



Transportation Concept Report

Interstate 580 Central

District 4

July 28, 2016



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California Department of Transportation

Provide a safe, sustainable, integrated and efficient transportation system
to enhance California's economy and livability.

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Stakeholder Acknowledgement

District 4 is pleased to acknowledge the time and contributions of stakeholders and partner agencies to this TCR. Development of System Planning documents such as this one is dependent upon the participation and cooperation of key stakeholders. This TCR represents a cooperative planning effort for the I-580 Central Corridor. Representatives of the Alameda County Transportation Commission, the cities of Oakland, San Leandro, Emeryville, and Alameda County provided essential information, advice and feedback for the preparation of this document.

This TCR will be posted on the Caltrans District 4 System Planning website at:
<http://www.dot.ca.gov/dist4/systemplanning/>

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ABOUT THE TRANSPORTATION CONCEPT REPORT

System Planning is the long-range Transportation Planning process for the California Department of Transportation (Caltrans). The System Planning process fulfills Caltrans statutory responsibility as owner/operator of the State Highway System (SHS) (Gov. Code §65086) by identifying deficiencies and proposing improvements to the SHS. Through System Planning, Caltrans focuses on developing an integrated multimodal transportation system that meets Caltrans goals of safety and health, stewardship and efficiency, sustainability, livability and economy, system performance, and organizational excellence.

The System Planning process is primarily composed of four parts: the District System Management Plan (DSMP), the Transportation Concept Report (TCR), the Corridor System Management Plan (CSMP), and the DSMP Project List. The District-wide **DSMP** is a strategic policy and planning document that focuses on maintaining, operating, managing, and developing the transportation system. The **TCR** identifies the existing and future route conditions as well as future needs for each route on the SHS. The **CSMP** is a complex, multi-jurisdictional document that identifies future needs within corridors experiencing or expected to experience high levels of congestion. The CSMP also serves as a TCR for segments covered by the CSMP. The **DSMP Project List** is an inventory of planned and partially programmed transportation projects used to recommend projects for funding. These System Planning products are also intended as resources for stakeholders including the public, partner, regional and local agencies.

TCR Purpose

California's State Highway System needs long-range planning documents to guide the logical development of transportation systems as required by law and as necessitated by the public, stakeholders, and system users. The purpose of the TCR is to evaluate current and projected conditions along the route and communicate the vision for the development of each route in each Caltrans District during a 20-30 year Planning horizon. The TCR is developed with the goals of increasing safety, improving mobility, providing excellent stewardship, and meeting community and environmental needs along the corridor through integrated management of the transportation network, including the highway, transit, pedestrian, bicycle, freight, operational improvements and travel demand management components of the corridor.

STAKEHOLDER PARTICIPATION

Stakeholder participation was sought throughout the development of the Interstate 580 Central TCR. During the information gathering stage for the TCR, stakeholders were contacted for initial input related to their particular interests, and to help verify data accuracy. As the document was finalized, stakeholders were asked to review the document for consistency with regard to existing plans, policies, and procedures. The final document was presented to stakeholder groups as a method of information sharing. The process of including stakeholders adds value to the TCR by allowing for outside input and ideas to be reflected in the document and help strengthen public support.

EXECUTIVE SUMMARY

Interstate 580 (I-580) is a freeway route that begins at I-5 in San Joaquin County (Caltrans District 10) and terminates at United States Highway 101 (US 101) in Marin County. The route enters District 4 in Alameda County near the I-580/I-205 interchange and continues through Alameda, Contra Costa and Marin Counties. Due to its length and complexity, District 4 has divided the route into four legs and has developed Corridor Planning documentation for each leg. For this report, the “I-580 Central” Corridor is a six to ten-lane divided freeway from the I-580/I-238 Interchange to the I-80/I-580/I-880 Interchange. The I-580 Central Corridor travels through Alameda County, unincorporated Castro Valley and the cities of Hayward, San Leandro, Oakland and Emeryville. The I-580 Central Corridor serves local traffic between Hayward and Emeryville, links commuters to economic and employment centers, supports interregional travel through direct access to I-80 and I-880 (via I-238). Except during “Sig-Alerts” on I-880 or I-238, trucks over 4.5 tons are restricted on the I-580 Central Corridor between Foothill Boulevard in San Leandro and Grand Avenue in Oakland. The I-580 Central Corridor also provides primary access to the Central Valley and points beyond including recreational opportunities in the Sierra Nevada Mountains. This I-580 Central TCR evaluates current traffic conditions along the route using 2010 as the base year and provides forecast conditions for a horizon year of 2040.

Table 1. I-580 Central Concept Summary

I-580 Central Concept Summary				
TCR Segment	Segment Description	Existing Facility	30-Year Capital Facility Concept	30-Year System Operations and Management Concept
1	I-238 to 150 th Street	6-8F	6-8F	<ul style="list-style-type: none"> • Throughout corridor, activate existing ITS installations that currently are not fully operational. • Throughout corridor, fill gaps in the current and programmed ITS installations as needed. • Throughout corridor, upgrade TOS and Install RM.
2	150 th Street to Foothill Boulevard	8F	8F	
3	Foothill Boulevard to SR-13	8F	8F	
4	SR-13 to Grand/Lakeshore Avenue	8F	8F	
5	Grand/Lakeshore Avenue to SR-24/I-980	6-10F	6-10F	
6	SR-24/I-980 to I-80/I-580/I-880	6-10F	6-10F	

PM – Post Mile, F – Freeway Facility

Concept Rationale

The Association of Bay Area Governments (ABAG) anticipates moderate growth and development along the I-580 Central Corridor creating the need for a thirty-year Route Concept which includes strategies for increased route preservation, maintenance and operations. The 2040 Route Concept consists of the District 4 2014 and 10-Year State Highway Operations and Protection Program (SHOPP) projects identified for I-580 Central. The thirty-year concept maintains a facility including six to eight lanes, rehabilitated bridges and pavement, Adaptive Ramp Metering (ARM), upgrading and construction of Intelligent Transportation System (ITS) infrastructure, and implementation of Traffic Operation System (TOS) elements along I-580 Central.

Proposed Projects and Strategies

Preservation and operational improvements are planned for all segments of I-580 Central. Recent transportation plans and studies have focused on preservation and improving freeway operations as ways to reduce delay and improve reliability, mobility and safety for all users (see Key Corridor Issues section). These plans and studies have helped inform the regional Transportation Planning process by recommending concepts and strategies for the development of future transportation projects on I-580 Central (see Corridor Concept section).

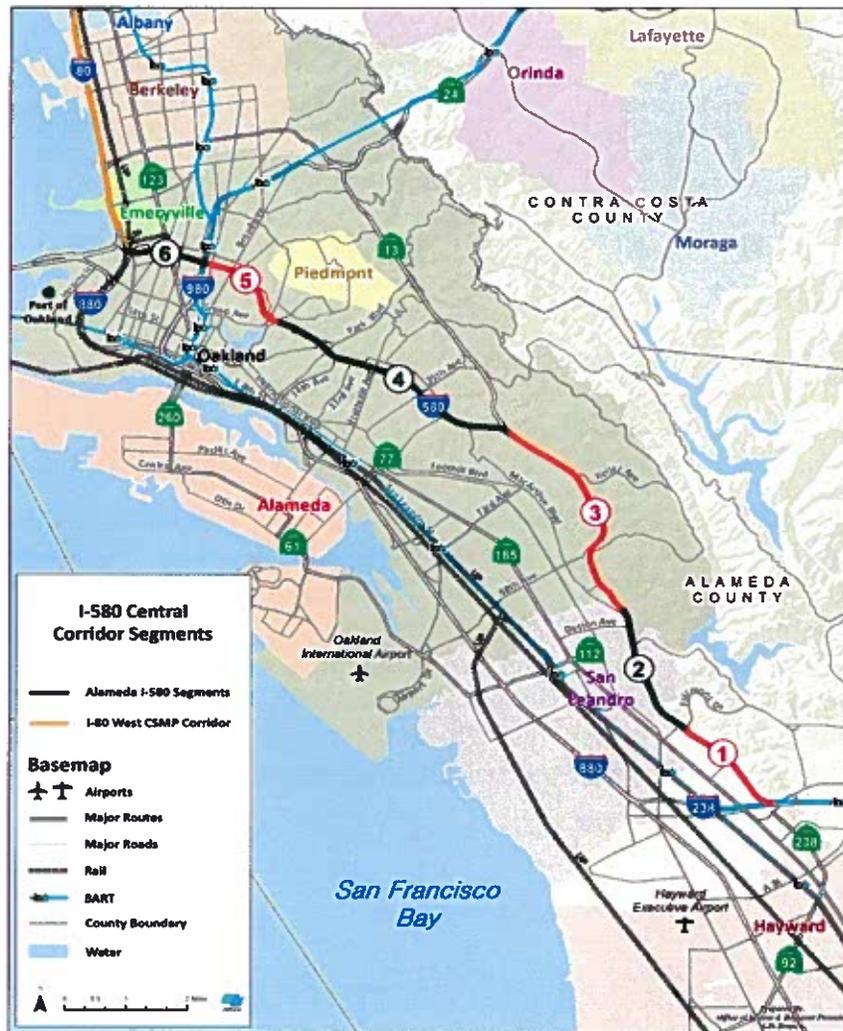
CORRIDOR OVERVIEW

Route Segmentation

Table 2. I-580 Central Route Segmentation

I-580 Central Route Segmentation ¹			
TCR Segment	Location Description	Co_Route_Beginning PM	Co_Route_Ending PM
1	I-580/I-238 Interchange to 150 th Street	ALA_580_30.81	ALA_580_32.84
2	150 th Street to Foothill Boulevard	ALA_580_32.84	ALA_580_35.11
3	Foothill Boulevard to I-580/SR 13 Interchange	ALA_580_35.11	ALA_580_39.24
4	I-580/SR 13 Interchange to Grand/Lakeshore Avenue	ALA_580_39.24	ALA_580_43.48
5	Grand/Lakeshore Avenue to SR 24/I-980 Interchange	ALA_580_43.48	ALA_580_45.151
6	SR 24/I-980 Interchange to I-80/I-580/I-880 Interchange	ALA_580_45.151	ALA_580_46.46R

Figure 1. I-580 Central Route Segmentation Map



¹ <http://earth.dot.ca.gov/>

Route Description

I-580, also known as the MacArthur Freeway in Alameda County, begins at I-5 in San Joaquin County within neighboring Caltrans District 10. The route enters District 4 in Alameda County near the I-580/I-205 interchange. It continues through Alameda and Contra Costa Counties and terminates at US 101 in Marin County. Due to its length and complexity, District 4 has divided the route into four legs and has developed Corridor Planning documentation for each leg. Table 3 below lists these four documents.

Table 3. I-580 Planning Documents in District 4

Corridor Legs	Corridor Limits	Document
1	SJ/ALA County Line to I-238/I-880 Interchange	I-580 East CSMP* (completed 2010)
2	I-238 to I-80/I-580/I-880 Distribution Structure	I-580 Central TCR
3	I-80/I-580/I-880 Distribution Structure to I-80/I-580 Split	I-80 West CSMP (completed 2010)
4	I-80/I-580 Split to US 101	I-580 West TCR (in development)

*CSMP - Corridor System Management Plan

This document represents the second of four I-580 freeway legs. I-580 Central is functionally classified as an Interstate Freeway on the California Road System (CRS). The Corridor is approximately 15.65 miles long and consists of a six to ten-lane divided freeway beginning at the I-580/I-238 interchange in unincorporated Alameda County. The freeway continues in a northwesterly direction situated between the east shore of the San Francisco Bay and the East Bay Hills. The route passes through unincorporated Castro Valley, the cities of Hayward, San Leandro, and Oakland before ending at the I-80/I-580/I-880 Distribution Structure in Emeryville. The route is also designated as a Scenic Highway from the city of Oakland and San Leandro border to SR-24. Along the way, the route intersects State Routes (SR) 13, 24, 123 and Interstates 80, 880 (via I-238) and 980. The route, combined with its State highway connections, serves as a major commuter link between suburban communities and local and regional employment centers in the East Bay, San Francisco Peninsula and Silicon Valley communities. I-580 Central also provides access to local and regional recreational land uses and serves as a secondary route from Alameda County to the San Joaquin Valley and points beyond including the Sierra Nevada Mountains.

Trucks weighing over 4.5 tons are prohibited from an 8.7 mile segment of I-580 Central between Foothill Boulevard in San Leandro and Grand Avenue in Oakland.² In the event of a "Sig-Alert" or other type of road closure on I-880 or I-238, trucks are temporarily allowed on the I-580 Central Corridor. 2010 Average Annual Daily Truck Traffic (AADTT) ranged from 10,408 vehicles at the I-580/I-238 Interchange east of the restricted area to 563 vehicles at High Street in Oakland (within the restricted area). Reported truck traffic recovers to some degree in the westernmost segments of the route where 2010 AADTT reported 2,832 vehicles at the I-80/I-580/I-880 Distribution Structure in Emeryville. A summary of route designation and characteristics as well as features, purpose and description are summarized in Table 4.

² <http://www.dot.ca.gov/hq/traffops/engineering/trucks/>

Route Designation and Characteristics

Table 4. I-580 Central Route Designation and Characteristics

I-580 Central Route Designation and Characteristics						
TCR Segment	1	2	3	4	5	6
Freeway & Expressway System	Yes	Yes	Yes	Yes	Yes	Yes
National Highway System	Yes	Yes	Yes	Yes	Yes	Yes
Strategic Highway Network	Yes	Yes	Yes	Yes	Yes	Yes
Scenic Highway	No	Officially Designated	Officially Designated	Officially Designated	Officially Designated	No
Federal Functional Classification	Interstate Freeway	Interstate Freeway	Interstate Freeway	Interstate Freeway	Interstate Freeway	Interstate Freeway
Goods Movement Route	No	No	No	No	No	No
Truck Designation*	Non STAA/NHFN	Non STAA/NHFN	Non STAA/4.5 Ton Limit	Non STAA/4.5 Ton Limit	Non STAA/NHFN	Non STAA/NHFN
Rural/Urban/Urbanized	Urban	Urban	Urban	Urban	Urbanized	Urbanized
Metropolitan Planning Organization	Metropolitan Transportation Commission (MTC)	MTC	MTC	MTC	MTC	MTC
Congestion Management Agency	Alameda County Transportation Commission (Alameda CTC)	Alameda CTC	Alameda CTC	Alameda CTC	Alameda CTC	Alameda CTC
Local Agencies	Alameda County	Alameda County/City of San Leandro	City of Oakland	City of Oakland	City of Oakland	City of Oakland/City of Emeryville
Tribes	N/A	N/A	N/A	N/A	N/A	N/A
Air District	Bay Area Air Quality Mgmt District (BAAQMD)	BAAQMD	BAAQMD	BAAQMD	BAAQMD	BAAQMD
Terrain	Rolling	Rolling	Rolling	Rolling	Flat	Flat

* Federal Surface Transportation Assistance Act of 1982 / National Network Federal Highway Freight Network (FAST Act 2015)

Community Characteristics

Although the cities of Oakland, San Leandro and Emeryville represent established communities along the I-580 Central Corridor, there are also developed residential communities in unincorporated areas of Alameda County such as Castro Valley. According to the 2010 Census data, about 33 percent of residents in the Corridor live in unincorporated Alameda County. The largest city population is in Oakland followed by San Leandro and then Emeryville.

On average, County and city residents living along I-580 Central spend nearly an hour each day traveling to and from their employment destinations both along and outside of the corridor. The 2006-2010 American Communities Survey (ACS)³ reports that over the course of their daily commute, 62 percent of residents drove alone, 10 percent chose to carpool, five percent rode the bus and nine percent took Bay Area Rapid Transit (BART).

Oakland, San Leandro and Emeryville value their historical and cultural character and all have adopted policies in their General Plans to protect and preserve their communities. All three have established Priority Development Areas (PDA) for infill development to accommodate future gains in population and employment. Table 5 summarizes 2010 Census data for the four jurisdictions along the corridor.

Table 5. 2010 Census Demographic Data

	Alameda County	Emeryville	San Leandro	Oakland
Total Population	1,510,271	10,080	84,950	390,724
Non-Hispanic White	649,122 (43.0%)	4,490 (44.5%)	31,946 (37.6%)	134,925 (34.5%)
Non-Hispanic African American	190,451 (12.6%)	1,764 (17.5%)	10,437 (12.3%)	109,471 (28.0%)
Non-Hispanic Asian	394,560 (26.1%)	2,775 (27.5%)	25,206 (29.7%)	65,881(16.8%)
Hispanic or Latino	339,899 (22.5%)	927 (9.2%)	23,237 (27.4%)	99,068(25.4%)
Language Spoken at Home – English Only	49.30%	62.00%	51.00%	60.40%
Population Density (people/square mile)	2,049	8,090	6,366	7,004
Number of Households	545,138	5,694	30,717	153,791
Average Household Size	2.70	1.76	2.74	2.49
Number of Housing Units	582,549	6,646	32,419	169,710
Owner-Occupied Housing Units	53.4%	35.4%	57.5%	44.1%
Median Household Income (Estimate, 2006-2010 American Community Survey)	\$70,821	\$69,274	\$61,857	\$48,596
Mean Travel Time to Work (min)	27.9	28.6	26.9	27.5

Source: Data compiled from the U.S. Census Bureau.

³ http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_5YR_S0801

Land Use

Alameda County encompasses approximately 821 square miles including the incorporated cities along the I-580 Central corridor (Emeryville, Oakland and San Leandro). The County's economy is based mostly on the manufacturing and wholesale trade of nondurable goods and textiles but also supports some public land uses associated with the East Bay Regional Park District (EBRPD) and East Bay Municipal Utility District (EBMUD). The area is known for its manufacturing of textiles and maritime industries among others.

The land uses along I-580 Central include a mixture of residential and commercial which predate construction of the I-580 freeway and those that which were built since. In addition to the summary of corridor land uses in Table 6, construction of the freeway allowed for development of land east of the corridor along most of the route segments except for segments 5 and 6 which were constructed above grade in order to reduce right of way cost and connect to I-80.

The I-580 Central Corridor is a critical route that connects neighboring communities to job centers, airports, seaports, and recreational and entertainment facilities around the region. Universities and colleges adjacent to the I-580 Central Corridor include Patton University, Mills College and the California College of the Arts. There are approximately seven K through 12 schools located along the I-580 Central Corridor. Shopping areas along the Corridor include Fairmont Plaza, Foothill Square, Bay Fair Mall, Powell Street Plaza and Bay Street.

Table 6. I-580 Central Land Use Summary per Segment

TCR SEGMENT	POST MILES	LAND USES
Segment 1	ALA 30.81– 32.84	West: Low-Med Commercial, Med-High Residential, Institutional (Academy), BART
		East: Low Retail/Commercial, Open Space, Low-Med Residential, Institutional (Hospital)
Segment 2	ALA 32.84 – 35.11	West: Low-Med Commercial, Med-High Residential, Institutional (School), BART
		East: Open Space, Low-Med Residential, Park Land, Recreational
Segment 3	ALA 35.11 – 39.24	West: Low-Med Commercial, Med-High Residential, Institutional (Church)
		East: Open Space, Low-Med Residential, Park Land, Recreational, Institutional (Hospital)
Segment 4	ALA 39.24 – 43.48	West: Med-High Commercial, Med-High Residential, Recreational, Office
		East: Low-Med Commercial, Low-Med Residential,
Segment 5	ALA 43.48 – 45.15	West: Med-High Commercial, Med-High Residential, Low Med Retail, Office
		East: Low-Med Retail/Commercial, Low-Med Residential, Park Land
Segment 6	ALA 45.15 – 46.46	West: Low-Med Commercial, Med-High Residential, Institutional (Hospital)
		East: Low-Med Retail/Commercial, Low-Med Residential, Open Space

Source: <http://mapgis.oaklandnet.com/planmap/>
<http://www.sanleandro.org/civicax/filebank/blobdload.aspx?blobid=5505>

Priority Development Areas and Priority Conservation Areas

Plan Bay Area, approved in 2013, is a long-range integrated transportation and land-use/housing strategy and serves as the Regional Transportation Plan for the San Francisco Bay Area. Plan Bay Area responds to Senate Bill 375 (2008) which requires metropolitan regions in the State to develop Sustainable Communities Strategies (SCS) to accommodate future population growth while reducing greenhouse gas emissions from cars and light trucks. The identification and establishment of local Priority Development Areas (PDA) will help focus 80 percent of new housing and 66 percent of new jobs forecast for the region. Priority Conservation Areas (PCA) are areas identified through consensus by local jurisdictions and park/open space districts as land in need of protection due to pressure from urban development or other factors. The Metropolitan Transportation Commission (MTC) produced the RTP in concert with the Association of Bay Area Governments who is responsible for developing regional housing and employment forecasts. Within the Plan's horizon year (2040) population estimates for the Bay Area include two million new residents and a total population topping nine million. PDAs in Alameda County help accommodate a large share of forecasted growth in the Bay Area. Table 7 below lists the PDAs along the I-580 Central Corridor and Figure 3 (Environmental Factors Map) displays where these PDAs (and PCAs) are located.

Table 7. I-580 Central Priority Development Areas

I-580 Central Priority Development Area	
PDA	Designation
Alameda County: Castro Valley BART	Planned
Alameda County: East 14 th Street. and Mission Blvd	Existing
City of Emeryville: Mixed Use Core	Existing
City of Oakland: Fruitvale & Dimond Areas	Existing
City of Oakland: Eastmont Town Center	Existing
City of Oakland: Transit Orientated Development Corridors	Planned
City of Oakland: MacArthur BART Transit Village	Existing
City of San Leandro: Bayfair BART Transit Village	Planned
City of San Leandro: E. 14 th Street	Existing
City of San Leandro: Downtown Transit Oriented Development	Planned

Complete Streets

A Complete Street is defined as a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, trucks, and motorists, appropriate to the function and context of the facility. Complete Streets concepts apply to rural, suburban, and urban areas. Providing Complete Streets increases travel options which in turn can reduce congestion, increase system efficiency, and enable more environmentally sustainable alternatives to single driver automotive trips.

Implementing Complete Streets and other multi-modal concepts supports the California Complete Streets Act of 2008 (AB 1358), as well as the California Global Warming Solutions Act of 2006 (AB 32), Senate Bill (SB) 375 and SB 391, which outline the State's role in reducing greenhouse gas emissions. In support of Complete Streets, Caltrans Deputy Directive 64-Revision 2 (DD-64-R2) provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities on the State Highway System. Caltrans views all transportation improvements (new and retrofit) as opportunities to improve safety, access, and mobility for all travelers and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system. With AB 1358, DD-64-R2, and the endorsement of the National Association of City Transportation Officials (NACTO) Urban Design guidelines, both Caltrans and local agencies are working together to address common goals.

MTC's One Bay Area Grant (OBAG) Program requires participating agencies to adopt resolutions which incorporate MTC Complete Streets elements and modify their General Plans to comply with the California Complete Streets Act. Agencies are encouraged to consult with internal departments as well as stakeholders and to go beyond the required elements to accommodate all users of the roadway network. Language in the elements is kept general to allow jurisdictions the flexibility they need to develop their own policy. Beginning in 2015, jurisdictions were required to update the Circulation Element of their General Plans for compliance with the California Complete Streets Act to maintain eligibility for these funds.

Sustainable Communities Strategy

In support of linking land use with transportation, Senate Bill 375 (SB 375) was passed in 2008 and signed by then Governor Schwarzenegger. The bill requires Metropolitan Planning Organizations (MPO) to meet State-mandated greenhouse gas (GHG) emission targets for automobiles and light trucks for Years 2020 and 2050. MPOs must accurately account for the environmental benefits of more compact development and reduced vehicle miles traveled. If regions develop integrated land use, housing and transportation plans that meet the emission reduction targets, some in-fill projects in these regions can be relieved of certain requirements of the [California Environmental Quality Act](#) (CEQA). The emission reduction targets apply to the 18 designated MPO regions in the State.

The recently approved Regional Transportation Plan (RTP), also known as Plan Bay Area, adopted on July 18, 2013 by MTC, includes a Sustainable Communities Strategy (SCS) as required by SB 375. The SCS lays out how GHG emissions reduction targets will be met for cars and light trucks. The legislation also synchronizes the Regional Housing Needs Assessment (RHNA) process with the RTP process, requires local governments to revise their General Plans to be consistent with their updated Housing Elements within three years of adoption, and provides that RHNA allocations must be consistent with the development pattern in the SCS. This entire process represents a dramatic change in how land use, transportation and future project selection will be prioritized and funded.

Senate Bill 743

Signed by Governor Brown on September 27, 2013, SB 743 requires the Governor's Office of Planning and Research (OPR) to update the California Environmental Quality Act (CEQA) Guidelines to change the way transportation impacts from proposed land use development projects are analyzed under CEQA. Vehicle delay and Level of Service (LOS) are no longer valid measures of significant impact and mitigation. While new CEQA guidelines are still being developed and have not been adopted, as a result of the passage of SB 743, the focus of transportation analyses for proposed developments may shift from an assessment of vehicular delay to a measure of Vehicle Miles Traveled (VMT) and levels of greenhouse gas (GHG) emission output. The intent is to shift transportation analysis recommendations to focus less on roadway improvements and encourage more investment in multimodal transportation networks and mixed land uses. This also helps to support the policies of a region's SCS.

California Transportation Plan

Senate Bill 391 (SB 391) in 2009 required Caltrans update the statewide California Transportation Plan (CTP) by December 31, 2015 and every five years thereafter. The CTP shall identify the integrated multimodal transportation system needed to achieve maximum feasible greenhouse gas emissions reductions to 1990 levels by 2050 and 80 percent below 1990 levels by 2050 (as required by AB 32). Additionally, SB 391 requires the CTP incorporate transportation policies and system performance objectives from approved RTPs produced by MPOs. Caltrans must also consult, coordinate, and make drafts of the CTP available for review and comment to the: California Transportation Commission (CTC), Strategic Growth Council, California Air Resources Board (CARB), State Energy Resources Conservation

and Development Commission, Air Quality Management Districts, public transit operators, and Regional Transportation Planning Agencies (RTPA).

Smart Mobility Framework

In 2010 Caltrans introduced the concept of Smart Mobility to its Transportation Planning process and established the Smart Mobility Framework (SMF)⁴. Smart Mobility is defined as the movement of people and freight while enhancing California’s economic, environmental and human resources by emphasizing convenient and safe multi-modal travel, speed suitability, accessibility, management of the circulation network, and efficient use of land. The SMF is built on six principles: Location Efficiency, Reliable Mobility, Health and Safety, Environmental Stewardship, Social Equity, and Robust Economy. SMF allows planners to respond to the needs of communities in order to accommodate the mobility needs of all users while balancing economic prosperity, environmental quality and social equity. It also helps achieve the goals of reducing per capita VMT and addresses climate change challenges presented in AB 32 and SB 375.

Based on the Location Efficiency principle, the SMF introduces “Place Types” to help inform transportation decision-making. Each of the place types represent a distinct context where implementation of certain transportation investments, along with planning and management strategies, will help improve location efficiency and achieve Smart Mobility benefits. Notable I-580 Central Corridor SMF Place Types that will inform the route concept (Table 18) are described in Table 8.

Table 8. I-580 Central Smart Mobility Framework Place Types

<i>Place Type</i>	<i>Transportation Projects and Programs</i>
<i>Protected Lands</i>	<ul style="list-style-type: none"> • <i>Increase capacity and connectivity increase only when required</i> • <i>Bicycle facility and trail projects where public access and recreational use is permitted</i>
<i>Suburban Communities</i>	<ul style="list-style-type: none"> • <i>Improve the efficiency of arterials and freeway corridors</i> • <i>Investments that shorten trip lengths and encourage use of other modes</i> • <i>Complete Street Projects</i>
<i>Compact Communities</i>	<ul style="list-style-type: none"> • <i>Pedestrian facilities with high amenity levels</i> • <i>Extensive network of bicycle facilities</i> • <i>Convenient multi-modal transfers and transit transfers</i> • <i>On-going reinvestment in existing facilities</i>
<i>Close-in Compact Communities-Centers</i>	<ul style="list-style-type: none"> • <i>Complete Streets projects</i> • <i>On-going reinvestment in existing facilities</i> • <i>High capacity transit linking neighborhoods to employment centers</i> • <i>Local transit with excellent coverage providing connections to high capacity transit lines</i>
<i>Urban Center</i>	<ul style="list-style-type: none"> • <i>High capacity and speed transit with major transit hubs</i> • <i>High amenity pedestrian and extensive bicycle networks</i> • <i>Opportunities for multi-modal and transit transfers</i> • <i>Ongoing reinvestment in existing facilities</i>

⁵ <http://www.dot.ca.gov/hq/top/offices/ocp/smf.html>

System Characteristics

The I-580 Central Corridor is approximately 15.65 miles in length and represents the second of four I-580 freeway legs. The entire I-580 Corridor begins near unincorporated Vernalis (San Joaquin County) and ends in the city of San Rafael (Marin County); a distance of approximately 80 miles. The I-580 Central Corridor provides essential interregional connectivity to both the State Highway and Interstate Systems. I-580 Central consists of six segments that vary between six and ten lanes. Segments Two through Five are officially designated as a Scenic Highway. I-580 Central is also host to a network of transportation modes with some serving intraregional (local) travel and others utilizing interregional and interstate travel demand. On weekdays the majority of travel and delay on I-580 Central is caused by commuter traffic demand. However, the route can also experience congestion on weekends from recreational travel demand. Due to a 4.5 ton truck weight restriction along a portion of the route, I-580 Central averages low truck volumes.

Current ITS infrastructure on the I-580 Central Corridor includes (CCTV) cameras, changeable message signs (CMS), extinguishable message signs (EMS), Highway Advisory Radio (HAR), ramp metering (RM) stations and Traffic Monitoring Stations (TMS). Non recurrent incident management is provided by the MTC Freeway Service Patrol (FSP).

Capitol Corridor and Amtrak trains provide interregional rail service between Sacramento and San Jose and points beyond. There are stations adjacent to the corridor in Hayward, Oakland and Emeryville. The Alameda County Transportation Commission (Alameda CTC) and other agencies coordinate with the Alameda-Contra Costa Transit District (AC Transit) which provides local and transbay bus services including connections to BART in Castro Valley, San Leandro and Oakland.

Pedestrian and bicycle access along the route is restricted. A network of connecting local and county maintained roads, multi-use trails (MUT), and other paths allow pedestrians and cyclists to reach destinations along the corridor. Pedestrian and cyclist access across the I-580 Central Corridor is achieved at interchanges. However, the ability to cross the route varies due to inconsistencies in access to the interchanges, spacing between them and a lack of supportive infrastructure making some crossings more challenging than others.

Alameda County's long-range Transportation Planning process is organized at the county level by Alameda CTC with active local and county representation in four subregional "Planning Areas." The Countywide Transportation Plan (CWTP) informs the RTP while focusing on reducing GHG emissions, transportation system management, goods movement, transit connectivity, maintenance and operations. County Planning efforts rely upon federal, State and county funds to maintain investments in resource, homeland security, and all transportation infrastructure which cannot be sustained on local funding sources. Table 9 lists additional System Characteristics Data for the I-580 Central TCR including the concept facility for the Horizon Year (2040). Since there are not any major capital-based improvements planned for the I-580 Central Corridor, the 30-year facility concept for the route essentially remains the same.

The pavement conditions for a significant portion of I-580 Central receive a bad ride quality grade, but there are segments with minor and major structural distress. As indicated in Figure 4 below, Poor Ride Only represents the third state of pavement distress level. The corresponding treatment is called Capital Preventive Maintenance (CAPM), which should be applied to affected sections on I-580 West. Figure 5 shows where these sections are located. This program is funded through the State Highway Operation and Protection Program (SHOPP).

Figure 2. Pavement Distress Level and Corresponding Treatment



State 1: Good/excellent condition with few potholes or cracks ⇒ Preventive maintenance project

State 2: Fair condition with minor cracking or slabcracking ⇒ Corrective maintenance project

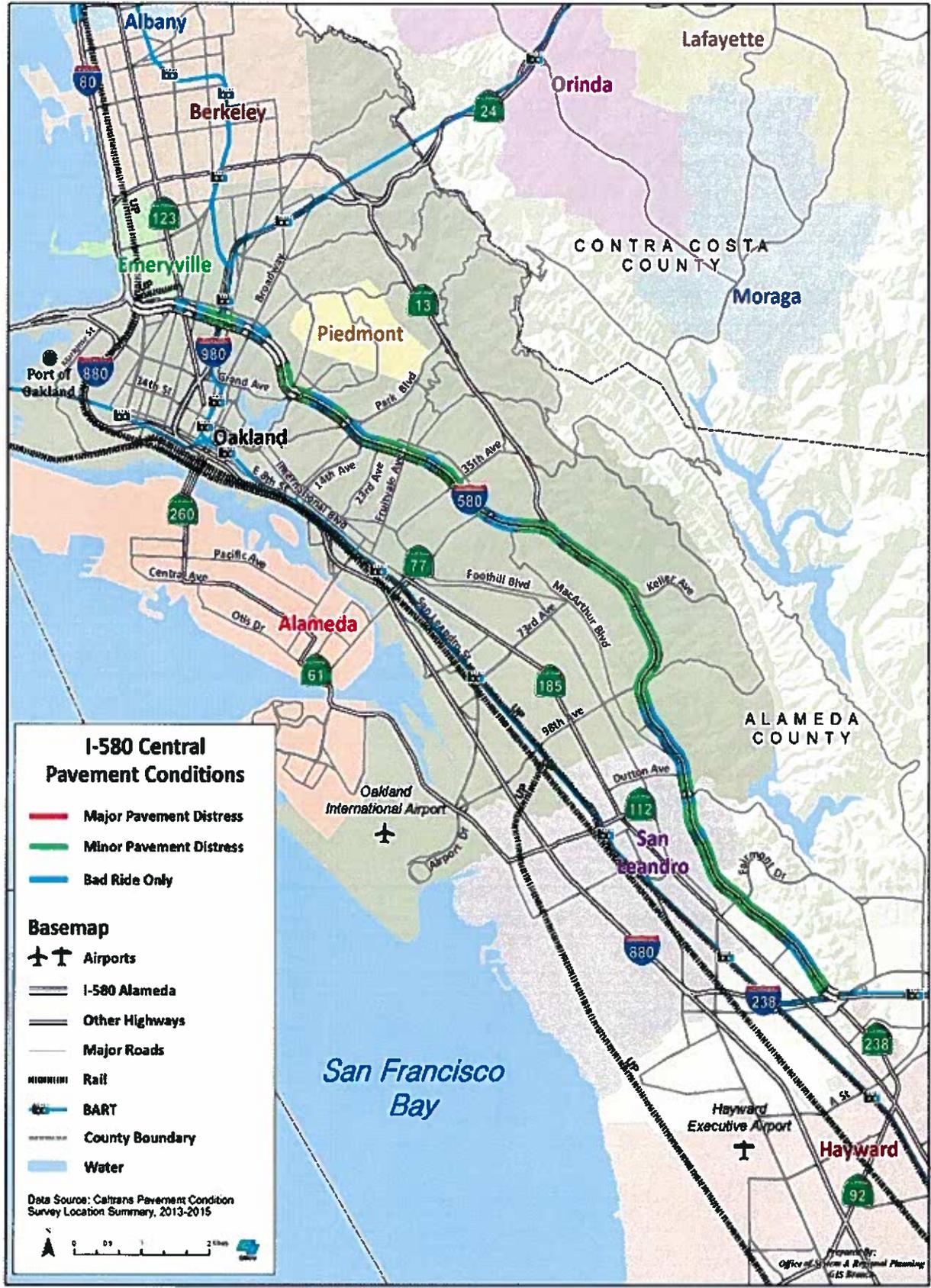
State 3: Poor condition with significant to extensive cracks or poor ride only ⇒ CAPM , rehabilitation or reconstruction project

Table 9. I-580 Central System Characteristics Data Table

I-580 Central System Characteristics Data						
TCR Segment	1	2	3	4	5	6
Existing Facility (2010)						
Facility Type	F	F	F	F	F	F
General Purpose Lanes	6-8	8	8	8	6-10	6-10
Lane Miles	16.24	18.16	33.04	33.92	16.24	10.47
Centerline Miles	2.030	2.270	4.130	4.240	2.030	1.309
Median Width	22-99	22	22	22	22	22-99
Median Characteristics	H, J, K, Q	H, J, K	J	H, J, K	H	H, J, K, Q
Distressed Pavement	See Figures 2 and 3					
ROW	100'	100'	100'	100'	100'	100'
Concept Facility (2040)						
Facility Type	F	F	F	F	F	F
General Purpose Lanes	6-8	8	8	8	6-10	6-10
Lane Miles	16.24	18.16	33.04	33.92	16.24	10.47
Centerline Miles	2.030	2.270	4.130	4.240	2.030	1.309
Transportation Management System Elements						
2010 Base Year	Vehicle Detection System (VDS), Ramp Metering (RM), Changeable Message Sign (CMS), Closed Circuit Television (CCTV), Traffic Monitor Stations (TMS)					
2040 Horizon Year	Mainline Vehicle Detection System (MVDS), Ramp Metering (RM), Closed Circuit Television (CCTV), Extinguishable Message Sign (EMS), Traffic Monitor Stations (TMS)					

F - Freeway, H - Paved, J - Unpaved, K - Separate Grades, Q - Separate Structures

Figure 3. I-580 Central Pavement Conditions Map



Bicycle Facilities

Due to access restrictions, the I-580 Central bicycle network consists of county and local systems including Class 2 (bike lane), Class 3 (bike route) and shared travel lane facilities. The City of Oakland Bicycle Facilities Map⁵ identifies a network of connecting Class 2, Class 3 and shared road facilities beginning on Foothill Boulevard and continuing on Bancroft Avenue and MacArthur Boulevard to the SR 13 interchange. The remainder of the network relies on MacArthur Boulevard and Grand Avenue before ending at the SR 24/I-980 interchange. From there the network heads west on the Class 1 San Francisco Bay Trail to the San Francisco Oakland Bay Bridge (SFOBB) Bike Trail and into the City of Emeryville. Future improvements focus on reducing or eliminating existing gaps and barriers in the network. The map envisions programs, projects and the creation of a bicycle network that connects jurisdictions, provides access to transit and Central Business Districts as well as the inter-jurisdictional trail network. The map also improves access for communities with large concentrations of lower-income populations with inadequate access to other transportation modes while reducing and/or removing network gaps and barriers created by physical geography and existing infrastructure. Table 10 below lists the current county and local bicycle network along the I-580 Central Corridor.

Table 10. I-580 Central Bicycle Facilities

TCR Segment	Bicycle Facilities Parallel to I-580 Central					Bicycle Facilities Crossing I-580 Central	
	Post Mile	Location Description	Facility Location	Class	Posted Speed Limit	Junction	
						Location	Type
1	30.81-32.84	I-238 to 150 th Ave.	Foothill Blvd.	2/ Shared	35 mph	150 th Ave.	Grade separated, signalized
2	32.84-35.11	150 th Ave. to Foothill Blvd.	Bancroft Ave.	3/ Shared	35 mph	Grand Ave.	Grade separated, not signalized
3	35.11-39.24	Foothill Blvd. to SR 13	Bancroft Ave./ Macarthur Blvd.	2/3 Shared	25/35 mph	Golf Links /Edwards Ave	Grade separated, signalized
4	39.24-43.48	SR 13 to Grand Ave.	Macarthur Blvd.	2/ Shared	25 mph	MacArthur Blvd.	Grade separated, signalized
5	43.48-45.51	Grand Ave. to SR 24/I-980	Grand Ave.	2/ Shared	25 mph	Park Blvd./ 14 th Ave.	Grade separated, signalized
6	45.51-46.46	SR 24/I-980 to I-580/I-880	Grand Ave., Mandela Pkwy.	2/ Shared	25 mph	SR24/980- Grand Ave.	Grade separated, not signalized

⁵ <http://sfgis.com/bikemap/>

Pedestrian Facilities

Due to controlled access, the pedestrian network for I-580 Central consists of small, locally accessible nodes and direct access route facilities. A combination of local pedestrian infrastructure and freeway interchanges provide access along and across the I-580 Central Corridor. Barriers to expanding the pedestrian network include lower density (auto-oriented) land uses, physical geography and existing infrastructure that focuses more on vehicular access. Gaps in the pedestrian network exist due to lack of connectivity between a hierarchy of existing facilities including Multi Use Trails (MUT), interregional and local roadway facilities. Larger intersection corner radii tends to encourage higher vehicle turning speeds and longer pedestrian crossing distance. These factors may lead to increased vehicle-pedestrian conflicts and discourage walking through the area. As mentioned in the Bicycle Facilities section, future improvements listed in the Alameda Countywide Pedestrian Plan focus on reducing or eliminating gaps and barriers in the pedestrian network. Table 11 below lists presents county and local pedestrian networks along the I-580 Central Corridor.

Table 11. I-580 Central Pedestrian Facilities

TCR Segment	Pedestrian Facilities Parallel to I-580 Central							Pedestrian Facilities Crossing I-580 Central			
	Post Mile	Location Description	Facility Location	Sidewalk Present	Sidewalk Width	Facility Description	Volume	Junction			
								Location	Type	Large Corner Radii	Crossing Distance
1	30.81-32.84	I-238 to 150 th Ave.	Foothill Blvd.	Varies	>4ft.	Sidewalk/ Crosswalk	Med	150 th Ave.	Grade separated, signalized	Yes	30 ft.
2	32.84-35.11	150 th Ave. to Foothill Blvd.	Bancroft Ave.	Yes	>4ft.	Sidewalk/ Crosswalk	Low	Grand Ave.	Grade separated, not signalized	Yes	30 ft.
3	35.11-39.24	Foothill Blvd. to SR 13	Bancroft Ave./ Macarthur Blvd.	Yes	>4ft.	Sidewalk/ Crosswalk	Low	Golf Links / Edwards Ave	Grade separated, signalized	Yes	30 ft.
4	39.24-43.48	SR 13 to Grand Ave.	Macarthur Blvd.	Yes	>4ft.	Sidewalk/ Crosswalk	Low	MacArthur Blvd.	Grade separated, signalized	Yes	30 ft.
5	43.48-45.51	Grand Ave. to SR 24/I-980	Grand Ave.	Yes	>4ft.	Sidewalk/ Crosswalk	Low	Park Blvd./ 14 th Ave.	Grade separated, signalized	Yes	30 ft.
6	45.51-46.46	SR 24/I-980 to I-580/I-880	Grand Ave. Mandela Pkwy.	Yes	>4ft.	Sidewalk/ Crosswalk	Low	SR24/I-980/ Grand Ave.	Grade separated, not signalized	Yes	30 ft.

Transit Service

Alameda CTC coordinates directly with a coalition of transit operators, including the Alameda-Contra Costa Transit District (AC Transit) and the Bay Area Rapid Transit District (BART). These agencies provide local bus, peak period express bus and rail services to connect transit riders with regional economic and employment centers in Alameda, Contra Costa and San Francisco Counties. Within the I-580 Central Corridor, AC Transit intercity bus service is available daily between San Francisco, Castro Valley, San Leandro, Oakland and Emeryville. Transbay bus service is available five days a week between Castro Valley, San Leandro, Oakland and Emeryville. Transit headways vary between peak hour, weekday and weekend service. Most AC Transit vehicles are equipped with racks to carry two bicycles. Future improvements include new rolling stock and expanded Rapid Bus service along the Corridor. BART operates daily service from stations in Castro Valley, San Leandro, Oakland, and most recently Oakland International Airport. Transit headways vary between peak, daily, and weekend service. Bicycles are permitted on BART trains however they are restricted from the first car on each train. Future BART service includes track extensions to San Jose and service to Livermore is proposed along the Dublin/Pleasanton lines. Capitol Corridor/Amtrak regional rail service between San Jose and Auburn is available from the Emeryville Intermodal Station. Rail service is available seven days a week with headways varying from thirty minutes during weekday peak periods to 2.5 hours during off peak hours and weekends. Most trains feature facilities for bicycles however, capacity varies depending upon rolling stock and differing policies between Capitol Corridor and Amtrak. Lastly, transit connections to various Park and Ride facilities located in Castro Valley and Oakland furnish commuters with the option to carpool or use transit. Table 12 displays present transit options in the I-580 Central Corridor.

Table 12. I-580 Central Transit Service

I-580 Central Transit Service												
TCR Segment	Mode & Collateral Facility	Name	Route End Points	Headway	Operating Period	ITS & Technology	Stations		Amenities	Bikes Allowed on Transit	Location Description	# Parking Spaces
							Cities	Post Miles				
1-6	Local / Transbay	AC Transit	Castro Valley/San Francisco	H M L	M-F & Daily	Real-time	Castro Valley, San Leandro, Oakland	30.81 to 46.46	Bike Racks, Wi-Fi	Y	NA	NA
1-6	Express Bus	AC Transit	Bayfair BART/ Downtown Berkeley	H M L	Daily	Real-time	San Leandro, Oakland, Berkeley	30.81 to 45.51	Bike Racks	Y	NA	NA
1-6	Regional Rail	BART	Millbrae/ Richmond/ Fremont/ Pleasanton	H M L	Daily	ETA - ETD	Castro Valley, San Leandro, Oakland	30.81 To 45.51	Space for Bike Racks, Wi-Fi	Y	NA	NA
1	Park & Ride	Caltrans	NA	NA	NA	NA	Castro Valley	NA	10 Bike Lockers	Y	Center St/	138
									NA		John Dr.	8
4	Park & Ride	Caltrans	NA	NA	NA	NA	Oakland	NA	10 Bike Lockers	Y	Fruitvale Ave./I-580	178
									36 Bike Racks		Grand Ave./I-580	58
6	Intercity Rail	Capital Corridor	Sacramento/ San Jose	H M L	Daily	NA	Emeryville	46.46	Bike Racks, Wi-Fi	Y	I-580/I-80 Powell Ave.	120

H - Peak Hour, M - Daily, L - Weekend Holiday

Freight

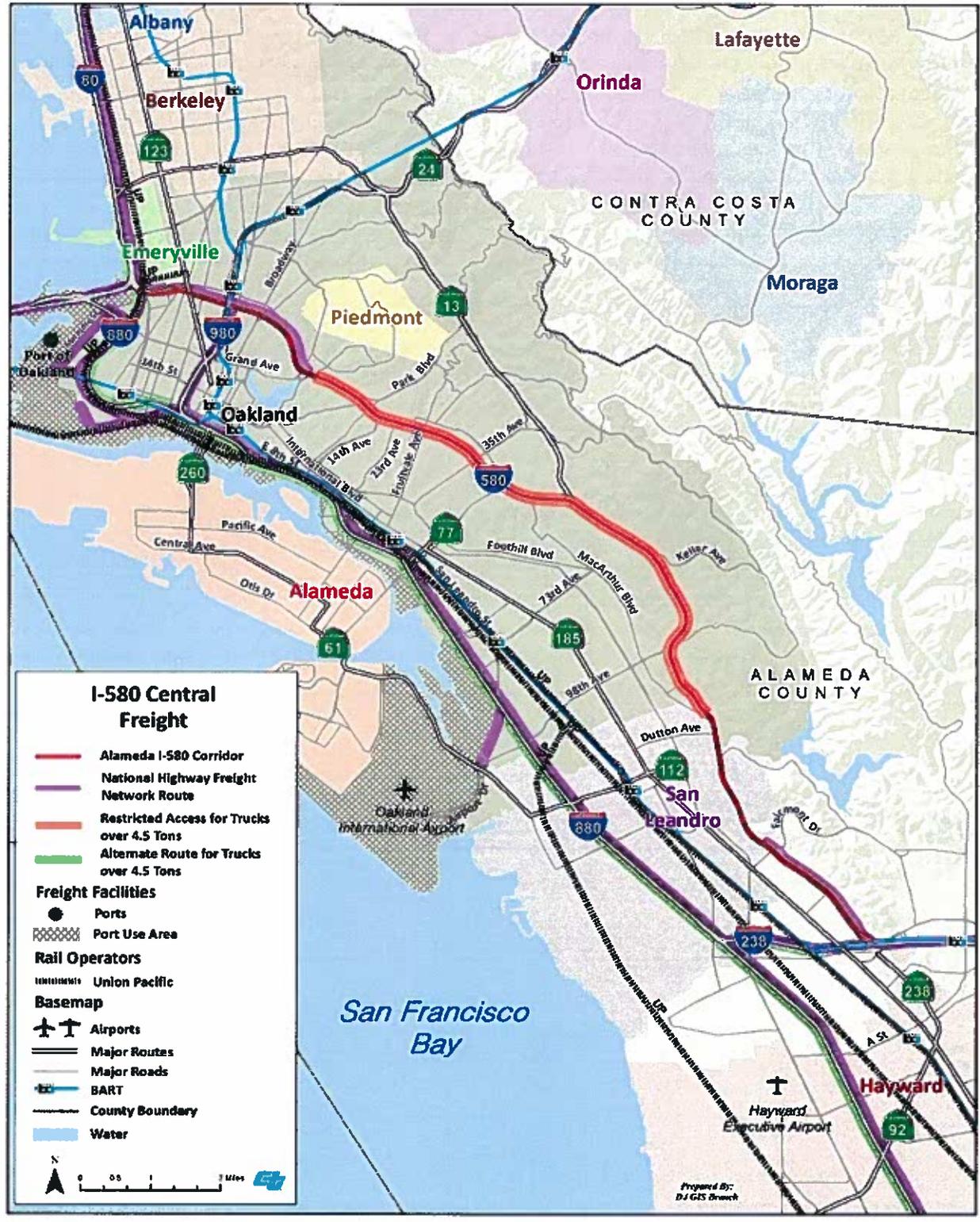
The San Francisco Bay Area serves as a west coast gateway for the flow of commerce and economic activity across regional and interstate transportation networks. Most freight movement in and around I-580 Central takes place on I-238 and I-880 due to trucks over 4.5 tons (except buses) being restricted on Segments 3,4 and 5 between Foothill Boulevard and I-980/SR-24 in Oakland. In the event of a "Sig-Alert" or closure on I-880 and/or I-238, trucks are temporarily allowed to use I-580 Central. The restriction was made permanent in 2000 with the passing of Assembly Bill (AB) 500 which adds the mandate to the California Vehicle Code section 35655.5. Trucks traveling eastbound toward I-580 East must exit the route before reaching the Grand Avenue/Lakeshore Avenue exit in Oakland and trucks traveling westbound must exit at Foothill Boulevard in San Leandro. The route is exempt from the federal Surface Transportation Assistance Act (STAA), approved in 1982, under a "grandfather" provision which states that since the truck restriction existed prior to the day STAA became law, the route cannot be included in the STAA National Network. Percentages of truck traffic vary between five and one half of a percent with the highest percentage observed on segments outside the truck weight limitation. Five axle trucks account for between three and third and one half of a percent of total trucks with the lowest percentage observed inside the segments subject to the truck weight restriction. Table 13 and Figure 2 display current regional freight facilities along I-580 Central.

Table 13. I-580 Central Freight Facilities

I-580 Central Freight Facilities					
Facility Type / Freight Generator	Location	Mode	Name	Major Commodity / Industry	Comments / Issues
Intermodal Container Port Facility	Oakland	Ship, rail, truck	Port of Oakland	Bulk -Agriculture Products, Automobiles	Shipping and UPRR Intermodal Freight Facility. Large source of peak hour congestion on I-880, I-238 and I-580 East connections.
Goods Movement Dependent Businesses	Castro Valley, Hayward, San Leandro & Oakland	Truck	Manufacturers, Retailers, Suppliers & Consumers of Goods and Services	Industries that supply, produce, warehouse/store, sell, transport, and/or deliver goods and materials	Use of local streets and conventional State Highways during peak hours. On-Off Ramp congestion.
Highway	Oakland	Truck	I-880 (National Highway Freight Network)	Electronics, Manufactured Products, Agriculture	Advisory STAA Route for trucks weighing 4.5 tons or more.
Highway	Hayward	Truck	I-580 East (National Highway Freight Network)	Electronics, Manufactured Products, Agriculture	Up to 6,100 Truck AADT. EB I-580 East and I-238. Class D weight station located @ PM R8.9
Highway	Hayward	Truck	I-238 (National Highway Freight Network)	Electronics, Manufactured Products, Agriculture	Advisory STAA Route for trucks weighing 4.5 tons or more.
Highway	Castro Valley, Hayward, San Leandro & Oakland	Truck	I-580 Central (National Highway Freight Network)	Electronics, Manufactured Products, Agriculture	In the event of a closure on I-880 trucks over 4.5 tons are allowed on I-580 Central

Source: <http://www.dot.ca.gov/hq/traffops/engineering/trucks/>

Figure 4. I-580 Central Freight Facilities Map



Environmental Considerations

The purpose of the environmental scan is to conduct a high level identification of potential environmental factors that may require future analysis in the project development process. This information may not represent all environmental considerations that exist within the corridor vicinity. The environmental factors have been categorized based on a scale of High-Medium-Low probability of an environmental resource issue and were determined by District 4 Transportation Planning staff. Table 14 below lists environmental factors present in the I-580 Central Corridor and their impact probability. A summary of the environmental factors included in this scan is also displayed in Figure 5.

Table 14. I-580 Central Environmental Factors Probability Table

I-580 Central Environmental Factors Probability																				
TCR Segment	Recreational and Protected Lanes	Visual Aesthetics	Geology / Soils / Seismic	Floodplain	Climate Change / Sea Level Rise	Hazardous Materials	Naturally Occurring Asbestos	Air Quality			Noise	Waters and Wetlands	Special Status Species	Habitat Connectivity						
								Ozone	PM						CO					
									2.5	10										
1	Low	Low	High	Low	Low	Low	Low	Non Attainment	Non Attainment	Non Attainment / Unclassified	Non Attainment / Unclassified	Low	Low	Low	Low					
2	Low	Low														Med	Low	Low	Low	Med
3	High	High	Low	Low	Low		Low					Med	Non Attainment	Non Attainment / Unclassified	Non Attainment / Unclassified	Med	Low	Low	High	High
4	Low	High	Med	Med	Low		Low					Low	Non Attainment	Non Attainment / Unclassified	Non Attainment / Unclassified	Med	Med	High	High	
5				Low	Low		Low					Low	Low	Non Attainment	Non Attainment / Unclassified	Non Attainment / Unclassified	Med	Med	Low	Low
6	Low	Low	Med	Med	Med		Low					Low	Non Attainment	Non Attainment / Unclassified	Non Attainment / Unclassified	Med	Low	Low	Low	Low

Source:

4F <http://www.calands.org/>

Farmland <ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/ala10.pdf>

EJ <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

Cultural http://www.dot.ca.gov/hq/structur/strmaint/hs_state.pdf

Visual <http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm>

Seismic http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx

Hazardous <http://www.calepa.ca.gov/SiteCleanup/CorteseList/default.htm>

HOA <http://www.dot.ca.gov/hq/maint/>

AQ <http://arbis.arb.ca.gov/desig/adm/adm.htm>

Noise <http://www.dot.ca.gov/hq/env/noise/index.htm#2011catnap>

Watershed – Wetlands <http://www.dot.ca.gov/hq/tsip/gis/data/library/gisdata/library.html>

Special Status Species <http://www.dfg.ca.gov/biogeodata/cnddb/>

Habitat Connectivity <http://www.dfg.ca.gov/habcon/connectivity/#EcoregionalAnalyses>

Discussion of the Environmental Factors included in the probability matrix are as follows:

- **Recreational and Protected Lands** – Segment 3 of I-580 Central is bordered to the north by a buffer of US Forest Service land and the larger Knowland Park and Arboretum which includes the City of Oakland Zoo. Additional notable open space land includes the Hellman Recreational Area, East Bay Municipal Utility District (EBMUD) watershed and the Dunsmuir Estate Park. Impacts to these lands should be a consideration during operational activities and/or design and construction of transportation projects within the segment.
- **Geology/Soils/Seismic** – The Hayward Fault Zone which includes the San Andreas Fault to the west and the Calaveras Fault to the east is present along segments one through five of I-580 Central. Combined these three faults span 74 miles and are positioned between the Pacific and North American Tectonic Plates. United States Geological Survey (USGS) mapping of Oakland and San Leandro suggest that soil liquefaction probability could occur during a significant seismic event. The susceptibility of the route to seismic activity should be considered during the design and construction of transportation projects within the corridor.
- **Flood Plain** – Segments 3 and 6 include areas that could be subject to inundation during a 100-year flood and/or tsunami event. In Segment 3 this includes the tributaries, marshlands and wetlands in the vicinity of Lake Merritt in Oakland. Segment 6 also features the boundary where the low lying tidal lands of Emeryville meet the San Francisco Bay shoreline. The California Emergency Management Agency (Cal EMA) identifies these lands within their flood overlay area.
- **Climate Change and Sea Level Rise Vulnerability** – Figure 6 displays locations along the I-580 Central Corridor that could be affected by a 16 and 55-inch rise in the sea level. Executive Order (EO) S-13-08 (November 2008) and the State of California Sea-Level Rise Interim Guidance Document (October 2010) directs all State agencies planning construction projects in areas vulnerable to sea level rise to begin planning for potential impacts by considering a range of sea level rise scenarios for the Years 2050 and 2100. Project Initiation Documents (PID) will investigate whether future projects can avoid or mitigate any identified risks associated with climate change. Although EO S-13-08 allows for some exemptions for routine maintenance projects and or projects programmed for construction through 2013, the intent is to plan ahead to assess project vulnerability and reduce anticipated risks associated with sea level rise.
- **Hazardous Materials** – The Department of Toxic Substances Control EnviroStor database identifies hazardous locations featuring underground tanks along Segments 4, 5 and 6 with a considerable concentration in the vicinity of the I-80/I-580/I-880 Distribution Structure in Emeryville.
- **Naturally Occurring Asbestos (NOA)** – Segments 2 and 3 contain areas likely to contain naturally occurring asbestos due to existing serpentinized ultramafic rock.
- **Air Quality** – According to the California Environmental Protection Agency (CalEPA) and the California Air Resources Board (CARB), Alameda County region exceeds State air quality standards for ozone, particulate matter 2.5 (PM 2.5), PM 10 and carbon dioxide. The federal Environmental Protection Agency (EPA) reports that the Alameda County region exceeds the federal air quality standards for ozone and PM 2.5 but is in compliance for PM 10 and carbon monoxide.

- **Noise** – Caltrans Traffic Noise Protocol (March 2011) requires noise abatement for new highway construction, reconstruction and retrofit barrier projects. It describes a scientific process that combines levels of noise abatement with the noise sensitivity of adjacent land uses. Immediate low noise sensitive industrial land uses as well as peripheral high noise sensitive land uses are present along Segment 6 while immediate high noise sensitive land uses such as protective lands and residential housing occupy the land adjacent to Segments 1 through 5. Noise sensitive land uses should be addressed during design and construction of new transportation projects within the corridor.
- **Waters and Wetlands** – The San Leandro, Peralta and Sausal Creeks and their adjacent riverine wetland habitats intersect the I-580 Central Corridor in Segments 2 and 4.
- **Special Status Species** – The California Natural Diversity Database (CNDD) identifies special status species in close proximity to the route to include the California Clapper Rail (*Rallus longirostris obsoletus*), California least tern (*Sternula antillarum browni*) and the Alameda whipsnake (*Masticophis lateralis euryxanthus*). The California Department of Fish and Wildlife protect habitat for any special status and at-risk species found within the County.

Figure 5. I-580 Central Environmental Factors Map

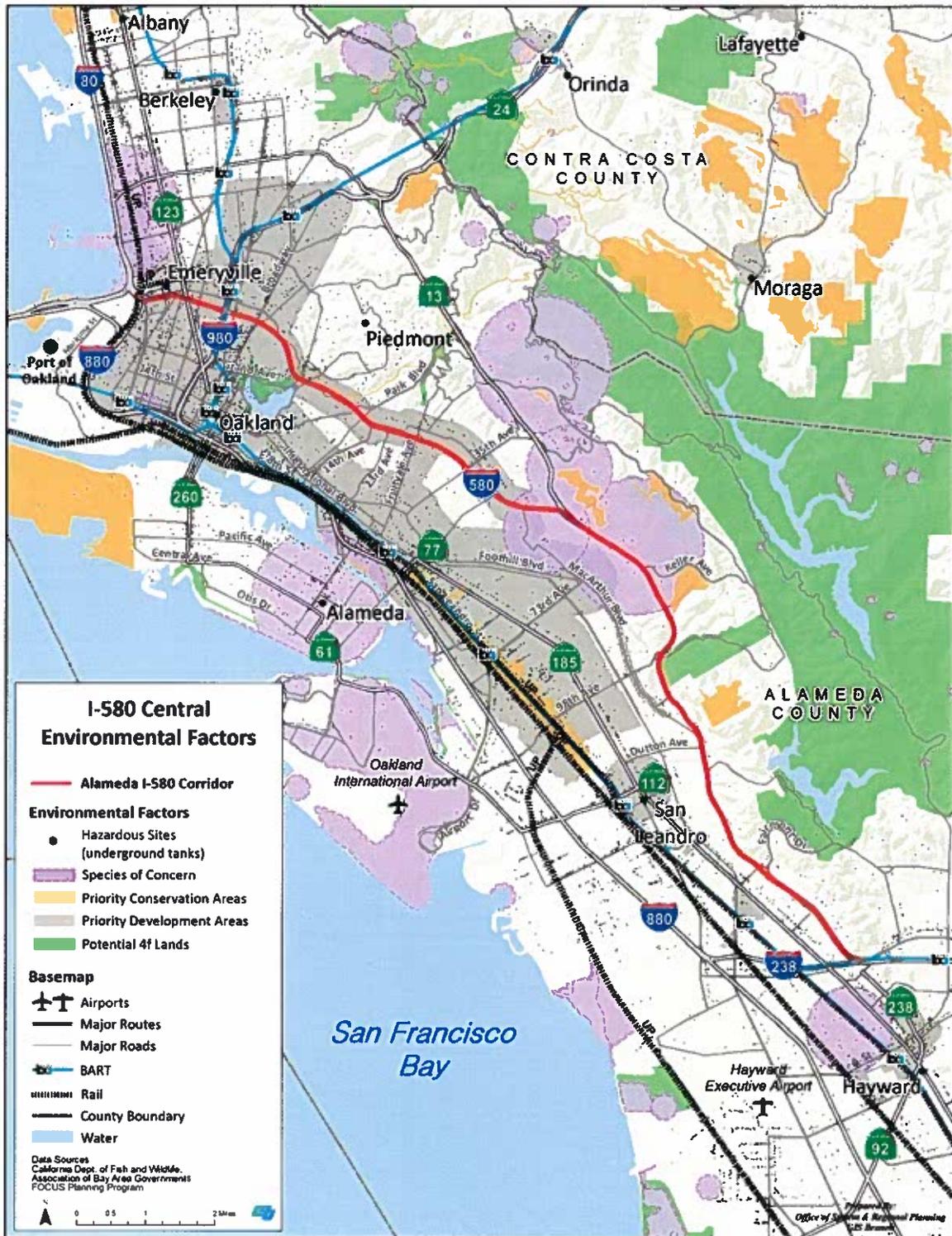
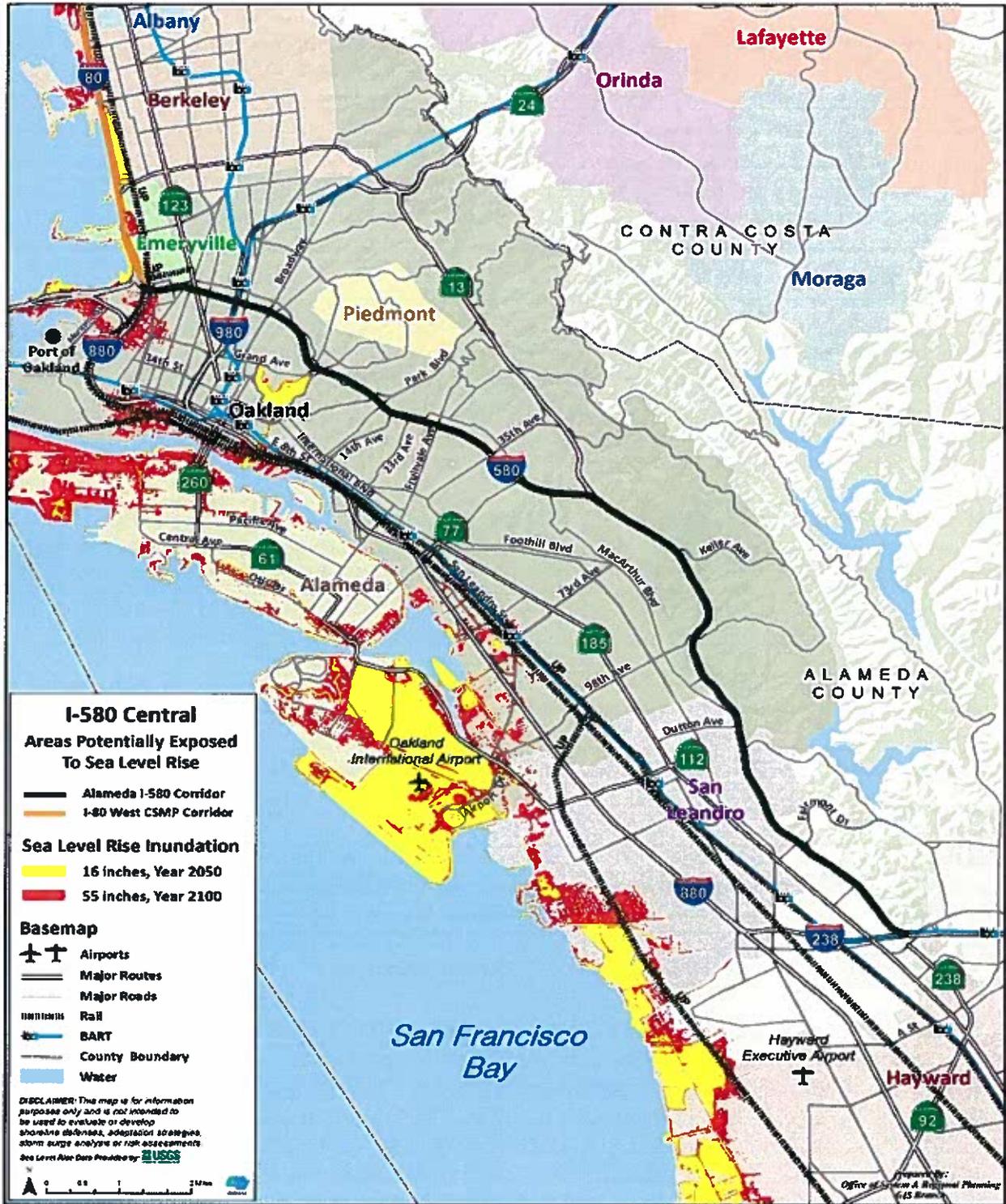


Figure 6. I-580 Central Sea Level Rise Map



CORRIDOR PERFORMANCE

The Alameda CTC travel demand model was used to obtain vehicle traffic performance data for the I-580 Central Corridor. The model uses the Association of Bay Area Government (ABAG) 2009 projections to report population and job levels in the base year (BY) 2010 and the horizon year (HY) 2040. In 2010, Segment 6, which connects to the I-80/I-880 interchange, carried the most daily traffic followed by Segment 3, which connects to the SR-24/I-980 interchange. However, in 2040 the model forecasts this trend will reverse as demand shifts from I-80 west to the SR-24 and I-580/I-238 corridors. An updated Alameda CTC travel demand model is currently being developed and will concentrate more on focused land use, active transportation, and transit operations. This updated travel demand model may result in lower forecasts than what is currently being provided and described in this TCR.

Base year peak hour volumes suggest a westbound AM peak followed by an eastbound PM peak with a directional split of 62% (AM) and 57% (PM). The model also forecasts that AM and PM peak directions will remain prominent in 2040 but their percentage share of all peak hour traffic will decline as non-peak directional traffic volumes increase. By 2040, as traffic on the route becomes more saturated in both on and off-peak directions, VMT, calculated as Average Annual Daily Traffic (AADT) x Segment Length, is forecast to grow by 756,884 miles for the entire corridor.

As traffic patterns change and non-peak hour demand increases, volumes will continue to outpace capacity along the I-580 Central Corridor. In 2010, volumes along Segments 3, 4 and 6 exceeded facility capacity with ratios at or over a 1:1 Vehicle-to-Capacity (V/C) ratio while the remaining segments continued to operate within close range of 1.00 V/C. As 2040 nears, the volumes along all six segments of I-580 Central will continue this trend as drivers experience slower speeds and increased delay.

The Caltrans Freeway Performance Measurement System (PeMS) identified a number of existing AM and PM bottlenecks during the 2010 base year. For the bottlenecks found within the corridor, PeMS data suggests constraints in off-ramp storage, freeway-to-freeway connector capacity and mainline capacity downstream of freeway on-ramps as the main causes of congestion in the corridor. During the AM and PM peak periods, the most prevalent and recurring mainline bottlenecks exist at Seminary Avenue (PM 38.89), High Street (PM 40.11), Fruitvale Avenue (PM 41.51), and West Street (PM 45.56). During the AM peak period a recurring bottleneck exists on the westbound I-80 to eastbound I-580 connector (PM 47.49). During the PM peak period, eastbound I-80 congestion through Emeryville and Berkeley causes traffic to back up onto the westbound I-580 to eastbound I-80 connector as well as upstream mainline segments of I-580 Central. There is also recurrent congestion at the I-580/I-238 interchange (PM 30.81). Table 15 on the next page summarizes corridor performance for I-580 Central.

Additionally, AB 500 which was passed in 2000, permanently restricts trucks over 4.5 tons on I-580 Central from Foothill Boulevard (between Segments 2 and 3) and Grand Avenue (between Segments 4 and 5) in Oakland and lifts the restriction only when there is a "Sig-Alert" or freeway closure on I-880 or I-238. 2013 AADTT and total trucks as a percentage of AADT were highest in the segments east of the 4.5 ton truck restriction and lowest in segments west of the restriction with very small amounts reported. This may suggest a travel pattern where a portion of trucks traveling along the corridor are exiting at Foothill Boulevard and diverting onto the local road networks of San Leandro and Oakland. These trucks then either return to I-580 Central on the unrestricted segments to the west or continue along the local street network toward I-880 and points beyond.

Table 15. I-580 Central Corridor Performance

I-580 Central Corridor Performance						
TCR Segment	1	2	3	4	5	6
Basic Systems Operations						
AADT (Base Year 2010)*	135,589	156,556	175,656	167,013	174,894	246,959
AADT (Horizon Year 2040)*	185,484	221,427	226,669	211,444	212,353	272,342
AADT: Growth Rate/Year	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
VMT (Base Year)	275,245	355,382	725,459	708,135	355,035	323,269
VMT (Horizon Year)	376,532	502,639	936,142	896,523	431,077	356,496
Truck Traffic Data**						
Total Average Annual Daily Truck Traffic (AADTT) (BY)	10,408	8,638	872	604	2,553	2,832
Total Trucks (% of AADT) (BY)	5.75%	6.17%	0.51%	0.40%	1.11%	1.20%
5+ Axle Average Annual Daily Truck Traffic (AADTT)(BY)	7,139	5,534	24	29	546	568
5+ Axle Trucks (as % of AADT)(BY)	68.59%	64.06%	2.80%	4.72%	21.39%	20.07%
Bottleneck Data***						
Bottleneck Existing	Y	Y	Y	Y	Y	Y
AM Bottleneck Location	30.81	38.89	40.11	41.51	45.56	47.49
Bottleneck Queue (length)	1-2	2.7	1.2	2.3	1.4	1.7
Bottleneck Causality	I-580/ I-238	Volume/ Ramp	Volume/ Ramp	Volume/ Ramp	Volume/ Ramp	I-80/I-580 Connector
PM Bottleneck Location	30.81	38.89	40.11	41.51	45.56	47.49
Bottleneck Queue (length)	3.0	2.7	1.3	2.9	1.1	1.3
Bottleneck Causality	I-238 NB	Volume/ Ramp	Volume/ Ramp	Volume/ Ramp	Volume/ Ramp	I-80 EB
Peak Hour Traffic Data						
AM Peak Hour Directional Split (BY)*	54%/45%	51%/49%	67%/33%	70%/30%	67%/33%	51%/48%
PM Peak Hour Directional Split (BY)*	53%/46%	60%/40%	66%/33%	52%/48%	51%/49%	56%/44%
Peak Hour V/C (BY) AM/WB	0.81	0.90	1.10	1.02	.98	1.11
Peak Hour V/C (BY) PM/EB	0.87	0.88	.97	1.05	.98	1.09
Peak Hour V/C (HY) AM/WB	1.00	1.01	1.20	1.14	1.11	1.18
Peak Hour V/C (HY) PM/EB	1.03	1.07	1.15	1.17	1.09	1.15

* http://www.alamedactc.org/app_pages/view/8079

** <http://traffic-counts.dot.ca.gov/>

***<http://pems.dot.ca.gov/>

KEY CORRIDOR ISSUES

I-580 Central Freight

Although trucks over 4.5 tons are restricted on certain segments of I-580 Central, they are not restricted from using some city streets and conventional State highways that parallel restricted freeway segments to reach shipping and delivery destinations in the area. Large trucks mixing with local motorized and non-motorized traffic may cause congestion and raise concerns about safety. The MTC Goods Movement Collaborative Study recommends constructing a Truck Bypass Lane at the I-580 Central interchange with I-238 in Hayward in order to remove a conflicting merge-weave section as cars and trucks move onto I-238 from I-580 East.

Congestion

I-580 Central Corridor users experience moderate to heavy levels of mainline delay during the AM and PM peak periods caused by a lack of off-ramp storage, mainline capacity and traffic incidents. Other sources of peak period delay are due to a lack of direct route-to-route connections, bottlenecks on adjacent routes that produce traffic queues long enough to extend onto I-580 Central.

Traffic Operations Strategies (TOS) and Deficiencies

The Caltrans Freeway Performance Measurement System (PeMS) reports 105 Mainline Vehicle Detection System (MVDS) induction loops and ramp detectors along the corridor. Recent PeMS inquiries suggest that currently distance between existing MVDS loops on the route varies between one-half and five miles with the largest gaps being between segments one through four. While construction and repair projects for these MVDS loops and ramp components are listed in the SHOPP, this will take years to complete and corridor performance monitoring, which aids in the identification of capacity and operational improvement strategies, may suffer as a result.

Right of Way Availability

Although most of the I-580 Central Corridor includes standard lane widths, shoulder expansion opportunities to potentially increase route capacity or allow for transit vehicle bypass may be limited due to existing retaining walls, culverts and structural overcrossings and pavement conditions. Any improvements requiring new right-of-way within the Corridor could likely be cost prohibitive and/or require extensive environmental mitigation.

Bicycle- Pedestrian Network

The interchanges along I-580 Central are essential to the passage of bicyclists and pedestrians across the route. Many of these interchanges lack sidewalks, feature narrow crossings without shoulders and large corner radii which may hinder access and mobility for bicyclists, pedestrians and persons with disabilities.

Transit

Due to structural constraints there are segments of I-580 Central that may not be able to accommodate heavy transit vehicles outside of existing travel lanes. Local efforts to augment or increase transit operations may need to focus on transit bypass lanes along freeway on and off ramps only, improved operations along parallel arterials (MacArthur Boulevard) and expanding both the number and size of Park and Ride facilities along the corridor to accommodate potential transit patrons. AC Transit's Major Corridors Study and Alameda CTC's Multimodal Arterial and Transit Plans, all currently being developed, will examine potential short and long-term (2020–2040) projects that will improve transit service and operations. The AC Transit Major Corridors Study will also specifically examine transit options along the I-580 Central Corridor.

CORRIDOR CONCEPT

Concept Rationale

The Corridor Concept conveys the Caltrans vision for a route with respect to corridor capacity and operations for a 30-year Planning horizon. The concept takes many factors into account that create interregional, regional, and local travel demand, including commute, freight, and recreational-based travel needs as well as surrounding land uses.

ABAG's Projections 2015 report anticipates moderate employment and population growth with associated development along all segments of the I-580 Central Corridor. The Corridor Concept recommends rehabilitation and preservation of existing bridges and roadway pavement combined with an overall Transportation System Management and Operations (TSMO) development strategy. Both of these strategies will help alleviate forecasted increases in congestion and delay along the corridor due to drivers slowing down for distressed surfaces. The overall 2040 concept consists of programmed and planned SHOPP projects identified for the I-580 Central Corridor. The 30-Year Capital Facility Concept maintains the existing facility including the replacement and rehabilitation of bridges and roadway pavement from I-238 to I-80 but does not call for additional freeway lanes. The 30-Year System Operations and Management Concept includes approved and planned projects from the Caltrans 2015 Ramp Metering Development Plan (RMDP). These projects are primarily focused on the completion and upgrade of the existing Mainline Vehicle Detection System, ramp metering and ITS related component deployments. Table 16 lists, by segment, the 30-Year Corridor Concepts for the I-580 Central Corridor.

Table 16. I-580 Central Concept Summary

I-580 Central Concept Summary				
TCR Segment	Segment Description	Existing Facility	30-Year Capital Facility Concept	30-Year System Operations and Management Concept
1	I-238 to 150 th Street	6-8F	6-8F	<ul style="list-style-type: none"> • Throughout corridor, activate existing ITS installations that currently are not fully operational. • Throughout corridor, fill gaps in the current and programmed ITS installations as needed. • Throughout corridor, upgrade TOS and Install RM.
2	150 th Street to Foothill Boulevard	8F	8F	
3	Foothill Boulevard to SR-13	8F	8F	
4	SR-13 to Grand/Lakeshore Avenue	8F	8F	
5	Grand/Lakeshore Avenue to SR-24/I-980	6-10F	6-10F	
6	SR-24/I-980 to I-80/I-580/I-880	6-10F	6-10F	

As travel demand builds over the next 30 years, it is important for I-580 Central to continue functioning as a direct connection to the San Francisco Oakland Bay Bridge as well as an interregional link between the I-5 and I-80 Corridors. Original construction of I-580 through Oakland and San Leandro required massive retaining walls and numerous elevated roadway segments which make capacity improvements likely cost prohibitive. Instead, key infrastructure investments and bus modal technologies (electronic tolling, computer aided dispatching, automated vehicle locating) are recommended. The 30-year concept focuses on strategies to improve operations and Travel Demand Management (TDM) that could alleviate forecast increases in travel times and decreased mobility and reliability along the I-580 Central Corridor.

Increasing utilization of multi-modal options and connectivity is important for the sustainment of this 30-year facility concept. Modal choices could be enhanced by improving access and increasing transit service connections to BART. Connectivity between modes could also be enhanced by increasing Capitol Corridor

service frequency during peak demand periods, timed transfers between modes and additional boarding location opportunities in the Priority Development Areas being planned in Oakland, San Leandro and Alameda County.

Implementation of the Alameda CTC Countywide Bicycle and Pedestrian Plans will improve local access and mobility to destinations within the County. The MTC Regional Bicycle Plan for I-580 Central suggests closing local and regional network gaps and reducing the barriers to Active Transportation options. Recommended improvements for consideration include minimizing turn radii, and providing marked pedestrian crossings at interchanges along the corridor, upgrading existing transportation infrastructure to provide pedestrian and bicycle access such as curb ramps, and reducing existing gaps and barriers within the network. Tables 17 and 18 list the Caltrans Ten-Year SHOPP planned and programmed projects identified for the I-580 Central Corridor as well projects and strategies to achieve the 30-year concept.

Planned and Programmed Projects

Table 17. I-580 Central Planned and Programmed Projects

I-580 Central Planned and Programmed Projects					
TCR Segment	Description	Planned or Programmed	Location	Source	Purpose
1-3	In San Leandro and Oakland, from routes 580 East/238 to Fruitvale Ave. Rehabilitate pavement	Programmed	PM 30.8 – R41.5	2014 SHOPP	Rehabilitation/ Preservation
4-6	In Oakland and Emeryville, From Fruitvale Ave. to I-80 Rehabilitate pavement	Planned	PM 41.5 – 46.1	2015 10 Yr. SHOPP	Rehabilitation/ Preservation
1-4	In Oakland, at Oakland Ave. Undercrossing No. 33-0288. Rehabilitate bridge deck	Planned	PM 44.3	2015 10 Yr. SHOPP	Rehabilitation/ Preservation
5	In Oakland, at MacArthur Blvd. Bridge No. 33-0061 L/R. Rehabilitate bridge.	Planned	PM 46.1	2015 10 Yr. SHOPP	Rehabilitation/ Preservation
3-6	In Oakland, from 0.1 mile east of Boston Avenue to 0.2 mile east of Route 80/580 Junction. Rehabilitate pavement/curb ramps	Planned	PM 41.2 – 47.0	2015 10 Yr. SHOPP	Rehabilitation/ Preservation
2	In Oakland at Foothill Blvd Bridge No. 33 0334 L/R. Rehabilitate bridge.	Planned	PM 35.11	2015 10 Yr. SHOPP	Bridge Rehabilitation
1-6	In San Leandro and Oakland, from routes 580 East/238 to I-80 Install High Friction Surface Treatment	Programmed	PM 30.8 – R46.5	2014 SHOPP	Collision Reduction
1-6	In San Leandro and Oakland, from routes 580 East/238 to I-80 Upgrade Transition Railing	Planned	PM 30.8 – R46.5	2015 10 Yr. SHOPP	Collision Reduction
4	In Oakland, Upgrade sidewalk and curb ramps.	Planned	PM 39.24-43.48	2015 10 Yr. SHOPP	Mandate
5	In Oakland, at Santa Clara Ave. Bridge No. 33 0312 - Seismic retrofit bridge.	Planned	PM 43.76-43.8	2015 10 Yr. SHOPP	Bridge Preservation
1-6	From I-580 East/I-238 to I-80. Upgrade TOS and Install RM	Planned	PM 30.8 – R46.5	2015 10 Yr. SHOPP	Rehabilitation/ Preservation

Projects and Strategies to Achieve Concept

Table 18. I-580 Central Projects and Strategies to Achieve Concept

I-580 Central Projects and Strategies to Achieve Concept				
Seg.	Description	Location	Source	Purpose
1-2	Improve Bike/Pedestrian access at Interchanges Crossing Freeway in Castro Valley and San Leandro	PM 30.81 – 35.11	Caltrans Smart Mobility Framework	Bike/Ped
3-6	Improve Bike/Pedestrian access at Interchanges Crossing Freeway in Oakland	PM 35.11 – 46.46R	Caltrans Smart Mobility Framework	Bike/Ped
1-6	Support Enhanced/Expanded Transit Service along the Corridor	PM 30.81 – 46.46	Caltrans Smart Mobility Framework	Transit/BRT/Park and Ride
1-6	Improve the efficiency of arterials and freeway corridor and make investments that shorten trip lengths and encourage use of other modes	PM 30.81 – 46.46	Caltrans Smart Mobility Framework	Reliable Mobility/Health & Safety
1-6	Improve the amenities of the existing Pedestrian Facilities and expand the Bicycling network	PM 30.81 – 46.46	Caltrans Smart Mobility Framework	Location Efficiency/Health & Safety
1-6	Make on-going investments in infrastructure with the goal of creating facilities that will allow for convenient multi-modal and transit transfers	PM 30.81 – 46.46	Caltrans Smart Mobility Framework	Reliable Mobility/Social Equity
1-6	Make on-going investments in infrastructure with the goal of providing high capacity transit that can link neighborhoods with employment centers with connections to local transit	PM 30.81 – 46.46	Caltrans Smart Mobility Framework	Reliable Mobility/Location Efficiency
1	I-238/I-580 truck bypass lane. Construct a truck bypass lane from I-580 to I-238 to improve capacity and safety by eliminating current left merge.	PM 35.0	MTC Goods Movement Collaborative	Operational Safety
3-4	City of Oakland. Truck facilities, Truck route rehabilitation	PM 35.11 – 43.48	Alameda County Goods Movement Study	Operational Improvement
1-6	Install and activate Ramp Metering in the EB direction between I-980/SR 24 and 163 rd Ave in Castro Valley.	PM 30.81 – 46.46	District 4 2013 Ramp Meter Development Plan	Operational Improvement
1-6	Install and activate Ramp Metering in the WB direction between Foothill Blvd and W. MacArthur Blvd/SR-123.	PM 30.81 – 46.46	District 4 2015 Ramp Meter Development Plan	Operational Improvement
1-6	Activate existing ITS installations that currently are not fully operational.	PM 30.81 – 46.46	Caltrans District 4	Operational Improvement/Reliability
1.6	Fill gaps in the current and programmed ITS installations as needed	PM 30.81 – 46.46	Caltrans District 4	Operational Improvement/Reliability
1-6	Improved bicycle-pedestrian access-infrastructure in coordination with the preservation of I-580 Central bridges and pavement.	PM 30.81 – 46.46	Caltrans District 4	Bike/Ped – Bridge Preservation

APPENDIX

Appendix A

GLOSSARY OF TERMS AND ACRONYMS

Acronyms

AAADT- Annual Average Daily Traffic
AADTT – Annual Average Daily Truck Traffic
AB – Assembly Bill
ABAG – Association of Bay Area Governments
ADA – Americans with Disabilities Act of 1990
ADT- Average Daily Traffic
BAAQMD – Bay Area Air Quality Management District
BCDC – Bay Conservation and Development Commission
BY- Base Year
Caltrans – California Department of Transportation
CMA- Congestion Management Agencies
CMP – Congestion Management Plan
CSMP – Corridor System Management Plan
CEQA- California Environmental Quality Act
CSS – Context Sensitive Solutions
CTP – California Transportation Plan
DD – Deputy Directive
DSMP – District System Management Plan
ECA – Essential Connectivity Areas
FHWA – Federal highway Administration
FSR – Feasibility Study Report
FSTIP- Federal Statewide Transportation Improvement Program
FTIP – Federal Transportation Improvement Program
GHG- Greenhouse Gas
GIS – Geographic Information System
HCP- Habitat Conservation Plan
HOT-High occupancy toll lane
HOV-High occupancy vehicle lane
HY- Horizon Year
IGR-Intergovernmental Review
ITIP – Interregional Transportation Improvement Program
ITS – Intelligent Transportation System
ITSP – Interregional Transportation Strategic Plan
KPRA – Kingpin-to-Rear-Axle
LOS – Level of Service
MPO- Metropolitan Planning Organizations
MTC – Metropolitan Transportation Commission
NOA – Naturally Occurring Asbestos
NCCP- Natural Community Conservation Plan

NEPA- National Environmental Policy Act
PCA – Priority Conservation Area
PDA – Priority Development Area
PID-Project Initiation Document
PM – Post Mile
PSR- Project Study Report
PTSF – Percent Time Spent Following
RHNA- Regional Housing Needs Allocation
RTP- Regional Transportation Plan
RTIP – Regional Transportation Improvement Program
RTPA- Regional Transportation Planning Agencies
SAFETEA-LU - Safe, Accountable, Flexible and Efficient Transportation Equity Act, a Legacy for Users
SB – Senate Bill
SCS- Sustainable Community Strategies
SHOPP- State Highway Operation Protection Program
SHS – State Highway System
SMF – Smart Mobility Framework
SR – State Route
STIP – State Transportation Improvement Program
TEA-21 Transportation Equity Act for the 21st Century
TCR – Transportation Concept Report
TDM – Transportation Demand Management
TMS – Transportation Management System
TSN- Transportation System Network
VMT – Vehicle Miles Traveled
VTA – Santa Clara Valley Transportation Authority
VPH – Vehicles per Hour

Definitions

AADT – Annual Average Daily Traffic is the total volume for the year divided by 365 days. The traffic count year is from October 1st through September 30th. Traffic counting is generally performed by electronic counting instruments moved from location throughout the state in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present. Annual ADT is necessary for presenting a statewide picture of traffic flow, evaluating traffic trends, computing accident rates, planning and designing highways and other purposes.

Base Year – The year that the most current data is available to the Districts

Bikeway Class I (Bike Path) – Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with cross flow by motorists minimized.

Bikeway Class II (Bike Lane) – Provides a striped lane for one-way bike travel on a street or highway.

Bikeway Class III (Bike Route) – Provides for shared use with pedestrian or motor vehicle traffic.

Bottlenecks – A bottleneck is a location where traffic demand exceeds the effective carrying capacity of the roadway. In most cases, the cause of a bottleneck relates to a sudden reduction in capacity, such as a lane drop, merging and weaving, driver distractions, a surge in demand, or a combination of factors.

Capacity – The maximum sustainable hourly flow rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of a lane or roadway during a given time period under prevailing roadway, environmental, traffic, and control conditions.

Capital Facility Concept – The 20-25 year vision of future development on the route to the capital facility. The capital facility can include capacity increasing, State Highway, bicycle facility, pedestrian facility, transit facility (Intercity Passenger Rail, Mass Transit Guideway etc.), grade separation, and new managed lanes.

Conceptual Project– A conceptual improvement or action is a project that is needed to maintain mobility or serve multimodal users, but is not currently included in a fiscally constrained plan and is not currently programmed. It could be included in a General Plan or in the unconstrained section of a long-term plan.

Corridor – A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways, bicycle, pedestrian, and transit route alignments. Off system facilities are included as informational purposes and not analyzed in the TCR.

Facility Concept – Describe the Facility and strategies that may be needed within 20-25 years. This can include capacity increasing, State Highway, bicycle facility, pedestrian facility, transit facility, Non-capacity increasing operational improvements, new managed lanes, conversion of existing managed lanes to another managed lane type or characteristic, TMS field elements, Transportation Demand Management and Incident Management.

Facility Type – The facility type describes the State Highway facility type. The facility could be freeway, expressway, conventional, or one-way city street.

Freight Generator – Any facility, business, manufacturing plant, distribution center, industrial development, or other location (convergence of commodity and transportation system) that produces significant commodity flow, measured in tonnage, weight, carload, or truck volume.

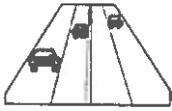
Horizon Year – The year that the future (20-25 years) data is based on.

Intermodal Freight Facility – Intermodal transport requires more than one mode of transportation. An intermodal freight facility is a location where different transportation modes and networks connect and freight is transferred (or “transloaded”) from one mode, such as rail, to another, such as truck.

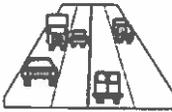
ITS – Intelligent Transportation System improves transportation safety and mobility and enhances productivity through the integration of advanced communications technologies into the transportation infrastructure and in vehicles. Intelligent transportation systems encompass a broad range of wireless and wire line communications-based information and electronics technologies to collect information, process it, and take appropriate actions.

LOS – Level of Service is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in terms of speed,

travel time, freedom to maneuver, traffic interruption, comfort, and convenience. Six levels of LOS can generally be categorized as follows:



LOS A describes free flowing conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway.



LOS B is also indicative of free-flow conditions. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver.



LOS C represents a range in which the influence of traffic density on operations becomes marked. The ability to maneuver with the traffic stream is now clearly affected by the presence of other vehicles.



LOS D demonstrates a range in which the ability to maneuver is severely restricted because of the traffic congestion. Travel speed begins to be reduced as traffic volume increases.



LOS E reflects operations at or near capacity and is quite unstable. Because the limits of the level of service are approached, service disruptions cannot be damped or readily dissipated.



LOS F is a stop and go, low speed conditions with little or poor maneuverability. Speed and traffic flow may drop to zero and considerable delays occur. For intersections, LOS F describes operations with delay in excess of 60 seconds per vehicle. This level, considered by most drivers unacceptable often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection.

Multi-modal – The availability of transportation options using different modes within a system or corridor, such as automobile, subway, bus, rail, or air.

System Operations and Management Concept – Describe the system operations and management elements that may be needed within 20-25 years. This can include Non-capacity increasing operational improvements (Aux. lanes, channelization's, turnouts, etc.), conversion of existing managed lanes to another managed lane type or characteristic (e.g. HOV lane to HOT lane), TMS Field Elements, Transportation Demand Management, and Incident Management.

Peak Hour – The hour of the day in which the maximum volume occurs across a point on the highway.

Peak Hour Volume – The hourly volume during the highest hour traffic volume of the day traversing a point on a highway segment. It is generally between 6 percent and 10 percent of the ADT. The lower values are generally found on roadways with low volumes.

Planned Project– A planned improvement or action is a project in a fiscally constrained section of a long-term plan, such as an approved Regional or Metropolitan Transportation Plan (RTP or MTP), Capital Improvement Plan, or measure.

Post Mile – A post mile is an identified point on the State Highway System. The milepost values increase from the beginning of a route within a county to the next county line. The milepost values start over again at each county line. Milepost values usually increase from south to north or west to east depending upon the general direction the route follows within the state. The milepost at a given location will remain the same year after year. When a section of road is relocated, new milepost (usually noted by an alphabetical prefix such as "R" or "M") are established for it. If relocation results in a change in length, "milepost equations" are introduced at the end of each relocated portion so that mileposts on the remainder of the route within the county will remain unchanged.

Programmed Project– A programmed improvement or action is a project in a near-term programming document identifying funding amounts by year, such as the State Transportation Improvement Program or the State Highway Operations and Protection Program.

Route Designation –A route's designation is adopted through legislation and identifies what system the route is associated with on the State Highway System. A designation denotes what design standards should apply during project development and design. Typical designations include but not limited to National Highway System (NHS), Interregional Route System (IRRS), Scenic Highway System,

Rural – Fewer than 5,000 in population designates a rural area. Limits are based upon population density as determined by the U.S. Census Bureau

Segment – A portion of a facility between two points.

TDM – Transportation Demand Management programs designed to reduce or shift demand for transportation through various means, such as the use of public transportation, carpooling, telework, and alternative work hours. Transportation Demand Management strategies can be used to manage congestion during peak periods and mitigate environmental impacts.

TMS – Transportation Management System is the business processes and associated tools, field elements and communications systems that help maximize the productivity of the transportation system. TMS includes, but is not limited to, advanced operational hardware, software, communications systems and infrastructure, for integrated Advanced Transportation Management Systems and Information Systems, and for Electronic Toll Collection System.

Urban – 5,000 to 49,999 in population designates an urban area. Limits are based upon population density as determined by the U.S. Census Bureau

Urbanized – Over 50,000 in population designates an urbanized area. Limits are based upon population density as determined by the U.S. Census Bureau.

VMT – Is the total number of miles traveled by motor vehicles on a road or highway segments.

APPENDIX B

RESOURCES

Association of Bay Area Governments, FOCUS

<http://www.bayareavision.org/initiatives/index.html>

Bay Conservancy & Development Commission

<http://www.bcdc.ca.gov>

California Department of Fish and Game, California Natural Diversity Database, Quick viewer

http://imaps.dfg.ca.gov/viewers/cnddb_quickviewer/app.asp

California Department of Fish and Game, Biogeographic Information and Observation System (BIOS)

<http://imaps.dfg.ca.gov/viewers/biospublic/app.asp>

California Natural Diversity Database (CNDD)

<http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf>

California Department of Transportation, 2010 Smart Mobility Handbook, Ch 3: Applying the Smart Mobility to Place Types

http://www.dot.ca.gov/hq/tpp/offices/ocp/smf_files/SmMbilty_v6-3.22.10_150DPI.pdf

California Department of Transportation District 4, Highway Operations Division, Park and ride

http://www.dot.ca.gov/dist4/highwayops/parkandride/documents/park_ride_lots_master_list_12_14_09.pdf

California Department of Transportation, Division of Transportation System Information, California Road System (CRS) Maps 05M34, 05M35, 05M45 and 06M41

http://dot.ca.gov/hq/tsip/hseb/crs_maps/

California Department of Transportation, Interregional Transportation Strategic Plan (ITSP), June 1998

<http://www.dot.ca.gov/hq/transprog/ocip/te/itsp.pdf>

California Department of Transportation, California Scenic Highway Program

http://www.dot.ca.gov/hq/LandArch/scenic_highways/scenic_hwy.htm

California Department of Transportation, Traffic Noise Protocol dated March 2011

http://www.dot.ca.gov/hq/env/noise/pub/ca_tnap_may2011.pdf

California, Department of Transportation, Traffic Operations Division, Traffic Data Branch, Traffic Volumes and Truck Traffic

<http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm>

California Department of Transportation, Truck Network on California State Highways, District 4 Map 1 of 1,

<http://www.dot.ca.gov/hq/traffops/trucks/truckmap/truckmap-d04.pdf>

California Department of Transportation, Truck Map Legend Truck Lengths and Routes,

<http://www.dot.ca.gov/hq/traffops/trucks/truckmap/truck-legend.pdf>

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) State Area Designation Maps: Maps, Ozone: http://www.arb.ca.gov/desig/adm/2011/state_o3.pdf

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) State Area Designation Maps, PM2.5: http://www.arb.ca.gov/desig/adm/2011/state_pm25.pdf

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) State Area Designation Maps, PM 10: http://www.arb.ca.gov/desig/adm/2011/state_pm10.pdf

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) State Area Designation Maps, Carbon Monoxide: http://www.arb.ca.gov/desig/adm/2011/state_co.pdf

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) National Area Designation Maps, 8 Hour Ozone: http://www.arb.ca.gov/desig/adm/2011/fed_o3.pdf

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) National Area Designation Maps, PM 2.5: http://www.arb.ca.gov/desig/adm/2011/fed_pm25.pdf

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) National Area Designation Maps, PM 10: http://www.arb.ca.gov/desig/adm/2011/fed_pm10.pdf

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) National Area Designation Maps, Carbon Monoxide: http://www.arb.ca.gov/desig/adm/2011/fed_co.pdf

The California Streets and Highways Code, Division 1, Chapter 2, Article 3; The State Highway Routes, Section 309 <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=shc&group=00001-01000&file=300-635>

California Sea-Level Rise Interim Guidance Document

http://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20110311/12.SLR_Resolution/SLR-Guidance-Documents.pdf

City of Oakland Zoning Map

<http://mapgis.oaklandnet.com/planmap/index.aspx>

City of San Leandro Zoning Map

<http://www.sanleandro.org/depts/cd/plan/zonemap.asp>

County of Alameda Land Use Map

<https://www.acgov.org/cda/planning/ordinance/maps.htm>

U.S. Census Bureau, United States Census 2010, State & County Quickfacts

<http://quickfacts.census.gov/qfd/states/06000.html>

U.S. Census Bureau, United States Census 2010, Community Facts

<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

United State Geological Survey, Liquefaction Hazard Map,

<http://earthquake.usgs.gov/regional/nca/qmap/>

