Transportation Concept Report

Interstate 980

District 4

June 1, 2017

Disclaimer: The information and data contained in this document are for planning purposes and should not be relied upon for final design of any project. Any information in this Transportation Concept Report (TCR) is subject to modification as conditions change and new information is obtained. Although planning information is dynamic and continually changing, the District 4 Office of System and Regional Planning makes every effort to ensure the accuracy and timeliness of the information contained in the TCR. The information in the TCR does not constitute a standard, specification, or regulation, nor is it intended to address design policies and procedures.

California Department of Transportation

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

Approvals:

05-26-17	6/1/17
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Stakeholder Acknowledgement

District 4 is pleased to acknowledge the stakeholders and partner agencies in development of this Transportation Concept Report (TCR). Preparation of this document was coordinated with Alameda County Transportation Commission, the City of Oakland and Alameda County.

This Final TCR will be posted on the Caltrans Corridor Mobility website at:
http://www.dot.ca.gov/hq/tpp/corridor-mobility/

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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 evaluating conditions and proposing enhancements 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 **DSMP** is a strategic policy and planning document that focuses on maintaining, operating, managing, and developing the transportation system. The **TCR** is a planning document that identifies the existing and future route conditions as well as future needs for each route on the SHS. The **CSMP** is a more complex, multi-jurisdictional planning document that identifies future needs within freeway corridors experiencing or expected to experience high levels of congestion. The CSMP serves partially as a TCR for segments covered by the CSMP. The **DSMP Project List** is a list of planned and partially programmed transportation projects used to recommend projects for funding. These System Planning products are also intended as resources for stakeholders, 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 CA Gov. Code §65086 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 20-25 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 980 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 accuracy and 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

Concept Summary

Located in District 4, Interstate (I) 980 is a five to ten-lane divided freeway that runs from I-880 in the City of Oakland to I-580 near the Oakland-Emeryville border. It runs through Oakland to Emeryville, links commuters to major economic/employment centers, supports interregional travel and goods movement to I-80 (via I-580 and I-880) and carries local commuter and truck traffic in Alameda County. I-980 also provides primary access to the east from I-880 and the Port of Oakland. This I-980 TCR evaluates current traffic conditions along the route using 2016 as the Base Year (BY) and provides forecast conditions for a Horizon Year (HY) of 2040. Segmentation for this TCR is based upon changes in jurisdictional borders, facility types, lane configurations, access, land use and/or travel demand.

Table ES1. I-980 Segmentation and Concept Summary

Segment	Post Miles	Segment Description	Existing Facility	25-yr Capital Facility Concept:	25 Year System Operations and Management Concept	Multimodal Concept
1	ALA 980 0.30-1.03	I-880 to 18th. Street	5-6F	5-6F	• Activate existing ITS installations that currently are not fully operational • Fill gaps in the current and programmed ITS installations as needed • Upgrade TOS, Install and activate RM	• Improve pedestrian safety at ramp intersections • Improve Corridor crossings close gaps in pedestrian infrastructure • Promote Travel Demand Management strategies • Construct protected/separated Bicycle facilities • Promote real-time signal timing for transit vehicles
2	ALA 980 1.03-2.04	18th. Street to I-580	6-10F	6-10F		

Legend: *F= Freeway*

Concept Rationale

The two segments of I-980 will remain a freeway with the same number of lanes. Segment 2 will continue to process larger traffic volumes than Segment 1 into the 2040 horizon year, while Segment 1 will continue to accommodate the bulk of the route's truck volume. Adding freeway capacity is not a priority for I-980. The 25-year concept focuses on opportunities to improve operations and Travel Demand Management (TDM) strategies that could mitigate forecasted increases in travel time with decreased mobility and reliability along the I-980 Corridor.

Other conceptual components include improving bicycle and pedestrian access along and across the Corridor, enhancing transit service and facilitating multimodal connections. Tables ES2 and ES3 list the Caltrans Ten-Year SHOPP planned and programmed projects identified for the I-980 Corridor as well projects and strategies to achieve the 25-year concept.

Table ES 2. Planned and Programmed Projects and Strategies

Seg	Description	Planned or Programmed	Location	Source	ID	Completion Date
1-2	Install Maintenance Vehicle Pullout(s)/Pave Right Shoulder	Planned	ALA 0.30 – 2.04	2017 Ten Year SHOPP Plan/2020 PID Workplan	SHOPP Tool ID 14108	NA
2	In Oakland on Route 980, TMC network hardware lifecycle replacement	Planned	ALA 1.2	2017 Ten Year SHOPP Plan/2018 PID Workplan	SHOPP Tool ID 16815	NA
1-2	In Oakland on Route 980 at various locations, rehabilitate bridge decks	Programmed	ALA 0.30 – 2.04	2014 SHOPP	EA 4H830	11/16
1-2	In Oakland on Route 980 at various locations, replace overhead sign panels	Programmed	ALA 0.30 – 2.04	2014 SHOPP	EA 2J140	5/17
1	In Oakland on 14th Street construct a Class II (Bike Lane) between Wood Street and Martin Luther King Way	Planned	ALA 0.70	Alameda CTC Multi Modal Arterial Plan*	N/A	N/A
1	In Oakland on 14th Street construct a Class IV (Cycle Track) from Brush Street to Lakeside Drive	Programmed	ALA 0.70	City of Oakland Bicycle Master Plan	N/A	2021
2	In Oakland on San Pablo Avenue construct a Class II (Protected Bike Lane) between Wood Street and Martin Luther King Way	Planned	ALA 2.04	Alameda CTC Multi Modal Arterial Plan*	N/A	N/A
1	In Oakland on 7Th Street construct a Class II (Bike Lane) between Wood Street and Clay Street	Planned	ALA 0.36	Alameda CTC Multi Modal Arterial Plan*	N/A	N/A

*Adopted June 2016

Table ES 3. Proposed Projects and Strategies

Seg	Description	Location/Post Mile	Mode
1-2	Upgrade intersections/roadways in order to better facilitate bike/pedestrian crossing freeway and improve connectivity to existing bicycle/pedestrian network	7th St. ALA 0.36	Bike/Ped
		11th St. ALA 0.54	
		12th St. ALA 0.56	
		14th St. ALA 0.70	
		17th St. ALA 0.83	
		18th St. ALA 0.90	
		Grand Ave. ALA 1.16	
		27th St ALA 1.48	
1-2	Improved bicycle-pedestrian access-infrastructure in coordination with the preservation of I-980 bridges and pavement.	ALA 0.30 – 2.04	Bike/Ped
1-2	Support enhancement to existing bus service to improve efficiency, better connectivity to transit and expanded local and transbay transit services between job and housing centers	Off- System	Transit
1-2	Support Bay Area Travel Demand Management efforts as alternatives to SOV travel and research potential Park and Ride lots along I-980	Off-System/under freeway structures	Transit/Ride Sharing
1	Study potential idle-free and freight vehicle charging station rest areas under freeway structures in Oakland	Under I-980/I-880 structures	Freight
1-2	Activate existing ITS installations that currently are not fully operational and install additional TOS elements as determined by the Division of Traffic Operations	ALA 0.30 – 2.04	Motorized Vehicle
1-2	Implement planned ramp metering projects from the 2015 Ramp Metering Development Plan	EB at Castro St / 12th St ALA 0.9	Motorized Vehicle
		EB at Castro St / 18th St ALA 1.01	
		EB at 27th St (on Rte 980 seg to EB Rte 580) ALA 1.66	
		EB at 27th St ALA 1.86	
		WB at Brush St / 11th St ALA 0.42	
		WB at 17th St / West St ALA 0.63	
		WB at EB Rte 580 ALA 1.84	
		WB at WB Rte 580 ALA 1.84	
1-2	Capital Prevention Maintenance Projects for sections with Poor Ride Quality	Sections with Poor Ride Only designation	Motorized Vehicle

CORRIDOR OVERVIEW

Route Segmentation

For the purpose of this document, I-980 (Corridor) is segmented based on the routes length and county boundaries since it straddles both Alameda and Contra Costa counties. See Table 1 and Figure 1.

Table 1. I-980 Route Segmentation

Segment	Location Description	County, Route Beg. PM	County, Route End. PM
1	I-880 to 18th Street	ALA 0.30	ALA 1.03
2	18th Street to I-580 interchange	ALA 1.03	ALA 2.04

Figure 1. I-980 Corridor Segments

Route Description

I-980 is a freeway that travels in a southwest-northeast direction for roughly two miles through Alameda County. The Corridor begins at I-880 in the City of Oakland. It then travels across the City of Oakland ending at the I-580/State Route (SR)-24 Interchange near the Oakland-Emeryville border in Alameda County. The route connects with the local street network through a series of braided on and off ramps. At post mile (PM) 1.36 the Bay Area Rapid Transit District (BART) rail line enters the median to the route's end and continues easterly into Contra Costa County in the contiguous SR 24 median.

I-980 is functionally classified as an Interstate freeway on the California Road System (CRS) as well as part of the Strategic Highway Network (STRAHNET). The route is part of the National Highway Freight Network (NHFN). I-980 played a major role subsequent to the collapse of I-880 during the Loma Prieta earthquake in 1989 by helping restore the circulation of goods and services around the region.

Route Designation and Characteristics

Table 2. Route Description by Segment

Segment#	1	2
Freeway & Expressway System	Yes	Yes
FHWA National Highway System	Yes	Yes
FHWA Strategic Highway Network	Yes	Yes
Scenic Highway	No	No
Caltrans Interregional Road System (IRRS)	No	No
Federal Functional Classification	Freeway	Freeway
Goods Movement Route	Yes*	Yes*
Truck Designation	National Highway Freight Network CA Legal Network	National Highway Freight Network CA Legal Network
Rural/Urban/Urbanized	Urbanized	Urbanized
Metropolitan Planning Organization	Metropolitan Transportation Commission (MTC)	MTC
Congestion Management Agency	Alameda County Transportation Commission (Alameda CTC)	Alameda CTC
Local Agencies	Alameda County /City of Oakland	Alameda County /City of Oakland
Air District	Bay Area Air Quality Mgmt District (BAAQMD)	BAAQMD
Terrain	Flat	Flat

* Alameda County Goods Movement Plan designates I-980 as a Tier 2 truck route

Community Characteristics

Alameda County encompasses approximately 739 square miles and has just over a million and a half inhabitants according to the 2010 US Census. In contrast, the City of Oakland covers approximately 78 square miles and is home to a third of the County's residents with almost four hundred thousand residing in Oakland. There are many attractive destinations in Oakland including arts and entertainment, museums, restaurants and night life. I-980 serves as a barrier between the Central Business District to the east and the more residential, economically disadvantaged neighborhoods in West Oakland. The areas surrounding I-980 are predominately urban in character, including housing, parks, schools and light industrial/office uses and smaller retail districts. The Oakland Central Business District represents the core of the area's commerce, retail, and governmental activity. Notable interregional and international connections are provided by BART along the Corridor, and Amtrak/Capitol Corridor serves Jack London Square Station at the foot of I-980, both of which connect to the Oakland International Airport, located approximately five miles southeast from the Corridor. See Transit section. Community parks dot the landscape along I-980, the largest being Grove Shafter Park, Marston Campbell Park, Preservation Park,

and Lowell Park. City of Oakland streets provide offer bicycle and pedestrian facilities for recreation and commuting.

Table 3. Demographics for Oakland and Alameda County

Demographics	Oakland	Alameda County
Total Population	390,724	1,510,271
Number of Households	153,791	545,138
Average Household Size	2.49	2.70
Number of Housing Units	169,710	582,549
Median Household Income (Estimate, 2006-2010 American Community Survey)	$48,596	$70,821
Transportation Means to Work		
Drive Alone to Work	57.2%	66.3%
Carpooling	10.7%	10.6%
Transit	16.7%	11.3%
Bicycling/Walking	1.9% / 4.4%	1.5% / 3.6%
Mean Travel Time to Work (min)	27.5	27.9

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

Land Use

General land uses along the I-980 Corridor comprise an eclectic mixture of urban residential and commercial to heavy industrial due to the route's demarcation between West and Downtown Oakland. In addition public land uses are found within the Port and railroad areas and parks and open space along the Oakland Esutuary.

MTC's Plan Bay Area (2013 Regional Transportation Plan) emphasizes growth in downtown Oakland, West Oakland, Jack London Square featuring "urban villages" characterized by medium-density housing, mixed-use zoning, good public transit and an emphasis on pedestrians and public space along existing and planned transit lines such as BART, Amtrak, the Water Transportation Authority (WETA) Ferry, Alameda/Contra Costa Transit (AC Transit) Bus Rapid Transit (BRT) and Transbay corridors.

One area for major development is expected along the Brooklyn Basin District found along the Oakland Estuary. With the conversion of Port of Oakland land and infill, retail and residential land use, the area will begin to realize higher degrees of Location Efficiency (defined as integrated transportation and land use that helps reduce vehicular travel while providing a high level of accessibility) through community design and connection to the transportation system including plans for developing the shoreline with housing and connecting to Jack London Square entertainment complexes.

Table 4: Land Uses along I-980

Segment	Land Uses
1	• Mixed Residential • Urban Residential • Commercial • Central Business District • Open Space/ Park
2	• Mixed Residential • Urban Residential • Commercial • Institutional • Central Business

Priority Development Areas and Priority Conservation Areas

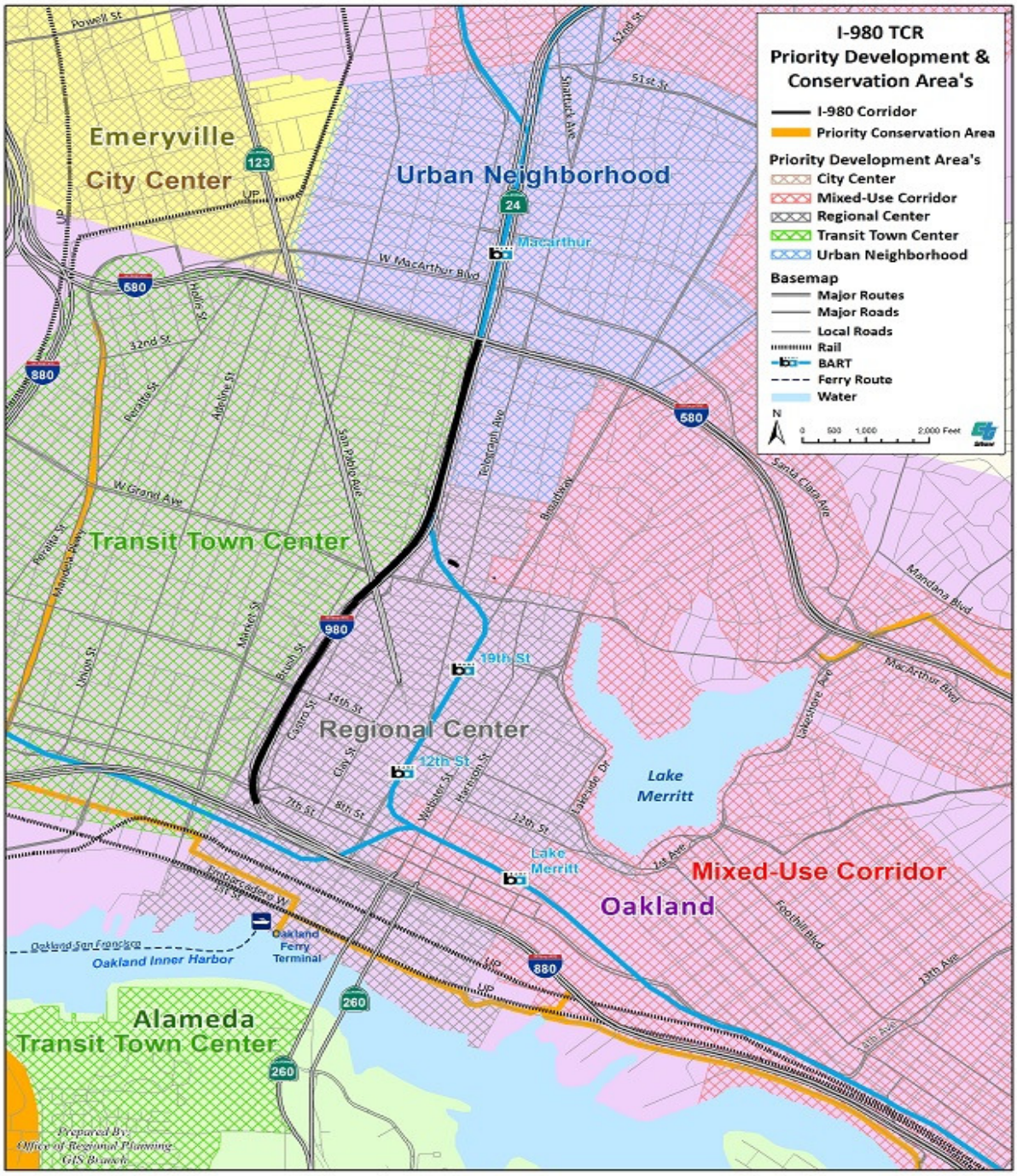
Plan Bay Area (PBA), approved in 2013, is a long-range integrated transportation and land-use/housing strategy and serves as the Regional Transportation Plan (RTP) for the San Francisco Bay Area. PBA responded to Senate Bill 375 (2008) which requires metropolitan regions in the State to develop a Sustainable Communities Strategy (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) were developed simultaneously for existing parks and open space as well as other areas that need protection from further development.

PDAs are locally designated areas within existing communities that have been identified and approved by local cities or counties for future growth. These areas are typically more accessible to transit, jobs, shopping and other services. Priority Conservation Areas (PCA) are areas identified through consensus by local jurisdictions and park/open space districts as lands 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 (ABAG) 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. The next update, called Plan Bay Area 2040, is now underway and scheduled for adoption in 2017. Figure 2 displays where these PDAs and PCAs are located along I-980.

California Transportation Plan

Senate Bill 391 (SB 391) of 2009 requires Caltrans to update the 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). In addition, SB 391 requires the CTP to incorporate transportation policies and system performance objectives from approved Regional Transportation Plans produced by the MPOs. Caltrans must also consult, coordinate, and make drafts of the CTP available for review and comment to the: California Transportation Commission, Strategic Growth Council, State Air Resources Board, State Energy Resources Conservation and Development Commission, Air Quality Management Districts, public transit operators, Regional Transportation Planning Agencies, MPOs and other interested parties. The current CTP was adopted in June 2016.

Figure 2. I-980 PDAs and PCAs



Smart Mobility Framework

In 2010, Caltrans introduced the concept of Smart Mobility through establishment of the Smart Mobility Framework (SMF). The SMF is a transportation planning guide that includes the notion of place types to further integrate smart growth concepts into transportation and land use development. The goal of this framework is to serve as a guide and assessment tool for determining how well plans, programs, and projects meet the definition of "smart mobility" and ensure applicability of the framework for both

Caltrans as well as partner agencies. Location Efficiency of a place type is measured and ranked based on its Community Design characteristics and Regional Access to the transportation system.

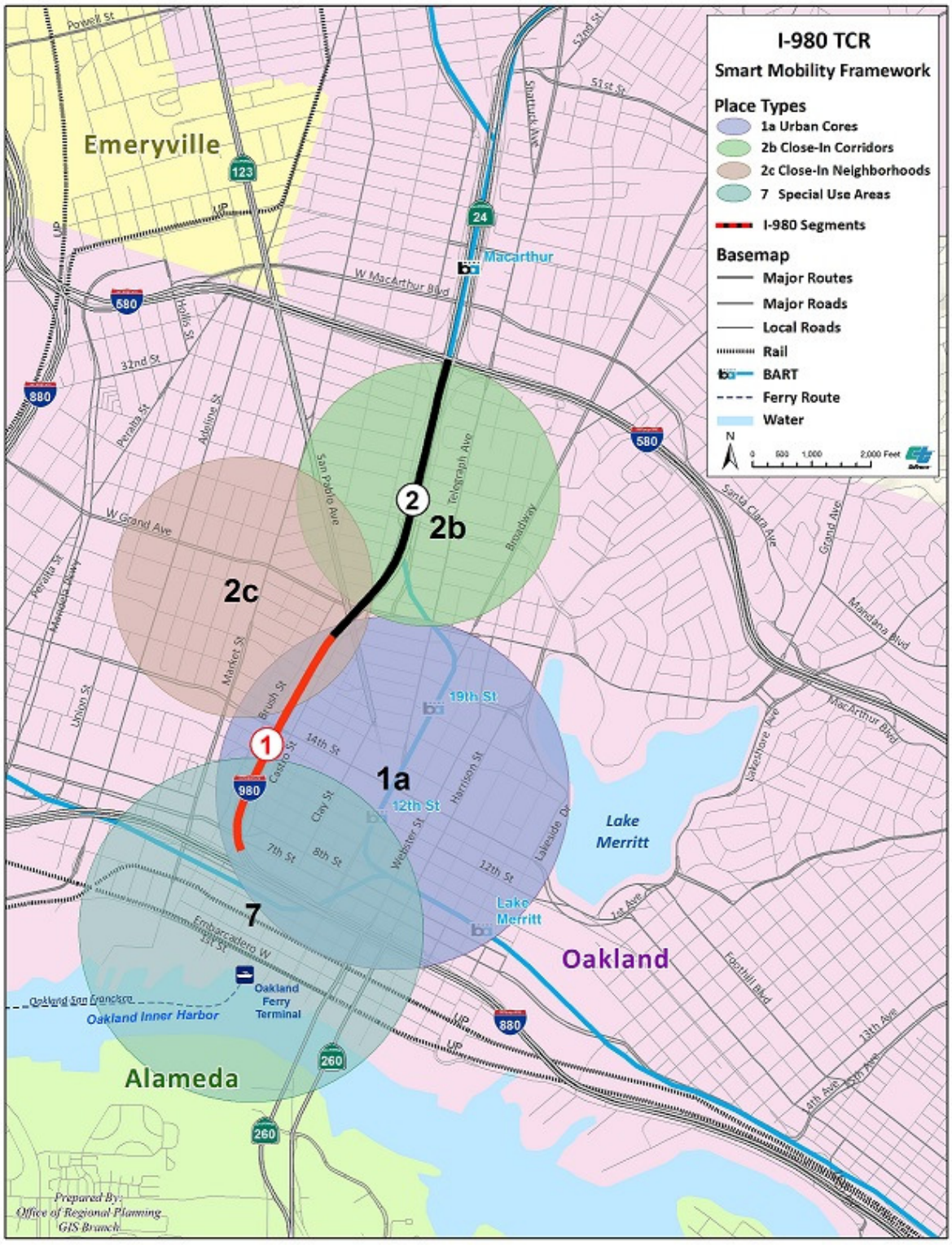
Place Types help planners determine transportation needs. By identifying what kind of built environment is most prevalent along a State highway corridor, the interrelated challenges of mobility and sustainability in specific areas can become clearer. The analysis is based on Caltrans Mission and Goals. Once likely transportation, development and conservation investment strategies are identified, a Place Type Location Efficiency factor can be applied and further smart mobility benefits can be realized in the future. Figure 3 shows the place types along the Corridor and Table 5 identifies some potential transportation programs/projects for each of these place types.

Table 5. I-980 Smart Mobility Framework Place Type by Segment

Segment	Place Type	Transportation, Development and Conservation Measures
1	**1a – Urban Cores**	• Creation and improvement of major transportation hubs connecting modes for intra and inter regional travel. • Ongoing re-investment in existing roadways to protect asset value and provide customer satisfaction. • Projects providing service, facility and connectivity improvements to connectedness to all population groups. • Pedestrian and bicycle facilities with high amenity levels.
2	**2b – Close in Corridors**	• Complete streets projects. • Identify locations where multi-modal connectivity to urban centers can be improved. • Transit and stations accessed by walking and bicycling and interconnecting transit. • Street network connectivity including an extensive network of bicycle facilities and continuous pedestrian facilities with high amenity level. • Transit centers and high capacity transit stations accessed primarily by walking, bicycling, and interconnecting transit, with managed parking supply.
1,2	**2c – Close-in Neighborhoods**	
1	**7 – Special Use Areas**	• Role of the area as a local, regional and sub-regional trip generator of passenger and goods movement. • Issues regarding health, safety, and environmental impacts arising from the particular activities and mobility of the area.

Source: Smart Mobility 2010 – A Call to Action for the New Decade, Caltrans, 2010: http://www.dot.ca.gov/hq/tpp/offices/ocp/documents/smf_files/SMF_handbook_062210.pdf

Figure 3. I-980 Smart Mobility Place Types



System Characteristics

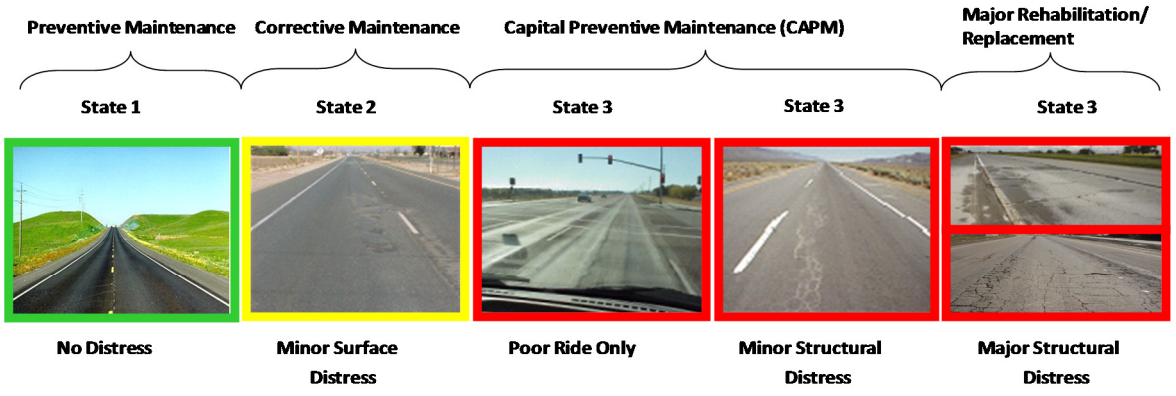
The I-980 Corridor is approximately two miles long. The western end of the Corridor begins at I-880 in Oakland. The route provides intra-regional access between San Francisco and the Diablo Valley communities east of the Caldecott Tunnel through Oakland. The number of freeway lanes ranges from six to eight. The Bay Area Rapid Transit District (BART) Pittsburg Baypoint/San Francisco International Airport (SFO), Richmond-San Francisco and Richmond-Fremont lines operate in the median of I-980 between West Grand Avenue and I-580. There are auxiliary lanes in both segments.

Table 6. I-980 Auxiliary Lane Locations

Eastbound			Westbound	
Segment	**Location Description**	**PM limits**	**Location Description**	**PM Limits**
1	I-880 - I-980 split	0.00 – 0.05	I-980 – I-880 Merge	0.05 – 0.00
2	18Th St – 27Th St.	1.02 – 1.52	27Th St. – 18Th St.	1.52 – 1.02
	32nd St. - I-580	1.85– 2.02	I-580 – 32nd St.	2.02 – 1.85

Table 7 summarizes the existing and future system characteristics for I-980. Transportation Management System (TMS) elements are implemented within the Corridor, including mainline detection, Closed-Circuit Televisions (CCTVs), Changeable Message Signs (CMSs) and ramp meters. Non recurrent incident management is provided by the MTC Freeway Service Patrol (FSP). According to 2013-2015 data, the pavement conditions for a significant portion of I-980 receive a poor ride/bad ride quality grade, although no structural distress is present. As indicated in Figure 4 below, Poor Ride Only represents the third state of pavement distress level. The corresponding treatment program is called Capital Preventive Maintenance (CAPM), which should be applied to affected sections on I-980. Figure 5 shows where these sections are located.

Figure 4. Pavement Distress Severity and Treatment



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

State 2: Fair condition with minor cracking or slab cracking ⇨ Corrective maintenance project

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

Figure 5. I-980 Pavement Conditions 2013-2015

Table 7. Existing and Future System Characteristics

TCR Segment #	1	2
Existing Facility (2016)		
Facility Type	F	F
General Purpose Lanes	5-6	6-10
Auxiliary Lanes	Yes	Yes
Lane Miles	5.15	6.06
Centerline Miles	1.03	1.01
Median Width	38-99’	28-99’
Median Characteristics	J, Z	H, J, K,Q,R
Distressed Pavement (2013)	50%	75%
ROW	100’	100’
Concept Facility (2040)		
Facility Type	F	F
General Purpose Lanes	5-6	6-10
Auxiliary Lanes	Yes	Yes
Lane Miles	5.15	6.06
Centerline Miles	1.03	1.01
ROW Needs	100’	100’
TMS Elements		
TMS Elements (BY)	• Mainline Vehicle Detection • Closed Circuit TV • Highway Advisory Radio Freeway Ramp Meters CCTA/CMS	
TMS Elements (HY)	• Mainline Vehicle Detection • Closed Circuit TV • Highway Advisory Radio	• Changeable Message Signs • Ramp Meters

F-Freeway, H-Paved, J- Unpaved, K-Separate Grades, Q-Separate Structures, R-Railroad, Z-Other

Bicycle Facilities

Bicycles are not permitted to ride on the I-980 mainline, which includes the shoulders. The Alameda CTC Multimodal Arterial Plan identifies a network of interconnected Class 2, Class 3 and shared road facilities on Market Street, West Street, Martin Luther King Jr. Way and San Pablo Avenue between I-880 and I-580. The remainder of the bicycle network relies on freeway interchanges and local streets to travel across I-980. Continuing beyond the immediate network, cyclists are able to reach BART, Jack London Square, and the San Francisco Bay Trail to the San Francisco-Oakland Bay Bridge Bike Trail and the City of Emeryville. Future improvements focus on reducing or eliminating existing gaps and barriers in the network. The Arterial Plan 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 Plan also improves access for communities with large concentrations of lower-income populations with inadequate access to other transportation modes. Table 8 below lists the current bicycle facilities and the map provided in Appendix C displays the bicycle network along the I-980 Corridor.

Table 8. I-980 Bicycle Facilities

Bicycle Facilities Parallel to I-980					
Seg.	**Post Mile**	**Location Description**	**Facility Location**	**Class**	**Speed Limit**
1	0.30-1.03	3rd Street to 18th Street.	Market Street	II	35 mph
		3rd Street to 18th Street.	Martin Luther King Way	III	25/35 mph
		3rd Street to 18th Street.	Jefferson Avenue	Shared	25/35 mph
2	1.03 – 2.04	18th Street to I-580	Market Street	II	25/35 mph
		18th Street to I-580	West Street	III	25 mph

Pedestrian Facilities

Due to controlled access, the pedestrian network for I-980 consists of local pedestrian infrastructure and freeway interchanges provide accommodation along and across the I-980 Corridor. Present barriers to the pedestrian network include a limited number of crossing opportunities, narrow and limited sidewalks and high motor vehicle speeds at ramp intersections. Gaps in the pedestrian network exist due to lack of connectivity between a hierarchy of existing facilities including shared bike/pedestrian path, interregional and local roadway facilities. Larger intersection corner radii tends to encourage higher vehicle turning speeds and longer pedestrian crossing distances. 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 CTC Multimodal Arterial Plan focus on reducing or eliminating gaps and barriers in the pedestrian network. Table 9 below lists presents pedestrian networks along the I-980 Corridor. Table 10 lists the crossing opportunities along the I-980 Corridor for bicycles and pedestrian.

Table 9. I-980 Pedestrian Facilities

Pedestrian Facilities Parallel to I-980						
TCR Seg.	**Post Miles**	**Location Description**	**Facility Location**	**Sidewalk Present**	**Sidewalk Width**	**Facility Description**
1	00.30 – 1.03	I-880 to 18th Street	Brush Street	Yes	>4ft.	Sidewalk/ Crosswalk
			Castro Avenue	Yea	>4ft.	Sidewalk/ Crosswalk
2	1.03 -2.04	18th Street to I-580	Martin Luther King Way	Yes	>4ft.	Sidewalk/ Crosswalk
			Telegraph Avenue	Yes	>4ft.	Sidewalk/ Crosswalk

Table 10. Crossing Opportunities for Cyclists and Pedestrians

Segment	ALA 980 PM	Location	Interchange	Bike/Ped Facility Type	Comments
1	0.36	7Th Street	N	Shared/ Sidewalk	No EB 7th St crossing
	0.55	11th Street EB	Y	Shared/ Sidewalk	Brush St. faded crossings
	0.59	12Th Street WB	N	Shared/ Sidewalk	
	0.70	14Th Street	N	Shared /Sidewalk	Class I on 14th St
	0.85	17th Street EB	Y	Shared/ Sidewalk	Brush St faded markings
	0.90	18Th Street WB	Y	Shared/Sidewalk	Brush St faded markings
2	1.11	San Pablo Avenue	N	Class I/Sidewalk	Encampment encroaches on sidewalk
	1.15	W. Grand Avenue	N	Class I/Sidewalk	Encampment encroaches on sidewalk
	1.22	Martin Luther King Way.	N	Shared/Sidewalk	Lighting/Trash
	1.22	23Rd Street	N	Shared/Sidewalk	Lighting/Trash
	1.38	Sycamore Street	N	Shared/Sidewalk	Encampment encroaches on sidewalk
	1.48	27Th Street	Y	Class I/Sidewalk	Encampment encroaches on sidewalk
	1.63	29TH Street	N	Shared/Sidewalk	Lighting/BART Access
	1.68	30TH Street	N	Shared/ Sidewalk	Lighting
	1.94	34Th Street	N	Shared/Sidewalk	Open Space Park

Transit

Alameda CTC has adopted its first Countywide Transit Plan in 2016, which identifies the framework or vision for the countywide transit network. Alameda CTC has a Transit Committee, a sub-Committee of the Commission, which provides a forum to discuss transit related issues in the county and to report on the implementation of the Countywide Transit Plan. AC Transit, BART and WETA provide intercity and commute express bus, rail and ferry service connecting transit riders with regional economic and employment centers in Alameda, Contra Costa and San Francisco Counties. AC Transit Intercity bus service is available daily seven days a week between Castro Valley, San Leandro, Oakland and Emeryville. Transbay bus service is available five days a week between Alameda, 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. Current improvements being made include new rolling stock and expanded BRT, currently under construction between downtown Oakland and the San Leandro BART station. Future improvements according to the AC Transit Major Corridor Study (2015) BRT service and adjusting signal timing to reflect real-time data between downtown Oakland, Berkeley and Richmond and an extension of the previously mentioned BRT service from the San Leandro BART station to the Bayfair BART station. BART operates daily service seven days a week from stations in Oakland, San Leandro and Berkeley, as well as service to the Oakland International Airport (OAK) via the automated BART to OAK line. Transit headways vary between peak, daily, and weekend service. Bicycles are permitted on BART trains, however they are restricted from the first car of each train at all time and from

the first three cars during commute hours (7:00 to 9:00 AM and 4:30 to 6:30 PM). Future service expansion includes extending the Warm Springs/South Fremont line to San Jose with infill stations at Montague Expressway in Milpitas and Berryessa Road in San Jose. The reauthorization of Santa Clara County Tax Measure B secures funding for further BART expansion into the Santa Clara Valley. Access to Capitol Corridor/Amtrak interregional rail service between San Jose and Auburn is available from the Oakland Jack London Square 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. Greyhound Bus Lines provides intercity bus service across the country from stations in Oakland and San Francisco. Service connection to Amtrak are available at various Amtrak locations. Bicycles are allowed on Greyhound coaches, however space is limited and on a first come, first served basis. There is a Caltrans operated Park and Ride lot located adjacent to I-980 on Linden Street at 7th Street. Table 11 lists present transit options in the I-980 Corridor.

Table 11. I-980 Transit Services

I-980 Transit Service												
TCR Segment	Mode & Collateral Facility	Name	Route End Points	Headway	Operating Period	ITS & Technology	Stops		Amenities	Bikes Allowed	Location Description	# Parking Spaces
							Cities	Post miles				
1/2	Local / Transbay/ Night owl	AC Transit	Oakland /San Francisco	Med	M-F	Real-time	Alameda, San Francisco, Oakland	0.30 To 2.04	Bike Racks, WIFI	Y	NA	NA
1/2	Intercity Bus Service	Greyhound Bus Lines	Reno NV/Las Vegas NV. Medford OR.	Med	Daily	Real-Time	Oakland, San Francisco, Berkeley	0.30 To 2.04	Bike Racks, WIFI	Y	Castro St. & San Pablo Ave.	NA
1	Ferry	San Francisco - Oakland	19th Street/ BART/ San Francisco	Low	Daily	Real-time	Alameda, Oakland, San Francisco	0.30 To 1.03	Bike Racks	Y	Jack London Square	NA
1/2	Urban Rail	BART	SF Airport/ Richmond/ Warm Springs/ South Fremont/ Pittsburg/ Bay Point	Med	Daily	ETA-	Castro Valley, San Leandro, Oakland	0.30 To 2.04	Space for Bike Racks, WIFI	Y	MacArthur Blvd./ 19Th St 12Th St	NA
1	Park & Ride	Caltrans	NA	NA	NA	NA	Oakland	0.30 To 1.03	No Bike Lockers NA	Y	7th Street / Linden St.	180
1	Intercity Rail	Capitol Corridor	Sacramento/ San Jose	Med	Daily	NA	Oakland/ Emeryville	0.30 To 1.03	Bike Racks, WIFI	Y	Jack London Square/ I-580/I-80 Powell Ave.	NA

Freight

I-980 serves as a part of a gateway for the flow of commerce and economic activity across regional and interstate transportation networks. Alameda CTC's Good Movement Plan was developed in close coordination with Caltrans and classifies I-980 as a Tier 2 truck route, one that provides intra-county and inter-city goods movement connectivity while providing an alternative to higher-use Tier 1 truck routes. The Port of Oakland is the Bay Area's principal international, water-trade gateway with its majority of trade coming from Asia. National commodities such as sundries, apparel, and machinery traveling to and from the Port of Oakland utilize the I-980 Corridor. The Port handles 99 percent of the containerized goods moving through Northern California and is one of only a few West Coast ports where exports exceed imports. I-980 truck traffic counts peak at about seven percent of total traffic with about 41 percent of those trucks being five-axle or greater vehicles in Segment 1. In Segment 2 these figures fall to about three percent and just under 19 percent at I-580. It is anticipated that over the twenty-year Planning horizon, five-axle plus Average Annual Daily Truck Traffic (AADTT) will increase to between 18 and 25percent. Union Pacific (UP) and BNSF Railway each operate intermodal terminals at the Port. The Oakland International Gateway (OIG) and Oakland Rail-port feature loading and unloading tracks, container staging, and serve BNSF and UP respectively at the Port. Future improvement projects include the Oakland Global Logistics Park on the former 360-acre Oakland Army Base which will be transformed into a logistic center featuring a bulk terminal, truck service area and recycling center. Table 12 and Figure 6 display current regional freight facilities along I-980.

Table 12. I-980 Freight Facilities

Facility Type/Freight Generator	Location	Mode	Name	Major Commodity/ Industry	Comments/Issues
Port	Oakland	Ship, rail, truck	Port of Oakland	Containers, Bulk -agricultural products, automobiles	Shipping and UPRR Intermodal Freight Facility. Large source of peak hour congestion on I-880, I-238 and I-580 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-580 Central NHFN*	Electronics, manufactured products, agriculture	Advisory STAA** Route for trucks weighing 4.5 tons or more.
Highway	Hayward	Truck	I-580 East NHFN	Electronics, manufactured products, agriculture	Up to 6,100 Truck AADT. EB I-580 East and I-238. Class D weigh station located at PM R8.9
Highway	Hayward	Truck	I-238 NHFN	Electronics, manufactured products, agriculture	

*National Highway Freight Network
**Surface Transportation Assistance Act

Figure 6. I-980 Freight Facilities

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 factors are categorized based on a scale of Low-Medium-High probability of an environmental issue and determination was made by District 4 Transportation Planning. Caltrans supports reducing environmental impacts from the transportation system as an overall strategic objective. One of Caltrans sustainability objectives is to achieve an 80 percent reduction in greenhouse gas emissions below 1990 levels by 2050. Table 13 below lists environmental factors present in the I-980 Corridor and their impact probability. A summary of the environmental factors included in this scan are also displayed in Figure 7.

Table 13. I-980 Environmental Considerations

I-980 Environmental Factors Probability														
TCR Segment	Recreational and Protected Lands	Environmental Justice	Visual Aesthetics	Geology/Soils/ Seismic	Floodplain	Climate Change/ Sea Level Rise	Hazardous Materials	Naturally Occurring Asbestos	Air Quality				Noise	Special Status Species
									Ozone	PM		CO		
										2.5	10			
1	*Low*	*High*	*Low*	*Med*	*Low*	*Low*	*Med*	*Low*	*Non Attainment*	*Non Attainment*	*Non Attainment / Unclassified*	*Attainment / Unclassified*	*Med*	*Low*
2	*Low*	*High*	*Low*	*Med*	*Low*	*Low*	*Med*	*Low*	*Non Attainment*	*Non Attainment*	*Non Attainment / Unclassified*	*Attainment / Unclassified*	*Med*	*Low*

4F http://www.calands.org/
Farmland ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/ala10.pdf
EJ www.uscensus/factfinder/san leandro/oakland/alameda county
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/datalibrary/gisdatalibrary.html
Special Status Species http://www.dfg.ca.gov/biogeodata/cnddb/
Habitat Connectivity http://www.dfg.ca.gov/habcon/connectivity/#EcoregionalAnalyses

Environmental Factors included in the probability matrix are as follows:

- **Section 4(f) - Recreational and Protected Lands** - Segment 1 of I-980 is bordered to the east by Preservation Park which is on the Federal Registry of Historical Places and Marsten Campbell and Lowell Parks to the west. Other notable lands include the Martin Luther King and Lafayette Elementary Schools. Impacts to these locations should be a consideration during operational activities and/or design and construction of transportation projects within the segment.

- **Environmental Justice** - There is a significant minority population and people living in poverty along I-980. These populations meet or exceed State poverty level averages. No I-980 projects are identified within the Corridor which would likely displace or disproportionately affect minority populations. However, these groups should be contacted prior to public outreach to allow for full participation in Transportation Planning efforts within the Corridor.

- **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 I-980. 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 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 and also during maintenance activities.

- **Floodplain** – Segment 1 includes areas that could be subject to inundation during a 100-Year flood and/or tsunami event. In Segment 1 this includes below grade sections of the routes traveled way and areas around the perimeter of the Port of Oakland near and under I-880. The California Emergency Management Agency (Cal EMA) has identified these lands within their flood overlay area.

- **Air Quality (Ozone)** – According to the California Environmental Protection Agency (Cal EPA) and the California Air Resources Board (CARB), Alameda County exceeds State air quality standards for ozone, Particulate Matter 2.5 (PM 2.5) and PM 10 but is in compliance for carbon monoxide. The federal Environmental Protection Agency (EPA) reports that Alameda County exceeds the federal air quality standards for ozone and PM 2.5 but is in compliance for carbon monoxide. PM 10 level is unclassified under the federal standard.

- **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 Segments 1 and 2. Noise sensitive land uses should be addressed during design and construction of transportation projects within the Corridor.

- **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*), Santa Cruz Tar Plant (*Holocarpha macradenia*) and the Tidelands Goby (*Eucyclogobius newberryi*). The California Department of Fish and Wildlife protect habitat for any special status and at-risk species found within the county.

- **Hazardous Materials** - The Department of Toxic Substances Control EnviroStor database identifies hazardous locations featuring underground tanks along Segments 1 and 2 with a considerable concentration in the vicinity of the I-980/I-580 Interchange.

- **Naturally Occurring Asbestos (NOA)** - Segments 1 and 2 contain areas likely to contain naturally occurring asbestos due to existing serpentinized ultramafic rock.

Figure 7. I-980 Environmental Factors

CORRIDOR PERFORMANCE

Caltrans Freeway Performance Measurement System (PeMS) and Alameda CTC travel demand model were used to obtain 2016 and 2040 vehicle traffic performance data for the I-980 Corridor. PeMS uses vehicle count data to report base year (BY) 2016 Annual Average Daily Traffic (AADT) and the Alameda CTC travel demand model uses the Association of Bay Area Government (ABAG) 2013 projections to report AADT in the horizon year (HY) 2040. In 2010, Segment 2 which includes the 27th Street/Grand Avenue and I-580/SR-24 Interchanges, carried the most daily traffic followed by Segment 1 between 18Th Street and I-880. The 2040 model forecasts this trend will continue as demand on adjacent I-580 and SR-24 increases.

Base year AM and PM peak hour volumes suggest a westbound AM peak followed by an eastbound PM peak with the percentage of peak directional split of 76 percent (AM) and 52 percent (PM). These percentages suggest that many of the AM peak work trips have destinations in the Oakland Central Business District and that during the PM peak this scenario is reversed to some degree. The Alameda CTC 2016 Level of Service (LOS) Report reveals that during the AM Peak LOS is B in both the EB and WB directions and during the PM Peak the west bound direction retains a LOS B whereas the EB LOS deteriorates to D.

As traffic patterns change and non-peak hour demand increases, Segment 2 base year volumes will continue to be greater than in Segment 1. In 2016, volumes along Segment 2 increased towards facility capacity with vehicle-to-capacity ratios (V/C) reaching the 85 percentile while Segment 1 continued to operate at 48 percent of 1.00 V/C. As 2040 nears, the volumes along Segment 2 of I-980 will continue to outpace those in Segment 1 as drivers experience slower speeds and increased delay.

Daily truck volumes reported in 2013 reveal that truck AADT is highest at the junction with I-880 with 5+ axle trucks representing 41.37 percent of all trucks and lowest at I-580 where 5+ axle trucks represent only 18.35 percent of all trucks. This suggests that long-haul and drayage trucks traveling northbound on I-880 use I-980 and City of Oakland streets to access the Port of Oakland instead of continuing on I-880 to the Port. Trucks traveling southbound on I-880 access the Port directly from the freeway. Upon leaving the Port, however, most trucks will directly access either I-880 or I-80 depending on their destination due to weight restrictions on I-580 through Oakland between Grand Avenue and Foothill Boulevard. Currently Caltrans and the City of Oakland are utilizing available State right-of-way under I-880 in downtown Oakland to provide drayage and long-haul truck operators secure short and long–term overnight parking in order to reduce congestion on I-880, I-980 and local streets.

PeMS data suggests that downstream bottlenecks outside the I-980 Corridor and storage constraints at on and off ramps as well as freeway-to-freeway connectors are the causes of congestion during peak periods. The locations with the most recurring congestion are the I-580/I-980 freeway connectors and the eastbound on-ramps at 27th Street – Grand Avenue connecting to I-580 and State Route 24. Table 14 summarizes I-980 Corridor performance. However, capacity increasing improvements to I-980 itself would not solve these congestion problems.

Table 14. I-980 Corridor Performance

		Segment 1		Segment 2	
Basic Systems Operations* **					
AADT (2016)		37,450		47,891	
AADT (2040)		47,038		60,152	
AADT: Growth Rate/Year		3.1%		3.1%	
VMT (2016)		38,574		49,328	
VMT (2040)		48,449		61,957	
Truck Traffic Data**					
Total Average Annual Daily Truck Traffic (AADTT)		5,132		3,178	
Total Trucks (% of AADT)		7.03		2.89	
5+ Axle Average Annual Daily Truck Traffic (AADTT)		2,142		583	
5+ Axle Trucks (as % of AADTT)		41.73		18.35	
Bottleneck Data***					
Bottleneck Existing		NA		Y	
Bottleneck Location		NA		27th/Grand Ave. EB/PM	
Bottleneck Queue (length)		NA		n/a	
Bottleneck Causality		NA		Peak Hour Demand	
Peak Hour Traffic Data*+					
		EB	WB	EB	WB
Peak Hour Volumes	AM 2010	**2085**	2004	1931	**5083**
	PM 2010	**3425**	1767	**4437**	2084
	AM 2040	2111	**2942**	1697	**5855**
	PM 2040	**3898**	2154	**5465**	2705
Peak Hour Directional Split - Volume Capacity Ratio					
AM Peak Hour Directional Split (2010)		51%/49%		76%/26%	
PM Peak Hour Directional Split (2010)		52%/48%		52%/48%	
Peak Hour V/C (2010) AM/WB		.30		.85	
Peak Hour V/C (2010) PM/EB		.48		.74	
Peak Hour V/C (2040)AM/WB		.38		.94	
Peak Hour V/C (2040)PM/EB		.53		.83	

+ Peak direction in **BOLD** **-** Peak Hour/Direction Volumes

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

**http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/truck2011final.pdf

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

KEY CORRIDOR ISSUES

Capacity

Current and forecast performance data suggest that Segment 1 between I-880 and 18th street has excess capacity. This is due to a majority of the corridor trips having origins and destinations along Segment 2 of the route and travelers to and from the Oakland CBD using I-880 and city streets instead of I-980. However, Segment 1 also has the highest 5+ axle truck volumes in the Corridor. Some local advocacy groups have suggested the facility could be changed to a boulevard while continuing to support truck traffic to and from the Port of Oakland by redirecting trucks to I-880 and surface streets with direct port access. Benefits realized from such action include facilitation of other travel modes along and across the Corridor, and improvement to livability along the Corridor. This change will require support from federal, State, regional and local agencies. As the necessary coordination and support has not yet occurred, it is not currently part of the 25-year concept for I-980. The City of Oakland and the Alameda CTC plan to conduct a study in order to gauge the feasibility of the proposal.

Future Corridor Reliability

As congestion mounts over the course of the 25 year corridor concept, stakeholders should consider operational strategies to sustain the Corridor's remaining capacity in order for it to respond reliably to future demand. The Caltrans Strategic Management Plan sets a goal of 80% Intelligent Transportation System ITS coverage by 2020. Current ITS coverage along I-980 is sufficient for the time being but expansion of Closed Circuit Television (CCTV), Changeable Message Signs (CMS), Highway Advisory Radio (HAR) and Ramp Metering (RM) technologies in the Corridor could improve its chances of sustaining its reliability over the next 25 years.

Transportation System Management and Operations (TSMO)

Caltrans is committed to effective TSMO to optimize the performance of California's transportation systems for all users and modes of travel. TSMO strategies are essential to a performance-based decision making process Caltrans will use to improve the efficient and effective operation of the transportation network. Examples of TSMO strategies include, but are not limited to, ramp metering, traffic signal synchronization, ITS and managed lanes. Efficiency can often be achieved by operational improvements through ITS deployments. These include four types of management for improving throughput:

- System management for recurring localized congestion (for instance, ramp metering, managed lanes, traveler information, dynamic speed limit, traffic signals and transit priority, ICM, parking management system, automated vehicles).
- Incident management for non-recurrent congestion (for instance, detection-verification-response, CCTV, CMS, HAR, weather detection, traveler information system, ICM).
- Event management for emergencies, disasters and other occurrences (for instance, through system monitoring, evacuation management, route selection, ICM).
- Asset Management for managing existing infrastructure and other assets to deliver an agreed standard of service. One of the first steps in the efficient management of the transportation system will be the completion and implementation of a Transportation Asset Management Plan.

In partnership with regional and local agencies, and other stakeholders, operational strategies form the basis of Integrated Corridor Management (ICM). TSMO and ICM require proactive integration of the transportation systems to efficiently move people and goods along highly congested urban corridors. TSMO and ICM strategies improve operations of multimodal transportation infrastructure.

Caltrans Strategic Management Plan 2015–2020 has a Strategic Objective to "Effectively manage transportation assets by implementing the asset management plan, embracing a fix-it-first philosophy" and specifies a Target of "By 2020, maintain 90% or better ITS elements health". Operations and maintenance (O&M) resources are essential to achieve this fix-it Target. Many TSMO strategies involve ITS equipment. As more TSMO/ITS elements (ramp meters, CCTV, CMS, detection stations, etc.) are implemented, O&M resource need will continue to grow.[1]

Bicycle- Pedestrian Network

The freeway interchanges and local streets along I-980 are essential to the passage of bicyclists and pedestrians across the route. Some State and local facilities feature intersections with missing or unrecognizable pedestrian markings, non-contiguous sidewalks, free left and right turn movements and large corner radii which allow for higher speed turns, homeless encampments and inadequate lighting which may hinder access and mobility for bicyclists, pedestrians and persons with disabilities.

Transit

Along I-980, transit options are limited to AC Transit local and night owl service. Additional Transbay and/or Rapid Service originating from the residential areas west of I-980 would offer under represented and/or economically disadvantaged households a less expensive and direct connection to job, education and recreation centers in San Francisco and the East Bay. Corridor improvements to facilitate augmented or increased transit operations will need to focus on on and off-ramps (transit bypass lanes), bus on shoulder operations, and by expanding the number and size of Park-and-Ride lots along the Corridor.

CORRIDOR CONCEPT

Concept Rationale

The Corridor Concept conveys the Caltrans vision for a route with respect to corridor capacity and operations for a 25-year Planning horizon. The concept takes into account factors that create interregional, regional, and local travel demand, including commuting, freight, recreation and land use. Moderate growth and development is anticipated along both segments of I-980 supporting a 25-year route concept which recommends preservation and rehabilitation of existing bridges and roadway pavement combined with a sustainable transportation system management and operations strategy. The 2040 concept consists of State Highway Operations and Protection Program (SHOPP) approved and planned projects identified for I-980. The 2040 Corridor Concept maintains a facility including the replacement and rehabilitation of bridge structures and decks and rehabilitation of roadway pavement from I-880 to I-580. The 25-year system operations and management concept includes implementing the Caltrans 2015 Ramp Metering Development Plan (RMDP) approved and planned projects and focusing on completion and upgrading the existing Mainline Vehicle Detection System (MVDS), Closed Circuit Televisions (CCTV), Changeable Message Signs (CMS) and other TOS elements. Table 15 below lists, by segment, the 25-year Corridor Concept for I-980.

Table 15. I-980 25-Year Corridor Concept

Segment	Post Miles	Segment Description	Existing Facility	25-yr Capital Facility Concept:	25 Year System Operations and Management Concept	Multimodal Concept
1	ALA 980 0.30-1.03	I-880 to 18th. Street	5-6F	5-6F	• Activate existing ITS installations that currently are not fully operational • Fill gaps in the current and programmed ITS installations as needed • Upgrade TOS, Install and activate RM	• Improve pedestrian safety at ramp intersections • Improve corridor crossings close gaps in pedestrian infrastructure • Promote Travel Demand Management strategies • Construct protected/separated Bicycle facilities • Promote real-time signal timing for transit vehicles
2	ALA 980 1.03-2.04	18th. Street to I-580	6-10F	6-10F		

Legend: *F= Freeway*

In the next 25 years it is important that I-980 continues to function as a direct connection to the City of Oakland as well as an interregional link between I-580 and I-880 as travel demand builds in the Corridor. Adding freeway capacity is not a priority for I-980. Instead, the 25-year concept focuses on opportunities to improve operations and Travel Demand Management (TDM) strategies that could mitigate forecasted increases in travel time with decreased mobility and reliability along the I-980 Corridor.

Increasing multi-modal choices and connectivity is key to this 25-year facility concept. Investments in bus technology are needed to help improve operation efficiency of existing service. Other operational improvements include transit bypass lanes at freeway ramps. Mode shift could be further enhanced by improving access and, increasing transit service connections to BART. Connectivity between modes could also be improved by increasing Capitol Corridor service frequency during peak periods, providing timed transfers between services and additional connections at planned PDAs in Alameda County, San Leandro and Oakland. Additional Transbay or Rapid service as well as Park and Ride lots would offer more transportation options as well. Implementation of the Alameda CTC Multi Modal Arterial Plan will improve local access and mobility to destinations within the County. The City of Oakland 2012 Bicycle Master Plan suggests closing local network gaps and reducing the barriers to Active Transportation options. Recommended interchange improvements that could be studied include minimizing turn radii, adding marked crossings and ADA curb ramps at interchanges, upgrading existing transportation infrastructure to provide improved pedestrian and bicycle access, while reducing existing gaps and barriers within the network. Table 16 lists the planned and programmed projects for the I-980 Corridor identified in Caltrans SHOPP Program, Ten Year SHOPP as well as local plans and programs. Table 17 lists proposed projects and strategies that help achieve the 25-year Corridor Concept.

Table 16. I-980 Planned and Programmed Projects

Seg	Description	Planned or Programmed	Location	Source	ID	Completion Date
1-2	Install Maintenance Vehicle Pullout(s)/Pave Right Shoulder	Planned	ALA 0.30 – 2.04	2017 Ten Year SHOPP Plan/2020 PID Workplan	SHOPP Tool ID 14108	NA
2	In Oakland on Route 980, TMC network hardware lifecycle replacement	Planned	ALA 1.2	2017 Ten Year SHOPP Plan/2018 PID Workplan	SHOPP Tool ID 16815	NA
1-2	In Oakland on Route 980 at various locations, rehabilitate bridge decks	Programmed	ALA 0.30 – 2.04	2014 SHOPP	EA 4H830	11/16
1-2	In Oakland on Route 980 at various locations, replace overhead sign panels	Programmed	ALA 0.30 – 2.04	2014 SHOPP	EA 2J140	5/17
1	In Oakland on 14th Street construct a Class II (Bike Lane) between Wood Street and Martin Luther King Way	Planned	ALA 0.70	Alameda CTC Multi Modal Arterial Plan*	N/A	N/A
1	In Oakland on 14th Street construct a Class IV (Cycle Track) from Brush Street to Lakeside Drive	Programmed	ALA 0.70	City of Oakland Bicycle Master Plan	N/A	2021
2	In Oakland on San Pablo Avenue construct a Class II (Protected Bike Lane) between Wood Street and Martin Luther King Way	Planned	ALA 2.04	Alameda CTC Multi Modal Arterial Plan*	N/A	N/A
1	In Oakland on 7Th Street construct a Class II (Bike Lane) between Wood Street and Clay Street	Planned	ALA 0.36	Alameda CTC Multi Modal Arterial Plan*	N/A	N/A

*Adopted June 2016

Table 17. I-980 Proposed Projects and Strategies

Seg	Description	Location/Post Mile	Mode
1-2	Upgrade intersections/roadways in order to better facilitate bike/pedestrian crossing freeway and improve connectivity to existing bicycle/pedestrian network	7th St. ALA 0.36	Bike/Ped
		11th St. ALA 0.54	
		12th St. ALA 0.56	
		14th St. ALA 0.70	
		17th St. ALA 0.83	
		18th St. ALA 0.90	
		Grand Ave. ALA 1.16	
		27th St ALA 1.48	
1-2	Improved bicycle-pedestrian access-infrastructure in coordination with the preservation of I-980 bridges and pavement.	ALA 0.30 – 2.04	Bike/Ped
1-2	Support enhancement to existing bus service to improve efficiency, better connectivity to transit and expanded local and transbay transit services between job and housing centers	Off- System	Transit
1-2	Support Bay Area Travel Demand Management efforts as alternatives to SOV travel and research potential Park and Ride lots along I-980	Off-System/under freeway structures	Transit/Ride Sharing
1	Study potential idle-free and freight vehicle charging station rest areas under freeway structures in Oakland	Under I-980/I-880 structures	Freight
1-2	Activate existing ITS installations that currently are not fully operational and install additional TOS elements as determined by the Division of Traffic Operations	ALA 0.30 – 2.04	Auto
1-2	Implement planned ramp metering projects from the 2015 RMDP	EB at Castro St / 12th St ALA 0.9	Auto
		EB at Castro St / 18th St ALA 1.01	
		EB at 27th St (on Rte 980 to EB Rte 580) ALA 1.66	
		EB at 27th St ALA 1.86	
		WB at Brush St / 11th St ALA 0.42	
		WB at 17th St / West St ALA 0.63	
		WB at EB Rte 580 ALA 1.84	
		WB at WB Rte 580 ALA 1.84	
1-2	Capital Prevention Maintenance Projects for sections with Poor Ride Quality	Sections with Poor Ride Only designation	Auto

APPENDIX

Appendix A GLOSSARY OF TERMS AND ACRONYMS

Acronyms

AADT– 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
Alameda CTC – Alameda County Transportation Commission
ATP – Active Transportation Program
BAAQMD – Bay Area Air Quality Management District
BCDC – Bay Conservation and Development Commission
BRT – Bus Rapid Transit
BY – Base Year
Caltrans – California Department of Transportation
CARB – California Air Resources Board
C/CAG – City/County Association of Governments of San Mateo County
CCC – California Conservation Corps
CCTA – Contra Costa Transportation Authority
CEC – California Energy Commission
CESA – California Endangered Species Act
CFAC – California Freight Advisory Committee
CFMP – California Freight Mobility Plan
CMA – Congestion Management Agencies
CMAQ – Congestion Mitigation and Air Quality
CMP – Congestion Management Plan
CSFAP – California Sustainable Freight Action Plan
CSMP – Corridor System Management Plan
CEQA – California Environmental Quality Act
CSS – Context Sensitive Solutions
CTC – California Transportation Commission
CTP – California Transportation Plan
DD – Deputy Directive
DSMP – District System Management Plan
ECA – Essential Connectivity Areas
FAST Act – Fixing America's Surface Transportation Act
FASTLANE – Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies grant program
FHWA – Federal Highway Administration
FSR – Feasibility Study Report
FSTIP – Federal Statewide Transportation Improvement Program
FTA – Federal Transit Administration
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
ICM – Integrated Corridor Mobility
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
MAP-21 – Moving Ahead for Progress in the 21st Century
MPO – Metropolitan Planning Organizations
MTC – Metropolitan Transportation Commission
NOA – Naturally Occurring Asbestos
NCCP – Natural Community Conservation Plan
NEPA – National Environmental Policy Act
NHS – National Highway System
NHFN – National Highway Freight Network
NMFN – National Multimodal Freight Network
NVTA – Napa Valley Transportation Authority
PAED – Project Approval/Environmental Document
PBA – Plan Bay Area
PCA – Priority Conservation Area
PDA – Priority Development Area
PFN – Primary Freight Network
PID – Project Initiation Document
PIR – Project Initiation Report
PM – Post Mile
PM 2.5 – Particulate Matter 2.5 micrometers or less in diameter
PM 10 – Particulate Matter 10 micrometers or less in diameter
PSR – Project Study Report
PR – Project Review
PTSF – Percent Time Spent Following
RHNA – Regional Housing Needs Allocation
RTP –Regional Transportation Plan
RTIP – Regional Transportation Improvement Program
RTPA – Regional Transportation Planning Agencies
SACOG – Sacramento Area Council of Governments
SAFETEA-LU – Safe, Accountable, Flexible and Efficient Transportation Equity Act, a Legacy for Users
SB – Senate Bill
SCS – Sustainable Community Strategies
SCTA – Sonoma County Transportation Authority
SFCTA – San Francisco County Transportation Authority
SHOPP – State Highway Operation Protection Program
SHS – State Highway System
SJCOG – San Joaquin Council of Governments

SMF – Smart Mobility Framework
SR – State Route
STA – Solano Transportation Authority
STIP – State Transportation Improvement Program
STP – Surface Transportation Program
STRAHNET – Strategic Highway Network
TAM – Transportation Authority of Marin
TCIF – Trade Corridors Improvement Fund
TCRP – Transit Cooperative Research Program
TEA-21 – Transportation Equity Act for the 21st Century
TCR – Transportation Concept Report
TIGER – Transportation Investment Generating Economic Recovery
TDM – Transportation Demand Management
TMP – Transportation Management Plan
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.

Bikeway Class IV (Separated Bikeway/Cycle Track) – Provides for exclusive use for bicycles by separating bikeway from 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.

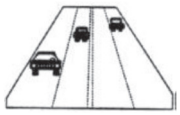
Freight Generator – Any facility, business, manufacturing plant, distribution center, industrial development, or other location (convergence of commodity and transportation system) that produces significant commodity flow, measured in tonnage, weight, carload, or truck volume.

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

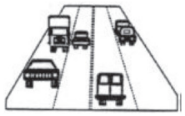
Intermodal Freight Facility – Intermodal transport requires more than one mode of transportation. An intermodal freight facility is a location where different transportation modes and networks connect and freight is transferred (or “transloaded”) from one mode, such as rail, to another, such as truck.

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 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 land 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 reminder 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/SmMblty_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-Document.pdf

Appendix C I-980 Bicycle Facilities Map