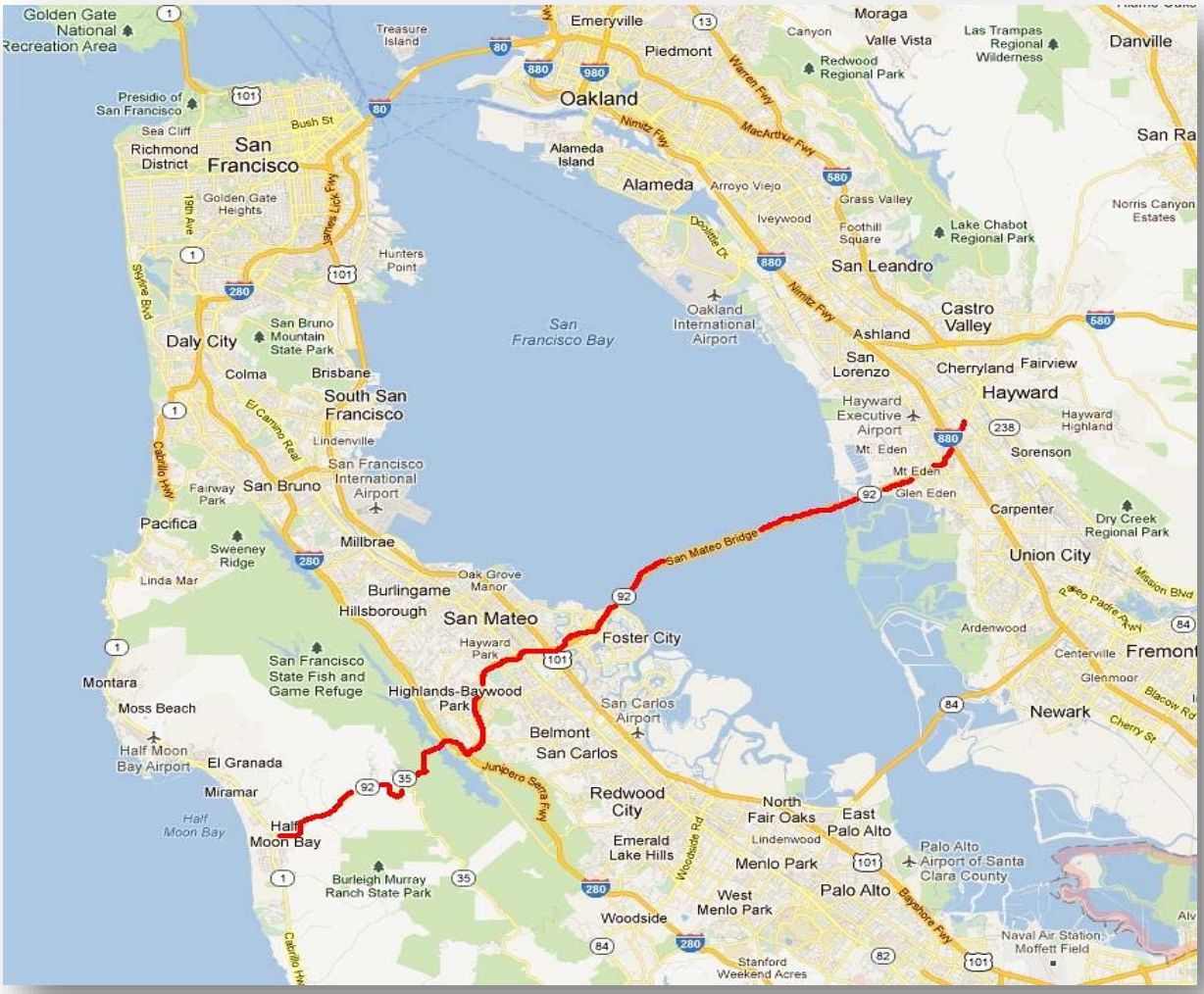
Transportation Concept Report
State Route 92

District 4

September 2016



California Department of Transportation

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

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This TCR will be posted in the Documents section of the Caltrans District 4 System Planning website at: http://www.dot.ca.gov/dist4/systemplanning/

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Cover Map: Google Maps

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CALTRANS MISSION & GOALS

MISSION:

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

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, comprehensive transportation planning process for the California Department of Transportation (Caltrans). The System Planning process fulfills Caltrans' statutory responsibility (Gov. Code §65086) as owner/operator of the State Highway System (SHS) by identifying deficiencies and proposing improvements to the SHS. Through System Planning, Caltrans develops an integrated, multimodal transportation system that meets Caltrans goals of safety, efficiency, sustainability, stewardship, and service.

The SHS serves primarily interregional and regional travel demand. While the SHS provides access to specific destinations such as public facilities or major tourist attractions, development of the SHS is conducted in the context of the mobility of regional and statewide to-and-through movement of people and goods.

TCR Purpose

California's State Highway System needs long-range planning documents to guide the logical development of transportation systems as required by law and as necessitated by the public, other stakeholders, and system users. The purpose of the TCR is to evaluate current and projected conditions along the route and communicate the vision for the development of each route in each Caltrans District during a 25 year planning horizon. The TCR is developed with the goals of increasing safety, improving mobility, providing excellent stewardship, and meeting community and environmental needs along the corridor through integrated management of the transportation network, including the highway, transit, pedestrian, bicycle, freight, operational improvements and travel demand management components of the corridor.

STAKEHOLDER PARTICIPATION

The SR 92 TCR is the product of the Office of System and Regional Planning, District 4, with consultation and review by Caltrans transportation partners in San Mateo and Alameda Counties.

EXECUTIVE SUMMARY

State Route 92 (SR 92) is a major transbay connector, linking San Mateo County with Alameda County and the East Bay via the San Mateo-Hayward Bridge.

Beginning in an easterly direction, SR 92 begins as a two-lane conventional highway at the Highway 1 (SR 1) on the coast in the town of Half Moon Bay, becomes a freeway from Interstate 280 (I-280) eastward, and provides the longest crossing of seven miles over San Francisco Bay. The bridge portion of SR 92 touches down in the East Bay in the city of Hayward, with an interchange at Interstate 880, and then terminates as a city street at its junction with Santa Clara Street, about 1.5 miles before downtown Hayward.

The 25-year concept from existing facility to future facility is summarized below, including recommended strategies by segment.

SR 92 Concept Summary

Segment	County	Segment Description	Existing Facility	25-yr Concept	Strategies To Achieve Concept
Segment A PM 0.00–R7.27	SM	SR 1 in Half Moon Bay to I-280	**2-4** lane **C**onventional Highway	**2-4** lane **C**onventional Highway	• Consider shoulder widening/turnouts for slower moving traffic (freight, bicycles) • Promote westbound slow vehicle lane between SR 35 and I-280 • Monitor and install rock slope protection and drainage • Implement TOS elements • Support "Connect the Coastside" plan
Segment B PM R7.27–12.14	SM	I-280 to US 101	**4**-lane **F**reeway	**4-6** lane **F**reeway	• Study feasibility of additional lane (HOV/HOT) • Continue I/C improvements at SR 82, 101 • Study ramp-braiding in areas of weaving • Implement TOS elements & ramp metering • Maintain & improve Park & Ride lots • Close gaps within the corridor's bicycle network (parallel and intersecting routes) • Improve pedestrian environment at I/S and I/C in areas with pedestrian demand
Segment C PM 12.14–18.80	SM	US 101 to SM/ALA County line	**4-6** lane **F**reeway	**4-6** lane **F**reeway	• Operational improvements to on/off-ramps • Implement TOS elements & ramp metering • Monitor and plan for sea level rise • Close gaps in the parallel and intersecting corridor bicycle network • Improve pedestrian environment at I/S and I/C in areas with pedestrian demand
Segment D PM 0.0–6.78	ALA	SM/ALA County line to Santa Clara St.	**4-6** lane **F**reeway (1 HOV)	**4-6** lane **F**reeway (1 HOV or Express)	• Convert westbound HOV to Express Lane • Study metering westbound from toll plaza • Monitor and plan for sea level rise • Promote TOS elements & ramp metering • Close gaps in the parallel and intersecting corridor bicycle network • Improve pedestrian environment at I/S and I/C in areas with pedestrian demand
Segment R PM 6.78–8.22	ALA	Santa Clara St. to SR92/238/185	Relinquishment in Process	Relinquished	• Finalize relinquishment process • Provide directional signage to State Highway System

PM = Post Mile

Concept Rationale

This TCR reflects the goals of the California Transportation Plan (CTP) 2040, the first statewide planning effort (2016) that provides a pathway for the transportation sector to help meet the State's ambitious climate change goals. As owner/operator of the State Highway System, Caltrans policy requires the State's transportation system to deliver mobility, safety, economic, accessibility, and environmental objectives.

Most Californians want a sustainable transportation system that is safe, reliable, cost-effective, and responsible to the environment that takes into consideration the health of the public and the character of the community. Mobility and accessibility are important factors in transporting goods as well. In order to accomplish these demands, the CTP 2040 looks to improve multimodal mobility and accessibility by creating fluidity amongst transit, bicycle/pedestrian and vehicles, optimizing the State's existing highway system.

With regard to this TCR and the SR 92 corridor, the 25-year Concept for SR 92 maintains a two to four-lane conventional highway where it currently exists (Segment A), and a four to six- lane freeway for the more developed portions of the route (Segments B, C, and D), including the San Mateo-Hayward Bridge. In Segment D, the westbound HOV lane between I-880 and the San Mateo-Hayward Bridge may be converted to an Express Lane (toll). Segment R, as listed above, is in the final stages of being relinquished to the city of Hayward.

The overall feasibility, benefits, cost, funding, and environmental constraints of widening the corridor's most congested Segment B (between US 101 and I-280) may benefit from additional study. While widening the freeway here from four to six lanes reflects the State's long-term desire to provide congestion relief, the tools and strategies to manage demand and improve operations other than freeway widening should be explored first, including improvement to transit and HOV lanes.

To meet long-term mobility needs and the statewide goal of reducing greenhouse gas (GHG) emissions, adding more lanes to address congestion may not be efficient, cost-effective, and sustainable. Throughout its entire length, as with many State routes throughout California, improvements to the SR 92 corridor consist primarily of build out of Intelligent Transportation Systems (ITS) infrastructure, implementation of Traffic Operation System (TOS) elements, and pavement preservation/rehabilitation. Improvements to the bicycle, pedestrian, and Park and Ride network and improvements in transit service frequency could keep some local trips off the freeway system entirely. Mobility improvements to the entire corridor will require not only getting the most efficiency out of the existing road system, but also investing in better linkages and integration between all transportation modes.

CORRIDOR OVERVIEW

ROUTE DESCRIPTION

State Route 92 (SR 92) is a major east-west connector in the Bay Area, linking the coastal communities of San Mateo County with the rest of the Peninsula and the East Bay via the San Mateo-Hayward Bridge. The route crosses State Routes 1, 35, 82, US 101, I-280, and I-880.

SR 92 begins as a two-lane conventional highway at Highway 1 (SR 1) in Half Moon Bay, a small coastal community on the Pacific coast. The route climbs and crosses the scenic Santa Cruz Mountains and SR 35, then descends into the metropolitan San Francisco Bay Area past a separated portion of the Golden Gate National Recreation Area in San Mateo County, Crystal Springs Reservoir, and the City of San Mateo. The highway becomes a freeway as it passes Interstate 280, continuing over SR 82 and US 101 into Foster City. The corridor includes the longest of all crossings (seven miles) over the San Francisco Bay via the San Mateo-Hayward Bridge. SR 92 reaches the East Bay in the City of Hayward, passes I-880, and then terminates as a city street at its junction with Santa Clara Street, just before downtown Hayward.

ROUTE SEGMENTATION

To better analyze a transportation corridor, most corridors are divided into smaller segments based on criteria such as changes in terrain, changes in facility type or function, or county and District boundaries. This approach provides a more detailed level of planning and analysis of the corridor. The following are some of the criteria used for dividing a route into route segments:

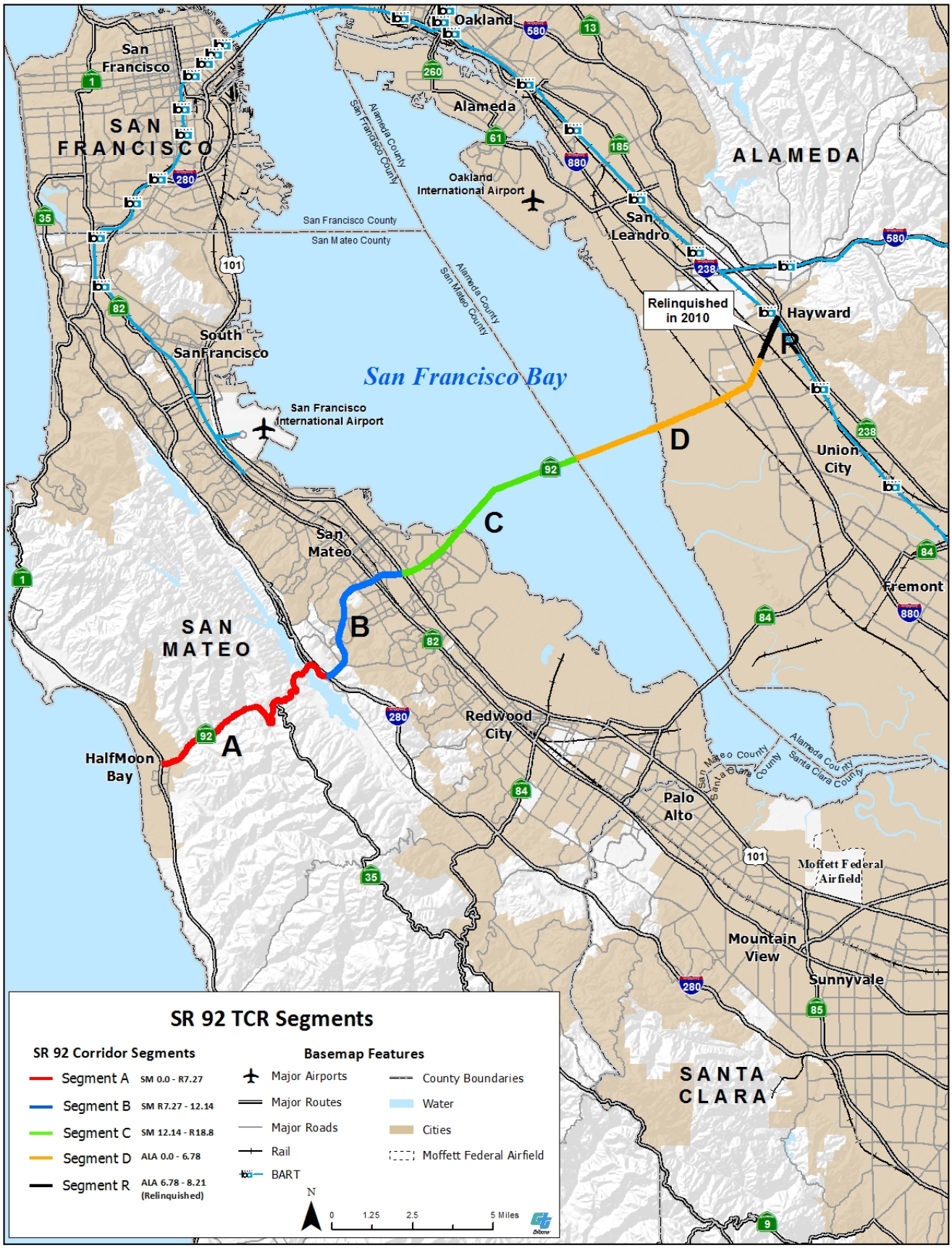
- Caltrans District boundaries
- County boundaries
- Major changes in traffic volumes or facility type
- Changes in the number of lanes
- Significant changes in grade/terrain
- Changes in route function including recreational, trucking, commuting, etc.

The SR 92 corridor was divided into five segments, labeled A through D, as shown in Table 1 and Figure 1. Segment "R" refers to the portion of SR 92 that is being relinquished to the City of Hayward.

Table 1: SR 92 Segmentation by Post Mile

Segment #	Location Description	County/Route/ Beginning PM	County/Route/ End PM
A	SR 1 in City of Half Moon Bay to I-280	SM_92_0.00	SM_92_R7.27
B	I-280 to US 101	SM_92_R7.27	SM_92_12.14
C	US 101 to SM/ALA County Line	SM_92_12.14	SM_92_R18.80
D	SM/ALA County Line to Santa Clara St.	ALA_92_0.00	ALA_92_6.78
R Relinquishment in Process	Santa Clara St. to Jct. SR 92/238/185	ALA_92_6.78	ALA_92_8.22

Figure 1: Corridor Segmentation Map



Segment A Summary

The State Route 92 corridor generally runs from west to east. The first lettered segment begins at Highway 1 in the town of Half Moon Bay on the Pacific Ocean. A 2008 operational improvement project widened the route near downtown from two to four lanes plus turning lanes and added aesthetic improvements from SR 1 to about 0.5 miles east of Main Street. The $21.8 million project included pedestrian and bicycle facility improvements.

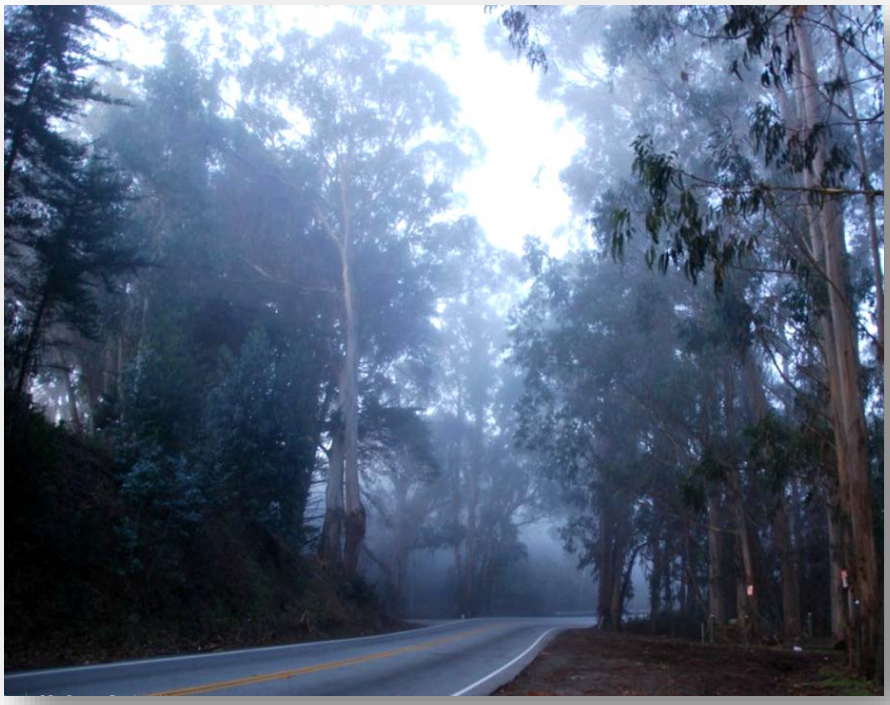
East of Half Moon Bay, the route passes several garden supply stores and nurseries and then climbs into the Santa Cruz Mountains as a steep and winding two-lane road with narrow shoulders. Rock slope protection (RSP) and drainage has been an issue in this segment. The Caltrans/San Mateo County Measure A funded project to widen and improve the 1.8 mile stretch of eastbound SR 92 between Pilarcitos Creek Road and SR 35 was completed in 2000. Improvements included a continuous uphill climbing lane for slow moving trucks and other traffic, retaining walls, a median barrier, and an extensive drainage system.

Segment A of SR 92 is included in the study area of a community planning effort for residents and businesses of coastal communities on Highway 1 called "Connect the Coastside," taking a comprehensive look at the transportation needs for Highway 1 and adjoining segment of SR 92. Segment A also sees a fair amount of truck traffic from activities at the Ox Mountain Landfill and Pilarcitos Quarry, both just off of SR 92.

Scenic SR 92 from SR 1 to I-280 is named the "J. Arthur Younger Freeway." Jesse Arthur Younger served in WWI and was the local congressman to the U.S. House of Representatives from 1953 to 1967. While not officially designated as a California Scenic Highway, this portion of SR 92 is "eligible" for Scenic Highway status, should a local government apply for and adopt a Corridor Protection Program. Segment A ends near I-280 and the Crystal Springs Reservoir, a pair of protected reservoirs serving as backup storage for northern San Mateo County and the City & County of San Francisco.

SR 92 Santa Cruz Mountains *Photo: Caltrans D4 Photography*

SR 92 Santa Cruz Mountains *Photo: Caltrans D4 Photography*



SR 92 Santa Cruz Mountains *Photo: Caltrans D4 Photography*

Segment B Summary

Segment B begins at I-280 near Crystal Springs Reservoir and is a four-lane freeway through the City of San Mateo to US 101. This segment passes through rolling terrain with residential, office, and commercial uses, including several shopping centers, religious institutions, and health facilities. Segment B sees the most congestion of any portion of SR 92, and includes several auxiliary lanes between closely-spaced interchanges. Non-standard weaving lengths at several ramps and a steep westbound grade of up to six percent slow traffic, contributing to back–ups in the segment. This segment of SR 92 intersects with SR 82 (El Camino Real), a major arterial, as well as the Caltrain rail line, both running parallel to US 101 and connecting San Francisco with the Peninsula and Silicon Valley/Santa Clara County.

Current efforts in Segment B include the SR 92/82 (El Camino Real) interchange, where the City of San Mateo, the San Mateo County Transportation Authority (SMCTA), and Caltrans have entered into a cooperative agreement to modify the on and off ramps from SR 82 to reduce traffic congestion, weaving, and queuing. This $18 million project, to begin in 2016 and be completed in 2019, will see the conversion of a 50-year old full cloverleaf interchange into a partial cloverleaf design with signalized interchanges for motorists entering SR 82. The project will also provide safer crossing by pedestrians and bicyclists on El Camino Real.

Additionally, the SR 92/US 101 and adjacent interchanges were the subject of a study by the Metropolitan Transportation Commission (*US101/SR92 Interchange Area Study*, *June 2013*) following the Corridor System Management Plan (CSMP, 2010) to identify operational deficiencies and improvement strategies in this portion of the corridor. The 2013 study recommended pursuing a package of capital improvement projects that would add a lane on US 101 and provide auxiliary lanes on both US 101 and SR 92.

Crystal Springs Reservoir at I-280 and SR 92 *Photo: Caltrans D4 Photography*

Interchange of US 101 and SR 92 *Photo: Caltrans D4 Photography*

Segment C Summary

Segment C covers the portion of SR 92 from US 101 in San Mateo, through the mixed-use planned community of Foster City, and over San Francisco Bay to the San Mateo/Alameda County line on the San Mateo-Hayward Bridge. Shortly after crossing US 101 in San Mateo, the route becomes three lanes in each direction. A large portion of this segment is over San Francisco Bay via the six-lane bridge.

The San Mateo-Hayward Bridge opened to traffic in 1967 with a high-rise steel girder span of 1.9 miles and a low-rise trestle portion of 5.1 miles. While the vertical clearance of the bridge is 135 feet, the approaches on both sides of San Francisco Bay are in areas subject to sea level rise. Tolls are collected in one direction (westbound) on the Hayward side. The bridge widening project, completed in January 2003, widened the low-rise portion of the bridge from four to six lanes to match the high-rise portion.

Aerial view of San Mateo-Hayward Bridge looking east *Photo: Caltrans D4 Photography*

Aerial San Mateo-Hayward Bridge looking east *Photo: Caltrans D4 Photography*

Eastbound on the San Mateo-Hayward Bridge *Photo: Caltrans D4 Photography*

Segment D Summary

Segment D covers the portion of the SR 92 corridor from the San Mateo/Alameda County Line on the San Mateo Bridge, touching down in the Bay mudflats of Hayward and the toll plaza area, continuing through industrial and residential areas to I-880 and Santa Clara Street.

The SR 92/I-880 Interchange project was completed in October 2011. The four-year, $245 million construction project resulted in the removal of the 60-year old cloverleafs built in the 1950s and replaced with improved "direct connectors" that provide direct freeway-to-freeway connections.

The route transitions from the six-lane freeway facility at I-880 to a six-lane conventional highway (West Jackson Street) in the City of Hayward. West Jackson Street is primarily mixed residential and commercial use. The SR 92 corridor terminates at Santa Clara Street, at which point the road becomes a local urban arterial into downtown Hayward.

I-880/ SR 92 Interchange *Photo: Caltrans D4 Photography*

End of freeway at West Jackson Street, Hayward *Photo: Google Maps Streetview*

Segment R Summary (Relinquished)

Segment R, from Santa Clara Street to the junction of SR 238 and SR 185, represents the portion of SR 92 that was agreed to be relinquished to the City of Hayward in 2010. The City of Hayward undertook the "Route 238 Corridor Improvement Project" that included a number of features designed to improve traffic flow in the area. The major project component is a loop concept of one-way traffic in the downtown area. As it approaches downtown Hayward, the road is classified as an urban primary arterial providing access to the downtown and serving mainly local travel demand. California Assembly Bill (AB 1386, 2009, Chapter 291) authorized the relinquishment to the City of Hayward, and ultimately this segment lined with commercial mixed uses will be removed from the State Highway System. The target effective date for completion of all relinquishment details is December 2016.

Eastbound, Approaching downtown Hayward *Photo: Google Maps Streetview*

Unconstructed SR 92

In addition to the existing SR 92 corridor and the relinquished portion of the route near downtown Hayward, there is also a portion of SR 92 that was defined legislatively but remains "unconstructed." The California Streets and Highways Code describes SR 92 as reaching "to Route 580 near Castro Valley and Hayward." However, from the junction of SR 238 and SR 185, going northeasterly to I-580, this 2.2 mile unbuilt alignment of SR 92 along the hillside was first adopted into the State's Freeway & Expressway System in 1963, but later rescinded in 1976 due to protracted litigation, voter referendum, and thus lack of local support.

ROUTE DESIGNATIONS

Table 2: Route Designations

SR 92 Route Designations and Characteristics					
Segment:	A	B	C	D	R
	SR 1 to I-280	I-280 to US-101	US-101 to SM/ALA Co. line	SM/ALA Co. line to Santa Clara St	Santa Clara St to SR92/238/185
California Freeway & Expressway System (F&E)	Yes	Yes	Yes	Yes	Yes
National Highway System (NHS)	No	Yes	Yes	Yes	No
Strategic Highway Network (STRAHNET)	No	No	No	No	No
Scenic Highway	Eligible	No	No	No	No
Interregional Road System (IRRS)	No	No	No	No	No
Federal Functional Classification	Other Principal Arterial/Minor Arterial	Other Freeway or Expressway	Other Freeway or Expressway	Other Freeway or Expressway	Other Principal Arterial
Goods Movement Route	No	No	No	No	No
Truck Designation	CA Legal Network/ Kingpin to Rear Axle 40 ft. max	National Network Route (STAA*) No length limit	National Network Route (STAA*) No length limit	National Network Route (STAA*) No length limit	Terminal Access Route (STAA*) Access to local roads allowed
Rural/Urban/Urbanized	Rural	Urbanized	Urbanized	Urbanized	Urbanized
Metropolitan Planning Organization/Regional Transportation Planning Agency	Metropolitan Transportation Commission				
Congestion Management Agency	San Mateo City/County Association of Governments			Alameda County Transportation Commission	
Local Agency	San Mateo Co./ City of Half Moon Bay	San Mateo Co./ City of San Mateo	San Mateo Co./ City of San Mateo/ Foster City	Alameda Co./ City of Hayward	City of Hayward
Native American Tribes	N/A	N/A	N/A	N/A	N/A
Air District	Bay Area Air Quality Management District				
Terrain	Mountainous/ Rolling	Rolling	Flat	Flat	Flat

*STAA = federal Surface Transportation Assistance Act of 1982

DEMOGRAPHICS

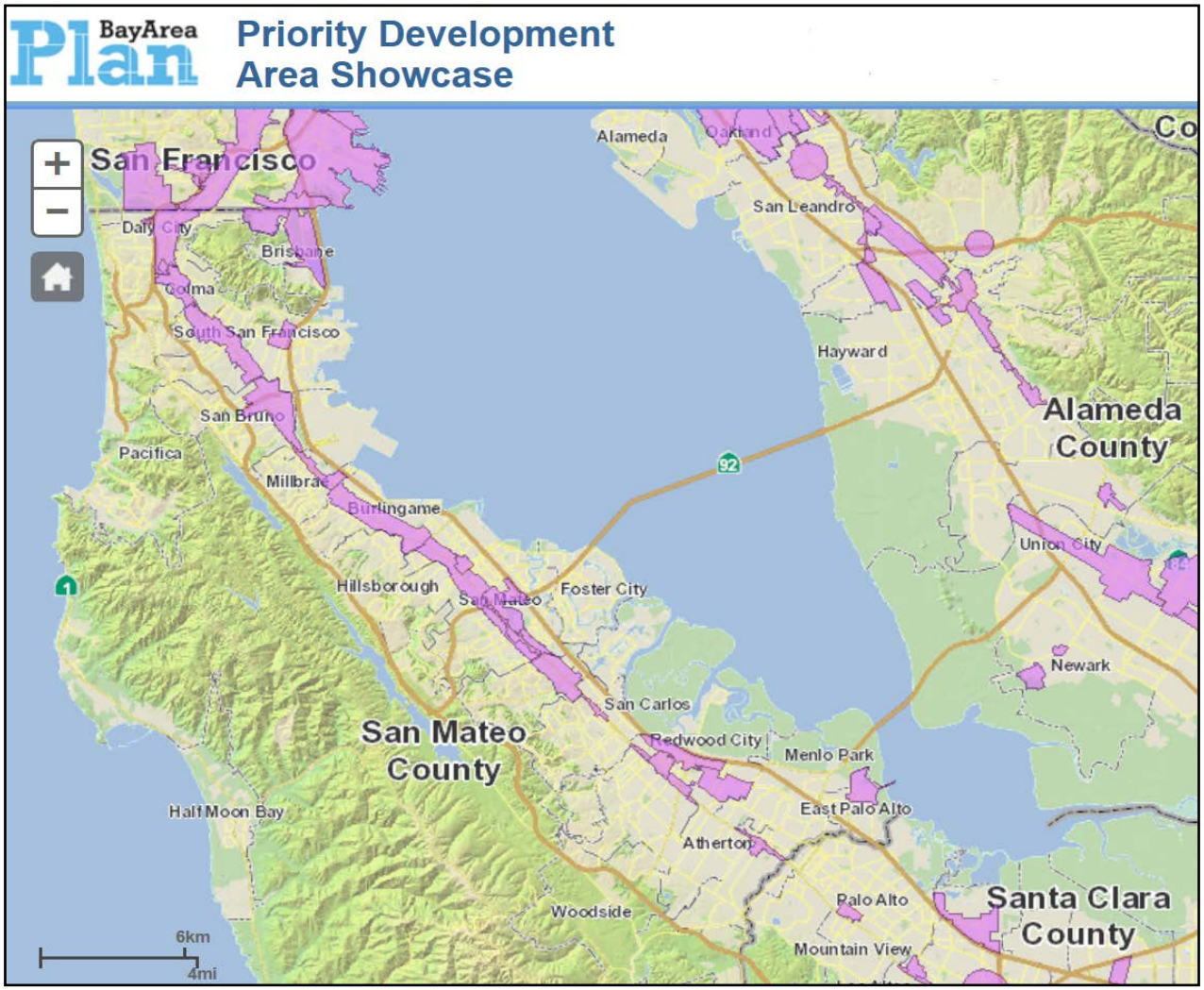
Table 3: 2040 Population, Household, and Employment Projections

COUNTY	POPULATION		% CHANGE	# HOUSEHOLDS		% CHANGE	EMPLOYMENT		% CHANGE
	2010	2040		2010	2040		2010	2040	
Alameda	1,510,000	1,988,00	32%	545,000	705,000	29%	694,000	948,000	37%
Contra Costa	1,049,000	1,338,000	27%	375,000	464,000	24%	345,000	467,000	35%
Marin	252,000	285,000	13%	103,000	112,000	9%	111,000	129,000	17%
Napa	136,000	164,000	20%	49,000	56,000	14%	71,000	90,000	27%
San Francisco	805,000	1,086,000	35%	346,000	447,000	29%	569,000	759,000	34%
San Mateo	718,000	905,000	26%	258,000	315,000	22%	345,000	445,000	29%
Santa Clara	1,782,000	2,423,000	36%	604,000	818,000	35%	926,000	1,230,000	33%
Solano	413,000	512,000	24%	142,000	169,000	19%	132,000	180,000	36%
Sonoma	484,000	598,000	24%	186,000	221,000	19%	192,000	257,000	34%
Total	**7,151,000**	**9,306,000**	30%	**2,608,000**	**3,307,000**	27%	**3,385,000**	**4,505,000**	33%

Source: Jobs Housing Connection Strategy, ABAG 2013

Considerable growth by 2040 is projected for both San Mateo and Alameda Counties in terms of population, number of households, and jobs. Population-wise, Alameda County is projected to grow by almost a third (32%) and San Mateo County by about a quarter (26%). Both counties expect an even greater increase in employment growth, which will inherently put more demand on the transportation system. Plan Bay Area, the region's Regional Transportation Plan to the Year 2040, concentrates development along transit corridors in Priority Development Areas (PDAs) (See Figure 2). In San Mateo County, development will be focused along the transit-rich El Camino Real (SR 82)/Caltrain rail corridor. PDAs here are found around the Caltrain Peninsula stations, such as Caltrain's Hayward Park Station in San Mateo. In Alameda County, the PDAs are generally within proximity of the BART stations, such as the Hayward BART Station close to Hayward's downtown.

Figure 2. Priority Development Areas in San Mateo County and Part of Alameda County



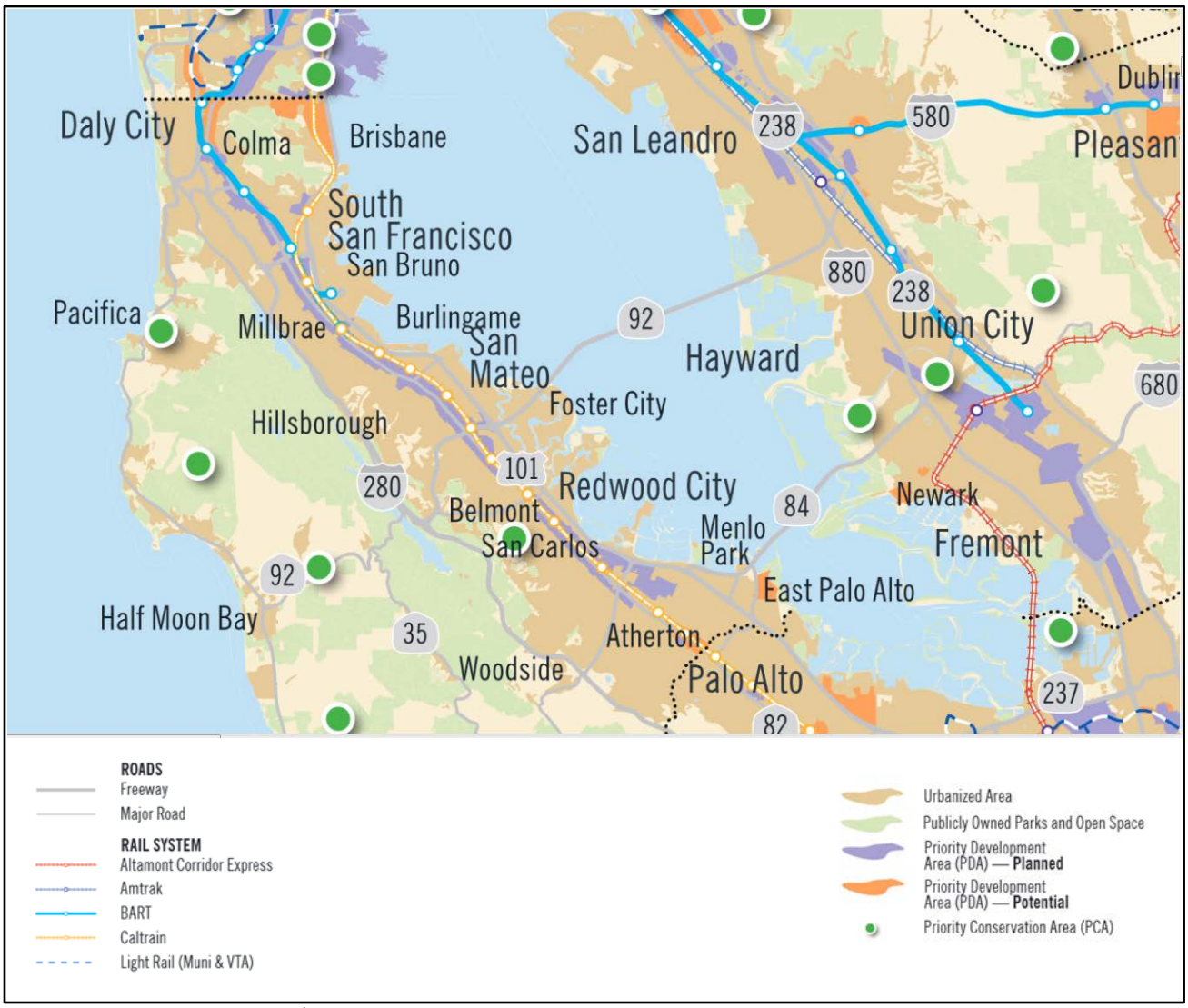
Source: Plan Bay Area, MTC /ABAG, 2013

LAND USE

State Route 92 covers a wide variety of land uses along its 26-mile length from the town of Half Moon Bay to the city of Hayward. On the San Mateo County side, the route passes through agricultural lands outside Half Moon Bay, through various county, State, and federal open space areas, and along medium-density residential and office space/commercial areas. Land uses on the Alameda County side of the Bridge include: bay mudflats, industrial, and low-density (mostly single-family) residential development before reaching the commercial center of downtown Hayward.

A significant portion of SR 92 crosses through or is adjacent to California designated "Protected Areas," which are areas that are environmentally sensitive, such as the Crystal Springs Reservoir in San Mateo County and the Eden Landing Ecological Reserve in Alameda County. Between the varied terrain, the already developed urban land uses, and the protected areas, possibilities for highway widening are limited. Growth, however, will continue to occur in areas adjacent to the corridor. Plan Bay Area, the Regional Transportation Plan (RTP) and Sustainability Communities Strategy (SCS) for the nine-county San Francisco Bay Area, shows urbanized areas within the corridor, as well as planned and future Priority Development Areas (Figure 3). SR 92 plays an important role in connecting both sides of the bay where growth is occurring.

Figure 3. Transportation and Land Uses in San Mateo County and Part of Alameda County



Source: Plan Bay Area, MTC /ABAG, 2013

SYSTEM CHARACTERISTICS

Table 4: SR 92 Facility and Lane Characteristics

SR 92 System Characteristics					
Segment	A	B	C	D	R
	SR 1 to I-280	I-280 to US-101	US-101 to SM/ALA Co. Line	SM/ALA Co. line to Santa Clara St.	Santa Clara St to SR92/238/185
Existing Facility (2014)					
Facility Type	C	F	F	F	C
General Purpose Lanes	4	4	4-6	4-6	6
Lane Miles	21.40	19.20	38.40	12.90	8.60
Centerline Miles	7.27	4.87	6.66	6.78	1.44
Median Width	0-16’	22-46’	8-46’	8-46’	12-22’
Median Characteristics	Striped	Guardrail	Barrier	Barrier	Striped
HOV Lanes	0	0	0	1 (EB)	0
Auxiliary Lanes	0	0	1	0	
Truck Climbing Lanes	1	0	0	0	0
Distressed Pavement (2015)	20%	10%	10%	10%	0%
ROW	<100’	100’+	100’+	100’+	
Concept Facility (2040)					
Facility Type	C	F	F	F	n/a
General Purpose Lanes	4	4	4-6	4-6	n/a
Lane Miles	21.40	19.20	38.40	12.90	n/a
Centerline Miles	7.27	4.87	6.66	6.78	n/a
HOV /HOT Lanes	0	0	0	1	n/a
Aux Lanes	0	0	1	0	n/a
Truck Climbing Lanes	1	0	0	0	n/a
TMS Elements					
TMS Elements (Base Year)	EMS	EMS CCTV CMS TMS	EMS CCTV CMS TMS	EMS, CCTV	n/a
TMS Elements (Horizon Year)	EMS, CCTV CMS TMS	EMS CCTV CMS TMS	EMS CCTV CMS TMS	EMS CCTV EMS TMS CMS	n/a

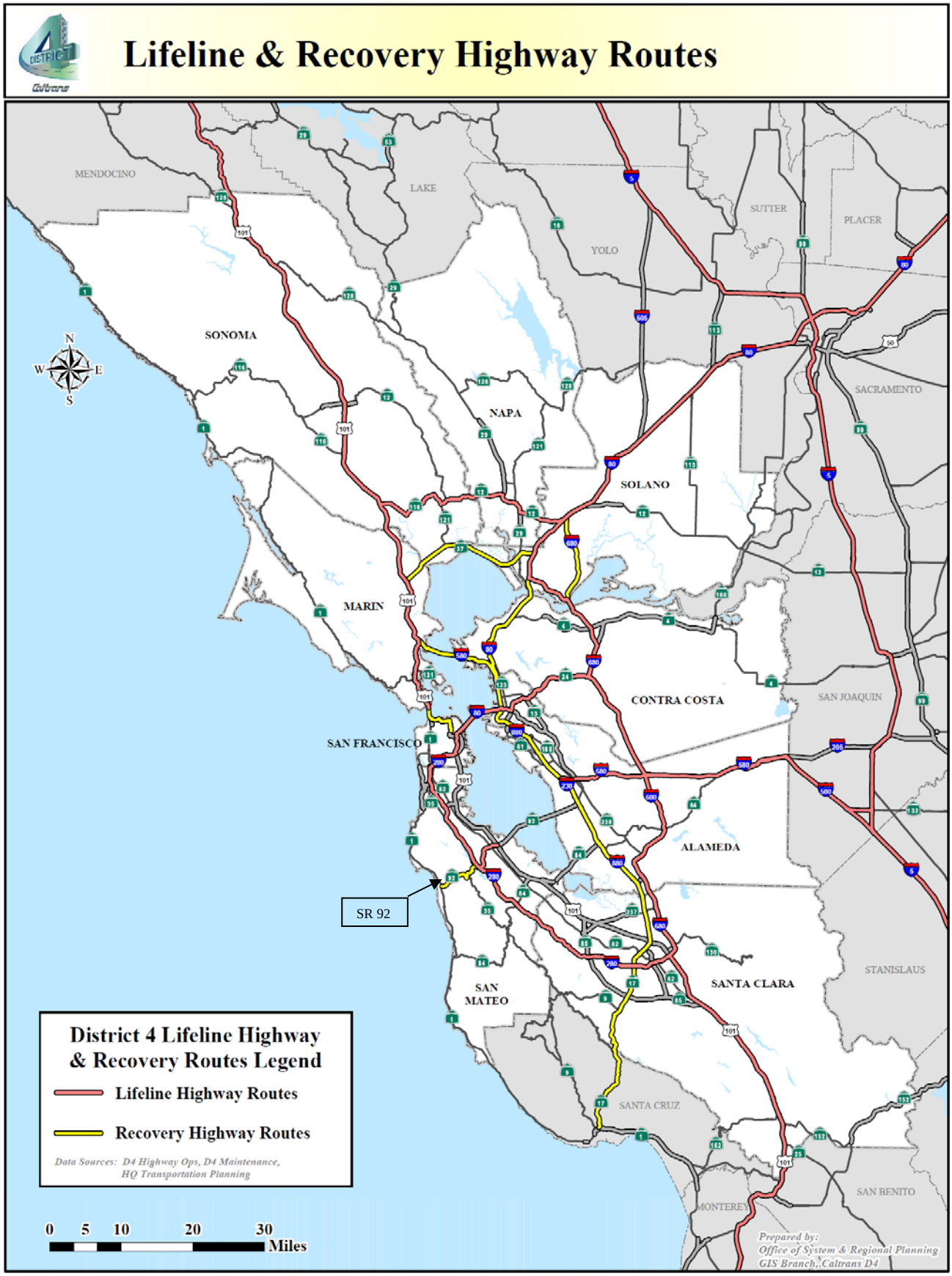
C=Conventional Highway
F=Freeway

CCTV = Closed Circuit Television
CMS = Changeable Message Signs
EMS = Extinguishable Message Signs
HAR = Highway Advisory Radio
TMS = Traffic Monitoring Stations

Lifeline & Recovery Route

SR 92 serves as both a Lifeline and Recovery route. A “Lifeline Route” is a subset of the State Highway System that is deemed so critical to emergency response/lifesaving activities of a region that it takes first priority in terms of route restoration immediately following a major earthquake or other disaster, or for which detour or expeditious repair and reopening can guarantee through movement of goods and services. SR 92 between I-280 and US 101 in San Mateo County is one such link in the Lifeline system. A secondary tier, or “Recovery Route” designation, is given to SR 92 between Half Moon Bay and I-280, highlighted for next priority in service attention after Lifeline routes have been restored. Figure 4 shows a map of the Bay Area Lifeline and Recovery routes.

Figure 4: Lifeline and Recovery Routes Map of District 4

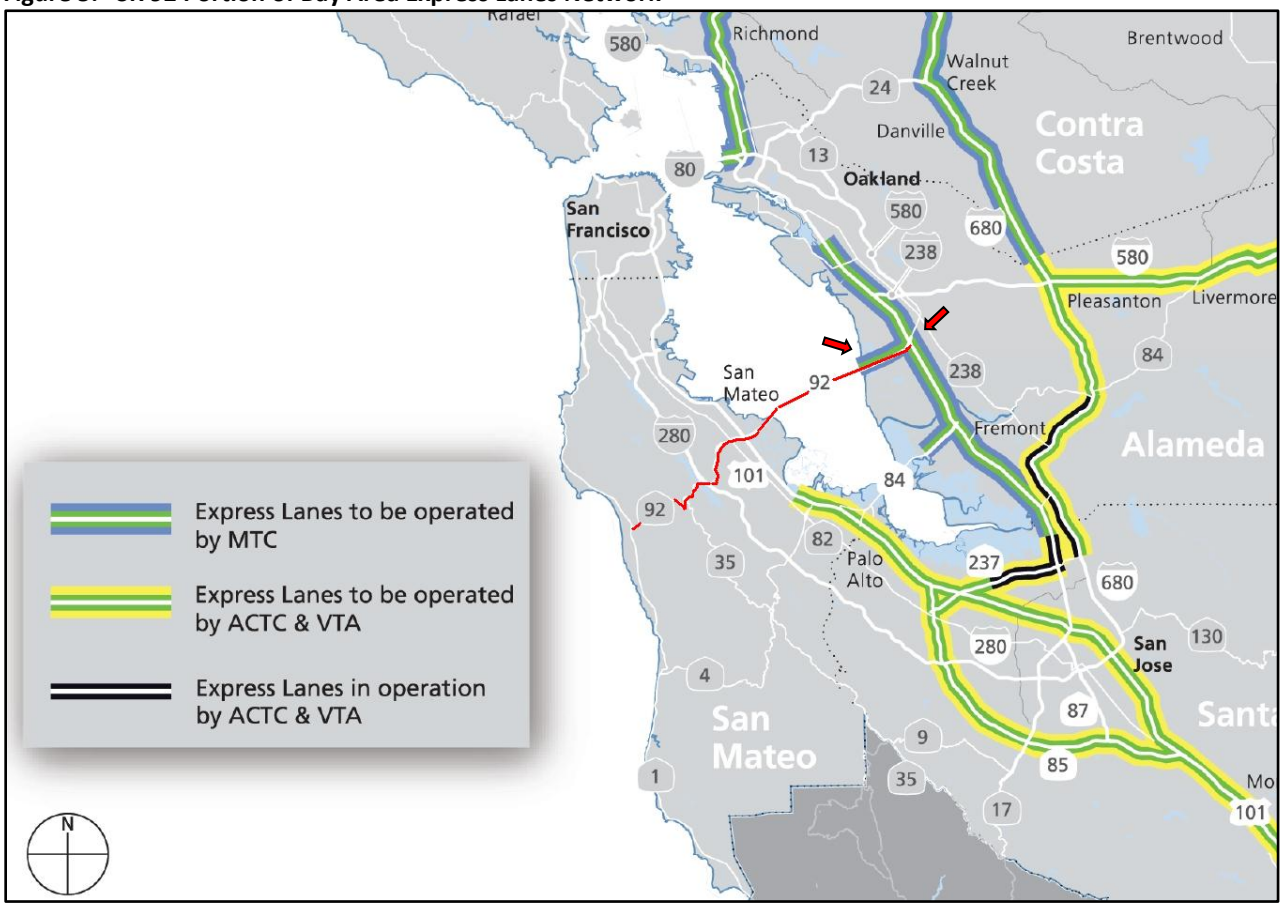


Express Lanes

Express Lanes are designated freeway and expressway lanes that provide toll-free or toll-reduced travel for carpools, buses, and eligible clean-air vehicles. Additionally, single-occupant drivers can pay to use the lanes to avoid congestion on parallel freeway lanes. By 2035 the Bay Area is expected to have a network of 550 miles of Express Lanes.

The Metropolitan Transportation Commission (MTC) is expanding Express Lanes in the Bay Area by converting existing HOV lanes and adding new lanes to fill gaps in the existing carpool lane system. Segment D contains the portion of SR 92 (San Mateo Hayward Bridge Toll Plaza to I-880) with an existing HOV lane that will eventually be converted to an Express Lane. The Express Lane in Segment D (shown in Figure 5 below) will be operated by MTC.

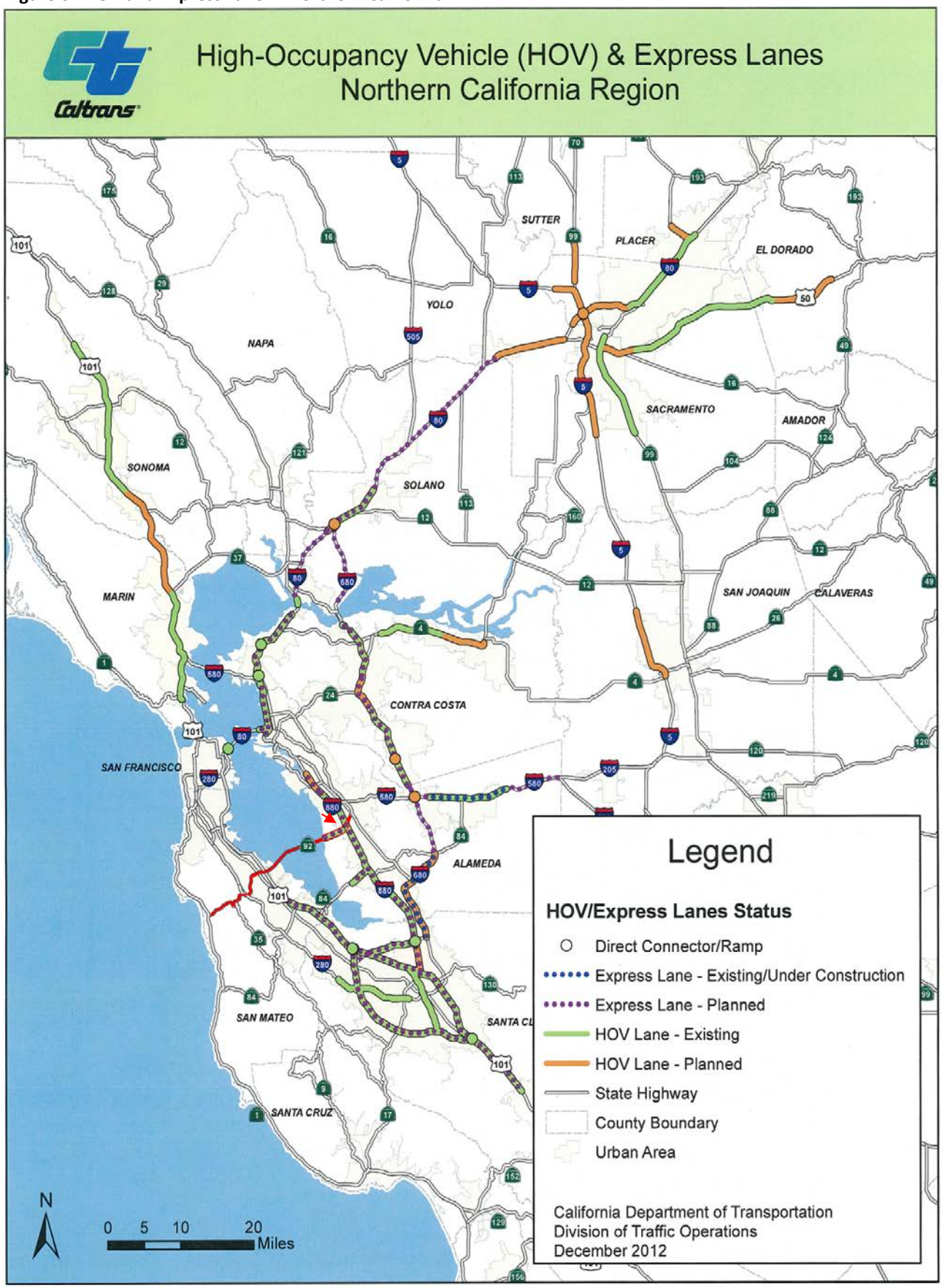
Figure 5: SR 92 Portion of Bay Area Express Lanes Network



Source: Bay Area Express Lanes, MTC/ABAG, 2013

Other portions of the connecting HOV and Express Lane Network will be operated by the Alameda County Transportation Commission (Alameda CTC) and the Santa Clara Valley Transportation Authority (VTA), as part of a region wide system that will eventually extend to Sacramento and beyond (Figure 6). Statewide, Caltrans is currently developing a "Managed Lanes System Plan" that will provide a blueprint for where "managed" lanes (High Occupancy Vehicle (HOV)/High Occupancy Toll (HOT)/Express) will operate on the State Highway System in the next 20 years. Due to be completed by the end of 2016, this System Plan will also include policy components to address operational, institutional, and performance issues associated with managed lanes.

Figure 6: HOV and Express Lane in Northern California



BICYCLE FACILITY

While the percentage of bicycle trips compared to all trips by other modes is relatively small in the Bay Area, it varies greatly from community to community. MTC's Travel Forecast Data Summary (2008) showed 2.1 percent of all trips within Alameda County were by bicycle; 1.9% was the bike share of all trips in San Mateo County. A growing number of people now bike for recreation, work, and shopping, and there is recognition that with an expanded and improved bicycle network, the mode share will go up.

Bicyclists are legal users of all State conventional highways and most expressways. Bicyclists are also allowed to travel on about 1,000 miles or 25 percent of California's freeway miles. In the Bay Area bicyclists are prohibited from most freeways, with the exception of freeway sections where no reasonable alternative/parallel route exists.

COMPLETE STREETS

Deputy Directive 64-R-1, Complete Streets – Integrating the Transportation System, highlights the Department's commitment to developing multi-modal projects and to improving access and safety within California's bicycle network and pedestrian facilities.

"The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system." (Caltrans Deputy Directive 64-R-1, 2008)

In April 2014 Caltrans endorsed the National Association of City Transportation Officials (NACTO) guidelines that include innovations such as buffered bike lanes and improved pedestrian walkways. In September 2014, the passage of State legislation (AB 1193) allowed for greater flexibility in bike facility design on State highways and local roads.

In its 2015-2020 Strategic Management Plan, Caltrans set a statewide goal of *tripling* bicycling trips by 2020 (baseline: 2010-2012 California Household Travel survey).

Existing Conditions

State highways provide bicycle access to rural, scenic, or remote areas, as SR 92 does to the western and central part of San Mateo County from Highway 1 in Half Moon Bay to I-280. However, the shoulders are narrow (less than four feet) in many locations along this winding road, and County bicycle maps recommend using extreme caution.

On freeway segments of SR 92, bicycling is prohibited. Parallel routes exist on local roads (a mix of shared roadways, bike lanes, and separated bike paths), but the system is not always continuous and connected, and requires out-of-direction travel. The freeway itself often creates a barrier to north-south bicycle network connectivity.

While there is no bicycle access on the San Mateo-Hayward Bridge, public transportation does provide for bicyclists to cross the bridge via the AC Transit Line "M" bus. The line can carry up to six bikes per trip.

The San Mateo County Comprehensive Bicycle and Pedestrian Plan of 2011 identifies the State Route 92 corridor as an east-west priority corridor. The Plan points to the need for better north-south crossings of SR 92. For the Alameda County portion of the corridor, the Alameda Countywide Bicycle Plan of 2012 suggests developing a list of crossings on Caltrans highways where bicycle access could be improved.

The following Table 5 summarizes existing bicycle facilities along the corridor, along with possible parallel route bicycle facilities.

Table 5: Bicycle Facilities

SR 92 Bicycle Facilities									
Segment	SR 92 Bicycle Facility						Parallel Bicycle Facility		
	Post Mile	Location Description	Bicycle Access Prohibited	Facility Type	Parallel Facility Present	Posted Speed Limit	Name	Location Description	Class
A	SM 0.00-R7.27	SR 1 Half Moon Bay to I-280	No	Shared roadway	No	45 mph	n/a	n/a	n/a
B	SM R7.27-12.14	I-280 to US 101	Yes	Bicycling Prohibited	Yes	n/a	Ralston Ave. Bike Trail	Canada Rd. to Polhemus Rd. /DeAnza Blvd. /Hillsdale Blvd.	I/II
C	SM 12.14-R18.80	US 101 to ALA/SM County Line	Yes	Bicycling Prohibited	Yes	n/a	Hillsdale	E. Hillsdale Blvd. to Beach Park Blvd. *No Bridge Entry*	II/III
D	ALA 0.00-6.78	ALA/SM County Line to Santa Clara St.	Yes	Bicycling Prohibited	Yes	n/a	Hayward Shoreline; Winton	*No Bridge Entry* Breakwater Ave. to Clawiter Rd./ Middle Lane/ Winton Ave./ Santa Clara St.	I/III
R	ALA 6.78-8.22	Santa Clara St. to SR92/238/ 185	No	Shared roadway	Yes	40 mph	D Street	Winton Ave. /D St. to Downtown Hayward	II

Class I: Bike path
Class II: Bike lane
Class III: Bike route

Bicyclists' Needs

The wide range of development patterns and terrain on the SR 92 corridor, from urban to rural and from mountainous to flat, precludes a one-size-fits-all approach to planning for bicyclists' needs. Freeways such as US 101, I-280, and I-880 are barriers to bicycle travel and present real challenges for bicycling. Major roadways such as El Camino Real (SR 82) and SR 1 provide direct bicycle access but interchanges are often not designed for the best accommodation of bicyclists. Additionally, there are different "types" of bicyclists and their needs vary, from the "strong and fearless" minority who will ride in any condition, to the bulk of riders who are more careful and concerned, and will ride only when they feel safe and comfortable under more protected conditions. The challenge to Caltrans is to provide the safest and most comfortable bicycling opportunities throughout the corridor for this important mode of transportation.

PEDESTRIAN FACILITY

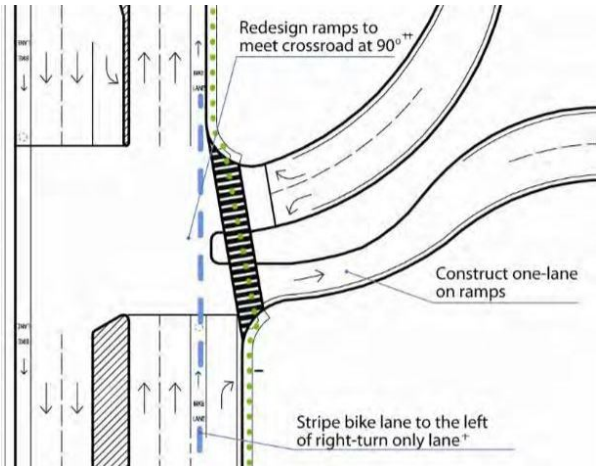
Unlike other modes of transportation which rely on extended networks to travel long distances, most walking "trips" are short by comparison, and take place within a relatively small area. While planning for pedestrians often takes place at the local level, it is also important to look at the pedestrian environment from a broader view to observe the effects that the larger transportation system, such as the State Highway System, can have on neighborhoods. Also, the linkages of pedestrians to other modes of transportation are vitally important to the trips that people take. Walking is the only transportation mode common to most people, leading them to their cars or bikes, to the bus, train, or ferry, and ultimately to their travel destination.

Overcrossing on SR 92 at Point Eden Way *Photo: Google Maps*

Existing Conditions

The most common issue for pedestrians along the SR 92 corridor is intersections that lack marked crosswalks. Also particularly troublesome for pedestrians are loop ramps, long crossing distances, large curb radii enabling higher speed turns by motorists, missing sidewalks, and areas where crossing is prohibited. Several locations along the corridor are surrounded by housing, employment, and shopping centers where walking is a viable mode. Planning for pedestrian treatments at these locations will improve access around the SR 92 facility and decrease the need to drive to destinations that are within walking distance. Intersections along the corridor that present challenges for pedestrians are shown in Table 6. A sketch of a preferred design at freeway ramp intersections with local roads is shown below in Figure 7, which includes right-angle intersections between ramps and crosswalks.

Figure 7



Preferred Design at Free Flow Ramp
Source: A Guide to Reconstructing Intersections and Interchanges for Pedestrians and Bicyclists, Caltrans, 2010

Table 6: SR 92 Pedestrian Intersections

SR 92 High Priority Pedestrian Intersections										
Seg	**Co**	**PM**	**City**	**Intersection**	**Long Crossing Distance**	**Loop Ramp**	**Crossing Prohibited**	**No Marked Crosswalks**	**Missing Sidewalks**	**Potential to Reduce Corner Radius**
A	SM	0.00	Half Moon Bay	SR92/SR1	x		x		x	NE corner
A	SM	0.20	Half Moon Bay	SR92/Main St.	x					NE & SW corners
B	SM	R7.92	San Mateo	SR92/Ralston Ave.		x		x		
B	SM	R8.70	San Mateo	SR92/De Anza Blvd.				x		
B	SM	R9.37	San Mateo	SR92/W. Hillsdale Blvd.		x	x			SR 92 on & off ramps
B	SM	R10.57	San Mateo	SR92/Alameda de las Pulgas						NE corner of WB off-ramp, NW corner of WB off-ramp, & SE corner of EB on-ramp
B	SM	R10.54	San Mateo	SR92/SR82 (El Camino Real)		x				
B	SM	R11.41	San Mateo	SR92/Concar Drive				x	x	SE & SW corners at SR 92 ramps
B	SM	R11.61	San Mateo	SR92/South Delaware St.	x		x			SE & SW corners at SR 92 ramps
C	SM	R12.40	San Mateo	SR92/Fashion Island Blvd.	x					NE corner at SR 92 ramp
C	SM	R12.80	San Mateo	SR92/Edgewater Blvd./Mariners Island Blvd.	x		x	x		At on and off-ramps
C	SM	R13.48	Foster City	SR92/Chess Dr.			x			At on and off-ramps
C	SM	R13.57	Foster City	SR92/Metro Center Blvd.			x	x	x	At on and off-ramps
D	ALA	R4.4	Hayward	SR92/Eden Landing Rd		x	x	x	x	At on and off-ramps
D	ALA	R4.6	Hayward	SR92/Clawiter		x	x	x	x	At on and off-ramps
D	ALA	R5.1	Hayward	SR92/Industrial Blvd.		x	x	x	x	At on and off-ramps
D	ALA	R5.8	Hayward	SR92/Hesperian Blvd.	x	x	x	x		At on and off-ramps
D	ALA	R6.8	Hayward	SR92/Santa Clara St.	x		x	x		SW corner

TRANSIT FACILITY

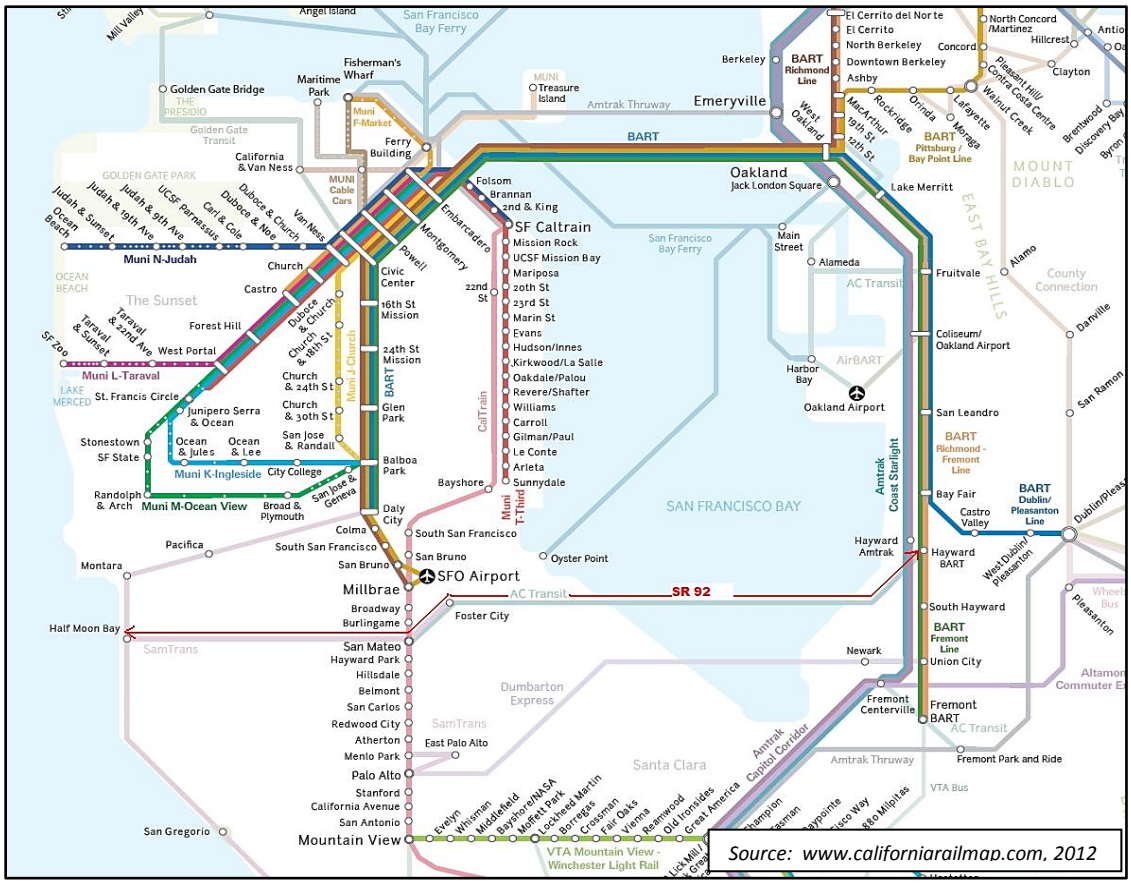
A limited variety of east-west transit options exist along the SR 92 corridor, as shown in Figure 8. Bus transit service is provided by San Mateo County Transit (SamTrans), which operates daily bus service (Route #294) between the City of Half Moon Bay and the Hillsdale Caltrain station in San Mateo. Route #294 generally runs only hourly, with sometimes poor connections to transbay travel possibilities between the city of San Mateo on the Peninsula and the city of Hayward in the East Bay. This transbay service between San Mateo and the Hayward BART Station is operated by the Alameda-Contra Costa Transit District (AC Transit). AC Transit's Line M operates approximately every 45 minutes during AM and PM peak hours only. Segment D in Hayward has easy connections to both the main Hayward BART and Hayward Amtrak stations.

For trip destinations just south of the SR 92 corridor, the *Dumbarton Express*, also operated by AC Transit, has commute hour bus service between Stanford University in Palo Alto and the Union City BART Station.

Caltrain offers north/south commuter train service to San Francisco and San Jose, including several stations in the Silicon Valley and San Mateo County.

For trip destinations north of the SR 92 corridor, bus connections to BART and Caltrain exist. The San Francisco Bay Ferry also operates transbay ferry service from Oyster Point in South San Francisco to Alameda/Oakland. None of the transbay transit options come close to matching the travel time for automobiles traversing the corridor. A trip solely by transit from Half Moon Bay to Hayward BART, for example, could easily take two and a half to three hours.

Figure 8: Rail Transit Network in relation to SR 92



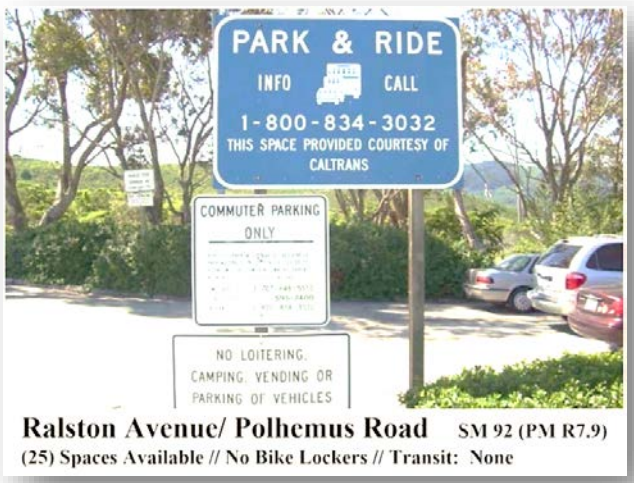
Park and Ride Lots

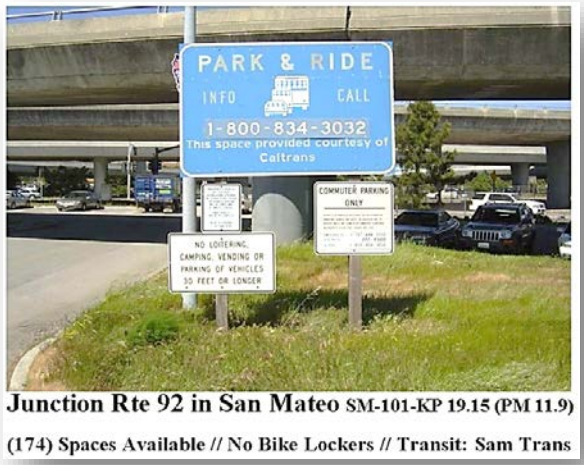
Park and Ride lots are designed to offer a convenient location to transfer from a car or bicycle to local or regional bus, transit, carpool, or vanpool. The goals of park and ride lots are to increase mobility options for travelers, increase person throughput on the transportation system, decrease the number of vehicle trips and congestion, and decrease greenhouse gas and air pollution.

There are two designated Caltrans Park and Ride Lots along SR 92 (listed in Table 7), catering mainly to carpools and vanpools. Nearby, Caltrain operates its own parking lot for Caltrain riders at its Hayward Park Station at Concar Drive in San Mateo (211 spaces, 20 bike racks). Additionally, in the East Bay the Hayward BART and Hayward Amtrak stations offer parking spaces to commuters.

Table 7. Park and Ride Facilities

SR 92 Corridor Park and Ride Lots					
Seg #	**Facility**	**Name**	**Location**	**Post Mile**	**# of Parking Spaces**
B	**Park & Ride Lots**	**Ralston**	**SE quadrant Ralston Ave/ SR 92, Belmont**	**SM 7.90**	**25**
B		**101/92**	**SW quadrant of I/C, near 19th Ave, San Mateo**	**SM 11.90**	**174**





Source: Caltrans D4 Office of Traffic Systems/Park and Ride Program

A 2013 survey of Park and Ride lots showed that the lot under the 101/92 Interchange had an 82% utilization rate, with room for expansion. By restriping and re-configuring the layout, 17 spaces could be easily added. Additional spaces may also be added by expanding the facility within Caltrans right-of-way. However, drainage issues here may have to be addressed and a further engineering assessment would need to be completed.

Park and Ride lots are a valuable resource to support transit use and carpooling. As such, these facilities must be kept in a good state of repair by Caltrans in terms of signage, landscaping, and maintenance.

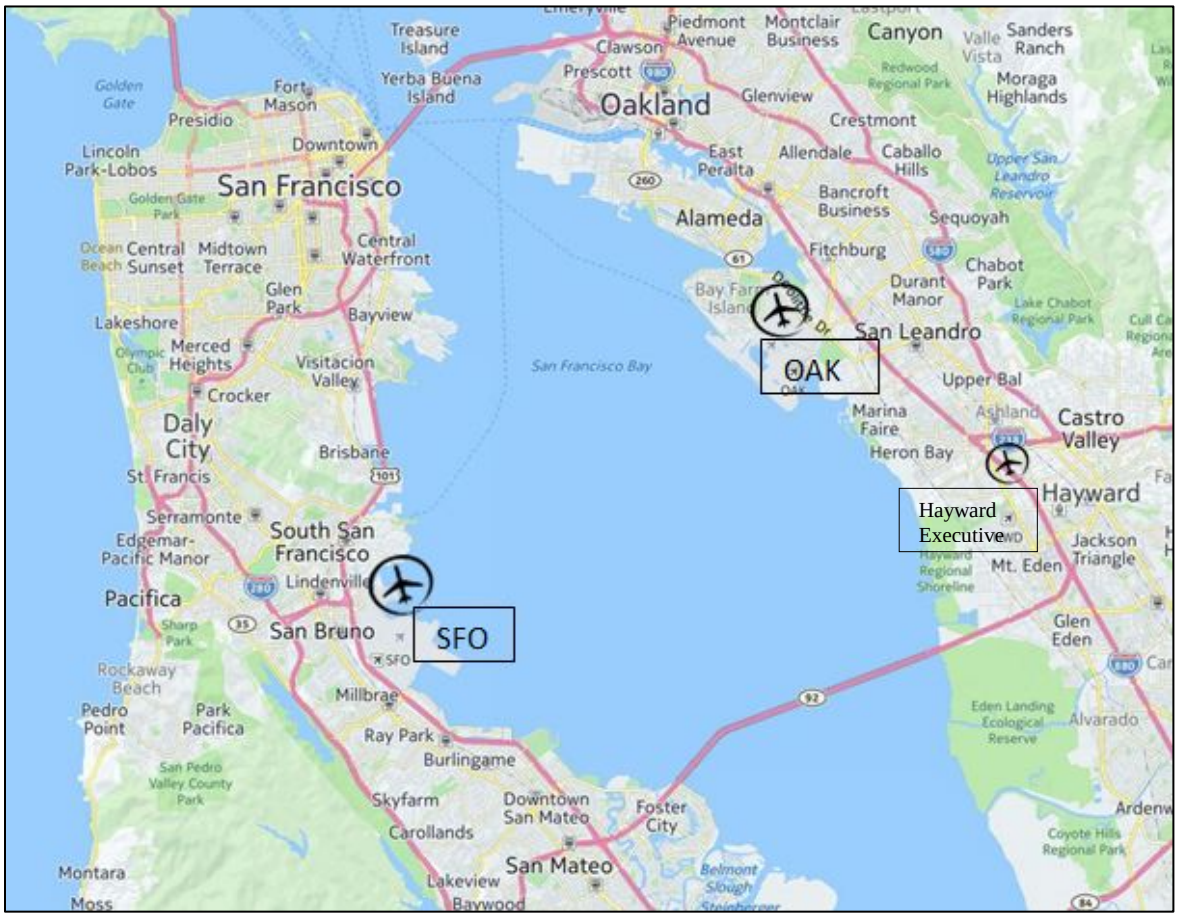
FREIGHT

From a regional perspective, SR 92 provides a moderate level of truck travel for goods movement in the San Francisco Bay Area. SR 92 is a nationally-designated STAA (Surface Transportation Assistance Act) truck route linking I-280 to I-880. Figure 9 below shows average daily truck traffic on SR 92. The heaviest concentration of truck traffic on the route occurs on the San Mateo-Hayward Bridge, connecting the north-south truck routes of US 101 and I-880, and providing access from the Peninsula to the Central Valley via I-880/I-238/I-580. Regional movement of freight is less between I-280 and the slower-moving SR 1 because of the hilly terrain between these routes, and the less dense population and land use along the coast.

Figure 9: Annual Average Daily Truck Traffic on SR 92

There are no rail, port, or airport facilities directly served by SR 92, although the route is near the Hayward Executive Airport, east of I-880 in Hayward. SR 92 also serves as the most direct route between San Francisco International Airport and Oakland International Airport for freight and passengers traveling on freeways between the two airports.

Figure 10: San Francisco and Oakland International Airports; Hayward Municipal Airport



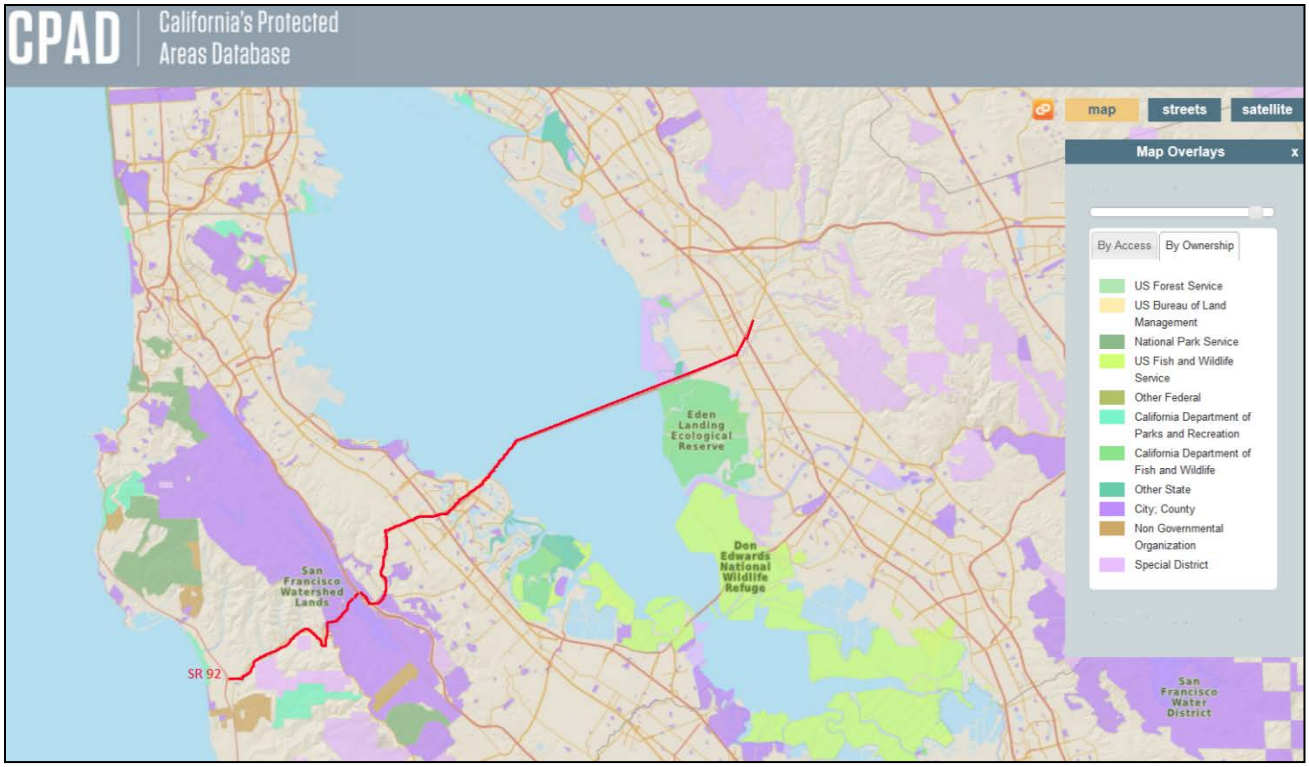
Source: Google Maps

ENVIRONMENTAL CONSIDERATIONS

All transportation corridors, including SR 92, traverse areas of varying degrees of environmental concern. These concerns include the possible presence of hazardous materials or facilities, habitats of threatened or potentially threatened species, wetlands and other sensitive habitats, and the presence of cultural and archeological sites, historic bridges, or other structures to name a few. This information needs to be taken into consideration when proposing any improvements or modifications to State facilities within the corridor.

SR 92 passes directly through San Francisco Watershed Lands adjacent to Crystal Springs Reservoir and other environmentally sensitive areas such as the Eden Landing Ecological Reserve, as shown on the California Protected Areas Database map (Figure 11):

Figure 11: Environmentally Sensitive Areas near SR 92



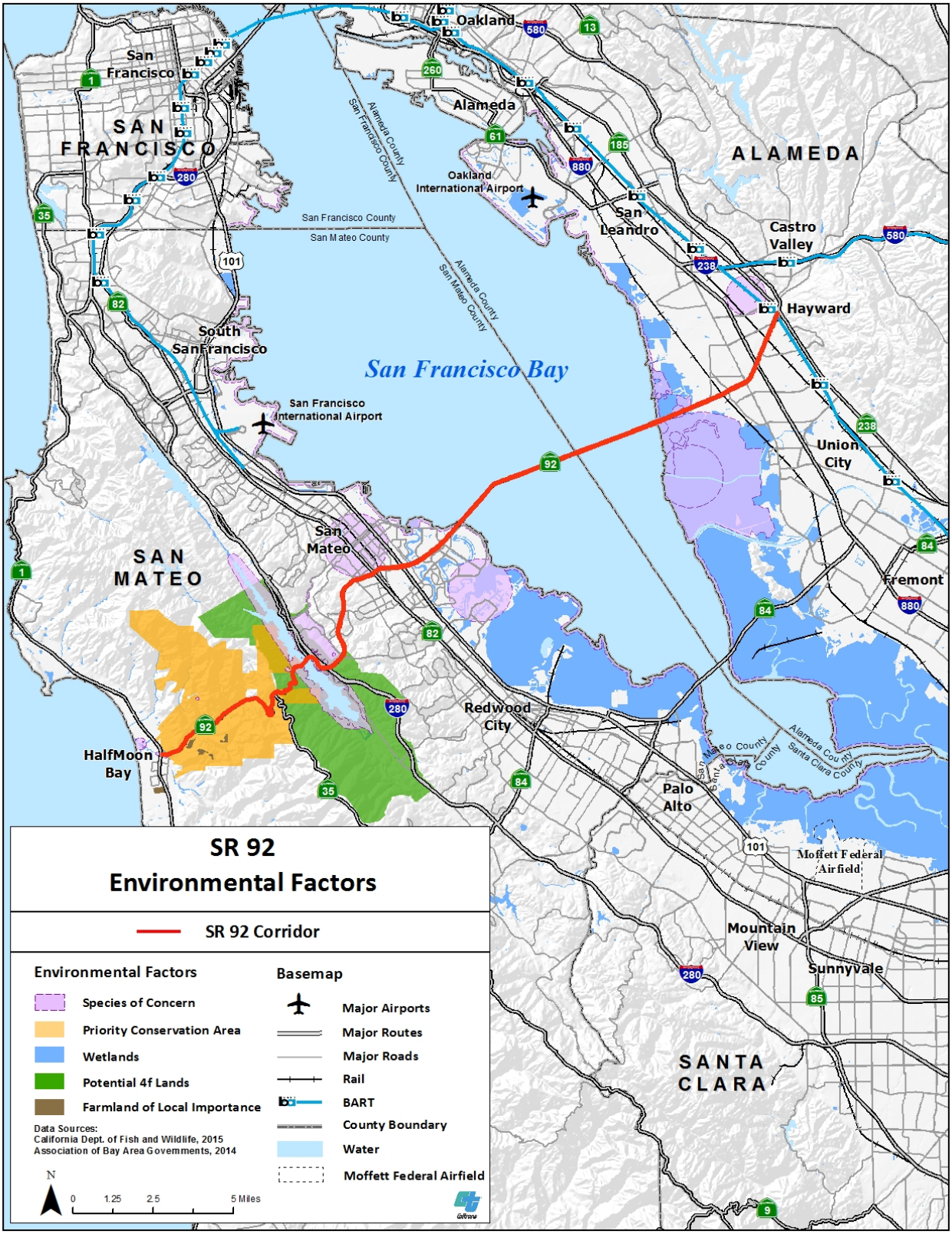
Source: http://www.calands.org/map

The California Natural Diversity Data Base (CNDDB) is a repository of plants and animals maintained by the Habitat Conservation Division of the California Department of Fish & Wildlife. The database indicates the following sensitive species may be found within the route limits:

Species	Latin Name	Location	Federal Listing	State Listing
Western snowy plover	*Charadrius alexandrinus nivosus*	Newark	Threatened	None
White-rayed pentachaeta	*Pentachaeta bellidiflora*	San Mateo	Endangered	Endangered
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	Woodside	Endangered	Endangered
Bay checkerspot butterfly	*Euphydryas editha bayensis*	San Mateo	Threatened	None
San Mateo thorn-mint	*Acanthomintha duttonii*	San Mateo	Endangered	Endangered
California clapper rail	*Rallus longirostris obsoletus*	Redwood Point	Endangered	Endangered
Marin western flax	*Hesperolinon congestum*	San Mateo	Threatened	Threatened
Fountain thistle	*Cirsium fontinale var. fontinale*	San Mateo	Endangered	Endangered
California red-legged frog	*Rana draytonii*	Half Moon Bay	Threatened	None
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	Half Moon Bay	Endangered	Endangered

Figure 12 depicts environmental considerations in the SR 92 corridor, including Priority Conservation Areas, farmlands, wetlands, parklands, and areas of Species of Concern.

Figure 12: SR 92 Environmental Factors Map

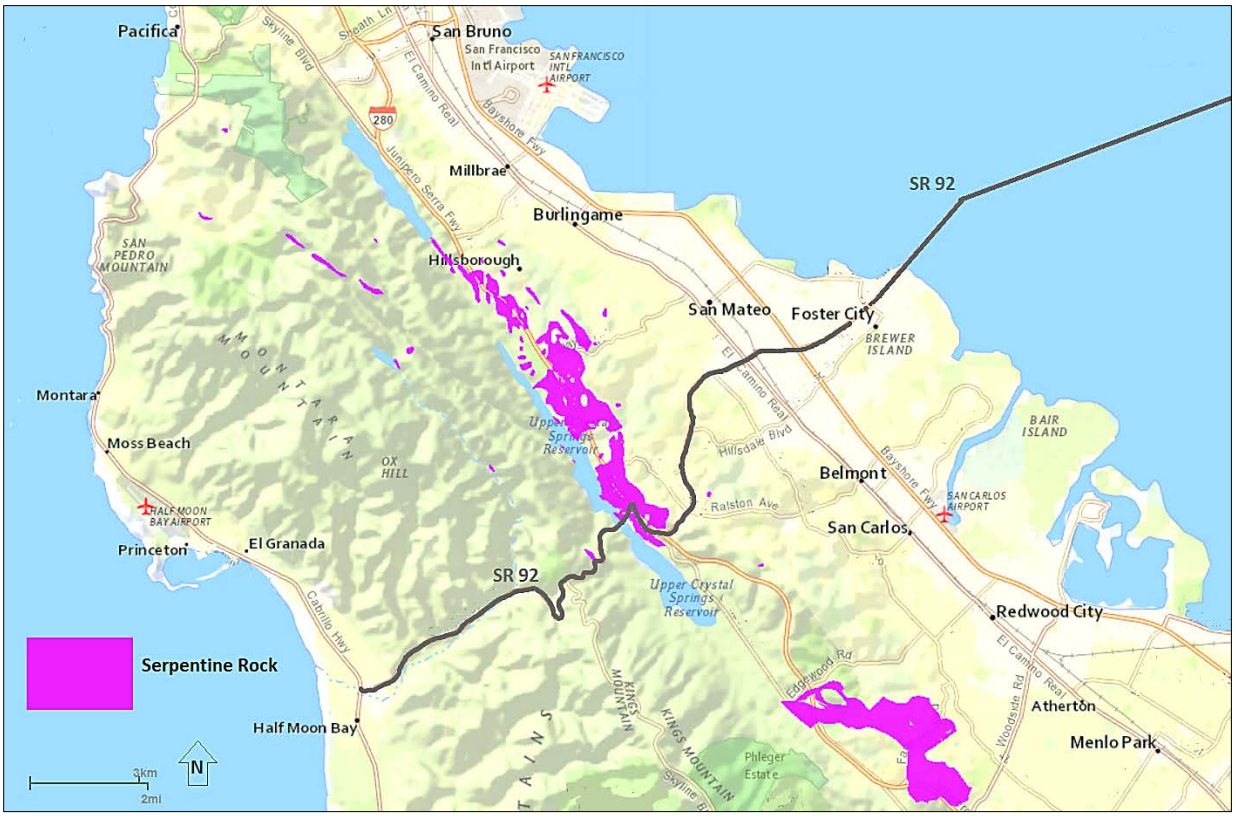


Source: California Department of Fish and Wildlife; ABAG, 2015

Naturally Occurring Asbestos

The map in Figure 13 shows general areas that are likely to contain natural occurrences of asbestos, a known carcinogen that becomes especially problematic when soils are disturbed. Asbestos is more likely to be encountered in and immediately adjacent to areas of "serpentine" rock (ultramafic, high-mineral rock), as can be found around the SR 92 and I-280 interchange. The map provides general information on areas where there is a good chance that naturally occurring asbestos might be encountered during highway construction and routine maintenance operations. The only way to establish the presence or absence of asbestos at a specific location is through a detailed site examination by a qualified geologist.

Figure 13: Naturally Occurring Asbestos in the SR 92 Corridor



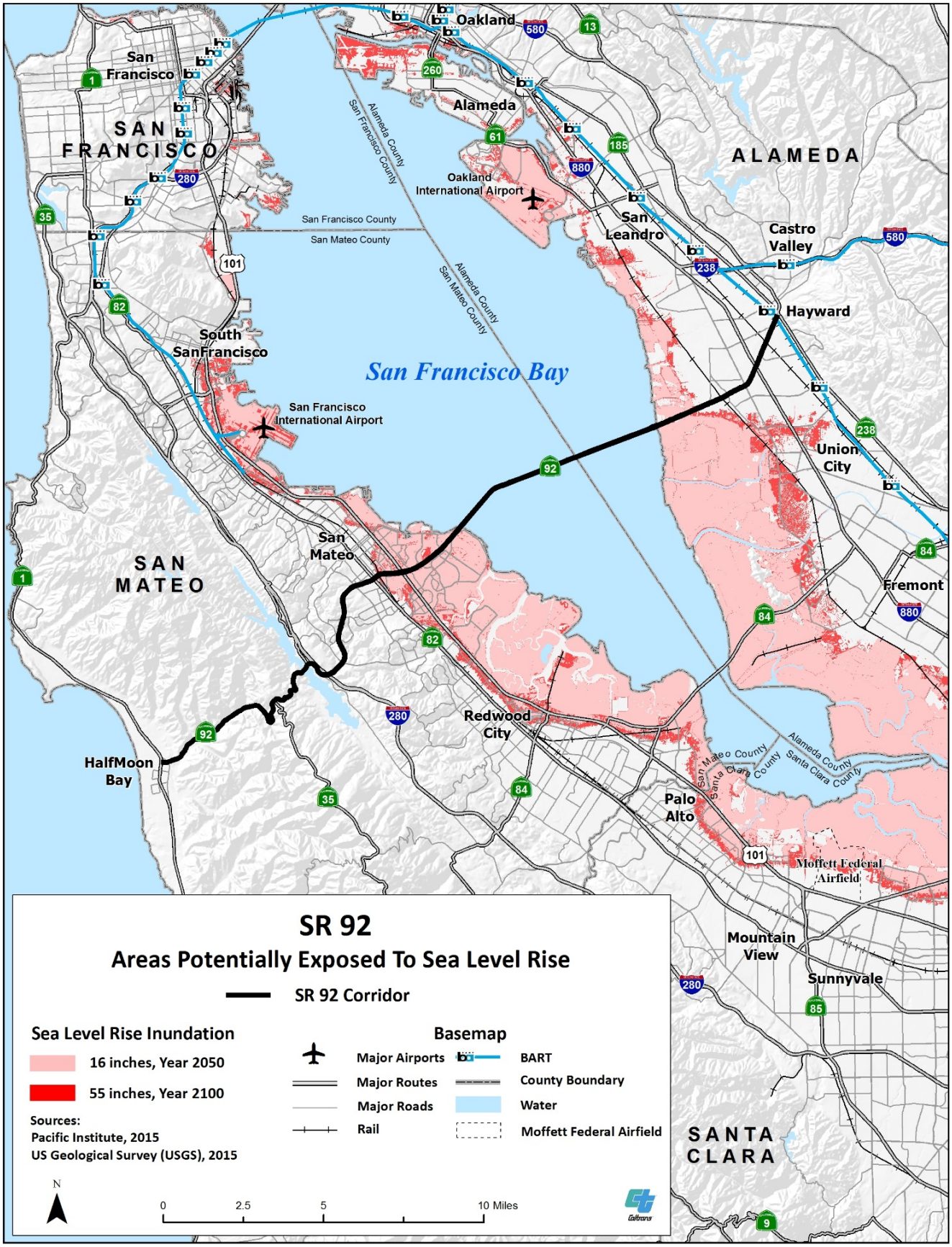
Source: District 4 Environmental Engineering, Hazardous Materials Data Viewer, 2016

Climate Change and Sea Level Rise (SLR)

Sea level rise is one of the best documented and widely accepted impacts of climate change. Data from tide gauges in the State collected over the past several decades indicate an upward trend of approximately 20 centimeters (7.9 inches) per century. Observation of sea levels along the California coast and projections indicate that areas along the San Francisco Bay will experience rising sea levels of 14 inches by mid-century (2050) and up to 55 inches by the end of this century. ("Guidance on Incorporating Sea Level Rise," Caltrans Climate Change Workgroup, May 2011 per California Ocean Protection Council Resolution of March 2011)

The effects of sea level rise and flooding are expected to increasingly impact transportation infrastructure in low-lying coastal areas and San Francisco Bay, including parts of SR 92 on both ends of the San Mateo-Hayward Bridge. The Federal Emergency Management Agency (FEMA), the Pacific Institute, and the U.S. Geological Survey have prepared inundation maps for the San Mateo County and Alameda County shorelines. The following map in Figure 14 reveals areas in which there are transportation assets and other facilities that would be vulnerable to the overlapping risks of inundation and flood hazard by wave and tidal action.

Figure 14: Bay Area Sea Level Rise Map



SR 92 Sea Level Rise Vulnerabilities

The recently completed *Climate Change and Extreme Weather Adaptation Options* study (MTC, December 2014) identified the following vulnerable areas for the SR 92 Alameda County subregion:

- The portion of SR 92 between the Toll Plaza and Whitesell Street in Hayward is within the existing 100-year floodplain. Flood risk will increase in extent, depth, and duration due to sea level rise in this area as it is already in a low-lying area.
- The toll plaza for SR 92 relies on electrical components that are not protected from flooding and would be damaged by salt water exposure.
- Saltwater intrusion and a rising groundwater table may cause corrosion problems for metal pipes, reinforcing in concrete structures, pump equipment that are necessary to maintain operations at the toll plaza, at-grade pavement structural sections, and landscaping.

CLIMATE CHANGE ADAPTATION CASE STUDIES

- ***Adapting to Rising Tides* (ART) Project**: The San Francisco Bay Conservation and Development Commission (BCDC), has an overall goal to develop and refine planning tools that will help to increase the preparedness and resilience of Bay Area communities to sea level rise.
- As part of the ART Project, BCDC, MTC, and Caltrans District 4 collaborated on the **2010-2011 FHWA pilot project** to assess climate vulnerability and risk to transportation and other critical infrastructure in Alameda County. Part of this effort was to prepare inundation maps, develop risk profiles and review adaptation options.
- Building on the FHWA pilot project, BCDC, MTC, BART, and Caltrans completed a regional and multi-modal adaptation plan in three focus areas in Alameda County in December 2014, called ***Climate Change and Extreme Weather Adaptation Options for Transportation Assets in the Bay Area*** *Pilot Project*. Core transportation assets were evaluated more closely (e.g., on past performance during extreme weather) and sea level rise maps were updated. A range of adaptation strategies were compared and prioritized. SR 92 was part of the study area.

The priority adaptation strategy recommended in the *Climate Change and Extreme Weather Adaptation Option*s study for the Hayward Focus Area was a detailed drainage assessment. An in-depth understanding of the drainage network and capacity performance is critical because additional vulnerabilities in the watershed may exist that have not yet been identified. The SR 92 drainage assessment is a necessary step that will provide stakeholders and adjacent landowners with an in-depth understanding of the drainage system and allow for the development of more robust adaptation strategies that address a wide range of vulnerabilities. Examples of adaptation strategies may include the consolidation of discharge points to a combined outfall location, or rerouting roadway drainage to more advantageous locations, coupled with physical strategies such as living levees and wetland restoration.

The use of alternative bridges for vehicles to cross San Francisco Bay offers no long-term solution. Both the Dumbarton Bridge to the south and the San Francisco-Oakland Bay Bridge to the north face similar exposure and vulnerability to storm events and sea level rise, particularly at the toll plaza approaches.

CORRIDOR PERFORMANCE

The corridor performance of SR 92 is evaluated based on current and projected Volume/Capacity (V/C) ratios, calculated for each segment of highway or freeway. The V/C ratio of "1.0" represents a freeway segment where volume "V" equals capacity "C," indicating that the route is operating at full capacity. Ratios >1.0 indicate very congested segments. Lower ratios (with numbers <1) indicate less congested segments. This TCR presents the baseline traffic data from 2014, along with the projected traffic data forecasts for 2040.

Along with data that Caltrans uses for monitoring corridor performance, the Congestion Management Agencies for San Mateo County and Alameda County both report on route performance using Level of Service (LOS) in their Monitoring Studies of 2013 and 2014 respectively. These Monitoring Studies are part of the Congestion Management Program (CMP) that each county is required by State law to develop and update biennially. Legislation such as SB 743 will allow alternate measures of congestion, such as Vehicle Miles Traveled (VMT). However, in these Monitoring Studies LOS was used as a performance measure.

Existing Conditions

In its various segments, SR 92 has an Annual Daily Traffic (ADT) count ranging from 22,000 – 153,000 (combined eastbound and westbound). The Volume/Capacity (V/C) ratios are shown in Table 8 below, with the highest volume of traffic in the most developed area of the corridor (where Segment B meets Segment C at US 101).

Table 8: Existing Traffic Volumes

2014 Traffic Volumes SR 92											
Segment	Directional										
	Data Location	AM Peak		PM Peak		AM Peak V/C		PM Peak V/C		ADT	
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
A	Jct. SR 35	1,261	485	701	1,093	0.74	0.29	0.41	0.64	10,984	10,660
B	Jct. SR 82	4,347	4,681	4,552	4,399	0.83	0.89	0.87	0.84	55,818	55,982
C	Jct. US 101	5,450	5,801	6,070	5,846	0.87	0.79	0.96	0.80	78,993	74,411
D	Jct. I-880	3,033	6,065	5,392	3,094	0.48	0.83	0.86	0.42	65,513	62,377
(Relinquished)	Jct. SR 185	947	1,286	1,206	900	0.23	0.31	0.29	0.21	15,941	13,966

Source: Caltrans D4 Office of Advance Planning, 2014

Future Conditions

Future traffic projections and V/C ratios are derived from MTC's Travel Demand Model, which models future land use based on the Association of Bay Area Governments (ABAG) projections for population and job growth. Per *Plan Bay Area*, the Region's 2040 Regional Transportation Plan, growth will be focused in the more dense cities of the region, close to shopping and transit and more conducive to biking and walking.

A V/C ratio exceeding 1.0 is equivalent to LOS (Level of Service) F, suggesting travel demand for auto traffic will exceed available capacity. The projections indicate that SR 92 will experience a significant increase in traffic volumes in 2040 during both the AM and PM peak hours. The V/C ratio will exceed 1.0 in all segments at several peak periods in either or both directions, as indicated in red in Table 9.

Table 9: 2040 Forecast Volumes

2040 Forecast SR 92											
Segment	Directional										
	Data Location	AM Peak		PM Peak		AM Peak V/C		PM Peak V/C		ADT	
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
A	Jct. SR 35	1,714	939	1,084	1,721	**1.01**	0.55	0.64	**1.01**	15,665	17,966
B	Jct. SR 82	5,217	5,861	5,487	5,033	0.99	**1.12**	**1.05**	0.96	67,140	67,167
C	Jct. US 101	6,376	7,414	7,500	7,115	**1.01**	**1.01**	**1.19**	0.97	95,146	92,823
D	Jct. I-880	3,570	7,193	6,785	3,972	0.57	0.98	**1.08**	0.54	80,514	76,035
(Relinquished)	Jct. SR 185	1,203	1,559	1,348	956	0.29	0.37	0.32	0.23	18,891	16,065

Source: Caltrans D4 Office of Advance Planning, 2014 /MTC Travel Demand Model

San Mateo County 2013 Congestion Management Program

The San Mateo City/County Association of Governments (C/CAG), as the Congestion Management Agency for San Mateo County, is required to prepare and adopt a Congestion Management Program (CMP) on a biennial basis. The SR 92 freeway segments in San Mateo County were evaluated using the basic freeway sections methodology of the Highway Capacity Manual (HCM, 2010), where the Level of Service (LOS) for each freeway segment is determined using its average travel speed detected from actual monitoring cars sent out on the freeway by Caltrans.

Newer CMP legislation will include substantive performance monitoring to establish trends in demand for different modes. However, in accordance with CMP legislation at the time, the County adopted LOS Standards for all CMP route segments within its jurisdiction, based on geographic areas, traffic counts, and projections. In its monitoring reports the County was then required to show that all route segments were operating at or above this LOS standard. When the Level of Service on a segment or at an intersection failed to attain the established Level of Service standard, a Deficiency Plan was required.

Table 10 below lists the LOS for the SR 92 segments as reported in the San Mateo County 2013 CMP.

Table 10: San Mateo County SR 92 LOS Monitoring 2013

LOS Monitoring SR 92 Segments in San Mateo County 2013				
Route	Roadway Segment Description	LOS Standard	2013 LOS	
			AM Peak	PM Peak
SR 92	SR 1 to I-280	**E**	**E**	**E**
	I-280 to US 101	**D**	**F**	**E**
	US 101 to Alameda County Line	**E**	**E**	**E**

Source: San Mateo County Congestion Management Plan (Final), Nov. 2013

Deficiencies below the County's LOS "Standards" for SR 92 (per its Congestion Management Program) included the following corridor segments:

- AM Peak – Eastbound and Westbound SR 92 between I-280 and US 101 (Segment B)
- PM Peak – Eastbound and Westbound SR 92 between I-280 and US 101 (Segment B)

Even with allowances or "exemptions" that are calculated in the Congestion Management Plan for interregional trips, the LOS Monitoring Report showed the freeway segment between I-280 and US 101 (TCR Segment B) performing below the San Mateo County Standard.

Freeway Performance Measurement System (PeMS)

In another method to study congestion and bottlenecks throughout the State Highway System, Caltrans utilizes its Freeway Performance Measurement System (PeMS) to collect, filter, process, aggregate, and examine large volumes of traffic data. This includes continuous measurements recorded from thousands of detectors and tag readers that are imbedded in the roadways throughout the Bay Area. The 2013 data for SR 92 was collected and examined for patterns in traffic delay.

As shown in Table 11 below, PeMS 2013 data identified two bottlenecks in the San Mateo portion of SR 92 that are starting to form intermittently. The AM bottleneck at Foster City Boulevard is active 24 percent of the time in the westbound AM peak hour, and 30 percent of the time in the eastbound PM peak hour.

Table 11: PeMS 2013 Bottleneck Locations for SR 92

PeMS Bottleneck Locations for SR 92 in San Mateo County 2013							
PM	Location	Length (miles)	Total Delay (vehicle-hrs./year)	Average Delay (vehicle hrs./day)	Average Duration (hours)	% Active Days	Period
13.93	Foster City Blvd	2.6	13,434	228	1.1	24%	AM
13.93	Foster City Blvd	2.9	14,951	197	1.5	30%	PM

Source: Caltrans Planning - Performance Management System (PeMS)

Alameda County 2014 LOS Monitoring Report

The Alameda County Transportation Commission (Alameda CTC), in its role as the Congestion Management Agency for Alameda County, conducts the biennially required Level of Service (LOS) Monitoring Report. The report examines traffic conditions on all major Alameda County roadways that are designated as part of the Congestion Management Program (CMP) network. The focus of the LOS Monitoring report is to measure speeds on the county roadways, identify congested segments, and assess long-term congestion trends.

Alameda CTC performs LOS monitoring by measuring the average speed of traffic as vehicles travel a length of roadway on the CMP network. The average speed is then classified from LOS A (best) to LOS F (worst). LOS A represents the best travel conditions from the driver's perspective where roadways are uncongested, and LOS F represents congested conditions or deteriorated traffic flows. These standards are based on the Highway Capacity Manual.

The 2014 LOS monitoring results for SR 92 freeway and arterial segments are shown below in Table 12. Both AM and PM Peak periods are shown. Traffic on SR 92 in Alameda County flows reasonably well; the only LOS "F" results below the County standard were found on the eastbound Clawiter Road to I-880 segment (in the PM Peak period), and the westbound Clawiter Road to Toll Plaza segment (in the AM Peak period). These two LOS "F" occurrences are highlighted in red in Table 12.

Table 12: Alameda County SR 92 LOS Monitoring 2014

LOS Monitoring SR 92 Segments in Alameda County in 2014								
Route	Segment Limits		Jurisdiction	Length (miles)	**Freeway** - AM Peak Period		**Freeway** - PM Peak Period	
	From	To			Average Speed	LOS	Average Speed	LOS
SR 92 -EB	San Mateo County Line	Toll Plaza	Unincorporated Alameda County	2.61	66.0	**A**	41.5	**D**
SR 92 -EB	Toll Plaza	Clawiter Rd.	Unincorporated Alameda County	1.76	65.7	**A**	39.0	**E**
SR 92 - EB	Clawiter Rd.	I-880	Hayward	2.1	58.2	**B**	20.5	**F**
SR 92 -WB	I-880	Clawiter Rd.	Hayward	2.01	30.5	**E**	62.0	**A**
SR 92 -WB	Clawiter Rd.	Toll Plaza	Unincorporated Alameda County	1.87	25.4	**F**	57.6	**B**
SR 92 -WB	Toll Plaza	San Mateo County Line	Unincorporated Alameda County	2.61	43.5	**D**	65.8	**A**
CMP Route	Segment Limits		Jurisdiction	Length (miles)	**Arterials** - AM Peak Period		**Arterials** - PM Peak Period	
	From	To			Speed	LOS	Speed	LOS
SR 92 -EB	I-880	Mission Blvd.	Hayward	1.59	25.5	**B**	14.5	**D**
SR 92 -WB	Mission Blvd.	I-880	Hayward	1.59	12.5	**E**	18.4	**C**

Source: Alameda CTC 2014 Level of Service (LOS) Monitoring Report

Traffic Operations Systems (TOS)

Traffic Operations Systems, or TOS elements, as installed on various segments of SR 92 are shown in Table 13. TOS elements serve to improve operations in areas that experience daily delay or recurrent congestion. In particular, they help to improve the response time to accidents or breakdowns. This process involves detection and verification of an incident, deployment of appropriate emergency personnel and equipment, and informing motorists of the freeway conditions. Once an incident is cleared, the freeway can be restored to normal operations. By implementing TOS elements, incidents can be detected from traffic monitoring stations (TMS) placed every 1/3 mile to 1/2 mile on the freeway. TMS provide an accurate measure of vehicular speed, volume, and density (vehicles/lane-mile) for valuable information on daily system performance.

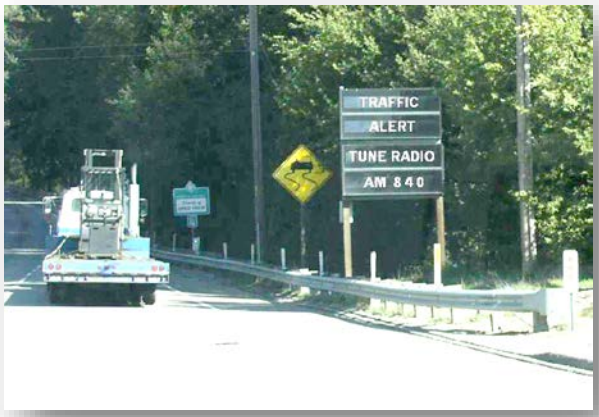


Photo: Caltrans D4 Photography

Table 13: Existing TOS Elements

Existing TOS Elements on SR 92 (2014)						
Segment	**TOS Type**	**County**	**Route**	**Approx. Post Mile**	**Direction**	**Location**
A	**EMS**	SM	92	6.65	W	
B	**TMS**	SM	92	7.48	E/W	
B	**EMS**	SM	92	7.80	E	
B	**CCTV**	SM	92	8.02	E	
B	**TMS**	SM	92	8.02	W	
B	**TMS**	SM	92	8.13	E	
B	**CCTV**	SM	92	8.67	W	
B	**CMS**	SM	92	8.67	W	
B	**TMS**	SM	92	8.72	W	
B	**TMS**	SM	92	8.82	E	
B	**CCTV**	SM	92	9.31	E	
B	**TMS**	SM	92	9.33	E/W	
B	**CCTV**	SM	92	9.59	E	
B	**CMS**	SM	92	9.60	E	
B	**CCTV**	SM	92	9.96	W	
B	**TMS**	SM	92	10.50	E	
B	**CCTV**	SM	92	10.55	W	
B	**TMS**	SM	92	10.70	W	
B	**TMS**	SM	92	11.15	W	
B	**CCTV**	SM	92	11.16	W	
B	**TMS**	SM	92	11.26	E	
B	**TMS**	SM	92	11.49	W	
B	**EMS**	SM	92	11.52	W	
B	**CCTV**	SM	92	11.65	W	
B	**TMS**	SM	92	11.75	E	
C	**TMS**	SM	92	12.30	E/W	

Segment	TOS Type	County	Route	Post Mile	Direction	Location
C	TMS	SM	92	12.86	W	
C	EMS	SM	92	12.92	E	
C	TMS	SM	92	12.95	E	
C	CCTV	SM	92	13.24	E	
C	TMS	SM	92	13.24	E/W	
C	TMS	SM	92	13.49	W	
C	TMS	SM	92	13.59	E	
C	TMS	SM	92	14.06	E/W	
C	CMS	SM	92	14.08	W	
C	CMS	SM	92	14.23	E	
C	CCTV	SM	92	14.38	E	
C	CCTV	SM	92	15.39	E/W	On Bridge
C	CMS	SM	92	16.21	E/W	On Bridge
C	CCTV	SM	92	16.23	E	On Bridge
C	CCTV	SM	92	17.35	E	On Bridge
C	CCTV	SM	92	18.46	E	On Bridge
D	TMS	ALA	92	0.20	E/W	
D	CCTV	ALA	92	0.70	E	
D	TMS	ALA	92	0.75	E/W	
D	CMS	ALA	92	1.50	W	
D	CCTV	ALA	92	1.80	E	
D	TMS	ALA	92	1.82	E/W	
D	TMS	ALA	92	2.24	E/W	
D	CCTV	ALA	92	2.59	W	
D	EMS	ALA	92	2.59	E	
D	HAR	ALA	92	2.59	W	
D	TMS	ALA	92	2.80	E/W	
D	CCTV	ALA	92	2.90	E	
D	CCTV	ALA	92	3.40	E	
D	TMS	ALA	92	3.47	E/W	
D	CCTV	ALA	92	4.30	E	
D	TMS	ALA	92	4.35	E	
D	TMS	ALA	92	4.60	W	
D	CCTV	ALA	92	5.00	E	
D	TMS	ALA	92	5.03	E/W	
D	CCTV	ALA	92	5.15	E	
D	EMS	ALA	92	5.65	W	
D	TMS	ALA	92	5.65	W	
D	CCTV	ALA	92	5.70	E	
D	TMS	ALA	92	5.79	E	
D	CCTV	ALA	92	6.21	E	

CCTV = Closed Circuit Television
CMS = Changeable Message Signs
EMS = Extinguishable Message Signs
HAR = Highway Advisory Radio
TMS = Traffic Monitoring Stations
E = Eastbound
W = Westbound

Traffic Monitoring Stations (TMS) or Microwave Vehicle Detection Sensors (MVDS) on the San Mateo-Hayward Bridge are installed approximately every quarter-mile to half-mile. These stations use microwave motion sensors to detect moving vehicles and relay the information to a monitoring center.

Closed Circuit Television (CCTV) cameras are usually placed approximately every mile on the freeway/highway if the line-of-sight from vehicles is acceptable, and may be placed more closely together for bridges and tunnels. CCTVs are used to verify and identify the nature of incidents and reduce time for verification and response.

Changeable Message Signs (CMS) that provide information to motorists about incidents and traffic problems are usually placed before freeway-to-freeway interchanges to help motorists make wise choices before reaching the interchange. Highway Advisory Radio (HAR) is used for longer messaging, with Extinguishable Message Signs (EMS), and more recent Variable Message Signs (VMS) alerting motorists that radio broadcasting is available to them to get more detailed information. Together, all of the TOS system elements help motorists with adverse traffic conditions and alternative routes to reduce overall incident delay in the system.

Caltrans is planning for increased use of fiber optics in its transportation communication systems. With increased traffic and more demand for efficiency, Caltrans has already installed a Fiber Optic Trunk line from the shoreline of Foster City in San Mateo County, across the San Mateo-Hayward Bridge, to the toll plaza in Hayward (Alameda County). Caltrans is looking to expand the use of fiber optics throughout the District as funding allows.

Ramp Metering on SR 92

Ramp metering is an additional traffic management strategy used by Caltrans to control the volume and spacing of vehicles entering the freeway by means of traffic signals at onramps. To meet its goals of performance, accessibility, and safety, Caltrans has found ramp metering to be effective in reducing congestion and travel time in corridors where deployed. The *Caltrans 2013 Ramp Metering Development Plan* brings these improvements to SR 92 in the next ten years. As indicated in Appendix C, the Ramp Metering Development Plan shows specific locations where ramp metering is planned or partially constructed. The Alameda County locations have been designated as High Priority for completion and operation.

KEY CORRIDOR ISSUES

Congestion between US 101 and I-280 (Segment B)

The 1986 Route Concept Report for SR 92 showed a six-lane freeway as the ultimate build-out of this freeway segment. The current configuration is a four-lane freeway that remains the most congested segment in the entire corridor.

A Project Study Report (PSR) was completed in 1992 to study the widening of the segment from US 101 to I-280, but the project was never programmed for funding. In July 2001, Caltrans prepared another PSR with similar scope to examine the possibility of widening. Three of the four build alternatives included a common feature to widen the segment by adding one lane in each direction. The proposed alternatives also included interchange modifications for operational improvement. The fourth build alternative proposed to add a westbound climbing lane for slower moving trucks from Alameda de las Pulgas to I-280. HOV and Express lanes were not proposed in either PSR. No further funds were programmed after the 2001 PSR. Traffic congestion in this segment has increased since that time.

Caltrans recognizes that adding more lanes to address congestion may not be efficient, cost-effective, or sustainable. In order to meet long-term mobility needs and statewide goals of reducing GHG emissions, Caltrans has adopted a general practice to consider alternative strategies to manage demand and improve operations before considering freeway widening. Alternative strategies include improving transit or implementing HOV lanes. In this particular segment of SR 92, freeway widening, with its overall feasibility, costs/benefits, funding and environmental constraints, should not be excluded from future consideration.

Freeway Operations

During the preparation of this Transportation Concept Report, various freeway operational issues were discussed to improve safety and reduce congestion in the corridor. The following warrant further study:

- Possible roundabout at the intersection of SR 92/SR 35 for operational and safety benefits that roundabouts can provide, i.e. elimination of crossing conflicts, traffic calming, and lower delay. [Segment A]

- Uphill Slow Vehicle Lane on SR 92, westbound from I-280 to SR 35. Similar to the eastbound climbing lane on the other side of the SR 35 summit, with mountainous terrain and steep grades of up to 7%, this 2.3 mile slow vehicle lane would provide safety benefits and traffic queue relief from trucks and other slow vehicles heading westbound on SR 92.

- The Delaware Street/El Camino Real on-ramps and off- ramps are spaced very closely together. “Braided ramps” on SR 92 between El Camino Real and Delaware Street interchanges would eliminate weaving by separating traffic entering the freeway from exiting traffic. Separating the traffic flows would improve safety and congestion. [Segment B]

- Possible ramp braiding on SR 92 (eastbound), between the I-280 connector ramps and the Ralston Avenue ramp. These freeway ramps are about 1200 feet apart, causing queuing. [Segment B]

- Possible westbound metering at the toll plaza on the San Mateo-Hayward Bridge. With the common use of FasTrak at the toll plaza, and westbound traffic is uncontrolled at this location and back-ups occur on the San Mateo County side of the bridge. [Segment D]

Non-Motorized Transportation Access and Safety

The San Mateo Comprehensive Bicycle and Pedestrian Plan of 2011 identifies the SR 92 corridor as an east-west priority corridor. On the SR 92 freeway segments of the corridor, bicycling is prohibited. Parallel routes exist on local roads (shared roadways, bike lanes, and separated bike paths), but the system is not always continuous and connected and requires out-of-direction travel. The freeway often creates a barrier to north-south bicycle network connectivity. Future projects along the freeway segments of the corridor should contribute to improving the corridor bicycle network and evaluate the need for shoulder widening on the conventional highway section of SR 92.

Pedestrian issues along the SR 92 corridor include intersections that lack marked crosswalks, areas where crossing is prohibited or where the crossing distances are long, the presence of loop ramps and large curb radii enabling higher speed turns by motorists. With several locations along the corridor surrounded by housing, employment, and shopping centers, planning for pedestrian treatments will improve access around SR 92, and decrease the need to drive to destinations that are actually within walking distance.

Access to the Coastal Communities

A San Mateo County planning effort now underway will study the transportation challenges for the coastal communities along SR 1 and 92 (Segment A only). "Connect the Coastside" will produce a comprehensive Transportation Management Plan of preferred alternatives that will look at ways to balance future development and transportation needs of the San Mateo Midcoast from just south of the Devil's Slide Tunnel to the southern limits of Half Moon Bay (http://www.connectthecoastside.com). This Management Plan will identify multi-modal improvement needs to accommodate anticipated growth, as required by the California Coastal Commission before approval of the San Mateo County Local Coastal Program (LCP). The Management Plan incorporated public workshops and revisions in 2015 and will ultimately help inform the San Mateo County Comprehensive Transportation Management Plan. Caltrans will partner with stakeholders to improve access and provide multi-modal options within the corridor.

Sea Level Rise Vulnerability

With the threat of sea level rise and the vulnerability of areas near SR 92, climate change risks should be considered in the planning, design, construction, and maintenance of all infrastructure projects. This should apply to new projects as well as the maintenance and rehabilitation of existing infrastructure. All new investments should incorporate measures to minimize climate change risks. Where the benefits of the project outweigh immediate climate change risks, risk management provisions should be undertaken.

SR 92 CORRIDOR CONCEPT

SR 92 Concept Summary

The 25-year concept from existing facility to future facility is summarized in the table below, including recommended strategies by corridor segment.

Table 14: Corridor Concept Summary

Segment	County	Segment Description	Existing Facility	25-yr Concept	Strategies To Achieve Concept
Segment A PM 0.00–R7.27	SM	SR 1 in Half Moon Bay to I-280	**2-4** lane **C**onventional Highway	**2-4** lane **C**onventional Highway	• Consider shoulder widening/turnouts for slower moving traffic (freight, bicycles) • Promote westbound slow vehicle lane between SR 35 and I-280 • Monitor and install rock slope protection and drainage • Implement TOS elements • Support "Connect the Coastside" plan
Segment B PM R7.27–12.14	SM	I-280 to US 101	**4**-lane **F**reeway	**4-6** lane **F**reeway	• Study feasibility of additional lane (HOV/HOT) • Continue I/C improvements at SR 82, 101 • Study ramp-braiding in areas of weaving • Implement TOS elements & ramp metering • Maintain & improve Park & Ride lots • Close gaps within the corridor's bicycle network (parallel and intersecting routes) • Improve pedestrian environment at I/S and I/C in areas with pedestrian demand
Segment C PM 12.14–18.80	SM	US 101 to SM/ALA County line	**4-6** lane **F**reeway	**4-6** lane **F**reeway	• Operational improvements to on/off-ramps • Implement TOS elements & ramp metering • Monitor and plan for sea level rise • Close gaps in the parallel and intersecting corridor bicycle network • Improve pedestrian environment at I/S and I/C in areas with pedestrian demand
Segment D PM 0.0–6.78	ALA	SM/ALA County line to Santa Clara St.	**4-6** lane **F**reeway (1 HOV)	**4-6** lane **F**reeway (1 HOV or Express)	• Convert westbound HOV to Express Lane • Study metering westbound from toll plaza • Monitor and plan for sea level rise • Promote TOS elements & ramp metering • Close gaps in the parallel and intersecting corridor bicycle network • Improve pedestrian environment at I/S and I/C in areas with pedestrian demand
Segment R PM 6.78–8.22	ALA	Santa Clara St. to SR92/238/185	Relinquishment in Process	Relinquished	• Finalize relinquishment process • Provide directional signage to State Highway System

PM=POST MILE

CONCEPT RATIONALE

This TCR reflects the goals of the California Transportation Plan (CTP) 2040, the first statewide planning effort (2016) that provides a pathway for the transportation sector to help meet the State's ambitious climate change goals. As owner/operator of the State Highway System, Caltrans policy requires the State's transportation system to deliver mobility, safety, economic, accessibility, and environmental objectives.

Most Californians want a sustainable transportation system that is safe, reliable, cost-effective, and responsible to the environment that takes into consideration the health of the public and the character of the community. Mobility and accessibility are important factors in transporting goods as well. In order to accomplish these demands, the CTP 2040 looks to improve multimodal mobility and accessibility by creating fluidity amongst transit, bicycle/pedestrian and vehicles, optimizing the State's existing highway system.

With regard to this TCR and the SR 92 corridor, the 25-year Concept for SR 92 maintains a two to four-lane conventional highway where it currently exists (Segment A), and a four to six- lane freeway for the more developed portions of the route (Segments B, C, and D), including the San Mateo-Hayward Bridge. In Segment D, the westbound HOV lane between I-880 and the San Mateo-Hayward Bridge may be converted to an Express Lane (toll). Segment R, as listed above, is in the final stages of being relinquished to the city of Hayward.

The overall feasibility, benefits, cost, funding, and environmental constraints of widening the corridor's most congested Segment B (between US 101 and I-280) may benefit from additional study. While widening the freeway here from four to six lanes reflects the State's long-term desire to provide congestion relief, the tools and strategies to manage demand and improve operations other than freeway widening should be explored first, including improvement to transit and HOV lanes.

To meet long-term mobility needs and the statewide goal of reducing greenhouse gas (GHG) emissions, adding more lanes to address congestion may not be efficient, cost-effective, and sustainable. Throughout its entire length, as with many State routes throughout California, improvements to the SR 92 corridor consist primarily of build out of Intelligent Transportation Systems (ITS) infrastructure, implementation of Traffic Operation System (TOS) elements, and pavement preservation/rehabilitation. Improvements to the bicycle, pedestrian, and Park and Ride network and improvements in transit service frequency could keep some local trips off the freeway system entirely. Mobility improvements to the entire corridor will require not only getting the most efficiency out of the existing road system, but also investing in better linkages and integration between all transportation modes.

The following projects and strategies are proposed to achieve the 25 year Concept for SR 92. These are presented in the categories of Traffic Operations, Transit, Bicycle, and Pedestrian strategies. These are followed by a chart (Table 15) of Planned and Programmed Projects within the corridor.

PROJECTS AND STRATEGIES TO ACHIEVE CONCEPT

PLANNED FREEWAY TRAFFIC OPERATIONS SYSTEMS (TOS)

San Mateo County:

- From SR 1 to I-280:

    - Closed-circuit television cameras (CCTVs) and traffic monitoring stations are planned for this segment, with CCTVs spaced every mile or closer depending on sight distance.
    - Traffic Monitoring Stations (TMS) to be installed every half-mile.
- Between I-280 and the San Mateo-Hayward Bridge approach (PM 7.3 to PM 14.4):
    - Additional TMSs to be installed to fill gaps in coverage.
- On San Mateo-Hayward Bridge, between the western Bridge approach and the Alameda County Line (PM 14.4 to PM 18.8):
    - Existing microwave vehicle detection systems (MVDS) to be upgraded or replaced
    - Two CMS (Changeable Message Sign) installations to be completed.

Alameda County:

- From the San Mateo County Line to I-880:
    - TMS to be installed to fill in gaps in coverage.
    - CMS to be installed on EB SR 92, approaching I-880.
- On San Mateo-Hayward Bridge, between the San Mateo County Line and Bridge approach:
    - Existing Microwave Video Detection Systems (MVDS) to be upgraded or replaced;
    - Expansion of fiber optics communication to existing and proposed elements is being planned.

Planning for fiber optics communication to existing and proposed land-based elements is underway, with the San Mateo-Hayward Bridge already having fiber optics. Besides acquiring the necessary funding for expansion of fiber optics on SR 92, an important criterion for a well-functioning system is that a larger fiber optic network is in place in the broader Bay Area to support communications with the District 4 Transportation Management Center (TMC) in Oakland.

OTHER TRAFFIC OPERATIONS STRATEGIES

Along with the TOS elements that will provide efficiency benefits to the operation of the State Highway System, there are other long-term operational strategies that show merit for incorporation into this SR 92 corridor plan and should be considered:

- Possible roundabout at SR 92/SR 35 to help reduce traffic conflicts and delay.
- Uphill slow vehicle lane between I-280 and SR 35, an idea that has been in the Regional Transportation Plan for several years and supported by San Mateo County, to increase safety and reduce delay.
- Braided ramps to eliminate weaving where on and off-ramps are spaced closely together (between Ralston Avenue and I-280 and between El Camino Real and Delaware St).
- Ramp metering for westbound traffic entering the Toll Plaza on the San Mateo-Hayward Bridge.

TRANSIT STRATEGIES

- Support technologies and capital improvements that increase convenience and competitiveness of public transit and rail, thereby making transit and rail a viable mode alternative. This includes real-time transit information and trip planning tools, universal payment systems, and cost-effective infrastructure improvements optimizing reliability and connectivity between systems.

- Work with transit operators on the planning and implementation of projects to increase people throughput in the corridor such as: HOV and bypass lanes, Park and Ride facilities, bus signal priority, transit stops and shelters.
- Support operations and expansion of transit service and improve amenities; increase frequency and passenger comfort and reduce travel times, including a Regional Express Bus network.
- Support expanded cross-bay water transit service as provided by the Water Emergency Transportation Authority (WETA).

BICYCLE STRATEGIES

- Incorporate bicycle facility design treatments (bike lanes or wider shoulders, ramp reconstruction to intersect at a 90-degree angle, bike lane striping to the left of right-turn-only lane, avoidance of dual right-turn lanes) into interchange reconfiguration/reconstruction projects where feasible.
- Review and evaluate all maintenance projects for the feasibility of incorporating striping and signage improvements to enhance bicycle access and safety at ramp intersections with local roads.
- Support bicycle network improvements paralleling and crossing SR 92.
- Promote wider shoulders on SR 92 between SR 1 and SR 35, as suggested by the San Mateo County Comprehensive Bicycle and Pedestrian Plan (2011).
- Support regional and county efforts to provide and promote connectivity of existing facilities for access to intermodal hubs.
- Improve Park and Ride lots to better serve bicyclists.
- Evaluate all possibilities for bicycle/pedestrian overcrossings, as SR 92 presents a barrier for north/south travel.

PEDESTRIAN STRATEGIES

- Remove barriers to pedestrian circulation by squaring up ramp intersections to slow turning vehicles and shorten crossing distances, by striping crosswalks at on and off-ramps along ramp termini to direct pedestrians and notify motorists of their presence, and by adding pedestrian countdown signals where feasible.
- Review and evaluate future interchange configuration/reconstruction projects. Based on pedestrian demand, consider the need to provide and connect sidewalks around ramp intersections.
- Analyze lane widths of road facilities to consider the addition of medians to provide pedestrian refuge and help with traffic calming.
- Work with local agencies on implementing planned and programmed pedestrian and bicycle network improvements. These may include on-street improvements or grade-separated facilities.

PLANNED AND PROGRAMMED PROJECTS

The following Table 15 shows all major planned and programmed projects along SR 92, by corridor segment. This table summarizes the project description, project location, Regional Transportation Plan ID number, general purpose of the project, and implementation timeline as of 2016.

Table 15: SR 92 Summary of Planned and Programmed Projects

Seg.	Description	Planned or Programmed	Location	Source	Purpose	Implementation Phase
A	Widen SR 92 between Half Moon Bay and Pilarcitos Creek, including widening of travel lanes and shoulders	Planned $5.33M	Half Moon Bay	RTP Plan Bay Area ID #21893	Improve Operations and Safety	Long Term 2016-2019
A	Construct westbound slow vehicle lane on SR 92 between SR 35 and I-280	Planned $20.87M	I-280 to SR 35	RTP Plan Bay Area ID #94644	Improve Operations and Safety	Long Term 2019-2021
B	Convert .9 mile of service road to multi-purpose trail for pedestrians, cyclists, and equestrians.	Programmed	Between SR 92 and Ralston Bike Trail on Cañada Rd.	RTP Plan Bay Area ID #230430	Multi-modal improvements	Countywide Program
B	SR 92/82 (El Camino Real) Interchange Improvement – turn lanes, signalization, sidewalks, traffic striping	Programmed $18M	City of San Mateo SR 92/SR 82	RTP Plan Bay Area ID #21613	Improve Operations on on and off ramps	Long Term 2016-2019
B	Improve operations at US 101 near SR 92	Planned	US 101/SR 92	RTP Plan Bay Area ID #22282	Congestion Relief	Long Term 2018-2020
B	Widen SR 92 between San Mateo Bridge & I-280, including uphill passing lane from US 101 to I-280	Planned	San Mateo Bridge to I-280	RTP Plan Bay Area ID #21613	Safety Congestion Relief	Long Term
D	Convert SR 92 westbound HOV lanes to Express Lanes from Hesperian Blvd. to San Mateo Bridge Toll Plaza	Planned	Hayward	RTP Plan Bay Area ID #230672/ #240741	Accelerate completion of Express Lane System	Under MTC Regional Express Lane Network 2016-2019
D	Construct new Interchange at SR 92/Whitesell St. and extend Whitesell St. to Clawiter	Planned	Hayward	RTP Plan Bay Area ID #240015	Improve Operations and Safety	Long Term 2016-2040
D	Implement SR 92/Clawiter Rd/Whitesell St. Interchange improvements	Planned	Hayward	RTP Plan Bay Area ID #21093	Improve Operations and Safety	Long Term 2016-2019
D	Upgrade Clawiter Rd/ SR 92 Interchange	Planned	Hayward	RTP Plan Bay Area ID #240562	Collision Reduction	Long Term 2016-2019
D	Widen SR 92/Industrial Blvd Interchange	Programmed	Hayward	RTP Plan Bay Area ID #240065	Congestion Relief	100% locally funded 2015-2040

Programmed - projects included in the State Transportation Improvement Program (STIP), State Highway Operation and Protection Program (SHOPP), or California Federal Transportation Improvement Program (FTIP)

Planned - projects included in an approved State, Regional, or Countywide Transportation Plan

APPENDICES

APPENDIX A
GLOSSARY OF TERMS AND ACRONYMS

Acronyms

AADT- Annual Average Daily Traffic
ADT- Average Daily Traffic
CALTRANS - California Department of Transportation
CCTV – Closed Circuit Television
CMA - Congestion Management Agencies
CMS – Changeable Message Signs
CSS - Context Sensitive Solutions
EMS – Extinguishable Message Signs
FHWA - Federal Highway Administration
GHG - Green House Gas
HAR – Highway Advisory Radio
HCP - Habitat Conservation Plan
HCS - Highway Capacity Software
ITS - Intelligent Transportation System
LOS - Level of Service
MPO - Metropolitan Planning Organizations
NOA - Naturally Occurring Asbestos
NCCP - Natural Community Conservation Plan
PID - Project Initiation Document
PSR - Project Study Report
RTP - Regional Transportation Plan
RTIP - Regional Transportation Improvement Program
RTPA - Regional Transportation Planning Agencies
SCS - Sustainable Community Strategies
SHOPP - State Highway Operation Protection Program
STIP - State Transportation Improvement Program
TDM - Transportation Demand Management
TMS - Transportation Management System
TMS – Traffic Monitoring Station
TOS – Traffic Operations Systems
TSN - Transportation System Network
VMT - Vehicle Miles Traveled

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.

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.

Concept LOS – The minimum acceptable LOS over the next 20-25 years

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 financially constrained plan and is not currently programmed. It could be included in a General Plan or in the unconstrained section of a long-term plan.

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

Facility Concept – Describes 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.

Freeway & Expressway System (F&E) – The Statewide system of highways declared by the Legislature to be essential to the future development of California. The F&E System has been constructed with a large investment of funds for the ability to control access, in order to ensure the safety and operational integrity of the highways.

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

Focus Routes – These routes are a subset of the High Emphasis Routes, representing interregional corridors that should be of the highest priority for completion to minimum facility standards in a 20-year period.

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.

Functional Classification – the process by which streets and highways are grouped into classes, or systems, according to the character of traffic service that they provide. There are three main highway functional classifications: arterial, collector, and local roads. All streets and highways are grouped into one of these classes, depending on the character of the traffic (i.e., local or long distance) and the degree of land access that they allow.
Headway – The time between two successive vehicles as they pass a point on the roadway, measured from the same common feature of both vehicles.

High Emphasis Routes – routes that are characterized as being the most critical Interregional Road System (IRRS) routes for travel throughout the State.

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

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

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 financially constrained section of a long-term plan, such as an approved Regional or Metropolitan Transportation Plan (RTP or MTP), Capital Improvement Plan, or measure.

Post Mile – A post mile is an identified point on the State Highway System. The milepost values increase from the beginning of a route within a count 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.

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 20-25 year horizon. The post-25 year concept can be used to identify potential widening, realignments, future facilities, and rights-of-way required to complete the development of each corridor.

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

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

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

Scenic Highway – An officially designated portion of the State Highway System traversing areas of outstanding scenic beauty which, together with the adjacent scenic corridors, requires special scenic conservation treatment.

Strategic Highway Network (STRAHNET) – is a national network of highways designated by the Department of Defense for emergency response. These routes may be used to transport personnel and equipment in time of emergency.

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

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

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

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

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

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

APPENDIX B
FEDERAL, STATE, AND REGIONAL PLANS AND POLICIES

FEDERAL

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

FAST 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 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.

10-Year SHOPP

The 10-year SHOPP is a state plan for the rehabilitation and reconstruction, or both, of state highways and bridges by the SHOPP. The purpose of the plan is to identify needs for the upcoming 10 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. 10-year SHOPP differs from SHOPP, as it has no funding constraints assigned.

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.

California Strategic Growth Plan

The Governor and Legislature have initiated the first phase of a comprehensive Strategic Growth Plan to address California's critical infrastructure needs over the next 20 years. California faces over $500 billion in

infrastructure needs to meet the demands of a population expected to increase by 23 percent over the next two decades. In November 2006, the voters approved the first installment of that 20-year vision to rebuild California by authorizing a series of general obligation bonds totaling $42.7 billion.

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-375requires 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 by December 31, 2015, and every 5 years thereafter. The bill requires the plan 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% below 1990 levels by 2050. The bill requires the plan to identify the statewide integrated multimodal transportation system needed to achieve these results.

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) now 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."

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.

California Freight Mobility Plan Final, 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 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 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.

Regional Blueprint Planning Program

The Regional Blueprint Planning Program supports the smart growth element of the Strategic Growth Plan by promoting smart land use choices at the regional and local levels. The Regional Blueprint Planning Program was a grant program that supported Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies (RTPAs) to conduct comprehensive scenario planning. Using consensus-building and a broad-based visioning approach it's goal was to envision future land use patterns and their potential impacts on a region's transportation system, housing supply, jobs/housing balance, resource management and other protections. The Blueprint planning effort in the San Francisco Bay Area is the Focus our Vision (FOCUS) program, which is led by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) with support from the Bay Area Air Quality Management District (BAAQMD) the Bay Conservation and Development Commission (BCDC), and Caltrans. These agencies and local governments participated in the Regional Blueprint Planning Program since the program's inception in 2005, receiving grants for all four years, and now carry on regional blueprint goals through *the FOCUS program.*

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
RAMP METERING DEVELOPMENT PLAN – SR 92

2013 Ramp Metering Development Plan

STA	DISTRICT	COUNTY	ROUTE	POSTMILE	DIRECTION	LOCATION	Ramp Type	# of Lanes	HOVPLanes	COMMENT
	4	SM	92	T6.92	WB	NB Rte 280	C	1		Planned
	4	SM	92	R7.53	EB	NB Rte 280	C	1		Planned
	4	SM	92	R7.53	EB	SB Rte 280	C	2		Planned
	4	SM	92	R7.94	WB	Ralston Ave / Polhemus Rd	L	1		Planned
	4	SM	92	R8.13	EB	Ralston Ave / Polhemus Rd	S	1		Planned
	4	SM	92	R8.42	WB	De Anza Blvd	S	1		Planned
	4	SM	92	R8.85	EB	De Anza Blvd	S	1		Planned
	4	SM	92	R9.27	WB	W Hillsdale Blvd	S	1		Planned
	4	SM	92	R9.37	EB	EB W Hillsdale Blvd	L	1		Planned
	4	SM	92	R9.53	EB	WB W Hillsdale Blvd	S	1		Planned
	4	SM	92	R10.46	WB	Alameda De Las Pulgas	S	1		Planned
	4	SM	92	R10.70	EB	Alameda De Las Pulgas	S	1		Planned
	4	SM	92	R11.06	WB	SB Rte 82	S	1		Planned
	4	SM	92	R11.17	EB	SB Rte 82	L	1		Planned
	4	SM	92	R11.25	WB	NB Rte 82	L	1		Planned
	4	SM	92	R11.33	EB	NB Rte 82	S	1		Planned
	4	SM	92	R11.47	WB	Concar Dr / S Delaware St	H	2		Planned
	4	SM	92	R11.74	EB	S Delaware St / 19th Ave	S	2		Planned
	4	SM	92	R11.92	WB	SB Rte 101	C	1		Planned
	4	SM	92	R11.96	WB	NB Rte 101	C	1		Planned
	4	SM	92	R12.37	EB	SB Rte 101	C	2		Planned
	4	SM	92	R12.37	EB	NB Rte 101	C	1		Planned
	4	SM	92	R12.82	WB	Fashion Island Blvd / Mariners Island Blvd	S	2		Part Const
	4	SM	92	R12.95	EB	Mariners Island Blvd / Edgewater Blvd	H	1		Part Const
	4	SM	92	R13.41	WB	Chess Dr / Foster City Blvd	H	2		Planned
	4	SM	92	R13.63	EB	Foster City Blvd / Metro Center Blvd	H	2		Part Const
●	4	ALA	92	R4.42	EB	Clawiter Rd	L	2	M	Non Op
●	4	ALA	92	R4.54	WB	Clawiter Rd	L	2	M	Non Op
●	4	ALA	92	R5.00	WB	Industrial Blvd / Cryer St	S	2		Non Op
●	4	ALA	92	R5.1	EB	Industrial Blvd / Sleepy Hollow Ave	L	2	M	Non Op
●	4	ALA	92	R5.62	WB	Hesperian Blvd	S	2		Non Op
●	4	ALA	92	R5.84	EB	Hesperian Blvd	S	2	M	Non Op
	4	ALA	92	6.26	WB	SB Rte 880	C	1		Planned
	4	ALA	92	6.35	EB	SB Rte 880	C	1		Planned
	4	ALA	92	6.51	WB	NB Rte 880	C	1		Planned
	4	ALA	92	6.55	EB	NB Rte 880	C	1		Planned

● Existing Meter

High Priority

C: Connector
L: Loop
S: Slip
H: Hook

M: Metered
Non Op: Non Operational

APPENDIX D
RESOURCES

CORRIDOR OVERVIEW

California Scenic Highways
http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm
Bicycling: Alameda Countywide Bicycle Plan
http://www.alamedAlameda CTC.org
Bicycle and Pedestrian Plan: San Mateo County
http://www.ccag.ca.gov/CBPP_2011.html
Demographics: Jobs Housing Connection Strategy, 2012
http://www.abag.ca.gov/abag/events/agendas/e051712a-Item%204.A.2,%20Preferred%20Land%20Use%20Scenario%20-Jobs-Housing%20Connection%20Strategy.pdf
Environmental: California's Protected Areas Database
http://www.calands.org/
Environmental: Naturally Occurring Asbestos
ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/ofr_2000-019.pdf
Climate Change
http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/documents/guide_incorp_slr.pdf#zoom=65
Express Lane Network
http://www.mtc.ca.gov/projects/express_lanes/pdfs/expresslanefactsheet_031413.pdf
Transit: Alameda-Contra Costa Transit District (AC Transit)
http://www.actransit.org/
Transit: San Mateo County Transit District (SamTrans)
http://www.samtrans.com/

CORRIDOR PERFORMANCE

Alameda County 2012 LOS Monitoring Study
http://www.alamedAlameda CTC.org/files/managed/Document/10384/2012_LOS_Monitoring_Report-Full_Report.pdf
San Mateo County C/CAG LOS and Performance Measure Monitoring Report -2013
http://www.ccag.ca.gov/pdf/Studies/2013/2013%20CMP_Final%20Nov13.pdf
Traffic Operations – Ramp Metering
http://www.dot.ca.gov/hq/traffops/trafmgmt/ramp_meter/

KEY CORRIDOR ISSUES

Sea Level Rise – Adapting to Rising Tides Vulnerability and Risk Assessment - BCDC/NOAA Nov 2011
http://www.mtc.ca.gov/planning/climate/
Highway Operations
http://www.dot.ca.gov/dist4/highwayops/hoindex.html
Non-Motorized Transportation Access – Office of Transit & Community Planning
http://www.dot.ca.gov/dist4/transplanning/pedbikeprogram/pedbikeprogram.html

CORRIDOR CONCEPT

Regional Transportation Plan – Plan Bay Area
http://onebayarea.org/plan-bay-area/final-plan-bay-area/final-supplementary-reports.html
State Transportation Improvement Program – STIP
http://www.dot.ca.gov/hq/LocalPrograms/STIP.htm
State Highway Operation and Protection Program – SHOPP
http://www.dot.ca.gov/hq/transprog/shopp.htm