Water Quality Technical Report

VAN NESS AVENUE BUS RAPID TRANSIT

Prepared for

The San Francisco County Transportation Authority (SFCTA)
Federal Transit Administration (FTA)
San Francisco Municipal Transportation Agency (SFMTA)

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The following information was added to this technical report in June 2013:

- Appendix A: Locally Preferred Alternative Water Quality Impacts

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1. INTRODUCTION

1.1. Project Overview

The SFCTA, in cooperation with the Federal Transit Administration (FTA) and the San Francisco Municipal Transportation Agency (SFMTA), proposes to implement bus rapid transit (BRT) improvements along Van Ness Avenue in San Francisco. Figure 1-1 provides a regional location map. Van Ness Avenue is one of San Francisco's key north-south arterials that is also designated as US 101, connecting freeway entrances and exits to the south of the City with Lombard Street and the Golden Gate Bridge that provide access north of the City. Van Ness Avenue is a bustling six-lane arterial that carries a mix of cars, trucks, transit, pedestrians and bicycles. The proposed BRT would be implemented along a 2.2 mile stretch of Van Ness Avenue (including a one-block portion of South Van Ness Avenue) in San Francisco, from Mission Street at the south to North Point Street at the north. Figure 1-2 provides a map showing the project alignment. Project improvements would be confined largely within the right-of-way along Van Ness Avenue.

1.2. Proposed Project

Project improvements would be confined largely within the right-of-way along Van Ness Avenue.

Four alternatives have been defined for the proposed Van Ness Avenue BRT Project, including one no-build alternative and three build alternatives. All of the build alternatives include the following elements: a lane dedicated to transit (except for Alternative 2, which would be traversable for turning and parking mixed traffic; higher capacity bus vehicles; level boarding from curb to bus; replacement of Overhead Contact System (OCS) Poles/Street Lights; sidewalk extension, or bulbs, at corners; pedestrian safety, landscaping and streetscape improvements and amenities; access and lighting improvements; high-quality stops/stations; proof of payment/all door boarding/fare prepayment; and transportation system management (TSM) capabilities. These standard BRT features are described in greater detail below:

- *Dedicated Bus Lanes/BRT Transitway.* BRT buses would operate in an exclusive, dedicated bus lane on the street surface. One mixed traffic lane in each direction would be dedicated to BRT vehicles only (except for Alternative 2, which would allow shared use for right-turning traffic and parking. The bus lane would be distinguished from mixed traffic lanes by physical separation and/or colored pavement. To reduce conflicts with the bus lane, left turn opportunities for mixed traffic would be reduced in each direction and right-turn pockets would be introduced at some intersections. Bus lanes would accommodate both Muni and Golden Gate Transit vehicles,[1] and be available for use by emergency response vehicles.
- *Bus Vehicle.* The design vehicle for BRT service would be a low-floor vehicle that offers increased passenger capacity over the existing Muni 47 and 49 line buses.

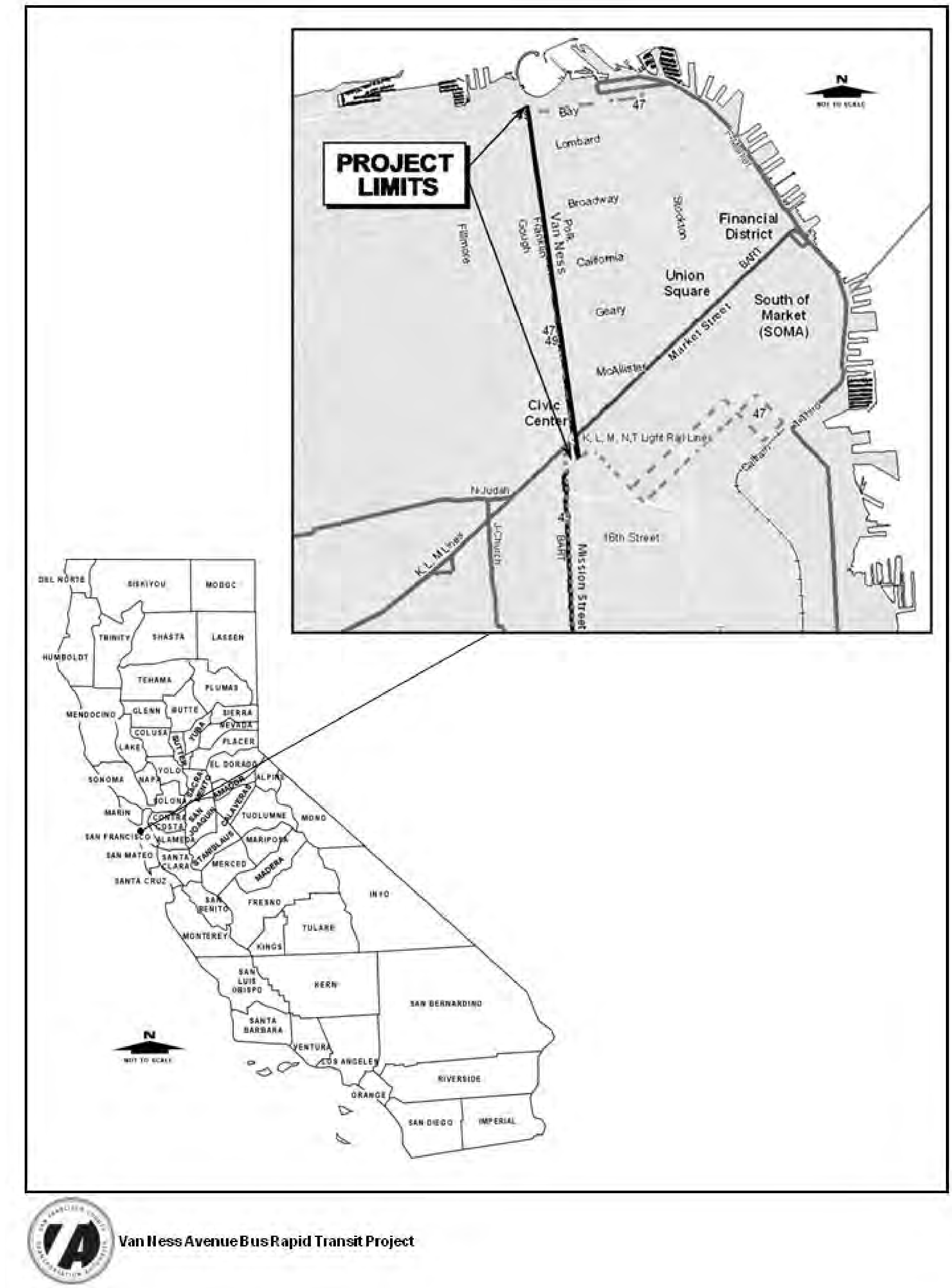

Figure 1.1 Regional Project Location Map

- *Level Boarding.* The BRT build alternatives would provide level boarding from curb to bus; a feature that is also included in the no-build alternative. Figure 3 (B) depicts level boarding.
- *High-Quality Stops/Stations.* Each BRT build alternative would provide fewer stop locations than existing bus service, intended to reduce dwell time delays. Station platforms would be upgraded,
- providing larger shelters and improved wayfinding and information. Stops/stations would be located on the far side of signalized intersections, as feasible, in order to take advantage of transit signal priority.
- *Streetscape Improvements and Amenities.* Each BRT build alternative would include pedestrian safety improvements (corner bulb-outs and median refuge upgrades), as well as enhanced landscaping. Proposed amenities include pedestrian-scale sidewalk lighting, pedestrian countdown and audible signals at all BRT stations, and improved landscaping that also serves to buffer pedestrians and waiting passengers from motor vehicle traffic. Additional pedestrian design guidelines include:
  - No restrictions on pedestrian crossings at intersection legs;
  - Maximum of four lanes between pedestrian refuges;
  - Minimum four-foot wide pedestrian refuge, which extends through the crosswalk.
- *Proof of Payment / All-door Boarding / Fare Prepayment.* SFMTA expects to implement all-door boarding on Van Ness Avenue in the future, allowing passengers with proof of payment, such as a Fast Pass, to board through any door.
- *Transit Signal Priority.* The BRT build alternatives would include transit signal priority, a feature that is also included in the no-build alternative.
- *Overhead Contact System Pole/Street Light Replacement.* The SFMTA, together with San Francisco Department of Public Works (DPW) and the Public Utilities Commission (PUC), would replace the street lights, which also function as support poles for MUNI’s Overhead Contact System (OCS). This construction would be coordinated as part of the build alternatives, and would include removal of existing poles and lights, and installation of new poles and lights. In most cases, the new poles would be installed approximately 100 feet apart.

Alternative 1: No-Build Alternative/Baseline/Transportation Systems Management (TSM) Alternative

Alternative 1, the no-build alternative, would not include a BRT service. Alternative 1 considers projected demographic and land use characteristics in addition to proposed Transportation Systems Management (TSM) capabilities improvements expected to be implemented independent of the Van Ness Avenue BRT Project by the near-term horizon year 2015, or long-range horizon year 2035. These transportation system improvements are planned to occur within the identified timeframes regardless of implementation of any proposed BRT build alternative. The transportation system improvements considered in Alternative 1 include the following:

- *SFgo (Traffic signal infrastructure for real time traffic management).* SFMTA plans to install a new fiber optic traffic signal communications network on Van Ness Avenue, that will allow traffic conditions to be monitored and adjusted in real time to actively manage operations and delays. SFgo will also implement transit signal priority, a technique to speed up bus services at signalized intersections. Buses signal their impending arrival at the intersection to receive green lights.

- *Low-floor Buses.* SFMTA is gradually converting its fleet to low-floor buses which will provide relatively level boarding and alighting. Low-floor buses would not require passengers to climb steps to board or exit buses, helping to shorten dwell times, especially for passengers in wheelchairs.
- *Sidewalk/Street Lighting Improvements.* The Department of Public Works (DPW) plans sidewalk landscaping improvements along Van Ness Avenue as part of the Van Ness Avenue Enhancements Project. Proposed streetscape improvements include removal of sign clutter, enhanced existing bus stops and street furniture, installation of planter boxes, decorative paving, pedestrian scale lighting, and new landscaping along Van Ness Avenue between Mission and McAllister Streets. Although these measures do not affect transit operations directly, these programs will make stops more convenient, safer and attractive and thereby contribute to increased transit use.
- *NextMuni Real Time Passenger Information.* SFMTA is installing real-time bus arrival information displays (NextMuni) at major stops with shelters along Van Ness Avenue.
- *Pavement Resurfacing*. Caltrans prepared a draft Capital Preventative Maintenance Project Report in 2008 to address pavement rehabilitation on Van Ness Avenue between Golden Gate Avenue and Lombard Street. This project is included in the 2007 Ten-Year SHOPP Plan for 2011/2012 FY and is a candidate for the 2010 State Highway Operation and Protection Program (SHOPP), but is not currently funded.

The aforementioned transportation system improvements are planned by local transportation agencies to occur by 2015, independent of the build alternatives proposed as part of the Van Ness Avenue BRT Project.

Alternative 2: Curb Lane BRT with Parallel Parking

Alternative 2 is a build alternative that would provide a dedicated bus lane in the rightmost lane of Van Ness Avenue in both the northbound and southbound directions, next to the existing lane of parallel parking. The bus lanes, though distinguished by colored pavement, would be traversable for mixed traffic, which would enter the bus

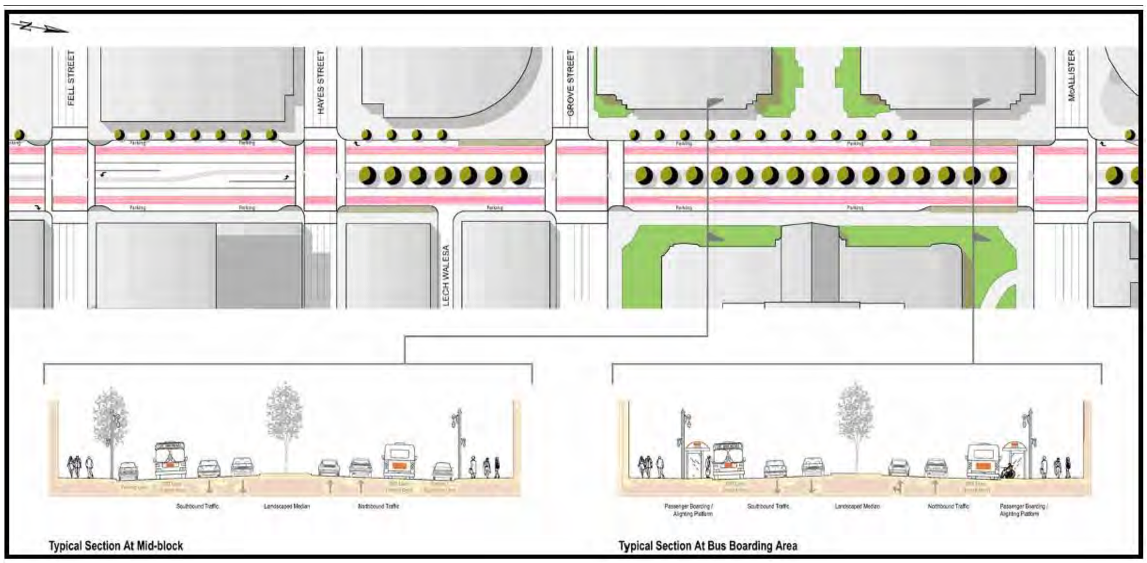

Figure 2.1 Preliminary Plan and Section View of Alternative 2

lanes to parallel park in the curb lane or make a right turn. BRT stations would be located within the parking strip as extensions to the sidewalk, eliminating the need for buses to pull out of the bus lane to pick up passengers. Under this alternative, the existing OCS support and power delivery system would remain in service, although the existing support poles and lights would be replaced.

Figure 2.1 provides a conceptual plan view and cross section view of Alternative 2 at sample location. The configuration shown would continue throughout the project alignment with little variation. The existing overhead contact support and power delivery system (OCS) would remain in service.

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

Alternative 3 is a build alternative that would convert the existing landscaped median and portions of the two inside traffic lanes, both northbound and southbound, to dedicated bus lanes separated from mixed traffic by dual landscaped medians. The medians would be approximately four feet to nine feet wide in many locations. Station platforms would be located on the right-side median, allowing right-side boarding.

Alternative 3 includes the following features of BRT previously described: dedicated bus lanes, higher capacity bus vehicles, level boarding, high-quality stops/stations, streetscape improvements and amenities, proof of payment/all door boarding/fare prepayment, and TSM capabilities. In addition, Alternative 3 would include OCS pole/street light replacement; additionally, this alternative would require relocation or replacement of the existing OCS support and power delivery system.

Figure 2.2 provides a conceptual plan view and cross section view of Build Alternative 2 at sample location. The configuration shown would continue throughout the project alignment with little variation. The existing overhead contact support and power delivery system (OCS) would remain in service.

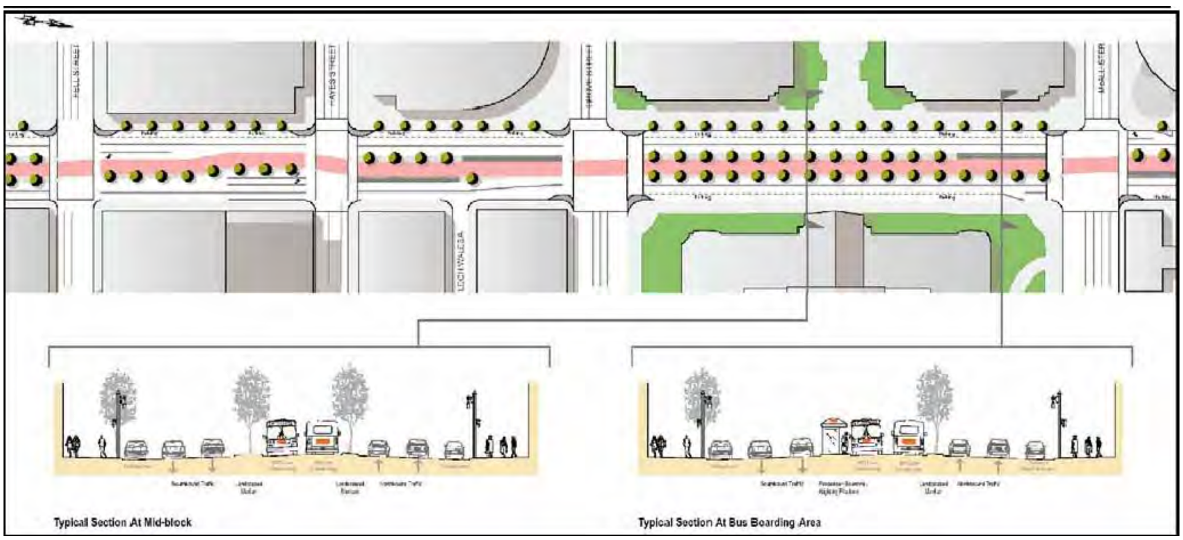

Figure 2.2 Preliminary Plan and Section of Alternative 3

Alternative 4: Center Lane BRT with Left-Side Boarding/Center Median

Alternative 4 would convert the inside lane of mixed traffic in each direction into a dedicated bus lane operating adjacent to the existing landscaped median. Station platforms would be located on the single center median, requiring left-side passenger loading and unloading. Bus vehicles serving this route would need doors on the left and right sides of the vehicle to allow service to both the left-side BRT platforms and right-side stops throughout the non-BRT portions of the routes.

Alternative 4 includes the following features of a BRT previously described in detail: dedicated bus lanes, higher capacity bus vehicles, level boarding, high-quality stops/stations, streetscape improvements and amenities, proof of payment/all door boarding/fare prepayment, and TSM capabilities. In addition, Alternative 4 would include OCS pole/street light replacement; additionally, this alternative would require relocation or replacement of the existing OCS support and power delivery system.

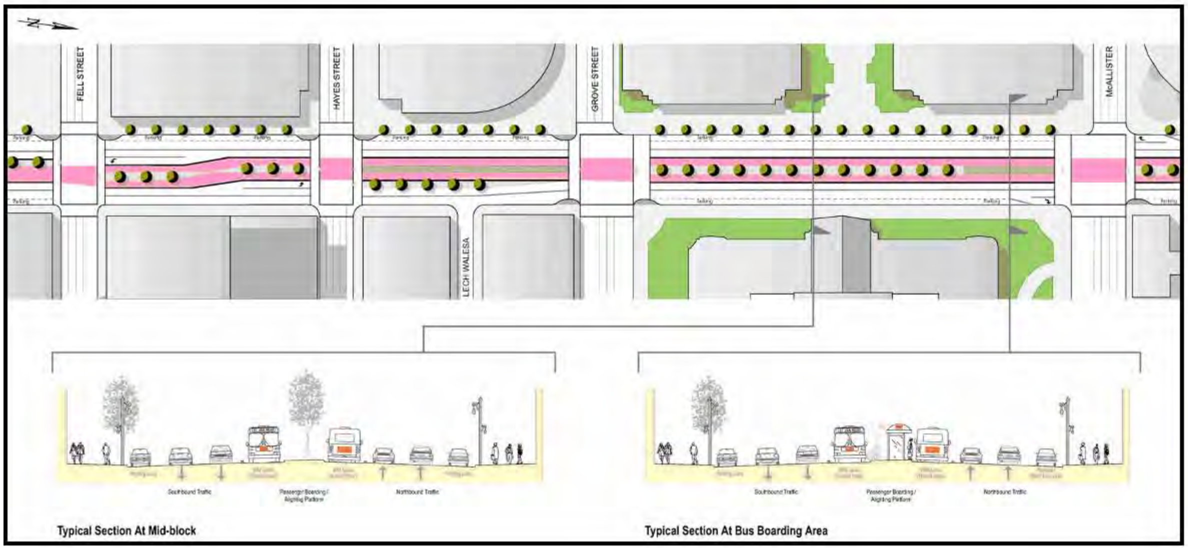

Figure 2.3 Preliminary Plan and Section for Alternative 4

1.3. Report Objective

The objectives of this Water Quality Technical Report are to describe existing water resources, to determine potential impacts to water resources from the construction and operation of the project, and to identify feasible impact reduction measures for the proposed project.

2. AFFECTED ENVIRONMENT

2.1. Topography

The terrain in the project area of San Francisco is characteristically hilly, consisting of a number of gently to moderately steep sloping ridgelines, or hills, and spur ridges ranging from an elevation of 200 feet up to over 900 feet, which are separated by small valleys or basins. The project alignment crosses near the low point of one of these east-west trending ridgelines, which connect Nob Hill to the east with Pacific Heights to the west. Further north, the project alignment crosses near the western toe of Russian Hill.

Local variations in slope reflect the drainage pattern. The valleys are typically filled by sediments, particularly by the irregular forms of alluvium and dune sands. To a lesser extent, the native topography has been altered by urban development, particularly by the grading and placement of fill materials to varying extents along the entire length of the project alignment.

2.1.1. Mission Street to McAllister Street

This 2,600-foot long segment of Van Ness Avenue, located between Mission and McAllister Streets, ascends a gradual southeasterly facing slope at a gradient of less than 2.5 percent. Ground elevations are approximately 40 feet above mean sea level at Mission Street, 55 feet at the Market Street intersection, and 76 feet at the McAllister Street intersection.

2.1.2. McAllister Street to Clay Street

The topography along this 4,490-foot segment is characterized by a gentle south-facing slope with a gradient of between 2.0 and 9.0 percent, reaching the crest of the hill near the California Street intersection. Between California Street and Clay Street, the gradient is nearly level (less than 1.5 percent). The maximum elevation of approximately 200 feet occurs at the Clay Street intersection.

2.1.3. Clay Street to Union Street

The topography along this 2,320-foot long segment is characterized by a north-facing slope with a gentle to moderate gradient of between 1 to 10 percent. The steepest slopes exist between the Pacific Street and Broadway Street intersections (9.9 percent), and between the Broadway and Vallejo Street intersections (7.4 percent). Elevations range from approximately 200 feet above sea level (ASL) at Clay Street to 100 feet ASL near the Union Street intersection.

2.1.4. Union Street to North Point Street

The topography along this 1,060-foot segment is characterized by nearly level ground with less than 1 percent slope between Union and Filbert Streets, a short south facing slope between Filbert and Greenwich Streets of 4.5 percent, and a short north facing slope between Greenwich and North Point Streets of 3 to 4 percent. Elevations range from 99 feet at both Filbert and North Point Streets to 110 feet at the Greenwich Street intersection.

2.2. Regional and Local Climate and Precipitation

The proposed project is located in the northwestern quadrant of the City and County of San Francisco, California. In general, City of San Francisco climate is mild during summer when temperatures tend to be in the 60's and cool during winter when temperatures tend to be in the 50's. The warmest month of the year is September with an average maximum temperature of 71 degrees Fahrenheit, while the coldest month of the year is January with an average minimum temperature of 46 degrees Fahrenheit. The annual average precipitation at San Francisco is 22 inches. Winter months tend to be wetter than summer months. The wettest month of the year is January with an average rainfall of 4.7 Inches. The "rainy season", as defined by the San Francisco Regional Water Quality Control Board (RWQCB), is from October 1st through May 1st.

2.3. Soil Report

The soil information is obtained by AGS, Inc. The subsurface soil conditions underlying the proposed project alignment were evaluated by reviewing available publications and geotechnical soils reports for buildings and structures in the project vicinity, typically less than 1,000 feet from Van Ness Avenue. These soils reports were obtained through the San Francisco Department of Building Inspections.

2.3.1. Mission Street to McAllister Street

This section consists of approximately 6 to 8 feet of loose- to medium-dense sandy fill material. Beneath the sandy fill soils, medium-dense to very-dense sand exists to a depth of 25 to 30 feet below the ground surface (bgs).

2.3.2. McAllister Street to Clay Street

Geophysical data from the site indicates average conditions across the site consist of loose fills soils to a depth of approximately 4 feet bgs, stiff soils and sand to a depth of approximately 10 feet bgs, and hard sediments deeper than approximately 14 -15 feet bgs.

2.3.3. Clay Street to Union Street

This section is characterized as having silty sand to a depth of approximately 23 to 24.5 feet bgs with a few lenses of gravel. Silty clay was found beneath the sand, which was described as medium-stiff to stiff.

2.3.4. Union Street to North Point Street

This section is characterized as having shallow rock formations (sandstone and shale) at a depth less than 5 feet bgs.

2.4. Surface Water Features

2.4.1. Beneficial Use

The project area drains via a system of storm drain lines to the Central San Francisco Bay. In accordance with the San Francisco RWQCB Basin Plan, the beneficial uses of the bay in this are include industrial service and process supply, commercial fishing, shellfish harvesting, estuarine habitat, fish migration, rare and endangered species

Figure 2.4 Watershed

habitat, fish spawning, wildlife habitat, recreation and navigation.

2.4.2. Watershed

The north part of the project area is located in the Central San Francisco Bay Watershed and the south part of the project area is located in San Bay Watershed as shown in Figure 2.4. In general, runoff flows through the City's drainage system which drains northerly and easterly to the Bay as shown in Figure 2.5. There are no significant streams within this portion of the watershed.

Figure 2.5 SF Sewer System

2.4.3. Existing Drainage Condition

The City and County of San Francisco collects the wastewater in a combined sewer system. According to Figure 2.5, the project site falls under the areas that uses combined sewer system. That is, the domestic sewage, industrial wastewater, and stormwater runoff are all collected in the same pipes (combined sewer). Such system is subject to overloading during severe storms. Most other communities in California have a separated sewer system: one set of pipes for domestic sewage and industrial wastes and another set for stormwater.

The drainage system in the City of San Francisco is a combined sewer system. The sewer system discharges through the North Shore transportation/storage structures with the help of pump stations to the North Point Wet Weather Facility (which operates only during rainstorms to treat flow from the northeastern section of the bay side) or to the Southeast Treatment Plant as shown in Figure 2.6. The waste water from the project site will be treated in the North Point Wet Weather Facility or Southeast

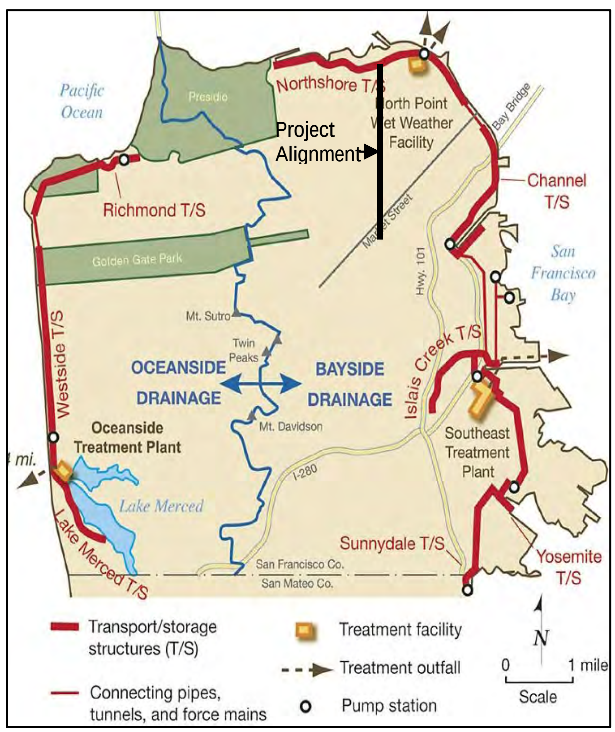

Figure 2.6 City Drainage Systems

Treatment Plant before discharging to the San Francisco Bay.

San Francisco is near completion of the primary components of its wastewater facilities master plan. This construction program began in 1974 with the publication of the Master Plan Environmental Impact Statement and Report. The integrated wastewater control system established by the master plan has been designed to provide control and treatment for both dry weather sewage and wet weather storm flows. All dry weather flows currently receive secondary level treatment. At program completion in 1996, all wet weather flows including stormwater runoff will be captured and will receive a specified level of treatment depending on the size of the storm. Pollutant removal from stormwater will be approximately 60 percent system-wide (measured as reduction in total suspended solids).

2.4.4. Surface Water Quality

The Southeast Water Pollution Control Plant is a major component of San Francisco's wastewater treatment system. The plant provides secondary level treatment for all dry weather domestic and industrial wastewater from the Bayside drainage area in San Francisco (approximately 75 percent of the total citywide flow). The Oceanside plant provides similar treatment on the Westside. The storage/transports around the periphery of the city store combined sewage for treatment after the storms subside. Additionally, northeast zone storm flows receive treatment at the Northpoint wet weather treatment plant. The treatment plans are shown in Figure 2.5.

The project site falls within the Central San Francisco Bay Basin. Table 2.1 lists the pollutant and potential sources of pollutants within the Central San Francisco Bay.

Table 2.1 303(d) List for Central San Francisco Bay

Pollutant Stressor	Potential Source	Current Status
Chlordane	Nonpoint Source	TMDL Required
DDT	Nonpoint Source	TMDL Required
Dieldrin	Nonpoint Source	TMDL Required
Dioxin Compounds	Atmospheric Deposition	TMDL Required
Exotic Species	Ballast Water	TMDL Required
Furan Compounds	Atmospheric Deposition	TMDL Required
Mercury	Atmospheric Deposition, Industrial Point Sources, Municipal Point Sources, Natural Sources, Nonpoint Source, Resource Extraction	Being Addressed by USEPA Approved TMDLs
PCBs (Polychlorinated biphenyls)	Unknown Nonpoint Source	TMDL Required
Selenium	Agriculture, Exotic Species, Industrial Point Sources, and Natural Sources	TMDL Required

2.5. Groundwater

2.5.1. Beneficial Use

The beneficial use of groundwater for the City of San Francisco includes municipal and domestic water supply, industrial water supply, industrial process supply, agricultural water supply, groundwater recharge, and freshwater replenishment to surface waters.

2.5.2. General Features

The north portion of the project site is located within Marina Groundwater Basin (2-39) and the south portion of the project site is located within Downtown San Francisco Basin (2-40), as shown in Figure 2.7. The Marina Groundwater Basin is the northernmost of seven small groundwater basins delineated on the San Francisco peninsula. The Marina groundwater basin is made up of shallow unconsolidated alluvium underlain by less permeable bedrock, and drains the area east and north of Nob Hill including most of the Presidio and Fort Point (the southern abutment of the Golden Gate Bridge). In general, groundwater flow is to the north following the topography. Groundwater recharge for the San Francisco area generally occurs from infiltration of rainfall and irrigation water, and from leakage of water and sewer pipes.

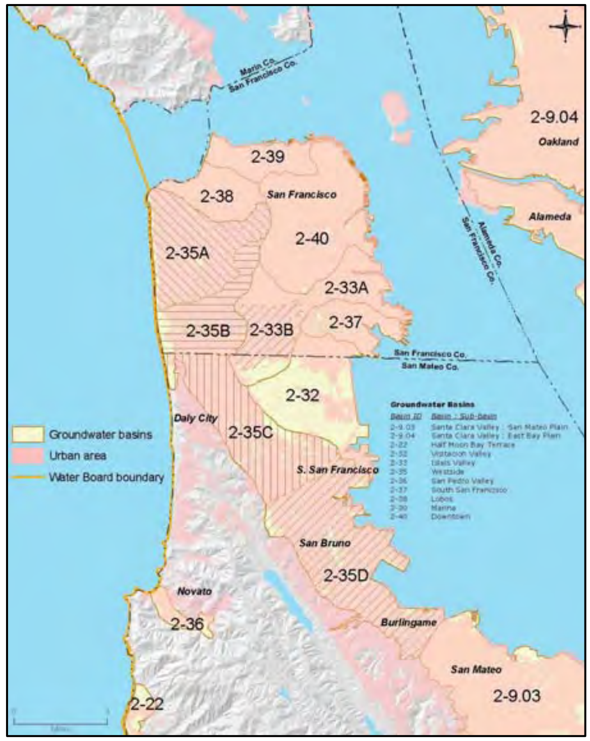

Figure 2.7 Groundwater Basin Map

The Downtown San Francisco groundwater basin is located on the northeastern portion of the San Francisco peninsula. The groundwater basin is made up of shallow unconsolidated alluvium underlain by less permeable bedrock within the watershed located east and northeast of the Twin Peaks area including Nob and Telegraph Hills to the north and Potrero Point to the east, as well as most of the downtown area. Bedrock outcrops along much of the ridge form the northeastern and southern basin boundaries. In general, groundwater flow is northeast, following the topography. Groundwater recharge to the groundwater basin occurs from infiltration of rainfall, landscape irrigation, and leakage of water and sewer pipes. Recharge to the Downtown San Francisco groundwater basin was estimated to be 5,900 ac-ft per year.

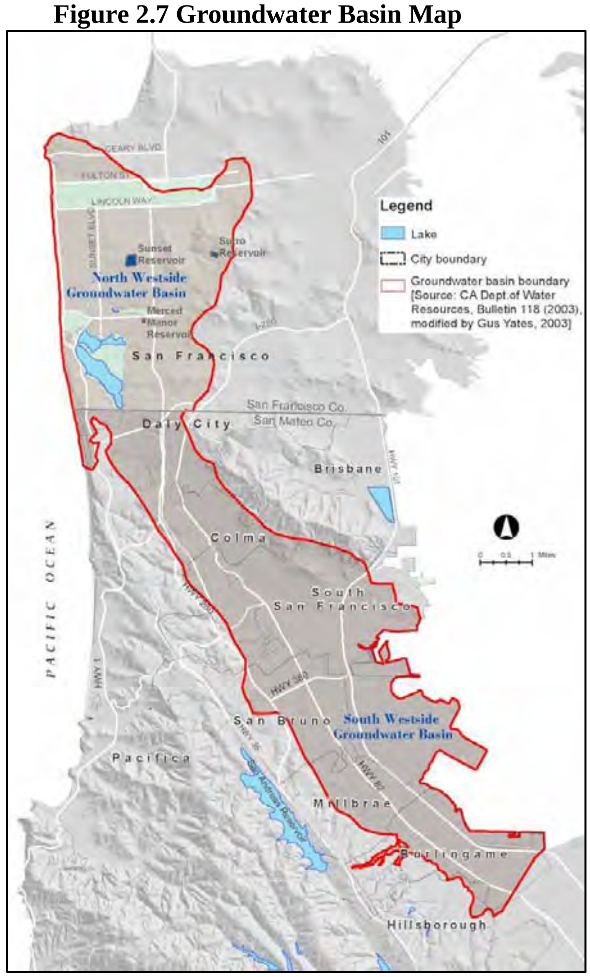

Figure 2.8 Westside Groundwater Aquifer

A proposed San Francisco Groundwater Supply Project would extract groundwater from the Westside Basin aquifer, which underlies Golden Gate Park and the Sunset District in San Francisco and extends southward through San Bruno. The Westside Basin, as shown in Figure 2.8 is 40 square miles in area and extends to a depth of up to 800 feet below the ground surface. About 25 square miles of the basin are within San Mateo County and 15 square miles within San Francisco. The cities of South San Francisco, Daly City, and San Bruno pump groundwater from the basin as an important part of their drinking water supply. Westside Basin wells typically draw water from depths of between 300 and 700 feet below the ground surface. Groundwater flow direction varies with the topography. The EDR GeocheckTM Report (2008) indicates groundwater flow in the vicinity of Mission and Market Street is to the east. On the south facing hillside north of the Civic Center the flow is generally to the south or southeast, and on the north facing hillside north of Clay Street, flow is generally to the northwest.

2.5.3. Site Specific Groundwater Information

None of the geologic formations along the project alignment are considered useful aquifers due to poor overall water quality and high concentrations of undesirable minerals. Geologic mapping indicates the groundwater table occurs less than 20 feet below the ground surface in most of the lower lying areas along the project alignment, where the ground elevation is less than approximately 150 feet above mean sea-level (Knudsen et. al., 2006).

From Mission Street to McAllister Street, groundwater was encountered at a depth of approximately 20 feet bgs. From McAllister Street to Clay Street, groundwater was not encountered when the groundwater was penetrated from 39 feet to the maximum depth explored of 50 feet bgs. From Clay Street to Union Street, groundwater was not encountered when six borings were drilled to as deep as 26.5 feet bgs. From Union Street to North Point Street, no major groundwater was encountered according to the Geotechnical Report prepared by AGS, Inc., dated June, 2009.

2.5.4. Groundwater Quality

In general, groundwater quality throughout most of the San Francisco region is suitable for most urban and agricultural uses with only local impairments. The primary constituents of concern are high TDS, nitrate, boron, and organic compounds. The areas of high TDS (and chloride) concentrations are typically found in the region’s groundwater basins that are situated close to the San Francisco Bay. Releases of fuel hydrocarbons from leaking underground storage tanks and spills/leaks of organic solvents at industrial sites have caused minor to significant groundwater impacts in many basins throughout the region. Methyl tertiary-butyl ether (MTBE) and chlorinated solvent releases to soil and groundwater continue to be problematic. Environmental oversight for many of these sites is performed either by local city and county enforcement agencies, the RWQCB, the Department of Toxic Substances Control, and/or the U.S. Environmental Protection Agency.

2.6. Wetlands

2.6.1. Beneficial Use

The beneficial uses of the wetlands of the San Francisco Bay include industrial water supply, commercial, estuary habitat, rare and endangered species habitat, spawning, wildlife, recreation and navigation.

2.6.2. Wetland Features

The closest wetland to the project area is the South San Francisco Bay. The wetlands closest to the project site are located at Belmont Slough, Foster City Lagoon and Bair Island, about 30 miles away from the project site as shown in Figure 2.9. The wetlands are categorized as Marshland.

2.7. Flooding

No major streams exist along the project alignment, and the project alignment is not mapped by the Federal Emergency Management Agency's (FEMA). As noted earlier, the project area is located within the City of San Francisco Combined Sewer System network. This network is sized for storm events less than the 100-year storm. Shallow flooding has been evident within some of the lower lying areas within the City during high storm events, though the area within the project site has not been subject to flooding in the past.

Figure 2.9 Wetlands Map

3. CONSTRUCTION-RELATED WATER QUALITY IMPACTS AND MITIGATION

In general, construction will include shallow ground disturbance, earthwork grading and soil excavation within the existing roadway median and sidewalk areas. The disturbed soil area is 4.4 acres for Alternative 2; 9.4 acres for Alternative 3; and 5.2 acres for Alt 4. The impacts related to such construction are minimal because the proposed project would require minimal earthwork and the area of soil to be disturbed is limited.

The deepest excavation work would be installation of signal poles, involving excavation of up to 16 feet bgs, in an area approximately 3 feet in diameter. Other deep excavation would include removal and replacement of the existing OCS poles, which would involve excavation of up to 13 feet bgs, in an area approximately 3 feet in diameter. Most excavation and other soil disturbance during project construction would occur within 5 feet bgs, and would involve construction of station platforms, controller cabinets, streetlights and signage, in addition to utility relocation and pavement work.

3.1. Alternative 2 Impact and Mitigation

Alternative 2 as shown in Figure 2.1 is a build alternative that would provide a dedicated bus lane in the rightmost lane of Van Ness Avenue in both the northbound and southbound directions, next to the existing lane of parallel parking. The bus lanes, though distinguished by colored pavement, would be traversable for mixed traffic, which would enter the bus lanes to parallel park in the curb lane or make a right turn. BRT stations would be located within the parking strip as extensions to the sidewalk, eliminating the need for buses to pull out of the bus lane to pick up passengers. Figure 3.1 illustrates both a typical plan view and cross-sectional view of Alternative 2 at a sample location. The configuration shown would continue throughout the project alignment with little variation. The existing overhead contact support and power delivery system (OCS) would remain in service. Under this alternative the improvements that will disturb soil include: 1) the proposed landscaping along Van Ness Avenue between Mission Street and Lombard Street; 2) placement of new stations; 3) placement of OCS and light poles, 4) pavement resurfacing; 5) the removal of existing curb bulbs; 6) the placement of new curb bulbs; and 7) trenching for utility relocations.

Note that replacement of the sewer will require coordination with the SFPUC.

3.1.1. Storm Water Mitigation

Impact: The potential impacts resulting from construction of Alternative 2 include:

1) Increases in suspended sediment and hydrocarbons which may potentially violate state and federal water quality standards. The potential for accidental spills of sediment, fuel, and other toxic materials may occur at any time during any construction period. The water quality impacts from spills could be short or long term depending on the type of material, size of the spill, and seasonal timing.

2) Shallow ground disturbance, earthwork grading and soil excavation, and placement of backfill soil during utility trenching, and demolition of existing portions of the pole foundations and putting in new pole foundations. These construction activities could produce waterborne sediment migration to or directly into the sewer/drainage system and/or offsite areas.

Mitigation: Construction related storm water impacts can be mitigated throughout the project site through: 1) the appropriate use of storm water best management practices including flow diversion devices, 2) drilling/ piling operations in accordance with guidelines set forth by local permitting requirements, 3) lining storage areas, and 4) proper and expeditious disposal of items to be removed such as landscaping, the curb bulb waste, the existing bus stop shelter, etc.

All exposed soil material should be covered and soil stockpiles generated during construction should be properly analyzed and characterized for possible contaminants before proceeding with off-site disposal and/or on-site reuse. All construction activities should prevent the creation of potential conduits that allow or facilitate direct vertical migration of near-surface soil contaminants into the underlying groundwater zone or otherwise enhance lateral migration of residual contaminants in the project area. During wet weather, runoff water should be prevented from entering the excavation, and collected and disposed of outside the construction limits. To prevent runoff from entering the excavation, a perimeter berm may be constructed at the top of the excavated area. The sidewalls of the excavation may be covered by plastic sheeting to prevent saturation of the earth material.

In addition, completion of a Storm Water Pollution Prevention Plan (SWPPP) for the National Pollutant Discharge Elimination System (NPDES) General Permit is required which will also help to identify and implement construction BMPs to reduce impacts on water quality. Coordination with the appropriate regulatory agencies will be necessary to ensure compliance with the appropriate local, state, and federal standards. The SWPPP will address water quality impacts associated with construction activities, including non-storm water controls. Detailed specific mitigation measures for construction activities will be needed once the project is in the design phase.

3.1.2. Groundwater Mitigation

Estimated excavation depths along the proposed alignment are listed in Table 3.1. As shown, the majority of excavation will be relatively shallow. Again, the deepest excavations would most likely be at the locations where the signal poles are proposed at the intersection, where excavation would be as deep as 16 bgs.

Table 3.1 ANTICIPATED CONSTRUCTION DEPTHS

Construction Item	Limits	Maximum Depth
OCS Pole Replacement	Within Sidewalk, project limits; 3 ft dia	11 ft
Street Light Replacement	Within Sidewalk, project limits; 3 ft x 3 ft or 2.5 ft dia	5.5 ft
OCS Conduit Trench	Within Sidewalk, project limits; 2 ft wide	3 ft
Signal Poles	Intersection areas; 3 ft dia	16 ft
Controller cabinets	Intersection areas; 2.5 x 4 ft	3 ft
Curb Bulbs & Sidewalk Reconstruction	Various intersections per Alternatives Plans, project limits	1.5 ft
Pavement Rehabilitation	Outside lane under Alt 2 or Inside lane under Alt 4, project limits	0.7 ft
Pavement Reconstruction	Outside lane under Alt 2 or Inside lane under Alt 4, project limits	1.5 ft
New Pavement	Within median throughout Project Limits under Alt 3	3 ft

Utility Relocation (sewer)	Relocate/replace under Alt 3; relocate outside platform locations under Alt 4	11 ft
Station Platform	Platform Locations; 9-14 ft wide by 150 ft long	1 ft
Station Canopy Foundation	Platform Locations; assume 2.5 ft dia	5 ft
Median Island Landscaping	New or changed median islands	2 ft

As described previously, groundwater was not encountered within 16 feet below ground surface for the entirety of the alignment. Therefore, no groundwater impact is anticipated to occur, and no mitigation will be required.

3.2. Alternative 3 General Construction Impacts

In Alternative 3, as shown in Figure 2.2, the improvements that will disturb soil include: 1) the proposed landscaping along Van Ness Avenue between Mission Street and Lombard Street; 2) placement of new stations; 3) placement of lighting poles; 4) the pavement resurfacing; 5) the removal of existing curb bulbs; 6) the placement of new curb bulbs;7) removal of the median and existing pavement within the center two lanes and associated modification to the drainage system; and 8) relocation or replacement of an 11-ft deep sewer running down the center of the road, and trenching for other utility relocations.

In general, the impact and mitigation would be the same as in Alternative 2. Note that replacement of the sewer will require coordination with the SFPUC.

3.3. Alternative 4 General Construction Impacts

In Alternative 4, as shown in Figure 2.3, the improvements that will disturb soil include: 1) the proposed landscaping along Van Ness Avenue between Mission Street and Lombard Street; 2) placement of new stations; 3) placement of lighting poles; 4) the pavement resurfacing; 5) the removal of existing curb bulbs; 6) the placement of new curb bulbs; and 7) relocation or replacement of the 11-ft deep sewer at station locations, and trenching for other utility relocations. The impacts and mitigation are the same as in Alternative 2.

3.4. No-Build Alternative/Baseline/Transportation Systems Management (TSM) Alternative

The No-Build Alternative includes: 1) installation of new fiber optic traffic signal communications network; 2) converting the fleet to low-floor buses which will provide relatively level boarding and alighting; 3) removal of sign clutter, enhanced existing bus stops and street furniture, installation of planter boxes, decorative paving, pedestrian scale lighting, and new landscaping along Van Ness Avenue between Mission and McAllister Streets; 4) installing real-time bus arrival information displays (NextMuni); and 5) pavement resurfacing. The improvements that will disturb soil include: 1) the placement of new landscaping along Van Ness Avenue between Mission and McAllister Streets; 2) placement of OCS/light poles; and 3) the pavement resurfacing. Although this is much more limited in scope, the general construction-related impacts and mitigation are the same as those discussed for Alternative 2.

4. PERMANENT WATER QUALITY IMPACTS AND MITIGATION

4.1. Alternative 2 Impacts and Mitigation

4.1.1. Surface Water Impact and Mitigation

The total project area is 31.2 acres. In Alternative 2, the total disturbed soil area is approximately 4.4 acres, where the proposed impervious area is 3 acres, and the proposed landscaping (pervious area) is 1.4 acres, creating 0.7 acre more landscaping than in existing condition. The existing impervious area is 30.5 acres, and the existing landscaping is 0.7 acres. After the construction is complete, the impervious area will be 29.8 acres, and the pervious area will be 1.4 acres. Since there is no net increase in impervious area, the proposed improvements will not adversely impact the flow rate entering the existing drainage/sewer system.

Impact: The daily operation and maintenance of the BRT will not increase surface water runoff to the combined sewer/drainage system. Impacts that could result from BRT operations include potential impacts on water quality from non-point source pollution, urban runoff. The non-point source pollution may contain a slight increase in suspended solids, organic and inorganic compounds, oils and grease, and miscellaneous waste from the roadways, bus station, and landscaping. This would ultimately enter the combined sewer/drainage system which ultimately drains to the South San Francisco Bay after treatment.

Mitigation: Pollutants from stations can be treated like those detected in runoff from roads and other impervious surfaces. Stations should be equipped with trash receptacles to minimize the miscellaneous waste that may enter the storm drain system. The runoff that may contain slightly elevated concentrations of contaminants discussed previously will discharge to the closest drain inlet and be conveyed into the combined sewer/drainage system. This runoff ultimately drains to outfalls near the bay where the combined sewer/ drainage water is treated (see Figure 2.2) before discharging to the San Francisco Bay. In this way, the water quality entering the receiving water body (the Central San Francisco Bay) will not be degraded.

Impact: Increased use of herbicides and fertilizers from station landscaping could increase levels of nutrients and pesticides in the surface water runoff that is conveyed to the combined sewer/drainage system.

Mitigation: The runoff that may contain slightly elevated concentrations of nutrients and pesticides discussed previously will discharge to the closest drain inlet and be conveyed into the combined sewer/drainage system. This runoff ultimately drains to outfalls near the bay where the combined sewer/ drainage water is treated (see Figure 2.2) before discharging to the San Francisco Bay. In this way, the water quality entering the receiving water body (the Central San Francisco Bay) will not be degraded.

4.1.2. Groundwater Impact and Mitigation

Impact: The project site is located near commercial and residential neighborhoods. Runoff will collect the storm water pollutants from the surrounding area, which could ultimately infiltrate under ground and impact any shallow groundwater aquifers.

Mitigation: The project will include measures to prevent runoff containing potential contaminants from being conveyed directly to pervious surfaces, which could lead to infiltration into the underlying groundwater regime. Instead, runoff will be conveyed directly to the confined sewer/drainage system via impervious curb and gutter. This runoff will ultimately be treated before discharging to the San Francisco Bay.

4.2. Alternative 3 Impacts and Mitigation

The total project area is 31.2 acres. In Alternative 3, the total disturbed soil area is approximately 9.4 acres, where the proposed impervious area is 8.3 acres, and the proposed landscaping (pervious area) is 1.1 acres, creating 0.4 acre more landscaping than in existing condition. The existing impervious area is 30.5 acres, and the existing landscaping is 0.7 acres. After the construction is complete, the impervious area will be 30.1 acres, and the pervious area will be 1.1 acres. Since there is no net increase in impervious area, the proposed improvements will not adversely impact the flow rate entering the existing drainage/sewer system.

4.3. Alternative 4 Impacts and Mitigation

The total project area is 31.2 acres. In Alternative 4, the total disturbed soil area is approximately 5.2 acres, where the proposed impervious area is 4.0 acres, and the proposed landscaping (pervious area) is 1.2 acres, creating 0.5 acre more landscaping than in existing condition. The existing impervious area is 4.5 acres, and the existing landscaping is 0.7 acres. After the construction is complete, the impervious area will be 30 acres, and the pervious area will be 1.2 acres. Since there is no net increase in impervious area, the proposed improvements will not adversely impact the flow rate entering the existing drainage/sewer system.

5. APPLICABLE REGULATIONS, PLANS, AND POLICIES

Regulatory agency descriptions, permits and approvals that may apply to the construction activities within or adjacent to water resources are described in this section.

5.1 Federal

U.S. Environmental Protection Agency (USEPA)

The primary federal law governing water quality is the Clean Water Act (CWA) of 1972. This Act provides for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. The CWA emphasizes technology-based (end-of-pipe) control strategies and requires discharge permits to allow use public resources for waste discharge. The Act also limits the amount of pollutants that may be discharged and requires wastewater to be treated with the best treatment technology economically achievable regardless of receiving water conditions. The control of pollutant discharges is established through NPDES permits that contain effluent limitations and standards.

The 1987 amendments to the Clean Water Act included Section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges. The amendment also provides a framework for regulating storm water runoff from construction sites. On November 16, 1990, the USEPA published final regulations that established requirements for storm water permits.

In 1998, Section 303(d) was amended to the CWA, requiring the state to identify and maintain a list of water bodies that do not meet water quality objectives through the control of point source discharges under NPDES permits. For these water bodies, states are required to develop appropriate Total Maximum Daily Loads (TMDLs). TMDLs are the sum of the individual pollutant load allocations for point sources, nonpoint sources and natural background conditions, with an appropriate margin of safety for a designated water body. The TMDLs are established based upon a quantitative assessment of water quality problems, the contributing sources, and load reductions or control actions needed to restore and protect an individual water body (USEPA, 2000). As opposed to the NPDES programs, which focus on reducing or eliminating non-storm water discharges and reducing the discharge of pollutants to the maximum extent practicable, TMDLs provide an analytical basis for planning and implementing pollution controls, land management practices, and restoration projects needed to protect water quality. TMDLs and 303(d) listed impairments of the receiving water bodies in this area have been provided in this report.

Federal Emergency Management Agency (FEMA)
A Floodplain Evaluation is required as described under the National Flood Insurance Program (23 CFR 650, Subpart A Section 650). Section 650.111 of the regulations call for location hydraulic studies to be performed with detailed engineering design drawings if construction occurs within a floodplain or floodway. As noted earlier, no major streams exist along the alignment of the proposed project and the project site is not mapped by the Federal Emergency Management Agency's (FEMA). Since there are no designated flood hazard areas within the site, location hydraulic studies should not be required.

U.S. Army Corps of Engineers (ACOE)
The ACOE issues Clean Water Act Section 404 permits for discharges to waters of the United States and dredging and fill projects in navigable waters, incorporating conditions of its nationwide permits. Since no major streams exist along the alignment and no work is proposed that will require fill within waters of the U.S., there should be no need to obtain a Section 404 permit for this project.

5.2 State

State Water Resources Control Board (SWRCB)
The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) is the basic water quality control law for California. The Act authorizes the state to implement the provisions of the Clean Water Act. The Porter-Cologne Act establishes a regulatory program to protect the water quality of the state and the beneficial uses of state waters. Under this act, the SWRCB provides policy guidance and review for the RWQCBs, and the RWQCBs implement and enforce the provisions of the Act. The San Francisco

RWQCB developed the Water Quality Control Plan (Basin Plan) dated January 18, 2007. The Basin Plan is intended to help preserve and enhance water quality and to protect the beneficial uses of state waters.

Establishment of the NPDES regulations in 1987, under Section 402(p) of the Clean Water Act, required that the USEPA delegate the responsibility of the NPDES program to the State. The SWRCB was given the responsibility to enforce the regulations of the NPDES program and did so in the form of the NPDES Permit for General Construction Activities (Order No. 99-08-DWQ), adopted in 1992 and amended in August of 1999 and 2001. On December 2, 2002, the SWRCB approved the “Modification of Water Quality Order 99-08-DWQ State Water Resources Control Board (SWRCB) NPDES General Permit for Construction Activity (One to Five Acres).” The Permit requires that all owners of land within the State with construction activities resulting in more than 0.4 hectares (1 acre) of soil disturbance (clearing, grubbing, grading, trenching, stockpile, utility relocation, temporary haul roads, etc.), comply with the General Permit. A Notice of Intent (NOI) to construct must be filed with the RWQCB at least 30 days prior to any soil-disturbing activities. The purpose of the Permit is to ensure that the land owners: 1) eliminate or reduce non-storm water discharges to storm drains and receiving waters; 2) develop and implement a Storm Water Pollution Prevention Plan (SWPPP); 3) inspect the Water Pollution Controls specified in the SWPPP; and 4) monitor storm water runoff from construction sites to ensure that the best management practices (BMPs) specified in the SWPPP are effective.

California Department of Fish and Game (DFG)

Section 1601 of the California State Department of Fish and Game Code requires a Streambed Alteration Agreement for any alteration to the bank or bed of a stream or lake. Since no major streams exist along the alignment and no work is proposed that will require alterations to the bank or bed of any stream or lake, there should be no need to obtain a Section 1601 Agreement for this project.

California Department of Toxic Substances Control

This department issues orders in accordance with Chapter 6.8 of Division 20 of the California Health and Safety Code. It regulates the handling, transportation, and disposal of hazardous waste, such as calcines and mercury-laden soils likely to be involved in future projects undertaken in compliance with the Basin Plan amendment.

San Francisco Regional Water Quality Control Board (RWQCB)

The proposed project is located within the jurisdiction of the San Francisco RWQCB (Region 2). All projects within the San Francisco Region are subject to the requirements of the San Francisco RWQCB. The Water Board is a State agency with a regional jurisdiction covering most of the Bay Area counties. The job of the RWQCB is to protect and improve the quality of the natural water resources in the region. These resources include San Francisco and the Ocean, streams that flow into the Bays and Ocean, and groundwater throughout the region. This is done by regulating discharges to the waters and by requiring cleanups of unplanned or illegal discharges. The regulating of discharges is done through a variety of permits. Permits issued by the Water Board put restrictions on discharges of wastes, such as concentrations of certain pollutants, or the amount of flow. Permits can also require dischargers to take certain kinds of actions; for example, installing certain technologies to treat or contain wastes, or implementing practices to manage stormwater.

Section 401 of the Clean Water Act stipulates that any action that requires a federal license or permit and that may result in a discharge of pollutants into waters of the U.S. also requires water quality certification. Locally, this program is administered by the San Francisco RWQCB and is designed to ensure that the discharge will comply with applicable federal and state effluent limitations and water quality standards. Certification applies to both construction and operation. Since the project should not affect Waters of the U.S., a 401 Water Quality Certification should not be required.

5.3 Local Agencies

Local agencies that have jurisdiction within the area include the San Francisco County Transportation Authority (SFCTA), the San Francisco Public Utilities Commission (SFPUC), the City of San Francisco, and the County of San Francisco. Any work that impacts the combined storm sewer system will require coordination with the SFPUC.

6. REFERENCES

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Technical Study Project Description for the Van Ness Avenue Bus Rapid Transit Project, by Parsons, May 18, 2009

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Appendix A:

Locally Preferred Alternative Water Quality Impacts

Prepared for

The San Francisco County Transportation Authority (SFCTA)
Federal Transit Administration (FTA)
San Francisco Municipal Transportation Agency (SFMTA)

Prepared by

PARSONS

June 2013

INTRODUCTION

This appendix to the Water Quality Technical Report describes the Locally Preferred Alternative (LPA) that is included in the Final EIS/EIR for the Van Ness Avenue BRT Project, and identifies the amounts of impervious surface, pervious surface, and disturbed soil area that would result from implementation of the LPA.

LPA DESCRIPTION

LPA Selection

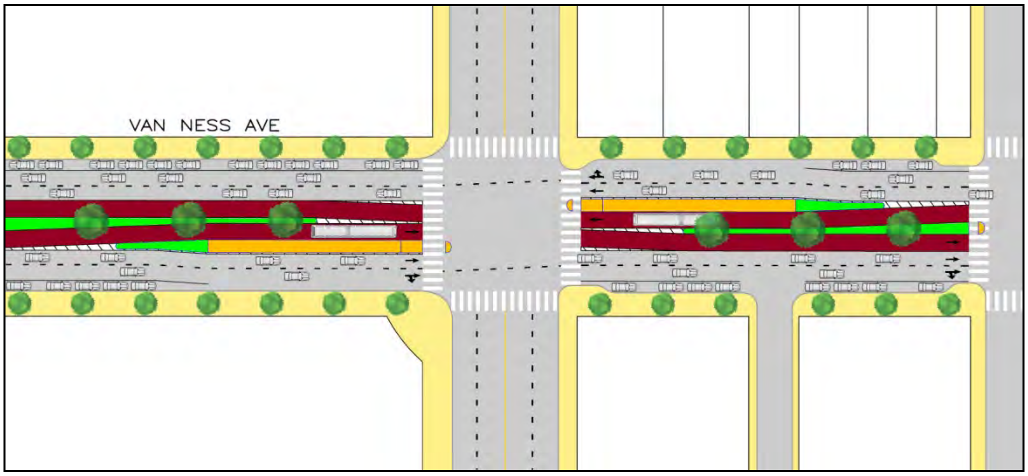
Three build alternatives and a design option for center-lane Alternatives 3 and 4 were analyzed in the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) and supporting August 2011 Air Quality Impact Report for the Van Ness BRT Project. Per requirements of the National Environmental Policy Act (NEPA), an LPA was selected for the project following circulation of the Draft EIS/EIR. The LPA is a combination and refinement of Build Alternatives 3 and 4 with Design Option B, presented in the Draft EIS/EIR and supporting August 2011 Air Quality Impact Report for the Van Ness BRT Project. The LPA is referred to as "Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns."

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

The LPA is a combination and refinement of the center-running alternatives with limited left turns (Build Alternatives 3 and 4 with Design Option B) and is referred to as Center-Lane BRT with Right-Side Boarding/Single Median and Limited Left Turns. The LPA retains the high-performance features of Build Alternatives 3 and 4 (e.g., maximum transit priority, fewest conflicts), while avoiding the need to acquire left-right door vehicles or remove the entire existing median. Under the LPA, BRT vehicles would run alongside a single median for most of the corridor, similar to Build Alternative 4; however, at station locations, BRT vehicles would transition to the center of the roadway, allowing right-side loading at station platforms as under Build Alternative 3. **Figure 1** provides an aerial schematic of the LPA, which shows the transition between a single median and dual median configuration.

The LPA incorporates Design Option B, the left-turn removal design option that would eliminate all left turns from Van Ness Avenue between Mission and Lombard streets with the exception of a southbound (SB) (two-lane) left turn at Broadway Street. The LPA station locations differ somewhat from those proposed under Build Alternatives 3 and 4 because all of the stations under the LPA are positioned at the near sides of intersections, whereas stations are generally proposed at the far side of intersections under Build Alternatives 3 and 4. Also, under the LPA the northbound Mission Street station proposed under Build Alternatives 3 and 4 was eliminated, and a new southbound station at Vallejo Street was introduced. Lastly, a northbound station at the Vallejo Street location is under consideration as a design variant under the LPA, called the Vallejo Northbound Station Variant. Incorporation of this northbound station at the Vallejo Street/Van Ness Avenue intersection will be decided at the time of project approval. **Figure 2** depicts cross sections of the LPA on a block without a station, and a block with a station, and shows the project alignment. **Figure 3** depicts the Vallejo Northbound Station Variant.

Figure 1: Aerial Schematic of LPA



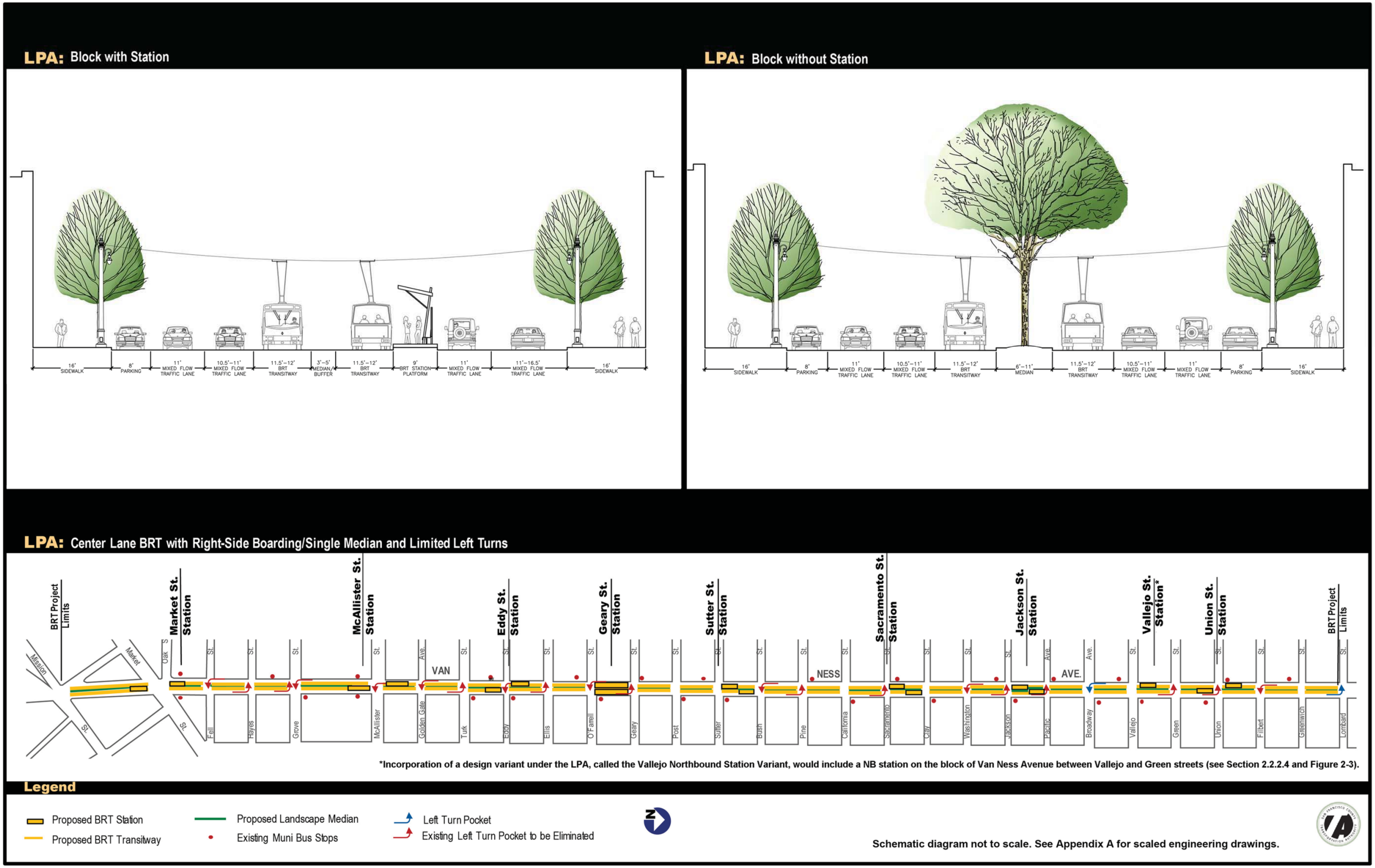


Figure 2 Cross Sections and Station & Left-Turn Pocket Location Map for the LPA

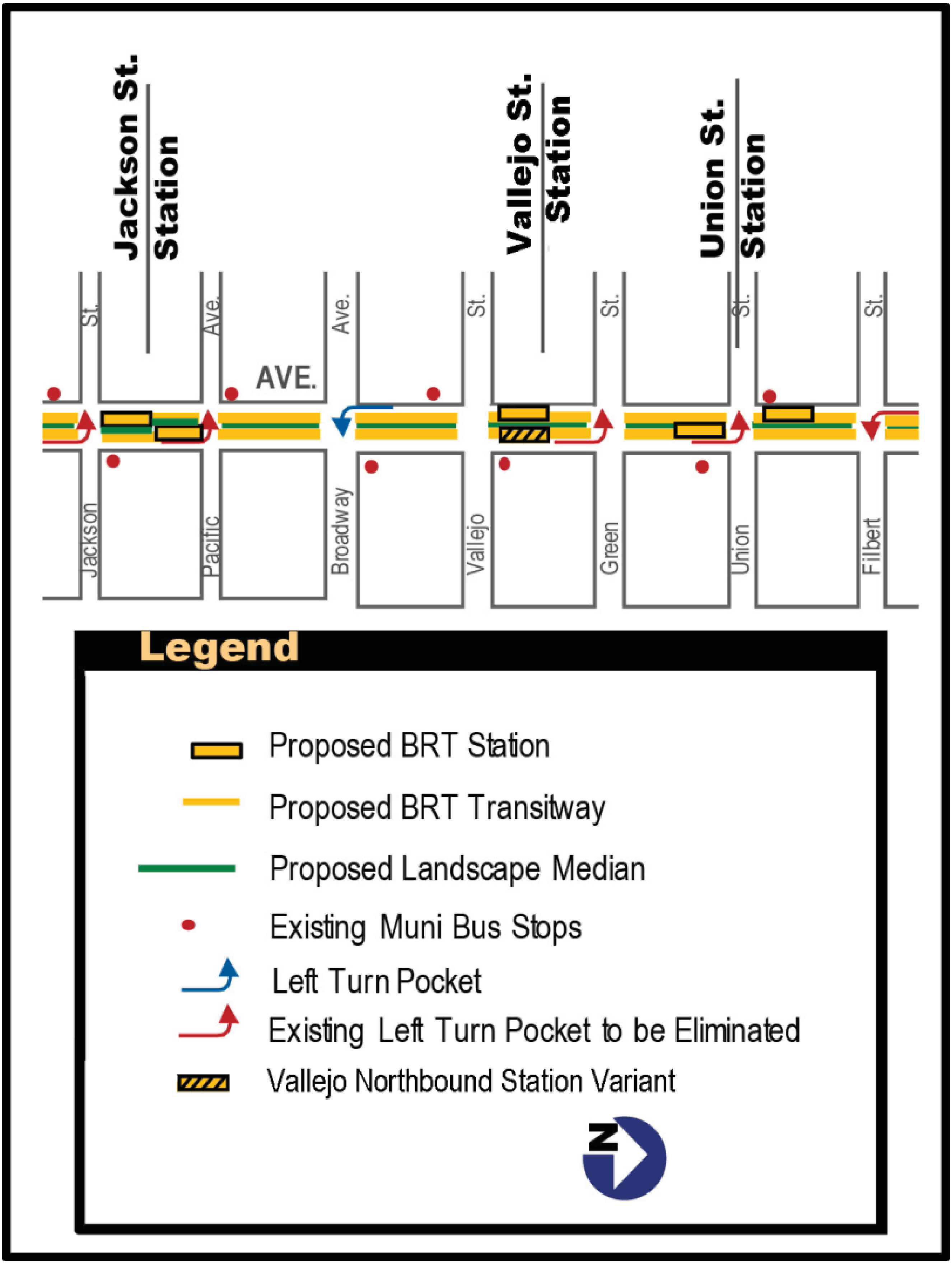


Figure 3 Vallejo Northbound Station Variant

WATER QUALITY IMPACTS

Under the LPA, the total project area would be 29.9 acres, and the total disturbed soil area would be approximately 5.8 acres without the Northbound Vallejo Station Design Variant, and approximately 5.9 acres with the Northbound Vallejo Station Design Variant. After completion of construction, there would be 29 acres of impervious area, and 0.9 acre of pervious area, with or without the Northbound Vallejo Station Design Variant. Since there is no net increase in impervious area, the proposed improvements will not adversely impact the flow rate entering the existing drainage/sewer system.

Surface water quality impacts and mitigation associated with the LPA would be as described in Section 4.1.1 of the Water Quality Technical Report. Groundwater quality impacts and mitigation for the LPA would be as described in Section 4.1.2 of the Water Quality Technical Report.