Draft Transportation Concept Report

State Route 13

District 4

July 2018

California Department of Transportation

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

Approvals:

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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 State Route 13. Essential information, advice and feedback for the preparation of this document was provided through engagement with the Metropolitan Transportation Commission (MTC), the Alameda County Transportation Commission (Alameda CTC), and the cities of Oakland, Piedmont, Emeryville and Berkeley.

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

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

VISION
A performance-driven, transparent and accountable organization that values its people, resources and partners, and meets new challenges through leadership, innovation and teamwork.

GOALS
Safety and Health - Provide a safe transportation system for workers and users, and promote health through active transportation and reduced pollution in communities.
Stewardship and Efficiency - Money counts. Responsibly manage California's transportation-related assets.
Sustainability, Livability and Economy - Make long-lasting, smart mobility decisions that improve the environment, support a vibrant economy, and build communities, not sprawl.
System Performance - Utilize leadership, collaboration and strategic partnerships to develop an integrated transportation system that provides reliable and accessible mobility for travelers.
Organizational Excellence - Be a national leader in delivering quality service through excellent employee performance, public communication, and accountability.

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: 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 long-range strategic policy and planning document that focuses on maintaining, operating, managing, and developing the transportation system. The Transportation Concept Report (TCR) is a multi-jurisdictional planning document that identifies the existing and future route conditions as well as future needs for each route on the SHS, and informs the DSMP Project List. The CSMP is a more complex document that identifies future needs within corridors experiencing or expected to experience high levels of congestion. The DSMP Project List is a long-range list of conceptual, planned, and partially programmed SHS transportation projects used to recommend projects for funding. These System Planning products are also intended as resources for stakeholders including the public, partners, regional, and local agencies.

The TCR includes detailed review of all transportation modes in the corridor and if applicable, their current and projected levels of operation. Land use, community characteristics, and environmental assessments are described to show a corridor's context and where applicable, are called out as Key Corridor Issues. The TCR also includes Caltrans suggestions for optimizing transportation modes in relation to system preservation, efficiency and expansion. The Corridor Concept, with consideration for various transportation issues, factors and needs, presents the long-term vision for a route during a 25-year planning horizon. Planned and programmed projects from State and local plans and programs are included in this document as well as project proposals to help inform the Caltrans Project Initiation Document (PID) and project development process.

Other policies that guided the development of this document include the Caltrans Strategic Management Plan (2015-2020), Assembly Bill (AB) 32, Senate Bill (SB) 375, SB 391, SB 743, SB 486, SB 32 the California Transportation Plan 2040 (CTP 2040), Deputy Directive (DD) 64-R2, Complete Streets – Integrating the Transportation System, Caltrans Smart Mobility Framework (SMF), the Statewide Transit Strategic Plan (STSP), the California Freight Mobility Plan (CFMP) and the Caltrans Interregional Transportation Strategic Plan (ITSP). Information on these efforts can be found at:

Caltrans Strategic Management Plan:	http://www.dot.ca.gov/perf
AB 32:	https://www.arb.ca.gov/cc/ab32/ab32.htm
SB 375:	http://www.arb.ca.gov/cc/sb375/sb375.htm
SB 391:	http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920100SB391
SB 743:	http://www.dot.ca.gov/hq/tpp/offices/omsp/SB743.html
SB 486:	http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB486
SB 32:	https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32
CTP 2040:	http://www.dot.ca.gov/hq/tpp/californiatransportationplan2040/2040.html
DD 64-R2, Complete Streets:	http://www.dot.ca.gov/hq/tpp/offices/ocp/complete_streets.html
SMF:	http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html
STSP:	http://www.dot.ca.gov/hq/MassTrans/statewide-transit.html
CFMP:	http://www.dot.ca.gov/hq/tpp/offices/ogm/cfmp.html
ITSP:	http://www.dot.ca.gov/hq/tpp/offices/omsp/system_planning/itsp.html

STAKEHOLDER PARTICIPATION

Stakeholder participation was sought in the development of this TCR. Outreach involved internal and external stakeholders. During the initial information resource gathering for the TCR, stakeholders were contacted for input related to their particular specializations and to help verify data accuracy. The SR 13 TCR was sent out to the local agencies of Oakland, Berkeley, Emeryville, Piedmont, and the County of Alameda. Their feedback provided important information for improving the document. The process of working closely with stakeholders adds value and relevance to the TCR.

EXECUTIVE SUMMARY

Concept Summary

The State Route (SR) 13 corridor (Corridor) is located entirely in Alameda County. It is a south-north freeway in the City of Oakland south of SR 24, and a conventional highway north of SR 24 in the Cities of Oakland and Berkeley.

Figure ES1. *Segment Map*

The four-lane freeway runs along the hillside and generally follows the Hayward fault line, surrounded by residential and commercial development in Oakland and Piedmont. It is referred to in this document as Segment 1.

The northern section of the route, Segment 2, is a conventional highway. The route is primarily two lanes in the hillier area in Oakland and Berkeley, partly with bike lanes. Where the route continues west in the flatter parts of Berkeley it becomes three to four lanes. It ends at Interstate (I-) 80. The area surrounding the eastern part of the conventional route has sparser development while the western portion travels through denser residential and industrial areas.

Table ES1. *Corridor Concept Summary*

Segment	Segment Description	Existing Facility	Ten-Year System Operation, Maintenance, and Management Improvements	Ten-Year Multimodal Improvements	25-Year Capital Facility Concept
1	I-580 to SR 24 Post Mile (PM) 4.26 – 9.86	4F	ITS	Local bicycle improvements, Class II Bikeways	4F
2	SR 24 to I-80 PM 9.86 – 13.92	2-4C	ITS	Pedestrian walkway Improvements	R

F = Freeway Lane C = Conventional Lane R = Relinquishment

Concept Rationale

Since congestion is mainly caused by bottlenecks outside the freeway section of SR 13, no capacity-increasing projects are proposed for Segment 1. Instead, this TCR recommends Intelligent Transportation Systems (ITS), such as implementation of ramp metering, and multimodal improvements within the Corridor.

Segment 2 mainly carries local traffic, and does not play a significant role in serving interregional and statewide travel. Therefore, this TCR recommends relinquishment as the 25-year capital concept for Segment 2. A relinquishment would help reduce the on-going maintenance costs and tort liability for the State, increase local agencies' responsiveness to community interest, and result in a cost saving to taxpayers by eliminating the need for State encroachment permits. It should be noted that relinquishment is a locally-driven process, and no official relinquishment request has been received from local jurisdictions along Segment 2. As a result, Caltrans will continue any multimodal studies and improvements to implement Caltrans' Complete Streets policy, as well as any on-going maintenance and operational needs.

Programmed, Planned, and Proposed Projects

Table ES2. *SR 13 Programmed, Planned, and Proposed Projects to Help Achieve Concept*

Segment	Description	Planned, Programmed, Proposal	Cost	Location	Source	Implementation Phase
Motorized On State Highway						
1	Barrier separation between SR 13 and Monterey Boulevard	Programmed	$2.0 M	PM 6.7-7.2	2016 SHOPP EA 4J490	2021 - 2023
1	Interchange improvements, ramp metering, sound walls in Alameda County.	Planned	--	Var	PBA Project ID: 17-01-0007	2018 - 2040
1	Wildlife Crossing Study	Proposed	--	PM 4.26 – 9.86	TCR Proposal	TBD
2	I-80/Ashby Interchange Improvements, roundabouts	Programmed	$60.0 M	PM 13.92	PBA Project ID: 17-01-0037	2022
Motorized Off State Highway						
1/2	Fourth Bore Settlement Projects Including: noise reduction, air quality measures, barrier creation, bicycle and pedestrian improvements, and park expansion.	Programmed	$10.0 M	Var	Caldecott Tunnel Settlement Agreements	In progress
TOS / ITS						
1	Ramp Metering	Planned	$4.0 M	PM 4.26 – 9.86	CT 2017 Ramp Metering Development Plan	TBD
Active Transportation						
1	Bicycle and pedestrian improvements, local streets/crossings in freeway section (See Table 6)	Planned/ Proposed	--	Freeway corridor	Oakland Bicycle Master Plan/D4 Bike Plan	TBD
1	Provide Class I trail parallel to SR 13 freeway	Proposed	$1.5 – $7M	Freeway corridor	Caltrans D4 Bike Plan	TBD
1	Bruns Court pedestrian bridge rehabilitation	Planned	$1.2 M	Freeway corridor	2017 SHOPP Ten-Year Plan	2020 - 2022
1, 2	Bike and pedestrian facilities Tunnel Road, Upper Broadway, Lake Temescal	Programmed	$10.0 M	Var	Caldecott Tunnel Settlement Agreements	In progress
1, 2	Lake Temescal Bicycle Bridge, path to Tunnel Road	Planned	--	SR 24/SR 13	Oakland Bicycle Plan, 2007	TBD
2	Ashby Avenue Corridor Improve-ments for pedestrians	Programmed	$5.3 M	Var	2016 SHOPP (2G481, 2G460, 2G660)	2016 - 2023
2	Ashby/Avenue Corridor improve ments for pedestrians	Programmed	$3.5 M	Shattuck to Seventh (PM 12.1 – 13.4)	2018 SHOPP (2G482)	2018 - 2021
2	Ashby/Adeline Intersection Study	Proposed	$0.5 M	PM 12.22	TCR Proposal	TBD

PBA = MTC's Plan Bay Area (2040) *SHOPP = State Highway Operations and Protection Program*
TOS = Traffic Operations Strategies *ITS = Intelligent Transportation Systems*
FY = Fiscal Year *PID = Project Initiation Document*

CORRIDOR OVERVIEW AND ANALYSIS

INTRODUCTION

SR 13 is a south-north freeway in Oakland between I-580 and SR 24, and a conventional route between SR 24 and I-80 in Berkeley. The I-80/SR 13 Interchange straddles Berkeley and Emeryville. The four-lane freeway segment runs through a scenic forested area along the Hayward fault line and is surrounded by pockets of urban development in Oakland and Piedmont. The conventional route is a two to four-lane roadway in the hillier area to the east, and a four-lane roadway located in a denser urban setting in the flatlands of Berkeley to the west.

Corridor Segmentation

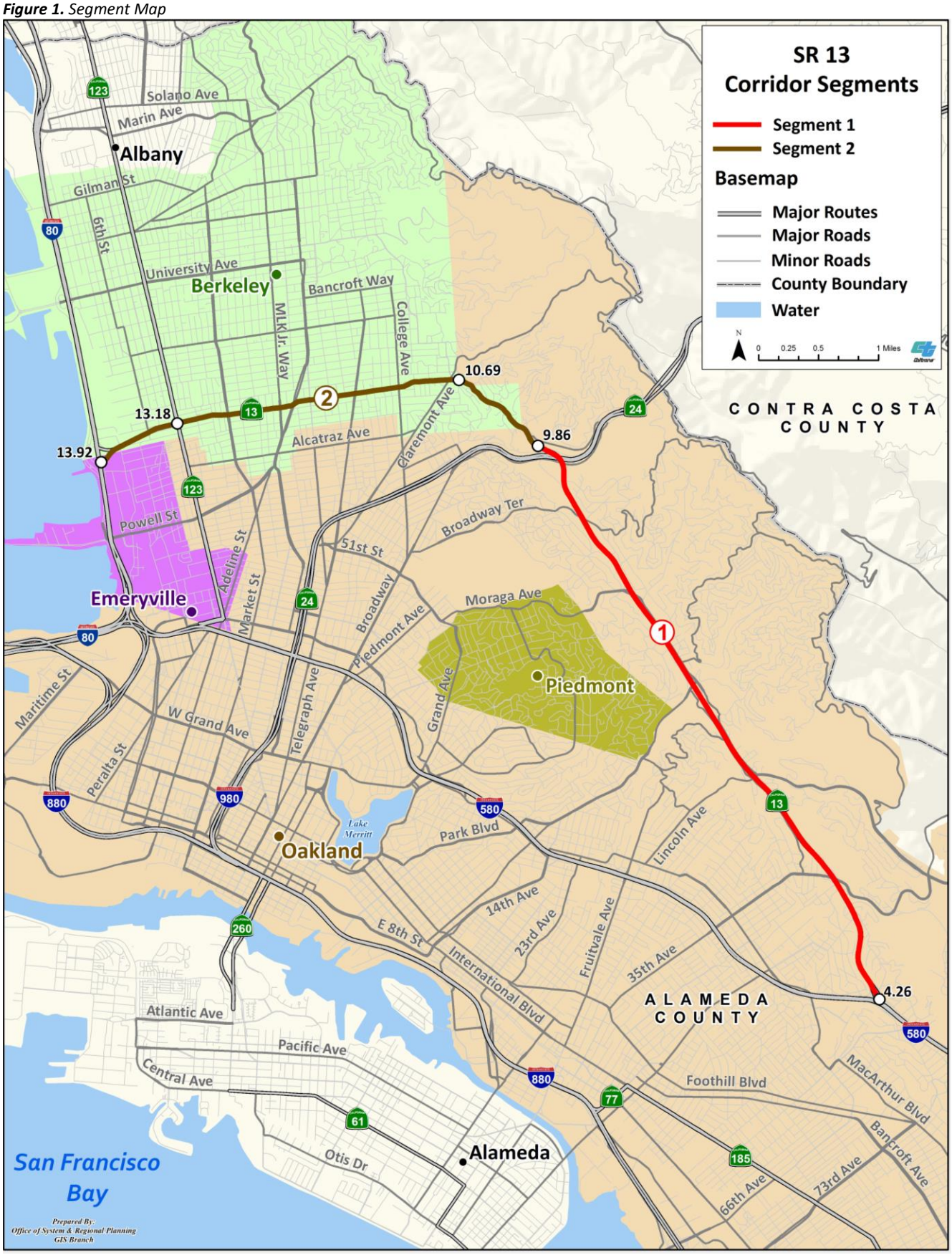
The freeway section, Segment 1, starts at I-580 near Mills College in Oakland and serves as a connecting route between I-580 and SR 24; it provides access to the State Highway System (SHS) for the Oakland Hills neighborhoods and Piedmont. The conventional section, Segment 2, is found between SR 24 and I-80, virtually all within the Berkeley city limits.

The route begins at Post Mile 4.26, since the original concept included an unconstructed segment to SR 61 that was legislatively deleted in 1982.

Table 1. *SR 13 TCR Segments*

Segment	Location	Begin Post Mile (PM)	End PM
1 (Freeway)	I-580 to SR 24	4.26	9.86
2 (Conventional)	SR 24 to I-80	9.86	13.92

Figure 1. *Segment Map*



Corridor Description

SR 13 has two distinct sections. First, SR 13 is a south-north freeway in Oakland between I-580 and SR 24. It has four lanes and a median. Local roadways are found parallel along one or both sides of the freeway, accommodating bicyclists and pedestrians. The Montclair neighborhood contains a concentration of retail use around La Salle Avenue (PM 7.75) and is a destination for people living nearby, including residents from the City of Piedmont. Notable destinations along the freeway segment of SR 13 also include the Redwood Regional Park, Joaquin Miller Park, Oakland Zoo, Chabot Space & Science Center and the Mountain View Cemetery. The Temescal Regional Recreation Area is located close to the SR 13/ SR 24 Interchange.

The second segment of SR 13 is a conventional highway northwest of SR 24, mostly in the City of Berkeley. This segment consists of two streets: Tunnel Road and Ashby Avenue. Tunnel Road, between the Caldecott Tunnel and Domingo Avenue (PM 10.69), is a curvy two-lane roadway, with a split profile between the two directions of travel in the hilliest parts of the route, and has a buffered bicycle lane along some of the roadway. Ashby Avenue, between Domingo Avenue and I-80 is mostly a four-lane facility, though the number of lanes varies between two and four lanes east of Shattuck Avenue (PM 12.06). On-street parking is allowed outside the restricted hours (7-9 am in the westbound direction and 4-6 pm in the eastbound direction) between San Pablo Avenue and Harper Street; the parking restrictions help establish a second lane for the commute direction. Russell Street, located one block north of Ashby Avenue, is a bicycle boulevard. Nearby destinations include Ashby BART Station, Aquatic Park, and the Claremont Canyon Regional Preserve. Businesses and employment also cluster around major intersections. The University of California—Berkeley is located about a mile away from Ashby Avenue to the north.

Table 2. *Corridor Description by Segment*

Segment #	1 (Freeway)	2 (Conventional)
Freeway & Expressway	Yes	No
National Highway System	No	No
LifeLine and Strategic Highway Network	No	No
Strategic Interregional Corridor	No	No
Scenic Highway	Yes	No
Caltrans Interregional Road System (IRRS)	No	No
Federal Functional Classification	Other Freeway or Expressway	Other Principal Arterial
National Highway Freight Network	No	No
Truck Designation	CA Legal – 40 feet length	CA Legal – 40 feet length
Metropolitan Planning Organization	Metropolitan Transportation Commission (MTC)	MTC
Congestion Management Agency	Alameda County Transportation Authority (Alameda CTC)	Alameda CTC
Local Agency	City of Oakland	Cities of Oakland and Berkeley
Tribes	Ohlone	Ohlone
Air District	Bay Area Air Quality Management District (BAAQMD)	BAAQMD
Terrain	Rolling	Rolling/Flat

CORRIDOR SETTING

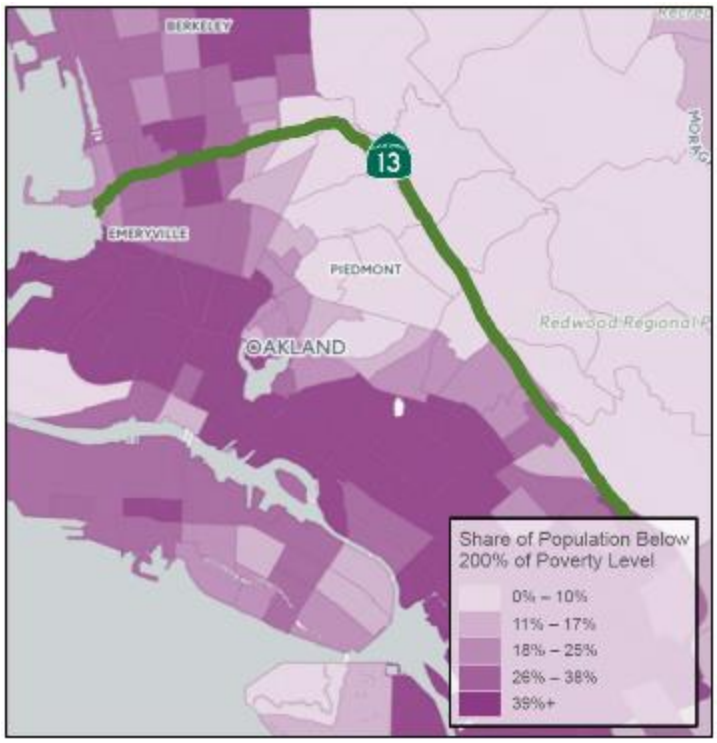
A transportation corridor exists in a setting that involves more than just the movement of people and vehicles. Land uses, plans and community characteristics are vital aspects that can influence future transportation concepts.

Community Characteristics

The land surrounding the freeway portion of SR 13 consists of suburban land uses in Oakland and Piedmont with relatively low population densities. The conventional route travels through areas with higher density in Berkeley, especially between Domingo Avenue and San Pablo Avenue, though the predominant land use is single-story homes. West of San Pablo Avenue, land use along the SR 13 Corridor contains light-industrial land uses.

As shown in Figure 2, the areas surrounding the freeway segment and Tunnel Road contain relatively few people living in poverty as defined by MTC (below 200 percent of federal poverty line). In contrast, the Ashby area contains a relatively high number of people living in poverty, particularly in the area surrounding Sacramento Street. Additionally, *MTC Vital Signs* (though not shown here) describes a lower level of labor force participation both along Segment 1 and the poorer areas along Segment 2, while the remainder of Segment 2 in Berkeley shows a higher labor participation rate.

Figure 2. *Poverty along SR 13*



Source: MTC Vital Signs, 2013

Local General Plans

Piedmont has a well-established land use pattern, and the focus of its General Plan is on preserving the stability and integrity of the city's residential areas. Only a limited amount of change in land use, primarily on commercial land and publicly-owned sites, is anticipated. For Berkeley, Emeryville and Oakland, the Priority Development Areas show where land use changes may be concentrated. Emeryville and nearby Berkeley south of SR 13 are envisioned to contain more mixed uses, strengthening their core city functions. Adeline, crossing Ashby Avenue at PM 12.24, is a mixed-use corridor, and the Adeline Corridor Specific Plan is in development. No significant changes are envisioned along the freeway segment in Piedmont and Oakland.

Caltrans 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.

As the place type map shows, the areas along the freeway segment of SR 13 can be characterized as suburban neighborhoods that continue into the hillier parts of Berkeley. Where the surrounding lands of SR 13 become flatter, the character becomes more urban, designated here as close-in neighborhoods. Concentrations of shops and communal activities are found in Claremont in Oakland (Suburban Center), and both Adeline Avenue and College Avenue in Berkeley (Close-in Corridors). Closer to the I-80 freeway in Berkeley, light-industrial land uses are found (Dedicated Use Area).

Figure 3. *Place Type Designations along SR 13*

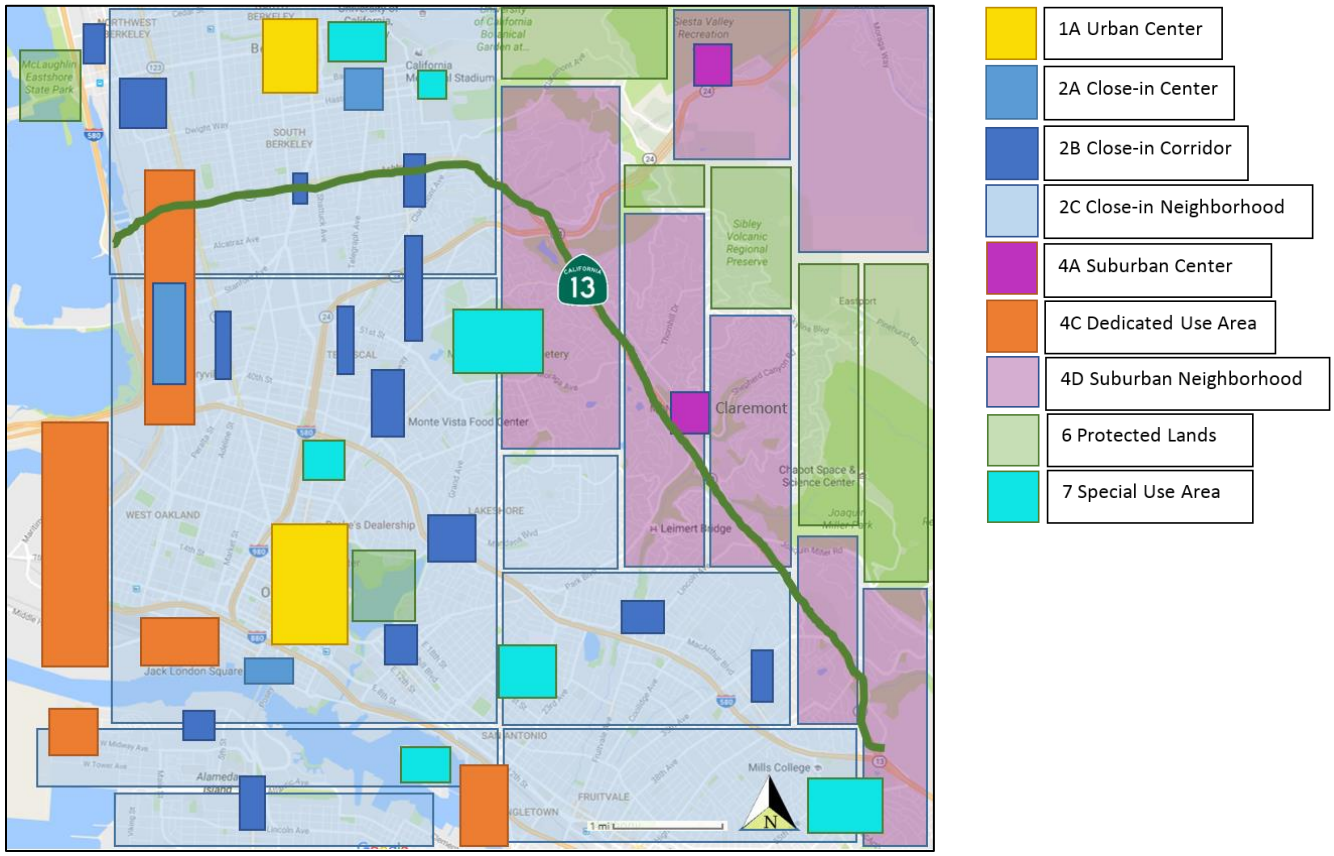


Table 3. *Smart Mobility Framework Place Type Designations along SR 13*

Segment	Place Type	Transportation Strategies
1 Freeway	*Close-in Communities*	• *Designate locations for close-in compact communities* • *Complete Streets Projects* • *Bicycle network* • *Continuous pedestrian facilities with high amenity levels* • *High-capacity transit centers with managed parking* • *Transit linked to high-capacity transit lines, employment centers, regional institutions*
	Suburban Communities	• *Investments that improve operational efficiency of existing arterials* • *Connectivity improvements leading to shorter trip lengths and increased non-auto mode share* • *Investments in Complete Streets*
	Dedicated Use Areas	• *Investments in Complete Streets and safe routes to school; connectivity improvements creating shorter routes*
2 Conventional	*Urban Core Communities*	• *Encourage high-density, mixed-use infill development* • *Reduce parking requirements* • *Creation/improvement major transit/transfer hubs* • *Pedestrian facilities with high amenity levels* • *Extensive network bicycle facilities* • *Roadway and parking pricing*
	Close-in Communities	• *Designate locations for close-in compact communities* • *Complete Streets Projects* • *Bicycle network* • *Continuous pedestrian facilities with high amenity levels* • *High-capacity transit centers with managed parking* • *Transit linked to high-capacity transit lines, employment centers, regional institutions*
	Suburban Communities	• *Investments that improve operational efficiency of existing arterials* • *Connectivity improvements leading to shorter trip lengths and increased non-auto mode share* • *Investments in Complete Streets*
	Dedicated Use Areas	• *Investments in Complete Streets and safe routes to school; connectivity improvements creating shorter routes*

Priority Development and Priority Conservation Areas

Plan Bay Area 2040, approved in 2017, is a long-range integrated transportation and land-use/housing strategy and serves as the Regional Transportation Plan for the San Francisco Bay Area. PBA responds 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 in these areas. 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. PDAs in Alameda County help accommodate a large share of forecasted growth in the Bay Area region. The update of the plan, called Plan Bay Area 2050, is being developed.

Figure 5 shows the PDA's along and near SR 13. The Adeline Street area is a PDA, and this mixed-use corridor has a Specific Plan in development. See example in Figure 4 of proposed housing; SR 123 (San Pablo Avenue) is planned to be a mixed-use corridor. SR 13 ends at I-80, adjacent to the Emeryville Mixed-Use Core PDA (see Figure 5). This PDA is experiencing rapid development that includes light industrial, residential and office uses as well as a concentration of commercial uses.

Figure 4. *Rendition of 50 new housing units at Adeline Street, one block from Ashby BART Station.*

Source: Berkeleyside.com, May 2017

Figure 5. *Priority Development 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 factors are categorized based on a scale of low-medium-high probability of an environmental issue and determination was conducted by District 4 Transportation Planning. Caltrans supports reducing adverse environmental impacts from the transportation system as an overall strategic objective. Table 4 below lists environmental factors present in the SR 13 Corridor and shows their impact probability.

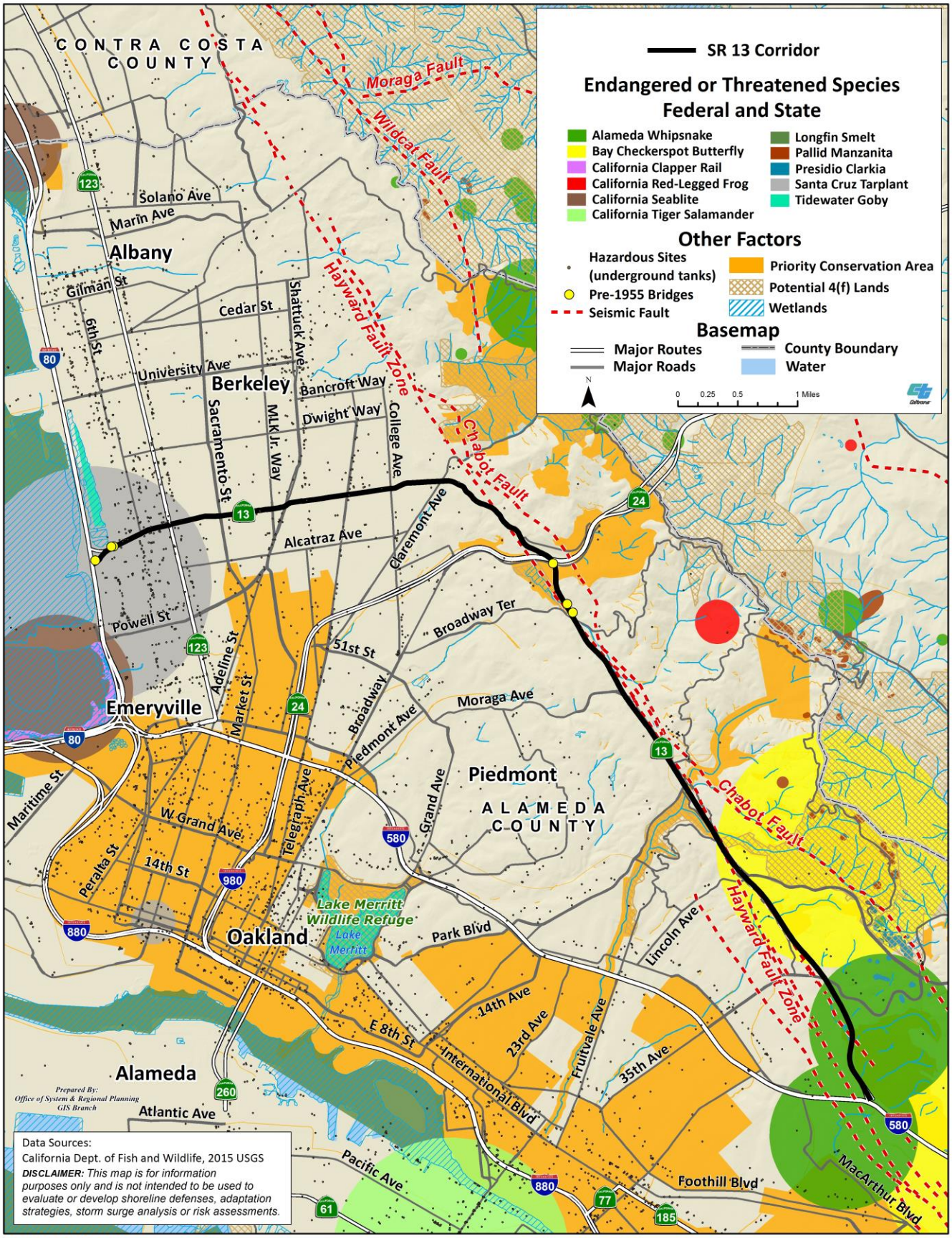
Table 4. *Environmental Considerations*

Segment			1 (Freeway)	2 (Conventional)
Section 4(f) Land			*Med*	*Low*
Bay Conservation Zone			*N/A*	*Med*
Environmental Justice			*Low*	*Med*
Cultural Resources			*High*	*Med*
Visual Esthetics			*Med*	*Med*
Geology/Soils/Seismic			*High*	*Med*
Climate Change/Sea Level Rise			*N/A*	*Med*
Hazardous Materials			*Low*	*Med*
Naturally Occurring Asbestos			*Low*	*N/A*
Air Quality	**Ozone**		*Non-Attainment*	*Non-Attainment*
	Particulate Matter (PM)	**2.5**	*Non-Attainment*	*Non-Attainment*
		10	*Non-Attainment*	*Non-Attainment*
	CO		*Attainment*	*Attainment*
Noise			*Med*	*Med*
Waters and Wetlands			*NA*	*High*
Special Status Species			*High*	*Med*
Fish Passage			*Med*	*N/A*
Habitat Connectivity			*Med*	*Low*

The SR 13 Corridor area contains a number of endangered species. In the southern part around the freeway segment, Alameda Whipsnakes and Bay Checkerspot Butterflies are found. The Tidewater Goby is found along the Berkeley side of the Bay, while the Santa Cruz Tarplant is found in that vicinity both in Berkeley and in Emeryville. Fault lines run beneath and along the freeway segment and Tunnel Road. Hazardous sites, primarily underground tanks, are found mostly along the conventional highway part of the route.

As Figure 6 shows, some PCAs are found in urban areas, such as the Oakland Urban Greening areas found in and around downtown Oakland.

Figure 6. *Environmental Map*



CORRIDOR COMPONENTS

Caltrans is a multimodal transportation agency, and all transportation modes are included in this report, guided by Caltrans Strategic Management Plan Goals.[1] To achieve a 15 percent reduction of statewide per capita VMT relative to 2010 levels, reliance on other modes to help achieve this Caltrans target is needed. One of Caltrans sustainability objectives is to achieve an 80 percent reduction in greenhouse gas emissions below 1990 levels by 2050. Where possible, operational coordination of multiple transportation networks and cross-network connections can improve the functioning of the transportation corridor. This report is one of the ways through which Caltrans plans, with other responsible organizations, a multimodal approach towards improving mobility.

Commute Mode Split

While much of the Bay Area economy operates on a 24-hour/seven-day basis, the networks are used most intensely during commute hours. As such, the commute mode split provides an indication how the transportation system is utilized. Table 5 shows neighborhood mode splits along SR 13 based on data from MTC's 2014 Vital Signs.

Table 5. *Traffic Performance on State Highway*

Commute Mode Split	Neighborhoods along freeway Segment 1	Neighborhoods along conventional Segment 2
Car, Truck – Driving alone	**43 – 76 percent**	**35 – 52 percent**
Car, Truck – Carpool	**4 – 16 percent**	**5 – 12 percent**
Public Transportation	**6 – 20 percent**	**20 – 30 percent**
Walked	**0.5 – 5 percent**	**1 – 14 percent**
Bicycled	**0.5 – 1 percent**	**2 – 12 percent**
Worked at Home	**2 – 13 percent**	**3 – 10 percent**

Source: MTC Vital Signs, 2014

Neighborhoods closer to the freeway segment of SR 13 generally had higher carpooling and driving alone percentages than residents along the conventional highway section of the route. About 14 percent of Piedmont's employed residents carpooled to work in 2014, the highest percentage among cities in Alameda County. Although there are no high occupancy vehicle (HOV) lanes on SR 13, drivers from neighborhoods along Segment 1 have the option to pick up additional passengers from several casual carpool locations and take advantage of the HOV lanes on other freeways such as I-80 and I-880. Walking and biking rates are lower for neighborhoods along Segment 1, possibly due to a hillier landscape as compared to the neighborhoods surrounding the much flatter, conventional highway Segment 2.

Figure 7. *Casual Carpool Locations*

Source: SFCasualCarpool

Pedestrian and Bicycle Facilities

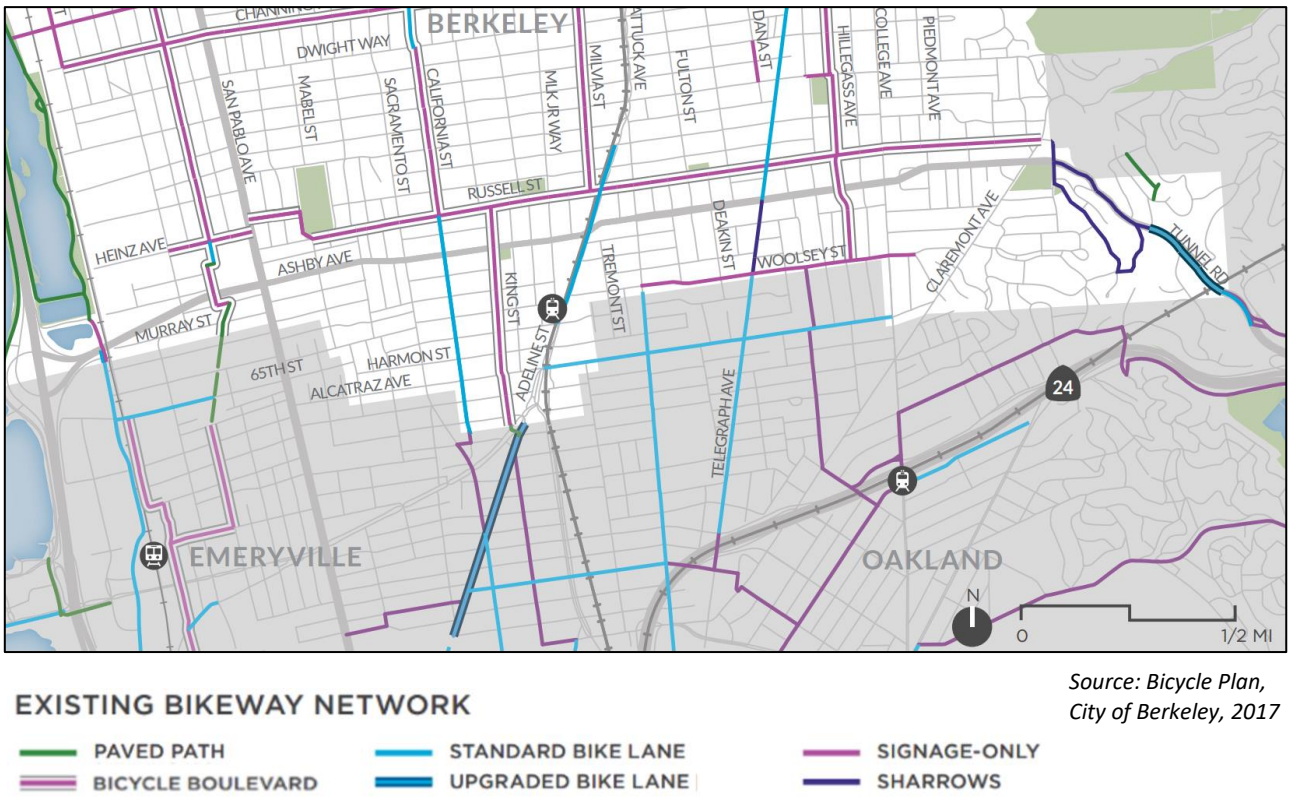
With the 2010-12 California Household Travel survey serving as a baseline, two of Caltrans Strategic Management Plan 2015-2020 performance targets are to triple bicycle and double pedestrian trips. The underlying strategic objective is to help improve the quality of life for all Californians by providing mobility choices, increasing accessibility to all modes of transportation and creating transportation corridors not only for conveyance of people, goods, and services, but also as livable public spaces.

[1] 2015-2020 Caltrans Strategic Management Plan

Many of the local streets crossing over or under the freeway segment of SR 13 provide sidewalks for pedestrian movements. In addition, there are several pedestrian bridges and underpasses that also accommodate bicyclists. Yet for most local streets crossing the freeway, bicyclists do not have a bike lane and need to make use of the regular traffic lane. Bicyclists and pedestrians are not permitted on the freeway. The Oakland 2007 Bicycle Master Plan proposes to create a number of improvements on streets that cross the SR 13 freeway, including an overcrossing near Park Boulevard, and ensuring the bike route along SR 13 is at minimum a Class II facility. These are consistent with Caltrans District 4 Bike Plan, which calls for Class II improvements at spot locations, new separated crossings, and a Class I trail paralelling the entire freeway.

In Segment 2, Tunnel Road is a two-lane street and contains a split-profile median concrete barrier for half of it to the east. In the northbound (NB) direction, a bike lane that is part Class II and part Class IV can be found between (PM 13.06 – PM 10.70), while the remainder of Tunnel Road is a Class III bike route. There is no bicycle facility in the southbound (SB) direction, but a restricted shoulder for vehicles is available for bikes. Sidewalks are present on both sides of Tunnel Road in Berkeley, while improvements are in progress for the short segment found within the Oakland city limits. Ashby Avenue itself does not have bicycle facilities, though bicyclists are permitted to use the road. A bicycle boulevard is found on Russell Street/Oregon Street/Heinz Avenue (collectively referred to as Russell Street hereinafter), one block north of Ashby Avenue, providing an excellent nearby alternative. Sidewalks are available on both sides along the entire length of Ashby Avenue, though the approach to and passage underneath the rail tracks and Bay Street dead ends at I-80. Many intersections have no marked crosswalks (particularly T-intersections) or only one crosswalk marked across Ashby Avenue; not all intersections were evaluated in Table 6. At the beginning of 2017, ADA compliant curb ramps and sidewalk SHOPP improvements in 15 locations were installed between Shattuck Avenue and 7th Street.

Figure 8. *SR 13 Conventional Route Pedestrian and Bicycle Map*



Source: Bicycle Plan, City of Berkeley, 2017

The bicycle map of the conventional segment (Ashby Avenue and Tunnel Road) shows a bicycle boulevard along most of the route on Russell Street. The bicycle boulevard is found between Claremont Avenue to the east and beyond Seventh Street to the west, on Heinz Avenue.

Table 6. *Pedestrian and Bicyclist Needs Along SR 13, including City of Oakland Planned Proposals*

Location	Proposed Needs
Calaveras Avenue (PM 4.33)	Sidewalk on one side; no bike lanes. Pedestrian bridge 3,000 feet to the north. Class II proposed.
Carson Street (PM 5.21)	Sidewalks on both sides; no bike lanes. Pedestrian bridge 1,000 feet to the south. New separated crossing proposed for ped and bike.
Redwood Road (PM 5.90)	Sidewalks on both sides; no bike lanes. Class II proposed.
Joaquin Miller Road (PM 6.46)	Sidewalks on both sides in need of upgrade; no bike lanes. Pedestrian-bike underpass 3,000 feet to the north (dark and narrow). Class II proposed.
Park Boulevard (PM 7.39)	Sidewalks on both sides of roadway in need of upgrade; no bike lanes. Curb ramps as well as pedestrian refuge island missing. Pedestrian-bike underpass 2,500 feet to the south. New separated Class I proposed.
La Salle Avenue (PM 7.76)	Sidewalks on both sides; no bike lanes. Pedestrian bridge 750 feet to the north. Class III (sharrows) proposed.
Moraga Avenue (PM 8.31)	Sidewalk on one side; no bike lanes. High speed environment. Pedestrian bridge 2,000 feet to the south. Class II proposed.
Broadway Terrace (PM 9.08)	High-speed environment. Sidewalks on both sides, but connections, curb ramps and crosswalk markings are missing; bike lanes in faded condition. Class II proposed.
Lake Temescal Bridge	Proposed bridge links the Lake Temescal Path to Tunnel Road near the interchange of SR 24 and SR 13.
Crossing SR 24 (PM R9.62)	There is no direct alignment for bicyclists and pedestrians crossing SR 24 to continue on or along SR 13. Steep undercrossing 3,000 feet to the west; overcrossing 2,500 feet to the east. Study proposed.
Hiller Drive at Tunnel Road (PM 10.09)	Intersection does not contain any pedestrian accommodation. Pedestrian accommodation proposed.
Tunnel Road (PM 10.09 – 10.58)	Review of all side streets needed for pedestrian accommodation.
Tunnel Road – Russell Street connection	Intersections at Tunnel and Domingo, and at Russell and Claremont in need of upgrade.
Ashby Avenue (PM 10.58 – 13.45)	ADA compliance (in progress).
Claremont Avenue (PM 10.79)	Channelized right-turn, update lay-out needed. Refuge islands on Claremont proposed.
Piedmont Avenue (PM 11.11)	Pedestrian movements prohibited on west side. Complete Streets intersection proposed.
Ashby Place (PM 11.14)	Pedestrian crossings absent at east end of Ashby Place. Complete Streets adjustments proposed.
Hillegass Avenue	Intersection Improvements proposed.
Wheeler Street (PM 11.92)	Pedestrian crossings absent across Ashby Avenue. Complete Streets adjustments proposed.
Adeline Street (PM 12.24)	Intersection improvements proposed to facilitate pedestrian movements better.
California Street	Intersection improvements proposed.
Sacramento Street (PM 12.77)	Pedestrian refuge islands proposed.
San Pablo Avenue (PM 13.18)	Has median, but pedestrian refuge islands missing. Intersection improvements proposed.
Ashby Plaza (PM 13.33)	Pedestrian crossings/sidewalks proposed at west end of Ashby Plaza.
Ninth Street (PM 13.34)	Pedestrian refuge islands proposed on Ashby Avenue.
Seventh Street (PM 13.45)	Pedestrian refuge islands proposed for all directions.
Towards I-80 (PM 13.45 – 13.73)	No signage declaring dead-end walkways. Lighting may be an issue. Full interchange reconstruction study underway.

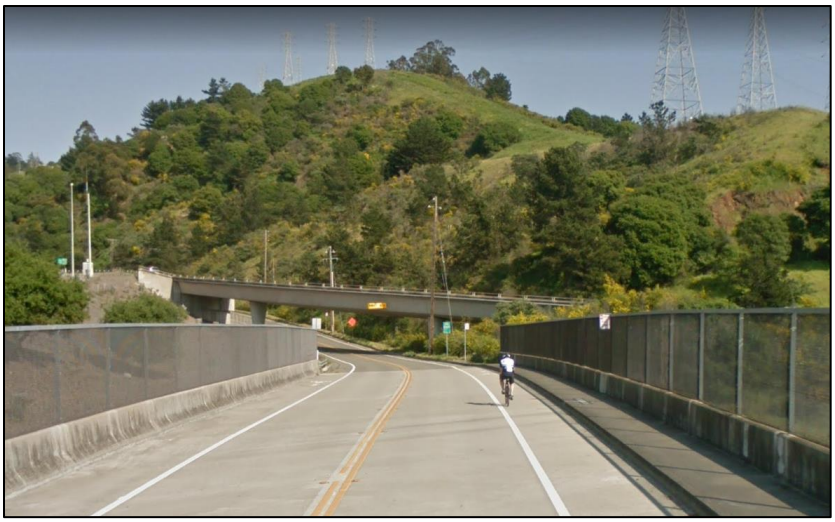
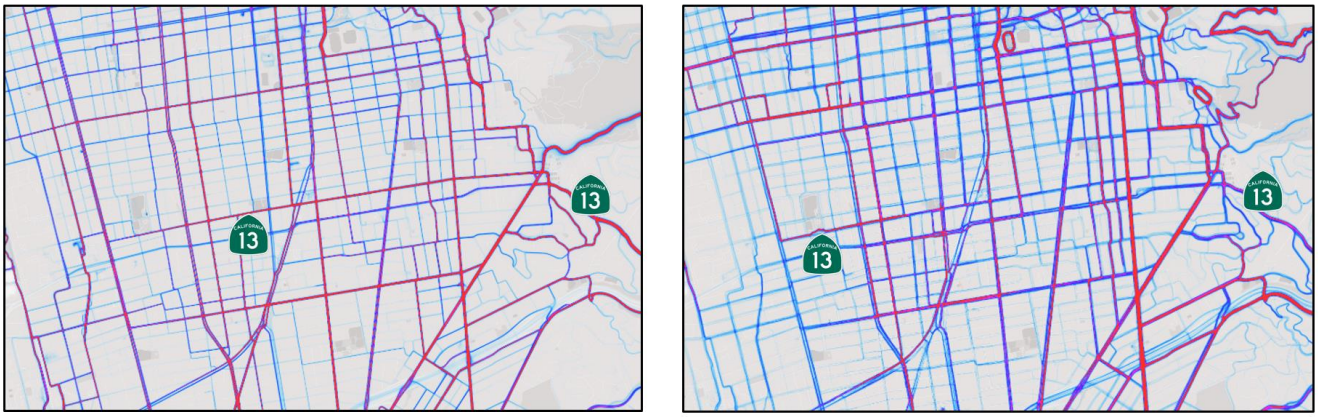


Figure 9. *Broadway crossing SR 13*
Recent bicycle improvements, part of the Caldecott Fourth Bore Settlement.

Source: Google Streetview

Strava Heat Map

Strava users are athletes that use cell phone technology to track their personal achievements. Their collective activities in the area are shown in the heat maps below for the year 2015, bicyclist data to the left, runner data to the right. Activity levels are visible in red and blue, with red indicating the routes that are used most. Please note that the data does not represent all bicyclists and pedestrians, but route popularity can reasonably be estimated.



Figures 10a and 10b. *2015 Strava Athlete Bicycle Heat Map and Runner Heat Map*
Strava Bicycle Heat Map to the left, Runners Heat Map to the right, with red indicating the most used routes.

A distinction between users of SR 13 is seen with the Strava heat maps. On the map to the left, bicyclists are clearly choosing to use the Bicycle Boulevard on Russell Street, one street north of SR 13 in Berkeley, and only moderately use Ashby Avenue. In contrast, the pedestrian map to the right shows that athlete runners do not have a particularly clear preference of Ashby Avenue over Russell Street. Though a Complete Streets policy is followed for Ashby Avenue, bicyclist popularity of Russell Street shows how the east-west needs in this area are addressed. Meanwhile for the freeway segment (not shown), bicyclists and runners appear to be using the corridor in similar ways, even though some of the popular pedestrian routes are not used much by bicyclists; this is perhaps due to the steepness of particular local roads.

Ashby/Adeline Intersection

Figure 11. *Ashby and Adeline Intersection*

The Ashby Avenue (SR 13) and Adeline Street intersection represents a major challenge for pedestrians within the Corridor. There is an offset between the east and west legs of the intersection, resulting in skewed crosswalks with considerable lengths. The longest crosswalk is 150 feet, one-third longer than a perpendicular crossing would be. While other solutions should also be studied (for instance, a roundabout or installing perpendicular crosswalks while leaving the roadway intact), the option to convert to two contiguous T-intersections as shown in blue in Figure 11 is suggested as a potential study. The drawing shows potential reconfiguration.

Transit Facility

Based on the 2010-12 California Household Travel survey, the Caltrans Strategic Management Plan calls for doubling the number of transit trips by 2020. In District 4, an extensive managed lane network, which is defined as high occupancy vehicle (HOV), high occupancy/toll (HOT) or express toll lanes (ETL), is frequently used by transit service providers. Other transit such as BART commuter rail and VTA light rail often utilize Caltrans Right of Way. While most transit trips take place outside the SHS, transit is a vital modal choice option and Caltrans remains focused on partnering with local and regional transit service providers to help achieve our strategic goals. In coordination and partnership with the California Transit Association (CTA), the California Association for Coordinated Transportation (CalACT), and transit stakeholders across the State, the 2012 Statewide Transit Strategic Plan sets a new direction that supports public transportation in the future.

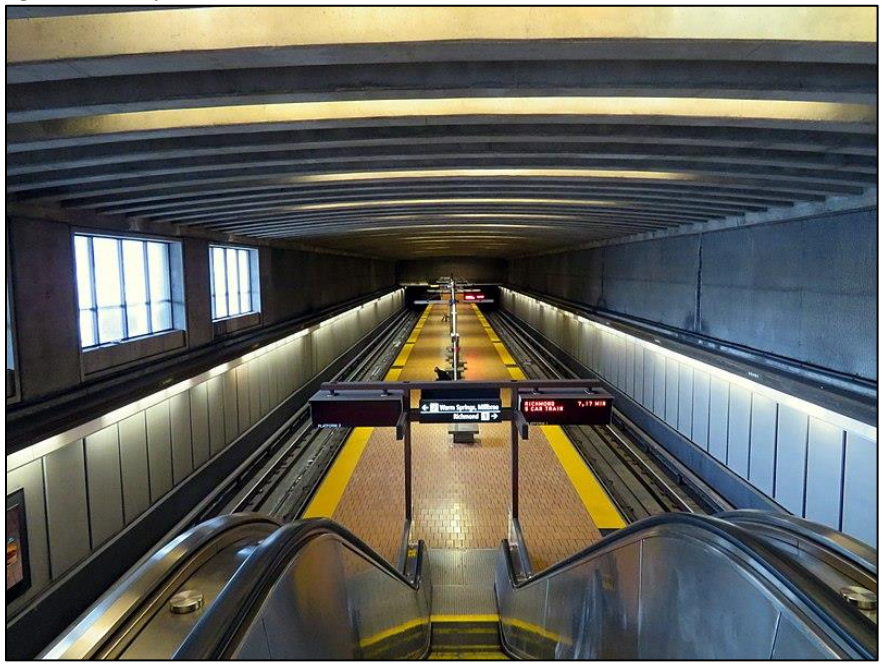
Two rail transit services intersect with SR 13: Amtrak near I-80, and BART beneath Adeline Street. The Emeryville Amtrak Station is the busiest Amtrak station in the Bay Area and connects passengers to Sacramento and San Jose and beyond. From this station, passengers can also take an Amtrak Thruway bus to San Francisco.

BART passes underneath SR 13 at Adeline Street with the Ashby BART Station located half a block south of Ashby Avenue. Ridership at this station was relatively moderate at 6,000 passengers a day in 2015, with forty percent of the passengers walking to the station, and another eight percent riding bikes. BART also passes under SR 13 (Tunnel Road) near SR 24 and the Caldecott Tunnel. The closest station is Rockridge Station, serving 5,700 daily riders in 2015. By connecting Contra Costa County to Alameda County, and Santa Clara County, BART can provide an alternative to drivers using the SR 13 freeway section and the Caldecott Tunnel.

Locally, a number of free bus services are provided in the Corridor. Segment 2 is served by the West Berkeley Shuttle, while the Emery-go-round provides service close to Ashby Avenue (see Figure 13). These free bus services are funded fully or mostly by local businesses.

The SR 13 Corridor has a number of Alameda-Contra Costa Transit (AC Transit) bus routes. Route 49 serves Ashby Avenue from 7th Street to College Avenue. Other routes found on the Corridor include: J, 800, E, CB, V, 18, and 54. The following bus routes cross SR 13: Z, 26, 72, 802, 88, 12, F, 18 (twice), 6, 51B, and 851.

Figure 12. *Ashby BART Station*



Source: WikiMedia (Author Pi.1415926535)

Alameda Countywide Multimodal Arterial Plan

Alameda CTC led the development of a Countywide Multimodal Arterial Plan to better understand the existing and future role and function of the countywide arterial system. Alameda CTC closely coordinated its Countywide Multimodal Arterial Plan with Caltrans, local jurisdictions, and transit operators. The plan provides a framework for designing, prioritizing and implementing improvements in the context of the surrounding land uses, and addresses the needs of all modes on the county's arterial roadways. This plan provides a basis for integrated management of major arterial corridors and identifies a priority list of short- and long-term improvements and strategies.

The plan proposes enhanced bus improvements for Ashby Avenue, such as on-street improvements that reduce travel time, improve passenger comfort and increase operational efficiency.

Figure 13. *Transit Map*

Freight

SR 13 connects to I-580 where a truck ban is in place from Foothill Boulevard in San Leandro to Grand Avenue in Oakland. When traffic incidents tie up two or more lanes of I-880 for two or more hours, trucks are allowed on I-580 and these trucks may then temporarily use SR 13 in larger numbers as well. On SR 13, the highest number of trucks are found near I-80, on the conventional highway segment of the route, an area with established light-industrial land uses. In the Alameda County Goods Movement Plan, SR 13 in its entirety is shown as a Tier 3 route, a roadway mainly used by trucks for local pickup and delivery.

State Highway Characteristics and Performance

The two segments of SR 13 differ in character and setting. The four-lane freeway Segment 1 of the route moves through a hillside landscape with land uses ranging from residential and commercial to open space. For much of this segment, a parallel local roadway is found along one or both sides of the freeway. Multiple ramps provide access between the freeway and local neighborhoods. The freeway segment has an uninterrupted median barrier with some portions landscaped.

The conventional highway segment contains up to four lanes in a mix of hilly and flatter urban setting. Before reaching SR 24 and the freeway segment of SR 13, the roadway becomes more windy. Parking is generally allowed along Ashby Avenue, but is prohibited in many places during commute hours in the peak direction.

Figure 14. *Distressed Pavement 2016*

As of 2016, the pavement conditions of many sections of SR 13 received a *poor ride only* grade, which indicates that the pavement conditions have deteriorated, resulting in a rough ride quality. During the rainy season of 2016/17, a large sink hole appeared on SR 13 close to SR 24, while a mudslide closed the route temporarily, emphasizing the on-going maintenance needs along the route, especially in Segment 1.

Table 7. *State Highway Characteristics*

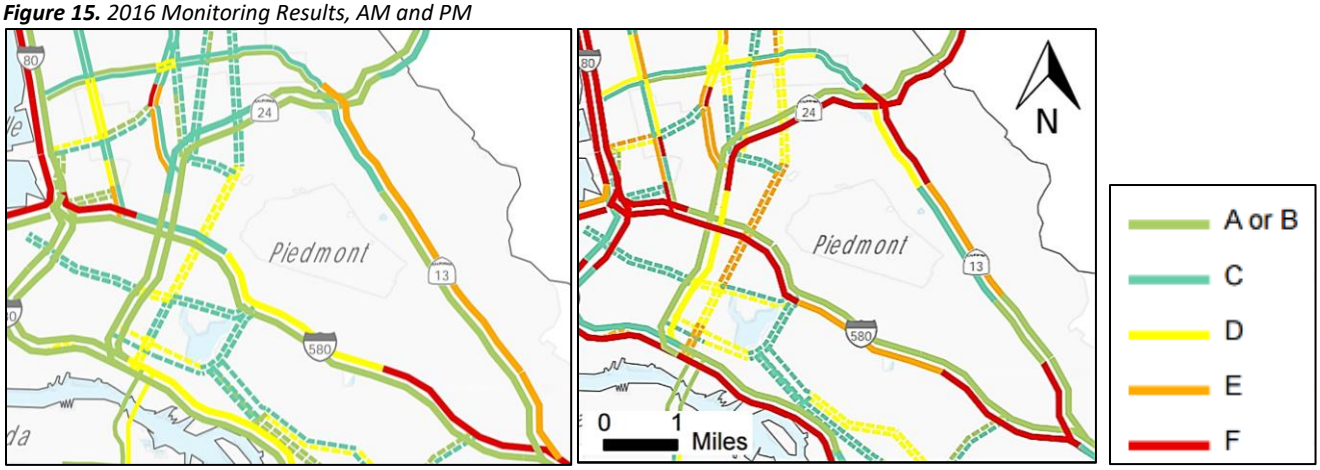
Segment	**1** (Freeway)	**2** (Conventional)
Existing Facility		
Facility Type	F	C
Total Lanes	4	2 – 4
Centerline Miles	5.60	4.06
Median Width	0 – 45 feet	0 – 4 feet
Median Characteristics	Paved/Shrubs	Minor section with median concrete barrier
Shoulder	8 – 12 feet paved	Parking/sidewalk
Distressed Pavement as of 2016[2]	20% Ride Only	100% Ride Only
ROW	120 - 440 feet	50 - 100 feet

Table 7 describes some of the SR 13 characteristics. Closer to the I-580 and SR 24 Interchanges, wider right of way is found to accommodate the freeway-to-freeway connector ramps. Tunnel Road, in the hillier parts of Berkeley, has the narrowest right of way.

As shown in Figure 15, congestion was mostly found on the freeway segment of SR 13 in 2016. During the AM commute hours, the northbound direction was congested with unstable traffic flows and unpredictable speeds. southbound traffic experienced no congestion during the AM Peak hours, indicating this route was not a heavily used commuter short-cut for traffic from northern Alameda and Contra Costa County to southern Alameda and Silicon Valley.

During the PM commute hours, traffic experiences heavy congestion at both ends of the freeway section. The congestion occurs in the north of SR 13 due to traffic backing up from a bottleneck on SR eastbound 24 toward the Caldecott Tunnel in combination with a lane drop at Tunnel Road, and in the south on SR 13 where the I-580 Interchange is a bottleneck that limits the south- and eastbound flow of traffic.

Figure 15. *2016 Monitoring Results, AM and PM*



*Source: Alameda CTC Monitoring Report (*dashed arterials are local roadways)

[2] Caltrans Pavement Program Website

A similar traffic pattern is found in Table 8 with 2015 traffic information based on MTC modeling data. Northbound SR 13 freeway traffic had the highest number of vehicles during the morning peak hour in Segment 1, while southbound had the lowest number of vehicles during the same time. The truck percentages are similar for 2015 and 2040, though there is an increase in total actual number of trucks. Compared to 2015, the directional traffic for Segment 1 is expected to remain similar in 2040. For Segment 2, the peak direction is expected to become more prominent during peak hours. Vehicle Miles Traveled (VMT) is expected to grow 17% by 2040 for Segment 1.

Table 8. *Traffic Performance on State Highway*

Segment	1	2
Basic System Operations		
AADT 2015	75,000	26,000
AADT 2040	88,000	31,500
AADT: Growth Rate/Year (%)	0.7	0.85
VMT 2015 per day	420,000	105,560
VMT 2040 per day	492,800	127,890
Truck Traffic 2015		
Total Average Annual Daily Truck Traffic	1042	697
Total Trucks (% of AADT)	1.6	2.2
5+ Axle Average Annual Daily Truck Traffic	87	164
5+ Axle Trucks (as % of *AADTT*)	8.5	23.6
Truck Traffic 2040		
Total Average Annual Daily Truck Traffic	1260	818
Total Trucks (% of AADT)	1.6	2.2
5+ Axle Average Annual Daily Truck Traffic (Optional)	105	192
5+ Axle Trucks (as % of *AADTT*) (Optional)	8.5	23.6
Peak Hour Traffic Data 2015		
AM NB Peak Hour Volume	3381	1351
AM SB Peak Hour Volume	2718	948
AM Peak Hour Directional Split	***55***/45	***59***/41
PM Peak Hour Directional Split	49/***51***	32/***68***
PM NB Peak Hour Volume	3117	869
PM SB Peak Hour Volume	3242	1847
Peak Hour V/C (2000 vehicles per freeway lane)	0.679 – 0.845	n/a
Peak Hour Traffic Data 2040		
AM NB Peak Hour Volume	4002	1441
AM SB Peak Hour Volume	3564	956
AM Peak Hour Directional Split	***53***/47	***60***/40
PM Peak Hour Directional Split	48/***52***	30/***70***
PM NB Peak Hour Volume	3832	864
PM SB Peak Hour Volume	4079	1988
Peak Hour V/C (2000 vehicles per freeway lane)	0.891 – 1.019	n/a

Data source: MTC Travel Model

TECHNOLOGY AND TRAFFIC MANAGEMENT

Technology influences the outcomes in the transportation field by providing effective tools for traffic management.

Technological Innovations

Technological innovations are changing the transportation system today and will continue to do so in the future. Shared mobility, defined as sharing the use of a vehicle, bicycle, or other mode on a short-term or "as-needed" basis, is now a reality. Self-driving vehicles, while difficult to forecast their full transportation system integration, are promising to transform transportation as we know it. Current car technology provides an increasing number of vehicles with automatic assistance, improving safety along the way. Many pilot programs are underway for fully automated self-driving vehicles, and this includes advancements for freight delivery. There is a tremendous potential for change occurring in the field of transportation, ranging from platooning vehicles to smaller-sized pods, from shared ownership issues to nearing zero accidents, and from high speed rail to highly complex Hyperloop technology. Yet the socioeconomic and industry-driven changes are not crystalized well enough for further discussion here at this point in time. An acknowledgment is, however, in place that technological changes will have implications for corridor concept development. Autonomous vehicles, for instance, will likely increase capacity of our road ways, while this could also lead to induced demand, suburban sprawl and more congestion.

Transportation Systems Management and Operations (TSMO)

Caltrans is committed to effective Transportation Systems Management and Operations 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 ramp metering, traffic signal synchronization, Intelligent Transportation Systems (ITS) and managed lanes. Efficiency can often be achieved by operational improvements through ITS deployments. These include three types of management for improving throughput:

- System management for recurring localized congestion (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 (detection-verification-response, CCTV, CMS, HAR, weather detection, traveler information system, ICM).
- Event management for emergencies, disasters and other occurrences (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 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 and embracing a fix-it-first philosophy." The plan specifies a target of maintaining 90 percent or better ITS element health by 2020. Operation and Maintenance (O&M) resources are essential to achieve this fix-it target. As more TSMO/ITS elements are implemented, O&M resource needs will continue to grow.

One local example is the I-80 Safety, Mobility and Automated Real-time Traffic Management (SMART) Corridor that was implemented in 2016. This corridor uses a network of integrated electronic signs, ramp meters and other state-of-the-art elements to enhance motorist safety, improve travel time reliability and reduce accidents and associated congestion. This Integrated Corridor Management (ICM) project is located on a 20-mile stretch of I-80 between the Carquinez Bridge and the Bay Bridge. The I-80/SR 13 interchange is within the ICM project limits. The SR 13 Corridor is not expected to require TSMO strategies as complex as ICM, however.

Figure 16. *Lane Usage Signs*

Source: I-80 SMART Corridor Project[3]

Figure 17. *Suggested Speed Signs*

Source: I-80 SMART Corridor Project

[3] http://www.dot.ca.gov/80smartcorridor/index.html

Figure 18. *TSMO Inventory (Existing and Planned) Map*

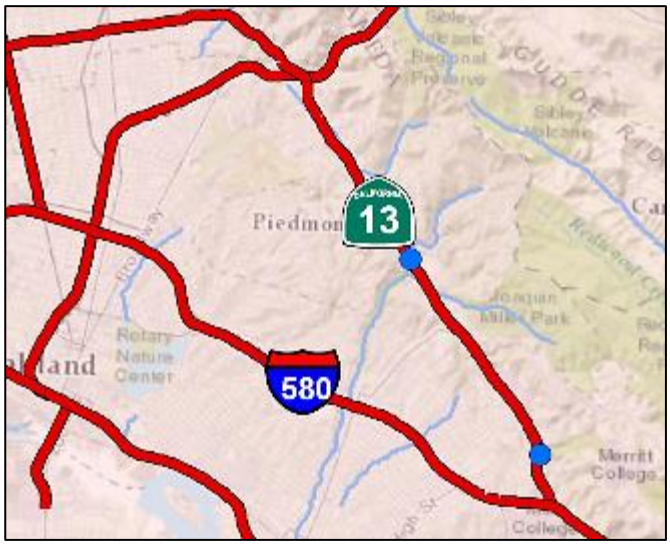
PROPOSALS, FUNDING AND CONNECTION TO DSMP

One of the objectives of the TCR is to establish new proposals for consideration while remaining realistic about available funding sources and currently programmed projects. TCR suggestions may move to the District System Management Plan (DSMP) project list, and can be further refined in the Project Initiation Documentation (PID) process.

Corridor SHOPP Suggestions

In 2015, Senate Bill 486 was signed into law by Governor Brown, requiring Caltrans develop and implement a *robust Asset Management Plan* by the end of 2020. The State Highway Operations and Protection Program (SHOPP) is the primary program available to Caltrans to execute the Asset Management Plan. The SHOPP addresses the State's *fix-it-first* approach to the State Highway System. For SHOPP cycles, priorities are evaluated to match funding and the goals established in the Caltrans Strategic Management Plan, such as Safety, Sustainability, Livability, Economy and Performance. As projects are selected and developed, they will also address Complete Streets, the Americans with Disabilities Act (ADA), Sea Level Rise, and issues such as fish passage in particular. The SHOPP is limited to maintenance, safety, and rehabilitation projects on existing State highways and bridges, with generally no projects that add new traffic capacity.

Figure 19. *SR 13 Fish Barriers*



Fish passages

Two fish passage barriers exist within the Corridor, both located within the freeway segment. One fish barrier is found near I-580 at Horseshoe Creek (to Lion Creek) between Leona Heights Park and McCrea Memorial Park. Further north, a fish barrier is found at Shepard Creek (Park Boulevard and SR 13).

Pedestrian and Bicyclist Accommodation

Many areas along the freeway segment are not pedestrian or bicycle friendly. While local roadways help accommodate pedestrian and bicycles, there are many gaps in the existing networks, including the needs identified already in Table 6.

Figure 20. *LaSalle Avenue Bridging SR 13*

Source: Google Maps

Funding Sources

Active Transportation Program

The State of California established the Active Transportation Program (ATP) in September 2013. Funding is awarded based on a competitive process. Half of the funding is awarded through statewide competition, while 40 percent is awarded through regional competition. MTC is responsible for developing the region's guidelines, and for submitting projects to the CTC for adoption. The remaining ten percent of the regional program is managed by the State for the small urban and rural areas.

Alameda County Sales Tax Measures

Voters in Alameda County have approved several sales tax measures and programs to fund transportation projects. They are summarized in Table 9.

Table 9. *Transportation Measures*

Transportation Measures	Rate / Horizon Year	Eligible Project Types
Local Measure BB (2014)	1 cent sales tax / 2045	Expand mass transit; Improve highway infrastructure; Improve local roads and streets; Improve bicycle and pedestrian safety; Expand special transportation for seniors and people with disabilities
State Vehicle Registration Fee (2013)	$11 Million annually	Transportation Improvements
State Transportation Bond Funds (2006)	$800 Million total	Goods Movement; Innovative Technologies; Express Lanes

Senate Bill 1

The Road Repair and Accountability Act of 2017, Senate Bill 1 (SB 1), was signed into law on April 28, 2017; there is no sunset date. The funding package provides $52.4 billion over the next decade to fix roads, freeways and bridges in communities across California and put more dollars toward transit and safety and Caltrans Planning grant program. Funds will be split equally between State and local investments over a ten-year horizon. SB 1 includes funding augmentation to existing programs as well as the establishment of new funding programs, such as the Solutions for Congested Corridor Program.

ADDITIONAL CORRIDOR ISSUES

Caldecott Tunnel Settlement Agreement

In 2011, Caltrans and the City of Oakland agreed on a settlement to ameliorate the operational impacts to the North Oakland Hills, Rockridge and Temescal Districts by adding the fourth bore to the Caldecott Tunnel. According to the Settlement Agreement, projects must have as their primary purpose the improvement of pedestrian, bicycle, transit and local streets, including noise barriers and projects that support the use of transit to the greater community in the Highway 24 Corridor between I-580 and the Caldecott Tunnel. In 2016, about 18 projects were either underway or awaiting implementation.

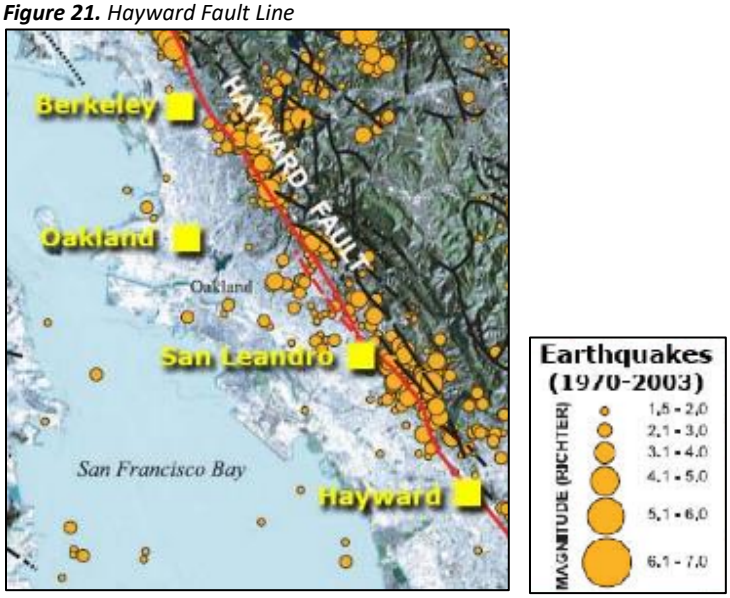
With Berkeley, Caltrans agreed on a settlement that included improvement projects along the Highway 13 Corridor to alleviate transportation issues anticipated from the Caldecott 4th Bore project.

Hayward Fault

The Hayward Fault line runs beneath the freeway segment of SR 13. Geologists believe the fault has a greater built-up potential than any other fault in the Bay Area. According to the USGS, the last major earthquake on this

fault was in 1868, and estimated to have been a 6.8 magnitude earthquake. Past major events appear to have occurred about 140 years apart on average. There is a 70 percent chance of a magnitude 6.8 earthquake in the next 30 years.

Figure 21. *Hayward Fault Line*



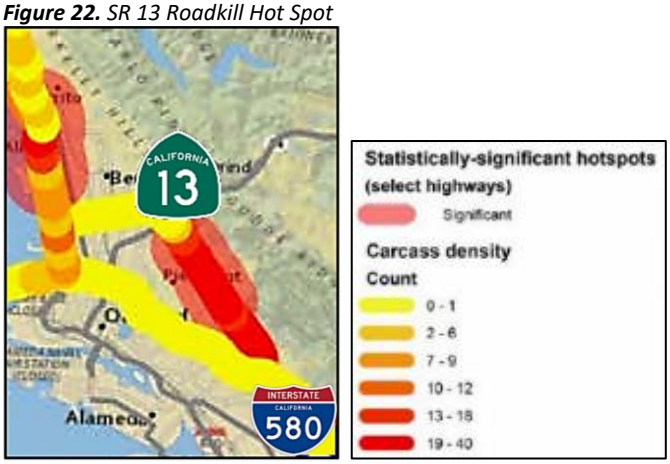
Source: USGS

Wildlife Crossings

Animals often attempt to cross a road where open space is bisected by a highway. In particular, the freeway segment of SR 13 is a major roadkill hotspot. Roadkills also attract more animals, resulting in secondary kills. Use of wildlife over- or underpasses can reduce collision, injury and death to both drivers and wildlife. The recent median barrier is a deterrent to crossing.

Some fixes can be simple and cheap. For example, squirrels will use rope bridges to cross a road, if available. However, further studies are warranted along SR 13 in Segment 1 to examine wildlife crossing challenges, barriers and potential solutions.

Figure 22. *SR 13 Roadkill Hot Spot*



Source: *UC Davis Road Ecology Center*

CORRIDOR CONCEPT

Table 10. *Corridor Concept Summary*

Segment	Segment Description	Existing Facility	Ten-Year System Operation, Maintenance, and Management Improvements	Ten-Year Multimodal Improvements	25-Year Capital Facility Concept
1	I-580 to SR 24	4F	ITS, ramp metering	Local bicycle improvements, Class II Bikeways	4F
2	SR 24 to I-80	2-4C	ITS, ramp metering	Pedestrian Walkway Improvements	R

F = Freeway Lane C = Conventional Lane R = Relinquishment

CONCEPT RATIONALE

Since congestion is mainly caused by bottlenecks outside the freeway section of SR 13, no capacity-increasing projects are proposed for Segment 1. Instead, this TCR recommends ITS improvements, such as implementation of ramp metering, and multimodal improvements within the Corridor.

Segment 2 mainly carries local and regional traffic, and plays a less significant role in serving interregional travel. Therefore, this TCR recommends relinquishment as the 25-year capital concept for Segment 2. It should be noted that relinquishment is a locally-driven process, and no official relinquishment request has been received from local jurisdictions along Segment 2. As a result, Caltrans will continue any multimodal studies and improvements to implement the Caltrans Complete Streets policy, as well as any on-going maintenance and operational needs.

PLANNED, PROGRAMMED AND PROPOSED PROJECTS

Table 11. *Programmed, Planned and Proposed Projects*

Segment	Description	Planned, Programmed, Proposal	Cost	Location	Source	Implementation Phase
Motorized On State Highway						
1	Barrier separation between SR 13 and Monterey Boulevard	Programmed	$2.0 M	PM 6.7-7.2	2016 SHOPP EA 4J490	2021 - 2023
1	Interchange improvements, ramp metering, sound walls in Alameda County.	Planned	--	Var	PBA Project ID: 17-01-0007	2018 - 2040
1	Wildlife Crossing Study	Proposed	--	PM 4.26 – 9.86	TCR Proposal	TBD
2	I-80/Ashby Interchange Improvements, roundabouts	Programmed	$60.0 M	PM 13.92	PBA Project ID: 17-01-0037	2022
Motorized Off State Highway						
1/2	Fourth Bore Settlement Projects Including: noise reduction, air quality measures, barrier creation, bicycle and pedestrian improvements, and park expansion.	Programmed	$10.0 M	Var	Caldecott Tunnel Settlement Agreements	In progress
TOS / ITS						
1	Ramp Metering	Planned	$4.0 M	PM 4.26 – 9.86	CT 2017 Ramp Metering Development Plan	TBD

***Table 11** continued. Programmed, Planned and Proposed Projects*

Segment	Description	Planned, Programmed, Proposal	Cost	Location	Source	Implementation Phase
Active Transportation						
1	Bicycle and pedestrian improvements, local streets/crossings in freeway section (See Table 6)	Planned/ Proposed	--	Freeway corridor	Oakland Bicycle Master Plan/D4 Bike Plan	TBD
1	Provide Class I trail parallel to SR 13 freeway	Proposed	$1.5 – $7M	Freeway corridor	Caltrans D4 Bike Plan	TBD
1	Bruns Court pedestrian bridge rehabilitation	Planned	$1.2 M	Freeway corridor	Ten-Year SHOPP	2020 - 2022
1, 2	Bike and pedestrian facilities Tunnel Road, Upper Broadway, Lake Temescal	Programmed	$10.0 M	Var	Caldecott Tunnel Settlement Agreements	In progress
1, 2	Lake Temescal Bicycle Bridge, path to Tunnel Road	Planned	--	SR 24/SR 13	Oakland Bicycle Plan, 2007	TBD
2	Ashby Avenue Corridor Improve ments for pedestrians	Programmed	$5.3 M	Var	2016 SHOPP (2G481, 2G460, 2G660)	2016 - 2023
2	Ashby Avenue Corridor improve ments for pedestrians	Programmed	$3.5 M	Shattuck to Seventh (PM 12.1 – 13.4)	2018 SHOPP (2G482)	2018 - 2021
2	Ashby/Adeline Intersection Study	Proposed	$0.5 M	PM 12.22	TCR Proposal	TBD

PBA = MTC's Plan Bay Area 2040 *SHOPP = State Highway Operations and Protection Program*
TOS= Traffic Operations Strategies *ITS = Intelligent Transportation Systems*
FY = Fiscal Year *PID = Project Initiation Document*

APPENDICES

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
CDFW – California Department of Fish and Wildlife
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
EPA – Environmental Protection Agency
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
USFWS – United States Fish and Wildlife Service
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.

Express Lanes – Specially designated highway lanes that are toll-free for carpools, vanpools, motorcycles, buses and eligible clean-air vehicles. Solo drivers can choose to pay a toll to access the lanes for reliable travel times.

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.

Headway – The time between two successive transit net vehicles as they pass a point on the roadway, measured from the same common feature of both vehicles.

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

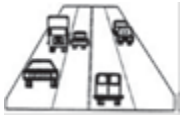
Intermodal Freight Facility – Intermodal transport requires more than one mode of transportation. An intermodal freight facility is a location where different transportation modes and networks connect and freight is transferred (or “transloaded”) from one mode, such as rail, to another, such as truck.

IRRS – The Interregional Road System, a series of interregional State highways outside the urbanized areas that provides access to, and links between, the State’s economic centers, major recreational areas, and urban and rural regions.

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 wireline communications-based information and electronics technologies to collect and process information, 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, ferry, rail, or air.

Managed Lanes – highway facilities or a set of lanes where operational strategies are proactively implemented and managed in response to changing conditions.

NHFS – a federally established freight network to strategically direct Federal resources and policies toward improved performance of highway portions of the U.S. freight transportation system.

National Highway System (NHS) – a federally established interconnected system of principle arterial routes to serve major travel destinations and population centers, international border crossings, as well as ports, airports, public transportation facilities, and other intermodal facilities. The NHS must also meet national defense requirements and server interstate and interregional travel.

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 local Sales Tax 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 (STIP) or the State Highway Operations and Protection Program (SHOPP).

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), and Scenic Highway System.

P3 - A public–private partnership, which is a cooperative arrangement between one or more public and private sectors.

Post 25-Year Concept – This dataset may be defined and re-titled at the District's discretion. In general, the post 25-year concept could provide the maximum reasonable and foreseeable roadway needed beyond a 20 to 25 year horizon. The post 25-year concept can be used to identify potential widenings, realignments, future facilities, and rights-of-way required to complete the development of each corridor.

Relinquishment – the act and the process of legally transferring property rights, title, liability, and maintenance responsibilities of a portion or entirety of a state highway or a park-and-ride lot to another entity.

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.

TSMO – Integrated strategies to optimize the performance of existing infrastructure through the implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects, describing the system

operations and management elements that may be needed within 20-25 years. This can include Non-capacity increasing operational improvements (auxiliary 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.

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.

FEDERAL

Fixing America's Surface Transportation Act (FAST Act) December, 2015

FAST Act will provide $305 Billion in funding for surface transportation programs and was signed into law in December 2015. The federal spending bill replaces MAP-21, Moving Ahead for Progress in the 21st Century signed into law in 2012. FAST Act provides funding for highway, transit, and railroad networks, most of which will be distributed to state departments of transportation and local transit agencies.

Federal Transportation Improvement Program (FTIP)

All federally funded projects, and regionally significant projects (regardless of funding), must be listed in the FTIP per federal law. A project is not eligible to be programmed in the FTIP until it is programmed in the *State Transportation Improvement Program* (STIP) or in the *State Highway Operations and Protection Program* (SHOPP). Other types of funding (Federal Demonstration, Congestion Mitigation and Air Quality (CMAQ), Transportation Enhancement Activities (TEA), and Surface Transportation Program (STP) must be officially approved before the projects can be included in the FTIP.

STATE

California Transportation Plan (CTP) 2040

The CTP is a long-range policy framework to meet California's future multi-modal mobility needs and reduce greenhouse gas and particulate matter (PM) emissions. The CTP defines goals, performance-based policies, and strategies to achieve a collective vision for California's future Statewide, integrated, multimodal transportation system. A new updated plan was recently finalized in June 2016. It focuses on meeting new trends and challenges, such as economic and job growth, climate change, freight movement, and public health. In addition, performance measures and targets were developed to assess performance of the transportation system to meet the requirements of MAP-21.

California Interregional Blueprint (CIB)

Responding to Senate Bill 391 of 2009, CIB informs and enhances the State's transportation planning process. Similar to requirements for regional transportation plans under Senate Bill 375, SB 391 requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill 32. In response to these statutes, Caltrans is preparing a state-level transportation blueprint to inform CTP 2040 and articulate the State's vision for an integrated, multi-modal interregional transportation system that integrates the Regional Blueprint Program (see the Regional appendix section) and complements regional transportation plans. The CIB will integrate the State's long-range multi-modal plans and Caltrans-sponsored programs with the latest technology and tools to enhance our ability to plan for and manage a transportation system that will expand mode choices and meet future increases in transportation needs and still meet the GHG-reduction targets or SB 375.

State Transportation Improvement Program (STIP)

The STIP is a multi-year capital improvement program of transportation projects on and off the State Highway System, funded with revenues from the Transportation Investment Fund and other funding sources. Caltrans and the regional planning agencies prepare transportation improvement plans for submittal. Local agencies work through their Regional Transportation Planning Agency (RTPA), County Transportation Commission, or Metropolitan Planning Organization (MPO), as appropriate, to nominate projects for inclusion in the STIP.

Interregional Transportation Improvement Program (ITIP)

The Interregional Transportation Improvement Program (ITIP) is a state-funding program for the Interregional Improvement Program (IIP) and is a sub-element of the State Transportation Improvement Program. The

2014 ITIP is a five year program of projects from fiscal years 2014-15 through 2018-19. The IIP is a state funding category created in SB 45 for intercity rail, interregional road or rail expansion projects outside urban areas, or projects of statewide significance, which include projects to improve State highways, the intercity passenger rail system, and the interregional movement of people, vehicles, and goods. Caltrans nominates and the California Transportation Commission approves a listing of interregional highway and rail projects for 25% of the funds to be programmed in the STIP (the other 75% are Regional Improvement Program funds). Only projects planned on State highways are to be included in this program.

Interregional Transportation Strategic Plan (ITSP) 2015
The ITSP is a California Department of Transportation (Caltrans) document that provides guidance for the identification and prioritization of interregional State highway projects. The ITSP promotes the State of California's role of improving mobility while providing opportunity for efficient goods movement. It also provides summary information regarding other interregional transportation modes—in particular, intercity passenger rail. The ITSP highlights critical planning considerations such as system planning, complete streets, and climate change.

District System Management Plan (DSMP)
The DSMP provides a vehicle for the development of multi-modal and multi-jurisdictional transportation strategies. These strategies must be based on an analysis that is developed in partnership with regional and local agencies. The DSMP is the State's counterpart to the Regional Transportation Plan (RTP) for the region. The former Transportation System Development Program (TSDP) is now incorporated within this management plan as a Project List.

State Highway Operation and Protection Program (SHOPP)
Caltrans prepares the SHOPP for the expenditure of transportation funds for major capital improvements necessary to preserve and protect the State Highway System. The SHOPP is a four-year funding program, focusing available resources on the most critical categories of projects: safety mandates, bridge, and pavement preservation. The 10-Year SHOPP anticipates long-term projected expansion and maintenance needs.

Ten-Year SHOPP
The Ten-Year SHOPP is a State plan for the rehabilitation and reconstruction, of State highways and bridges by the SHOPP. The purpose of the Plan is to identify needs for the upcoming ten years. The Plan is updated every two years. It includes specific milestones, quantifiable accomplishments and strategies to control cost and improve the efficiency of the Program. The Ten-Year SHOPP differs from SHOPP, as it has no funding constraints assigned.

Senate Bill 32 (SB 32)
SB 32 (2016) extends the State Air Resources Board authorization to adopt regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reduction in a manner that benefits the state's most disadvantaged communities and shall ensure a reduction to at least 40 percent below the 1990 levels by December 31, 2030.

Senate Bill 45 (SB 45)
SB 45 (1997) establishes guidelines for the California Transportation Commission to administer the allocation of funds appropriated from the Public Transportation Account for capital transportation projects designed to improve transportation facilities.

Smart Mobility Framework
Caltrans released *Smart Mobility 2010: A Call to Action for the New Decade* in February 2010. SMF was prepared in partnership with US Environmental Protection Agency, the Governor's Office of Planning and Research, and the California Department of Housing and Community Development to address both long-range

challenges and short-term pragmatic actions to implement multi-modal and sustainable transportation strategies in California.

Smart Mobility 2010 provides new tools and techniques to improve planning. It links land use "place types," considers growth scenarios and how growth will best gain the benefits of smart mobility. The SMF emphasizes travel choices, healthy, livable communities, reliable travel times for people and freight, and safety for all users. This vision supports the goals of social equity, climate change intervention, and energy security as well as a robust and sustainable economy.

Caltrans Deputy Directive 64-R2 *Complete Streets - Integrating the Transportation System, 2008 & 2014*
This Deputy Directive expresses Caltrans commitment to provide for the needs of all travelers including pedestrians, bicyclists and persons with disabilities in all programming, planning, maintenance, construction, operations, and project development activities and products.

State Assembly Bill 32 (AB 32) *Global Warming Solutions Act, September 2006*
This bill requires the State's greenhouse gas emissions to be reduced to 1990 levels by the Year 2020. Caltrans strategy to reduce global warming emissions has two elements. The first is to make transportation systems more efficient through operational improvements. The second is to integrate emission reduction measures into the planning, development, operations and maintenance of transportation elements.

Senate Bill 375 (SB 375) *Addressing Greenhouse Gas Emissions from the Transportation Sector*
SB 375 provides a means for achieving AB 32 goals from cars and light trucks. The transportation sector contributes over 40 percent of the GHGs throughout the State. Automobiles and light trucks alone contribute almost 30 percent. SB-375 requires the California Air Resources Board (ARB) to develop regional greenhouse gas (GHG) emission reduction targets for cars and light trucks for each of the 18 Metropolitan Planning Organizations (MPOs). Through their planning processes, each of the MPOs is required to develop plans to meet their regional GHG reduction target. This would be accomplished through either the financially constrained "Sustainable Communities Strategy" as part of their Regional Transportation Plan (RTP) or an unconstrained alternative planning strategy. SB-375 also provides streamlining of California Environmental Quality Act (CEQA) requirements for specific residential and mixed-use developments.

Senate Bill 391 (SB 391) *California Transportation Plan updates, 2009*
This bill requires the department to update the California Transportation Plan (CTP) by December 31, 2015, and every five years thereafter. The bill requires the CTP to address how the State will achieve maximum feasible emissions reductions in order to attain a statewide reduction of greenhouse gas emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. SB 391 requires the Plan to identify the statewide integrated multimodal transportation system needed to achieve these results. CTP was finalized in June 2016.

Senate Bill 486 (SB 486) *Department of Transportation: Goals and Performance Measures, 2014*
The bill requires the department to submit an Interregional Transportation Strategic Plan (ITSP), directed at achieving a high functioning and balanced interregional transportation system, and to draft a 5-year Interregional Transportation Improvement Program (ITIP) by October 15 of each odd-numbered year.

Senate Bill 743 (SB 743) *California Environmental Quality Act (CEQA) updates, 2013*
This bill requires the Office of Planning and Research to update guidelines for analyzing transportation project impacts as they relate to CEQA legislation. Vehicle Miles Traveled (VMT) provides an alternative to LOS for evaluating transportation impacts. Particularly within areas served by transit, those alternative criteria must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Alternative criteria may include "vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated."

Caltrans - Climate Action Plan

Greenhouse gas (GHG) emissions and the related subject of global climate change are emerging as critical issues for the transportation community. Caltrans recognizes the significance of cleaner, more energy efficient transportation. On June 1, 2005 the State established climate change emissions reduction targets for California that lead to development of the Climate Action Program. This program highlights reducing congestion and improving efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems (objectives of the State's Strategic Growth Plan). The Climate Action Plan approach also includes institutionalizing energy efficiency and GHG emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

Corridor System Management Plans (CSMP)

In 2007, the California Transportation Commission adopted a resolution stating "…the Commission expects Caltrans and regional agencies to preserve the mobility gains of urban corridor capacity improvements over time that will be described in Corridor System Management Plans (CSMPs)." A CSMP is a transportation planning document that will study the facility based on comprehensive performance assessments and evaluations. The strategies are phased, and include both operational and more traditional long-range capital expansion strategies. They take into account transit usage, projections, and interactions with arterial network, and connection to State highways. Each CSMP presents an analysis of existing and future traffic conditions and proposes traffic management strategies and capital improvements to maintain and enhance mobility within each corridor.

A CSMP results in a listing and phasing plan of recommended operational improvements, Intelligent Transportation System (ITS) strategies, and system expansion projects to preserve or improve performance measures within the corridor. CSMPs are required for all projects receiving Proposition 1B (2006) Corridor Mobility Improvement Account (CMIA) funding.

California Freight Mobility Plan Dec. 2014

The California State Transportation Agency (CalSTA) and Caltrans developed a State freight plan, titled the California Freight Mobility Plan (CFMP). Per Assembly Bill 14 (Lowenthal, 2013) the CFMP is a comprehensive plan that governs the immediate and long-range planning activities and capital investments of the State with respect to the movement of freight. The CFMP will also comply with the relevant provisions of the federal Moving Ahead for Progress in the 21st Century Act (MAP-21) which encourages each state to develop a freight plan. The *CFMP* is a modal plan contributing to the Department's ongoing *California Interregional Blueprint (CIB)* initiative. The plan will also incorporate information from the Freight Element of the *California State Rail Plan.* It will use recent freight industry information developed by seaports, railroads, airports, and others, as well as benefit from important regional freight mobility planning programs by partner agencies.

California State Rail Plan (CSRP), 2013

The California State Rail Plan is a plan for passenger and freight rail to address environmental, economic development, and population growth challenges such as increased travel demand, traffic congestion, and Greenhouse Gas emissions. CSRP programs additional funding for capital investments, operations, and maintenance. The plan provides a framework for improving the State's rail system, noting improvements, future needs, and plans for expansion/integration of rail services.

REGIONAL

Regional Transportation Plan (RTP) "Plan Bay Area"

Plan Bay Area is a long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay Area. On July 18, 2013, the Plan was jointly approved by the Association of Bay Area

Governments (ABAG) Executive Board and by the Metropolitan Transportation Commission (MTC). The Plan includes the region's Sustainable Communities Strategy (SCS) and the 2040 Regional Transportation Plan represents the next iteration of a Planning process that has been in place for decades.

Plan Bay Area marks the nine-county region's first long-range plan to meet the requirements of California's landmark 2008 Senate Bill 375, which calls on each of the State's 18 metropolitan areas to develop a Sustainable Communities Strategy (SCS) to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks. Working in collaboration with cities and counties, the Plan advances initiatives to expand housing and transportation choices, create healthier communities, and build a stronger regional economy.

Regional Transportation Improvement Program (RTIP)

The Regional Transportation Improvement Program is a sub-element of the State Transportation Improvement Program (STIP). The Metropolitan Transportation Commission is responsible for developing regional project priorities for the RTIP for the nine counties of the Bay Area. The biennial RTIP is then submitted to the California Transportation Commission for inclusion in the STIP.

Freeway Performance Initiative (FPI)

This is the Metropolitan Transportation Commission's ongoing effort to improve the operations, safety, and management of the Bay Area's freeway network by deploying system management strategies, completing the HOV lane system, addressing regional freight issues, and closing key freeway infrastructure gaps.

APPENDIX C: LINKS TO USED SITES

MTC Mode Share
http://www.vitalsigns.mtc.ca.gov/commute-mode-choice

Bike Berkeley
http://www.bikeberkeley.com/wp-content/uploads/2016/10/Public-Draft-Plan-Revised-for-Oct.-20-Transportation-Commission.pdf

Fourth Bore Settlement
http://www.cityofberkeley.info/Public_Works/Transportation/Highway_13_Corridor_Improvements_Project.aspx
http://www2.oaklandnet.com/oakca1/groups/pwa/documents/report/oak028543.pdf

Oakland Bicycle Master Plan
http://www2.oaklandnet.com/government/o/PWA/o/EC/s/BicycleandPedestrianProgram/OAK024597
Oakland Walks! 2017 Pedestrian Master Plan Update
http://www2.oaklandnet.com/oak/groups/pwa/documents/report/oak063431.pdf

Hayward Fault
http://pubs.usgs.gov/of/2008/1135/of2008-1135.pdf
http://www.dailymail.co.uk/sciencetech/article-3607268/Forget-Cascadia-San-Andreas-Hayward-fault-cause-greatest-natural-disaster-hit-warn-experts.html
http://www.dailycal.org/2017/03/06/bay-area-long-overdue-earthquake-along-hayward-fault-according-us-geological-survey/