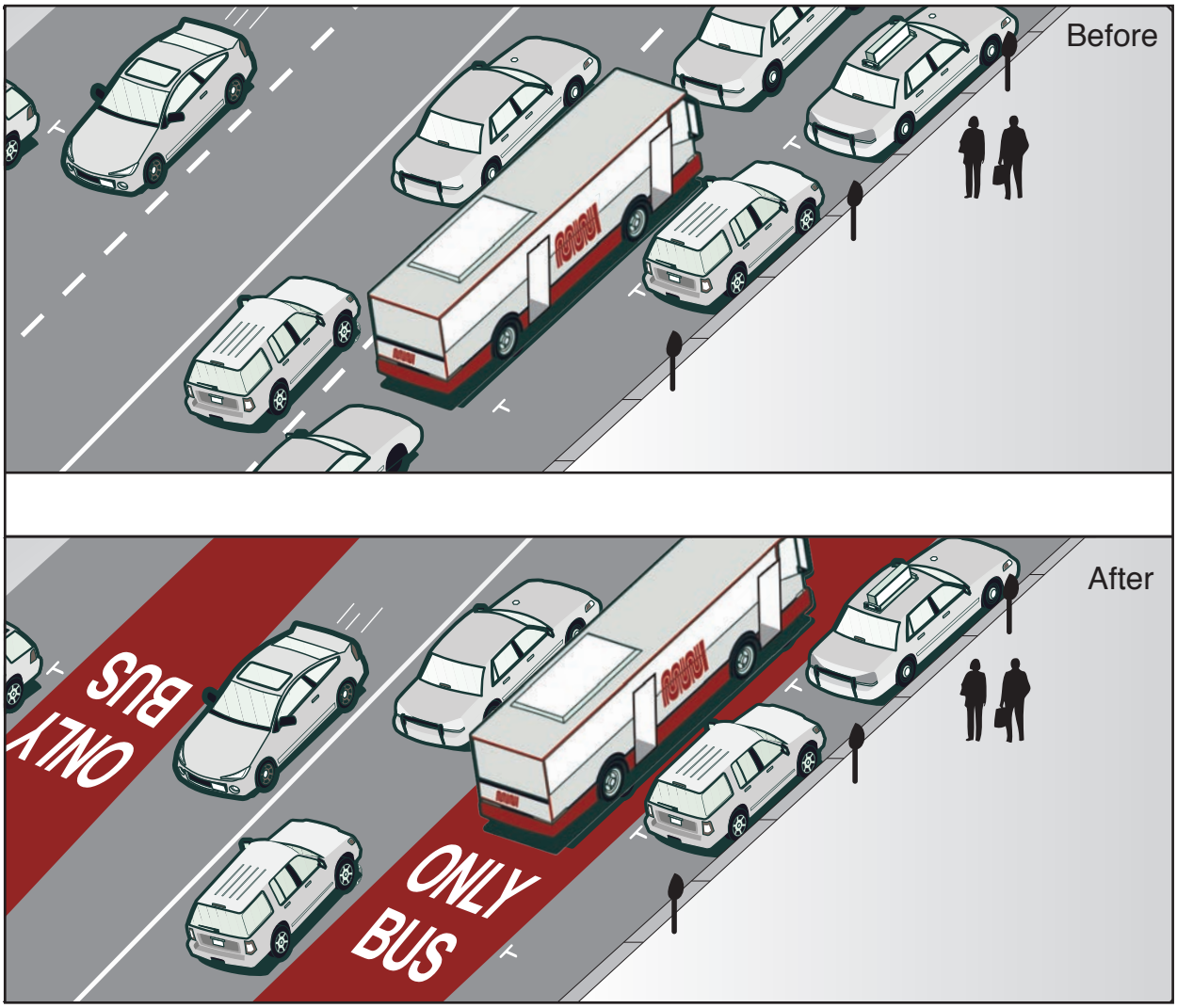
Lane modification proposals would change the configuration of travel and parking lanes within the existing right-of-way, typically with striping and signage. Proposed lane modifications include creating transit-only lanes, creating transit queue jump/bypass lanes, creating dedicated turn lanes, and widening mixed-flow lanes by reducing the number of mixed-flow lanes. Each of these elements is described in detail below.

7. Establish Transit-Only Lanes. A transit-only lane is a travel lane that is dedicated for the exclusive use of transit vehicles. Transit-only lanes are typically identified with signs and pavement markings. Implementation of transit-only lanes under the proposed project could include the application of red color to the pavement of the transit-only lane using special paint. The SFMTA is considering the use of red paint for transit-only lanes to improve their efficacy by making them more visibly prominent to non-transit vehicles.[17] A pilot project has been approved to test the effectiveness of transit-only lanes demarcated with red paint on a portion of Church Street between Duboce Avenue and 16th Street along the TTRP.J route. This pilot project received separate environmental clearance.[18]

Transit-only lanes can reduce transit travel times by allowing transit vehicles to bypass traffic congestion and avoid conflicts with other vehicles in mixed-flow lanes. Transit-only lanes are typically 11 to 13 feet in width (depending on the operating environment) and at least one block long. Figure 4g depicts how a transit-only lane would operate. Transit-only lanes are typically considered on streets with two or more mixed-flow lanes in the same direction. Non-transit vehicles are generally permitted to enter transit-only lanes to access curbside parking or to complete a turn, unless specifically prohibited. Emergency vehicles may use transit-only lanes at all times, and often taxis may also use these lanes. Transit-only lanes can be created by converting an existing mixed-flow lane or by removing a parking lane. Transit-only

[17] In order to use red paint for transit-only lanes, the SFMTA would need permission from the CTCDC. The CTCDC has suggested that lanes demarcated with a solid red pavement color be 24-hour transit-only lanes, rather than posted for specific hours with non-transit use of the lane permitted outside those posted hours. The CTCDC has approved a pilot implementation of red pavement color transit lanes.

[18] Case No. 2012.1141E - Church Street Transit-only Lane Pilot Project. Information on this pilot project is available at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of the specified case file number.



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Establish Transit-Only Lanes. A transit-only lane is a travel lane that is dedicated for the exclusive use of transit vehicles. Transit-only lanes are typically identified with signs and pavement markings. Transit-only lanes can reduce transit travel times by allowing transit vehicles to bypass traffic congestion and avoid conflicts with other vehicles in mixed travel lanes. Non-transit vehicles are generally permitted to enter transit-only lanes to access curbside parking or to complete a turn, unless specifically prohibited. Emergency vehicles may use transit-only lanes at all times, and often taxis may also use these lanes. Transit-only lanes can be created by removing an existing travel lane or by removing a parking lane.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

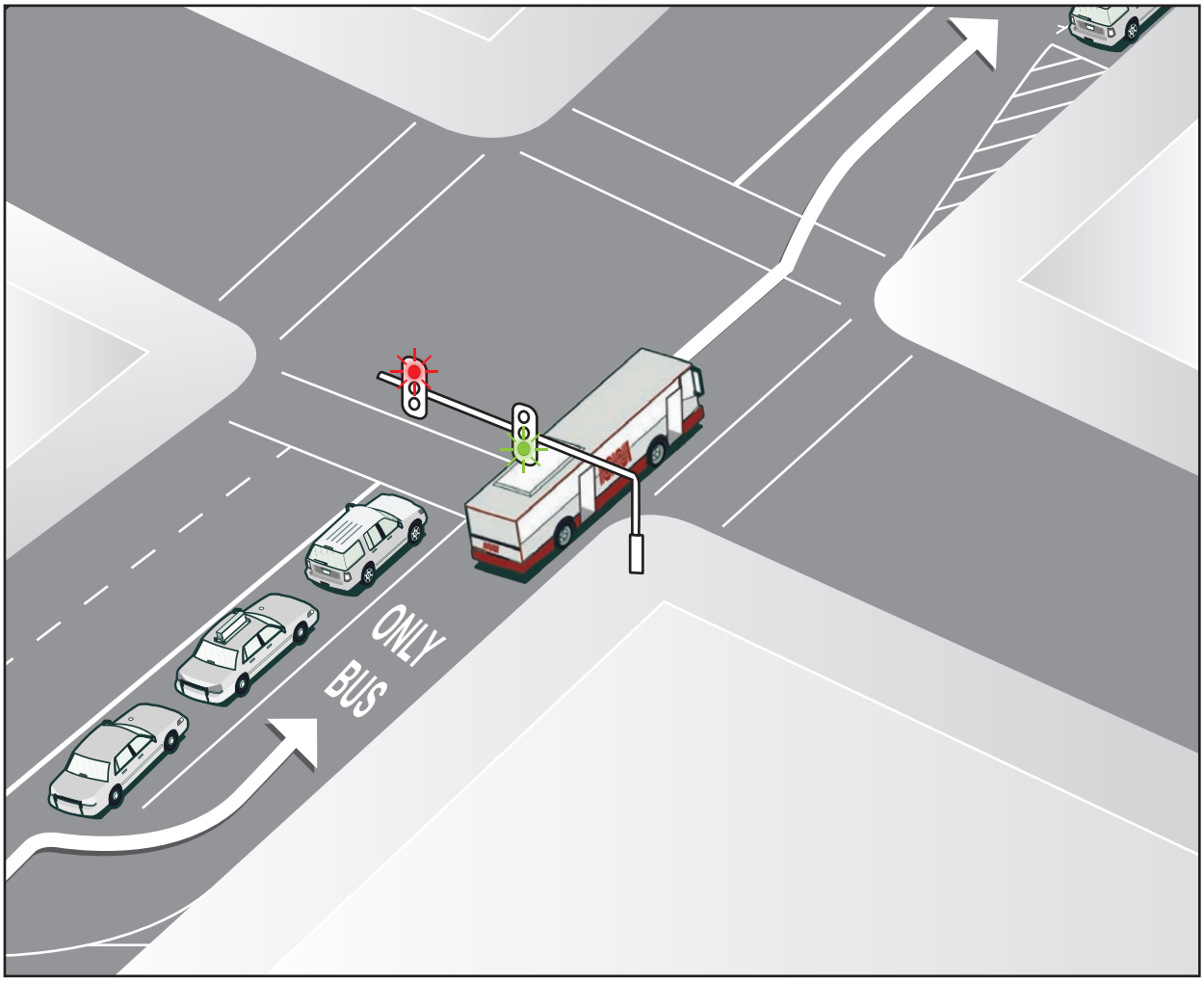
TRANSIT EFFECTIVENESS PROJECT

FIGURE 4g - ESTABLISH TRANSIT-ONLY LANES

lanes could be dedicated full-time or only for certain hours of the day, such as during peak traffic hours which vary by roadway segment but are generally between 7 to 9 a.m. and 4 to 6 p.m. For example, transit-only lanes may be created in wide parking lanes with peak-period parking restrictions and tow-away. Installation of striping and paint color on the lane pavement for new transit-only lanes as well as appropriate signage would be the anticipated extent of physical changes needed to install the transit-only lane. Therefore, no excavation is anticipated for the implementation of this element.

8. Establish Transit Queue Jump/Bypass Lanes. Transit queue jump/bypass lanes can reduce transit travel times by providing priority to transit vehicles at signalized intersections. A transit queue jump/bypass lane allows transit vehicles to bypass general traffic stopped at a signalized intersection and move through the intersection ahead of general traffic by using an exclusive traffic signal phase for the transit vehicles. Figure 4h illustrates a transit queue jump/bypass lane at a signalized intersection. A transit queue jump/bypass lane is typically 10 to 13 feet in width and generally between 100 to 150 feet in length. A transit queue jump/bypass lane may be created by restricting parking at an intersection approach or by allocating a mixed-flow lane to transit vehicles only near the intersection where more than one mixed-flow lane is available. Installation of striping and related signage for queue jumps would be the extent of physical changes. Therefore, no excavation is anticipated for the implementation of this element.

9. Establish Dedicated Turn Lanes. Dedicated turn lanes can reduce transit travel times by providing a dedicated space for turning vehicles to queue at an intersection approach without blocking the through-movement of transit vehicles and other traffic. Dedicated turn lanes are typically 9 to 12 feet in width and 100 to 150 feet in length. An example of a dedicated right-turn lane is illustrated in Figure 4i. At some signalized intersections with a dedicated left-turn lane, the traffic signal may be modified to provide a protected signal phase for left-turning vehicles while opposing traffic is held with a red light. Dedicated turn lanes may require the removal of parking at intersection approaches. Installation of striping and related signage, as well as removal of parking meters would be the general extent of physical changes required to create a dedicated turn lane. Therefore, no excavation is anticipated for the implementation of this element.



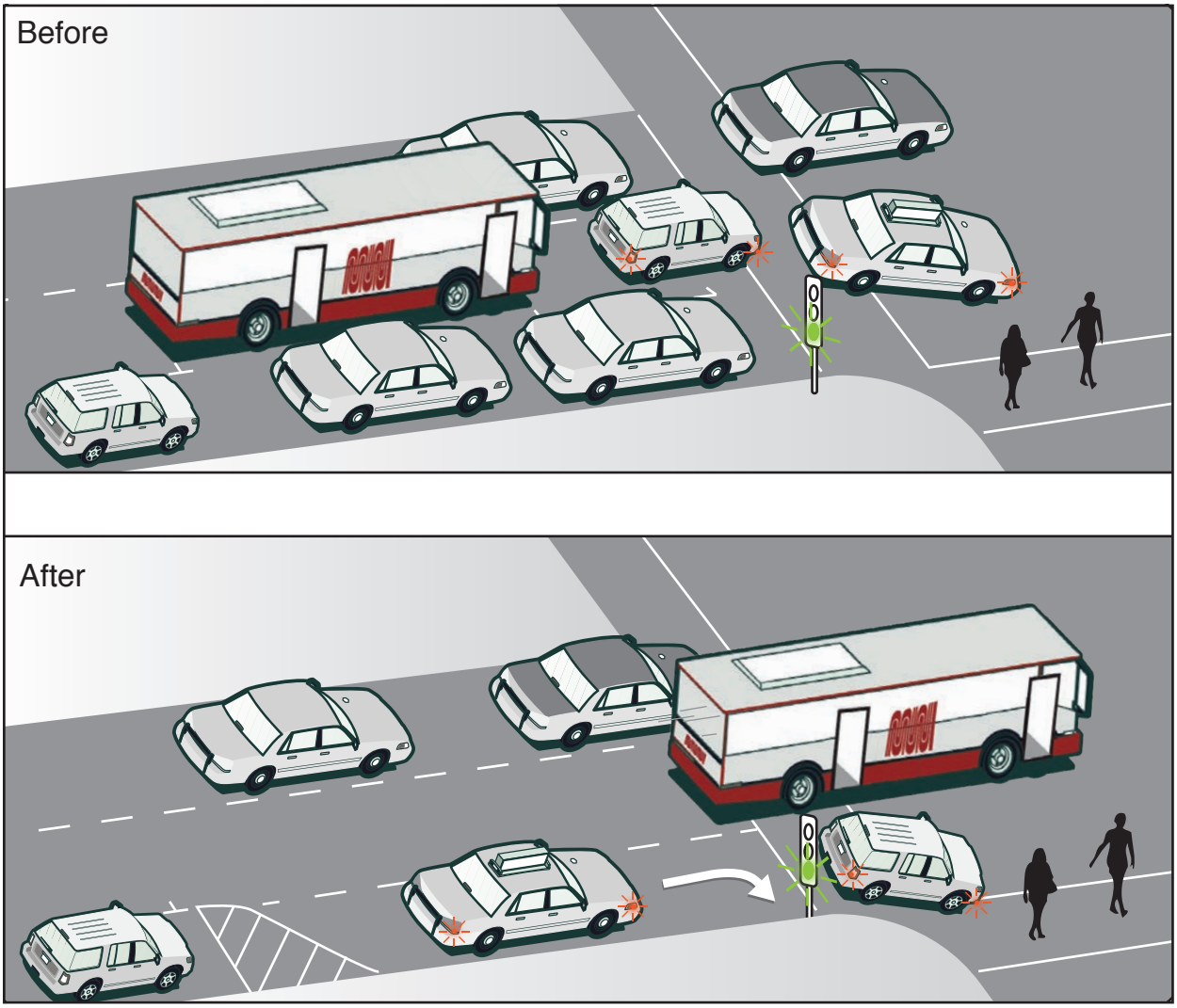
Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Establish Transit Queue Jump/Bypass Lanes. Transit queue jump/bypass lanes can reduce transit travel times by providing priority to transit vehicles at signalized intersections. A transit queue jump/bypass lane allows transit vehicles to bypass traffic stopped at a signalized intersection and move through the intersection ahead of general traffic by using an exclusive traffic signal phase for the transit vehicles. A transit queue jump/bypass lane may be created by restricting parking at an intersection approach or by allocating a mixed-flow lane to transit vehicles only near the intersection where more than one mixed-flow lane is available.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4h - ESTABLISH TRANSIT QUEUE JUMP/BYPASS LANES



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Establish Dedicated Turn Lanes. Dedicated turn lanes can reduce transit travel times by providing a dedicated space for turning vehicles to queue at an intersection approach without blocking the through-movement of transit vehicles and other traffic. At some signalized intersections with a dedicated left-turn lane, the traffic signal may be modified to provide a protected signal phase for left-turning vehicles while opposing traffic is held with a red light. Dedicated turn lanes may require the removal of parking at intersection approaches.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

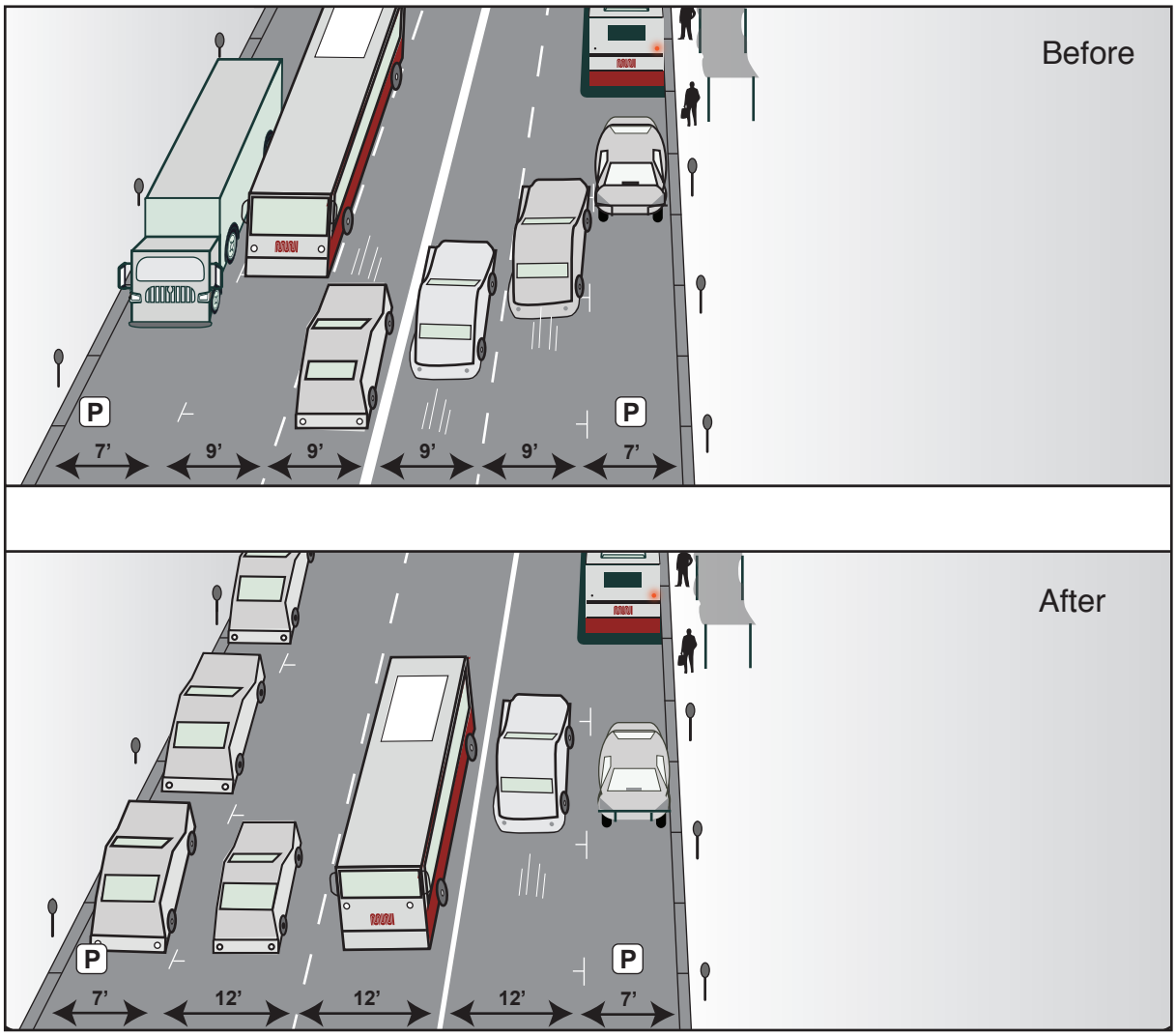
FIGURE 4i - ESTABLISH DEDICATED TURN LANES

10. Widen Travel Lanes through Lane Reductions. Widening mixed-flow lanes can decrease transit travel times and improve safety and reliability by reducing friction with other vehicles and eliminating the need for buses and other large vehicles to straddle two mixed-flow lanes. On streets with two or more mixed-flow lanes in the same direction, removing one mixed-flow lane would allow for widening of the remaining lanes. Figure 4j illustrates an example of removing one mixed-flow lane and widening the remaining mixed-flow lanes. Removing mixed-flow lanes to provide wider lanes can result in an overall decrease in vehicle capacity or worsen operating conditions on a street. This may result in diversion of vehicular traffic to other streets, depending on the existing traffic volumes relative to the available roadway capacity. Installation of striping and related signage to widen travel lanes within the existing right-of-way would be the extent of physical changes required. Therefore, no excavation is anticipated for the implementation of this element.

Parking and Turn Restrictions

Parking and turn restrictions would limit or prohibit parking, or limit or prohibit turns at intersections. They would involve signs indicating tow-away zones or other restrictions and/or lane markings in the right-of-way. Proposed parking and turn restrictions include restricting turns at intersections to improve transit and traffic flow and restricting parking to provide wider mixed-flow lanes. Each of these elements is described in further detail below.

11. Implement Turn Restrictions. Turn restrictions can reduce transit travel times by preventing turning vehicles from blocking the through-movement of transit vehicles and other traffic. For example, left-turn restrictions would generally be applied on two-way streets where right-of-way is not available to provide dedicated left-turn lanes, or where left-turning vehicles are required to cross or enter a transit-only lane to complete a turn. Turn restrictions can be part-time or full-time. In locations where part-time turn restrictions are already in place, consistent hours would be considered at multiple intersections along a corridor to improve compliance and clarity. At locations where heavy traffic and/or pedestrian volumes result in few gaps for turning vehicles, turn restrictions would enhance overall intersection capacity, improve transit and traffic flow, reduce conflicts between turning vehicles and other traffic and pedestrians, and improve pedestrian safety. Figure 4k illustrates an example of how a left-turn restriction would eliminate conflicts and delay associated with left-turning vehicles waiting for a gap in opposing traffic to complete a left turn. Installation of



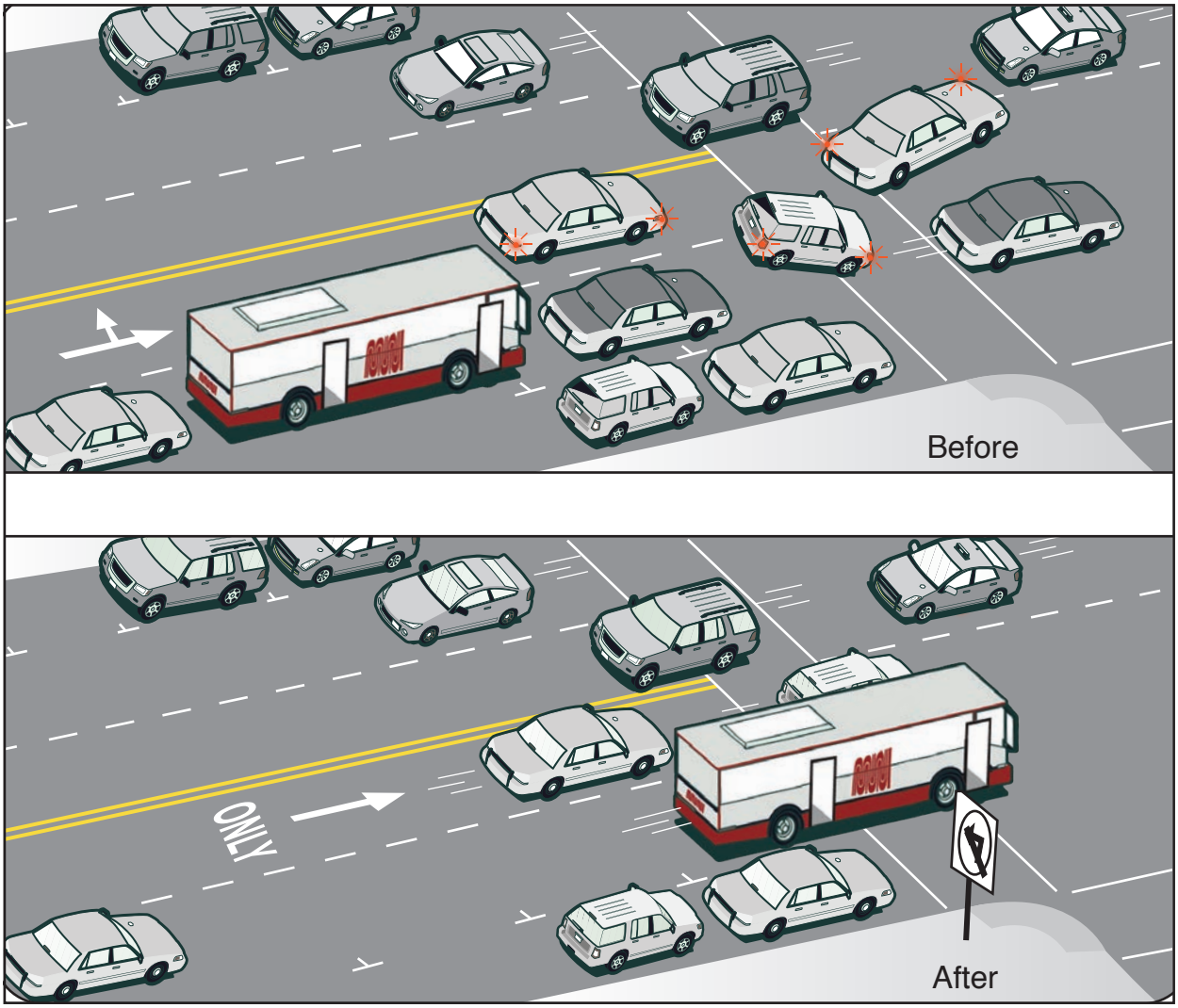
Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Widen Travel Lanes through Lane Reductions. Widening mixed-flow lanes can decrease transit travel times and improve safety and reliability by reducing friction with other vehicles and eliminating the need for buses and other large vehicles to straddle two travel lanes. On streets with two or more mixed-flow lanes in the same direction, removing one mixed-flow lane would allow for widening of the remaining lanes. Removing mixed-flow lanes to provide wider lanes can result in an overall decrease in vehicle capacity on a street. This may result in diversion of vehicular traffic to other streets, depending on the existing traffic volumes relative to the available roadway capacity.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4j - WIDEN TRAVEL LANES THROUGH LANE REDUCTIONS



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Implement Turn Restrictions. Turn restrictions can reduce transit travel times by preventing turning vehicles from blocking the through-movement of transit vehicles and other traffic. For example, left-turn restrictions would generally be applied on two-way streets where right-of-way is not available to provide dedicated left-turn lanes, or where left-turning vehicles are required to cross or enter a transit-only lane to complete a turn. Turn restrictions can be part-time or full-time. In locations where part-time turn restrictions are already in place, consistent hours would be considered at multiple intersections along a corridor to improve compliance and clarity.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4k - IMPLEMENT TURN RESTRICTIONS

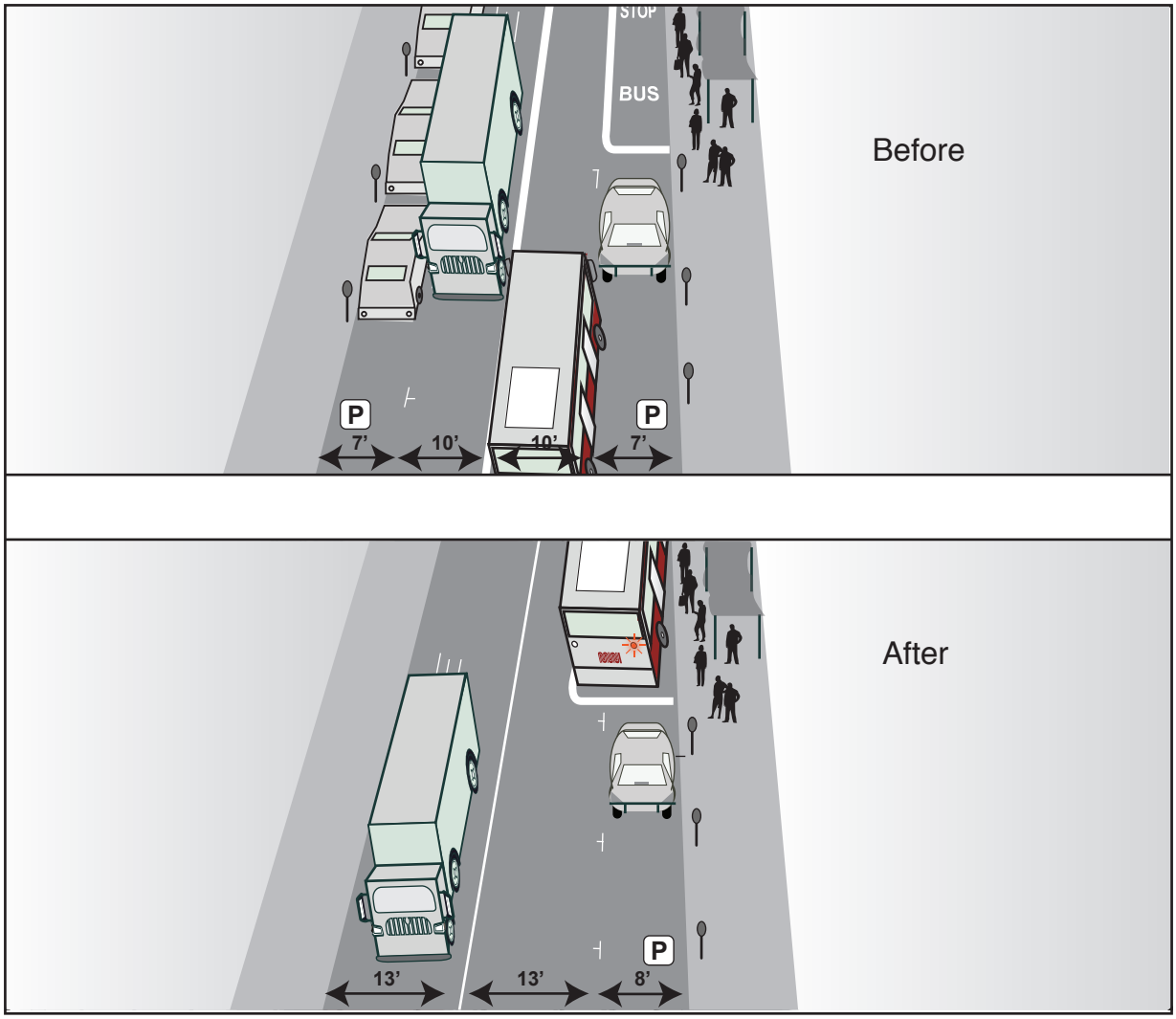
striping and related signage to implement turn restrictions would be the extent of physical changes required. Therefore, no excavation is anticipated for the implementation of this element.

12. Widen Travel Lanes through Parking Restrictions. At locations with narrow mixed-flow lanes, traffic lanes can be widened by restricting parking and reallocating street space. This can reduce transit travel times by eliminating the need for buses and other large vehicles to straddle two mixed-flow lanes, by reducing delays associated with parking maneuvers, and by providing additional space for through-moving transit vehicles. Parking lanes are typically seven to eight feet in width. Parking restrictions could be implemented either during peak periods, such as 7 to 9 a.m. or 4 to 6 p.m., or full-time to facilitate bus travel on streets with narrow mixed-flow lanes. Figure 4l illustrates an example of how parking restrictions provide wider mixed-flow lanes for transit. Installation of striping and related signage to widen would generally be the extent of physical changes required to implement this element. Therefore, no excavation is anticipated for the implementation of this element.

Traffic Signal and Stop Sign Changes

Proposed traffic signal and stop sign changes include installing traffic signals, replacing all-way stop signs with traffic signals, removing the stop sign on the street with transit, or removing the stop signs on both streets. In the last example, traffic calming measures would be added to the intersection to improve conditions for all modes of transportation, including pedestrians. Each of these elements is described in detail below.

13. Install Traffic Signals at Uncontrolled and Two-way Stop-Controlled Intersections. At some intersections that are uncontrolled or have stop signs requiring only vehicles on the cross street without transit to stop, intersection safety and/or pedestrian access to transit stops may be improved with added right-of-way controls. At these intersections, particularly on Rapid Network corridors, installing a traffic signal could improve vehicular and pedestrian safety by clarifying the right-of-way for crossing the street while minimizing travel time delays for transit vehicles. New traffic signals would include pedestrian countdown signals and marked crosswalks, and could take advantage of planned transit signal priority improvements that reduce signal delay for approaching transit vehicles. Traffic signal poles are typically up to 30 feet in height. The installation of traffic signals at uncontrolled and



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Widen Travel Lanes through Parking Restrictions. At locations with narrow mixed-flow lanes, traffic lanes can be widened by restricting parking and reallocating street space. This can reduce transit travel times by eliminating the need for buses and other large vehicles to straddle two mixed-flow lanes, by reducing delays associated with parking maneuvers, and by providing additional space for through-moving transit vehicles. Parking restrictions could be implemented either during peak periods, such as 7 to 9 a.m. or 4 to 6 p.m., or full-time to facilitate bus travel on streets with narrow mixed-flow lanes.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

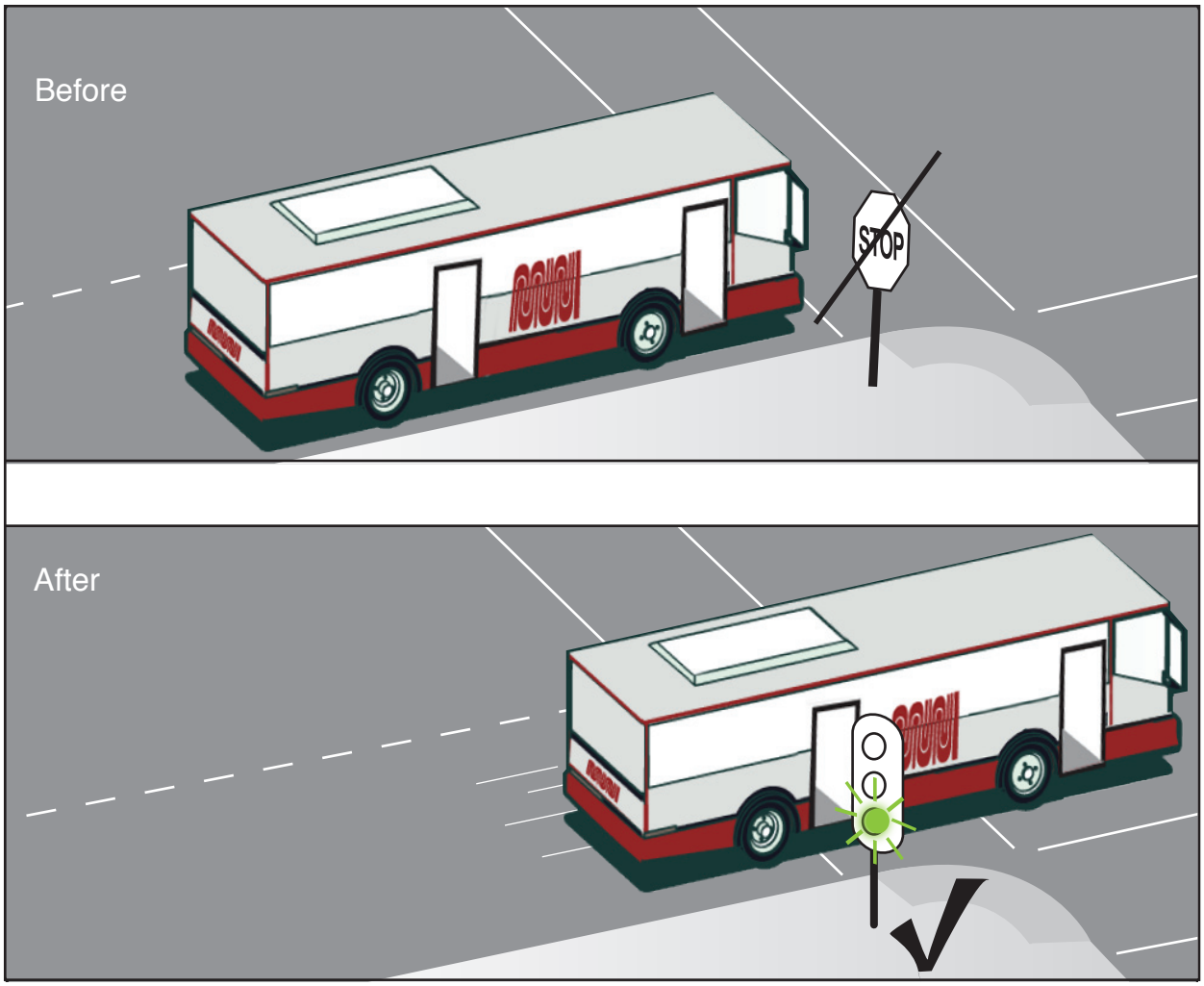
FIGURE 4l - WIDEN TRAVEL LANES THROUGH PARKING RESTRICTIONS

two-way stop-controlled intersections may require that a curb ramp be rebuilt, or, in places where none exists, that a curb ramp be added. Figure 4m is an illustration of stop signs replaced by traffic signals. Installation of traffic signals and related traffic control utility boxes and signage is anticipated to require a maximum nine-foot bgs excavation depth (signal mast arm foundation).

14. Install Traffic Signals at All-way Stop-Controlled Intersections. Installing traffic signals at all-way stop-controlled intersections can reduce transit travel times by allowing transit vehicles to take advantage of planned transit signal priority improvements that reduce signal delay for approaching transit vehicles. This treatment also reduces delays associated with long vehicle queues at busy intersections which are stop-controlled with stop signs. New traffic signals would include pedestrian countdown signals and marked crosswalks. The installation of traffic signals at all-way stop-controlled intersections may require that a curb ramp be rebuilt, or, in places where none exists, that a curb ramp be added. Figure 4m is an illustration of stop signs replaced by traffic signals. Installation of traffic signals and related traffic control utility boxes and signage is anticipated to require a maximum nine-foot bgs excavation depth (signal mast arm foundation).

15. Replace All-way Stop-Controls with Traffic Calming Measures at Intersections. At some intersections with all-way stop signs, the stop signs on the street with transit can be removed and traffic calming measures implemented to reduce transit travel time by allowing transit vehicles to proceed slowly through intersections without coming to a complete stop. This treatment also reduces delays associated with long vehicle queues at busy intersections with stop signs. Stop signs would typically be retained on the non-transit cross street, but in some cases may be removed on both streets. In conjunction with removing the stop signs, other traffic calming measures would be implemented. Such measures would generally involve improving crossing conditions for pedestrians, slowing traffic, and reducing right-of-way conflicts between pedestrians and other traffic. Examples of traffic calming measures that could be applied in conjunction with stop sign removal include, but are not limited to, the following:

- Traffic circles;
- Pedestrian refuge islands;
- Pedestrian or transit bulbs;
- Speed humps (designed with a transit pass through feature);
- Median extensions through an intersection;



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Install Traffic Signals at All-way Stop-Controlled Intersections. Installing traffic signals at all-way stop-controlled intersections can reduce transit travel times by allowing transit vehicles to take advantage of planned transit signal priority improvements that reduce signal delay for approaching transit vehicles. This treatment also reduces delays associated with long vehicle queues at busy intersections which are stop-controlled with stop signs. New traffic signals would include pedestrian countdown signals and marked crosswalks.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

- Flashing beacons to draw the attention of roadway users to pedestrian crossings;
- Parking restrictions at intersection approaches to improve sight distance; and
- Enhanced crosswalk markings and signs.

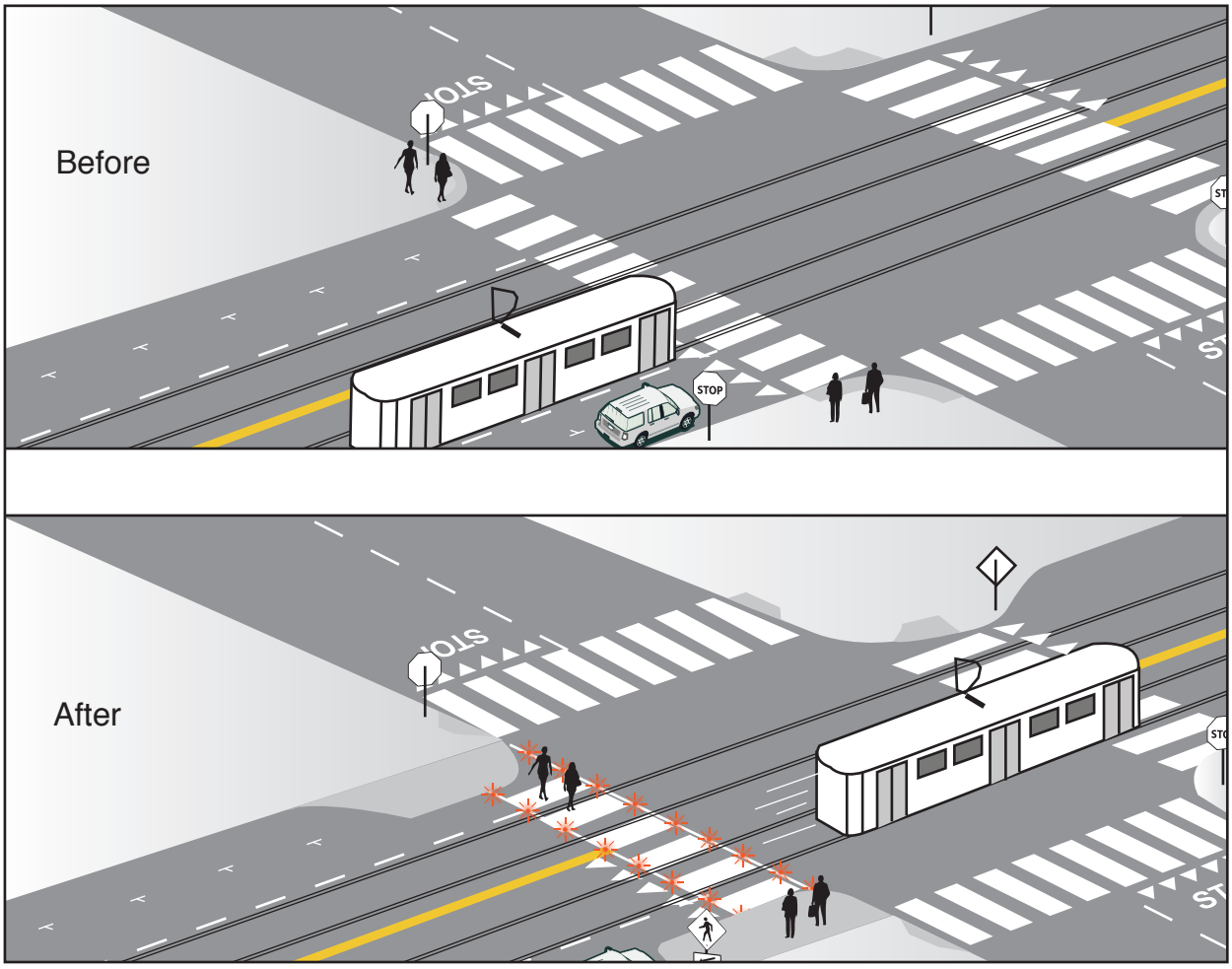
Figure 4n depicts an all-way stop sign-controlled intersection converted to a two-way stop sign-controlled intersection with pedestrian or transit bulbs added.

Traffic circles would involve construction of a circular island in the center of an intersection, and may remove the stop signs facing one or both streets. Pedestrian bulbs may require relocating existing catch basins and storm sewers. Although uncommon, in some instances the installation of pedestrian refuge islands and median extensions may also require the relocation of existing catch basins and storm sewers. Some of these elements require the installation of curb ramps. Curb ramps, other concrete surface structures, and minor utility relocation associated with traffic calming measures are anticipated to require excavation up to two feet bgs.

Pedestrian Improvements

Proposed pedestrian improvements include pedestrian refuge islands, pedestrian bulbs and sidewalk widening. Pedestrian treatments help enhance pedestrian safety, improve access to transit stops and in some instances can also improve transit reliability and reduce transit travel time. Each of these elements is described in detail below.

16. Install Pedestrian Refuge Islands. Pedestrian refuge islands are raised islands in the center of the street at an intersection that provide space for pedestrians to wait while crossing a street, as shown in Figure 4o. Pedestrian refuge islands can reduce transit travel time by shifting mixed-flow lanes toward the curb and eliminating the need for buses to exit and re-enter the flow of traffic to access curbside transit stops. A typical pedestrian refuge island would be four to six feet in width and 10 to 25 feet long. Pedestrian refuge islands can also improve pedestrian safety by increasing pedestrian visibility and minimizing pedestrian exposure to vehicular traffic. Although uncommon, in some instances the installation of pedestrian refuge islands may require the relocation of existing catch basins and storm sewers. In addition, the installation of pedestrian refuge islands may require upgrading the crosswalk which may include construction of a curb ramp. Curb ramps and other minor utility relocations surface structures associated with pedestrian refuge islands is anticipated to require excavation of up to two feet bgs.



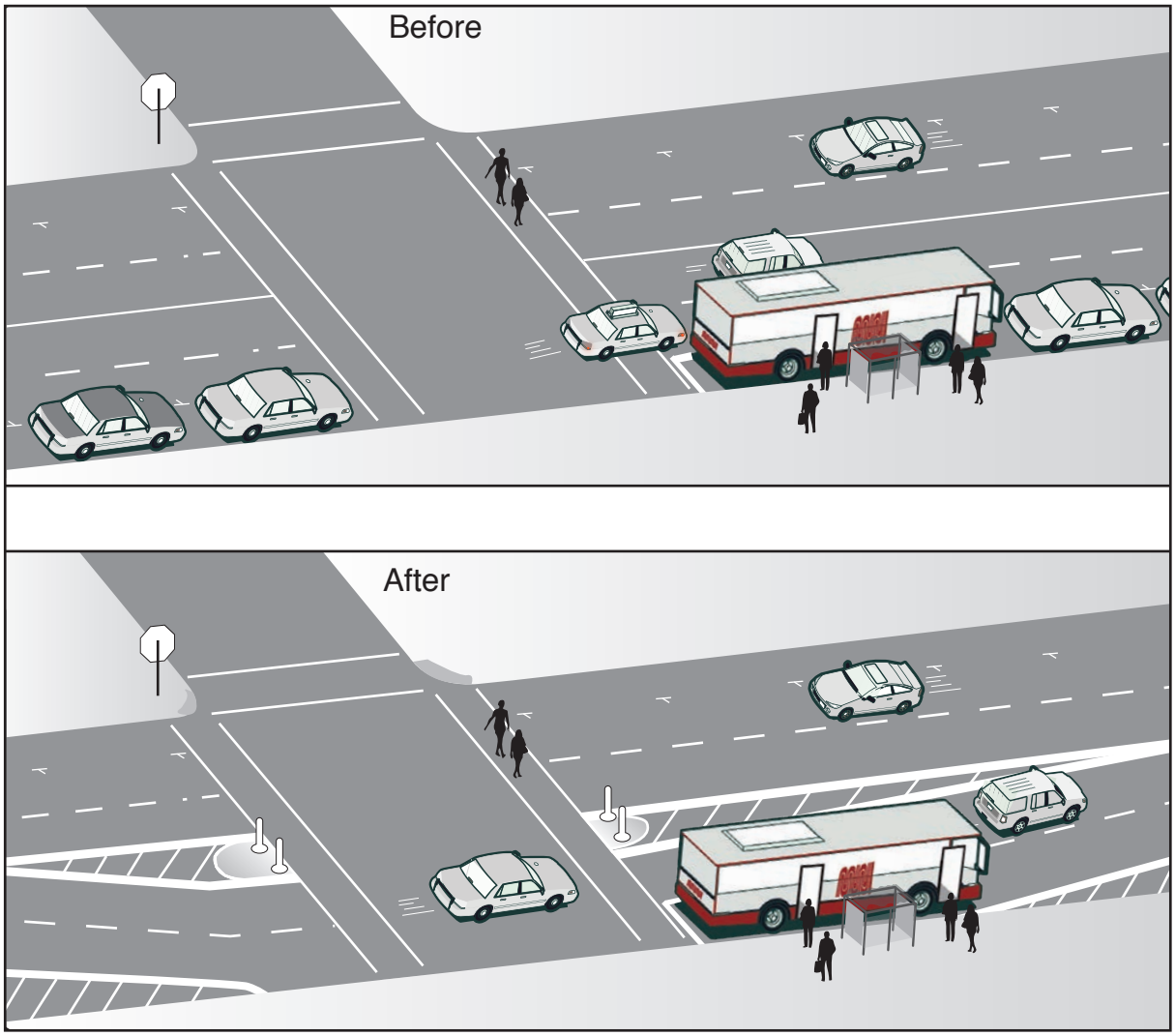
Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Replace All-way Stop Controls with Traffic Calming Measures at Intersections. At some intersections with all-way stop signs, the stop signs on the street with transit can be removed to reduce transit travel time by allowing transit vehicles to proceed without coming to a complete stop. This treatment also reduces delays associated with long vehicle queues at busy intersections with stop signs. Stop signs would typically be retained on the street without transit. In conjunction with removing the stop signs, other traffic calming measures, which would generally involve improving crossing conditions for pedestrians, slowing traffic, and reducing-right-of way conflicts between pedestrians and other traffic, could be installed.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4n - REPLACE ALL-WAY STOP CONTROLS WITH TRAFFIC CALMING MEASURES AT INTERSECTIONS



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Install Pedestrian Refuge Islands. Pedestrian refuge islands are raised islands in the center of the crosswalk at an intersection that provide space for pedestrians to wait while crossing a street. Pedestrian refuge islands can reduce transit travel time by shifting mixed-flow lanes toward the curb and eliminating the need for buses to exit and re-enter the flow of traffic to access curbside transit stops. Pedestrian refuge islands can also improve pedestrian safety by increasing pedestrian visibility and minimizing pedestrian exposure to vehicular traffic.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

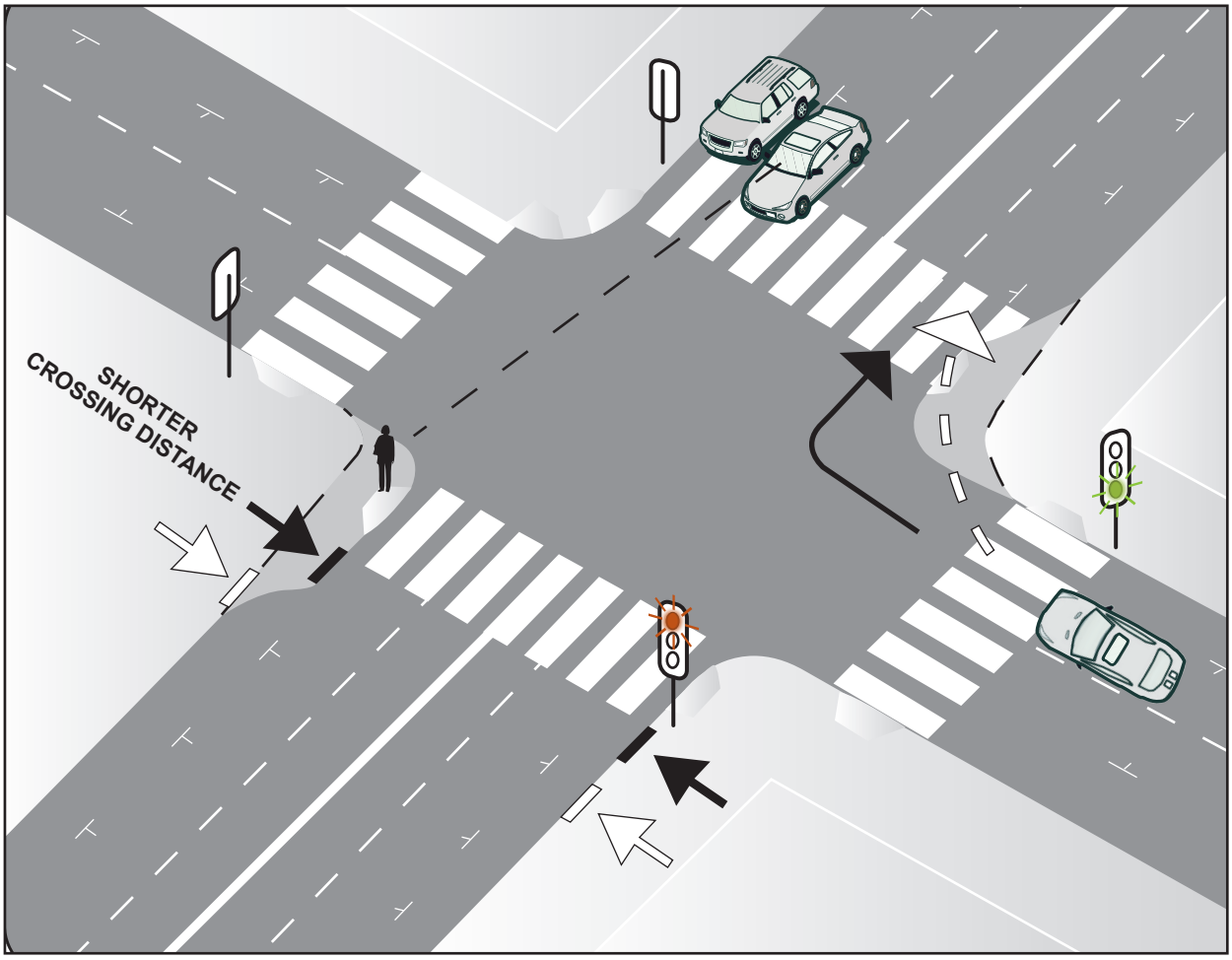
TRANSIT EFFECTIVENESS PROJECT

FIGURE 4o - INSTALL PEDESTRIAN REFUGE ISLANDS

17. Install Pedestrian Bulbs. Pedestrian bulbs are sidewalk extensions at non-transit stop intersection corners that widen the sidewalk by typically four to six feet for the width of the crosswalk. In addition, approximately 20 feet is needed to transition to the regular sidewalk width. Pedestrian bulbs at signalized intersections can reduce transit travel time by reducing the roadway crossing distance, which can provide flexibility in traffic signal timing and reduce the likelihood of transit vehicles arriving on a red signal indication. Pedestrian bulbs improve pedestrian safety by shortening the street crossing distance, improving pedestrian visibility, and reducing the speed of turning traffic, as shown in Figure 4p. Any existing catch basins, storm sewers, or other utility structures situated at the corner where a pedestrian bulb is proposed may need to be relocated as part of the construction of the bulb. The installation of pedestrian bulbs may require rebuilding a curb ramp or introducing a new one. Curb ramps and other minor utility relocation associated with pedestrian bulbs is anticipated to require excavation up to two feet bgs.

18. Widen Sidewalk: Sidewalk widening can improve pedestrian conditions by providing additional space for pedestrians, transit shelters, landscaping and other amenities. Sidewalk widening can also improve pedestrian safety by shortening the street crossing distance. Sidewalk widening often requires removal of parking, as shown in Figure 4q**,** but could also be accomplished through mixed-flow lane removal on streets with multiple mixed-flow lanes in the same direction. Existing sidewalk widths and conditions vary throughout the City; therefore, the extent of sidewalk widening would vary. If the widened sidewalk were proposed on a street with one lane plus parking in each direction, parking would need to be eliminated.[19] Any existing catch basins and storm sewers may need to be relocated as part of constructing a wider sidewalk. Widening a sidewalk may also require rebuilding a curb ramp or adding a new one. Construction of curb ramps, associated utility relocation, and concrete sidewalk is anticipated to require excavation up to two feet bgs.

[19] In limited instances on streets with wide lanes, the extra sidewalk width could be achieved by redesigning the lane widths of the existing parking and mixed-flow lanes without removing either a parking or a mixed-flow lane.



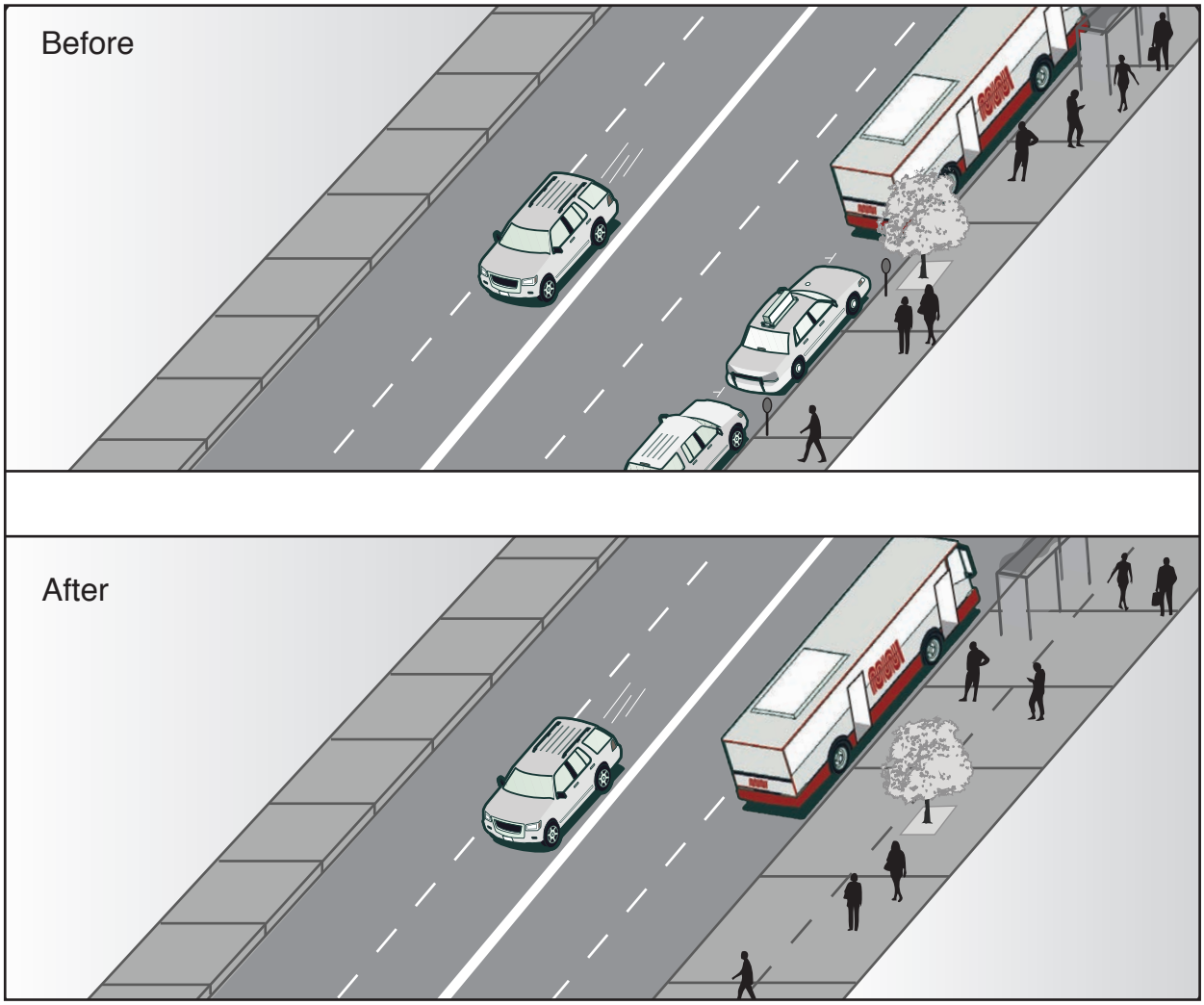
Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Install Pedestrian Bulbs. Pedestrian bulbs are sidewalk extensions at non-transit stop intersection corners that widen the sidewalk by a distance equal to or less than the width of the parking lane for the width of the crosswalk. Pedestrian bulbs at signalized intersections can reduce transit travel time by reducing the roadway crossing distance, which can provide flexibility in traffic signal timing and reduce the likelihood of transit vehicles arriving on a red signal indication. Pedestrian bulbs improve pedestrian safety by shortening the street crossing distance, improving pedestrian visibility, and reducing the speed of turning traffic.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4p - INSTALL PEDESTRIAN BULBS



Note: The above conceptual figure is not to scale and is for illustrative purposes only.

Widen Sidewalk. Sidewalk widening can improve pedestrian conditions by providing additional space for pedestrians, transit shelters, landscaping and other amenities. Sidewalk widening can also improve pedestrian safety by shortening the street crossing distance. Existing sidewalk widths and conditions vary throughout the City; therefore, the extent of sidewalk widening would also vary. If the widened sidewalk were proposed on a street with one lane plus parking in each direction, parking would need to be eliminated.

SOURCE: SFMTA, Turnstone Consulting, Fehr & Peers, Jungle Communications

TRANSIT EFFECTIVENESS PROJECT

FIGURE 4q - WIDEN SIDEWALK

A.4.3.2 Program-Level TTRP Corridors

The exact locations (e.g., corner of a particular intersection) of the TPS Toolkit elements that would be applied to the nine Rapid Network corridors listed below in order to improve transit service have not yet been defined. It is assumed for environmental review purposes that any of the TPS Toolkit elements could be applied at various locations along these TTRPs to achieve transit travel time reductions. Therefore, these nine TTRPs are generally analyzed at a program-level in this environmental review. However, to the extent that specific details are not necessary to fully assess the TPS Toolkit elements' impacts for certain CEQA topics (for example, Topic 2, Aesthetics, Topic 4, Cultural Resources, Topic 9, Wind and Shadow, or Topic 13, Biological Resources, among others), this Initial Study offers a complete, project-level type analysis for those topics. A summary of the environmental topics for which project level analysis for all of the TEP components has been conducted is provided at the end of this Initial Study.

TTRP.1 for the 1 California route: For this proposal, the TPS Toolkit would be applied along the 1 California route. The TPS Toolkit elements would be implemented along the following streets: Drumm, Sacramento, Steiner, and California streets, 32nd Avenue and Geary Boulevard (outbound), and along Geary Boulevard, 33rd Avenue, Clement Street, 32nd Avenue, California, Steiner, Sacramento, Gough and Clay streets (inbound). The corridor extends from the intersection of Geary Boulevard and 33rd Avenue to the intersection of Clay and Drumm streets, providing transit improvements to a major east-west route in the Rapid Network. This Rapid Network corridor provides transit connections between the northern portion of the Richmond District and neighborhoods to the east, including Pacific Heights, Nob Hill, Chinatown, the Financial District and the Embarcadero.

TTRP.9 for the 9 San Bruno and 9L San Bruno Limited routes: For this proposal, the TPS Toolkit would be applied along two segments of the 9 San Bruno/9L San Bruno Limited routes. The TPS Toolkit elements would be implemented along the following streets in two segments: Segment 1: 11th and Division streets, Potrero Avenue, Bayshore Boulevard, Silver and San Bruno avenues. This part of the corridor extends from the intersection of Market and 11th streets to the intersection of San Bruno and Silver avenues. Segment 2: Bayshore Boulevard, Sunnydale Avenue, Schwerin Street, Geneva Avenue, Santos Street and Sunnydale Avenue. This part of the corridor extends from the intersection of Visitacíon Avenue and Bayshore

Boulevard to the existing terminus at 2070 Sunnydale Avenue, adjacent to the Gleneagles Golf Course in McLaren Park. This is a major north-south route in the Rapid Network. This Rapid Network corridor provides transit connections between the Civic Center and Downtown and neighborhoods to the southeast, including SoMa, the Mission, Showplace Square, Potrero Hill, Bernal Heights, Portola, Silver Terrace, Bay View, and Visitacion Valley.

TTRP.22_2 for the 22 Fillmore route: For this proposal, the TPS Toolkit would be applied along a segment of the 22 Fillmore route. The TPS Toolkit elements would be implemented along the following streets: Church, Hermann, Fillmore, Broadway, Steiner, and Union streets. This part of the 22 Fillmore corridor extends from the intersection of 16th and Church streets to the intersection of Bay and Fillmore streets. This is a major north-south route in the Rapid Network. This Rapid Network corridor provides crosstown transit connections between the following neighborhoods: Duboce Triangle, the Lower Haight and Western Addition, the Fillmore, Japantown, Pacific Heights, Cow Hollow and the Marina neighborhoods.

TTRP.28_2 for the 28L 19th Avenue Limited: For this proposal, the TPS Toolkit would be applied along a segment of the 28L 19th Avenue Limited route (portion of U.S. 101). The TPS Toolkit elements would be implemented along the following streets: Van Ness Avenue, Lombard Street and Richardson Avenue. This part of the 28 19th Avenue Limited corridor extends from the intersection of Beach Street and Van Ness Avenue to the intersection of Lyon Street and Richardson Avenue (US 101 N). This would improve an east-west portion of the Rapid Network connecting the future Van Ness BRT with the 28L 19th Avenue Limited, which provides transit connections through the Marina and the Presidio to the Richmond and Sunset Districts.

TTRP.30_2 for the 30 Stockton route: For this proposal, the TPS Toolkit would be applied along a segment of the 30 Stockton route. The TPS Toolkit elements would be implemented along Chestnut, Broderick, Divisadero and Jefferson streets, from the intersection of Van Ness Avenue and Chestnut Street to the intersection of Jefferson and Broderick streets. This would improve an east-west portion of the Rapid Network connecting the future Van Ness BRT with the 30 Stockton to provide transit connections between the Marina, Russian Hill, Civic Center, the North Waterfront, North Beach, Chinatown, Union Square, the Financial District, SoMa and the Caltrain Station.

TTRP.71 for the 71L Haight-Noriega Limited and 6 Parnassus routes: For this proposal, the TPS Toolkit would be applied along a segment of the 71L Haight-Noriega Limited and 6 Parnassus routes. The TPS Toolkit elements would be implemented along the following streets: Ortega Street, 47th Avenue, Noriega Street, 22nd Avenue, Lincoln Way, Frederick, Stanyan, and Haight streets (inbound), and along Haight, Stanyan, and Frederick streets, Lincoln Way, 23rd Avenue, Noriega Street, the Great Highway and Ortega Street (outbound). This corridor extends from the intersection of Ortega Street and 48th Avenue to the intersection of Market and Gough streets. This would improve an east-west portion of the Rapid Network connecting the Outer and Inner Sunset Districts with Cole Valley, the Haight Ashbury, the Lower Haight, Hayes Valley, Civic Center and Downtown and providing a future connection to the Van Ness BRT and Better Market Street improvements.

TTRP.K for the K Ingleside light rail line: For this proposal, the TPS Toolkit would be applied along Junipero Serra Boulevard and Ocean Avenue, from the intersection of San Jose Avenue and Oneida Street (Balboa Park Station) to Sloat and Junipero Serra boulevards. This Rapid Network corridor provides transit connections between the West Portal, St. Francis Wood, and Ingleside neighborhoods as well as the City College of San Francisco (CCSF) main campus and vicinity and Balboa Park Station. Inbound, the K Ingleside enters the Muni System underground at West Portal Station. From West Portal Station the K Ingleside becomes the T Third Street and continues to Embarcadero Station, providing connections from the above neighborhoods to Forest Hill, Midtown Terrace, the Castro/Eureka Valley/Corona Heights, Duboce Triangle, Church and Market streets vicinity, and destinations in Civic Center and Downtown before resurfacing after Embarcadero Station to provide transit service along the Embarcadero, through SoMa and Mission Bay, to Potrero Hill, Hunter's Point, Bay View and Visitacíon Valley neighborhoods.

TTRP.L for the L Taraval light rail line: For this proposal, the TPS Toolkit would be applied primarily along Ulloa Street, 15th Avenue, Taraval Street, 46th Avenue, Vicente Street, 47th Avenue, Wawona Street and 46th Avenue, from the intersection of West Portal Avenue and Ulloa Street (at West Portal Station) to the intersection of Wawona Street and 46th Avenue. This Rapid Network corridor provides transit connections between West Portal Station and the southern portion of the Outer Sunset neighborhoods. The L Taraval continues along West Portal Avenue to West Portal Station where inbound it enters the Muni System underground to Embarcadero Station providing connections from the above neighborhoods to Forest Hill, Midtown

Terrace, the Castro/Eureka Valley/Corona Heights, Duboce Triangle, Church and Market streets vicinity, and destinations in Civic Center and Downtown.

TTRP.M for the M Ocean View light rail line: For this proposal, the TPS Toolkit would be applied along the dedicated right-of-way south of St. Francis Circle, 19th Avenue, Parkmerced local streets, Randolph Street, Orizaba Avenue, Broad Street and San Jose Avenue, from the intersection of 19th and Holloway avenues to Geneva and San Jose avenues near the Balboa Park Station. This corridor provides transit connections between West Portal Station and Balboa Park Station (Muni and BART), and includes transit service for the West Portal, St. Francis Wood, Stonestown/San Francisco State University, Ingleside and Parkmerced neighborhoods. The M Ocean View continues along West Portal Avenue to West Portal Station, where inbound it enters the Muni System underground to Embarcadero Station providing connections from the above neighborhoods to Forest Hill, Midtown Terrace, the Castro/Eureka Valley/Corona Heights, Duboce Triangle, Church and Market streets vicinity, and destinations in the Civic Center and Downtown.

With the application of the TPS Toolkit elements, travel times on the TTRPs are forecast to be reduced by 10 to 25 percent. When combined with other ongoing SFMTA program and policy changes, such as transit signal priority and all-door boarding, the estimated travel time savings are forecast to range from 15 to 30 percent. The travel time savings that could be achieved with implementation of each element would vary widely and would depend on a number of factors specific to each corridor. Factors include the existing roadway configuration, traffic volumes, level of pedestrian activity, number and locations of left and right turns, on-street parking locations and level of use, and the types of traffic control in place.

A.5 DESCRIPTION OF PROJECT-LEVEL TEP COMPONENTS

The following sections describe the components of the TEP that have been developed and designed in sufficient detail to be analyzed at a project level across all CEQA topics. Generally, these projects would be installed in the earlier phases of the TEP implementation and include Service Improvements, Service-related Capital Improvements, and TTRPs. Each of these components is described below.

A.5.1 Service Improvements

The TEP proposes a series of transit service changes (Service Improvements) that would allocate resources more cost effectively, better serve Muni passengers, reflect changing travel patterns within San Francisco, provide improved connection to

regional transit, and streamline routes for improved reliability and reduced delay. These proposed Service Improvements would include developing new routes, modifying existing routes, or adding transit service to streets currently without any transit service; eliminating underutilized existing routes or route segments; changing the transit vehicle type operating along a route; changing the frequency and span of service; changing the mix of local/limited/express service offered along a particular route; and other changes, such as adding new express service stops, expanding Limited-stop service to include Sundays, and expanding other service by adding days of operation. Implementation of some of the Service Improvements would rely on the completion of Service-related Capital Improvements (e.g., overhead wire expansion).

Table 5 identifies each Muni route by its proposed service route category. Routes would be assigned to tiers based on existing performance but may be reclassified as usage and travel patterns change. The route type would determine the Service Improvements and Service-related Capital Improvements planned for the respective routes with the greatest allocation of resources allocated to the Rapid Networks and less to the others.

Table 5: Muni Routes by Service Route Categories

Category	Route	
Rapid Network	E Embarcadero* F Market-Wharves J Church KT Ingleside-Third L Taraval M Ocean View N Judah 1 California 5 Fulton/5L Fulton Limited* 8X-Bayshore Express	9 San Bruno/9L San Bruno Limited 14 Mission/14L Mission Limited 22 Fillmore[1] 28 19th Avenue/28L 19th Avenue Limited 30 Stockton 38 Geary/38L Geary Limited 47 Van Ness 49L Van Ness-Mission Limited* 71L Haight-Noriega
Local Network	2 Clement[1] 6 Parnassus 10 Townsend[2] 11 Downtown Connector 12 Folsom 18 46th Avenue 19 Polk 21 Hayes 23 Monterey 24 Divisadero[1] 27 Folsom[2] 29 Sunset	31 Balboa 33 Stanyan 41 Union 43 Masonic 44 O'Shaughnessy 45 Union/Stockton[3] 48 Quintara/24th 54 Felton 58 24th Street 108 Treasure Island[3]

Category	Route	
Community Connectors	17 Parkmerced 32 Roosevelt 35 Eureka 36 Teresita 37 Corbett	39 Coit 52 Excelsior 56 Rutland 66 Quintara 67 Bernal Heights[3]
Specialized Services	1AX California Express 1BX California Express 8AX Bayshore Express 8BX Bayshore Express 14X Mission Express[3] 16X Noriega Express 30X Marina Express 31AX Balboa Express 31BX Balboa Express	38AX Geary 38BX Geary 41 Union 76 Marin Headlands 80X Gateway Express[3] 81X Caltrain Express[3] 82X Levi Plaza Express 83X Mid-Market Express 88 BART Shuttle 90 Owl[3] 91A Owl* 91 B Owl*

Notes:

1 With proposed Service Improvements, Routes 2 Clement, 10 Sansome, 22 Fillmore, 24 Divisadero, and 43 Masonic would replace service along portions of the existing 3 Jackson, which would be discontinued as part of proposed Service Improvements.

2 Routes 27 Bryant and 10 Townsend would replace the 12 Folsom/Pacific, which would be discontinued as part of proposed Service Improvements.

3 Route does not have proposed service changes, and is therefore not analyzed in the environmental review.

* New routes proposed as part of the TEP.

Source: SFMTA, 2012.

The SFMTA is proposing to add up to 350,000 service hours on an annual basis to the existing 2011 service hours (approximately 3,500,000) as part of the proposed Service Improvements. This section describes in detail these proposed service changes, which are anticipated to take effect between 2014 and 2016, pending resource availability. At the time of implementation, the SFMTA many need to make minor modifications to the details described below in order to respond to new information, such as updated ridership data. This type of flexibility and responsiveness is necessary in order to provide the most efficient transit service possible. A summary of the proposed TEP Service Improvements is provided in Table 6. While the specific service plan outlined in Table 6 is based on current conditions and best available information, the SFMTA would likely need to make minor adjustments in the service plan prior to implementation, but would stay within the maximum 350,000 additional annual service hours.

No service changes are proposed for Muni routes that are not listed in Table 6.

Table 6: Summary of Proposed Service Improvements*

Transit Route	New Route	Route Elimination	Change to Route Alignment	Change to Headway	Change to Vehicle Type	Other Changes[1]
E Embarcadero	X					
F Market-Wharves				X		
J Church				X		X
K-T Ingleside-Third				X		
L Taraval				X		
M Ocean View				X		
N Judah				X		[5]
1 California				X		
1AX California Express						X
1BX California Express			X			X
2 Clement			[4]	X	[2]	X
3 Jackson		X				
5 Fulton			X	X	[2]	[5]
5L Fulton Limited	X					[5]
6 Parnassus			X			
8X Bayshore Express			X	X		[5]
8AX Bayshore Express				X		[5]
8BX Bayshore Express			X			[5]
9 San Bruno						X
9L San Bruno Limited				X		X

Transit Route	New Route	Route Elimination	Change to Route Alignment	Change to Headway	Change to Vehicle Type	Other Changes[1]
10 Sansome (formerly 10 Townsend)			X	X		X
11 Downtown Connector	X		[4]			
12 Folsom-Pacific		X				
14 Mission					X[2]	[5]
14L Mission Limited				X	X[2]	[5]
14X Mission Express				X		[5]
16X Noriega Express			X[4]			X
17 Parkmerced			X	X		X
18 46th Avenue			X			
19 Polk			X			X
21 Hayes				X		
22 Fillmore			X[4]	X	[2]	[5]
23 Monterey			X			
24 Divisadero				X		
27 Bryant			X[4]			X
28 19th Avenue			X	X		[5]
28L 19th Avenue Limited			X	X		[5]
29 Sunset			X	X		
30 Stockton					X	[5]
30X Marina Express				X		
31 Balboa				X		

Transit Route	New Route	Route Elimination	Change to Route Alignment	Change to Headway	Change to Vehicle Type	Other Changes[1]
31AX Balboa Express						X
31BX Balboa Express						X
32 Roosevelt	X		[4]			
33 Stanyan			X[4]			
35 Eureka			X	X	X	
36 Teresita				X	X	
37 Corbett			X	X	X	
38 Geary				X		
38 Geary Short				X		
38L Geary Limited				X		
38AX Geary Express						X
38BX Geary Express				X		X
41 Union				X		
43 Masonic			X	X		
44 O'Shaughnessy				X		
45 Union-Stockton						[5]
47 Van Ness			X	X		
48 Quintara-24th Street			X	X		X
49 Van Ness-Mission		X				
49L Van Ness-Mission Limited	X				X[2]	
52 Excelsior			X	X		X

Transit Route	New Route	Route Elimination	Change to Route Alignment	Change to Headway	Change to Vehicle Type	Other Changes[1]
54 Felton			X	X		
56 Rutland			X	X	X	
58 24th Street	X					
66 Quintara					X	
71/71L Haight-Noriega[3]			X[4]	X		X
76 Marin Headlands (Sundays Only)			X			X
88 BART Shuttle				X		
91 Owl A			X			
91 Owl B			X			

Notes:

* The 39 Coit, 67 Bernal Heights, 82X Levi Express, 88 BART Shuttle, and 108 Treasure Island do not have any changes associated with them and, therefore are not listed.

[1] "Other Changes" includes miscellaneous service improvements such as new express service stops, and expanding limited-stop service to Sundays, and the addition of a day of service for a route.

[2] The 2 Clement, 5 Fulton shortline 14 Mission, 14L Mission Limited, 22 Fillmore, and 49L Van Ness have service variants related to a change in vehicle type.

[3] Currently, the 71L Haight-Noriega Limited operates in the peak direction during the weekday peak period only, covering the same route as the 71 Haight-Noriega local service. The limited stop area is between Haight Street and Masonic Avenue and Market Street and 11th Street/Van Ness Avenue. As part of the TEP, there would no longer be 71 Haight-Noriega local service. Instead, all service on this route would be provided by the 71L Haight-Noriega Limited. See the 71L Haight-Noriega Limited Service Route map in Appendix A for more information.

[4] The 2 Clement, 11 Downtown Connector, 16X Noriega Express, 22 Fillmore, 27 Bryant, 32 Roosevelt, and 71L Haight-Noriega Limited have service variants related to a route change. The 33 Stanyan would have a route change as part of the 22 Fillmore Variant 1.

[5] "Other Changes", such as stop relocation and elimination, are planned along a portion of this route as part of a project-level TTRP. See associated project-level TTRP for a detailed description of these changes.

The SFMTA has ongoing facility requirements for the storage and maintenance of transit vehicles. Implementation of the TEP would increase the number of transit vehicles required to operate the Muni system over time by approximately 60 vehicles. These vehicles would incrementally increase the SFMTA's facility needs for storage and maintenance of additional buses and trains. In the short term, these changes could be accommodated within existing SFMTA-owned or leased facilities. Long-term vehicle storage needs would be addressed through the SFMTA's routine facilities planning practices.

Table 7 provides a detailed description of the proposed Service Improvements for each of the transit routes listed above. For routes with proposed changes, the type of change (e.g., new route, route elimination, or change to the existing alignment) is stated after the name of those routes. The descriptions of the proposed service changes present route and service changes by location; list street segments where transit routes would be discontinued or added; discuss changes to vehicle types, if applicable; and summarize the project variants to proposed service changes that are being evaluated. Changes to service frequencies during the a.m. and p.m. peak periods are also presented for each line. Changes to service frequencies are also referred to as changes in the route headway.[20] Graphic depictions of all Service Improvements described in Table 7 are shown on route maps that are attached as Appendix A to this Initial Study. In addition, these route maps are available at the Planning Department's Web page for the environmental review of the TEP in Appendix A to the Initial Study at http://tepeir.sfplanning.org.

A.5.1.1 Service-Related Variants

Several service-related variants are under consideration by the SFMTA to maintain flexibility with respect to phasing and the implementation of the proposed Service Improvements on 12 routes. Proposed Service Improvement variants would either modify the proposed route or change the type of proposed transit vehicle. Therefore, each service-related variant for the specified Service Improvements would be similar to the proposed project except for the specific variation described. The project-level analysis incorporates these service-related variants in this description of the Service Improvements and analyzes environmental effects of each variant. The service-related variants are described in Table 7 and also shown on the route and service-related variant maps attached as Appendix A, Service Improvement Maps, to this Initial Study.

[20] Headway is the scheduled time interval between any two revenue transit vehicles operating in the same direction on a route.

Table 7: Description of Proposed Service Improvements

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
E Embarcadero (New Route)	• New historic streetcar line connecting Fisherman's Wharf and the northeast waterfront to AT&T Park and the Caltrain Station. • Line would start at the F Market & Wharves' northern terminus at Jones Street, then travel south along The Embarcadero to Market Street, and then follow the N/T Line alignment to King Street to the E Embarcadero terminus at the Caltrain Station at Fourth and King streets. • No capital improvements are needed for this Line.[21]	N/A	15	N/A	15
F Market & Wharves	• No route changes proposed. • Frequencies would be reduced due to the additional capacity provided by the new E Embarcadero Line. • Midday frequency would change from 5 to 6 minutes.	6.5	7.5	6	5
J Church	• No route changes proposed. • TTRP.J is also proposed for this corridor to reduce transit travel time.	9.5	8	8	9
K-T Ingleside-Third	• No route changes proposed. • TTRP.K is also proposed for this corridor to reduce transit travel time.	9.5	8.5	9.5	8.5

[21] E Embarcadero - While no capital improvements are necessary to implement this service, TTPI.3 proposes to develop a new independent terminal for the E Embarcadero at the north end of the route near Jones and Beach streets. The terminal would facilitate independent movements of E and F streetcars, which would improve reliability for both routes by allowing for independent terminal departures. This would also prevent trains on one route from stacking up behind trains from the other route and being unable to pass.

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
L Taraval	• No route changes proposed. • TTRP.L is also proposed for this corridor to reduce transit travel time.	8	7.5	7	7.5
M Ocean View	• No route changes proposed. • New terminal at Parkmerced is planned and would be funded by the private developer with an estimated year 2020 completion. During peak periods, alternate trips would originate/terminate from/to the Balboa Park Station and this new terminal. • TTRP.M is also proposed for this corridor to reduce transit travel time.	8.5	8.5	9.5	8.5
N Judah	• No route changes proposed. • TTRP.N is also proposed for this corridor to reduce transit travel time.	7.5	5.5	7	6
1 California (west of Presidio Avenue)	• No route changes proposed. • TTRP.1 is also proposed for this corridor to reduce transit travel time.	7	No Change	7	6
1 California (east of Presidio Avenue)	• No route changes proposed. • TTRP.1 is also proposed for this corridor to reduce transit travel time.	3.5	No Change	3.5	3
1AX California Express	• No route changes proposed. • New transit stop would be added on Pine Street (p.m.) and Bush Street (a.m.) at Van Ness Avenue to improve transit connections to the Civic Center and the northern waterfront. • TTRP.1 is also proposed for this corridor to reduce transit travel time.	9	No Change	13	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
1 BX California Express	• No stops would be eliminated, but the route alignment would change. Where the inbound (eastbound) route currently turns south on Fillmore Street, the proposed route would continue on California Street and turn south on Gough Street to Bush Street. The route segment that extends south on Fillmore Street and east on Bush Street to Gough Street would be discontinued. • New transit stop would be added on Pine Street (pm) and Bush Street (am) at Van Ness Avenue to improve transit connections to the Civic Center and the northern waterfront. • TTRP.1 is also proposed for the California Street corridor to reduce transit travel time.	7	No Change	12	No Change
2 Clement (west of Presidio Avenue)	• No route changes proposed. • Supplemental trolley coach service would be added between Downtown (Sansome/Market streets) and Presidio Avenue to maintain current transit frequencies on Sutter and Post streets after replacing the discontinued 3 Jackson route on this segment. • 2 Clement Service Variant proposes an alternative alignment that would use existing overhead wires for trolley coach service on the entire Sutter Street corridor. Instead of operating on Clement Street from Arguello Boulevard to Park Presidio Boulevard, the route would continue on California Street to Eighth Avenue, then south to Clement Street to Sixth Avenue. This service variant would include a terminal loop at Sansome Street in the Downtown area.	12	10	12	10

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
2 Clement (east of Presidio Avenue)	• No route changes proposed. • Supplemental trolley coach service would be added between Downtown (Sansome/Market streets) and Presidio Avenue to maintain current transit frequencies on Sutter and Post streets after replacing the discontinued 3 Jackson route on this segment. • 2 Clement Service Variant proposes an alternative alignment that would use existing overhead wires for trolley coach service on the entire Sutter Street corridor. Instead of operating on Clement Street from Arguello Boulevard to Park Presidio Boulevard, the route would continue on California Street to Eighth Avenue, then south to Clement Street to Sixth Avenue. This service variant would include a terminal loop at Sansome Street in the Downtown area.	12	5	12	5
3 Jackson (Route Elimination)	• Route would be discontinued. • Other Muni routes would provide service on streets currently served by this route, except for Jackson Street between Divisadero Street and Presidio Avenue which would be eliminated due to low ridership. Transit headways on Sutter Street would be maintained by adding supplemental trolley coach service on the 2 Clement between Downtown and Presidio Avenue.	13.5	N/A	12	N/A

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
5 Fulton Short-line/5L Fulton Limited (west of Eighth Avenue) (New Route)	• New Limited Service route would make local stops west of Eighth Avenue, limited stops between Eighth Avenue and Market Street, and resume local stops on Market Street to the Transbay Terminal. • 5L Fulton Limited would be supplemented by 5 Fulton short-line with local service from Eighth Avenue to Downtown. Working together, the 5/5L would serve all local stops from Ocean Beach to Downtown; passengers who want to travel from a local stop west of Eighth Avenue to a local stop between Eighth Avenue and Market Street would need to transfer from the 5L Fulton Limited to the 5 Fulton Short-line route. • In order to maintain Route 5/5L as an electric trolley coach service, bypass wires would be installed to allow limited-stop trolley coaches to pass local trolley coaches between Eighth Avenue and Market Street (OWE.4 The 5 Limited/Local Bypass Wire project). • TTRP.5 is also proposed for this corridor to reduce transit travel time. • The 5 Fulton Service Variant would operate the 5 Fulton short-line with motor coach service prior to the installation of bypass wires.	6	7.5	9	8

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
5 Fulton Short-line/5L Fulton Limited (east of Eighth Avenue) (New Route)	• New Limited Service route would make local stops west of Eighth Avenue, limited stops between Eighth Avenue and Market Street, and resume local stops on Market Street to the Transbay Terminal. • 5L Fulton Limited would be supplemented by 5 Fulton short-line with local service from Eighth Avenue to Downtown. Working together, the 5/5L would serve all local stops from Ocean Beach to Downtown; passengers who want to travel from a local stop west of Eighth Avenue to a local stop between Eighth Avenue and Market Street would need to transfer from the 5L Fulton Limited to the 5 Fulton Short-line route. • Midday frequency would change from 4.5 to 5 minutes. • In order to maintain Route 5/5L as an electric trolley coach service, bypass wires would be installed to allow limited-stop trolley coaches to pass local trolley coaches between Eighth Avenue and Market Street (OWE.4 The 5 Limited/Local Bypass Wire project). • TTRP.5 is also proposed for this corridor to reduce transit travel time. • The 5 Fulton Service Variant would operate the 5 Fulton short-line with motor coach service prior to the installation of bypass wires.	4	No Change	4.5	4

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
6 Parnassus[22] (Alignment Change)	• New alignment would follow Stanyan Street, instead of Masonic Avenue, between Haight Street and Parnassus Avenue to provide increased service on the busiest portion of Haight Street. Low ridership route segment in Ashbury Heights would be discontinued. Combined with service provided by the 71L Haight-Noriega Limited, the 6 Parnassus would provide local and limited-stop service along the full length of Haight Street. • Streets eliminated from the 6 Parnassus route would include Masonic Avenue, Frederick and Clayton streets, and Parnassus Avenue between Clayton and Stanyan streets. The 32 Roosevelt and 33 Stanyan routes would continue to offer service along these segments. Reroute on Haight Street between Masonic Avenue and Stanyan Street would require new overhead wire on Stanyan Street between Haight Street and Parnassus Avenue. (See OWE.3, 6 Parnassus on Stanyan Street). • In the future, the 6 Parnassus route would be extended to West Portal Station. Overhead wires would be extended to West Portal Station from current terminal at 14th Avenue and Quintara Street (OWE.6 New Overhead Wire - 6 Parnassus Extension to West Portal Station). The exact route for OWE 6 is unknown at this time; therefore, OWE.6 is being analyzed programmatically. • TTRP.71 is also proposed for this corridor to reduce transit travel time.	10.5	10	10	No Change

[22] 6 Parnassus - Proposed alignment includes two-way service on lower Haight Street consistent with the SFMTA project to convert Haight Street to two-way traffic between Gough Street and Octavia Boulevard, which has undergone its own environmental review process and is scheduled for construction starting in February 2014 and would be completed by December 2014. This would allow the 6 Parnassus and 71L Haight-Noriega Limited to continue east on Haight from Laguna to Market. When completed, inbound buses will have fewer turns and would not be delayed by traffic on Page Street turning onto Octavia Boulevard.

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
8X Bayshore Express (Alignment Change)	• Segment north of Broadway would be eliminated (replaced by 11 Downtown Connector). Proposed eliminated segments north of Pacific Avenue would be Bay and North Point streets between Powell and Kearny streets, Kearny Street between Bay and North Point streets, Powell Street between Columbus Avenue and North Point Street, Columbus Avenue between Powell Street and Pacific Avenue, and Stockton Street between Green Street and Broadway. Route 11 Downtown Connector would provide replacement service on Powell Street and Columbus Avenue. E and F Line service would be available nearby on Jefferson and Beach streets instead of service on Bay and North Point streets. • Midday frequency would change from 9 to 8 minutes • During non-peak periods, the 8X would layover on Kearny Street between Pacific Avenue and Broadway. In addition to the existing transit zone, a reduction of five parking spaces would be required (parking is currently prohibited from 3 to 6 p.m. as part of the Kearny Street tow-away zone.) The parking restriction hours would need to be extended to all day. • In the p.m. peak, the 8AX and 8BX would have separate terminals. The 8AX would stop on Kearny Street, nearside of the intersection with Columbus Avenue, and the 8BX would use the 8X midday terminal on Kearny Street between Pacific Avenue and Broadway. The 8AX would not layover Downtown in the a.m. peak (similar to existing conditions). • TTRP.8X is also proposed for this corridor to reduce transit travel time. • Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years.	7.5	No Change	7.5	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
8AX Bayshore Express	• No route changes proposed. • See 8X Bayshore Express for terminal details. • TTRP.8X is also proposed for this corridor to reduce transit travel time. • Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years.	7.5	No Change	7.5	No Change
8BX Bayshore Express (Alignment Change)	• Segment north of Broadway would be eliminated (replaced by 11 Downtown Connector). • Proposed eliminated segments north of Pacific Avenue would be Bay and North Point streets between Powell and Kearny streets, Kearny Street between Bay and North Point streets, Powell Street between Columbus Avenue and North Point Street, Columbus Avenue between Powell Street and Pacific Avenue, and Stockton Street between Green Street and Broadway. Route 11 Downtown Connector would provide replacement service on Powell Street and Columbus Avenue. E Embarcadero and F Market & Wharves Lines service would be available nearby on Jefferson and Beach streets instead of service on Bay and North Point streets. • See 8X Bayshore Express for terminal details. • TTRP.8X is also proposed for this corridor to reduce transit travel time. • Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years.	8	7.5	7.5	No Change
9 San Bruno	• No route changes proposed. • TTRP.9 is also proposed for this corridor to reduce transit travel time.	12	No Change	12	No Change
9L San Bruno Limited	• No route changes proposed. • TTRP.9 is also proposed for this corridor to reduce transit travel time.	12	10	12	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
10 Sansome (currently 10 Townsend) (Alignment Change)	• 10 Townsend would be renamed the 10 Sansome, since service would be rerouted off of Townsend Street. • Service would continue to operate between Jackson and Steiner streets and 24th Street and Potrero Avenue via Potrero Hill, but would be rerouted at Fourth Street south of the Caltrain Station through the Mission Bay neighborhood. From Fourth Street, the route would extend through Mission Bay to new proposed street segments on Seventh Street between Mission Bay Boulevard and Irwin Street, on Irwin Street between Seventh and 16th streets, on 16th Street between Irwin and Connecticut streets, and on Connecticut Street between 16th and 17th streets. The southern terminal loop would be modified by extending service on Potrero Avenue, right on Cesar Chavez Street, right on Hampshire Street, and right on 24th Street. • The northern terminal would continue to be located on Jackson Street between Fillmore and Steiner streets. On the weekends and evenings, all trips would continue to terminate at Van Ness Avenue, but would use a slightly different route. From Jackson Street the route would continue right on Franklin Street and right on Pacific Avenue. The one block segment on Van Ness Avenue between Jackson Street and Pacific Avenue may be eliminated to reduce conflicts with the proposed Van Ness BRT Project. This will be addressed as part of the Van Ness BRT study. • Proposed eliminated segments would be on Townsend Street between Fourth and Eighth streets, Rhode Island Street between Eighth and 17th streets, and 17th Street between Rhode Island and Connecticut streets. The segment on Townsend Street between Fourth and Eighth streets would be served by the rerouted 47 Van Ness route and the 83X Mid Market Express between Fourth and Eighth streets during limited hours. • Midday frequency would change from 20 to 12 minutes. • Southern terminal would be located on Hampshire Street adjacent to James Rolph Jr. Playground and would require a reduction of up to nine parking spaces on Hampshire between 26th and Cesar Chavez streets.	20	6 (east of Van Ness Avenue)	20	6 (east of Van Ness Avenue)

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
11 Downtown Connector (New Route)	• New 11 Downtown Connector would provide SoMa with two connections to Market Street, at the Van Ness and Montgomery Stations, and would provide North Beach with a direct connection to the Financial District and Montgomery Station. • Southbound, the new route would run on Van Ness Avenue, Bay, Polk, North Point, and Powell streets, on Columbus Avenue, on Montgomery, Clay, Sansome, Market, Second, Harrison, 11th, and Mission streets, to a southern terminal on South Van Ness Avenue. Northbound (IB), the new route would run on South Van Ness Avenue, Market, 11th, Folsom, Second, Market, Sutter, Sansome, and Washington streets, on Columbus Avenue, Powell and North Point and Bay streets to the northern terminal on Van Ness Avenue. • Proposed route in SoMa would operate on an east/west couplet on Folsom and Harrison streets. • The southern terminal would be located at the southeast corner of South Van Ness Avenue and Market Street. The 140-foot transit zone would require a reduction of up to eight parking spaces. • The northern terminal will be located on Van Ness Avenue between Bay and North Point streets requiring a 130-foot transit zone and the removal of up to six parking spaces. • The 11 Downtown Connector Service Variant would evaluate two-way operation on Folsom Street consistent with the proposal in the Western SoMa Community Plan.	N/A	12	N/A	12

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
12 Folsom-Pacific (Route Elimination)	• Route would be discontinued. • Service on Folsom Street from Second to Fifth streets would be provided by the11 Downtown Connector. Service on Folsom Street from Fifth to Cesar Chavez streets, including the terminal loop to the 24th Street BART Station, would be replaced by rerouted 27 Bryant. • Service along Pacific Avenue, Sansome and Second streets would be provided by the 10 Sansome. The 11 Downtown Connector would also provide SoMa service on Folsom and Harrison streets, and Downtown service across Market Street on Sansome and Second streets.	20	N/A	20	N/A
14 Mission (north of Lowell Street)	• No route changes proposed. • Proposed conversion from trolley to motor coach. • TTRP.14 is also proposed for this corridor to reduce transit travel time. • TTPI.1 also proposes a new pedestrian bulb at the northwest corner of Ocean Avenue and Mission Street.	6	7.5	7.5	No Change
14 Mission (south of Lowell Street)	• No route changes proposed. • Proposed conversion from trolley to motor coach. • TTRP.14 is also proposed for this corridor to reduce transit travel time. • TTPI.1 also proposes a new pedestrian bulb at the northwest corner of Ocean Avenue and Mission Street.	15	No Change	15	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
14L Mission Limited	• No route changes proposed. • Route would operate as a trolley coach service, replacing current motor coach service, along with the 49L Van Ness-Mission Limited. The 14 Mission Local would be converted to motor coach to allow limited-stop services to pass local services. • TTRP.14 is also proposed for this corridor to reduce transit travel time.	9	7.5	9	7.5
14X Mission Express	• No route changes proposed. • TTRP.14 is also proposed for this corridor to reduce transit travel time.	8	7.5	8	7.5
16X Noriega Express (Alignment Change)	• Route would be extended to Market and Spear streets in the Financial District (currently terminates at Fourth Street). • Extension would run in the a.m. inbound from Golden Gate Avenue to Market and Spear streets, and in the p.m. outbound from Mission, Main and Market streets to Turk Street. • To create a 100-foot-long terminal layover space during the peak period, a peak tow-away zone from 4 to 6 p.m. would be adopted on the south side of Mission Street between Steuart and Spear streets. This would require a reduction of up to five parking spaces during the peak period. • Under existing conditions, the outbound route operates on 23rd Avenue between Lincoln Way and Noriega Street, and inbound on 22nd Avenue. The proposed 16X Service Variant would operate two-way inbound/outbound service on 22nd Avenue to provide better connections to the N Judah.	9	No Change	9	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
17 Parkmerced (Alignment Change)	• Would replace existing Route 18 46th Avenue segment around Lake Merced via John Muir Drive and Skyline Boulevard. The Daly City portion of the route would make limited stops at key destinations. • One-way loop on Arballo, Garces, and Gonzalez drives in Parkmerced would be replaced by two-way service on Font Boulevard to simplify route. • New street segments would be from Font Boulevard and Arballo Drive via Font Boulevard, Chumasero Drive, Junipero Serra Boulevard, John Daly Boulevard, Daly City BART, John Daly Boulevard, Lake Merced Boulevard, John Muir Drive, and Skyline Boulevard, Herbst Road (toward West Portal only), and Skyline and Sloat boulevards to Everglade Drive. • Midday frequency change from 30 to 20 minutes. • The bus would terminate near Lakeshore Plaza on the south side of Sloat Boulevard at Havenside Drive and would require removing up to four parking spaces. At the other end of the route, the route would terminate at its current West Portal Station location.	30	20	30	15
18 46th Avenue (Alignment Change)	• Proposed alignment would operate on a more direct route between the San Francisco Zoo and Stonestown Galleria shopping center via Sloat, Sunset, and Lake Merced boulevards and Winston Drive. Service along Skyline Boulevard, John Muir Drive and Lake Merced Boulevard between Font Boulevard and Winston Drive would be replaced by the revised 17 Parkmerced route. • Service along Lake Merced Boulevard between John Muir Drive and Font Boulevard would be discontinued.	20	No Change	20	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
19 Polk (Alignment Change)	• Proposed route would continue to operate between Van Ness Avenue/North Point Street but service to the south would be cut back to San Francisco General Hospital at 23rd Street and Potrero Avenue. The route segment south of 24th Street would be replaced with the rerouted 48 Quintara. With this change, passengers would be required to transfer to reach the Civic Center, but would have a more direct connection to Potrero Avenue, the Mission (including 24th Street BART Station), Noe Valley and the Sunset District. • Route would be modified in Civic Center area to simplify route structure and reduce travel times in both directions. The line would run from Seventh and McAllister streets to Polk Street, and from Polk, McAllister, to Hyde Street. With these changes, the 19 Polk would no longer run on Market Street (between Seventh and Ninth streets), Larkin, Eddy or Hyde (between Eddy and McAllister) streets, or on Geary Boulevard (between Larkin and Polk streets). • Southbound routing to San Francisco General Hospital would be from Rhode Island Street, right on to 23rd Street, left on Utah Street, right on 24th Street, right on Potrero Avenue, and right on 23rd Street. • New terminal would be located at the existing 10 Townsend terminal on 24th Street at Potrero Avenue.	15	No Change	15	No Change
21 Hayes	• No route changes proposed.	9	8	10	9

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
22 Fillmore (Alignment Change)	• Would be rerouted to continue along 16th Street to Third Street, creating new connections to Mission Bay from the Mission District. • The proposed route change would add transit to 16th Street between Kansas and Third streets, Mission Bay Boulevard between Fourth and Third streets, Fourth Street between Gene Friend Way and Mission Bay Boulevard, and along Gene Friend Way. • Segment along Connecticut and 18th streets would be replaced by rerouted 33 Stanyan. Service on Kansas and 17th streets would be eliminated, although Kansas Street would continue to be used for short turns and other operational adjustments. • TTRP.22_1 and TTRP.22_2 are proposed for this corridor to reduce transit travel time. • Midday Frequency Change from 10 to 7.5 minutes. • New terminal loop would run from Third Street, Mission Bay Boulevard North, Fourth Street, Mission Bay Boulevard South, and Third Street, as presented in the Mission Bay EIR. • Proposed variants would evaluate motor coach service between Mission Bay and the 16th Street BART Station for initial service phase prior to new overhead wire construction (see OWE.5 for the 22 Fillmore). - 22 Fillmore Service Variant 1 would include new motor coach service to the Mission Bay terminus from the 16th Street BART Station and a reroute of the 33 Stanyan along the current 22 Fillmore route. The Mission Bay motor coach service would include a western terminal loop that would make a right on Mission Street, left on 15th Street, left on Valencia Street and back onto 16th Street to Mission Street. The eastern terminus would utilize the proposed 22 Fillmore terminal loop in Mission Bay. The 22 Fillmore trolley coach service would conduct a terminal loop by turning right on Kansas Street, right on 17th Street, right on Vermont Street and left on 16th Street. There is existing overhead wiring at this location.	9	6	8	5.5

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
22 Fillmore (continued)	- 22 Fillmore Service Variant 2 would have a similar motor coach service between 16th Street BART Station and Mission Bay. However, instead of rerouting the 33 Stanyan to 18th Street, that segment would be covered by sending every other 22 Fillmore trolley coach to the current terminal at Third and 20th streets and terminating the rest at the existing loop on Kansas, 17th and Vermont streets.				
23 Monterey (Alignment Change)	• Segment on Toland Street, Jerrold Avenue and Phelps Street proposed to be eliminated to provide a more direct path of travel. Route would operate on Oakdale Avenue, Industrial Way and Palou Avenue. Transit would be added to Palou Avenue between Barneveld Avenue and Industrial Way, and Barneveld Street between Oakdale and Palou avenues.	20	No Change	20	No Change
24 Divisadero	• No route changes proposed.	10	9	10	9

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
27 Folsom (current 27 Bryant) (Alignment Change)	• Would be renamed the 27 Folsom since the route would no longer operate on Bryant Street. • Service would be extended north on Leavenworth Street and west on Vallejo Street to Van Ness Avenue, and would be moved from Bryant Street to Folsom Street to replace 12 Folsom service on Folsom Street from Fifth to Cesar Chavez streets, including the terminal loop to the 24th Street BART Station. • Existing passengers on Bryant Street could use 9 San Bruno/9L San Bruno Limited rapid service on Potrero Avenue or local service on Folsom Street. • The 27 Folsom Service Variant 1 would evaluate two-way service on Leavenworth and Ellis streets, and two-way service on Folsom Street, as proposed in the Tenderloin Community Plan and the Western SoMa Community Plan, respectively. • 27 Folsom Service Variant 2 would evaluate transit service on Harrison Street in the Inner Mission from 11th to Cesar Chavez streets. • New terminal loop would follow Vallejo Street, Van Ness Avenue, Green and Polk streets. The terminal would be located on Vallejo Street at Van Ness Avenue and would be 100 feet long, requiring a reduction of up to five parking spaces.	15	No Change	15	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
28 19th Avenue (Alignment Change)	• Proposed alignment would terminate at Golden Gate Bridge (Toll Plaza Area) during daytime hours. Service to Van Ness Avenue and North Point Street via the Marina District would be provided by the 28L 19th Avenue Limited and service to Fort Mason would be provided by Route 43 Masonic. • When 28L 19th Avenue Limited is not in service, the 28 19th Avenue would provide evening service to Van Ness Avenue/North Point Street via Lombard Street. • Midday frequency change from 12 to 9 minutes. • To accommodate a new terminal at the northern segment of the route, the existing red curb in the eastern parking lot of the Toll plaza, adjacent to the new Pavilion building, would be designated as a bus terminal (the precise location would be selected in consultation with Golden Gate Bridge, Highway and Transportation District and Golden Gate National Recreation Area). • TTRP.28_1 is proposed to reduce transit travel time on this corridor.	11	9	10	9

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
28L 19th Avenue Limited (Alignment Change)	• Proposed alignment would provide all-day rapid, very limited-stop cross-town service, increasing access to San Francisco State University and CCSF from Van Ness Avenue/North Point streets and would provide better connections between the Marina, Richmond, Sunset, and Excelsior neighborhoods. Route would be extended to Van Ness Avenue/North Point Street from Lombard Street and to Mission Street/Geneva Avenue via I-280. (Note: Golden Gate Bridge Toll Plaza would not be served by this route.) • New streets on northern segment are Lombard Street, between Laguna Street and Van Ness Avenue, and on sections of Alemany Boulevard, between Sagamore Street and San Jose Avenue; I-280 between Ocean and Sickles avenues exit, Brotherhood Way, between Junipero Serra Boulevard and Sagamore Street, on Niagara Avenue between Alemany Boulevard between Niagara and Geneva avenues (to accommodate the terminal loop). • Midday service would operate every 9 minutes. • Limited-stop service would operate seven days a week from 6 a.m. to 9 p.m. with wider stop spacing than current 28L 19th Avenue Limited (currently limited-stop service operates weekdays only approximately 7 - 9 a.m. and 2 - 4 p.m.). • TTRP.28_1 and TTRP.28_2 are proposed to reduce transit travel time on this corridor. • The southern terminal would be located on Geneva Avenue midblock between Mission Street and Alemany Boulevard. The terminal loop would be right onto Mission Street, right onto Niagara Avenue, and right onto Alemany Boulevard. This would require a reduction of up to five parking spaces. • Northern terminal will require a 160 foot extension of the current 30 Stockton short line service terminal located on North Point Street between Van Ness Avenue and Polk Street. Accommodating the 28L 19th Avenue Limited at this location will require the removal of up to 10 parking spaces.	12	9	N/A	N/A

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
28L 19th Avenue Limited (continued)	• In October 2011, the 28L 19th Avenue Limited was extended to Fort Mason, with express service from Park Presidio Boulevard and California Street to Lombard Street. Currently there is a temporary reroute due to the major Doyle Drive reconstruction underway which requires the utilization of California Street to access the Marina District**.**				
29 Sunset[23] (Alignment Change)	• Would provide a more direct route on Ocean Avenue to Balboa Park Station (instead of current route on Mission Street and Geneva Avenue). • Route would extend from Persia Avenue to Ocean Avenue to Plymouth Avenue. New street segment on Persia Avenue between Mission Street and Ocean Avenue in association with TTPI.1 Persia Triangle Improvements. • Service would be eliminated on Mission Street between Persia and Geneva avenues and on Geneva Avenue between Mission Street and Ocean Avenue. • Two-way service on Gilman Avenue would simplify route to/from Candlestick Park; service on Fitzgerald Street would be discontinued.	10	9	10	No Change

[23] SFMTA is pursuing a separate project that would reduce travel time by enabling the bus to turn left from Lincoln Way onto 19th Avenue instead of going right on 20th Avenue, left on Irving Street and left on 19th Avenue.

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
30 Stockton (east of Van Ness Avenue)	• No route changes proposed. • Subject to equipment availability, all service on Stockton Street would be provided by 60-foot articulated buses to reduce crowding and improve reliability. • Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years. • TTRP.30 is also proposed to reduce transit travel time along this corridor.	N/A	N/A	4	No Change
30 Stockton (west of Van Ness Avenue)	• No route changes proposed. • Subject to equipment availability, all service on Stockton Street would be provided by 60-foot articulated buses to reduce crowding and improve reliability. • Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years. • TTRP.30 is also proposed to reduce transit travel time along this corridor.	7.5	7	12	No Change
30X Marina Express	• No route changes proposed. • In the a.m. peak period, the 30X Marina Express would use 60-foot articulated motor coaches instead of standard 40-foot motor coaches.	4	5.5	7.5	7
31 Balboa	• No route changes proposed.	12	No Change	14	12

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
31AX Balboa Express	• No route changes proposed. • New stop would be added on Bush and Pine streets at Van Ness Avenue to improve connections to the northern waterfront and the Civic Center.	12	No Change	11	No Change
31BX Balboa Express	• No route changes proposed • New stops would be added on Bush and Pine streets at Van Ness Avenue to improve connections to the northern waterfront and the Civic Center.	10	No Change	12	No change
32 Roosevelt (New Route)	• Proposed route would replace Roosevelt Way segment of Route 37 Corbett but would not extend north of Cole/Frederick streets. • Route would travel from Church and Market streets via Church Street left on Hermann Street, left on Fillmore Street, left on Duboce Avenue, right on Church Street, right on 14th Street, followed by Roosevelt Way, Buena Vista Terrace, Buena Vista East, Upper Terrace, Masonic Avenue, Roosevelt Way, then on 17th, Cole, Frederick, Clayton, and 17th streets, on Roosevelt Way onto to 14th Street and then, left onto Church Street. This would require modifying the existing no left turn restriction at Fillmore Street and Duboce Avenue to no left turns except Muni. • Terminal would be on Church Street between Market and Reservoir streets. This would require a reduction of up to five parking spaces (when combined with the 37 Corbett terminal in the same location). • 32 Roosevelt Service Variant would include an alternative alignment along Church Street, Hermann Street, Fillmore Street and Duboce Avenue. • Recommended for van service, but the timeline for van procurement is uncertain.	N/A	20	N/A	20

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
33 Stanyan (Alignment Change)	• Would operate on current route on 18th Street west of Valencia Street and 16th Street between Valencia Street and Potrero Avenue. • Would cross Potrero and continue east on 16th Street to Connecticut Street, south to 18th Street, to Third Street, 20th and Tennessee streets to cover Potrero Hill segment of 22 Fillmore that would be eliminated. • Service would be rerouted onto Valencia Street between 16th and 18th streets (new street segment) to alleviate transit congestion on Mission Street and provide better connections with 22 Fillmore as described in Service-related Capital Improvement project OWE.1. • Potrero Avenue passengers would use Route 9 San Bruno/9L San Bruno Limited.	15	No Change	15	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
35 Eureka (Alignment Change)	• Service would be extended to Glen Park Station via Diamond Heights Boulevard and Diamond Street. • Would be rerouted between 21st and 24th streets to replace existing Route 48 Quintara on Hoffman Avenue and Douglass Street. • Buses would turn around near Glen Park Station using Wilder, Arlington, Bosworth and Diamond streets. • Segment along Farnum, Moffitt, Bemis, and Addison streets would be eliminated. • New transit street segments on Arlington Street between Bosworth and Wilder streets; Wilder Street, between Arlington and Diamond streets, and on 21st Street between Eureka and Douglass streets. • Midday frequency would change from 30 to 20 minutes. • Recommended for van service, but the timeline for van procurement is uncertain. • Potential 35 Eureka variant would include an alignment along Diamond Street.	30	20	20	No Change
36 Teresita (Alignment Change)	• Recommended for van service, but the timeline for van procurement is uncertain. • Service to Forest Knolls (via Warren Drive) would be eliminated to make remaining service less circuitous; service to Midtown Terrace would be unchanged. • Eliminated streets include Clarendon Avenue between Panorama and Oak Park drives, Oak Park and Warren drives, Lawton and Seventh avenues to Clarendon Avenue. • Midday frequency would change from 30 to 20 minutes.	30	20	30	20

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
37 Corbett[24] (Alignment Change)	• The Roosevelt Way branch of the 37 Corbett would be replaced by the new 32 Roosevelt route. • Streets in the Roosevelt Way branch proposed to be served by the 32 Roosevelt would be: Market, Sanchez, and 14th streets, Roosevelt Way, Buena Vista Terrace, Buena Vista East, Upper Terrace, Masonic Avenue, Roosevelt Way, 17th, Cole, Frederick, Clayton, and 17th streets, Roosevelt Way, and 14th. • Streets no longer served by either 37 Corbett or 32 Roosevelt are Clayton Street between 17th and Carmel streets, Carmel Street between Clayton and Cole streets, Cole Street between Carmel and 17th streets, Cole Street between Frederick and Haight streets, and Haight Street, Masonic Avenue, Waller and Ashbury streets. • The new terminal loop would operate from Market Street, left on Church Street, left on Hermann Street, left on Fillmore Street, left on Duboce Avenue, and right on Church Street. The terminal would be on Church Street between Market and Reservoir streets. This would require a reduction of up to five parking spaces (when combined with the 32 Roosevelt terminal in the same location). • 37 Corbett Service Variant would include an alternative alignment along Church Street, Hermann Street, Fillmore Street and Duboce Avenue.	15	No Change	20	15

[24] 37 Corbett - Segments of the 37 Corbett route on Portola Avenue between Burnett Avenue and Glenview Drive, Glenview Drive, and Dawn View Drive are proposed to be eliminated in 2012 and are not analyzed as part of TEP. Information regarding this project is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California as part of Case File Number 2012.0796 E.

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
38 Geary (west of 33rd Avenue)	• No route changes proposed. • Midday frequency would change from 16 to 15 minutes west of 33rd Avenue. • Would coordinate with Geary BRT study currently underway.	12	15	16	12
38 Geary (east of 33rd Avenue)	• No route changes proposed. • Would coordinate with Geary BRT study currently underway.	12	7.5	8	6
38L Geary Limited	• No route changes proposed (Proposed Geary BRT is subject to its own environmental review). • Midday frequency change from 5.5 to 5 minutes. • Limited-stop service would be expanded to include Sundays. • Would coordinate with Geary BRT Study currently underway.	5.5	5	5.5	5
38AX Geary Express	• No route changes proposed. • New stops would be added on Pine and Bush streets at Van Ness Avenue to improve connections to the northern waterfront and the Civic Center.	11	No Change	9	No Change
38BX Geary Express	• No route changes proposed. • New stops would be added at Pine and Bush streets at Van Ness Avenue to improve connections to the northern waterfront and the Civic Center.	11	No Change	9	No Change
41 Union	• No route changes proposed.	10	7	8	7

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
43 Masonic (Alignment Change)	• Proposed alignment would extend from Chestnut/Fillmore streets to Fort Mason (Marina Boulevard/Laguna Street), replacing the existing Route 28 19th Avenue/28L 19th Avenue Limited terminal. • Service in the Presidio would be modified to connect to the Presidio Transit Center; then exit the Presidio in the Marina District at Richardson Avenue instead of Lombard Street. Modified route would use Presidio Avenue, Lincoln Boulevard, Graham Street (Presidio Transit Center), Halleck Street, Gorgas and Richardson avenues, to Lombard Street. • The 43 Masonic would no longer serve Letterman Drive and Lombard Street between Presidio and Richardson avenues.	10	8	12	10
44 O'Shaughnessy	• No route changes proposed.	9	7.5	9	8

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
47 Van Ness (Alignment Change)	• Route would terminate at Van Ness Avenue and North Point Street and would share a terminal with the 49L Van Ness-Mission Limited. A common terminal for both routes serving Van Ness Avenue would improve reliability by allowing line management from a single point; North Point segment would be covered by new Route 11 Downtown Connector. • Northern street segments that would be eliminated include portions of North Point, Stockton, Beach, and Powell streets. • Route would operate along South Van Ness Avenue, Division and Townsend streets, instead of Bryant and Harrison streets to provide faster connection to Caltrain and better connections to the commercial and residential centers along 13th and Division streets. New transit streets on the southern segment are South Van Ness Avenue between Mission and 13th streets; 13th Street between South Van Ness Avenue and Bryant Street; and Division Street between Brannan and Townsend streets. • Southern street segments that would be eliminated are Mission, 11th Street, Harrison, Bryant, Fifth, and Fourth streets. • Midday frequency would change from 10 to 9 minutes. • Proposed route change would coordinate with proposed Van Ness BRT project.	10	7.5	10	7.5

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
48 Quintara-24th Street (Alignment Change)	• Service would operate all day from 48th Avenue to the Hunters Point Naval Shipyard; new Route 58 24th Street would provide complementary service between Diamond Street and the 22nd Street Caltrain Station. • Would provide more direct routing from Portola Drive to 24th Street via Clipper and Douglass streets; new transit streets would be Clipper Street between Grandview Terrace and Douglass Street, and Douglass Street between Clipper and 24th streets; drop-off only on-demand service on the Hoffman Loop, Grandview Terrace, and Fountain Street would be discontinued; service on Douglass Street and Hoffman Avenue would be replaced by the modified Route 35 Eureka. • At 25th and Connecticut streets, this route would no longer follow the existing Route 48 Quintara alignment and would change to follow the existing 19 Polk route to Hunters Point via Evans and Innes avenues. • New connection from the Mission District, Noe Valley and the Sunset to Third Street and Hunters Point would be provided, covering a portion of existing Route 19 Polk on Evans and Innes avenues and Galvez Street. • The part-time terminal on the Lower Great Highway nearside at Rivera Street would become an all-day terminal. No additional parking reduction would be required. The southeastern end of the route would use the existing 19 Polk terminal at the former Navy Yard Gate.	11	15	12	15

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
49L Van Ness-Mission Limited (New Route)	• No route changes proposed. • To provide shorter travel times, proposed service would make local stops (as proposed in the Van Ness BRT project) on Van Ness Avenue and on Ocean Avenue and make limited stops on Mission Street. • The 49L Van Ness-Mission Limited would follow the current 49 Van Ness-Mission route. • The TTPI.1, Persia Triangle Improvements, would construct two new transit zones with transit bulbs along Ocean Avenue for the 49L Van Ness-Mission Limited.	N/A	7.5	N/A	7.5
52 Excelsior (Alignment Change)	• Route would be extended from the Excelsior District to Balboa Park Station and CCSF via Naples Street and Geneva Avenue to include segments currently covered by the 54 Felton that would be eliminated. • Would provide the Excelsior with two connections to BART. • Two-way service would be provided on Excelsior Avenue and Naples Street; service would be discontinued on Brazil Avenue, Prague Street, and La Grande Avenue. • Transit would be added to Naples Street between Brazil and Russia avenues. • Midday frequency change from 30 to 20 minutes. • A new terminal would be located on the western side of Phelan Avenue between Cloud Circle Street and Ocean Avenue in front of the CCSF bookstore; a 100-foot-long terminal would be created that would result in a reduction of up to five parking spaces and moving the existing motorcycle parking north approximately 100 feet.	20	No Change	20	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
54 Felton (Alignment Change)	• Route would be modified in several segments to make service quicker, more direct and less circuitous for passengers. • Two-way service on Hunters Point hilltop would begin at Third Street and Palou Avenue, run two-way on Hudson Avenue, North Ridge Road, Jerrold Avenue, Kirkwood Street, Kiska Road, Ingalls Street, Van Dyke Avenue, and then continue through Silver Terrace. • More direct routing on Bacon Street through the reservoir would eliminate the segment on Holyoke and Woolsey streets, and University Street between Bacon and Woolsey streets. • Routing via Persia, Ocean, and Plymouth avenues would streamline service and improve access to/from CCSF and Balboa Park Station; some eliminated segments between Geneva Avenue and the Balboa Park Station would be picked up by the revised 52 Excelsior. • The inbound route would travel from BART access road (Daly City BART Station), right on John Daly Boulevard, right on Junipero Serra Boulevard, right on Alemany Boulevard, right on Sagamore Street, left on Plymouth Avenue, right on Ocean Avenue (Balboa Park Station), right on Persia Avenue, left on Athens Street, right on Avalon Avenue, left on Felton Street, right on University Street, left on Bacon Street, left on Phelps Street, left on Vesta Street, right on Thornton Avenue, right on Bridgeview Drive, right on Topeka Avenue, right on Thornton Avenue, left on Reddy Street, straight on Williams Avenue, straight onto Van Dyke Avenue, left on Ingalls Street, right on Kiska Road, straight on Kirkwood Avenue, left on Earl Street, left on Jerrold Avenue, and straight onto Northridge Road, Hudson Avenue, Third Street and Palou Avenue. • The outbound route would travel from Third Street and Palou Avenue via Palou Avenue, Newhall Street, Third Street, Hudson Avenue, Northridge Road, Jerrold Avenue, Earl Street, Kirkwood Avenue, Kiska Road, Ingalls Street, Van Dyke Avenue, Williams Avenue, Reddy Street, Thornton Avenue,	20	15	20	15

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
54 Felton (continued)	Topeka Avenue, Bridgeview Drive, Thornton Avenue, Vesta Street, Phelps Street, Bacon Street, University Street, Felton Street, Moscow Street, Persia and Ocean avenues (Balboa Park Station), Plymouth Avenue, Sagamore Street, Alemany Boulevard, St. Charles Avenue, and BART Access Road (Daly City BART). • The bus would share the existing 24 Divisadero terminal on Third Street between Palou Avenue and Oakdale Street.				
56 Rutland (Alignment Change)	• Route would be shortened and the service frequency increased. • Proposed one-way loop route: from terminal at Arleta Avenue and Bayshore Boulevard, left on San Bruno Avenue, left on Wilde Avenue, left on Rutland Street, right on Raymond Avenue, left on Sawyer Street, left on Leland Avenue, left on Alpha Street, right on Arleta Avenue to terminal at Arleta Avenue and Bayshore Boulevard. • Route would follow Leland Avenue, rather than Sunnydale Avenue, between Sawyer and Alpha streets. • Segments on Sawyer Street between Leland and Visitacíon avenues, Hahn Street, Rutland Street between Sunnydale and Leland avenues, and Sunnydale Avenue between Schwerin and Hahn streets would be discontinued. The 8X Bayshore Express and 9 San Bruno would cover segments of Route 56 Rutland on Sunnydale Avenue between Rutland and Schwerin streets, and on Hahn Street between Visitacíon and Sunnydale avenues. • Transit would be added to Leland Avenue between Sawyer and Rutland streets and Rutland Street between Tioga and Wilde avenues, Alpha Street between Leland and Arleta avenues and Arleta Avenue between Alpha Street and Bayshore Boulevard.	30	20	30	20

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
56 Rutland (continued)	• Route segments to/from Executive Park and along Visitacíon Avenue would be discontinued on Wilde between Delta and Rutland streets, Delta between Wilde and Tioga avenues, and Tioga between Delta and Rutland streets. • Midday frequency would change from 30 to 20 minutes. • New terminal would be located at the nearside corner of Arleta Avenue at Bayshore Boulevard. This would require a reduction of up to five parking spaces. • Recommended for van service, but the timeline for van procurement is uncertain.				
58 24th Street (New Route)	• Route would operate between Diamond and Third streets to increase service frequency on 24th Street and to provide connection between the 24th Street BART Station and 22nd Street Caltrain Station (previously provided by Route 48 Quintara). • Eastern portion of new route would replace existing Route 48 Quintara service in Potrero Hill. • Buses would turn around on the northern portion of the route using 24th, Diamond, Clipper, and Castro streets to 24th Street; Clipper Street between Castro and Diamond streets is not currently used for buses. • Terminal would be located on Castro Street nearside of the intersection with 25th Street; the existing transit zone would be extended, which would require a reduction of up to five parking spaces.	N/A	15	N/A	15
66 Quintara	• No route change proposed. • Recommended for van service, but the timeline for van procurement is uncertain.	20	No Change	20	No Change

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
71L Haight-Noriega Limited[25] Route)	• No route changes proposed. • Existing 71L Haight-Noriega Limited, which operates only in the peak period and peak direction, would replace the 71 Haight Noriega and provide all day limited-stop service on Haight Street in both directions. • Route would make local stops west of Stanyan Street and on Market Street; route would make limited stops between Stanyan and Market streets. • Route includes inbound/outbound service on 22nd/23rd Avenue couplet. 71L Haight-Noriega Limited Service Variant would evaluate two-way, inbound/outbound service on 22nd Avenue to improve connections to the N Judah. • Midday frequency would change from 12 to 10 minutes. • TTRP.71 is proposed to reduce transit travel time on this corridor.	10.5	9	10	9

[25] 71L Haight-Noriega Limited - Proposed route includes two-way service on lower Haight Street consistent with the SFMTA project (in design phase) to convert Haight Street to two-way traffic operation between Gough Street and Octavia Boulevard. This would allow the 6 Parnassus and 71L Haight-Noriega Limited to continue east on Haight from Laguna to Market streets. When completed, inbound buses would have fewer turns and would not be delayed by traffic on Page Street turning onto Octavia Boulevard.

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
76 Marin Headlands (Alignment Change)	• Route segment south of Market Street to Caltrain Station would be discontinued. • Northern segment of the outbound route would be extended to serve the Point Bonita lighthouse via Field Road and Battery Alexander; however, the terminal loop would remain at the existing terminal location at Fort Cronkhite. • New southern terminal would be located in the vicinity of Montgomery Station. The terminal would be located at the existing NX Judah Express terminal, at the northwest corner of the intersection of Sutter and Sansome streets. This terminal would be at an existing farside stop and would not require the removal of any additional parking. • Route is proposed to run on Saturdays, Sundays and holidays (currently Sundays and holidays only).[26]	Sunday and holidays only	Saturday, Sunday, and holidays	Sunday and holidays only	Saturday, Sunday, and holidays

[26] A 24-month pilot project for the 76 Marin Headland service changes received environmental clearance on October 11, 2012. The file is available for review at the San Francisco Planning Department, 1650 Mission Street, 4th floor, as part of case file 2012.1140E.

Table 7: Description of Proposed Service Improvements (continued)

Transit Line (Type of Change)	Description of Proposed Service Change	a.m. Existing	a.m. Proposed	p.m. Existing	p.m. Proposed
		Change to Headway [1, 2] Peak Period (Minutes)			
91 Owl A (Alignment Change)	• In conjunction with 91B Owl, would replace the existing 91 Owl. This bus would operate between 1 and 5 a.m. weekdays, and between 1 and 6 a.m. on Saturday and Sunday. • Existing 91 Owl loop line would be split in two to improve reliability. • Would operate from Mission Street/San Jose Avenue in Daly City to the Caltrain Station at Fourth and King streets via 19th Avenue, Lombard Street, Columbus Avenue, and Stockton and Fourth streets. • Would connect with the 14 Owl, and also connect with SamTrans at the Daly City BART Station. • Frequency of service would be the same as the existing 91 Owl – every 30 minutes. • The Daly City terminal loop would follow John Daly Boulevard, Mission Street, Flournoy Street, San Jose Avenue, to John Daly Boulevard. • The Caltrain Station terminal loop would follow Fourth, Townsend, and Third streets.	N/A	N/A	N/A	N/A
91 Owl B (Alignment Change)	• In conjunction with 91A Owl, would replace the 91 Owl. • Existing 91 Owl loop line would be split in two to improve reliability. • 91B would be through-routed with the N Owl (Fourth and Townsend streets to West Portal Station via Third Street, Geneva and Ocean avenues). • Frequency of service would be the same as the existing 91 Owl - every 30 minutes. • Cargo Way segment would be eliminated.	N/A	N/A	N/A	N/A

Note:

1 The a.m. peak period is between 7 a.m. and 9 a.m.; the p.m. peak period is between 4 p.m. and 6 p.m., and the midday period is between 9 a.m. and 2 p.m. ‘

2 On some lines, the headways for the inbound and outbound directions during the peak period are different and an average of the two headways is shown. Also, the headways are rounded to the half a minute.

A.5.2 Project-Level Service-related Capital Improvements

Project-level Service-related Capital Improvements include one TTPI project, five OWE projects, and one SCI project. These are described in detail in the following Sections A.5.2.1 through A.5.2.3.

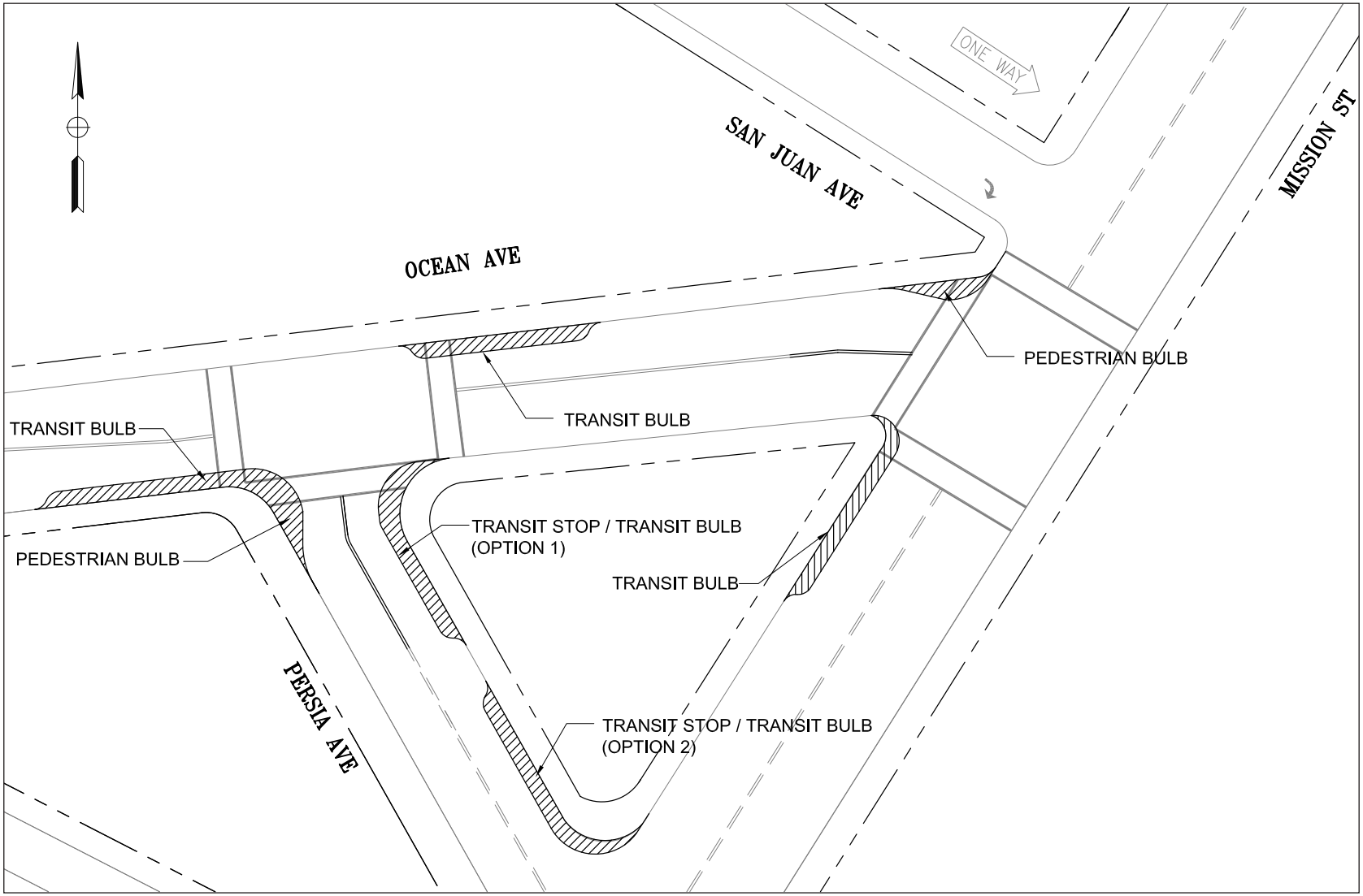
A.5.2.1 Project-Level Terminal and Transfer Point Improvements

TTPIs are required to support Service Improvements and to provide improved transfer points for passengers, to provide adequate layover locations for buses, and to provide access to restroom facilities for transit operators. A terminal provides layover space at the end of a route for transit vehicles to wait while operators take a break, get back on schedule, or use the restroom, or turnaround to begin service in the opposite direction. A terminal may include customer and operator amenities, such as restrooms, wayfinding signage and benches, and may also serve as a transfer point to other Muni and regional transit routes. Transfer points, by contrast, may be located at any point along a route where transfer opportunities to other transit routes occur.

TTPI.1 – Persia Triangle Improvements

The Persia Triangle Improvements (TTPI.1) would change the pedestrian and transit circulation along the intersections of Mission Street and Ocean Avenue, Mission Street and Persia Avenue, and Ocean and Persia avenues, which form the "Persia Triangle." The proposed project would include improvements to complement the realignment of the 29 Sunset route to travel along Ocean Avenue between Mission Street and the Balboa Park Station. Currently, the inbound 29 Sunset route turns left onto southbound Mission Street from Persia Avenue, turns right onto westbound Geneva Avenue from Mission Street, and proceeds along Geneva Avenue to the Balboa Park Station. The revised inbound (northbound) route would continue on Persia Avenue across Mission Street and turn left onto Ocean Avenue to proceed to the Balboa Park Station. The new segment of the 29 Sunset route would operate in both the inbound and outbound directions. The existing 29 Sunset route along Persia Avenue (east of Mission) would remain unchanged (see Figure 5).

A new transit stop would be added on the east side of Persia Avenue between Mission Street and Ocean Avenue. There are two possible locations under



SOURCE: SFMTA

TRANSIT EFFECTIVENESS PROJECT

FIGURE 5 - TTPI.1 PERSIA TRIANGLE IMPROVEMENTS

consideration for this new stop on Persia Avenue; one would be nearside at the intersection with Ocean Avenue, and the other would be farside at the intersection with Mission Street. This transit stop would include the construction of a transit bulb. As part of the project, curb radii modifications at the T-intersection of Persia and Ocean avenues would also be completed by installing a pedestrian bulb at the southwest corner of the intersection to improve the turning radius for outbound buses traveling from Ocean Avenue to Persia Avenue. The new transit stops with transit bulbs would be approximately 60 feet in length by six feet in width and the pedestrian bulb approximately 20 feet in length by six feet in width.

In addition, two new transit zones with transit bulbs (approximately 60 feet in length by six feet in width) would be constructed along Ocean Avenue at the intersection with Persia Avenue for the 49L Van Ness-Mission Limited route. One would be located on the north side of Ocean Avenue midblock between Persia Avenue and Mission Street. The other stop would be located on the nearside of the intersection of Ocean Avenue with Persia Avenue for the inbound 49L Van Ness-Mission Limited route. A pedestrian bulb approximately 20 feet in length by six feet in width would be added on the northwest corner of the intersection of Ocean Avenue and Mission Street and a new transit stop with a transit bulb would be added on the southwest corner of this intersection to serve the 14 Mission and 14L Mission Limited routes. Up to five existing parking spaces would need to be removed to construct the improvements for the Persia Triangle Improvements project.

A.5.2.2 Project-Level Overhead Wire Expansion Projects

Overhead wire expansion would support rerouting of bus routes serviced by electric trolley coaches, and would facilitate shared terminal facilities among terminals that service multiple trolley coach routes. Construction of new overhead wires often requires the installation of new pole foundations and/or underground duct work. Poles to support overhead wires would vary in height from 26 to 30 feet and would be approximately eight to 13 inches in diameter at the base, and four to nine inches in diameter at the top of the poles. The pole foundations are typically three feet in diameter and 12 feet deep. These poles are typically installed every 90 to 100 feet along a street segment. Another part of the infrastructure for overhead wire service is the electrical distribution system that provides power to the trolleys. Electrical wires in conduits are placed in groups, called duct banks, within the center and along the sides of streets in order to transport electricity from the source (electrical transformer) to the wires in the poles which then power the overhead trolley wires. At

some locations, the construction of new curb ramps, transit bulbs and pedestrian refuge islands may also be required. It is anticipated that no parking would be removed as a result of these overhead wire projects.

OWE.1 – New Overhead Wiring - Reroute 33 Stanyan onto Valencia Street

The New Overhead Wiring - Reroute 33 Stanyan onto Valencia Street (OWE.1) project would install new two-way overhead wire infrastructure and underground duct bank on Valencia Street between 17th and 18th streets (there are existing wires between 16th and 17th streets) to allow the 33 Stanyan to be rerouted from 18th to 16th streets via Valencia Street rather than Mission Street. Approximately 700 linear feet of overhead wire and about 24 poles would be installed. Valencia Street was recently reconstructed in the project vicinity, so construction of new curb ramps would not be required. New electrical wiring in underground conduits, along with new and additional support poles would be installed at the northeast and southeast corners of 16th and Valencia streets, on the west and east side of Valencia Street between 17th and 18th streets, and at the northwest and southwest corners of 18th and Valencia streets. Existing overhead wire and the related underground power feed is in place on Valencia Street between 16th and 17th streets.

OWE.2 – Bypass Wires at Various Terminal Locations

Bypass Wires at Various Terminal Locations (OWE.2) would install bypass wires to improve terminal operations where multiple trolley coach routes share a terminal. This project would provide trolley coach access to and egress from terminals and would improve route reliability by preventing trolley coaches from one route from getting stuck behind trolley coaches from another route. Currently, at terminals shared by multiple trolley coach routes, operators must exit their vehicle and pull trolley poles in order to pass a coach already in the terminal. A combined total of about 1,200 linear feet of overhead bypass wires and the installation of about 50 poles are proposed at the following terminal locations:

- Lyon and Union streets (Terminal for Routes 41 and 45). Installation of overhead bypass wires would involve the installation of additional pole foundations within sidewalks along the north and south sides of Greenwich Street between Lyon and Baker streets, and along the west and east side of a portion of Lyon Street between Greenwich and Filbert streets.

No underground electrical wiring, or duct work, would be required. Construction of three new curb ramps to provide disabled access would be required at the intersection of Lyon and Greenwich streets. As curb ramps are typically installed at the same location as an existing sidewalk, it is not anticipated that any utilities, such as catch basins, would need to be relocated. An existing operator restroom facility is located at the northwest corner of Lyon and Greenwich streets which would remain.

- Presidio Avenue and Sacramento Street (Terminal for Routes 1 and 2 short-line). This proposal would provide a common inbound stop for the 1 California and its short-line and would also accommodate the western 2 Clement short-line terminal, which would use trolley coaches. New poles, overhead wires, and duct banks, would be constructed. Four new curb ramps to meet accessibility standards are proposed for both the Laurel Street and Walnut Street intersections with Sacramento Street; in addition, four curb ramps are proposed on the north side of California Street at its intersection with Laurel and Walnut streets for a total of eight curb ramps. The installation of poles and underground wiring may require minor utility relocation, such as moving catch basins.

OWE.3 – New Overhead Wiring – 6 Parnassus on Stanyan Street

The New Overhead Wiring – 6 Parnassus on Stanyan Street (OWE.3) project would build new two-way overhead wiring on Stanyan Street between Haight Street and Parnassus Avenue to enable the 6 Parnassus to operate on Haight Street west of Masonic Avenue, and then connect to the existing 6 Parnassus route at Stanyan Street and Parnassus Avenue. The project would require new overhead wires on Stanyan Street between Haight Street and Parnassus Avenue (there are existing wires on Haight Street between Masonic Avenue and Stanyan Street). The new overhead wiring would allow the 6 Parnassus to operate on Haight Street between Masonic Avenue and Stanyan Street, and on Stanyan Street and would provide increased transit service on the busiest portion of the corridor. Collectively, the 6 Parnassus and 71L Haight-Noriega Limited would provide local and limited-stop service along the full length of Haight Street.

Approximately 2,000 linear feet of new wiring and 50 new poles would be installed. Poles, eight to 13 inches in diameter, would be placed approximately every 90 feet. A total of 12 curb ramps could be constructed along Stanyan Street at its intersections with Beulah, Frederick, and Carl streets and Parnassus Avenue.

OWE.4 – Bypass Wires - 5 Fulton Limited/5 Fulton Local

The 5 Fulton Limited/Local Bypass Wires (OWE.4) project would enable the 5 Fulton and 5L Fulton Limited service to operate with trolley coaches on one set of wires in each direction along the 5 Fulton corridor between Sixth Avenue and Market Street on Fulton, Central and McAllister streets. The proposed project would install up to six overhead bypass wires at strategic points in each direction, between Sixth Avenue and Fulton Street and Market and McAllister streets so that both the 5L Fulton Limited and 5 Fulton local service could operate concurrently. This would also enable 5L Fulton Limited trolley coaches to pass the 5 Fulton local coaches. Having a local and limited network on Fulton and McAllister streets would improve travel times and transit reliability.

The proposed project would involve the installation of approximately 50 poles and additional overhead wiring. Overhead wiring would be installed on the north and south side of Fulton Street at the Shrader Street/Parker Avenue (offset) intersection[27] and at the Clayton Street intersection. On McAllister Street, wiring and poles would be installed on the north and south side of McAllister Street at its intersection with Baker, Pierce, Gough and Laguna streets. Curb ramps to meet accessibility standards would be installed at each corner of the McAllister and Baker streets and McAllister and Pierce streets intersections, for a total of eight curb ramps. The installation of poles and underground wiring may require minor utility relocation, such as moving catch basins.

Transit bulbs and pedestrian refuge islands would also be constructed on Fulton and McAllister streets as part of the proposed TTRP.5 improvements. For more detailed information regarding the TTRP.5 project, please see pp. 128-133.

OWE.5 - 22 Fillmore Extension to Mission Bay[28]

The 22 Fillmore Extension to Mission Bay (OWE.5) would involve the construction of new overhead wires on 16th and Third streets and parts of the University of California, San Francisco Mission Bay (UCSF) campus to allow the 22 Fillmore to continue east along 16th Street to Third Street, and north on Third Street to a new terminal in

[27] An offset intersection occurs when two different streets intersect the same street and are slightly misaligned, but cross traffic on the two streets can still proceed through the intersection.

[28] Caltrain and the California High Speed Rail Authority are proposing electrification and high speed rail respectively in San Francisco. This project could require a grade-separated crossing at the intersection of 16th and 7th streets. If this project were to materialize, the SFMTA would need to make transit service adjustments.

Mission Bay. The new overhead wire project would provide a direct transit connection between development at Mission Bay and the 16th Street BART Station, the Mission District, and Fillmore Street. This overhead wire extension project was evaluated in the Final Mission Bay Subsequent Environmental Impact Report (SEIR) in 1998 and is provided here for informational and cumulative context.[29] The SEIR addressed changes proposed for 16th Street between its intersection with Terry A. Francois Boulevard and the intersection with Mississippi and Seventh streets. This project would facilitate an important east-west transit connection for the rapidly developing Mission Bay neighborhood.

The portion of the project on 16th Street between Kansas and Connecticut streets would be constructed as part of an overhead wire replacement project (including the block of Connecticut Street between 16th and 17th streets that will be used by the 33 Stanyan to provide service on the portion of Potrero Hill that will no longer be served by the 22 Fillmore). Infrastructure, including the poles and underground conduits for the electrical wiring, within the Mission Bay terminal loop has been constructed by developers of adjacent parcels along the route. The overhead and underground electrical wiring would be installed by the SFMTA and has already received separate environmental clearance as part of the Mission Bay project SEIR described above.

The proposed project would involve the installation of about 4,300 linear feet of overhead wiring and the construction of about 85 support poles on 16th Street between Arkansas and Third streets, and a total of 26 curb ramps along 16th Street at the following intersections:

- Rhode Island/16th streets (northern and southern corners) – four curb ramps
- Carolina /16th streets (northern and southern corners) – four curb ramps
- Wisconsin/16th streets (northern and southern corners) – four curb ramps
- Arkansas/16th streets (southeast and southwest corners) – two curb ramps
- Hubbell/16th streets (northeast and northwest corners) – two curb ramps
- Daggett/16th streets – two curb ramps
- Missouri/16th streets (southeast and southwest corners) – two ramps
- Owens/16th streets (northern and southern corners) – four curb ramps

[29] San Francisco Planning Department/San Francisco Redevelopment Agency, *Final Mission Bay Subsequent Environmental Impact Report* p. V.E.53. Certified September 17, 1998. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of case file 2011.0558E; the entire SEIR is available there in case file 96.771E.

- Fourth/16th streets (northeast and northwest corners) – two curb ramps

Transit bulbs and pedestrian refuge islands would also be constructed on 16th Street, including between Kansas and Third streets as part of the proposed TTRP.22 improvements. For more detailed information concerning the TTRP.22 project, please see pp. 154-159.

A.5.2.3 Project-Level Systemwide Capital Infrastructure

SCI improvements are proposed projects that would construct infrastructure to support transit route changes, enhance accessibility and/or reduced transit travel time and improve reliability, but that are not included in the TTRPs. One project level SCI is proposed as described below.

SCI.2 – Sansome Street Contraflow Lane Extension

The Sansome Street Contraflow Lane Extension (SCI.2) project would extend the existing southbound "transit-commercial"[30] contraflow lane three blocks to the north on Sansome Street from Washington Street to Broadway. Under existing conditions, Sansome Street is a one-way northbound street north of Washington Street with transit-commercial contraflow lane south of Washington Street to Market Street. The inbound (southbound) Routes 10 Townsend and 12 Folsom currently follow Broadway, make a right on Battery Street and then, right onto Washington Street to access Sansome Street south of Washington Street (see Figure 6)**.**

The contraflow lane extension would require roadway restriping, signage and modification of three existing traffic signals from Broadway to Washington Street. Existing traffic signals at the Sansome/Washington streets, Sansome/Jackson streets, and Pacific/Sansome streets intersections would be modified in order to control traffic in the southbound direction. Curb ramps would also be installed at each of the four corners at these intersections.

Proposed signal modifications at each of the three intersections would include the installation of two traffic signal mast-arm poles (excavation dimensions of approximately nine feet in depth and three feet in diameter) and six standard traffic

[30] The contraflow lane is restricted to transit only during peak periods; taxi and delivery vehicles are permitted to use the contraflow lane during off-peak periods.

SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 6 - SCI.2 SANSOME STREET CONTRAFLOW LANE EXTENSION

signal poles (excavation depth of approximately three feet and one foot in diameter). Excavation for traffic signal infrastructure, including foundations for mast arms signal poles and conduits, would be required to implement this project. It is anticipated that up to 17 of the 27 parking spaces along the west side of Sansome Street would be converted to commercial loading zones as a result of this project. The other 10 parking spaces are existing commercial loading zones.

A.5.3 Project-Level Travel Time Reduction Proposals

For the following eight transit corridors on the Rapid Network, project-level TTRPs have been developed using the TPS Toolkit elements in order to reduce transit travel time. The categories of TPS Toolkit elements include transit stop changes, lane modifications, parking and turn restrictions, traffic signal and stop sign changes, and pedestrian improvements. These toolkit elements are summarized in Table 2 on p. 19, and are described in detail under Description of TPS Toolkit Elements, Section A.4.3.1 beginning on p. 30.

Pursuant to *CEQA Guidelines* §15126.6, a range of reasonable alternatives to the proposed project must be considered in the environmental analysis if an environmental impact report is being prepared. For the TEP, a range of potential combinations of the elements in the TPS Toolkit is being considered for the TTRPs in order to reduce transit travel time. The range of TTRP treatments being analyzed has been bracketed by: 1) a moderate set of TPS Toolkit elements referred to as the Moderate Alternative; and 2) an expanded set of TPS Toolkit elements referred to as the Expanded Alternative. The difference between these two alternatives is that the Expanded Alternative is comprised of TPS Toolkit elements that may have a greater potential to trigger physical environmental effects such as substantial changes to traffic, bicycle, or pedestrian circulation or similar impacts, whereas the Moderate Alternative is expected to have fewer physical environmental effects due to the nature of the TPS Toolkit elements chosen. These two alternatives are being analyzed at an equal level of detail in this environmental review. The TEP public outreach process and further design refinement would inform the ultimate design of each TTRP corridor segment prior to implementation. The SFMTA would not necessarily adopt the Expanded Alternative or Moderate Alternative systemwide. Depending upon the results of the transportation analysis, design refinement, and public outreach, the SFMTA might choose to implement the Expanded Alternative on one corridor, the Moderate Alternative on another, and a modified combination

consisting of elements from both the Modified and Expanded Alternatives on another corridor.

A.5.3.1 TTRP.J: J Church

TTRP.J would provide transit improvements for the J Church light rail line along the Church and 30th streets and San Jose Avenue corridors. The proposed project would implement the specified TPS Toolkit elements in both the inbound and outbound directions, from the intersection of Church Street and Duboce Avenue to Balboa Park Station. The inbound direction for this route is north towards the intersection of Church Street and Duboce Avenue (continuing downtown in the underground) and the outbound direction is south toward Balboa Park Station.

The TTRP.J project has a Moderate and an Expanded Alternative. The Moderate Alternative would include transit stop changes and pedestrian improvements. This alternative would also include the replacement of all-way stop signs with new traffic signals at five intersections along Church Street. The Expanded Alternative would include the same transit stop changes, pedestrian improvements, and traffic signal and stop sign changes as the Moderate Alternative, except the stop signs at four of the intersections would be replaced with traffic calming measures as described below, rather than traffic signals. The Expanded Alternative would also establish a transit-only lane in both directions on Church Street between Duboce Avenue and 16th Street.[31]

Details of the two project alternatives for this corridor are provided below. Implementation of the improvements in both the Moderate and Expanded Alternatives would result in an estimated net reduction of up to 20 parking spaces. The parking removal would be due to the construction of transit bulbs, boarding islands, and extensions to existing boarding islands. There would not be a reduction in the number of loading spaces with implementation of either the Moderate or Expanded Alternative.

[31] SFMTA has proposed to install the transit-only lane in both directions on Church Street between Duboce Avenue and 16th Street as a pilot project. The pilot project receiving separate environmental clearance (Planning Department Case No. 2012.0796E) and was implemented in November of 2012 for a duration of 18 months.

TTRP.J Moderate Alternative

TPS Toolkit elements in the Moderate Alternative include transit stop changes, pedestrian improvements, and replacement of all-way stop signs with traffic signals.

Transit Stop Changes (Moderate). Transit bulbs (80-foot-long) would be constructed at the inbound and outbound stops located on Church Street at Clipper and 27th streets and on 30th at Dolores streets. A transit bulb up to 13 feet in width by 80 feet in length would be installed at the inbound stop at Church and 22nd streets. This bulb would be up to 13 feet wide due to the wide traffic lane at this location; it would not eliminate any traffic lanes.

The existing boarding islands at the inbound stops on San Jose Avenue at Santa Rosa (29-foot-long) and Santa Ynez (36-foot-long) avenues would be extended to 80 feet in length. The outbound stops on Church Street at 18th and on San Jose Avenue at Santa Rosa Avenue and the stops in both directions on Church Street at 24th Street would be relocated from the nearside to the farside of the intersection. The stop at 24th Street would have a new 80-foot-long boarding island. The stop at 18th Street would be a platform due its location inside Dolores Park. The outbound stop at Church and 22nd streets would be relocated from the farside of the intersection to the nearside of the intersection and the existing platform at that new location would be extended to 80 feet in length, subject to right-of-way acquisition from the adjoining property.

The inbound and outbound stops at the intersection of the J Church right-of-way and Liberty Street, and the inbound stop at Church and 30th streets would be removed.

Pedestrian Improvements (Moderate). Pedestrian bulbs would be constructed at the southeast and southwest corners of 30th and Chenery streets at the existing Fairmount School crosswalk. Also, a new crosswalk would be installed at the intersection of San Jose Avenue and Colonial Way to connect to the new outbound transit boarding island on San Jose Avenue spanning from Santa Rosa Avenue to Colonial Way.

Traffic Signal and Stop Sign Changes (Moderate). This alternative would also include proposals to replace existing stop signs with traffic signals on Church Street at the intersections with 24th, 25th, 26th, Cesar Chavez, and Day streets.

TTRP.J Expanded Alternative

Transit Stop Changes and Pedestrian Improvements (Expanded). The Expanded Alternative would include the same proposed transit stop changes and pedestrian improvements as the Moderate Alternative.

Parking and Turn Restrictions (Expanded). At the intersections of Church/15th and Church/16th the Expanded Alternative would prohibit left turns from Church Street 24 hours a day, with taxis and Muni exempt at the intersection of Church/16th.

Traffic and Stop Sign Changes (Expanded). This alternative would convert the existing all-way stop-controlled intersections of Church/25th, Church/26th, Church/Cesar Chavez, and Church/Day to two-way stop-sign controlled (Church Street approaches would no longer have stop signs) and additional traffic calming measures would be implemented. The traffic calming measures would consist of the following:

> Church/25th streets: Pedestrian bulbs would be added on the northwest and southwest corners on Church Street. Pedestrian half-bulbs would be added on the northeast and southeast corners of Church Street.
>
> Church/26th streets: Pedestrian bulbs would be added on all four corners on Church Street.
>
> Church/Cesar Chavez streets: Pedestrian bulbs would be added on all four corners on Church Street.
>
> Church/Day streets: Speed humps would be added in both directions of Church Street in the curbside mixed-flow lane next to the boarding island. Pedestrian bulbs would be added to the southeast and northwest corners on Church Street.

This alternative would include replacing the existing all-way stop signs with traffic signals on Church Street at 24th Street, the same as proposed in the Moderate Alternative.

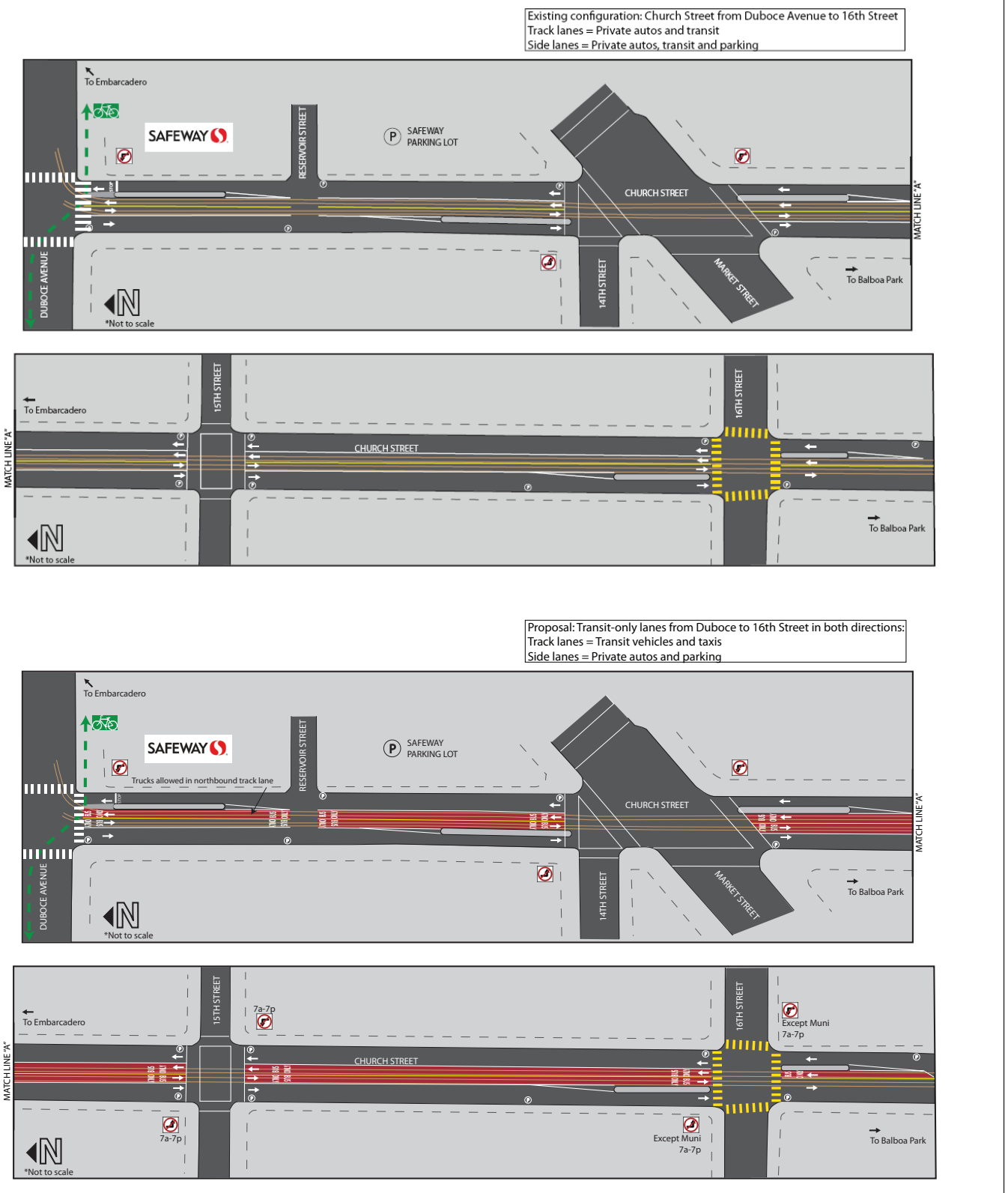
Lane Modifications (Expanded). A 24-hours a day, Monday through Sunday, transit-only lane in both directions would be established on Church Street between Duboce Avenue and 16th Street by removing one mixed-flow lane in both directions while maintaining the existing parking lanes. The transit-only lane would be

demarcated with red paint on the lane pavement. Figure 7 shows the existing and proposed configurations. The inbound transit-only lane would begin 160 feet south of Church and 16th streets at the existing boarding island. This lane would be used by both the 22 Fillmore trolley coach line and the J Church metro line.

Except for taxis, all non-transit vehicles would be required to use the single curbside mixed-flow lane in both directions of this portion of Church Street, with the exception that trucks would be permitted in the northbound transit-only lane on Church Street between Duboce Avenue and Reservoir Street. Reservoir Street is a public right-of-way that serves as the entrance into the parking lot for the Safeway shopping center at 2020 Market Street and is used by trucks making deliveries to the Safeway store's truck loading area adjacent to Church Street. Due to the truck turning radius for large trucks, trucks exiting the loading area to northbound Church Street would need to enter the transit-only lane. Non-transit vehicles on southbound Church Street would be permitted to make left turns from southbound Church Street onto Reservoir Street. Therefore, the portion of the transit-only lane on southbound Church Street from Duboce Avenue to Reservoir Street would have "Bus Only" pavement signage and would not be demarcated with red paint on the pavement. Additionally, a dashed white line would be used to separate the transit-only lane from the curbside mixed-flow lane at the location where non-transit vehicles could enter the transit-only lane to complete the left turn onto Reservoir Street.

An 18-month pilot project for the collection of data for a portion of the improvements being studied for the TTRP.J has undergone separate environmental review[32] and was approved by the City Traffic Engineer on October 29, 2012. This pilot project would include the designation of a center-running transit-only lane in both directions of Church Street, between Duboce Avenue and 16th Street, for the exclusive use of transit vehicles: the J Church Line and the 22 Fillmore route, and taxis. The 24-hour, seven-day-a-week transit-only lane on this three-block segment of Church Street would be demarcated with red paint on the roadway surface. Left turns on Church Street at 15th and 16th streets would be limited to only Muni vehicles and taxis from 7 a.m. to 7 p.m. The purpose of this 18-month pilot project is to analyze transit travel time savings, transit reliability impacts, and changes to area traffic patterns

[32] Case 2012.1141E. SFMTA TEP TTRP.J Pilot Project – Church Street Transit-only Lane. October 18, 2012. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2012.1141E.



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 7 - TTRP.J LANE MODIFICATIONS EXPANDED ALTERNATIVE

resulting from implementation of the transit-only lane in this area, the performance of the red paint applied to the roadway surface, and whether the demarcation of the transit-only lanes with a red pavement color improves compliance with transit-only lane restrictions.

Figure 8 shows the TTRP.J Expanded Alternative. Narrative text describes differences in the Expanded and Moderate Alternatives.

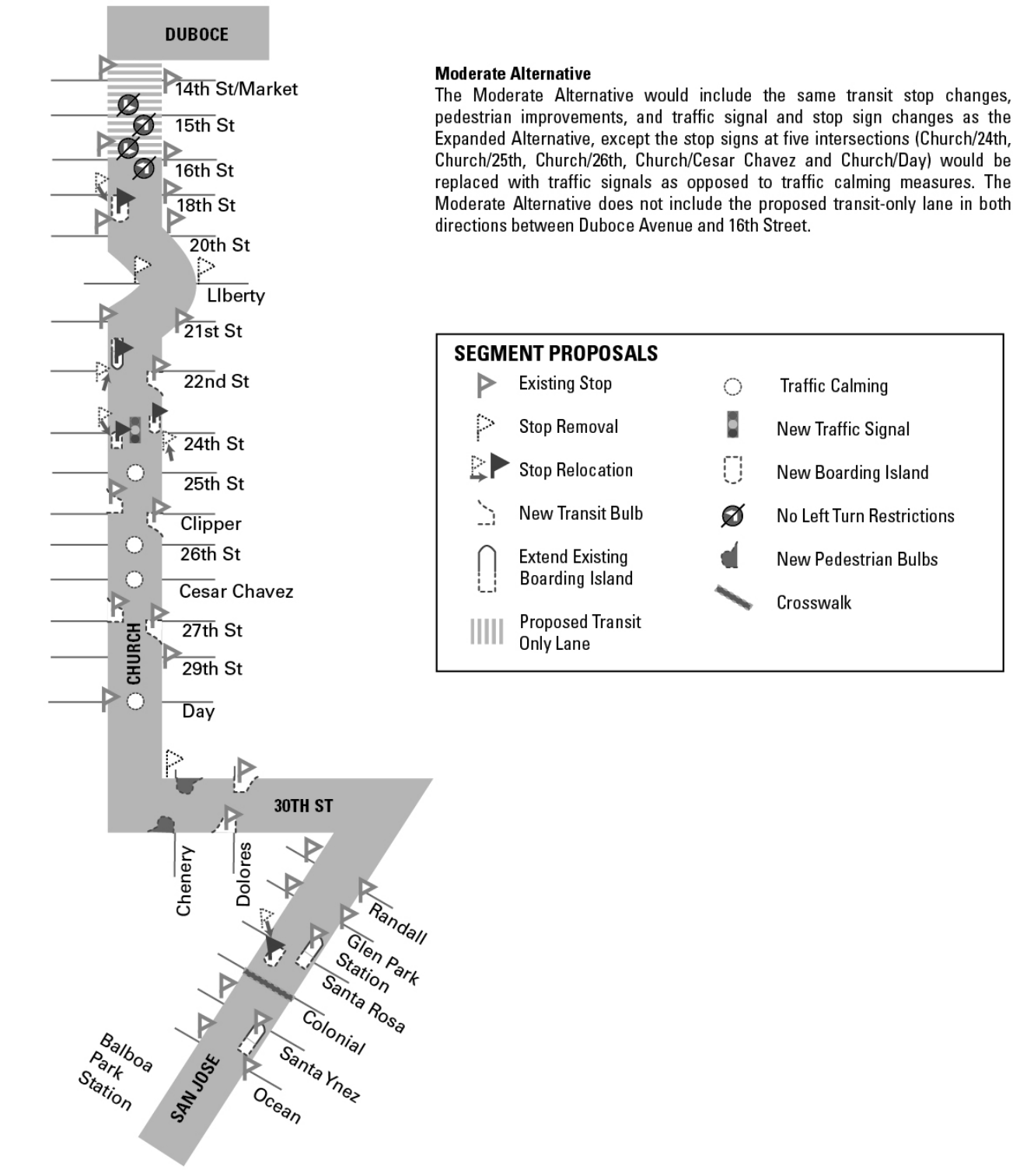
Please see information and additional graphics illustrating the TTRP.J project at the SFMTA Web site, online at http://www.sftep.com.

A.5.3.2 TTRP.N: N Judah

TTRP.N would provide transit improvements for the N Judah light rail line along Carl, Irving and Judah streets. The proposed project would implement TPS Toolkit elements in both the inbound and outbound directions, from the intersection of Carl and Cole streets to the intersection of Judah and La Playa streets. The inbound direction for this route is east toward The Embarcadero and the Caltrain Station and the outbound direction is west toward the Great Highway.

The TTRP.N project has a Moderate and an Expanded Alternative. The Moderate Alternative would include transit stop changes, pedestrian improvements, and parking and turn restrictions. This alternative would also replace stop signs with traffic signals at seven intersections on Judah Street and one intersection on Irving Street. The Expanded Alternative would include the same transit stop changes, pedestrian improvements, parking and turn restrictions, and traffic signal and stop sign changes as the Moderate Alternative, except that stop signs at five of the intersections along Judah Street would be replaced with traffic calming measures as described below, rather than traffic signals.

Implementation of the improvements in both the Moderate and Expanded Alternatives would result in an estimated net reduction of up to 125 parking spaces. All of the parking spaces removed would be due to the new construction and extension of boarding islands and transit bulbs. No loading spaces would be removed with implementation of either the Moderate or Expanded Alternative.



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 8 - TTRP.J EXPANDED ALTERNATIVE

Details of the two project alternatives for this corridor are provided below.

TTRP.N Moderate Alternative

TPS Toolkit elements in the Moderate Alternative include transit stop changes, pedestrian improvements, parking and turn restrictions, and traffic signal and stop sign changes.

Transit Stop Changes (Moderate). Farside 160-foot-long transit bulbs would be installed in the outbound direction at the intersections of Irving Street at Fifth and Ninth avenues. Nearside 160-foot-long outbound transit bulbs would be installed on Carl Street at Stanyan Street and on Judah Street at La Playa Street. Inbound 160-foot-long transit bulbs would be installed on the farside of the intersections of Irving Street at Sixth and Ninth avenues.

Existing transit boarding islands would be extended to 160 feet and widened to nine feet at the following intersections on Judah Street: at 12th, 16th, 23rd, 25th, 28th, 34th, 40th, 43rd, and 46th avenues in the outbound direction; and at 12th, 15th, 22nd, 25th, 28th, 31st, 34th, 43rd, and 46th avenues in the inbound direction. The existing inbound boarding island on Judah Street at 19th Avenue would be extended to 220 feet and include a key stop for wheelchair accessibility. The existing outbound boarding island at 19th Avenue would be extended to 225 feet so that it would connect to the existing accessible platform located on Judah Street at 18th Avenue. A new 115-foot transit boarding island would be installed at the nearside inbound stop on Judah Street at 48th Avenue.

The inbound and outbound stops at Irving Street and Ninth Avenue would be moved from the nearside to the farside of the intersection with new 160-foot-long transit bulbs. Due to the wide curb lanes at these locations, the inbound bulb would be up to 18 feet wide and the outbound would be up to 13 feet wide. The outbound stop on Judah Street at 31st Avenue would be moved from the nearside to the farside of the intersection with a new 160-foot long boarding island.

At Judah Street and Sunset Boulevard, the stops in both directions would be moved from the nearside to the farside of the intersection with new 160-foot-long boarding islands. The outbound accessible platform would remain on the nearside of this intersection while the inbound accessible platform would be relocated from the nearside at 37th Avenue to the nearside at Sunset Boulevard. At Judah Street and

40th Avenue, the farside inbound stop would be moved to the nearside with a new 160-foot long boarding island.

Flag stops would be removed in the inbound and outbound directions on Irving Street at Fourth and Seventh avenues, and those stops would be consolidated into a new outbound stop at the farside of Fifth Avenue and a new inbound stop at the farside of Sixth Avenue. The flag stops would be removed in both directions at Judah Street and Funston Avenue.

Pedestrian Improvements (Moderate). The intersection at Arguello Boulevard with Carl Street would be reconfigured to simplify the right-of-way. This would be accomplished by adding median islands within the intersection so that right-of-way for southbound traffic turning left to Carl Street or continuing straight towards Irving Street would be better defined for vehicles. The northernmost stop sign facing southbound Arguello Boulevard traffic would be removed, but the southernmost stop sign would remain.

Parking and Turn Restrictions (Moderate). At the intersections of Judah Street at 36th and 37th avenues, there would be right-turn only restrictions in both the northbound and southbound directions. The turn restrictions would be needed due to the proposed relocation of transit stops from the nearside to the farside of the intersection at Judah Street/Sunset Boulevard, and the installation of 160-foot-long boarding islands, which would extend through these closely-spaced intersections.

A new bulb would be added at the northwest corner of Arguello Boulevard and Irving Street to prevent vehicles from parking and encroaching into the dynamic envelope (clearance zone) of the light rail vehicles.

Traffic Signal and Stop Sign Changes (Moderate). The all-way stop signs would be replaced with traffic signals at the following eight intersections: Irving Street at Fourth Avenue and Judah Street at 10th, Funston, 18th, 22nd, 23rd, 31st, and 41st avenues.

TTRP.N Expanded Alternative

Transit Stop Changes, Pedestrian Improvements, and Parking and Turn Restrictions (Expanded). The Expanded Alternative would include the same proposed transit stop changes, pedestrian improvement, and parking and turn restrictions as in the Moderate Alternative.

Traffic Signal and Stop Sign Changes (Expanded). All-way stop signs would be replaced with traffic calming measures at the following intersections with Judah Street: 10th, Funston, 22nd, 23rd, and 41st avenues. The stop signs on Judah Street would be removed, but the stop signs would remain on the cross streets. The traffic calming measures would consist of the following:

Judah Street/10th Avenue: A six-foot-wide pedestrian bulb would be added to the southwest corner on Judah Street. A speed hump would be added to the curbside mixed-flow lanes in both directions on Judah Street.

Judah Street/Funston Avenue: Six-foot-wide pedestrian bulbs would be added to the northwest, southwest, and southeast corners on Judah Street. A speed hump would be added in the eastbound direction to the curbside mixed-flow lane on Judah Street. Special striping would be added on Judah Street in advance of the crosswalk.

Judah Street/22nd Avenue: A six-foot-wide pedestrian bulb would be added to the southwest and northeast corners on Judah Street. Speed humps would be added in both directions to the curbside mixed-flow lane on Judah Street. Special striping would be added on Judah Street in advance of the crosswalk.

Judah Street/23rd Avenue: Six-foot-wide pedestrian bulbs would be added to the northwest, southeast and southwest corners on Judah Street. Speed humps would be added in both directions to the curbside mixed-flow lane on Judah Street. Special striping would be added on Judah Street in advance of the crosswalk.

Judah Street/41st Avenue: Six-foot-wide pedestrian bulbs would be added to the northeast and southwest corners on Judah Street. Speed humps would be added in both directions to the curbside mixed-flow lane on Judah Street. Special striping would be added on Judah Street in advance of the crosswalk.

The stop signs on Judah Street at 18th and 31st avenues and on Irving Street at Fourth Avenue would be replaced with traffic signals, the same as in the Moderate Alternative.

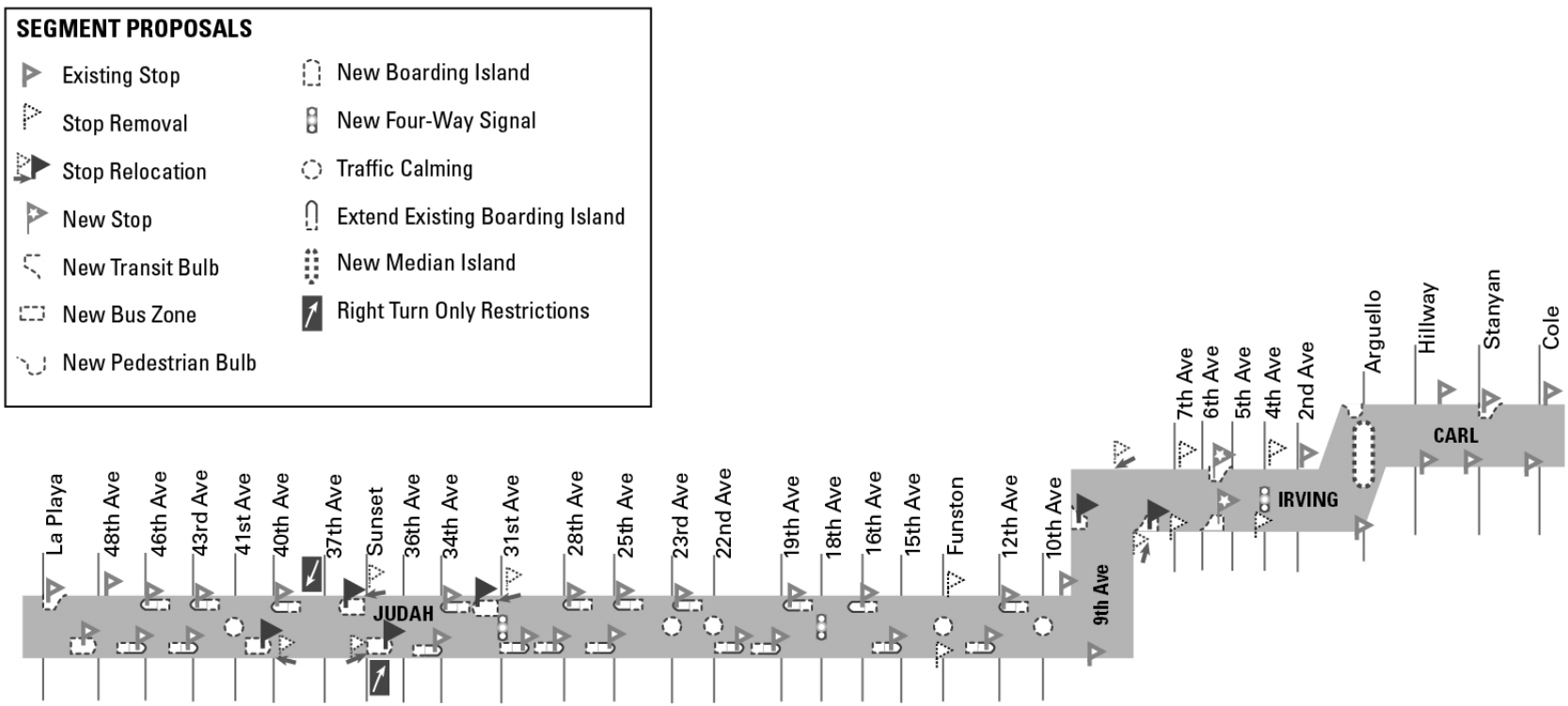
Figure 9 shows the TTRP.N Expanded Alternative, and includes text describing the differences between the Moderate and Expanded Alternatives.

Please see information and additional graphics illustrating the TTRP.N project at the SFMTA Web site, online at http://www.sftep.com.

SFMTA | Municipal Transportation Agency

N JUDAH

TRAVEL TIME REDUCTION PROPOSAL Expanded Alternative



Moderate Alternative

The Moderate Alternative would replace stop signs with traffic signals at seven intersections on Judah Street (10th, Funston, 18th, 22nd, 23rd, 31st and 41st avenues) and one intersection on Irving Street and 4th Avenue. The Expanded Alternative would include the same transit stop changes, pedestrian improvements, parking and turn restrictions, and traffic signal and stop sign changes as the Moderate Alternative, except that stop signs at five of the intersections along Judah Street would be replaced with traffic calming measures, rather than traffic signals.

SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 9 - TTRP.N EXPANDED ALTERNATIVE

A.5.3.3 TTRP.5: 5 Fulton and 5L Fulton Limited

TTRP.5 would provide transit improvements for the 5 Fulton and the new 5L Fulton Limited routes along the Fulton and McAllister streets corridor. The proposed project would implement specified TPS Toolkit elements in both the inbound and outbound directions, from the intersection of McAllister and Market streets to the intersection of La Playa and Cabrillo streets. The inbound direction for these routes is east toward Downtown (i.e., toward Market Street) and the outbound direction is west toward the Sixth Avenue short-line terminus for the 5 Fulton and Ocean Beach terminus for the 5L Fulton Limited.

The TTRP.5 project has a Moderate and an Expanded Alternative. The Moderate Alternative would include transit stop changes, pedestrian improvements, parking and turn restrictions, and traffic signal and stop sign changes. This alternative would replace stop signs at six intersections on McAllister Street and two intersections on Fulton Street with traffic signals and relocate transit stops at two of these intersections from nearside to farside. The transit stops at the intersection of McAllister Street and Central Avenue would be relocated from farside to nearside The Expanded Alternative would include the same improvements as the Moderate Alternative, with the following differences. At two intersections along Fulton Street where pedestrian bulbs are proposed under the Moderate Alternative, pedestrian refuge islands would be built under the Expanded Alternative; a stretch of Fulton Street between Stanyan Street and Central Avenue would be reduced from four lanes to three lanes to provide a center left-turn lane; and stop signs would be replaced with traffic-calming measures instead of traffic signals at six intersections on McAllister Street and transit stops would not be relocated at two of these intersections; one additional intersection on McAllister Street and Central Avenue would have stop signs replaced with traffic-calming measures, but would not have transit stops relocated.

Implementation of the improvements in the Moderate Alternative would result in an estimated net reduction of up to 10 parking spaces. There would be an estimated net reduction of up to 40 spaces with implementation of the Expanded Alternative. These totals include 10 spaces that would not be available during peak-hours due to part-time tow-away restrictions. Implementation of improvements in either the Moderate or Expanded Alternative would not result in a reduction to the number of loading spaces.

Details of the two project alternatives for this corridor are provided below.

TTRP.5 Moderate Alternative

TPS Toolkit elements in the Moderate Alternative include transit stop changes, pedestrian improvements, parking and turn restrictions, and traffic signal and stop sign changes.

Transit Stop Changes (Moderate). Transit bulbs would be constructed at outbound stops on McAllister Street at Larkin Street, at Van Ness Avenue, and at Fillmore and Divisadero streets, and on Fulton Street at Arguello and Park Presidio boulevards, at Ashbury Street, at Sixth, Eighth, 28th, 33rd, 40th, 43rd, and 46th avenues, and at 25th Avenue/Crossover Drive. In the inbound direction, transit bulbs would be constructed on McAllister Street at Van Ness Avenue and at Fillmore and Divisadero streets, and on Fulton Street at Park Presidio Boulevard, Masonic, Eighth, 25th, 28th, 33rd, 37th, 40th, 43rd, and 46th avenues. The new transit bulbs on McAllister Street at Van Ness Avenue (inbound) and on Fulton Street at Park Presidio Boulevard, and at Sixth, Eighth, 25th, 28th, 33rd, 37th, 40th, 43rd, and 46th avenues would be 45 feet long; all of the other transit bulbs would be 90 feet long. All of the transit bulbs would be located at the farside of intersections.

The inbound stops on McAllister Street at Divisadero Street, and on Fulton Street at Park Presidio Boulevard and at Masonic, 18th, 37th and 43rd avenues, and the outbound stops on Fulton Street at 28th, 30th, 40th and 43rd avenues and McAllister Street at Divisadero Street would be relocated from nearside to farside of the intersection. In conjunction with the proposal to signalize the intersections on McAllister Street at Laguna and Pierce streets, the stops at these intersections would be moved from nearside to farside. The inbound and outbound stops at the intersection of McAllister Street and Central Avenue would be relocated from farside to nearside.

The inbound and outbound stops on McAllister Street at Polk, Octavia, Webster, and Broderick streets, and on Fulton Street at 12th, 16th, and 20th avenues, the inbound stop on Fulton Street at 36th Avenue, and the outbound stop on Fulton Street at 38th Avenue would be removed. Flag stops would be converted to farside bus zones on Fulton Street at 28th, 30th, 33rd and 40th avenues in the outbound direction.

Pedestrian Improvements (Moderate). Pedestrian bulbs would be constructed on Fulton Street at Clayton, and Cole streets to shorten crosswalk distance.

Parking and Turn Restrictions (Moderate). Right-turn pockets would be added in the eastbound direction at the intersections of McAllister Street with Fillmore, and Divisadero streets; in the westbound direction on McAllister Street at its intersections with Fillmore (70-foot-long) and Divisadero streets; and in the eastbound direction on Fulton Street at its intersection with Masonic Avenue. The existing right-turn pocket in the eastbound direction at the intersection of McAllister Street with Van Ness Avenue (135-feet-long) would be changed from a.m. only to full time. Except as specifically called out, all of the above noted turn pockets would be 60 feet in length.

A peak-period tow-away zone would be established on the entire east side of Central Avenue between Fulton and McAllister streets.

Traffic Signal and Stop Sign Changes (Moderate). Traffic signals would be installed on Fulton Street at 47th Avenue and La Playa Street, which are currently intersections with all-way stop sign controls.

All-way stop intersections would be replaced with traffic signals on McAllister Street at Laguna, Steiner, Scott, Pierce, Broderick, and Lyon streets.

TTRP.5 Expanded Alternative

Transit Stop Changes, Pedestrian Improvements, Parking and Turn Restrictions, Lane Modifications, and Traffic Signal and Stop Sign Changes (Expanded). The Expanded Alternative would include the same transit stop changes, pedestrian improvements, parking and turn restrictions, and traffic signal and stop sign changes as the Moderate Alternative, except as indicated below.

Transit Stop Changes (Expanded). The existing transit stops on McAllister Street at Laguna and Pierce streets would remain nearside in conjunction with replacing stop signs with traffic circles at these intersections. The existing transit stops at the intersection of McAllister Street and Central Avenue would remain farside in conjunction with replacing stop signs with a pedestrian bulb at this intersection.

Pedestrian Improvements (Expanded). This alternative would include the installation of pedestrian refuge islands on Fulton Street at Clayton and Cole streets, instead of the pedestrian bulbs proposed in the Moderate Alternative. The pedestrian refuge islands would only be built on the west side of these intersections.

Lane Modification (Expanded). The number of mixed-flow lanes on Fulton Street between Central Avenue and Stanyan Street would be reduced from four lanes (two

lanes in each direction) to three (one lane in each direction with a two-way left-turn lane in the center). See Figure 10, which shows an example of the existing and proposed roadway modifications.

Traffic Signal and Stop Sign Changes (Expanded). This alternative would include replacing the all-way stop signs with traffic calming measures instead of the traffic signals proposed in the Moderate Alternative at the following intersections with McAllister Street: Steiner, Scott, Broderick, Laguna, Pierce, and Lyon streets and Central Avenue. The traffic calming measures would consist of the following:

McAllister/Steiner streets: A traffic circle would be added to the intersection.

McAllister/Scott streets: A traffic circle would be added to the intersection.

McAllister/Broderick streets: A traffic circle would be added to the intersection.

McAllister/Laguna streets: A traffic circle would be added to the intersection.

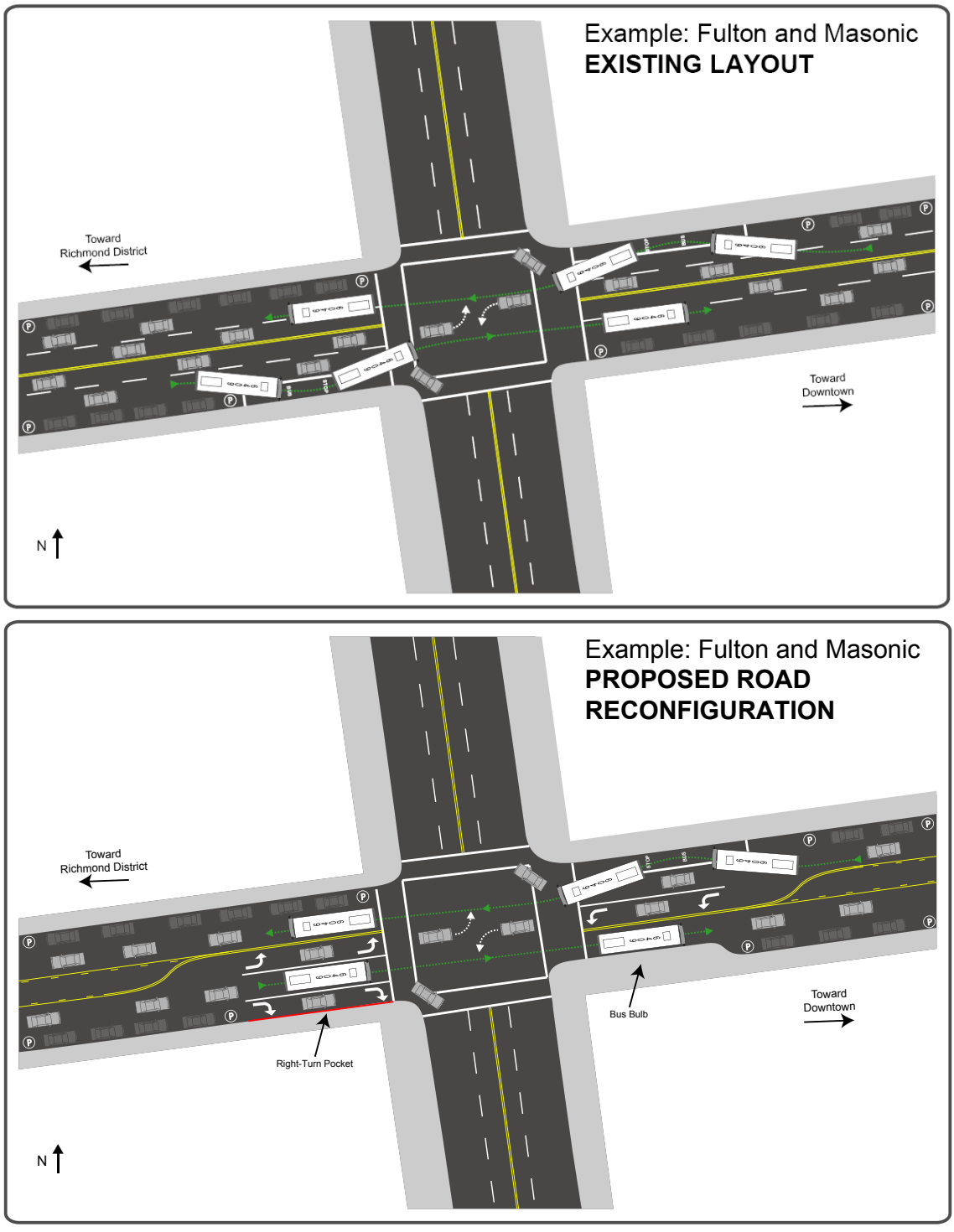
McAllister/Pierce streets: A traffic circle would be added to the intersection.

McAllister/Lyon streets: A traffic circle would be added to the intersection.

McAllister Street/Central Avenue: A six-foot-wide pedestrian bulb would be added on the southwest corner of this intersection that would project into McAllister Street only, not into Central Avenue.

Figure 11 shows the TTRP.5 Expanded Alternative, and includes a narrative describing differences between the Moderate and Expanded Alternatives.

Please see information and additional graphics illustrating the TTRP.5 project at the SFMTA Web site, online at http://www.sftep.com.



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 10 - TTRP.5 LANE MODIFICATIONS EXPANDED ALTERNATIVE

SFMTA | Municipal Transportation Agency

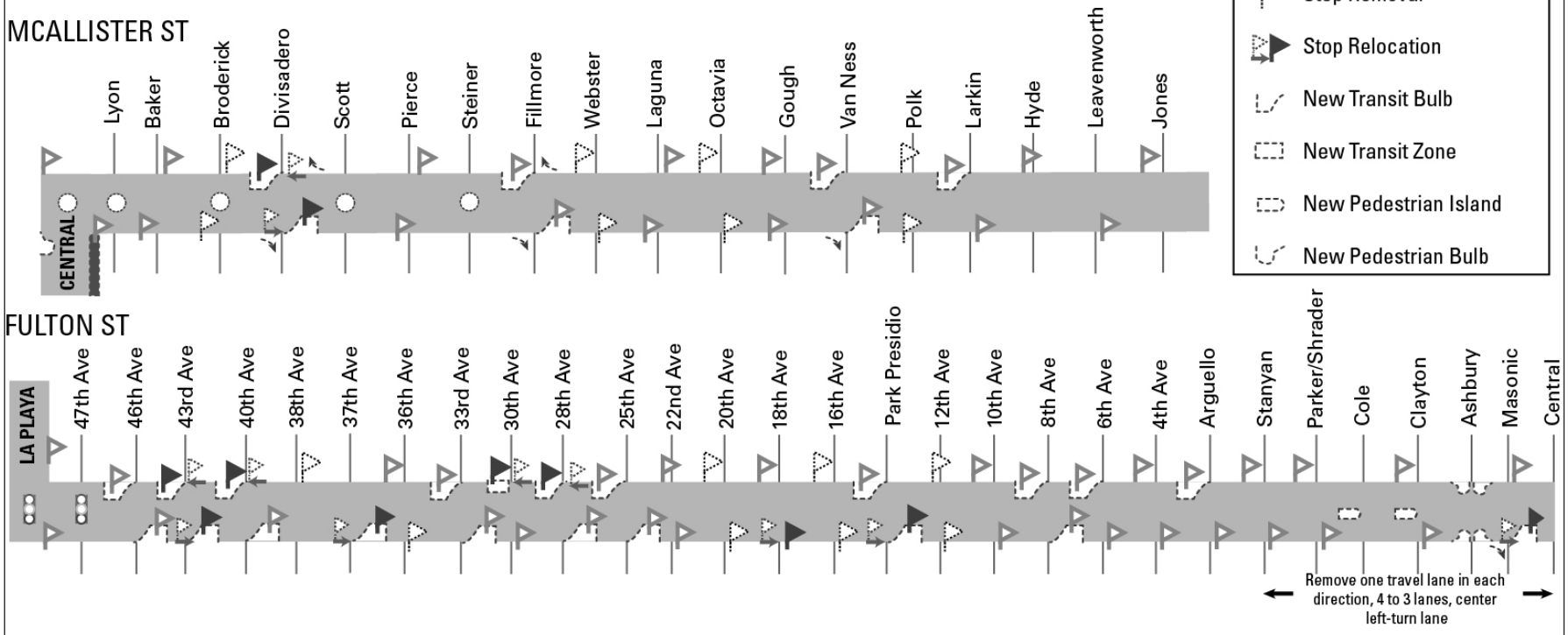
5 FULTON

TRAVEL TIME REDUCTION PROPOSAL Expanded Alternative

Moderate Alternative

This alternative would include the installation of pedestrian bulbs on Fulton Street at Clayton and Cole streets, instead of the pedestrian refuge islands proposed in the Expanded Alternative. The pedestrian bulbs on Fulton Street at Ashbury are also included in the Moderate Alternative.

This alternative would also include replacing the stop signs with traffic signals on McAllister Street at Steiner, Scott, Broderick, Laguna, Pierce, and Lyon streets, instead of the traffic circles proposed in the Expanded Alternative. Additionally, the removal of one travel lane on Fulton Street between Stanyan and Central and a six-foot wide pedestrian bulb on the southwest corner of McAllister/Central are not proposed in the Moderate Alternative. The Moderate Alternative does not propose any traffic calming/stop sign replacement at McAllister/Central, and the stops at that intersection would be optimized from farside to nearside. In addition to the traffic signals proposed at McAllister/Laguna and McAllister/Pierce, the stops at these two intersection would be optimized from nearside to farside.



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 11 - TTRP.5 EXPANDED ALTERNATIVE

A.5.3.4 TTRP.8X: 8X Bayshore Express

TTRP.8X would provide transit improvements for the southern portion of the 8X Bayshore Express bus route along the San Bruno, Visitacíon, and Geneva avenues corridors. The proposed project would implement specified TPS Toolkit elements in both the inbound and outbound directions, from the intersection of Silver and San Bruno avenues to the intersection of Lee and Ocean avenues. The inbound direction for this route is east and north towards the SoMa Area and the outbound direction is south and west towards the CCSF campus.

The TTRP.8X project has a Moderate and an Expanded Alternative. The Moderate Alternative would include transit stop changes, parking and turn restrictions, lane modifications, and traffic signal and stop sign changes. The Expanded Alternative would include the same parking and turn restrictions and traffic and stop sign changes and most of the transit stop changes and lane modifications as the Moderate Alternative. The Expanded Alternative would also include additional transit stop changes at three intersections, establishment of a transit-only lane on Geneva Avenue between Santos Street and Moscow Avenue, and replacement of all-way stop signs with a traffic signal at one intersection and with other traffic-calming measures at four intersections. Both the Moderate and Expanded Alternatives would include bicycle lanes on Geneva, but the location would vary by proposal.

Implementation of the improvements in the Moderate Alternative would result in an estimated net reduction of up to 90 parking spaces and up to 80 in the Expanded Alternative. There would be no net loss of loading spaces in either alternative. Details of the two alternatives are provided below.

TTRP.8X Moderate Alternative

The Moderate Alternative would include transit stop changes, parking and turn restrictions, lane modifications, and traffic signal and stop sign changes. In addition, bicycle lanes would be installed on Geneva Avenue.

Transit Stop Changes (Moderate). Transit bulbs would be added in several locations as described below, and all transit bulbs would be 55 feet in length except as noted below. Transit bulbs would be added at stops in the outbound (south/westbound) direction on San Bruno Avenue at Mansell Avenue (60-foot-long), on Visitacíon Avenue at Rutland and Schwerin streets, on Hahn Street at Sunnydale Avenue, on Sunnydale Avenue at Santos Street, on Santos Street at Velasco

Avenue, and on Geneva Avenue at Naples Avenue (120-foot-long). In the inbound (north/eastbound) direction, transit bulbs would be built at stops on Santos Street at Velasco and at Sunnydale avenues, on Sunnydale Avenue at Hahn Street, and on Visitacíon Avenue at Sawyer, Schwerin, and at Rutland avenues. New farside boarding islands would be added in the inbound (east) direction on Geneva Avenue at Mission Street (130-foot-long) and at Munich Street (65-foot-long) and in the outbound (west) direction at Geneva Avenue and Prague Street (65-foot-long).

Stops would be lengthened at outbound (south/west) locations on San Bruno at Silver avenues (from 70 feet to 160 feet), Bacon (from 102 feet to 162 feet), Paul Avenue/Dwight Street (from 75 feet to 165 feet), and Arleta Avenue/Bayshore Boulevard (from 100 feet to 135 feet) and on Geneva Avenue at Santos Street (from 50 feet to 175 feet), and inbound (north/east) locations on Geneva Avenue at Cayuga Avenue (from 80 feet to 165 feet) and Geneva Avenue at Santos Street (from 75 feet to 100 feet), on San Bruno Avenue at Paul Avenue/Dwight Street (from 150 feet to 165 feet), Bacon Street (from 97 feet to 180 feet), and Silver Avenue (from 105 feet to 125 feet).

Stops in the outbound (west) direction on Geneva Avenue at Carter, Prague and Naples streets, and at Cayuga Avenue (165-foot-long transit zone) would be relocated from nearside to the farside of the intersection. Stops in the inbound (east/north) direction would be relocated from the farside to the nearside of the intersection on Santos Street at Sunnydale Avenue (55-foot-long transit bulb), and on Sunnydale Avenue at Hahn Street (55-foot-long transit bulb).

Stops would be converted from flag stops to transit zones in the outbound (south/west) direction on San Bruno Avenue at Somerset Avenue and at 3800/3801 San Bruno Avenue[33] (120-foot-long bus zone farside), on Visitacíon Avenue at Sawyer Avenue (120-foot-long bus zone nearside), and on Geneva Avenue at 1720-1750 Geneva Avenue (145-foot-long bus zone). For the inbound (north/east) direction, conversion of flag stops to bus zones is proposed on San Bruno Avenue at Somerset Avenue and on 3800/3801 San Bruno Avenue (120-foot-long bus zone).

New stops would be added in both directions on San Bruno Avenue at Harkness Avenue (both 100-foot-long bus zones farside) to consolidate stops at Wilde and Ward avenues which would be removed. A nearside 120-foot-long stop would be

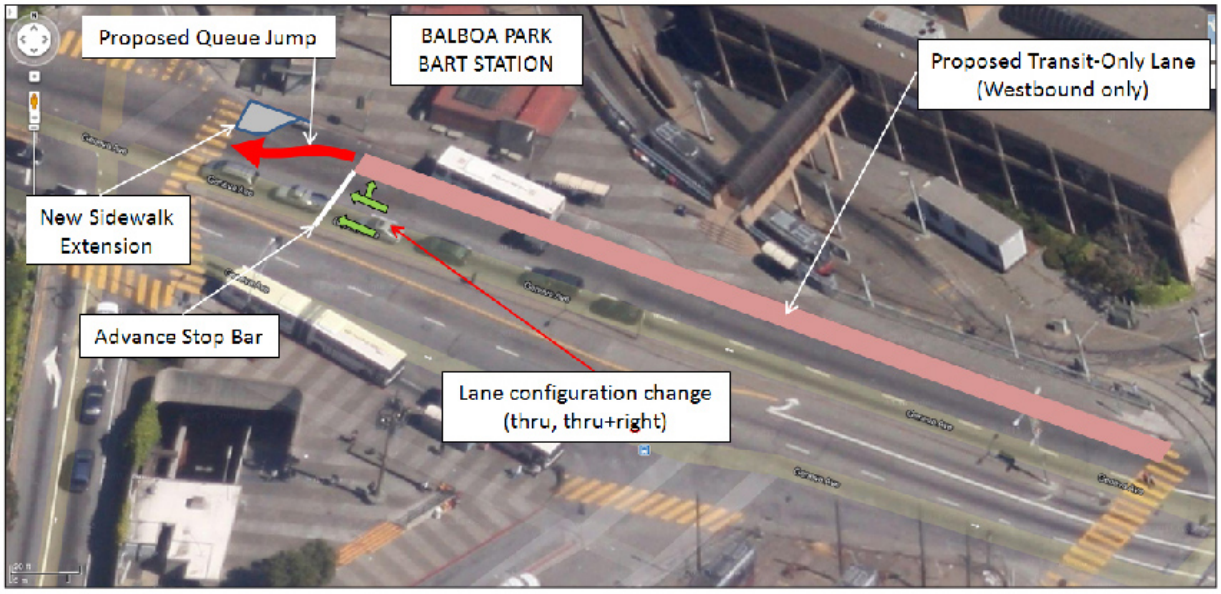
[33] For reference, this stop is located adjacent to the Beeman Lane stairway.

established in both directions on Visitacíon Avenue at Desmond Avenue. Outbound (south/west) stops would be removed on San Bruno Avenue at Woolsey Avenue; on Bayshore Boulevard at Leland Avenue; on Visitacíon Avenue at Bayshore Boulevard and Britton Avenue; on Hahn Street at Visitacíon Avenue; on Santos Avenue at Brookdale Avenue; and on Geneva Avenue at 1650/1651 Geneva Avenue, and at Moscow and Paris streets, and Delano Avenue. Inbound (north/east) stops would be removed on Geneva Avenue at Delano Avenue and Paris Street and at 1650/1651 Geneva Avenue; on Santos Street at Brookdale Avenue; on Visitacíon Avenue at Britton and Cora streets; on Bayshore Boulevard at Visitacíon Avenue; and on San Bruno Avenue at Wayland Avenue.

Parking and Turn Restrictions (Moderate). The parking lane would be removed in the outbound (south) direction on San Bruno Avenue at its intersection with Paul Avenue/Dwight streets (93-foot-long area on the southwest corner) to allow buses to bypass left turning vehicles, and on the southbound approach to the intersection of San Bruno Avenue with Arleta Avenue/Bayshore Boulevard (110-foot-long) to allow buses to wait closer to the intersection.

Lane Modifications (Moderate). Curbside transit-only lanes would be established in the outbound (westbound) direction on Geneva Avenue along the block between Delano and San Jose avenues by removing the existing white zone and narrowing the painted median. The transit-only lane would continue westbound to the next block, between San Jose Avenue and the I-280 eastbound ramps, by narrowing the two existing mixed-flow lanes. The two mixed-flow lanes would include one through-lane in the center and a through and right-turn lane next to the curbside transit-only lane. The transit-only lane would include a curb extension to delineate the space for transit and minimize vehicle violations. The traffic signal would be modified to add a queue jump to allow buses to go westbound through the intersection of Geneva Avenue at the eastbound I-280 ramps before the two mixed-flow lanes get a green light (see Figure 12).

Bicycle lanes would be established in the westbound direction on Geneva Avenue along the block between Paris and London streets and in the eastbound direction on Geneva Avenue along the two blocks between Mission and Paris streets.



SOURCE: SFMTA, Turnstone Consulting

FIGURE 12 - TTRP 8X LANE MODIFICATIONS MODERATE ALTERNATIVE

A right-turn pocket would be implemented in the outbound (westbound) direction on Geneva Avenue at San Jose Avenue, and a left turn pocket (75-foot-long) would be established on northbound San Bruno Avenue at its intersection with Bacon Street. For the inbound (north/east) direction, right-turn pockets would be established on Geneva Avenue in the eastbound direction at the I-280 westbound ramp entrance, Mission Street (60-foot-long), on San Bruno Avenue at Bacon Street (75-foot-long) and at Silver Avenue (120-foot-long). The right-turn pocket proposed on northbound San Bruno Avenue at Silver Avenue would be a signalized queue jump. To allow through-traveling Muni buses to proceed across the intersection, this right-turn pocket proposed on northbound San Bruno Avenue at Silver Avenue would be designated as "Right Turn Only Except Muni." Muni vehicles would receive a signal indication before the vehicular traffic, which would allow buses to utilize the right-turn lane to proceed across the intersection. At the intersection of San Bruno and Silver avenues, the eastbound and westbound approaches of Silver Avenue would also have new 75-foot-long left turn pockets.

Traffic Signal and Stop Sign Changes (Moderate). All-way stop signs would be replaced with a traffic signal at the intersection of Geneva and Cayuga avenues.

The following Transit Stop Changes and Lane Modifications are part of the Moderate Alternative and are not part of the Expanded Alternative.

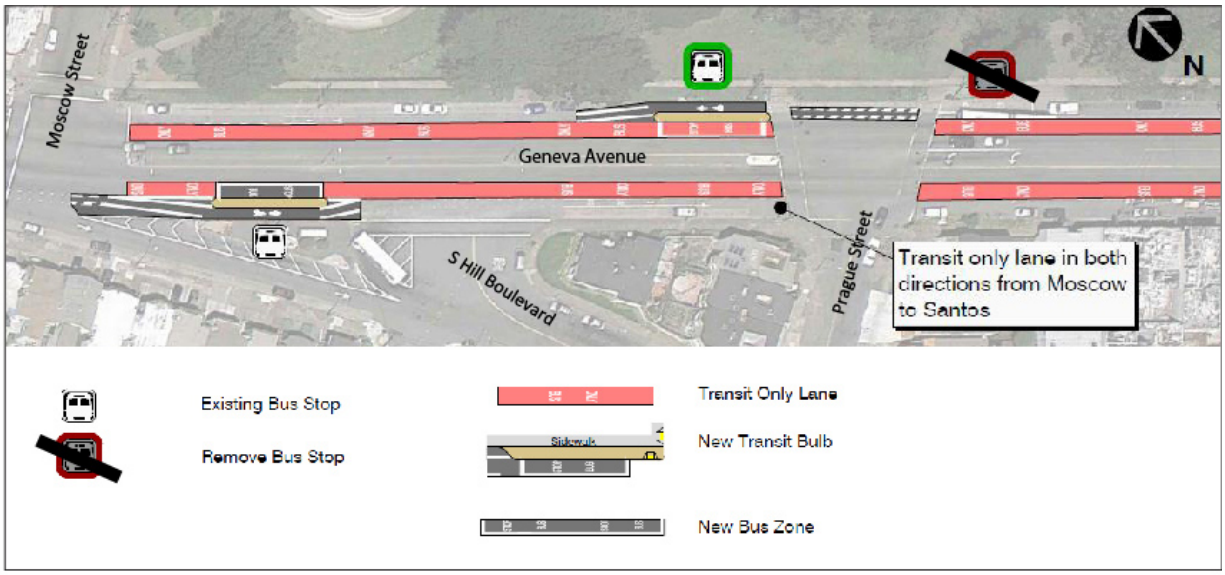
Transit Stop Changes and Lane Modifications (Moderate Only). At the intersection of San Bruno Avenue and Felton Street intersection, the inbound (north) stop on San Bruno Avenue would be relocated from the farside to the nearside of the intersection with a new 20-foot-long front door bulb and the existing outbound (south) stop would be lengthened from 120 feet to 165 feet. A boarding island for the outbound (west) stop on Geneva Avenue at Mission Street (extending 130 feet from London Street to 60 feet east of Mission Street) would be installed separating the bicycle lane from the mixed-flow lanes and a 60-foot-long right-turn pocket would be established in front of this transit island.

TTRP.8X Expanded Alternative

Transit Stop Changes, Lane Modifications, and Traffic Signal and Stop Sign Changes (Expanded). The Expanded Alternative would include the transit stop changes, lane modifications and traffic signal and stop sign changes included in the Moderate Alternative, except for several transit stop changes and lane modifications noted above as Moderate Only.

Transit Stop Changes (Expanded). The following additional transit stop changes would be included in this alternative. At the San Bruno Avenue/Felton Street intersection, the outbound (south) transit stop on San Bruno Avenue would be relocated from nearside to a 170-foot-long transit zone on the farside of the intersection and the inbound (north) stop would be lengthened from 54 feet to 75 feet in conjunction with adding a 15- to 20-foot pedestrian bulb into Thornton Avenue. On Thornton Avenue parking would be relocated from the north side of the street to the south side. At Geneva Avenue and Mission Street, the outbound (west) stop on Geneva Avenue would be relocated from the nearside to the farside of the intersection and the existing pedestrian plaza would be used as a transit bulb.

Lane Modifications (Expanded). As shown in Figure 13, a mixed-flow lane in both directions on Geneva Avenue would be converted into a transit-only lane and a bicycle lane between Moscow and Santos streets.



SOURCE: SFMTA, Turnstone Consulting

FIGURE 13 - TTRP.8X LANE MODIFICATIONS EXPANDED ALTERNATIVE

Traffic Signal and Stop Sign Changes (Expanded). A new traffic signal would be installed at the intersection of San Bruno Avenue and Felton Street, replacing the existing all-way stop-controlled intersection. All-way stop signs on Visitacíon Avenue at Peabody, Cora, Britton, and Loehr streets would be replaced with stop signs on the cross street and none on Visitacion Avenue, and six-foot-wide pedestrian bulbs added on all four corners of Visitacíon Avenue with bulb-outs into both Visitacíon Avenue and the side street. Ten-foot wide pedestrian refuge islands would be added on Visitacíon Avenue at its intersections with Britton and Loehr streets.

Figure 14 shows the TTRP.8X Expanded Alternative. Narrative text describes the differences in the Expanded and Moderate Alternatives.

Please see information and additional graphics illustrating the TTRP.8X project at the SFMTA Web site, online at http://www.sftep.com.

SFMTA | Municipal Transportation Agency

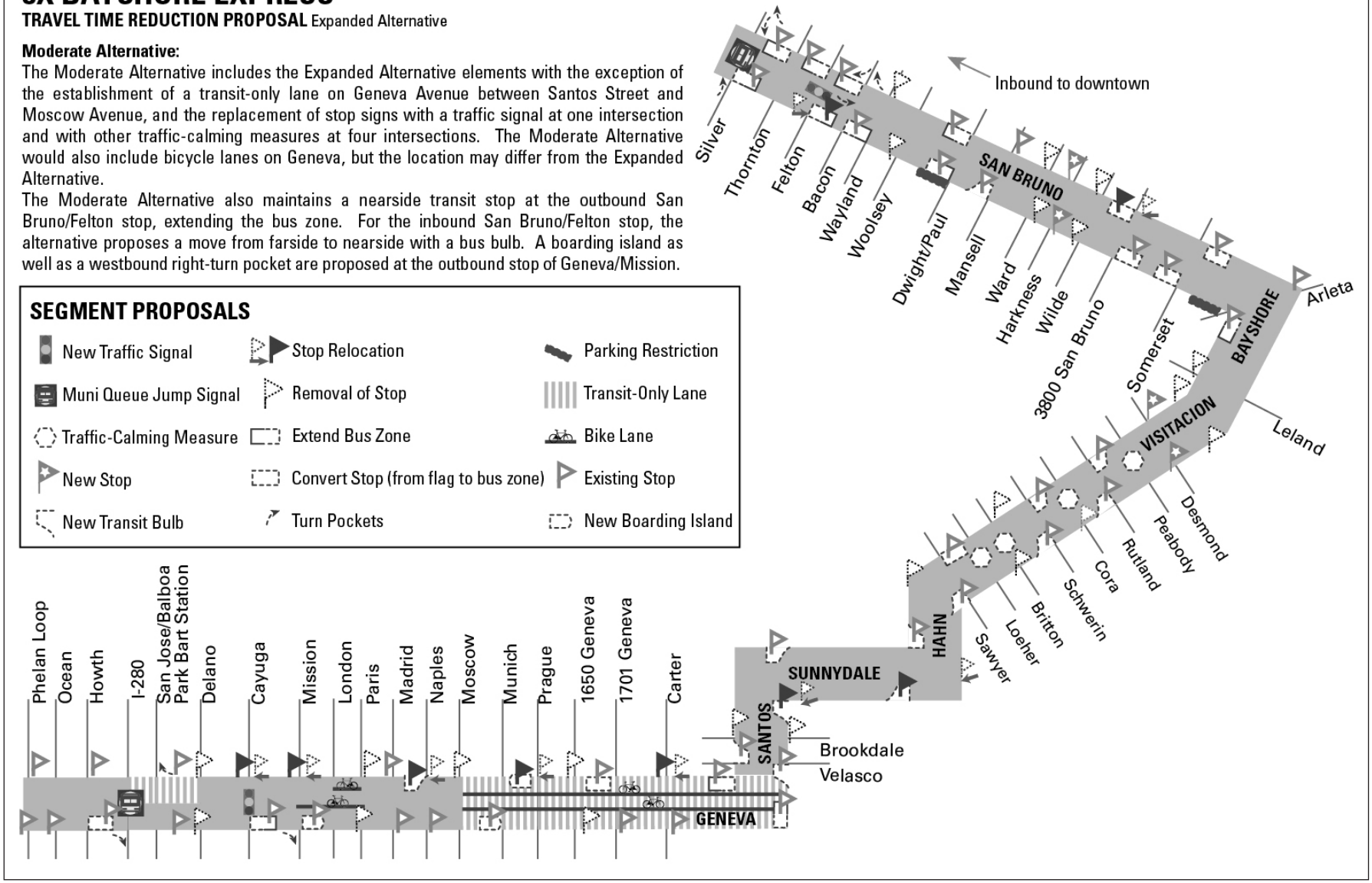
8X BAYSHORE EXPRESS

TRAVEL TIME REDUCTION PROPOSAL Expanded Alternative

Moderate Alternative:

The Moderate Alternative includes the Expanded Alternative elements with the exception of the establishment of a transit-only lane on Geneva Avenue between Santos Street and Moscow Avenue, and the replacement of stop signs with a traffic signal at one intersection and with other traffic-calming measures at four intersections. The Moderate Alternative would also include bicycle lanes on Geneva, but the location may differ from the Expanded Alternative.

The Moderate Alternative also maintains a nearside transit stop at the outbound San Bruno/Felton stop, extending the bus zone. For the inbound San Bruno/Felton stop, the alternative proposes a move from farside to nearside with a bus bulb. A boarding island as well as a westbound right-turn pocket are proposed at the outbound stop of Geneva/Mission.



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 14 - TTRP.8X EXPANDED ALTERNATIVE

A.5.3.5 TTRP.14: 14 Mission and 14L Mission Limited

TTRP.14 would provide transit improvements for the 14 Mission and 14L Mission Limited routes along the length of the Mission Street corridor extending from the Ferry Building to Daly City. TTRP.14 includes recommendations for both the inbound and outbound directions, from the intersection of Mission and Spear streets in Downtown San Francisco to Mission and Goethe streets near the border of Daly City and San Francisco. The inbound direction for these routes is north towards the Ferry Building, and the outbound direction is south towards Daly City. The project corridor is entirely on Mission Street, with the exception of a portion of the outbound direction which includes a two-block segment of Otis Street.

The TTRP.14 project has a Moderate and an Expanded Alternative. The Moderate Alternative would include transit stop changes, parking and turn restrictions, lane modifications, and traffic signal and stop sign changes. In addition to these changes, there are two options proposed for the Moderate Alternative, which will be referred to as TTRP.14 Moderate Alternative - Variants 1 and 2. TTRP.14 Moderate Alternative Variant 1 would establish side-running transit-only lanes in both directions during peak periods on Mission Street between 13th and Cesar Chavez streets. Tow-away restrictions would be implemented for the parking lanes on both sides of the street during peak periods in order to reduce parking friction. Due to the narrow width of these curbside parking lanes, they would not be used as additional travel lanes during these peak periods. TTRP.14 Moderate Alternative Variant 2 would create 7-day, 24-hour side-running transit-only lanes in both directions on Mission Street between 13th and Cesar Chavez streets. A parking lane on one side of the street would be permanently removed from this portion of Mission Street. In the Moderate Alternative and its variants, to reduce parking friction, the parking lanes on both sides of Mission Street, from Cesar Chavez to Randall Avenue and from Silver Avenue to Geneva Avenue, would be tow-away zones in the peak direction during the peak period (inbound AM, outbound PM).

The Expanded Alternative would include most of the changes proposed in the Moderate Alternative, excluding the elements proposed under the two Moderate Alternative Variants 1 and 2, and would instead relocate the existing side-running transit-only lanes into center-running transit-only lanes from First to Fifth streets outbound and from Sixth to First streets inbound, transition the outbound transit-only lane back to its existing curbside configuration and rescind the inbound transit-only lane from Seventh to Sixth streets, then, establish a new outbound transit-only lane

extending from 11th to Cesar Chavez streets. Between 11th and 13th streets this would be achieved by converting a southbound mixed-flow lane into a transit-only lane. Between 13th and Cesar Chavez streets, this would be achieved by reducing the roadway from four lanes to three lanes, with a transit-only lane and a mixed-flow lane in the southbound direction and single mixed-flow lane in the northbound direction. From Cesar Chavez Street to Randall Avenue and from Silver Avenue to Geneva Avenue, a mixed-flow lane in both directions would be converted to an all-day side-running transit-only lane. Several other changes to support these transit-only lanes would be made in the Expanded Alternative.

Implementation of the improvements in the Moderate Alternative would result in an estimated net reduction of up to 1,320 parking spaces (including 1,270 that would not be available during part-time tow-away restrictions) with Moderate Alternative Variant 1 and up to 1,100 parking spaces with Moderate Alternative Variant 2 (including 835 that would not be available during part-time tow-away restrictions). There would be a reduction of up to 540 parking spaces (including 235 that would not be available during part-time tow-away restrictions) with implementation of the Expanded Alternative. Implementation of either the Moderate or Expanded Alternatives would result in a net reduction of up to 12 loading spaces.

TTRP.14 Moderate Alternative

The Moderate Alternative would include transit stop changes, pedestrian improvements, parking and turn restrictions, lane modifications, and traffic signal and stop sign changes as described below.

Transit Stop Changes (Moderate). Boarding island and transit bulb changes are proposed as follows. A 115-foot nearside boarding island would be constructed on Mission Street at Fremont Street in the inbound direction in conjunction with the Transbay Transit Center District Plan Projects.[34] Transit bulbs would be installed on Mission Street at the following intersections in the outbound direction: 11th and 20th streets, and Richland and Silver avenues. The bulbs in the outbound direction at 11th

[34] The Transit Center District Plan (TCDP) proposed this feature as part of its public realm plan. The TCDP project includes the creation of center-running transit-only lanes between First and New Montgomery streets. The TCDP was approved by the City on July 31, 2012; therefore, this modification has undergone the requisite environmental review. It is discussed here for informational purposes and to present a full picture of the corridor as well as acknowledge the cumulative context. Documents related to the TCDP environmental review may be viewed at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of case files 2007.0558E and 2008.0789E.

and 20th streets and at Silver Avenue would be 130 feet long, whereas the bulb in the outbound direction at Richland Avenue would be 145 feet long. Transit bulbs would be installed on Mission Street in the inbound direction: at 11th, 16th and 20th streets, and Richland, Silver, and Lowell avenues and would be 130 feet long.

Additionally, the outbound transit bulb on Mission Street at 30th Street would be extended in length from 85 feet to 115 feet and the inbound bulb at 30th Street would be extended in length from 90 feet to 125 feet. The outbound transit bulb at Goethe Street and the inbound transit bulb at Evergreen Avenue would be extended from 40 feet to 115 feet. In addition, existing transit bulbs would be removed at the following locations: at 150 Otis Street in the outbound direction and on Mission Street at 22nd Street in both directions to provide additional lane width for the 14L Mission Limited buses to pass the local 14 Mission buses.

Transit stop locations would be relocated at the following intersections. Transit zones that are currently located on the nearside of intersections would be relocated to the farside of the Mission Street intersections at 11th Street and Richland Avenue in the inbound direction, and at Cortland, Appleton, and Onondaga avenues in the outbound direction. In addition, in the outbound direction, the transit stop at Francis Street would be moved from the farside of Francis Street to the farside of Excelsior Avenue.

Transit stops proposed for consolidation are as follows: Two closely-spaced stops would be consolidated into one at Spear and Beale streets (outbound), Precita and Fair avenues (inbound), Norton and Ruth streets (outbound), Mount Vernon and Foote avenues (outbound), Allison and Guttenberg streets (inbound), and Whittier Street and Lawrence Avenue/Oliver Street (both directions). For each of the pairs of transit stops removed, a new transit stop would be established at the following locations: Main Street (outbound), Powers Avenue (inbound), Ocean Avenue (outbound), Ottawa Avenue (both directions), and Farragut Avenue (both directions). Table 8 lists each stop consolidation.

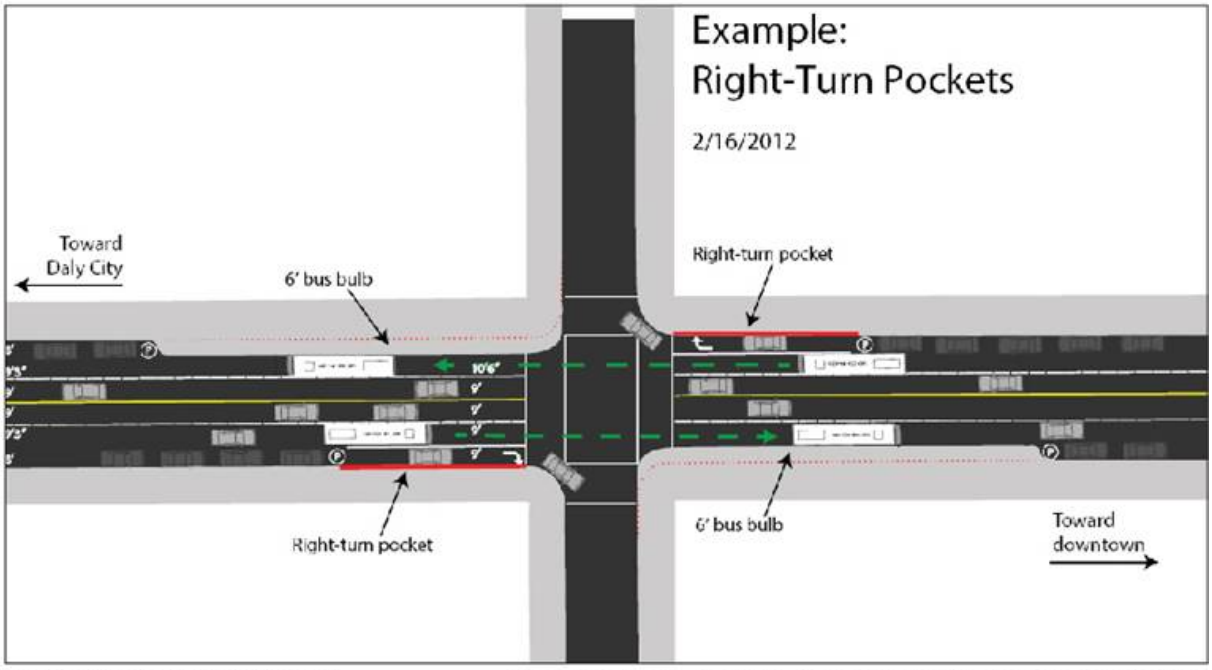
Bus stops proposed for removal are as follows. Stops would be removed in both the inbound and outbound directions on Mission Street at 15th, 19th, 21st, 23rd, and 29th streets, as well as at Highland Avenue. Outbound bus stops on Mission Street at Precita Avenue and 4080 Mission Street would be removed as would the inbound bus stop at Brazil Avenue.

Table 8: 14 Mission and 14L Mission Limited Stop Consolidations

Stops Consolidated – Moved from:	New Stop at:
OUTBOUND	
Spear Street, Beale Street	Main Street
Norton Street, Ruth Street	Ocean Avenue
Mount Vernon Avenue, Foote Avenue	Ottawa Avenue
Whittier Street, Lawrence Avenue	Farragut Avenue
INBOUND	
Precita Avenue, Fair Avenue	Powers Avenue
Allison Street, Guttenberg Street	Ottawa Avenue
Whittier Street, Oliver Street	Farragut Avenue

Parking and Turn Restrictions (Moderate). The existing weekday and Saturday left-turn restrictions would be modified from the current 4 p.m. to 6 p.m. to extend to 7 a.m. to 7 p.m. at the following Mission Street intersections: 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, and 26th streets in both directions, 15th Street in the inbound direction only, and 14th Street in the outbound direction only. At Cesar Chavez Street, a new left-turn restriction would be implemented from 7 a.m. to 7 p.m. and would exclude Muni vehicles.

Lane Modifications (Moderate). Dedicated right-turn pockets would be added at the following Mission Street intersections in both directions: 16th, 17th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, Cesar Chavez, and Valencia/Fair streets, and Francis Street/Excelsior Avenue, and Norton Street/Brazil Avenue (see Figure 15). They would also be established in the inbound direction at the following Mission Street intersections: 14th Street, Precita, Cortland, Persia, and Italy avenues. Right-turn pockets would be established in the outbound direction on Mission Street at Ninth Street, South Van Ness Avenue, and 15th, 18th, and 29th streets, and Silver Ocean, and Onondaga/Russia avenues. Right-turn pockets would be established by eliminating existing on-street parking spaces generally within 75 feet of the intersection in the location of the proposed right-turn pocket. A left-turn pocket would be added on Mission Street at Silver Avenue in the inbound direction. At South Van Ness Avenue, parking would be removed on Mission Street and the center median would be rebuilt at a narrower width. At Mission and Randall streets, parking would be removed on the east side of Mission Street and lanes would be shifted over to establish a 120-foot-long right-turn pocket in the outbound direction.



SOURCE: SFMTA, Turnstone Consulting

FIGURE 15: TTRP.14 LANE MODIFICATIONS MODERATE ALTERNATIVE

The existing transit-only lane hours of 4 p.m. to 6 p.m. in both directions and 7 a.m. to 9 a.m. in the inbound direction would be extended to 7-day, 24-hours for the segment of Mission Street between Fourth and 11th streets. The existing 7 a.m. to 6 p.m. hours of the Mission Street transit-only lanes between Fourth and Main streets in the outbound direction and between Fourth and Beale streets in the inbound direction would be extended to 7-day, 24-hours.

Traffic Signal and Stop Sign Changes (Moderate). The all-way stop sign at Mission Street and Templeton Avenue in Daly City would be replaced with a traffic signal.

Note: The following Transit Stop Changes, Traffic Signal and Stop Sign Changes, and Parking and Turn Restrictions changes would also be implemented in the Moderate Alternative but would not be implemented in the Expanded Alternative.

Transit Stop Changes (Moderate Only). The inbound transit zone at Fifth Street would be extended in length from 120 feet to 185 feet, and the inbound transit zone that is currently located on the nearside of Second Street would be relocated to the farside of the intersection.

Traffic Signal and Stop Sign Changes (Moderate Only). The traffic signal timing at Mission Street and Cortland Avenue would be altered to provide southbound to eastbound left turns from Mission Street onto Cortland Avenue a protected turning phase to remove delay caused to southbound transit.

Parking and Turn Restrictions (Moderate Only). Right-turn pockets would be lengthened on Mission Street in the outbound direction at the following intersections: Third and Fifth streets. The striped queue jump lane in the outbound direction at Third Street would be lengthened.

The existing weekday tow-away restrictions on Mission Street between Beale and First streets from 3 p.m. to 6 p.m. in the outbound direction and from 7 a.m. to 9 a.m. and 3 p.m. to 6 p.m. in the inbound direction would be extended to 7 a.m. to 7 p.m. in both directions.

The existing weekday tow-away restrictions on Mission Street between First and Third streets from 7 a.m. to 9 a.m. and 3 p.m. to 6 p.m. in both directions would be extended to 7 a.m. to 7 p.m. in both directions.

The existing weekday tow-away restrictions on Mission Street between Fourth and Fifth streets from 3 p.m. to 6 p.m. in the outbound direction would be extended to 7 a.m. to 7 p.m.

The existing weekday tow-away restrictions on Mission Street between Fifth and 11th streets from 4 p.m. to 6 p.m. in the outbound direction and 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. in the inbound direction would be extended to 7 a.m. to 7 p.m. in both directions.

TTRP.14 Moderate Alternative - Variant 1

Variant 1 would include the addition of the following lane modifications and parking and turn restrictions to the above listed changes in the Moderate Alternative to create a transit-only lane in both directions between 13th and Cesar Chavez streets. Please note that due to conflicts between the two variant proposals, only one of the two (TTRP.14 Moderate Alternative Variant 1 or 2) could be implemented, not both.

Parking and Turn Restriction (TTRP.14 Moderate Alternative - Variant 1). Under Variant 1, a tow-away zone during peak periods would be established for the parking lanes on both sides of Mission Street from 13th to Cesar Chavez Street.

Lane Modification (TTRP.14 Moderate Alternative - Variant 1). Under Variant 1, a mixed-flow lane in both directions of Mission Street would be converted to a side-running transit-only lane during peak periods from 13th Street to Cesar Chavez Street.

TTRP.14 Moderate Alternative –Variant 2

Variant 2 would include adding the following lane modifications and parking and turn restrictions to the above listed changes in the Moderate Alternative to create 7-day, 24-hour transit-only lanes in both directions of Mission Street between 13th Street and Cesar Chavez Street.

***Lane Modifications (TTRP.14 Moderate Alternative - Variant** 2).* Under Variant 2, a mixed-flow lane in both directions of Mission Street would be converted to a 7-day, 24-hour side-running transit-only lane from 13th to Cesar Chavez streets.

Parking and Turn Restrictions (TTRP.14 Moderate Alternative – Variant 2). Under Variant 2, a parking lane would be permanently removed from one side of Mission Street from 14th Street to Cesar Chavez Street. The parking lane removal would alternate between sides of Mission Street every two blocks from 14th Street to Cesar Chavez Street.

TTRP.14 Expanded Alternative

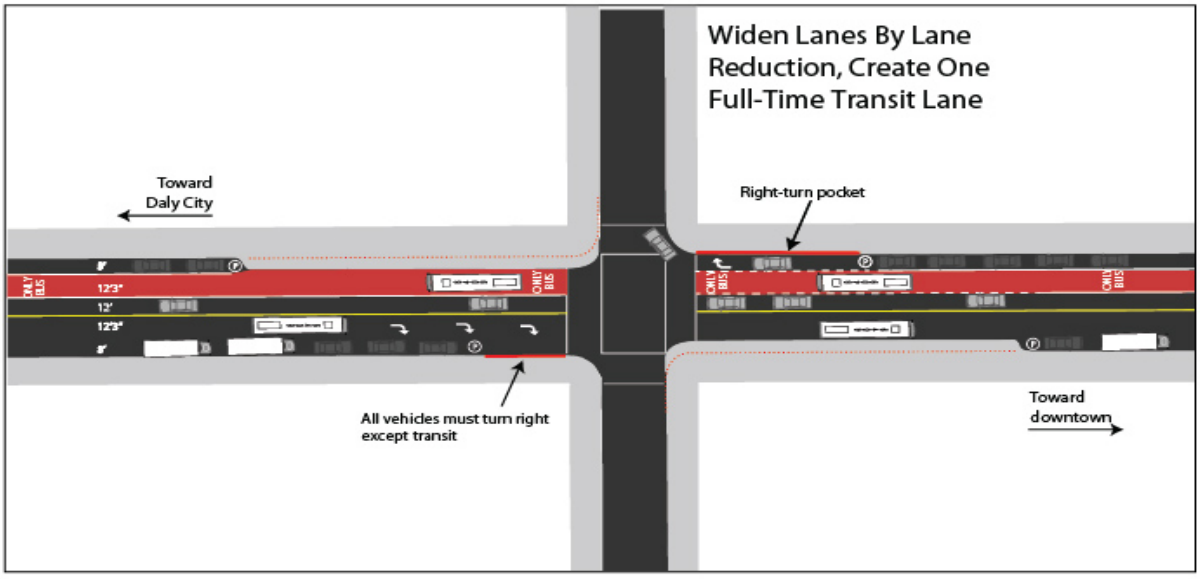
The Expanded Alternative would include additional changes, largely to facilitate the implementation of transit-only lanes. The Expanded Alternative would include the transit stop changes, lane modifications, parking and turn restrictions, and traffic signal and stop sign changes noted above in the Moderate Alternative except those (*Moderate Only*) noted to conflict with the Expanded Alternative, as well as those in TTRP.14 Moderate Alternative Variants 1 and 2. The Expanded Alternative would include the following additional changes.

Transit Stop Changes (Expanded). Nearside transit boarding islands would be installed in the segment of Mission Street where there would be center-running transit-only lanes. The islands would be installed in both directions on Mission Street at Second, Third and Fourth streets (all 115-foot-long), and in the inbound only direction at Fifth Street (115-foot-long) and Sixth Street (55-foot-long).

Lane Modifications (Expanded). Transit-only lanes would be established on portions of the 14 Mission/14L Mission Limited route where none exist under existing

conditions, and changes would be made to existing transit-only lanes. Center-running transit-only lanes would be established on a portion of the route by converting a mixed-flow traffic lane to a transit-only lane in both directions. The existing side-running transit-only lane would be eliminated on blocks where the center-running transit-only lane is established. In the outbound direction, the center-running transit-only lane would begin at First Street and end at Fifth Street. In the inbound direction, the center-running transit-only lane would begin at Sixth Street and continue to First Street. As part of this proposal, the existing peak period side-running transit-only lane would also be eliminated between Seventh and Sixth streets to allow traffic to merge out of the center lane and allow buses to be in the center lane by the time they reach Sixth Street.

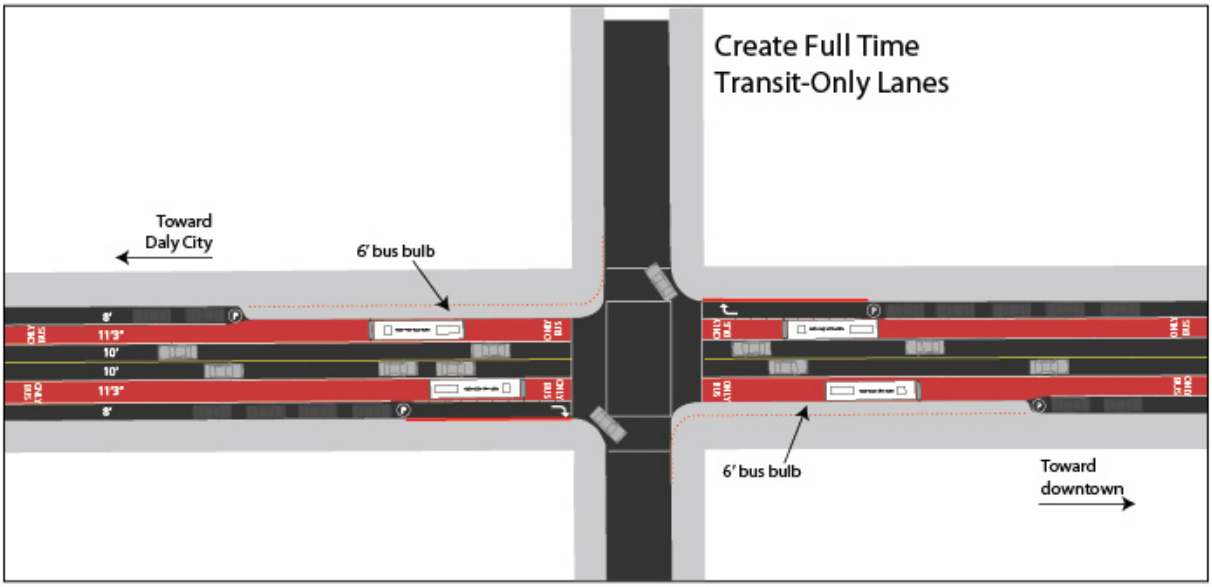
From 11th Street to 13th Street, a side-running transit-only lane would be established in the outbound direction by reconstructing the center median at South Van Ness Avenue in order to provide sufficient width for a transit-only lane, which would be converted from a mixed-flow lane to a transit-only lane. The median would be reconstructed at a narrower width to gain approximately five feet of street space on the north side of Mission Street at South Van Ness Avenue. The additional five feet would be allocated to the transit-only lane as well as the right-turn pocket discussed in the *Lane Modifications (Moderate)* section. The transit-only lane would extend from South Van Ness Avenue to 13th Street on Otis Street, also by converting a mixed-flow lane to a transit-only lane (see Figure 16a).



SOURCE: SFMTA, Turnstone Consulting

FIGURE 16a: TTRP, 14 LANE MODIFICATION FROM 14TH TO CESAR CHAVEZ STREETS (EXPANDED)

From 14th to Cesar Chavez streets, a transit-only lane in the outbound (southbound) direction would be established by converting the four existing mixed-flow lanes into one outbound side-running transit-only lane, one outbound mixed-flow lane, one inbound mixed-flow lane with forced right turns at every intersection for non-transit vehicles, and parking maintained on both sides of the street. From Cesar Chavez to Randall streets and from Silver to Geneva avenues, a side-running transit-only lane in both directions would be created by removing one mixed-flow lane in each direction (see Figure 16b).



SOURCE: SFMTA, Turnstone Consulting

FIGURE 16B: TTRP, 14 LANE MODIFICATION FROM CESAR CHAVEZ TO RANDALL STREETS AND FROM SILVER TO GENEVA STREETS (EXPANDED)

A signalized queue jump would be installed at First Street in the outbound direction to allow buses to merge into the proposed center-running transit-only lane.[35] At Fifth Street, there would be an additional signalized queue jump in the outbound direction to allow the bus to merge out of the transit-only lane, back to the curb lane.

[35] The TCDP project includes the creation of center-running transit-only lanes between First and New Montgomery streets. The TCDP was approved by the City on July 31; therefore, this modification has undergone the requisite environmental review. It is discussed here for informational purposes and to present a full picture of the corridor as well as acknowledge the cumulative context. Documents related to the TCDP environmental review may be viewed at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of case files 2007.0558E and 2008.0789E.

At Randall Street, parking would be eliminated on the east side of Mission Street, lanes would shift four to six feet to the east, and a 75-foot-long right-turn pocket would be created in the southbound direction.

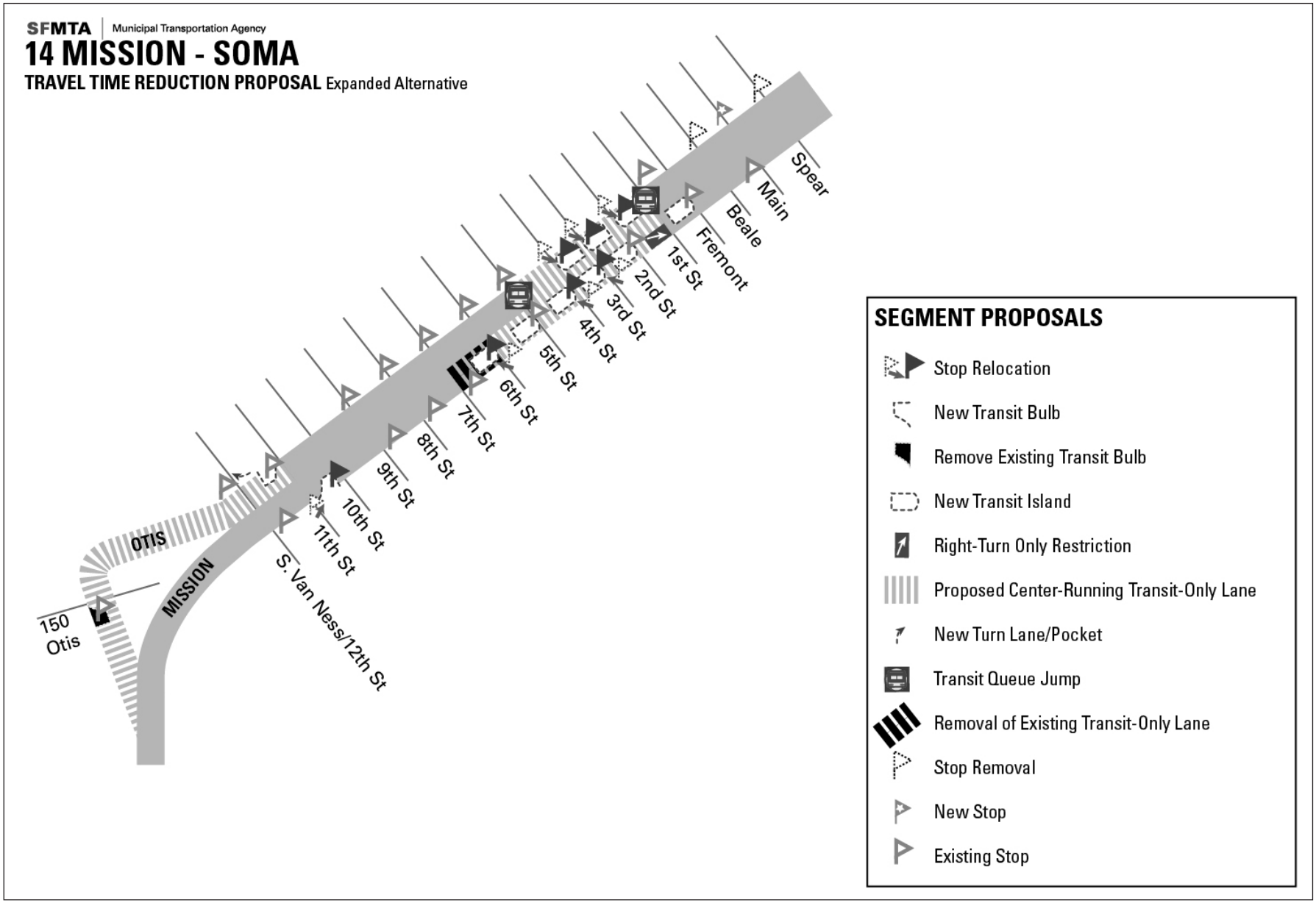
At Cortland Avenue, the Expanded Alternative would remove the transit bulb in the outbound direction to create the necessary street width for a left-turn pocket in the southbound direction.

Traffic Signal and Stop Sign Changes (Expanded). The all-way stop sign would be converted to a new traffic signal at the intersection of Mission and Randall streets.

Parking and Turn Restrictions (Expanded). In conjunction with the installation of the center-running transit-only lanes on Mission Street in the Downtown area, a right-turn-only except for Muni restriction would be implemented in the inbound direction at First Street. Parking would be removed at all times on Mission Street from Fremont to 3rd Streets in both directions. In the westbound/outbound direction, parking would be removed on Mission Street between 4th Street and Jessie Street East, and between 5th Street and 200' east of 6th Street. In the eastbound/inbound direction, parking would be removed from 200' west of 6th to 6th Street, and from Mary Street to 5th Street.

Figures 17 to 19 show the TTRP.14 Expanded Alternatives along the corridor and describe the differences in the Expanded and Moderate Alternatives.

Please see information and additional graphics illustrating the TTRP.14 project at the SFMTA Web site, online at http://www.sftep.com.



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 17 - TTRP.14 (SOMA) - EXPANDED ALTERNATIVE

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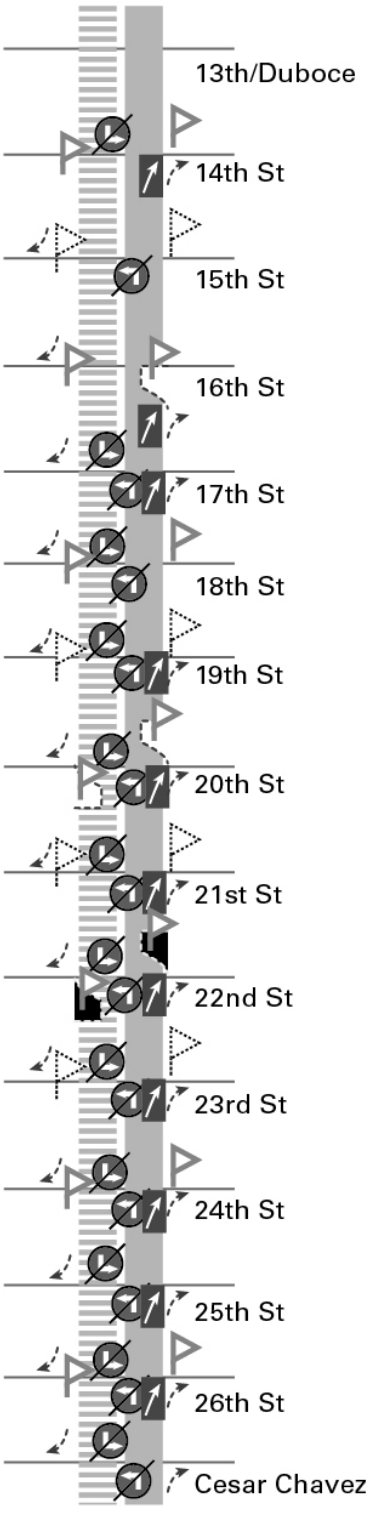
14 MISSION - Inner Mission

TRAVEL TIME REDUCTION PROPOSAL Expanded Alternative, Design Option 3



Travel lanes will be widened along entire corridor from 13th/Duboce to Cesar Chavez Street by elminating one northbound lane of traffic.

Moderate Alternatives

Design Variant 1: Converts the existing parking lane on both sides of Mission Street from 13th Street to Cesar Chavez Street and from Silver Avenue to Geneva Avenue into a tow-away lane during peak periods and converts the curb-side mixed-flow lanes into transit-only lanes.

Design Variant 2: Convert an existing mixed-flow lane in both directions to a curb-side transit-only lane and remove parking on one side of the street between 13th and Cesar Chavez streets

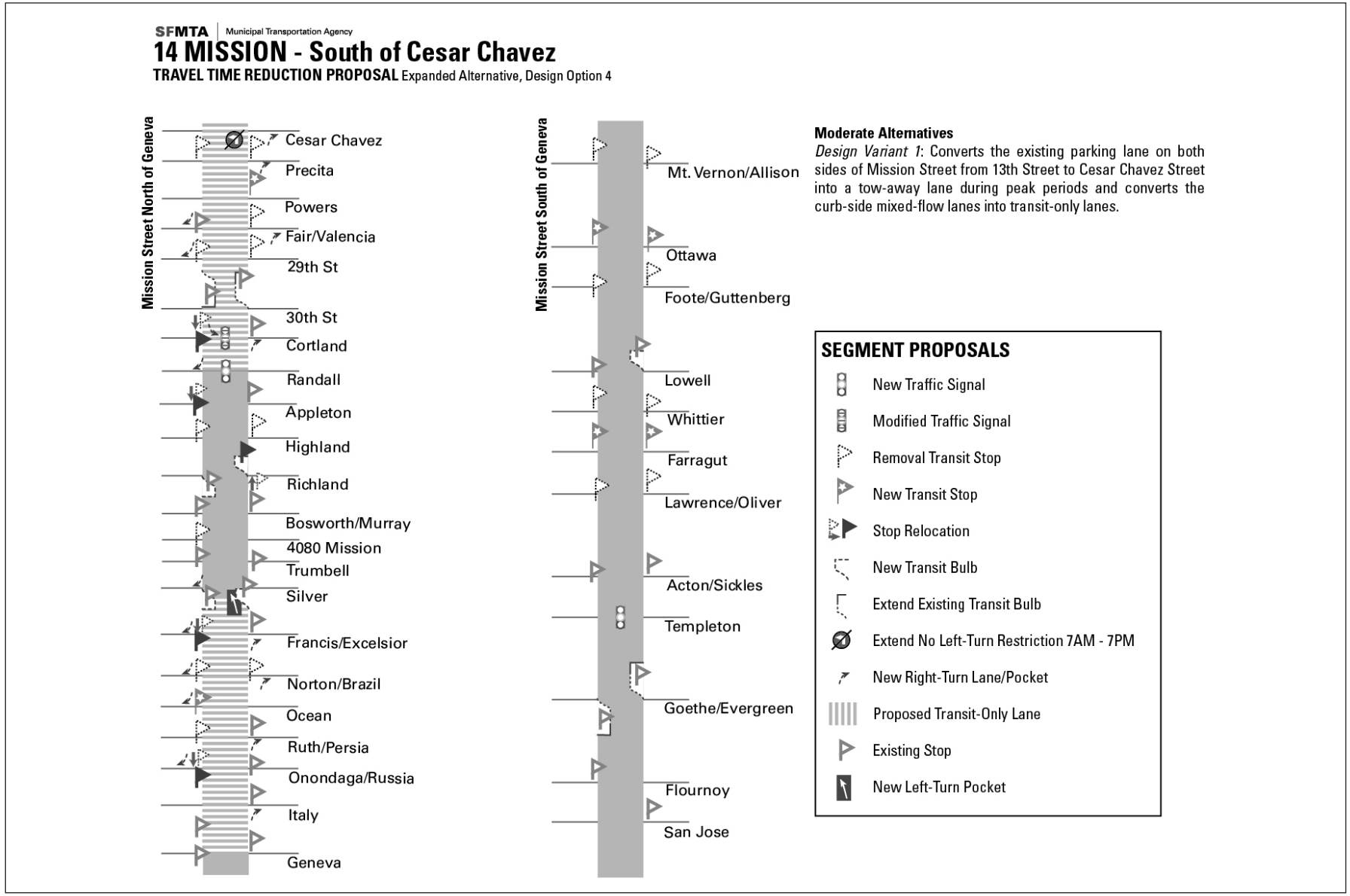
SEGMENT PROPOSALS

- New Transit Bulb
- Remove Transit Stop
- Remove Transit Bulb
- Extend No Left-Turn Restrictions 7AM - 7PM
- Right-Turn Only Restrictions
- New Turn Lanes/Pockets
- Proposed Transit-Only Lane
- Existing Stop

SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 18 - TTRP.14 (INNER MISSION) - EXPANDED ALTERNATIVE



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 19 - TTRP.14 (OUTER MISSION) EXPANDED ALTERNATIVE

A.5.3.6 TTRP.22_1: 22 Fillmore

TTRP.22_1 would provide transit improvements for the southeastern portion of the 22 Fillmore route along the 16th Street corridor. The proposed project would implement specified TPS Toolkit elements in both the inbound and outbound directions, from Church Street to Third Street. The inbound direction for this route is west towards Church Street and the outbound direction is east towards Third Street.The TTRP.22_1 project has a Moderate and an Expanded Alternative. The Moderate Alternative would include transit stop changes and parking and turn restrictions. The Expanded Alternative would include the same parking and turn restrictions and most of the same transit stop changes as the Moderate Alternative, along with a center-running transit-only lane in both directions from Third Street to Bryant Street. The Expanded Alternative has two variants for providing a transit-only lane on 16th Street from Bryant Street to Church Street. These variants are referred to as TTRP.22_1 Expanded Alternative Variant 1 and TTRP.22_1 Expanded Alternative Variant 2. The TTRP.22_1 Expanded Alternative Variant 1 and TTRP.22_1 Expanded Alternative Variant 2 could be implemented in addition to the project, however, due to conflicts between the two variant proposals, only one of the two (TTRP Variant 1 or 2) could be implemented, not both.

Implementation of the improvements in the Moderate Alternative would result in an estimated net gain of up to 10 parking spaces. There would be a net reduction of up to 525 parking spaces with implementation of the Expanded Alternative Variant 1 (including 240 that would not be available during part-time tow-away restrictions). The net reduction in parking spaces as a result of Variant 2 would be up to 290 parking spaces. Implementation of improvements in either the Moderate or Expanded Alternative would not result in the reduction of the number of loading spaces.

TTRP.22_1 Moderate Alternative

The Moderate Alternative would include transit stop changes and parking and turn restrictions.

Transit Stop Changes (Moderate). Transit stops in both directions on 16th Street at Guerrero and Harrison/Treat streets would be moved from the nearside to the farside of the intersection. Transit stops would be removed at the intersections on 16th Street at Valencia and Dolores streets in both directions, on 16th Street at Vermont Street in

the inbound (west) direction, and on 16th Street at San Bruno Avenue in the outbound (south) direction.

Due to the change to the 22 Fillmore route, service would be moved from 17th and 18th streets to 16th Street between Kansas and Third streets, and stops would be removed in both directions on 17th Street at Kansas, De Haro, Wisconsin and Connecticut streets.[36] New stops would be established in both directions on 16th Street at Fourth, Wisconsin, and Missouri streets and in the inbound (west) direction at Kansas Street.

Transit bulbs would be constructed in both directions at the farside of the intersection on 16th Street at Harrison, Mission, and Guerrero streets and in the inbound (west) direction at Folsom and Church streets, and in the outbound (east) direction at Shotwell Street.

Parking and Turn Restrictions (Moderate). Left turns would be prohibited in both directions on 16th Street at Florida, Alabama, Harrison, Folsom, Shotwell, Capp, Mission, Hoff/Julian, Valencia, Albion, Guerrero, and Dolores streets and at South Van Ness Avenue.

Note: The following Transit Stop Changes are included only in the Moderate Alternative and not in the Expanded Alternative.

Transit Stop Changes (Moderate only). New transit bulbs would be constructed for the new stops in both directions on 16th Street at the farside of the intersections of Fourth, Missouri, and Wisconsin streets. In the inbound (west) direction, a new transit bulb would be constructed for the new farside stop on 16th Street at Kansas Street.

In the outbound (east) direction, existing stops on 16th Street at Potrero Avenue and at Kansas Street would be moved from the nearside to the farside of the intersection, and new transit bulbs would be constructed for these stops. In the inbound (west) direction, the existing stop on 16th Street at Bryant Street would be moved from midblock to the farside of the intersection and a new transit bulb would be constructed. Transit bulbs would be added to the existing inbound (west) farside stop

[36] The 22 Fillmore would no longer make stops on 18th, 20th, or Third streets, but these stops would be served by the 33 Stanyan, which will be rerouted to cover this portion of the existing 22 Fillmore route.

at 16th Street and Potrero Avenue and to the existing outbound (east) farside stop at 16th Street and Bryant Street. All new transit bulbs would be 45 feet in length.

TTRP.22_1 Expanded Alternative

The Expanded Alternative would include the same transit stop changes and parking and lane modifications included in the Moderate Alternative except those noted as *Moderate Only*. The Expanded Alternative would include the following additional changes.

Transit Stop Changes (Expanded). Median boarding islands would be built in both directions on the nearside of the intersection on 16th Street at Missouri, Wisconsin, Kansas, and Bryant streets, and at Potrero Avenue. At the intersection of 16th and Fourth streets, median boarding islands would be built on 16th Street on the nearside of the intersection in the inbound (west) direction and on the farside of the intersection in the outbound (east) direction. Boarding islands would be 80 feet in length.

Lane Modifications (Expanded). Center-running transit-only lanes and one mixed-flow lane would be provided in each direction on 16th Street between Bryant and Third streets. On 16th Street from Seventh to Kansas streets, the existing bike lane is proposed to be removed and relocated to 17th Street.

A left-turn lane in the westbound direction would be added on 16th Street at Mississippi Street by removing the existing right-turn lane. A left turn lane would also be added in the westbound direction on 16th Street at Seventh Street. At Third Street, a transit-only left-turn lane in the outbound (east) direction would be installed as an extension of the median transit-only lane.

On 16th Street between Seventh and Third streets, the University of California San Francisco expansion plan calls for a second northbound left-turn lane on Owens Street at 16th Street when certain traffic volume triggers are met.[37] To accommodate the installation of this lane and maintain the proposed center-running transit-only lanes, the 16th Street bike lanes would be converted to sharrows west of Owens Street and parking would be removed on the south side of 16th Street in order to

[37] University of California, San Francisco. 2012. *UCSF Medical Center at Mission Bay – Fourth Street Public Plaza Final EIR*, State Clearinghouse No. 2011122065, Certified May 18, 2012. Available online at http://campusplanning.ucsf.edu/pdf/Fourth_Street_Final_EIR_Consolidated_5-30-12.pdf. Accessed July 30, 2012.

create two receiving westbound mixed-flow lanes. This modification would only be necessary if future traffic volumes were large enough to warrant the creation of a double left-turn lane from northbound Owens Street onto westbound 16th Street. At 16th and Third streets, traffic volume triggers could require reconfiguring the intersection to one westbound mixed-flow lane, one westbound transit-only lane, one eastbound transit-only left-turn lane, one eastbound through left-turn lane, one eastbound through lane, and one right-turn lane pocket. This would be accommodated by removing parking and converting the eastbound bike lane to sharrows. Similarly, these modifications would only be necessary if future traffic volumes were sufficiently large enough to exceed capacity thresholds.

Parking and Turn Restrictions (Expanded). Left turns would be prohibited in both directions on 16th Street at Bryant, Utah, San Bruno, Kansas, Rhode Island, De Haro, Carolina, Wisconsin, Arkansas, Connecticut, Missouri, and Fourth (westbound only) streets and at Potrero Avenue (westbound only).

As discussed in the following Pedestrian Improvements section, parking would be removed from both sides of 16th Street between Potrero Avenue and Seventh Street to allow for the widening of the adjacent sidewalks up to 18 feet in width, as well as the addition of pedestrian lighting. Parking would also be removed on the south side of 16th Street from Third to Seventh streets to accommodate boarding islands and turn pockets.

Traffic Signal and Stop Sign Changes (Expanded). New traffic signals would be installed on 16th Street at San Bruno, Wisconsin, Connecticut, and Missouri streets.

At 16th and Third streets, a Muni-only left turn signal and signage would be added to the transit-only outbound (east) left-turn lane to Third Street.

Pedestrian Improvements (Expanded). The sidewalks on both sides of 16th Street between Potrero Avenue and Seventh Street would be widened from 10 to 18 feet by removing the parking lanes on both sides of the street. Parking/delivery "pockets" would be carved out of the widened sidewalk and provided along 16th Street based on specific land use demands.

Pedestrian bulbs would be installed at Dolores, Valencia, Mission, Capp, Folsom, Harrison, San Bruno, Kansas, Rhode Island, De Haro, Wisconsin, and Connecticut streets. A new crosswalk and pedestrian bulbs would be installed at Julian Avenue.

TTRP.22_1 Expanded Alternative – Variant 1

Lane Modifications (Expanded – Variant 1). From Bryant Street to Church Street, 16th Street would be restriped with two wider (13-foot-wide) mixed-flow and two (12-foot-wide) parking lanes with tow away restrictions during peak periods. During peak periods, the parking lanes would be used as curbside transit-only lanes.

TTRP.22_1 Expanded Alternative – Variant 2

Transit Stop Changes (Expanded – Variant 2). Transit bulbs would be constructed in both directions at the farside of the intersection on 16th Street at Harrison, Mission, and Guerrero streets and in the inbound (west) direction at Folsom and Church streets, and in the outbound (east) direction at Shotwell Street.

Lane Modifications (Expanded – Variant 2). From Bryant Street to Church Street, 16th Street would be restriped for one mixed-flow lane in both directions, parking in both directions, and a full time, inbound (westbound) side-running transit-only lane.

Figure 20 shows the TTRP.22 Expanded Alternative. Narrative text describes differences in the Expanded and Moderate Alternatives.

Please see information and additional graphics illustrating the TTRP.22_1 project at the SFMTA Web site, online at http://www.sftep.com.

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22 FILLMORE

TRAVEL TIME REDUCTION PROPOSAL Expanded Alternative

Segment Proposals

- Transit Only Lane
- New Traffic Signal
- Stop Removal
- Existing Stop
- Stop Optimization
- New Stop
- New Transit Island
- New Transit Bulb
- No Left Turn Restrictions
- Crosswalk
- New Pedestrian Bulb
- New Left-Turn Pocket

Moderate Alternative

The Moderate Alternative would include the same parking and turn restriction proposals of the Expanded Alternative with the following exceptions: Left turns would only be prohibited in both directions on 16th Street at Florida, Alabama, Harrison, Folsom, Shotwell, Capp, Mission, Hoff/Julian, Valencia, Albion, Guerrero, and Dolores streets and at South Van Ness Avenue. The Moderate Alternative does not include a center-running transit-only lane in both directions from Third Street to Bryant Street. The Moderate Alternative includes the following transit stop changes:

Transit Stop Changes

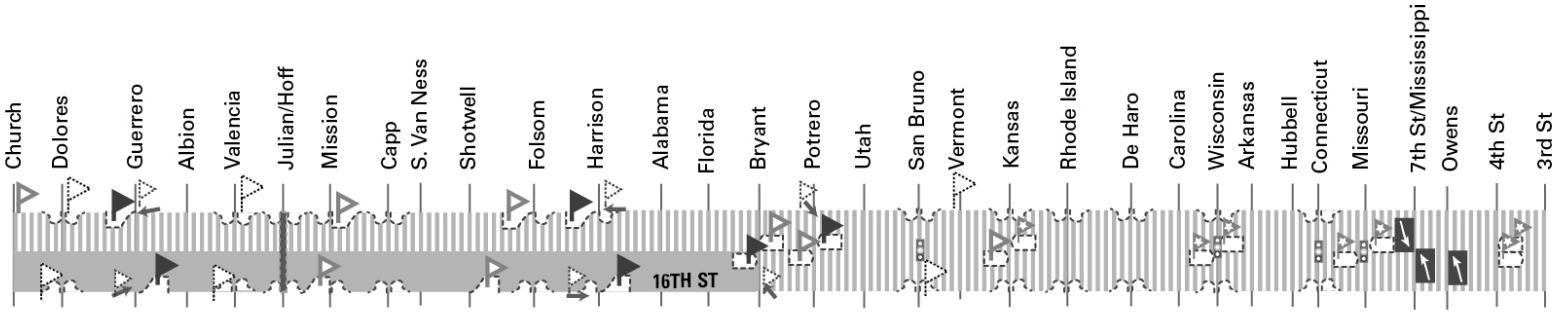
New bus bulbs would be constructed for the new stops in both directions on 16th Street at the farside of the intersections of 4th, Missouri, Wisconsin, Harrison, Mission, and Guerrero streets. In the inbound direction, a new bus bulb would be constructed for the new stop on 16th Street at Rhode Island Street. In the outbound direction, existing stops on 16th Street at Potrero Avenue and at Kansas Street would be moved from the nearside to the farside of the intersection, and new bus bulbs would be constructed for these stops. In the inbound direction, the existing stop on 16th Street at Bryant Street would be moved from midblock to the farside of the intersection and a new bus bulb would be constructed. Bus bulbs would be added to the existing inbound farside stop at 16th Street and Potrero Avenue and to the existing outbound farside stop at 16th Street and Bryant Street.

Expanded Alternative – Variant 1

From Bryant Street to Church Street, 16th Street would be restriped with two wider (13-foot-wide) mixed-flow and two (12-foot-wide) parking lanes with tow away restrictions during peak hours. During peak hours, the parking lanes would be used as curbside transit-only lanes.

Expanded Alternative – Variant 2

Transit Stop Changes (Expanded – Variant 2) Bus bulbs would be constructed in both directions at the farside of the intersection on 16th Street at Harrison, Mission, and Guerrero streets and in the inbound direction at Folsom and Church streets, and in the outbound direction at Shotwell Street. From Bryant Street to Church Street, 16th Street would be restriped for one mixed-flow lane in both directions, parking in both directions, and a full time, inbound (westbound) side-running transit-only lane.



Expanded Alternative Proposed Left-Turn Restrictions

- 16th St / Florida
- 16th St / Alabama
- 16th St / Harrison
- 16th St / Folsom
- 16th St / Shotwell
- 16th St / S Van Ness
- 16th St / Capp
- 16th St / Mission
- 16th St / Hoff & Julian
- 16th St / Valencia
- 16th St / Albion (westbound only)
- 16th St / Guerrero
- 16th St / Dolores
- 16th St / 4th St (westbound only)
- 16th St / Missouri (westbound only)
- 16th St / Connecticut (westbound only)
- 16th / Hubbell (eastbound only)
- 16th St / Arkansas (westbound only)
- 16th St / Wisconsin
- 16th St / Carolina
- 16th St / De Haro
- 16th St / Rhode Island
- 16th St / Kansas
- 16th St / San Bruno
- 16th St / Utah
- 16th St / Potrero (westbound only)
- 16th St / Bryant

SOURCE: SFMTA, Turnstone Consulting

FIGURE 20 - TTRP.22 EXPANDED ALTERNATIVE

A.5.3.7 TTRP.28_1: 28 19th Avenue and 28L 19th Avenue Limited

TTRP.28_1 would provide transit improvements for the 28 19th Avenue and 28L 19th Avenue Limited bus routes along the 19th Avenue corridor. TPS Toolkit improvements would be implemented in both the inbound and outbound directions, from the intersection of 19th Avenue and Lincoln Way to the intersection of 19th Avenue and Junipero Serra Boulevard. The inbound direction for these routes is north toward the Golden Gate Bridge (28 19th Avenue) and the Marina District (28L19th Avenue Limited). The outbound direction is south toward the Daly City BART Station (28 19th Avenue) and the Excelsior District (28L 19th Avenue).

The TTRP.28_1 project has a Moderate and Expanded Alternative. The Moderate Alternative would include transit stop changes and pedestrian improvements. The Expanded Alternative would include the same proposals as the Moderate Alternative, as well as a proposal to shorten one of two northbound left-turn lanes at 19th Avenue/Winston Drive to prevent vehicles from delaying M Ocean View LRV movements at the intersection.

Implementation of the improvements in both the Moderate and Expanded Alternatives would result in a net gain of up to 10 parking spaces. There would not be a reduction in the number of loading spaces due to the implementation of improvements for either the Moderate or Expanded Alternative.

Details of the two project alternatives for this corridor are provided below.

TTRP.28_1 Moderate Alternative

The Moderate Alternative would include transit stop changes and pedestrian improvements.

Transit Stop Changes (Moderate). Transit bulbs would be constructed for the inbound (north) bus stops on 19th Avenue at Judah (130-foot-long), Noriega, Ortega, Taraval (130-foot-long), and Vicente streets, Sloat Boulevard, Eucalyptus Drive, Holloway Avenue (130-foot-long), and Junipero Serra Boulevard. Transit bulbs would be constructed for the outbound (south) transit stops at Lincoln Way, Judah (130-foot-long), Lawton, Noriega Ortega, Quintara, Rivera, Taraval (130-foot-long), and Vicente streets, Sloat Boulevard, Eucalyptus Drive, and Winston Drive (130-foot-long). A boarding island may be constructed at Winston Drive instead of a transit bulb. Except as noted above, the transit bulbs would be 65 feet in length. All of the

transit bulbs would be located at the farside of intersections, except at Winston Drive, where a nearside transit bulb or boarding island would be constructed.

Transit stops that are currently located on the nearside of the intersection would be relocated to the farside of the intersection on 19th Avenue at Judah, Noriega, and Vicente streets, and at Eucalyptus Drive in the inbound (north) direction, and at Taraval Street and Eucalyptus Drive in the outbound (south) direction. Both inbound (north) and outbound (south) stops would be removed on 19th Avenue at Irving, Kirkham, Moraga, Pacheco, Santiago, Ulloa, and Wawona streets, and at Ocean Avenue.

Pedestrian Improvements (Moderate). Pedestrian bulbs would be built at both the northeast and southwest corners in both directions on 19th Avenue at Irving, Kirkham, Moraga, Pacheco, Santiago, Ulloa, and Wawona streets, and Ocean Avenue, with three additional pedestrian bulbs on the northeast corners at Lawton, Quintara, and Rivera streets. All of the pedestrian bulbs would be located at the farside of intersections.

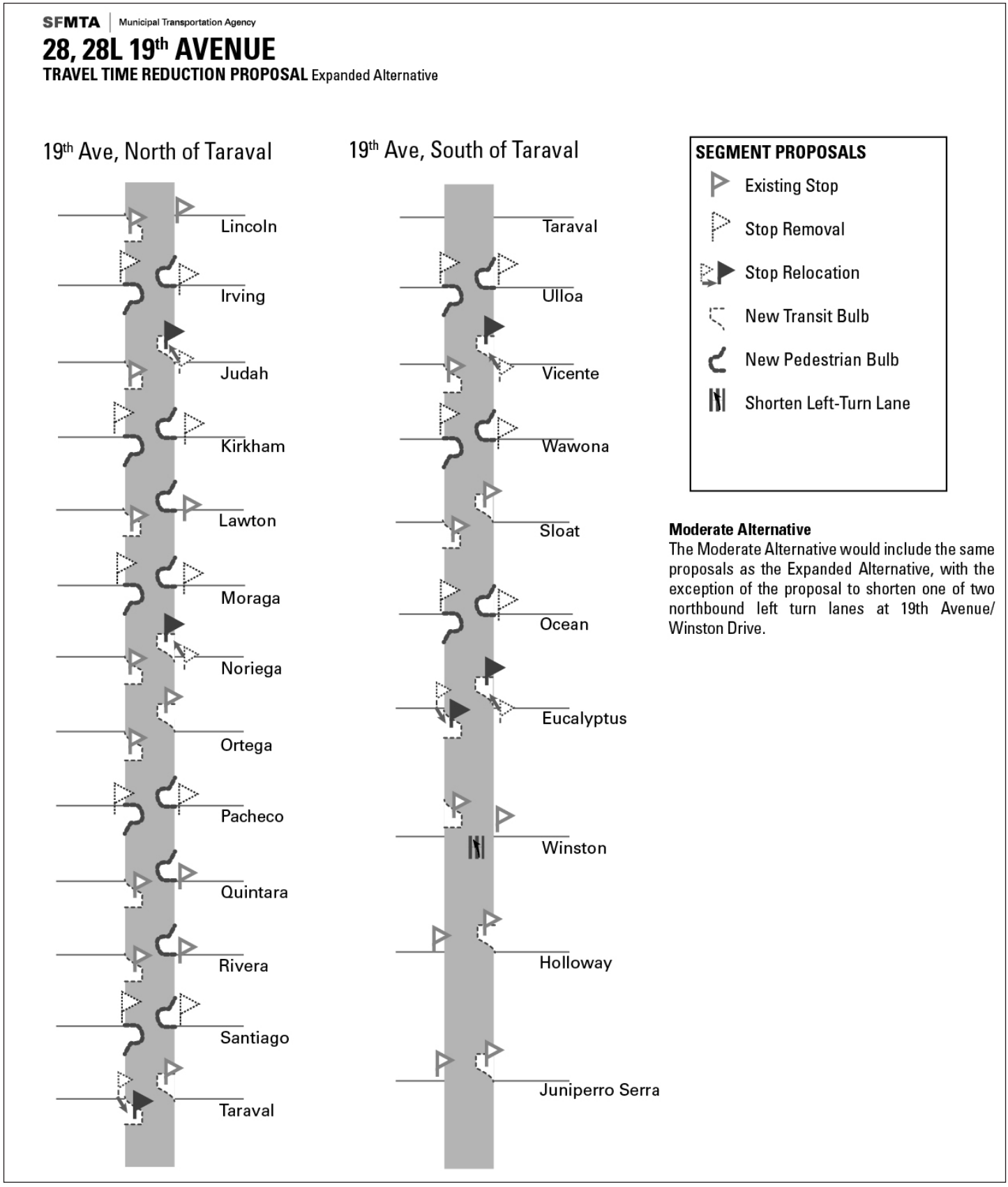
TTRP.28_1 Expanded Alternative

Transit Stop Changes, Pedestrian Improvements, and Parking and Turn Restrictions (Expanded). The Expanded Alternative would include the same transit stop changes, pedestrian improvements, and parking and turn restrictions as the Moderate Alternative.

Lane Modifications (Expanded). One of the two existing left-turn lanes would be shortened in the northbound direction on 19th Avenue at the intersection of 19th Avenue with Winston Drive. The M Ocean View rail line currently operates in its own dedicated right-of-way in the median of 19th Avenue with the exception of the northbound direction at Winston Drive, where one of the two left-turn lanes is used for both left-turning vehicles and through Muni light rail trains. Consequently, all inbound (north) M Ocean View trains must wait for the left turn queue to dissipate before proceeding through the intersection. This alternative would minimize transit delay by shortening a portion of the leftmost left-turn lane, thereby limiting the stacking length available to non-transit vehicles to queue in front of a transit vehicle. This would allow for both the non-transit vehicles and transit vehicle to clear the intersection in one left-turn signal phase.

Figure 21 shows the TTRP.28 Expanded Alternative. Narrative text describes differences in the Expanded and Moderate Alternatives.

Please see information and additional graphics illustrating the TTRP.28 project at the SFMTA Web site, online at http://www.sftep.com.



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 21 - TTRP.28 EXPANDED ALTERNATIVE

A.5.3.8 TTRP.30_1: 8X Bayshore Express, 30 Stockton, and 45 Union-Stockton

TTRP.30_1 would provide transit improvements for the 30 Stockton bus route along the Van Ness Avenue, North Point Street, Columbus Avenue, Stockton Street, and Kearny Street corridors. The 8X Bayshore Express and 45 Union-Stockton routes also use portions of this corridor and would benefit from these improvements. The proposed project would implement specified TPS Toolkit elements in both the inbound and outbound directions, from the intersection of Van Ness Avenue and Lombard Street to the intersections of Stockton and Market streets and Kearny and Market streets. The inbound direction for this route is south towards Market Street and the outbound direction is north towards North Point Street.

The TTRP.30_1 project has a Moderate and Expanded Alternative. The Moderate Alternative would include transit stop changes. The Expanded Alternative would include the same transit stop changes as the Moderate Alternative, along with the addition of a transit-only lane in both directions on Van Ness Avenue between Lombard and Bay streets and on Columbus Avenue between Filbert Street and Stockton Street/Green Street, and a transit-only lane in the outbound direction on Kearny Street between Market and Sutter streets. The Expanded Alternative also would include two variants to widen the mixed-flow lanes on Columbus Avenue between Stockton Street/Green Street and Vallejo Street. These are referred to as TTRP.30_1 Expanded Alternative Variants 1 and 2. TTRP.30_1 Expanded Alternative Variant 1 would include rescinding the p.m. peak period tow-away zone on the west (inbound) side of the street and converting the two inbound (south) and one outbound (north) mixed-flow lanes to a single mixed-flow lane in each direction with a parking lane on both sides. TTRP.30_1 Expanded Alternative Variant 2 would include maintaining the p.m. peak period tow-away zone on the west side of Stockton Street and eliminating the parking lane on the east side, as well as widening the two inbound (south) lanes (from 10 to 12 feet) and narrowing the one outbound (north) mixed-flow lane (from approximately 17 to 13 feet).

Implementation of the improvements in the Moderate Alternative would result in a net addition of up to 15 parking spaces and the loss of 6 loading spaces. With the implementation of the Expanded Alternative the number of parking spaces removed would be the same as the number of parking spaces added. However, there would be a net reduction in 8 loading spaces with implementation of the Expanded Alternative.

Details for the two project alternatives for this corridor are provided below.

TTRP.30_1 Moderate Alternative

The Moderate Alternative would include transit stop changes.

Transit Stop Changes (Moderate). Transit bulbs would be constructed for the inbound bus stops on Van Ness Avenue at Bay Street (65-foot-long), at North Point/Polk streets (65-foot-long), and Columbus Avenue at Bay (55-foot-long) and Union (140-foot-long) streets. Transit bulbs would be constructed for the outbound transit stops on North Point Street at Polk Street (65-foot-long), on Columbus Avenue at North Point (55-foot-long), Chestnut (65-foot-long), Greenwich (85-foot-long including 20-foot-wide crosswalk width), and Union (130-foot-long) streets, and on Stockton Street at Columbus Avenue (55-foot-long).

Existing transit bulbs in the inbound direction would be extended on Stockton Street at Pacific (from 80 to 130 feet), Sacramento (from 50 to 130 feet), and Sutter (from 70 to 130 feet) streets. An existing boarding island on Stockton Street at Geary Street would be extended from 85 to 130 feet as part of the Union Square Pedestrian Right-of-way Accessibility Improvement Project proposed by the DPW.[38]

Stops for both directions on North Point Street at Hyde Street would be relocated from nearside to 100-foot-long transit zones on the farside of the intersection. On Stockton Street, the inbound midblock stop at the intersection of Stockton and Washington streets would be moved to a new 130-foot-long transit bulb on the farside of the intersection.

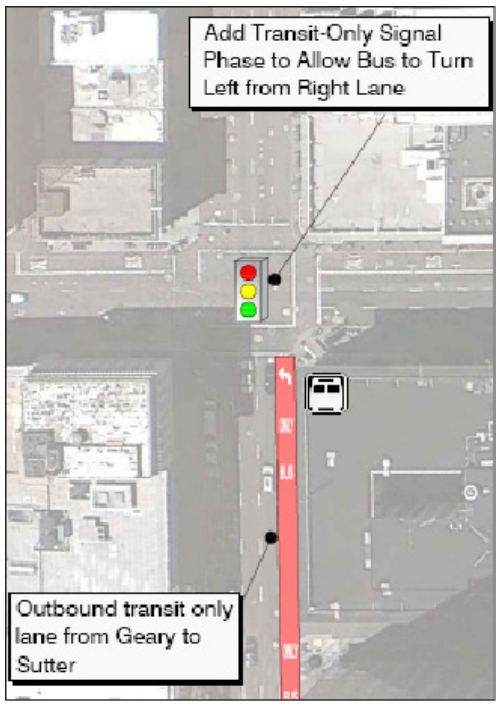
A new stop would be created in the inbound direction at a new 65-foot-long transit bulb at the farside of the intersection of Columbus Avenue and Greenwich Street. In the outbound direction, a new stop would be created on Stockton Street at a new 55-foot-long transit bulb at the farside of the intersection with Washington Street. Both inbound and outbound stops would be removed on North Point Street at Larkin Street, and Columbus Avenue at Francisco Street. In the inbound direction, the stops on North Point Street at Van Ness Avenue, and on Columbus Avenue at Lombard and Filbert streets would be removed.

[38] Environmental review for the Union Square Pedestrian Right-of-way Accessibility Improvement Project was completed June 5, 2012. Documents are available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2011.0833E.

TTRP.30_1 Expanded Alternative

Transit Stop Changes (Expanded). The Expanded Alternative would include all the transit stop changes included in the Moderate Alternative.

Lane Modifications (Expanded). Side-running transit-only lanes would be created by converting a mixed-flow lane to a transit-only lane in both directions on Van Ness Avenue between Lombard and Bay streets and on Columbus Avenue between Filbert Street and Stockton Street/Green Street. To facilitate the transition to the outbound Columbus Avenue transit-only lane, one outbound mixed-flow lane would be removed on Columbus Avenue from Vallejo Street to Stockton Street/Green Street. A right-turn pocket in the westbound direction on Columbus Avenue would be added to allow turns onto northbound Stockton Street and eastbound Green Street. A mixed-flow lane would be converted to a curbside transit-only lane in the outbound direction on Kearny Street between Market and Sutter streets. At the intersection of Kearny and Sutter streets, a queue-jump signal would be installed to allow buses to turn left from the transit-only lane in advance of other vehicular movements in the northbound direction (see Figure 22a).



SOURCE: SFMTA, Turnstone Consulting

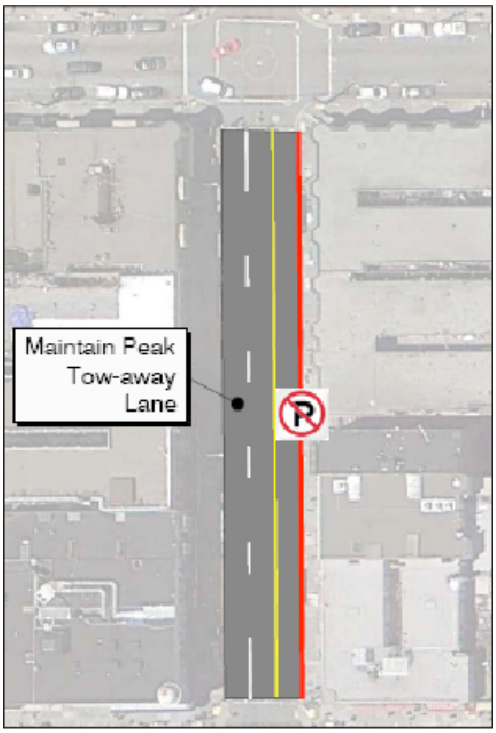
FIGURE 22a: TTRP 30 1 LANE MODIFICATION (EXPANDED)

Two variants are proposed for Stockton Street between Columbus Avenue and Broadway. TTRP.30_1 Expanded Alternative Variant 1 would include rescinding the p.m. peak period tow-away zone on the west (inbound) side of the street and converting the two inbound and one outbound mixed-flow lanes to a widened single mixed-flow lane in each direction with a parking lane on both sides. TTRP.30_1 Expanded Alternative Variant 2 would include maintaining the p.m. peak period tow-

away zone on the west side of Stockton Street and eliminating the parking lane on the east side, as well as widening the two inbound lanes and narrowing the one outbound mixed-flow lane (see Figure 22b).

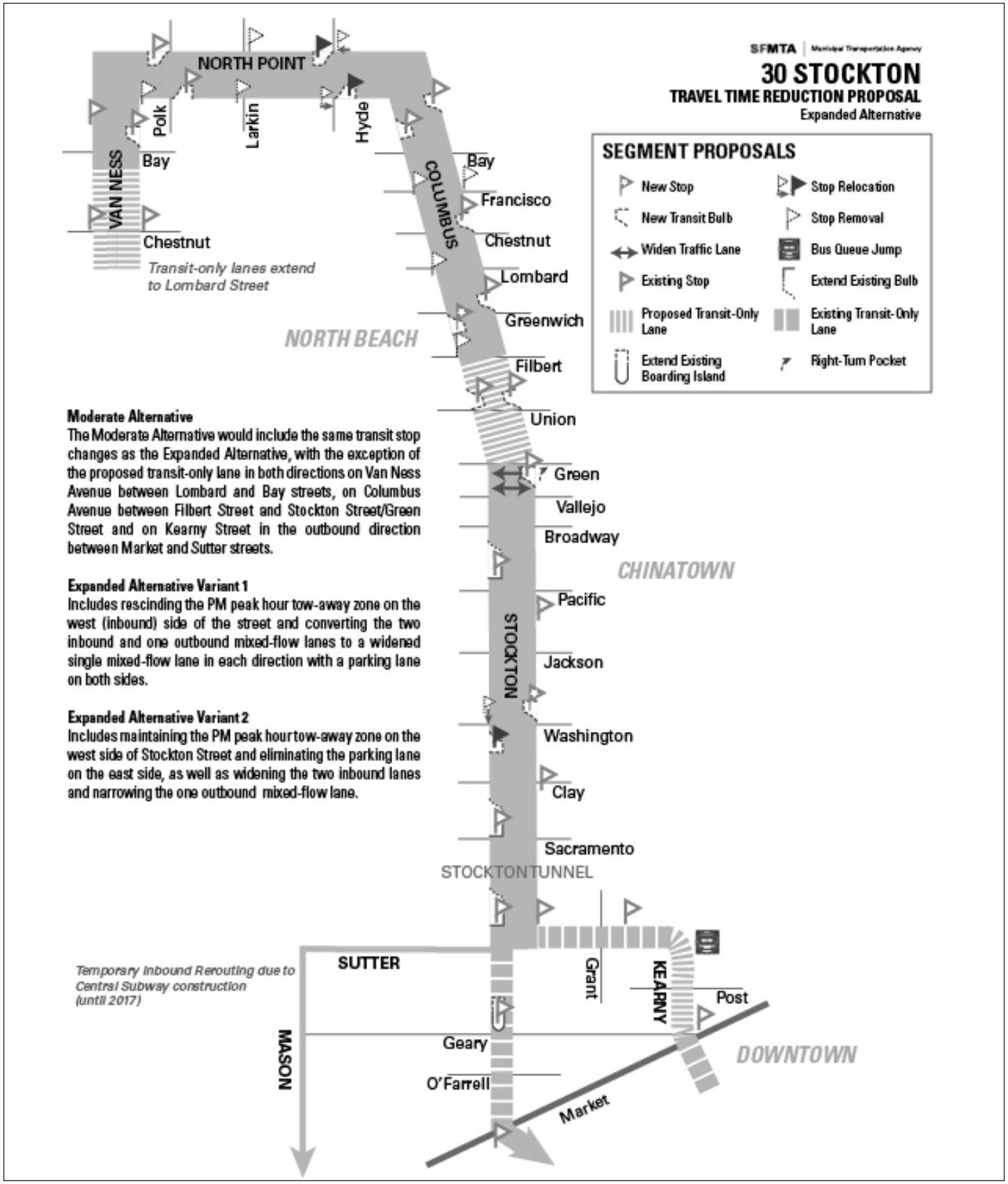
Figure 23 shows TTRP.30_1 Expanded Alternative and describes the differences between the Expanded and Moderate Alternatives.

Please see information and additional graphics illustrating the TTRP.30 project at the SFMTA Web site, online at http://www.sftep.com.



SOURCE: SFMTA, Turnstone Consulting

FIGURE 22b: TTRP 30 1 LANE MODIFICATION (EXPANDED-VARIANT 2)



SOURCE: SFMTA, Turnstone Consulting

TRANSIT EFFECTIVENESS PROJECT

FIGURE 23 - TTRP.30 EXPANDED ALTERNATIVE

A.6 PROJECT CONSTRUCTION

The TEP is a set of projects. Some projects would require construction to implement them, such as the Service-related Capital Improvements and TTRPs; others, such as the Policy Framework and Service Improvements, with the exception of minor curb changes, striping, and signage that may be associated with new route terminus locations, would not. Construction of the Service-related Capital Improvements would include a combination of the following elements, as specified in the respective descriptions of the projects: curb and sidewalk changes, the application and removal of pavement markings, the installation or removal of parking meters and signs, the installation of overhead wire support poles and wires and underground duct banks, the installation of traffic signals and related signal control equipment, the installation of new bypass rails and switches, and the installation and relocation of curb ramps and associated utilities. The construction of TTRPs would include curb and sidewalk changes, the application and removal of pavement markings, the installation or removal of parking meters and signs, the installation of traffic signal poles, both with and without mast arms, with associated signal control equipment, stop signs, and traffic calming measures at intersections, the installation of pedestrian light poles, and the installation or relocation of curb ramps and the potential relocation of other utility infrastructure. Service Improvements could include curb and sidewalk changes, as well changes to pavement markings and signage. Street trees may be removed to accommodate some TEP components such as transit and pedestrian bulbs or to relocate utilities. In most cases trees removed would be replaced in nearby locations; up to about 10 trees may be removed without being replaced as a result of the TEP.

Construction of curb and sidewalk modifications would involve excavation depths of one to two feet bgs. Installation of traffic signals would require excavation depths of up to 9 feet. Overhead wire support poles would require excavation depths of up to 12 feet, while the associated duct banks and utility vaults would require a 6-foot-deep excavation. The installation of bypass rail is anticipated and would involve a maximum excavation of 2 feet bgs for subgrade preparation of the rail bed. After placement of the rail, a rebar-reinforced concrete road bed is formed and poured. Construction would involve the use of heavy equipment and various fuels and oils and lubricants. Paints, solvents and other chemicals would also be used. Erosion control features, such as silt fences, straw bales and other mechanical barriers would be used where necessary to prevent silt and chemicals from entering catch basins with stormwater runoff. Baker tanks may be used in some construction locations to

contain runoff and allow sediment to settle before discharge to the sewer system, although few construction sites would be expected to be large enough to require this measure.

It is unlikely that construction of all the project-level Service-related Capital Improvements and TTRPs would occur in the same fiscal year (FY). However, there would be some overlap. The SFMTA has a five-year budget and anticipated schedule for completion of these projects outlined in the following Project Schedule section. The construction time for each capital improvement and TTRP project would be dependent on the extent of the improvements identified and is anticipated to be constructed in its entirety, rather than in phases.

Construction activities for SCI.1, the Sansome Contraflow project are anticipated to take between six and nine months. Construction activities for TTPI.1 - Persia Triangle Improvements are anticipated to take between six and 12 months. Construction activities for the OWE are anticipated to take between six and 12 months, depending on whether the project requires new poles and associated wire infrastructure.

The TTRPs vary in terms of the length of the corridor proposed for improvement as well as the number of TPS Toolkit elements being implemented. Therefore, the duration of the construction activities associated with the TTRPs within the right-of-way would also vary. It is anticipated that the amount of time that it would take to construct and implement these projects would range from six to 18 months.

A.7 PROJECT SCHEDULE

It is anticipated that implementation of the TEP would occur between FY 2014 and FY 2019, subject to funding source and resource availability. The Service Improvements would be rolled out in phases with the first group implemented in Fiscal Year 2015 and the second group in a subsequent phase. The first group of Service-related Capital Improvements would also be constructed in Fiscal year 2015. The TTRPs would be constructed in groups, the TTRP.14 and TTRP.30, constructed in Fiscal year 2014 and the TTRP.N and TTRP.8X in Fiscal Year 2015. The TTRP.J is planned for Fiscal year 2016 and the remaining three project-level TTRPs, TTRP.5, TTRP.22_1, and TTRP.28_1, are all planned for implementation in Fiscal Year 2017.This implementation schedule is subject to change as specific funding sources and resources are identified.

The first series of service changes to be implemented would likely be changes that only require legislation. Signage and striping changes and that are not dependent on new Service-related Capital Improvements. Due to the lead time required for the construction of capital improvements, any service changes dependent on these projects, such as installation of overhead wire or underground infrastructure projects would be more likely to occur in the later part due to the dependence on the completion of the capital project. However, certain Service Improvement variants could be implemented to address such issues (for example, the 22 Fillmore with motor coach service).

Systemwide capital infrastructure improvements would occur between FYs 2014 and 2015. The TTPI projects are tentatively scheduled to be constructed by FY 2016. Overhead wire expansion and implementation of the TTRPs would occur throughout between FYs 2014 and 2019. A number of the Service-related Capital Improvements would be expected to be constructed concurrently or with some degree of overlap. The specific order and timing of construction of these capital improvements and TTRPs would be dependent on available funding sources and resources as well as direction from the SFMTA Board of Directors.

A.8 APPROVALS REQUIRED

It is anticipated that the proposed TEP program of projects may require the following actions under existing regulations and ordinances, although approvals may vary depending on the specific project being considered:

Actions by the San Francisco Planning Commission

- Certification of the Environmental Impact Report.
- Approval of any structure improvements in the Local Coastal Zone by the Planning Commission.

Actions by the San Francisco Municipal Transportation Agency Board of Directors

- Approval of the Transit Effectiveness Project and approval to implement changes to each transit route and related construction.
- Approval of the implementation of certain parking and traffic measures in accordance with section 201(c) of the Transportation Code.

Actions by the San Francisco Board of Supervisors

- May consider and reject route abandonments. In accordance with the City Charter regulations 8A.106 (D) and 8A.108, the San Francisco Board of Supervisors would consider approving system changes related to route abandonments.

Actions by other San Francisco Agencies

- Approval of property encroachment by the San Francisco Recreation and Park Commission.
- Approval of Sidewalk Legislation and associated *General Plan* referral by the DPW and the San Francisco Board of Supervisors.
- Approval of construction period encroachment permits by DPW.
- Approval of Special Traffic Permit by the Department of Parking and Traffic in instances where work does not comply with Blue Book[39] regulations or traffic routing specifications in a City Contract.

Actions by Agencies Outside of the City and County of San Francisco

- Approval of the installation of a traffic signal and transit bulb in Daly City.
- Approval of temporary construction street encroachment permit by the California Department of Transportation.

B. PROJECT SETTING

The TEP project area encompasses the 49 square-mile-area of the City and County of San Francisco, which is served by the SFMTA's public transit system, operated as Muni, along with several regional transit agencies that provide connections between San Francisco and other Bay Area counties. Short segments of a few Muni routes operate within San Mateo County, and one Muni route operates in Marin County on

[39] San Francisco Municipal Transportation Agency, "Regulations for Working in San Francisco Streets," 7th Edition, October 2006. This document is available on the SFMTA web site at http://www.sfmta.com/cms/vcons/documents/BlueBook7thEd-OnlineVers2008-0701.pdf, accessed on December 26, 2012.

Sundays and holidays. The SFMTA's public transit operations are conducted primarily within the public right-of-way with some larger publicly owned facilities, such as maintenance yards/bus storage facilities. The TEP project would be implemented within the public right-of-way.

Muni, which serves the City's 815,000 residents, was founded in 1912 and is considered one of the oldest continually operating public transit agencies in the United States. Muni operates 24 hours a day, 365 days a year with a fleet of over 1,000 vehicles that carry about 700,000 daily passengers. The majority of routes operate between 5 a.m. and midnight; however, the Muni service includes ten evening Owl routes that operate between midnight and 5 a.m. Muni operates a diverse fleet to provide public transit: 313 electric trolley coaches, 420 diesel motor coaches, 86 diesel hybrid-electric motor coaches, 151 light rail vehicles, 40 historic light rail vehicles and 40 cable cars.

Muni operates a route network of approximately 75 routes that provide access to most locations throughout San Francisco, and most City residents are within a quarter mile of a transit stop. The Muni network also provides connections to regional transit, including BART, Golden Gate Transit, SamTrans, Caltrain, and Alameda Contra Costa County Transit. Muni averages about 214 million annual customer trips, making it the most heavily-used transit system in the Bay Area and the seventh most heavily-used in the nation.

A plurality of San Francisco residents use Muni to commute to work. In 2000, an estimated 31 percent of San Franciscans commuted to work by transit; in 2010, this estimate increased to about 34 percent. This increase reverses a 20-year decline of 12 percent in Muni ridership from 1986 to 2005.[40]

In contrast, school trips account for 9 percent of Muni trips, and shopping trips about 5 to 7 percent.

[40] San Francisco Municipal Transportation Agency, "San Francisco Transportation Fact Sheet, November 2011," available on the SFMTA website at www.sfmta.com/cms/rfact/documents/SFFactSheet201111-29-2011.pdf, accessed on December 8, 2012..

C. COMPATIBILITY WITH EXISTING ZONING AND PLANS

	Applicable	Not Applicable
Discuss any variances, special authorizations, or changes proposed to the Planning Code or Zoning Map, if applicable.		X
Discuss any conflicts with any adopted plans and goals of the City or Region, if applicable.	X	
Discuss any approvals and/or permits from City departments other than the Planning Department or the Department of Building Inspection, or from Regional, State, or Federal Agencies.	X	

SAN FRANCISCO PLANNING CODE AND ZONING MAP

Section 203 of the San Francisco Planning Code (Planning Code) states that the Planning Code shall not limit the construction, installation or operations by any public agency of any street or transportation line, or of incidental appurtenances to any of the foregoing when located in a street, alley, or other right-of-way. As the proposed TEP would be built and operated within the public rights-of-way, the components of the TEP would not be subject to the Planning Code (require variances, special authorizations, or changes to the Planning Code or Zoning Map). Accordingly, this significance threshold is not applicable to the project.

PLANS AND POLICIES

The TEP project was reviewed for its consistency with the following applicable plans and policies and no conflicts or inconsistencies were identified. The TEP's compatibility with plans and policies that do not relate to physical environmental issues will be considered by decision-makers in choosing whether to approve, modify, or disapprove the proposed project. Any potential conflicts identified as part of the approval process would not alter the physical environmental effects of the proposed project. The following is a list of applicable adopted plans against which the proposed project was reviewed for inconsistencies.

- *San Francisco General Plan*.
- Proposition M, Accountable Planning Initiative.
- *Transit First* policy.
- San Francisco Bicycle Plan.

- Better Streets Plan.
- The San Francisco Bay Plan.
- The Sustainability Plan for the City of San Francisco.
- The San Francisco Regional Water Quality Control Board Basin Plan.
- The San Francisco Congestion Management Program.
- The Bay Area Air Quality Plan.
- Transit Signal Priority.
- SF*go.*
- Transit Center District Plan.
- Eastern Neighborhoods Area Plans.
- Market and Octavia Area Plan
- Balboa Park Station Area Plan.
- Glen Park Community Plan.
- Rincon Hill Community Plan.
- Western SoMa Community Plan.

Many of the plans listed above address programs and policies related to the implementation of projects and improvements to better manage and improve various transportation modes within the existing City right-of-way. Due to the constraints of the existing public right-of-way, the City balances the needs of all transportation modes that share the right-of-way including bicycles, pedestrians, transit and vehicles. Conflicts between plans that focus on a particular mode within the City right-of-way may arise; however, many of the plans and policies include some language that indicates that implementation of programs or capital improvements would be coordinated with SFMTA transit improvements, including the TEP. Moreover, the SFMTA has and would continue to incorporate transportation-related elements of applicable plans and projects into the TEP, as feasible, such as the Eastern Neighborhoods Trips and Western SoMa Community Plan. Overall, the SFMTA transit staff has and will continue to coordinate implementation of the TEP with other transportation programs and projects for non-transit modes to ensure that on-balance, the project continues to be consistent with adopted plans and policies.

APPROVALS AND PERMITS

Approval actions to implement the TEP are described in detail on pp. 170-171 in the Project Description. In addition to approvals required by the City, the proposed project would require approvals by nearby local jurisdictions and state and federal agencies.

Within the City and County of San Francisco, approval actions would be required by the Planning Commission, SFMTA Board of Directors, the Department of Public Works, Recreation and Park Commission, and the San Francisco Board of Supervisors.

Approvals and permits would be required from the City of Daly City to install improvements for the 14 Mission TTRP that extend into that city's jurisdiction.

At the state level, Caltrans approvals would be required for temporary construction encroachment permits on 19th Avenue for the TTRP.28.

No other approvals from local jurisdictions or regional, state, or federal agencies have been identified. However, approvals may vary depending on the specific projects being considered.

D. SUMMARY OF ENVIRONMENTAL EFFECTS

The proposed project could potentially affect the environmental factor(s) checked below. The following pages present a more detailed checklist and discussion of each environmental factor.

	Check
Land Use and Land Use Planning	
Aesthetics	
Population and Housing	
Cultural and Paleontological Resources	X
Transportation and Circulation	X
Noise	X
Air Quality	X
Greenhouse Gas Emissions	
Wind and Shadow	
Recreation	

	Check
Utilities and Service Systems	
Public Services	
Biological Resources	
Geology and Soils	
Hydrology and Water Quality	
Hazards/Hazardous Materials	X
Mineral/Energy Resources	
Agricultural and Forest Resources	
Mandatory Findings of Significance	X

E. EVALUATION OF ENVIRONMENTAL EFFECTS

INTRODUCTION

As described in the project description, the SFMTA proposes a Policy Framework for its transit service. The Policy Framework is a policy document with objectives and actions developed to guide the provision of reliable and efficient transit service throughout the City. As such, the Policy Framework would not result in direct physical changes to the environment for any of the environmental topics analyzed in the environmental review for the TEP. Indirect physical effects of the Policy Framework would result from the implementation of projects developed pursuant to these policies. The TEP projects described below provide a good representative sample of the types of projects, both in size and scope, that may be proposed under the Policy Framework. Thus, the analysis of these currently proposed projects informs the analysis of the potential indirect effects of the Policy Framework. However, the implementation of the Policy Framework over time may result in other projects for the transit network that could result in indirect physical changes to the environment. Such future projects, once developed, may require additional environmental review. With respect to the TEP, indirect effects of the Policy Framework would result from implementation of the Service Improvements, the Service-related Capital Improvements, and the transit TTRPs. Thus, the indirect effects of the Policy Framework that may result from the TEP are being analyzed as part of this environmental review. Therefore, if the analysis for a particular environmental topic demonstrates that there would be no significant impacts with respect to any of the described components, then it is reasonable to conclude that there would be no significant indirect impacts with respect to the Policy Framework for that topic.

Pursuant to CEQA Section 21158.5(b), an EIR may be focused only on topics that are found to have a potentially significant effect on the environment. The environmental topics addressed through this initial study and found to be less than significant or less than significant with mitigation would not require further environmental review.

As set forth in Section A, Project Description, the TEP project is comprised of both program-level and project-level components, depending upon the level of detail known regarding the project designs. For each of the environmental topics in the Initial Study Checklist, the analysis below summarizes the aspects of the project most

relevant for the environmental topic being discussed (e.g., for potential archeological resource impacts, it is important to understand the depth of soils disturbance necessary to construct the different project components). In some instances, sufficient project detail is available for both the program-level and project-level TEP components to conduct the required environmental analysis and to determine the level of significance of the potential environmental effects for that topic such that the topic may not require additional environmental review. For example, sufficient information is available to assess the TEP's potential to increase population (with respect to both residential and employment) for both the program-level or project-level components.

Cumulative impacts from the proposed project are analyzed for each environmental topic when appropriate. When evaluating cumulative impacts, CEQA envisions the use of either a list-based approach (a list of past, present, and reasonably foreseeable projects, including projects outside the control of the lead agency), a plan-based approach (a summary of projections in an adopted general plan or related planning document), or a reasonable combination of the two.[41] In general, the City and County of San Francisco uses a plan-based approach that relies on local/regional growth projections (i.e., population, jobs, and number and type of residential units). This is the approach that is used for many of the environmental topics in this EIR. However, for certain topics such as shadow, consideration of a list of projects is more appropriate. The anticipated projects used in the list-based analysis, have filed formal applications, received their entitlements, and/or commenced construction. The cumulative analyses in this Initial Study consider the City to be the geographic context for this project since the project affects the transit system throughout the City. For certain topics, such Aesthetics, Hazards and Hazardous Materials, and Hydrology and Water Quality, the analysis considers the effects of the TEP with common types of projects occurring routinely within the public right-of-way. The analysis is appropriately tailored to the particular environmental topic based upon the potential for combined localized environmental impacts. These are described in the respective topical sections in this chapter.

[41] CEQA Guidelines, Section 15130(b)(1)

TOPIC 1: LAND USE AND LAND USE PLANNING

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Physically divide an established community?				X	
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X		
c) Have a substantial impact upon the existing character of the vicinity?			X		

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to land use and land use planning would result from application of the of the TPS Toolkit elements along the

TTRPs, the limited construction related to the installation of curb ramps for some of the Service Improvements, and the construction of Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional CEQA analysis if necessary once such projects are developed and proposed.

As discussed above, for certain CEQA topics a sufficient level of detail exists for all TEP components to allow them to be analyzed at a project level. Specifically, the evaluation of potential land use and land use planning impacts of the program-level Service-related Capital Improvements and TTRPs is not dependent on the specific design details of the improvements or the specific locations of the TPS Toolkit elements on the TTRP corridors. Land use development patterns are not substantially affected by the introduction of or change to elements commonly found within the public right-of-way, such as transit zones or pedestrian bulbs. For example, the land use patterns of a block or neighborhood would not be altered by the relocation of a transit stop from the nearside to farside of an intersection or the replacement of stop signs at an intersection with a traffic signal. Rather, the identification of the general location and nature of the changes that would result from the TTRPs and Service-related Capital Improvements allows for an analysis of the TEP's land use impacts. Sufficient information about the program-level components of the TEP is known to provide a complete analysis of land use impacts. For example, the general locations of the corridors and the geographic extent of the program-level Service-related Capital Improvements and the nine program-level TTRPs are known, and the general characteristics of the TPS Toolkit elements are also known. Therefore, the following discussion evaluates the environmental effects of both program- and project-level TEP components.

Impact LU-1: The proposed project would not physically divide an established community. *(No Impact)* (Criterion 1a)

The TEP project site encompasses various street corridors throughout the City. The TEP components would be constructed and operated within the City's established street grid; the TEP would not alter the established street grid and would not permanently close any streets or sidewalks. The Policy Framework does not contain objectives or actions that would indirectly result in the physical division of any neighborhood. Rather, the objectives and actions in this policy document include the intent to continue to provide strong geographic coverage to all residents by ensuring that they are within a quarter mile of transit and that most trips can be made with no

more than one transfer, and to provide equitable public transit options for residents, employees and visitors to travel to a broad range of destinations.

As described in Section A, Project Description, the proposed TEP components would include street features, such as transit and pedestrian bulbs, overhead wires and poles, transit zones, traffic signals, accessible ramps, etc. These elements would not be so substantial as to physically divide a community, and would not interfere with or change the existing street plan nor impede the passage of persons or vehicles. The TEP would not involve the construction of a physical barrier to neighborhood access or the removal of an existing means of access. Rather, the TEP components are intended to enhance transit connections within and between San Francisco's neighborhoods.

For these reasons, both the program-level and project-level components of the TEP would not result in impacts that would physically divide an established community. No mitigation is necessary and this topic will not be discussed further in the EIR.

Impact LU-2: The proposed project would not conflict with applicable land use plans, policies, or regulations of an agency with jurisdiction over the project (including, but not limited to, a General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect. *(Less than Significant)* (Criterion 1b)

The TEP includes service changes (Service Improvements) and the construction of physical improvements (Service Improvements, Service-related Capital Improvements, and TTRPs) within existing rights-of-way that are not regulated by the San Francisco Planning Code.

The TEP would not conflict with the City's *General Plan* or any of its adopted Area Plans. Rather, the TEP would, on balance, be consistent with transit improvements supporting the objectives and policies of the *General Plan* — in particular, its Transportation Element.[42] The TEP components have been developed in coordination with the City's transportation-related plans and programs, including but not limited to the *Transit First* policy, the Better Streets Plan, and the San Francisco

[42] General Plan consistency is determined by reviewing and weighing the goals and policies of *all* elements of the Plan. Both the City's General Plan and case law interpreting general plan requirements recognize that the General Plan is a collection of goals and policies, which must be read together, as a whole and not in isolation, policy by policy. In reviewing a project for consistency with the General Plan, the City is required to balance the goals and policies. Case law has determined that a project "need not be in perfect conformity with each and every policy" and that "no project could completely satisfy every policy stated in the General Plan, and that State law does not impose such a requirement."

Bicycle Plan. Therefore, the program-level and project-level components of the TEP would not conflict with applicable land use plans, policies, or regulations of an agency with jurisdiction over the project and adopted for the purpose of avoiding or mitigating an environmental effect. Based upon the nature of the physical environmental changes that would result from the proposed projects, the TEP would have a less than significant land use impact, and no mitigation is necessary. This topic will not be discussed further in the EIR.

Impact LU-3: The proposed project would not have a substantial impact on the existing character of the vicinity. *(Less than Significant)* (Criterion 1c)

The TEP would result in construction and operation of transit improvements primarily within the public right-of-way and would not introduce any new land uses. Rather, components of the TEP are intended to improve transit service. Transit service and the associated physical infrastructure (transit stops, transit boarding islands, signage, overhead wires, etc.) are one of many components that contribute to the creation of neighborhood character. The TEP would result in changes to transit service and the associated infrastructure in many parts of the City, including the addition of transit service on some streets that currently do not have it; however, these changes would be relatively minor in the overall scheme of San Francisco's transportation system and the many other physical elements that define a neighborhood's character (such as size and architectural style of buildings, type of land uses, etc.). As such, the TEP would not have a substantial impact on the existing character of affected City neighborhoods.

While the changes in transit service and the construction of physical transit infrastructure as a result of the TEP may affect how residents perceive a particular street, these changes would not substantially affect the existing character of the vicinity where they are being implemented. In addition, these effects represent the indirect land use character effects that would result from the Policy Framework with respect to the TEP.

For these reasons, the program-level and project-level TEP components would not have a substantial adverse impact on the existing character of the City's neighborhoods. This impact would be less than significant, and no mitigation measures are required. This topic will not be discussed further in the EIR.

Combined Impacts

Considered collectively, the TEP's effects related to the topic of Land Use and Land Use Planning would remain negligible in that they would not affect the City's overall development pattern or character. Therefore, regardless of whether or not individual TEP components are implemented simultaneously with other TEP components and whether or not they are located within the same street corridors, the combined impacts of the TEP and Policy Framework related to the topic of Land Use and Land Use Planning would be less than significant.

Cumulative Impacts

Impact C-LU-1: The proposed project, in combination with past, present, or reasonably foreseeable future projects in the project vicinity, would not have a cumulatively considerable contribution to a significant cumulative land use or land use planning impact. ***(Less than Significant)***

The TEP would not introduce any new land uses, nor alter existing land uses. Rather, it would improve transit service to existing land uses and would serve future development as anticipated by the *General Plan* and its Area Plans.

Cumulative impacts occur when impacts that are significant or less than significant from a proposed project combine with similar impacts from other past, present, or reasonably foreseeable projects. The geographic context for cumulative land use impacts are the streets (the public right-of-way) and their vicinity[43] affected by the TEP.

The Policy Framework and TEP in combination with past, present, or reasonably foreseeable land use development along the affected streets would not have a cumulatively considerable contribution to significant cumulative land use impacts. This is because the TEP's effects on land use would be negligible in that they would result in relatively small changes to the City's overall transportation system and the right-of-way infrastructure. For example, the TEP would not provide a brand new rail line to a neighborhood that is currently not served by Muni.

Additionally, the Policy Framework and TEP in combination with past, present, or reasonably foreseeable transportation network changes would not have a cumulatively considerable contribution to significant cumulative land use impacts.

[43] Portions of the TTRP.J and TTRP.5 proposals are within right-of-way adjacent to land under the jurisdiction of the San Francisco Recreation and Park Department.

The TEP was developed to be compatible with other transportation projects with the intent of making the overall transportation system more efficient and accommodating all modes of travel. The type of physical and operational alterations to the right-of-way (such as transit-only lanes, bicycle lanes, the reversal of street direction for traffic, the removal or reconfiguration of parking, or the installation of landscaping and street furniture, etc.) that are anticipated throughout the City, together with those of the TEP, are not expected to have a substantial effect related to the topic of Land Use and Land Use Planning. In general, improvements to the City's streets and public realm, whether proposed as part of an area plan, a project, or in response to individual site issues, are coordinated efforts that include City agency review and oversight.

The *General Plan* and its Area Plans encourage development along transit corridors. The TEP is consistent with existing and anticipated growth under the *General Plan* and its Area Plans. The TEP, in combination with past, present, and reasonably foreseeable future projects would serve development and land use patterns consistent with local and regional growth projections such as the 2009 Update of the Housing Element of the *General Plan*.

For these reasons, the proposed project, at both the program-level and project-level, in combination with past, present, and reasonably foreseeable future projects, would have less-than-significant cumulative land use and land use planning impacts. Both the program-level and project-level components of the proposed project would not make a cumulatively considerable contribution to a significant cumulative land use and land use planning impact, and no mitigation measures are required.

For the above reasons, additional environmental review with respect to land use and land use planning is not expected to be needed for any of the TEP components.

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TOPIC 2: AESTHETICS

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Have a substantial adverse effect on a scenic vista?			X		
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and other features of the built or natural environment which contribute to a scenic public setting?			X		
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			X		
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area or which would substantially impact other people or properties?			X		

Design and aesthetics are, by definition, subjective and open to interpretation by decision-makers and members of the public. In determining whether an impact is significant under CEQA, the question is whether a project would affect the environment of persons in general, not whether a project would affect particular persons. A proposed project would therefore be considered to have a significant adverse effect on visual quality under CEQA only if it would cause a substantial and demonstrable negative change in the physical environment that affects the public in one or more ways.

The focus of the analysis in this Aesthetics section is on impacts caused by alterations to the physical environment resulting from the TEP and the Policy Framework. The TEP components that would result directly in physical changes pertinent to Aesthetics include the Service-related Capital Improvements and TTRPs, which are comprised of combinations of the TPS Toolkit elements.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the Service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to aesthetics would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional CEQA analysis if necessary once any such projects are developed and proposed.

The implementation of the Service Improvements would have the visual effect of altering the location, frequency, and pattern of transit vehicles on City streets, including the provision of transit service along streets where buses do not currently operate. Such an effect would not be considered a significant impact related to Aesthetics under CEQA. The visual effect of moving transit vehicles is transitory. Transit vehicles are familiar and accepted visual conditions of San Francisco's urban environment. The visual effect of additional transit vehicles will not be discussed further in this Initial Study.

Impacts related to the topic of Aesthetics resulting from project construction activities would not be considered significant. Project construction activities would be temporary and short-term in duration and would not, in themselves, necessitate the construction of fixed structures that could have a significant impact related to scenic vistas, scenic resources, visual character and quality, and light and glare. Project construction will not be discussed further in this Aesthetics section.

The design details of the program-level Service-related Capital Improvements and the selection and location of the specific TPS Toolkit elements within the program-level TTRPs are not known. However, sufficient information about the general location of the nine program-level TTRPs, the geographic extent of the Service-related Capital Improvements, and the visual characteristics of TPS Toolkit improvements, wherever they may occur along TTRPs, is known such that an assessment of aesthetic impacts of both program- and project-level TEP components may be conducted. As such, the following project-level analysis sets forth the environmental review for the entirety of the TEP with respect to aesthetics.

Impact AE-1: The proposed project would not have a substantial adverse effect on a scenic vista. *(Less than Significant)* (Criterion 2a)

Distant street-level scenic vistas in densely developed San Francisco are typically defined, directed, and framed along view corridors created by streets. The City's *General Plan* identifies the importance of protecting major views in the City, with particular attention to views of open space and water. The Urban Design Element of the *General Plan* includes a map entitled "Quality of Street Views." The map identifies particular street segments throughout the City possessing "Excellent Quality of Street Views."[44] Additionally, at the State level, the California Scenic Highway Program identifies highways of outstanding natural beauty. No highways within the City and County of San Francisco are designated under this program, however, Interstate 80 and State Route 1 are identified as an "Eligible State Scenic Highway-Not Officially Designated."[45]

Travel Time Reduction Proposals

For the nine program-level TTRPs (TTRP.1, TTRP.9, TTRP.22_2, TTRP.28_2, TTRP.30_2, TTRP.71, TTRP.K, TTRP.L, TTRP.M) the SFMTA would develop designs using the TPS Toolkit engineering design elements along the nine program-level TTRPs in order to achieve reductions in transit travel time and to improve transit operation for reliability and efficiency. For the eight project-level TTRPs (TTRP.J, TTRP.N, TTRP.5, TTRP.8X, TTRP.14, TTRP.22_1, TTRP.28, and TTRP.30) the

[44] San Francisco Planning Department Map entitled "San Francisco Streets 2007," May 2007, based on the San Francisco General Plan Urban Design Element, available on the Planning Department's Web site in the Map Library, at http://www.sf-planning.org/ftp/files/publications_reports/library_of_cartography/excellent_street_views.pdf. Accessed December 7, 2012.

[45] California Department of Transportation (CalTrans). 2012. Eligible (E) And Officially Designated (OD) Routes. Available online at http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm, accessed October 16, 2012.

SFMTA has developed specific designs using the TPS Toolkit engineering design elements.

Program-level TTRP.1, TTRP.22_2, TTRP.28_2, TTRP.30_2, TTRP.71, TTRP.K, and TTRP.L, and Project-level TTRP.J, TTRP.N, TTRP.5, and TTRP.30 are along, or cross, street segments identified as possessing "Excellent Quality of Street Views" in the *General Plan*.

The TPS Toolkit elements would be subject to standard design specifications as described in Initial Study Project Description in Section A.4.3.1, Description of TPS Toolkit Elements, on pp. 30-58. TPS Toolkit Elements for program-level and project-level TTRPs would consist of striping (transit zones and transit-only lanes) and construction of boarding islands, curb ramps, transit and pedestrian bulbs. These elements would have dimensions similar to existing standard SFMTA transit-related improvements and DPW specifications for curb ramps, medians, and sidewalks throughout the City. Program- and project-level TTRP features such as transit zones, transit bulbs and boarding islands are visually unobtrusive and are common and accepted visual features of San Francisco's dense and varied visual environment. Therefore, neither the project-level TTRPs nor future implementation of the TPS Toolkit would have a substantial adverse effect on a scenic vista.

As described below, the Service-related Capital improvements consist of Terminal and Transfer Point Improvements, Overhead Wire Expansion projects, and Systemwide Capital Infrastructure projects.

Terminal and Transfer Point Improvements

TTPI projects would include some or all of the following elements: the installation of new switches, bypass rails, transit bulbs, and overhead wiring and poles and associated underground wiring; the expansion of transit zones for bus layovers; the reconfiguration or elimination of on-street parking; and possible sidewalk modifications. Program-level TTPI.2 (Lyon Street/Richardson Avenue), TTPI.3 (E Line Independent Terminal at Beach Street/Jones Street), and TTPI.4 (San Francisco General Hospital Transfer Point) are not located within roadway segments noted for "Excellent Quality of Street Views." Project-level TTPI.1, Persia Triangle Improvements, is located at the intersections of Persia Avenue with Ocean Avenue and Mission Street and not along a roadway segment noted for "Excellent Quality of Street Views." Therefore, the TTPIs would not have a substantial adverse effect on a scenic vista.

Overhead Wire Expansion

The specific street segments for program-level OWE.6 (6 Parnassus Extension to West Portal Station) have not yet been determined. However, the proposed project would connect the current 6 Parnassus terminal at 14th Avenue and Quintara Street to West Portal Station. A segment of 14th Avenue between Taraval Street and Rivera Street is noted for "Excellent Quality of Street Views." OWE.6 may be constructed along this segment of 14th Avenue. However, OWE.6 would not have a significant impact on a scenic vista since overhead wires and related infrastructure would not substantially obscure scenic views along this segment of 14th Avenue. Overhead utility wires are already part of the visual setting of views along 14th Avenue and overhead wires are familiar and accepted visual features of San Francisco's dense and varied visual environment. For this reason, the potential scenic vista impact along this segment of 14th Avenue would not be significant.

Project-level OWE.1 (Reroute 33 Stanyan on Valencia Street), OWE.2 (Bypass Wires at Lyon and Union Streets, and Presidio and Sacramento Streets, where overhead wires already exist), OWE.3 (Reroute 6 Parnassus on Stanyan Street), and OWE.5 (22 Fillmore extension to Mission Bay) are not located within a roadway segments noted for "Excellent Quality of Street Views." Project-level OWE.1, OWE.2, OWE.3, and OWE.5 would not have a substantial adverse effect on a scenic vista.

A segment of Project-level OWE.4 (Bypass Wires for 5 Fulton Limited/Local) is located within a segment of Fulton Street between Shrader Street and Central Avenue, and within a segment of McAllister Street between Divisadero Street and Masonic Avenue that are noted for "Excellent Quality of Street Views." OWE.4 would not have a significant impact on a scenic vista for the following reasons. Overhead wires are already part of the visual setting of views along these streets, as the 5 Fulton already operates on these segments. Overhead wires and related infrastructure would not substantially obscure scenic views along Fulton and McAllister streets as overhead wires are common and accepted visual features of San Francisco's dense and varied visual environment. Project-level OWE.4 would not have a substantial adverse effect on a scenic vista.

Systemwide Capital Infrastructure

Program-Level SCI.1 (Accessible Platforms) would construct accessible platforms along the surface portions of the existing light rail system to facilitate access for disabled persons. While the specific locations for these platforms are not known at

this time, they would be constructed along existing light rail tracks. None of the streets with light rail lines are noted for "Excellent Quality of Street Views." However, several rail lines cross streets with excellent quality of street views or are in close proximity to a street with an excellent quality view. In particular, the J Church operates along Dolores Park, the K Ingleside operates along Ocean Avenue between Keystone Way and Westgate Drive, and the N Judah operates along Judah Street between 27th Avenue and Pino Aly (between 35th and 36th Avenues).

Typical dimensions of an accessible surface platform are 60 inches by 90 inches. The heights of the platforms would vary by location, but would not exceed three and one-half feet from the ground surface or six and one-half feet in height total with the open railing. At this height, the platforms would be visually unobtrusive structures within the existing roadway and would not substantially obscure or degrade any scenic vista now available along streets. Accessible platforms are familiar and accepted visual features of San Francisco's dense and varied visual environment. In light of the fact that none of the streets with light rail lines are noted for "Excellent Quality of Street Views" and given the dimensions of the accessible platforms, the potential scenic vista impact resulting from the installation of accessible platforms would not be significant.

Project-level SCI.2 (Sansome Contraflow Lane Extension) would include the installation of new traffic signals and changes to the striping within the roadway segment. These changes would not be visually prominent and would not have an effect on a scenic view. In addition, SCI.2 is not located within a roadway segment noted for "Excellent Quality of Street Views." Project-level SCI.2 would not have a substantial adverse effect on a scenic vista.

Conclusion

As discussed above, the application of the TPS Toolkit Elements for the TTRPs, Service Improvements, and Service-related Capital Improvements, at both the program- and project-level, would not substantially obscure or degrade any scenic vista now available along streets. Even where TEP components would be located along, or intersect with, street segments having scenic views, TEP components would not obscure such views and would be unobtrusive and accepted visual elements of San Francisco's visual setting. As such, neither program-level nor project-level components of the TEP would have a significant adverse effect on a scenic vista and no mitigation measures are required. Also, there would be no

indirect effects to scenic vistas from the Policy Framework as related to TEP. This topic will not be discussed further in the EIR.

Impact AE-2: The proposed project would not have a substantial adverse effect on scenic resources, including, but not limited to, trees, rock outcroppings, and other features of the built or natural environment which contribute to a scenic public setting. *(Less than Significant)* (Criterion 2b)

The TEP would be constructed and operated within the existing public right-of-way, which does not include scenic resources except for street trees. For this reason, both program-level and project-level components of the TEP would not have a substantial adverse effect on scenic resources such as rock outcroppings. With respect to potential impacts on historic resources (see Topic 4, Cultural and Paleontological Resources on pp. 201 to 230). Certain components of the TEP may require limited removal of street trees. The SFMTA would follow the requirements of the Urban Forestry Ordinance with respect to permits needed for tree removal and any required tree replacement (see Topic 13, Biological Resources in this Initial Study on pp. 284 to 291). For these reasons, the proposed project would not have a substantial adverse effect on scenic resources. Both program- and project-level components of the TEP would not have a significant effect on scenic resources. In addition, given the above analysis there would be no indirect aesthetics effects related to scenic resources for the Policy Framework as related to TEP. No mitigation measures are required. This topic will not be discussed further in the EIR.

Impact AE-3: Implementation of the proposed project would not substantially degrade existing visual character or quality of the project sites and surroundings. *(Less than Significant)* (Criterion 2c)

The character and visual quality of the public realm in densely developed San Francisco is primarily defined by the varied land uses and the visual character and quality of the buildings which bound and visually enclose its streets. Elements of the transportation network, as it manifests itself in physical form, are not prominent visual features within the streetscape. Rather, they are unobtrusive and utilitarian features that neither define, nor substantially detract from, the visual character and quality of the public realm in San Francisco. The TEP would not result in fundamentally changing any of the physical components of the transportation network in a way that would substantially degrade the visual character of a street/neighborhood. The relatively small changes will be noticeable to people that live or frequent the affected streets but they would not degrade the visual quality of a neighborhood.

Program-level and project-level components of the TEP would not result in the construction of any buildings or structures that could have a substantial adverse effect on existing visual character or quality of the public realm. Physical changes that would result from Implementation of the TEP include changes to the transportation network within the City. Transit service would be added to some streets where service currently does not exist and eliminated from other streets. In addition, construction of the TEP components would result in the addition of physical transit improvements (such as transit and pedestrian bulbs, transit boarding islands and pedestrian refuge islands, changes to roadway striping, and additional overhead wires).

Typical of existing physical features of the transit network, new physical features that would be constructed under program-level and project-level components of the TEP would be visually unobtrusive and similar to existing transportation features that currently exist along many transit corridors in the City. These changes would consist of familiar and accepted visual features of San Francisco's dense and varied visual environment.

The SFMTA proposes the use of red paint for transit-only lanes to improve their efficacy by making them more visible to non-transit vehicles. A pilot project has been approved to test the effectiveness of transit-only lanes demarcated with red paint on a portion of Church Street between Duboce and 16th streets within the TTRP.J.[46] Red-painted transit-only lanes, although a new feature in San Francisco, would occur at street grade. They would therefore not be visually obtrusive new features in a dense and varied urban visual setting.

For these reasons, both program- and project-level components of the TEP would not have a significant effect on existing visual character or quality. In addition, given the above analysis there would be no indirect aesthetics effects related to existing visual character or quality for the Policy Framework as related to TEP. No mitigation measures are required. This topic will not be discussed further in the EIR.

Impact AE-4: The proposed project would not create a new source of substantial light or glare that would have a substantial adverse effect on day or nighttime views. *(Less than Significant)* (Criterion 2d)

[46] The SFMTA received separate environmental clearance for this 18-month pilot project under case number 2012.1141E. This case file is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400.

The TEP would be located within the public right-of-way, which is lit by an existing system of street lights partially maintained by the San Francisco Public Utilities Commission (SFPUC) and partially maintained by the Pacific Gas and Electric Company. The TPS Toolkit includes the following elements: the installation of new traffic signals and the implementation of flashing beacons to alert roadway users of pedestrian crossings. Each of these would create a new source of light. Traffic signals introduced as part of the TEP would be installed at roadway intersections. Flashing beacons to alert roadway users of pedestrian crossings may be installed along the edge of a crosswalk in order to alert vehicles, especially turning vehicles, when the walk signal is active. The flashing beacons provide added safety for pedestrians and are considered a traffic calming measure. Such beacons would be installed at grade and would not be visually obtrusive in the context of existing urban street lights. They would not substantially interfere with day or nighttime views. Both traffic signals and flashing beacons for crosswalks would be installed pursuant to specifications in the California Manual on Uniform Traffic Control Devices.

Under TTRP.22_1, the removal of parking along 16th Street between Potrero Avenue and Seventh Street would allow for pedestrian improvements, including sidewalk widening and the installation of lighting. The proposed lighting would be pedestrian-scaled “acorn torchiere” lampposts, which would be considerably lower (15-18 feet) than typical “cobra head” street lamps. The new lighting would be located along an existing commercial corridor, and would replace the existing cobra head street lamps. Street lights are a typical element of the streetscape. The acorn torchiere style lampposts are intended to provide a more visually distinctive, pedestrian-scale lighting than the cobra head street lamps they would replace, while continuing to provide sufficient nighttime lighting for safety and visibility. Such lampposts would not be visually obtrusive in the context of existing urban street lights and would not substantially interfere with day or nighttime views.

For these reasons, program-level and project-level components of the TEP would not have a substantial adverse effect related to light and glare. In addition, given the above analysis there would be no indirect aesthetics effects related to light and glare for the Policy Framework as related to TEP. No mitigation measures are required. This topic will not be discussed further in the EIR.

Combined Impacts

Regardless of whether or not individual TEP components are constructed simultaneously with other TEP components and within the same project corridors, the

aesthetic impact of TEP components would be site-specific and limited to the localized area where the component is installed and/or operated, and there would be no opportunity for combined effects except where certain Service-related Capital Improvements and/or TTRPs would overlap (for example the locations where the bypass wires in OWE.5 for the 5 Fulton route would overlap with installation of TPS Toolkit elements on the same route in TTRP.5). In the limited number of locations where combined aesthetic impacts could occur, the impacts would be less than significant. This is because the combined features of TEP components would not be prominent new visual features, but together would be familiar and accepted visual features of San Francisco's dense and varied visual environment. Therefore, the combined aesthetic impacts of the TEP as a whole, and any indirect aesthetic effects of the Policy Framework as related to TEP, would be less than significant.

Cumulative Impacts

Impact C-AE-1: The proposed project, in combination with past, present, or reasonably foreseeable future projects, would not have a cumulatively considerable contribution to a significant aesthetics impact. ***(Less than Significant)***

Cumulative impacts occur when impacts from a proposed project combine with similar impacts from other past, present, or reasonably foreseeable projects in a similar geographic area. The geographic context for cumulative aesthetic impacts is the streets (public rights-of-way) and their vicinity affected by the TEP.

Developments that may result in aesthetic impacts typically relate to the scale of the proposed buildings constructed, especially in consideration of the scale (height and bulk) of existing surrounding development. Physical changes from land use development that may result in aesthetic impacts would not be similar to the changes proposed as part of TEP. Therefore, these effects would not combine with the TEP to result in cumulative aesthetic impacts.

Other projects occurring within the public right-of-way in San Francisco that may combine with the effects of the TEP would include projects implemented by the SFPUC, the DPW, the Planning Department, and the SFMTA. The SFPUC implements projects to address water infrastructure including sewer and storm water management throughout the City. DPW is responsible for maintenance of the City's streets including the condition of pavement in the roadways. The Planning Department often includes public realm improvements as part of area plans in the San Francisco *General Plan*. The SFMTA operates Muni, regulates parking and

loading facilities, plans bicycle and pedestrian improvements for the public right-of-way, and oversees traffic operations within the transportation network of the City. Insofar as these improvements are visible and not subsurface, they would be similar to TEP components in that these projects would result in elements typical of the urban context, such as new roadway striping, sidewalk improvements and street furniture, and painted curbs. Therefore, the cumulative aesthetic impacts of multiple changes to the public right-of-way as described above by the variety of City agencies with jurisdiction, would not be significant.

As described in the discussion for Impacts AE-1, AE-2, and AE-3, the implementation of the TEP would not have a significant adverse impact related to aesthetics, including scenic resources, scenic vistas, visual character and quality, and light and glare. Physical alterations to the physical environment under the program-level and project-level components of the TEP would consist of construction of visually unobtrusive improvements within the existing public right-of-way. Such improvements are common and accepted visual features of San Francisco's dense and varied visual environment. The introduction of red transit-only lanes would be a change to the visual environment, but not one that would result in a significant impact. Indirect effects of the Policy Framework related to the TEP would be manifest in the effects described above for the TEP components. For these reasons, the Policy Framework and the TEP, in combination with other past, present or reasonably foreseeable projects, would not result in cumulative effects related to aesthetics, and no mitigation measures are required. This topic will not be discussed further in the EIR.

For the reasons provided above, additional environmental review with respect to aesthetics may not be needed for the Policy Framework as related to TEP or for any of the TEP components.

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TOPIC 3: POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X		
b) Displace substantial numbers of existing housing units or create demand for additional housing, necessitating the construction of replacement housing?				X	
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X	

In general, a project would be considered growth-inducing if its implementation would result in a substantial population increase, employment increase and/or new development that might not occur if the project were not implemented. The proposed program- and project-level components of the TEP relate to transportation improvements for transit that would accommodate current and future transit ridership; none of the TEP components include features that would result in the displacement of housing or people, or would result in the construction of new housing that would directly result in population growth.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service

improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to population and housing would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional environmental review pursuant to CEQA if necessary once any such projects are developed and proposed.

Population and housing effects of the TEP would be the same at both the program level and project level because the elements of both are sufficiently defined to determine whether they would induce population growth, or displace housing or people. Therefore, the following discussion evaluates both program- and project-level environmental effects of the TEP in its entirety under the topic of population and housing.

The Planning Department routinely prepares land use and development projections for the purpose of analyzing proposed plans, programs and projects to evaluate potential growth inducing effects of projects undergoing environmental review in the City.

Population growth can be induced directly, through the construction of new homes and businesses, which attract new residents and employees from other areas of the City, or from outside the City. Population growth can also be induced indirectly, through the extension of roads or other infrastructure (e.g., water, wastewater, electrical lines) to previously un-served areas. Population growth may also be indirectly stimulated by improvements to existing infrastructure, such as the paving of a gravel road, or through economic stimulation such as enhanced amenities (e.g., new or upgraded recreational or park facilities).

Implementation of the Policy Framework and the project-level Service Improvements may have indirect effects on population and housing as these aspects of the TEP would improve transit service and reliability that would support new development in

the City, but such effects would be minimal. Potential population and housing impacts of these components are addressed below.

The proposed Service-related Capital Improvements, at both the program and project level, support implementation of the Service Improvements; however, these TEP components by themselves would not induce or result in population and housing effects and are not discussed in the analysis below. Similarly, implementation of the TTRPs have been designed to reduce transit travel time and would occur within the Rapid Network; however, these TEP components in and of themselves would not result in direct or indirect population and housing effects, and therefore are not discussed in the analysis below.

Impact PH-1: The proposed project would not induce substantial population growth, either directly or indirectly. (*Less than Significant*) (Criterion 3a)

Population

The proposed TEP would be implemented primarily within the existing public right-of-way and would not extend or improve existing roads, utilities, or other infrastructure besides transit facilities within the City. Implementation of the proposed TEP would not directly result in the construction of any new homes and businesses. It would not substantially alter existing or induce new development as transit service already exists in the areas where the improvements would be made.

Implementation of the Policy Framework could indirectly support higher density and infill development where improved transit service, reliability and effectiveness are proposed, as well as other transit enhancements and amenities that could be implemented throughout the Muni system that are not included as part of the TEP. However, implementation of the Policy Framework would not support development and population growth beyond what has already been anticipated and planned for in City and regional population growth projections through 2035.

Implementation of the Service Improvements would not induce population growth beyond growth that has already been planned for and anticipated within Citywide and regional population projections because population growth in the City through 2035 would occur as planned and forecast irrespective of whether or not the Service Improvements are implemented. While the TEP has the potential to affect the mode by which people travel or the particular Muni lines that they elect to use, it is not anticipated to induce population growth beyond what is expected to occur without the proposed project. Moreover, the TEP is not expected to shift travel patterns in the

City in any fundamental way such that growth would occur in neighborhoods where it is not otherwise anticipated.

For these reasons, indirect population growth impacts from the program- and project-level TEP components would be less than significant because the proposed project would not result in new development or transit use and travel patterns that would induce direct or indirect population growth. No mitigation measures are required. This topic will not be discussed further in the EIR.

Employment

Implementation of the TEP, including both the program- and project-level components, would result in an estimated 150 to 200 new SFMTA employees. The majority of these employees are likely to be existing San Francisco or Bay Area residents who are not anticipated to relocate and seek housing. Therefore, the proposed project would not induce substantial population growth or increase demand for housing that could not already be accommodated within projected employment and housing growth in the City or the region.[47]

The TEP would include construction related to certain TEP components, such as the Service-related Capital Improvements and TTRPs. Construction of the program- and project-level Service-related Capital Improvements and TTRPs would result in construction-related employment. An increase in population related to construction employment would be marginal because TEP construction would consist of relatively small, short-term projects that would require skills of construction contractors and their workers in the Bay Area and San Francisco that typically bid on public works projects and are familiar with construction requirements and procedures in the City. TEP construction would be phased, subject to funding sources and resource availability, between FY 2014 and 2019 and would not result in long-term, construction projects. Construction related to the proposed Service-related Capital Improvements would require intermittent and/or short-term construction jobs, typically within six to eighteen months that would be unlikely to attract new residents to the City or the region.

[47] Based on the Association of Bay Area Government's projected population of San Francisco will be 969,000 in 2035, an increase of 159,000 persons over the total population of San Francisco in 2010. The number of households is expected to reach 415,000 by 2035, an increase of 68,320 households from 2010. Association of Bay Area Governments, *Projections and Priorities 2009*, San Francisco County Projections, p. 92, available at http://www.abag.ca.gov/planning/currentfcst/#, accessed on December 6, 2012. A copy of this document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2011.0558E.

Based on the discussion above, the proposed project would have a less-than-significant impact on population and employment-related population growth at both the program- and project level because the up to 200 estimated new employees would be negligible within the context of projected employment growth for San Francisco and because potential construction employment is anticipated to be drawn from the pool of workers of existing construction contractors already established within the City and Bay Area. No mitigation measures are necessary. This topic will not be discussed further in the EIR.

Impact PH-2: The proposed project would not displace existing housing units or create demand for additional housing or displace substantial numbers of people, necessitating the construction of replacement housing. (*No Impact*) (Criteria 3b and 3c)

The TEP components would be implemented on public land primarily within the public right-of-way throughout the City, and thus would not displace existing housing or persons. As discussed under Impact PH-1, the TEP would not involve new development or generate substantial new employment that would create the demand for additional housing. Therefore, implementation of the program-level and project-level TEP components would have no impact on housing demand or the displacement of housing. In addition, there would be no indirect effects from the Policy Framework as related to the TEP with respect to housing demand or the displacement of housing.

For the reasons discussed above, at both the program- and project-level, the proposed project would have no impacts on housing displacement or new housing demand. No mitigation measures are required. This topic will not be discussed further in the EIR.

Combined Impacts

The above analysis for the proposed project would not result in combined impacts, as implementation of the proposed project would not result in combined physical effects (e.g., simultaneous construction of individual TEP projects) that would induce population or housing growth, either directly or indirectly.

Cumulative Impacts

Impact C-PH-1: The proposed project in combination with other past, present, or reasonably foreseeable future projects would not result in a cumulatively

considerable contribution to significant cumulative impacts on population and housing. (*Less than Significant*)

The geographic context for cumulative population and housing impacts is the entire City and County of San Francisco. Cumulative impacts occur when the impacts from the proposed project combine with similar impacts from other past, present or reasonably foreseeable future projects in a similar geographic area.

The estimated increase of 150 to 200 new SFTMA employees would be within the Association of Bay Area Governments' projected regional growth data. Implementation of the TEP would not result in population growth in San Francisco beyond regional projections, either directly or indirectly.

Implementation of the TEP would not result in, or contribute to, substantial demolition of existing housing that would displace existing people or housing units because no demolition of housing is proposed. Because the effects of the TEP represent the indirect effects of the Policy Framework as relates to the TEP, there would be no significant population and housing impact as a result of implementing the Policy Framework. Therefore, the Policy Framework as relates to the TEP would not result in, or contribute to any significant cumulative impact with respect to population and housing.

For the reasons provided above, implementation of the Policy Framework as related to the TEP or any components of the TEP may therefore not require further environmental review with respect to Population and Housing.

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TOPIC 4: CULTURAL AND PALEONTOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco *Planning Code*?			X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X			
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X			
d) Disturb any human remains, including those interred outside of formal cemeteries?		X			

The focus of this section is on potential impacts resulting from alterations to the physical environment with respect to cultural and paleontological resources resulting from program-level and project-level TEP components.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may

indirectly result in changes to the physical environment. The TEP's proposed service improvements, the Service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to cultural and paleontological resources would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional CEQA analysis if necessary once any such projects are developed and proposed.

The Service Improvements proposed would involve operational changes to the frequency and route alignments of Muni service and types of transit vehicles within the existing public right-of-way, which are transitory in nature and would not be expected to have an impact on cultural, archeological, or paleontological resources. No direct physical impacts on Cultural and Paleontological Resources would result from the Service Improvements proposed in the TEP. The TEP components that have the potential to affect Cultural and Paleontological Resources include the limited construction for Service Improvements, TPS Toolkit elements as applied to the TTRPs, and the Service-related Capital Improvements. Implementation of these components would result in construction and the introduction of streetscape improvements in the public right-of-way.

For the purposes of this Initial Study, the term "historic architectural resource" refers to buildings, structures, objects, sites, landscapes, and historic districts. The term is used to distinguish such resources from archaeological resources. Both historic architectural resources (Topic 4a in the checklist above) and archaeological resources (Topic 4b above) may also be considered "historical resources" under CEQA. Historic architectural resources are studied under Impact CP-1. Archaeological resources are studied under Impact CP-2. Paleontological resources are studied under Impact CP-3.

Historic Architectural Resources

Background

Additional information on the historic architectural context and the historic architectural resources evaluated within this section is provided within the Historic Resource Evaluation Response (HRER) prepared by the San Francisco Planning Department[48] which is attached as Appendix B to this Initial Study. The general San Francisco historic architectural context presented in the HRER is summarized below.

General San Francisco Historic Architectural Context

The character of San Francisco's built environment has been influenced over time by a number of factors, including significant historical events, cultural influences, technological advances, significant individuals, and evolving trends in urban design and architecture - all of which has been significantly influenced by the city's dramatic topography. The cultural landscape that emerged here during the 19th and 20th centuries resulted in the alteration of the original physical landscape, as coves and marshes along the Bay were filled in, and hills and dunes were leveled. San Francisco's built environment today displays a tremendous variety of architectural periods and styles that reflect the city's layered historical development.

Evaluative Framework

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance. Numerous laws, regulations, and statutes, on both the federal and state levels, seek to protect and target the management of cultural resources. Depending upon a variety of preconditions such as the inclusion of federal monies or significant effects on wetlands, federal or state law may be the primary governing code. These laws include the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and CEQA.

The National Register Criteria for Evaluation

The National Register of Historic Places (NRHP) is the nation's master inventory of known historic resources. It is administered by the National Park Service in

[48] San Francisco Planning Department, *Historic Resource Evaluation Response: SFMTA Transit Effectiveness Project*, January 7, 2013. This document is attached as Appendix B and is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2011.0558E.

conjunction with the State Office of Historic Preservation. The National Register includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. Section 106 of the NHPA[49] requires federal agencies to consider the effects of their actions on properties listed on, or eligible for listing on, the National Register.

To be eligible for the NRHP, a cultural resource must meet specific criteria identified in 36 Code of Federal Regulations, Part 60. The National Register criteria are as follows:

A. Resources that are associated with events that have made a significant contribution to the broad patterns of history;

B. Resources that are associated with the lives of persons significant in our past;

C. Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Resources that have yielded or may likely yield information important in prehistory or history.

Historic Integrity. In addition to identifying the significance of buildings, structures or objects, each potential resource is assessed for integrity. Integrity is the ability of a property to convey its significance through its physical characteristics that existed its period of significance. As defined by the National Park Service in *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*, integrity is defined through seven aspects, which are as follows:

- Location is the place where the historic property was constructed or the place where the historic event occurred.

- Design is the combination of elements that create the form, plan, space, structure, and style of a property.

- Setting is the physical environment of the historic property.

[49] The National Historic Preservation Act (NHPA), 36 CFR Part 800: Protection of Historic Properties.

- Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration form a historic property.

- Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.

- Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.

- Association is the direct link between an important historic event or person and a historic property.

To protect and maintain the historic significance of a historic resource means to avoid demolition, destruction, relocation, alteration or any activity that would impair the significance of a historical resource and to retain those physical characteristics that convey the property's historical significance and justify its eligibility for inclusion in the national, state or local historic register. To retain integrity, and therefore avoid an impact, the historic resource must retain most of the seven aspects of integrity as defined by the National Register Criteria.

California Register Criteria for Evaluation

The California Register of Historical Resources (CRHR) is a statewide inventory of significant historical and archeological resources. To be eligible for listing in the CRHR, a resource must usually be more than 50 years old, must have historical significance, and must retain its historic integrity. In terms of historic significance, a resource is evaluated on the following four criteria:

- Criterion 1 (Event): Resources associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

- Criterion 2 (Person): Resources associated with the lives of persons important to local, California, or national history.

- Criterion 3 (Design/Construction): Resources that embody the distinctive characteristics of a type, period, region or method of construction, or that represent the work of a master or possess high artistic values.

- Criterion 4 (Information Potential): Resources that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

City and County of San Francisco Criteria for Evaluation

The City and County of San Francisco maintains a list of locally designated City Landmarks and Historic Districts, similar to the National Register of Historic Places but at the local level. Landmarks can be buildings, sites, or landscape features. Districts are defined generally as an area of multiple historic resources that are contextually united. The regulations governing Landmarks, as well as the list of individual Landmarks and descriptions of each Historic District, are found in Article 10 of the Planning Code.

Article 10. Article 10 of the Planning Code identifies buildings, properties, structures, sites, districts, and objects that possess "special character or special historical, architectural or aesthetic interest or value and are an important part of the City's historical and architectural heritage." Article 10 protects City Landmarks and Historic Districts from inappropriate alteration and demolition through Certificate of Appropriateness review procedures overseen by the San Francisco Historic Preservation Commission.

Article 11. Article 11 of the Planning Code identifies individual buildings, and concentrations of buildings within the Downtown C-3 District that possess "special architectural, historical, and aesthetic character which contribute to the urban environment." Article 11 protects Significant or Contributory buildings and establishes Conservation Districts, which protect buildings from inappropriate alteration and demolition through Permit to Alter review procedures overseen by the San Francisco Historic Preservation Commission.

Other Historic Resources. Pursuant to *San Francisco Preservation Bulletin No. 16-City and County of San Francisco CEQA Review Procedures for Historic Resources* (03/31/2008), the City and County of San Francisco categorizes historical resources, as either Category A.1 (Resources listed on or formally determined to be eligible for the California Register) or Category A.2 (Resources listed on adopted local registers, and properties that have been determined to appear or may become eligible, for the California Register).

Evaluating Impacts on Historical Resources under CEQA

"Historical Resource" Defined under CEQA

CEQA Guidelines Section 15064.5(a) defines a "historical resource" as:

> (1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code, Section 5024.1, Title 14 CCR, Section 4850 et seq.).
>
> (2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
>
> (3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code, Section 5024.1, Title 14 CCR, Section 4852) including the following:
>
> > (A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
> >
> > (B) Is associated with the lives of persons important in our past;
> >
> > (C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
> >
> > (D) Has yielded, or may be likely to yield, information important in prehistory or history.
>
> (4) The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a

lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

For the purposes of this section, historic architectural resources are defined as those resources designated or determined eligible for the National Register of Historic Places, California Register of Historical Resources, and local register of historical resources, Article 10 and 11 of the San Francisco Planning Code, as well as resources included in a qualified historic resource survey or identified as a historic resource by the City and County of San Francisco. Potentially affected historic architectural resources include individually identified resources, historic districts, historic landscapes, as well as potential historic architectural resources that are yet to be identified.[50]

Defining a Significant Impact to an Historic Architectural Resource under CEQA. Under CEQA, a project that results in a "substantial adverse change in the significance of an historical resource" may have a significant adverse effect on the environment. The California Public Resources Code defines "substantial adverse change" as "demolition, destruction, relocation or alteration," activities that would impair the significance of an historical resource. CEQA defines activities that would impair the significance of an historical resource:

a. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in the California Register of Historic Resources; or

b. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historic resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1 (g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

c. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance

[50] Under the CEQA Guidelines Section 15064.5(a)(4), even if a resource is not included on any local, State, or Federal register, or identified in a qualifying historical resources survey, a lead agency may still determine that any resource is an historical resource for the purposes of CEQA if there is substantial evidence supporting such a determination. A lead agency must consider a resource to be historically significant if it finds that the resource meets the criteria for listing in the California Register of Historical Resources.

and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

According to *CEQA Guidelines* Section 15064.5 (b)(3) "Generally, a project that follows The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (Standards and Guidelines)...shall be considered as mitigated to a level of less than a significant impact on the historical resource".

Historic Architectural Resources Along TEP Corridors

A number of historic architectural resources are located along TEP corridors. For example, TTRP.28_1 runs adjacent to the Shriners' Hospital for Crippled Children and TTRP.5 runs along the War Memorial Building and City Hall, all Article 10 City Landmarks.[51] In addition to being located adjacent to designated Articles 10 and 11 historic resources, the TTRP corridors are located on streets that may have other historic architectural resources considered "historical resources" under *CEQA Guidelines* Section 15064.5(a).[52] The analysis below considers the proposed project's impacts on all historical resources, as defined by CEQA.

Impact CP-1: The proposed project would not cause a substantial adverse change in the significance of an historic architectural resource. *(Less than Significant)* (Criterion 4a)

The analysis of impacts on historic architectural resources typically assesses the nature of specific physical alterations on particular identified historic architectural resources. As discussed below, both program- and project-level components of the proposed project would occur within the public right-of-way, and would not result in any direct physical impact on an historical resource.

This analysis of impacts under the proposed project, then, focuses on indirect impacts on the visual setting surrounding historic architectural resources. As discussed above, under the subheading "Historic Integrity" on p. 204, among the

[51] Information regarding the *San Francisco Planning Code* Articles 10 and 11 historic resources that are located along the TEP project sites is attached to the HRER for the TEP. The HRER is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2011.0558E.

[52] Under *CEQA Guidelines* Section 15064.5(a)(4), even if a resource is not included on any local, State, or Federal register, or identified in a qualifying historical resources survey, a lead agency may still determine that any resource is an historical resource for the purposes of CEQA if there is substantial evidence supporting such a determination. A lead agency must consider a resource to be historically significant if it finds that the resource meets the criteria for listing in the California Register of Historical Resources.

seven aspects of historic resource integrity that allow a resource to convey its historic significance, is integrity of setting. Alterations to the surrounding setting of an historical resource could potentially have an indirect effect on the historic significance of an historical resource.

The design details of the program-level Service-related Capital Improvements and the selection and location of the specific TPS Toolkit elements within the program-level TTRP corridors are not known. However, sufficient information about the visual characteristics of such improvements, wherever they may occur within the public right-of-way, is known at this time and allows for assessment of impacts of both program- and project-level TEP components on historic architectural resources. Therefore, an evaluation of potential impacts on historic architectural resources resulting from the construction of all program-level and project-level TEP components was completed. As such, the following analysis sets forth the environmental review for the entirety of the TEP at the program and project level.

The proposed program-level and project-level components of the TEP that would involve construction would not result in any demolition, damage, alteration, relocation, or other direct physical impact on historic architectural resources, with the exception of alterations to Dolores Park, a resource determined eligible for the National Register of Historic Places. As part of the TTRP.J, a new boarding platform (measuring approximately 8-ft wide by 160-ft long) would be constructed within the northwestern corner of Dolores Park adjacent to Church and18th streets. The construction of this boarding platform would result in a less-than-significant impact, since this area is already being used for transit uses and would not impact any character-defining features of the Dolores Park.

Physical alterations under the TEP would otherwise take place within the existing public right-of-way. Overhead wires would not be attached to any buildings under the proposed TEP, but would be affixed to existing or newly placed poles. No distinctive and historically significant street paving material is known to exist within any of the proposed TTRP corridors or within the sites proposed for Service-related Capital Improvements. Likewise, no historically significant street furniture (such as the Path of Gold Light Standards along Market Street [City Landmark # 200]) and landmark street trees (such as the palm trees within the Dolores Street median) are located within any proposed TTRP corridors or within the sites proposed for Service-related Capital Improvement Projects under the TEP.

Construction of program-level and project-level components of the TEP would require various construction activities in the vicinity of historic architectural resources (e.g., asphalt and concrete removal, jack-hammering, excavation, compacting, paving, and construction equipment movements). These construction activities are commonplace in an urban environment and, with exercise of ordinary precautions, present no particular threat to historic architectural resources in the vicinity of such work resulting from vibration or collision. Additionally, no particularly fragile historic architectural resources have been identified within or adjacent to program-level and project-level components of the TEP.

In addition to not resulting in a direct physical impact on historic architectural resources, the TEP would not have any indirect physical impact on historic architectural resources and would not alter the visual setting of historic architectural resources. Potentially affected historic architectural resources include individually identified resources, historic districts, historic landscapes, as well as potential historic architectural resources that are yet to be identified.

For example, the proposed TTRP.5 for the 5 Fulton and 5L Fulton Limited is an example of a TTRP with a number of proposed physical changes (including construction of transit bulbs and pedestrian islands, changes in transit stops and changes in traffic signals and stop signs) that would run through three designated historic districts. The TTRP.5 alterations are representative of potential impacts of TPS Toolkit elements and the TTRP proposals on historic architectural resources. The 5 Fulton and proposed 5L Fulton Limited route runs along McAllister Street through the Civic Center Historic District (designated locally under Article 10 of the Planning Code and listed on the National Register of Historic Places) and the Alamo Square Historic District (designated locally under Article 10 of the Planning Code), and runs along Fulton Street at the northern border Golden Gate Park (listed on the National Register of Historic Places).

Program-level and project-level components of the TEP would not result in the construction of any new structures that could have a substantial adverse effect on the visual setting of Civic Center Historic District, Alamo Square, or Golden Gate Park. Physical alterations under program-level and project-level components of the TEP (such as, overhead wires, transit stop changes, the installation of transit bulbs and transit boarding islands, lane modifications, parking and turn restrictions, traffic signal and stop sign changes, and pedestrian improvements such as pedestrian bulbs, pedestrian refuge islands) would not obscure views of historic architectural resources

(including buildings, structures, and landscape features [like the monumental gateway entrance to Golden Gate Park at Arguello Boulevard and Fulton Street]) along TEP corridors. Physical alterations under program-level and project-level components of the TEP would not be prominent new features in the overall visual setting of historic architectural resources, where discernible at all. The program-level and project-level components of the TEP would be visually unobtrusive and would not draw undue attention to themselves and away from historic architectural features of historic architectural resources. The program-level and project-level components of the TEP would be simple and utilitarian in design and would be visually differentiated from historic construction as to not create a false sense of historical development.

For these reasons, the Policy Framework as related to the TEP and both program-level and project-level components of the proposed TEP would not materially impair the significance of any identified historic architectural resource. By the same reasoning, neither the Policy Framework as related to TEP nor the proposed TEP would materially impair the significance of any yet unidentified potential historic architectural resource. Therefore, the proposed project would not have a substantial adverse effect on an historical resource under CEQA, and no mitigation measures are necessary. This topic will not be discussed further in the EIR.

For the reasons given above, additional environmental review with respect to the topic of Historic and Architectural Resources is not expected to be needed for the Policy Framework as related to the TEP or for any of the TEP components.

Archaeological Resources

General San Francisco Archaeological Context

The City and County of San Francisco has a rich, complex, and unusually well-preserved archaeological record that to date is known to extend back to nearly 6,000 years before the present. Our knowledge of all of the significant historical periods and movements of pre-Modern San Francisco—the Hispanic Period (1776-1846), the Yerba Buena Period (1835-1848), the Early and Late Gold Rush Periods (1848-1860), and the Victorian Period (1860-1906)—continually expands with the discovery and research of new archaeological sites. Archaeological resources in San Francisco can be vertically found as deep as 75 feet below existing grade as well as at the existing ground surface (Lake Merced Midden). An archaeological resource can be as massive in scale as a buried Gold Rush period storeship (for example, the

General Harrison); as complex as sites representing occupations of several peoples of disparate origins, languages, and cultures over a period of 3,000 years; as fragile and disperse as a prehistoric lithic scatter site; or as small as a single artifact. Since human occupation of the northern San Francisco peninsula extended considerably deep into geologic time when the bay and ocean shorelines were much lower and distant than their current alignments, it is not surprising that we encounter archaeological remains of older prehistoric populations in submerged contexts.

Significance of Archaeological Resources

CEQA recognizes two different categories of significant archaeological resources: a "unique" archaeological resource (CEQA Section 21083.2) and an archaeological resource that qualifies as a "historical resource" under CEQA (CEQA Section 21084.1 and *CEQA Guidelines* Section 15064.5).

An archaeological resource can be significant as both or either a "unique" archaeological resource and an "historical resource" but the process by which the resource is identified, under CEQA, as either one or the other is distinct (CEQA Section 21083.2(g) and *CEQA Guidelines* Section 15064.5(a)(2)).

An archaeological resource is an "*historical resource*" under CEQA if the resource is:

1) listed on or determined eligible for listing on the CRHR (*CEQA Guidelines* Section 15064.5). This includes National Register-listed or –eligible archaeological properties.

2) listed in a "local register of historical resources"[53]

3) listed in a "historical resource survey". (*CEQA Guidelines* Section 15064.5(a)(2))

Generally, an archaeological resource is determined to be an "historical resource" due to its eligibility for listing to the CRHR/NRHP because of the potential scientific value of the resource, that is, "has yielded, or may be likely to yield, information important in prehistory or history" (*CEQA Guidelines* Section 15064.5 (a)(3)). An archaeological resource may be CRHR-eligible under other Evaluation Criteria, such as Criterion 1, association with events that have made a significant contribution to the broad patterns of history; Criterion 2, association with the lives of historically important persons; or Criterion 3, association with the distinctive characteristics of a

[53] A "local register of historical resources" is a list of historical or archaeological properties officially adopted by ordinance or resolution by a local government (Public Resources Code § 5020.1 (k)).

type, period, region, or method of construction. Appropriate treatment for archaeological properties that are CRHR-eligible under Criteria other than Criterion 4 may be different than that for a resource that is significant exclusively for its scientific value.

Failure of an archaeological resource to be listed in any of these historical inventories is not sufficient to conclude that the archaeological resource is not an "historical resource". When the lead agency believes there may be grounds for a determination that an archaeological resource is a "historical resource", then the lead agency should evaluate the resource for eligibility for listing to the CRHR (*CEQA Guidelines* Section 15064.5(a)(4)).

A "*unique archaeological resource*" is a category of archaeological resources created by the CEQA statutes (CEQA Section 21083.2(g)). An archaeological resource is a unique archaeological resource if it meets any of one of three criteria:

1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;

2) Has a special and particular quality such as being the oldest of its type or the best available example of its type;

3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Under CEQA, evaluation of an archaeological resource as an "historical resource" is privileged over the evaluation of the resource as a "unique archaeological resource", in that, CEQA requires that "when a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource" (*CEQA Guidelines* Section 15064.5 (c)(1).

Evaluation of an Archaeological Resource as Scientifically Significant

In requiring that a potentially affected archaeological resource be evaluated as an historical resource, that is as an archaeological site of sufficient scientific value to be CRHR-eligible, CEQA presupposes that the published guidance of the California Office of Historic Preservation (OHP) for CEQA providers is to serve as the methodological standard by which the scientific, and thus, the CRHR-eligibility, of an archaeological resource is to be evaluated. As guidance for the evaluation of the scientific value of an archaeological resource, the OHP has issued two guidelines:

Archaeological Resource Management Reports (1989) and the *Guidelines for Archaeological Research Designs* (1991).

Integrity of an Archaeological Resource

Integrity is an essential criterion in determining that a resource, including an archaeological resource, is an historical resource. In terms of CEQA "integrity" can, in part, be expressed in the requirement that an historical resource must retain "the physical characteristics that convey its historical significance" (*CEQA Guidelines* Section 15064.5 (b)).

For an archaeological resource that is evaluated for CRHR-eligibility under Evaluation Criterion 4, "has yielded or may be likely to yield information important to prehistory or history", integrity is conceptually different than how it is usually applied to the built environment. For an historic building, possessing integrity means that the building retains the defining physical characteristics from the period of significance of the building. In archaeology, an archaeological deposit or feature may have undergone substantial physical change from the time of its deposition but it may yet have sufficient integrity to qualify as a historical resource. The integrity test for an archaeological resource is whether the resource can yield sufficient data (in type, quantity, quality, diagnosticity) to address significant research questions. Thus, in archaeology "integrity" is often closely associated with the development of a research design that identifies the types of physical characteristics ("data needs") that must be present in the archaeological resource and its physical context to adequately address research questions appropriate to the archaeological resource.

Significant Adverse Effect on an Archaeological Resource

The determination of whether an effect on an archaeological resource is significant depends on the effect of the project on those characteristics of the archaeological resource that make the archaeological resource significant. For an archaeological resource that is an historical resource because of its prehistoric or historical information value, that is, its scientific data, a significant effect is impairment of the potential information value of the resource.

The depositional context of an archaeological resource, especially soils stratigraphy can be informationally important to the resource in terms of dating and reconstructing the characteristics of the resource present at the time of deposition and interpreting the impacts of later deposition events on the resource. Thus, for an archaeological resource eligible to the CRHR under Criterion 4, a significant adverse effect to its

significance may not be limited to impacts on the artifactual material but may include effects on the soils matrix in which the artifactual matrix is situated.

Mitigation of an Adverse Effect on an Archaeological Resource

Preservation in place is the preferred treatment of an archaeological resource (CEQA Section 21083.2(b); *CEQA Guidelines* Section 15126.4 (b)(3)(a)). When preservation in place of an archaeological resource is not feasible, data recovery, in accord with a data recovery plan prepared and adopted by the lead agency prior to any soils disturbance, is the appropriate mitigation (*CEQA Guidelines* Section 15126.4 (b)(3)(C)). In addition to data recovery, under CEQA, the mitigation of effects to an archaeological resource that is significant for its scientific value, requires curation of the recovered scientifically significant data in an appropriate curation facility (*CEQA Guidelines* Section 15126.4(b)(3)(C), that is a curation facility compliant with the *Guidelines for the Curation of Archaeological Collections* (California Office of Historic Preservation. 1993). Final studies reporting the interpretation, results, and analysis of data recovered from the archaeological site are to be deposited in the California Historical Resources Regional Information Center (*CEQA Guidelines* Section 15126.4(b)(3)(C).

In order to determine impacts on archaeological resources, factors considered in determining the potential for encountering archaeological resources are evaluated, including the location, depth, and amount of excavation proposed, as well as any existing information about known resources in the project area. The implementation of the proposed TEP project includes both construction and operational phases. Of the two, only the construction phase would involve excavation of soils. Therefore, the operational phase would not have any potential impacts on archaeological resources, and no further review of it is warranted.

Due to the proposed excavation work that would be required during the construction phase of the project, the Planning Department conducted a Preliminary Archaeological Review (PAR) to determine if any archaeological resources would be impacted. In a memorandum dated November 20, 2012, [54] the Planning Department staff archaeologist evaluated potential impacts resulting from construction of the program-level and project-level TEP components. Information and analysis from the PAR are summarized below.

[54] San Francisco Planning Department, *Environmental Planning Preliminary Archaeological Review Checklist*, November 20, 2012. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2011.0558E.

Human Remains

Impacts on Native American burials are considered under *CEQA Guidelines* Section 15064.5(d)(1). When an Initial Study identifies the existence of, or the probable likelihood of, Native American human remains within a project site, the CEQA lead agency is required to work with the appropriate tribal entity, as identified by the California Native American Heritage Commission (NAHC). The lead agency may develop an agreement with the appropriate tribal entity for testing or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials. By implementing such an agreement, the project becomes exempt from the general prohibition on disinterring, disturbing, or removing human remains from any location other than the dedicated cemetery (Health and Safety Code Section 7050.5) and the requirements of CEQA pertaining to Native American human remains.

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Proposed Project Excavation Depths

As described above, the depths required to construct both the program-level and project-level components of the TEP are known. Some components would require excavation of up to 12 feet bgs in depth. The anticipated excavation depths would be less than 2 feet bgs (curb and sidewalk changes) for all TPS Toolkit elements except for the two elements involving the installation of traffic signals *(13. Install Traffic Signals at Uncontrolled and Two-way Stop-controlled Intersections* and *14. Install Traffic Signals at All-way Stop-controlled Intersections*) which would require up to 9 ft. bgs. Therefore, the potential impact resulting from the construction of both the program-level and project-level TTRPs can be evaluated, assuming a maximum 12 ft.

excavation depth within the public right-of-way along the entire program-level TTRP corridors.

Service-related Capital Improvements involving the installation of new overhead wires, overhead wire support poles, and duct banks would require excavations of up to 12 ft. bgs in depth (overhead wire support pole foundation), and would occur in both program-level and project-level OWE projects. The Sansome Contraflow Lane Extension (SCI.2) may involve the installation of new traffic signals which would involve excavation of up to 12 ft. bgs for the signal mast arm. All other program-level and project-level Service-related Capital Improvements would require a maximum of 2 ft. bgs excavation depth to construct the curb and sidewalk changes associated with those projects.

Impact CP-2: The proposed project could cause a substantial adverse change in the significance of an archaeological resource pursuant to *CEQA Guidelines* Section 15064.5. (*Less than Significant with Mitigation*) *(Criteria 4b and 4d)*

The analysis of impacts on archaeological resources typically assesses the general location and extent of ground disturbance and the archaeological sensitivity of the general area. While the design details of the program-level Service-related Capital Improvements and the selection and location of the specific TPS Toolkit elements within the program-level TTRP corridors are not known, the maximum depth of excavation required to construct these elements is known. In addition, the locations of the program-level TTRPs are known as well as the general area and extent within which the Service-related Capital Improvements would be constructed. Therefore, an evaluation of potential impacts on archaeological resources resulting from the construction of all program-level and project-level TEP components was completed. As such, the following analysis sets forth the environmental review for the entirety of the TEP.

Due to the depth of excavation required and the locations for the project construction, the PAR evaluation of the program-level and project-level TEP components found that except in four instances, discussed below, the construction of the proposed components would not require an excavation depth and/ or be located in an area where the potential for effect on archaeological resources is likely. However, in order to avoid any potential adverse impact to archaeological resources where the presence of the resource cannot be known, foreseen, or predicted, the standard Accidental Discovery Archaeological Mitigation Measure, M-CP-2a, would be implemented for all TEP components. This mitigation measure requires that upon

accidental discovery of an archaeological resource during construction, the appropriate treatment of the resource would be carried out by a qualified archaeological consultant, thereby, reducing any potential adverse impact on the newly-discovered resource to less than significant.

Mitigation Measure M-CP-2a: Accidental Discovery of Archeological Resources

The following mitigation measure is required to avoid any potential adverse effect from the proposed project on accidentally discovered buried or submerged historical resources as defined in *CEQA Guidelines* Section 15064.5(a)(c). The project sponsor shall distribute the Planning Department archaeological and paleontological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); and to any utilities firm involved in soils disturbing activities within the project site. Prior to any soils disturbing activities being undertaken, each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The project sponsor shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the ERO confirming that all field personnel have received copies of the Alert Sheet.

Should any indication of an archaeological resource be encountered during any soils disturbing activity of the project, the project Head Foreman and/or project sponsor shall immediately notify the ERO and shall immediately suspend any soils disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures should be undertaken.

If the ERO determines that an archaeological resource may be present within the project site, the project sponsor shall retain the services of an archaeological consultant from the pool of qualified archaeological consultants maintained by the Planning Department archaeologist. The archaeological consultant shall advise the ERO as to whether the discovery is an archaeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archaeological resource is present, the archaeological consultant shall identify and evaluate the archaeological resource. The archaeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the project sponsor.

Measures might include: preservation in situ of the archaeological resource, an archaeological monitoring program, or an archaeological testing program. If an archaeological monitoring program or archaeological testing program is required, it shall be consistent with the Environmental Planning division guidelines for such programs. The ERO may also require that the project sponsor immediately

implement a site security program if the archaeological resource is at risk from vandalism, looting, or other damaging actions.

The project archaeological consultant shall submit a Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archaeological resource and describing the archaeological and historical research methods employed in the archaeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archaeological resource shall be provided in a separate removable insert within the final report.

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archaeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound copy, one unbound copy, and one unlocked searchable Portable Document Format (PDF) copy on CD of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the NRHP/CRHR. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

As described above, the PAR identified four TEP components with the potential to adversely affect archaeological resources due to excavation at a depth and/or at a location where such resources may be impacted. These identified projects are: two program-level TTRPs, TTRP.9 and TTRP.22_2, and two project-level Service-related Capital Improvements, OWE.1 New Overhead Wiring – Reroute 33 Stanyan onto Valencia Street and SC1.2 Sansome Street Contraflow Lane.

TTRP.9 would include a segment of Bayshore Boulevard, and TTRP. 22_2 would include a segment of Richardson Avenue. These segments occur along the historic shoreline, estuary, tidal marsh or lagoon, or watercourse and such sites may include prehistoric archaeological resources. No historical documentation of deposits exists within the proposed construction areas. However, excavation for traffic signal mast arms (9-foot-depth) within these two areas would have the potential to adversely impact archaeological resources unless additional identification and evaluation techniques, such as archaeological testing or monitoring, are implemented. Excavation for all other TPS Toolkit elements (up to 2-foot-depth) within these two identified areas would be at a shallower depth and would not have the potential to impact any prehistoric archaeological resources. Implementation of the Mitigation Measure for Archaeological Monitoring, M-CP-2b, would require additional evaluation

and identification of all future traffic signal mast arm installations within these two areas (Bayshore Boulevard and Richardson Avenue) of TTRP.9 and TTRP.22_2 to avoid any potential adverse impacts on potentially significant archaeological resources.

The two project-level Service-related Capital Improvements, OWE.1 and SCI.2, would involve excavation of up to 12 feet bgs and 9 feet bgs, respectively. The installation of overhead wire support poles and duct banks along a two-block portion of Valencia Street (OWE.1) would be constructed in the Mission Dolores area in which there is a potential for significant archaeological resources from the Hispanic Period. The installation of traffic mast arms along a three-block portion of Sansome Street (SCI.2) would occur in an area with the potential for impacts to archaeological resources from the Yerba Buena period. Excavation associated with the construction of these two Service-related Capital Improvements would have the potential to adversely impact significant archaeological resources unless additional identification and evaluation techniques, such as archaeological testing or monitoring, are implemented. Implementation of the Mitigation Measure for Archaeological Monitoring, M-CP-2b, would require additional evaluation and identification of the improvements associated with these two TEP components ahead of construction activities in order to avoid any potential adverse impacts to significant archaeological resources during construction of OWE.1 and SCI.2.

Mitigation Measure M-CP-2b: Archaeological Monitoring

Based on the reasonable potential that archaeological resources may be present within the project site, the following measures shall be undertaken to avoid any potentially significant adverse effect from the proposed project on buried or submerged historical resources. Once engineering design details for the identified projects (OWE.1, SCI.2, TTRP.9 and TTRP.22_2) are known, the project sponsor shall consult with the Planning Department archeologist regarding the specific aspects of these proposals that would require monitoring. If required by the Planning Department archeologist, the project sponsor shall retain the services of an archaeological consultant from the pool of qualified archaeological consultants maintained by the Planning Department archaeologist. The archaeological consultant shall undertake an archaeological monitoring program. All plans and reports prepared by the consultant as specified herein shall be submitted first and directly to the Environmental Review Officer (ERO) for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO. Archaeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of *construction* can be extended beyond four weeks only if such a suspension is the

only feasible means to reduce to a less than significant level potential effects on a significant archaeological resource as defined in *CEQA Guidelines* Sect. 15064.5 (a)(c).

Archaeological monitoring program (AMP). The archaeological monitoring program shall minimally include the following provisions:

- The archaeological consultant, project sponsor, and ERO shall meet and consult on the scope of the AMP reasonably prior to any project-related soils disturbing activities commencing. The ERO, in consultation with the project archaeologist, shall determine what project activities shall be archaeologically monitored. In most cases, any soils disturbing activities, such as demolition, foundation removal, excavation, grading, utilities installation, foundation work, driving of piles (foundation, shoring, etc.), site remediation, etc., shall require archaeological monitoring because of the potential risk these activities pose to archaeological resources and to their depositional context.

- The archaeological consultant shall advise all project contractors to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archaeological resource.

- The archaeological monitor(s) shall be present on the project site according to a schedule agreed upon by the archaeological consultant and the ERO until the ERO has, in consultation with the archaeological consultant, determined that project construction activities could have no effects on significant archaeological deposits.

- The archaeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis.

- If an intact archaeological deposit is encountered, all soils disturbing activities in the vicinity of the deposit shall cease. The archaeological monitor shall be empowered to temporarily redirect demolition/excavation/ pile driving/construction crews and heavy equipment until the deposit is evaluated. If in the case of pile driving activity (foundation, shoring, etc.), the archaeological monitor has cause to believe that the pile driving activity may affect an archaeological resource, the pile driving activity shall be terminated until an appropriate evaluation of the resource has been made in consultation with the ERO. The archaeological consultant shall immediately notify the ERO of the encountered archaeological deposit. The archaeological consultant shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, present the findings of this assessment to the ERO.

Consultation with Descendant Communities: On discovery of an archaeological site[55] associated with descendant Native Americans or the Overseas Chinese, an appropriate representative[56] of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archaeological field investigations of the site and to consult with ERO regarding appropriate archaeological treatment of the site, of recovered data from the site, and, if applicable, any interpretative treatment of the associated archaeological site. A copy of the Final Archaeological Resources Report shall be provided to the representative of the descendant group.

If the ERO, in consultation with the archaeological consultant, determines that a significant archaeological resource is present and that the resource could be adversely affected by the proposed project, at the discretion of the project sponsor, either:

A) The proposed project shall be re-designed so as to avoid any adverse effect on the significant archaeological resource; or

B) An archaeological data recovery program shall be implemented, unless the ERO determines that the archaeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible.

If an archaeological data recovery program is required by the ERO, the archaeological data recovery program shall be conducted in accord with an archaeological data recovery plan (ADRP). The project archaeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP. The archaeological consultant shall prepare a draft ADRP that shall be submitted to the ERO for review and approval. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archaeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical.

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55 The term “archaeological site” is intended here to minimally include any archaeological deposit, feature, burial, or evidence of burial.

56 An “appropriate representative” of the descendant group is here defined to mean, in the case of Native Americans, any individual listed in the current Native American Contact List for the City and County of San Francisco maintained by the California Native American Heritage Commission, and in the case of the Overseas Chinese, the Chinese Historical Society of America.

The scope of the ADRP shall include the following elements:

- *Field Methods and Procedures*. Descriptions of proposed field strategies, procedures, and operations.

- *Cataloguing and Laboratory Analysis*. Description of selected cataloguing system and artifact analysis procedures.

- *Discard and Deaccession Policy*. Description of and rationale for field and post-field discard and deaccession policies.

- *Interpretive Program*. Consideration of an on-site/off-site public interpretive program during the course of the archaeological data recovery program.

- *Security Measures*. Recommended security measures to protect the archaeological resource from vandalism, looting, and non-intentionally damaging activities.

- *Final Report*. Description of proposed report format and distribution of results.

- *Curation*. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

Human Remains, Associated or Unassociated Funerary Objects. The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable State and federal Laws, including immediate notification of the Coroner of the City and County of San Francisco and, in the event of the Coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The archaeological consultant, project sponsor, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (*CEQA Guidelines* Sec. 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, curation, possession, and final disposition of the human remains and associated or unassociated funerary objects.

Final Archaeological Resources Report. The archaeological consultant shall submit a Draft Final Archaeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archaeological resource and describes the archaeological and historical research methods employed in the archaeological testing/monitoring/data recovery program(s) undertaken. Information that may put at risk any archaeological resource shall be provided in a separate removable insert within the draft final report.

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO copies of the FARR shall be distributed as follows: California Archaeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound, one unbound, and one unlocked searchable PDF copy on CD of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the NRHP/CRHR. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

For the above reasons, implementation of mitigation measures, M-CP-2a Accidental Discovery and M-CP-2b Archaeological Monitoring, would ensure that potential archaeological resource impacts from construction of either the program- or project-level TEP components would be less than significant.

Human Remains

The proposed project's treatment of human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activity would comply with applicable state laws, including immediate notification of the City and County of San Francisco Coroner. If the Coroner were to determine that the remains are Native American, the NAHC would be notified and would appoint a Most Likely Descendant (Public Resources Code Section 5097.98). The archeological sensitivity analysis, discussed above under Impact CP-2, did not identify any excavation within potential Native American burial sites or dedicated cemeteries. As such the project is not anticipated to disturb any human remains, including Native American burials, and is expected to have no impact on human remains. However, in order to avoid any potential adverse impact to human remains that may be disturbed during construction of the project where the presence of the resource cannot be known, foreseen, or predicted, the implementation of the Standard Accidental Discovery Archeological Mitigation Measure, M-CP-2a, would be implemented for all TEP components. This mitigation measure requires that upon accidental discovery of any human remains during construction, the appropriate treatment of the resource would be carried out by a qualified archeological consultant. For these reasons, the proposed program-level and project level components of the proposed TEP would not result in a significant impact on human remains.

For the reasons given above, and based on implementation of Mitigation Measures M-CP-2a and M-CP-2b, additional environmental review with respect to the topic of

Archaeological Resources is not anticipated to be needed for the Policy Framework as related to the TEP or for any of the TEP components.

Paleontological Resources

Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. Paleontological resources include vertebrate, invertebrate, and plant fossils or the trace or imprint of such fossils. The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms from which they were derived no longer exist. Thus, once destroyed, a fossil can never be replaced. Paleontological resources are generally lithologically dependent; that is, deposition and preservation of paleontological resources are related to the lithologic unit in which they occur. If the rock types were formed in a deposition environment not conducive to deposition and preservation of fossils, fossils will not be present. Lithological units which may be fossiliferous include sedimentary and volcanic formations.

Impact CP-3: The proposed project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. *(Less than Significant with Mitigation)* (Criterion 4c)

The analysis of impacts on paleontological resources typically assesses the general location and depth of ground disturbance and the potential paleontological sensitivity of the general area. While the design details of the program-level Service-related Capital Improvements and the selection and location of the specific TPS Toolkit elements for the program-level TTRPs are not known, the maximum depth of excavation required to construct these elements is known. In addition, the specific corridors for the program-level TTRPs are known, as well as the general area and extent within which the Service-related Capital Improvements would be constructed. Therefore, an evaluation of potential impacts on paleontological resources resulting from the construction of all program-level and project-level TEP components was completed. As such, the following analysis sets forth the environmental review for the entirety of the TEP at the program and project level. Both program-level and project-level TEP components would be constructed within the existing rights-of-way covered with concrete and asphalt in an urbanized area. Construction would generally occur in relatively flat terrain along existing streets, most of which are underlain primarily by artificial fill and absent any intact geologic sedimentary bedrock formations where fossil-containing beds are predisposed to occur.

Construction of both program-level and project-level components of the TEP would require shallow excavation as described above for archaeological resources on p. 212. Given the shallow excavation depths of TEP construction activities and previous ground disturbance that is common within the public right-of-way, there is a low probability of encountering significant paleontological resources in the course of project construction. However, the presence of shallow paleontological resources within areas of excavation under the proposed project cannot be conclusively ruled out. Disturbance of paleontological resources could impair the ability of paleontological resources to yield important scientific information. Unless mitigated, such an impact would be considered a potentially significant impact under CEQA.

Mitigation Measure M-CP-3: Paleontological Resources Accidental Discovery, would apply in the event that any indication of a paleontological resource is encountered in the course of TEP project construction activities. The mitigation measure calls for suspending soils disturbing activities in the area of the find, and contacting the Planning Department Environmental Review Officer (ERO) in the event that potential archaeological resources are encountered during the course of construction. If the ERO determines that a paleontological resource is present, the mitigation measure calls for a qualified paleontologist to implement an approved Paleontological Resources Monitoring and Mitigation Program (PRMMP). Implementation of Mitigation Measure M-CP-3 would ensure that the scientific significance under CRHR Criterion 4 (Information Potential) of any paleontological resource that may be encountered during project construction activities would be preserved and/or realized. With implementation of Mitigation Measure M-CP-3, construction of the proposed project would not cause a substantial adverse change to the scientific significance of a paleontological resource. Therefore, this impact would be less than significant with mitigation. The subtopic of paleontological resources will not be addressed in the EIR.

Mitigation Measure M-CP-3: Paleontological Resources Accidental Discovery

In order to avoid any potential adverse effect in the event of accidental discovery of a paleontological resource during construction of the project, the project sponsor shall be responsible for ensuring that all project contractors and subcontractors involved in soil-disturbing activities associated with the project comply with the following procedures in the event of discovery of a paleontological resource. Paleontological remains, or resource, can take the form of whole or portions of marine shell, bones, tusk, horn and teeth from fish, reptiles, mammals, and lower order animals. In the case of Megafauna, the remains, although partial,

may be large in scale. Also paleontological resources include petrified wood and rock impressions of plant or animal parts.

Should any indication of a paleontological resource be encountered during any soil- disturbing activity of the project, the project foreman and/or project sponsor shall immediately notify the City Planning Department's Environmental Review Officer (ERO) and one of its designated paleontologists (currently, Dr. Jean De Mouthe/Dr. Peter Roopnarine in the Geology Department of the California Academy of Sciences) and immediately suspend any soil-disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures are needed.

If the ERO determines that a potentially-significant paleontological resource may be present within the project site, the project sponsor shall retain the services of a qualified paleontological consultant with expertise in California paleontology to design and implement a Paleontological Resources Mitigation Plan (PRMMP). The PRMMP shall include a description of discovery procedures; sampling and data recovery procedures; procedures for the preparation, identification, analysis, and curation of fossil specimens and data recovered; and procedures for the preparation and distribution of a final paleontological discovery report (PDR) documenting the paleontological find.

The PRMMP shall be consistent with the Society for Vertebrate Paleontology Standard Guidelines for the mitigation of construction-related adverse impacts to paleontological resources and the requirements of the designated repository for any fossils collected. In the event of a verified paleontological discovery, the remaining construction and soil-disturbing activities within those geological units specified as paleontologically sensitive in the PRMMP shall be monitored by the project paleontological consultant.

The consultant's work shall be conducted in accordance with this mitigation measure and at the direction of the City's ERO. Plans and reports prepared by the consultant shall be submitted for review and approval by the ERO.

Combined Impacts

Regardless of whether or not individual TEP components are constructed simultaneously with other TEP components and within the same project corridors, the combined impacts of the TEP on historic architectural resources would be less than significant. None of the TEP components, and no physical changes that may occur as part of implementing the Policy Framework, would demolish or alter any historic architectural resources. Alterations under the TEP as a whole would be visually unobtrusive and would not draw undue attention to themselves and away from historic architectural features of historic architectural resources. They would be simple and utilitarian in design, are common streetscape elements found throughout

the City, and would be visually differentiated from historic construction as to not create a false sense of historical development.

In the event that ground disturbing construction activities of individual TEP components occur simultaneously within the same area, resulting in combined effects on archaeological and/or paleontological resources, mitigation measures M-CP-2a Accidental Discovery, M-CP-2b Archaeological Monitoring, and M-CP-3: Paleontological Resources Accidental Discovery would continue to apply. Implementation of the applicable mitigation measures to ground disturbing construction activities would ensure that potential combined impacts on archaeological resources and paleontological resources would be less than significant.

Cumulative Impacts

Impact C-CP-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not result in a cumulatively considerable contribution to significant cumulative impacts on cultural resources or archaeological resources. ***(Less than Significant)***

Physical alterations under the TEP would take place primarily with the existing public right-of-way and would involve changes to transit service and the improvement of transit infrastructure. The TEP would not demolish or otherwise physically alter any historic architectural resource. As described above, the introduction of these types of streetscape elements such as transit boarding islands, transit bulbs and pedestrian refuge islands would not materially impair historic resources located within the project vicinity. Therefore, implementation of both program-level and project-level components of the proposed TEP would not contribute to any cumulative impact on historic architectural resources.

When considered with other past, proposed, and reasonably foreseeable future development projects involving excavation in the street right-of-way within San Francisco, such as projects implemented by the SFPUC for wastewater and stormwater management and projects implemented by DPW for street maintenance, the potential disturbance of archaeological and paleontological resources under the proposed TEP project could make a cumulatively considerable contribution to a loss of significant historic and scientific information about California, Bay Area, and San Francisco history and prehistory. Multiple construction activities occurring in the right-of-way in the same general location are subject to the requirements of Public Works Code Article 2.4, which requires coordination of excavation among the various

City agencies and utility providers in Section 2.4.11 based on five-year plans that are updated every six months. As discussed above, implementation of Mitigation Measure M-CP-2a: Accidental Discovery, Mitigation Measure M-CP-2b: Archaeological Monitoring, and Mitigation Measure M-CP-3: Paleontological Resources Accidental Discovery would preserve and realize the information potential of archaeological and paleontological resources if such resources are encountered during construction. The recovery, documentation, and interpretation of information about archaeological and paleontological resources that may be encountered during construction would enhance knowledge of prehistory and history. This information would be available to future archaeological and paleontological studies, contributing to the collective body of scientific and historic knowledge, rather than contributing to a cumulative loss thereto.

For these reasons, the proposed project's contribution to cumulative impacts on Cultural and Paleontological Resources would not be cumulatively considerable. Therefore, this impact would be less than significant and will not be discussed further in the EIR.

For the reasons provided above, additional environmental review with respect to Cultural and Paleontological Resources is not anticipated to be needed for the Policy Framework as related to TEP or for any of the TEP components at the program- and project-level.

TOPIC 5: TRANSPORTATION AND CIRCULATION

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	X				
b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	X				
c) Result in a change in air traffic patterns, including either an increase in traffic levels, obstructions to flight, or a change in location, that results in substantial safety risks?					X

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses?			X		
e) Result in inadequate emergency access?	X				
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	X				

The TEP is a citywide transportation improvement project that could have potentially significant impacts on various aspects of the transportation and circulation network. Thus, a Transportation Impact Study (TIS) will be prepared for the TEP. The TIS will examine existing transportation and circulation conditions and assess the proposed project's potential impacts on the transportation network, including the indirect transportation effects of the Policy Framework as related to the TEP. The information in the TIS will be summarized in the EIR.

The project site is not located within an airport land use plan area or in the vicinity of a private airstrip. Therefore, Topic 5c is not applicable to the proposed project and will not be addressed in this Initial Study, the TIS or the EIR.

With the exception of painting transit-only lanes red, the proposed project would not introduce design features that have not been used throughout the City. The limited construction for the Service Improvements, the application of the TPS Toolkit to the TTRPs, and the Service-related Capital Improvements would install elements such as curb ramps, transit bulbs, pedestrian bulbs, boarding islands, overhead wires, accessible platforms, signage, and additional roadway striping that are common in San Francisco. Therefore, the proposed project, including the red transit-only lanes, would not substantially increase hazards due to a design feature (e.g., sharp curves

or dangerous intersections) or introduce an incompatible use. There would be no significant impact with respect to Topic 5d as a result of the TEP or indirectly as a result of the Policy Framework related to TEP. Therefore, Topic 5d will not be discussed further in the EIR.

TOPIC 6: NOISE

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	X				
b) Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	X				
c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	X				

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	X				
e) For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?					X
f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?					X
g) Be substantially affected by existing noise levels?			X		

Implementation of the TEP would include changes to the built environment that would result in construction activities and changes to transit service. These changes could result in potential noise and vibration impacts that will be analyzed and discussed in the EIR. The noise analysis will describe general existing noise conditions throughout the City, discuss noise standards and ordinances applicable to both construction and operation of the proposed project, and identify any significant

changes in noise or vibration levels that could result from the proposed project and affect sensitive receptors.

The proposed project is not located in the vicinity of a private airstrip, within an airport land use plan area, or within two miles of any nearby public airports or public use airports that have not adopted land use plans. Thus, Topics 6e and 6f are not applicable to the TEP or Policy Framework as related to the TEP, and these topics will not be discussed in the EIR.

The proposed project would result in changes to the existing transit system in San Francisco. No new noise-sensitive uses would be introduced as a result of the proposed project and existing noise levels would not result in significant impacts on transit passengers. Thus, the proposed project would not be substantially affected by existing noise levels and any impact would be less than significant. Topic 6g will not be discussed further in the EIR.

TOPIC 7: AIR QUALITY

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Conflict with or obstruct implementation of the applicable air quality plan?	X				
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	X				

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	X				
d) Expose sensitive receptors to substantial pollutant concentrations?	X				
e) Create objectionable odors affecting a substantial number of people?				X	

The San Francisco Bay Area Air Basin encompasses San Francisco, Alameda, Contra Costa, San Mateo, and Napa counties, and includes parts of Solano and Sonoma counties. Although air quality in the air basin has generally improved over the last several decades, elevated levels of ozone, carbon monoxide, and particulate matter have occurred. The Bay Area Air Quality Management District (BAAQMD) is the primary regulatory agency in the Bay Area responsible for planning, implementing, and enforcing federal and state ambient air quality standards. These standards are established in regulations implementing the Clean Air Act and the California Clean Air Act. An Air Quality Technical Report (AQTR) will be prepared for the TEP to assess the potential air quality impacts that may result from construction and implementation of the TEP components. Most or all of the construction projects that would result from implementing the TEP would be short-term activities that would not be expected to emit large amounts of air pollutants; this will be discussed in more detail in the EIR. In most of the Bay Area, transportation-related sources account for a majority of air pollutant emissions. Therefore, a major focus of the BAAQMD is reducing vehicle trips associated with new development. While the TEP components are expected to result in the increased use of transit and potential reduction of private

vehicle travel in San Francisco, the proposed project would also result in an increased number of transit trips with some increase in the number of transit vehicles, including diesel motor coaches on some streets within San Francisco. The potential air quality effects related to Service Improvements will be analyzed in the AQTR. The results will be summarized in the EIR.

Odor impacts could result from siting new odor sources such as a wastewater treatment plant, a landfill or composting facility, a refinery or chemical plant, or a food processing facility, near existing sensitive receptors, or placing new receptors near an existing odor source. The TEP would not involve siting any new facilities that would generate substantial odors, and would not involve construction of new facilities to house new residents or attract new employees to a location with existing odor sources. Therefore the proposed project would not create objectionable odors affecting substantial numbers of people. For this reason, there would be no odor impacts, and Topic 7e will not be discussed in the EIR.

TOPIC 8: GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X		
b) Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X		

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHGs has been

implicated as the driving force for global climate change. The primary GHGs are carbon dioxide, methane, nitrous oxide, ozone, and water vapor.

Individual projects contribute to the cumulative effects of climate change by emitting GHGs during demolition, construction, and operational phases. While the presence of the primary GHGs in the atmosphere is naturally occurring, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are largely emitted from human activities, accelerating the rate at which these compounds occur within earth's atmosphere. Emissions of carbon dioxide are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Black carbon has recently emerged as a major contributor to global climate change, possibly second only to CO_2. Black carbon is produced naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels and biomass.[57] N_2O is a byproduct of various industrial processes and has a number of uses, including use as an anesthetic and as an aerosol propellant. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes. Greenhouse gases are typically reported in "carbon dioxide-equivalent" measures (CO_2E).[58]

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to global warming. Many impacts resulting from climate change, including increased fires, floods, severe storms and heat waves, are occurring already and will only become more frequent and more costly.[59] Secondary effects of climate change are likely to include a global rise in sea level, impacts to agriculture, the state's electricity system, and native freshwater fish ecosystems, an increase in the vulnerability of levees in the Sacramento-San Joaquin Delta, changes in disease vectors, and changes in habitat and biodiversity.[60,61]

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57 Center for Climate and Energy Solutions. *What is Black Carbon?*, April 2010. Available online at: http://www.c2es.org/docUploads/what-is-black-carbon.pdf. Accessed September 27, 2012.

58 Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

59 California Climate Change Portal. Available online at: http://www.climatechange.ca.gov. Accessed September 25, 2012.

60 California Climate Change Portal. Available online at: http://www.climatechange.ca.gov/. Accessed September 25, 2012.

61 California Energy Commission. California Climate Change Center. *Our Changing Climate 2012*. Available online at:http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf. Accessed August 21, 2012.

The California Air Resources Board (ARB) estimated that in 2009 California produced about 457 million gross metric tons of CO_2E ($MMTCO_2E$).[62] The ARB found that transportation is the source of 38 percent of the State's GHG emissions, followed by electricity generation (both in-state generation and imported electricity) at 23 percent and industrial sources at 18 percent. Commercial and residential fuel use (primarily for heating) accounted for nine percent of GHG emissions.[63] In the Bay Area, the transportation (on-road motor vehicles, off-highway mobile sources, and aircraft) and industrial/commercial sectors were the two largest sources of GHG emissions, each accounting for approximately 36 percent of the Bay Area's 95.8 $MMTCO_2E$ emitted in 2007.[64] Electricity generation accounts for approximately 16 percent of the Bay Area's GHG emissions followed by residential fuel usage at seven percent, off-road equipment at three percent and agriculture at one percent.[65]

In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows: by 2010, reduce GHG emissions to 2000 levels (approximately 457 $MMTCO_2E$); by 2020, reduce emissions to 1990 levels (estimated at 427 $MMTCO_2E$); and by 2050 reduce statewide GHG emissions to 80 percent below 1990 levels (approximately 85 $MMTCO_2E$).

In response, the California legislature passed Assembly Bill No. 32 in 2006 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires ARB to design and implement emission limits, regulations, and other measures, such that feasible and

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62 California Air Resources Board (ARB). *California Greenhouse Gas Inventory for 2000-2009— by Category as Defined in the Scoping Plan*. Available online at: http://www.arb.ca.gov/////ghg_inventory_scopingplan_00-09_2011-10-26.pdf. Accessed August 21, 2012.

63 ARB. *California Greenhouse Gas Inventory for 2000-2009— by Category as Defined in the Scoping Plan*. Available online at: http://www.arb.ca.gov/cc/inventory/data/table/ghg_inventory_scopingplan_00-09_2011-10-26.pdf. Accessed August 21, 2012.

64 Bay Area Air Quality Management District (BAAQMD). *Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2007*, February 2010. Available online at: http://www.baaqmd.gov/~//Files/%20and%20Research/%20Inventory/_2_10.ashx. Accessed August 21, 2012.

65 BAAQMD. *Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2007, Updated: February 2010*. Available online at: http://www.baaqmd.gov/~/media/Files/ning%20and%20Research/%20Inventory/regionalinventory2007_2_10.ashx. Accessed August 21, 2012.

cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction from forecast emission levels).[66]

Pursuant to AB 32, ARB adopted a Scoping Plan in December 2008, outlining measures to meet the 2020 GHG reduction limits. The Scoping Plan is the State's overarching plan for addressing climate change. In order to meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emission levels, or about 15 percent from 2008 levels.[67] The Scoping Plan estimates a reduction of 174 $MMTCO_2E$ (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and high global warming potential sectors, see Table 9, below. ARB has identified an implementation timeline for the GHG reduction strategies in the Scoping Plan.[68]

The AB 32 Scoping Plan recommendations are intended to curb projected business-as-usual growth in GHG emissions and reduce those emissions to 1990 levels. Therefore, meeting AB 32 GHG reduction goals would result in an overall annual net decrease in GHGs as compared to current levels and accounts for projected increases in emissions resulting from anticipated growth.

The Scoping Plan also relies on the requirements of Senate Bill 375 (SB 375) to implement the carbon emission reductions anticipated from land use decisions. SB 375 was enacted to align local land use and transportation planning to further achieve the State's GHG reduction goals. SB 375 requires regional transportation plans, developed by Metropolitan Planning Organizations, to incorporate a "sustainable communities strategy" in their regional transportation plans (RTPs) that would achieve GHG emission reduction targets set by ARB. SB 375 also includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development. SB 375 would be implemented over the next several years and the Bay Area Metropolitan Transportation Commission's 2013 RTP, Plan Bay Area, would be its first plan subject to SB 375.

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[66] Governor's Office of Planning and Research (OPR). Technical Advisory- CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review, June 19, 2008. Available online at: http://opr.ca.gov/docs/june08-ceqa.pdf. Accessed August 21, 2012.

[67] ARB. *California's Climate Plan: Fact Sheet*. Available online at: http://www.arb.ca.gov/cc//scoping_plan_fs.pdf. Accessed August 21, 2012.

[68] ARB. Assembly Bill 32: Global Warming Solutions Act. Available online at: http://www.arb.ca.gov/cc/ab32/ab32.htm/. Accessed August 21, 2012.

Table 9: GHG Reductions from the AB 32 Scoping Plan Sectors[69,70]

GHG Reduction Measures By Sector	GHG Reductions (MMT CO_2E)
Transportation Sector	62.3
Electricity and Natural Gas	49.7
Industry	1.4
Landfill Methane Control Measure (Discrete Early Action)	1
Forestry	5
High Global Warming Potential GHGs	20.2
Additional Reductions Needed to Achieve the GHG Cap	34.4
Total	174
Other Recommended Measures	
Government Operations	1-2
Methane Capture at Large Dairies	1
Additional GHG Reduction Measures:	
Water	4.8
Green Buildings	26
High Recycling/ Zero Waste • Commercial Recycling • Composting • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing	9
Total	**41.8-42.8**

AB 32 further anticipates that local government actions will result in reduced GHG emissions. ARB has identified a GHG reduction target of 15 percent from current levels for local governments themselves and noted that successful implementation of the Scoping Plan relies on local governments' land use planning and urban growth decisions because local governments have the primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions.[71] The BAAQMD has conducted an analysis of the effectiveness of the region in meeting AB 32 goals from the actions outlined in

[69] ARB. Climate Change Scoping Plan, December 2008. Available online at: http://www.arb.ca.gov//scopingplan//adopted_scoping_plan.pdf. Accessed August 21, 2012.

[70] ARB. *California's Climate Plan: Fact Sheet*. Available online at: http://www.arb.ca.gov/cc/facts/_plan_fs.pdf. Accessed August 21, 2012.

[71] ARB. *Climate Change Scoping Plan*. December 2008. Available online at: http://www.arb.ca.gov//scopingplan//adopted_scoping_plan.pdf. Accessed August 21, 2012.

the Scoping Plan and determined that in order for the Bay Area to meet AB 32 GHG reduction goals, the Bay Area would need to achieve an additional 2.3 percent reduction in GHG emissions from the land use driven sector.[72]

Senate Bill 97 (SB 97) required the Office of Planning and Research (OPR) to amend the state *CEQA Guidelines* to address the feasible mitigation of GHG emissions or the effects of GHGs. In response, OPR amended the *CEQA Guidelines* to provide guidance for analyzing GHG emissions. Among other changes to the *CEQA Guidelines*, the amendments added a new section to the CEQA Checklist (*CEQA Guidelines* Appendix G) to address questions regarding the project's potential to emit GHGs.

The BAAQMD is the primary agency responsible for air quality regulation in the nine county San Francisco Bay Area Air Basin. The BAAQMD recommends that local agencies adopt a Greenhouse Gas Reduction Strategy consistent with AB 32 goals and that subsequent projects be reviewed to determine the significance of their GHG emissions based on the degree to which that project complies with a Greenhouse Gas Reduction Strategy.[73] As described below, this recommendation is consistent with the approach to analyzing GHG emissions outlined in the *CEQA Guidelines*.

At a local level, the City has developed a number of plans and programs to reduce the City's contribution to global climate change. San Francisco's GHG reduction goals, as outlined in the 2008 Greenhouse Gas Reduction ordinance are as follows: by 2008, determine the City's GHG emissions for the year 1990, the baseline level with reference to which target reductions are set; by 2017, reduce GHG emissions by 25 percent below 1990 levels; by 2025, reduce GHG emissions by 40 percent below 1990 levels; and finally by 2050, reduce GHG emissions by 80 percent below 1990 levels. San Francisco's Greenhouse Gas Reduction Strategy documents the City's actions to pursue cleaner energy, energy conservation, alternative transportation, and solid waste policies. As identified in the Greenhouse Gas Reduction Strategy, the City has implemented a number of mandatory requirements and incentives that have measurably reduced GHG emissions including, but not limited to, increasing the

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[72] BAAQMD. *California Environmental Quality Act Guidelines Update, Proposed Thresholds of Significance*, December 2009. Available online at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Proposed%20Thresholds%20of%20Significance%20Dec%207%2009.ashx. Accessed September 25, 2012.

[73] BAAQMD. *California Environmental Quality Act Air Quality Guidelines*, May 2012. Available online at: http://www.baaqmd.gov/~/media//Planning%20and%20Research/QA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en. Accessed September 25, 2012.

energy efficiency of new and existing buildings, installation of solar panels on building roofs, implementation of a green building strategy, adoption of a zero waste strategy, a construction and demolition debris recovery ordinance, a solar energy generation subsidy, incorporation of alternative fuel vehicles in the City's transportation fleet (including buses), and a mandatory recycling and composting ordinance. The strategy also identifies 42 specific regulations for new development that would reduce a project's GHG emissions.

The Greenhouse Gas Reduction Strategy concludes that San Francisco's policies and programs have resulted in a reduction in GHG emissions below 1990 levels, exceeding statewide AB 32 GHG reduction goals. As reported, San Francisco's communitywide 1990 GHG emissions were approximately 6.15 $MMTCO_2E$. A recent third-party verification of the City's 2010 communitywide and municipal emissions inventory has confirmed that San Francisco has reduced its GHG emissions to 5.26 $MMTCO_2E$, representing a 14.5 percent reduction in GHG emissions below 1990 levels.[74,75]

In compliance with SB 97, OPR amended the *CEQA Guidelines* to address the feasible mitigation of GHG emissions or the effects of GHGs. Among other changes to the *CEQA Guidelines*, the amendments added a new section to the CEQA Checklist (*CEQA Guidelines* Appendix G) to address questions regarding the project's potential to emit GHGs. The potential for a project's implementation to result in GHG emissions that would have a significant global climate change impact is based on the *CEQA Guidelines* and CEQA Checklist, as amended by SB 97, and is determined by an assessment of the project's compliance with local and state plans, policies and regulations adopted for the purpose of reducing the cumulative effects of climate change. GHG emissions are analyzed in the context of their contribution to the cumulative effects of climate change because, by itself, a project could not generate enough GHG emissions to change the global average temperature noticeably. *CEQA Guidelines* Sections 15064.4 and 15183.5 address the analysis and determination of significant impacts from a proposed project's GHG emissions.

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74 ICF International. *Technical Review of the 2010 Community-wide GHG Inventory for City and County of San Francisco*. Memorandum from ICF International to San Francisco Department of the Environment, April 10, 2012. Available online at: http://www.sfenvironment. org/ download/greenhouse-gas-inventory-3rd-party-verification-memo. Accessed September 27, 2012.

75 ICF International. *Technical Review of San Francisco's 2010 Municipal GHG Inventory*. Memorandum from ICF International to San Francisco Department of the Environment, May 8, 2012. Available online at: http://www.sfenvironment.org/download/third-party-verification-of-san-franciscos-2010-municipal-ghg-inventory. Accessed September 27, 2012.

CEQA Guidelines Section 15183.5 allows public agencies to analyze and mitigate GHG emissions as part of a larger plan for the reduction of greenhouse gases and describes the required contents of such a plan. As discussed above, San Francisco has prepared its own Greenhouse Gas Reduction Strategy, demonstrating that San Francisco's policies and programs have collectively reduced communitywide GHG emissions to below 1990 levels, meeting GHG reduction goals outlined in AB 32. The City is also well on its way to meeting the long-term GHG reduction goal of reducing emissions 80 percent below 1990 levels by 2050. Chapter 1 of the City's *Strategies to Address Greenhouse Gas Emission (*the Greenhouse Gas Reduction Strategy) describes how the strategy meets the requirements of *CEQA Guidelines* Section 15183.5. The BAAQMD has reviewed San Francisco's Greenhouse Gas Reduction Strategy, concluding that "Aggressive GHG reduction targets and comprehensive strategies like San Francisco's help the Bay Area move toward reaching the State's AB 32 goals, and also serve as a model from which other communities can learn."[76]

With respect to *CEQA Guidelines* Section 15064.4(b), the factors to be considered in making a significance determination include: 1) the extent to which GHG emissions would increase or decrease as a result of the proposed project; 2) whether or not a proposed project exceeds a threshold that the lead agency determines applies to the project; and finally 3) demonstrating compliance with plans and regulations adopted for the purpose of reducing or mitigating GHG emissions.

The GHG analysis provided below includes a qualitative assessment of GHG emissions that would result from a proposed project, including emissions from an increase in vehicle trips, natural gas combustion, and/or electricity use among other things. Consistent with the *CEQA Guidelines* and BAAQMD recommendations for analyzing GHG emissions, the significance standard applied to GHG emissions generated during project construction and operational phases is based on whether the project complies with a plan for the reduction of GHG emissions. The City's Greenhouse Gas Reduction Strategy is the City's overarching plan documenting the policies, programs and regulations that the City implements towards reducing municipal and communitywide GHG emissions. In particular, San Francisco implements 42 specific regulations that reduce GHG emissions, which are applied to projects within the City. Projects that comply with the Greenhouse Gas Reduction

[76] BAAQMD. *Letter from J. Roggenkamp, BAAQMD, to B. Wycko, San Francisco Planning Department*, October 28, 2010. Available online at: http://www.sf-planning.org/ftp/files/MEA/GHG-Reduction_Letter.pdf. Accessed September 24, 2012.

Strategy would not result in a substantial increase in GHGs, since the City has shown that overall communitywide GHGs have decreased and that the City has met AB 32 GHG reduction targets. Individual project compliance with the City's Greenhouse Gas Reduction Strategy is demonstrated by completion of the Compliance Checklist for Greenhouse Gas Analysis.

In summary, the two applicable greenhouse gas reduction plans, the AB 32 Scoping Plan and the City's Greenhouse Gas Reduction Strategy, are intended to reduce GHG emissions below current levels. Given that the City's local greenhouse gas reduction targets are more aggressive than the State's 2020 GHG reduction targets and consistent with the long-term 2050 reduction targets, the City's Greenhouse Gas Reduction Strategy is consistent with the goals of AB 32. Therefore, proposed projects that are consistent with the City's Greenhouse Gas Reduction Strategy would be consistent with the goals of AB 32, would not conflict with either plan, and would therefore not exceed San Francisco's applicable GHG threshold of significance. Furthermore, a locally compliant project would not result in a substantial increase in GHGs.

The following analysis of the proposed project's impact on climate change focuses on the project's contribution to cumulatively significant GHG emissions. Given the analysis is in a cumulative context, this section does not include an individual project-specific impact statement.

Impact C-GG-1: The proposed project would generate greenhouse gas emissions, but not in levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions. (*Less than Significant*) (Criteria 8a and 8b)

The most common GHGs resulting from human activity associated with land use decisions are CO_2, black carbon, CH_4, and N_2O.[77] Individual projects contribute to the cumulative effects of climate change by directly or indirectly emitting GHGs during construction and operational phases. Direct operational emissions include GHG emissions from new vehicle trips and area sources (natural gas combustion). Indirect emissions include emissions from electricity providers, energy required to pump, treat, and convey water, and emissions associated with landfill operations.

[77] Office of Planning and Research. Technical Advisory- CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review, June 19, 2008. Available at the Office of Planning and Research's website at: http://www.opr.ca.gov/ceqapdfs/june08-ceqa.pdf. Accessed March 3, 2010.

With respect to GHG emissions, indirect effects of the Policy Framework as related to the TEP would result from implementation of the Service Improvements, the Service-related Capital Improvements, and the transit TTRPs referred to here as the proposed project. The proposed project would increase the activity along the San Francisco public rights-of-way (streets) during the construction of the TTRPs and Service-related Capital Improvements, and the limited number of curb ramps related to Service Improvements, that would result in GHG emissions during the construction phases. The proposed project would also result in an increase in direct and indirect Muni transit vehicle GHG emissions during the operation of the TEP.

The construction vehicles and equipment used to implement the TTRPs and Service-related Capital Improvements would result in an increase in GHG emissions. Greenhouse gases would also be emitted from vehicles delivering supplies to construction sites and construction worker vehicle trips.[78] Additionally, construction of some TPS Toolkit elements, such as transit bulbs or pedestrian refuge islands, would require demolition of portions of the street or sidewalk, resulting in an increase in GHG related to landfill transport. Therefore, the proposed project would temporarily contribute to increases in GHGs due to construction activity.

Direct GHG emissions from transit vehicles would increase due to the increase in the frequency of service for biodiesel-fueled motor coaches (standard biodiesel buses and biodiesel hybrid-electric buses) and the corresponding increase in transit vehicle miles traveled.[79] However, increased use of public transit is an important element in local and regional GHG reduction strategies. A study by the U.S. Department of Transportation based on transit system data from throughout the U.S. found that, on average, public diesel-fueled buses produced 33 percent less GHG emissions per passenger mile than the average single-occupancy vehicle.[80] The savings increase to 82 percent for a typical diesel transit bus when it is full with 40 passengers.[81] The local and regional GHG reduction strategies recognize that improvements in public transit service and efficiency will result in an increase in the number of passengers who otherwise would be using privately owned passenger vehicles. For instance,

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78 Workers that walk, bike, or take public transit would not create GHG emissions.

79 Increase in the service frequency of electric trolley coaches and light rail vehicles would not result in an increase in GHG emission since these vehicles are powered by hydroelectric sources, which do not produce GHG emissions.

80 U.S. Department of Transportation, Federal Transit Administration, Public Transportation's Role in Responding to Climate Change, January 2010. Available at U.S. Department of Transportation's website at: http://www.fta.dot.gov/documents/TransportationsRoleInRespondingToClimateChange2010.pdf. Accessed October 5, 2012.

81 Ibid.

San Francisco's Climate Action Plan indicates that the major ways to reduce transportation sector GHG emissions are by reducing vehicle trips by encouraging a shift from driving to alternative modes such as public transit.[82] The proposed project may result in an increase in the number of passengers who would otherwise use privately owned vehicles. In addition, a greater decrease in annual long-term GHG emissions is anticipated from the replacement over time of the SFMTA's transit fleet such that by 2020 the fleet would consist entirely of zero-emissions vehicles.[83]

As discussed above and consistent with the state *CEQA Guidelines* and BAAQMD recommendations for analyzing GHG emissions under CEQA, projects that are consistent with San Francisco's *Strategies to Address Greenhouse Gas Emissions* would result in a less-than-significant GHG impact. Based on an assessment of the proposed project's compliance with San Francisco's *Strategies to Address Greenhouse Gas Emissions*, the proposed project would be required to comply with the following ordinances that reduce greenhouse gas emissions, see Table 10.

[82] San Francisco Department of the Environment and San Francisco Public Utilities Commission. Climate Action Plan for San Francisco: Local Actions to Reduce Greenhouse Emissions, September 2004. Available at San Francisco Department of the Environment's website at: http://www. sfenvironment.org//default/files/fliers/files/climateactionplan.pdf. Accessed October 5, 2010.

[83] San Francisco Municipal Transportation Agency. 2008. *2009 Climate Action Plan* (draft). Available at the SFMTA web site online at http://www.sfmta.com/cms/rcap/documents/ClimateActionPlan12-19-08FINALweb.pdf. Accessed January 15, 2013.

Table 10: Regulations Applicable to Municipal Projects

Regulation	Requirement(s)	Project Compliance	Discussion
Transportation sector			
Commuter Benefits Ordinance (San Francisco Environment Code, Section 421)	All City employees are offered commuter benefits for transit and vanpool expenses. The City Hall bike room provides secure bicycle parking, showers, and lockers for bicycle commuters. City employees are also eligible for telecommuting and alternative work schedules.	**Project Complies**	City employees hired as a result of this project would be eligible for Commuter Benefits under the existing ordinance. Additionally, SFMTA employees are not charged to use the Muni system. The TEP would not include any specific actions that would interfere with any existing policies or practices related to the City's implementation of the Commuter Benefits Ordinance.
Emergency Ride Home Program	All City employees are automatically eligible for the emergency ride home program.	**Project Complies**	City employees hired as a result of this project would be automatically eligible for the Emergency Ride Home Program. The TEP would not include any specific actions that would interfere with any existing policies or practices related to the City's implementation of the Emergency Ride Home Program.

Regulation	Requirement(s)	Project Compliance	Discussion
Healthy Air and Clean Transportation Ordinance (San Francisco Environment Code, Chapter 4)	Implements policies to minimize the use of single occupancy vehicles and reduce the total number of passenger vehicles and light-duty trucks in the Municipal Fleet. In addition, requires all new purchases or leases of passenger vehicles and light-duty trucks to be the cleanest and most efficient vehicles available on the market. There are also requirements for medium and heavy-duty vehicles and for phasing out highly polluting vehicles (biodiesel Muni buses).	**Project Complies**	The TEP would include the addition of a fleet of smaller vehicles (referred to as Community Vans) designed to operate on lighter ridership routes and serve some of San Francisco's narrower neighborhood streets. These vans would replace existing 30-foot vehicles and accommodate approximately 20 to 25 passengers. Since the vans would replace existing buses, these would not be an expansion fleet. Operationally, the change in vehicle type would prioritize lowering emissions. These medium-duty vans would likely have comparable to or lower emissions of particulate matter, nitrogen oxides (NOx), and the greenhouse gases such as carbon dioxide than the hybrid transit buses they replace. The vans would be powered by the cleanest available technology that meets the SFMTA's duty cycle reliability and performance needs. Over project implementation, the TEP would increase the number of buses in the Muni fleet. The new buses would be hybrid-electric, powered by biodiesel, producing less NOx emissions than existing vehicles. In addition, the TEP would not interfere with or impact the SFMTA's strategy to reduce fleet emissions through maximizing the use of zero- and low-emission buses, converting buses to biodiesel, and replacing conventional diesel buses with hybrids as a bridge technology to fuel cells. Therefore, the TEP would comply.

Regulation	Requirement(s)	Project Compliance	Discussion
Biodiesel for Municipal Fleets (Executive Directive 06-02)	Requires all diesel-using City Departments to begin using 20 percent biodiesel blend (B20). Sets goals for all diesel equipment to be run on biodiesel by 2007 and goals for increasing biodiesel blends to 100 percent.	**Project Complies**	The SFMTA currently uses B20 (a blend of 20% biodiesel and 80% ultra-low-sulfur diesel in all Agency diesel vehicles. Conversions of all three SFMTA motor coach divisions to B20 was completed on August 1, 2012. All new transit buses, including those purchased as a result of the TEP, would be compatible with B20. The TEP does not include any specific provisions related to the use of biodiesel. However, any increase in vehicles as a result of this project would comply with the SFMTA's policies to use biodiesel. The TEP would not alter the SFMTA's policy to increase the use of biodiesel in City-owned diesel vehicles.
Clean Construction Ordinance (San Francisco Administrative Code, Section 6.25)	Effective March 2009, all contracts for large (20+ day) City projects are required to fuel diesel vehicles with B20 biodiesel, anduse construction equipment that meet USEPA Tier 2 standards or best available control technologies for equipment over 25 hp.	**Project Complies**	TEP construction activities would be performed in accordance with the Clean Construction Ordinance. Contract specifications would include the requirement for B20 biodiesel and Tier 2 construction equipment or best available control technology for diesel exhaust emissions.
Waste Reduction Sector			
Resource Efficiency and Green Building Ordinance (San Francisco Environment Code, Chapter 7)	The ordinance requires all demolition and new construction projects to prepare a Construction and Demolition Debris Management Plan designed to recycle construction and demolition materials to the maximum extent feasible, with a goal of 75% diversion. The ordinance specifies requirements for all city buildings to provide adequate recycling space.	**Project Complies**	Construction contract specifications for the TEP projects would include the requirement that the contractor prepare a Construction and Demolition Debris Management Plan to recycle demolition or other construction waste to the maximum extent possible, with a goal of 75 percent diversion.

Regulation	Requirement(s)	Project Compliance	Discussion
Resource Conservation Ordinance (San Francisco Environment Code, Chapter 5)	This ordinance establishes a goal for each City department to (i) maximize purchases of recycled products and (ii) divert from disposal as much solid waste as possible so that the City can meet the state-mandated 50% division requirement. Each City department shall prepare a Waste Assessment. The ordinance also requires the Department of the Environment to prepare a Resource Conservation Plan that facilitates waste reduction and recycling. The ordinance requires janitorial contracts to consolidate recyclable materials for pick up. Lastly, the ordinance specifies purchasing requirements for paper products.	**Project Complies**	The TEP would not alter any existing policies or practices within the SFMTA to meet the requirements of Chapter 5 of the San Francisco Environment Code. The SFMTA would comply with the Resource Conservation Ordinance for any actions related to the TEP, as applicable. Construction contract specifications would include the requirement that the contractor comply with Resource Efficiency and Green Building Ordinance's goal of recycling 75% of construction waste and therefore, would also comply with the Resource Conservation Ordinance goal of 50% waste diversion.
Construction Recycled Content Ordinance (San Francisco Administrative Code, Section 6.4)	The Construction Recycled Content Ordinance requires the use of recycled content material in public works projects to the maximum extent feasible and gives preference to local manufacturers and industry.	**Project Complies**	Construction contract specifications would be prepared in accordance with the requirements of Section 6.4 of the San Francisco Administrative Code. Construction of the TEP would comply to the extent applicable.
Environment/Conservation Sector			
Street Tree Planting Requirements for New Construction (San Francisco Planning Code Section 143)	Planning Code Section 143 requires new construction, significant alterations or relocation of buildings within many of San Francisco's zoning districts to plant on 24-inch box tree for every 20 feet along the property street frontage.	**Project Complies**	Trees would be removed or relocated in a few locations as part of the TEP construction. San Francisco transit-related infrastructure improvements are designed with a goal of preserving existing trees. However, for any TEP proposal where trees would be removed, the SFMTA would comply with the Planning Code and the Urban Forestry Ordinance to replace any such trees as required.

Regulation	Requirement(s)	Project Compliance	Discussion
Stormwater Management Ordinance and Construction Pollution Prevention (San Francisco Environment Code, Chapter 7)	For City sponsored projects, the LEED Project Administrator shall submit documentation verifying that a construction project that is located outside the City and County of San Francisco achieves the LEED SS6.2 credit. Construction projects located within the City and County of San Francisco shall implement the applicable stormwater management controls adopted by the SFPUC. All construction projects shall develop and implement construction activity pollution prevention and stormwater management controls adopted by the SFPUC, and achieve LEED prerequisite SSp1 or similar criteria adopted by the SFPUC, as applicable.	**Project Complies**	The SFMTA would comply with the SFPUC's Stormwater Management Controls, as applicable to the TEP proposals.

San Francisco Municipal Transportation Agency's Departmental Climate Action Plan and the Climate Action Strategy

In addition to complying with the City's regulations, the 2008 Green Building Ordinance requires that all City Departments prepare an annual department-specific climate action plan. In 2009, the SFMTA adopted its first 2009 Climate Action Plan, which detailed policies, program, goals, funding and relationships with other City departments to reduce GHG emissions in the transportation sector and in agency operations. The SFMTA comprehensive Climate Action Plan was updated in 2011.[84]

The SFMTA Climate Action Plan outlines steps needed to achieve the goal of a 20 percent reduction in GHGs from 1990 levels, including emission-free vehicles, fewer vehicle miles traveled and modal shift to transit, bikes, and walking. As an organization responsible for pedestrian circulation, bicycling, parking, street

[84] San Francisco Municipal Transportation Agency, Departmental Climate Action Plan, March 31, 2011, available at http://www.sfmta.com/cms/cmta/documents/4-19-11Item13CASmemoaccessible.pdf, accessed on December 24, 2012.

management, and the Muni transit system, the SFMTA is essential to reducing carbon emissions in San Francisco. While the SFMTA itself contributes one percent to the City's carbon footprint, it directly prevents much larger amounts of emissions by attracting people to sustainable transportation modes. Approximately 50 percent of San Franciscans commute to work by transit, walking, carpooling, or bicycling – a higher percentage than nearly every other American city.[85] Among City agencies, the SFMTA and its multi-modal purview is especially able to effect significant reductions in GHG emissions since private automobiles are the primary source of emissions in this sector, representing 60 percent of the problem. Remaining emissions come from heavy trucks and buses, trains, boats, planes and all other mobile sources.

More than half of Muni's transit vehicles are powered by non-polluting, hydroelectric power, including light rail vehicles, historic streetcars, cable cars, and the largest fleet of electric trolley buses in North America. Additionally, since 1990, the SFMTA has replaced most of its diesel motor coach fleet with modern, low-emission models and introduced fuel-efficient hybrid buses. Muni has also begun to implement its *Clean Air Plan: Zero Emissions 2020*, a blueprint for further reducing motor coach emissions and fossil fuel use through bridge technologies such as hybrid buses and cleaner fuels such as biodiesel.

The SFMTA has applied for the American Public Transportation Association Sustainability Commitment program for transit agencies and related private companies at the Gold level. This program has a ranking system similar to LEED and is based around ISO-14001 operations standards and practices.[86]

In addition to the City departmental goal of a 20 percent reduction in GHG emissions, Proposition A, passed by voters in November 2007, included a 20 percent reduction goal for carbon emission levels specific to the entire transportation sector. In compliance with the mandates of Proposition A, the SFMTA prepares a Climate

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[85] This transportation mode split is based on 2009 American Community Survey Data that is presented in the SFMTA Climate Action Strategies (CAS). It should be noted that the data only includes City residents and does not factor in the contribution of regional trips that end in San Francisco.

[86] International Organization for Standardization, ISO 14000 is a series of voluntary standards in the environmental field under development by the ISO; ISO 14001 requires that a community or organization put in place and implement a series of practices and procedures that, when taken together, result in an environmental management system. Available at the U.S.EPA website at: http://water.epa.gov/polwaste/wastewater/Environmental-Management-System-ISO-14001-Frequently-Asked-Questions.cfm, accessed on December 24, 2012.

Action Strategies (CAS) document with updates every two years. The SFMTA is working to reduce the impacts of automobile emissions and congestion through multiple initiatives some of which are described in the SFMTA CAS, which complements the San Francisco Department of the Environment's Climate Action Plan by focusing on carbon emission reductions achieved through transportation policies and programs.

The SFMTA's CAS details efforts to reduce carbon emissions in two key categories: Travel Demand Management (TDM) and Infrastructure Support. The SFMTA's CAS indicates that Travel Demand Management would be accomplished through improvements in Travel Choices and Information, Demand Pricing, and Transit-Oriented Development. Infrastructure Support would be accomplished through measures such as Transit Improvements, Complete Streets, and Electric Vehicles. Existing and proposed actions within these areas are described below.

Travel Choices and Information are actions that the SFMTA can implement in the near-term at a relatively low cost while generating net revenue. Currently, the SFMTA has an active parking cash-out program. In the future, the SFMTA proposes to establish or expand measures to coordinate private shuttles with the transit system; to expand carshare and commuter carpool options; and to create employer-paid transit passes and vanpools.

Demand Pricing are actions that the SFMTA can implement in the near term but cannot succeed without transit upgrades and expansions. The SFMTA recently expanded the SF*park* Program and demand-based parking fees citywide. In the future, the SFMTA proposes to reform off-street parking policies; to implement variable rate road pricing on bridges and streets; and to optimize peak hour service delivery schedules.

Transit-Oriented Development relies on zoning changes and regional economic growth to continue positive changes to the built environment. It also generates more walking, bicycling and transit trips while reducing per capita vehicle miles traveled. Thus far, the SFMTA has worked with other City agencies to focus housing and job growth and infill redevelopment along existing transit lines and within regional Priority Development Areas. The SFMTA proposes to continue working with other City agencies to require all new developments to have smart mobility passes as part of homeowners' association fees and business leases; to optimize carshare parking near transit centers; require sufficient parking for carshare and bicycles in new

developments; and to remove parking requirements for new developments, including to unbundle parking in new developments from residential units.

Transit Improvements are critical to allow the TDM strategies to succeed. The SFMTA is currently working towards the improvement of transit reliability and transit travel time, and reduction in overcrowding though the TEP, which would be implemented following this environmental review. In addition, the SFMTA is funding State of Good Repair and safety improvements. In the future, the SFMTA proposes to expand its transit fleet and storage and maintenance facilities to accommodate growth; and to the extent possible, to dedicate exclusive San Francisco rights-of-way for rail and bus networks.

The development of *Complete Streets* can be phased and play a critical role in speeding transit service, allowing safe pedestrian trips and increasing bicycle travel. The SFMTA is currently working to complete implementation of the SFMTA Bicycle Plan, to increase bicycle parking capacity citywide, and to develop pedestrian amenities and plazas, including the completion of the street grid to the waterfront. In the future, the SFMTA proposes to complete green streets and slow zones citywide; and implement a bicycle sharing program and develop capacity for electric bicycles.

Electric Vehicles have significant carbon dioxide reduction potential with high private costs and require significant infrastructure upgrades. The SFMTA is currently converting 100 percent of the taxi fleet to low-carbon vehicles and expanding its program for neighborhood charging and residential retrofits. In the future, the SFMTA proposes to provide incentives for shared low-carbon and electric vehicles; to require charging infrastructure for new development, carsharing and electric bicycles; to require smart-grid networked vehicle charging systems in high demand areas; and to require low-carbon service delivery vehicles in the city.

The SFMTA has prepared a status report on its efforts to reduce GHG emissions (FY 2009-2010 Departmental Climate Action Plan). The status report demonstrates that the SFMTA is ahead of schedule in meeting Departmental 2012 greenhouse gas reduction targets. As of the end of June 2010, the SFMTA reduced 1990 greenhouse gas emissions by 21 percent from 1990 levels.

Conclusion

Depending on a proposed project's size, use, and location, a variety of controls are in place to ensure that a proposed project would not impair the State's ability to meet

statewide GHG reduction targets outlined in AB 32, or impact the City's ability to meet San Francisco's local GHG reduction targets. Given that: (1) San Francisco has implemented regulations to reduce GHG emissions specific to new construction and renovations of private developments and municipal projects; (2) San Francisco's sustainable policies have resulted in the measured reduction of annual GHG emissions; (3) San Francisco, including the efforts of city agencies such as the SFMTA, has met and exceeds AB 32 GHG reduction goals for the year 2020 and is on track towards meeting long-term GHG reduction goals; (4) current and probable future state and local GHG reduction measures will continue to reduce a project's contribution to climate change; and (5) San Francisco's *Strategies to Address Greenhouse Gas Emissions* meet the CEQA and BAAQMD requirements for a Greenhouse Gas Reduction Strategy, projects that are consistent with San Francisco's regulations would not contribute significantly to global climate change. The proposed project would be required to comply with the requirements referenced above, and was determined to be consistent with San Francisco's *Strategies to Address Greenhouse Gas Emissions.*[87] As such, the proposed program-level and project-level TEP project would result in a less-than-significant impact with respect to GHG emissions. The indirect effects of the Policy Framework as related to TEP would also result in a less than significant impact with respect to emissions. No mitigation measures are necessary. This topic will not be discussed in the EIR.

For the above reasons, additional environmental review with respect to greenhouse gas emissions is not expected to be needed for the Policy Framework as related to TEP or any of the TEP components.

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[87] San Francisco Planning Department, Compliance Checklist Greenhouse Gas Analysis for Transit Effectiveness Project, October 2012. A copy of this document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File. 2011.0558E.

TOPIC 9: WIND AND SHADOW

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Alter wind in a manner that substantially affects public areas?				X	
b) Create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas?			X		

The project-level Service Improvements relate to transit operations and would not have direct effects on wind or shadow and are not discussed in the following impact analysis.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to wind and shadow would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional environmental review pursuant to CEQA if necessary once any such projects are developed and proposed.

None of the TEP components would result in the construction or relocation of buildings or structures that typically create wind and shadow effects. The proposed

project would involve construction of above-grade poles for the OWE projects, and certain elements of the TPS Toolkit and TTRPs that involve relocation or installation of new traffic signals. These components of the TEP are addressed in the impact discussion below. Other Service-related Capital Improvements, such as the TTPIs and SCI projects, and curb ramps related to Service Improvements would be constructed at or close to grade and would not result in wind or substantial shadow effects; these TEP components are not discussed in the impact analysis.

Effects on wind and shadow would be the same at both the program and project level because the physical characteristics and extent of the elements that would be constructed for both the program- and project-level TEP components is known and provides sufficient detail for analysis regardless of the specific location for implementation. Thus, the following discussion evaluates the environmental effects of the TEP in its entirety, including indirect effects of the Policy Framework, under the topic of wind and shadow.

Wind

Impact WS-1: The proposed project would not alter winds in a manner that would substantially affect public areas. *(No Impact)* (Criterion 9a)

Wind impacts are generally caused by large building masses extending substantially above neighboring buildings, and by new buildings oriented or designed with large walls that that interfere with and channel prevailing winds, particularly if such a wall contains little or no articulation. Generally, wind impacts are caused by construction of buildings over 80 feet tall that are located in high-density areas.

The City's wind standards (Planning Code Section 148) do not apply to the Policy Framework or TEP because none of the project components would involve the construction of buildings or occupied structures, or any structures with massing capable of affecting street level wind conditions in any consequential manner. The proposed project would involve construction of above-grade structures, including overhead wire support poles and wires, traffic signal mast arms, accessible boarding platforms, pedestrian lighting, and stop signs, for the Service-related Capital Improvements and TTRPs. The maximum height of the traffic signal poles and overhead wire support poles and wires, the tallest physical structures in the TEP, would be 30 feet. Overhead wire support poles have a diameter of up to 13 inches at the base of the pole. Traffic signal poles have a diameter of up to 16 inches at their base. Given the largest pole diameter is approximately 16 inches, this would not be

sufficient mass to substantially alter local wind patterns. The accessible platform structures (SCI.2) would be 5 feet wide by 7 and one-half-feet long, but are approximately 6 and one-half feet in height (with the top 3 feet consisting of open railing) and would not be of sufficient height and mass to have any effect on local wind patterns. All other physical improvements constructed as part of the TEP would be at- or below-grade and would not result in any change to wind conditions.

The proposed program- and project-level TEP components would not have an impact on wind. This topic will not be discussed further in the EIR.

Shadow

Impact WS-2: The proposed project would not create new shadow that substantially affects outdoor recreation facilities or other public areas. *(Less than Significant)* (Criterion 9b)

A proposed project would have a significant shadow effect if it would create or result in new shadow that substantially affects outdoor recreation facilities or other public areas. The TEP would not result in the construction of any buildings or structure of any height or bulk such that significant shadowing would occur on public open spaces, including those under the jurisdiction of the Recreation and Park Commission. Section 295 of the Planning Code was adopted in response to Proposition K (passed in November 1984) in order to protect certain public open spaces from shadowing by new structures during the period between one hour after sunrise and one hour before sunset, year round. Section 295 restricts new shadow upon public spaces under the jurisdiction of the Recreation and Park Commission by any structure exceeding 40 feet unless the City Planning Commission and the Recreation and Park Commission find the impact to be insignificant.

Section 295 of the Planning Code does not apply to the TEP as no building permit is required for the proposed project. In addition, the maximum height of any of the physical improvements constructed as part of the TEP would be 30 feet. Given the 16-inch diameter of the tallest proposed TEP components, the 30-foot-tall traffic signal and overhead wire support poles, these structures would not have a sufficient mass to create substantial new shadow. Therefore, due to the limited bulk of the program- and project-level TEP components, any new shadows produced as a result of the proposed project would be minimal and would have a less-than-significant shadow impact on outdoor recreation facilities and other public areas. This topic will not be discussed further in the EIR.

For the reasons above, the Policy Framework as related to the TEP or any components of the TEP are not anticipated to require further environmental review with respect to wind and shadow impacts.

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TOPIC 10: RECREATION

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?			X		
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X	
c) Physically degrade existing recreational resources?			X		

Within San Francisco, the San Francisco Recreation and Park Department (RPD) manages and operates more than 220 parks, playgrounds, and open space areas throughout the City. The RPD recreation facilities include 15 recreation centers, nine swimming pools, five golf courses, and more than 300 athletic fields, tennis courts, and basketball courts. Regional parks within or in close proximity to the City and under the jurisdiction of the National Park Service include the Golden Gate National Recreation Area (with open space areas such as Ocean Beach and Baker Beach in San Francisco and the Marin Headlands north of the City) and the Presidio of San Francisco. These facilities are currently served by the SFMTA's existing transit

network, as well as limited service by other regional transit operators (Golden Gate Transit) or special transit districts (Presidio Go).

Inasmuch as the Policy Framework may indirectly result in alteration of the physical environment due to the TEP, the physical alterations are embodied as Service Improvements, Service-related Capital Improvements, and the TTRPs. To the extent that implementation of objectives and action items of the Policy Framework could potentially result in significant impacts on parks and recreational facilities that are not addressed in the analysis of the TEP, such projects may be required to undergo additional CEQA analysis to disclose the potential for any new significant environmental impacts not discussed in this Initial Study, and will identify feasible mitigation measures if required.

Effects on parks and recreation facilities and resources would be similar for both the program-level and project-level TEP components because the extent, general locations, and magnitude of the physical effects are sufficiently defined to conduct analysis. For example, the general locations of the corridors and the geographic extent of the program-level Service-related Capital Improvements and the nine program-level TTRPs are known, and the general characteristics of the TPS Toolkit elements are also known. Therefore, the following discussion evaluates both program- and project-level environmental effects of the TEP in its entirety under the topic of recreation.

Impact RE-1: The proposed project would not result in the increased use of existing neighborhood or regional parks or other recreation facilities such that substantial physical deterioration would occur or be accelerated. (*Less than Significant*) (Criterion 10a)

Increased recreational facility or park use in a community is usually driven by the addition of new users, typically new residents, and to a lesser degree, new workers. As discussed in Topic 1, Land Use and Land Use Planning, and Topic 3, Population and Housing, the proposed project is not anticipated to result in an increase in population, housing, or residents, and would not exceed what has already been anticipated and planned for in City and regional population growth projections through 2035. Any increased employment during the construction phase of the TEP project is anticipated to be temporary and likely to draw from the regional workforce; thus, these construction workers would not be expected to result in a perceptible increase in the use of City recreation facilities. An additional 150-200 SFMTA employees are anticipated to be added as a result of TEP implementation. As some

of these permanent employees may either spend more time in the City, or relocate their residence to the City, a negligible increase in the use of parks and recreational facilities may result.

The Service Improvements, Service-related Capital Improvements, and TTRPs would include or facilitate the creation of new routes, changes to some route alignments, changes to the span and frequency of service on other routes, and reduced transit travel time. These changes would alter the access to some parks and recreational facilities by relocating stops, requiring use of alternate routes, or providing different travel times. These changes may make traveling to some parks and recreation facilities more convenient and therefore result in an incremental increase in usage. On the other hand, the proposed changes may require users to walk farther or perhaps transfer in order to access a facility. Therefore, the changes would not result in a marked difference in the overall use of the parks and recreational facilities.

For example, service on the Route 76 Marin Headlands serving the Marin Headlands would be expanded to include Saturday service in addition to existing Sunday service. Additionally, stops along this route within its Downtown San Francisco segment would be consolidated to improve travel time and increase its reliability.[88] This overall expansion in service may provide more residents with opportunities to use the Marin Headlands open space area, but a portion of that increase in use may be residents already using the park but accessing it with another mode, such as private vehicles, Golden Gate Transit, bicycles, etc. The Route 76 Marin Headlands service would provide approximately one bus each hour and modifications would result in relatively minor increases in the number of visitors to the Golden Gate National Recreation Area.[89] Therefore, this service improvement would not result in increased deterioration of any recreational facilities.

Examples of other service changes altering the access to parks and recreation facilities as a result of TEP include the following: Hawk Hill (6 Parnassus Extension to West Portal resulting from the proposed Service Improvements extending the route, supported by the Service-related Capital Improvement Project OWE.3), Justin Herman Plaza (16X Noriega Express), San Juan Batista Circle and San Francisco

[88] The SFMTA received environmental clearance to conduct a pilot for this service improvement. The pilot project received an exemption for information collection under case number 2012.1140E. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2012.1140E.

[89] In 2011, there were 14,567,487 visitors to the Golden Gate National Recreation Area. https://irma.nps.gov/Stats/Reports/ReportList, Accessed December 19, 2012.

State University (17 Parkmerced), Civic Center Park (19 Polk), Mission Bay Commons (22 Fillmore), the Presidio (43 Masonic), Douglass Playground/Tennis Courts, West Sunset Playground, and Ocean Beach (48 Quintara-24th Street), University Mound Reservoir Water Facilities Open Space and Balboa Park (54 Felton), and Visitacion Valley Playground (56 Rutland).

The changes in access to City and regional parks and recreation facilities as a result of TEP would not substantially increase the use of any of these facilities such that substantial physical deterioration would occur or be accelerated. Therefore, the TEP components would have a less-than-significant impact on parks and recreational facilities. In addition there would be no indirect recreation effects from the Policy Framework as related to TEP.

Impact RE-2: The proposed project would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. (*No Impact*) (Criterion 10b)

The Policy Framework is a policy document setting forth objectives and future actions for transit improvements. Related to the TEP, the indirect effects of the Policy Framework are manifest in the effects on recreational facilities identified for the TEP components. The TEP components include planned service changes and physical improvements designed to enhance the customer experience, transit reliability, and to reduce travel time for the City's Muni transit system. No recreation facilities would be constructed as part of the project.

The TTRP.J would relocate the J Church outbound transit stop from the north side of 18th Street to the south side, into the northwest corner of Dolores Park adjacent to the existing inbound stop. A new boarding platform would be constructed within the boundaries of the park; however, as discussed in Impact RE-3, below, this new boarding platform would not degrade existing recreational facilities or require the construction or expansion of recreational facilities, and would not result in any physical impacts due to any such construction or expansion.

As stated in Impact RE-1, the construction and operation of the TEP components is anticipated to result in a negligible increase in the use of recreational facilities due to a slight increase in SFMTA employees. However, these additional 150 to 200 employees are not anticipated to generate more than a minor increase, if any, in the use of recreational facilities. Therefore, no additional construction or expansion of recreational facilities resulting from the implementation of the TEP is anticipated.

Thus, implementation of both the program-level and project-level TEP components would not have any impact requiring the construction or expansion of recreational facilities.

Impact RE-3: The proposed project would not result in the degradation of recreational resources. (*Less than Significant*) (Criterion 10c)

Recreational impacts occur when a project physically degrades existing recreational facilities. The TEP would have the potential to physically affect parks, recreation facilities, and open spaces due to the construction of physical improvements adjacent to or within an established transit right-of-way within a park. The TTRPs would include the construction of transit improvements within the existing Fulton Street right-of-way along the northern edge of Golden Gate Park (TTRP.5), and the existing Lincoln Way and Stanyan Street rights-of-way along the southern edge the park (TTRP.71). All of these improvements would be completed within the existing developed portions of these rights-of-way currently legislated for such transportation elements. Examples of these TTRP improvements within these existing rights-of-way include the addition of concrete pads at several transit stops along Fulton Street to facilitate customer amenities at these stops as part of the TTRP.5.

The TTRP.J would include the relocation of the outbound J-Church transit stop at the intersection of Church and 18th streets from Church Street to a boarding platform within Dolores Park, opposite the existing inbound platform and with a similar physical design. The land that would be used for this platform is located between the existing inbound stop and Church Street. It is a very small portion of Dolores Park, and is not currently used for active recreational purposes. Two mature trees would need to be removed to construct the new boarding platform for the outbound transit stop; the loss of these two trees would not result in substantial degradation in Dolores Park requiring new or replacement park facilities (see also the discussion of tree removal in Topic 13, Biological Resources). Thus, the boarding platform installed at the northwest corner of Dolores Park as part of the TTRP.J improvements would have a less-than-significant impact on this recreational resource.

The Service Improvements would include changes in the frequency of transit vehicles alongside or within existing recreational resources, such as the J Church and 76 Marin Headlands. However, given the magnitude (up to 10 percent) of the proposed service increase across the entire Muni system, the increase in Muni transit vehicle trips adjacent to or within the park or open space is not anticipated to have a substantial physical impact, which would degrade these resources. Therefore, the

Policy Framework as related to the TEP and the proposed program- and project-level TEP components would have a less-than-significant impact on recreational resources and no mitigation is necessary. This topic will not be discussed in the EIR.

Combined Impacts

The combined impacts of the Policy Framework as related to TEP and TEP components as a whole on citywide and regional recreational facilities and public open spaces would be less than significant because, insofar as these impacts may combine, the TEP would not result in a substantial increase in the use of existing parks and recreational facilities. Therefore, there would be no substantial degradation of recreational resources necessitating new, replacement or expansion of recreational facilities.

Cumulative Impacts

Impact C-RE-1: The proposed project in combination with other past, present, or reasonably foreseeable future projects would not result in a cumulatively considerable contribution to significant cumulative impacts on recreation. (*Less than Significant*)

The geographic context for the cumulative impacts associated with recreation is the entire City of San Francisco. Cumulative impacts occur when the impacts from the proposed project combine with similar impacts from other past, present, or reasonably foreseeable future projects in a similar geographic area

As discussed under Impact RE-1, the Policy Framework and TEP proposals would not introduce new land uses. Implementation of the Policy Framework and the TEP would not add residents to the City beyond those already accounted for in estimated growth projections used in these analyses, and would add only a small number of employees to San Francisco. The increased park use by new employees would be negligible when applied across the City's parks and compared to development projects generating larger increases in park use. While the TEP would result in altered access to parks and recreational facilities, it would not result in a change in usage that would lead to deterioration of any such facilities.

Therefore, the Policy Framework as related to the TEP and the TEP, when considered in combination with reasonably foreseeable cumulative development, would not result in a cumulatively considerable contribution to significant cumulative impacts to recreational resources, and no mitigation is necessary. Therefore, this topic will not be discussed further in the EIR.

For the reasons above, the Policy Framework as related to the TEP or any components of the TEP are not anticipated to require further environmental review recreation impacts.

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TOPIC 11: UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			X		
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X		
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X		
d) Have sufficient water supply available to serve the project from existing entitlements and resources, or require new or expanded water supply resources or entitlements?			X		

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
e) Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X		
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X		
g) Comply with federal, state, and local statutes and regulations related to solid waste?			X		

The proposed project would not involve development of new residential units, commercial businesses, or industrial uses. The various TEP components would be constructed and operated primarily within the public right-of-way. As a result, utility and service systems throughout the City would pertain to the proposed project, including wastewater, stormwater drainage, and water supply facilities, and solid waste disposal.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood.

Any indirect effects of the Policy Framework with respect to utilities and service systems would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional CEQA analysis if necessary once any such projects are developed and proposed.

The Service Improvements, which would include the creation of new routes, changes to route alignment, and changes to frequency of some routes, would result in the need for approximately 60 additional transit vehicles. The addition of transit vehicles may affect utilities because of the additional water used for maintenance of these vehicles. There would be no other effects with respect to utilities as a result of the Service Improvements.

The Service-Related Capital Improvements (Terminal and Transfer Point Improvements, Overhead Wire Expansion projects, and Systemwide Capital Infrastructure projects) and the TTRPs would make physical changes to the streets, which could affect storm sewers and might require relocation of the other subsurface utilities.

Impacts on utilities and service systems would be similar for both the program-level and project-level components of the TEP. The evaluation with respect to this topic is not dependent on the final determination of the specific design details of Service-related Capital Improvements or the specific locations and TPS Toolkit elements used on each of the nine program-level TTRP corridors. The construction parameters for the Service Improvements, Service-related Capital Improvements and TPS Toolkit elements are known, including depth of excavation and potential effects to utilities. Therefore, the following discussion evaluates both program-level and project-level TEP components together in their entirety.

Impact UT-1: The proposed project would not exceed the wastewater treatment requirements of the Regional Water Quality Control Board. *(Less Than Significant Impact)* (Criterion 11a)

The City's combined sanitary sewer and stormwater system collects, transports, and treats sanitary sewage and stormwater runoff in the same facilities. Discharges to federal and state waters are governed by two National Pollutant Discharge

Elimination System (NPDES) permits: the 2008 Bayside Permit (NPDES Permit No. CA0037664) and the 2009 Oceanside Permit (NPDES Permit No. CA0037681).

The TEP is located within the two drainage areas of the City's combined sanitary sewer and stormwater system, the Bayside and the Westside.[90] All wastewater and stormwater flows that emanate from the Bayside basin are subject to the 2008 Bayside Permit, issued and enforced by the San Francisco Bay Regional Water Quality Control Board. The 2008 Bayside Permit specifies discharge prohibitions, dry-weather effluent limitations, wet-weather effluent performance criteria, receiving water limitations, sludge management practices, and monitoring and reporting requirements for the Southeast Water Pollution Control Plant, the North Point Wet-Weather Facility, and the Bayside Wet-Weather Transport/Storage and Diversion Structures. During wet weather, the capacity at the Southeast Water Pollution Control Plant is supplemented by the North Point Wet-Weather Facility and the Bayside Wet-Weather Transport/Storage and Diversion Structures, a series of storage/transport boxes located around the perimeter of the City.[91] If wet-weather flows exceed the capacity of the overall system, the excess (primarily stormwater) is discharged from one of 36 combined sewer overflow (CSO) structures located along the waterfront. The permit prohibits overflows from the CSO structures during dry weather, and requires wet-weather overflows to comply with the nine minimum controls specified in the federal Combined Sewer Overflow Control Policy.

Implementation of the Policy Framework or TEP components would not result in new residents or businesses, and the proposed project would not substantially increase the amount of impervious surfaces as the components would be almost entirely implemented within the existing public right-of-way (which, in general, is already paved surface), and this would not change the volume of stormwater flows, as discussed in more detail in Impact UT-2. Certain Service-Related Capital Improvements (Terminal and Transfer Point Improvements) and the TTRPs would make some physical changes that could affect storm sewers. The creation of new transit bulbs, pedestrian bulbs, widened sidewalks, pedestrian islands, and transit

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[90] San Francisco is roughly divided into two major drainage areas: the Bayside and Westside basins, which are further divided into eight subdrainage areas. SFPUC, *San Francisco Sewer System Master Plan,* June 15, 2010, pp. 3-1 – 3-4, available at http://www.sfwater.org/modules/showdocument.aspx?documentid=723, accessed on November 30, 2012.

[91] The storage/transport boxes provide treatment consisting of settling and screening of floatable materials inside the boxes and is equivalent to primary treatment at the wastewater treatment plants. SFPUC, *San Francisco Sewer System Master Plan,* June 15, 2010, pp. 3-1 – 3-10, available at http://www.sfwater.org/modules/showdocument.aspx?documentid=723, accessed on November 30, 2012.

islands may require that storm water catch basins be relocated or reconstructed. The Service-Related Capital Improvements that would not involve in-street construction (Overhead Wire Expansion projects, and Systemwide Capital Infrastructure projects), would have no impact on storm sewers.

The relocation and reconstruction of storm sewers would be done in accordance to the DPW specifications and the San Francisco Public Works Code (Article 2.4, Section 2.4.13(7)),[92] which requires that transit projects within the public right-of-way incorporate low-impact design stormwater facilities consistent with Stormwater Design Guidelines to the maximum extent practical and feasible. These designs would reduce and delay the peak flows of stormwater reaching the San Francisco sewer system, thereby reducing combined sewer discharges, preventing flooding, and improving water quality. The relocation and reconstruction of stormwater catchbasins would therefore not cause the proposed project to exceed the wastewater treatment requirements of the Regional Water Control Board.

The 60 additional buses that would be added to the Muni fleet under the TEP and would need to be washed, adding slightly to the amount of wastewater that would be treated in San Francisco, but this wastewater would be created in existing SFMTA maintenance facilities that are fully served by adequate wastewater treatment facilities.

The construction activities for the Service Improvements, the TTRPs and the Service-related Capital Improvements would also create some construction-related impacts to wastewater flows. Runoff during construction would be subject to San Francisco Stormwater Management Ordinance. Compliance with existing regulations regarding stormwater Best Management Practices (BMPs) and DPW permit requirements would reduce any potential construction impacts on the wastewater system from both program-level and project level TEP components to less than significant.

The Policy Framework as related to the TEP and the TEP would have less-than-significant impacts related to exceeding wastewater treatment requirements because the storm sewers would be relocated and rebuilt pursuant to the Public Works Code, the small increase in wastewater from washing additional buses would be adequately treated, and runoff during construction would be treated with BMPs. No mitigation measures are necessary and this topic will not be discussed in the EIR.

[92] The San Francisco Public Works Code is available online at http://www.sfdpw.org/index.aspx?page=739, accessed December 4, 2012.

Impact UT-2: The proposed project would not require or result in the construction of new or the expansion of existing water, wastewater treatment or stormwater drainage facilities; or result in a determination that the wastewater treatment provider has inadequate capacity to serve the project. *(Less than Significant)* (Criteria 11b, 11c, 11e)

Water

San Francisco's water supply system is owned and operated by the SFPUC, which supplies water to the City and County of San Francisco and to other users in the Central Valley and the Peninsula. The implementation of the TEP would not result in the construction of habitable structures.

Program-level and project-level TEP components that would involve construction (the Service-related Capital Improvements, the TPS Toolkit as applied to the TTRPs, and limited construction for the Service Improvements to install curb ramps for accessibility) would likely include the use of water for dust control in compliance with the San Francisco Public Works Code requirements in Article 21, which requires the use of reclaimed water or groundwater.[93] Such compliance would reduce or eliminate any short-term water demand as a result of the TEP.

Operation of the TEP components would use water for maintenance of the additional 60 buses added for service during the implementation of the TEP. These 60 new buses would be added to the existing fleet of nearly 1,000 vehicles. This increase in water use would, therefore, be minimal and would be within the increases in water use anticipated in the 2010 Urban Water Management Plan for the City and County of San Francisco. This less-than-significant increase in water demand would be negligible within the context of overall City water use, and implementation of the program-level and project-level TEP components would not require the construction of new water supply facilities.

Wastewater and Stormwater

The City's combined sanitary sewer and stormwater system collects, transports, and treats sanitary sewage and stormwater runoff in the same facilities. Stormwater runoff comprises the primary source of total flows collected, conveyed, and eventually treated at the City's wastewater treatment facilities. Implementation of the proposed project would not alter wastewater flows in the City. Implementation of

[93] If there is no non-potable water available, an exception can be made by the General Manager of the Water Department pursuant to section 1102 of Article 21.

Service-related Capital Improvements (Terminal and Transfer Point Improvements, the Overhead Wire Expansion projects, and Systemwide Capital Infrastructure projects) and TTRPs would include the construction of improvements, such as accessible platforms, the installation of new overhead wires and associated duct banks, pedestrian islands, pedestrian bulbs, transit bulbs, lane modifications, and parking and turn restrictions. In a limited number of transit stop locations, the proposed project would install new concrete pad waiting areas, install curb ramps, or construct new accessible stops or other stop modifications. Program-level TEP components would construct similar transit-related improvements. However, the TEP program-level and project-level physical improvements would be small in scale and would not substantially increase the amount of impervious surfaces. Therefore the TEP would not substantially increase the amount of stormwater drainage, as nearly all of the improvements would occur within paved roadways and existing sidewalks and would replace existing non-permeable surfaces. In some cases, existing stormwater collection facilities, such as drain inlets at street intersections, may need to be relocated and/or enlarged for new transit or pedestrian bulbs, or other TPS Toolkit elements. However, all such relocations would require issuance of a permit by DPW, the review for which would ensure adherence to all applicable ordinances and codes.[94] No increase in the amount of stormwater drainage would be expected.

Since the proposed project would not substantially increase stormwater flow, the proposed project would not require construction of new wastewater, and stormwater collection, conveyance, or treatment facilities; although minor changes to existing stormwater collection facilities may be required. Thus, implementation of the Policy Framework as related to the TEP and program-level and project-level TEP components would result in a less-than-significant impact on wastewater treatment and stormwater drainage facilities; and would not result in a determination by the SFPUC that it has insufficient capacity to continue providing wastewater treatment. No mitigation is necessary, and this topic will not be discussed further in the EIR.

Impact UT-3: The proposed project would have sufficient water supply available from existing entitlements and would not require new or expanded water supply resources or entitlements. *(Less than Significant)* (Criterion 11d)

[94] Heidi Kline, San Francisco Planning Department, Environmental Planning, telephone record of call with Nick Elsner, SF DPW, on November 15, 2012. A copy of this document is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, Case File No. 2011.0558E.

The SFPUC provides an average of approximately 265 million gallons per day of water to approximately 2.5 million people in San Francisco, Santa Clara, Alameda, San Mateo, and Tuolumne Counties.[95] Approximately 96 percent of the water provided to San Francisco is supplied by the SFPUC Regional Water System, which is made up of water from the Hetch Hetchy Reservoir and Bay Area reservoirs in the Alameda Creek and Peninsula watersheds.[96] The City is currently served by this adequate water delivery infrastructure.

The Service Improvements would increase transit service hours, the provision of which would require increasing the current Muni fleet by approximately 60 vehicles. This would result in a negligible increase in long-term demand for water in San Francisco, compared to the usual and ongoing use of water in the maintenance of Muni vehicles.

As explained in Impact UT-2, the amount of water used during construction of the program-level and project-level Service Improvements, Service-related Capital Improvements and TTRPs would be minimal. In addition, non-potable or recycled water is required to be used at construction sites under Article 21 of the Public Works Code.

The proposed project would not generate additional demand for water that would exceed available water resources. Impacts of the Policy Framework as related to the TEP and program-level and project-level TEP components on water supply resources would, therefore, be less than significant, and no mitigation is required. Thus, this topic will not be addressed further in the EIR.

Impact UT-4: The proposed project would increase the amount of solid waste generated on the project sites, but would be adequately served by the City's landfill and would comply with federal, state and local statutes and regulations related to solid waste. *(Less than Significant)* (Criteria 11f and 11g)

Implementation of the proposed project would not result in the construction of new residences or commercial structures; thus, no new residential, commercial, or

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95 SFPUC, *2010 Urban Water Management Plan for the City and County of San Francisco*, adopted June 2011, pp. 7, 14, 22-25. A copy of this document is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File 2011.0558E, and available on the internet at http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=1055, accessed November 30, 2012.

96 SFPUC, *2010 Urban Water Management Plan for the City and County of San Francisco*, adopted June 2011, pp. 22-25. Groundwater and recycled water make up the remainder of the SFPUC supplies to the City.

industrial solid waste would be generated by the proposed project. As stated, indirect effects that may result from the Policy Framework related to the TEP are manifest in the effects identified for the TEP components. However, several components of the TEP would require construction of transit infrastructure. Service Improvements may include limited construction for curb ramps at some locations. The Service-related Capital Improvements include the TTPI, the OWE, and the SCI projects. The TTPI would include sidewalk modifications, installation of new switches, new bypasses, and overhead wiring. The OWE would include the installation of overhead wires, new poles, and utility trenches, and may require installation of duct banks to power the overhead wires. The SCI would involve constructing new accessible platforms, new signage, new traffic signals, and re-striping. The TTRPs would include the construction of several types of TPS Toolkit elements, including pedestrian bulbs, pedestrian refuge islands, transit boarding islands, transit bulbs, and new traffic signals.

The construction from these activities would generate construction debris and waste. The excavated soil and debris from construction sites would be transported off-site to landfill sites. The SFMTA would be required to comply with the Resource Efficiency and Green Building Ordinance (San Francisco Environment Code, Chapter 7). The Green Building Ordinance requires all demolition and new construction projects to prepare a Construction and Demolition Debris Management Plan designed to recycle construction and demolition materials to the maximum extent feasible, with a goal of 75 percent diversion.

Construction contract specifications for the TEP projects would include the requirement that the contractor prepare a Construction and Demolition Debris Management Plan to recycle demolition or other construction waste to the maximum extent possible, with a goal of 75 percent diversion.

Given the above, the construction components of the waste stream generated by the proposed project would be expected to comply with published federal, state, and local statutes and regulations related to solid waste. The Policy Framework as related to the TEP, and proposed program-level and project-level TEP components would therefore result in a less-than-significant impact on the capacity of the landfills used by construction contractors in the region. No mitigation measures are required, and this topic will not be discussed further in the EIR.

Combined Impacts

Regardless of whether or not several individual program- and/or project-level TEP components are constructed at the same time, the use of water for construction dust control at multiple sites would not combine to create a need for additional water treatment facilities, because non-potable water is required to be used for this purpose. Operational use of water is analyzed above considering the TEP as a whole, with the addition of approximately 60 new transit vehicles that would increase the use of water for maintenance, but not in sufficient quantities to require development of new water treatment facilities or new water supplies. The Policy Framework as related to the TEP and the TEP as a whole would not result in a substantial increase in impermeable surfaces throughout the City, and therefore would not result in a significant combined impact on wastewater facilities. Solid waste generated from the combined construction activities of the TEP are analyzed above and would be less than significant because construction contractors would be required to comply with required Construction and Demolition Debris Management Plans with a goal of reducing construction waste by 75 percent.

Cumulative Impacts

Impact C-UT-1: The proposed project in combination with other past, present, or reasonably foreseeable future projects would not result in a cumulatively considerable contribution to significant cumulative impacts on utilities and service systems. (*Less than Significant*)

Reasonably foreseeable future cumulative development and population growth in the City would incrementally increase demand on citywide utilities and service systems.

The City has existing service management plans related to water, wastewater, and solid waste that address anticipated growth in the City and region. Cumulative growth is accounted for in these plans. The Policy Framework as related to the TEP and program-level and project-level TEP components would not result in substantial demands on utility systems, as discussed in Impacts UT-1 through UT-4, and would not cause population growth as discussed in Topic 3: Population and Housing, pp. 195-200. Therefore, the proposed project would not be expected to result in a cumulatively considerable contribution to significant cumulative impacts on utility service provision or facilities. Therefore, this topic will not be discussed further in the EIR.

Additional environmental review with respect to utilities and service systems is not expected to be needed for the Policy Framework as related to the TEP or any components of the TEP.

TOPIC 12: PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire protection, police protection, schools, parks, or other services?			X		

Public Service impacts are assessed by determining whether a project would result in the need to increase or alter service in such a way that would necessitate construction of new facilities or alteration of existing facilities that, in turn, would have an adverse impact on the physical environment. As discussed in Topic 3, Population and Housing, the TEP is not anticipated to generate an increase in population which drives demand for public services. Rather, the TEP components have been designed to serve the existing and anticipated transit needs.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to public services would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional CEQA analysis if necessary once any such projects are developed and proposed.

Effects on public services would be similar for both the program-level and project-level TEP components. While specific details about program-level TEP components have not been defined (e.g., the locations of transit bulbs along the 1 California for TTRP.1 or the exact configuration of the E Line Terminal at Beach and Jones streets), the extent and locations of the physical elements and magnitude of service changes related to these components are sufficiently defined to conduct the analysis with respect to this topic. For example, the general locations of the corridors and the geographic extent of the program-level Service-related Capital Improvements and the nine program-level TTRPs are known, and the general characteristics of the TPS Toolkit elements are also known. Therefore, the following discussion evaluates both program- and project-level environmental effects of the TEP in its entirety under the topic of public services.

Public Service impacts related to parks, open spaces, and other recreation resources are analyzed in Topic 10, Recreation.

Impact PS-1: The proposed project would not result in substantial adverse physical impacts associated with the provision of police protection, fire protection, schools, and library services in order to maintain acceptable service ratios, response times, or other performance objectives. ***(Less than Significant)*** **(Criterion 12a)**

Police Protection Services

The San Francisco Police Department (SFPD) provides police protection services in the City and County of San Francisco. The proposed project crosses into every police station's service area in the City. A map of all eleven San Francisco police station districts is available on the San Francisco Police Department website.[97]

The proposed project would not result in increased residential population or introduce new commercial, office, or industrial uses into San Francisco. The proposed project would include an additional 150 to 200 new employees. Therefore, the proposed project would not generate demand for new police services based on population or employment.

The increase in service hours and the addition of up to 60 transit vehicles could generate a minor increase in the demand for police services for traffic incidents, such as accidents, injuries, and crimes committed on vehicles. SFPD bases its estimates of need for additional facilities on the number and types of calls for service, types and times of traffic and pedestrian flow patterns, and operational hours of uses within each Police District area.[98] Since the additional transit service hours would constitute a ten percent increase above the existing Muni transit service hours, it is not expected that the proposed project would result in a substantial increase in police service hours that would generate a need for new or physically altered police facilities.

The construction of the Service-related Capital Improvements and TTRPs, and curb ramps related to Service Improvements, may generate a temporary increase in demand for traffic control during the construction phase. Construction on certain streets within the City is required to have police personnel onsite, generally stipulated as part of a Special Traffic Permit. Since the construction-related police services (if needed) would be temporary in duration, this would not result in the need for altered or new police facilities, and its impact would, therefore, be less than significant.

The SFMTA has a Security, Investigations and Enforcement Unit that provides overall security and enforcement services for the agency. The Security Operations

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97 San Francisco Police Department, *San Francisco with Police Districts,* November 8, 2010, available at: http://sf-police.org/Modules/ShowDocument.aspx?documentid=26545, accessed on October 2, 2012.

98 Acting Captain Arthur J. Borges, Jr., San Francisco Police Department, Response to Transit Center District Plan EIR Police Services Questionnaire, June 9, 2010, in Transit Center District Plan and Transit Tower Final Environmental Impact Report, May 24, 2012, p. 546.

Unit consists of the Proof of Payment (POP) Group, Investigations, Muni Transit Assistance Program, and a work order with the San Francisco Police Department including a contract for private security guards at all transit facilities. The POP Group administers fare inspections on all transit revenue vehicles and in the subway or on designated platforms/bus stops. The Investigations Group is responsible for handling special investigations of workplace policy violations, graffiti prevention and abatement and Muni-related crime statistics. The Muni Transit Assistance Program provides community-based staff to ride transit lines with high incidences of graffiti and juvenile disturbances to assist with enforcement. Transit Assistants also monitor high schools and junior high schools as well as bus stops and bus lines around the city.[99]

The Enforcement Unit consists of the General Enforcement, Special Events, Enforcement and Enforcement Administration. The General Enforcement Group oversees enforcement activities related to street sweeping, residential permit parking, meters, improperly used disabled placards, booting and towing vehicles and removing abandoned vehicles. The Special Events Enforcement Group oversees and manages the parking enforcement needs and requirements for the various city special events, by enforcing parking restrictions at such events, and by directing traffic flow, prior to and after such events conclude.[100]

The Emergency Preparedness Unit provides agency-wide leadership in coordinating efforts and initiatives designed to maintain a high level of awareness and readiness and response to emergencies including acts of terrorism. This unit also provides liaison and coordination functions with Bay Area regional transit agencies, City and County of San Francisco departments as well as state and federal emergency management officials and agencies.[101]

All of the above-described functions within SFMTA ensure that reliance on SFPD services is minimized, particularly for relatively minor issues such as graffiti or traffic management during special events.

The additional police hours required as a result of TEP implementation, or indirectly from the Policy Framework as related to the TEP, would not necessitate new or altered police facilities. The program-level and project-level impact on police

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99 Email from Sean Kennedy, SFMTA, to Debra Dwyer. January 11, 2013. A copy of this email is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File 2011.0558E

100 Ibid.

101 Ibid.

protection services from the proposed project would be less than significant and no mitigation is necessary. The topic of police services will not be discussed in the EIR.

Fire Protection and Emergency Services

The San Francisco Fire Department (SFFD), headquartered at 698 Second Street, provides fire suppression and emergency medical services to the City and County of San Francisco. The SFFD consists of three divisions, which are subdivided into 10 battalions and 42 active stations located throughout the City. There are currently no plans to increase SFFD personnel beyond the new station planned for Third Street and Mission Rock. A map of all San Francisco fire stations is available on the San Francisco Fire Department website.[102]

The proposed project would not result in increased residential population or introduce new commercial, office, or industrial uses into San Francisco. The project would include an additional 150 to 200 new SFMTA employees. Therefore, the proposed project would not generate demand for new fire suppression and emergency medical services based on population or employment.

The increase in transit service hours and the addition of up to 60 transit vehicles could generate a negligible increase in the demand for fire suppression and emergency medical services for traffic incidents. Since the additional transit service hours would constitute a ten percent increase above the existing Muni transit service hours, it is not expected that the proposed project would result in a substantial increase in demand for fire protection services such that new or physically altered fire protection facilities would be required. Although construction of the TTRPs would result in changes within the public right-of-way, the physical improvements would not adversely impact response time for the emergency vehicles as there would be no change to the existing street grid.

Thus, the additional fire suppression and emergency medical services required as a result of TEP implementation, or indirectly as a result of the Policy Framework related to the TEP, would not necessitate new or altered Fire Department facilities. In addition, the TEP physical improvements would not adversely impact response time for emergency vehicles. The program-level and project-level impact of the proposed project on fire suppression and emergency medical services would be less than

[102] San Francisco Fire Department, *San Francisco Fire Station Locations*, undated, available at: http://www.sf-fire.org/index.aspx?page=176, accessed on October 3, 2012.

significant and no mitigation is necessary. The topic of fire and emergency medical services will not be discussed in the EIR.

Schools

The San Francisco Unified School District (SFUSD) operates San Francisco's public schools. SFUSD managed 112 schools during the 2009 – 2010 academic year, including 73 elementary schools, 13 middle schools, 19 high schools, and nine charter schools, with a total enrollment of 55,140.[103] SFUSD student enrollment declined from 1995 to 2007 and has stabilized since then.[104] In the years to come, SFUSD anticipates that elementary school and middle school enrollment will grow, but high school enrollment is expected to decline due to the declining birth rates of the 1990s. Additional schools are under consideration in fast-growing areas of San Francisco, e.g., Mission Bay, Treasure Island, and Bayview Hunters Point, but no final decisions have been made. A list of all SFUSD schools and their addresses is available at the SFSUD website.[105]

The demand for additional school facilities is driven largely through the increase in residential population in a community. The proposed project would not introduce new residential units or population growth. Implementation of the TEP may result in 150 to 200 additional SFMTA employees. There may be an incremental increase in the student population as a result of these new employees. The increase, if any, would not be substantial, and no new school facilities would be needed as a result of this small employment growth. Additionally, an increase in construction workers is anticipated during the construction of the TEP physical improvements but would be a temporary increase, would likely draw from a regional workforce, and would not result in the need for new school facilities.

In San Francisco, school children often use the Muni system to travel to and from school facilities. As a result of the TEP, there may be service changes that alter the transit routes that some students use. However, these kinds of changes would not require provision of new school facilities. Therefore, the indirect effects of the Policy Framework related to the TEP as well as the implementation of both the program-level and project-level TEP components would have a less-than-significant impact on

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[103] San Francisco Unified School District Overview, available at http://www.sfusd.edu/en/about-sfusd/sfusd-profile.html; accessed on July 30, 2012.

[104] California Department of Education, Educational Demographics Office, available at http://dq.cde.ca.gov/dataquest, accessed on September 26, 2012.

[105] SFUSD, *San Francisco Unified School District, All Schools,* 2012, available at http://www.sfusd.edu/en/schools/all-schools.html, accessed on October 3, 2012.

school facilities, and no mitigation is necessary. Thus, this topic will not be discussed in the EIR.

Libraries

The San Francisco Public Library operates the Main Library at Civic Center, at 100 Larkin Street, and 28 neighborhood branches throughout San Francisco. Community-based branch libraries, as well as the Main Library, provide reading rooms, book lending, information services, access to technology, and library-sponsored public programs.

In 1994, San Francisco voters passed Proposition E, a Charter amendment that created the Library Preservation Fund, which provided library services and materials, and aids in the operation of library facilities. Proposition E requires the City to maintain funding for the San Francisco Public Library at a level no lower than the amount it spent during the 1992–1993 fiscal year. Voters renewed the Library Preservation Fund in November 2007 (Proposition D).

The Branch Library Improvement Program resulted from a bond measure passed in November 2000 to provide $106 million in funding to upgrade San Francisco's branch library system, and Proposition D, which passed in November 2007, authorizing additional funding to improve the branches. A map of all libraries in San Francisco is available on the San Francisco Library website.[106]

The demand for libraries is driven largely through the increase in residential units and population in a community. The proposed project would not introduce new residential units or population growth. Implementation of the TEP may result in 150 to 200 additional SFMTA employees which may produce an incremental increase in the use of library services. The increase, if any, would not be substantial, and no new libraries would be needed as a result of this small employment growth. Additionally, an increase in construction workers is anticipated during the construction of the TEP physical improvements but would be considered a temporary increase, would likely draw from a regional workforce, and would not have an adverse impact on library facilities.

Therefore, due to the negligible increase in demand for library services as a result of the additional SFMTA employees, the implementation of both the program-level and

[106] City and County of San Francisco, *Library Locations and Hours, March 12, 2012,* available at: http://sfpl.org/pdf/libraries/sfpl421.pdf, and accessed on October 3, 2012.

project-level TEP components would have a less-than-significant impact on library facilities. For this reason there would be no significant indirect effects on libraries from the Policy Framework as related to the TEP. No mitigation is necessary. Thus, this topic will not be discussed in the EIR.

Combined Impacts

There could be an incremental increase in demand for police services for traffic diversion when multiple TEP components are under construction simultaneously. However, police personnel are used for traffic diversion on construction sites in high traffic or particularly congested areas, so although multiple construction TEP projects may occur simultaneously, this would not result in the need for new or altered police facilities.

The analysis in Impact PS-1 considered construction and operation of the TEP, and indirect effects of the Policy Framework, and therefore analyzed the combined effects on the need for new or altered police, fire, school, and library facilities, and determined that no new or altered facilities would be needed. Therefore, there would not be significant physical environmental effects on these services from the combined Policy Framework and construction and operation of the TEP.

Cumulative Impacts

Impact C-PS-1: The proposed project in combination with other past, present or reasonably foreseeable future projects would not result in a cumulatively considerable contribution to significant impacts on police services, fire protection, emergency services, schools, or libraries such that new or altered facilities are required. *(Less than Significant*)

When considered with reasonably foreseeable future cumulative development in the vicinity of the project site, implementation of the proposed project would not affect demand for police protection, fire protection, emergency services, schools, or libraries beyond levels anticipated and planned for by these service providers. Construction projects within the City's rights-of-way are permitted through DPW and during that process referrals are sent to the Fire and Police Departments, which would be able to address any temporary construction issues they may have concerning concurrent construction projects. As described, the Policy Framework as related to the TEP and TEP projects would only incrementally increase the need for police, fire and emergency services, if at all, and would not require additional or altered facilities to meet the demand generated. Therefore, the proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on police protection, fire protection and emergency services, schools, and

libraries, to the extent that would affect service levels or necessitate new or altered service facilities, and the proposed project's program-level and project-level impacts would be less than significant.

Additional environmental analysis with respect to the need to alter or provide new facilities for public services is not anticipated to be required for the Policy Framework as related to the TEP or any of the TEP components.

TOPIC 13: BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			X		

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X		
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?					X

A project would have significant impacts on biological resources if it were to have a substantial adverse effect on candidate, sensitive, or special status species; riparian habitat or a sensitive natural community; federally protected or wetlands; the movement of any migratory fish, wildlife, within migratory wildlife corridors; or conflict with local policies or ordinances related to biological resources, or conflict with any habitat conservation plan. There are no adopted habitat conservation or natural community conservation plans within San Francisco, so Topic 13f is not applicable to the proposed project.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to biological resources would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional CEQA analysis if necessary once any such projects are developed and proposed.

TEP components that could have potential impacts on biological resources include physical changes that would occur with the construction and implementation of curb ramps for the Service Improvements, the Service-related Capital Improvements (TTPIs, OWE, and SCI projects), as well as the application of the TPS Toolkit elements (e.g., transit bulbs, pedestrian islands) for the TTRPs. These TEP components would involve changes to the physical environment that could affect biological resources, and are addressed in the impact analysis below.

Both the program-level and project-level TEP components would be constructed and operated primarily within the existing public right-of-way. Within this context, effects on biological resources would be similar at both the program-level and project-level because the physical characteristics are sufficiently defined to determine potential

effects on biological resources in San Francisco, an urban environment. For example, the general locations of the corridors and the geographic extent of the program-level Service-related Capital Improvements and the nine program-level TTRPs are known, and the general characteristics of the TPS Toolkit elements are also known. Therefore, the following discussion evaluates both program- and project-level environmental effects of the TEP in its entirety under the topic of biological resources.

Impact BI-1: The proposed project would not have a substantial adverse effect, either directly or through habitat modifications, on any special status species, riparian habitat or other sensitive natural community, or federally protected wetlands. (*Less than Significant*) (Criteria 13a, 13b, and 13c)

The TEP would include alteration to or construction of improvements and the operation of transit within the existing public right-of-way throughout the City. In general, the public right-of-way in a developed urban setting does not support or provide habitat for rare or endangered species or sensitive natural communities.

Due to the extent of development and past filling, wetlands are not prevalent within the City. There are no federally protected wetlands[107] area within the City and County of San Francisco. As such, construction and operation of the proposed project would not affect federally protected wetlands. However, wetlands are present in Lake Merced, Glen Canyon Park, Bayview Park, Pine Lake, India Basin, and Treasure Island.[108] Wetlands are also located within the jurisdictional boundary of the Port of San Francisco (Pier 94, Pier 98, and Heron's Head Park), and in the Presidio at locations such as the edges of Mountain Lake, near Crissy Field, and along Lobos Creek.

None of the Service Improvement route changes, or the Service-related Capital Improvements (TTPI, OWE, and SCI projects) would be located within or immediately adjacent to these wetland areas, as construction and operation of the TEP would occur primarily within the public right-of-way.

The Recreation and Park Department has identified about 1,107 acres of significant natural resource areas located within 32 parks and portions of parks in the City. San

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[107] Wetlands are a subset of "waters of the United States" and receive protection under Section 404 of the Clean Water Act.

[108] San Francisco Planning Department, *Significant Natural Areas Management Plan*, Draft EIR, August 2011, p. 286. The Draft EIR is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2005.1912E or online at http://tinyurl.com/sfceqadocs under Case File No. 2005.1912E.

Francisco's natural areas contain rich and diverse plant and animal communities. Some of the Service Improvements would operate within existing right-of-way that adjoins designated natural areas. For example, the new segment for the 17 Park Merced route would be added to the existing roadways surrounding Lake Merced, a natural resource area that includes fresh and seasonal wetlands. This change to bus service would replace the existing service provided by the 18 46th Avenue route service, and there would be no net increase or change in transit service in this area.

The 76 Marin Headlands route uses existing paved right-of-way in the Golden Gate National Recreation Area in the Presidio of San Francisco and in Marin County. The Service Improvements would include service on Saturday as well as the current service on Sunday. This additional service would result in more bus travel in park areas but would not cause any impacts on sensitive biological resources.

As with all of the other proposed Service Improvements, the new bus service described in these examples would be implemented within the existing right-of-way where other vehicular traffic currently operates and would not result in a significant change from existing conditions to the nearby biological resources.

Therefore, the program-level and project-level components of the TEP would have a less-than-significant impact on sensitive natural areas, such as wetlands, riparian areas, or habitat for special status species because the proposed project would be located in the public right-of-way and, in limited cases, on right-of-way that goes through park land. No mitigation is required and this topic will not be discussed further in the EIR.

Impact BI-2: The proposed project would not interfere with the movement of native resident or wildlife species or with established native resident or migratory wildlife corridors. (*Less than Significant*) (Criterion 13d)

There are approximately 400 resident and migratory species of birds in San Francisco, due to the diverse habitats of the Bay Area and its position on a coastal migration path known as the Pacific Flyway. Birds and active nests are protected by the California Fish and Game Code (CFG Code) or the Migratory Bird Treaty Act (MBTA) (16 U.S. Code, Sec. 703 Supp. I, 1989).

Both program- and project-level OWE projects would require installation of new or additional support poles that would vary in height from 26 to 30 feet and would be placed approximately every 90 to 100 feet along a street segment. These support poles would enable the installation of overhead wires to support service changes for

the electric trolley coaches. The TTRP.22 Fillmore would involve installation of new 13-foot-tall pole pedestrian-scale street lights on 16th Street between Potrero Avenue and 7th Street. In addition, the program- and project-level TTRPs and the SC1.1 (Sansome Street Contraflow Lane) would require installation of new traffic signals with mast arms at various locations. In a dense urban setting, overhead wires, light poles and traffic light signals are a common element of the environment, and would not create hazards to birds or interfere with their migration.

The implementation of the TEP has been designed to minimize tree removal. Should tree removal be necessary, compliance with the requirements of the MBTA and the CFG Code would ensure that there would be no significant impact to migratory birds as a result of tree removal and construction disturbances. Depending on the time of year, the SFMTA would be required to comply with the requirements of the MBTA and the CFG Code to ensure the protection of nesting migratory birds. Under these requirements, tree removal activities would be conducted during the non-breeding season (i.e., September through February), or a qualified ornithologist or wildlife biologist would conduct a survey of trees to be removed within three months of the proposed tree removal to determine whether any active nests are present, to avoid impacts on nesting birds.

Therefore, the proposed project would have a less-than-significant impact on the movement of wildlife species or migratory wildlife corridors because the TEP would not involve above-ground buildings or occupied structures, and the elevated poles and traffic light signal masts included in the project are typical elements that already exist and are common in the public right-of-way throughout the City. Impacts on nesting birds would be avoided by compliance with the requirements of state statute and the MBTA. No mitigation is necessary and this topic will not be discussed further in the EIR.

Impact BI-3: The proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (*Less than Significant*) (Criterion 13e)

The San Francisco Planning Department, Department of Building Inspection, and DPW have established guidelines to ensure that the Urban Forestry Ordinance governing the protection of trees is implemented. Public Works Code Section 8.02-8.11 requires disclosure and protection of Landmark, Significant, and Street trees, collectively “protected trees” located on private and public property. A Landmark Tree has the highest level of protection and must meet certain criteria and

be found worthy of Landmark status designation. A Significant tree is either on property under the jurisdiction of the DPW, or on privately owned land within 10 feet of the public right-of-way which satisfies certain criteria. Street trees are trees within the public right-of-way or within the jurisdiction of DPW.

The Service Improvements would not result in any impacts to trees as they would involve operational changes to transit service, which would occur within the right-of-way and would not affect trees. The TEP has been designed to minimize the removal of trees for construction of the Service-related Capital Improvements and TTRPs. The proposed project could require removal of up to ten trees at various locations. However, in the event that street tree removal is necessary, the SFMTA would comply with the requirements of the Urban Forestry Ordinance and the Planning Code, and thus would not conflict with the City's adopted plans concerning the preservation of trees. The DPW Bureau of Urban Forestry must issue a permit before any trees with protected status under the Urban Forestry Ordinance can be removed. If any construction activity is to occur within the dripline of any protected tree, an International Society of Arboriculture-certified arborist must prepare a tree protection plan, and the plan must be submitted to the Planning Department for review and approval before a permit is issued.

Therefore, impacts related to conflicts with a tree preservation ordinance would be less than significant at both the program- and project-level because the SFMTA would be required to comply with city, state, and federal requirements with respect to tree removal and, as discussed under Impact BI-2, the protection of nesting birds. No mitigation is necessary and this topic will not be discussed further in the EIR.

Combined Impacts

Regardless of whether TEP components are constructed simultaneously or operated in adjacent locations, combined impacts on biological resources would be less than significant. Individual project components would all be located in an urban environment, primarily within the public right-of-way that does not support or provide habitat for special status species, and would involve physical street- and transit-related improvements similar to those that already exist. Combined effects of tree removal could occur with respect to nesting migratory birds; however, compliance with federal, state, and local requirements, would ensure that combined effects of tree removal in close proximity would avoid impacts on nesting birds and trees. In particular, with respect to any tree removal, the SFMTA would comply with the requirements of the City Urban Forestry Ordinance. Therefore, there would be no

significant biological resource impacts with respect to the combined effects of TEP components and the Policy Framework as related to TEP.

Cumulative Impacts

Impact C-BI-4: The proposed project in combination with other past, present, or reasonably foreseeable future projects would not result in a cumulatively considerable contribution to significant cumulative impacts on biological resources. (*Less than Significant*)

The geographic context for the cumulative impacts to biological resources is generally a localized area in the immediate vicinity of the project site. Cumulative impacts occur when the environmental impacts from the proposed project combine with similar impacts from other past, present or reasonably foreseeable future projects in a nearby geographic area. Tree removal at various locations would incrementally contribute to the removal of trees within the City; however, the removal of up to ten trees by the proposed project would not be a cumulatively considerable contribution to tree loss citywide in the context of the City's over 100,000 street trees.[109] Implementation of the proposed project would not modify or interfere with existing habitats, sensitive natural areas, riparian habitats or wetlands, migratory wildlife corridors, and would not conflict with adopted regulations, plans or policies intended to protect and preserve rare or endangered species and their habitats. Compliance with federal state, and local requirements would ensure that combined effects of tree removal in close proximity would avoid impacts on nesting birds and trees. The contribution of potential impacts from the implementation of the Policy Framework as related to TEP and the proposed TEP to any cumulative biological resource impacts would not be cumulatively considerable, and cumulative impacts to biological resources would be less than significant.

Therefore, implementation of the Policy Framework as related to the TEP or any components of the TEP may not require further environmental review with respect to biological resources.

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[109] John Wildermuth, Chronicle Staff Writer "S.F. Begins Turning Tree Care Over to Residents," *San Francisco Chronicle*, January 16, 2012, available at www.sfgate.com/bayarea/article/S-F-begins-turning-tree-care-over-to-residents-2556538.php, accessed on December 7, 2012.

TOPIC 14: GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)			X		
ii) Strong seismic ground shaking?			X		
iii) Seismic-related ground failure, including liquefaction?			X		
iv) Landslides?			X		
b) Result in substantial soil erosion or the loss of topsoil?			X		

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?			X		
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property?			X		
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?					X
f) Change substantially the topography or any unique geologic or physical features of the site?			X		

The City and County of San Francisco has a combined sewer system and does not rely on the use of septic tanks or alternative wastewater disposal systems. Therefore, Topic 14e is not applicable to the proposed project. This topic will not be discussed further in this environmental review.

As stated in the significance criteria above, geology and soils impacts may occur when a project directly or indirectly exposes people or structures to geologic hazards or alters the topography in a way that results in erosion or changes to unique geologic features. Whether this type of impact occurs is typically determined by assessing the potential for geologic hazards in the project vicinity and then evaluating whether the proposed project would result in a direct or indirect significant exposure to those hazards. While specific details about program-level components of the TEP have not been defined (for example, the location of a transit bulb along the 1 California for TTRP.1 or the exact configuration of the E Line Terminal at Beach and Jones streets), the project description provides sufficient information to determine whether program-level components of the TEP have the potential to expose people to geologic hazards beyond what would be expected without the project or create undesirable impacts from changes in topography. This is because the general locations of the TTRP corridors and the geographic extent of the Service-related Capital Improvements are known. In addition, general characteristics of the TPS Toolkit elements that would be implemented for the program level TTRPs are also known. As such, the following analysis sets forth the environmental review for the entirety of the TEP at the program and project level.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to geology and soils would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework

may be required to undergo additional CEQA analysis if necessary once any such projects are developed and proposed.

Impact GE-1: Implementation of the proposed project would not result in exposure of people and structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, seismic ground-shaking, liquefaction, lateral spreading, or landslides. (*Less than Significant*) (Criterion 14a)

The 2012 Draft Community Safety Element of the *San Francisco General Plan* contains maps that show areas of the City subject to seismic geologic hazards. The TEP is a citywide program, and includes programs and projects within areas subject to ground shaking from earthquakes along the San Andreas, Northern Hayward and other Bay Area faults. Because the City and County is located in a seismically active region, the potential exists for seismic-related ground failure, seismic-related liquefaction, or landslides.[110] These areas generally include the Western Shoreline, Presidio, Northeastern Waterfront, Downtown, Mission Bay, SoMa, the Mission, Central Waterfront, and Bayview-Hunters Point. These areas are more vulnerable during an earthquake as they are in low-lying and filled land along the Bay, in low-lying valleys and old creek beds, and to some extent, along the ocean. The hills along the central spine of the San Francisco peninsula are composed of rock and soils that are less likely to magnify ground shaking, although they are sometimes vulnerable to landslides during an earthquake. There are, however, no known fault zones or designated Alquist-Priolo Earthquake Fault Zones within the City and County of San Francisco.[111]

The Seismic Hazard Zones Map for San Francisco[112] illustrates the areas with liquefaction potential and those subject to earthquake induced-landslides. This map is used by the City and in its permitting processes. Development requiring excavation within the City right-of-way is subject to DPW permitting requirements, including applicable health and safety requirements of Public Works Code Article 2.4, Excavation in the Public Right-of-Way. In addition to these requirements and given

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[110] San Francisco Planning Department, Draft Community Safety Element, Map 04 – Seismic Hazard Zones, June, 2012. This document is available online at: http://www.sf-planning.org/ftp/General_Plan/Community_Safety_Element_2012.pdf, accessed October 15, 2012.

[111] California Geological Survey, Alquist-Priolo Earthquake Fault Zones, 2010, available online at www.conservation.ca.gov/cgs/rghm/ap/Pages/affected.aspx, accessed October 15, 2012.

[112] California Geological Survey, State of California Seismic Hazard Zones, City and County of San Francisco, California, Official Map, November 17, 2000, available online at: http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_sf.pdf, accessed October 19, 2012.

conditions within San Francisco, the SFMTA engineers take into account geologic and seismic hazards when designing projects that require any type of foundation such as overhead wiring poles or traffic signal mast arms. These types of features are conservatively designed and constructed in accordance with applicable foundation standards taking into account such parameters as soil type, height, grade, etc.[113]

Program-Level Impacts

Although the potential for seismic ground shaking and ground failure to occur within San Francisco is unavoidable, implementation of the TEP would not create habitable structures that would expose people to significant new seismic-related hazards.

Development of the program-level Service-related Capital Improvements would include some new construction for transit terminal and transfer point improvements (TTPI.2, TTPI.3, and TTPI.4), new overhead wiring (OWE.6), and accessible platforms (SCI.1). Most of the construction would affect surface-level improvements such as tracks, pavement, sidewalks and curbs, and transit platforms. The Overhead Wiring Expansion – 6 Parnassus Extension to West Portal Station (OWE.6) project site is greater than one acre in total area and would require more intensive earthmoving work including excavation for utility vaults and conduits. Although the specific locations have not been specified for the program-level TTRP improvements, numerous traffic engineering changes are anticipated within the nine program-level TTRPs and the location of the affected corridors is known (TTRP.1, TTRP.9, TTRP.22_2, TTRP.28_2, TTRP.30_2, TTRP.71, TTRP.K, TTRP.L, and TTRP.M). TTRPs would include the installation of TPS Toolkit elements, such as transit stop changes, lane modifications, parking and turn restrictions, traffic signal and sign changes, and pedestrian improvements that could be affected by seismic shaking.

All program-level TEP components would be located within the existing City right-of-way (primarily City streets) and would not affect any potentially unstable slopes susceptible to landslides. No impacts related to seismic hazards would be anticipated during construction, but program-level TEP components would be subject to potential impacts from ground shaking and ground failure during the operational phase of the TEP. Damage to surface improvements from seismic events, such as accessible platforms constructed under SCI.1, would not create a significant impact

[113] Telephone conversation between D. Dwyer, Environmental Planner, San Francisco Planning Department, and C. Hennessey, Engineer, Division of Sustainable Streets, San Francisco Municipal Transportation Agency, November 20, 2012.

to life and health, but seismic-related damage to other aboveground improvements, such as the overhead wiring poles installed under OWE.6 or traffic signals installed within the TTRPs, have the potential to affect nearby residents and property. For this reason, the SFMTA maintains the Overhead Lines Department within the SFMTA Transit Division. These staff have specialized training to respond to and address incidents of downed overhead wires as safely as possible (see Impact PS-1 in Topic 12, Public Services, on p. 276 for information about the SFMTA Security, Investigations and Enforcement Unit that provides overall security services for the agency.[114]

As noted above, no TEP program-level components would expose persons or structures to new seismic hazards, and improvements such as utility and overhead wiring poles would be subject to engineering requirements as part of the DPW permitting process and engineering design specifications followed by the SFMTA.[115] Therefore, implementation of the TEP program-level components would not result in any significant impacts related to strong seismic ground shaking and seismic-related ground failure, liquefaction, or landslides.

In addition, since there are no known fault zones or designated Alquist-Priolo Earthquake Fault Zones in the City, the implementation of the program-level components of the TEP would have no direct impact on people or structures with respect to rupture of a known earthquake fault. Indirect impacts due to ground shaking related to a fault rupture, would not be significant, as discussed above.

Project-Level Impacts

Implementation of project-level Service Improvements would involve minimal construction, consisting of curb ramps, and no other changes that would be affected by seismic hazards. The project-level Service-related Capital Improvement Projects, including the Persia Triangle Improvements (TTPI.1), overhead wire expansion projects (OWE.1, OWE.2, OWE.3, OWE.4, and OWE.5), and the Sansome Street Contraflow Extension (SCI.2), would include construction similar in nature to that required by the program-level components. The eight project-level TTRP corridors (TTRP.5, TTRP.8X, TTRP.14, TTRP.22_1, TTRP.22_1, TTRP.28_1, TTRP.30_1, TTRP.J, and TTRP.N) would also require construction for transit stop changes, lane

[114] Telephone conversation between D. Dwyer, Environmental Planner, San Francisco Planning Department, and C. Hennessey, Engineer, Division of Sustainable Streets, San Francisco Municipal Transportation Agency, November 20, 2012.

[115] Ibid.

modifications, parking and turn restrictions, traffic signal and sign changes, and pedestrian improvements.

All project-level TEP components would be located within the existing City right-of-way (primarily City streets) and would not affect any potentially unstable slopes susceptible to landslides. No impacts related to seismic hazards would be anticipated during construction, but project-level TEP components would be subject to potential impacts from ground shaking and ground failure during the operation phase of the TEP. All project-level TEP components would be required to comply with the previously discussed permitting requirements and engineering design standards applicable to the program-level components. Therefore, implementation of the TEP project-level components would have a less than significant impact related to the exposure of people and structures to strong seismic ground shaking and seismic-related ground failure, or rupture of a known earthquake fault, including liquefaction, or landslides.

Based on the above analysis, neither program- nor project-level components of the TEP would result in significant impacts from exposure of people or structures to geologic hazards. In addition, there would be no indirect effects from the Policy Framework with respect to the TEP. No mitigation is necessary and this topic will not be addressed in the EIR.

Impact GE-2: The implementation of the proposed project would not result in substantial erosion, loss of topsoil, or adverse impacts to topographical features (*Less than Significant*) (Criteria 14c and 14d)

Program-Level Impacts

Construction activities from the program-level Service-related Capital Improvements and program-level TTRPs, discussed above under Impact GE-1, would expose soils during grading and excavation. Absent proper construction management and implementation of soil erosion control measures, this could result in erosion as well as potentially change topographic features.

For TEP components affecting one acre or more, compliance with NPDES permits related to construction activities as administered by the San Francisco Bay Regional Water Quality Control Board would reduce impacts. Under these regulations, a project sponsor, including the SFMTA, must obtain a general permit through the NPDES Stormwater Program for all construction activities with ground disturbance of one acre or more, which may be required for some of the larger program-related

components, such as OWE.6. The general permit requires the implementation of best management practices to control erosion, including the development of an erosion and sediment control plan for wind and rain.

Other provisions in the San Francisco Public Works Code would be applicable to smaller construction areas. Construction projects greater than 5,000 square feet in area must prepare a Stormwater Control Plan in accordance with Article 4, Section 2.147 of the Public Works Code. All excavation in the public right-of-way, regardless of size, must incorporate several measures to prevent erosion. These include requirements for covering excavation sites, removal of excavated material at the end of each work day, and requirements that any fill material, sand, aggregate, or asphalt may only be stored at the site in covered, locked containers (Public Works Code Article 2, § 4.53).

Implementation of the TEP program-level components would be subject to the above requirements during construction and would therefore minimize the amount of erosion and loss of topsoil due to rain and wind. Although the specific location of all the TPS toolkit elements within the program-level TTRPs are not known, the above regulations would apply wherever these elements are constructed, as they would to the final design of the Service-related Capital Improvements independent of location.

TEP program-related components are located primarily within previously-developed City right-of-way. No significant changes to topography would occur and no unique geologic or physical features are present in these locations. The TEP program-related components would therefore not create an adverse impact related to topographic features.

Following construction, surface soils would be covered with concrete and asphalt which would eliminate the potential for soil erosion. Though some landscape areas may remain, these areas would be covered with an approved surface treatment to minimize the loss of topsoil through erosion. Therefore, the program-level TEP components would have a less than significant impact on the loss of topsoil and potential for on- or off-site erosion.

Project-Level Impacts

Implementation of project-level Service Improvements would involve minimal construction, consisting of curb ramps, and no other changes that would expose soils and potentially result in erosion. The remaining components, the project-level

Service-related Capital Improvements and project-level TTRPs, described above under Impact GE-1, would involve construction similar in nature to that required by the program-level components. Following construction, surface soils would no longer be exposed and no potential for erosion would be present.

All project-level TEP components would be required to comply with the previously discussed regulatory requirements applicable to the program-level components during construction to minimize erosion and topsoil loss. Following construction, surface soils would be covered with concrete and asphalt which would eliminate the potential for soil erosion. Though some landscaped areas may remain, these areas would be covered with an approved surface treatment to minimize the loss of topsoil through erosion. Therefore, the project-level TEP components would have a less than significant impact on the loss of topsoil and potential for on- or off-site erosion.

Based on the above analysis, neither the program-level nor the project-level components of the TEP would result in a significant geology and soils impact and no mitigation is necessary. In addition, there would be no indirect geology and soils effects from the Policy Framework as related to the TEP. This topic will not be addressed further in the EIR.

Impact GE-3: The implementation of the proposed project would not locate sensitive land uses on geologic units or soils that are expansive, unstable, or that would become unstable as a result of future uses, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. (*Less than Significant*) (Criteria 14b and 14f)

The TEP would result in construction and operation of transit improvements primarily within the City right-of-way. Neither the program-level components nor the project-level components of the TEP would introduce any new land uses, including residential units, at any location.

Program-Level Impacts

Implementation of TEP program-level components would not introduce any new sensitive land uses, such as habitable structures, that could potentially expose people to new significant hazards from expansive or unstable soils. Therefore, no potential impacts related to unstable soils, such as landslides, lateral spreading, subsidence, liquefaction, or collapse, would occur. Development of the program-level Service-related Capital Improvements and program-level TTRPs, described above under Impact GE-1, would include new construction, though much of it would

involve surface improvements, where unstable or expansive soils would not present a significant safety risk as a result of structure collapse. Improvements such as utility overhead wiring poles and underground utility vaults would be subject to DPW specifications, City permitting requirements, and the SFMTA application of engineering design standards, as described above under Impact GE-1. These requirements include additional measures subject to engineering controls and safety requirements in areas where geologic hazards such as unstable soils may be present.[116] Therefore, impacts related to expansive or unstable soils during construction and operation of TEP program-related components would be less than significant.

Project-Level Impacts

As with the program-level components of TEP, some of the project-level components would not have the potential for impacts from unstable or expansive soils. Implementation of project-level Service Improvements would involve limited construction for curb ramps at a few locations and would not result in other changes that would expose persons to geologic hazards. The remaining project-level components would involve construction, similar in nature to that required by the program-level components. As with the program-level components, all project-level TEP components would be required to comply with the previously discussed regulatory requirements. Therefore, impacts on the project-level TEP components related to expansive or unstable soils would be less than significant.

The proposed project would not be constructed on soils that would become unstable as a result of future uses, or potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. Based on the above analysis neither the program- nor the project-level components would alter the topography in a way that results in significant impacts related to erosion or changes to unique geologic features. No mitigation measures are necessary. Therefore, this topic will not be discussed in the EIR.

Combined Impacts

No significant impacts related to geology and soils were identified for either the program- or project-level components of the TEP or indirectly for the Policy

[116] Telephone conversation between D. Dwyer, Environmental Planner, San Francisco Planning Department, and C. Hennessey, Engineer, Division of Sustainable Streets, San Francisco Municipal Transportation Agency, November 20, 2012.

Framework as related to the TEP. Impacts related to geologic hazards are generally site-specific, because each project area has unique geologic considerations that would be subject to uniform site development and construction standards. While certain Service-related Capital Improvements such as the overhead wire projects would occur in overlapping geographic areas with certain TTRPs (for example, OWE for 5 Fulton bypass Wires would overlap with TTRP.5), no combined impacts related to geology and soils would occur since the previously discussed regulatory requirements and design standards would be applied. Therefore, combined impacts from the project- and program-level components would not be expected. As a result, no significant impacts with respect to geology and soils would result from the combined program- and project-level TEP components.

Cumulative Impacts

Impact C-GE-1: The proposed project in combination with other past, present, or reasonably foreseeable future projects would not result in a cumulatively considerable contribution to significant cumulative impacts on geology and soils. (*Less than Significant*)

As described above, under Combined Impacts, impacts related to geologic hazards are generally site-specific, rather than cumulative in nature. Therefore, the potential for cumulative impacts is limited. Impacts associated with potential geologic hazards related to soil or other conditions occur at individual sites. These effects are also site-specific, and therefore, the impacts would not be compounded by additional land use development occurring on parcels adjacent to the right-of-way. The TEP project would be constructed and operated within the public right-of-way. To the extent that other transportation or utility projects occur in the same public right-of-way that may combine with the effects of the TEP related to geology and soils, such as projects implemented by the SFPUC, DPW, the Planning Department or the SFMTA, the work is coordinated through DPW permit review procedures as specified in Article 2.4 of the Public Works Code. In particular Section 2.4.11 involves coordination of projects proposed within the City right-of-way among DPW, the Fire and Police Departments, the SFPUC, and other relevant City agencies.

Compliance with existing federal, state, and local geologic safety requirements would reduce the effects of implementation of the program- and project-level components of the TEP on geologic hazards to a less than significant level. Therefore, implementation of the proposed project would not result in a cumulatively considerable contribution to cumulative impacts regarding geology and soils, and the cumulative impact would be less than significant.

For the above reasons, additional environmental review with respect to geology and soils is not anticipated to be required for the Policy Framework as related to the TEP or any TEP components.

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TOPIC 15: HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Violate any water quality standards or waste discharge requirements?			X		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X		
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration for the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?			X		

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?			X		
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X		
f) Otherwise substantially degrade water quality?			X		
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map?					X
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?			X		
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X		

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?			X		

Program-level and project-level TEP components would not create housing. Therefore, significance Topic 15g is not applicable and is therefore not discussed further.

As stated in the significance criteria above, hydrology and water quality impacts may occur when a project directly or indirectly exposes people or structures to flooding hazards, degrades surface or groundwater resources, or alters drainage in a way that results in erosion or siltation. Whether this type of impact occurs is typically determined by assessing the potential for flooding hazards and water quality impacts in the project vicinity and then evaluating whether the proposed project would directly or indirectly result in a significant exposure to flooding hazards, impact to water resources, or erosion. While specific details about program-level components of the TEP have not been defined (for example, the location of a transit bulb along the 1 California for TTRP.1 or the exact configuration of the E Line Terminal at Beach and Jones streets), the project description provides sufficient information to determine whether program-level components of the TEP have the potential to create flooding hazards beyond what would be expected without the project or affect surface or groundwater resources. This is because the general locations of the nine program-level TTRP corridors and the geographic extent of the program-level Service-related Capital Improvements are known, as are, general characteristics of the TPS Toolkit elements. As such, the following analysis sets forth the environmental review for the entirety of the TEP.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised

of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to hydrology and water quality would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional CEQA analysis if necessary once any such projects are developed and proposed.

Impact HY-1: The implementation of the proposed project would not violate water quality or waste discharge standards, exceed the capacity of existing drainage systems, provide additional sources of polluted runoff, or otherwise substantially degrade water quality. (*Less than Significant*) (Criteria 15a, 15e, and 15f)

Program-Level Impacts

The TEP would include the construction and operation of improvements located primarily within the City's public right-of-way. The rights-of-way are predominantly covered with impervious materials with the exception of minor landscaped areas, such as tree wells, typically located in the sidewalk. The primary water quality concern for implementation of the TEP would be the potential degradation of stormwater runoff flowing into San Francisco's combined sewer system, which receives both stormwater runoff and wastewater. Although implementation of the TEP program-level components would not result in a significant change to the amount or locations of impervious surfaces in the City or the volume of stormwater entering existing drainage systems, the proposed project could affect localized stormwater quality and drainage patterns.

As an urbanized area, San Francisco has an abundance of impervious surface, such as buildings, streets, parking lots, and other paved surfaces, which prevent the absorption of rainfall. Urban stormwater runoff can be polluted with urban-type pollutants generated by leaks of fuel or lubricants from vehicles, tire wear, brake dust, and fallout from vehicle exhaust. These sources contribute petroleum hydrocarbons, heavy metals and sediment to runoff, and those pollutants flow into the San Francisco's combined sewer system contributing to pollutants being discharged at sewer system overflow locations. During dry weather conditions, all stormwater and wastewater undergoes primary and

secondary treatment. During heavy storms, flows may exceed the capacity of transport/storage facilities, and overflows may be discharged with only primary or decanting treatment. All discharges from the combined sewer system are regulated under the Bayside and Oceanside discharge permits which define treatment standards and require a Long-Term Control Plan to manage stormwater flows and minimize the effects of stormwater-related wastewater discharges.[117]

Natural systems can often be an effective supplement to treatment, helping to absorb the stormwater and filter out pollutants from stormwater runoff. Natural vegetation, landscaped swales and gardens included in site designs can reduce, filter, or slow stormwater runoff. "Green streets" that include pervious concrete, planters and landscaped strips adjacent to sidewalks can reduce stormwater flows and the amount of urban-type pollutants that end up in stormwater.

San Francisco's combined sewer system is managed in accordance with a comprehensive master plan adopted approximately 40 years ago. The sewer system has operated well but aging infrastructure, funding constraints, and deferred maintenance have created the need for an updated long-term master plan. In 2005, the SFPUC initiated the preparation of a new master plan to develop a long-term strategy for management of San Francisco's wastewater and stormwater, to provide a detailed roadmap for improvements needed over the next few decades, to estimate funds to implement these improvements, to address specific challenges facing the system, and to maximize system reliability and flexibility. The SFPUC is also preparing the Recycled Water Master Plan, which would guide implementation of recycled water projects that would reduce overall need for additional wastewater treatment. Regulations that would reduce potential impacts from pollutant-laden runoff include compliance with NPDES permits related to construction activities as administered by the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) and Article 4 of the Porter-Cologne Water Quality Act, compliance with the Combined Sewer Overflow Control Policy, and Total Maximum Daily Load standards as set forth by the Regional Water Board Basin Plan.[118]

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[117] SFPUC, Draft Sewer System Improvement Program Report, Revised August 10, 2010, available online at: http://www.sfwater.org/modules/showdocument.aspx?documentid=984, accessed December 4, 2012.

[118] Regional Water Board, 2010, Water Quality Control Plan (Basin Plan), incorporating all amendments approved by the Office of Administrative Law as of December 31, 2011 (hereinafter "Regional Water Board 2010"), available online at: http://www.waterboards.ca.gov/sanfranciscobay/basin_planning.shtml, accessed October 15, 2012.

Regulations incorporated into the San Francisco Green Building Ordinance address stormwater management by seeking to reduce impervious cover, promote infiltration, and capture and treat 90 percent of the runoff from an average annual rainfall event using acceptable BMPs. These regulations require that projects on undeveloped sites would need to avoid any increase in runoff, while previously developed sites would be required to reduce runoff from existing amounts. These requirements apply to any project that disturbs more than 5,000 square feet of impervious surface, but do not apply to surface pavement maintenance activity or utility repair work.[119] With respect to the TEP, these requirements may be applicable to the program level Terminal and Transfer Point Improvements, but would not apply to construction for most improvements, which are typically smaller in area and only require minor changes to surface pavement and pavement markings.

The Public Works Code (Article 2, Section 2.4.13(7)) requires that transit projects within the public right-of-way incorporate low-impact design (LID) stormwater facilities consistent with Stormwater Design Guidelines[120] to the maximum extent practical and feasible. LID measures presented in the Stormwater Design Guidelines are designed to reduce and delay the volumes and peak flows of stormwater reaching the San Francisco sewer system, thereby reducing combined sewer discharges, preventing flooding, and improving water quality.

Implementation of the program-level TEP components could potentially affect stormwater runoff both during the construction and operational phases, as described below.

Construction of the program-level Service-related Capital Improvements would include new construction for transit terminal and transfer point improvements (TTPI.2, TTPI.3, and TTPI.4), new overhead wire projects (OWE.6), and accessible platforms (SCI.1). Although the specific TPS toolkit treatments for the program-level TTRP corridor improvements have not been specified, numerous traffic engineering changes are anticipated within the 9 TTRPs on the corridors identified (TTRP.1, TTRP.9, TTRP.22_2, TTRP.28_2, TTRP.30_2, TTRP.71, TTRP.K, TTRP.L, and TTRP.M). These TTRPs would include the installation of varied combinations of TPS

[119] SFPUC, Stormwater Design Guidelines – Frequently Asked Questions, October 2012, available online at: http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=2767, accessed December 4, 2012.

[120] SFPUC, Stormwater Design Guidelines, November 2009, available online at: http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=2779, accessed October 15, 2012.

Toolkit elements, such as transit stop changes, lane modifications, parking and turn restrictions, traffic signal and sign changes, and pedestrian improvements.

During construction, soils exposed during grading and excavation activities could potentially be entrained in stormwater and transported with runoff to the combined sewer system. The use of hazardous materials during construction, which would include fuels, oils, thermoplastic traffic striping material, and other chemicals, could result in accidental releases or spills, potentially affecting stormwater quality. This potential impact is further discussed in Topic 16, Hazards and Hazardous Materials on pp. 321-334.

Construction of the program-level TEP components would require the relocation of some existing catch basins and storm sewers. For example, the TTRPs would include widening of sidewalks, installation of pedestrian and transit bulbs, and installation of new transit islands, which may necessitate catch basin relocation. The Service-related Capital Improvements may also require similar construction to install some curb ramps. Changes to the drainage infrastructure would be constructed pursuant to DPW specifications for such improvements and would be subject to review by the DPW during permit review. In addition to requiring the incorporation of LID stormwater facilities, DPW may also add conditions to permits in order to protect public health, safety, and welfare (Article 2, Section 4.20). All excavation in the public right of way must comply with requirements for covering excavation sites, hazardous material handling, removal of excavated material at the end of each work day, and requirements that any fill material, sand, aggregate, or asphalt may only be stored at the site in covered, locked containers (Article 2, Section 4.50 *et seq.*). Compliance with existing regulations regarding stormwater BMPs and DPW permit requirements would reduce any potential construction impacts from program-level TEP components to less than significant.

As the TEP program-level components are located within the public right-of-way that is almost completely covered with impervious surfaces, and only minor changes to drainage infrastructure and negligible changes in the amount of impervious surfaces are proposed by the TEP, no increases in volumes of runoff or stormwater runoff quality or significant changes to general drainage patterns in the vicinity of the improvements would be expected during the operational phases of the program-level TEP components. To the extent that required LID stormwater facilities are incorporated in the design of the individual components, there may be a minor beneficial improvement to stormwater quality compared to existing conditions.

Therefore, operation of the TEP program-level components would not directly result in an increase in stormwater volumes, and impacts to water quality and waste discharge would be less than significant based on compliance with existing regulations.

Project-Level Impacts

Implementation of project-level Service Improvements would involve minor construction to install a limited number of curb ramps, and would not result in substantial changes that would have an effect on water quality. The project-level Service-related Capital Improvement Projects, including the Persia Triangle Improvements (TTPI.1), overhead wire expansion projects (OWE.1, OWE.2, OWE.3, OWE.4, and OWE.5), and the Sansome Street Contraflow Extension (SCI.2), would include construction similar in nature to that required by the program-level components. The eight project-level TTRPs (TTRP.5, TTRP.8X, TTRP.14, TTRP.22_1, TTRP.22_1, TTRP.28_1, TTRP.30_1, TTRP.J, and TTRP.N) would also require construction for transit stop changes, lane modifications, parking and turn restrictions, traffic signal and sign changes, and pedestrian improvements. The construction of the project-level components would, similarly to the program-level components, not substantially increase impervious surface areas and would be subject to stormwater control regulations (including BMPs); construction of these components would therefore have a less-than-significant impact on the volume of stormwater runoff and water quality.

The construction and operation of all project-level TEP components would be required to comply with the previously discussed state and local regulations applicable to the program-level components. Incorporation of required LID stormwater facilities in design of the individual components may create a minor beneficial improvement to stormwater quality compared to existing conditions. Therefore, implementation of the TEP project-level components would have a less than significant impact on water quality and wastewater discharge.

Based on the analysis above, the program- and project-level components of the TEP would not result in significant impacts on water quality or wastewater discharge and no mitigation measures are necessary. This topic will not be discussed in the EIR.

Impact HY-2: The proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. (*Less than Significant*) (Criterion 15b)

Program-Level Impacts

San Francisco overlies all or part of seven groundwater basins. These groundwater basins include the Westside, Lobos, Marina, Downtown, Islais Valley, South San Francisco, and Visitation Valley basins. The Lobos, Marina, Downtown and South basins are located wholly within the limits of San Francisco, while the remaining three groundwater basins extend south into San Mateo County. With the exception of the Westside and Lobos basins, all of the basins are generally inadequate to supply a significant amount of groundwater for municipal supply due to low yield.[121] Local groundwater use has occurred in small quantities in San Francisco. For several decades groundwater has been pumped from wells located in Golden Gate Park and the San Francisco Zoo within the North Westside Groundwater Basin. The groundwater is mostly used by the Recreation and Park Department for irrigation in Golden Gate Park and at the Zoo. The California Department of Water Resources has not identified this basin as over-drafted, nor is it projected to be over-drafted in the future.

Recharge of groundwater occurs in non-paved areas of San Francisco. Since the program-level TEP components would occur primarily in already paved areas within the City's public right-of-way, there would be little to no change in groundwater recharge as a result of program-level TEP component construction. The potential impact to groundwater recharge areas from the program-level TEP components would have a less than significant impact on groundwater recharge.

Although depths to groundwater vary throughout the City, excavation required for construction of the program-related TEP improvements, described under Impact HY-1 above, such as installation of utility vaults and duct banks, would not be anticipated to be deep or extensive enough to require significant, if any, dewatering. No aspect of the TEP would require excavation greater than 12 feet in depth and most excavation would be on the order of one to two feet. Therefore, no significant impacts to groundwater supplies during construction would be expected. Groundwater that may be encountered during construction is subject to the requirements of the City's Industrial Waste Ordinance (Ordinance Number 199-77), requiring that groundwater meet specified water quality standards before it may be discharged into the sewer system. Treatment would be provided pursuant to the effluent discharge standards contained in the City's NPDES permit for its wastewater treatment plants. Thus, construction activities associated with the program-level TEP

[121] Regional Water Board, 2010, *op cit*.

improvements would not substantially affect the groundwater supplies and this would be a less than significant impact.

Since the program-level TEP components would be implemented in areas that are already paved, no change in recharge to the groundwater would occur during the operational phase of the program-level TEP components; in addition, groundwater would not be used during operation of the program-level TEP components. Therefore, impacts to groundwater supplies or recharge areas would be less than significant.

Project-Level Impacts

Implementation of project-level Service Improvements would involve limited construction for curb ramps at some locations, and would not result in substantial changes that would affect groundwater supplies. The remaining project-level components, described above under Impact HY-1, would involve construction and operation activities similar in nature to those required by the program-level TEP components, and would not directly result in the significant removal of groundwater or removal of paved surfaces. Therefore, impacts to groundwater supplies and groundwater recharge areas would be less than significant.

Based on the analysis above, the program-level or project-level components of the TEP, or indirectly the Policy Framework as related to the TEP, would not result in significant impacts on groundwater. No mitigation measures are necessary. This topic will not be addressed further in the EIR.

Impact HY-3: The implementation of the proposed project would not substantially alter existing drainage patterns, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation. (*Less than Significant*) (Criterion 15c)

Program-Level Impacts

Many small creeks historically ran from the east side of San Francisco to the Bay, including Hayes Creek, Arroyo Delores, Mission Creek, Precita Creek, Islais Creek, and Yosemite Creek. The Presidio is home to Lobos Creek and Dragonfly Creek; Islais Creek runs through Glen Canyon and O'Shaughnessy Hollow in Glen Canyon Park. However, most of these creeks have been filled or run underground in culverts and are not free-flowing on the surface. There are no existing rivers in the City.

As described under Impact HY-1, above, construction or operation of program-level TEP components would not significantly change existing drainage patterns. The construction and operation of these components would not result in any direct erosion effects or alter the course of a stream or river, since improvements would occur within the existing public right-of-way. Requirements for stormwater control, described under Impact HY-1, above, would require construction erosion control BMPs, such as silt fences, straw bales, and other mechanical barriers to minimize the potential for silt from becoming suspended in stormwater runoff from the project sites and entering catch basins or overland flows. Therefore impacts related to erosion and siltation from program-level TEP components would be less than significant.

Project-Level Impacts

Similar to the program-level components of TEP, project-level TEP components would not significantly change existing drainage patterns. The construction and operation of these components would not result in any direct erosion effects or alter the course of a stream or river, since improvements would occur within the existing public right-of-way and construction erosion control BMPs would be used; therefore, impacts related to erosion and siltation from project-level TEP components would be less than significant.

Based on the analysis above, the program- and project-level components of the TEP would not result in significant erosion or siltation effects, and no mitigation measures are necessary. In addition, there would be no indirect impacts for the Policy Framework related to the TEP. This topic will not be addressed further in the EIR.

Impact HY-4: The implementation of the proposed project would not expose people or structures to substantial risk of loss due to flooding. (*Less than Significant*) (Criteria 15d, 15h, and 15i)

Program-Level Impacts

Development in San Francisco must account for flooding potential. Areas located on fill or Bay mud can subside to a point at which the sewers do not drain freely during a storm (and sometimes during dry weather) and there can be backups or flooding near these streets and sewers. Portions of San Francisco are prone to flooding during storms, especially where a structure's ground floor is located below an elevation of 0.0 City Datum or, more importantly, below the hydraulic grade line or water level of the sewer.

Flood risk assessment and some flood protection projects are conducted by federal agencies including the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers. The flood management agencies and cities implement the National Flood Insurance Program (NFIP) under the jurisdiction of FEMA and its Flood Insurance Administration. The NFIP, which designates flood-prone areas, has recently completed mapping communities along the San Francisco Bay, including San Francisco. Areas currently designated as prone to surface flooding in San Francisco on the new floodplain maps are in portions of Mission Bay, Treasure Island, Hunters Point Shipyard and Candlestick Point, as well as significant portions of the Port.

In 2008, the Board of Supervisors adopted the Floodplain Management Ordinance as part of the City's effort to join the NFIP FEMA has prepared draft Flood Insurance Rate Maps (FIRMs) for the City and County of San Francisco. FIRMs identify areas that are subject to inundation during a flood having a one percent chance of occurrence in a given year (also known as a "base flood" or "100-year flood"). FEMA refers to the floodplain that is at risk from a flood of this magnitude as a special flood hazard area (SFHA).

FEMA has tentatively identified SFHAs along the City's shoreline in and along the San Francisco Bay consisting of Zone A (in areas subject to inundation by tidal surge) and Zone V (areas of coastal flooding subject to wave hazards). As part of the Floodplain Management Ordinance, DPW will publish flood maps for the City, and applicable City departments and agencies may begin implementation for new construction and substantial improvements in areas shown on the Interim Floodplain Map.[122]

The Floodplain Management Ordinance requires the first floors of structures in flood zones to be constructed above the floodplain or to be flood-proofed with variances for exceptional circumstances. The Interim Floodplain Map designates portions of waterfront piers, Mission Bay, Bayview Hunters Point, Hunters Point Shipyard, Candlestick Point, and Treasure Island in coastal flood hazard zones. Any construction for program-level TEP components requiring excavation in the public right-of-way is subject to DPW permit requirements and applicable sections of the Public Works Code (Article 2.4). If flooding is a potential concern, the SFPUC and/or

[122] City and County of San Francisco, San Francisco Citywide Interim Floodplain Map, Final Draft, July 2008, available online at: http://sfgsa.org/index.aspx?page=828, accessed on October 15, 2012.

its delegate (DPW, Hydraulics Section) would review the permit application and evaluate the proposed application and the potential for flooding during wet weather. Permit requirements may include provisions to minimize flooding, such as special sidewalk construction and the provision of deep gutters.

According to the Bay Conservation and Development Commission (BCDC), best available projections for California and the Bay Area currently assume 12-18 inches of sea level rise by 2050 and 21-55 inches of sea level rise by 2100, given current carbon emissions trends. These projections are likely to change over time as climate science progresses. This may increase the number of residents at risk during storm events. Much of San Francisco's land composed of Bay-front filled area is at risk for inundation due to its low elevation and subsidence over time due to compaction from buildings and soil desiccation. BCDC's mapping of areas, potentially affected by sea level rise, generally includes the same coastal areas designated on the Interim Floodplain map.[123] Additionally, sea walls located along the Embarcadero and along the Great Highway may be at risk for overtopping and inundation based on the extent of sea level rise.

The significance of global warming has been clarified in recent years. Science correlates climate change with an increase in the frequency of natural disasters, and in economic losses from these disasters. Results of global warming include increasing runoff from urban storms, springtime floods from swollen rivers and rising sea levels. Recent studies show that more than two-thirds of the measured climate change in the past 50 years has been human-induced, and human actions can also stem this tide. New urban systems to handle stormwater runoff and flood control structures may be needed. Continuation of the SFPUC's upgrade of the City combined sewer system is one facet of preparation, but also critical are more imaginative solutions, like capturing stormwater for irrigation, increasing urban forestry activities and other green uses.

Program-level TTRPs and construction areas for the other program-level TEP components are located outside of mapped flood zones and SFHAs. DPW and/or SFPUC permit requirements would address the potential for localized flooding impacts. Therefore, the construction and operation of the program-level TEP

[123] Bay Conservation and Development Commission (BCDC), Shoreline Areas Potentially Exposed to Sea Level Rise, Central Bay, 2009, available online at: http://www.bcdc.ca.gov/planning/climate_change/maps/16_55/cbay.pdf, accessed October 15, 2012.

components would not expose people, housing, or structures to substantial risk of loss due to flooding; this is therefore a less than significant impact.

Project-Level Impacts

Although portions of Muni transit lines that would be affected by the Service Improvements are located in mapped 100-year flood zones or SFHAs, such as the portions of Routes 18 and 23 along the Lower Great Highway near the Pacific Ocean, no habitable structures would be constructed within these areas. Although service on routes within these flood hazard zones may be impacted by flooding and result in potential disruption to transit service should a 100-year flood event occur, the TEP would not exacerbate flooding or result in any additional significant impact related to flooding. Project-level TTRPs and construction areas for the other project-level components are located outside of mapped flood zones and SFHAs. City permit requirements would address the potential for localized flooding impacts. Therefore, the development and operation of the project-level TEP components would not expose people or structures to substantial risk of loss due to flooding.

Based on the analysis above, neither program-level nor project-level components of the TEP would result in a significant impact by exposing people or structures to flooding hazards, and no mitigation measures are necessary. In addition, there would be no indirect effect from the Policy Framework related to TEP with respect to flooding hazards. This topic will not be discussed further in the EIR.

Impact HY-5: The implementation of the proposed project would not expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow, or as a result of the failure of a reservoir. (*Less than Significant*) (Criterion 15j)

The greatest risks to life and property in San Francisco from seismic events result directly from the ground shaking and ground failure associated with large earthquakes, discussed under the Geology and Soils analysis of this Initial Study. However, other less common natural hazards include flooding due to a tsunami, seiche, or reservoir failure, which may occur as a result of an earthquake.

Tsunamis (seismic sea waves) are large, long-period waves that are typically generated by underwater seismic disturbances, volcanic eruptions, or submarine landslides. Damaging tsunamis are not common on the California coast. Most California tsunamis are associated with distant earthquakes (such as those originating in Alaska, South America, or Asia), not with local earthquakes.

Devastating tsunamis have not occurred in historic times in the Bay Area. Because of the lack of reliable information about the kind of tsunami run-ups that have occurred in the prehistoric past, there is considerable uncertainty over the extent of tsunami run-up that could occur. There is ongoing research into the potential tsunami run-up in California. Map 5 (Tsunami Hazard Zones) in the 2012 Draft Community Safety Element of the *General Plan* shows areas where tsunamis are thought to be possible.

Low-lying coastal areas such as tidal flats, marshlands, and former Bay margins that have been artificially filled but are still at or near sea level are generally the most susceptible to tsunami inundation. Some coastline residential areas and existing parks and recreational facilities, including Ocean Beach, the Presidio, Crissy Field, Marina Green, Aquatic Park, Justin Herman Plaza, Treasure Island and Candlestick Point Recreation Area are located within mapped tsunami inundation areas.[124]

A seiche is an oscillation of a water body, such as a bay, which may cause local flooding. A seiche could occur in the San Francisco Bay due to seismic or atmospheric activity. Seiches can result in long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up. According to the historical record, seiches are rare. Mudflows are a type of landslide; potential landslide impacts are evaluated in Topic 14, Geology and Soils, in this Initial Study on pp. 292-303.

The SFPUC owns above-ground reservoirs and tanks in San Francisco. Their inundation areas are shown in Map 6 of the 2012 Draft Community Safety Element.[125] The SFPUC owns above-ground reservoirs and tanks within San Francisco and monitors its facilities and submits periodic reports to the California Department of Water Resources, Division of Safety of Dams, which regulates large dams. San Francisco's largest reservoir is the Sunset Reservoir located in the Outer Sunset area. The reservoir includes a publicly accessible park around its perimeter and users within its potential inundation area could potentially be subject to risk from flooding in the event of reservoir failure. The SFPUC has recently completed a seismic retrofit of the Sunset Reservoir. The north basin roof, columns and beams

[124] San Francisco Planning Department, Draft Community Safety Element, Map 05 – Tsunami Hazard Zones, June 2012, available online at: http://www.sf-planning.org/ftp/General_Plan/Community_Safety_Element_2012.pdf, accessed October 15, 2012.

[125] San Francisco Planning Department, Draft Community Safety Element, Map 06 – Potential Inundation Areas Due to Reservoir Failure, June 2012, available online at: http://www.sf-planning.org/ftp/General_Plan/Community_Safety_Element_2012.pdf, accessed October 15, 2012.

have been seismically reinforced and the earth embankment around the reservoir was stabilized to minimize risk from liquefaction.

In the event that an earthquake occurred that would be capable of producing a tsunami that could affect San Francisco, the National Warning System would provide warning to the City. The City has reactivated the old World War II sirens to provide alerts to residents, and is further upgrading the system to broadcast voice instructions for responding to an emergency. The advance warning system would allow for evacuation of people prior to a seiche and would provide a high level of protection to public safety.

Program-Level Impacts

Program-level TTRPs and construction areas for the program-level Service-related Capital Projects are located outside of mapped tsunami hazard zones. Although some program-level TEP components are located within mapped reservoir inundation areas, such as TTRP.L and TTRP.28_2, the TEP would not directly or indirectly affect the risk of flooding impact. In addition, these reservoirs are actively maintained in accordance with State requirements, and potential flooding hazards from reservoir failure would be considered less than significant.

Therefore, the construction and operation of the program-level TEP components would not expose people, housing, or structures to substantial risk of loss due to inundation by seiche, tsunami, or mudflow, or as a result of the failure of a reservoir and would be considered a less than significant impact

Project-Level Impacts

As with the program-level components of the TEP, portions of transit routes that would be affected by the project-level Service Improvements are located in mapped tsunami hazard areas and reservoir inundation areas, but no habitable structures would be constructed within these areas. No project-level Service-related Capital Improvements are located in mapped flood, tsunami, or reservoir inundation hazard areas. Portions of project-level TTRPs are within mapped reservoir inundation areas, such as TTRP.28_1, but this impact would be less than significant, as the reservoirs are actively maintained in accordance with state requirements. Therefore, the construction and operation of the project-level TEP components would not expose people, housing, or structures to substantial risk of loss due to inundation by seiche, tsunami, or mudflow, or as a result of the failure of a reservoir.

Based on the above analysis, the proposed project would have less-than-significant impacts on hydrology and water quality at both the program-level and project-level. No mitigation measures are necessary and this topic will not be discussed in the EIR.

Combined Impacts

No significant impacts related hydrology and water quality were identified for either the program- or project-level components of the TEP, or indirectly the Policy Framework as related to the TEP. To the extent that stormwater control is incorporated in the design of the individual TEP components as required under permit requirements, there may be a minor beneficial improvement to stormwater quality and hydrology compared to existing conditions. In addition, each construction contractor would be required to comply with relevant laws and regulations that reduce the potential for significant impacts on hydrology and water quality. Therefore, impacts from simultaneous construction of project- and program-level components at multiple locations would not increase the severity of impacts. As a result, no significant hydrology and water quality impacts would result from the combined program- and project-level TEP components.

Cumulative Impacts

Impact C-HY-1: The proposed project in combination with other past, present, or reasonably foreseeable future projects would not result in a cumulatively considerable contribution to significant cumulative impacts on water quality and hydrology. (*Less than Significant*)

Cumulative impacts occur when impacts from a proposed project combine with similar impacts from other past, present, or reasonably foreseeable projects in a similar geographic area. The geographic context for cumulative hydrology and water quality impacts is San Francisco, including the streets (public rights-of-way) and their vicinity affected by the TEP. Other projects occurring in the public right-of-way in San Francisco that may combine with the effects of the TEP related to water quality and hydrology would include projects implemented by the SFPUC, DPW, the Planning Department, and the SFMTA. The SFPUC implements projects to address water infrastructure including sewer and storm water management throughout the City. DPW is responsible for maintenance of the City's streets including the condition of pavement in the roadways. The Planning Department often includes public realm improvements as part of area plans in the *San Francisco General Plan*. The SFMTA operates Muni, regulates parking and loading facilities, plans bicycle and pedestrian

improvements for the public right-of-way, and oversees traffic operations within the transportation network of the City.

Land development projects on parcels adjacent to locations where TEP projects were being constructed would not have the potential for combined effects on hydrology or water quality because SFPUC reviews and approves all water and sewer connections and requires preparation of Stormwater Control Plans, and DPW reviews all building permits and requires compliance with the City's Stormwater Control Guidelines. Land use projects on sites located in areas subject to flooding require early consultation with SFPUC and DPW. In addition, larger land development projects are required to undergo environmental review pursuant to CEQA. No impacts were identified that would be compounded by additional projects in the City right-of-way implemented by other City or state agencies.

Multiple construction activities occurring in the same general location within the public right-of-way would be subject to the requirements of Public Works Code Article 2.4 and would be required to be coordinated, pursuant to Section 2.4.11. Implementation and operation of the program- and project-level components of the TEP would not result in any significant impacts related to water quality and hydrology. Also, there would be no indirect effects from the Policy Framework as related to TEP. Therefore, implementation of the proposed project would not result in a cumulatively considerable contribution to cumulative impacts regarding water quality and hydrology, and the cumulative impact would be less than significant.

For the reasons provided above, additional environmental review with respect to hydrology and water quality is not anticipated to be required for the Policy Framework as related to the TEP or any of the TEP components.

TOPIC 16: HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		X			
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		X			
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?		X			
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X		

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?					X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?					X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X		
h) Expose people or structures to a significant risk of loss, injury or death involving fires?			X		

Because the nearest public use airport, San Francisco International Airport, is located about 8 miles south of the City, and no private airstrips are located within the City, Topics 16e and 16f are not applicable.

As stated in the significance criteria above, hazards and hazardous materials[126] impacts may occur when a project directly or indirectly results in hazardous materials exposures affecting people or the environment, subjects people or structures to wildfire hazards, or interferes with emergency response or evacuation plans. Whether this type of impact occurs is typically determined by assessing the potential for hazardous materials exposure, and wildfire hazards, and the potential for emergency response restrictions to occur in the project vicinity and then evaluating whether the proposed project would directly or indirectly result in a significant change in these conditions which could pose a threat to public health and safety.

While specific details about program-level components of the TEP have not been defined (for example, the location of a transit bulb along the 1 California for TTRP.1 or the exact configuration of the E Line Terminal at Beach and Jones streets), the project description provides sufficient information to determine whether program-level components of the TEP have the potential to increase the use of hazardous materials beyond what would be expected without the project or would pose a threat to public health and safety from hazardous materials release. The general locations of the TTRP corridors and the geographic extent of the program-level Service-related Capital Improvements are known. In addition, general characteristics to implement the TPS Toolkit elements as well as for construction and operation of the TEP are also known. As such, the following analysis sets forth the environmental review with respect to hazards and hazardous materials for the entirety of the TEP.

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any

[126] The California Health and Safety Code defines a hazardous material as, "...any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety, or to the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, radioactive materials, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment." (California Health and Safety Code Section 25501)

indirect effects of the Policy Framework with respect to hazards and hazardous materials would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional environmental review pursuant to CEQA if necessary once any such projects are developed and proposed.

Impact HZ-1: Implementation of the proposed project would not create a significant hazard through routine transport, use, disposal, handling, or emission of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (*Less than Significant with Mitigation*) (Criteria 16a and 16b)

The use, storage, and disposal of hazardous materials is regulated by numerous local, state, and federal laws and regulations. The U.S. Environmental Protection Agency is the federal agency that administers hazardous materials and hazardous waste regulations. State agencies include the California EPA, which includes the California Department of Toxic Substances Control (DTSC), the State Water Resources Control Board (State Water Board), the Air Resources Board (ARB), and other agencies. The San Francisco Bay Regional Water Quality Control Board (Regional Water Board), the BAAQMD, and San Francisco Department of Public Health (DPH) have jurisdiction on a regional or local level.

Most routine hazardous materials management programs in the City are administered locally by DPH, under the California Certified Unified Program Agency (CUPA) program. The CUPA program encompasses several hazardous materials programs: Hazardous Materials Management Plans program, California Accidental Release Prevention program, underground storage tank (UST) program, aboveground storage tank program, and hazardous waste generation and disposal.

Other City programs have been enacted to address the potential to encounter hazardous materials in the soil at development sites and the safe handling of hazardous materials. They are contained in the San Francisco Health Code in Article 22A (Analyzing the Soil for Hazardous Waste, formerly the Maher Ordinance, also referenced in Public Works Code as Article 20), Article 21 (Hazardous Materials), Article 21A (Risk Management Program), and Article 22 (Hazardous Waste Management).

Program-Level Impacts

Construction of some of the program-level TEP components would include the routine use, storage, and disposal of hazardous materials. Implementation of the TEP would involve the use and disposal of traffic striping material for removal or addition of striping within the public right-of-way to remove or add bus zones or terminal space at the end of a route. The thermoplastic traffic striping material used by the SFMTA is a solid powder which liquefies when heated during application and quickly solidifies again as it cools. Material Safety Data Sheets (MSDSs) for the material indicates that it is lead-free and has no chronic health effects related to exposure, though it may cause skin, eye, and respiratory irritation in powder form, and may cause burns in its liquid form due to the heat used during application.[127] SFMTA also uses a non-toxic, water-based red asphalt coating[128] to demarcate transit-only lanes, and limited quantities of more traditional traffic paints for small areas such as curbs. Used in accordance with material specifications, the traffic striping material, asphalt coating, and paints would not be expected to pose a health risk to workers, the nearby public, or the environment.

Development of the program-level Service-related Capital Improvements would include new construction for transit terminal and transfer point improvements (TTPI.2, TTPI.3, and TTPI.4), new overhead wire projects (OWE.6), and accessible platforms (SCI.1). Although the specific locations of the elements for the program-level TTRPs within the corridors have not been specified, numerous traffic engineering changes are anticipated within the nine TTRP corridors (TTRP.1, TTRP.9, TTRP.22_2, TTRP.28_2, TTRP.30_2, TTRP.71, TTRP.K, TTRP.L, and TTRP.M). The locations of these corridors are known. TTRPs would include the installation of TPS Toolkit elements, such as transit stop changes, lane modifications, parking and turn restrictions, traffic signal and sign changes, and pedestrian improvements. Installation of some of these elements would require excavation as described in Section A, Project Description.

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[127] Ennis Paint Company, 2008 and 2007, MSDS for Coatings, Resins and Related Materials, White Thermoplastic Roadmarking Compound (revised March 14, 2008) and Lead Free Yellow Thermoplastic Roadmarking Compound (revised January 15, 2007). This document is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File 2011.0558E.

[128] Streetbond Corporation, 2011, MSDS for StreetbondCL Part A and Streetbond150 Part B, revised October 2011, available online at: http://www.streetbond.com/?q=content/sb-150-tech-data#MSDS and http://www.streetbond.com/?q=content/sb-cl-tech-data#MSDS, accessed December 28, 2012.

Construction activities would include the use of hazardous materials commonly used in transportation projects, such as thermoplastic traffic striping material and asphalt coating to color the transit–only lanes, and those related to heavy construction equipment, such as motor fuels, oils, solvents, and lubricants. If contamination were encountered during construction, contaminated soils could also require management and disposal. Improper management of these hazardous materials would have the potential to result in releases of hazardous materials with potential impacts on human health and the environment.

Provisions in Public Works Code regarding excavation in the public right-of-way (Article 2.4, Section 2.4.53) would apply to construction of the TEP components. Section 4.53(d) states that excavation contractors are subject to all applicable hazardous material guidelines for disposal, handling, release, and treatment of hazardous material; site remediation; and worker safety and training.

Article 20 of the Public Works Code and Article 22A of the San Francisco Health Code require environmental investigation at construction sites where contaminated fill materials may be encountered. An Article 22A investigation is required if: (1) more than 50 cubic yards of soil are to be disturbed, (2) the project site is bayward of the 1851 high-tide line (i.e., in an area of Bay fill), as designated on an official City map, or (3) the site is at any other location in the City designated for investigation by the Director of the DPH. The reports are submitted to the DPW and DPH. Article 22A regulations take effect at the time of the permit application for projects located on filled land requiring excavation.

For TEP components affecting one acre or more, such as OWE.6, compliance with NPDES permits related to construction activities as administered by the Regional Water Board would further reduce impacts from hazardous materials used during construction. Under these regulations, a project sponsor must obtain a general permit through the NPDES Stormwater Program for all construction activities with ground disturbance of one acre or more. The general permit requires the implementation of best management practices for hazardous material storage and soil stockpiles, inspections, maintenance, training of employees, and containment of releases to prevent runoff of hazardous materials into existing stormwater collection systems or waterways.

All excavation in the public right-of-way, regardless of size, must comply with permit requirements for covering excavation sites, hazardous material handling, removal of

excavated material at the end of each work day, and requirements that any fill material, sand, aggregate, or asphalt may only be stored at the site in covered, locked containers (Article 2, Section 4.50 *et seq*.). Although designed for stormwater protection, these permit requirements would also reduce potential impacts related to accidental releases of hazardous materials during construction. Stormwater protection is discussed further under Impact HY-1 in Topic 15, Hydrology and Water Quality on pp. 303-320 of this Initial Study. To ensure that potential significant impacts from release of hazardous materials during construction are reduced to less-than-significant levels, the SFMTA and construction contractors would be required to implement Mitigation Measure M-HZ-1, Hazardous Materials Soil Testing.

Mitigation Measure M-HZ-1: Hazardous Materials Soil Testing

In order to protect both construction workers and the public from exposure to hazardous materials in soils encountered during construction of the proposed project, the project sponsor agrees to adhere to the following requirements.

1) Any soil excavated and then, encapsulated under concrete and/or asphalt covering within the same area as its excavation shall not require testing for the presence of hazardous materials in levels exceeding those acceptable to government agencies unless the TEP project or construction manager determines any extenuating circumstances exist, such as odors, unusual color or presence of foreign material. The reuse, remediation, or disposal of any soil tested and found to contain hazardous materials under these circumstances shall be in compliance with the requirements of the San Francisco Department of Public Health (DPH) and other agencies. The project sponsor shall be responsible for reporting the test results of any soil with hazardous material content to DPH within 21 days of the completion of testing, accompanied with a map showing the excavation location.

2) Any excavated soil not reused and encapsulated under concrete and/or asphalt covering within the same area as its excavation, shall be tested for the presence of hazardous materials in levels exceeding those acceptable to government agencies, before it is moved from the area of excavation. The transportation and disposal of the soil shall be in compliance with DPH, state, and federal requirements. The project sponsor shall be responsible for reporting the test results of any soil with hazardous material content to DPH within 21 days of the completion of testing, accompanied with a map showing the excavation location.

3) If the proposed excavation activities encounter groundwater, the groundwater shall be tested for hazardous materials. Copies of the test results shall be submitted to DPH within 21 days of the completion of testing. Any dewatering shall adhere to DPH, SFPUC, and state requirements.

In the event that a subsequent ordinance or regulations are adopted by DPH governing the handling and testing of hazardous materials encountered during construction within the public right-of-way, DPH shall be given the option to require the project sponsor to adhere to the implementation of the new ordinance or regulations in lieu of the above requirements if they provide similar safety protection for both construction workers and the public.

Implementation of the TEP program-level components would be subject to the above requirements and the SFMTA would require construction staff to implement Mitigation Measure HZ-1 during construction, and therefore TEP construction activities would not result in a significant hazard through routine transport, use, disposal, handling, or emission of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Following construction, no routine use, storage, or disposal of significant quantities of hazardous materials would be anticipated. Thus, no significant impacts would be expected during the operational phase of the TEP program-level components, and no significant indirect impacts would be expected from the Policy Framework as related to the TEP. Therefore, with implementation of Mitigation Measure HZ-1, the construction and operation of the program-level TEP components would not result in a significant hazard through routine transport, use, disposal, handling, or emission of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Project-Level Impacts

Implementation of project-level Service Improvements would not involve construction, except for curb ramps in a limited number of locations, but, as with the program-level Service-related Capital Improvements, may include the use and disposal of traffic striping material removal to remove or add transit zones or terminal space at the end of a route. The project-level Service-related Capital Improvement Projects, including the Persia Triangle Improvements (TTPI.1), overhead wire expansion projects (OWE.1, OWE.2, OWE.3, OWE.4, and OWE.5), and the Sansome Street Contraflow Extension (SCI.2), would include construction similar in nature to that required by the program-level components. The eight project-level TTRPs (TTRP.5, TTRP.8X, TTRP.14, TTRP.22_1, TTRP.22_1, TTRP.28_1, TTRP.30_1, TTRP.J, and TTRP.N) would also require construction for transit stop changes, lane modifications, parking and turn restrictions, traffic signal and sign changes, and pedestrian improvements.

Implementation of project-level TEP components would likely require the routine use, storage, and disposal of hazardous materials. As with the program-level TEP components, construction activities may involve use, storage and disposal of motor fuels, oils, solvents, lubricants, traffic striping and asphalt coating, and contaminated soils. All project-level TEP components would be required to comply with the previously discussed federal, state, and local regulations applicable to the program-level components, and the SFMTA would require City staff and construction contractors to implement Mitigation Measure HZ-1. Therefore, implementation of the TEP project-level components would not result in any significant impacts through routine transport, use, disposal, handling, or emission of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Following construction, no routine use, storage, or disposal of significant quantities of hazardous materials is anticipated beyond that already in use by the SFMTA for maintenance of transit vehicles. Therefore no significant impacts would be expected during the operation phase of the TEP project-level components. Accordingly, the construction and operation of the project-level TEP components would not result in a significant hazard through routine transport, use, disposal, handling, or emission of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Based on the above analysis, there would be no significant impacts due to hazards or hazardous materials from program- or project-level components of the TEP. Also, there would be no indirect significant impacts from the Policy Framework related to the hazardous material effects of the TEP. This topic will not be discussed in the EIR.

Impact HZ-2: Implementation of the proposed project would not substantially emit hazardous emissions or acutely hazardous materials near schools. (*Less than Significant with Mitigation*) (Criterion 16c)

Hazardous materials emissions near schools are a particular concern because children, due to their size and stage of development, are more susceptible to many potential health risks from hazardous materials. However, as discussed under Impact HZ-1, above, the construction and operation of the program- and project-level TEP components would not result in significant hazardous materials emissions or the handling of acutely hazardous materials during the construction or operational phases, with implementation of Mitigation Measure HZ-1. Therefore program- and

project-level impacts would be less than significant and this topic will not be discussed in the EIR.

Impact HZ-3: Implementation of the proposed project would not create a significant hazard to the public or the environment by location on a hazardous materials site (*Less than Significant*) (Criterion 16d)

The Hazardous Waste and Substances Sites (Cortese) list, compiled pursuant to Government Code Section 65962.5, contains names and addresses of sites that have been identified as being contaminated from the release of hazardous materials, including industrial sites, waste disposal facilities, and sites containing leaking USTs.

The Cortese list of sites within San Francisco includes a large number of sites, but the vast majority no longer pose a potential risk to human health and the environment. For example, there are 794 leaking UST sites on the Cortese list in San Francisco, but 756 of them have been closed, indicating that investigation and remediation of the sites has been completed.[129] Of the 142 Cortese list sites overseen by DTSC, 105 have been closed or referred to other agencies.[130]

Absent remediation, contamination at a Cortese list site may have the potential to migrate via groundwater to nearby properties. Contamination that migrates in this manner generally affects soils and groundwater at the depth of groundwater. If construction workers were to excavate to the depth of groundwater during construction of program- or project-level TEP components, and soils and groundwater contained contaminants from reported hazardous material sites, the contaminated soil and groundwater could pose a risk to human health and the environment.

TEP components would be constructed primarily within the existing public right-of-way and would not be located on or directly affect industrial parcels or other reported hazardous materials sites. In addition, as detailed under Impact HY-2 in Topic 15, Hydrology and Water Quality, on pp. 303-320 of this Initial Study, excavation would generally be approximately 2 to 12 feet in depth and would not be anticipated to be deep enough to encounter groundwater, and therefore contamination that may have migrated from a nearby site would not affect the specific excavation.

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[129] State Water Resources Control Board, Geotracker Database, San Francisco Sites, available online at www.geotracker.waterboards.ca.gov, accessed November 20, 2012.

[130] Department of Toxic Substances Control, Envirstor Database, San Francisco Sites, available online at http://www.envirostor.dtsc.ca.gov/public/, accessed on November 27, 2012.

Other existing laws, regulations and ordinances would protect construction workers and the general public in the event that hazardous materials from nearby hazardous material sites are encountered during construction of TEP components. As detailed under Impact HZ-1, above, Article 20 of the Public Works Code and Article 22A of the Health Code require a hazardous materials investigation in areas where significant excavation in potentially contaminated fill materials is proposed. Permit provisions in Article 2, Section 4 of the Public Works Code regarding excavation in public rights-of-way requires compliance with all existing hazardous materials guidelines for disposal, handling, release, and treatment of hazardous material; site remediation; and worker safety and training. DPW is authorized to require emergency remediation if hazardous materials are encountered at an excavation within a public right-of-way (Public Works Code Article 2, Section 4.73). In addition, application of mitigation measure M-HZ-1 would ensure that should contaminated soils be encountered by construction of the proposed project, the contractor would follow protocols deemed appropriate by DPH to address potential exposure.

Implementation of mitigation M-HZ-1 and compliance with DPW permit requirements for excavation within the right-of-way would reduce potential impacts from contact with contaminated soils from hazardous material sites during construction to a less-than-significant level.

Following construction, no potential exposure to contaminated soils from hazardous material sites would be anticipated. Therefore no significant impacts would be expected during the operational phase of the proposed project.

Based on the above analysis, the program- and project-level components of the TEP would have a less-than-significant impact on the creation of a significant hazard to the public or the environment if one or more of the TEP components were located adjacent to a hazardous materials site. Also, there would be no indirect effects from the Policy Framework as a result of the TEP with respect to this topic. Therefore, this topic will not be discussed in the EIR.

Impact HZ-4: Implementation of the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving fires, and would not interfere with the implementation of an emergency response plan. (*Less than Significant*) (Criteria 16g and 16h)

Program-Level Impacts

Implementation of existing hazardous material requirements, discussed under Impact HZ-1, above, would require the safe use, storage, and disposal of flammable materials during construction of program-level TEP components, including Service-related Capital Improvements and TTRPs, minimizing potential fire risks.

Excavation in the public right-of-way would require a permit from DPW. Provisions in the Public Works Code regarding excavation (Article 2.4, Section 2.4.52) prohibit excavations greater than 1,200 feet in length without prior written approval of the Director of Public Works, in part to ensure that construction projects do not create significant barriers to emergency response. DPW may also add conditions to excavation permits in order to protect public health and safety (Article 2.4, Section 2.4.20). As part of right-of-way permit review, DPW provides notice to other City agencies, such as the SFFD.

Adherence to the Public Works Code and DPW permit and coordination requirements would ensure that operation of TEP program-level components do not expose persons or structures to significant impacts from increased fire risks or interfere with emergency response during construction.

Following construction, no routine use of flammable materials or potential interference with emergency response would be anticipated. The TEP would not interfere with implementation of an emergency response plan. No significant impacts with respect to hazardous materials or interference with an emergency response plan would be anticipated during the operation phase of the TEP program-level components.

Therefore, the program-level TEP components would have a less-than-significant impact on the exposure of people or structures to a significant risk of loss, injury, or death involving fires, and the interference with the implementation of an emergency response plan.

Project-Level Impacts

As with the program-related TEP components, adherence to the requirements of Article 2.4 of the Public Works Code and DPW permit requirements would ensure that construction of TEP project-related components do not expose persons or structures to significant impacts from increased fire risks or interfere with emergency response during construction.

Following construction, no routine use of flammable materials or potential interference with implementation of an emergency response plan would be anticipated. No significant impacts with respect to hazardous materials or interference with an emergency response plan would be expected during the operational phase of the TEP project-level components.

Therefore, the project-level TEP components would have a less-than-significant impact on the exposure of people or structures to a significant risk of loss, injury, or death involving fires, and the interference with the implementation of an emergency response plan.

Based on the above analysis, neither the program-level nor the project-level TEP components would result in a significant impact, and this topic will not be analyzed further in the EIR.

Combined Impacts

No significant impacts related to hazards and hazardous materials were identified that would be compounded by a combination of several TEP components under construction in the same area at the same time, because each construction project would be required to comply with the same laws and regulations and implement Mitigation Measure HZ-1. Therefore, impacts from combined TEP components would not increase the severity of impacts in any one area. As a result, no significant hazards and hazardous materials impacts would result from the combined program- and project-level TEP components, and no indirect significant impacts related to hazards and hazardous materials would result from the Policy Framework as related to the TEP.

Cumulative Impacts

Impact C-HZ-1: The proposed project in combination with other past, present, or reasonably foreseeable future projects would not result in a cumulatively considerable contribution to significant cumulative impacts with respect to hazards and hazardous materials. (*Less than Significant*)

Cumulative impacts occur when impacts from a proposed project combine with similar impacts from other past, present, or reasonably foreseeable projects in a similar geographic area. The geographic context for cumulative hazards and hazardous materials impacts is the streets (public rights-of-way) and their vicinity affected by the TEP. Other projects occurring in the public right-of-way in San Francisco that may combine with the effects of the TEP would include projects

implemented by the SFPUC, DPW, the Planning Department, and the SFMTA. The SFPUC implements projects to address water infrastructure including sewer and storm water management throughout the City. DPW is responsible for maintenance of the City's streets including the condition of pavement in the roadways. The Planning Department often includes public realm improvements as part of area plans in the *San Francisco General Plan*. The SFMTA operates Muni, regulates parking and loading facilities, plans bicycle and pedestrian improvements for the public right-of-way, and oversees traffic operations within the transportation network of the City.

No impacts were identified that would be compounded by additional projects in the City right-of-way implemented by other City or state agencies. This is because multiple construction activities occurring in the same general location would all be subject to the requirements of Public Works Code Article 2.4 and would be required to coordinate excavation and construction activities, pursuant to Section 2.4.11. Implementation of Mitigation Measure HZ-1, Hazardous Materials Soil Testing, would further reduce any potential hazards and hazardous materials impacts related to contaminated soil and groundwater in project construction areas. Operation of the TEP would not result in any significant impacts related to hazards and hazardous materials because no use of hazardous materials (beyond minor quantities of maintenance and cleaning compounds) would occur during the operational phase of the project. No impacts were identified that would be compounded by additional development or transportation projects implemented in the City right-of-way by the SFMTA or other City or state agencies because hazards and hazardous materials impacts are generally limited to the immediate vicinity of the use, storage, disposal, or release of the hazardous materials. Although the development of other projects in San Francisco could result in similar hazardous materials impacts, those impacts would not intensify the potential impacts of the TEP, and the TEP would not intensify hazardous materials impacts at other locations in the project vicinity. Therefore, implementation of the proposed project would not result in a cumulatively considerable contribution to cumulative impacts regarding hazards and hazardous materials, and the cumulative impact would be less than significant.

For the reasons provided above, additional environmental review with respect to hazards and hazardous materials is not anticipated to be required for the Policy Framework as related to the TEP or for any of the TEP components.

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TOPIC 17: MINERAL AND ENERGY RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X	
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X	
c) Encourage activities which result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner?			X		

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any indirect effects of the Policy Framework with respect to minerals and energy resources would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-

related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional environmental review pursuant to CEQA if necessary once any such projects are developed and proposed.

Effects on mineral resources would be similar for all TEP components because the proposed project would be implemented primarily within the public right-of-way and would affect mineral resources in a similar manner. TEP components that could increase fuel, water and energy use include construction of the TPS Toolkit as applied to the TTRPs, curb ramps associated with some Service Improvements, and the Service-related Capital Improvements, and implementation of the Service Improvements with the increase in the number of transit trips, increase in transit vehicles (up to 60), and increase in service hours. Operation of the OWEs would also increase energy use. These TEP components are addressed in the impact discussion below.

Program-level and project-level effects on mineral and energy resources would be the same at both the program-level and project-level because the elements of both are sufficiently defined and are not dependent on design details or locations to determine whether they would result in the loss of mineral resources or result in excessive use of fuel, water or energy. For example, the construction of a transit bulb for the program-level TPS Toolkit or a project-level TTRP would use substantially the same amount of fuel, water, and energy regardless of location. Therefore, the following discussion evaluates both program- and project-level environmental effects of the TEP in its entirety under the topic of mineral and energy resources.

Impact ME-1: The proposed project would not result in the loss of availability of a known mineral resource or a locally-important mineral resource recovery site. *(No Impact)* (Criteria 17a and 17b)

All land in the City and County of San Francisco is designated Mineral Resource Zone 4 (MRZ-4) by the California Division of Mines and Geology under the Surface Mining and Reclamation Act of 1975.[131] This designation signifies that the City and County of San Francisco land is not located within a designated area of significant mineral deposits. The TEP would be implemented primarily within the public right-of-way. There are no designated mineral resource recovery sites within the City and

[131] California Division of Mines and Geology, Open File Report 96-03, 1996 and Special Report 146 Parts I and II, 1986. A copy of this document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2011.0558E.

County of San Francisco project area whose operations or accessibility would be affected by the construction or operation of the TEP. Therefore, the proposed project would not have an impact on mineral resources at either the program or project-level since there are no designated areas of significant mineral deposits or mineral resource recovery sites in the City that would be affected by the TEP. No mitigation is necessary and this topic will not be discussed further in the EIR.

Impact ME-2: The proposed project would not result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner. ***(Less than Significant)*** **(Criterion 17c)**

The construction of curb ramps for some Service Improvements, and the construction of Service-related Capital Improvements and the TTRPs would result in increased fuel and water and energy use for the construction vehicles and equipment, and water for construction site activities, such as dust control and equipment wash downs. However, the amounts of fuel and energy used during construction would be typical of public works projects and would not be used in a wasteful manner. As explained in Topic 11, Utilities and Service Systems, in Impact UT-2, non-potable water is required to be used for construction dust control pursuant to Article 21 of the Public Works Code. The proposed project would also be required to comply with the Resource Efficiency and Green Building Ordinance and Construction Recycled Content Ordinance, which indirectly reduces energy use by reducing the need to extract, transport and manufacture new construction materials.

Evaluation of additional fuel and energy use for the TEP relates to the Service Improvements, TTRPs, and also the operation of routes following the overhead wire projects that are part of the construction of Service-related Capital Improvements.

Implementation of Service Improvements could increase energy consumption through the creation of new routes, changes to route alignment, changes to the route headways (frequency) and hours of transit service, and transit service expansion. On balance, however, proposed Service Improvements have been developed to eliminate underutilized existing routes or route segments; and to change transit vehicle types on specific routes to better meet changing customer travel patterns and service needs (e.g., changing from motor coaches to smaller van service in hilly neighborhoods).

Implementation of the TEP would increase the number of transit vehicles required to operate the Muni system over time by up to 60 vehicles, which would consume

additional energy. This increased energy consumption would be substantially offset by the SFMTA's policy to increase the use of biodiesel in City-owned diesel vehicles. The TEP does not include any specific provisions related to the use of biodiesel. However, any increase in vehicles as a result of the TEP would comply with the SFMTA's policies to use biodiesel fuel in transit vehicles and to meet its goal of providing a zero emissions fleet by 2020. The SFMTA has complied with Executive Directive 06-02 which requires all diesel-using City Departments to begin using B20. All new motor coaches, including those purchased as a result of the TEP would be compatible with B20. Furthermore, all new motor coaches would be diesel hybrid-electric vehicles, which are more fuel efficient than traditional diesel buses at the lower speeds that are typical of San Francisco's operating environment.

Additionally, the SFMTA has one of the largest zero emission fleets in the country, as well as a growing diesel hybrid-electric motor coach fleet. SFMTA's fleet consists of 420 diesel-powered motor coaches, 86 diesel hybrid-electric motor coaches, 313 electric-powered trolley coaches, and 151 electric-powered LRVs. The SFMTA estimates that the diesel hybrid-electric coaches currently achieve 26 to 28 percent greater fuel economy than diesel-powered coaches; this reduction in fuel use would continue to be achieved for diesel hybrid-electric coaches that are operated for the Service Improvements.

The program-level and project-level OWE projects would increase electricity use. SFMTA operates with hydro-powered electricity provided by the San Francisco Public Utilities Commission Hetch Hetchy system, which is more efficient than other sources of energy used to produce electrical power.

Energy and fuel would also be used more efficiently with implementation of the program-level and project-level TTRPs. The TTRPs have been planned with the goal to reducing transit travel time to complete service routes by minimizing idle time caused by congestion and intersection wait times, which increase energy and fuel use.

For the reasons discussed above, the proposed project would have a less-than-significant impact on water, fuel and energy use because the addition of 60 vehicles would be relatively small (about 6 percent) of the SFMTA's existing vehicle fleet of approximately 1,200 vehicles. The continued and increased use of biodiesel fuels and diesel hybrid-electric motor coaches, and the reduced idling time during service operations of the TTRPs would reduce overall fuel and energy use by the transit

system. These reductions, both from existing City requirements and from implementation of the TEP, would balance the limited increase in water, fuel and energy use from the increase in service hours related to implementation of the Service Improvements, the TTRPs, and operation of the OWEs. Additionally, as a result of the TEP, some people may shift from vehicle use to transit which would also reduce fuel and energy use. Therefore, impacts on energy, fuel and water resources would be less than significant at both the program-level and project-level. No mitigation is necessary and this topic will not be discussed further in the EIR.

Combined Impacts

The proposed project would not result in combined impacts because effects on mineral and energy resources are not related to whether individual projects or components would occur simultaneously or overlap in the same adjacent locations. Fuel, water and energy use effects on the physical environment relate to the total of use of these resources regardless of the location.

Cumulative Impacts

Impact C-ME-1: The proposed project in combination with other past, present, or reasonably foreseeable future projects would not result in a cumulatively considerable contribution to significant cumulative impacts on mineral and energy resources. *(Less than Significant)*

The geographic context for cumulative mineral and energy impacts is the San Francisco Bay Area. Cumulative impacts occur when the environmental impacts from the proposed project combine with similar impacts from other past, present or reasonably foreseeable future projects in a similar geographic area. As mentioned above, the City is not a designated area of significant mineral deposits; therefore, no impact on mineral resources, either individually or cumulatively, would occur as a result of the implementation of the TEP and Policy Framework as related to the TEP.

Overall, the SFMTA goals to increase efficiency of transit operations may be met through implementation of the Policy Framework and TEP proposals, including the Service Improvements, the Service-related Capital Improvements, and TTRPs. In addition, the City and the SFMTA have instituted policies to increase use of biodiesel fuel for any increase in transit vehicles related to TEP. For these reasons, the proposed project's contribution to impacts on energy resources would not be cumulatively considerable. Therefore, implementation of the Policy Framework as

related to the TEP and the TEP would have a less-than-significant cumulative impact on energy resources. This topic will not be discussed further in the EIR.

For the reasons above, additional environmental review with respect to minerals and energy resources is not anticipated to be required for implementation of the Policy Framework as related to the TEP or any of the TEP components.

TOPIC 18: AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X	

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X	
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)) or timberland (as defined by Public Resources Code Section 4526)?				X	
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X	
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or forest land to non-forest use?				X	

Although adoption of the Policy Framework would not directly result in any physical changes in the environment, projects proposed under the Policy Framework, both now and in the future, may cause such changes. Thus, the Policy Framework may indirectly result in changes to the physical environment. The TEP's proposed service improvements, the service-related Capital Improvements, and the TTRPs, comprised of the TPS Toolkit elements, provide a good representative sample of the types of projects, both in size and scope, that could be proposed under the Policy Framework. Thus, by analyzing these TEP elements, including the TPS Toolkit elements and the TTRPs, the potential indirect effects of the Policy Framework can be understood. Any

indirect effects of the Policy Framework with respect to agriculture and forest resources would result from application of the TPS Toolkit elements for the TTRPs, the limited construction related to installation of curb ramps in conjunction with some Service Improvements, and the construction and implementation of the Service-related Capital Improvements. Additionally, future projects proposed under the Policy Framework may be required to undergo additional CEQA analysis if necessary once any such projects are developed and proposed.

The effects of TEP on agriculture and forest resources would be similar at both the program-level and project-level because there is sufficient detail for the project elements to determine whether the Policy Framework and TEP would result in the conversion or loss of agricultural or forest land to a different use. For example, the general locations of the TTRP corridors and the geographic extent of the program-level Service-related Capital Improvements and the nine program-level TTRPs are known, and the general characteristics of the TPS Toolkit elements are also known. Therefore, the following discussion evaluates both program- and project-level environmental effects of the proposed project in its entirety under the topic of agriculture and forest resources.

Impact AF-1: The proposed project would not have a substantial adverse effect on agriculture or forest resources. *(No Impact)* (Criteria 18a, 18b, 18c, and 18d)

The Policy Framework as related to TEP and TEP, in its entirety, including the Service Improvements, Service-related Capital Improvements, and TTRPs, would be implemented within San Francisco, an urban area, and would be located primarily within the public right-of-way. According to the California Department of Conservation's Farmland Mapping and Monitoring Program, land within the City and County of San Francisco is categorized as "Urban and Built-up Land."[132] Additionally, no land within the City is zoned for agricultural or forest uses.[133] Because the public right-of-way does not contain agricultural or forest uses and no proposed locations are zoned for such uses, the proposed project would not convert any land designated as Prime Farmland, Unique Farmland or Farmland of Statewide Importance to non-agricultural use, conflict with any existing agricultural zoning or a

[132] California Department of Conservation, Farmland Mapping and Monitoring Program, *Bay Area Region Important Farmland 2004 and Urbanization 1984 – 2004*. Available at ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/statewide/2002/fmmp2002_11_17.pdf. Accessed on March 6, 2012.

[133] City and County of San Francisco, San Francisco Planning Code, as amended, § 201 Classes of Use Districts.

Williamson Act contract, or involve any changes to the environment that could result in the conversion of farmland to a non-agricultural use.[134] The TEP would not be located within any known forest land or timberland areas (as defined by Public Resources Code Sections 12220(g) and 4526, respectively). Thus, neither the TEP nor the Policy Framework as related to the TEP would result in the loss of forest land or timberland or in the conversion of forest land to non-forest use.

For the reasons discussed above, the proposed TEP project would not adversely affect agricultural or forest resources and there would be no impact with respect to agriculture or forest resources at either a program-level or project-level because the City land within the City and County of San Francisco does not include agriculture or forest land or land zoned for these purposes. No mitigation is necessary and this topic will not be discussed further in the EIR.

For the reasons above, additional environmental review with respect to agricultural and forest resources is not anticipated to be required for the Policy Framework as related to TEP or any of the TEP components.

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[134] The TEP would include installation of a traffic signal and bus bulb in Daly City for the TTRP.14; however these improvements would not affect agricultural and forest uses.

TOPIC 19: MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?		X			
b) Have impacts that would be individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	X				

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
c) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	X				

As described, the potential indirect effects of the Policy Framework related to TEP are represented by the physical effects of the TEP analyzed in the Initial Study. The following topics have been fully analyzed for the TEP components and Policy Framework as related to the TEP and have been determined to have less-than-significant impacts with mitigation included in the proposed project, less-than-significant impacts, or no impacts and would not contribute considerably to significant cumulative impacts: land use and land use planning, aesthetics, population and housing, cultural and paleontological resources, greenhouse gas emissions, wind and shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral and energy resources, and agricultural and forest resources.

The construction and operation of the TEP would not cause degradation in the quality of the environment in most topic areas, and there would be no significant impacts on biological resources and therefore no significant cumulative impacts. The potentially significant impacts on archaeological and paleontological resources that could eliminate important examples of California history that may result from construction of TEP components would be mitigated to less-than-significant levels with mitigation measures included in the proposed project, as discussed in Topic 4, Cultural and Paleontological Resources. The potentially significant impacts that could result during construction if hazardous materials are encountered would be mitigated to less-than-significant levels with the mitigation measure included in the proposed project, discussed in Topic 16, Hazards and Hazardous Materials.

The TEP could result in significant transportation impacts; therefore, this topic will be analyzed in detail and discussed in the EIR. In addition, the TEP could potentially cause significant air quality or noise impacts that, if they occur, would cause

substantial adverse impacts on people in San Francisco. Therefore, air quality and noise will be analyzed in detail and discussed in the EIR.

_____

F. MITIGATION MEASURES AND IMPROVEMENT MEASURES

For most topics fully analyzed in this Initial Study, the proposed project would have less-than-significant impacts without mitigation for both program level and project level components.

The San Francisco Municipal Transportation Authority has agreed to implement the following mitigation measures, which are necessary to reduce impacts on archaeological and paleontological resources and impacts from hazardous materials to less-than-significant levels:

Mitigation Measure M-CP-2a: Accidental Discovery of Archeological Resources

The following mitigation measure is required to avoid any potential adverse effect from the proposed project on accidentally discovered buried or submerged historical resources as defined in *CEQA Guidelines* Section 15064.5(a)(c). The project sponsor shall distribute the Planning Department archaeological and paleontological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); and to any utilities firm involved in soils disturbing activities within the project site. Prior to any soils disturbing activities being undertaken, each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The project sponsor shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the ERO confirming that all field personnel have received copies of the Alert Sheet.

Should any indication of an archaeological resource be encountered during any soils disturbing activity of the project, the project Head Foreman and/or project sponsor shall immediately notify the ERO and shall immediately suspend any soils disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures should be undertaken.

If the ERO determines that an archaeological resource may be present within the project site, the project sponsor shall retain the services of an archaeological

consultant from the pool of qualified archaeological consultants maintained by the Planning Department archaeologist. The archaeological consultant shall advise the ERO as to whether the discovery is an archaeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archaeological resource is present, the archaeological consultant shall identify and evaluate the archaeological resource. The archaeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the project sponsor.

Measures might include: preservation in situ of the archaeological resource, an archaeological monitoring program, or an archaeological testing program. If an archaeological monitoring program or archaeological testing program is required, it shall be consistent with the Environmental Planning division guidelines for such programs. The ERO may also require that the project sponsor immediately implement a site security program if the archaeological resource is at risk from vandalism, looting, or other damaging actions.

The project archaeological consultant shall submit a FARR to the ERO that evaluates the historical significance of any discovered archaeological resource and describing the archaeological and historical research methods employed in the archaeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archaeological resource shall be provided in a separate removable insert within the final report.

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archaeological Site Survey NWIC shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound copy, one unbound copy, and one unlocked searchable PDF copy on CD of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the NRHP/CRHR. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

Mitigation Measure M-CP-2b: Archaeological Monitoring

Based on the reasonable potential that archaeological resources may be present within the project site, the following measures shall be undertaken to avoid any potentially significant adverse effect from the proposed project on buried or submerged historical resources. Once engineering design details for the identified projects (OWE.1, SCI.2, TTRP.9 and TTRP.22_2) are known, the project sponsor shall consult with the Planning Department archeologist regarding the specific aspects of these proposals that would require monitoring. If required by the Planning Department archeologist, the project sponsor shall retain the services of an archaeological consultant from the pool of qualified archaeological consultants maintained by the Planning Department archaeologist. The

archaeological consultant shall undertake an archaeological monitoring program. All plans and reports prepared by the consultant as specified herein shall be submitted first and directly to the Environmental Review Officer (ERO) for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO. Archaeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of *construction* can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archaeological resource as defined in *CEQA Guidelines* Sect. 15064.5 (a)(c).

Archaeological monitoring program (AMP). The archaeological monitoring program shall minimally include the following provisions:

- The archaeological consultant, project sponsor, and ERO shall meet and consult on the scope of the AMP reasonably prior to any project-related soils disturbing activities commencing. The ERO, in consultation with the project archaeologist, shall determine what project activities shall be archaeologically monitored. In most cases, any soils disturbing activities, such as demolition, foundation removal, excavation, grading, utilities installation, foundation work, driving of piles (foundation, shoring, etc.), site remediation, etc., shall require archaeological monitoring because of the potential risk these activities pose to archaeological resources and to their depositional context.

- The archaeological consultant shall advise all project contractors to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archaeological resource.

- The archaeological monitor(s) shall be present on the project site according to a schedule agreed upon by the archaeological consultant and the ERO until the ERO has, in consultation with the archaeological consultant, determined that project construction activities could have no effects on significant archaeological deposits.

- The archaeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis.

- If an intact archaeological deposit is encountered, all soils disturbing activities in the vicinity of the deposit shall cease. The archaeological monitor shall be empowered to temporarily redirect demolition/excavation/ pile driving/construction crews and heavy equipment until the deposit is evaluated. If in the case of pile driving activity (foundation, shoring, etc.), the archaeological monitor has cause to believe that the pile driving activity may affect an archaeological resource, the pile driving activity shall be terminated until an appropriate evaluation of the resource has been made in consultation

with the ERO. The archaeological consultant shall immediately notify the ERO of the encountered archaeological deposit. The archaeological consultant shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, present the findings of this assessment to the ERO.

Consultation with Descendant Communities: On discovery of an archaeological site[135] associated with descendant Native Americans or the Overseas Chinese, an appropriate representative[136] of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archaeological field investigations of the site and to consult with ERO regarding appropriate archaeological treatment of the site, of recovered data from the site, and, if applicable, any interpretative treatment of the associated archaeological site. A copy of the Final Archaeological Resources Report shall be provided to the representative of the descendant group.

If the ERO, in consultation with the archaeological consultant, determines that a significant archaeological resource is present and that the resource could be adversely affected by the proposed project, at the discretion of the project sponsor, either:

A) The proposed project shall be re-designed so as to avoid any adverse effect on the significant archaeological resource; or

B) An archaeological data recovery program shall be implemented, unless the ERO determines that the archaeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible.

If an archaeological data recovery program is required by the ERO, the archaeological data recovery program shall be conducted in accord with an archaeological data recovery plan (ADRP). The project archaeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP. The archaeological consultant shall prepare a draft ADRP that shall be submitted to the ERO for review and approval. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archaeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data

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[135] The term "archaeological site" is intended here to minimally include any archaeological deposit, feature, burial, or evidence of burial.

[136] An "appropriate representative" of the descendant group is here defined to mean, in the case of Native Americans, any individual listed in the current Native American Contact List for the City and County of San Francisco maintained by the California Native American Heritage Commission, and in the case of the Overseas Chinese, the Chinese Historical Society of America.

recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical.

The scope of the ADRP shall include the following elements:

- *Field Methods and Procedures*. Descriptions of proposed field strategies, procedures, and operations.

- *Cataloguing and Laboratory Analysis*. Description of selected cataloguing system and artifact analysis procedures.

- *Discard and Deaccession Policy*. Description of and rationale for field and post-field discard and deaccession policies.

- *Interpretive Program*. Consideration of an on-site/off-site public interpretive program during the course of the archaeological data recovery program.

- *Security Measures*. Recommended security measures to protect the archaeological resource from vandalism, looting, and non-intentionally damaging activities.

- *Final Report*. Description of proposed report format and distribution of results.

- *Curation*. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

Human Remains, Associated or Unassociated Funerary Objects. The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable State and federal Laws, including immediate notification of the Coroner of the City and County of San Francisco and, in the event of the Coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission who shall appoint a MLD (Pub. Res. Code Sec. 5097.98). The archaeological consultant, project sponsor, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (*CEQA Guidelines*. Sec. 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, curation, possession, and final disposition of the human remains and associated or unassociated funerary objects.

Final Archaeological Resources Report. The archaeological consultant shall submit a Draft FARR to the ERO that evaluates the historical significance of any discovered archaeological resource and describes the archaeological and historical research methods employed in the archaeological testing/monitoring/data recovery program(s) undertaken. Information that may put

at risk any archaeological resource shall be provided in a separate removable insert within the draft final report.

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO copies of the FARR shall be distributed as follows: California Archaeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound, one unbound, and one unlocked searchable PDF copy on CD of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the NRHP/CRHR. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

Mitigation Measure M-CP-3: Paleontological Resources Accidental Discovery

In order to avoid any potential adverse effect in the event of accidental discovery of a paleontological resource during construction of the project, the project sponsor shall be responsible for ensuring that all project contractors and subcontractors involved in soil-disturbing activities associated with the project comply with the following procedures in the event of discovery of a paleontological resource. Paleontological remains, or resource, can take the form of whole or portions of marine shell, bones, tusk, horn and teeth from fish, reptiles, mammals, and lower order animals. In the case of Megafauna, the remains, although partial, may be large in scale. Also paleontological resources include petrified wood and rock impressions of plant or animal parts.

Should any indication of a paleontological resource be encountered during any soil- disturbing activity of the project, the project foreman and/or project sponsor shall immediately notify the City Planning Department's Environmental Review Officer (ERO) and one of its designated paleontologists (currently, Dr. Jean De Mouthe/Dr. Peter Roopnarine in the Geology Department of the California Academy of Sciences) and immediately suspend any soil-disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures are needed.

If the ERO determines that a potentially-significant paleontological resource may be present within the project site, the project sponsor shall retain the services of a qualified paleontological consultant with expertise in California paleontology to design and implement a Paleontological Resources Mitigation Plan (PRMMP). The PRMMP shall include a description of discovery procedures; sampling and data recovery procedures; procedures for the preparation, identification, analysis, and curation of fossil specimens and data recovered; and procedures for the preparation and distribution of a final PDR documenting the paleontological find.

The PRMMP shall be consistent with the Society for Vertebrate Paleontology Standard Guidelines for the mitigation of construction-related adverse impacts to paleontological resources and the requirements of the designated repository for any fossils collected. In the event of a verified paleontological discovery, the remaining construction and soil-disturbing activities within those geological units specified as paleontologically sensitive in the PRMMP shall be monitored by the project paleontological consultant.

The consultant's work shall be conducted in accordance with this mitigation measure and at the direction of the City's ERO. Plans and reports prepared by the consultant shall be submitted for review and approval by the ERO.

Mitigation Measure M-HZ-1: Hazardous Materials Soil Testing

In order to protect both construction workers and the public from exposure to hazardous materials in soils encountered during construction of the proposed project, the project sponsor agrees to adhere to the following requirements.

1) Any soil excavated and then, encapsulated under concrete and/or asphalt covering within the same area as its excavation shall not require testing for the presence of hazardous materials in levels exceeding those acceptable to government agencies unless the TEP project or construction manager determines any extenuating circumstances exist, such as odors, unusual color or presence of foreign material. The reuse, remediation, or disposal of any soil tested and found to contain hazardous materials under these circumstances shall be in compliance with the requirements of the San Francisco Department of Public Health (DPH) and other agencies. The project sponsor shall be responsible for reporting the test results of any soil with hazardous material content to DPH within 21 days of the completion of testing, accompanied with a map showing the excavation location.

2) Any excavated soil not reused and encapsulated under concrete and/or asphalt covering within the same area as its excavation, shall be tested for the presence of hazardous materials in levels exceeding those acceptable to government agencies, before it is moved from the area of excavation. The transportation and disposal of the soil shall be in compliance with DPH, state, and federal requirements. The project sponsor shall be responsible for reporting the test results of any soil with hazardous material content to DPH within 21 days of the completion of testing, accompanied with a map showing the excavation location.

3) If the proposed excavation activities encounter groundwater, the groundwater shall be tested for hazardous materials. Copies of the test results shall be submitted to DPH within 21 days of the completion of testing. Any dewatering shall adhere to DPH, SFPUC, and state requirements.

In the event that a subsequent ordinance or regulations are adopted by DPH governing the handling and testing of hazardous materials encountered during construction within the public right-of-way, DPH may require the project sponsor to adhere to the implementation of the new ordinance or regulations in lieu of the above requirements if they provide similar safety protection for both construction workers and the public.

G. PUBLIC NOTICE AND COMMENT

The Planning Department prepared a Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping (NOP) for the Transit Effectiveness Project in November 2011. Notice was published in a newspaper of general circulation on November 9, 2011, and notice was mailed to a mailing list of over 4,900 addresses, including adjacent cities and counties, other public agencies, and interested parties. Copies of the full NOP were placed in all San Francisco branch libraries. Two public scoping meetings were held in the evenings of December 6 and 7, 2011, beginning at 6:30 p.m., at which oral comments from the public were received and transcribed. Translators were available at both meetings as needed. Written comments regarding the scope of the environmental review for the TEP were accepted until 5:00 p.m. on December 9, 2011. At the two public meetings, a total of 21 persons offered oral comments. Written comments were received from 31 persons. The following issues were raised during the public scoping period:

- Aesthetics of various transit facilities, including overhead wires;
- Cultural resources issues related to archaeology;
- Transportation impact analysis suggestions, such as providing estimates of time saved, impacts of bus and pedestrian bulbs on traffic and potential for diversions, and the potential for shifts in travel modes;
- Concerns regarding pedestrian safety; and
- Issues related to the environmental review process.
- Development of reasonable alternatives for service improvements

Issues not related to environmental review that were raised during the public scoping period included:

- Support and opposition to various features of the proposed project and for various proposed route changes and proposed stop consolidations;
- Suggestions for improving existing Muni operations, such as penalties for vehicles parked in a Muni zone and removing violent passengers; and
- Concerns related to accessibility of transit service, particularly for seniors and disabled persons.
- Suggestions regarding Muni amenities which are not part of TEP proposals.

The environmental issues presented during the public scoping period have been taken into account during analyses prepared for this Initial Study, and will be considered in the analyses prepared for the Draft EIR.

H. DETERMINATION

On the basis of this Initial Study:

	Check
I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	
I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	
I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT Is required, but it must analyze only the effects that remain to be addressed.	X
I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.	

Date: January 18, 2013

Bill Wycko
Environmental Review Officer
for
John Rahaim
Director of Planning

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APPENDIX A

SERVICE IMPROVEMENT MAPS

Cable Car Routes

Legend

Cable Car Route

Rail Network

Muni Metro Stations

BART Stations

Caltrain Stations

0 0.25 0.5 Miles

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

Summary of Recommendations for E Embarcadero Line (new line):

- New historic streetcar line connecting Fisherman's Wharf and the northeast waterfront to AT&T Park and the Caltrain Station.
- Line would start at the F Market & Wharves' northern terminus at Jones Street, then travel south along The Embarcadero to Market Street, and then follow the alignment of the N/T lines to King Street to the E Embarcadero terminus at the Caltrain Station at Fourth and King streets.

Line E - Embarcadero
Recommended Route Alignment

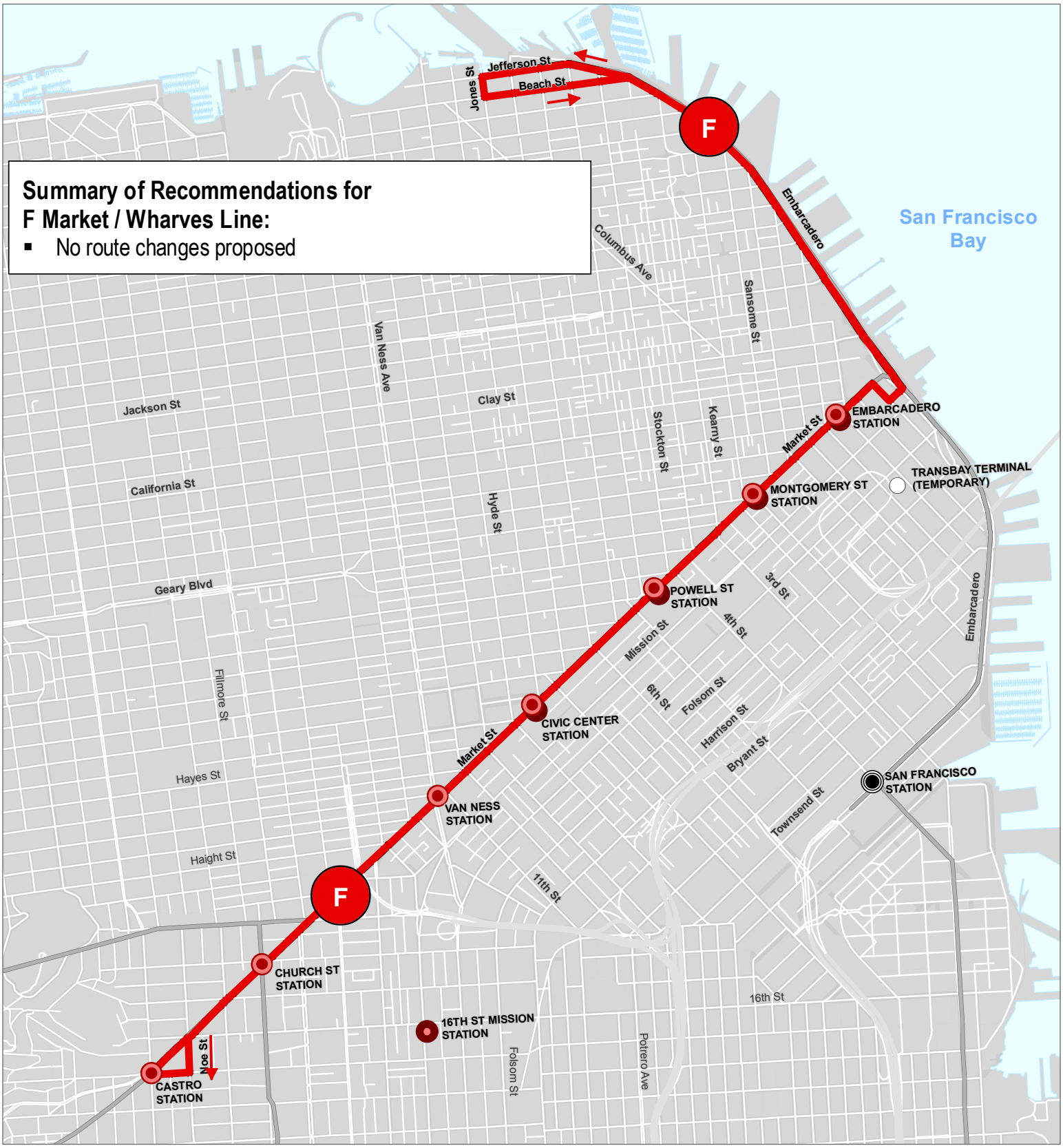
Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles



Line F - Market & Wharves
Recommended Route Alignment

Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

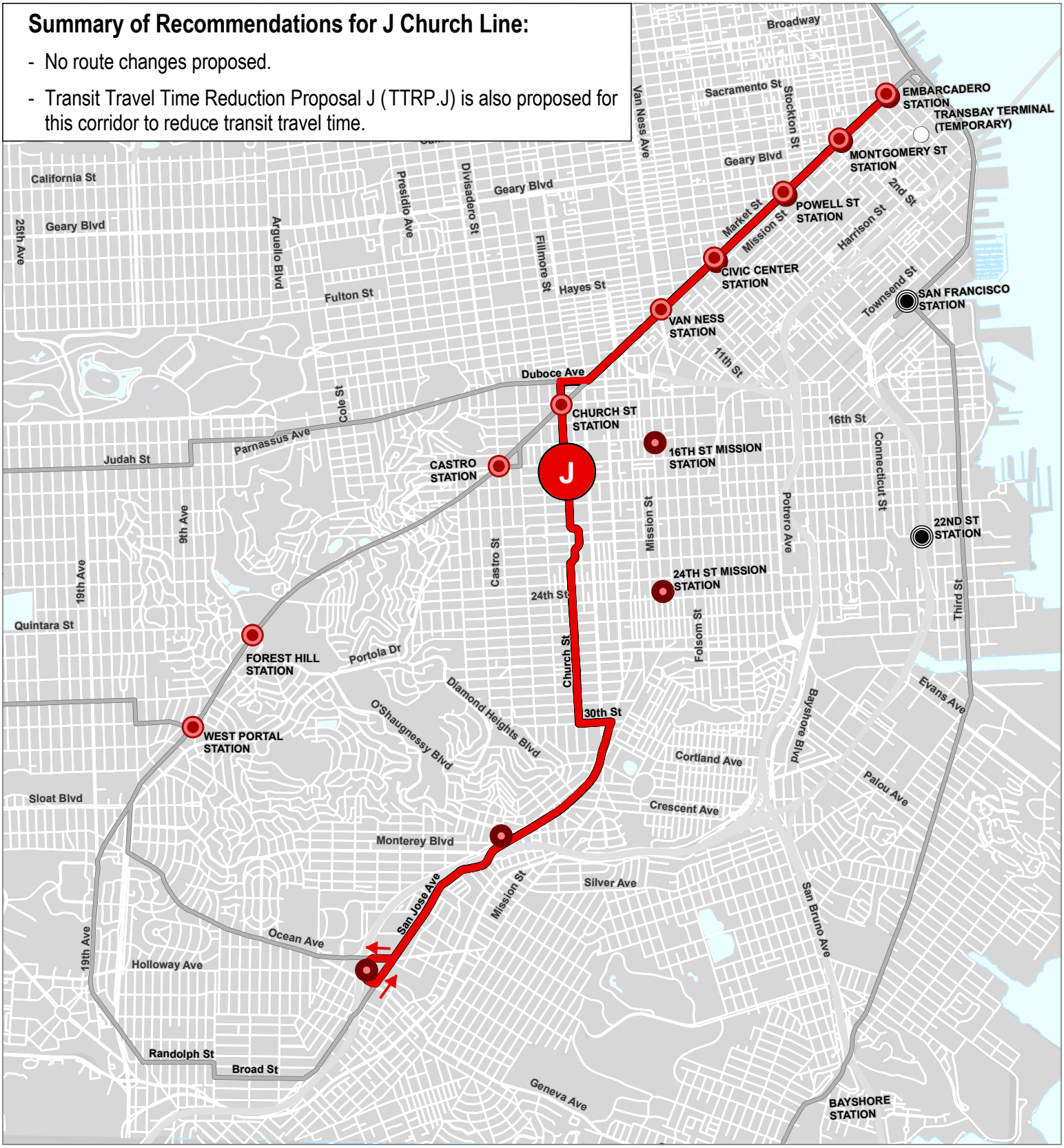
0 0.25 0.5 Miles

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

Summary of Recommendations for J Church Line:

- No route changes proposed.
- Transit Travel Time Reduction Proposal J (TTRP.J) is also proposed for this corridor to reduce transit travel time.



Line J - Church
Recommended Route Alignment

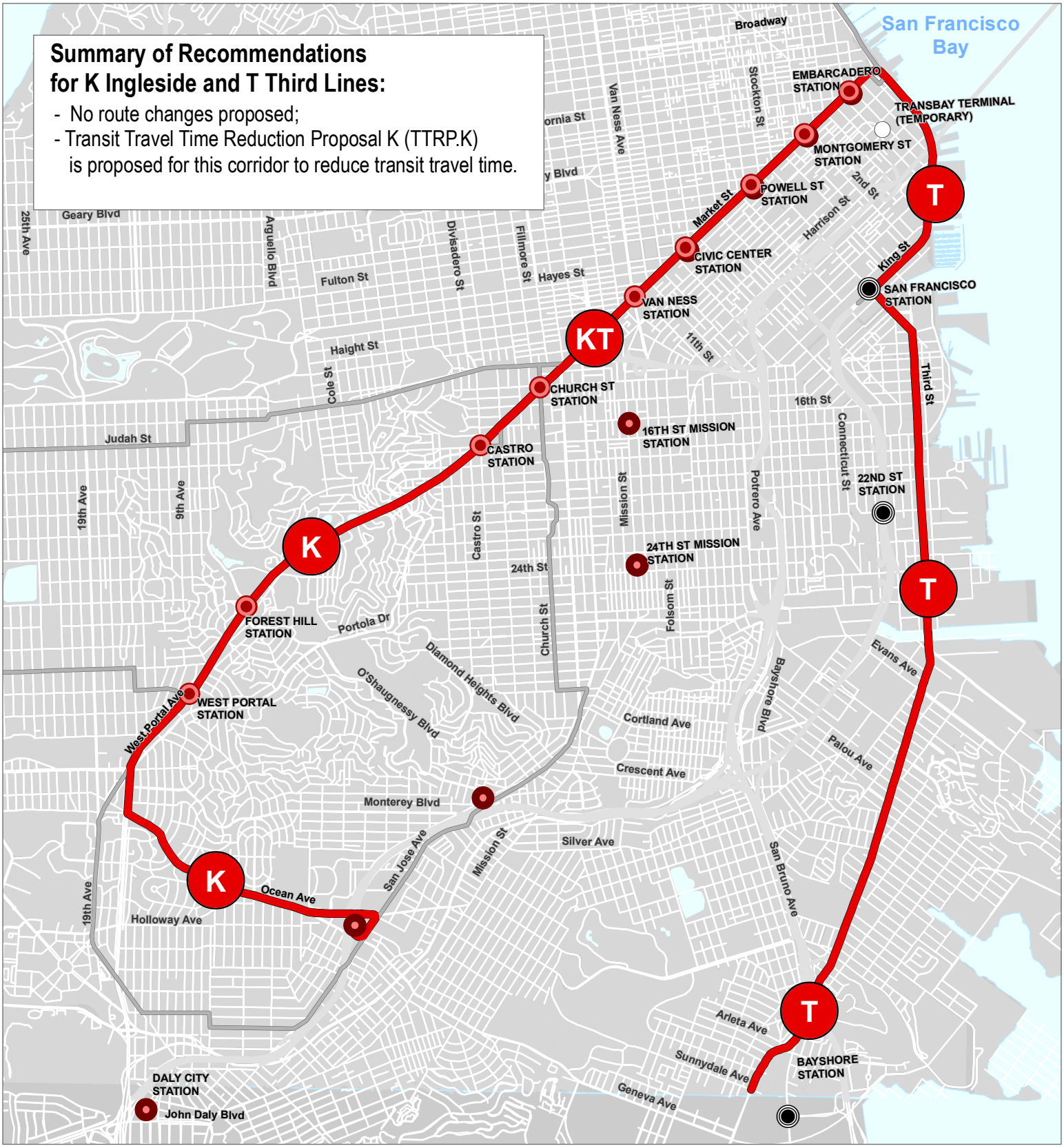
Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

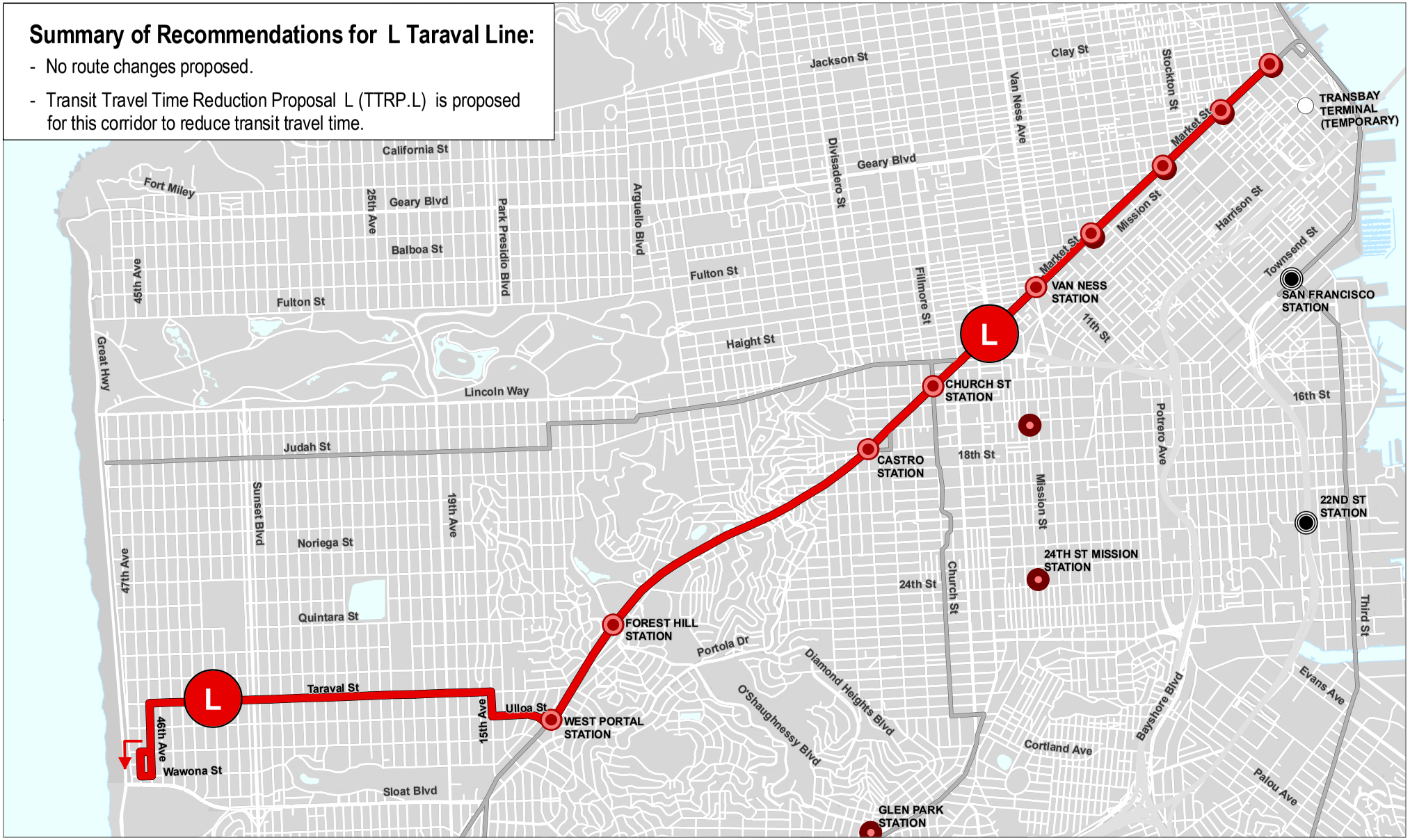
Map Updated
January 2013

0 0.5 1 Miles


Summary of Recommendations for K Ingleside and T Third Lines:
- No route changes proposed;
- Transit Travel Time Reduction Proposal K (TTRP.K) is proposed for this corridor to reduce transit travel time.
San Francisco Bay
Broadway
EMBARCADERO STATION
TRANSBAY TERMINAL (TEMPORARY)
MONTGOMERY ST STATION
POWELL ST STATION
CIVIC CENTER STATION
VAN NESS STATION
CHURCH ST STATION
16TH ST MISSION STATION
CASTRO STATION
24TH ST MISSION STATION
22ND ST STATION
SAN FRANCISCO STATION
FOREST HILL STATION
WEST PORTAL STATION
DALY CITY STATION
BAYSHORE STATION
Market St
Harrison St
2nd St
King St
Third St
Van Ness Ave
Stockton St
Fillmore St
Divisadero St
Arguello Blvd
25th Ave
Geary Blvd
Fulton St
Hayes St
Haight St
Cole St
Judah St
19th Ave
9th Ave
11th St
16th St
Connecticut St
Mission St
Potrero Ave
Castro St
24th St
Church St
Folsom St
Portola Dr
Diamond Heights Blvd
O'Shaugnessy Blvd
West Portal Ave
Cortland Ave
Crescent Ave
Bayshore Blvd
Evans Ave
Palou Ave
Monterey Blvd
Silver Ave
San Jose Ave
Ocean Ave
Holloway Ave
San Bruno Ave
Arleta Ave
Sunnydale Ave
Geneva Ave
John Daly Blvd
KT
K
T
Line KT - Ingleside/Third St
Recommended Route Alignment
Legend
Proposed Rapid Route
Rail Network
Muni Metro Stations
BART Stations
Caltrain Stations
SFMTA
Municipal Transportation Agency
Map Updated
December 2012
0
0.5
1
Miles

Summary of Recommendations for L Taraval Line:

- No route changes proposed.
- Transit Travel Time Reduction Proposal L (TTRP.L) is proposed for this corridor to reduce transit travel time.



Line L - Taraval

Recommended Route Alignment

Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

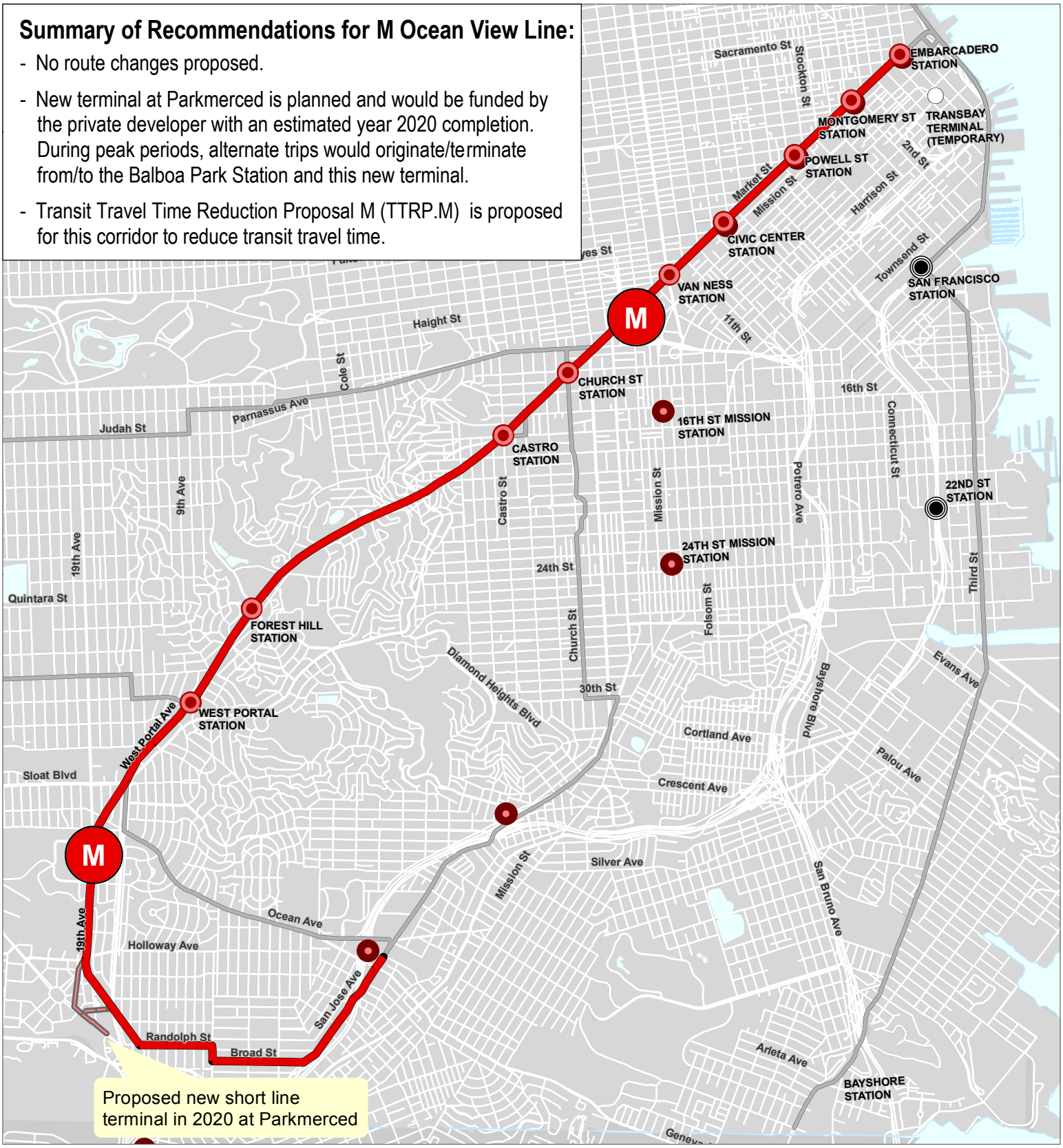
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for M Ocean View Line:

- No route changes proposed.
- New terminal at Parkmerced is planned and would be funded by the private developer with an estimated year 2020 completion. During peak periods, alternate trips would originate/terminate from/to the Balboa Park Station and this new terminal.
- Transit Travel Time Reduction Proposal M (TTRP.M) is proposed for this corridor to reduce transit travel time.



Line M - Ocean View
Recommended Route Alignment

Legend

- Recommended Rapid Route
- Segment Proposed for Elimination
- Parkmerced Extension
- Recommended Bus and Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

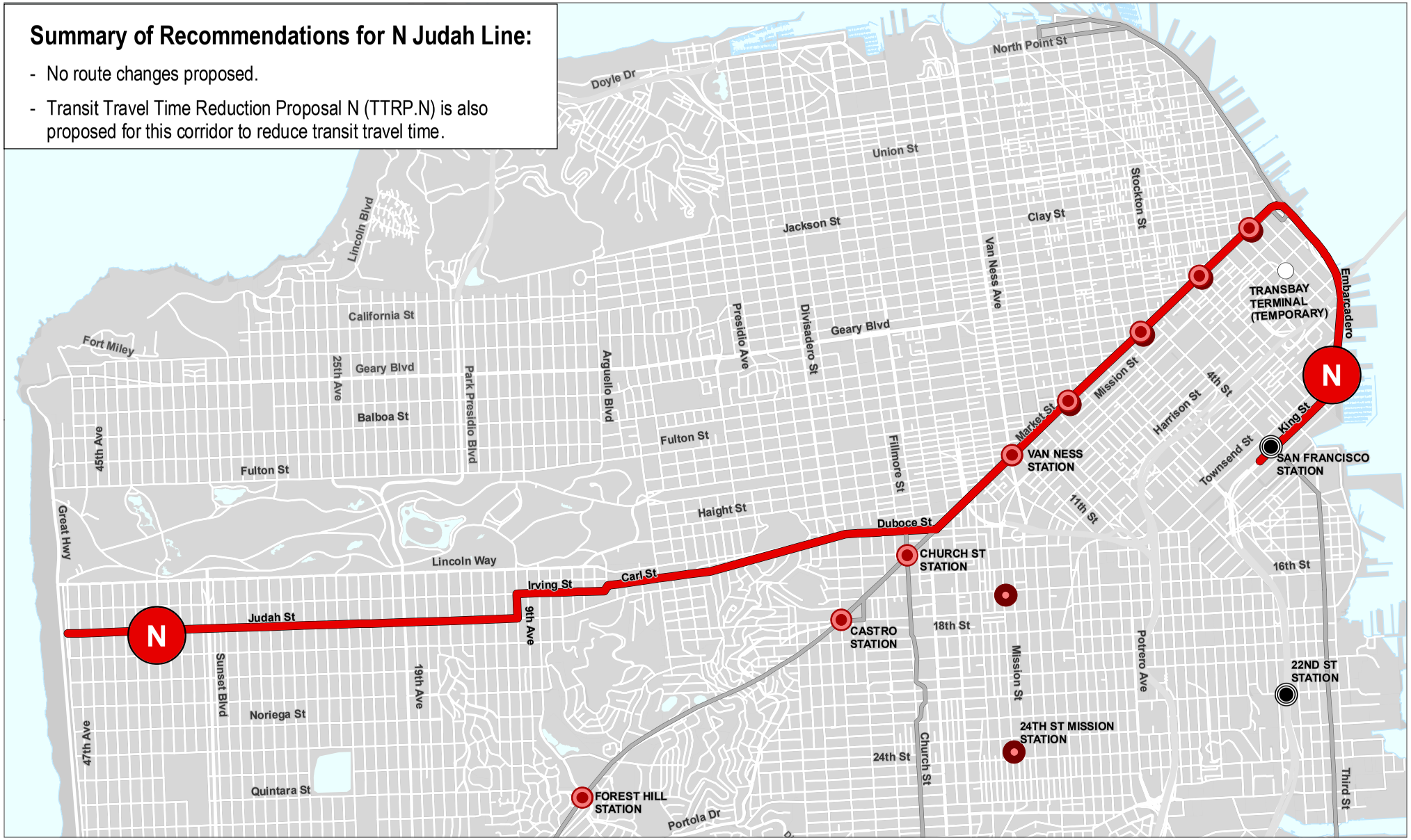
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for N Judah Line:

- No route changes proposed.
- Transit Travel Time Reduction Proposal N (TTRP.N) is also proposed for this corridor to reduce transit travel time.



Line N - Judah

Recommended Route Alignment

Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

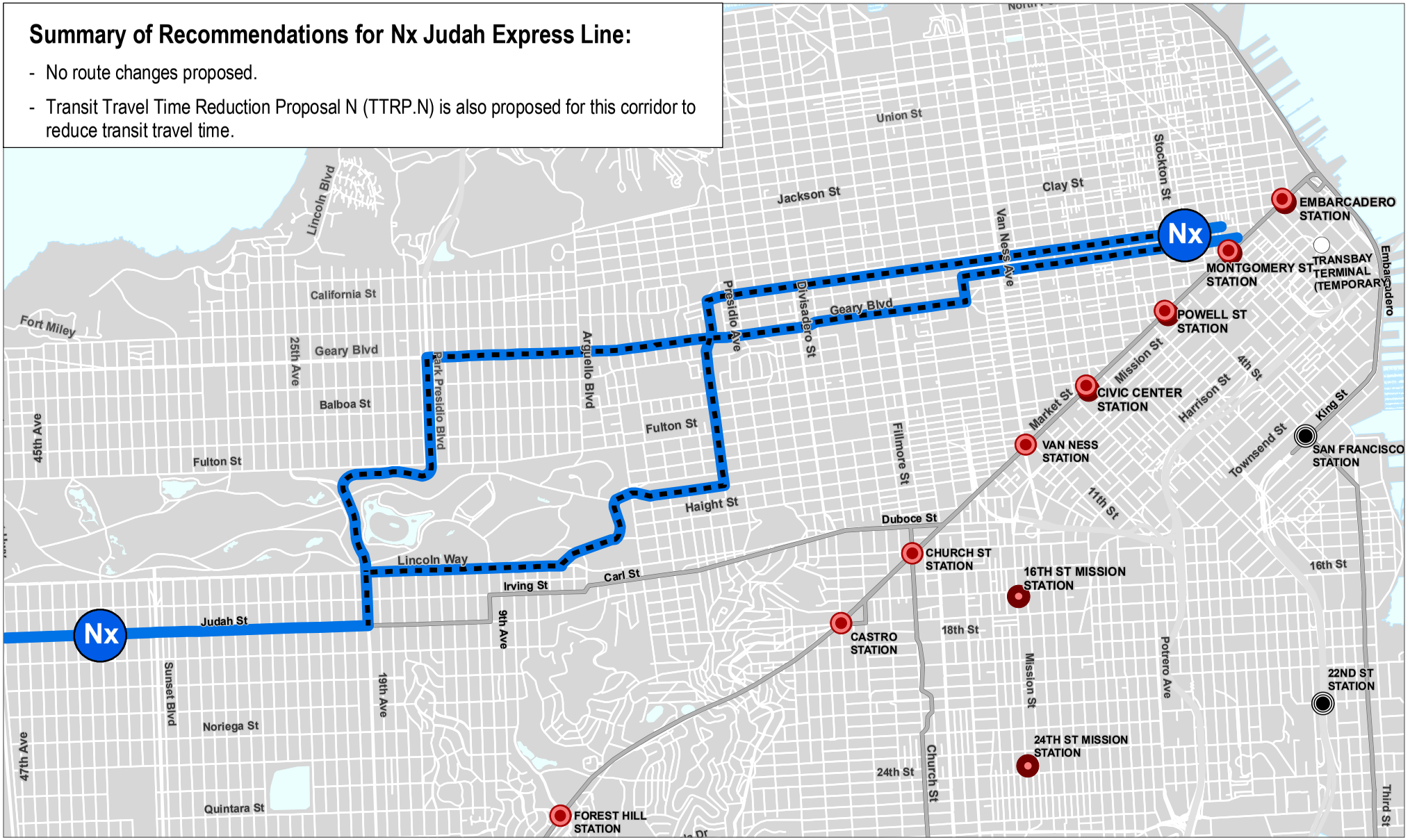
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for Nx Judah Express Line:

- No route changes proposed.
- Transit Travel Time Reduction Proposal N (TTRP.N) is also proposed for this corridor to reduce transit travel time.



Line Nx - Judah Express

Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Express Segment (No Stops)
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Line 1 - California

Recommended Route Alignment

Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

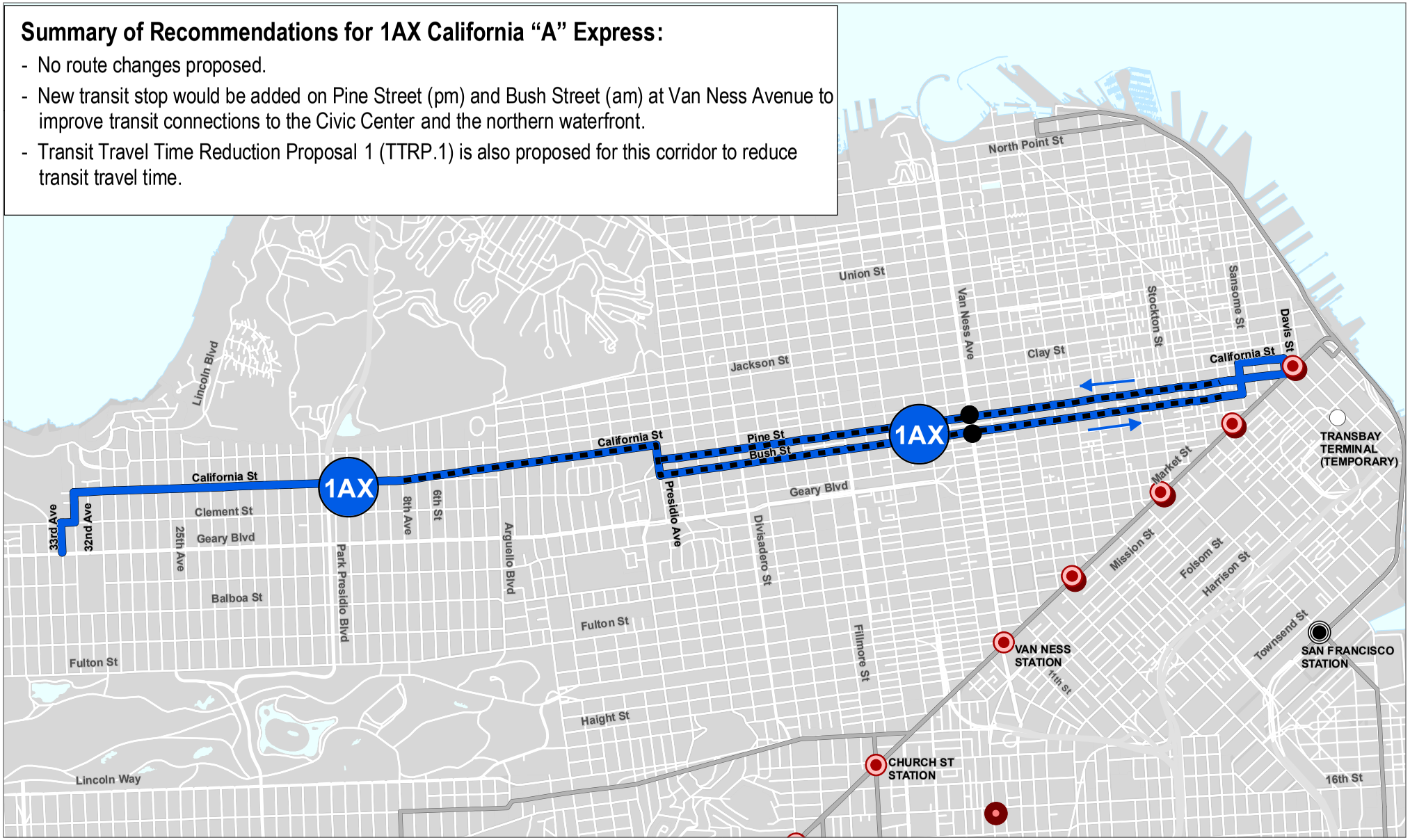
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 1AX California "A" Express:

- No route changes proposed.
- New transit stop would be added on Pine Street (pm) and Bush Street (am) at Van Ness Avenue to improve transit connections to the Civic Center and the northern waterfront.
- Transit Travel Time Reduction Proposal 1 (TTRP.1) is also proposed for this corridor to reduce transit travel time.



Line 1AX - California "A" Express

Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Express Segment (no stops)
- Rail Network
- New Stop
- Muni Metro Stations
- BART Stations
- Caltrain Stations

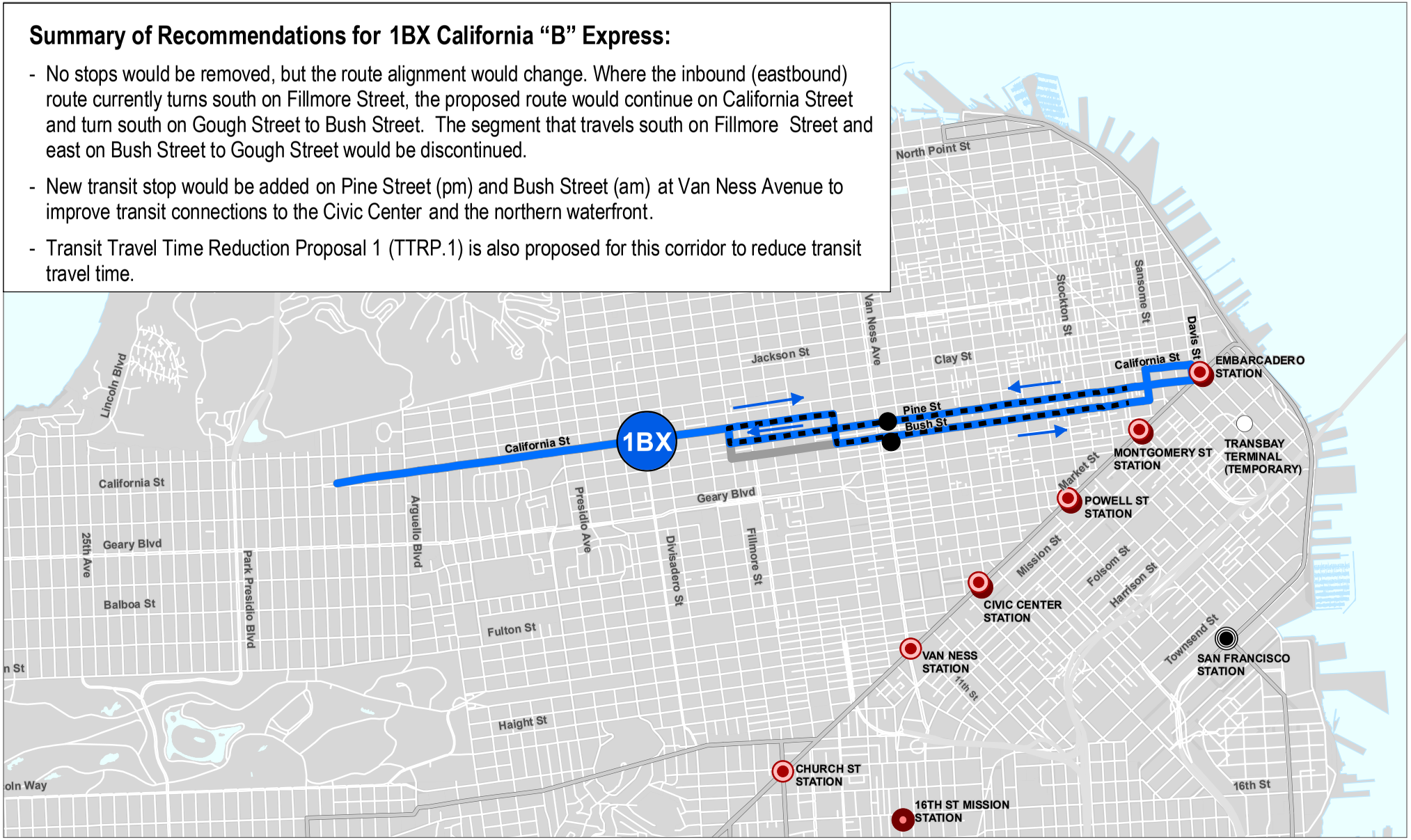
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 1BX California "B" Express:

- No stops would be removed, but the route alignment would change. Where the inbound (eastbound) route currently turns south on Fillmore Street, the proposed route would continue on California Street and turn south on Gough Street to Bush Street. The segment that travels south on Fillmore Street and east on Bush Street to Gough Street would be discontinued.
- New transit stop would be added on Pine Street (pm) and Bush Street (am) at Van Ness Avenue to improve transit connections to the Civic Center and the northern waterfront.
- Transit Travel Time Reduction Proposal 1 (TTRP.1) is also proposed for this corridor to reduce transit travel time.



Line 1BX - California "B" Express

Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Express Segment (no stops)
- Segment Proposed for Elimination
- Rail Network
- New Stop
- Muni Metro Stations
- BART Stations
- Caltrain Stations

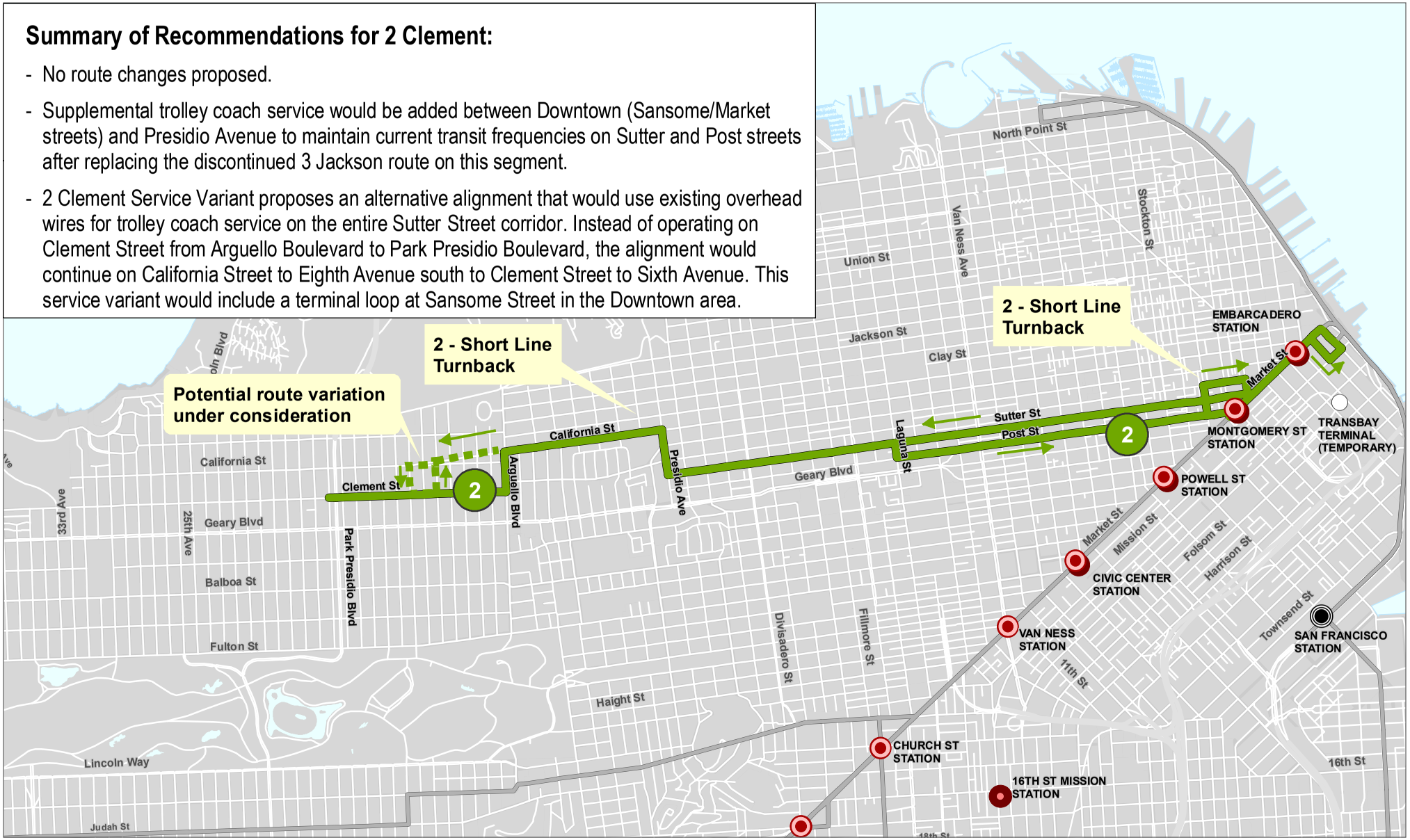
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 2 Clement:

- No route changes proposed.
- Supplemental trolley coach service would be added between Downtown (Sansome/Market streets) and Presidio Avenue to maintain current transit frequencies on Sutter and Post streets after replacing the discontinued 3 Jackson route on this segment.
- 2 Clement Service Variant proposes an alternative alignment that would use existing overhead wires for trolley coach service on the entire Sutter Street corridor. Instead of operating on Clement Street from Arguello Boulevard to Park Presidio Boulevard, the alignment would continue on California Street to Eighth Avenue south to Clement Street to Sixth Avenue. This service variant would include a terminal loop at Sansome Street in the Downtown area.



Line 2 - Clement
Recommended Route Alignment

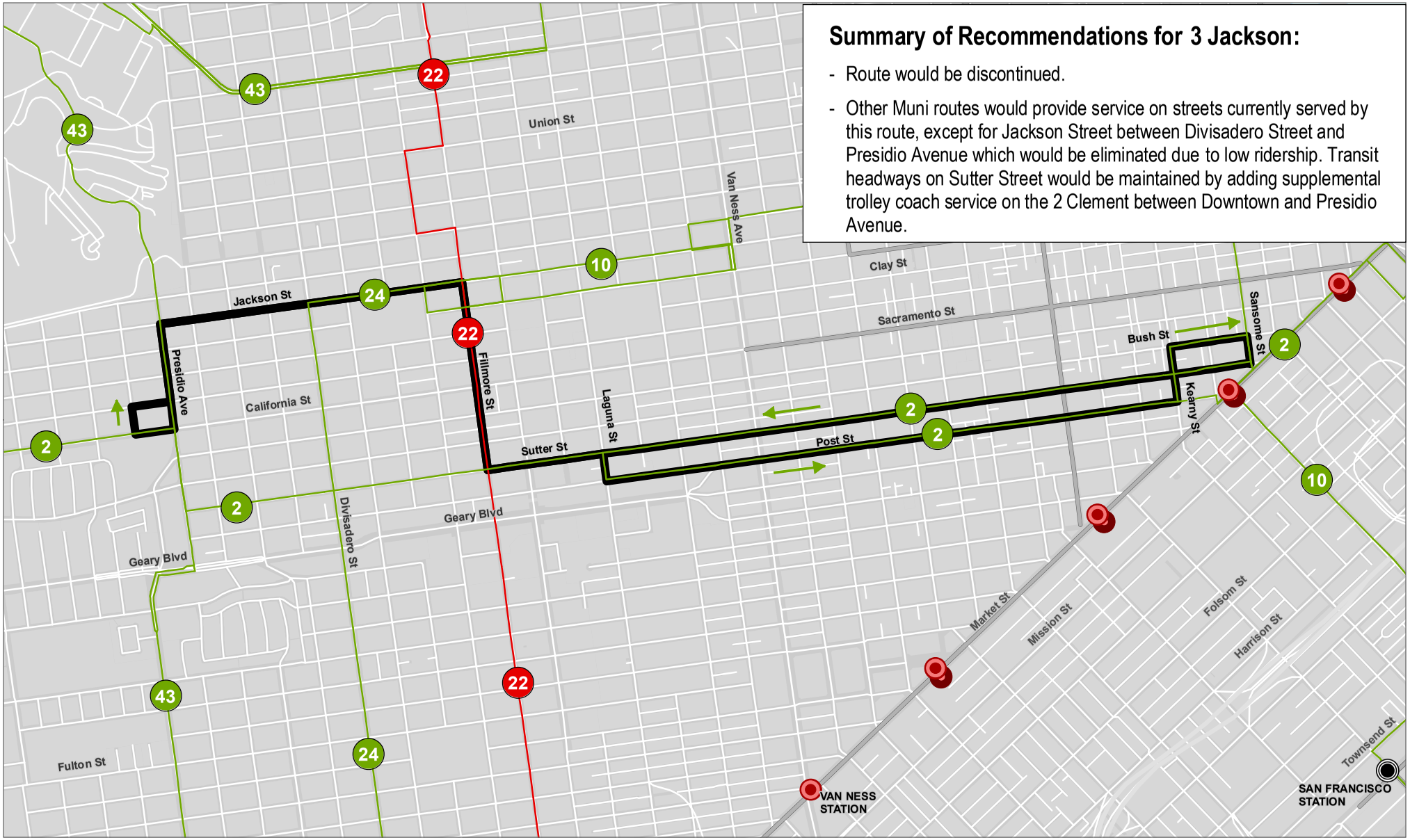
Legend

- Recommended Local Route
- Potential Route Variation
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles



Summary of Recommendations for 3 Jackson:

- Route would be discontinued.
- Other Muni routes would provide service on streets currently served by this route, except for Jackson Street between Divisadero Street and Presidio Avenue which would be eliminated due to low ridership. Transit headways on Sutter Street would be maintained by adding supplemental trolley coach service on the 2 Clement between Downtown and Presidio Avenue.

Line 3 - Jackson

Recommended Route Alignment

Legend

- Segment would be covered by another recommended route
- Recommended Bus and Rail Network
- Segment Proposed for Elimination
- Muni Metro Stations
- BART Stations
- Caltrain Stations

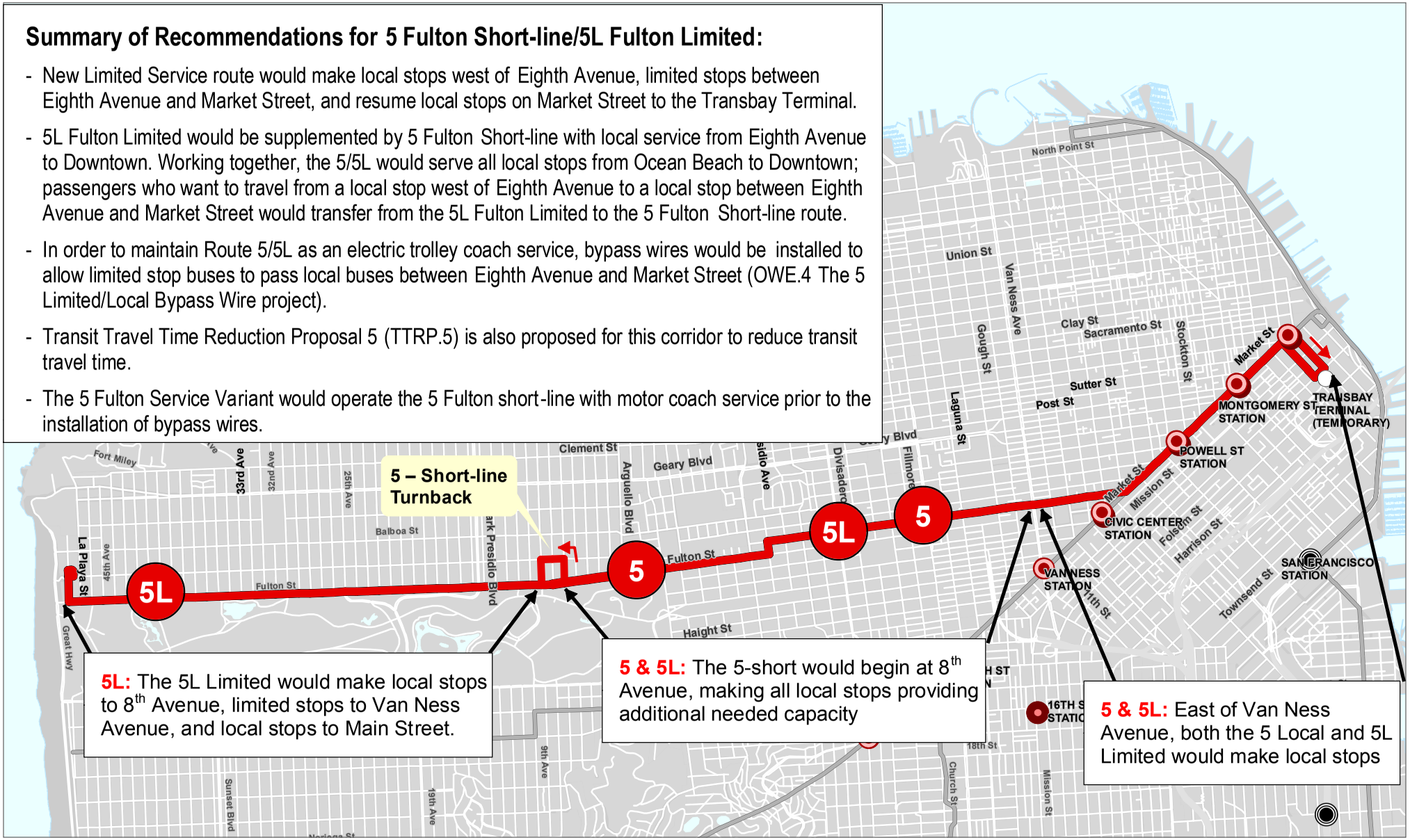
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles

Summary of Recommendations for 5 Fulton Short-line/5L Fulton Limited:

- New Limited Service route would make local stops west of Eighth Avenue, limited stops between Eighth Avenue and Market Street, and resume local stops on Market Street to the Transbay Terminal.
- 5L Fulton Limited would be supplemented by 5 Fulton Short-line with local service from Eighth Avenue to Downtown. Working together, the 5/5L would serve all local stops from Ocean Beach to Downtown; passengers who want to travel from a local stop west of Eighth Avenue to a local stop between Eighth Avenue and Market Street would transfer from the 5L Fulton Limited to the 5 Fulton Short-line route.
- In order to maintain Route 5/5L as an electric trolley coach service, bypass wires would be installed to allow limited stop buses to pass local buses between Eighth Avenue and Market Street (OWE.4 The 5 Limited/Local Bypass Wire project).
- Transit Travel Time Reduction Proposal 5 (TTRP.5) is also proposed for this corridor to reduce transit travel time.
- The 5 Fulton Service Variant would operate the 5 Fulton short-line with motor coach service prior to the installation of bypass wires.



Line 5/5L - Fulton

Recommended Route Alignment

Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

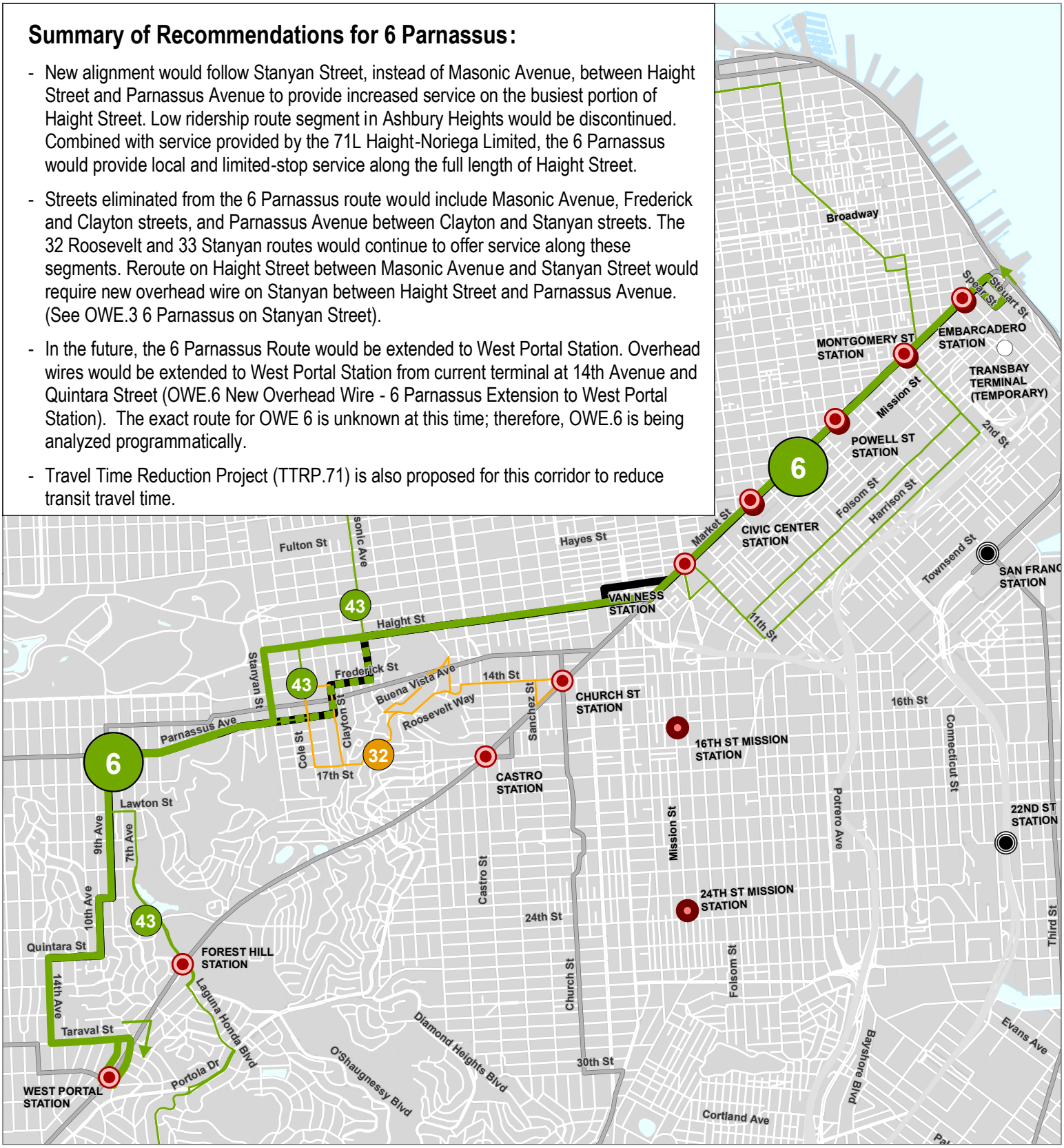
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 6 Parnassus:

- New alignment would follow Stanyan Street, instead of Masonic Avenue, between Haight Street and Parnassus Avenue to provide increased service on the busiest portion of Haight Street. Low ridership route segment in Ashbury Heights would be discontinued. Combined with service provided by the 71L Haight-Noriega Limited, the 6 Parnassus would provide local and limited-stop service along the full length of Haight Street.
- Streets eliminated from the 6 Parnassus route would include Masonic Avenue, Frederick and Clayton streets, and Parnassus Avenue between Clayton and Stanyan streets. The 32 Roosevelt and 33 Stanyan routes would continue to offer service along these segments. Reroute on Haight Street between Masonic Avenue and Stanyan Street would require new overhead wire on Stanyan between Haight Street and Parnassus Avenue. (See OWE.3 6 Parnassus on Stanyan Street).
- In the future, the 6 Parnassus Route would be extended to West Portal Station. Overhead wires would be extended to West Portal Station from current terminal at 14th Avenue and Quintara Street (OWE.6 New Overhead Wire - 6 Parnassus Extension to West Portal Station). The exact route for OWE 6 is unknown at this time; therefore, OWE.6 is being analyzed programmatically.
- Travel Time Reduction Project (TTRP.71) is also proposed for this corridor to reduce transit travel time.



Line 6 - Parnassus
Recommended Route Alignment

Legend

- Recommended Local Route
- Segment Proposed for Elimination
- Segment would be covered by another recommended route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

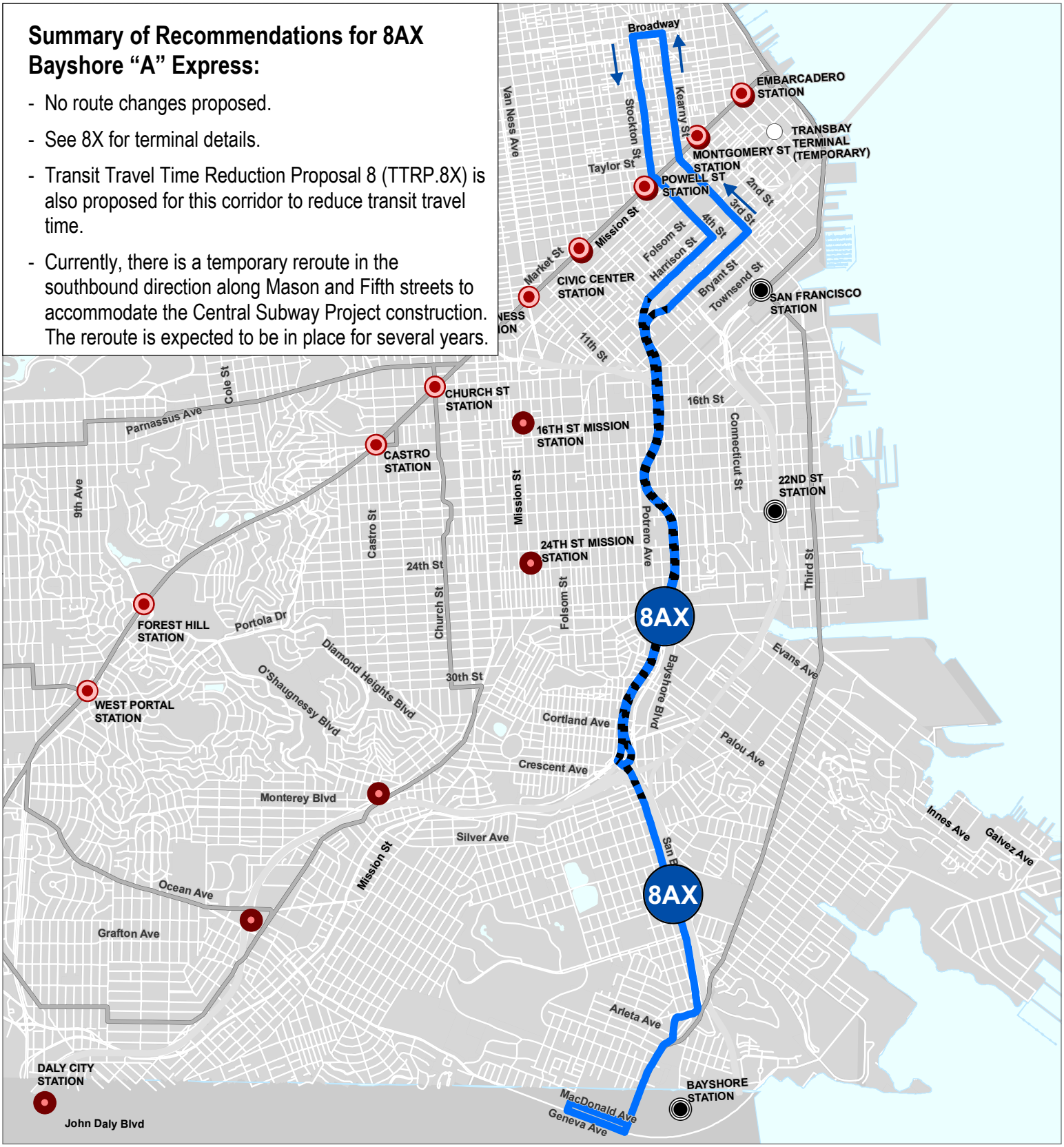
SFMTA | Municipal Transportation Agency

Map Updated
January 2013

0 0.5 1 Miles

Summary of Recommendations for 8AX Bayshore "A" Express:

- No route changes proposed.
- See 8X for terminal details.
- Transit Travel Time Reduction Proposal 8 (TTRP.8X) is also proposed for this corridor to reduce transit travel time.
- Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years.



Line 8AX - Bayshore "A" Express
Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Express Segment (no stops)
- Segment would be covered by another recommended route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

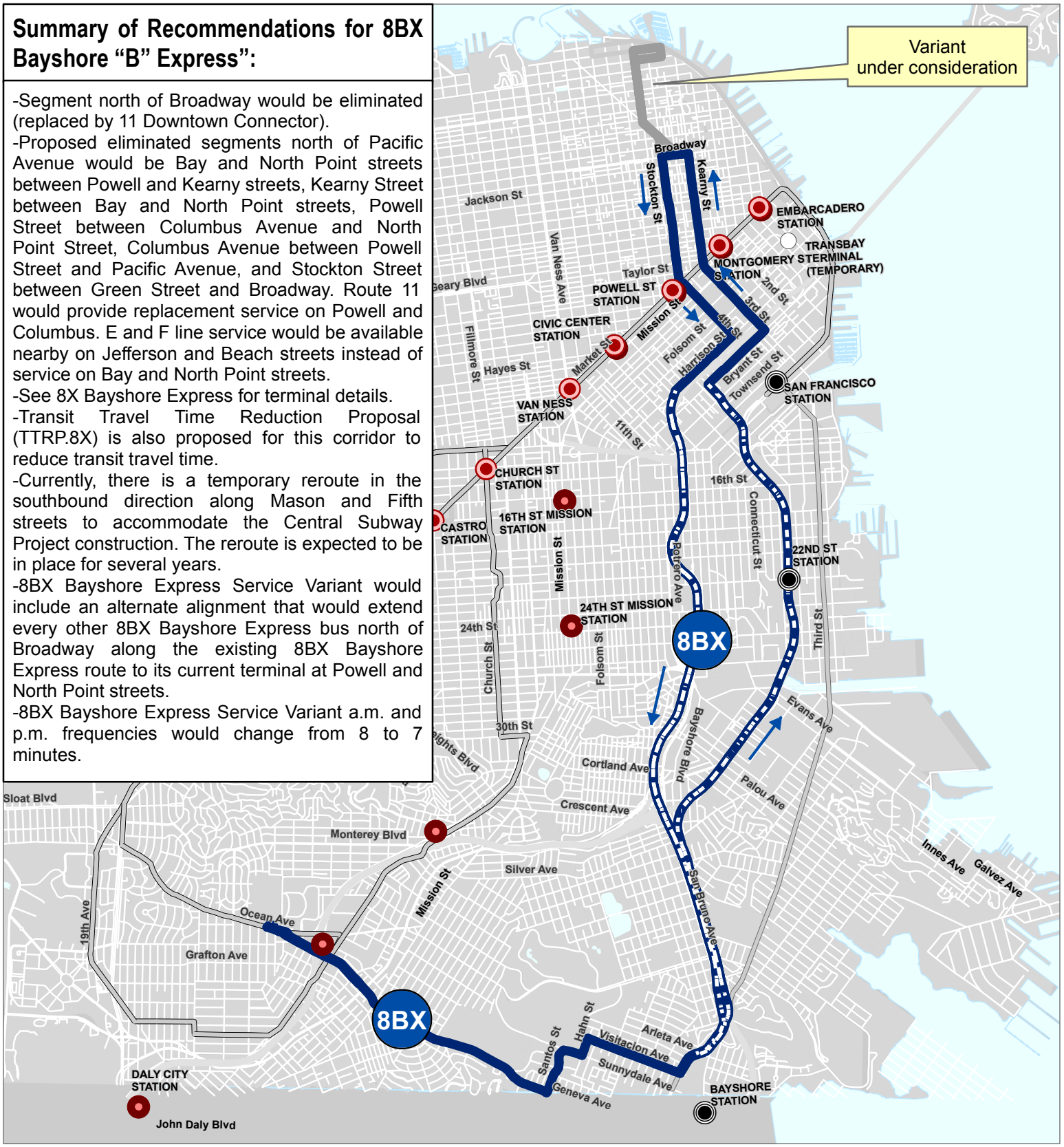
0 0.5 1 Miles

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

Summary of Recommendations for 8BX Bayshore "B" Express":

-Segment north of Broadway would be eliminated (replaced by 11 Downtown Connector).
-Proposed eliminated segments north of Pacific Avenue would be Bay and North Point streets between Powell and Kearny streets, Kearny Street between Bay and North Point streets, Powell Street between Columbus Avenue and North Point Street, Columbus Avenue between Powell Street and Pacific Avenue, and Stockton Street between Green Street and Broadway. Route 11 would provide replacement service on Powell and Columbus. E and F line service would be available nearby on Jefferson and Beach streets instead of service on Bay and North Point streets.
-See 8X Bayshore Express for terminal details.
-Transit Travel Time Reduction Proposal (TTRP.8X) is also proposed for this corridor to reduce transit travel time.
-Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years.
-8BX Bayshore Express Service Variant would include an alternate alignment that would extend every other 8BX Bayshore Express bus north of Broadway along the existing 8BX Bayshore Express route to its current terminal at Powell and North Point streets.
-8BX Bayshore Express Service Variant a.m. and p.m. frequencies would change from 8 to 7 minutes.



Line 8BX - Bayshore "B" Express (Revised)
Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Non-Stop Segment
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.5 1 Miles

SFMTA | Municipal Transportation Agency

Map Updated
March 2014

Summary of Recommendations for 8X Bayshore

-Proposed eliminated segments north of Pacific Avenue would be Bay and North Point streets between Powell and Kearny streets, Kearny Street between Bay and North Point streets, Powell Street between Columbus Avenue and North Point Street, Columbus Avenue between Powell Street and Pacific Avenue, and Stockton Street between Green Street and Broadway.

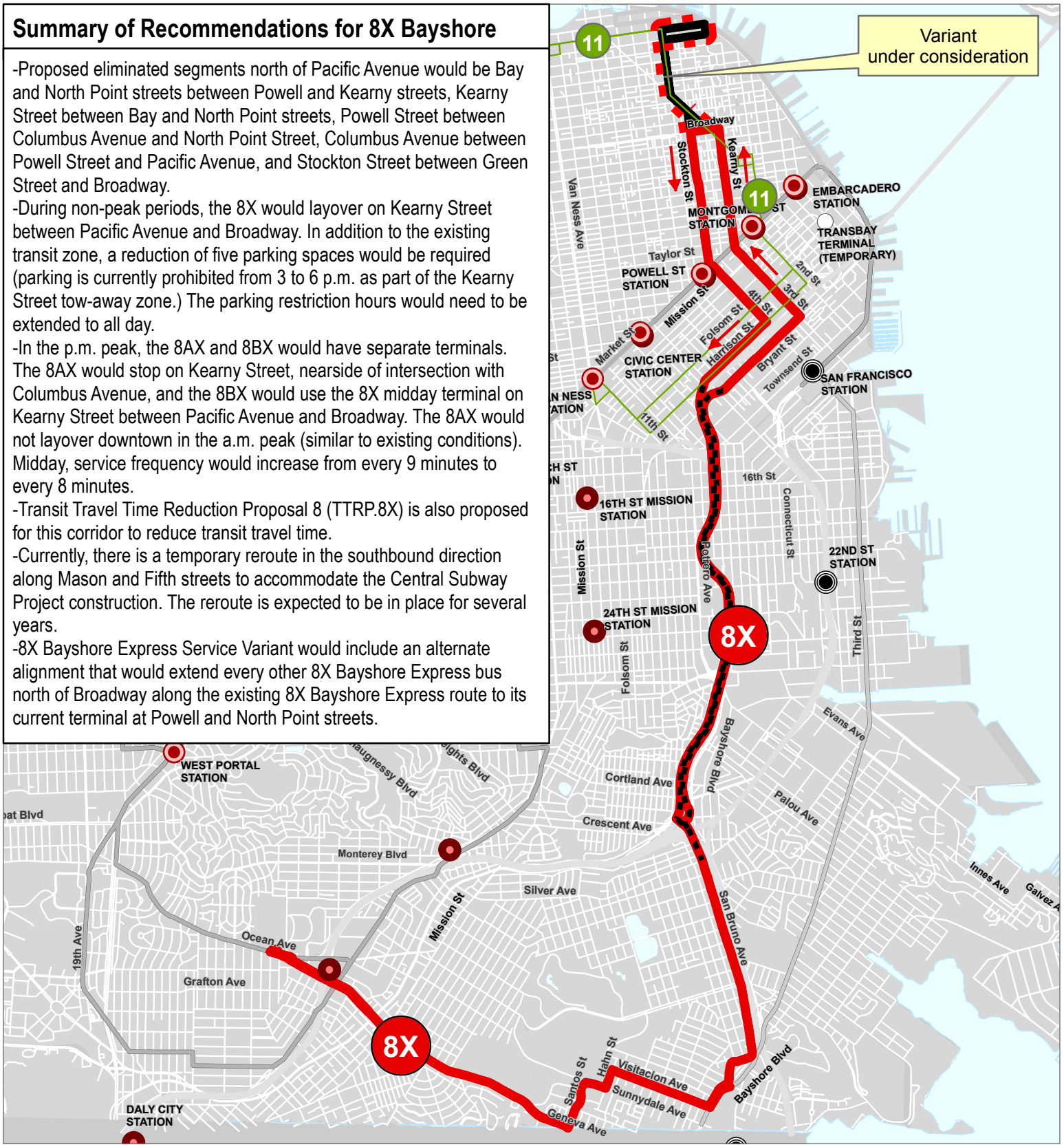
-During non-peak periods, the 8X would layover on Kearny Street between Pacific Avenue and Broadway. In addition to the existing transit zone, a reduction of five parking spaces would be required (parking is currently prohibited from 3 to 6 p.m. as part of the Kearny Street tow-away zone.) The parking restriction hours would need to be extended to all day.

-In the p.m. peak, the 8AX and 8BX would have separate terminals. The 8AX would stop on Kearny Street, nearside of intersection with Columbus Avenue, and the 8BX would use the 8X midday terminal on Kearny Street between Pacific Avenue and Broadway. The 8AX would not layover downtown in the a.m. peak (similar to existing conditions). Midday, service frequency would increase from every 9 minutes to every 8 minutes.

-Transit Travel Time Reduction Proposal 8 (TTRP.8X) is also proposed for this corridor to reduce transit travel time.

-Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years.

-8X Bayshore Express Service Variant would include an alternate alignment that would extend every other 8X Bayshore Express bus north of Broadway along the existing 8X Bayshore Express route to its current terminal at Powell and North Point streets.



Line 8X - Bayshore Express (Revised)

Recommended Route Alignment

Legend

- Recommended Rapid Route
- Rail Network
- Segment Proposed for Elimination
- Express Segment (no stops)
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
February 2014

0 0.5 1 Miles

Summary of Recommendations for 9 San Bruno/9L San Bruno Limited:

- No route changes proposed.
- Travel Time Reduction Project 9 (TTRP.9) is also proposed for this corridor to reduce transit travel time.

Line 9/9L - San Bruno
Recommended Route Alignment

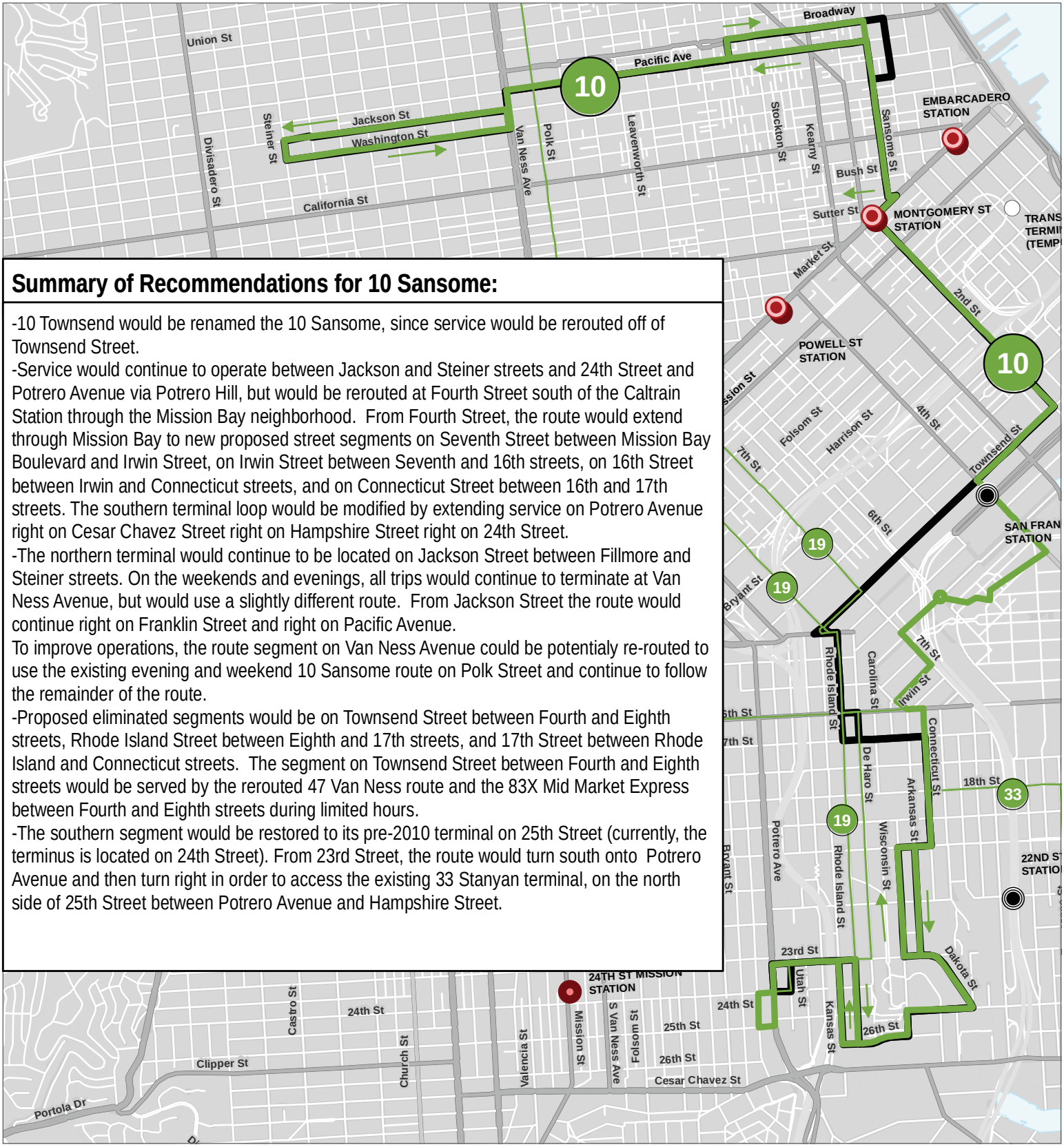
Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles



Summary of Recommendations for 10 Sansome:

-10 Townsend would be renamed the 10 Sansome, since service would be rerouted off of Townsend Street.

-Service would continue to operate between Jackson and Steiner streets and 24th Street and Potrero Avenue via Potrero Hill, but would be rerouted at Fourth Street south of the Caltrain Station through the Mission Bay neighborhood. From Fourth Street, the route would extend through Mission Bay to new proposed street segments on Seventh Street between Mission Bay Boulevard and Irwin Street, on Irwin Street between Seventh and 16th streets, on 16th Street between Irwin and Connecticut streets, and on Connecticut Street between 16th and 17th streets. The southern terminal loop would be modified by extending service on Potrero Avenue right on Cesar Chavez Street right on Hampshire Street right on 24th Street.

-The northern terminal would continue to be located on Jackson Street between Fillmore and Steiner streets. On the weekends and evenings, all trips would continue to terminate at Van Ness Avenue, but would use a slightly different route. From Jackson Street the route would continue right on Franklin Street and right on Pacific Avenue.

To improve operations, the route segment on Van Ness Avenue could be potentialy re-routed to use the existing evening and weekend 10 Sansome route on Polk Street and continue to follow the remainder of the route.

-Proposed eliminated segments would be on Townsend Street between Fourth and Eighth streets, Rhode Island Street between Eighth and 17th streets, and 17th Street between Rhode Island and Connecticut streets. The segment on Townsend Street between Fourth and Eighth streets would be served by the rerouted 47 Van Ness route and the 83X Mid Market Express between Fourth and Eighth streets during limited hours.

-The southern segment would be restored to its pre-2010 terminal on 25th Street (currently, the terminus is located on 24th Street). From 23rd Street, the route would turn south onto Potrero Avenue and then turn right in order to access the existing 33 Stanyan terminal, on the north side of 25th Street between Potrero Avenue and Hampshire Street.

Line 10 - Sansome (Revised)

Recommended Route Alignment

Legend

- Recommended Local Route
- Segment Proposed for Elimination
- Segment would be covered by another recommended route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

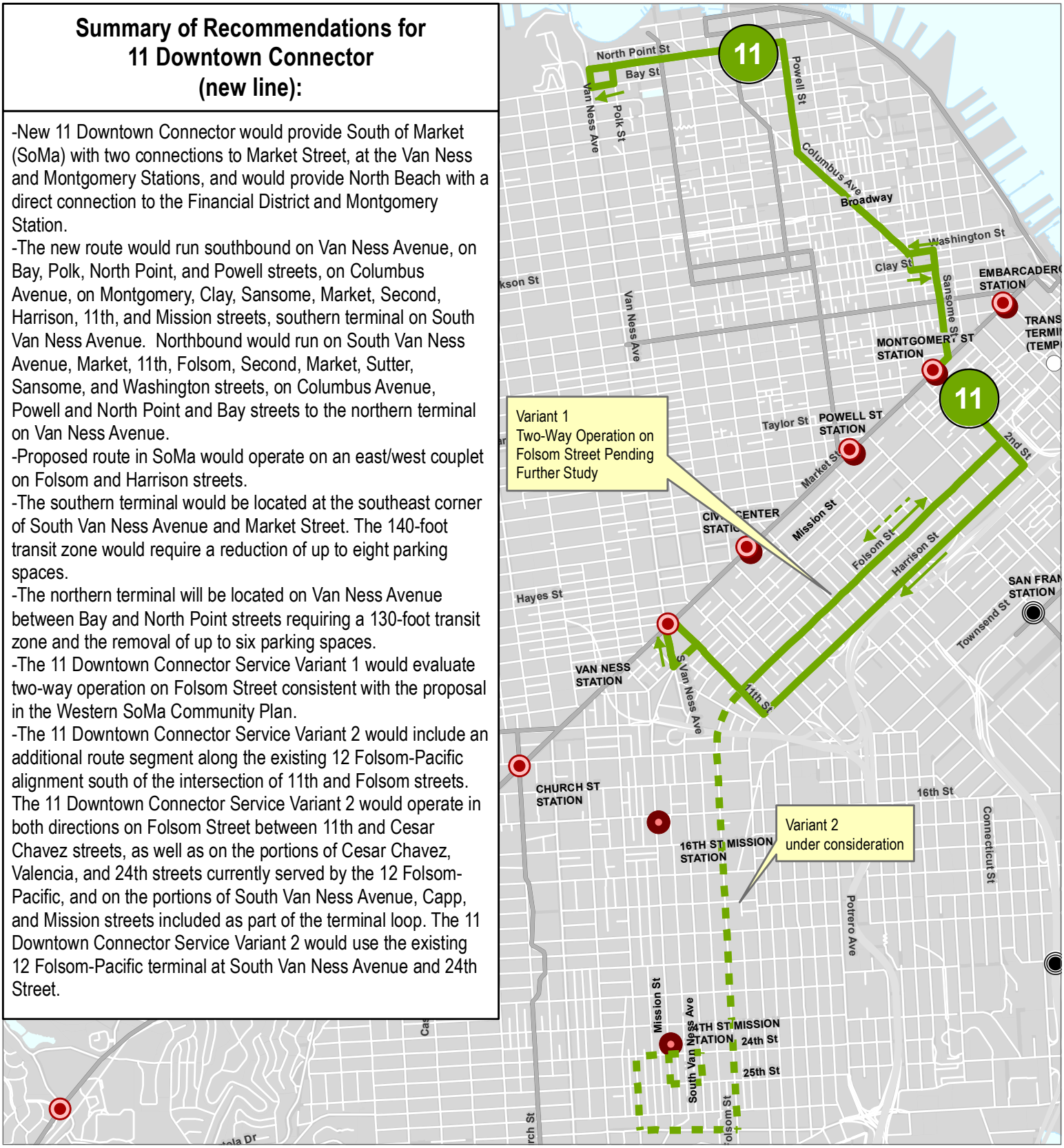
0 0.25 0.5 Miles

SFMTA | Municipal Transportation Agency

Map Updated
February 2014

Summary of Recommendations for 11 Downtown Connector (new line):

-New 11 Downtown Connector would provide South of Market (SoMa) with two connections to Market Street, at the Van Ness and Montgomery Stations, and would provide North Beach with a direct connection to the Financial District and Montgomery Station.
-The new route would run southbound on Van Ness Avenue, on Bay, Polk, North Point, and Powell streets, on Columbus Avenue, on Montgomery, Clay, Sansome, Market, Second, Harrison, 11th, and Mission streets, southern terminal on South Van Ness Avenue. Northbound would run on South Van Ness Avenue, Market, 11th, Folsom, Second, Market, Sutter, Sansome, and Washington streets, on Columbus Avenue, Powell and North Point and Bay streets to the northern terminal on Van Ness Avenue.
-Proposed route in SoMa would operate on an east/west couplet on Folsom and Harrison streets.
-The southern terminal would be located at the southeast corner of South Van Ness Avenue and Market Street. The 140-foot transit zone would require a reduction of up to eight parking spaces.
-The northern terminal will be located on Van Ness Avenue between Bay and North Point streets requiring a 130-foot transit zone and the removal of up to six parking spaces.
-The 11 Downtown Connector Service Variant 1 would evaluate two-way operation on Folsom Street consistent with the proposal in the Western SoMa Community Plan.
-The 11 Downtown Connector Service Variant 2 would include an additional route segment along the existing 12 Folsom-Pacific alignment south of the intersection of 11th and Folsom streets. The 11 Downtown Connector Service Variant 2 would operate in both directions on Folsom Street between 11th and Cesar Chavez streets, as well as on the portions of Cesar Chavez, Valencia, and 24th streets currently served by the 12 Folsom-Pacific, and on the portions of South Van Ness Avenue, Capp, and Mission streets included as part of the terminal loop. The 11 Downtown Connector Service Variant 2 would use the existing 12 Folsom-Pacific terminal at South Van Ness Avenue and 24th Street.



Line 11 - Downtown Connector (Revised)

Recommended Route Alignment

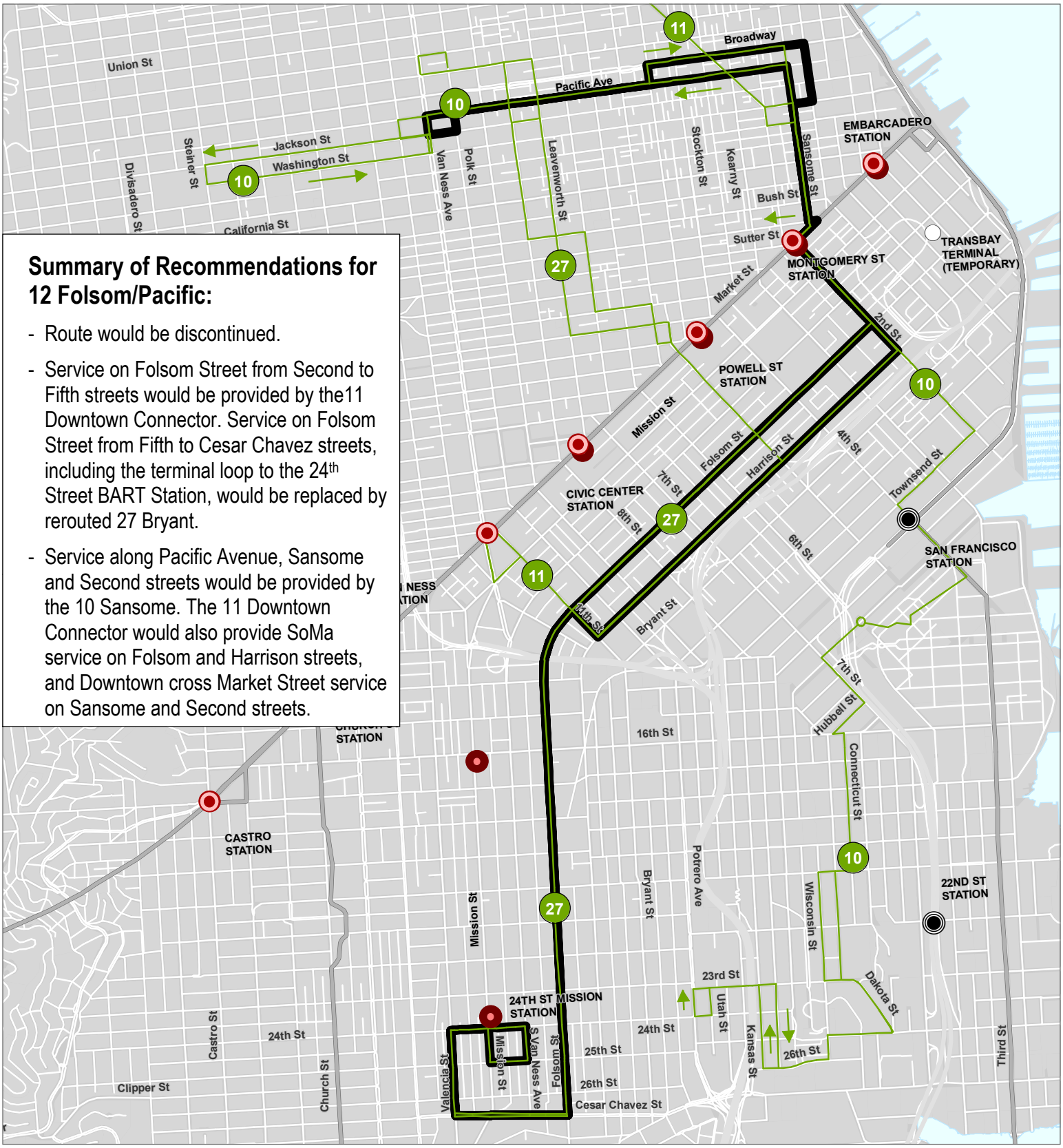
Legend

- Recommended Local Route
- Potentail Route Variation
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.5 1 Miles

SFMTA | Municipal Transportation Agency

Map Updated
February 2014



Line 12 - Folsom/Pacific
Recommended Route Alignment

Legend

- Segment would be covered by another recommended route
- Rail Network
- Segment Proposed for Elimination
- Muni Metro Stations
- BART Stations
- Caltrain Stations

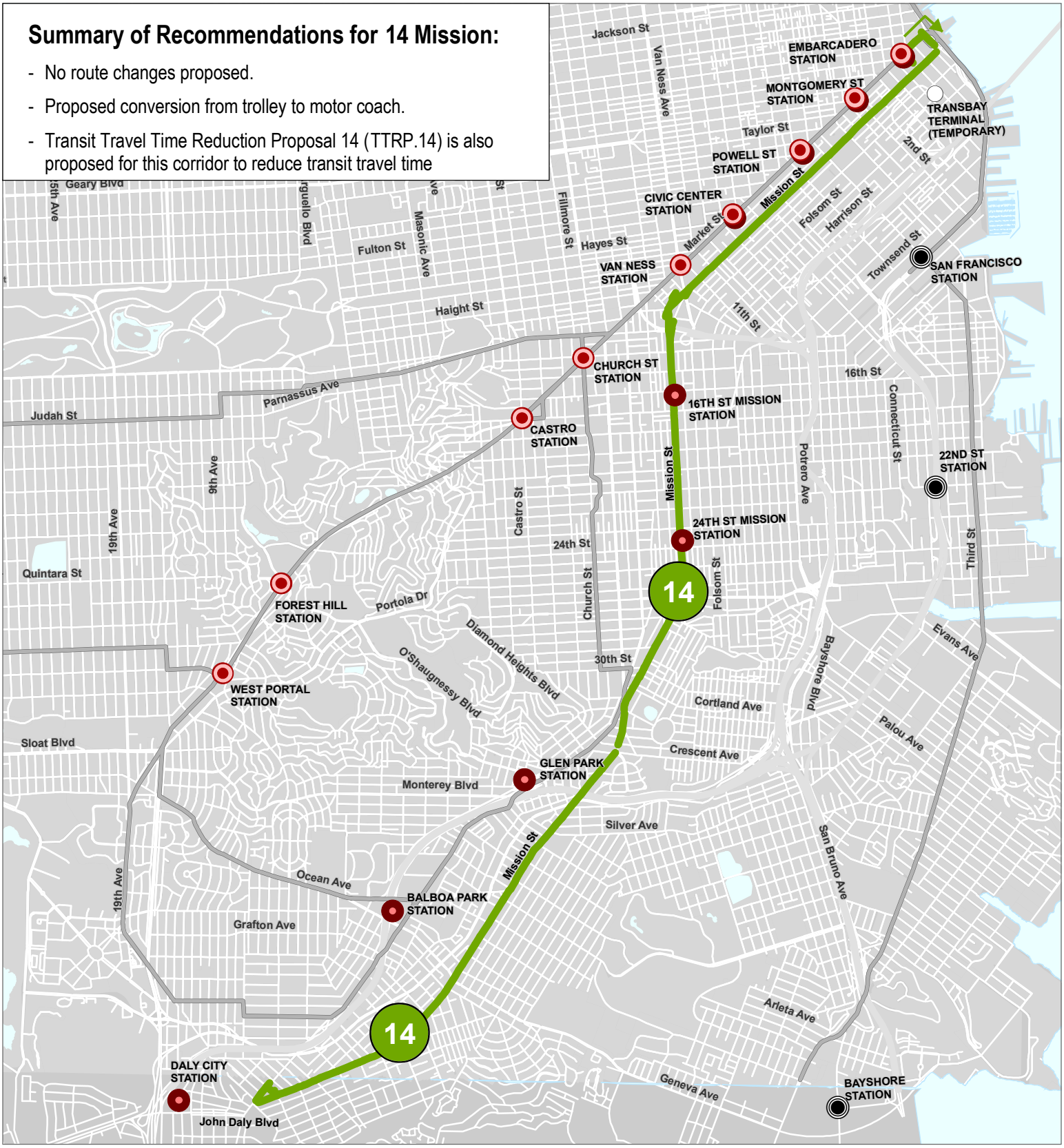
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles

Summary of Recommendations for 14 Mission:

- No route changes proposed.
- Proposed conversion from trolley to motor coach.
- Transit Travel Time Reduction Proposal 14 (TTRP.14) is also proposed for this corridor to reduce transit travel time



Line 14 - Mission
Recommended Route Alignment

Legend

- Recommended Local Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

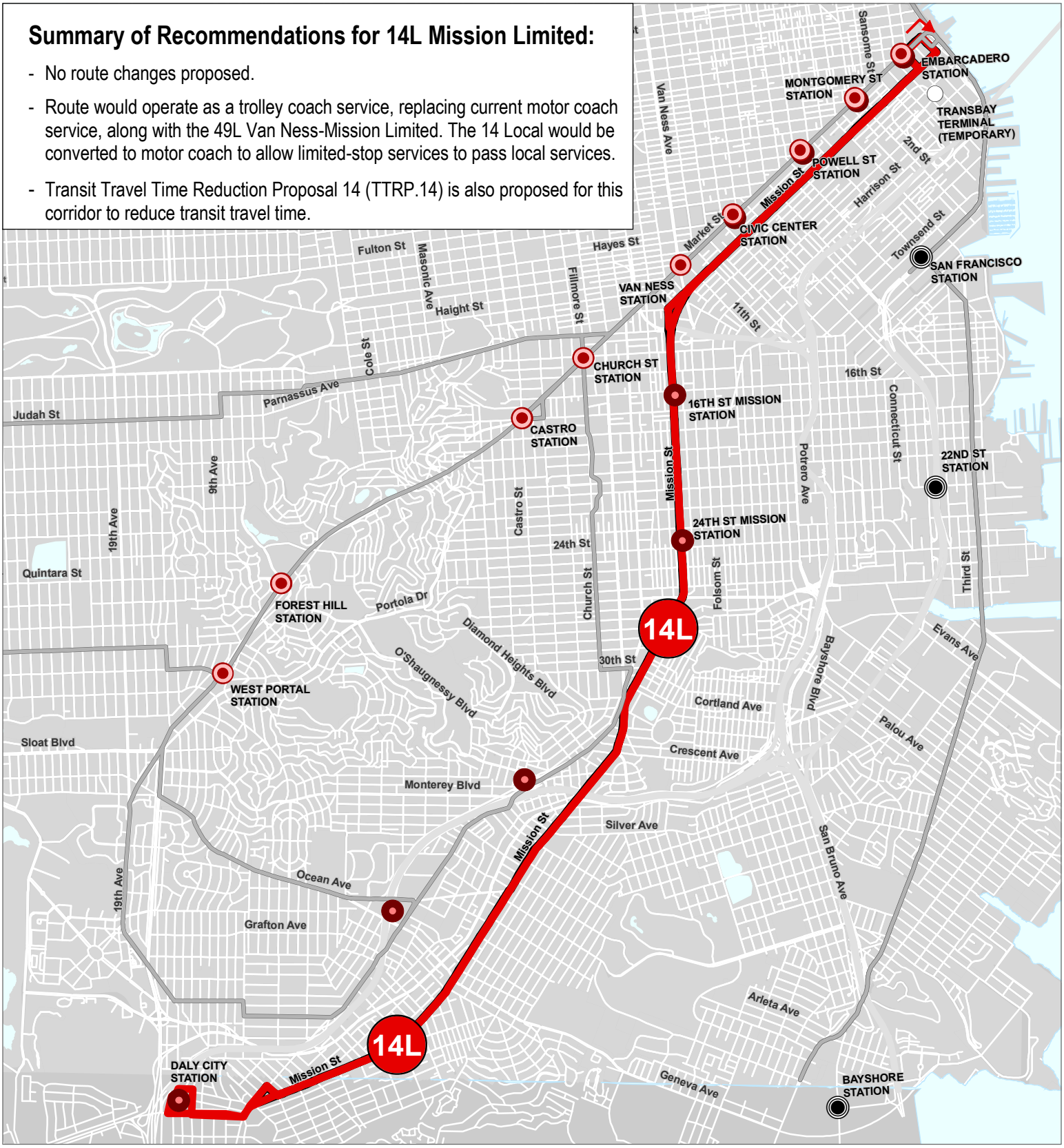
SFMTA | Municipal Transportation Agency

0 0.5 1 Miles

Map Updated
December 2012

Summary of Recommendations for 14L Mission Limited:

- No route changes proposed.
- Route would operate as a trolley coach service, replacing current motor coach service, along with the 49L Van Ness-Mission Limited. The 14 Local would be converted to motor coach to allow limited-stop services to pass local services.
- Transit Travel Time Reduction Proposal 14 (TTRP.14) is also proposed for this corridor to reduce transit travel time.



Line 14L - Mission Limited
Recommended Route Alignment

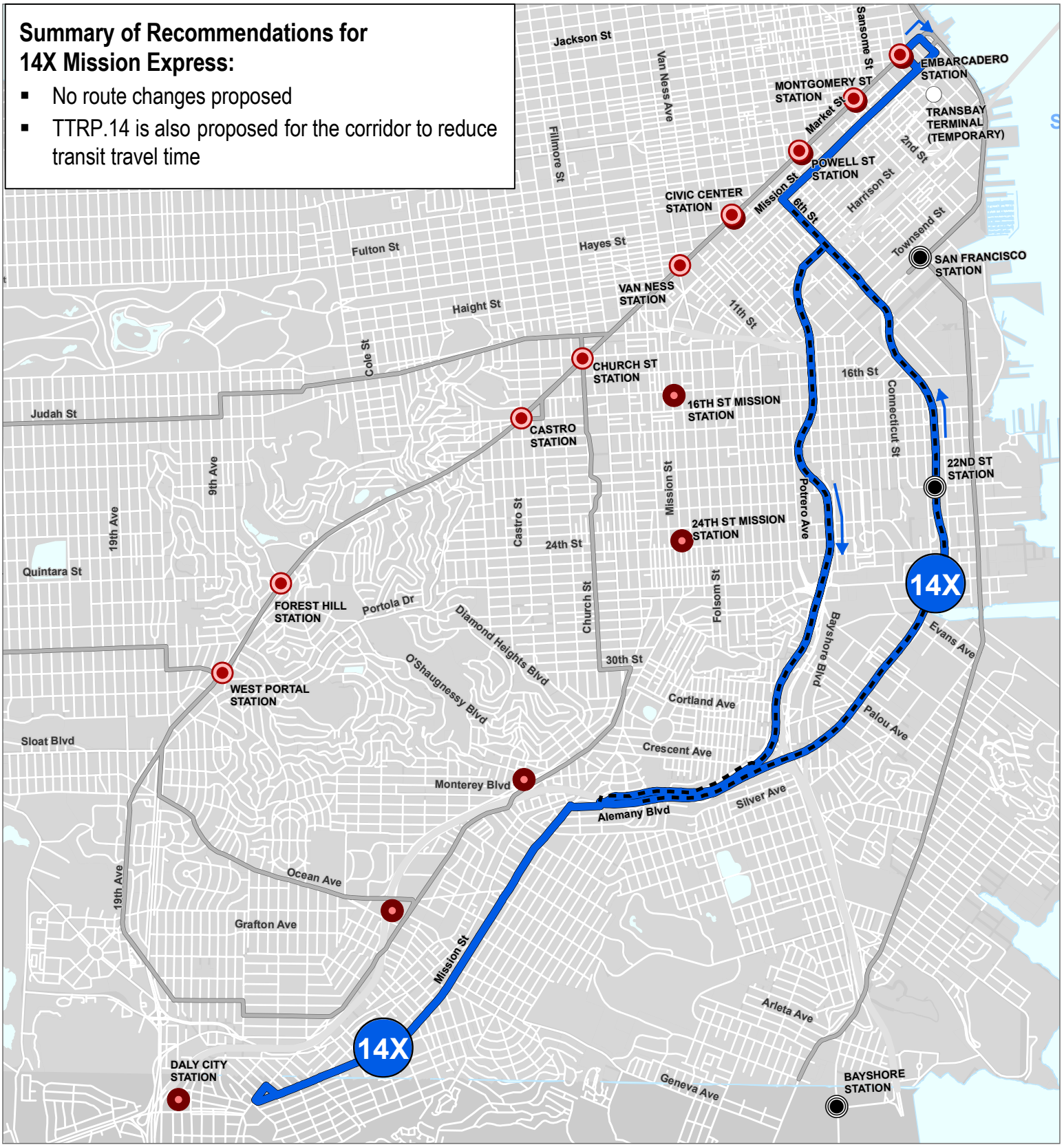
Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

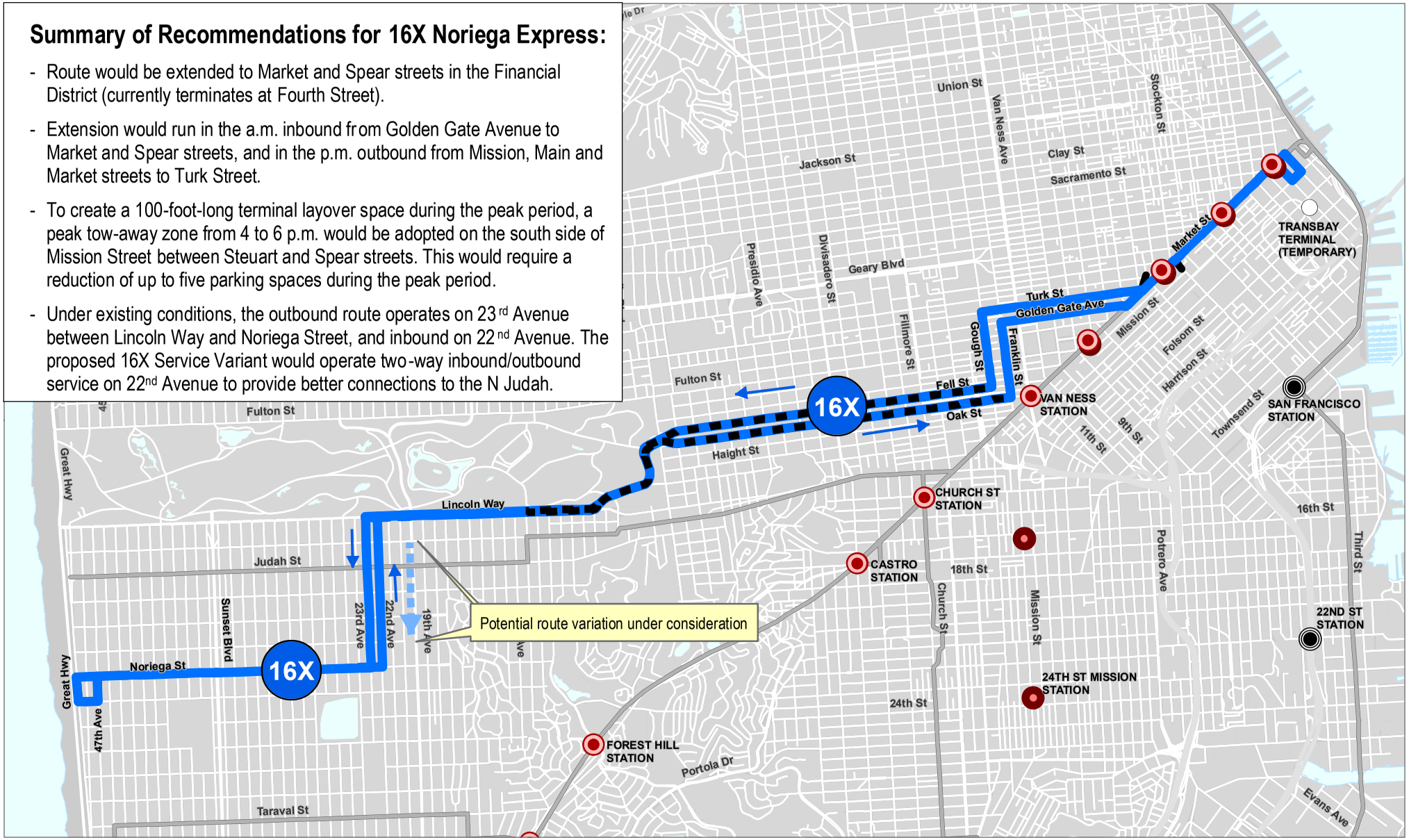
Map Updated
December 2012

0 0.5 1 Miles


Summary of Recommendations for 14X Mission Express:
No route changes proposed
TTRP.14 is also proposed for the corridor to reduce transit travel time
Jackson St
Van Ness Ave
Fillmore St
Sansome St
EMBARCADERO STATION
MONTGOMERY ST STATION
Market St
TRANSBAY TERMINAL (TEMPORARY)
2nd St
POWELL ST STATION
Mission St
8th St
Harrison St
CIVIC CENTER STATION
Townsend St
SAN FRANCISCO STATION
Fulton St
Hayes St
VAN NESS STATION
11th St
Haight St
Cole St
CHURCH ST STATION
16th St
16TH ST MISSION STATION
Judah St
CASTRO STATION
Connecticut St
22ND ST STATION
9th Ave
19th Ave
Castro St
Mission St
24th St
24TH ST MISSION STATION
Potrero Ave
Quintara St
14X
FOREST HILL STATION
Portola Dr
Diamond Heights Blvd
Church St
Folsom St
Evans Ave
Bayshore Blvd
30th St
WEST PORTAL STATION
O'Shaugnessy Blvd
Cortland Ave
Palou Ave
Sloat Blvd
Crescent Ave
Monterey Blvd
Silver Ave
Alemany Blvd
Ocean Ave
19th Ave
Grafton Ave
Mission St
Arleta Ave
14X
DALY CITY STATION
Geneva Ave
BAYSHORE STATION
Line 14X - Mission Express
Recommended Route Alignment
Legend
Recommended Specialized Route
Express Segment (no stops)
Rail Network
Muni Metro Stations
BART Stations
Caltrain Stations
SFMTA
Municipal Transportation Agency
Map Updated
January 2013
0
0.5
1
Miles

Summary of Recommendations for 16X Noriega Express:

- Route would be extended to Market and Spear streets in the Financial District (currently terminates at Fourth Street).
- Extension would run in the a.m. inbound from Golden Gate Avenue to Market and Spear streets, and in the p.m. outbound from Mission, Main and Market streets to Turk Street.
- To create a 100-foot-long terminal layover space during the peak period, a peak tow-away zone from 4 to 6 p.m. would be adopted on the south side of Mission Street between Steuart and Spear streets. This would require a reduction of up to five parking spaces during the peak period.
- Under existing conditions, the outbound route operates on 23rd Avenue between Lincoln Way and Noriega Street, and inbound on 22nd Avenue. The proposed 16X Service Variant would operate two-way inbound/outbound service on 22nd Avenue to provide better connections to the N Judah.



Line 16X - Noriega
Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Express Segment (no stops)
- Potential Route Variation
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 17 Parkmerced:

-Would replace existing Route 18 segment around Lake Merced via John Muir Drive and Skyline Boulevard. The Daly City portion of the route would make limited stops at key destinations.

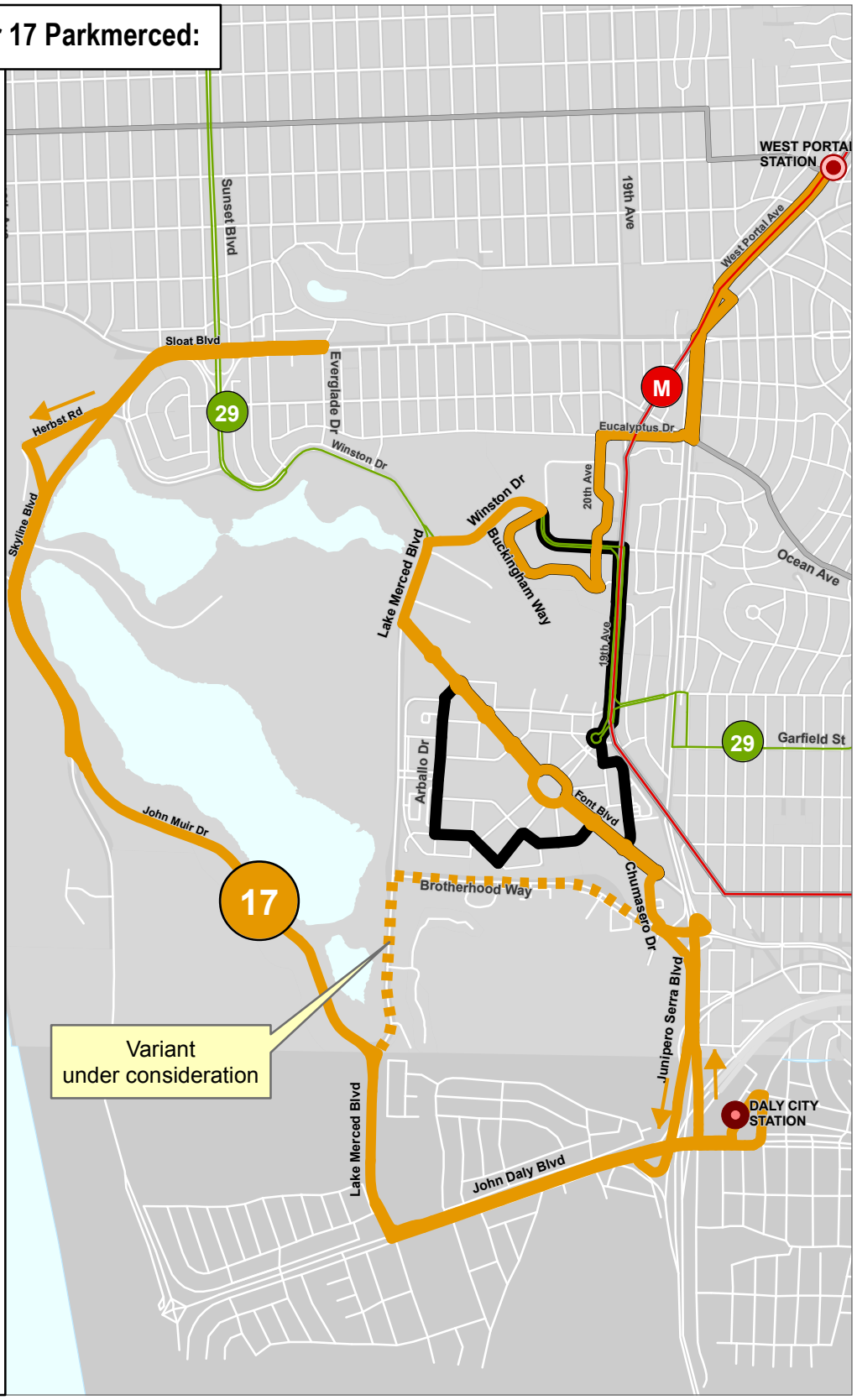
-One-way loop on Arballo, Garces, and Gonzalez drives in Parkmerced would be replaced by two-way service on Font Boulevard to simplify route.

-New street segments would be from Font Boulevard and Arballo Drive via Font Boulevard, Chumasero Drive, Junipero Serra Boulevard, John Daly Boulevard, Daly City BART, John Daly Boulevard, Lake Merced Boulevard, John Muir Drive, and Skyline Boulevard, Herbst Road (toward West Portal only), Skyline and Sloat boulevards to Everglade Drive.

-The bus would terminate near Lakeshore Plaza on the south side of Sloat Boulevard at Havenside Drive and would require removing up to four parking spaces. At the other end of the route, the route would terminate at its current West Portal Station location.

-•17 Parkmerced Service Variant would include an alternate alignment along Brotherhood Way, rather than extending service south to serve Westlake Plaza. North of the intersection of John Muir Drive/Lake Merced Boulevard, the 17 Parkmerced would extend along the existing 18 46th Avenue alignment on Lake Merced Boulevard between John Muir Drive and Brotherhood Way, on Brotherhood Way between John Muir Drive and Junipero Serra Boulevard, South of the intersection of Brotherhood Way/Junipero Serra Boulevard, the 17 Parkmerced would operate along the existing 28 19th Avenue alignment and would serve the Daly City BART Station, and then return in the opposite direction on Junipero Serra Boulevard. North of the Intersection of Brotherhood Way and Junipero Serra Boulevard, the 17 Parkmerced would serve Chumasera Drive, Font Boulevard, Lake Merced Boulevard, and Winston Drive between Lake Merced Boulevard and Buckingham Way. Between the intersection of Winston Drive and Buckingham Way and the West Portal Station, the 17 Parkmerced would operate on its current alignment.

-17 Parkmerced Service Variant new transit street segments include Font Boulevard between Lake Merced Boulevard and Arballo Drive, Chumasero Drive between Font Boulevard and Brotherhood Way, and Brotherhood Way between Junipero Serra and Lake Merced boulevards.



Line 17 - Park Merced (Revised)

Recommended Route Alignment

Legend

- Recommended Community Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.3 0.6 Miles

SFMTA | Municipal Transportation Agency

Map Updated
February 2014

Line 18 46th Avenue
Recommended Route Alignment

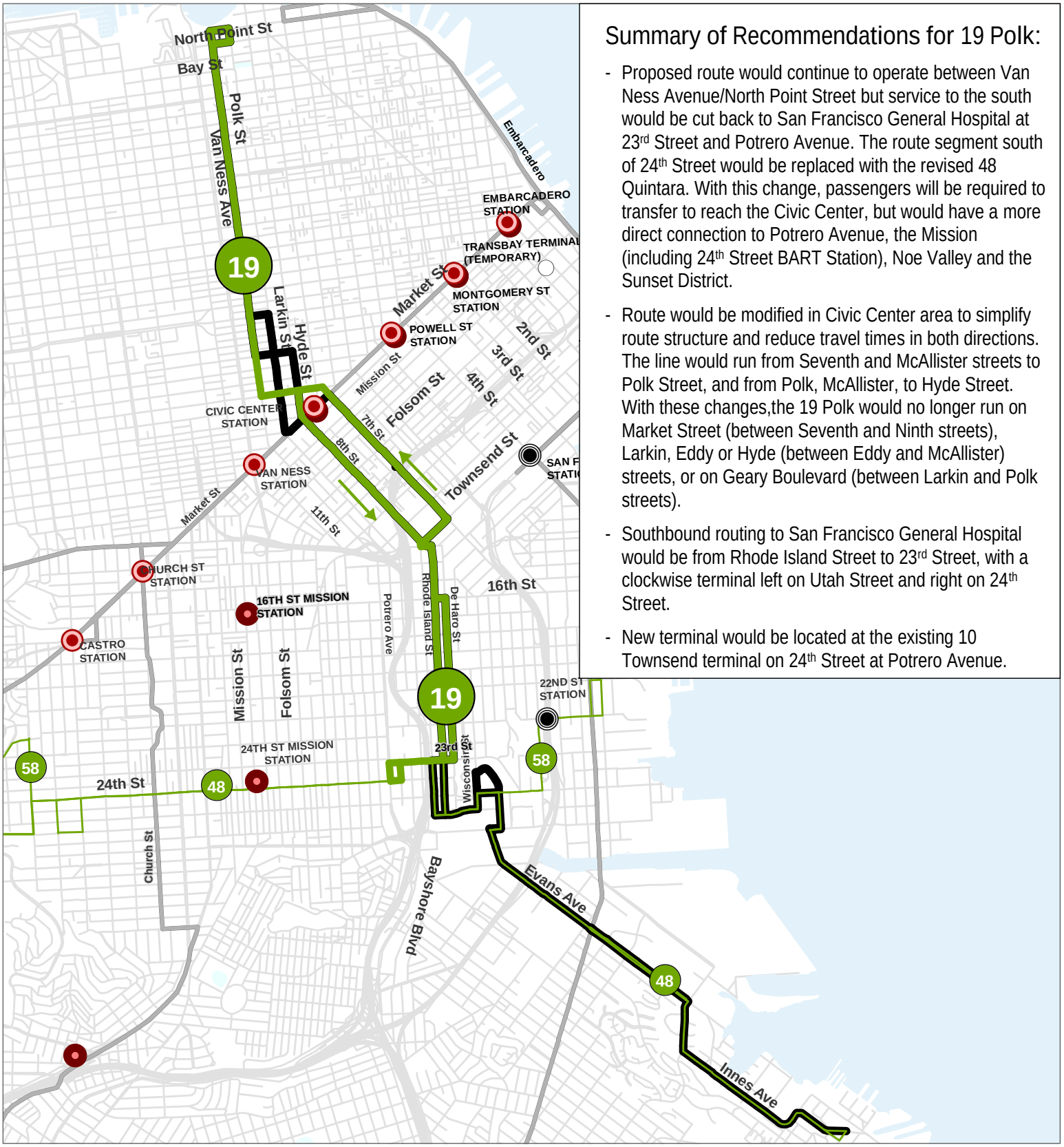
Legend

- Recommended Local Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles



Summary of Recommendations for 19 Polk:

- Proposed route would continue to operate between Van Ness Avenue/North Point Street but service to the south would be cut back to San Francisco General Hospital at 23rd Street and Potrero Avenue. The route segment south of 24th Street would be replaced with the revised 48 Quintara. With this change, passengers will be required to transfer to reach the Civic Center, but would have a more direct connection to Potrero Avenue, the Mission (including 24th Street BART Station), Noe Valley and the Sunset District.
- Route would be modified in Civic Center area to simplify route structure and reduce travel times in both directions. The line would run from Seventh and McAllister streets to Polk Street, and from Polk, McAllister, to Hyde Street. With these changes,the 19 Polk would no longer run on Market Street (between Seventh and Ninth streets), Larkin, Eddy or Hyde (between Eddy and McAllister) streets, or on Geary Boulevard (between Larkin and Polk streets).
- Southbound routing to San Francisco General Hospital would be from Rhode Island Street to 23rd Street, with a clockwise terminal left on Utah Street and right on 24th Street.
- New terminal would be located at the existing 10 Townsend terminal on 24th Street at Potrero Avenue.

Line 19 - Polk-Revised
Recommended Route Alignment

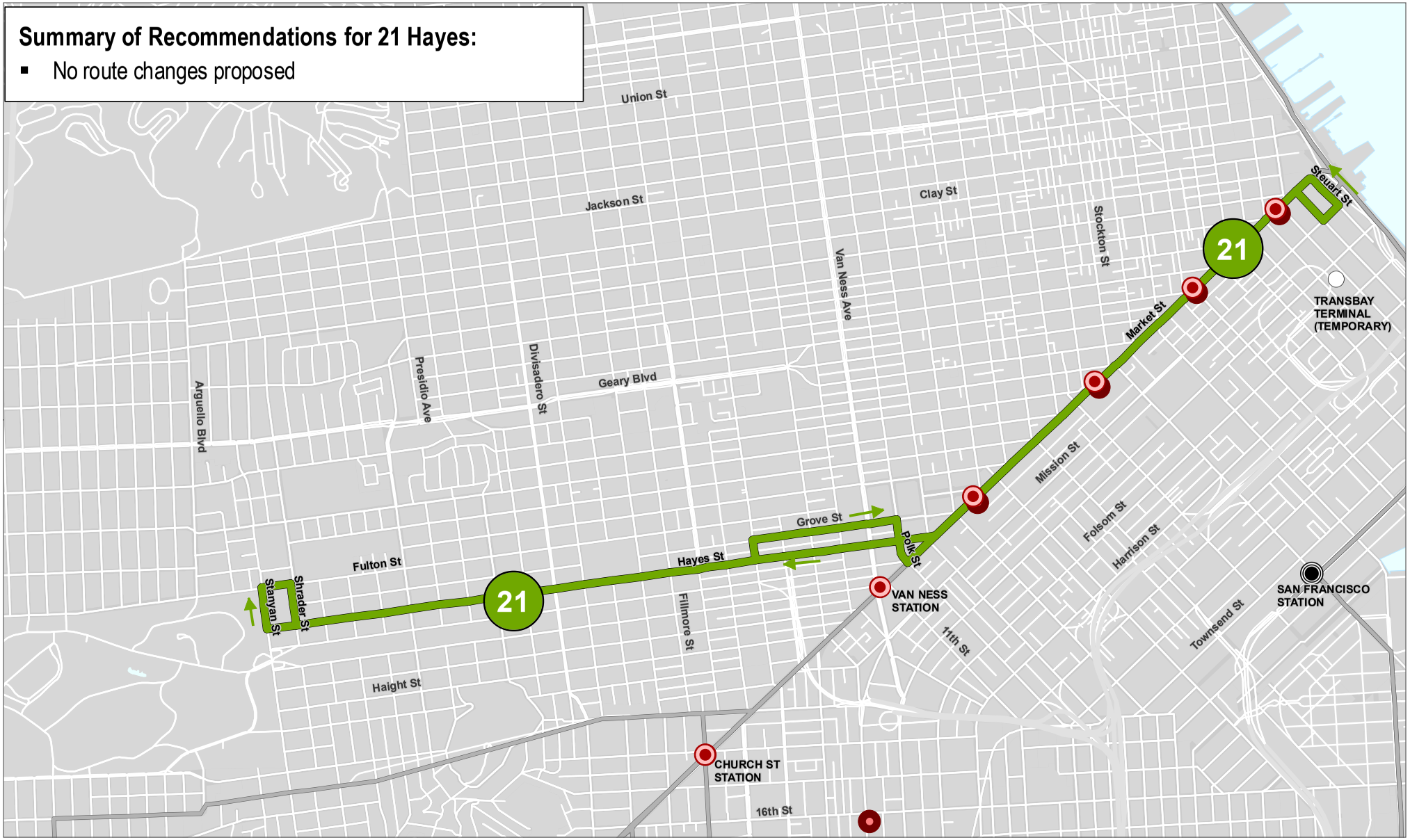
Legend

- Recommended Local Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
March 2014

0 0.5 1 Miles



Line 21 - Hayes

Recommended Route Alignment

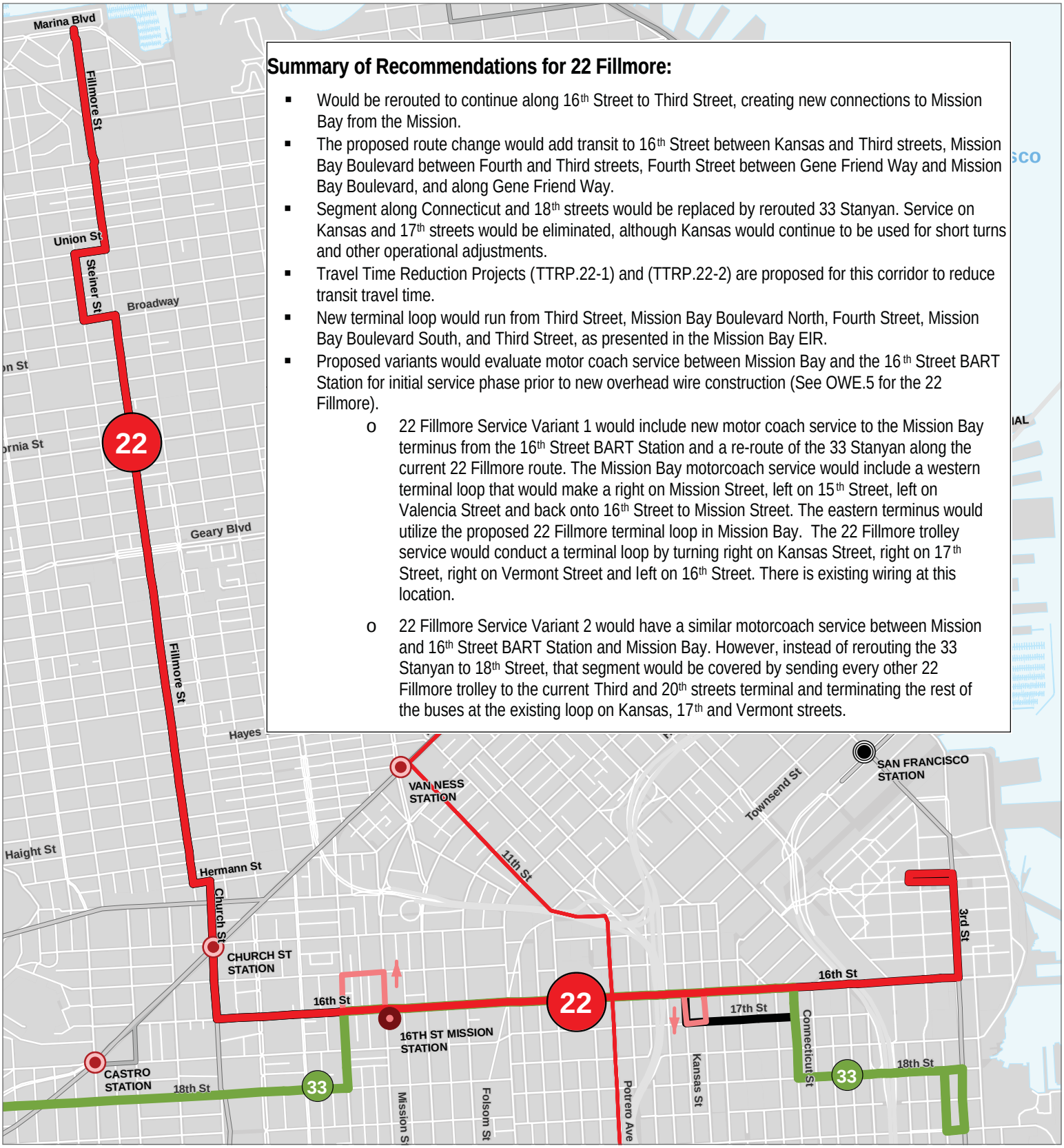
Legend

- Recommended Local Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles



Summary of Recommendations for 22 Fillmore:

- Would be rerouted to continue along 16th Street to Third Street, creating new connections to Mission Bay from the Mission.
- The proposed route change would add transit to 16th Street between Kansas and Third streets, Mission Bay Boulevard between Fourth and Third streets, Fourth Street between Gene Friend Way and Mission Bay Boulevard, and along Gene Friend Way.
- Segment along Connecticut and 18th streets would be replaced by rerouted 33 Stanyan. Service on Kansas and 17th streets would be eliminated, although Kansas would continue to be used for short turns and other operational adjustments.
- Travel Time Reduction Projects (TTRP.22-1) and (TTRP.22-2) are proposed for this corridor to reduce transit travel time.
- New terminal loop would run from Third Street, Mission Bay Boulevard North, Fourth Street, Mission Bay Boulevard South, and Third Street, as presented in the Mission Bay EIR.
- Proposed variants would evaluate motor coach service between Mission Bay and the 16th Street BART Station for initial service phase prior to new overhead wire construction (See OWE.5 for the 22 Fillmore).
    - 22 Fillmore Service Variant 1 would include new motor coach service to the Mission Bay terminus from the 16th Street BART Station and a re-route of the 33 Stanyan along the current 22 Fillmore route. The Mission Bay motorcoach service would include a western terminal loop that would make a right on Mission Street, left on 15th Street, left on Valencia Street and back onto 16th Street to Mission Street. The eastern terminus would utilize the proposed 22 Fillmore terminal loop in Mission Bay. The 22 Fillmore trolley service would conduct a terminal loop by turning right on Kansas Street, right on 17th Street, right on Vermont Street and left on 16th Street. There is existing wiring at this location.
    - 22 Fillmore Service Variant 2 would have a similar motorcoach service between Mission and 16th Street BART Station and Mission Bay. However, instead of rerouting the 33 Stanyan to 18th Street, that segment would be covered by sending every other 22 Fillmore trolley to the current Third and 20th streets terminal and terminating the rest of the buses at the existing loop on Kansas, 17th and Vermont streets.

Line 22 - Fillmore
Recommended Route Alignment

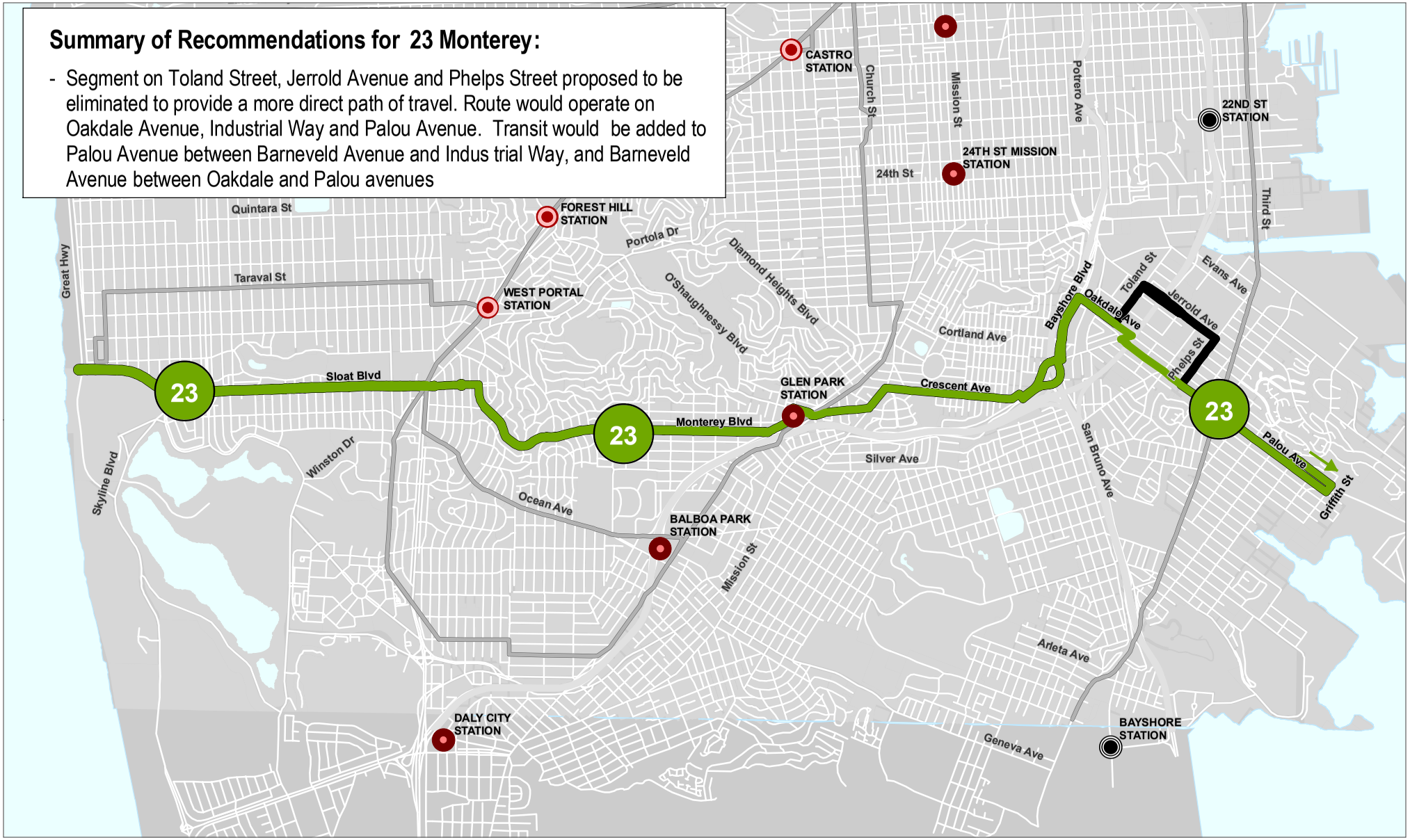
Legend

- Recommended Rapid Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
Revised June 2013

0 0.225 0.45 Miles



Line 23 - Monterey

Recommended Route Alignment

Legend

- Recommended Local Route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Line 24 - Divisadero
Recommended Route Alignment

Legend

- Recommended Local Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

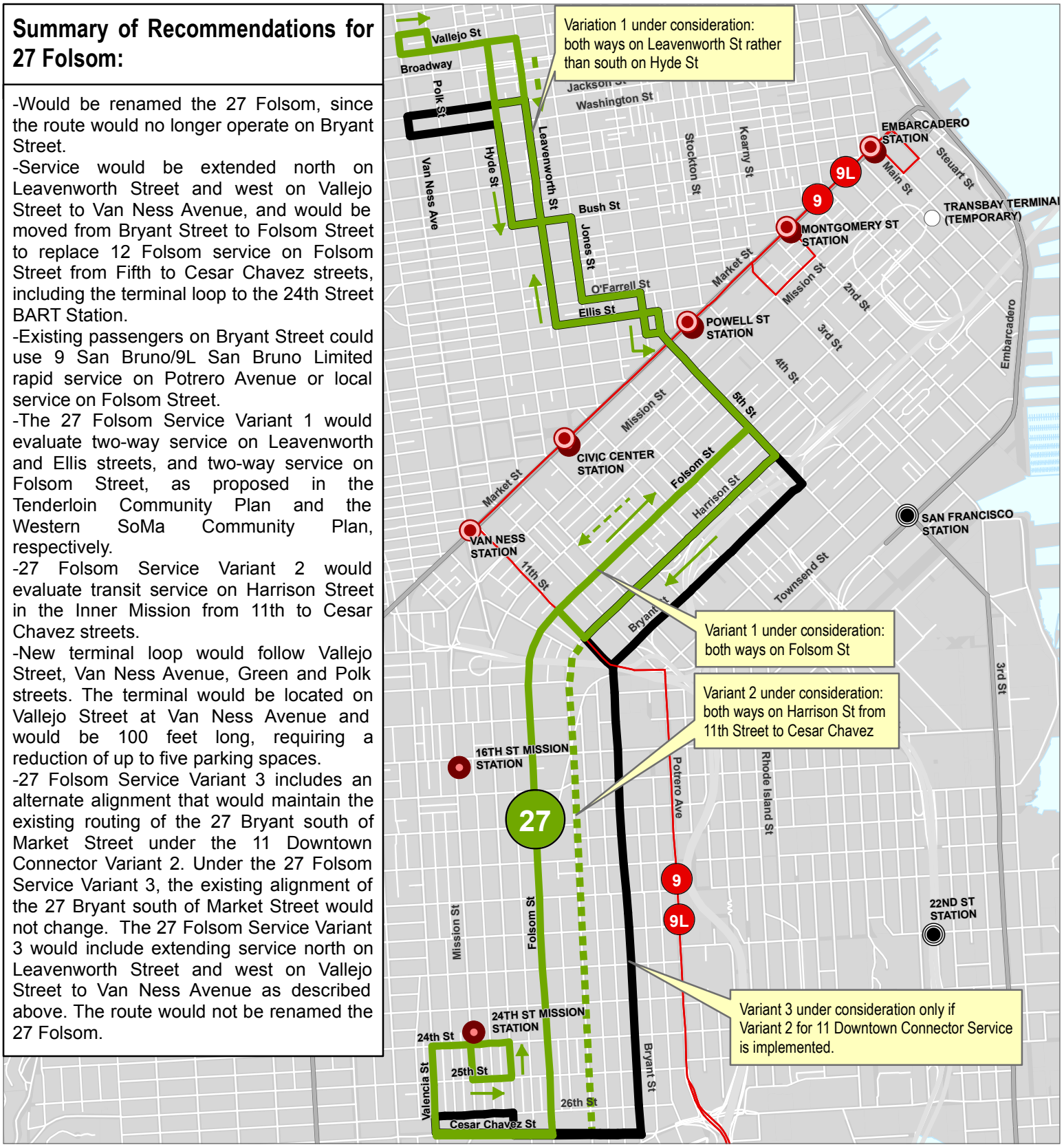
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles

Summary of Recommendations for 27 Folsom:

-Would be renamed the 27 Folsom, since the route would no longer operate on Bryant Street.
-Service would be extended north on Leavenworth Street and west on Vallejo Street to Van Ness Avenue, and would be moved from Bryant Street to Folsom Street to replace 12 Folsom service on Folsom Street from Fifth to Cesar Chavez streets, including the terminal loop to the 24th Street BART Station.
-Existing passengers on Bryant Street could use 9 San Bruno/9L San Bruno Limited rapid service on Potrero Avenue or local service on Folsom Street.
-The 27 Folsom Service Variant 1 would evaluate two-way service on Leavenworth and Ellis streets, and two-way service on Folsom Street, as proposed in the Tenderloin Community Plan and the Western SoMa Community Plan, respectively.
-27 Folsom Service Variant 2 would evaluate transit service on Harrison Street in the Inner Mission from 11th to Cesar Chavez streets.
-New terminal loop would follow Vallejo Street, Van Ness Avenue, Green and Polk streets. The terminal would be located on Vallejo Street at Van Ness Avenue and would be 100 feet long, requiring a reduction of up to five parking spaces.
-27 Folsom Service Variant 3 includes an alternate alignment that would maintain the existing routing of the 27 Bryant south of Market Street under the 11 Downtown Connector Variant 2. Under the 27 Folsom Service Variant 3, the existing alignment of the 27 Bryant south of Market Street would not change. The 27 Folsom Service Variant 3 would include extending service north on Leavenworth Street and west on Vallejo Street to Van Ness Avenue as described above. The route would not be renamed the 27 Folsom.



Line 27 - Folsom (Revised)
Recommended Route Alignment

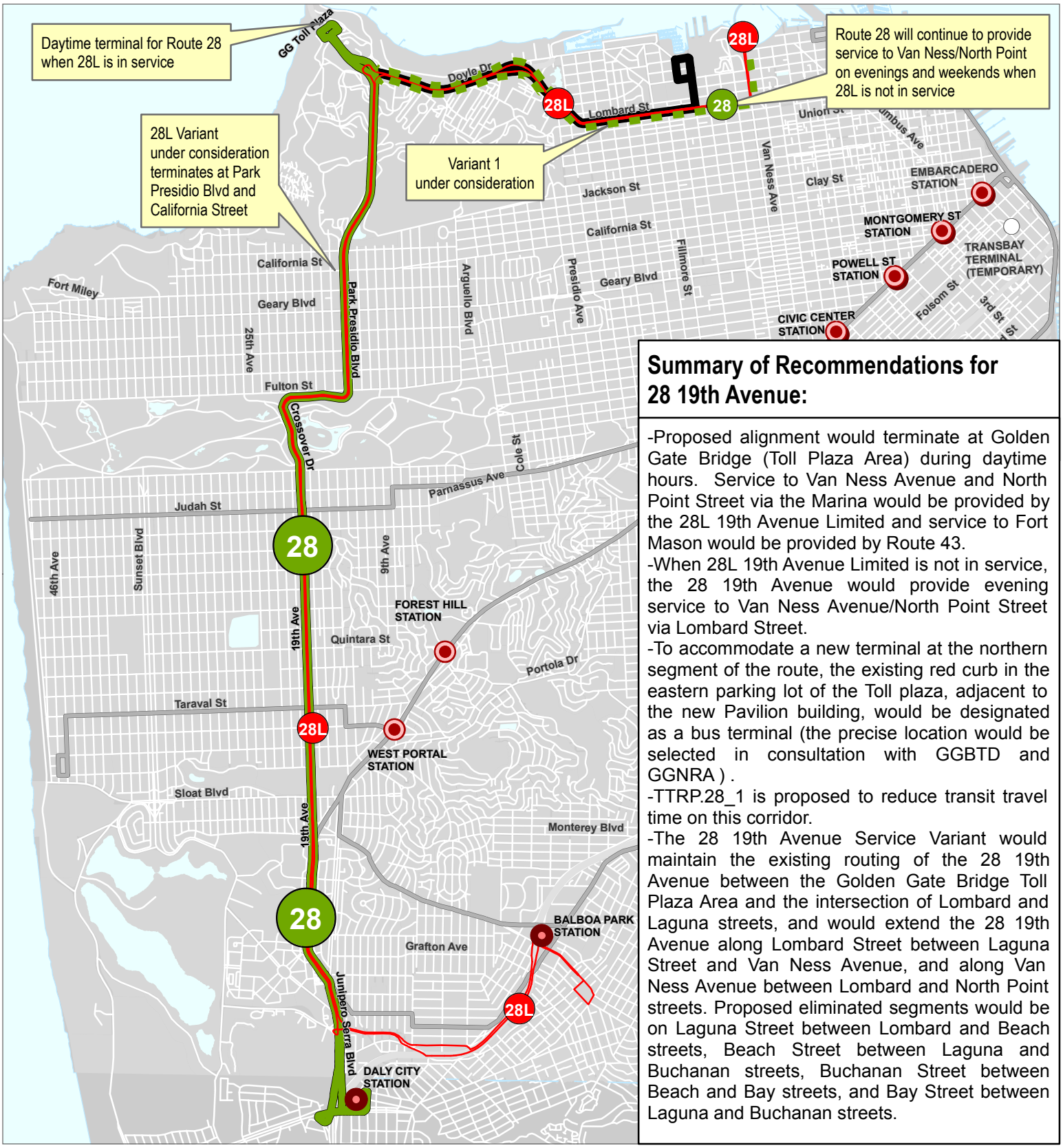
Legend

- Recommended Local Route
- Potential Route Variation
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.25 0.5 Miles

SFMTA | Municipal Transportation Agency

Map Updated
March 2014



Summary of Recommendations for 28 19th Avenue:

-Proposed alignment would terminate at Golden Gate Bridge (Toll Plaza Area) during daytime hours. Service to Van Ness Avenue and North Point Street via the Marina would be provided by the 28L 19th Avenue Limited and service to Fort Mason would be provided by Route 43.

-When 28L 19th Avenue Limited is not in service, the 28 19th Avenue would provide evening service to Van Ness Avenue/North Point Street via Lombard Street.

-To accommodate a new terminal at the northern segment of the route, the existing red curb in the eastern parking lot of the Toll plaza, adjacent to the new Pavilion building, would be designated as a bus terminal (the precise location would be selected in consultation with GGBTD and GGNRA) .

-TTRP.28_1 is proposed to reduce transit travel time on this corridor.

-The 28 19th Avenue Service Variant would maintain the existing routing of the 28 19th Avenue between the Golden Gate Bridge Toll Plaza Area and the intersection of Lombard and Laguna streets, and would extend the 28 19th Avenue along Lombard Street between Laguna Street and Van Ness Avenue, and along Van Ness Avenue between Lombard and North Point streets. Proposed eliminated segments would be on Laguna Street between Lombard and Beach streets, Beach Street between Laguna and Buchanan streets, Buchanan Street between Beach and Bay streets, and Bay Street between Laguna and Buchanan streets.

Line 28 - 19th Ave (Revised)
Recommended Route Alignment

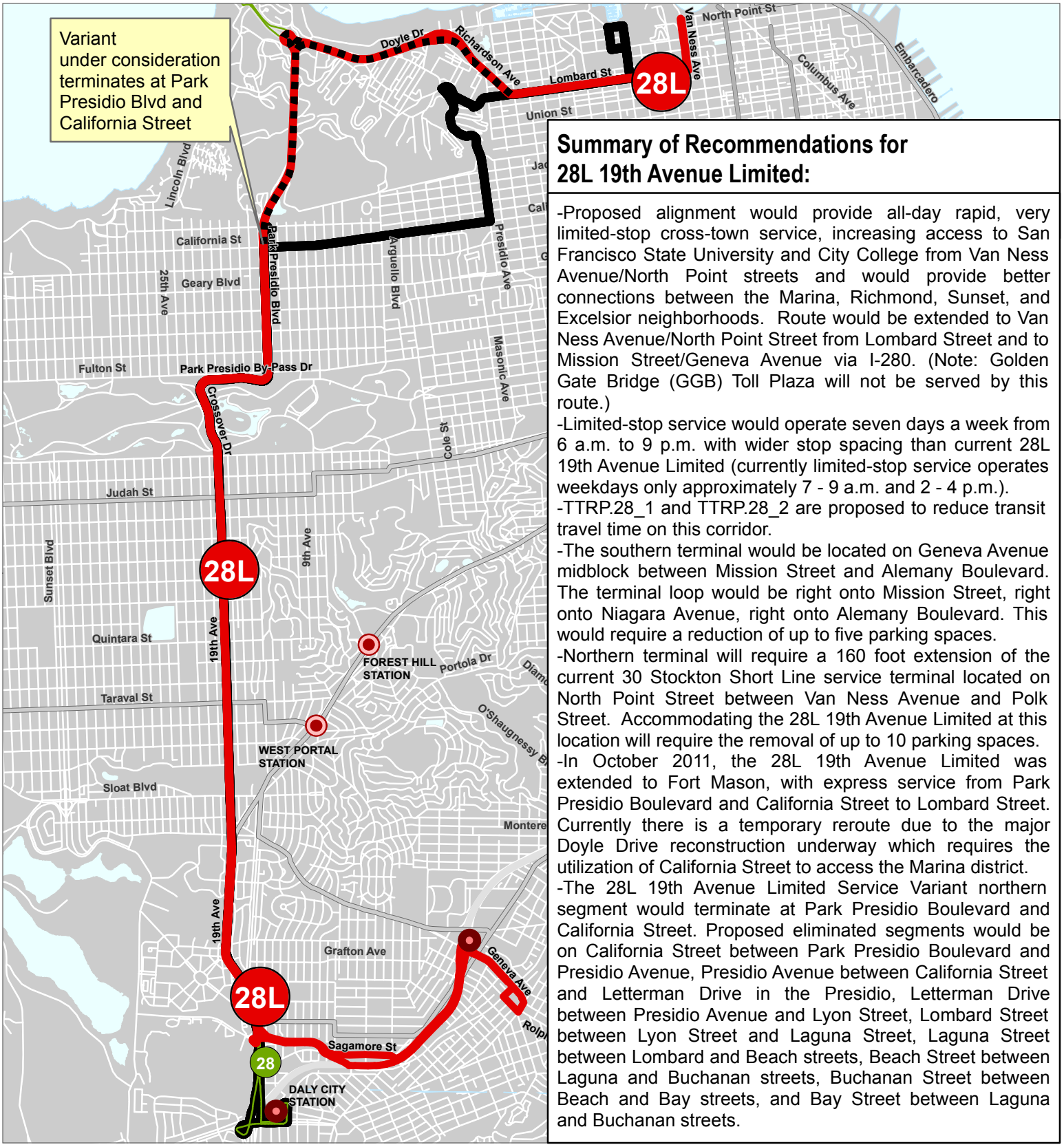
Legend

- Recommended Local Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

0 0.5 1 Miles

Map Updated
February 2014



Summary of Recommendations for 28L 19th Avenue Limited:

-Proposed alignment would provide all-day rapid, very limited-stop cross-town service, increasing access to San Francisco State University and City College from Van Ness Avenue/North Point streets and would provide better connections between the Marina, Richmond, Sunset, and Excelsior neighborhoods. Route would be extended to Van Ness Avenue/North Point Street from Lombard Street and to Mission Street/Geneva Avenue via I-280. (Note: Golden Gate Bridge (GGB) Toll Plaza will not be served by this route.)

-Limited-stop service would operate seven days a week from 6 a.m. to 9 p.m. with wider stop spacing than current 28L 19th Avenue Limited (currently limited-stop service operates weekdays only approximately 7 - 9 a.m. and 2 - 4 p.m.).

-TTRP.28_1 and TTRP.28_2 are proposed to reduce transit travel time on this corridor.

-The southern terminal would be located on Geneva Avenue midblock between Mission Street and Alemany Boulevard. The terminal loop would be right onto Mission Street, right onto Niagara Avenue, right onto Alemany Boulevard. This would require a reduction of up to five parking spaces.

-Northern terminal will require a 160 foot extension of the current 30 Stockton Short Line service terminal located on North Point Street between Van Ness Avenue and Polk Street. Accommodating the 28L 19th Avenue Limited at this location will require the removal of up to 10 parking spaces.

-In October 2011, the 28L 19th Avenue Limited was extended to Fort Mason, with express service from Park Presidio Boulevard and California Street to Lombard Street. Currently there is a temporary reroute due to the major Doyle Drive reconstruction underway which requires the utilization of California Street to access the Marina district.

-The 28L 19th Avenue Limited Service Variant northern segment would terminate at Park Presidio Boulevard and California Street. Proposed eliminated segments would be on California Street between Park Presidio Boulevard and Presidio Avenue, Presidio Avenue between California Street and Letterman Drive in the Presidio, Letterman Drive between Presidio Avenue and Lyon Street, Lombard Street between Lyon Street and Laguna Street, Laguna Street between Lombard and Beach streets, Beach Street between Laguna and Buchanan streets, Buchanan Street between Beach and Bay streets, and Bay Street between Laguna and Buchanan streets.

Line 28L - 19th Ave Limited (Revised)
Recommended Route Alignment

Legend

- Recommended Rapid Route
- Recommended Express Route
- Segment Proposed for Elimination
- Segment would be covered by another recommended route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.5 1 Miles

SFMTA | Municipal Transportation Agency

Map Updated
February 2014


Summary of Recommendations for 29 Sunset:
- Would provide more direct route on Ocean Avenue to Balboa Park Station (instead of current route on Mission Street and Geneva Avenue).
- Route would extend from Persia Avenue to Ocean Avenue to Plymouth Avenue. New street segment on Persia Avenue between Mission Street and Ocean Avenue in association with TTPI.1 Persia Triangle Improvements.
- Service would be eliminated on Mission Street between Persia and Geneva avenues and on Geneva Avenue between Mission Street and Ocean Avenue.
- Two-way service on Gilman Avenue would simplify route to/from Candlestick Park; service on Fitzgerald Street would be discontinued.
Related project underway to reroute 29 Sunset left from Lincoln Way to Crossover Drive to save travel time
Lincoln Blvd
25th Ave
California St
Geary Blvd
Balboa St
Fulton St
Crossover Dr
Lincoln Way
29
Judah St
Parnassus Ave
19th Ave
Noriega St
Quintara St
Sunset Blvd
Taraval St
Sloat Blvd
Lake Merced Blvd
Winston Dr
19th Ave
Garfield St
Grafton Ave
Plymouth Ave
Ocean Ave
Jackson St
43
Arguello Blvd
Presidio Ave
FOREST HILL STATION
WEST PORTAL STATION
Portola Dr
Diamond Heights Blvd
O'Shaugnessy Blvd
Monterey Blvd
Mission St
Silver Ave
14L
Geneva Ave
8X
Persia Ave
Mansell St
Arleta Ave
Paul Ave
Ingerson Ave
Gilman Ave
San Bruno Ave
Bayshore Blvd
Cortland Ave
Crescent Ave
Palou Ave
Evans Ave
30th St
24th St
Castro St
Church St
Mission St
Folsom St
Haight St
Market St
11th St
Townsend St
3rd St
16th St
VAN NESS STATION
CIVIC CENTER STATION
SAN FRANCISCO STATION
CHURCH ST STATION
16TH ST MISSION STATION
CASTRO STATION
24TH ST MISSION STATION
22ND ST STATION
14
14L
8X
Line 29 - Sunset
Recommended Route Alignment
Legend
Recommended Local Route
Segment would be covered by another recommended route
Segment Proposed for Elimination
Rail Network
Muni Metro Stations
BART Stations
Caltrain Stations
SFMTA | Municipal Transportation Agency
Map Updated
December 2012
0
0.5
1
Miles

Summary of Recommendations for 30 Stockton:

- No route changes proposed.
- Subject to equipment availability, all service on Stockton Street would be provided by articulated buses to reduce crowding and improve reliability.
- Currently, there is a temporary reroute in the southbound direction along Mason and Fifth streets to accommodate the Central Subway Project construction. The reroute is expected to be in place for several years.
- Transit Travel Time Reduction Proposal 30 (TTRP.30) is also proposed to reduce transit travel time along the corridor.

Line 30 - Stockton

Recommended Route Alignment

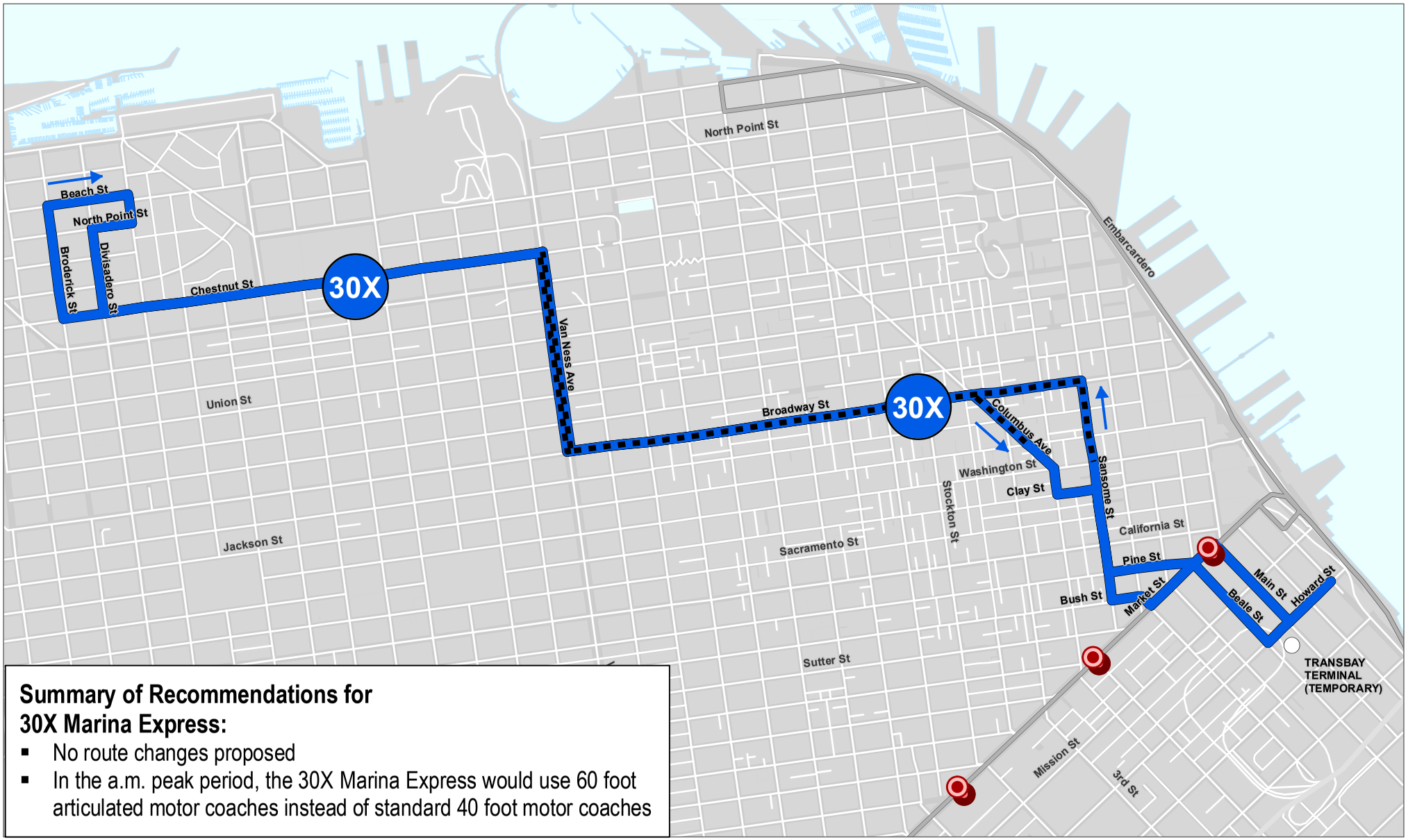
Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles



Summary of Recommendations for 30X Marina Express:

- No route changes proposed
- In the a.m. peak period, the 30X Marina Express would use 60 foot articulated motor coaches instead of standard 40 foot motor coaches

Line 30X - Marina Express

Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Express Segment (no stops)
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

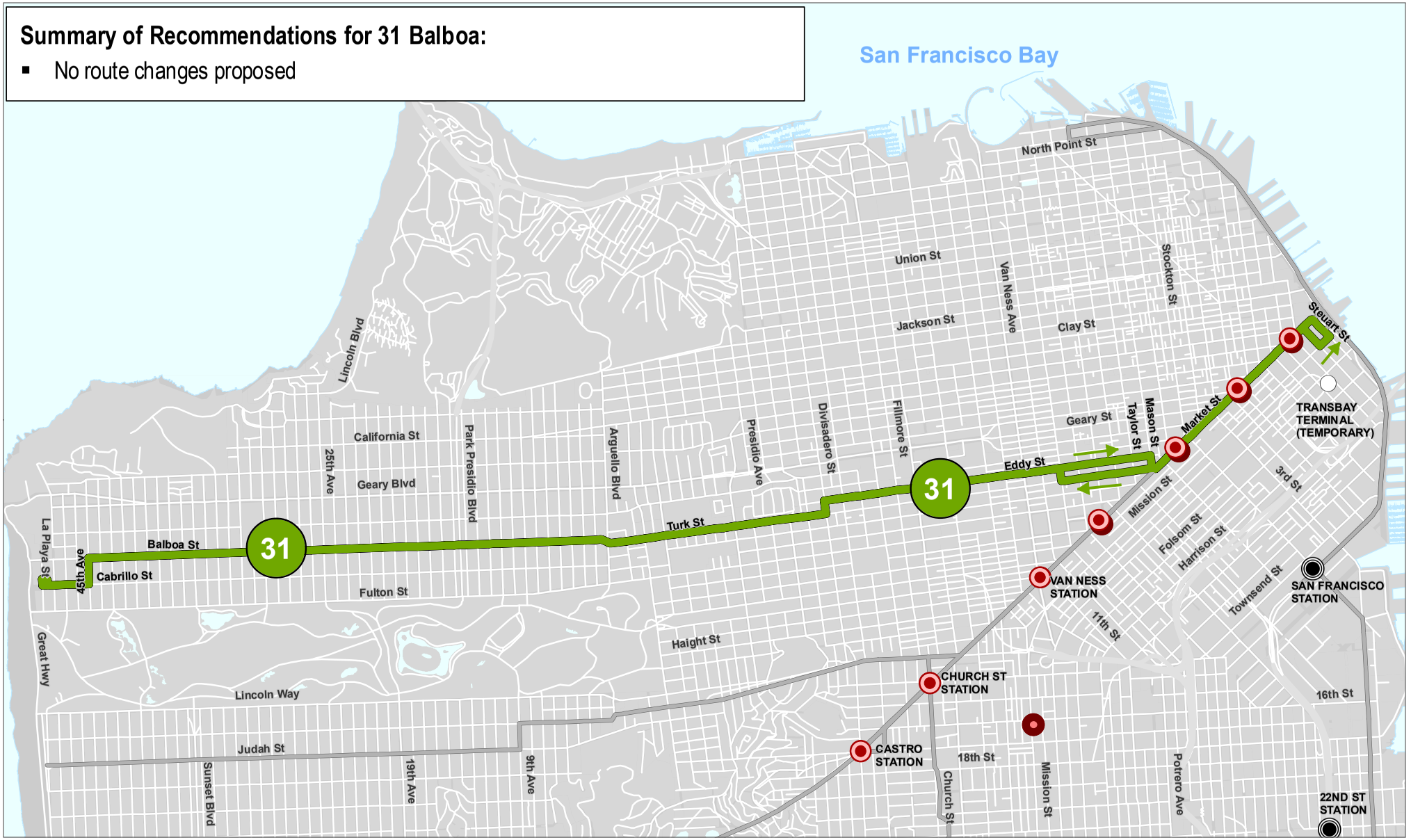
SFMTA | Municipal Transportation Agency

Map Updated
January 2013

0 0.25 0.5 Miles

Summary of Recommendations for 31 Balboa:

- No route changes proposed



Line 31 - Balboa

Recommended Route Alignment

Legend

- Recommended Local Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

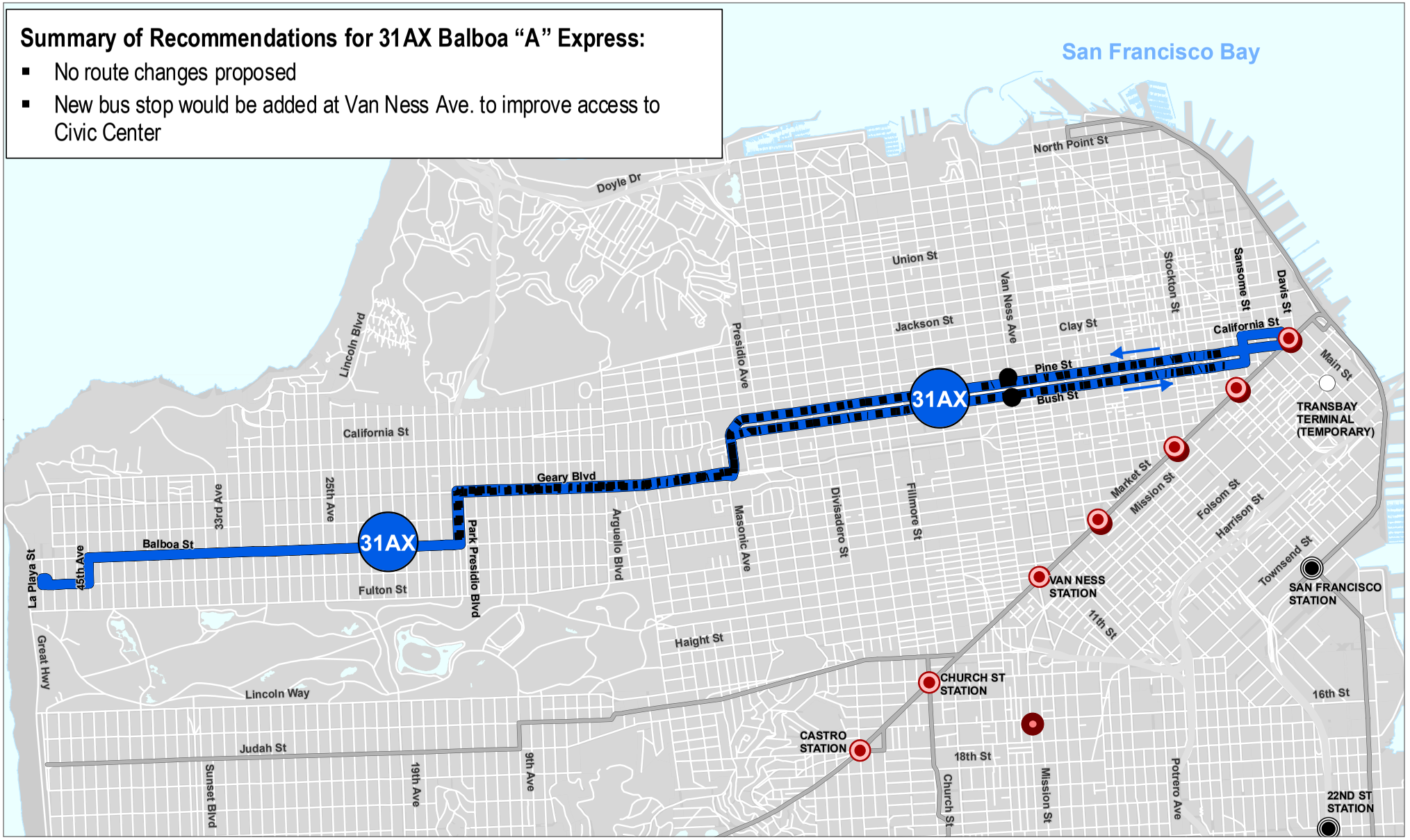
SFMTA | Municipal Transportation Agency

Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 31AX Balboa "A" Express:

- No route changes proposed
- New bus stop would be added at Van Ness Ave. to improve access to Civic Center



Line 31AX - Balboa "A" Express

Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Express Segment (no stops)
- Rail Network
- New Stop

SFMTA | Municipal Transportation Agency

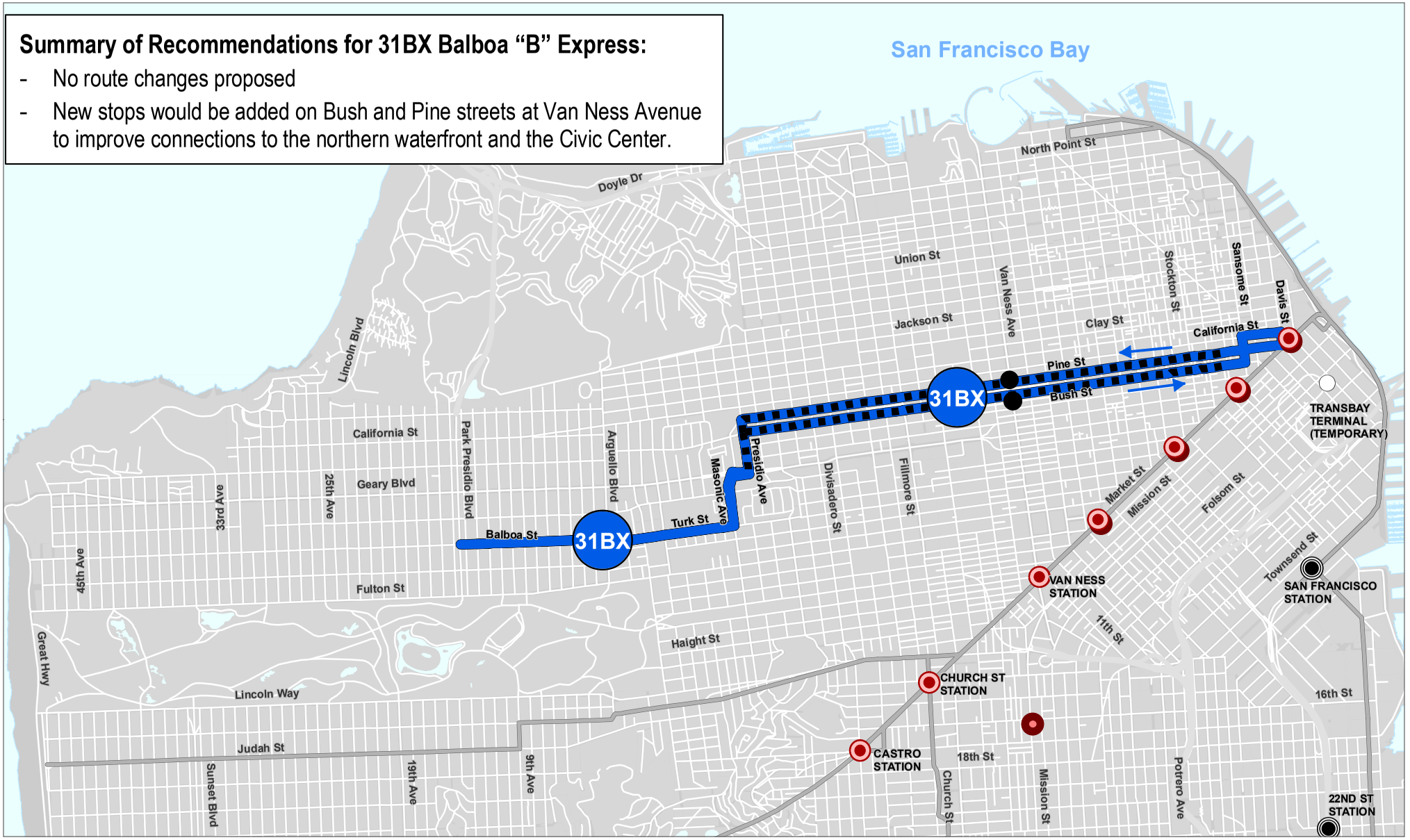
- Muni Metro Stations
- BART Stations
- Caltrain Stations

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 31BX Balboa "B" Express:

- No route changes proposed
- New stops would be added on Bush and Pine streets at Van Ness Avenue to improve connections to the northern waterfront and the Civic Center.



Line 31BX - Balboa "B" Express

Recommended Route Alignment

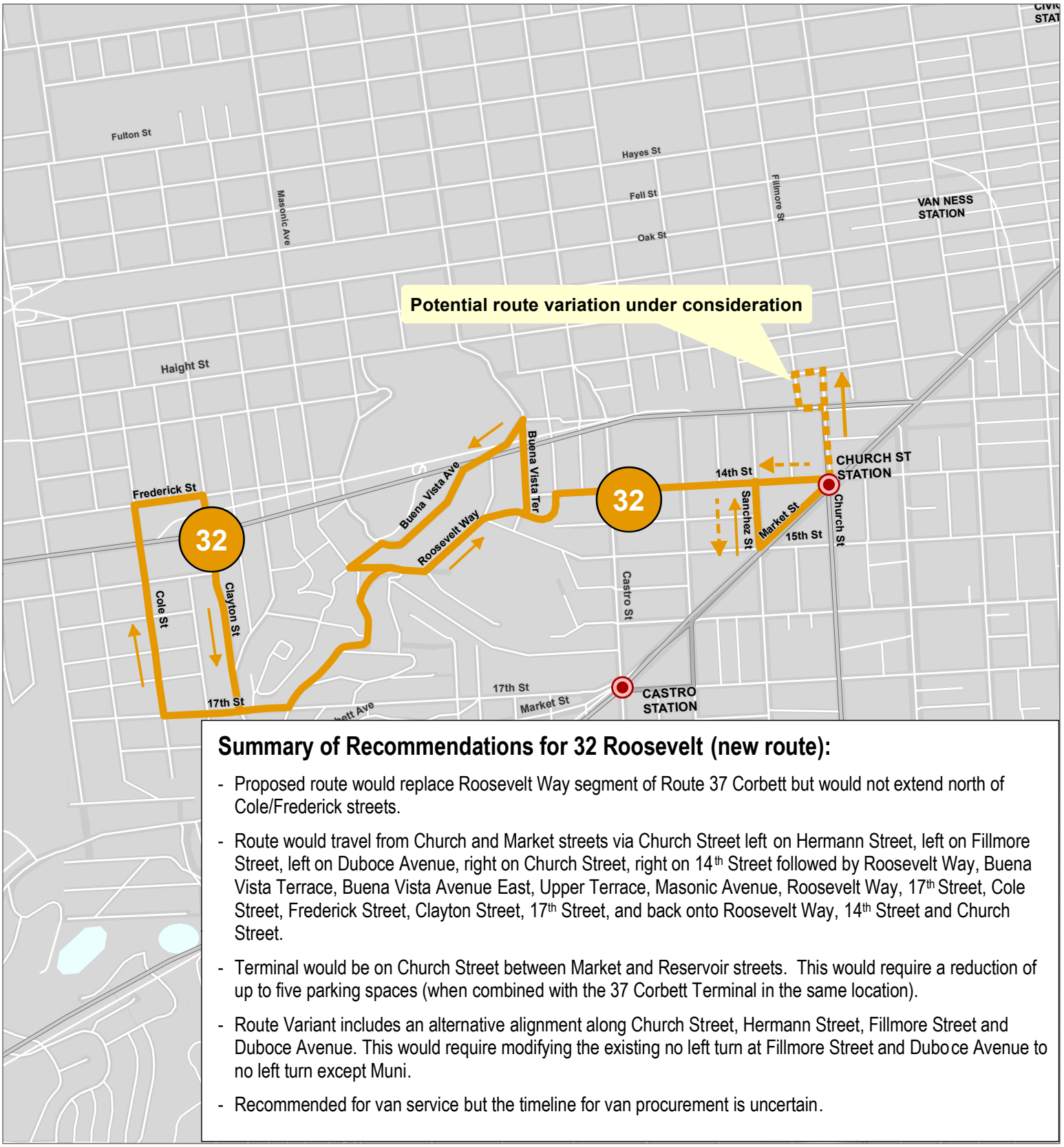
Legend

- Recommended Specialized Services Route
- Express Segment (no stops)
- Rail Network
- New Stop
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles



Summary of Recommendations for 32 Roosevelt (new route):

- Proposed route would replace Roosevelt Way segment of Route 37 Corbett but would not extend north of Cole/Frederick streets.
- Route would travel from Church and Market streets via Church Street left on Hermann Street, left on Fillmore Street, left on Duboce Avenue, right on Church Street, right on 14th Street followed by Roosevelt Way, Buena Vista Terrace, Buena Vista Avenue East, Upper Terrace, Masonic Avenue, Roosevelt Way, 17th Street, Cole Street, Frederick Street, Clayton Street, 17th Street, and back onto Roosevelt Way, 14th Street and Church Street.
- Terminal would be on Church Street between Market and Reservoir streets. This would require a reduction of up to five parking spaces (when combined with the 37 Corbett Terminal in the same location).
- Route Variant includes an alternative alignment along Church Street, Hermann Street, Fillmore Street and Duboce Avenue. This would require modifying the existing no left turn at Fillmore Street and Duboce Avenue to no left turn except Muni.
- Recommended for van service but the timeline for van procurement is uncertain.

Line 32 - Roosevelt
Recommended Route Alignment

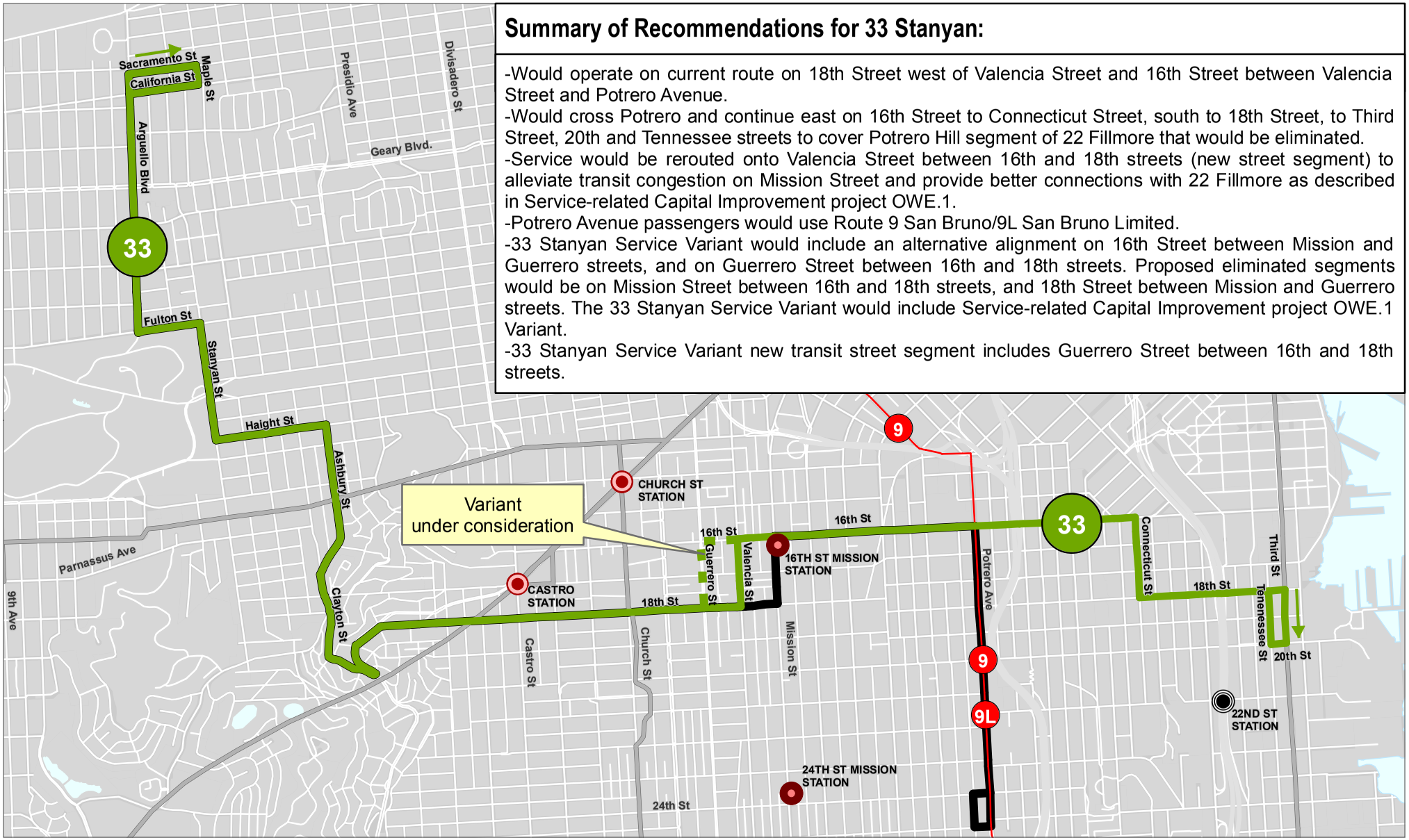
Legend

- Recommended Cummunity Route
- Potential Route Variation
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.125 0.25 Miles

SFMTA | Municipal Transportation Agency

Map Updated
January 2013



Line 33 - Stanyan (Revised)

Recommended Route Alignment

SFMTA | Municipal Transportation Agency

Legend

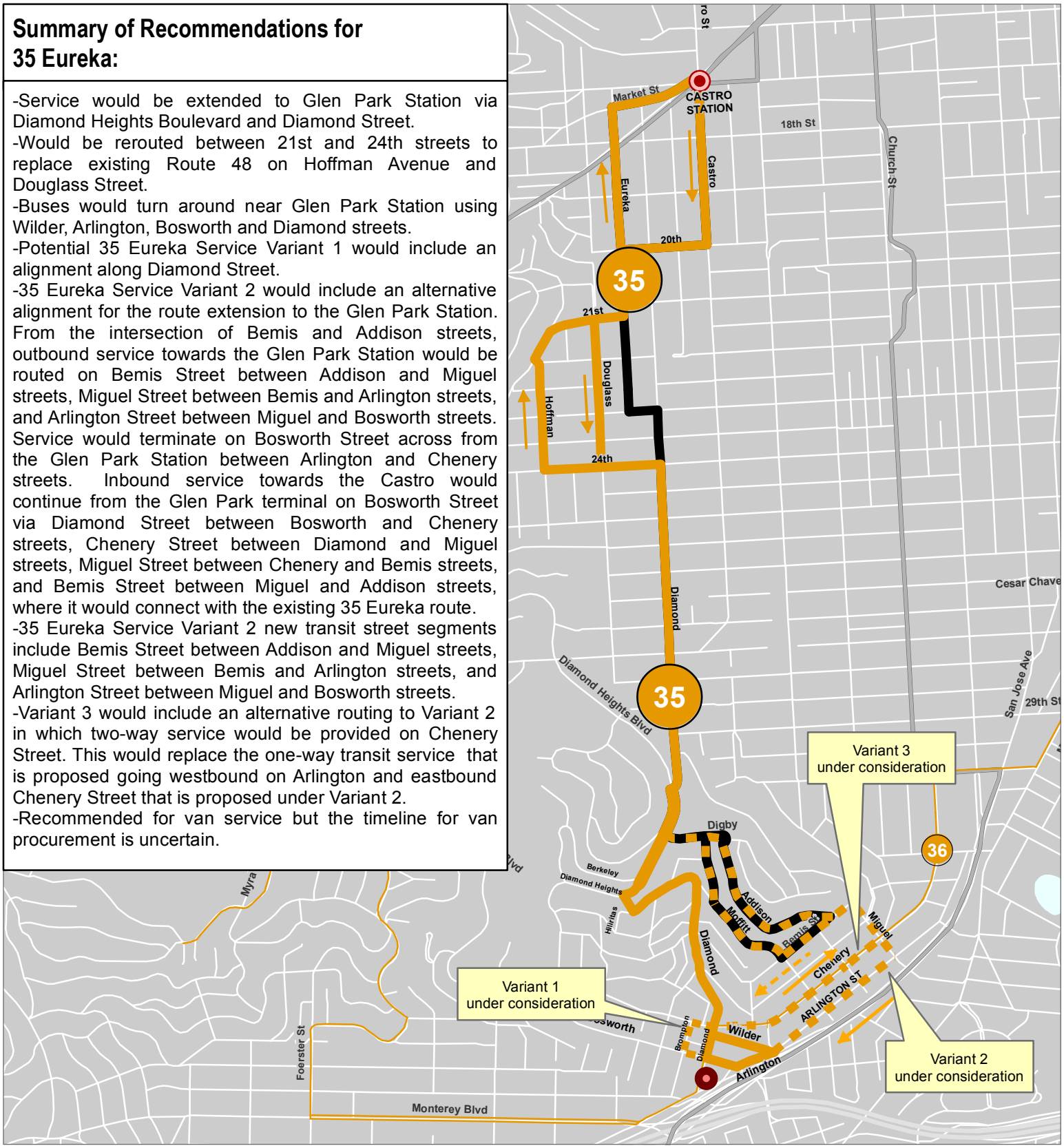
- Recommended Local Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

Map Updated
February 2014

0 0.25 0.5 Miles

Summary of Recommendations for 35 Eureka:

-Service would be extended to Glen Park Station via Diamond Heights Boulevard and Diamond Street.
-Would be rerouted between 21st and 24th streets to replace existing Route 48 on Hoffman Avenue and Douglass Street.
-Buses would turn around near Glen Park Station using Wilder, Arlington, Bosworth and Diamond streets.
-Potential 35 Eureka Service Variant 1 would include an alignment along Diamond Street.
-35 Eureka Service Variant 2 would include an alternative alignment for the route extension to the Glen Park Station. From the intersection of Bemis and Addison streets, outbound service towards the Glen Park Station would be routed on Bemis Street between Addison and Miguel streets, Miguel Street between Bemis and Arlington streets, and Arlington Street between Miguel and Bosworth streets. Service would terminate on Bosworth Street across from the Glen Park Station between Arlington and Chenery streets. Inbound service towards the Castro would continue from the Glen Park terminal on Bosworth Street via Diamond Street between Bosworth and Chenery streets, Chenery Street between Diamond and Miguel streets, Miguel Street between Chenery and Bemis streets, and Bemis Street between Miguel and Addison streets, where it would connect with the existing 35 Eureka route.
-35 Eureka Service Variant 2 new transit street segments include Bemis Street between Addison and Miguel streets, Miguel Street between Bemis and Arlington streets, and Arlington Street between Miguel and Bosworth streets.
-Variant 3 would include an alternative routing to Variant 2 in which two-way service would be provided on Chenery Street. This would replace the one-way transit service that is proposed going westbound on Arlington and eastbound Chenery Street that is proposed under Variant 2.
-Recommended for van service but the timeline for van procurement is uncertain.



Line 35 - Eureka (Revised)
Recommended Route Alignment

Legend

- Recommended Community Route
- Segment Proposed for Elimination
- Potential Route Variant
- Nearby Alternative Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.125 0.25 0.5 Miles

SFMTA | Municipal Transportation Agency

Map Updated
February 2014

Line 36 - Teresita
Recommended Route Alignment

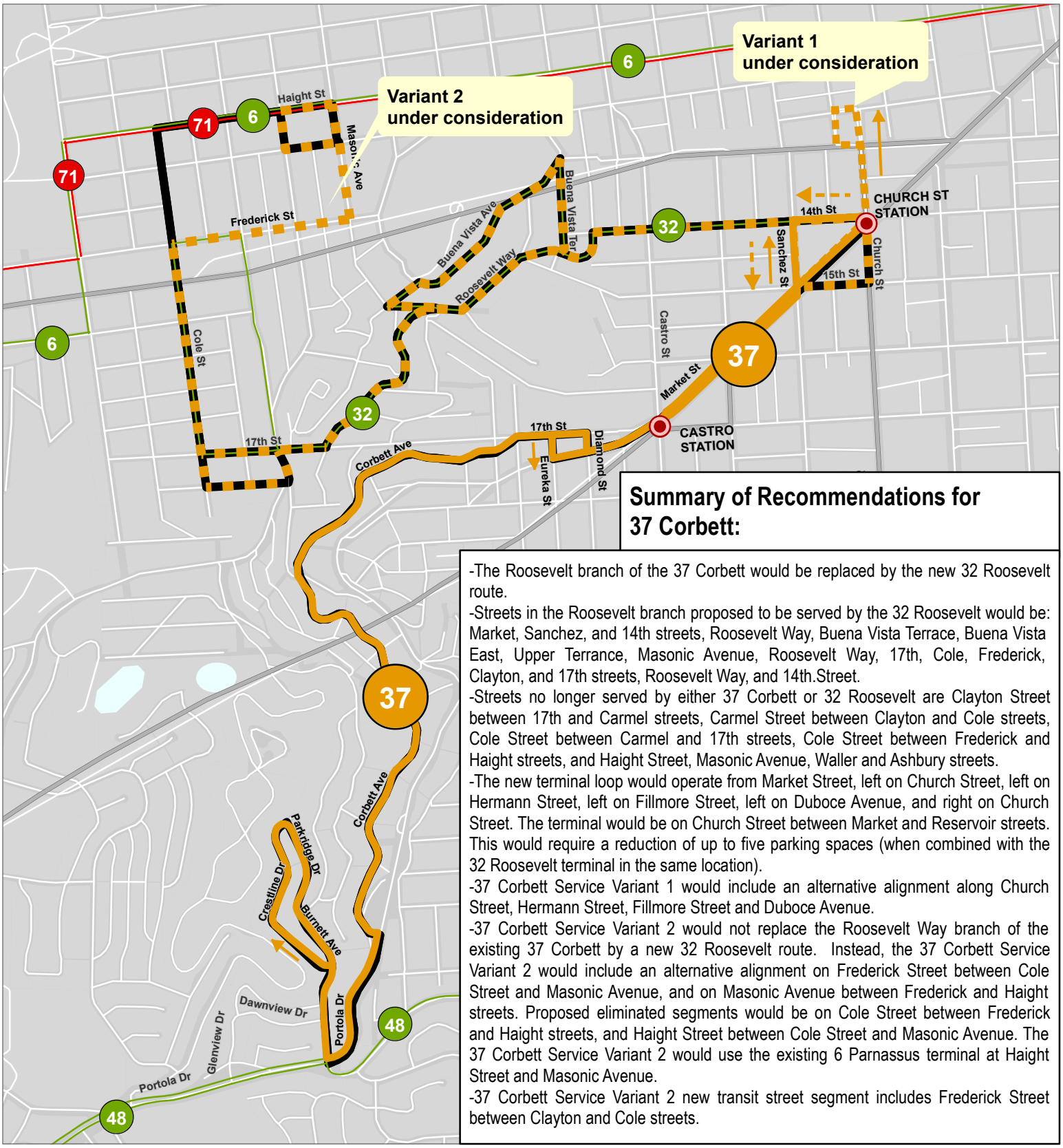
Legend

- Recommended Community Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles



Summary of Recommendations for 37 Corbett:

-The Roosevelt branch of the 37 Corbett would be replaced by the new 32 Roosevelt route.
-Streets in the Roosevelt branch proposed to be served by the 32 Roosevelt would be: Market, Sanchez, and 14th streets, Roosevelt Way, Buena Vista Terrace, Buena Vista East, Upper Terrance, Masonic Avenue, Roosevelt Way, 17th, Cole, Frederick, Clayton, and 17th streets, Roosevelt Way, and 14th.Street.
-Streets no longer served by either 37 Corbett or 32 Roosevelt are Clayton Street between 17th and Carmel streets, Carmel Street between Clayton and Cole streets, Cole Street between Carmel and 17th streets, Cole Street between Frederick and Haight streets, and Haight Street, Masonic Avenue, Waller and Ashbury streets.
-The new terminal loop would operate from Market Street, left on Church Street, left on Hermann Street, left on Fillmore Street, left on Duboce Avenue, and right on Church Street. The terminal would be on Church Street between Market and Reservoir streets. This would require a reduction of up to five parking spaces (when combined with the 32 Roosevelt terminal in the same location).
-37 Corbett Service Variant 1 would include an alternative alignment along Church Street, Hermann Street, Fillmore Street and Duboce Avenue.
-37 Corbett Service Variant 2 would not replace the Roosevelt Way branch of the existing 37 Corbett by a new 32 Roosevelt route. Instead, the 37 Corbett Service Variant 2 would include an alternative alignment on Frederick Street between Cole Street and Masonic Avenue, and on Masonic Avenue between Frederick and Haight streets. Proposed eliminated segments would be on Cole Street between Frederick and Haight streets, and Haight Street between Cole Street and Masonic Avenue. The 37 Corbett Service Variant 2 would use the existing 6 Parnassus terminal at Haight Street and Masonic Avenue.
-37 Corbett Service Variant 2 new transit street segment includes Frederick Street between Clayton and Cole streets.

Line 37 - Corbett (Revised)
Recommended Route Alignment

Map Updated
February 2014

0 0.125 0.25 Miles

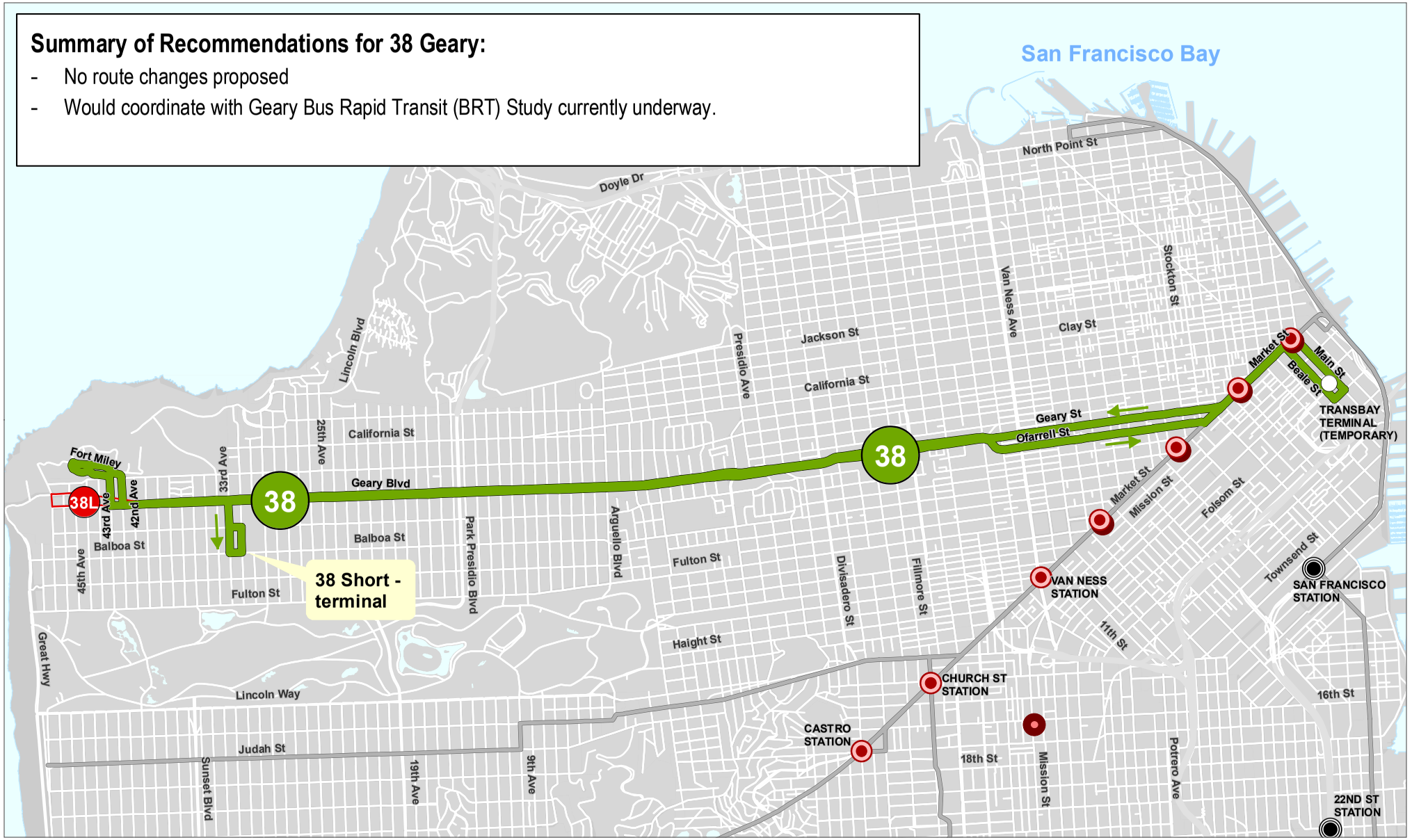
Legend

- Recommended Community Route
- Potential Route Variation
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Summary of Recommendations for 38 Geary:

- No route changes proposed
- Would coordinate with Geary Bus Rapid Transit (BRT) Study currently underway.



Line 38 - Geary

Recommended Route Alignment

Legend

- Recommended Local Route
- Segment would be covered by another recommended route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 38AX Geary "A" Express:

- No route changes proposed.
- New stops would be added on Pine and Bush streets at Van Ness Avenue to improve connections to the northern waterfront and the Civic Center.

Line 38AX - Geary "A" Express

Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Non-Stop Segment
- Rail Network
- New Stop
- Muni Metro Stations
- BART Stations
- Caltrain Stations

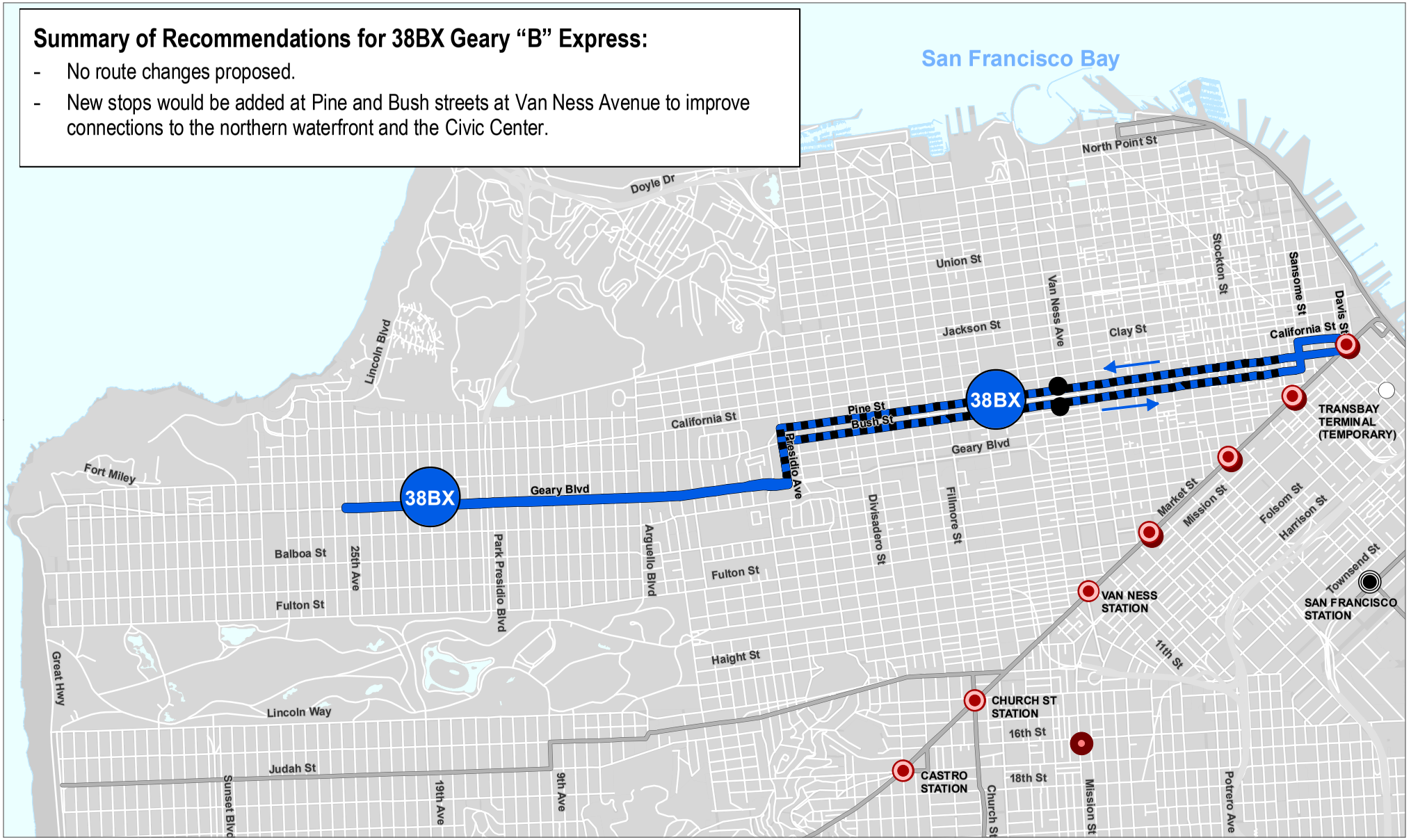
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 38BX Geary "B" Express:

- No route changes proposed.
- New stops would be added at Pine and Bush streets at Van Ness Avenue to improve connections to the northern waterfront and the Civic Center.



Line 38BX - Geary "B" Express

Recommended Route Alignment

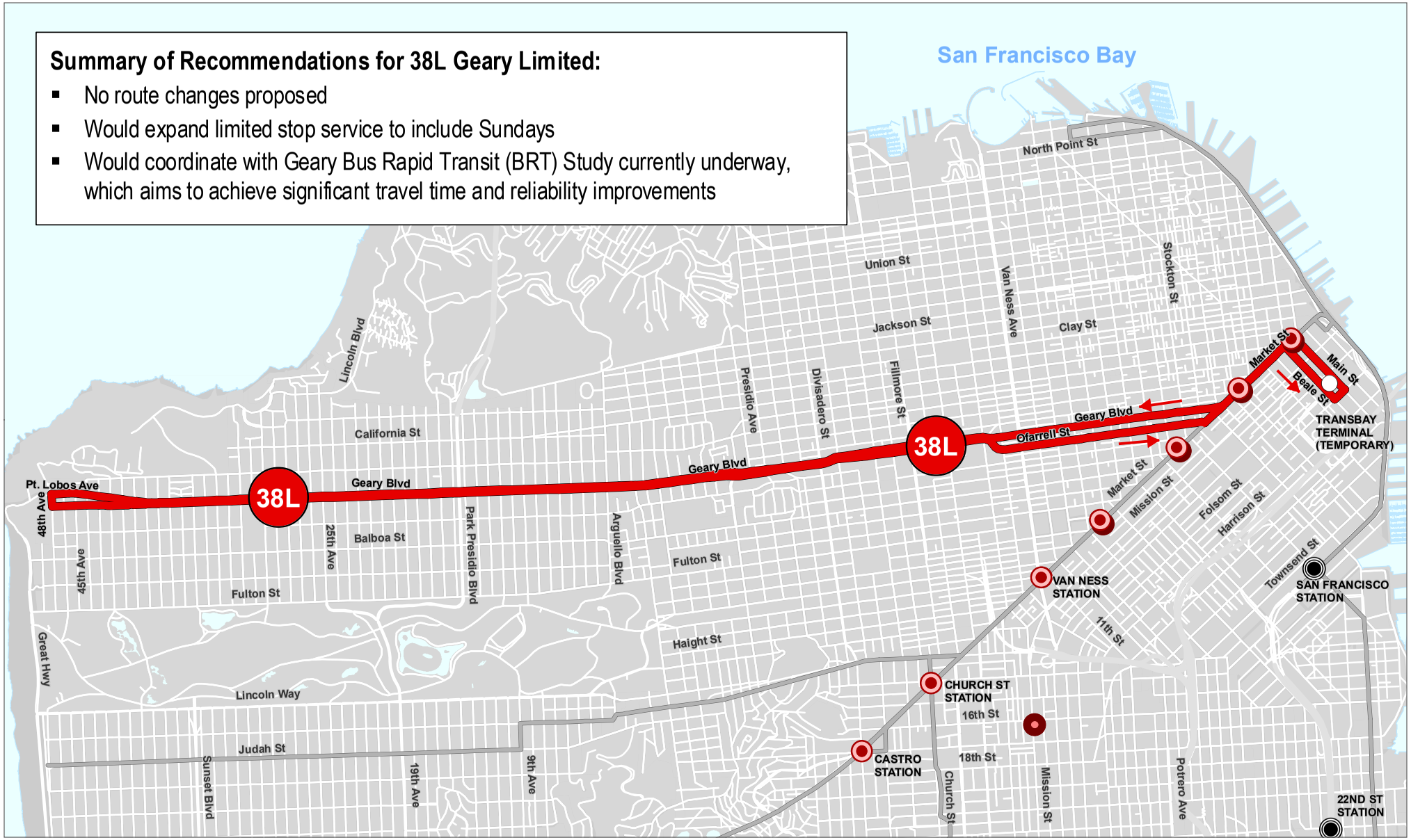
Legend

- Recommended Specialized Services Route
- Non-Stop Segment
- Rail Network
- New Stop
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles


Summary of Recommendations for 38L Geary Limited:
No route changes proposed
Would expand limited stop service to include Sundays
Would coordinate with Geary Bus Rapid Transit (BRT) Study currently underway, which aims to achieve significant travel time and reliability improvements
San Francisco Bay
North Point St
Union St
Jackson St
Clay St
Van Ness Ave
Stockton St
Lincoln Blvd
California St
Presidio Ave
Divisadero St
Fillmore St
Market St
Main St
Beale St
TRANSBAY TERMINAL (TEMPORARY)
Geary Blvd
Ofarrell St
38L
Pt. Lobos Ave
48th Ave
45th Ave
25th Ave
Balboa St
Park Presidio Blvd
Arguello Blvd
Fulton St
Mission St
Folsom St
Harrison St
Townsend St
SAN FRANCISCO STATION
VAN NESS STATION
11th St
Great Hwy
Lincoln Way
Haight St
CHURCH ST STATION
16th St
Judah St
Sunset Blvd
19th Ave
9th Ave
CASTRO STATION
18th St
Church St
Potrero Ave
22ND ST STATION
Line 38L - Geary
Recommended Route Alignment
Legend
Recommended Rapid Route
Rail Network
Muni Metro Stations
BART Stations
Caltrain Stations
SFMTA
Municipal Transportation Agency
Map Updated
December 2012
0
0.5
1
Miles

Line 39 - Coit
Recommended Route Alignment

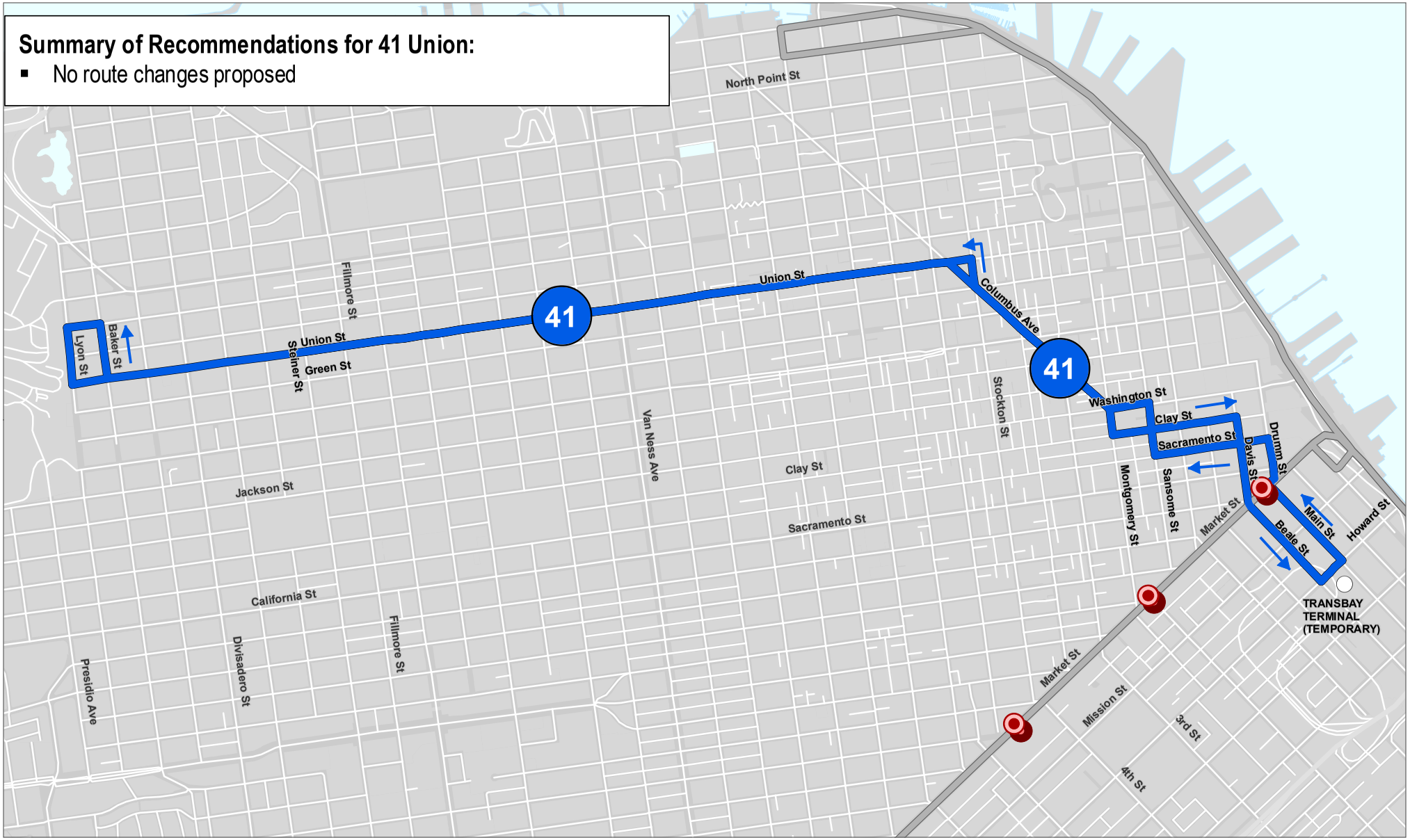
Legend

- Recommended Community Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
January 2013

0 0.05 0.1 Miles



Line 41 - Union

Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Segment would be covered by another recommended route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles

Summary of Recommendations for 43 Masonic:

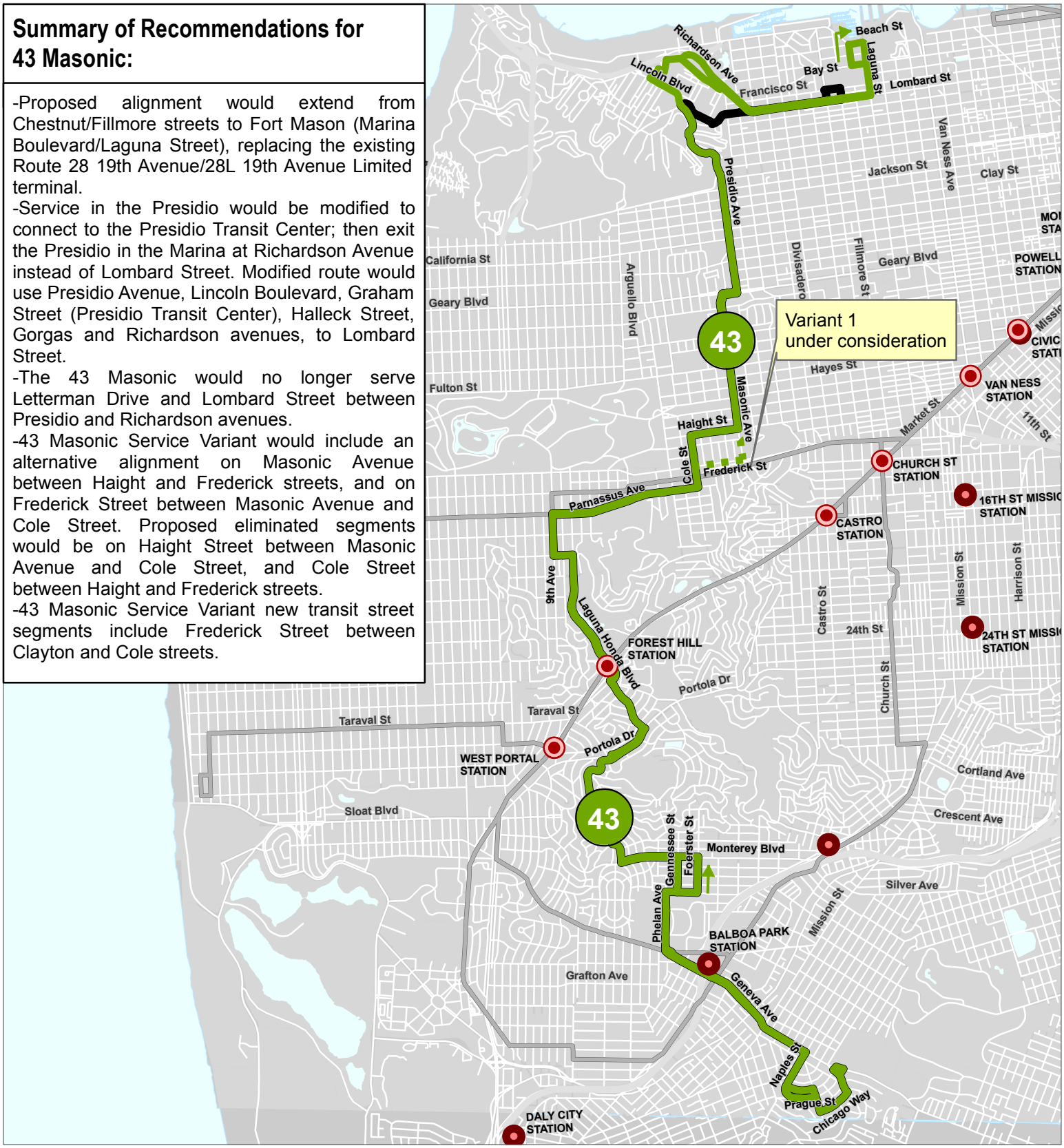
-Proposed alignment would extend from Chestnut/Fillmore streets to Fort Mason (Marina Boulevard/Laguna Street), replacing the existing Route 28 19th Avenue/28L 19th Avenue Limited terminal.

-Service in the Presidio would be modified to connect to the Presidio Transit Center; then exit the Presidio in the Marina at Richardson Avenue instead of Lombard Street. Modified route would use Presidio Avenue, Lincoln Boulevard, Graham Street (Presidio Transit Center), Halleck Street, Gorgas and Richardson avenues, to Lombard Street.

-The 43 Masonic would no longer serve Letterman Drive and Lombard Street between Presidio and Richardson avenues.

-43 Masonic Service Variant would include an alternative alignment on Masonic Avenue between Haight and Frederick streets, and on Frederick Street between Masonic Avenue and Cole Street. Proposed eliminated segments would be on Haight Street between Masonic Avenue and Cole Street, and Cole Street between Haight and Frederick streets.

-43 Masonic Service Variant new transit street segments include Frederick Street between Clayton and Cole streets.



Line 43 - Masonic (Revised)
Recommended Route Alignment

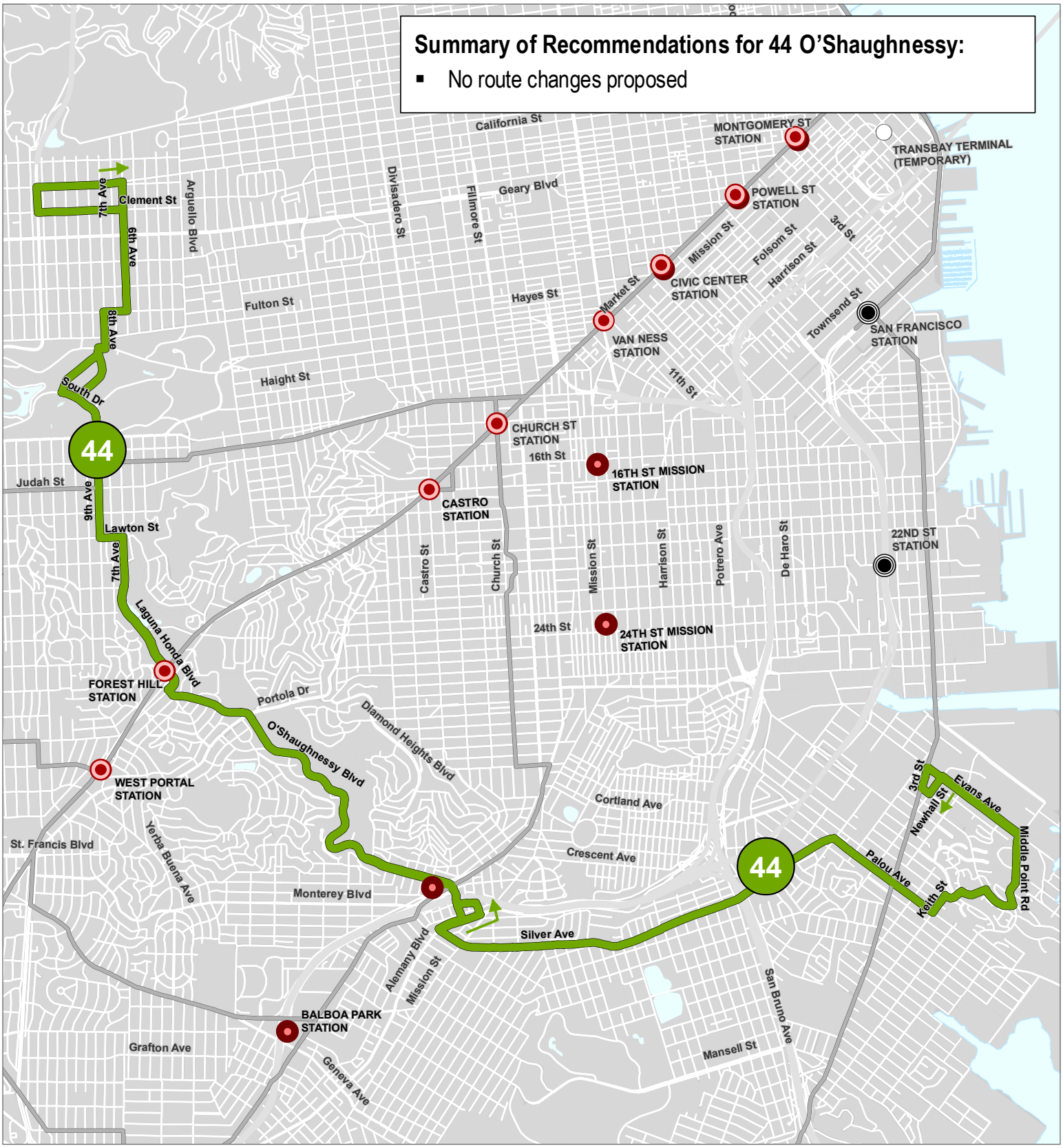
Legend

- Recommended Local Route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.5 1 Miles

SFMTA | Municipal Transportation Agency

Map Updated
February 2014



Line 44 - O'Shaughnessy
Recommended Route Alignment

Legend

- Recommended Local Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Line 45 - Union/Stockton
Recommended Route Alignment

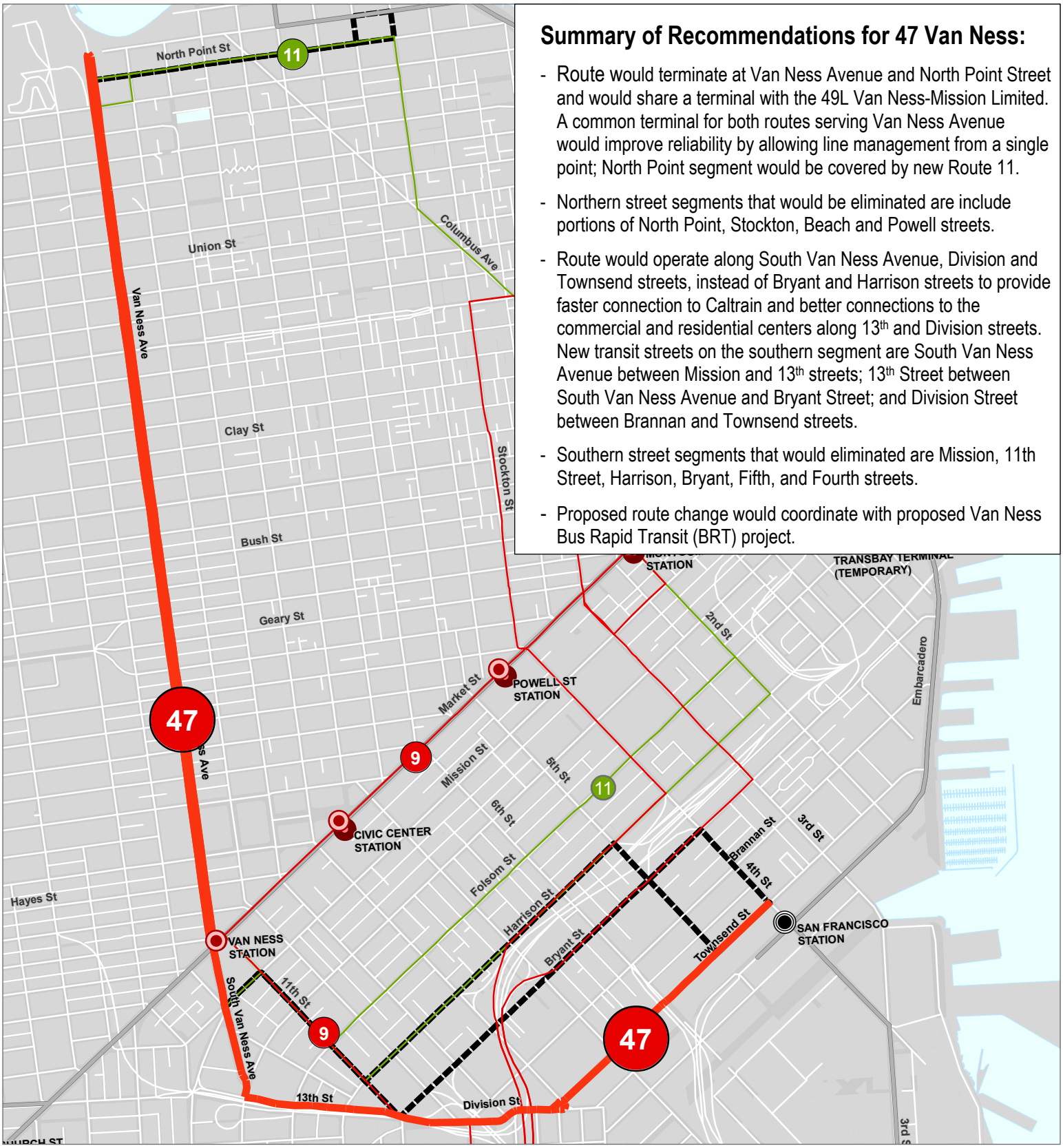
Legend

- Recommended Local Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles



Summary of Recommendations for 47 Van Ness:

- Route would terminate at Van Ness Avenue and North Point Street and would share a terminal with the 49L Van Ness-Mission Limited. A common terminal for both routes serving Van Ness Avenue would improve reliability by allowing line management from a single point; North Point segment would be covered by new Route 11.
- Northern street segments that would be eliminated are include portions of North Point, Stockton, Beach and Powell streets.
- Route would operate along South Van Ness Avenue, Division and Townsend streets, instead of Bryant and Harrison streets to provide faster connection to Caltrain and better connections to the commercial and residential centers along 13th and Division streets. New transit streets on the southern segment are South Van Ness Avenue between Mission and 13th streets; 13th Street between South Van Ness Avenue and Bryant Street; and Division Street between Brannan and Townsend streets.
- Southern street segments that would eliminated are Mission, 11th Street, Harrison, Bryant, Fifth, and Fourth streets.
- Proposed route change would coordinate with proposed Van Ness Bus Rapid Transit (BRT) project.

Line 47 - Van Ness
Recommended Route Alignment

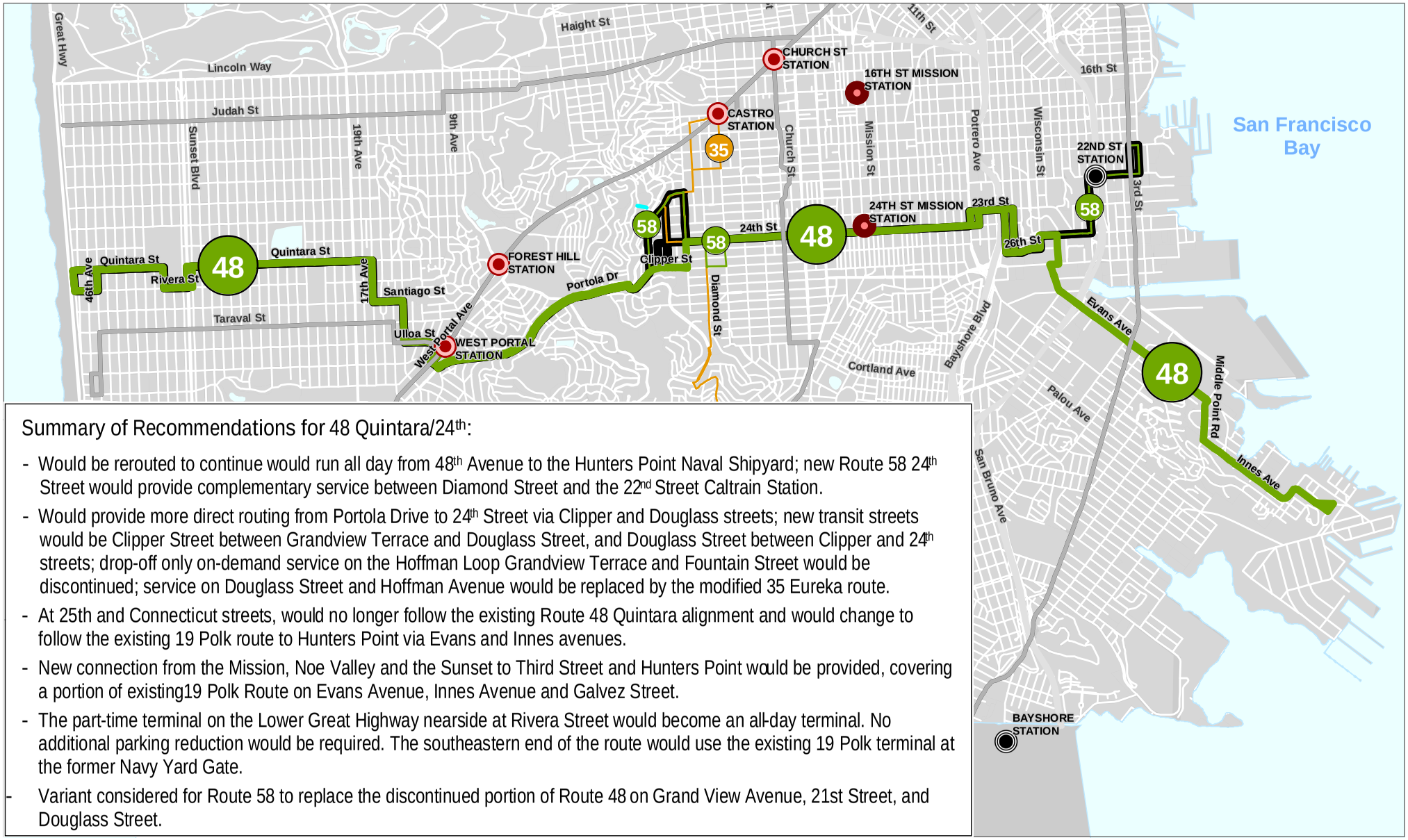
Legend

- Recommended Rapid Route
- Would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
January 2013

0 0.25 0.5 Miles



Summary of Recommendations for 48 Quintara/24th:

- Would be rerouted to continue would run all day from 48th Avenue to the Hunters Point Naval Shipyard; new Route 58 24th Street would provide complementary service between Diamond Street and the 22nd Street Caltrain Station.
- Would provide more direct routing from Portola Drive to 24th Street via Clipper and Douglass streets; new transit streets would be Clipper Street between Grandview Terrace and Douglass Street, and Douglass Street between Clipper and 24th streets; drop-off only on-demand service on the Hoffman Loop Grandview Terrace and Fountain Street would be discontinued; service on Douglass Street and Hoffman Avenue would be replaced by the modified 35 Eureka route.
- At 25th and Connecticut streets, would no longer follow the existing Route 48 Quintara alignment and would change to follow the existing 19 Polk route to Hunters Point via Evans and Innes avenues.
- New connection from the Mission, Noe Valley and the Sunset to Third Street and Hunters Point would be provided, covering a portion of existing19 Polk Route on Evans Avenue, Innes Avenue and Galvez Street.
- The part-time terminal on the Lower Great Highway nearside at Rivera Street would become an all-day terminal. No additional parking reduction would be required. The southeastern end of the route would use the existing 19 Polk terminal at the former Navy Yard Gate.
- Variant considered for Route 58 to replace the discontinued portion of Route 48 on Grand View Avenue, 21st Street, and Douglass Street.

Line 48 - Quintara/24th - Revised

Recommended Route Alignment

Legend

- Recommended Local Route
- Segment would be covered by another recommended route
- Rail Network
- Segment Proposed for Elimination
- Muni Metro Stations
- BART Stations
- Caltrain Stations

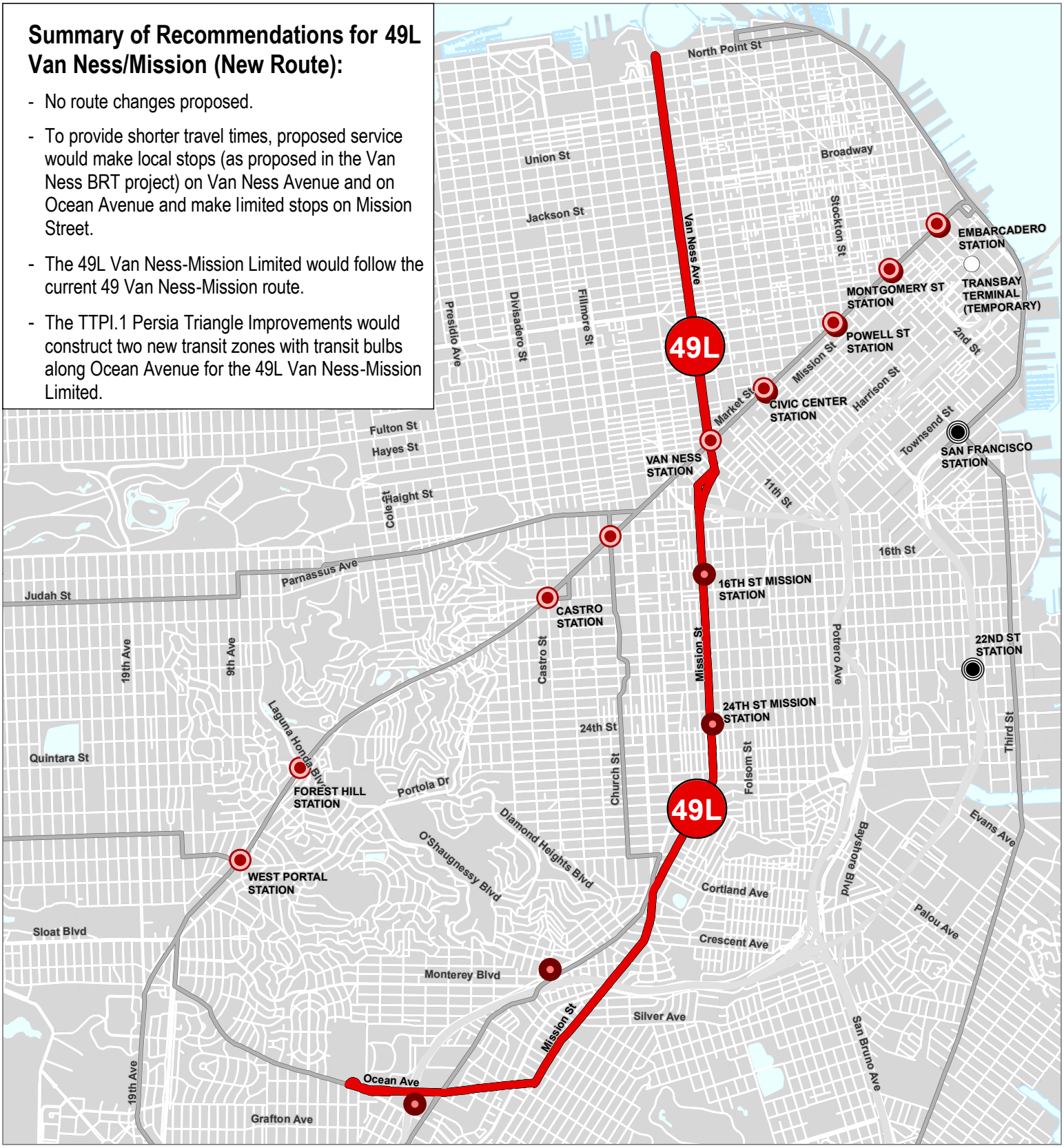
Map Updated
March 2014

0 0.5 1 Miles

SFMTA | Municipal Transportation Agency

Summary of Recommendations for 49L Van Ness/Mission (New Route):

- No route changes proposed.
- To provide shorter travel times, proposed service would make local stops (as proposed in the Van Ness BRT project) on Van Ness Avenue and on Ocean Avenue and make limited stops on Mission Street.
- The 49L Van Ness-Mission Limited would follow the current 49 Van Ness-Mission route.
- The TTPI.1 Persia Triangle Improvements would construct two new transit zones with transit bulbs along Ocean Avenue for the 49L Van Ness-Mission Limited.



Line 49L - Van Ness-Mission Ltd

Recommended Route Alignment

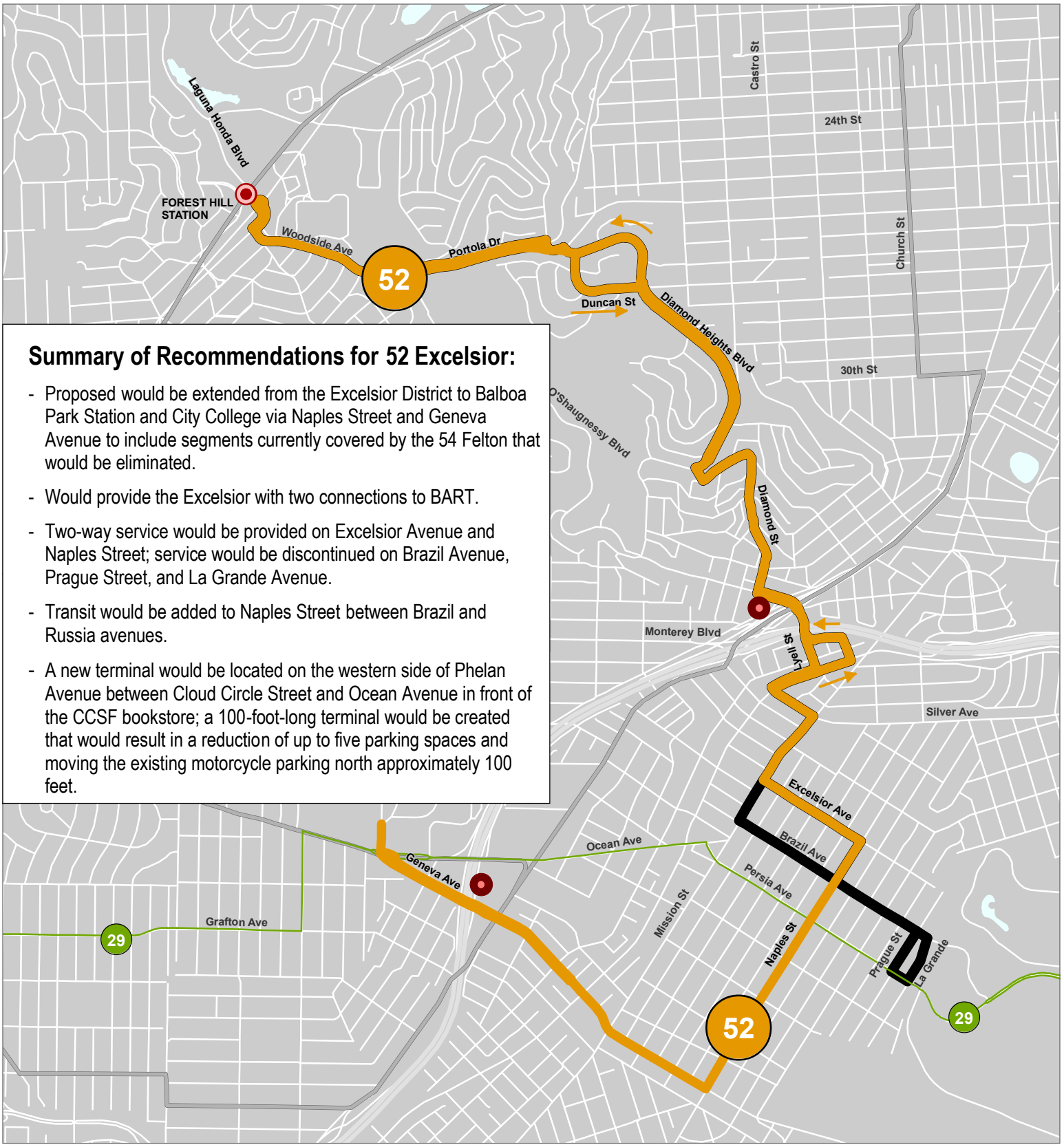
Legend

- Recommended Rapid Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.5 1 Miles

SFMTA | Municipal Transportation Agency

Map Updated
January 2013



Summary of Recommendations for 52 Excelsior:

- Proposed would be extended from the Excelsior District to Balboa Park Station and City College via Naples Street and Geneva Avenue to include segments currently covered by the 54 Felton that would be eliminated.
- Would provide the Excelsior with two connections to BART.
- Two-way service would be provided on Excelsior Avenue and Naples Street; service would be discontinued on Brazil Avenue, Prague Street, and La Grande Avenue.
- Transit would be added to Naples Street between Brazil and Russia avenues.
- A new terminal would be located on the western side of Phelan Avenue between Cloud Circle Street and Ocean Avenue in front of the CCSF bookstore; a 100-foot-long terminal would be created that would result in a reduction of up to five parking spaces and moving the existing motorcycle parking north approximately 100 feet.

Line 52 - Excelsior
Recommended Route Alignment

Legend

- Recommended Community Route
- Segment Proposed for Elimination
- Segment would be covered by another recommended route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

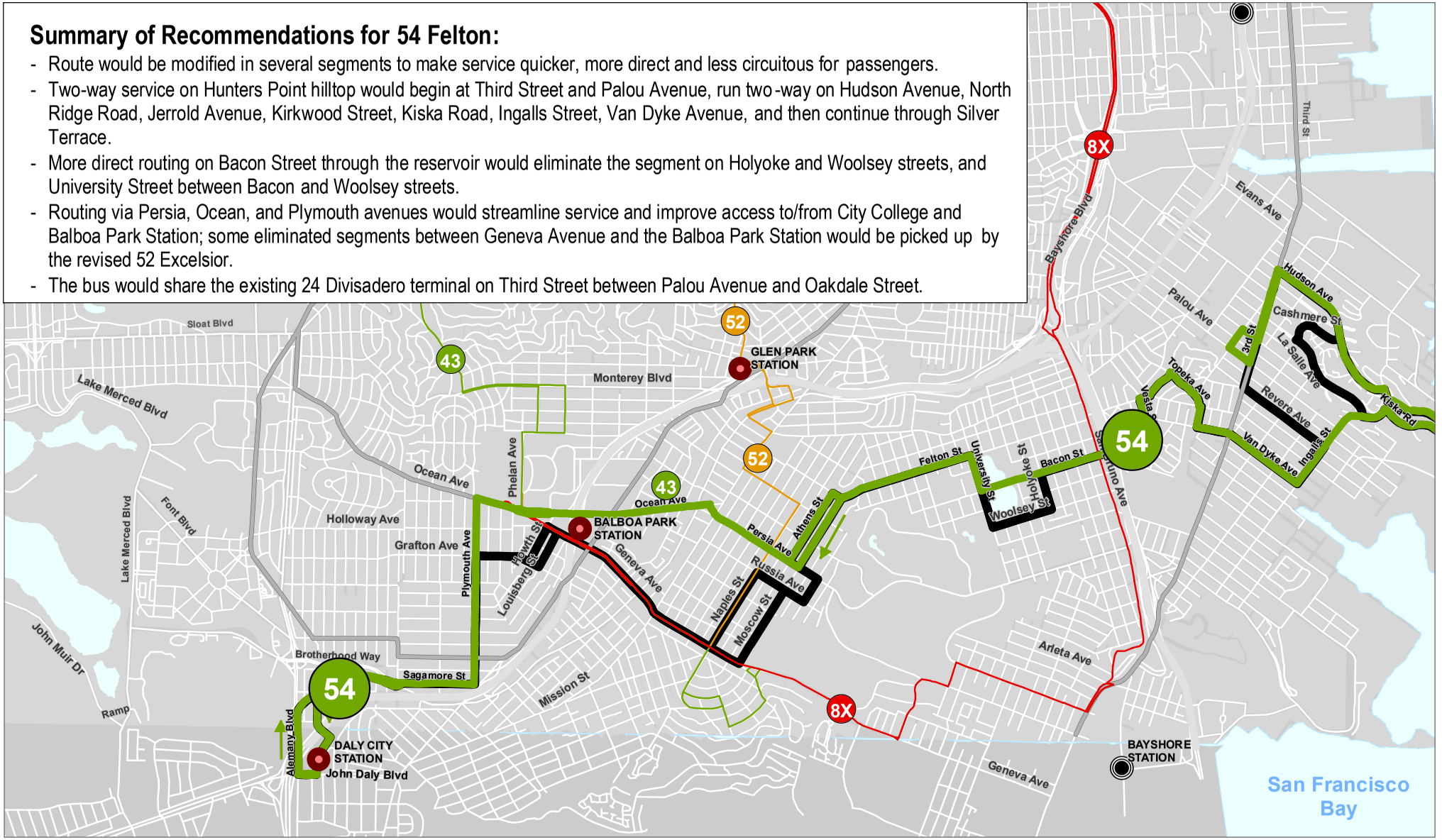
SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles

Summary of Recommendations for 54 Felton:

- Route would be modified in several segments to make service quicker, more direct and less circuitous for passengers.
- Two-way service on Hunters Point hilltop would begin at Third Street and Palou Avenue, run two-way on Hudson Avenue, North Ridge Road, Jerrold Avenue, Kirkwood Street, Kiska Road, Ingalls Street, Van Dyke Avenue, and then continue through Silver Terrace.
- More direct routing on Bacon Street through the reservoir would eliminate the segment on Holyoke and Woolsey streets, and University Street between Bacon and Woolsey streets.
- Routing via Persia, Ocean, and Plymouth avenues would streamline service and improve access to/from City College and Balboa Park Station; some eliminated segments between Geneva Avenue and the Balboa Park Station would be picked up by the revised 52 Excelsior.
- The bus would share the existing 24 Divisadero terminal on Third Street between Palou Avenue and Oakdale Street.



Line 54 - Felton
Recommended Route Alignment

Legend

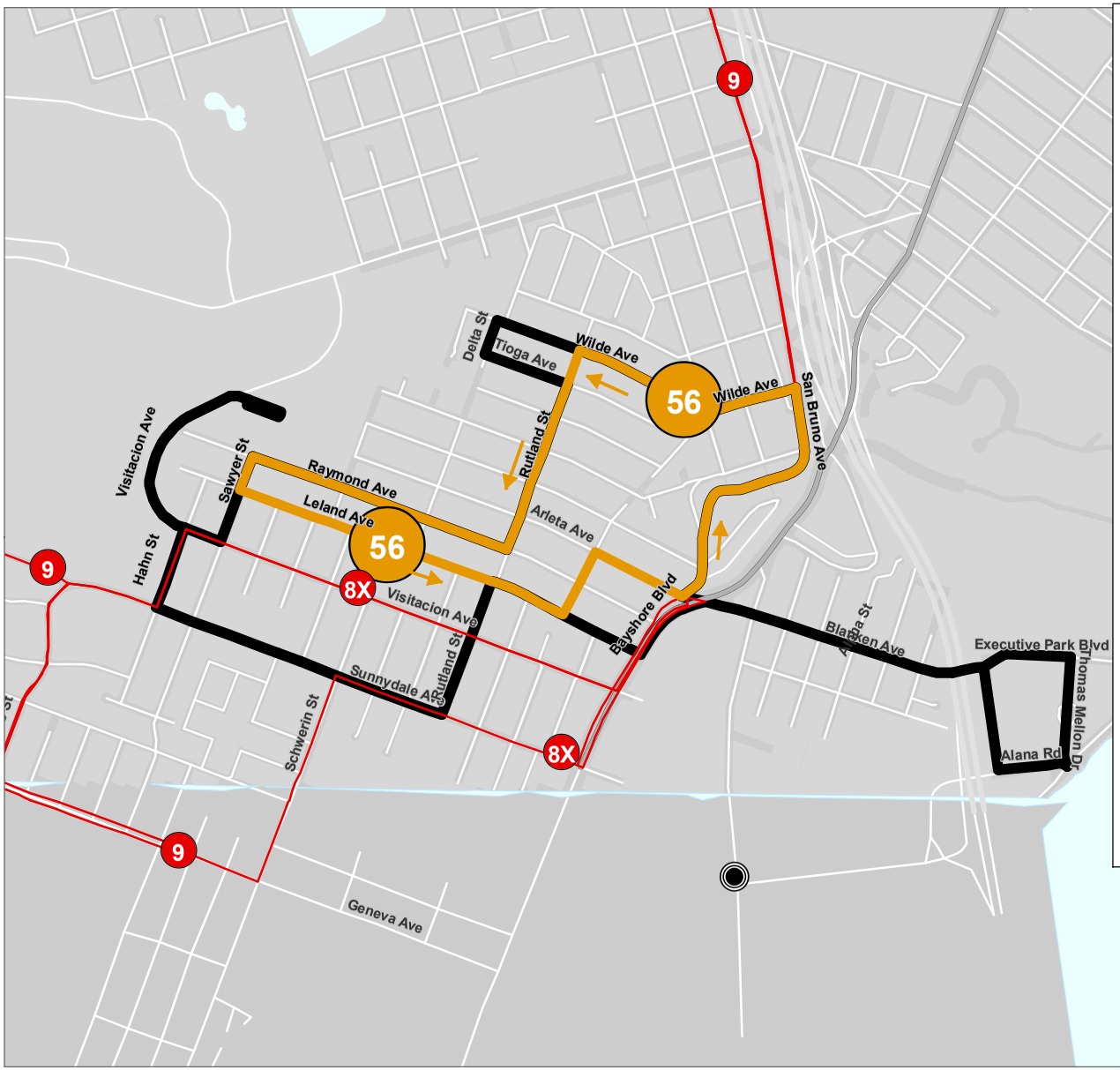
- Recommended Local Route
- Segment would be covered by another recommended route
- Rail Network
- Segment Proposed for Elimination

SFMTA | Municipal Transportation Agency

- Muni Metro Stations
- BART Stations
- Caltrain Stations

Map Updated
December 2012

0 0.5 1 Miles



Summary of Recommendations for 56 Rutland:

- Route would be shortened and the service frequency increased.
- Proposed one-way loop route: from terminal at Arleta Avenue and Bayshore Boulevard, left on San Bruno Avenue, left on Wilde Avenue, left on Rutland Street, right on Raymond Avenue, left on Sawyer Street, left on Leland Avenue, left on Alpha Street, right on Arleta Avenue to terminal at Arleta Avenue and Bayshore Boulevard.
- Segments on Sawyer Street between Leland and Visitacíon avenues, Hahn Street, Rutland Street between Sunnydale and Leland avenues, and Sunnydale Avenue between Schwerin and Hahn streets would be discontinued. The 8X Bayshore Express and 9 San Bruno cover segments of Route 56 on Sunnydale Avenue between Rutland and Schwerin streets, and on Hahn Street between Visitacíon and Sunnydale avenues.
- Route segments to/from Executive Park and along Visitacíon Avenue would be discontinued Wilde between Delta and Rutland streets, Delta between Wilde and Tioga avenues, and Tioga between Delta and Rutland streets would be discontinued).
- New terminal would be located at the nearside corner of Arleta Avenue at Bayshore Boulevard. This would require a reduction of up to five parking spaces.
- Recommended for van service but timeline for van procurement is uncertain.

Line 56 - Rutland
Recommended Route Alignment

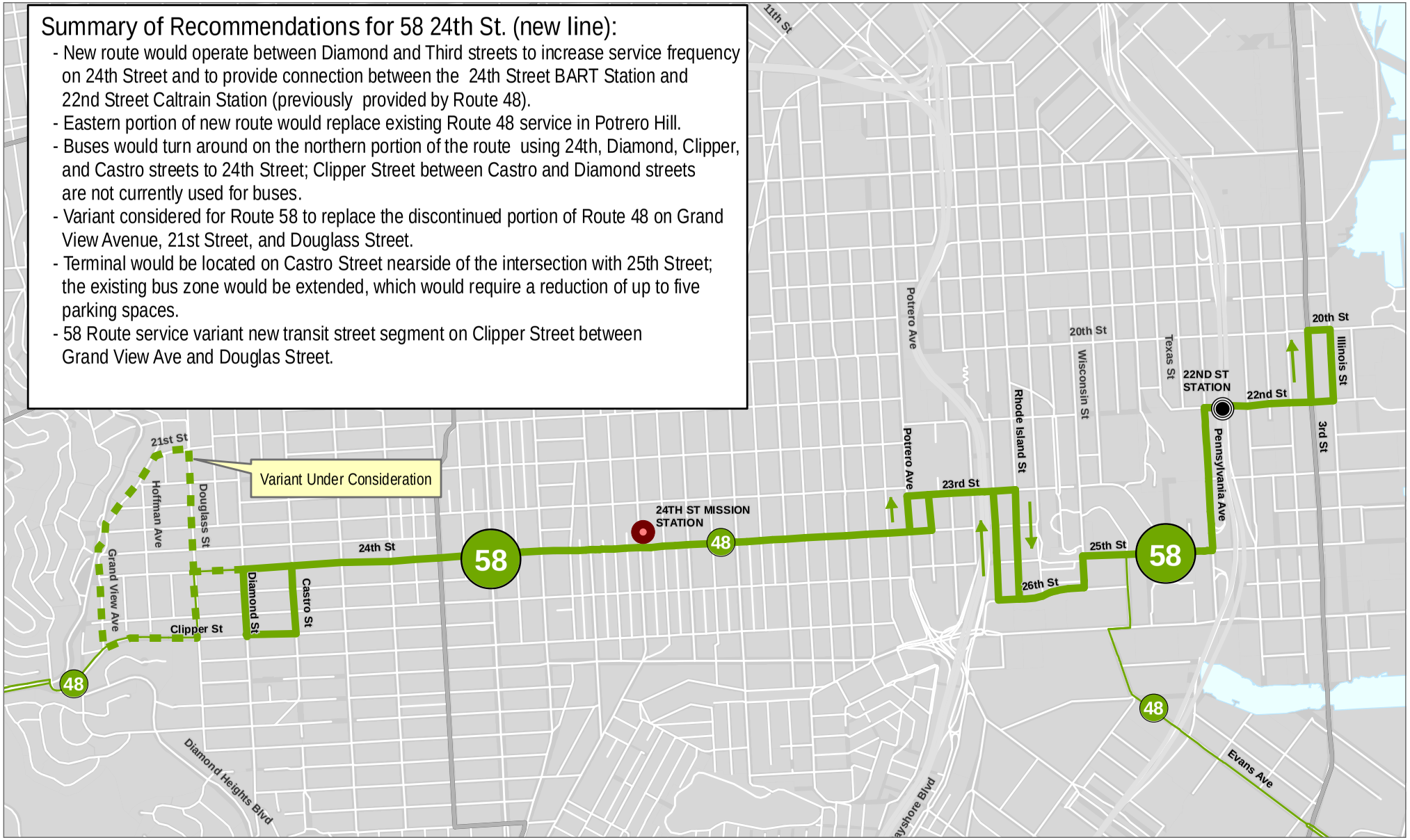
Legend

- Recommended Community Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.2 0.4 Miles



Line 58 - 24th St - Revised

Recommended Route Alignment

Legend

- Recommended Local Route
- Potential Route Variation
- Segment would be covered by another recommended route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

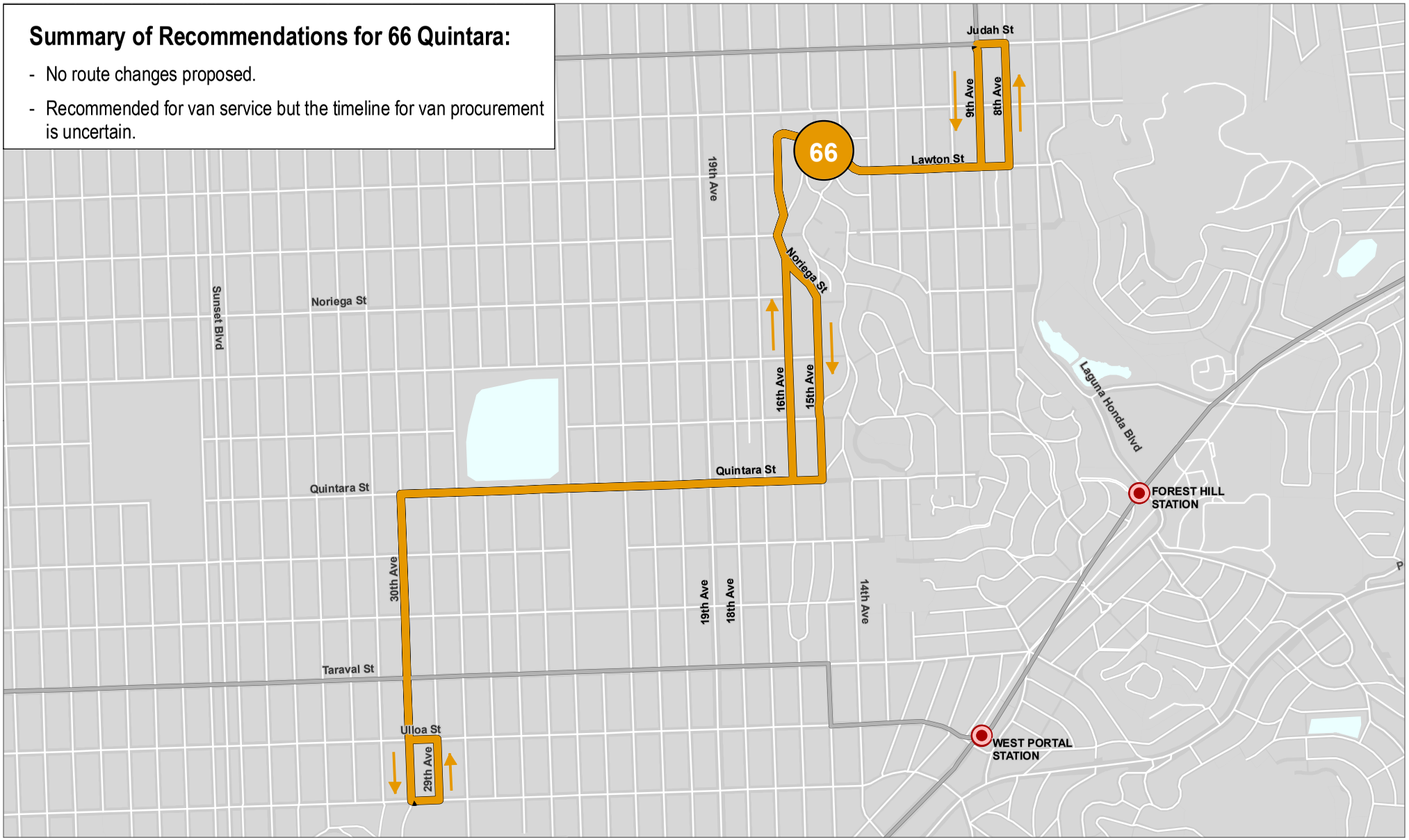
SFMTA | Municipal Transportation Agency

Map Updated
March 2014

0 0.25 0.5 Miles

Summary of Recommendations for 66 Quintara:

- No route changes proposed.
- Recommended for van service but the timeline for van procurement is uncertain.



Line 66 - Quintara
Recommended Route Alignment

Legend

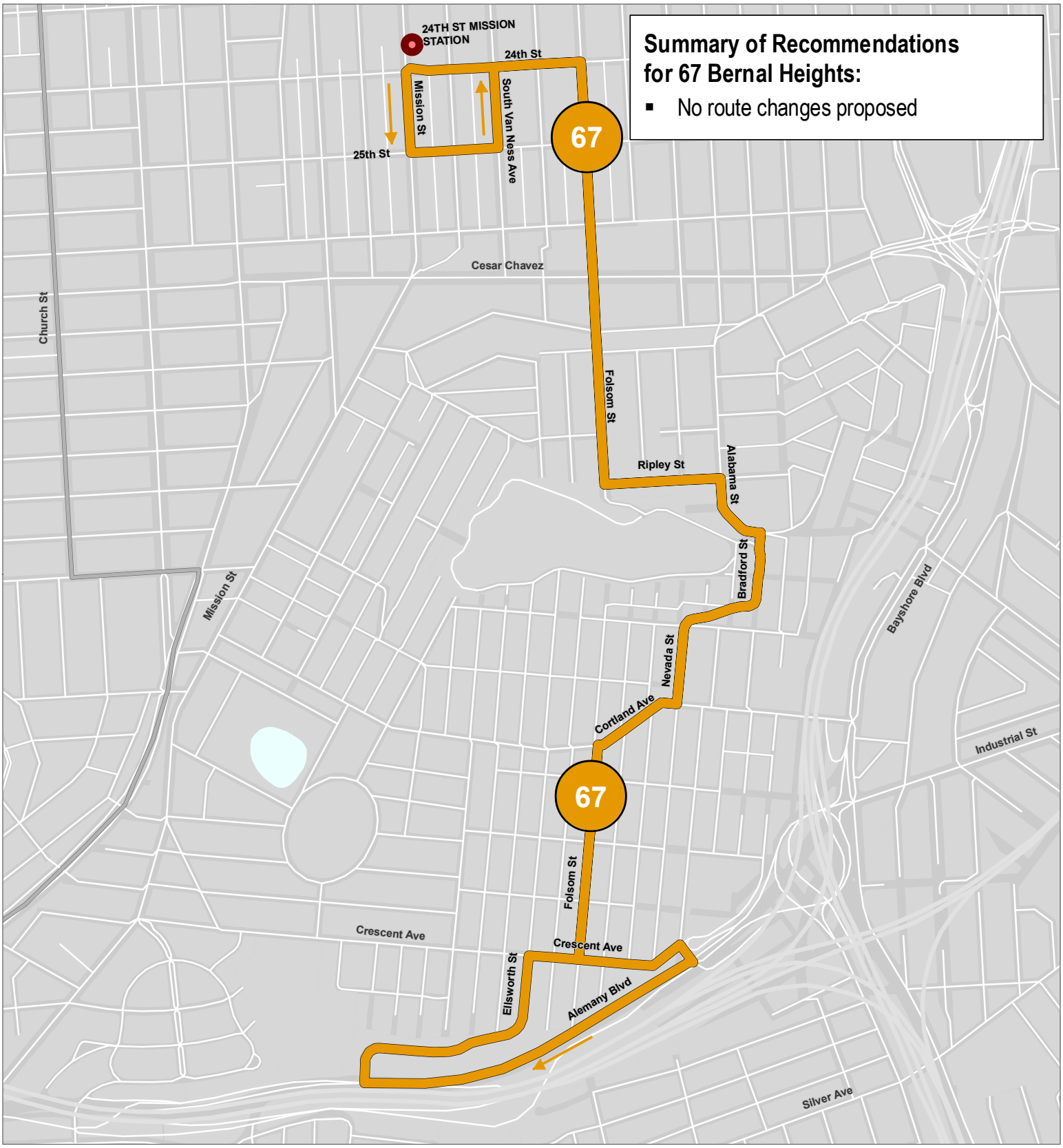
- Recommended Community Route
- Segment would be covered by another recommended route
- Rail Network

SFMTA | Municipal Transportation Agency

- Muni Metro Stations
- BART Stations
- Caltrain Stations

Map Updated
December 2012

0 0.25 0.5 Miles



Line 67 - Bernal Heights
Recommended Route Alignment

Legend

- Recommended Community Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

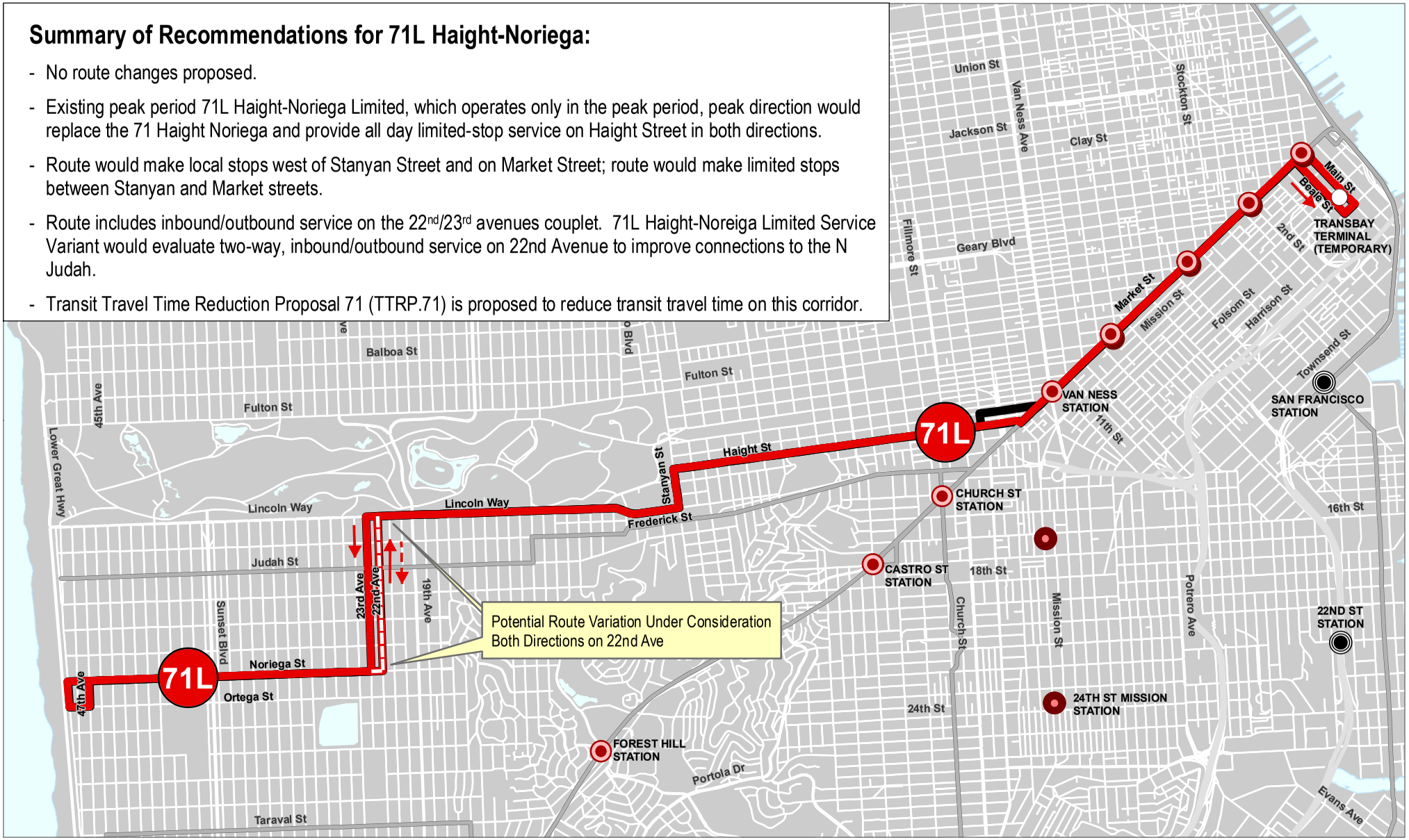
SFMTA | Municipal Transportation Agency

November 2011
December 2012

0 0.125 0.25 Miles

Summary of Recommendations for 71L Haight-Noriega:

- No route changes proposed.
- Existing peak period 71L Haight-Noriega Limited, which operates only in the peak period, peak direction would replace the 71 Haight Noriega and provide all day limited-stop service on Haight Street in both directions.
- Route would make local stops west of Stanyan Street and on Market Street; route would make limited stops between Stanyan and Market streets.
- Route includes inbound/outbound service on the 22nd/23rd avenues couplet. 71L Haight-Noriega Limited Service Variant would evaluate two-way, inbound/outbound service on 22nd Avenue to improve connections to the N Judah.
- Transit Travel Time Reduction Proposal 71 (TTRP.71) is proposed to reduce transit travel time on this corridor.



Line 71L - Haight-Noriega
Recommended Route Alignment

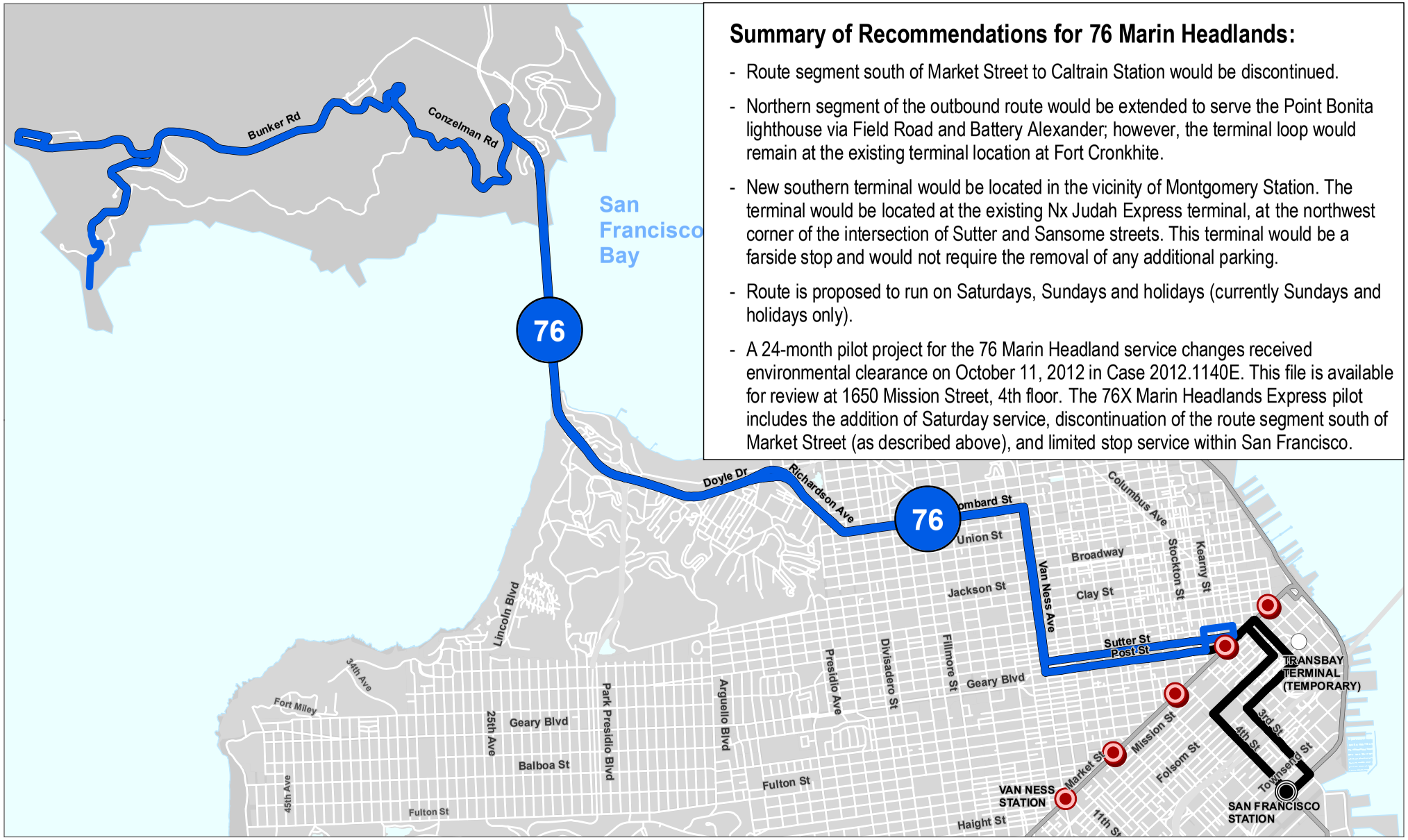
Legend

- Recommended Rapid Route
- Potential Route Variation
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles



Summary of Recommendations for 76 Marin Headlands:

- Route segment south of Market Street to Caltrain Station would be discontinued.
- Northern segment of the outbound route would be extended to serve the Point Bonita lighthouse via Field Road and Battery Alexander; however, the terminal loop would remain at the existing terminal location at Fort Cronkhite.
- New southern terminal would be located in the vicinity of Montgomery Station. The terminal would be located at the existing Nx Judah Express terminal, at the northwest corner of the intersection of Sutter and Sansome streets. This terminal would be a farside stop and would not require the removal of any additional parking.
- Route is proposed to run on Saturdays, Sundays and holidays (currently Sundays and holidays only).
- A 24-month pilot project for the 76 Marin Headland service changes received environmental clearance on October 11, 2012 in Case 2012.1140E. This file is available for review at 1650 Mission Street, 4th floor. The 76X Marin Headlands Express pilot includes the addition of Saturday service, discontinuation of the route segment south of Market Street (as described above), and limited stop service within San Francisco.

Line 76 - Marin Headlands
Recommended Route Alignment

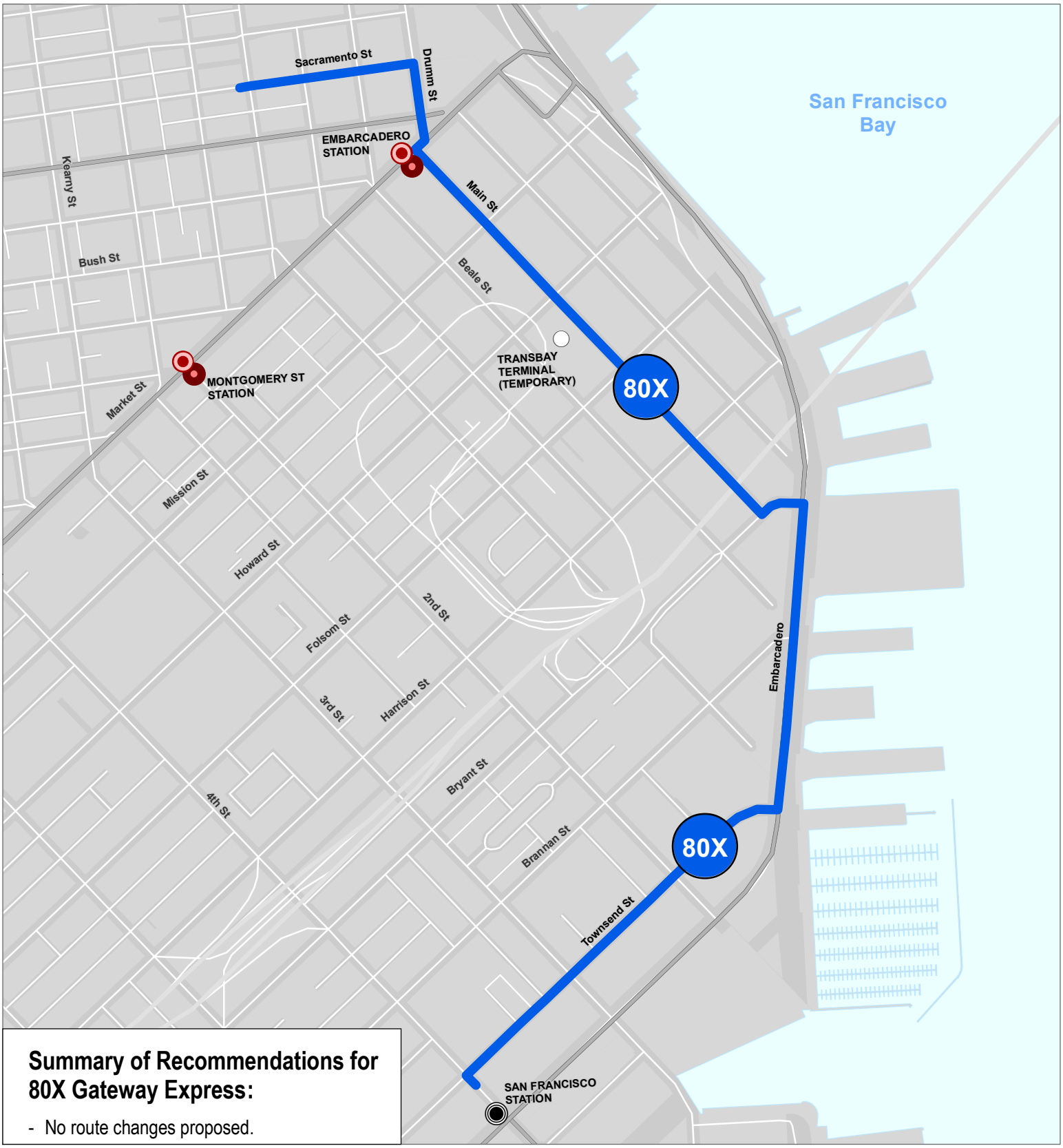
Legend

- Recommended Specialized Services Route
- Segment Proposed for Elimination
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
January 2013

0 0.5 1 Miles



Summary of Recommendations for 80X Gateway Express:

- No route changes proposed.

Line 80X - Gateway Express
Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Recommended Bus and Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.125 0.25 Miles

Summary of Recommendations for 81X Caltrain Express:

- No route changes proposed.

Line 81X - Caltrain Express
Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Express Segment (no stops)
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.125 0.25 Miles

Line 82X - Levi Plaza Express

Recommended Route Alignment

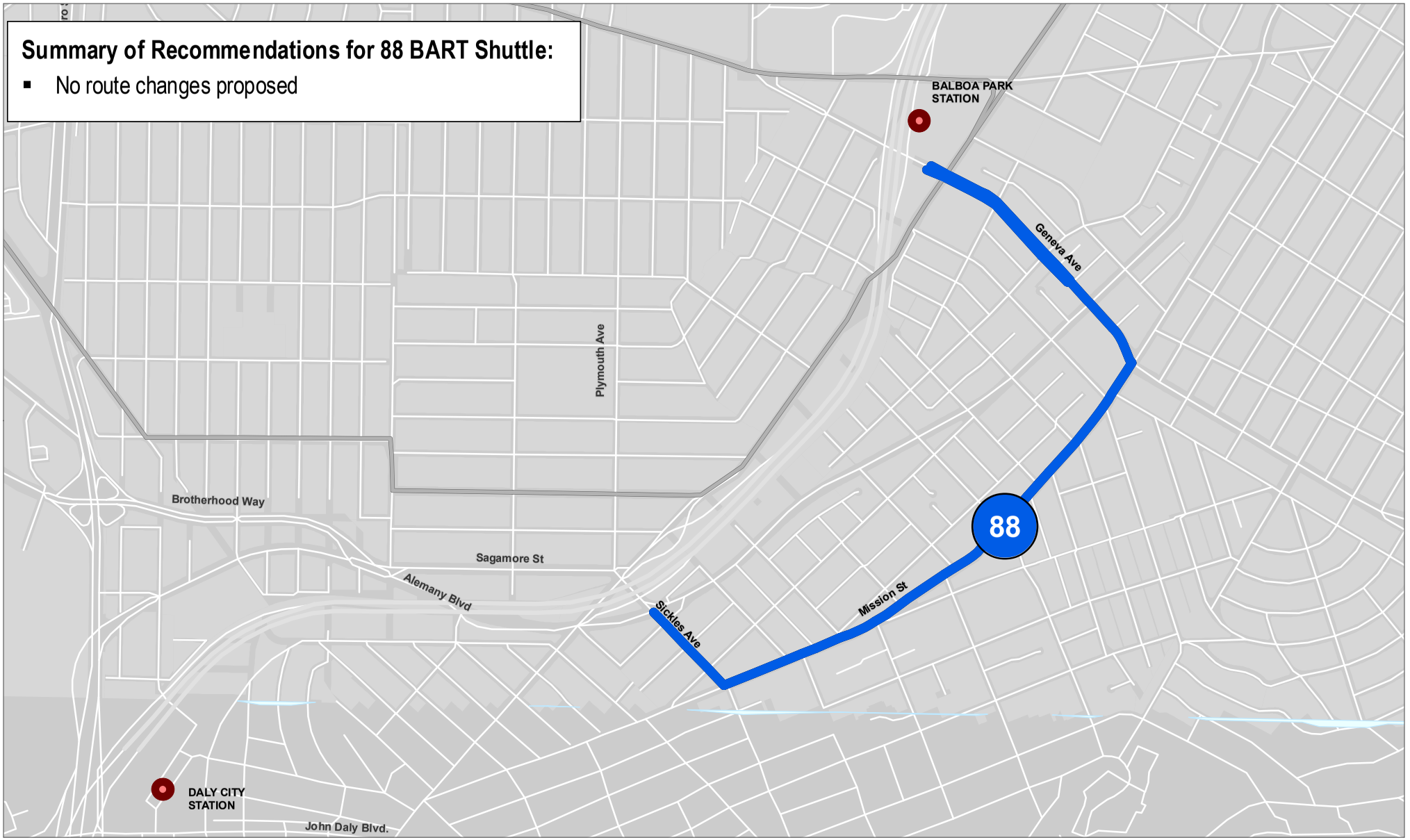
Legend

- Recommended Specialized Services Route
- Non-Stop Segment
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

0 0.125 0.25 Miles

SFMTA | Municipal Transportation Agency

Map Updated
December 2012



Line 88 - BART Shuttle

Recommended Route Alignment

Legend

- Recommended Specialized Services Route
- Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.125 0.25 Miles

Line 90 - Owl
Recommended Route Alignment

Legend

- Recommended Local Route
- Segment Proposed for Elimination
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 91A Owl (existing 91 Owl):

- In conjunction with 91B Owl, would replace the existing 91 Owl.
- Existing 91 Owl loop line would be split in two to improve reliability.
- Would operate from Mission Street/San Jose Avenue in Daly City to the Caltrain Station at Fourth and King streets via 19th Avenue, Lombard Street, Columbus Avenue, and Stockton and Fourth streets.
- Would connect with the 14 Owl, and also connect with SamTrans at the Daly City BART Station.
- Frequency of service would be the same as the existing 91 – every 30 minutes.
- The Daly City terminal loop would follow John Daly Boulevard, Mission Street, Flournoy Street, San Jose Avenue, to John Daly Boulevard.
- The Caltrain Station terminal loop would follow Fourth, Townsend, and Third streets.

Line 91A - Owl
Recommended Route Alignment

Legend

- Recommended Local Route
- Segment would be covered by another recommended route
- Segment Proposed for Elimination
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles

Summary of Recommendations for 91B Owl (existing 91 Owl):

- In conjunction with 91A Owl, would replace the 91 Owl.
- Existing 91 Owl loop line would be split in two to improve reliability.
- 91B would be through-routed with the N Owl (Fourth and Townsend streets to West Portal Station via Third Street, Geneva and Ocean avenues).
- Cargo Way segment would be eliminated.

Line 91B - Owl
Recommended Route Alignment

Legend

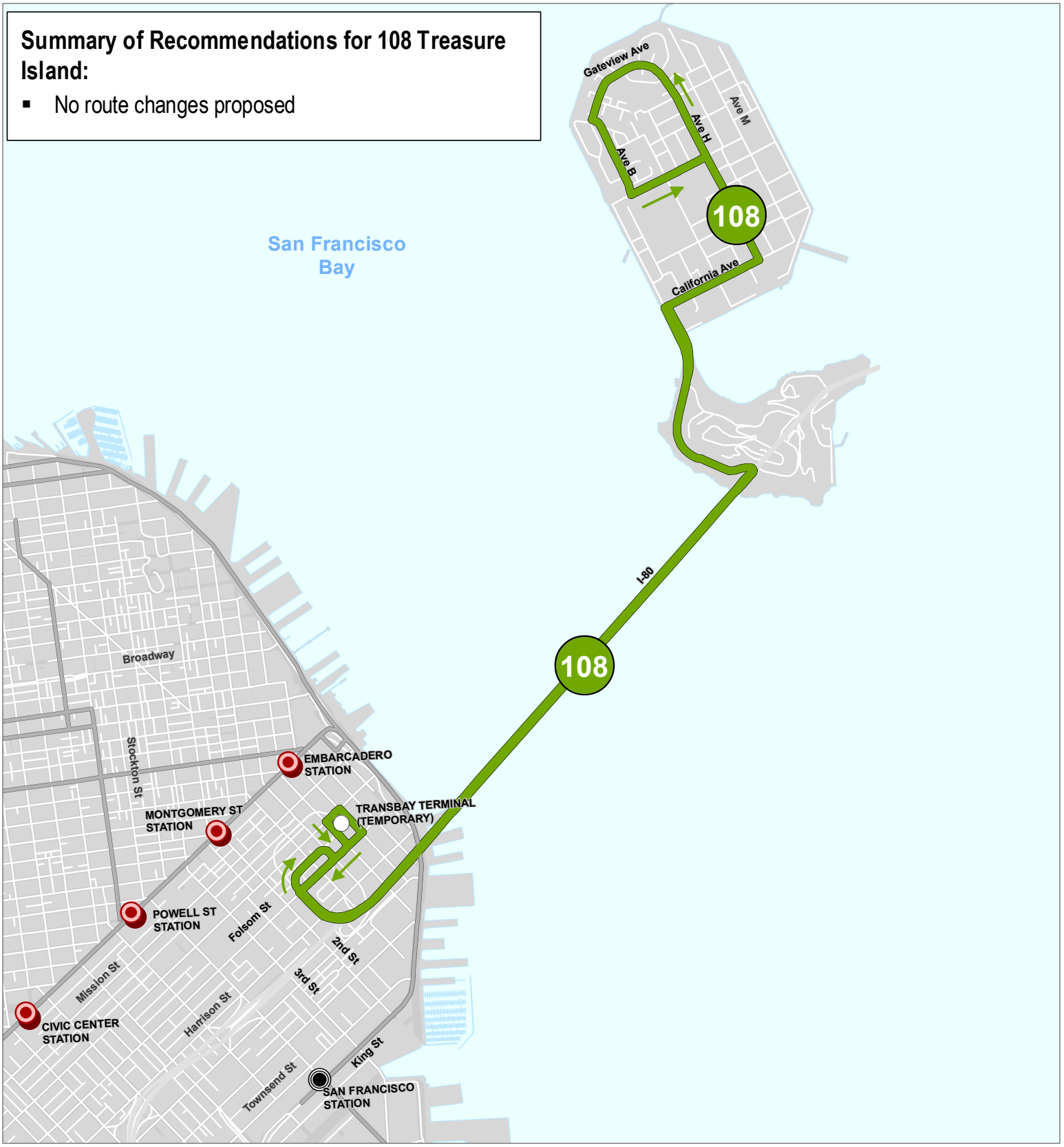
- Recommended Local Route
- Segment would be covered by another recommended route
- Recommended Owl Network
- Segment Proposed for Elimination

- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.5 1 Miles



Line 108 - Treasure Island
Recommended Route Alignment

Legend

- Recommended Local Route
- Recommended Bus and Rail Network
- Muni Metro Stations
- BART Stations
- Caltrain Stations

SFMTA | Municipal Transportation Agency

Map Updated
December 2012

0 0.25 0.5 Miles

APPENDIX B

HISTORIC RESOURCE EVALUATION RESPONSE

SAN FRANCISCO
PLANNING DEPARTMENT

MEMO

Historic Resource Evaluation Response

Case No.:	**2011.0558E**
Project Name:	**SFMTA Transit Effectiveness Project**
Project Address:	Various throughout the City
Date of Review:	January 7, 2013

Staff Contact: Debra Dwyer (Environmental Planner)
(415) 575-9031
debra.dwyer@sfgov.org

Richard Sucre (Preservation Planner)
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PART I: HISTORIC RESOURCE EVALUATION

Historic Architectural Context

To assist in establishing the setting of the historic architectural context, the following except provides a brief context and historical overview of the development of San Francisco, as noted in the 2007 Draft Preservation Element of the *San Francisco General Plan*:

> [In 1776] Spanish government established a military outpost, or *Presidio*, at the northern end of the peninsula near the mouth of the Golden Gate. At the same time, Catholic missionaries established the sixth in a chain of 21 California missions near what is now 16th Street and Dolores Street, today called Mission Dolores. Beginning in 1821 with Mexico's independence from Spain, the area became a territory of the Mexican government. By 1835 the civilian port settlement, the Pueblo of Yerba Buena, had been established in the area of California and Montgomery Streets, initially supported by the export of California hides and tallow and the import of goods from the eastern United States and Europe.
>
> In 1847, during the Mexican-American War that began the year before, the name Yerba Buena was officially changed to San Francisco. When the war ended and the United States officially assumed control of the territory in 1848, the population had reached about 400, including traders from the eastern United States and other countries. That soon changed, however, with the discovery of gold on the American River in the Sierra Nevada foothills that same year. [San Francisco's population boomed, and] by 1852 the population stood at approximately 34,776.

With an increasing population came new construction to support housing, commerce, and industry. [The port and related commercial structures developed in the area of today's Financial District and industrial activities established in the South of Market area. Residential areas developed along transportation corridors.] By the late 19th century, streetcar lines ran on nearly every major street, extending earlier housing patterns further westward.

At 5:12 a.m. on April 18th, 1906, a massive earthquake with a moment wave magnitude of approximately 7.9 struck San Francisco, and became one of the most significant events in the city's history. [Damage from the quake and resulting fires devastated the city.] For three days the fire blazed, and some 28,000 buildings that housed an estimated 250,000 people were destroyed…Rebuilding began immediately. New construction included both reconstruction on previously developed lots and expansion onto formerly vacant lots. New architectural styles emerged, both to address safety concerns more effectively and as a reflection of changing trends in design. In response to earlier fires, the use of brick and other fireproof construction materials had been required within specified commercial zones, and those zones were extended after 1906.

The building boom that began after the 1906 earthquake and fire continued nearly unabated through the 1920s. Much of the city had taken the physical shape that prevails today by the time of the Great Depression in the 1930s, during which new construction slowed dramatically. Despite the economic downturn, the Depression years provided the city with some of its finest public works projects [including the Bay Bridge, the Transbay Terminal, the Coit Tower, and numerous firehouses, libraries, police stations, and schools]. During the first half of the 1940s, World War II preempted all construction projects except work that supported military efforts.

Until the 20th century, architecture in San Francisco tended to utilize contemporary styles popular in the East, though on a somewhat delayed timeline. Greek Revival flourished in the 1850s and 1860s, Italianate in the 1870s, Stick Eastlake in the 1880s, Queen Anne in the 1890s, and Classical or Colonial Revival in the early 20th century. There were also a smaller number of homes built in the Gothic Revival, First Bay Area Tradition, and Craftsman styles. In the 1910s and 1920s, styles with origins in California were popularized, such as Mission, Spanish Colonial, and Mediterranean Revival. Art Deco was used beginning in the late 1920s, most often on commercial rather than residential buildings, as was the related Streamline Moderne style that emerged in the postwar era. International Modernism also appeared as early as the 1930s in San Francisco in the form of dramatic hillside residential buildings by architects such as Richard Neutra. The 1950s brought the concept of 'urban renewal' to San Francisco, resulting in the loss of many historic resources and a surge of new construction, often in the International style vernacular, in areas including Yerba Buena, the Western Addition, Golden Gateway, Diamond Heights, and parts of the Bayshore District. Brutalist styles and Postmodernism followed, and the Bay Area's Tech Boom of the late 1990s and early

> 2000s resulted in further development pressure and new construction in emerging 21st century styles. San Francisco's built environment today displays a tremendous variety of architectural periods and styles that reflect the city's layered historical development.[1]

Determination of Historic Architectural Resources

The Department concurs with the determination of historic architectural resources present within the Project Site, as prepared by the environmental consultant for the SFMTA Transit Effectiveness Project Draft Initial Study. This list of historic resources includes the following properties:

- Designated within Article 10 of the San Francisco Planning Code;[2]
- Designated within Article 11 of the San Francisco Planning Code;
- Listed in or determined eligible for the National Register of Historic Places;[3]
- Listed in or determined-eligible for the California Register of Historical Resources;[4] and,
- Other resources identified as individual historic resources, historic districts, historic landscapes and that have yet to be identified.[5]

Additional information on the historic context associated with the City and County of San Francisco is available within the "Cultural and Paleontological Resources" section of the Draft Initial Study for the Proposed Project.

CEQA HISTORIC RESOURCE DETERMINATION

☐ No Historic Resource Present

If there is no historic resource present, please have the Senior Preservation Planner review, sign, and process for the Environmental Planning Division.

☐ No Historic Resource Present, but is located within a California Register-eligible historic district

If there is a California Register-eligible historic district present, please fill out the *Notice of Additional Environmental Evaluation Review* and have the project sponsor file the **Part II: Project Evaluation** application fee directly to the Environmental Planning Division.

☒ Historic Resource Present

---

[1] The 2007 Draft Preservation Element of the *General Plan* has not been adopted as of writing of this report.
[2] Refer to Article 10 and Article 11 of the San Francisco Planning Code: http://www.amlegal.com/nxt/gateway.dll/California/planning/planningcode?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$sync=1
[3] Refer to National Park Service, National Register of Historic Places Database: http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome
[4] Refer to State of California, Office of Historic Preservation: http://ohp.parks.ca.gov/?page_id=1068
[5] For additional information on other historic resources, refer to San Francisco Planning Department, *Preservation Bulletin No. 16-CEQA and Historic Resources* (March 2008). The San Francisco Planning Department maintains information on the potential historic resource located within the City and County of San Francisco.

If a historic resource is present, please fill out the *Notice of Additional Environmental Evaluation Review* and have the project sponsor file the **Part II: Project Evaluation** application fee directly to the Environmental Planning Division.

PART I: SENIOR PRESERVATION PLANNER REVIEW

Signature: Tina Tam Date: 1-15-2013

Tina Tam, *Senior Preservation Planner*

PART II: PROJECT EVALUATION

PROPOSED PROJECT ☐ Demolition ☒ Alteration ☐ New Construction

PROJECT DESCRIPTION

The Proposed Project is described in detail within the Initial Study for the Transit Effectiveness Project. See A. Project Description. In short, the Project consists of the following:

> The project components being reviewed consist of the a transit Service Policy Framework, which establishes transit service delivery objectives and identifies actions that will be taken to fulfill these objectives throughout the City; and the TEP, a program comprised of the following distinct groups of proposals that are described in more detail in Section A.3 of this Chapter: a) Service Improvements reflecting a transit service plan for Muni; b) 12 Service-related Capital Improvement Proposals; and c) Transit Travel Time Reduction Proposals (TTRPs) for 17 Rapid Network Corridors. Details have been developed for the transit service plan referred to collectively as the Service Improvements, for seven of the Service-related Capital Improvement Proposals, and for eight of the TTRP corridors. For the remaining five Service-related Capital Improvement Proposals, the SFMTA has set forth conceptual designs. For the remaining nine TTRPs, the SFMTA has proposed a Transit Preferential Streets (TPS) Toolkit of traffic engineering changes that would reduce transit travel time. However, the locations where the specific TPS Toolkit elements would be implemented to improve Muni service along these nine TTRPs have not yet been identified.

This Historic Resource Evaluation Response is focused on Cultural and Paleontological Resources section of the Draft Initial Study. Specifically, the project evaluation is focused on impacts resulting from physical alterations to the physical environment. Within the overall project description, these elements include Transit Preferential Streets (TPS) Toolkit Elements, Service-Related Capital Improvements, and limited construction of curb ramps in some locations and roadway striping for the Service Improvements.

TPS Toolkit Elements are the physical improvements necessary to implement Travel Time Reduction Proposals (TTRPs) of the TEP. TPS Toolkit Elements in the Travel Time Reduction Proposals (TTRP) corridors could include alteration to or construction of at-grade improvements within existing public roadways, such as transit stop changes, lane modifications, parking and turn restrictions, traffic signal and stop sign changes, and pedestrian improvements. These physical improvements are described in detail in the Draft Initial Study within Section A.4.3.2 Description of TPS Toolkit Elements.

Service-Related Capital Improvements are physical improvements necessary to implement TEP Service Improvements, and fall within three categories:

- Transfer and Terminal Point Improvements (TTPI);
- Overhead Wire Expansion (OWE); and,
- Systemwide Capital Infrastructure (SCI).

These physical improvements are described in detail in the Draft Initial Study in Section A.3.3 Service-Related Capital Improvements.

Inasmuch as the Service Policy Framework and other components of the TEP (i.e., the Service Improvements, and TTRPs) may necessitate physical alteration of the physical environment, the physical alterations are embodied under the TEP as TPS Toolkit elements for the TTRPs, the Service Improvements, and the Service-related Capital Improvements.

PROJECT EVALUATION

Planning Department Preservation staff has reviewed the project description and concurs with the project evaluation provided by the environmental consultant and their associated subconsultants. Impacts upon archaeological resources are not addressed within this response.

Impact Summary
Provided below is a summary of the proposed project's impacts upon historic resources:

Impact-Historic Architectural Resources
The proposed project would not have a substantial adverse effect upon historic architectural resources, including: resources designated in Article 10 or Article 11 of the San Francisco Planning Code; resources listed in or determined eligible for the National Register of Historic Place; and, resources listed in or determined eligible for the California Register of Historical Resources. Staff has determined that this aspect of the proposed project will have a less than significant impact upon historic resources, as defined by CEQA.

To assist in the evaluation of impacts to historic architectural resources, the following provides a summary of the designated historic architectural resources located along TEP Corridors (Program-Level and Project-Level):

Table 8: Designated Historic Architectural Resources along TEP Corridors

Program-Level TEP Corridors	
TTRP.1	***Article 10 City Landmarks***
	Richard E. Queen House 2212 Sacramento
	Chambers Mansion 2220 Sacramento St.
	Health Sciences Library 2395 Sacramento St.
	Grace Cathedral 1051 Taylor St.
	Fairmont Hotel 950 Mason St.

Program-Level TEP Corridors	
	Chambord Apartments 1298 Sacramento St.
	Old Flood Mansion 1000 California Street
	Glazer Keating House 1110 Taylor Street
	Donaldina Cameron House 920 Sacramento St.
	Clay St. Center 940 Powell St. & 965 Clay St.
	U.S. Mint & Subtreasury Building 608 Commercial St.
	PG&E Old Station J 569 Commercial St.
	Federal Reserve Bank Building 400 Sansome St.
	Italian American Bank 460 Montgomery St
	Historic Districts
	Jackson Square (Article 10 and National Register)
	Chinatown (National Register)
	Commercial-Leidesdorff (Article 11 Conservation District)
	Front California (Article 11 Conservation District)
TTRP.9	***Article 10 City Landmarks***
	Jackson Brewery Co. Complex 1475-1489 Folsom St. & 301-333 11th St.
	Historic Districts
	None
TTRP.22_2	***Article 10 City Landmarks***
	2501 Fillmore St. 2501 Fillmore St.
	Market St. Railway Substation 1190 Fillmore St.
	Saint Francis Lutheran Church 152 Church St.
	Historic Districts
	Dogpatch (Article 10)
TTRP.28_2	***Article 10 City Landmarks***
	Shriners' Hospital for Crippled Children 1701 19th Ave.
	S.F. Conservatory of Music 19th Ave. & Ortega St

Program-Level TEP Corridors	
	Historic Districts
	Golden Gate Park (National Register)
TTRP.30_2	***Article 10 City Landmarks***
	Survey Marker Washington Square
	Ghirardelli Square Polk & Beach & Larkin & North Point St.
	Phelan Building 760-784 Market St.
	Historic Districts
	Fort Mason (National Register)
TTRP.71	***Article 10 City Landmarks***
	Richard Doolanin/ Norman Larson Residence 1500-1512 Haight St.
	San Francisco State Teacher's College 55 Laguna St.
	McMorry-Lagan Bldg 188-198 Haight St.
	Dietle Residence 294 Page St.
	Historic Districts
	Golden Gate Park (National Register)
TTRP.K	***Article 10 City Landmarks***
	S.F. & San Mateo Railroad Co. Office Bld. 2301 San Jose Ave.
	Historic Districts
	None
TTRP.L	***Article 10 City Landmarks***
	None
	Historic Districts
	None
TTRP.M	***Article 10 City Landmarks***
	S.F. & San Mateo Railroad Co. Office Bld. 2301 San Jose Ave.
	Historic Districts
	None
TTPI.2	***Article 10 City Landmarks***
	None
	Historic Districts
	The Presidio (National Register)
TTPI.3	***Article 10 City Landmarks***
	None

Program-Level TEP Corridors	
	Historic Districts
	None
TTPI.4	***Article 10 City Landmarks***
	None
	Historic Districts
	None
OWE.6	***Article 10 City Landmarks***
	None
	Historic Districts
	None

TTRP.5	***Article 10 City Landmarks***
	Hibernia Bank 1 Jones St.
	City Hall Dr. Carlton B. Goodlett Place
	War Memorial Building 401 Van Ness Avenue
	Historic Districts
	Alamo Square (Article 10t)
	Civic Center (Article 10 and National Register)
	Golden Gate Park (National Register)
TTRP.8X	***Article 10 City Landmarks***
	S.F. & San Mateo Railroad Co. Office Bld. 2301 San Jose Ave.
	Historic Districts
	None
TTRP.14	***Article 10 City Landmarks***
	The Old U.S. Mint 88 Fifth Street
	Saint Patrick's Cathedral 56 Mission St.
	Rincon Annex Post Office 101 Spear St. (at Mission & Howard & Steuart)
	Audiffred Building 1 - 21 Mission St.
	El Capitan Theater & Hotel 2353 Mission St.
	The New Mission Theater 2550 Mission St.

Project-Level TEP Corridors	
	Juvenile Court and Detention Center 150 Otis St.
	Historic Districts
	Second and Howard Streets (National Register)
TTRP.22_1	***Article 10 City Landmarks***
	2501 Fillmore St. 2501 Fillmore St.
	Market St. Railway Substation 1190 Fillmore St.
	Mission San Francisco De Asis 300 Dolores St.
	Saint Francis Lutheran Church 152 Church St.
	Brown's Opera House 2961 16th St.
	Historic Districts
	None
TTRP.28_1	***Article 10 City Landmarks***
	S.F. Gas Light Co. 3640 Buchanan St.
	Historic Districts
	The Presidio (National Register)
	Fort Mason (National Register)
TTRP.30_1	***Article 10 City Landmarks***
	Clay Street Center 940 Powell St. & 965 Clay St.
	Met Life Pacific Coast Head Office 600 Stockton St.
	Hammersmith Building 301-303 Sutter Street
	The Mechanics Institute 57-65 Post St.
	Chronicle Building 690 Market St.
	Historic Districts
	Apartment Hotel District (National Register)
	Kearny-Market-Mason-Sutter (Article 11 Conservation District)

Project-Level TEP Corridors	
TTRP.J	***Article 10 City Landmarks***
	Saint Francis Lutheran Church 152 Church St.
	Mission High School 3750 18th Street
	S.F. & San Mateo Railroad Co. Office Bld. 2301 San Jose Ave.
	Historic Districts
	Dolores Park (National Register)
TTRP.N	***Article 10 City Landmarks***
	None
	Historic Districts
	None
TTPI.1	***Article 10 City Landmarks***
	None
	Historic Districts
	None
OWE.1	***Article 10 City Landmarks***
	None
	Historic Districts
	None
OWE.2	***Article 10 City Landmarks***
	None
	Historic Districts
	The Presidio (National Register)
OWE.3	***Article 10 City Landmarks***
	None
	Historic Districts
	Golden Gate Park (National Register)
OWE.4	***Article 10 City Landmarks***
	Hibernia Bank 1 Jones St.
	City Hall Dr. Carlton B. Goodlett Place
	War Memorial Building 401 Van Ness Avenue
	Historic Districts
	Alamo Square (Article 10t)
	Civic Center (Article 10 and National Register)
	Golden Gate Park (National Register)
OWE.5	***Article 10 City Landmarks***
	None

Project-Level TEP Corridors	
	Historic Districts
	None
SCI.2	***Article 10 City Landmarks***
	None
	Historic Districts
	Jackson Square (Article 10 and National Register)

As noted within the Initial Study, both program-level and project-level components of TPS Toolkit Elements and Service-Related Capital Improvements would not result in the construction of any new structures that could have a substantial adverse effect on the visual setting of designated or eligible historic districts, including the Civic Center Historic District, Alamo Square Historic District, or Golden Gate Park Historic District. Physical alterations under program-level and project-level components of the TEP (such as, overhead wires, transit stop changes, lane modifications, parking and turn restrictions, traffic signal and stop sign changes, and pedestrian improvements) would not obscure views of historic architectural resources and would not be prominent features in the overall visual setting of historic architectural resources, where discernible at all. Both program-level and project-level components of TPS Toolkit Elements and Service-Related Capital Improvements would be visually unobtrusive and would not draw undue attention to themselves and away from character-defining features of historic architectural resources. Both program-level and project-level components of TPS Toolkit Elements and Service-Related Capital Improvements would be simple and utilitarian in design and would be visually differentiated from historic construction as to not create a false sense of historical development. Such alterations would also be reversible and could be readily removed in the future.

For the TPS Toolkit Elements and Service-Related Capital Improvements, the physical alterations would primarily occur within existing public roadways and facilities yards. Overhead wires would not be attached to any buildings under the proposed TEP, but would be affixed to existing or newly placed poles. No distinctive or historically significant street paving material is known to exist within any TTRP corridors or within the sites of Service-Related Capital Improvement Projects. Likewise, no historically significant street features (such as the Path of Gold Light Standards along Market Street [City Landmark # 200]) and landmark street trees (such as the palm trees within the Dolores Street median) are located within any TTRP corridors or within the sites of Service-Related Capital Improvement Projects under the proposed TEP.

As an example of the proposed work, a new boarding platform (measuring approximately 8-ft wide by 160-ft long) would be constructed on Church Street along the western edge of Dolores Park adjacent to 18th Street, as part of the TTRP.J. The construction of this boarding platform would result in a less than significant impact, since this area was once used for transit uses and would not impact any character-defining features of the Dolores Park. Additional analysis on this aspect of the project is provided within the environmental review for the proposed project at Dolores Park. Relative to the TTRP.J, this aspect of the project does not impact the overall historic character of Dolores Park, nor its eligibility for listing in the National Register of Historic Places.

Construction of program-level and project-level components of the TPS Toolkit Elements within TTRP Corridors and the Service-related Capital Improvement Projects would require various construction activities in the vicinity of historic architectural resources (e.g., asphalt and concrete removal, jack-hammering, excavation, compacting, paving, and construction equipment movements). However, these construction activities are commonplace in an urban environment and, with exercise of ordinary precautions, present no particular threat to historic architectural resources in the vicinity of such work resulting from vibration or collision. Additionally, no particularly fragile historic architectural resources have been identified within or adjacent to program-level and project-level components of the TPS Toolkit Elements within TTRP Corridors and the Service-related Capital Improvement Projects under the TEP.

PART II: SENIOR PRESERVATION PLANNER REVIEW

Signature: _____ Date: 1-15-2013

Tina Tam, *Senior Preservation Planner*

cc: Debra Dwyer / Environmental Planning Division
Heidi Kline / Environmental Planning Division
Beth Skrondal / Historic Resource Survey Team
I:\Cases\2011\2011.0558

RS: G:\Documents\Environmental\2011.0558E SFMTA Transit Effectiveness Plan EIR\HRER_TEP_2013-01-07.doc

APPENDIX 3
LIST OF STREETS FROM WHICH MUNI SERVICE WOULD BE ELIMINATED

Streets from which Muni Service would be Eliminated

Previous Muni Route(s)	Street Name	Cross Streets
3	Jackson Street	Presidio Boulevard to Divisidero Street
6	Masonic Avenue	Waller Street to Frederick Street
6	Frederick Street	Clayton Street to Masonic Avenue
6	Parnassus Avenue	Clayton Street to Cole Street
8X, 8BX	Bay Street	Powell Street to Kearney Street
8X, 8BX	Kearney Street	Bay Street to North Point
10	Washington Street	Sansome Street to Battery Street
12	Harrison Street	Second Street to Fourth Street
17	Arballo Drive	Font Boulevard and Garces Drive
17	Garces Drive	Arballo Drive to Gonzales Drive
17	Gonzales Drive	Garces Drive to Font Boulevard
17	Cambon Drive	Font Boulevard to Cardenas Avenue
17	Cardenas Drive	Cambon Drive to Gonzales Drive
17	Gonzales Drive	Gardenas Drive to Crespi Drive
18	Lake Merced Boulevard	Font Boulevard to John Muir Drive
19	Larkin Street	Geary Bouelvard to Eddy Street
19	Larkin Street	Turk Street to Market Street
19	Hyde Street	Eddy Street to McAlister Street
19	Conneticut Street	Wisconsin Street to 25th Street
22	Kansas Street	16th Street to 17th Street
22	17th Street	Kansas Street to Conneticut Street
23	Toland Avenue	Oakdale Avenue to Jerrold Avenue
23	Jerrold Avenue	Toland Avenue to Phelps Street
23	Phelps Street	Jerrold Avenue to Palou Avenue
27	Washington Street	Hyde Street to Van Ness Avenue
27	Bryant Street	11th Street to Cesar Chavez Street
27	Cesar Chavez Street	Bryant Street to Folsom Street
27	26th Street	Valencia Street to South Van Ness Avenue
29	Fitzgerald Avenue	Third Street and Hawes Street
29	Hawes Street	Fitzgerald Avenue to Gilman Avenue
33	18th Street	Valencia Street to Mission Street
35	Eureka Street	21st Street to 23rd Street
35	23rd Street	Eureka Street to Diamond Street
35	Diamond Street	23rd Street to 24th Street
35	Addison Street	Diamond Heights Boulevard to Bemis Street
35	Bemis Street	Addison Street to Moffitt Street
35	Moffitt Street	Bemis Street to Farnum Street
35	Farnum Street	Moffit Street to Addison Street
36	Lawton Street	6th Avenue to 7th Avenue
36	Warren Drive	6th Avenue to Oak Park Drive
36	Oak Park Drive	Warren Drive to Clarendon Avenue
36	Clarendon Avenue	Oak Park Drive to Panorama Drive

Previous Muni Route(s)	Street Name	Cross Streets
37	Waller Street	Ashbury Street to Masonic Street
37	Cole Street	17th Street to Carmel Street
37	Carmel Street	Cole Street to Clayton Street
37	15th Street	Market Street to Church Street
43	Letterman Drive	Lincoln / Presidio to Lombard Street
43	Lombard Street	Letterman Drive to Richardson Avenue
43	Webster Street	Lombard Street and Chestnut Street
47	Mason Street	Beach Street to North Point Street
48	Grandview Avenue	Hoffman Street to Clipper Street
48	24th Street	Fountain Street to Hoffman Street
48	Hoffman Street	24th Street to Fountain Street
48	25th Street	Hoffman Street to Fountain Street
48	Fountain Street	25th Street to 24th Street
52	Brazil Avenue	Mission Street to La Grande Avenue
52	La Grande Avenue	Brazil Avenue to Persia Avenue
52	Prague Street	Brazil Avenue to Persia Avenue
54	Howth Street	Geneva Avenue to Mount Vernon Avenue
54	Louisburg Street	Geneva Avenue to Mount Vernon Avenue
54	Grafton Avenue	Plymouth Avenue to Williar Avenue
54	Mount Vernon Avenue	Williar Avenue to Louisburg Street
54	Prague Street	Persia Avenue to Russia Avenue
54	Russia Avenue	Naples Street to Prague Avenue
54	Moscow Street	Russia Avenue to Geneva Avenue
54	Revere Avenue	Third Street to Ingalls Street
54	Cashmere Street	Hudson Avenue to La Salle Avenue
54	La Salle Avenue	Cashmere Street to Ingalls Street
54	University Street	Bacon Street to Woolsey Street
54	Woolsey Street	University Street to Holyoke Street
54	Holyoke Street	Woolsey Street to Bacon Street
56	Vistacion Avenue	Hahn Street to Mansell Street
56	Sawyer Street	Leland Avenue to Vistacion Avenue
56	Sunnydale Avenue	Schwern Street to Hahn Street
56	Rutland Street	Sunnydale Avenue to Leland Avenue
56	Wilde Street	Delta Street to Rutland Street
56	Delta Street	Wilde Avenue to Tioga Avenue
56	Tioga Avenue	Delta Street to Rutland Street
56	Blanken Ave	Bayshore Boulevard to Executive Park Boulevard
56	Executive Park Boulevard	Alana Way to Thomas Mellon Circle
56	Thomas Mellon Circle	Executive Park Boulevard to Alana Way
56	Alana Way	Executive Park Boulevard to Thomas Mellon Circle
10, 12	Broadway	Sansome Street to Battery Street
10, 12,27	Jackson Street	Leavenworth Street and Van Ness Avenue
16X/ 71L Variants	23rd Avenue	Lincoln Way to Noriega Street
27, 47	Bryant Street	7th Street to 11th Street
6, 37	Masonic Avenue	Haight Street to Waller Street

APPENDIX 4
BACKUP DOCUMENTS FOR NOISE ANALYSIS

BASELINE ENVIRONMENTAL CONSULTING

MEMORANDUM

Date: 8 April 2013 **Job No.:** 11209-00.7.a.3

To: Debra Dwyer, EIR Coordinator, San Francisco Planning Department

From: James McCarty, P.E., BASELINE Environmental Consulting

Through: Barbara Sahm, Turnstone Consulting

Subject: Supporting Material and Calculations for Noise and Vibration Analysis - Transit Effectiveness Project

Accompanying this memorandum are the supporting data and reference materials used to in the evaluation of the operational noise and vibration impacts for the Transit Effectiveness Project (TEP). The supporting documentation consists of the following documents:

- Minimum headway spreadsheet from SFMTA's SPASM model dated October 2012 [SPASM 2.3.0d—TEP TTRP Expanded-TSP-base –Adjusted Frequencies Oct 2012].
- Weekday Service Parameters from SPASM Model with headway and volume calculations.
- FTA input and the FTA Assessement spreadsheets for the following Muni motor coach and trolley coach route segments:
    - 22nd Street (Noriega Street to Lincoln Way);
    - Lincoln Boulevard (Graham Street to Letterman Drive);
    - Utah Street (23rd Street to 24th Street);
    - 14th Avenue (Quintara Street to Santiago Street);
    - 16th Street (Valencia Street to Potrero Avenue);
    - 16th Street (Irwin Street to Connecticut Street); and
    - 23rd Street (Utah Street to Kansas Street).

For the rail segments, supporting documentation consists of the following:

- Weekday Service Parameters from SPASM Model with headway calculations, referenced above.
- Calculation of an energy equivalent average Sound Exposure Level (SEL) for the historic streetcars based on the F-Line Extension EIS.[1]

[1] URS, Environmental Impact Statement for the Extension Of Historic Streetcar Service From Fisherman's Wharf To The San Francisco Maritime National Historical Park And Golden Gate National Recreation Area's Fort Mason Center, Appendix F, January 22, 2009. Available at website: http://parkplanning.nps.gov/document.cfm?parkID=303&projectID=15547&documentID=45807

- E-, T-, and N-Lines – (Market Street to King Street):
    - FTA input spreadsheet;
    - FTA Assessment spreadsheet for the light rail vehicles; and
    - Calculation of noise from historic streetcars spreadsheet (E Line), using FTA methodology and equations.
- E- and F-Lines (Jefferson, Jones, Beach Streets Loop)
    - FTA input spreadsheet;
    - Calculation of noise from historic streetcars spreadsheet using FTA methodology and equations; and
    - Noise Dissipation Calculations.

In addition, the copies of the relevant portions of the Federal Transit Administration's guidance manual: *Transit Noise and Vibration Impact Assessment*, dated May 2006 are provided. These include:

Page 5-5, Reference SEL's at 50 feet from Track and 50 miles per hour;

Page 5-6, Computation of Noise Exposure at 50 feet for Fixed-Guideway General Assessment;

Page 5-8, Reference SEL's at 50 feet and 50 miles per hour for Highway/Transit Assessment and Computation of Noise Exposure at 50 feet for Highway/Transit Assessment;

Pages 6-21 and 6-22, Noise Exposure vs. Distance Equations; and

Page 8-5, reference cited that states "approximately doubling the number of event is required for a significant increase" in vibration impact from rail corridors with more than 12 trains per day.

Please note that the TEP proposed headways for the 10 Sansome, east of Van Ness, have been adjusted from those shown in the SPASM model based on information provided by SFMTA and confirmed by Heidi Kline of San Francisco Environmental Planning.

v2.3.0d (Apr 2012)

THIS SCENARIO: **TEP with TTRP Expanded and TSP: Rev Oct 2012**

BASE DATA: Oct 2011 signup--base model (WEEKDAY)

MINIMUM HEADWAYS

Route	Vehicle Type		Period 1: 5:00 AM to: 7:00 AM		Period 2: 7:00 AM to: 9:00 AM		Period 3: 9:00 AM to: 2:00 PM		Period 4: 2:00 PM to: 4:00 PM		Period 5: 4:00 PM to: 6:00 PM		Period 6: 6:00 PM to: 7:00 PM		Period 7: 7:00 PM to: 10:00 PM		Period 8: 10:00 PM to: 1:00 AM		Period 9: 1:00 AM to: 5:00 AM	
	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data
1	T Std	T Std	10.0	10.0	7.0	7.0	5.0	5.0	5.0	5.0	6.0	7.0	7.0	8.0	12.0	12.0	20.0	20.0	0.0	0.0
1 Short	T Std	T Std	0.0	0.0	7.0	7.0	0.0	0.0	0.0	0.0	6.0	7.0	7.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0
1AX	M Std	M Std	0.0	0.0	9.0	9.0	0.0	0.0	0.0	0.0	13.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1BX	M Artic	M Artic	0.0	0.0	7.0	7.0	0.0	0.0	0.0	0.0	12.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	M Std	M Std	20.0	20.0	10.0	12.0	20.0	20.0	20.0	15.0	10.0	12.0	12.0	12.0	20.0	0.0	0.0	0.0	0.0	0.0
2 Short	T Std		20.0		10.0		20.0		20.0		10.0		12.0		20.0		20.0		0.0	
3	0	T Std	0.0	12.0	0.0	12.0	0.0	20.0	0.0	12.0	0.0	12.0	0.0	12.0	0.0	20.0	0.0	30.0	0.0	0.0
5	0	T Std	0.0	10.0	0.0	6.0	0.0	8.0	0.0	8.0	0.0	9.0	0.0	6.0	0.0	15.0	0.0	20.0	0.0	30.0
5 Short	T Artic	T Std	0.0	0.0	7.5	9.0	10.0	0.0	10.0	10.0	7.5	9.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5, 5L	T Artic		10.0		7.5		10.0		10.0		8.0		9.0		12.0		20.0		30.0	
6	T Std	T Std	12.0	12.0	10.0	10.0	12.0	12.0	12.0	12.0	10.0	10.0	12.0	12.0	20.0	20.0	20.0	30.0	0.0	0.0
8X, 8BX	M Artic	M Artic	8.5	8.5	7.5	7.5	8.0	9.0	7.5	8.0	7.5	7.5	7.5	7.5	12.0	12.0	15.0	15.0	0.0	0.0
8AX	M Artic	M Artic	7.5	8.0	7.5	8.0	0.0	0.0	7.5	7.5	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	M Std	M Std	15.0	15.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	15.0	15.0	20.0	20.0	0.0	0.0
9L	M Std	M Std	12.0	12.0	10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	M Std	M Std	12.0	20.0	12.0	20.0	10.0	20.0	8.0	20.0	12.0	20.0	8.0	20.0	20.0	20.0	20.0	0.0	0.0	0.0
10 Short	M Std		0.0		12.0		0.0		0.0		12.0		0.0		0.0		0.0		0.0	
11	M Std		15.0		12.0		12.0		12.0		12.0		12.0		15.0		20.0		0.0	
12	M Std	M Std	0.0	20.0	0.0	20.0	0.0	20.0	0.0	20.0	0.0	20.0	0.0	20.0	0.0	20.0	0.0	20.0	0.0	0.0
14	M Artic	T Artic	10.0	10.0	15.0	15.0	9.0	9.0	8.5	8.5	15.0	15.0	15.0	15.0	10.0	12.0	12.0	12.0	30.0	30.0
14 Short	M Artic	T Artic	10.0	10.0	15.0	15.0	0.0	0.0	0.0	0.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
14L	T Artic	M Artic	7.5	9.0	7.5	9.0	9.0	9.0	9.0	9.0	7.5	9.0	10.0	10.0	15.0	0.0	0.0	0.0	0.0	0.0
14X	M Artic	M Artic	7.5	8.0	7.5	8.0	0.0	0.0	0.0	0.0	7.5	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16X	M Std	M Std	0.0	0.0	9.0	9.0	0.0	0.0	0.0	0.0	9.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	M Small	M Small	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	15.0	30.0	15.0	30.0	20.0	30.0	30.0	30.0	0.0	0.0
18	M Std	M Std	30.0	30.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	0.0	0.0
19	M Std	M Std	20.0	20.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	20.0	20.0	30.0	30.0	0.0	0.0
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	T Std	T Std	12.0	12.0	8.0	9.0	12.0	12.0	10.0	10.0	9.0	10.0	12.0	12.0	20.0	20.0	30.0	30.0	0.0	0.0
22	T Std	T Std	10.0	10.0	6.0	9.0	7.5	10.0	7.5	8.0	5.5	8.0	8.0	8.0	15.0	15.0	15.0	15.0	30.0	30.0
23	M Std	M Std	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	0.0	0.0
24	T Std	T Std	12.0	12.0	9.0	10.0	10.0	10.0	10.0	10.0	9.0	10.0	10.0	10.0	15.0	15.0	20.0	20.0	30.0	30.0
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	M Std	M Std	20.0	20.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	20.0	20.0	30.0	30.0	0.0	0.0
28	M Std	M Std	10.0	10.0	9.0	10.0	9.0	12.0	9.0	10.0	9.0	10.0	10.0	12.0	15.0	20.0	20.0	20.0	0.0	0.0
28L	M Std	M Std	10.0	0.0	9.0	12.0	9.0	0.0	9.0	10.0	9.0	12.0	10.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
29	M Std	M Std	10.0	10.0	9.0	10.0	15.0	15.0	9.0	9.0	10.0	10.0	10.0	10.0	15.0	15.0	20.0	20.0	0.0	0.0
30	T Artic	T Std	10.0	10.0	7.0	7.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	15.0	20.0	0.0	0.0
30 Short	T Artic	T Artic	0.0	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
30X		M Std	0.0	20.0	0.0	4.0	0.0	0.0	0.0	7.5	0.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30X (AM)	M Artic		20.0		5.5		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
30X (PM)	M Std		0.0		0.0		0.0		7.0		7.0		0.0		0.0		0.0		0.0	
31	T Std	T Std	12.0	12.0	12.0	12.0	15.0	15.0	15.0	15.0	12.0	14.0	12.0	14.0	20.0	20.0	20.0	20.0	0.0	0.0
31AX	M Std	M Std	0.0	0.0	12.0	12.0	0.0	0.0	0.0	0.0	11.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31BX	M Std	M Std	0.0	0.0	10.0	10.0	0.0	0.0	0.0	0.0	12.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	Van		20.0		20.0		20.0		20.0		20.0		20.0		30.0		0.0		0.0	
33	T Std	T Std	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	20.0	20.0	20.0	30.0	0.0	0.0
35	Van	M Small	0.0	0.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	0.0	0.0
36	Van	M Small	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	30.0	30.0	0.0	0.0
37	M Small	M Small	15.0	15.0	15.0	15.0	20.0	20.0	20.0	20.0	15.0	20.0	20.0	30.0	20.0	30.0	0.0	0.0	0.0	0.0
38	M Artic	M Artic	9.0	9.0	15.0	12.0	15.0	16.0	15.0	16.0	12.0	16.0	12.0	15.0	10.0	10.0	10.0	10.0	30.0	30.0
38 Short	M Artic	M Artic	12.0	12.0	15.0	12.0	15.0	16.0	13.3	13.3	12.0	12.0	12.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
38AX	M Std	M Std	0.0	0.0	11.0	11.0	0.0	0.0	0.0	0.0	9.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38BX	M Std	M Std	0.0	0.0	11.0	11.0	0.0	0.0	0.0	0.0	10.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38L	M Artic	M Artic	7.0	7.0	5.0	5.5	5.0	5.5	5.0	5.5	5.0	5.5	6.0	7.0	10.0	10.0	0.0	0.0	0.0	0.0
39	M Small	M Small	0.0	0.0	0.0	0.0	20.0	20.0	20.0	20.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41 (AM)	T Artic	T Artic	30.0	30.0	7.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41 (PM)	T Std	T Std	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	8.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
43	M Std	M Std	20.0	15.0	8.0	10.0	12.0	12.0	12.0	12.0	10.0	12.0	12.0	15.0	20.0	20.0	30.0	30.0	0.0	0.0
44	M Std	M Std	12.0	12.0	7.5	8.0	12.0	12.0	9.0	10.0	8.0	9.0	10.0	12.0	20.0	20.0	20.0	20.0	0.0	0.0
45	T Std	T Std	10.0	10.0	7.0	7.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	15.0	15.0	20.0	0.0	0.0
47	M Std	M Std	10.0	10.0	7.5	10.0	9.0	9.0	9.0	10.0	7.5	10.0	8.0	10.0	15.0	15.0	20.0	20.0	0.0	0.0
48	M Std	M Std	15.0	14.0	15.0	10.0	15.0	15.0	15.0	12.0	15.0	12.0	15.0	16.0	20.0	20.0	20.0	30.0	0.0	0.0
49	0	T Artic	0.0	15.0	0.0	8.0	0.0	9.0	0.0	9.0	0.0	8.0	0.0	8.0	0.0	12.0	0.0	20.0	0.0	0.0
49L	T Artic		10.0		7.5		9.0		9.0		7.5		8.0		15.0		20.0		0.0	
52	M Small	M Small	30.0	30.0	20.0	20.0	20.0	30.0	20.0	30.0	20.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0
54	M Std	M Std	20.0	20.0	15.0	20.0	20.0	20.0	20.0	20.0	15.0	20.0	20.0	20.0	20.0	30.0	20.0	30.0	0.0	0.0
56	Van	M Small	0.0	0.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	0.0	0.0	0.0	0.0
58	M Std		15.0		15.0		15.0		15.0		15.0		15.0		20.0		0.0		0.0	
66	Van	M Small	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	0.0	0.0
67	M Small	M Small	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0
71, 71L	M Std	M Std	12.0	12.0	9.0	10.0	10.0	12.0	10.0	12.0	9.0	10.0	10.0	12.0	20.0	20.0	20.0	30.0	0.0	0.0
76	M Std	M Std	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80X	M Std	M Std	0.0	0.0	0.0	120.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81X	M Std	M Std	0.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82X	M Std	M Std	0.0	0.0	10.0	10.0	0.0	0.0	0.0	0.0	15.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88	M Std	M Std	10.0	20.0	10.0	20.0	0.0	0.0	0.0	0.0	10.0	20.0	10.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0
90	M Std	M Std	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	30.0

Route	Vehicle Type		MINIMUM HEADWAYS																	
			Period 1: to:	5:00 AM 7:00 AM	Period 2: to:	7:00 AM 9:00 AM	Period 3: to:	9:00 AM 2:00 PM	Period 4: to:	2:00 PM 4:00 PM	Period 5: to:	4:00 PM 6:00 PM	Period 6: to:	6:00 PM 7:00 PM	Period 7: to:	7:00 PM 10:00 PM	Period 8: to:	10:00 PM 1:00 AM	Period 9: to:	1:00 AM 5:00 AM
	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data	Proposed	Base Data
91	M Std	M Std	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	30.0
94L (L Owl)	M Std	M Std	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	30.0
94N (N Owl)	M Std	M Std	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	30.0
108	M Std	M Std	12.0	12.0	10.0	10.0	20.0	20.0	15.0	15.0	15.0	15.0	15.0	15.0	20.0	20.0	30.0	45.0	0.0	0.0
	0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	Streetcar		0.0		15.0		15.0		15.0		15.0		15.0		15.0		0.0		0.0	
F	Streetcar	Streetcar	10.0	10.0	7.5	6.7	6.0	5.0	6.0	5.0	5.0	5.0	6.0	5.0	10.0	8.0	15.0	14.0	0.0	0.0
J	LRV1	LRV1	8.5	8.5	8.0	9.0	10.0	10.0	6.7	6.7	9.0	9.0	9.0	9.0	9.2	9.2	20.0	20.0	0.0	0.0
KT	LRV1	LRV1	10.0	10.0	8.5	9.0	10.0	10.0	9.2	9.2	8.5	9.0	10.0	10.0	15.0	15.0	20.0	20.0	0.0	0.0
L	LRV2	LRV2	10.9	10.9	7.5	8.0	10.0	10.0	9.2	9.2	7.5	7.5	7.5	7.5	11.3	11.3	20.0	20.0	0.0	0.0
M	LRV2	LRV2	15.0	15.0	8.5	9.0	10.0	10.0	9.2	9.2	8.5	9.2	8.6	8.6	15.0	15.0	20.0	20.0	0.0	0.0
N	LRV2	LRV2	8.6	8.6	5.5	7.0	10.0	10.0	8.0	8.0	6.0	7.0	7.0	7.0	10.0	10.0	15.0	15.0	0.0	0.0
NX	M Std	M Std	10.0	10.0	10.0	10.0	0.0	0.0	0.0	0.0	10.0	10.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
Cable Car	Cable Car	Cable Car	#REF!		#REF!		#REF!		#REF!		#REF!		#REF!		#REF!		#REF!		#REF!	

Weekday Service Parameters from SPASM Model

TIME PERIODS			OUTBOUND				INBOUND												
Start Time	End Time	Period Length (hours)	TEP Headway (min)	Base Headway (min)	TEP Trips (per period)	Base Trips (per period)	TEP Headway (min)	Base Headway (min)	TEP Trips (per period)	Base Trips (per period)	TEP Total One-Way Trips (per period)	Base Total One-way trips (per period)	Delta One-way trips (per period)	Average TEP Day and Night Trips (veh/hr)	Delta TEP-Base Day and Night Trips (veh/hr)	Hrly Increase TEP Route (veh/hr)	Delta Hrly Increase TEP-Base Route (veh/hr)	Total Tep Trips per Day (veh/dy)	Total Base Trips per Day (veh/dy)	Delta Trips per Day (veh/dy)
Route 6																				
7:00 AM	9:00 AM	2:00	10.0	10.0	12.0	12.0	10.0	10.0	12.0	12.0	24.0	24.0	0.0			12.0	0.0			
9:00 AM	2:00 PM	5:00	12.0	12.0	25.0	25.0	12.0	12.0	25.0	25.0	50.0	50.0	0.0			10.0	0.0			
2:00 PM	4:00 PM	2:00	12.0	12.0	10.0	10.0	12.0	12.0	10.0	10.0	20.0	20.0	0.0			10.0	0.0			
4:00 PM	6:00 PM	2:00	10.0	10.0	12.0	12.0	10.0	10.0	12.0	12.0	24.0	24.0	0.0			12.0	0.0			
6:00 PM	7:00 PM	1:00	12.0	12.0	5.0	5.0	12.0	12.0	5.0	5.0	10.0	10.0	0.0			10.0	0.0			
7:00 PM	10:00 PM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
Average Daytime		15 Hours								Total Trips:	146.0	146.0	0.0	9.7	0.0					
10:00 PM	1:00 AM	3:00	20.0	30.0	9.0	6.0	20.0	30.0	9.0	6.0	18.0	12.0	6.0			6.0	2.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	12.0	12.0	10.0	10.0	12.0	12.0	10.0	10.0	20.0	20.0	0.0			10.0	0.0			
Average Nighttime		9 Hours								Total Trips:	38.0	32.0	6.0	4.2	0.7	12	2.0	184	178	6
Route 10																				
7:00 AM	9:00 AM	2:00	6.0 *	20.0	20.0	6.0	6.0 *	20.0	20.0	6.0	40.0	12.0	28.0			20.0	14.0			
9:00 AM	2:00 PM	5:00	10.0	20.0	30.0	15.0	10.0	20.0	30.0	15.0	60.0	30.0	30.0			12.0	6.0			
2:00 PM	4:00 PM	2:00	8.0	20.0	15.0	6.0	8.0	20.0	15.0	6.0	30.0	12.0	18.0			15.0	9.0			
4:00 PM	6:00 PM	2:00	6.0	20.0	20.0	6.0	6.0	20.0	20.0	6.0	40.0	12.0	28.0			20.0	14.0			
6:00 PM	7:00 PM	1:00	8.0	20.0	7.5	3.0	8.0	20.0	7.5	3.0	15.0	6.0	9.0			15.0	9.0			
7:00 PM	10:00 PM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
		15 Hours								Total Trips:	203.0	90.0	113.0	13.5	7.5					
10:00 PM	1:00 AM	3:00	20.0	0.0	9.0	0.0	20.0	0.0	9.0	0.0	18.0	0.0	18.0			6.0	6.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	12.0	20.0	10.0	6.0	12.0	20.0	10.0	6.0	20.0	12.0	8.0			10.0	4.0			
		9 Hours								Total Trips:	38.0	12.0	26.0	4.2	2.9	20	14.0	241	102	139
Route 19																				
7:00 AM	9:00 AM	2:00	15.0	15.0	8.0	8.0	15.0	15.0	8.0	8.0	16.0	16.0	0.0			8.0	0.0			
9:00 AM	2:00 PM	5:00	15.0	15.0	20.0	20.0	15.0	15.0	20.0	20.0	40.0	40.0	0.0			8.0	0.0			
2:00 PM	4:00 PM	2:00	15.0	15.0	8.0	8.0	15.0	15.0	8.0	8.0	16.0	16.0	0.0			8.0	0.0			
4:00 PM	6:00 PM	2:00	15.0	15.0	8.0	8.0	15.0	15.0	8.0	8.0	16.0	16.0	0.0			8.0	0.0			
6:00 PM	7:00 PM	1:00	15.0	15.0	4.0	4.0	15.0	15.0	4.0	4.0	8.0	8.0	0.0			8.0	0.0			
7:00 PM	10:00 PM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
		15 Hours								Total Trips:	114.0	114.0	0.0	7.6	0.0					
10:00 PM	1:00 AM	3:00	30.0	30.0	6.0	6.0	30.0	30.0	6.0	6.0	12.0	12.0	0.0			4.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	20.0	20.0	6.0	6.0	20.0	20.0	6.0	6.0	12.0	12.0	0.0			6.0	0.0			
		9 Hours								Total Trips:	24.0	24.0	0.0	2.7	0.0	8	0.0	138	138	0
Route 22																				
7:00 AM	9:00 AM	2:00	6.0	9.0	20.0	13.3	6.0	9.0	20.0	13.3	40.0	26.7	13.3			20.0	6.7			
9:00 AM	2:00 PM	5:00	7.5	10.0	40.0	30.0	7.5	10.0	40.0	30.0	80.0	60.0	20.0			16.0	4.0			
2:00 PM	4:00 PM	2:00	7.5	8.0	16.0	15.0	7.5	8.0	16.0	15.0	32.0	30.0	2.0			16.0	1.0			
4:00 PM	6:00 PM	2:00	6.0	8.0	20.0	15.0	6.0	8.0	20.0	15.0	40.0	30.0	10.0			20.0	5.0			
6:00 PM	7:00 PM	1:00	8.0	8.0	7.5	7.5	8.0	8.0	7.5	7.5	15.0	15.0	0.0			15.0	0.0			
7:00 PM	10:00 PM	3:00	15.0	15.0	12.0	12.0	15.0	15.0	12.0	12.0	24.0	24.0	0.0			8.0	0.0			
		15 Hours								Total Trips:	231.0	185.7	45.3	15.4	3.0					
10:00 PM	1:00 AM	3:00	15.0	15.0	12.0	12.0	15.0	15.0	12.0	12.0	24.0	24.0	0.0			8.0	0.0			
1:00 AM	5:00 AM	4:00	30.0	30.0	8.0	8.0	30.0	30.0	8.0	8.0	16.0	16.0	0.0			4.0	0.0			
5:00 AM	7:00 AM	2:00	10.0	10.0	12.0	12.0	20.0	20.0	6.0	6.0	18.0	18.0	0.0			9.0	0.0			
		9 Hours								Total Trips:	58.0	58.0	0.0	6.4	0.0	20	6.7	289	244	45
Route 33																				
7:00 AM	9:00 AM	2:00	15.0	15.0	8.0	8.0	15.0	15.0	8.0	8.0	16.0	16.0	0.0			8.0	0.0			
9:00 AM	2:00 PM	5:00	15.0	15.0	20.0	20.0	15.0	15.0	20.0	20.0	40.0	40.0	0.0			8.0	0.0			
2:00 PM	4:00 PM	2:00	15.0	15.0	8.0	8.0	15.0	15.0	8.0	8.0	16.0	16.0	0.0			8.0	0.0			
4:00 PM	6:00 PM	2:00	15.0	15.0	8.0	8.0	15.0	15.0	8.0	8.0	16.0	16.0	0.0			8.0	0.0			
6:00 PM	7:00 PM	1:00	15.0	15.0	4.0	4.0	15.0	15.0	4.0	4.0	8.0	8.0	0.0			8.0	0.0			
7:00 PM	10:00 PM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
		15 Hours								Total Trips:	114.0	114.0	0.0	7.6	0.0					
10:00 PM	1:00 AM	3:00	20.0	30.0	9.0	6.0	20.0	30.0	9.0	6.0	18.0	12.0	6.0			6.0	2.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	15.0	15.0	8.0	8.0	15.0	15.0	8.0	8.0	16.0	16.0	0.0			8.0	0.0			
		9 Hours								Total Trips:	34.0	28.0	6.0	3.8	0.7	8	2.0	148	142	6
Route 43																				
7:00 AM	9:00 AM	2:00	8.0	10.0	15.0	12.0	8.0	10.0	15.0	12.0	30.0	24.0	6.0			15.0	3.0			
9:00 AM	2:00 PM	5:00	12.0	12.0	25.0	25.0	12.0	12.0	25.0	25.0	50.0	50.0	0.0			10.0	0.0			
2:00 PM	4:00 PM	2:00	12.0	12.0	10.0	10.0	12.0	12.0	10.0	10.0	20.0	20.0	0.0			10.0	0.0			
4:00 PM	6:00 PM	2:00	10.0	12.0	12.0	10.0	10.0	12.0	12.0	10.0	24.0	20.0	4.0			12.0	2.0			
6:00 PM	7:00 PM	1:00	12.0	15.0	5.0	4.0	12.0	15.0	5.0	4.0	10.0	8.0	2.0			10.0	2.0			
7:00 PM	10:00 PM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
		15 Hours								Total Trips:	152.0	140.0	12.0	10.1	0.8					
10:00 PM	1:00 AM	3:00	30.0	30.0	6.0	6.0	30.0	30.0	6.0	6.0	12.0	12.0	0.0			4.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	20.0	15.0	6.0	8.0	20.0	15.0	6.0	8.0	12.0	16.0	-4.0			6.0	-2.0			
		9 Hours								Total Trips:	24.0	28.0	-4.0	2.7	-0.4	15	3.0	176	168	8
Route 48																				
7:00 AM	9:00 AM	2:00	15.0	10.0	8.0	12.0	15.0	10.0	8.0	12.0	16.0	24.0	-8.0			8.0	-4.0			
9:00 AM	2:00 PM	5:00	15.0	15.0	20.0	20.0	15.0	15.0	20.0	20.0	40.0	40.0	0.0			8.0	0.0			
2:00 PM	4:00 PM	2:00	15.0	12.0	8.0	10.0	15.0	12.0	8.0	10.0	16.0	20.0	-4.0			8.0	-2.0			
4:00 PM	6:00 PM	2:00	15.0	12.0	8.0	10.0	15.0	12.0	8.0	10.0	16.0	20.0	-4.0			8.0	-2.0			
6:00 PM	7:00 PM	1:00	15.0	16.0	4.0	3.8	15.0	16.0	4.0	3.8	8.0	7.5	0.5			8.0	0.5			
7:00 PM	10:00 PM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
		15 Hours								Total Trips:	114.0	129.5	-15.5	7.6	-1.0					
10:00 PM	1:00 AM	3:00	20.0	30.0	9.0	6.0	20.0	30.0	9.0	6.0	18.0	12.0	6.0			6.0	2.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	15.0	14.0	8.0	8.6	15.0	14.0	8.0	8.6	16.0	17.1	-1.1			8.0	-0.6			
		9 Hours								Total Trips:	34.0	29.1	4.9	3.8	0.5	8	2.0	148	159	-11
Route 58 (New Route)																				
7:00 AM	9:00 AM	2:00	15.0	NA	8.0	NA	15.0	NA	8.0	NA	16.0	0.0	16.0			8.0	8.0			
9:00 AM	2:00 PM	5:00	15.0	NA	20.0	NA	15.0	NA	20.0	NA	40.0	0.0	40.0			8.0	8.0			
2:00 PM	4:00 PM	2:00	15.0	NA	8.0	NA	15.0	NA	8.0	NA	16.0	0.0	16.0			8.0	8.0			
4:00 PM	6:00 PM	2:00	15.0	NA	8.0	NA	15.0	NA	8.0	NA	16.0	0.0	16.0			8.0	8.0			
6:00 PM	7:00 PM	1:00	15.0	NA	4.0	NA	15.0	NA	4.0	NA	8.0	0.0	8.0			8.0	8.0			
7:00 PM	10:00 PM	3:00	20.0	NA	9.0	NA	20.0	NA	9.0	NA	18.0	0.0	18.0			6.0	6.0			
		15 Hours								Total Trips:	114.0	0.0	114.0	7.6	7.6					
10:00 PM	1:00 AM	3:00	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	0.0	0.0			0.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	15.0	NA	8.0	NA	15.0	NA	8.0	NA	16.0	0.0	16.0			8.0	8.0			
		9 Hours								Total Trips:	16.0	0.0	16.0	1.8	1.8	8	8.0	130	0	130
Route 71L																				
7:00 AM	9:00 AM	2:00	9.0	10.0	13.3	12.0	9.0	10.0	13.3	12.0	26.7	24.0	2.7			13.3	1.3			
9:00 AM	2:00 PM	5:00	10.0	12.0	30.0	25.0	10.0	12.0	30.0	25.0	60.0	50.0	10.0			12.0	2.0			
2:00 PM	4:00 PM	2:00	10.0	12.0	12.0	10.0	10.0	12.0	12.0	10.0	24.0	20.0	4.0			12.0	2.0			
4:00 PM	6:00 PM	2:00	9.0	10.0	13.3	12.0	9.0	10.0	13.3	12.0	26.7	24.0	2.7			13.3	1.3			
6:00 PM	7:00 PM	1:00	10.0	12.0	6.0	5.0	10.0	12.0	6.0	5.0	12.0	10.0	2.0			12.0	2.0			
7:00 PM	10:00 PM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
		15 Hours								Total Trips:	167.3	146.0	21.3	11.2	1.4					
10:00 PM	1:00 AM	3:00	20.0	30.0	9.0	6.0	20.0	30.0	9.0	6.0	18.0	12.0	6.0			6.0	2.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	12.0	12.0	10.0	10.0	12.0	12.0	10.0	10.0	20.0	20.0	0.0			10.0	0.0			
		9 Hours								Total Trips:	38.0	32.0	6.0	4.2	0.67	13	2.0	205	178	27
Route E (New Route)																				
7:00 AM	9:00 AM	2:00	15.0	NA	8.0	NA	15.0	NA	8.0	NA	16.0	0.0	16.0			8.0	8.0			
9:00 AM	2:00 PM	5:00	15.0	NA	20.0	NA	15.0	NA	20.0	NA	40.0	0.0	40.0			8.0	8.0			
2:00 PM	4:00 PM	2:00	15.0	NA	8.0	NA	15.0	NA	8.0	NA	16.0	0.0	16.0			8.0	8.0			
4:00 PM	6:00 PM	2:00	15.0	NA	8.0	NA	15.0	NA	8.0	NA	16.0	0.0	16.0			8.0	8.0			
6:00 PM	7:00 PM	1:00	15.0	NA	4.0	NA	15.0	NA	4.0	NA	8.0	0.0	8.0			8.0	8.0			
7:00 PM	10:00 PM	3:00	15.0	NA	12.0	NA	15.0	NA	12.0	NA	24.0	0.0	24.0			8.0	8.0			
		15 Hours								Total Trips:	120.0	0.0	120.0	8.0	8.0					
10:00 PM	1:00 AM	3:00	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	0.0	0.0			0.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	0.0	0.0			0.0	0.0			
		9 Hours								Total Trips:	0.0	0.0	0.0	0.0	0.0			120	0	120
Route F																				
7:00 AM	9:00 AM	2:00	7.5	6.7	16.0	17.9	7.5	6.7	16.0	17.9	32.0	35.8	-3.8			16.0	-1.9			
9:00 AM	2:00 PM	5:00	6.0	5.0	50.0	60.0	6.0	5.0	50.0	60.0	100.0	120.0	-20.0			20.0	-4.0			
2:00 PM	4:00 PM	2:00	6.0	5.0	20.0	24.0	6.0	5.0	20.0	24.0	40.0	48.0	-8.0			20.0	-4.0			
4:00 PM	6:00 PM	2:00	5.0	5.0	24.0	24.0	5.0	5.0	24.0	24.0	48.0	48.0	0.0			24.0	0.0			
6:00 PM	7:00 PM	1:00	6.0	5.0	10.0	12.0	6.0	5.0	10.0	12.0	20.0	24.0	-4.0			20.0	-4.0			
7:00 PM	10:00 PM	3:00	10.0	8.0	18.0	22.5	10.0	8.0	18.0	22.5	36.0	45.0	-9.0			12.0	-3.0			
		15 Hours								Total Trips:	276.0	320.8	-44.8	18.4	-3.0					
10:00 PM	1:00 AM	3:00	15.0	14.0	12.0	12.9	15.0	14.0	12.0	12.9	24.0	25.7	-1.7			8.0	-0.6			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	10.0	10.0	12.0	12.0	10.0	10.0	12.0	12.0	24.0	24.0	0.0			12.0	0.0			
		9 Hours								Total Trips:	48.0	49.7	-1.7	5.3	-0.2	24	0.0	324	371	-47

Weekday Service Parameters from SPASM Model

TIME PERIODS			OUTBOUND				INBOUND													
Start Time	End Time	Period Length (hours)	TEP Headway (min)	Base Headway (min)	TEP Trips (per period)	Base Trips (per period)	TEP Headway (min)	Base Headway (min)	TEP Trips (per period)	Base Trips (per period)	TEP Total One-Way Trips (per period)	Base Total One-way trips (per period)	Delta One-way trips (per period)	Average TEP Day and Night Trips (veh/hr)	Delta TEP-Base Day and Night Trips (veh/hr)	Hrly Increase TEP Route (veh/hr)	Delta Hrly Increase TEP-Base Route (veh/hr)	Total Tep Trips per Day (veh/dy)	Total Base Trips per Day (veh/dy)	Delta Trips per Day (veh/dy)
Route J																				
7:00 AM	9:00 AM	2:00	8.0	9.0	15.0	13.3	8.0	9.0	15.0	13.3	30.0	26.7	3.3			15.0	1.7			
9:00 AM	2:00 PM	5:00	10.0	10.0	30.0	30.0	10.0	10.0	30.0	30.0	60.0	60.0	0.0			12.0	0.0			
2:00 PM	4:00 PM	2:00	6.7	6.7	17.9	17.9	6.7	6.7	17.9	17.9	35.8	35.8	0.0			17.9	0.0			
4:00 PM	6:00 PM	2:00	9.0	9.0	13.3	13.3	9.0	9.0	13.3	13.3	26.7	26.7	0.0			13.3	0.0			
6:00 PM	7:00 PM	1:00	9.0	9.0	6.7	6.7	9.0	9.0	6.7	6.7	13.3	13.3	0.0			13.3	0.0			
7:00 PM	10:00 PM	3:00	9.2	9.2	19.6	19.6	9.2	9.2	19.6	19.6	39.1	39.1	0.0			13.0	0.0			
		15 Hours								Total Trips:	205.0	201.6	3.3	13.7	0.2					
10:00 PM	1:00 AM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	8.5	8.5	14.1	14.1	8.5	8.5	14.1	14.1	28.2	28.2	0.0			14.1	0.0			
		9 Hours								Total Trips:	46.2	46.2	0.0	5.1	0.0	18	1.7	251	248	3
Route KT																				
7:00 AM	9:00 AM	2:00	8.5	9.0	14.1	13.3	8.5	9.0	14.1	13.3	28.2	26.7	1.6			14.1	0.8			
9:00 AM	2:00 PM	5:00	10.0	10.0	30.0	30.0	10.0	10.0	30.0	30.0	60.0	60.0	0.0			12.0	0.0			
2:00 PM	4:00 PM	2:00	9.2	9.2	13.0	13.0	9.2	9.2	13.0	13.0	26.1	26.1	0.0			13.0	0.0			
4:00 PM	6:00 PM	2:00	8.5	9.0	14.1	13.3	8.5	9.0	14.1	13.3	28.2	26.7	1.6			14.1	0.8			
6:00 PM	7:00 PM	1:00	10.0	10.0	6.0	6.0	10.0	10.0	6.0	6.0	12.0	12.0	0.0			12.0	0.0			
7:00 PM	10:00 PM	3:00	15.0	15.0	12.0	12.0	15.0	15.0	12.0	12.0	24.0	24.0	0.0			8.0	0.0			
		15 Hours								Total Trips:	178.6	175.4	3.1	11.9	0.2					
10:00 PM	1:00 AM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	10.0	10.0	12.0	12.0	10.0	10.0	12.0	12.0	24.0	24.0	0.0			12.0	0.0			
		9 Hours								Total Trips:	42.0	42.0	0.0	4.7	0.0	14	0.8	221	217	3
Route L																				
7:00 AM	9:00 AM	2:00	7.5	8.0	16.0	15.0	7.5	8.0	16.0	15.0	32.0	30.0	2.0			16.0	1.0			
9:00 AM	2:00 PM	5:00	10.0	10.0	30.0	30.0	10.0	10.0	30.0	30.0	60.0	60.0	0.0			12.0	0.0			
2:00 PM	4:00 PM	2:00	9.2	9.2	13.0	13.0	9.2	9.2	13.0	13.0	26.1	26.1	0.0			13.0	0.0			
4:00 PM	6:00 PM	2:00	7.5	7.5	16.0	16.0	7.5	7.5	16.0	16.0	32.0	32.0	0.0			16.0	0.0			
6:00 PM	7:00 PM	1:00	7.5	7.5	8.0	8.0	7.5	7.5	8.0	8.0	16.0	16.0	0.0			16.0	0.0			
7:00 PM	10:00 PM	3:00	11.3	11.3	15.9	15.9	11.3	11.3	15.9	15.9	31.9	31.9	0.0			10.6	0.0			
		15 Hours								Total Trips:	197.9	195.9	2.0	13.2	0.1					
10:00 PM	1:00 AM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	10.9	10.9	11.0	11.0	10.9	10.9	11.0	11.0	22.0	22.0	0.0			11.0	0.0			
		9 Hours								Total Trips:	40.0	40.0	0.0	4.4	0.0	16	1.0	238	236	2
Route M																				
7:00 AM	9:00 AM	2:00	8.5	9.0	14.1	13.3	8.5	9.0	14.1	13.3	28.2	26.7	1.6			14.1	0.8			
9:00 AM	2:00 PM	5:00	10.0	10.0	30.0	30.0	10.0	10.0	30.0	30.0	60.0	60.0	0.0			12.0	0.0			
2:00 PM	4:00 PM	2:00	9.2	9.2	13.0	13.0	9.2	9.2	13.0	13.0	26.1	26.1	0.0			13.0	0.0			
4:00 PM	6:00 PM	2:00	8.5	9.0	14.1	13.3	8.5	9.0	14.1	13.3	28.2	26.7	1.6			14.1	0.8			
6:00 PM	7:00 PM	1:00	8.6	8.6	7.0	7.0	8.6	8.6	7.0	7.0	14.0	14.0	0.0			14.0	0.0			
7:00 PM	10:00 PM	3:00	15.0	15.0	12.0	12.0	15.0	15.0	12.0	12.0	24.0	24.0	0.0			8.0	0.0			
		15 Hours								Total Trips:	180.5	177.4	3.1	12.0	0.2					
10:00 PM	1:00 AM	3:00	20.0	20.0	9.0	9.0	20.0	20.0	9.0	9.0	18.0	18.0	0.0			6.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	15.0	15.0	8.0	8.0	15.0	15.0	8.0	8.0	16.0	16.0	0.0			8.0	0.0			
		9 Hours								Total Trips:	34.0	34.0	0.0	3.8	0.0	14	0.8	215	211	3
Route N																				
7:00 AM	9:00 AM	2:00	5.5	7.0	21.8	17.1	5.5	7.0	21.8	17.1	43.6	34.3	9.4			21.8	4.7			
9:00 AM	2:00 PM	5:00	10.0	10.0	30.0	30.0	10.0	10.0	30.0	30.0	60.0	60.0	0.0			12.0	0.0			
2:00 PM	4:00 PM	2:00	8.0	8.0	15.0	15.0	8.0	8.0	15.0	15.0	30.0	30.0	0.0			15.0	0.0			
4:00 PM	6:00 PM	2:00	6.0	7.0	20.0	17.1	6.0	7.0	20.0	17.1	40.0	34.3	5.7			20.0	2.9			
6:00 PM	7:00 PM	1:00	7.0	7.0	8.6	8.6	7.0	7.0	8.6	8.6	17.1	17.1	0.0			17.1	0.0			
7:00 PM	10:00 PM	3:00	10.0	10.0	18.0	18.0	10.0	10.0	18.0	18.0	36.0	36.0	0.0			12.0	0.0			
		15 Hours								Total Trips:	226.8	211.7	15.1	15.1	1.0					
10:00 PM	1:00 AM	3:00	15.0	15.0	12.0	12.0	15.0	15.0	12.0	12.0	24.0	24.0	0.0			8.0	0.0			
1:00 AM	5:00 AM	4:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0			
5:00 AM	7:00 AM	2:00	8.6	8.6	14.0	14.0	8.6	8.6	14.0	14.0	27.9	27.9	0.0			14.0	0.0			
		9 Hours								Total Trips:	51.9	51.9	0.0	5.8	0.0	22	4.7	279	264	15

Source: SPASM 2.3.0d--TEP TTRP Expanded-TSP- base -Adjusted Frequencies Oct 2012.xls

Notes:
* Headways east of Van Ness, per email from Heidi Kline
min = minutes
veh/hr = vehicles per hour
veh/dy = vehicles per day

22nd Ave (Noriega St to Lincoln Way)

Routes: 71 Haight-Noriega & 71L Haight-Noriega Limited *	Route 71MC (Headway Change)	Route 71MC (New Route)	Total	Total Daily Increase in Trips
Daytime Increase (events/ hr):	0.7	5.6	6.3	94
Nighttime Increase (events/ hr):	0.33	2.1	2.4	22
Maximum Hourly Increase:	0.7	6.7	7.4	116

For FTA Assessment Spreadsheet Use (events/hr)

Motor Coach Daytime Increase:	6.3	
Motor Coach Nighttime Increase:	2.4	
Ambient Ldn:	55	dBA
Assumed Ambient Leq [1]:	53	dBA

Notes:

* Currently part of a couplet with 23rd Street, but 71L variant includes two-way service on 22nd.

New Route indicates that the specific Muni route is new to this roadway segement and therefore, the change is due to the TEP proposed frequencies.

Headway Change indicates that the specific Muni route in not new to the roadway segment and therefore, the change is due TEP proposed frequencies minus existing (Base) frequencies.

MC = motor coach

TC = trolley coach

events/hr = events per hour

[1] The general rule is that the Ldn is within plus or minus 2 dBA of the Leq during the peak traffic hour under normal traffic conditions [California Department of Transportation, Technical Noise Supplement, November 2009].

Therefore, the ambient Leq was conservatively assumed to be 2 dBA lower than the Ldn, which yields higher results; that is, a greater increase in noise at a given distance from the source than if the ambient noise level is assumed to be 2 dBA higher than the ambient Ldn.

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	22 Ave Noriega and Lincoln

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	55 dBA

Noise Source Parameters	
Number of Noise Sources:	1

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	6.3
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	2.4
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	55 dBA
Total Project Ldn:	54 dBA
Total Noise Exposure:	58 dBA
Increase:	3 dB
Impact?:	None

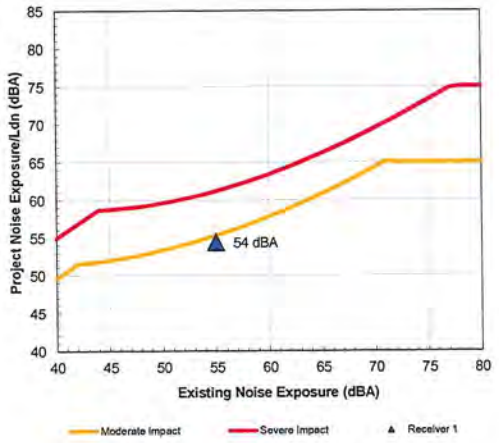
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	26 ft
Dist to Sev. Impact Contour (Source 1):	11 ft

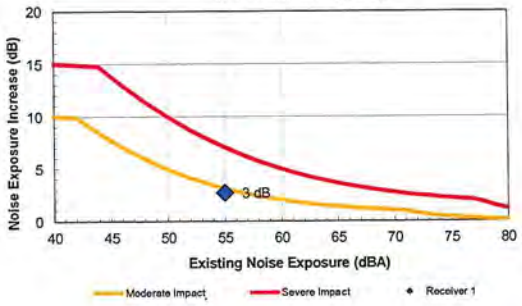
Source 1 Results

Leq(day):	49.9 dBA
Leq(night):	47.6 dBA
Ldn:	54.4 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	**22 Ave Noriega and Lincoln**

Receiver Parameters	
Receiver:	**Receiver 1**
Land Use Category:	**3. Institutional**
Existing Noise (Measured or Generic Value):	**53 dBA**

Noise Source Parameters	
Number of Noise Sources:	**1**

Noise Source Parameters		**Source 1**
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	7.4
Distance	**Distance from Source to Receiver (ft)**	30
	Number of Intervening Rows of Buildings	0
Adjustments	**Noise Barrier?**	No

Project Results Summary

Existing Leqh:	53 dBA
Total Project Leqh:	51 dBA
Total Noise Exposure:	55 dBA
Increase:	2 dB
Impact?:	None

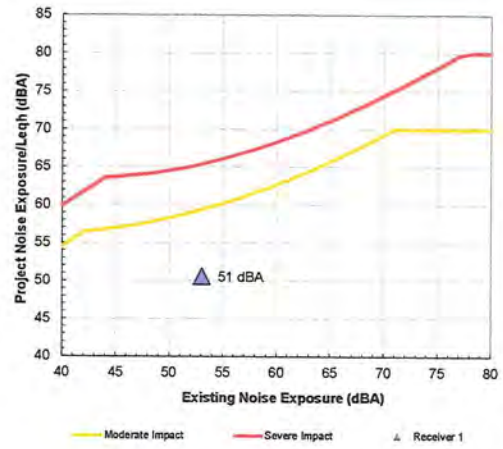
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	8 ft
Dist to Sev. Impact Contour (Source 1):	3 ft

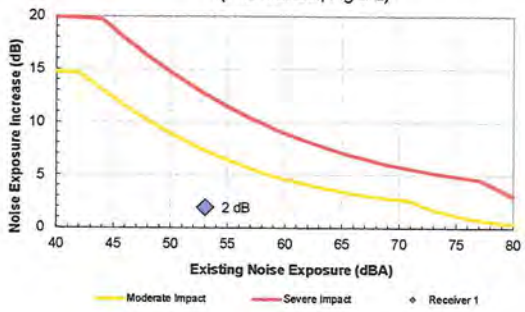
Source 1 Results

Leqh: 50.6 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Lincoln Blvd (Graham St to Letterman Dr)

Route: 43 Masonic	Route 43MC (New Route)	Total Daily Increase in Trips
Daytime Increase (events/ hr):	10.1	152
Nighttime Increase (events/ hr):	2.7	24
Maximum Hourly Increase:	15	176

For FTA Assessment Spreadsheet Use (events/hr)

Motor Coach Daytime Increase:	10.1	
Motor Coach Nighttime Increase:	2.7	
Ambient Ldn:	60	dBA
Assumed Ambient Leq [1]:	58	dBA

Notes:

New Route indicates that the specific Muni route is new to this roadway segement and therefore, the change is due to the TEP proposed frequencies.

MC = motor coach

TC = trolley coach

events/hr = events per hour

[1] The general rule is that the Ldn is within plus or minus 2 dBA of the Leq during the peak traffic hour under normal traffic conditic [California Department of Transportation, Technical Noise Supplement, November 2009].

Therefore, the ambient Leq was conservatively assumed to be 2 dBA lower than the Ldn, which yields higher results; that is, a greater increase in noise at a given distance from the source than if the ambient noise level is assumed to be 2 dBA higher than the ambient Ldn.

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	Lincoln Blv-Graham to Letterman

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	60 dBA

Noise Source Parameters	
Number of Noise Sources:	1

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	10.1
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	2.7
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	60 dBA
Total Project Ldn:	55 dBA
Total Noise Exposure:	61 dBA
Increase:	1 dB
Impact?:	None

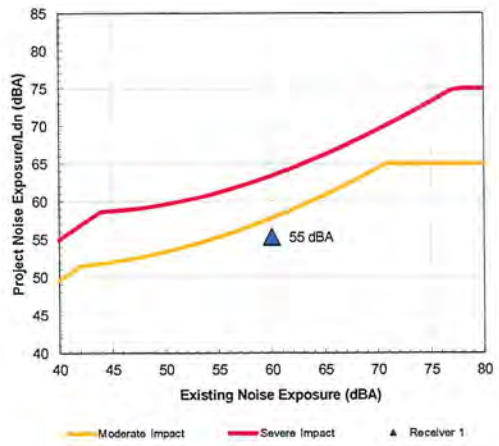
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	20 ft
Dist to Sev. Impact Contour (Source 1):	9 ft

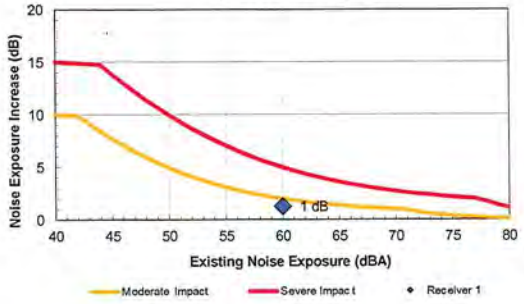
Source 1 Results

Leq(day):	51.9 dBA
Leq(night):	48.1 dBA
Ldn:	55.3 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	Lincoln Blv-Graham to Letterman

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	3. Institutional
Existing Noise (Measured or Generic Value):	58 dBA

Noise Source Parameters	
Number of Noise Sources:	1

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	15
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Leqh:	58 dBA
Total Project Leqh:	54 dBA
Total Noise Exposure:	59 dBA
Increase:	1 dB
Impact?:	None

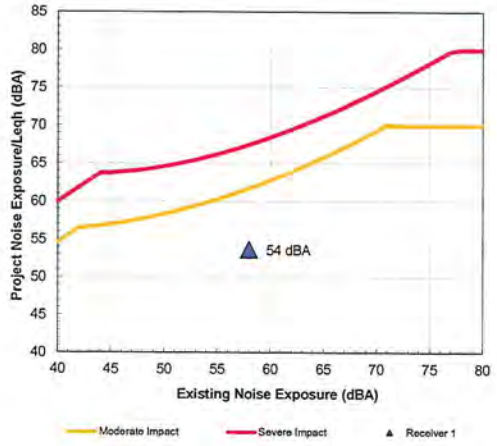
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	9 ft
Dist to Sev. Impact Contour (Source 1):	4 ft

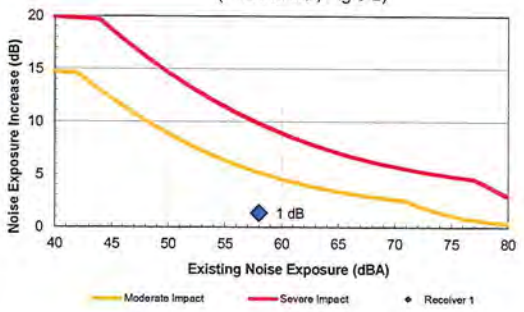
Source 1 Results

Leqh:	53.6 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Utah (23rd St to 24th St)

Routes: 10 Sansome, 19 Polk, 48 Quintara-24th St, and 58 24th St *	Route 10MC (Headway Change)	Route 19MC (New Route)	Route 48MC (Headway Change)	Route 58MC (New Route)	Total	Total Daily Increase in Trips
Daytime Increase (events/ hr):	3.8	3.8	-0.5	3.8	10.9	163
Nighttime Increase (events/ hr):	1.4	1.3	0.3	0.9	3.9	35
Maximum Hourly Increase:	7.0	4.0	-1.0	4.0	14	198

For FTA Assessment Spreadsheet Use (events/hr)

Motor Coach Daytime Increase:	10.9	
Motor Coach Nighttime Increase:	3.9	
Ambient Ldn:	60	dBA
Assumed Ambient Leq [1]:	58	dBA

Notes:

* One-way bus movement - Utah/ 24th streets used for westbound and Potrero/23rd for eastbound.

New Route indicates that the specific Muni route is new to this roadway segement and therefore, the change is due to the TEP proposed frequencies.

Headway Change indicates that the specific Muni route in not new to the roadway segment and therefore, the change is due TEP proposed frequencies minus existing (Base) frequencies.

MC = motor coach

TC = trolley coach

events/hr = events per hour

[1] The general rule is that the Ldn is within plus or minus 2 dBA of the Leq during the peak traffic hour under normal traffic conditions [California Department of Transportation, Technical Noise Supplement, November 2009].

Therefore, the ambient Leq was conservatively assumed to be 2 dBA lower than the Ldn, which yields higher results; that is, a greater increase in noise at a given distance from the source than if the ambient noise level is assumed to be 2 dBA higher than the ambient Ldn.

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	Utah-23rd to 24th

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	60 dBA

Noise Source Parameters	
Number of Noise Sources:	1

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	10.9
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	3.9
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	60 dBA
Total Project Ldn:	57 dBA
Total Noise Exposure:	62 dBA
Increase:	2 dB
Impact?:	None

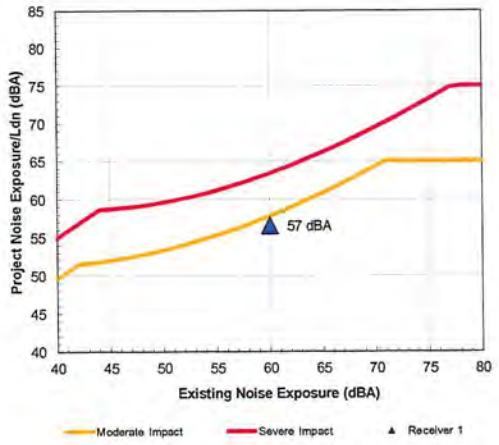
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	25 ft
Dist to Sev. Impact Contour (Source 1):	11 ft

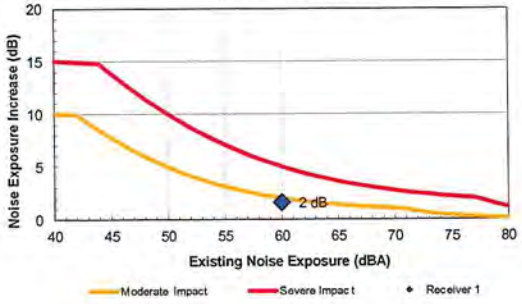
Source 1 Results

Leq(day):	52.3 dBA
Leq(night):	49.7 dBA
Ldn:	56.6 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	**Utah-23rd to 24th**

Receiver Parameters	
Receiver:	**Receiver 1**
Land Use Category:	**3. Institutional**
Existing Noise (Measured or Generic Value):	**58 dBA**

Noise Source Parameters	
Number of Noise Sources:	**1**

Noise Source Parameters		**Source 1**
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	14
Distance	**Distance from Source to Receiver (ft)**	30
	Number of Intervening Rows of Buildings	0
Adjustments	**Noise Barrier?**	No

Project Results Summary

Existing Leqh:	58 dBA
Total Project Leqh:	53 dBA
Total Noise Exposure:	59 dBA
Increase:	1 dB
Impact?:	None

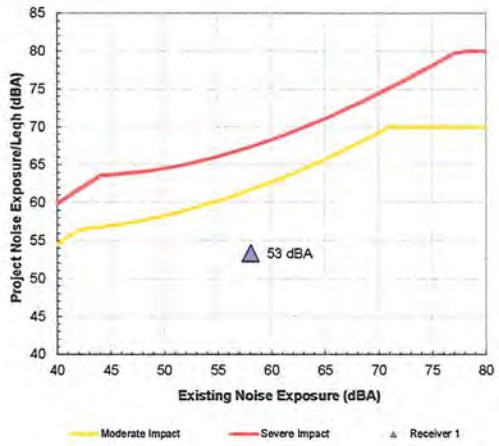
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	8 ft
Dist to Sev. Impact Contour (Source 1):	3 ft

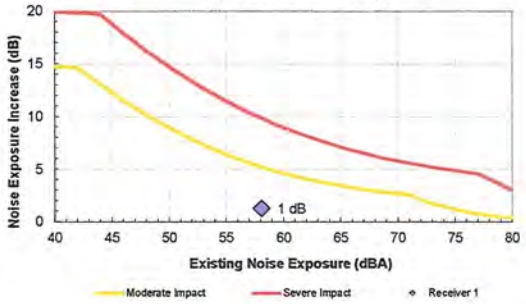
Source 1 Results

Leqh: 53.3 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



14th Ave (Quintara St to Santiago St)

Routes: 48 Quintara/24th & 6 Parnassus	Route 48MC (Headway Change)	Route 6TC (New Route)	Total	Total Daily Increase in Trips
Daytime Increase (events/ hr):	-1.0	9.7	8.7	131
Nighttime Increase (events/ hr):	0.5	4.2	4.8	43
Maximum Hourly Increase:	-2.0	12.0	10.0	173

For FTA Assessment Spreadsheet Use (events/hr)			
Motor Coach Daytime Increase:	-1.0	MC Daily Total	-11
Motor Coach Nighttime Increase:	0.5	TC Daily Total	184
Trolley Coach Daytime Increase:	9.7		
Trolley Coach Nightitme Increase:	4.2		

Ambient Ldn:	65	dBA
Assumed Ambient Leq [i]:	63	dBA

Notes:
New Route indicates that the specific Muni route is new to this roadway segement and therefore, the change is due to the TEP proposed frequencies.
Headway Change indicates that the specific Muni route in not new to the roadway segment and therefore, the change is due TEP proposed frequencies minus existing (Base) frequencies.
MC = motor coach
TC = trolley coach
events/hr = events per hour

[i] The general rule is that the Ldn is within plus or minus 2 dBA of the Leq during the peak traffic hour under normal traffic conditions [California Department of Transpo Technical Noise Supplement, November 2009].
Therefore, the ambient Leq was conservatively assumed to be 2 dBA lower than the Ldn, which yields higher results; that is, a greater increase in noise at a given distance from the source than if the ambient noise level is assumed to be 2 dBA higher than the ambient Ldn.

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	14th Ave - Quintara to Santiago

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	65 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	-1
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	0.5
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 2
	Source Type:	Highway/Transit
	Specific Source:	Buses (electric)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	9.7
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	4.2
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	65 dBA
Total Project Ldn:	51 dBA
Total Noise Exposure:	65 dBA
Increase:	0 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	7 ft
Dist to Sev. Impact Contour (Sources 1+2):	3 ft

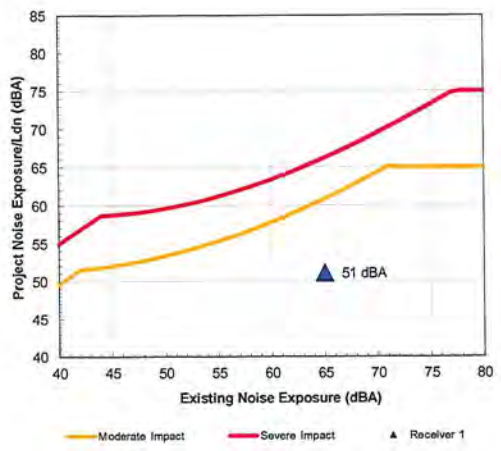
Source 1 Results

Leq(day):	0.0 dBA
Leq(night):	40.7 dBA
Ldn:	46.5 dBA

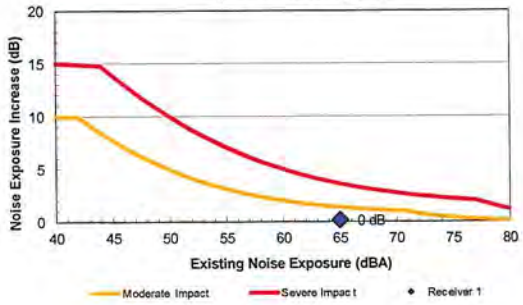
Source 2 Results

Leq(day):	43.0 dBA
Leq(night):	42.8 dBA
Ldn:	49.2 dBA
Incremental Ldn (Src 1-2):	51.1 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	14th Ave - Quintara to Santiago

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	3. Institutional
Existing Noise (Measured or Generic Value):	63 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	-2
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 2
	Source Type:	Highway/Transit
	Specific Source:	Buses (electric)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	12
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Leqh:	63 dBA
Total Project Leqh:	44 dBA
Total Noise Exposure:	63 dBA
Increase:	0 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	1 ft
Dist to Sev. Impact Contour (Sources 1+2):	1 ft

Source 1 Results

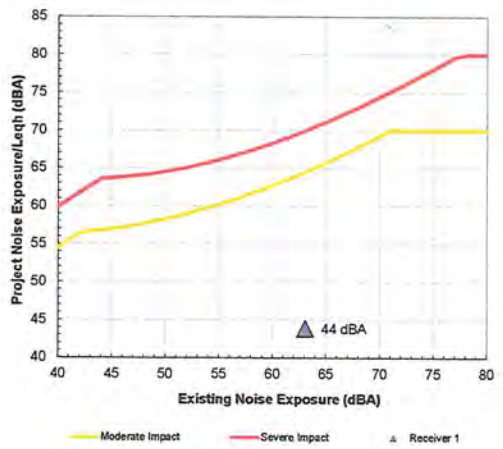
Leqh: 0.0 dBA

Source 2 Results

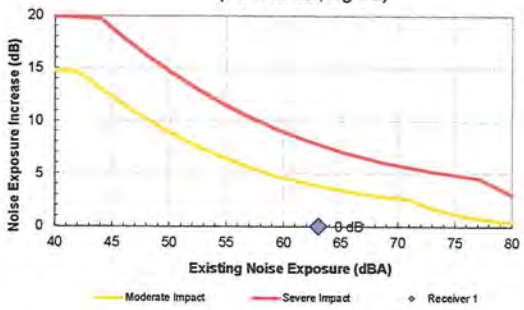
Leqh: 43.9 dBA

Incremental Leqh (Src 1-2): 43.9 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



16th Street (Valencia St to Potrero Ave and Irwin St to Connecticut St)

16th Street Segments	Existing Service			TEP Base			Variant 1			Variant 2		
	Existing Routes	Trolley	MC	TEP Base Routes	Trolley	MC	Variant 1 Routes	Trolley	MC	Variant 2 Routes	Trolley	MC
Valencia Street to Potrero Avenue	22T, 33T	386	0	22T, 33T	437	0	22MC, 22T, 33T	437	289	22MC, 22T, 33T	437	289
Delta Valencia to Mission					*51*	*0*		*51*	*289*		*51*	*289*
Irwin Street to Connecticut Street	None	0	0	10MC, 22T, 33T	437	241	10MC, 22MC, 33T	148	530	10MC, 22MC	0	530
Delta Irwin to Conneticut					*437*	*241*		*148*	*530*		*0*	*530*

16th Street - Valencia Street to Potrero Avenue (Variant 1) *

Route: 33 Stanyan, 22 Fillmore, & 22 Fillmore	Route 22MC (New Route)	Route 22TC (Headway Change)	Route 33TC (Headway Change)	Total
Daytime Increase (events/ hr):	15.4	3.0	0.0	18
Nighttime Increase (events/ hr):	6.4	0.0	0.67	7.1
Maximum Hourly Increase:	20.0	6.7	8.0	35

For FTA Assessment Spreadsheet Use (events/hr)

Motor Coach Daytime Increase:	15.4	MC Daily Total	289
Motor Coach Nighttime Increase:	6.4	TC Daily Total	51
Trolley Coach Daytime Increase:	3.0		
Trolley Coach Nightitme Increase:	0.7		
Ambient Ldn:	65 dBA		
Assumed Ambient Leq [1]:	63 dBA		

16th Street - Irwin Street to Connecticut Street (Variant 1) *

Route: 33 Stanyan, 22 Fillmore, & 10 Sansome	Route 10MC (New Route)	Route 22MC (New Route)	Route 33TC (Headway Change)	Total
Daytime Increase (events/ hr):	13.5	15.4	7.6	36.5
Nighttime Increase (events/ hr):	4.2	6.4	3.8	14.4
Maximum Hourly Increase:	20.0	20.0	8.0	48.0

For FTA Assessment Spreadsheet Use (events/hr)

Motor Coach Daytime Increase:	28.9	MC Daily Total	530
Motor Coach Nighttime Increase:	10.7	TC Daily Total	148
Trolley Coach Daytime Increase:	7.6		
Trolley Coach Nightitme Increase:	3.8		
Ambient Ldn:	70 dBA		
Assumed Ambient Leq [1]:	68 dBA		

Notes:

* Variant 1 includes 22 Fillmore supplemental motor coach service to Mission Bay, prior to installation of overhead wires.

New Route indicates that the specific Muni route is new to this roadway segement and therefore, the change is due to the TEP proposed frequencies.

Headway Change indicates that the specific Muni route in not new to the roadway segment and therefore, the change is due TEP proposed frequencies minus existing (Base) frequencies.

MC = motor coach

TC = trolley coach

events/hr = events per hour

[1] The general rule is that the Ldn is within plus or minus 2 dBA of the Leq during the peak traffic hour under normal traffic conditions [California Department of Transportation, Technical Noise Supplement, November 200.].

Therefore, the ambient Leq was conservatively assumed to be 2 dBA lower than the Ldn, which yields higher results; that is, a greater increase in noise at a given distance from the source than if the ambient noise level is assumed to be 2 dBA higher than the ambient Ldn.

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	16th St - Valencia to Potrero

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	65 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	15.4
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	6.4
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 2
	Source Type:	Highway/Transit
	Specific Source:	Buses (electric)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	3
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	0.7
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	65 dBA
Total Project Ldn:	59 dBA
Total Noise Exposure:	66 dBA
Increase:	1 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	22 ft
Dist to Sev. Impact Contour (Sources 1+2):	9 ft

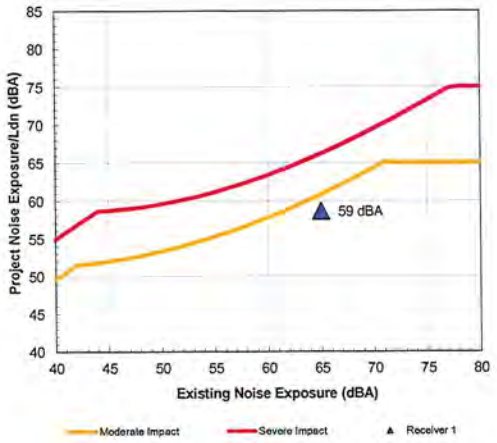
Source 1 Results

Leq(day):	53.8 dBA
Leq(night):	51.8 dBA
Ldn:	58.6 dBA

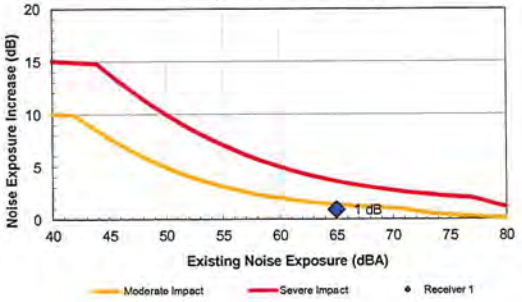
Source 2 Results

Leq(day):	37.9 dBA
Leq(night):	35.0 dBA
Ldn:	42.0 dBA
Incremental Ldn (Src 1-2):	58.7 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	16th St - Valencia to Potrero

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	3. Institutional
Existing Noise (Measured or Generic Value):	63 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	20
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 2
	Source Type:	Highway/Transit
	Specific Source:	Buses (electric)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	14.7
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Leqh:	63 dBA
Total Project Leqh:	55 dBA
Total Noise Exposure:	64 dBA
Increase:	1 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	7 ft
Dist to Sev. Impact Contour (Sources 1+2):	3 ft

Source 1 Results

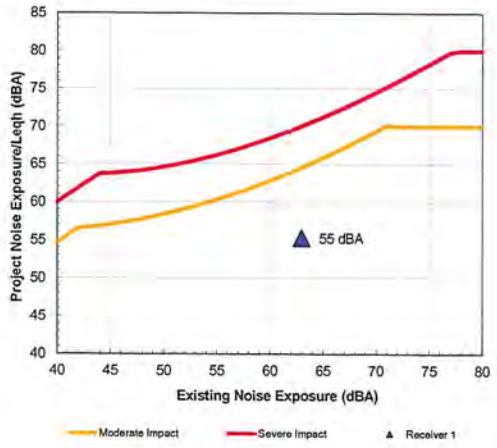
Leqh: 54.9 dBA

Source 2 Results

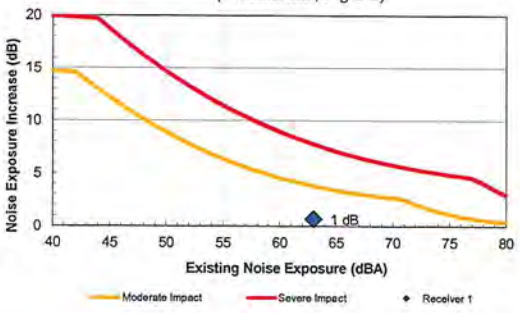
Leqh: 44.8 dBA

Incremental Leqh (Src 1-2): 55.3 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	16th St - Irwin to Connecticut

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	28.9
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	10.7
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 2
	Source Type:	Highway/Transit
	Specific Source:	Buses (electric)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	7.6
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	3.8
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	61 dBA
Total Noise Exposure:	71 dBA
Increase:	1 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	18 ft
Dist to Sev. Impact Contour (Sources 1+2):	8 ft

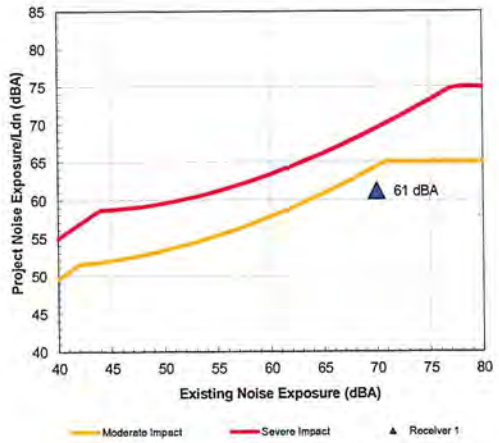
Source 1 Results

Leq(day):	56.5 dBA
Leq(night):	54.1 dBA
Ldn:	60.9 dBA

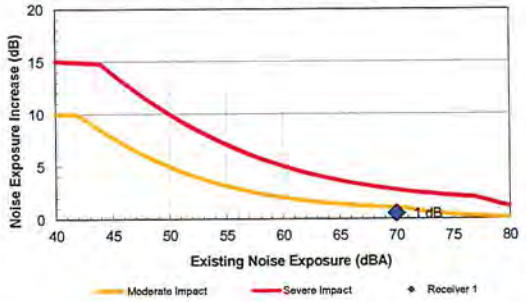
Source 2 Results

Leq(day):	41.9 dBA
Leq(night):	42.4 dBA
Ldn:	48.7 dBA
Incremental Ldn (Src 1-2):	61.2 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	16th St - Irwin to Connecticut

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	3. Institutional
Existing Noise (Measured or Generic Value):	68 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	40
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 2
	Source Type:	Highway/Transit
	Specific Source:	Buses (electric)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	8
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Leqh:	68 dBA
Total Project Leqh:	58 dBA
Total Noise Exposure:	68 dBA
Increase:	0 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	7 ft
Dist to Sev. Impact Contour (Sources 1+2):	3 ft

Source 1 Results

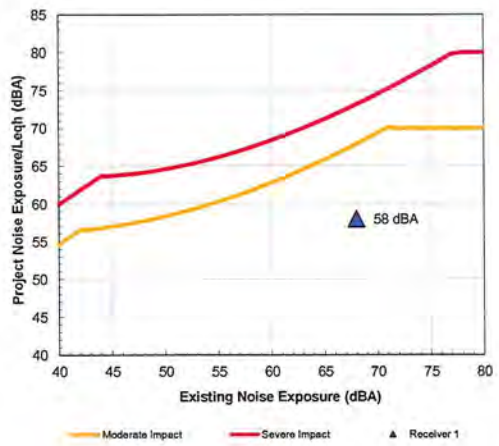
Leqh: 57.9 dBA

Source 2 Results

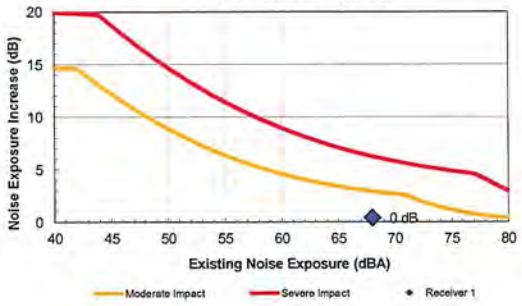
Leqh: 42.1 dBA

Incremental Leqh (Src 1-2): 58.0 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



23rd Street (Utah St to Kansas St)

Routes: 10 Sansome, 19 Polk, 48 Quintara-24th	Route 10MC (Headway Change)	Route 19MC (New Route)	Route 48MC (Headway Change)	Route 58MC (New Route)	Total	Total Daily Increase in Trips
Daytime Increase (events/ hr):	7.5	7.6	-1.0	7.6	21.7	326
Nighttime Increase (events/ hr):	2.9	2.7	0.5	1.8	7.9	71
Maximum Hourly Increase:	14	8.0	-2.0	8.0	28	396

For FTA Assessment Spreadsheet Use: (events/hr)

Motor Coach Daytime Increase:	21.7	
Motor Coach Nighttime Increase:	7.9	
Ambient Ldn:	70	dBA
Assumed Ambient Leq[1]:	68	dBA

Notes:

New Route indicates that the specific Muni route is new to this roadway segement and therefore, the change is due to the TEP proposed frequencies.

Headway Change indicates that the specific Muni route in not new to the roadway segment and therefore, the change is due TEP proposed frequencies minus existing (Base) frequencies.

MC = motor coach

TC = trolley coach

events/hr = events per hour

[1] The general rule is that the Ldn is within plus or minus 2 dBA of the Leq during the peak traffic hour under normal traffic conditions [California Department of Transportation, Technical Noise Supplement, November 2009].

Therefore, the ambient Leq was conservatively assumed to be 2 dBA lower than the Ldn, which yields higher results; that is, a greater increase in noise at a given distance from the source than if the ambient noise level is assumed to be 2 dBA higher than the ambient Ldn.

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	23rd St (Utah to Kansas)

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	1

Noise Source Parameters		Source 1
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Daytime hrs		
	Speed (mph)	15
	Avg. Number of Events/hr	21.7
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	7.9
Distance	Distance from Source to Receiver (ft)	30
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	60 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

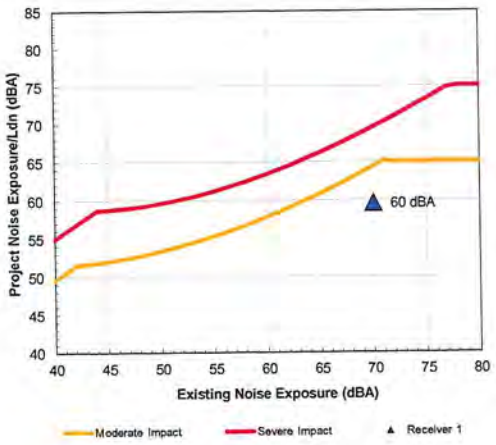
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	14 ft
Dist to Sev. Impact Contour (Source 1):	7 ft

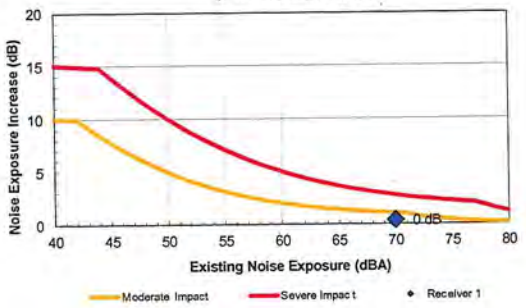
Source 1 Results

Leq(day):	55.2 dBA
Leq(night):	52.7 dBA
Ldn:	59.6 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	**23rd St (Utah to Kansas)**

Receiver Parameters	
Receiver:	**Receiver 1**
Land Use Category:	**3. Institutional**
Existing Noise (Measured or Generic Value):	**68 dBA**

Noise Source Parameters	
Number of Noise Sources:	**1**

Noise Source Parameters		**Source 1**
	Source Type:	Highway/Transit
	Specific Source:	Buses (diesel-powered)
Noisiest hr of Activity During Sensitive hrs		
	Speed (mph)	15
	Number of Events/hr	28
Distance	**Distance from Source to Receiver (ft)**	30
	Number of Intervening Rows of Buildings	0
Adjustments	**Noise Barrier?**	No

Project Results Summary

Existing Leqh:	68 dBA
Total Project Leqh:	56 dBA
Total Noise Exposure:	68 dBA
Increase:	0 dB
Impact?:	None

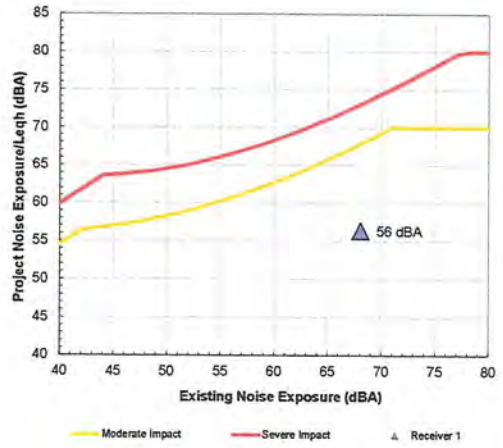
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	5 ft
Dist to Sev. Impact Contour (Source 1):	2 ft

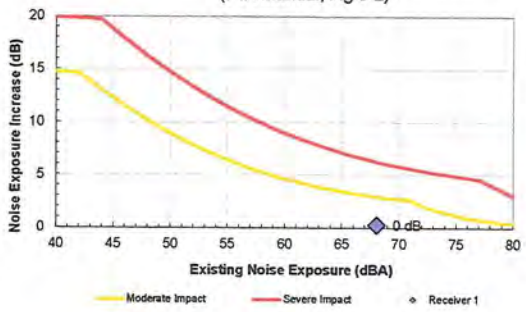
Source 1 Results

Leqh: 56.4 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



E-Line (Jefferson St, Jones St, and Beach St Loop and Market St to King St)

Routes: E-, KT-, & N-Lines - Market Street to King Street *	Route F (Headway Change)	Route E (New route)	Total	Total Daily Increase in Trips
Daytime Increase (events/ hr):	-1.5	4.0	2.5	37.6
Nighttime Increase (events/ hr):	-0.1	0.0	-0.1	-1.4
Maximum Hourly Increase:	0.0	4.0	4.0	36

For FTA Equations Use (events/hr)		
Streetcar Daytime Increase	2.5	
Streetcar Nighttime Increase	-0.10	
Ambient Ldn:	60	dBA
Assumed Ambient Leq[1]:	58	dBA

Routes: E-, KT-, & N-Lines - Market Street to King Street	Route K (Headway Change)	Route E (New route)	Route N (Headway Change)	Total	Total Daily Increase in Trips
Daytime Increase (events/ hr):	0.2	8.0	1.0	9.2	138
Nighttime Increase (events/ hr):	0.0	0.0	0.0	0.0	0.0
Maximum Hourly Increase:	0.0	8.0	4.7	12.7	138

For FTA Assessment Spreadsheet and Equations Use (events/hr)		
Streetcar Daytime Increase:	8.0	
Streetcar Nighttime Increase:	0.0	
Light Rail Vehicle Daytime Increase :	1.2	
Light Rail VehicleNighttime Increase:	0.0	
Ambient Ldn:	70	dBA
Assumed Ambient Leq[1]:	68	dBA

Notes:

* One-way route.

New Route indicates that the specific Muni route is new to this roadway segement and therefore, the change is due to the TEP proposed frequencies.

Headway Change indicates that the specific Muni route in not new to the roadway segment and therefore, the change is due TEP proposed frequencies minus existing (Base) frequencies.

MC = motor coach

TC = trolley coach

events/hr = events per hour

[1] The general rule is that the Ldn is within plus or minus 2 dBA of the Leq during the peak traffic hour under normal traffic conditions [California Department of Transportation, Technical Noise Supplement, November 2009].

Therefore, the ambient Leq was conservatively assumed to be 2 dBA lower than the Ldn, which yields higher results; that is, a greater increase in noise at a given distance from the source than if the ambient noise level is assumed to be 2 dBA higher than the ambient Ldn.

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	KT Ingleside & N Judah

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	1

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	Avg. Number of Rail Cars/train	2
	Speed (mph)	20
	Avg. Number of Events/hr	1.2
Nighttime hrs	Avg. Number of Rail Cars/train	2
	Speed (mph)	20
	Avg. Number of Events/hr	0
Distance	Distance from Source to Receiver (ft)	50
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	Yes
	Aerial Structure?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	43 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

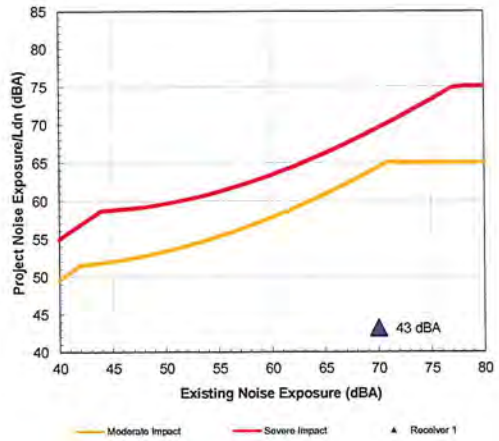
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	2 ft
Dist to Sev. Impact Contour (Source 1):	1 ft

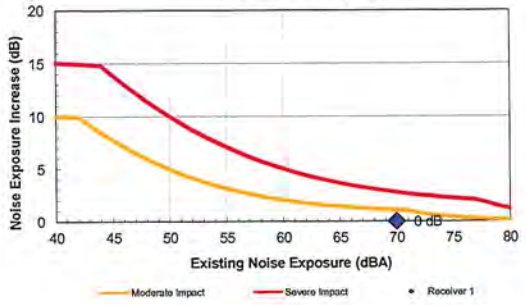
Source 1 Results

Leq(day):	45.2 dBA
Leq(night):	0.0 dBA
Ldn:	43.2 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	KT Ingleside/Third & N Judah

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	3. Institutional
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	1

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Noisiest hr of Activity During Sensitive hrs	Number of Rail Cars/train	2
	Speed (mph)	20
	Number of Events/hr	4.7
Distance	Distance from Source to Receiver (ft)	50
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	Yes
	Aerial Structure?	No

Project Results Summary

Existing Leqh:	70 dBA
Total Project Leqh:	51 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

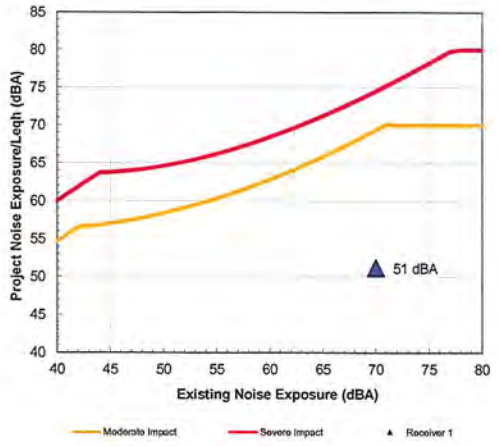
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	3 ft
Dist to Sev. Impact Contour (Source 1):	1 ft

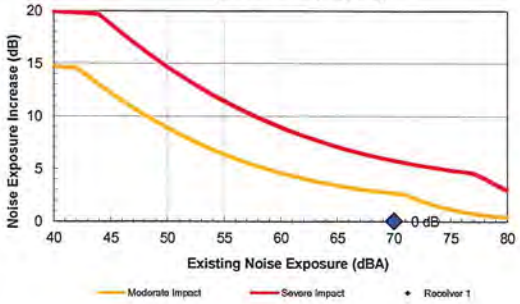
Source 1 Results

Leqh:	51.2 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Estimated Noise from Increase E Embarcadero (Market St to King St)
Transit Effectiveness Project (TEP)

Time Period		Hrs	Increase in Historic Streetcars veh/hr	veh/period	E Line (New Route)
7:00 AM	9:00 AM	2:00	8.0	16.0	16.0
9:00 AM	2:00 PM	5:00	8.0	40.0	40.0
2:00 PM	4:00 PM	2:00	8.0	16.0	16.0
4:00 PM	6:00 PM	2:00	8.0	16.0	8.0
6:00 PM	7:00 PM	1:00	8.0	8.0	24.0
7:00 PM	10:00 PM	3:00	8.0	24.0	0.0
10:00 PM	1:00 AM	3:00	0.0	0.0	0.0
1:00 AM	5:00 AM	4:00	0	0.0	0.0
5:00 AM	7:00 AM	2:00	0.0	0.0	

Source: SPASM Model

	Time	Volume			
DAYTIME	7:00 AM	8.0			
	8:00 AM	8.0			
	9:00 AM	8.0			
	10:00 AM	8.0			
	11:00 AM	8.0			
	12:00 PM	8.0			
	1:00 PM	8.0			
	2:00 PM	8.0			
	3:00 PM	8.0			
	4:00 PM	8.0			
	5:00 PM	8.0			
	6:00 PM	8.0			
	7:00 PM	8.0			
	8:00 PM	8.0	Total		
	9:00 PM	8.0	Daytime	120	
NIGHTTIME	10:00 PM	0.0			
	11:00 PM	0.0			
	12:00 AM	0.0			
	1:00 AM	0.0			
	2:00 AM	0.0			
	3:00 AM	0.0			
	4:00 AM	0.0			
	5:00 AM	0.0	Total		
	6:00 AM	0.0	Nighttime	0.0	
	TOTAL	120			

Light Rail

Constants:

Source Reference Level at 50 feet	89.2	dBA	(Composite of 12 measurements at SE Corner of Taylor and Beach Street 50 ft from rail center) *
Speed Constant (Cs)	20	speed constant, miles per hour	

Inputs:

N	1	Number of Cars
Sd	20	average vehicle speed during day, miles per hour
Sn	20	average vehicle speed during night, miles per hour
V	8	hourly volume of vehicles of this type, in vehicles per hour
Vd	8.0	average hourly daytime volume of this type, in vehicles per hour (total vehicle volume, 7am to 10pm)/15
Vn	0.0	average hourly nighttime volume of this type, in vehicles per hour (total vehicle volume, 10pm to 7am)/9
Embedded Track	+3	dBA

Results:

Hourly Leq at 50 feet	65.6	dBA		
Daytime Leq at 50 feet	65.6	dBA		
Nightime Leq at 50 feet	0.0	dBA		
Ldn at 50 feet	63.6	dBA		
At 50 feet:				
Ambient Noise Level (Ldn)	70	dBA	Assumed Ambient Leq	68 dBA
Resultant Noise Exposure (Ldn)	71	dBA	Resultant Noise Exposure (Leq)	70 dBA
Increase in Noise Level (Ldn)	0.9	dBA	Increase in Noise Level (Leq)	2.0 dBA

Notes:

Hourly Leq =	SELref+10*LOG(Ncars)+20*LOG(S/50)+10*LOG(V)-35.6+Embedded Track
Daytime Leq =	SELref+10*LOG(Ncars)+20*LOG(S/50)+10*LOG(Vd)-35.6+Embedded Track
Nightime Leq =	SELref+10*LOG(Ncars)+20*LOG(S/50)+10*LOG(Vn)-35.6+Embedded Track
Ldn =	10*LOG(15*10^(Leq (day)/10)+9*10^((Leq (night)+10)/10))-13.8
Noise Addition =	10* LOG(10^(dBA1/10)+10^(dBA2/10))

Source : Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

* Source: URS, Environmental Impact Statement for the Extension Of Historic Streetcar Service From Fisherman's Wharf To The San Francisco Maritime National Historical Park And Golden Gate National Recreation Area's Fort Mason Center, Appendix F, January 22, 2009.

Estimated Noise from Increase E Embarcadero North of Market - Jefferson, Jones, & Beach Sts Loop
Transit Effectiveness Project (TEP)

Time Period		Hrs	Increase in Historic Streetcars (one way traffic) veh/hr	veh/period	E Line (New Route)	F Line TEP	F Line Existing	Change in F Line
7:00 AM	9:00 AM	2:00	3.1	6.1	16.0	32.0	35.8	-3.8
9:00 AM	2:00 PM	5:00	2.0	10.0	40.0	100.0	120.0	-20.0
2:00 PM	4:00 PM	2:00	2.0	4.0	16.0	40.0	48.0	-8.0
4:00 PM	6:00 PM	2:00	4.0	8.0	16.0	48.0	48.0	0.0
6:00 PM	7:00 PM	1:00	2.0	2.0	8.0	20.0	24.0	-4.0
7:00 PM	10:00 PM	3:00	2.5	7.5	24.0	36.0	45.0	-9.0
10:00 PM	1:00 AM	3:00	-0.3	-0.9	0.0	24.0	25.7	-1.7
1:00 AM	5:00 AM	4:00	0	0.0	0.0	0.0	0.0	0.0
5:00 AM	7:00 AM	2:00	0.0	0.0	0.0	24.0	24.0	0.0

Source: SPASM Model

	Time	Volume			
DAYTIME	7:00 AM	3.1			
	8:00 AM	3.1			
	9:00 AM	2.0			
	10:00 AM	2.0			
	11:00 AM	2.0			
	12:00 PM	2.0			
	1:00 PM	2.0			
	2:00 PM	2.0			
	3:00 PM	2.0			
	4:00 PM	4.0			
	5:00 PM	4.0			
	6:00 PM	2.0			
	7:00 PM	2.5			
	8:00 PM	2.5	Total		
	9:00 PM	2.5	Daytime	38	
NIGHTTIME	10:00 PM	-0.3			
	11:00 PM	-0.3			
	12:00 AM	-0.3			
	1:00 AM	0.0			
	2:00 AM	0.0			
	3:00 AM	0.0			
	4:00 AM	0.0			
	5:00 AM	0.0	Total		
	6:00 AM	0.0	Nighttime	-0.9	
	TOTAL	37			

Light Rail

Constants:

Source Reference Level at 50 feet	89.2	dBA	(Composite of 12 measurements at SE Corner of Taylor and Beach Street 50 ft from rail center) *
Speed Constant (Cs)	20	speed constant, miles per hour	

Inputs:

N	1	Number of Cars
Sd	20	average vehicle speed during day, miles per hour
Sn	20	average vehicle speed during night, miles per hour
V	4	hourly volume of vehicles of this type, in vehicles per hour
Vd	2.5	average hourly daytime volume of this type, in vehicles per hour (total vehicle volume, 7am to 10pm)/15
Vn	-0.1	average hourly nighttime volume of this type, in vehicles per hour (total vehicle volume, 10pm to 7am)/9
Embedded Track	+3	dBA

Results:

			At 25 feet	
Hourly Leq at 50 feet	62.6	dBA	67.9	dBA
Daytime Leq at 50 feet	60.6	dBA	65.9	dBA
Nightime Leq at 50 feet	0.0	dBA	0.0	dBA
Ldn at 50 feet	58.6	dBA	63.8	dBA

At 25 feet:

Ambient Noise Level (Ldn)	60	dBA	Assumed Ambient Leq	58 dBA
Resultant Noise Exposure (Ldn)	65.3	dBA	Resultant Noise Exposure (Leq)	64 dBA
Increase in Noise Level (Ldn)	5.3	dBA	Increase in Noise Level (Leq)	5.9 dBA

Notes:

Hourly Leq = SELref+10*LOG(Ncars)+20*LOG(S/50)+10*LOG(V)-35.6+Embedded Track

Daytime Leq = SELref+10*LOG(Ncars)+20*LOG(S/50)+10*LOG(Vd)-35.6+Embedded Track

Nightime Leq = SELref+10*LOG(Ncars)+20*LOG(S/50)+10*LOG(Vn)-35.6+Embedded Track

Ldn = 10*LOG(15*10^(Leq (day)/10)+9*10^((Leq (night)+10)/10))-13.8

Noise Addition = 10* LOG(10^(dBA1/10)+10^(dBA2/10))

Noise Dispersion = dBA at D ft = dBA at 50 ft - 10 Log_b (D/50) - 10 *x G x (D/42)

Where:

D is the perpendicular distance from receiver to centerline of the lane.

G is a site parameter which takes on the value of 0 for a hard ground.

Source : Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

* Source: URS, Environmental Impact Statement for the Extension Of Historic Streetcar Service From Fisherman's Wharf To The San Francisco Maritime National Historical Park And Golden Gate National Recreation Area's Fort Mason Center, Appendix F, January 22, 2009.

Sound Exposure Level Calculations - Historic Streetcars

SEL at 50 ft from Center of Rail Line at the SE Corner of Taylor and Beach Streets	Ratio of Sound Energy to Reference Sound Energy
96.3	4.3E+09
94.1	2.6E+09
88.4	6.9E+08
88.1	6.5E+08
87.1	5.1E+08
85.2	3.3E+08
83.7	2.3E+08
83.2	2.1E+08
82.4	1.7E+08
82.1	1.6E+08
80.7	1.2E+08
78.1	6.5E+07
Average	8.3E+08
Average SEL	89.2

Source: URS, Environmental Impact Statement for the Extension Of Historic Streetcar Service From Fisherman's Wharf To The San Francisco Maritime National Historical Park And Golden Gate National Recreation Area's Fort Mason Center, Appendix F, January 22, 2009.

Notes:
SEL = Sound Exposure Level
Ratio of Sound Energy to Reference Sound Energy =10^(SEL/10)
SEL = LOG(Energy Ratio)

Noise Dissipation Calculations

Noise Source	Noise Level	Reference Distance	Receptor Distance	Resultant Noise Level
	dBA	ft	ft	dBA
Fixed Guideway Rail Car (Peak Leq)	62.6	50	25	67.9
Fixed Guideway Rail Car (daytime Leq)	60.6	50	25	65.9
Fixed Guideway Rail Car (nighttime Leq)	0.0	50	25	0.0
Fixed Guideway Rail Car (Ldn)	58.6	50	25	63.8

dBA at D ft = dBA at 50 ft - 10 Log_{10} (D/50) - 10 *x G x (D/42)

Where:

D is the perpendicular distance from receiver to centerline of the lane.

G is a site parameter which takes on the value of 0 for a hard ground.

Source : Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT

FTA-VA-90-1003-06 **May 2006**

Office of Planning and Environment
Federal Transit Administration

The reference SEL's are used in the equations of Table 5-2 to predict the noise exposure at 50 feet. Also shown in Table 5-2 are rough estimates of the noise reduction available from wayside noise barriers, the most common noise mitigation measure. See Chapter 6 for a complete description of the benefits resulting from noise mitigation. The approximate noise barrier lengths and locations developed in a General Assessment provide a preliminary basis for evaluating the costs and benefits of impact mitigation.

Table 5-1. Reference SEL's at 50 feet from Track and 50 mph

Source / Type		Reference Conditions	Reference SEL (SEL_{ref}), dBA
Commuter Rail, At-Grade	Locomotives	Diesel-electric, 3000 hp, throttle 5	92
		Electric	90
	Diesel Multiple Unit (DMU)	Diesel-powered, 1200 hp	85
	Horns	Within ¼ mile of grade crossing	110
	Cars	Ballast, welded rail	82
Rail Transit		At-grade, ballast, welded rail	82
Transit whistles / warning devices		Within 1/8 mile of grade crossing	93
AGT	Steel wheel	Aerial, concrete, welded rail	80
	Rubber Tire	Aerial, concrete guideway	78
Monorail		Aerial straddle beam	82
Maglev		Aerial, open guideway	72

Noise Exposure at 50 feet. After determining the reference levels for each of the noise sources, the next step is to determine the noise exposure at 50 feet expressed in terms of $L_{eq}(h)$ and L_{dn}. The additional data needed include:

- Number of train passbys during the day (defined as 7am to 10 pm) and night (defined as 10 pm to 7 am).
- Maximum number of train passbys during hours that Category 1 or Category 3 land uses are normally in use. This is usually the peak hour train volume.
- Number of vehicles per train (if this number varies during the day, take the average).
- Speed (maximum expected).
- Guideway configuration.
- Noise barrier location (if noise mitigation is determined necessary at the end of the first pass on the General Assessment).
- Location of highway and street grade crossings, if any.

These data are used in the equations in Table 5-2 to obtain adjustment factors to calculate L_{dn} and $L_{eq}(h)$ at 50 feet.

Table 5-2. Computation of Noise Exposure at 50 feet for Fixed-Guideway General Assessment	
LOCOMOTIVES[†] Hourly L_{eq} at 50 ft:	$L_{eqL}(h) = SEL_{ref} + 10\log(N_{locos}) + K\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$ Where K = -10 for passenger diesel; = 0 for DMU; = +10 for electric
LOCOMOTIVE WARNING HORNS[†††] Hourly L_{eq} at 50 ft:	$L_{eqH}(h) = SEL_{ref} + 10\log(V) - 35.6$
RAIL VEHICLES[††] Hourly L_{eq} at 50 ft:	$L_{eqC}(h) = SEL_{ref} + 10\log(N_{cars}) + 20\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$ use the following adjustments as applicable: + 5 → JOINTED TRACK + 3 → EMBEDDED TRACK ON GRADE + 4 → AERIAL STRUCTURE WITH SLAB TRACK (except AGT & monorail) - 5 → if a NOISE BARRIER blocks the line of sight
TRANSIT WARNING HORNS[†††] Hourly L_{eq} at 50 ft:	$L_{eqH}(h) = SEL_{ref} - 10\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$
COMBINED Hourly L_{eq} at 50 ft:	$L_{eq}(h) = 10\log\left[10^{\left(L_{eqL}/10\right)} + 10^{\left(L_{eqC}/10\right)}\right]$
Daytime L_{eq} at 50 ft:	$L_{eq}(day) = L_{eq}(h)\big\vert\ v = v_d$
Nighttime L_{eq} at 50 ft:	$L_{eq}(night) = L_{eq}(h)\big\vert\ v = v_n$
L_{dn} at 50 ft:	$L_{dn} = 10\log\left[(15)\times 10^{\left(L_{eq}(day)/10\right)} + (9)\times 10^{\left(L_{eq}(night)+10/10\right)}\right] - 13.8$
N_{locos} = average number of locomotives per train N_{cars} = average number of cars per train S = train speed, in miles per hour V = average hourly volume of train traffic, in trains per hour V_d = average hourly daytime volume of train traffic, in trains per hour $= \frac{number\ of\ trains,7\ am\ to 10\ pm}{15}$ V_n = average hourly nighttime volumes of train traffic, in trains per hour $= \frac{number\ of\ trains,10\ pm\ to 7\ am}{9}$	
[†] Assumes a passenger diesel locomotive power rating at approximately 3000 hp [††] Includes all commuter rail cars, transit cars, AGT and monorail [†††] Based on FRA's horn noise model (www.fra.dot.gov/downloads/RRDev/hornmodel.xls)	

These data are used in the equations in Table 5-4 with the reference SEL's to calculate $L_{eq}(h)$ and L_{dn} at 50 feet.

Table 5-3. Source Reference Levels at 50 feet from Roadway, 50 mph

Source†	Reference SEL (dBA)
Automobiles and Vans	74
Buses (diesel-powered)	82
Buses (electric)	80
Buses (hybrid)	83**

† Assumes normal roadway surface conditions

** For hybrid buses, Reference SEL should be determined on a case-by-case basis.

Table 5-4. Computation of L_{eq} and L_{dn} at 50 feet for Highway/Transit General Assessment

Hourly L_{eq} at 50 ft:	$L_{eq}(h) = SEL_{ref} + 10\log(V) + C_s \log\left(\frac{S}{50}\right) - 35.6$
Daytime L_{eq} at 50 ft:	$L_{eq}(day) = L_{eq}(h)\big\vert V = V_d$
Nighttime L_{eq} at 50 ft:	$L_{eq}(night) = L_{eq}(h)\big\vert V = V_n$
L_{dn} at 50 ft:	$L_{dn} = 10\log\left[(15)\times 10^{\left(L_{eq}(day)/10\right)} + (9)\times 10^{\left(L_{eq}(night)+10/10\right)}\right] - 13.8$
Speed Constant:	C_s = 15 Diesel Buses = 28 Electric Buses = 30, Automobile and van pools
Adjustment:	- 5 Noise Barrier

V	= hourly volume of vehicles of this type, in vehicles per hour.
V_d	= average hourly daytime volume of vehicles of this type, in vehicles per hour
	$= \frac{total\,vehicle\,volume,7\,am\,to\,10\,pm}{15}$
V_n	= average hourly nighttime volume of vehicles of this type, in vehicles per hour
	$= \frac{total\,vehicle\,volume,10\,pm\,to\,7\,am}{9}$
S	= average vehicle speed, in miles per hour

6.3 PROPAGATION CHARACTERISTICS

Once estimates of noise exposure at 50 feet from each source are available, then propagation characteristics must be taken into account to compute the noise exposure at receivers of interest. The steps, shown in Figure 6-4, for this are: 1) determine the propagation characteristics between each source and the receiver of interest; then, 2) draw a noise exposure-vs.-distance curve outward from each relevant source as a function of distance; and 3) add a final adjustment using the appropriate shielding term based on intervening barriers between source and receiver.

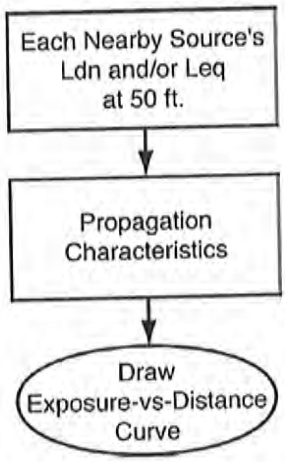


Figure 6-4. Flow Diagram for Determining Project Noise at Receiver Location

6.3.1 Noise Exposure vs. Distance

The following steps result in a noise exposure-vs.-distance curve for each project source:

1. Draw several approximate topographic sections, each perpendicular to the path of moving sources or outward from point sources, similar to those shown in Figure 6-5. Draw separate sections, if necessary, to account for significant changes in topography. Use judgment here to prevent an extreme number of different topographic sections. Often, several typical sections will suffice throughout the transit corridor.

2. For each topographic section, use the relationship illustrated in Figure 6-5 to determine the effective path height, H_{eff}, and from it the Ground Factor, G. Larger Ground Factors mean larger amounts of ground attenuation with increasing distance from the source. As shown in the figure, the effective path height depends upon source heights, which are standardized at the bottom of the figure, and upon receiver heights, which can often be taken as 5 feet for both outdoor receivers and first-floor receivers. With these standard heights, only one H_{eff} (and therefore one Ground Factor)

results from each cross section. For acoustically "hard" (i.e. non-absorptive) ground conditions, G should be taken to be zero.

3. Then for each L_{dn} and each L_{eq} at 50 feet developed earlier in the analysis, plot a noise exposure-vs.-distance curve with L_{dn} or L_{eq} represented on the vertical axis and distance on the horizontal axis using one of the following equations:

L_{dn} or L_{eq} $= (L_{dn} or L_{eq})\big|_{at50\ ft} - 20\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{50}\right)$ for stationary sources

$= (L_{dn} or L_{eq})\Big|_{at50\ ft} - 10\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{42}\right)$ for fixed-guideway rail car passbys

$= (L_{dn} or L_{eq})\big|_{at50\ ft} - 10\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{29}\right)$ For fixed-guideway locomotive and rubber-tired vehicle passbys, highway vehicle passbys and horns

2. *Moderately-used rail corridor (5 to 12 trains per day):* If the existing train vibration exceeds the impact criteria given in Tables 8-1 and 8-2, there will be no impact from the project vibration if the levels estimated using the procedures outlined in either Chapter 10 or 11 are at least 5VdB less than the existing train vibration. Otherwise, vibration criteria in Tables 8-1 and 8-2 apply to the project. The existing train vibration can be either measured or estimated using the General Assessment procedures in Chapter 10. It is usually preferable to measure vibration from existing train traffic.

3. *Heavily-used rail corridor (more than 12 trains per day):* If the existing train vibration exceeds the impact criteria given in Tables 8-1 and 8-2, the project will cause additional impact if the project significantly increases the number of vibration events. Approximately doubling the number of events is required for a significant increase.

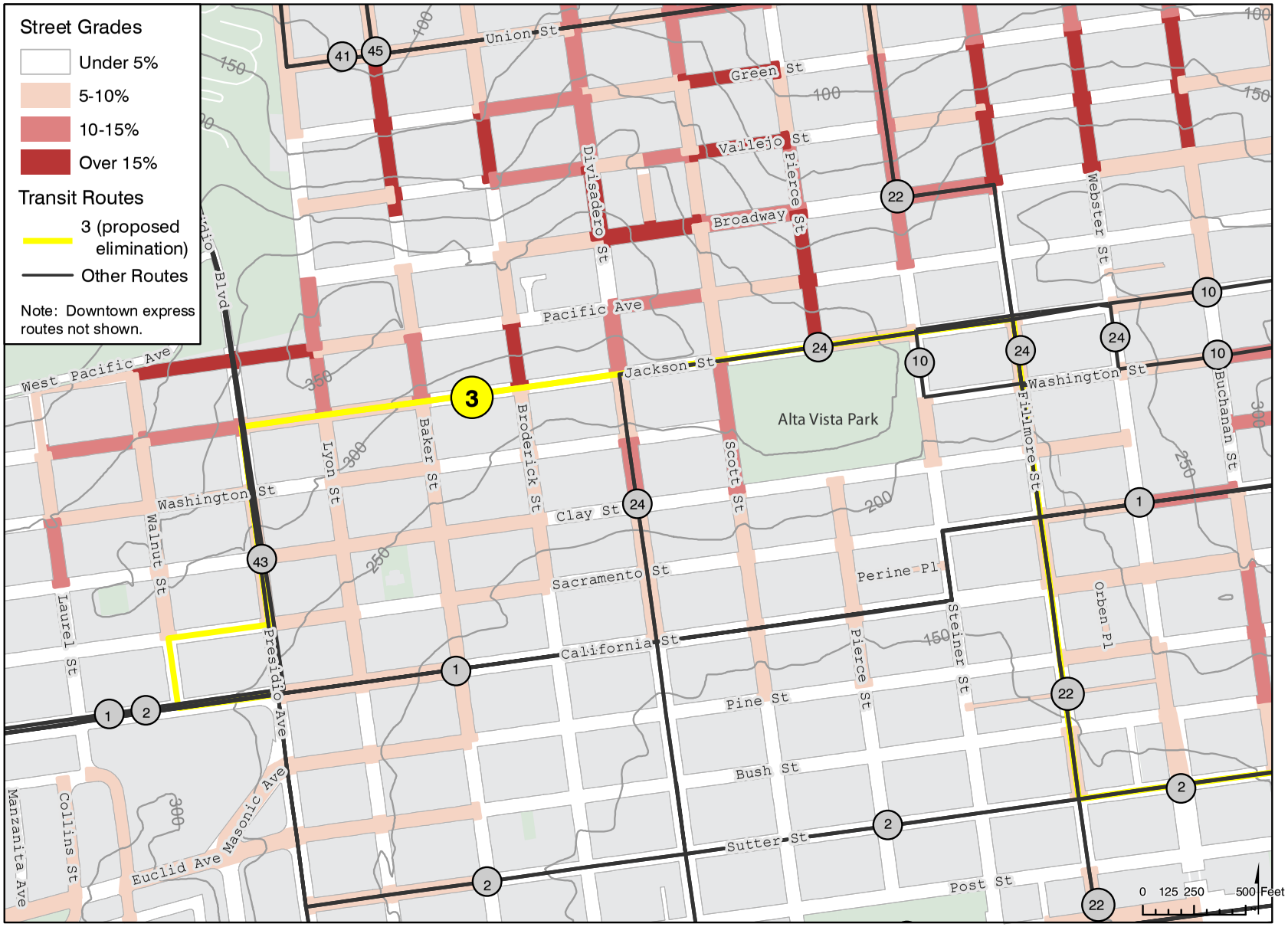
   If there is not a significant increase in vibration events, there will be additional impact only if the project vibration, estimated using the procedures of Chapters 10 or 11, will be 3 VdB or more higher than the existing vibration. An example of a case with no additional impact would be an automated people mover system planned for a corridor with an existing rapid transit service with 220 trains per day. On the other hand, there could be impact if it is a new commuter rail line planned to share a corridor with the rapid transit system. In this latter case, the project vibrations are likely to be higher than the existing vibrations by 3 VdB or more.

4. *Moving existing tracks:* Another scenario where existing vibration can be significant is when a new transit project will use an existing railroad right-of-way and result in shifting the location of existing railroad tracks. The track relocation and reconstruction can result in lower vibration levels, in which case this aspect of the project represents a benefit, not an adverse impact. If the track relocation will cause higher vibration levels at sensitive receptors, then the projected vibration levels must be compared to the appropriate impact criterion to determine if there will be new impacts. If impact is judged to have existed prior to moving the tracks, new impact will be assessed only if the relocation results in more than a 3 VdB increase in vibration level.

8.1.3 Application to Freight Trains

The impact thresholds given in Tables 8-1 and 8-2 are based on experience with vibration from rail transit systems. They have been used to assess vibration from freight trains since no specific impact criteria exist for freight railroads. However, the significantly greater length, weight and axle loads of freight trains make it problematic to use these impact criteria for freight rail. Nevertheless, in shared right-of-way situations where the proposed transit alignment causes the freight tracks to be moved closer to sensitive sites, these impact criteria will have to be used. In assessing the freight train vibration, a dual approach is recommended with separate consideration of the locomotive and rail car vibration. Because the locomotive vibration only lasts for a very short time, the few-event criterion is appropriate for fewer than 30 events per day. However, for a typical line-haul freight train where the rail car vibration lasts for several minutes, the many-event limits should be applied to the rail car vibration. Some judgment must be exercised to make sure that the approach is reasonable. For example, some spur rail lines carry very

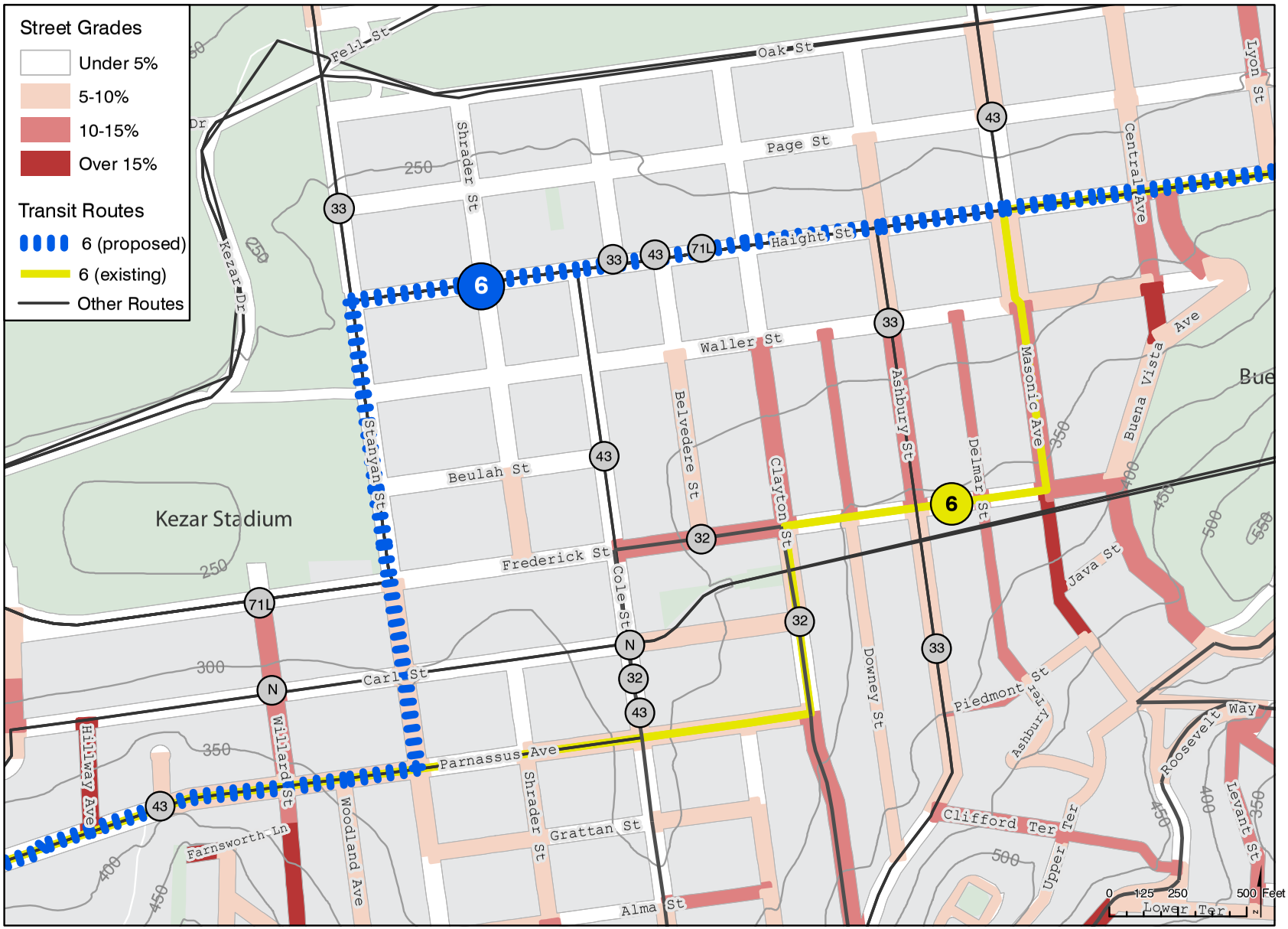
APPENDIX 5
SFMTA SERVICE AREA TOPOGRAPHICAL MAPS



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

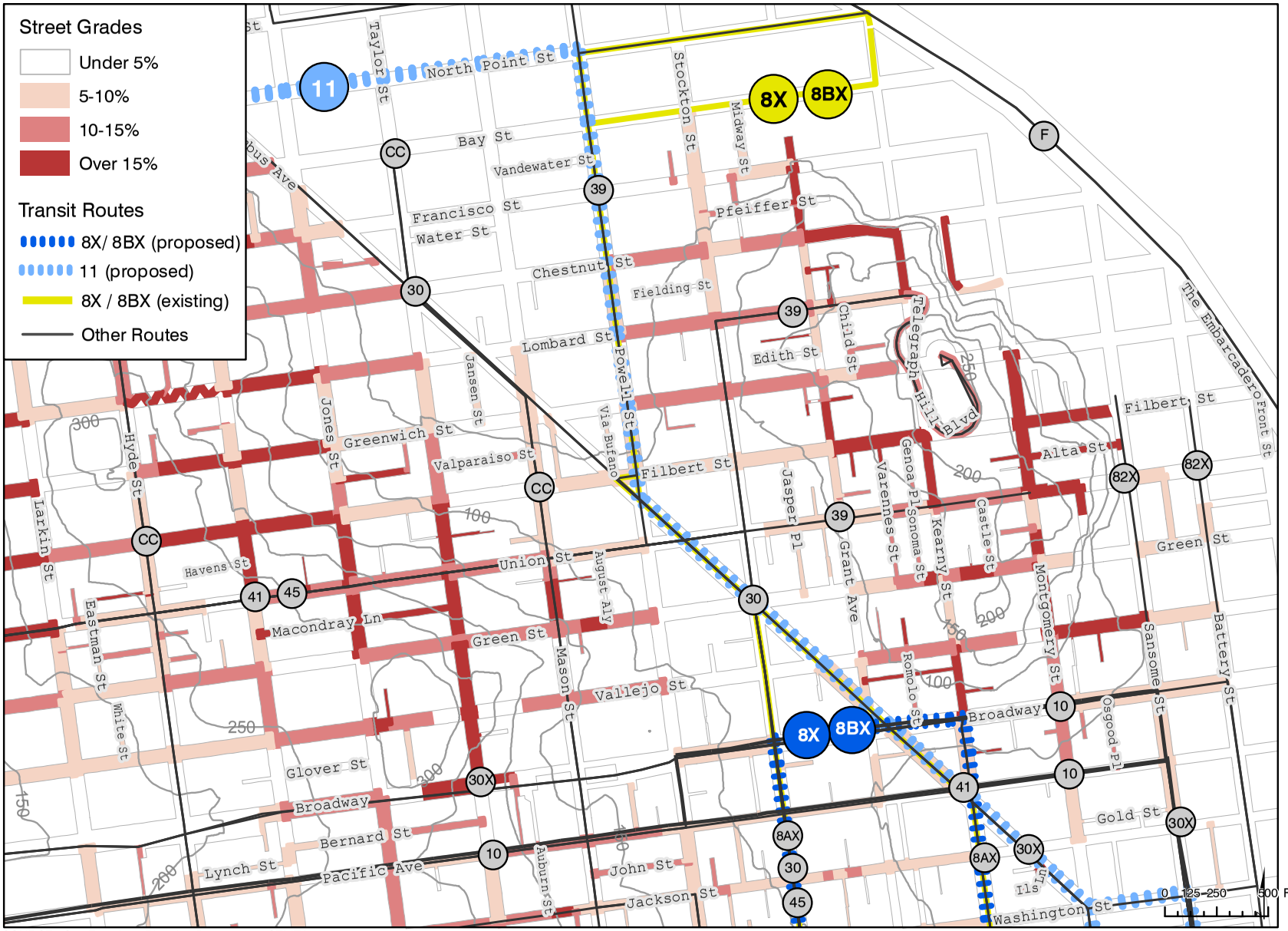
FIGURE A - 3 JACKSON ROUTE ELIMINATION
TOPOGRAPHY – FILLMORE STREET TO PRESIDIO AVENUE



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

FIGURE B - 6 PARNASSUS ROUTE CHANGE
TOPOGRAPHY – MASONIC AVENUE TO STANYAN STREET



SOURCE: San Francisco Planning Department; SFMTA

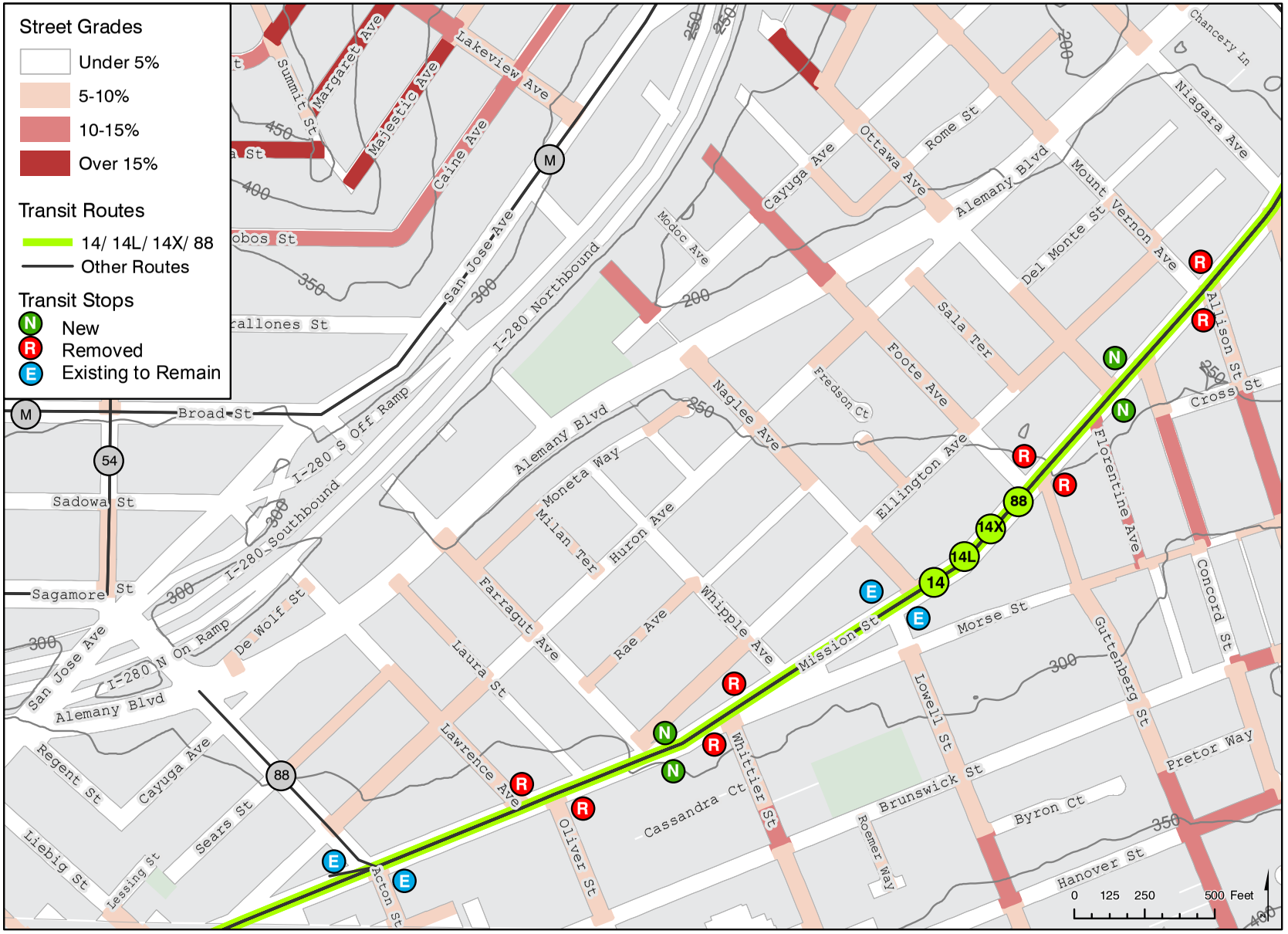
TRANSIT EFFECTIVENESS PROJECT

FIGURE C - 8X BAYSHORE EXPRESS ROUTE CHANGE
TOPOGRAPHY – NORTH BEACH AREA

SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

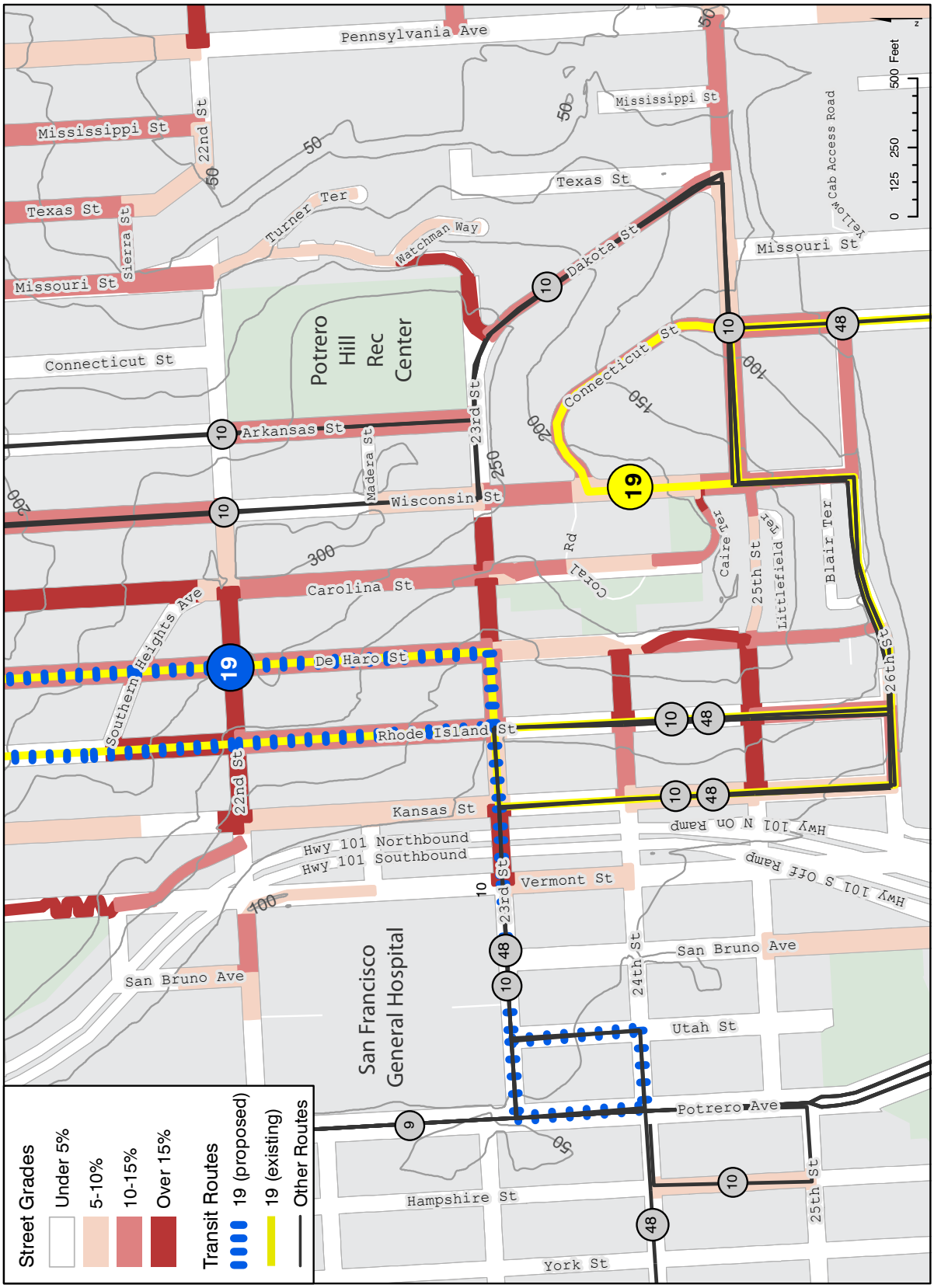
FIGURE D - 8X BAYSHORE EXPRESS STOP CONSOLIDATION
TOPOGRAPHY – VISITACION AVENUE BETWEEN BAY SHORE BOULEVARD AND HAHN STREET



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

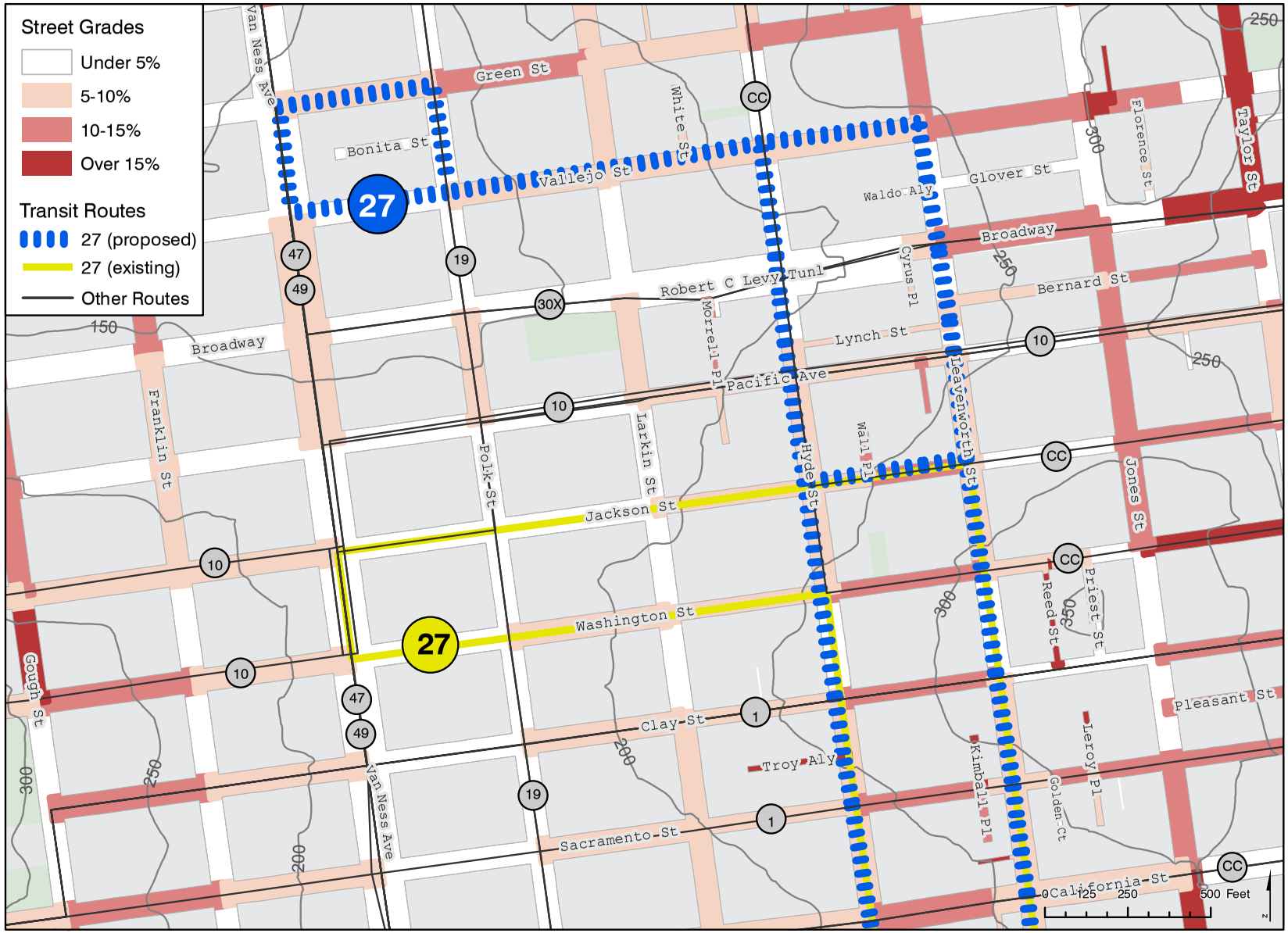
FIGURE E - 14 MISSION STOP CONSOLIDATION
TOPOGRAPHY – ALLISON STREET/MOUNT VERNON AVENUE TO ACTON STREET/SICKLES AVENUE



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

FIGURE F - 19 POLK ROUTE CHANGE
TOPOGRAPHY – POTRERO HILL AREA



SOURCE: San Francisco Planning Department; SFMTA

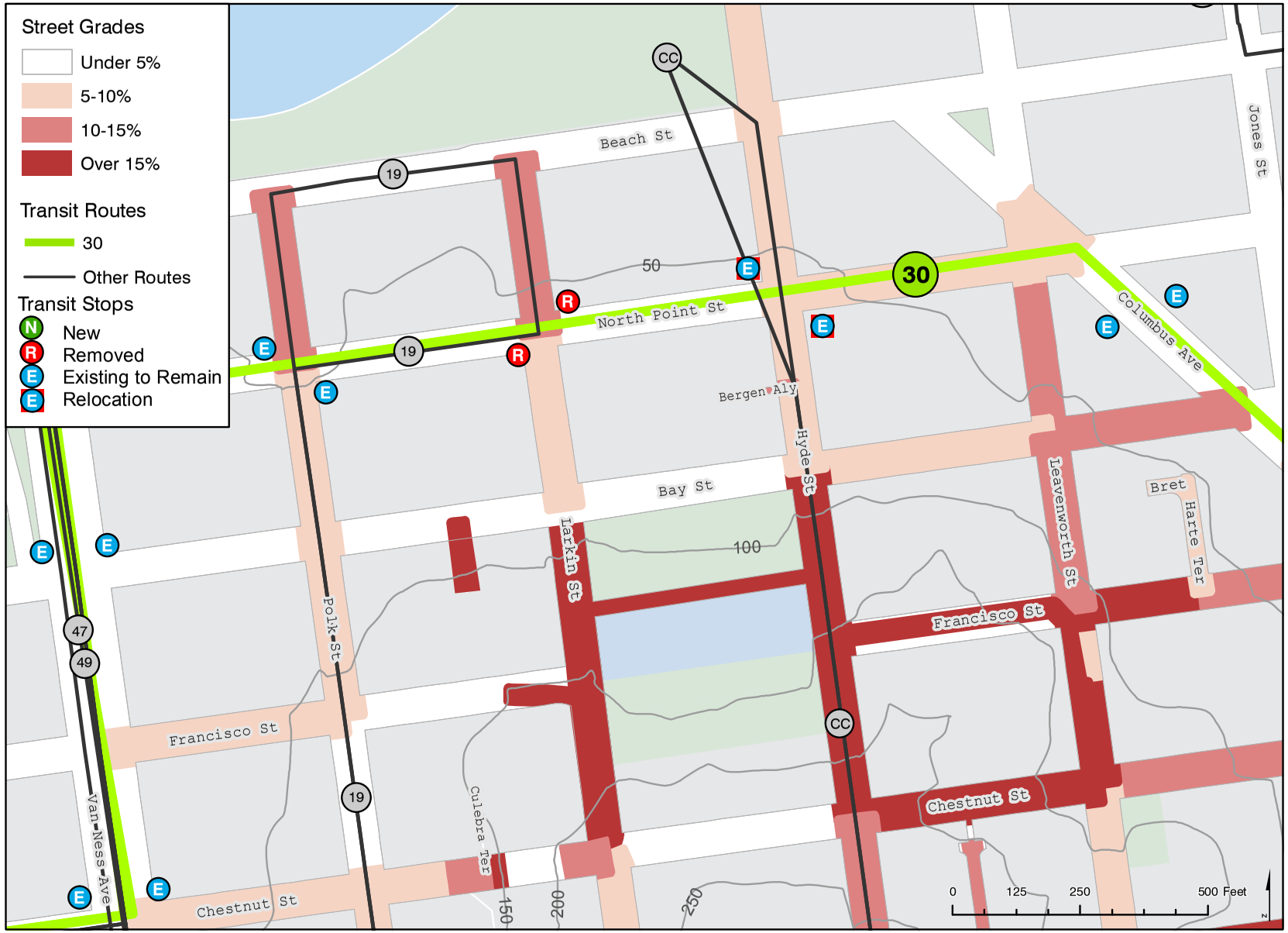
TRANSIT EFFECTIVENESS PROJECT

FIGURE G - 27 FOLSOM SEGMENTS TO BE ELIMINATED
TOPOGRAPHY – RUSSIAN HILL AREA, WASHINGTON AND JACKSON STREETS

SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

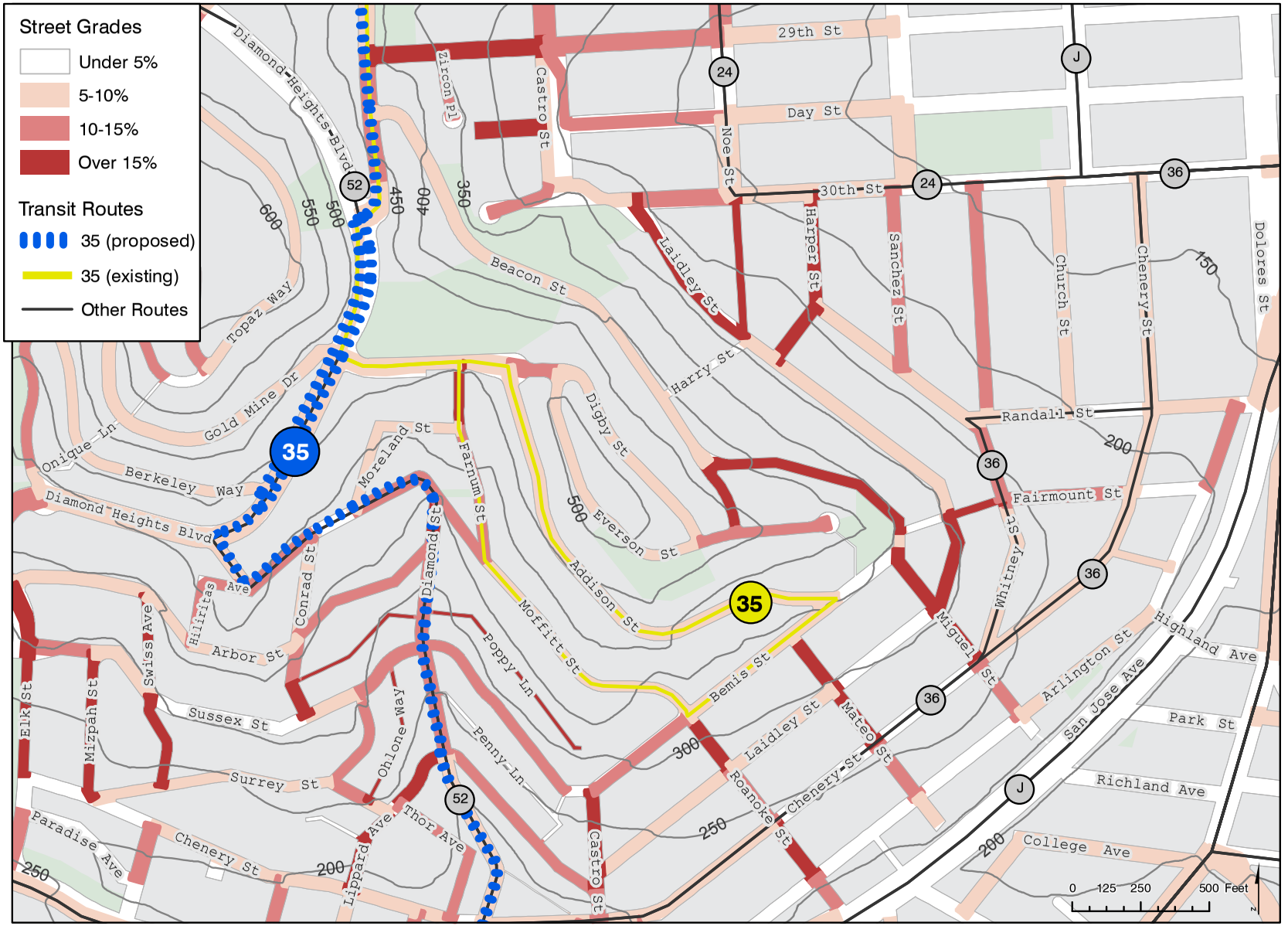
FIGURE H - 28 19TH AVENUE STOP CONSOLIDATION TOPOGRAPHY – JUDAH STREET TO NORIEGA STREET



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

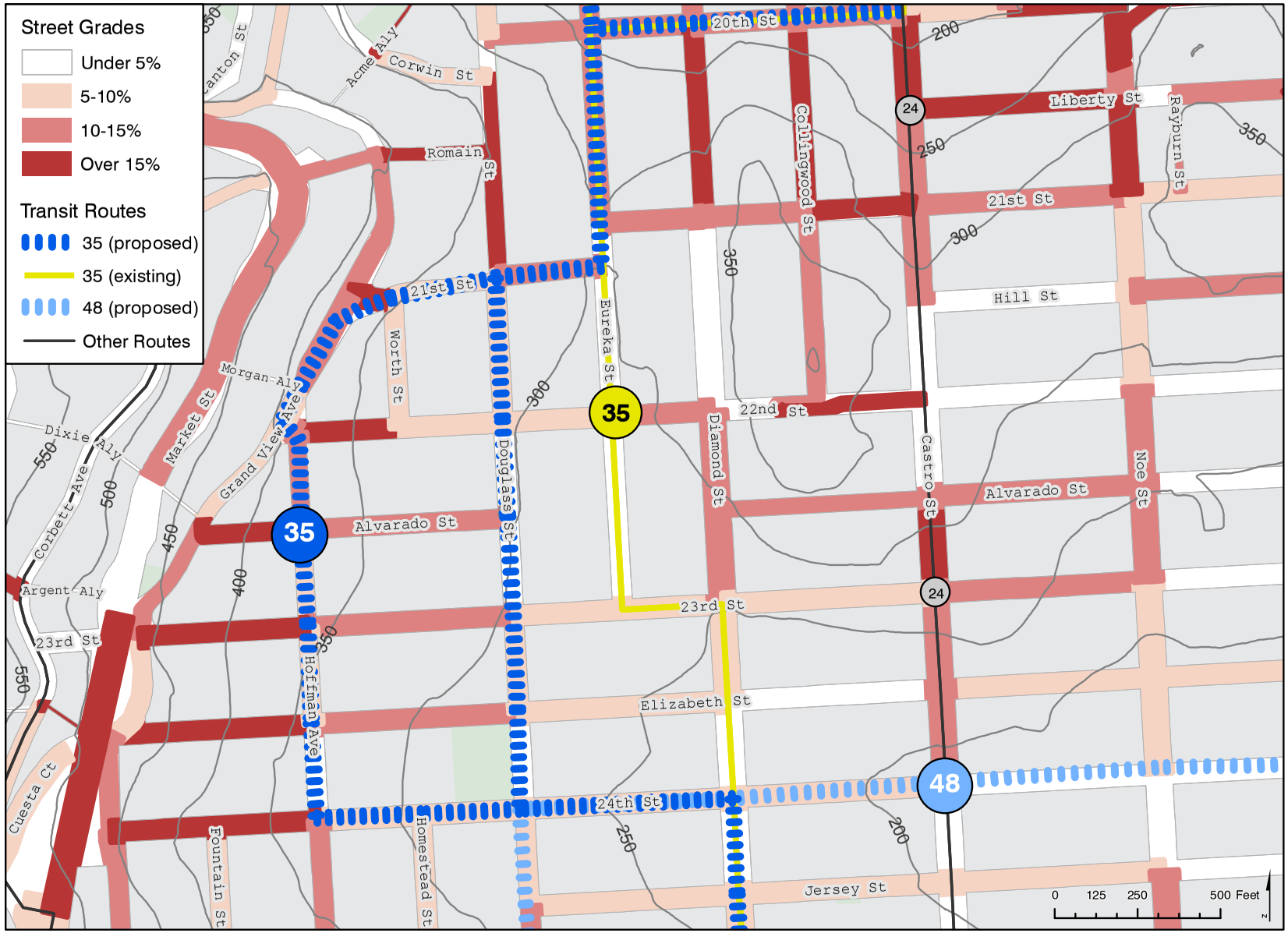
FIGURE I - 30 STOCKTON STOP CONSOLIDATION
TOPOGRAPHY – RUSSIAN HILL AREA ON NORTH POINT STREET
BETWEEN COLUMBUS AND VAN NESS AVENUES



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

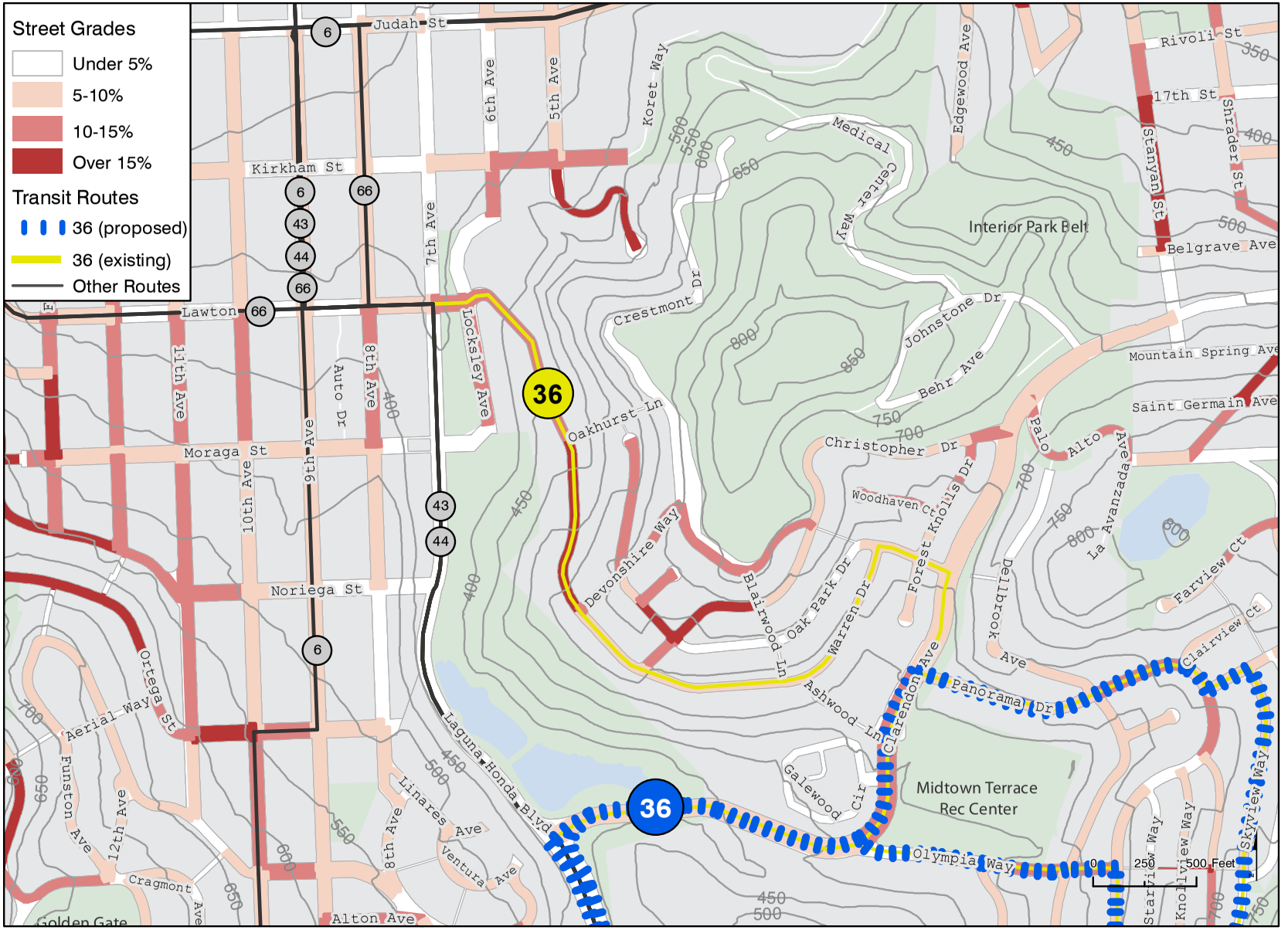
FIGURE J - 35 EUREKA SEGMENT TO BE ELIMINATED TOPOGRAPHY – DIAMOND HEIGHTS AREA ON DIGBY, FARNUM, MOFFIT, BEMIS, AND ADDISON STREETS



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

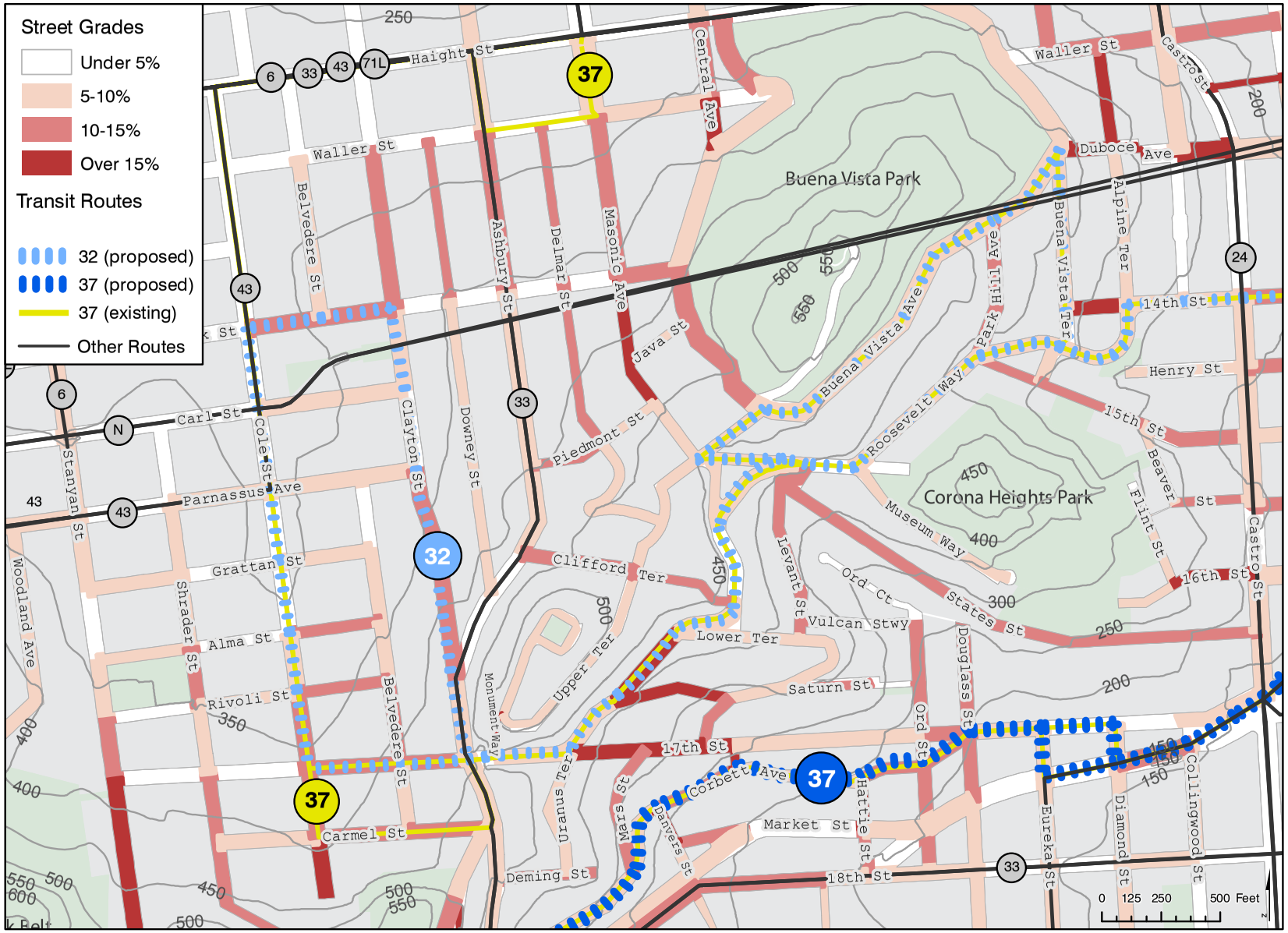
FIGURE K - 35 EUREKA SEGMENT TO BE ELIMINATED
TOPOGRAPHY – NOE VALLEY AREA, NOE STREET TO GRAND VIEW AVENUE



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

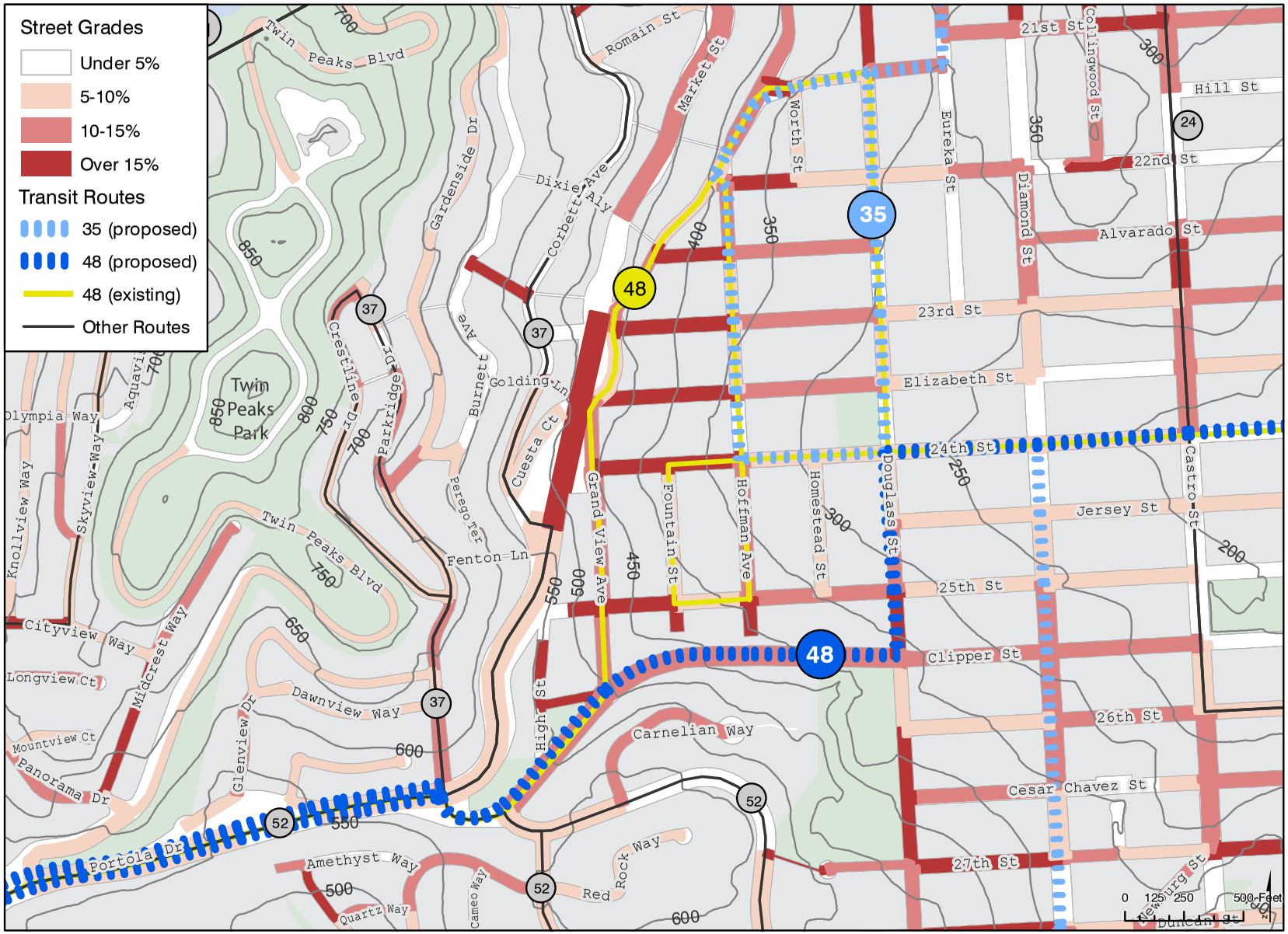
FIGURE L - 36 TERESITA SEGMENT TO BE ELIMINATED
TOPOGRAPHY – MIDTOWN TERRACE AREA, SEVENTH AVENUE AND WARREN DRIVE



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

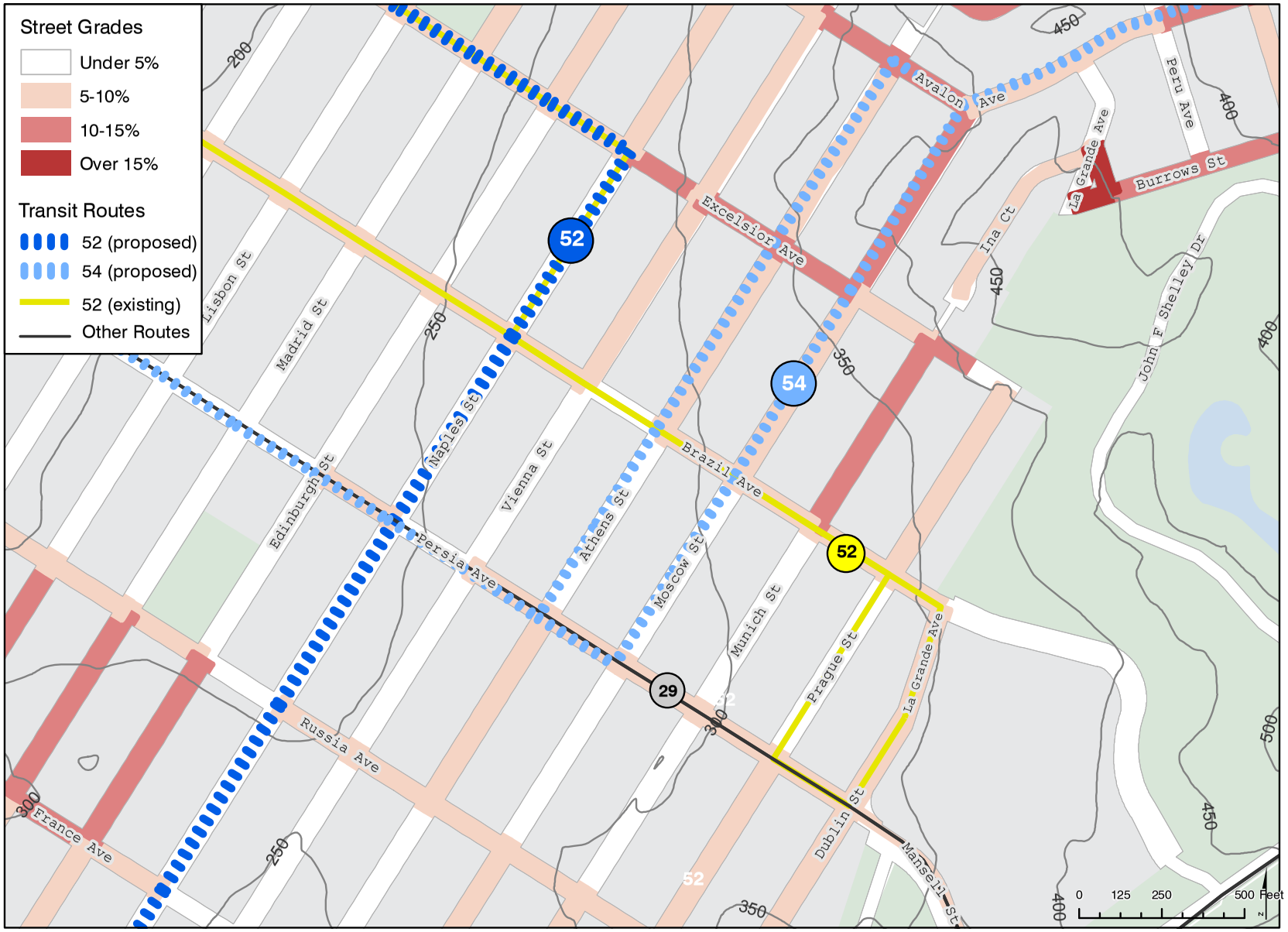
FIGURE M - 37 CORBETT SEGMENT TO BE ELIMINATED
TOPOGRAPHY – BUENA VISTA AREA



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

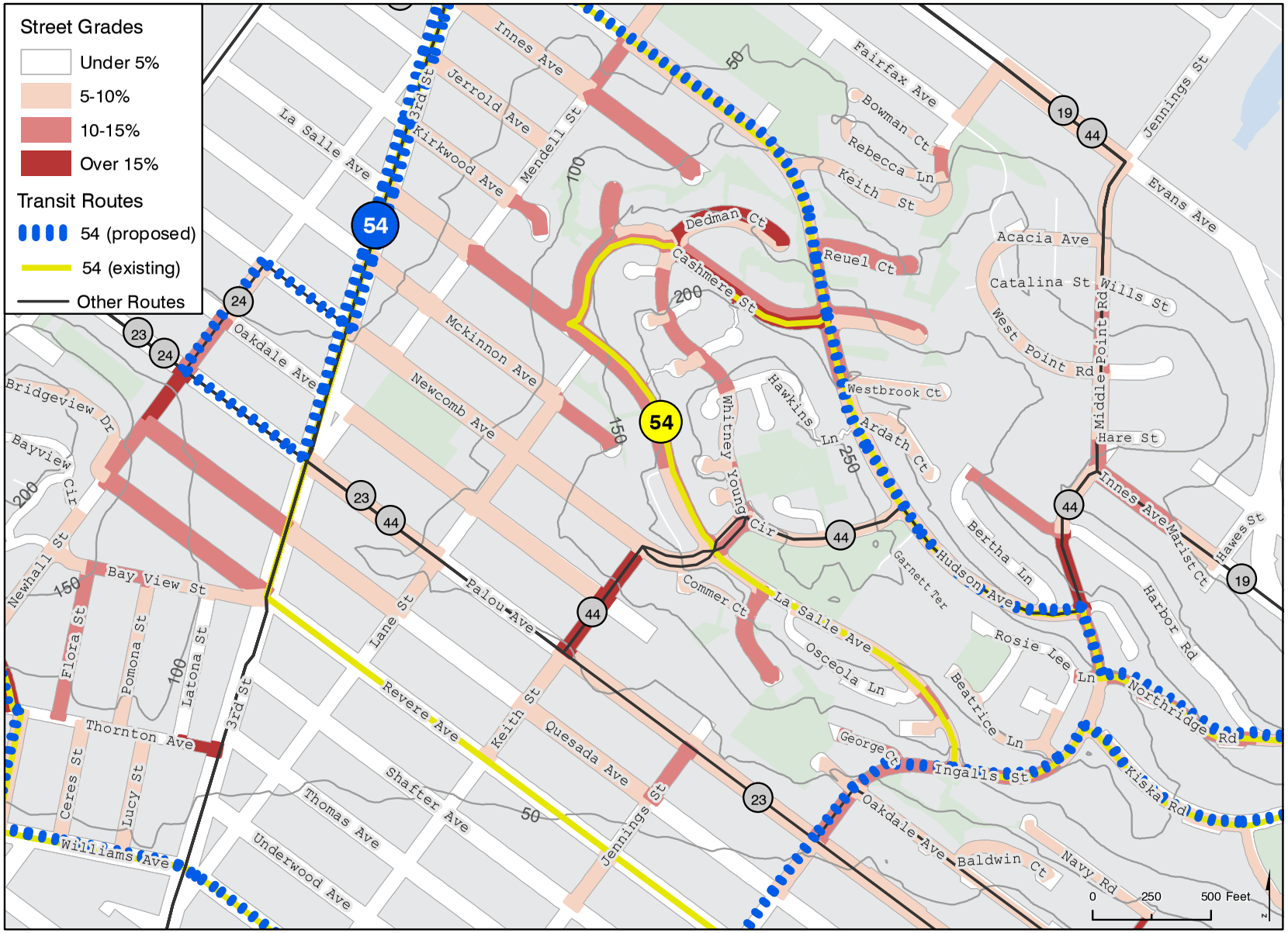
FIGURE N - 48 QUINTARA/24TH STREET SEGMENT TO BE ELIMINATED TOPOGRAPHY – GRAND VIEW AVENUE, 21ST STREET, DOUGLASS STREET, HOFFMAN AVENUE, 25TH STREET/FOUNTAIN STREET/24TH STREET LOOP



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

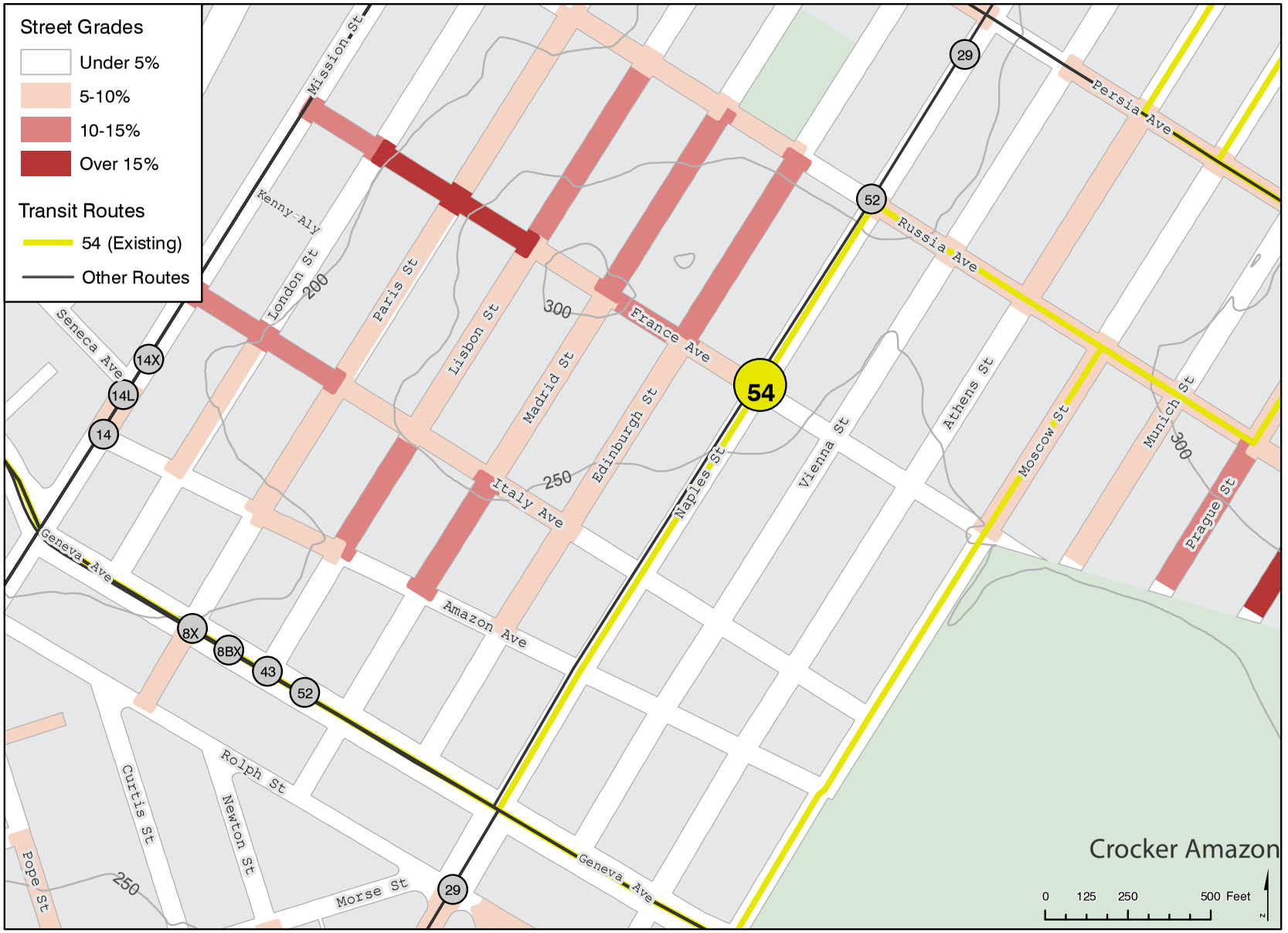
FIGURE O - 52 EXCELSIOR SEGMENTS TO BE ELIMINATED TOPOGRAPHY – BRAZIL AVENUE, LA GRANDE AVENUE, AND PRAGUE STREET



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

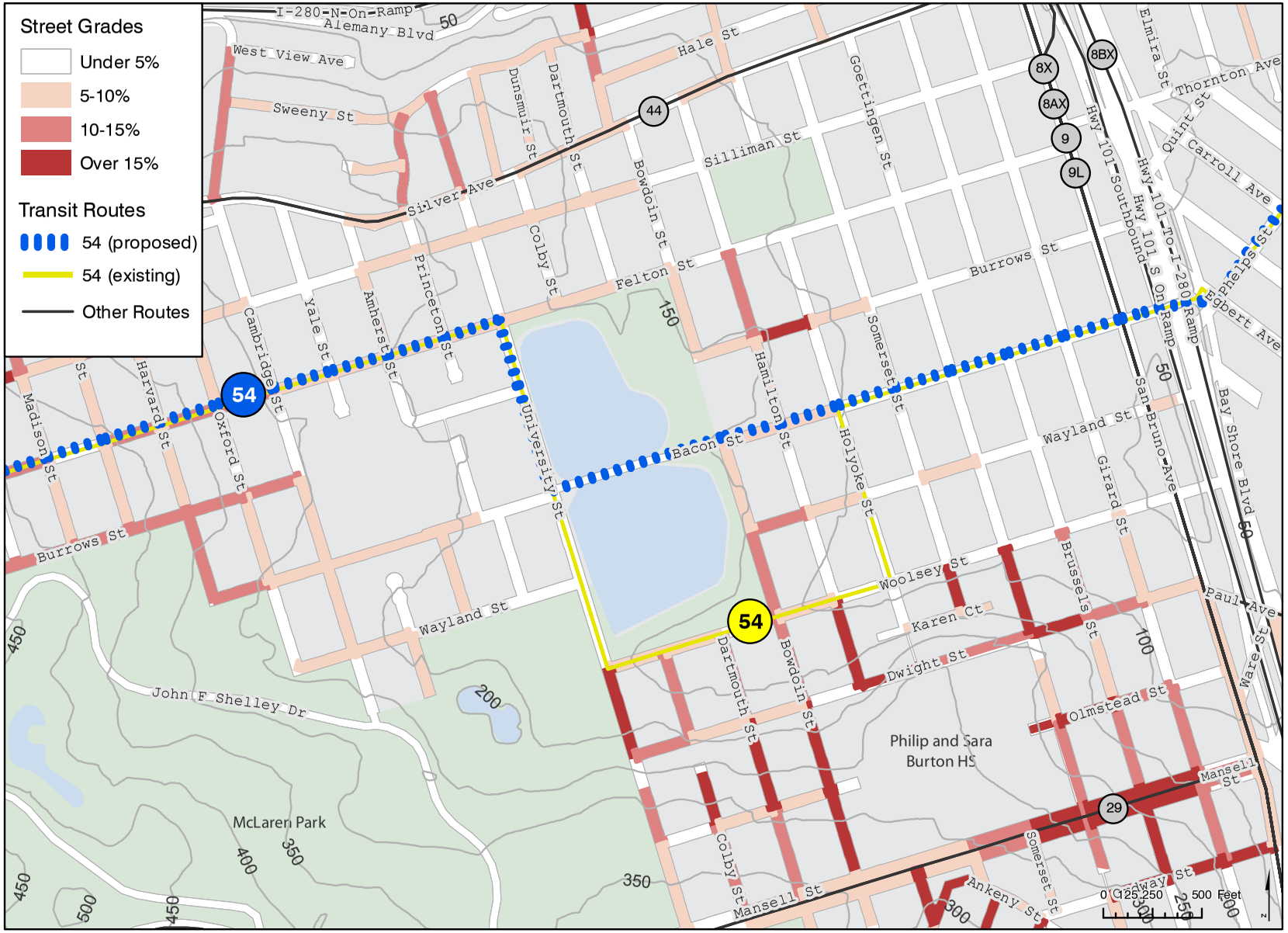
FIGURE P - 54 FELTON SEGMENT TO BE ELIMINATED TOPOGRAPHY – HUNTERS POINT AREA, LA SALLE AVENUE, CASHMERE STREET, AND REVERE AVENUE



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

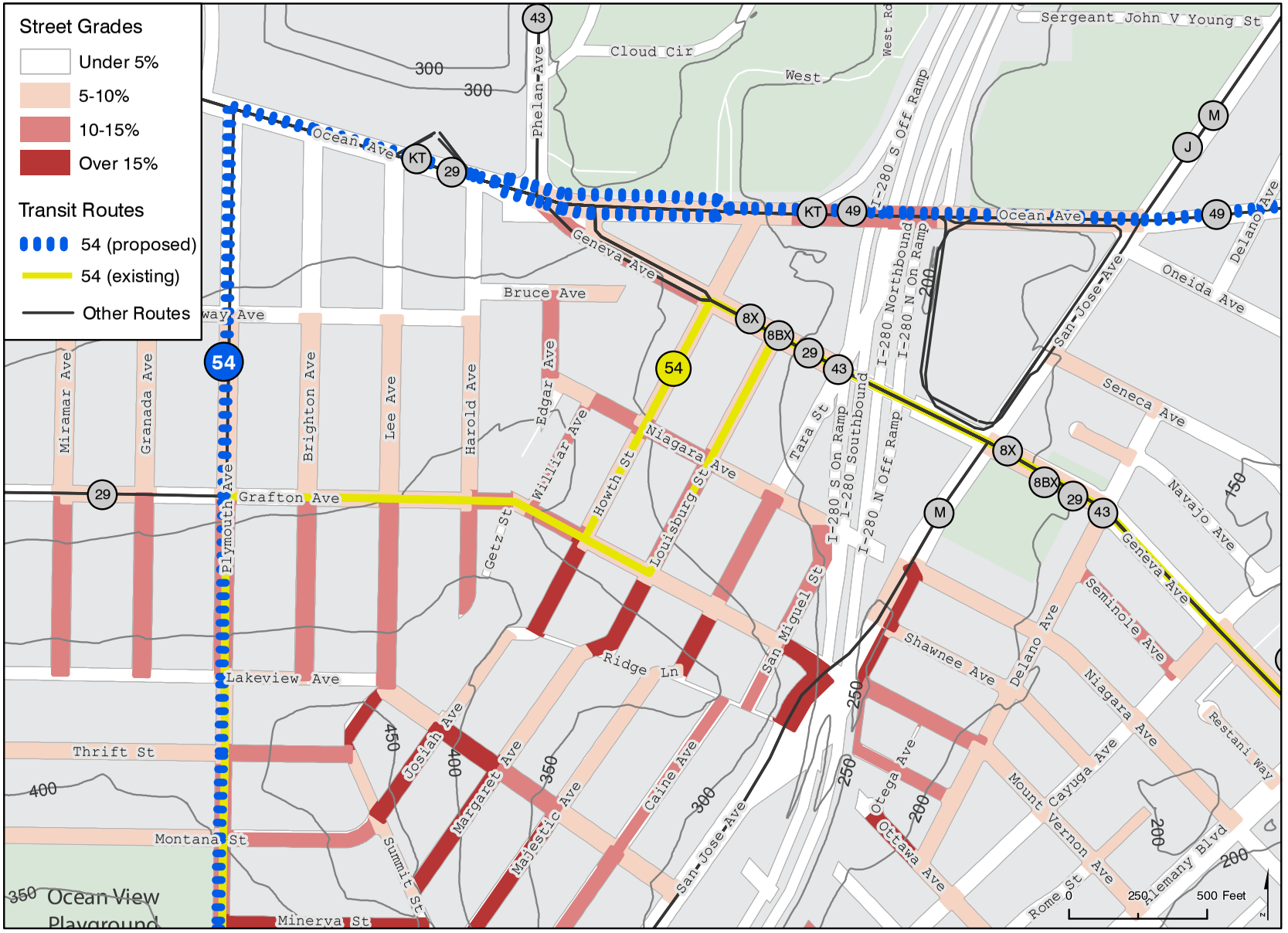
FIGURE Q - 54 FELTON SEGMENT TO BE ELIMINATED
TOPOGRAPHY – CROCKER AMAZON AREA, NAPLES AND MOSCOW STREETS



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

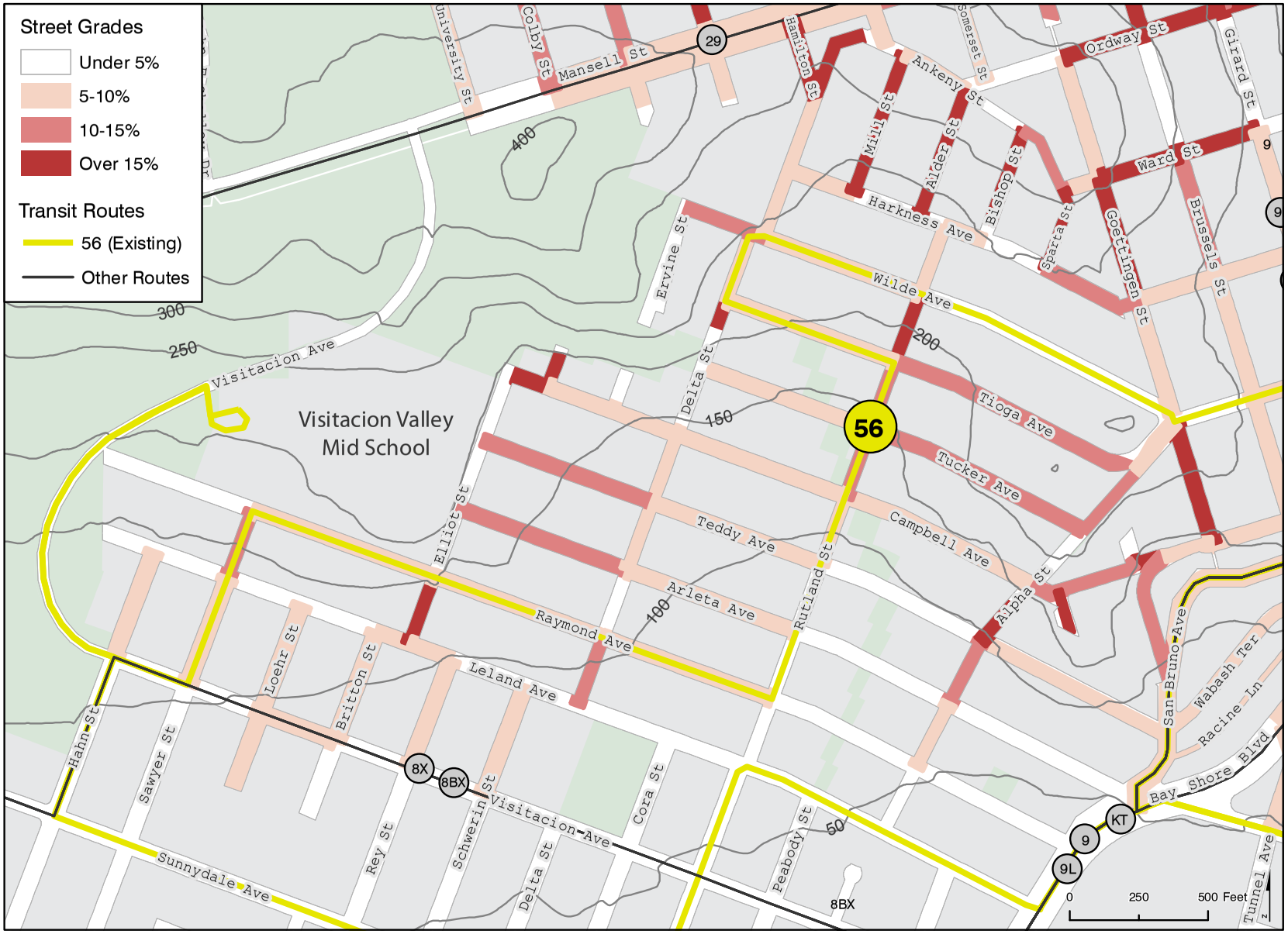
FIGURE R - 54 FELTON SEGMENT TO BE ELIMINATED
TOPOGRAPHY – UNIVERSITY MOUND AREA, HOLYOKE, WOOLSEY, AND UNIVERSITY STREETS



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

FIGURE S - 54 FELTON SEGMENT TO BE ELIMINATED
TOPOGRAPHY – BALBOA BART AREA, HOWTH STREET, LOUISBURG STREET, GRAFTON AVENUE



SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

FIGURE T - 56 RUTLAND SEGMENTS TO BE ELIMINATED TOPOGRAPHY – VISITACION VALLEY AREA

SOURCE: San Francisco Planning Department; SFMTA

TRANSIT EFFECTIVENESS PROJECT

FIGURE U - J CHURCH STOP REMOVAL TOPOGRAPHY – LIBERTY STREET