DRAFT:

San Jose/Santa Clara Water Pollution Control Plant: Existing Transportation Conditions

Source Cover Image:
Skidmore, Owings & Merrill LLP, 2010

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1. INTRODUCTION

The City of San José is developing a Master Plan for the San José/Santa Clara Water Pollution Control Plant (Plant) for the future to serve public health, the environment, and the community's quality of life, while maintaining the ability to grow sustainably. The Plant is located on a 2,684-acre site at the southern end of the San Francisco Bay just north of the Zanker Road/SR 237 interchange. The site is generally bounded by the bay to the north, Interstate 880 (I-880) to the east, State Route 237 (SR 237) to the south and the community of Alviso to the west.

The Plant Master Plan reserves approximately 450 acres for Plant operations, which includes space for potential processes needed to provide wastewater treatment for the Plant's service area to year 2040 and appropriate buffer to neighboring uses. About 300 acres are allocated to a mix of retail, office, and light industrial uses. The Plant Master Plan also includes 45 acres along SR 237 to allow for a clean tech and water institute that is envisioned to be an incubator and demonstration facility for water-related technologies. The exact scope of development envisioned in the Master Plan will be dependent on market demand, and buildout of the plan area is not expected until the end of the 2040 planning period.

In terms of transportation improvements, the Plant Master Plan proposes connecting Nortech Drive to Zanker Road. This road is proposed to be extended north to Dixon Landing Road. An additional connection between Zanker Road and McCarthy Boulevard (partially on Plant lands) would also increase access opportunities. These road connections would also provide bicycle and pedestrian access. As envisioned in the Master Plan, the improved circulation plan, when coupled with a proposed 16 miles of trails, will allow for enhanced access to the Bay and connect a vital segment of the Bay Trail linking Sunnyvale to Fremont through Alviso and the Plant. The Plant Master Plan area and proposed roadway improvements are illustrated in **Figure 1**.

Figure 1: Envisioned Circulation Improvements (Source: Skidmore, Owings & Merrill LLP, 2010)

This report outlines the existing transportation setting for the proposed Plant Master Plan. Specifically the regulatory framework is presented, along with a summary of travel characteristics for the City of San José as a whole and the Plant's adjacent Alviso neighborhood, and descriptions of existing roadway, transit, bicycle, and pedestrian facilities.

2. REGULATORY AND POLICY FRAMEWORK

Several local, regional, and state agencies have jurisdiction over transportation planning and implementation of circulation improvements in the City of San José and Santa Clara County. Each agency or relevant planning document is described below.

CITY OF SAN JOSÉ

Envision San José 2040 General Plan

The City of San José is undertaking the *Envision San José 2040 General Plan* update, which will serve as the blueprint in assisting staff and decision-makers with directing future growth and redevelopment in a sustainable manner. The General Plan includes specific objectives and policies for motor vehicle, public, and non-motorized transportation, as well as overall transportation systems management. The *Envision San José 2040 General Plan* is anticipated to be adopted by the end of 2011, and the transportation analysis for the Plant Master Plan will apply the LOS policies that are current at the time of the analysis.

Pertinent to the transportation impact analysis for the future Master Plan are the City's level of service (LOS) policies. The following LOS policies are from the *San José 2020 General Plan.* The LOS policies proposed as part of the *Envision San José 2040 General Plan* are generally the same and are not anticipated to change substantially with adoption of the 2040 General Plan.

Level of Service (LOS) Policies

The Level of Service policies from the current *Focus on the Future San José 2020 General Plan* set the minimum overall operating level and identify potential options for alternative mitigation of impacts. The General Pan states that the City of San José should achieve a minimum overall performance of City streets during peak travel periods of LOS "D", which is consistent with most jurisdictions in Santa Clara County. Development proposals that have the potential to reduce traffic conditions to "LOS E" or worse should be required to provide appropriate mitigation measures. These mitigation measures typically involve capacity enhancements for automobiles. There are a handful of exemptions to the LOS performance measures and alternative mitigation measures, which have been implemented since the current General Plan was approved. The exemptions, however, include projects that meet the definition of Infill Development, Special Strategy Area, and Downtown Core Area, which do not apply to the Plant Master Plan.

.The Alviso Master Plan: A Specific Plan for the Alviso Community (1998)

The neighborhood of Alviso is located at the northern tip of the City of San José, between Coyote Creek and the Guadalupe River. Alviso is characterized by its small town atmosphere, rich history, bayside location, wide open spaces, agricultural activities, and a mix of residential, commercial, and industrial uses. The entire planning area encompasses approximately 10,730 acres, while the focus of the Alviso Specific Plan is on 2,840 acres located within the Urban Service Area. The Alviso Specific Plan builds on the existing transportation network to facilitate the circulation of vehicles, public transportation, pedestrians, and bicycles. The roadway network consists of a grid pattern of streets in the Alviso village, major collectors, and other locally-serving streets. New streets are contemplated to serve new residential development adjacent to the Alviso Park and to support industrial development north of Nortech Parkway. Bicycle facilities are planned along key streets that link Alviso to

North San José and adjacent communities. The Specific Plan includes circulation policies to minimize the potential negative impacts of vehicular circulation to residential and sensitive environmental area. Other policies address pedestrian circulation, transit, bicycles, and trails.

Pedestrian Policy

The Specific Plan includes a Pedestrian Activity Objective, to encourage people to walk where they need to go. Pedestrian activity should be encourage by building more sidewalks, encouraging establishments to have street-facing entrances, and creating pleasant pedestrian sidewalk environments with landscaping and other sidewalk furniture.

Vehicular Circulation Policy

The Specific Plan includes vehicular circulation policies to "strengthen the existing roadway network, and balance the need for through movement with livability and pedestrian orientation." Policies include integrating new streets with the existing grid network, minimize the impact of new industrial and commercial-oriented new streets on residential and environmental areas, and improving pedestrian and bicycling street infrastructure.

Transit Circulation Objective

The Specific Plan aims to maintain and enhance transit service within Alviso and between Alviso and its surrounding communities. Currently there is only one bus line, Route 58 that serves Alviso.

Bicycle Circulation Policies

The Specific Plan aims to facilitate the development of a bicycle network, which serves places within Alviso and links Alviso to adjacent communities. Policies include making all village streets "bicycle-friendly," increasing bicycle facilities, and encouraging commercial and industrial development to accommodate safe bicycle travel by their employees and customers. Finally, the Specific Plan seeks to maintain and develop single and multiple use trails, including the San Francisco Bay Trail.

The Specific Plan addresses a number of key principles pertinent to the Water Pollution Control Plant and its Master Plan:

- Retain the residential neighborhoods located within the village and the opportunity for new medium density residential uses.
- Continue light industrial uses north of State Street.
- Provide for opportunities for new industrial parks and combined industrial/commercial ventures near SR 237.
- Continue the Water Pollution Control Plant, its associated activities and buffer lands
- Create opportunities for new community facilities, infrastructure improvements, and other community enhancements.

CITY OF SANTA CLARA

The City of Santa Clara is located between the cities of Sunnyvale and San José. Santa Clara is home to 116,000 residents, plus a number of high-tech companies, two universities, and an amusement park.

General Plan Update

In November 2010, the Santa Clara City Council adopted the 2010-2035 General Plan (2010). The Plan aggregated the Roadway, Transit, and Bicycle & Pedestrian Networks into Mobility and Transportation Diagrams.

Level of Service (LOS) Policies

Phase I of the General Plan will continue to follow the traditional assignment of a minimum acceptable operating vehicular LOS D. However, the General Plan requires that Phase II of the Plan select and implement an alternative to the traditional minimum LOS, such as replacing the standard with a weighted City-wide average of LOS D for vehicles. This LOS would only be applicable to City-controlled facilities; facilities controlled by the Santa Clara Valley Transportation Authority (VTA) and Santa Clara County would be subject to the standards of the Congestion Management Program (CMP) and the County standards, for which the standard for vehicles is LOS E. The General Plan requires the City to adopt an alternative LOS standard and implementation mechanism in cooperation with the VTA prior to 2015.

CITY OF MILPITAS

The City of Milpitas is located east of the Water Pollution Control Plant and includes sections of I-880 and I-680, the Montague Expressway, and State Route 237.

Level of Service (LOS) Policies

The City of Milpitas General Plan (1994) includes the following Level of Service Standards as identified by the CMP:

- The LOS target for all major intersections is LOS E, and the LOS target for all local intersections is LOS D
- The LOS standard for locations with a baseline (1991) LOS F are grandfathered in as LOS F;
- The LOS goal for the CMP system is LOS E; however, member agencies (including the City of Milpitas) are not required to conform to the goal.
- If the baseline (1991) LOS for a CMP System facility was LOS F, then any development project that has an impact on the facility at or greater than one percent of facility capacity must implement mitigation measures to reduce the development project's impacts below the one percent level or implement the mitigation measures as prescribed in an approved Deficiency Plan.

SANTA CLARA VALLEY TRANSPORTATION AUTHORITY (VTA)

The Santa Clara Valley Transportation Authority (VTA) is responsible for countywide transportation planning and is the County's Congestion Management Agency. Per California State legislation, the VTA provides a set of Transportation Impact Analysis (TIA) guidelines for Member Agencies to employ in transportation impact assessments. Local jurisdictions are required to follow the VTA's TIA methodologies to evaluate the impact of land use changes on the Congestion Management Program (CMP) facilities if they anticipate the changes will generate 100 or more AM or PM weekday or weekend peak-hour trips.

Transportation Impact Analysis (TIA) Guidelines

The following roadway facilities should be included in a TIA:

- A CMP intersection will be included if it is adjacent to the project, if the proposed land change (use or development) expects to generate an additional 10 or more peak-hour vehicles per lane to any intersection movement, or based on engineering judgment.
- A freeway segment will be included in the TIA if the project is adjacent to one of the segment's access or egress points, if the project adds at traffic equal to at least one percent of the freeway segment's capacity, or based on engineering judgment.
- Rural highway segments should be included in a TIA if the segment is adjacent to the project, if the project adds traffic equal to at least one percent of the rural highway segment's capacity, or based on engineering judgment.

The minimum acceptable level of service for CMP facilities is LOS E.

SANTA CLARA COUNTY

Santa Clara County is located at the southern tip of the San Francisco Bay and covers a total of 1,312 square miles. The County is home to 1.7 million residents and is a major employment center for people all over the Bay Area. In total, there are 15 cities in Santa Clara County and the County manages the expressways, which serve regional traffic with speeds of 45 miles per hour. The expressways in the immediate area of the Water Pollution Control Plant include:

- Montague Expressway
- Lawrence Expressway

The minimum acceptable level of service for these expressways is LOS E.

CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)

The California Department of Transportation (Caltrans) manages the state highway system, provides inter-city rail service, and administers six primary programs to improve mobility across the state: Aeronautics, Highway Transportation, Mass Transportation, Transportation Planning, Administration, and the Equipment Service Center. Caltrans approves the planning, design, and construction of improvements for all State-controlled facilities including SR 237, I-880 and the associated interchanges for these facilities.

3. TRAVEL CHARACTERISTICS

San José includes an array of transportation options ranging from the roadway network, to bicycle and pedestrian paths, to VTA bus and light rail lines. This chapter examines current travel characteristics and historical trends in San José and Alviso, which is the community immediately to the west of the Plant site.

Table 1 presents data from the 2000 Census that illustrates travel characteristics for the neighborhood of Alviso as compared to San José, Santa Clara City, Santa Clara County, the State of California, and the United States. At the time of this report, Census 2010 data has been released, but detailed summary tables for travel characteristics are not yet available. The 2000 Census data for Alviso illustrates commuting patterns for Alviso residents, which does not necessarily capture employees who work in Alviso, but live elsewhere. The commute patterns *to* Alviso is dependent on the current available transportation facilities, which currently are primarily automobile-oriented due to limited transit, bicycle, and pedestrian facilities. It is assumed this trend will continue unless alternative transportation facilities/services are provided.

TABLE 1:
ALVISO RESIDENTS JOURNEY TO WORK TRAVEL CHARACTERISTICS

Travel Characteristics	Alviso (*Census Tract 5046.02*)	San José	Santa Clara City	Santa Clara County	California	United States
Commute Mode Choice						
Single Occupant Auto	61.0%	76.4%	78.3%	77.4%	71.9%	75.8%
Carpool	26.6%	14.1%	11.4%	12.3%	14.6%	12.2%
Commute by automobile	*87.6%*	*90.7%*	*89.8%*	*89.7%*	*86.5%*	*88.0%*
Public Transit	3.2%	4.1%	2.9%	3.6%	5.2%	4.7%
Bicycle	0.0%	0.6%	1.4%	1.2%	0.8%	0.4%
Walk	3.9%	1.4%	3.2%	1.8%	2.9%	2.9%
Other Means	3.7%	0.7%	0.3%	0.6%	0.8%	0.7%
Work at Home	1.6%	2.5%	2.3%	3.1%	3.8%	3.3%
Other Commute-Related Data						
Percentage who work outside County of Residence	9.2%	10%	10%	12%	17%	23%
Percentage who Leave for Work between midnight and 7:00 AM	52%	29%	17%	25%	32%	31%
Percentage who Leave for Work between 7:00 AM and 9:00 AM	38%	47%	52.5%	50%	45%	47%
Average Travel Time to Work	23.6 minutes	29.9 minutes	21.8 minutes	28.1 minutes	29.3 minutes	27.0 minutes

Source: Census 2000, SF-3

Commuting by automobile is the most common form of transportation for workers across the board. Over 87 percent of Alviso workers commute by automobile; of those, nearly 27 percent carpool, which is about twice as high as the county, state, and nation-wide averages. Similarly, Alviso residents have the lowest percentage of residents who commute to work in a single-occupant automobile. The census data suggests that none of the commuters in Alviso bike to work, while close to four percent of commuters either walk to work or get to work by other means, which includes telecommuting. Alviso's combined walk and other means share of getting to work is more than twice the averages than in San José, Santa Clara City, Santa Clara County, the State of California, and the United States.

Over half of working Alviso residents leave for work before 7am, which is well above the city, county, state, and countrywide average. The average commute time for Alviso residents is 23.6 minutes, which is generally lower than the commute times for San José, Santa Clara City, the State of California, and the United States.

Table 2 shows changes in commute data travel characteristics from the 2000 Census and the 2009 American Community Survey (ACS) for the cities of San José and Santa Clara. The U.S. Census Bureau conducts the ACS to collect population and housing information from a sample size of three million households (vs. 18 million household that are surveyed in the decennial census). Unlike the Decennial Census, the ACS is conducted annually to provide up-to-date information on U.S. demographic, economic and housing data trends.

Commuting to work by automobile is the most common form of transportation, with approximately 90 percent in both cities for data from 2000 and 2009. However, the share of carpoolers decreased by two percentage points or more in both San José and Santa Clara

TABLE 2:
CHANGES IN SAN JOSÉ AND SANTA CLARA RESIDENT COMMUTE PATTERNS

	SAN JOSÉ			SANTA CLARA		
Travel Characteristics	**2000**	**2009**	**% Change**	**2000**	**2009**	**% Change**
Commute Mode Choice						
Single Occupant Auto	76.5%	76.4%	-0.1%	78.3%	79.8%	1.9%
Carpool	14.2%	12.2%	-14.1%	11.4%	9.1%	-20.2%
Commute by automobile	*90.7%*	*88.5%*	-2.4%	*89.8%*	*88.9%*	-1.0%
Public Transit	4.1%	3.2%	-22.0%	2.9%	2.2%	-24.1%
Bicycle	0.6%	0.9%	50.0%	1.4%	0.8%	-42.9%
Walk	1.4%	1.9%	35.7%	3.2%	3.3%	3.1%
Other Means	0.7%	1.7%	142.9%	0.3%	2.2%	633.3%
Work at Home	2.5%	3.5%	40.0%	2.3%	2.5%	8.7%
Other Commute-Related Data						
Percentage who work outside County of Residence	10%	11%	10%	10%	11%	10%
Percentage who Leave for Work between midnight and 7:00 AM	29%	26%	-10%	17%	13%	-22%
Percentage who Leave for Work between 7:00 AM and 9:00 AM	47%	46%	-2%	52.5%	52%	-1%
Average Travel Time to Work	29.9 min	27 min	-10%	21.8 min	23.3 min	7%

Source: Census 2000, ACS 2009

Between 2000 and 2009, public transit use decreased in both communities. Bicycle commuters increased in San José, while there was a decrease of bicycle commute share in Santa Clara. Approximately two and three percent of commuters in San José and Santa Clara walk to work, respectively. There was a large increase in the percentage of people who commuted by "Other Means," and those who "Work from Home."

Eleven percent of commuters in San José and Santa Clara work outside their county of residence. Leaving for work before 7 AM decreased by 10 percent in San José and 22 percent in Santa Clara. The most common time to leave for work is between 7am-9am. The average travel time to work in San José is 27 minutes and the average travel time to work in Santa Clara is 23.3 minutes.

4. EXISTING TRANSPORTATION FACILITIES

This chapter describes the existing conditions of the roadway, transit, pedestrian and bicycle facilities that currently exist in or near the Plant site.

EXISTING ROADWAY NETWORK

State Route 237 (SR 237) and I-880 provide regional access to the project site. Local access is primarily provided via Zanker Road, with additional local access provided via N. First Street. Descriptions of these roadways are presented below. **Figure 2** shows the locations of these facilities in relation to the project site.

SR 237 is an east-west freeway extending between the City of Mountain View and the City of Milpitas, with an interchange at Zanker Road. This freeway includes two mixed-flow lanes and a high-occupancy vehicle (HOV) lane in each direction. The HOV lanes are reserved for carpools, buses, and motorcycles during peak periods and are available for all vehicle types during non-peak periods. Data published by Caltrans indicates that the average daily traffic volume on SR 237 is about 77,000 vehicles near the project site (Caltrans, 2009). Traffic is evenly split between the eastbound and westbound commute directions during both the AM and PM peak hours.

I-880 is a north-south freeway extending from the City of San José at the I-280/I-880/SR 17 interchange to the City of Oakland. This facility includes three to four mixed-flow lanes and an HOV lane per direction. Data published by Caltrans indicates that the average daily traffic volume on I-880 is about 160,000 vehicles south of SR 237 and 190,000 vehicles north of SR 237 (Caltrans, 2009). Northbound I-880 is the peak commute direction during morning, and southbound I-880 is the peak commute direction during the evening.

Zanker Road is a north-south arterial that extends from the Plant area south towards it terminus near US 101. South of SR 237, Zanker Road is primarily a four-lane divided roadway. Within the Plant area, Zanker Road is a two-lane facility and continues as Los Esteros Road as the roadway curves to the west around the existing plant site. Based on data collected in 2011, Zanker Road has an ADT of approximately 3,600 vehicles north of the SR 237 Ramps.

North First Street is a north-south arterial that extends from downtown San José in the south to its terminus in Alviso in the north. Much of North First Street is a transit corridor with light rail service.(No daily traffic volume counts for N. First Street north of SR 237 were available for this study).

EXISTING TRANSIT SERVICE

Santa Clara Valley Transportation Authority (VTA)

The Santa Clara Valley Transportation Authority (VTA) is an independent special district responsible for bus, light rail, and paratransit operations, congestion management, highway improvement projects, and countywide transportation planning in Santa Clara County. VTA is both a transit provider and a multi-modal transportation planning organization involved with transit, highways, roadways, bikeways, and pedestrian facilities.

The Water Pollution Control Plant and its immediate environs are accessible by a limited number of transit routes operated by the VTA, as follows (Route Schedule, 2011)):

- *Route 58* – West Valley College to Alviso. Route 58 runs along N First Street and terminates in Alviso.
- *Route 47* – Great Mall/Main Transit Center to McCarthy Ranch. Route 47 terminates at the McCarthy Ranch Shopping Center.

The closest VTA Light Rail (LRT) route is the 901 line between Santa Teresa and Alum Rock route. The 901 Cisco Way and Baypointe LRT stations are both approximately 1 mile from the site. The Tasman station, just over a mile from the site, is the closest station that serves the 902 Mountain View to Winchester LRT line.

Great America Amtrak & ACE Station

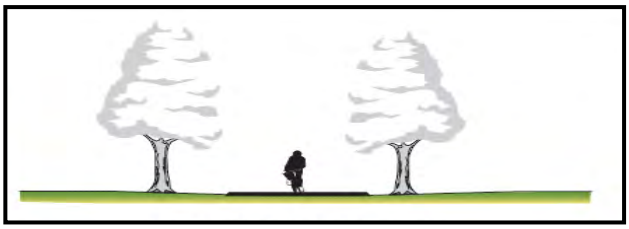
The Great America Station in Santa Clara serves both Amtrak's Capital Corridor and the Altamont Commuter Express (ACE Rail). The Amtrak Capital Corridor line runs from Sacramento to San José. The ACE runs from Stockton to San José. The Great America Amtrak and ACE station is located approximately two miles from the Plant site. Though the station is relatively close, there is no transit connectivity between the project site and the station. Added shuttle or bus service would need to be provided to facilitate connectivity between the project site and the Great America Amtrak & ACE station.

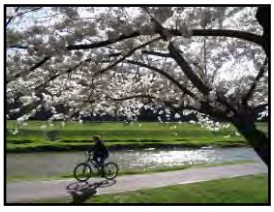
BICYCLE FACILITIES

The current General Plan calls for the development of a safe, direct, and well-maintained bicycle network that links residences, employment centers, schools, parks and transit facilities. The bicycle network promotes bicycling as an alternative mode of transportation for both commuting and recreation.

Bikeway planning and design in California typically relies on guidelines and design standards established by Caltrans in the Highway Design Manual (HDM)[1] Chapter 1000: Bikeway Planning and Design). Caltrans provides for three distinct types of bikeway facilities, as described below and shown on the accompanying figures.

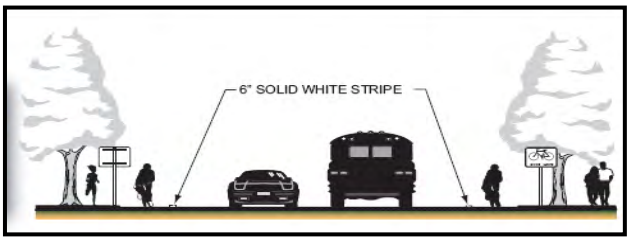
- **Bike paths (Class I)** are paved pathways separated from roadways that are designated for the exclusive use of bicycles and pedestrians. In general, bike paths serve corridors not served by streets and highways or where sufficient right-of-way exists to allow such facilities to be constructed away from the influence of parallel streets and numerous vehicle conflicts.



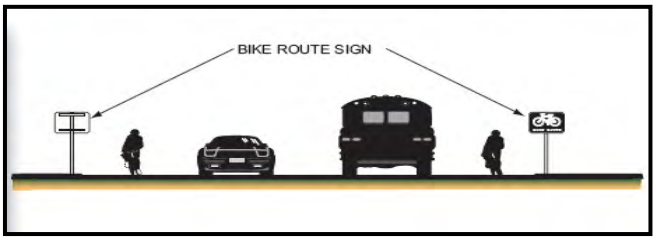


- **Bike lanes (Class II)** are lanes for bicyclists adjacent to the outer vehicle travel lanes. These lanes have special lane markings, pavement legends, and signage. Bike lanes are usually constructed to better accommodate bicyclists through corridors where insufficient room exists for safe bicycling on existing streets.

[1] *Highway Design Manual*, 2006, Caltrans.



- **Bike routes (Class III)** in general are located on low traffic volume streets that provide alternate routes for recreational, and in some cases, commuter, and school-age cyclists. These facilities are designated Class III and are signed for bike use, but have no separated bike right-of-way or lane striping. Bike routes serve either to: (1) provide continuity to other bicycle facilities, or (2) designate preferred routes through high demand corridors.



Currently, bicycle facilities in Alviso and near the Water Pollution Control Plant are limited due to the type of existing land uses. The facilities are listed below and shown in **Figure 2**.

- Class 1 bike trail**:** Parallel to SR 237 starting at the Zanker Road/SR 237 Westbound ramp intersection and heading east towards the Coyote Creek Trail

- Class II bike lanes: Zanker Road south of the Zanker Road/SR 237 Eastbound ramp intersection

Both the Alviso Specific Plan[2] and the San José 2040 General Plan[3] all for improved bicycle facilities to encourage more bicycling trips for both commuting and recreation.

San Francisco Bay Trail

The San Francisco Bay Trail is a bike and pedestrian trail that, when completed, will circumnavigate the shoreline of the San Francisco Bay with approximately 500 miles of continuous travel path. In 1989 the Association of Bay Area Governments (ABAG) adopted the Bay Trail Plan, which included a proposed trail alignment and policies to guide route design, alignment, implementation, and financing. Today the trail has roughly 310 miles of alignment, or 60 percent of the project's total length. The Trail provides recreational opportunities for cyclists, hikers, joggers, and outdoor enthusiasts. It also provides important transportation benefits as a commute alternative for cyclists as well as connections to a number of transit facilities.

The San Francisco Bay Trail Project Gap Analysis Study[4] identified, classified, and catalogued existing gaps in the Bay Trail. The Gap Analysis identified 12.79 miles of trail gaps in Santa Clara County: 3.9 miles of short-term projects (1-5 years) and 8.89 miles of Mid-term projects (6-10 years) . Many of the identified gap segments run through Alviso and the Water Pollution Control Plant area. The Plant Master Plan (2011) aims to build and

[2] *Alviso Master Plan*: A Specific Plan for the Alviso Community, 1998, Department of Planning, Building and Code Enforcement, City of San Jose.

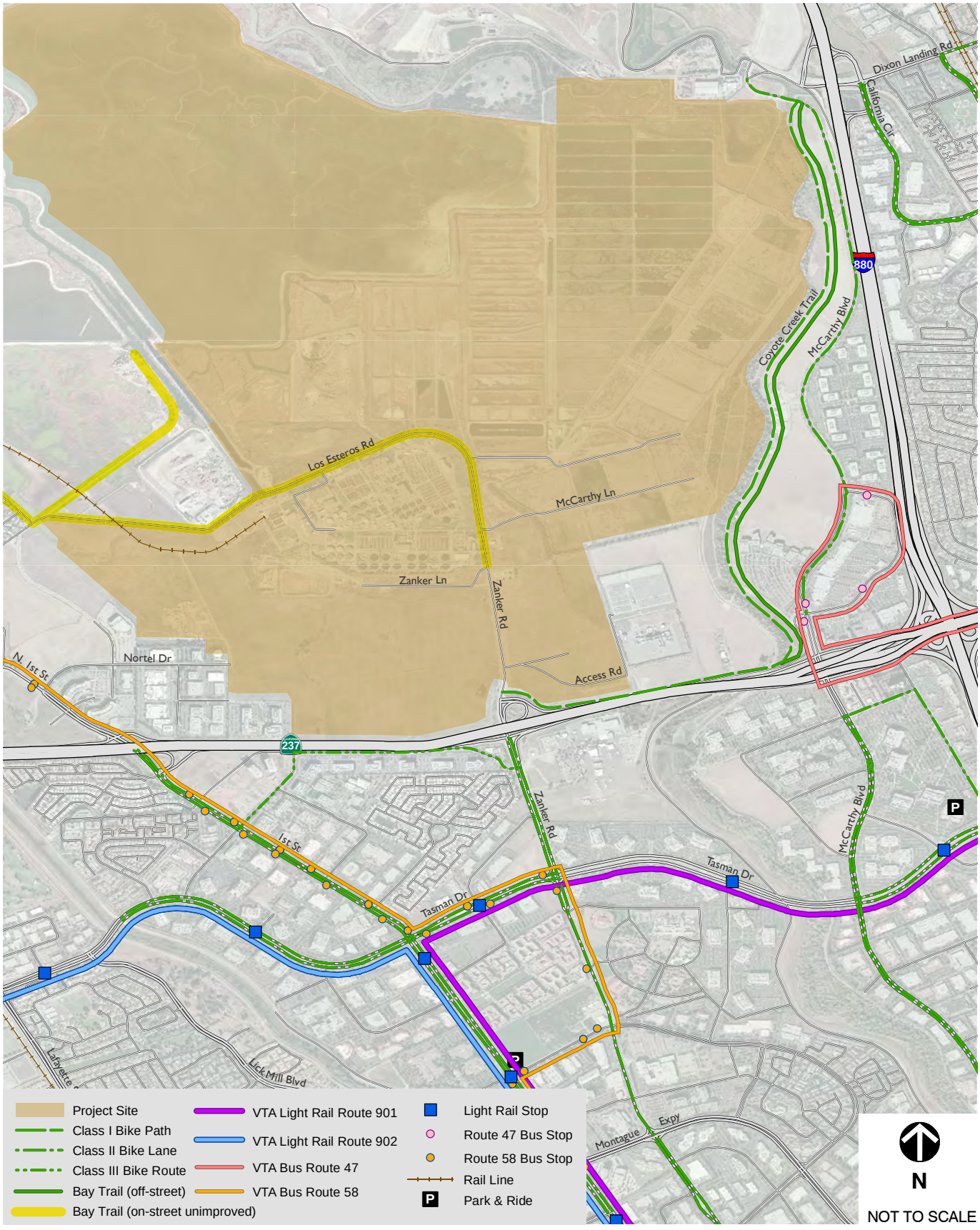
[3] *Draft San Jose 2040 General Plan*, April 2011, City of San Jose.

[4] *San Francisco Bay Trail Project*: Gap Analysis Study, September 2005, Association of Bay Area Governments Bay Trail Project.

connect over 10 miles of vital segments of the Bay Trail, which will link Sunnyvale to Fremont. **Figure 2** also shows the existing segment of the Bay Trail within the study area, which is on Zanker Road-Los Esteros Road and currently classified as unimproved Bay Trail that are on street and do not include bike lanes and/or no sidewalks.

PEDESTRIAN FACILITIES

Pedestrian facilities generally consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The project area currently has very limited pedestrian access. There are no sidewalks within the Plan area. Crosswalks are provided at north leg of the Zanker Road/SR 237 Westbound ramp and the west leg of the Zanker Road/SR 237 Eastbound ramp intersections. A sidewalk is provided on the west side of Zanker Road starting at the Zanker Road/SR 237 Westbound ramp intersection and heading south on Zanker Road away from the project site.



San Jose Water Pollution Control Plant Master Plan

FEHR PEERS

Existing Transportation Facilities

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Figure 2

5. TRAFFIC VOLUMES AND OPERATIONS

This chapter describes overall traffic volumes and operations for the study intersections and freeway segments with the results of level of service calculations and truck volumes on Zanker Road.

ANALYSIS METHODS

The operations of roadway facilities are described with the term *level of service*. Level of Service (LOS) is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, as the best operating conditions, to LOS F, or the worst operating conditions. LOS E represents "at-capacity" operations. When traffic volumes exceed the intersection capacity, stop-and-go conditions result, and operations are designated as LOS F.

Signalized Intersections

The method described in Chapter 16 of the 2000 *Highway Capacity Manual* (HCM) (Transportation Research Board, 2008) was used to prepare the level of service calculations for the study intersections. This level of service method, which is approved by the City of San José and VTA, analyzes a signalized intersection's operation based on average control delay per vehicle. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections is calculated using TRAFFIX analysis software and is correlated to a LOS designation as shown in **Table 3**.

TABLE 3:
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS
USING AVERAGE CONTROL VEHICULAR DELAY

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B+	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 12.0
B		12.1 to 18.0
B-		18.1 to 20.0
C+	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 23.0
C		23.1 to 32.0
C-		32.1 to 35.0
D+	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 39.0
D		39.1 to 51.0
D-		51.1 to 55.0
E+	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 to 60.0
E		60.1 to 75.0
E-		75.1 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Traffic Level of Service Analysis Guidelines*, VTA Congestion Management Program, June 2003; *Highway Capacity Manual*, Transportation Research Board, 2000.

Freeway Segments

Freeway segments are evaluated using VTA's analysis procedure, which is based on the density of the traffic flow using methods described in the *2000 HCM*. Density is expressed in passenger cars per mile per lane. The Congestion Management Program range of densities for freeway segment level of service is shown in **Table 4**. The LOS standard for the freeway segments is LOS E.

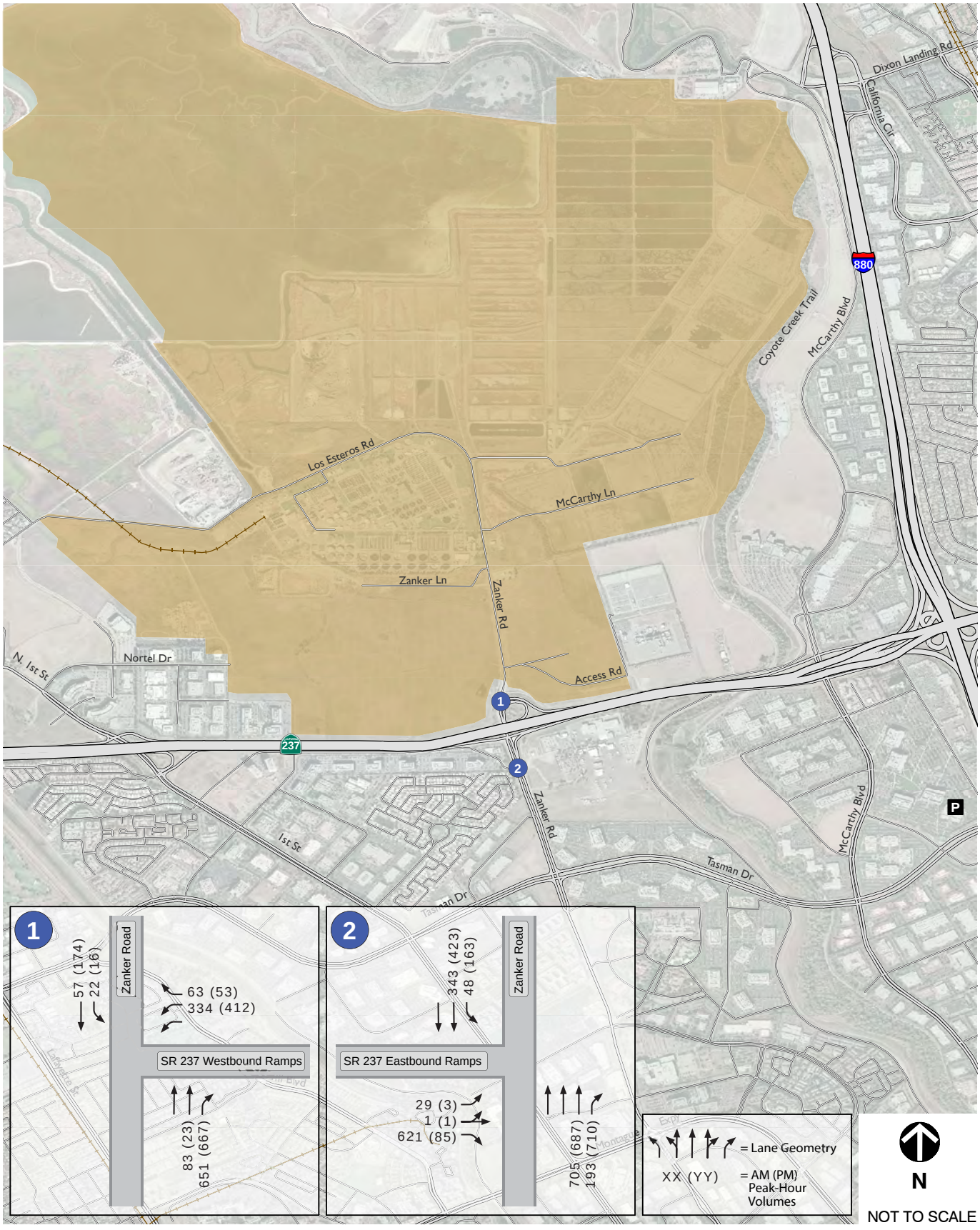
TABLE 4:
FREEWAY SEGMENT LEVEL OF SERVICE DEFINITIONS

Level of Service	Density (passenger cars per mile per lane)
A	≤ 11
B	11.1 to 18.0
C	18.1 to 26.0
D	26.1 to 46.0
E	46.1 to 58.0
F	> 58.0

Sources: *Traffic Level of Service Analysis Guidelines*, VTA Congestion Management Program, June 2003; *Highway Capacity Manual*, Transportation Research Board, 2000.

EXISTING INTERSECTION VOLUMES AND LANE CONFIGURATIONS

Zanker Road will serve as the main access point to the Master Plan area and this road and its intersections with the SR 237 ramps will need to accommodate the majority of the project's traffic in the future. As such, the Zanker Road intersections with the westbound and eastbound SR 237 ramps will be some of the main constraint points for the project and were selected for initial evaluation in this report to assess their current operations and to determine the amount of excess capacity. Both of the study intersections are considered CMP intersections and have a LOS E threshold. The existing operations were evaluated for the highest one-hour volume during the weekday morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak periods. AM and PM peak-hour intersection turning movement counts were conducted in May 2011. Copies of new traffic counts are included in **Appendix A**. **Figure 3** presents the existing AM and PM peak hour turning movement volumes, lane configurations, and traffic control devices at the two study intersections.



San Jose Water Pollution Control Plant Master Plan

FEHR PEERS

Existing Peak-Hour Volumes and Lane Geometries

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Figure 3

EXISTING INTERSECTION LEVELS OF SERVICE

Existing intersection lane configurations, signal timings, and peak-hour turning movement volumes were used to calculate the levels of service for the key intersections during each peak hour. The results of the LOS analysis using the TRAFFIX software program for Existing Conditions are presented in **Table 5**. **Appendix B** contains the corresponding calculation sheets.

The results of the LOS calculations indicate that the two study intersections operate at LOS B or better and currently have excess capacity to accommodate traffic growth in the area.

TABLE 5:
EXISTING INTERSECTION LEVELS OF SERVICE

	Intersection	Count Date	Peak Hour[1]	Intersection Control	Delay[2]	LOS[3]
1	Zanker Road/SR 237 Westbound Ramps*	May 2011	AM PM	Signal	10.2 10.2	B+ B+
2	Zanker Road/SR 237 Eastbound Ramps*	May 2011	AM PM	Signal	14.5 11.0	B B+

Notes:
1 AM = morning peak hour, PM = afternoon peak hour.
2 Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections. Signalized intersections include adjusted saturation flow rates to reflect Santa Clara County Conditions per VTA guidelines.
3 LOS = Level of Service. LOS calculations conducted using the TRAFFIX level of service analysis software package, which applies the methodology described in the *2000 HCM*.
* CMP intersection with LOS E threshold.
Source: Fehr & Peers, July 2011.

The LOS results from this report were compared to the most recent available CMP data from VTA, which included only PM peak hour volumes and LOS. The 2008 VTA data also showed LOS B+ for both intersections during the PM peak hour, with 11.1 and 11.2 seconds of delay for the westbound and eastbound ramps, respectively.

FIELD OBSERVATIONS

Field observations of the two study intersections were conducted during the morning and evening peak hours in July 2011. The intersections were observed to operate at the calculated levels of service for each peak hour and no major queues were observed. No pedestrians were observed at either of the study intersections, though a few (three) bicyclists were observed traveling on Zanker Road over SR 237 to access the bike trail near the Zanker Road/SR 237 Westbound Ramps.

EXISTING TRUCK VOLUMES

This section describes the current traffic volumes and historic traffic volume trends near the Water Pollution Control Plant. Axle sensors tracked the number and type of vehicles traveling northbound and southbound on Zanker Road between State Route 237 and Thomas Foon Chew Way (i.e. north of the Zanker Road/SR 237 Westbound ramp intersection). The methodology used to analyze traffic operations and current traffic operations based on weekday daily volumes is also described.

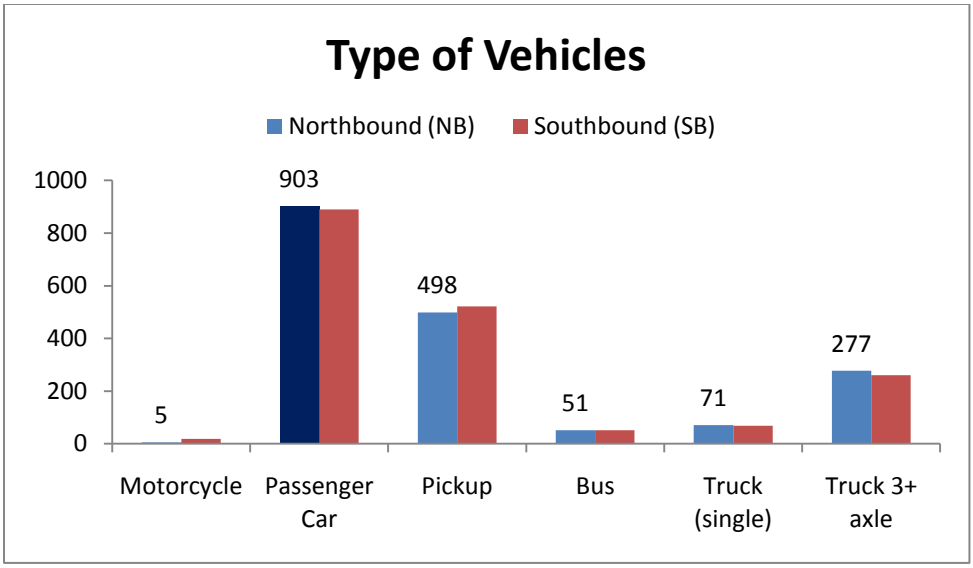
Traffic Data Collection

Automatic tube counts were collected for northbound and southbound vehicles at Zanker Road between Westbound SR-237 and Thomas Foon Chew Way. Traffic data collection took place May 17 to19, 2011 for a 72-hour period. The detailed vehicle classification counts are included in **Appendix A.**

Total Vehicles

The volume and types of vehicle traveling northbound and southbound on Zanker Road are similar (see **Figure 4**). Generally, passenger cars are the most common type of vehicle followed by pickup trucks, and then tucks with three or more axels.

Figure 4 Types of Vehicles

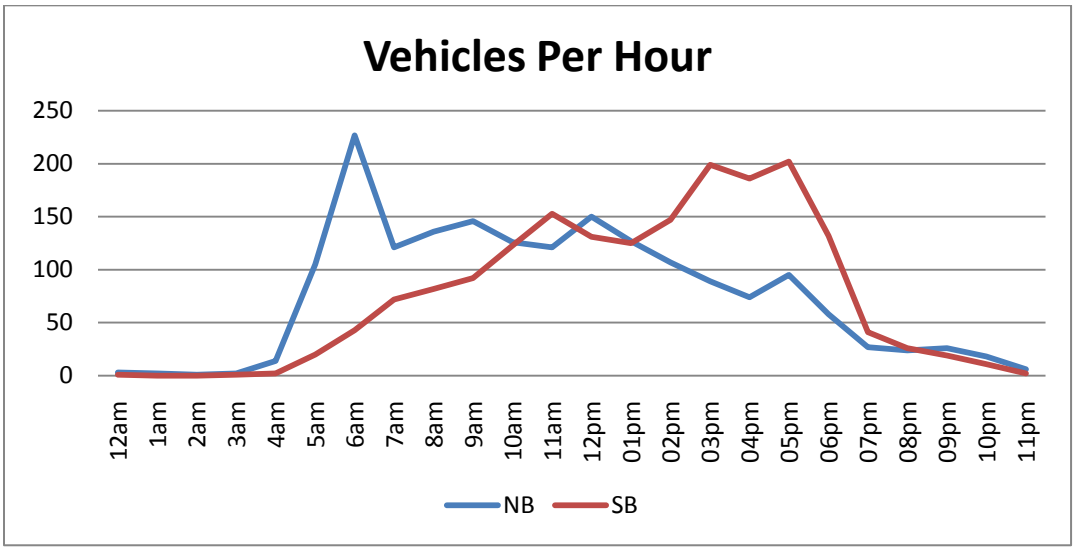


Vehicles per Hour

Figure 5 illustrates the temporal distribution of vehicles on Zanker Road. Overall the graph indicates a traffic pattern with heavier Northbound traffic volumes in the morning and Southbound traffic in the afternoon and evening. Northbound vehicles peak at 6 AM with a total of 227 vehicles per hour. During typical peak commute periods (7AM to 9AM and 4PM to 6 PM), the average vehicles per hour peaked at 9 AM and 5 PM Noon was also a peak hour for Northbound traffic. Southbound traffic has a slightly reverse pattern. The peak hour of southbound traffic is at 5 PM with 202 vehicles. During morning rush hour the peak hour is 9 AM with 92 vehicles per hour.

The data collected show that the roadway volumes on Zanker Road peak outside of the regular morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak commute periods. However, with the Master Plan's proposed development of a mix of retail, office, and light industrial uses the peak volumes on Zanker Road are expected to have the higher traffic volumes in the normal peak commute peak periods.

Figure 5 Vehicles per Hour

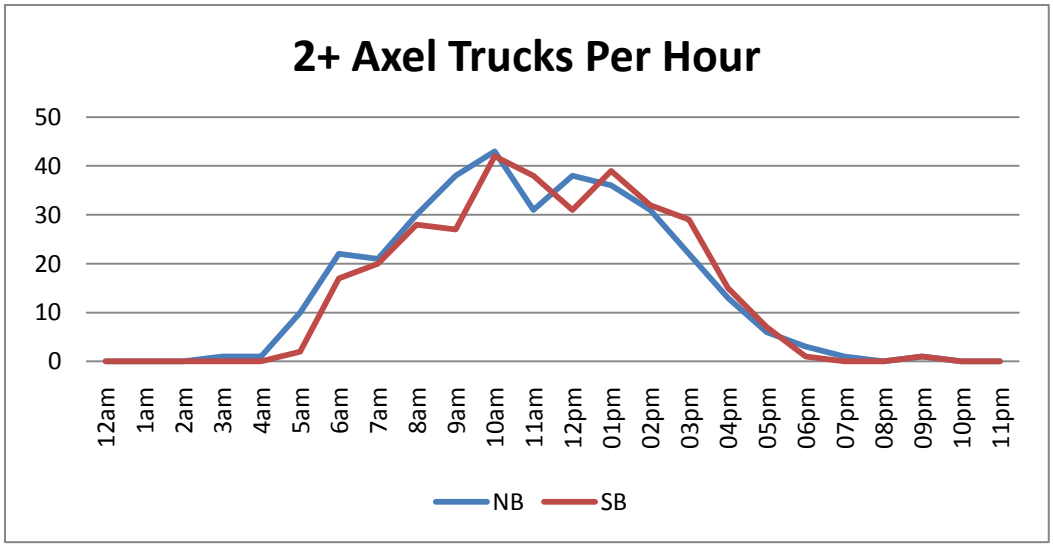


Trucks per Hour

The City of San José does not have established truck routes, though the *City's Municipal Code* Section 11.96 establishes roadways on which heavy truck traffic is prohibited. The Municipal Code lists 88 roadway segments on which truck traffic exceeding a maximum gross weight of five (5) tons is restricted and an additional 23 roadways on which vehicles exceeding seven (7) tons are prohibited. In general, the City encourages truck traffic to use state freeways, county expressways, and six-lane arterial streets.

As shown in **Figure 6,** truck traffic peaks at 10 AM for both Northbound and Southbound traffic with around 43 trucks per hour. Truck traffic picks up at 5 AM going Northbound and 6 AM going Southbound. The number of trucks decreases substantially at 5 PM in both directions.

Figure 6 Trucks per Hour



EXISTING FREEWAY OPERATIONS

Because the project site is located at the northern border of San José and is bounded by SR 237 and I-880, a majority of the project traffic will access the site via these two freeways. The SR 237 and I-880 segments immediately adjacent to the project site were selected for initial evaluation. **Table 6** contains the existing freeway segment LOS for the mixed-flow and HOV lanes, based on the segment densities reported in the VTA's 2010 CMP Monitoring and Conformance Report (the most recent report available as of July 2011).

TABLE 6:
EXISTING FREEWAY SEGMENT LEVELS OF SERVICE

Freeway Segment	Direction	Peak Hour[1]	Lanes		Density[2]		LOS[3]	
			Mixed	HOV	Mixed	HOV	Mixed	HOV
SR 237, Great America Pkwy to N. First St	EB	AM	2	1	39	27	D	D
		PM	2	1	**100**	29	**F**	D
	WB	AM	2	1	39	33	D	D
		PM	2	1	58	18	E	B
SR 237, N. First St to Zanker Road	EB	AM	2	1	39	21	D	C
		PM	2	1	**71**	39	**F**	D
	WB	AM	2	1	58	48	E	E
		PM	2	1	48	15	E	B
SR 237, Zanker Road to McCarthy Blvd	EB	AM	2	1	31	13	D	B
		PM	2	1	**75**	21	**F**	D
	WB	AM	2	1	**98**	**70**	**F**	**F**
		PM	2	1	**61**	10	**F**	A
SR 237, McCarthy Blvd to I-880	EB	AM	3	0	20	-	C	-
		PM	3	0	**90**	-	**F**	-
	WB	AM	3	0	**132**	-	**F**	-
		PM	3	0	21	-	C	B
I-880, Great Mall Pkwy to SR 237	NB	AM	3	0	28	-	D	-
		PM	3	0	**88**	-	**F**	-
	SB	AM	3	0	49	-	E	-
		PM	3	0	27	-	D	-
I-880, SR 237 to Dixon Landing	NB	AM	4	1	23	12	C	B
		PM	4	1	**72**	40	**F**	D
	SB	AM	4	1	**72**	50	**F**	E
		PM	4	1	24	16	C	B

Notes:
1 AM = morning peak hour, PM = afternoon peak hour.
2 Measured in passenger cars per mile per lane.
3 LOS = level of service.
N/A = Not applicable. Freeway Segment does not have HOV lanes.
Bold font indicates unacceptable operations based on VTA's LOS E Standard.
Source: *2010 Monitoring and Conformance Report*, VTA, May 2011.

The following mixed-flow freeway segments exceed VTA's LOS E standard during the specified peak hour:

- SR 237, Eastbound, Great America Parkway to N. First Street (PM peak hour)
- SR 237, Eastbound, N. First Street to Zanker Road (PM peak hour)
- SR 237, Eastbound, Zanker Road to McCarthy Boulevard (PM peak hour)
- SR 237, Westbound, Zanker Road to McCarthy Boulevard (AM and PM peak hours)
- SR 237, Eastbound, McCarthy Boulevard to I-880 (PM peak hour)
- SR 237, Westbound, McCarthy Boulevard to I-880 (AM peak hour)
- I-880, Northbound, Great Mall Parkway to SR 237 (PM peak hour)
- I-880, Northbound, SR 237 to Dixon Landing (PM peak hour)
- I-880, Southbound, SR 237 to Dixon Landing (AM peak hour)

All other freeway segments operate at acceptable LOS E or better during both peak periods.

In general the peak direction of travel on SR 237 is in the westbound direction in the AM peak hour and the eastbound direction during the evening commute peak. SR 237 is fairly congested during both peak periods and has limited capacity to accommodate addition growth in traffic. I-880 is primarily congested in the southbound direction during the AM peak period and the northbound direction in the evening peak hour. I-880 has slightly more capacity to accommodate additional growth in traffic, though it does have constraints in the peak directions of travel.