Solano Interstate 680
Transportation Concept Report

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

California Department of Transportation
Caltrans Improves Mobility Across California

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ABOUT THE TRANSPORTATION CONCEPT REPORT

System Planning is the long-range Transportation Planning process for the California Department of Transportation (Caltrans). The System Planning process fulfills Caltrans statutory responsibility as owner/operator of the State Highway System (SHS) (Gov. Code §65086) by identifying deficiencies and proposing improvements to the SHS. Through System Planning, Caltrans focuses on developing an integrated multi-modal transportation system that meets Caltrans goals of safety, mobility, delivery, stewardship, and service.

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

TCR Purpose

California's State Highway System needs long range planning documents to guide the logical development of transportation systems as required by law and as necessitated by the public, stakeholders, and system users. The purpose of the TCR is to evaluate current and projected conditions along the route and communicate the vision for the development of each route in each Caltrans District during a 20-25 year planning horizon. The TCR is developed with the goals of increasing safety, improving mobility, providing excellent stewardship, and meeting community and environmental needs along the corridor through integrated management of the transportation network, including the highway, transit, pedestrian, bicycle, freight, operational improvements and travel demand management components of the corridor.

Stakeholder Participation

Stakeholder participation was sought throughout the development of the Solano Interstate 680 TCR. During the information gathering stage for the TCR, stakeholders were contacted for initial input related to their particular interests, and to help verify data accuracy. As the document was finalized, stakeholders were asked to review the document for accuracy and consistency with regard to existing plans, policies, and procedures. The final document was presented to stakeholder groups as a method of information sharing. The process of including stakeholders adds value to the TCR by allowing for outside input and ideas to be reflected in the document and help strengthen public support.

EXECUTIVE SUMMARY

Within District 4, Solano I-680 is a four to nine lane divided freeway which begins at the Contra Costa/ Solano County line, continues north through the cities of Benicia and Fairfield and terminates at Interstate 80. To the south, I-680 intersects with Interstate and State Highway routes in Contra Costa, Alameda and Santa Clara Counties before terminating at US 101 in the City of San Jose. The Solano I-680 corridor serves local traffic between Benicia and Fairfield, links commuters to major economic/employment centers, supports interregional travel and goods movement through direct access to I-80 (via the I-80/I-680/SR 12 Interchange), and carries local truck traffic supporting general commerce in Solano County. Solano I-680 also provides primary access to the Sacramento Valley via I-80 and points beyond including recreational opportunities in the California Delta and Sierra Nevada Mountain range throughout the year. This Solano I-680 TCR evaluates current traffic conditions along the route using 2010 as the Base Year and provides forecast conditions for a Horizon Year of 2030. Segmentation for this TCR is based upon changes in jurisdictional borders, facility types, lane configurations, access, land use and travel demand.

Concept Summary					
Segment	**Post Miles**	**County**	**Segment Description**	**Existing Facility**	**20-yr Concept:**
1	(PM 0.00 to R1.002)	Solano	CC–SOL County Line (mid bridge span) to Bayshore Road	9F–4F	9F–6F(2H)
2	(PM R1.002 to R1.461)	Solano	Bayshore Road to Industrial Way	5F	5F–7F(2H)
3	(PM R1.461 to R2.819)	Solano	Industrial Way to Lake Herman Road	4F	6F(2H)
4	(PM R2.819 to R8.170)	Solano	Lake Herman Road to Fairfield City Limit	4F	6F(2H)
5	(PM R8.170 to R13.13)	Solano	Fairfield City Limit to I-80.	4F	6F(2H)

Table 1. SOL I-680 Concept Summary PM=Post Mile, F=Freeway, H=High Occupancy Vehicle/Toll Lane

Concept Rationale

The Association of Bay Area Governments (ABAG) anticipates moderate growth and development along the Solano I-680 corridor creating the need for a 20-year route concept which includes improvement strategies for increasing both capacity and operations. The 2030 route concept for the corridor is based on planned and programmed projects listed in the 2013 Regional Transportation Plan (RTP). The 20-year concept envisions a future facility with bi-directional mainline Express (toll) Lanes with direct connector ramps between I-80 and Solano I-680, Intelligent Transportation Systems (ITS) infrastructure, and Traffic Operations Systems (TOS) elements including ramp metering along the entire route.

Proposed Projects and Strategies

Capacity and operational improvements are currently planned for all segments of Solano I-680. Recent transportation planning studies have focused on improving freeway capacity, operations and connections to reduce delay, improve reliability, mobility and safety for all users (see Key Corridor Issues section, page 24). These transportation studies have helped inform the regional Transportation Planning process by recommending concepts and strategies for the development of future transportation projects on Solano I-680 (see Corridor Concept section, page 26).

CORRIDOR OVERVIEW

Route Segmentation

SOL I-680 Route Segmentation			
Segment	**Location Description**	**Co_Route_Beginning PM**	**Co_Route_Ending PM**
1	Contra Costa / Solano County line to Bayshore Road	SOL_680_0.00	SOL_680_1.002
2	Bayshore Road to Industrial Way	SOL_680_1.002	SOL_680_1.461
3	Industrial Way to Lake Herman Road	SOL_680_1.461	SOL_680_2.819
4	Lake Herman Road to Fairfield City Limit	SOL_680_2.819	SOL_680_8.170
5	Fairfield City Limit to I-80	SOL_680_8.170	SOL_680_R13.13

Table 2. SOL I-680 Route Segmentation

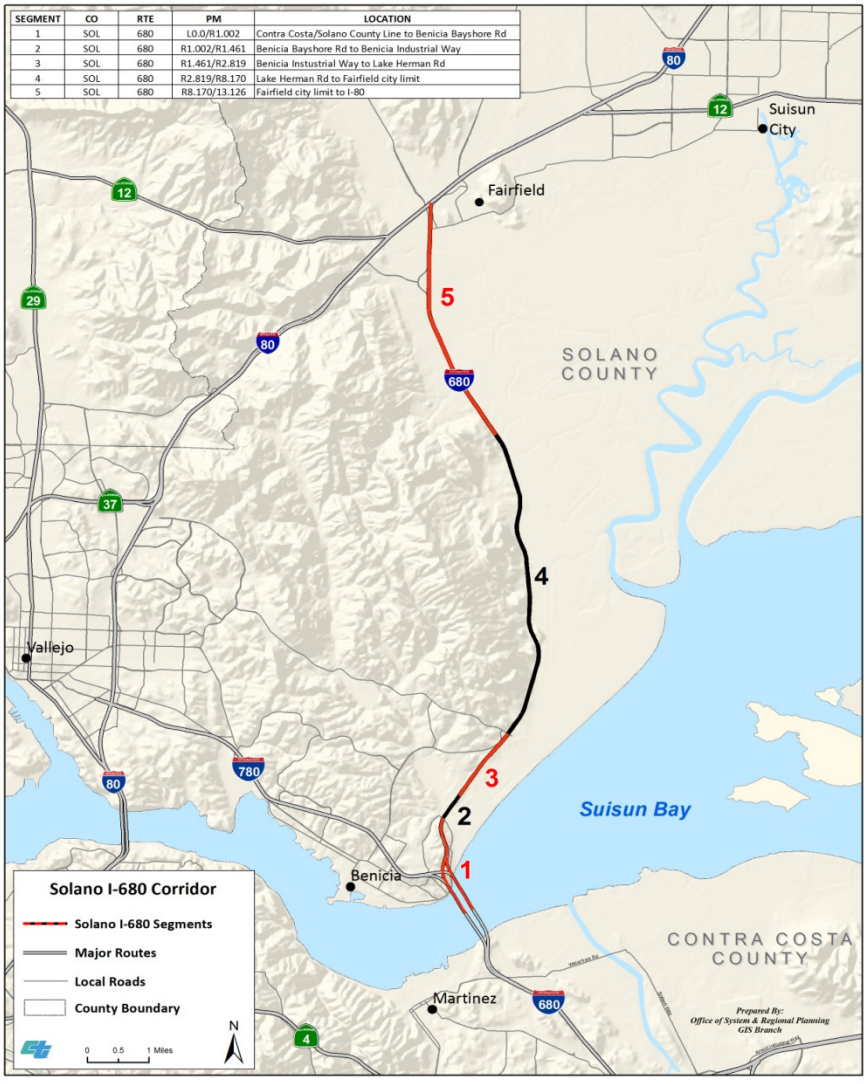


Figure 1. SOL I-680 Route Segmentation Map

Route Description

The Solano I-680/Luther E. Gibson Freeway is a south-north route that traverses Solano County connecting the Cities of Benicia, Fairfield and unincorporated Cordelia. The 2010 U.S. Census classifies Fairfield as an Urban Area and Benicia as Rural based on their population and housing densities. The corridor is 13.13 miles in length beginning at the Contra Costa-Solano County line and ending at the I-80/I-680/SR 12 Interchange. The southernmost segment of Solano I-680 travels over the Carquinez Strait via the Benicia - Martinez Bridge and joins with I-780 before bisecting the historic City of Benicia. Traversing the Suisun Bay shoreline, the route passes east of Benicia's residential and historic downtown district before entering the commercial and industrial sectors of the City as it crosses the Benicia Viaduct. Leaving Benicia at the junction of Lake Herman Road the route heads north across the alluvial lowlands of Green Valley bound by coastal foothills and the marshes of Grizzly Flat. Flanked by Lopes Road to the west, Solano I-680 emerges upon the suburban neighborhoods of the City of Fairfield before reaching I-80 which marks the terminus of the route.

Solano I-680 is identified as a Basic Route within the Caltrans Interregional Road System (IRRS) and is functionally classified as an Interstate Freeway on the California Road System (CRS). It is also designated as a Caltrans District 4 Recovery Route which is a subset of the California Lifeline Route System. Lifeline Routes take first priority in terms of route recovery/restoration following a major incident or disaster for the purpose of emergency movement of goods and services (aka emergency logistics). Recovery Routes are considered the next priority for recovery/restoration to further expand the movement of goods and services after major incidents or disasters. The 2008 Solano County General Plan also identifies the route as an Emergency Response Route. The Federal Highway Administration (FHWA) designates truck configurations allowed on State highways and identifies areas where truck length restrictions occur. The entire length of Solano I-680 is designated as a National Network (NN) route as authorized by the federal Surface Transportation Assistance Act (STAA) of 1982. This designation permits access for larger (width and length) trucks as defined by the federal National Highway System.

Solano I-680 also serves as a major commuter link between Solano County housing and central Contra Costa and Silicon Valley job centers. Communities in the Sacramento Valley Region (Fairfield, Vacaville and Suisun City) have grown considerably in recent decades. As a consequence, commute volumes have increased over the Benicia-Martinez Bridge (via Solano I-680) into Contra Costa, Alameda and Santa Clara Counties. MTC Regional Travel Demand Model (TDM) data claims that in 2009, during the southbound AM peak, nearly 64% of traffic coming from I-80 was destined for Contra Costa I-680 while 16% traveled on to I-780. During the northbound PM peak, approximately 90% of northbound traffic came from Contra Costa I-680 and 10% from I-780; with the vast majority continuing on to I-80. In 2030 the MTC Regional TDM suggests the percentage of AM and PM peak period vehicle trips destined for Contra Costa I-680 and I-80 will increase while trips coming to and from I-780 will decrease as Contra Costa and Solano County segments of I-680 are improved with the construction of Express Lanes and the installation of TOS elements. Diagrams on MTC Regional Travel Demand Model Origins and Destinations for 2009 and 2030 are located in Appendix C.

Lastly, while the Solano I-680 corridor has relatively low truck volumes (5% of total traffic), on average 51% of them are five-axle or more vehicles. Solano I-680 is also used for recreational purposes and is a secondary route from Contra Costa County to the Sacramento Valley and points beyond including the Sierra Nevada Mountains. A summary of route designation and characteristics as well as features, purpose and description are summarized in Table 3 on the next page.

Route Designation and Characteristics

SOL I-680 Route Designation					
Segment #	**1**	**2**	**3**	**4**	**5**
Freeway and Expressway System	Yes	Yes	Yes	Yes	Yes
National Highway System	Yes	Yes	Yes	Yes	Yes
Strategic Highway Network	Yes	Yes	Yes	Yes	Yes
Scenic Highway	No	No	No	No	No
Interregional Road System Route	Yes	Yes	Yes	Yes	Yes
High Emphasis Route	No	No	No	No	No
Focus Route	No	No	No	No	No
Federal Functional Classification	Freeway	Freeway	Freeway	Freeway	Freeway
Goods Movement Route	Yes	Yes	Yes	Yes	Yes
Truck Designation	*STAA/NN	STAA/NN	STAA/NN	STAA/NN	STAA/NN
Rural/Urban/ Urbanized	Rural	Rural	Rural	Urban Cluster	Urban Cluster
Metropolitan Planning Organization	Metropolitan Transportation Commission (MTC)	MTC	MTC	MTC	MTC
Congestion Management Agency	Solano Transportation Authority (STA)	STA	STA	STA	STA
Local Agencies	Solano County/ City of Benicia	Solano County/City of Benicia	Solano County/City of Benicia	Solano County/City of Fairfield	Solano County/City of Fairfield
Tribes	N/A	N/A	N/A	N/A	N/A
Air District	Bay Area Air Quality Mgmt District (BAAQMD)	BAAQMD	BAAQMD	BAAQMD	BAAQMD
Terrain	Rugged	Rolling	Rolling	Flat	Flat

Table 3. SOL I-680 Route Designation and Characteristics

* Federal Surface Transportation Assistance Act of 1982/National Network

Community Characteristics

Although the cities of Benicia and Fairfield represent established communities located along the Solano I-680 corridor, there are also clusters of residences in unincorporated areas of Solano County communities such as Cordelia and those associated within habitat preserves and recreational uses. According to the 2010 Census, up to 25% of the county residents live in this area along the corridor. On average, Solano County residents travel 29.5 minutes each way to and from employment destinations in the Sacramento Valley, the Bay Area and Silicon Valley. These communities are deeply rooted in their historical and cultural heritage, and the policies and directives outlined in the county of Solano and the cities of Benicia and Fairfield General Plans reflect preservation of those communities. The community has a close relationship to nearby historical landmarks, wildlife, habitats and cultural sites, including the Benicia Historic District, Grizzly Island Wildlife Preserve and Pioneer Monument. Active community involvement in recent planning efforts, including those related to Solano I-680, I-80 East and State Route (SR) 12 (see Key Corridor Issues section, page 24), reaffirm the community's interest in protecting their community identities and willingness to shape a near and long term vision of a viable community that is pedestrian and bicycle friendly.

2010 Census Data				
City	**Population**	**Housing Units**	**Median Income**	**Mean Travel time to Work**
Benicia	26,997	11,306	$87,018	29.7min
Fairfield	105,321	37,184	$68,009	28.8min
Solano County	416,471	152,698	$68,409	29.5min

Table 4. 2010 Census Quick Fact Data/Cities of Benicia, Fairfield and Solano County

Land Use

Solano County encompasses approximately 821 square miles. The County's economy is based mostly on agriculture and preservation which is encouraged by directing growth into incorporated areas. Land uses in unincorporated areas served by Solano I-680 are primarily agricultural, but also support some public land uses associated with Grizzly Island Wildlife Area and Travis Air Force Base. The area is known for its production of a variety of agricultural commodities including compost, alfalfa, tomatoes, and cattle among others. The area is also experiencing an increase in maritime industries such as automobile importing and distribution.

The City of Benicia is approximately three square miles. Solano I-680 bisects the city as a freeway adjacent to rail, maritime, commercial-industrial, and public/quasi-public land uses including the Union Pacific Rail Complex and the Port of Benicia. The route provides access to the city's commercial – industrial complexes and supports interregional goods movement through direct access to I-80, I-780, SR 12 and indirect access to I-5, I-505, SR 37 and SR 99.

The City of Fairfield is approximately 37 square miles. Solano I-680 intersects the City at the I-80/I-680/SR 12 Interchange just west of downtown Fairfield near industrial–commercial and retail land uses such as the Fairfield Business Park and Green Valley Shopping Center.

In 2010 the Caltrans Smart Mobility Framework (SMF) was developed as a help guide to assess how well plans, programs and projects meet the definition of location efficiency/smart mobility. Place Types, considered a tool for general land use based classifications of towns, cities, and larger areas, are measured and ranked based upon their community characteristics and regional access to the transportation system. Once an analysis has been completed, the SMF recommends likely transportation, development and conservation investment strategies so that greater mobility benefits can be realized in the future. The Solano I-680 corridor has six SMF Place Types which are described in Table 5 below and in Figure 2 on Page 8.

Solano I-680 Smart Mobility Framework Place Types	
Place Type	***Likely Transportation, Development and Conservation Measures***
3 - Compact Communities *Historic cities and towns as well as newer places characterized by strong presence of community design elements. While most compact communities are outside of metropolitan regions, some are on the periphery of metropolitan regions.*	*Improve capacity on freeways and arterials: connectivity between street, bicycle and pedestrian network: Express lane system and regional connectivity. Protect assets value while investing in transit centers. Enhance/revitalize neighborhoods and preserve affordable housing and open space.*
4- Suburban Communities *characterized by a low level of integration of housing with jobs, retail, and services, poorly connected street networks, low levels of transit service, large amounts of surface parking, and inadequate walk ability*	*Improve Operational efficiency and connectivity of arterials and fwys. Improve conditions for walking and bicycling. Improve Access mgmt & speed on arterials and Promote Transit & Ridesharing*
• ***4B – Corridors*** *Arterial streets with a variety of fronting development types, frequently characterized by inadequate walk and bike environments, low land use efficiency and poor aesthetics.*	*Improve Operational efficiency and connectivity of arterials and freeways: Conditions for walking and bicycling: Access mgmt & speed on arterials and Promote Transit & Ridesharing*
• ***4C - Dedicated Use Areas*** *Large tracts of land used for commercial purposes such as business or industrial park or warehousing, or for recreational purposes such as golf courses*	*Improve Operational efficiency and connectivity of arterials and fwys. Improve conditions for walking and bicycling. Improve Access mgmt & speed on arterials and Promote Transit & Ridesharing*
• ***4D- Neighborhoods*** *Residential subdivisions and complexes including housing, public facilities and local-serving commercial uses, typically separated by arterial corridors.*	*Improve Operational efficiency and connectivity of arterials and fwys. Improve conditions for walking and bicycling. Improve Access mgmt & speed on arterials and Promote Transit & Ridesharing*
6 – Protected lands *Lands protected from development by virtue of ownership, long-term regulation, or resource constraints.*	*Improve capacity, internal-interregional connectivity, bicycle circulation and trail access. Create strategies to retain open space, natural resources and landscapes.*

Table 5. SOL I-680 Smart Mobility Framework Place-Types

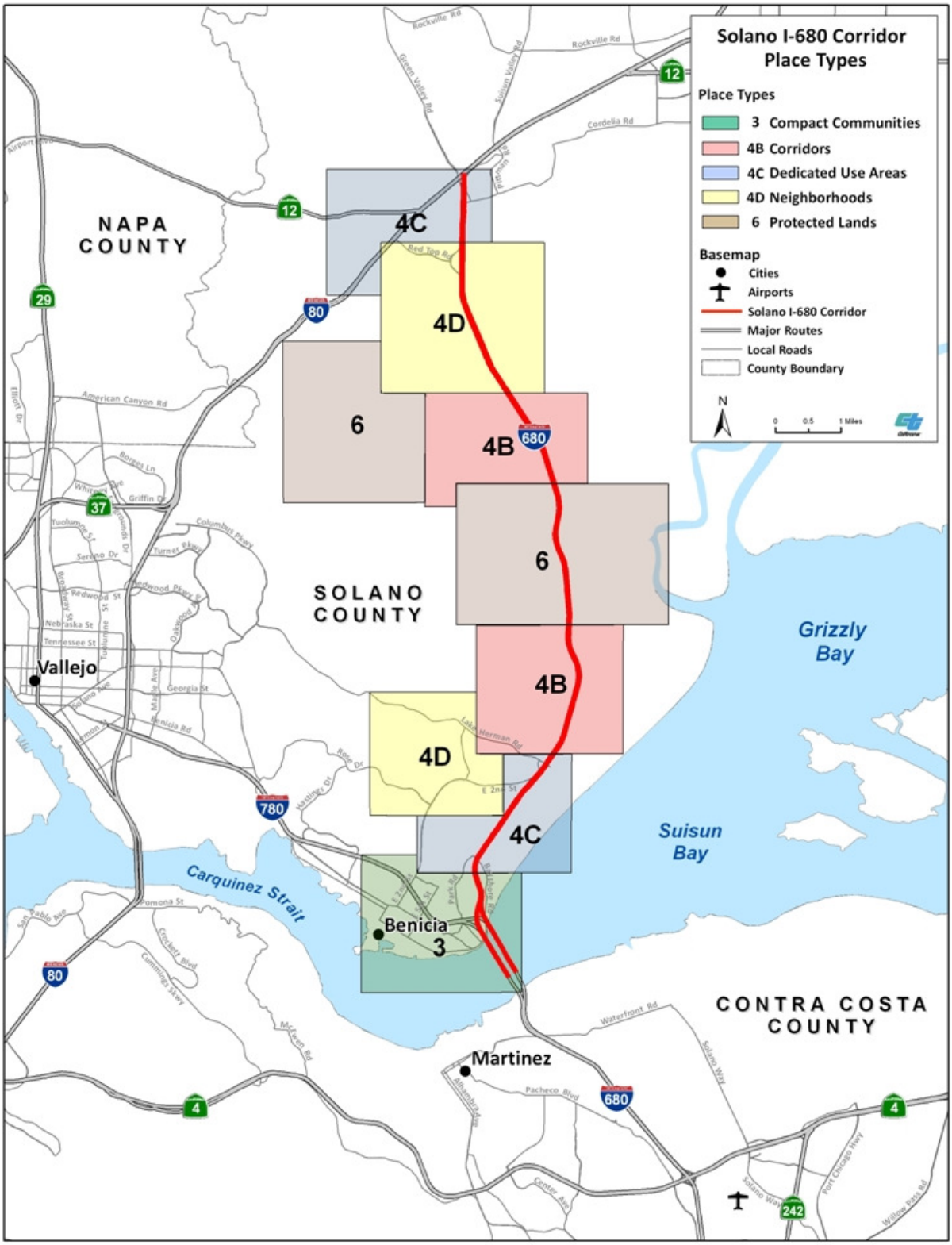


Figure 2. SOL I-680 Smart Mobility Framework Place Types

In 2007, ABAG established the FOCUS program and invited local governments to apply for regional designation of areas within their city or county as Priority Development Areas (PDA). PDAs are defined as infill development opportunities within existing communities. They are committed to creating more housing choices in locations easily accessible to transit, jobs, shopping and services. To be eligible to become a PDA, an area had to be within an existing community, near existing or planned fixed transit or served by comparable bus service, and planned for more housing. An "*approved area"* is part of an existing plan that is more specific than a general plan, such as a specific plan or an area plan. A "*potential area"* may be envisioned as a potential planning area that is not currently identified in a plan or may be part of an existing plan that needs changes. Table 6 below lists the planned and potential PDAs within the Solano I-680 corridor area.

SOL I-680 Priority Development Area	
PDA	**Designation**
City of Benicia: *Downtown*	Approved
City of Benicia: *Benicia-Industrial Park*	Approved
City of Fairfield: *Downtown South*	Approved
City of Fairfield: *Fairfield/Vacaville Train Station*	Potential
City of Fairfield: *North Texas Street Core*	Potential
City of Fairfield: *West Texas Street Gateway*	Potential
City of Suisun City: *Downtown/Waterfront District*	Approved

Table 6. SOL I-680 Priority Development Areas

Complete Streets

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

Implementing Complete Streets and other multi-modal concepts supports the California Complete Streets Act of 2008 (AB 1358), as well as the California Global Warming Solutions Act of 2006 (AB 32), Senate Bill (SB) 375 and SB 391, which outline the State's role in reducing greenhouse gas emissions. In support of Complete Streets, Caltrans Deputy Directive 64-Revision (CDD-64R) provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities on the State Highway System. Caltrans views all transportation improvements (new and retrofit) as opportunities to improve safety, access, and mobility for all travelers and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system. With AB 1358 and DD-64-R1, both Caltrans and local agencies are working to address common goals.

MTC's One Bay Area Grant (OBAG) Program requires participating agencies to adopt resolutions which incorporate (MTC) Complete Streets elements and modify their general plans to comply with the California Complete Streets Act. Agencies are encouraged to consult with internal departments as well as stakeholders and to go beyond the required elements to accommodate all users of the roadway network. Language in the elements is kept general to allow jurisdictions the flexibility they need to develop their own policy. Beginning in 2015, jurisdictions will be required to update the circulation element of their general plans for compliance with the CA Complete Streets Act to maintain eligibility for these funds. The cities of Benicia and Fairfield as well as the County of Solano have each drafted

Complete Streets resolutions. However, in Fairfield's case, they did not pass a resolution instead opting to update/amend their general plan to incorporate Complete Streets policy statements. The Solano Transportation Authority (STA) approved this approach.

California Transportation Plan (CTP)
SB 391 requires Caltrans update the statewide California Transportation Plan (CTP) by December 31, 2015 and every five years thereafter. The CTP shall identify the integrated multimodal transportation system needed to achieve maximum feasible greenhouse gas emissions reductions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050 (as required by AB 32). In addition, SB 391 requires the CTP incorporate transportation policies and system performance objectives from approved regional transportation plans. Caltrans must also consult, coordinate, and make drafts of the CTP available for review and comment to the: California Transportation Commission, Strategic Growth Council, State Air Resources Board, State Energy Resources Conservation and Development Commission, air quality management districts, public transit operators, and Regional Transportation Planning Agencies.

Sustainable Communities Strategy (SB 375)
SB 375 requires Metropolitan Planning Organizations (MPO) to meet State mandated greenhouse gas emission reduction targets for automobiles and light trucks for years 2020 and 2035. MPO's must accurately account for the environmental benefits of more compact development and reduced vehicle miles traveled. If regions develop integrated land use, housing and transportation plans that meet the SB 375 targets, new projects in these regions can be relieved of certain review requirements of the California Environmental Quality Act (CEQA). The emission reduction targets apply to the 18 designated MPO regions in the State.

The 2013 Regional Transportation Plan approved by MTC, the MPO for the San Francisco Bay Area Region, includes a Sustainable Community Strategy (SCS) as required by SB 375. The bill synchronizes the Regional Housing Needs Assessment (RHNA) process with the RTP process, requires local governments to rezone their general plans, consistent with the updated housing element within three years of adoption, and provides that RHNA allocations must be consistent with the development pattern in the SCS. The SCS will lay out how greenhouse gas (GHG) emission reduction targets will be met for cars and light trucks and will provide new strategies for addressing land use and transportation over a long-range planning horizon**.**

System Characteristics

The Solano I-680 corridor is approximately 13.13 miles in length. It is the northernmost part of I-680 which begins in San Jose (Santa Clara County) and ends in Fairfield (Solano County). Solano I-680 provides essential interregional connectivity to the California State Highway and Interstate System. Solano I-680 consists of six segments varying from four and nine lanes. Notable bridge structures include the George Miller Jr. - Benicia-Martinez Bridge and the Benicia Viaduct. Solano I-680 is also host to a network of transportation modes with some serving intraregional (local) travel and others utilizing interregional and interstate travel demand. The majority of travel on Solano I-680 is commuter traffic during the week, however the route can also experience congestion on weekends from recreational travel demand. The route averages relatively low truck volumes.

Current ITS infrastructure on the Solano I-680 Corridor includes closed-circuit television (CCTV) cameras, changeable message signs (CMS), extinguishable message signs (EMS), Highway Advisory Radio (HAR), ramp metering (RM) stations and traffic monitoring stations (TMS). Non recurrent incident management is provided by Caltrans on the Benicia-Martinez Bridge and by the MTC Freeway Service Patrol (FSP) on the remaining segments of the route.

Capitol Corridor and Amtrak trains provide interregional rail service between Sacramento and San Jose and points beyond. There are stations adjacent to the corridor in Martinez and Fairfield-Suisun City and a planned station in the vicinity of Lake Herman Road in Benicia and Fairfield-Vacaville in Fairfield. The Solano Transportation Authority (STA) coordinates directly with a coalition of transit operators including Solano Transit (SolTrans) and Fairfield and Suisun Transit (FAST). Both public transit operators provide intercity and interregional transit service connections to the Bay Area Rapid Transit District (BART) at Pleasant Hill and Walnut Creek stations in Contra Costa County, Baylink Ferry in Vallejo, and Amtrak/Capitol Corridor at Fairfield-Suisun City and Martinez stations.

Pedestrian and bicycle access along the route is allowed on the Multiple Use Trail (MUT) atop the Benicia-Martinez Bridge. Along the remaining route segments a network of connecting local and county maintained roads, MUT's, and other paths allow pedestrians and cyclists to reach destinations along the remaining segments of the corridor. Pedestrian and bicycle access across Solano I-680 corridor is provided at corridor interchanges. However, the ability to cross the route varies due to inconsistencies in access to the interchanges, spacing between them and lack of supportive infrastructure making some crossings more challenging than others.

Planning processes for both STA's Comprehensive Transportation Plan and Countywide Bicycle and Pedestrian Plans are well organized at the local and county level. Local plans focus on economic development while retaining historical heritage and character. County planning efforts rely upon federal, State and county funds to maintain investments in resource, homeland security, transportation and maritime infrastructure which cannot be sustained on local funding sources. Table 7 on the next page lists additional System Characteristics Data for Solano I-680 and also includes the 20-year facility concept for the route. Performance Characteristics can be found in Table 13 on page 23.

SOL I-680 System Characteristics Data					
Segment #	**1**	**2**	**3**	**4**	**5**
Existing Facility (2010)					
Facility Type	F	F	F	F	F
General Purpose Lanes	9-4	4	4	4	4
Lane Miles	6.272	1.836	5.432	21.404	19.824
Centerline Miles	1.092	.459	1.358	5.351	4.956
Median Width	6-45’	22’	22-46’	8-46’	8-46’
Median Characteristics	Paved	Guardrail	Guardrail	Barrier	Barrier
HOV Lanes	0	0	0	0	0
Auxiliary Lanes	0	0	0	0	0
Truck Climbing Lanes	0	0	0	0	0
Distressed Pavement	5-35%	84%	67%	29%	29%
ROW	100’+	100’+	100’+	100’+	100’+
Concept Facility (2030)					
Facility Type	F	F	F	F	F
General Purpose Lanes	9-6	6	6	6	6
Lane Miles	8.456	2.754	8.148	32.106	29.736
Centerline Miles	1.092	.459	1.358	5.351	4.956
HOV /HOT Lanes	2	2	2	2	2
Aux Lanes	0	0	0	0	0
Truck Climbing Lanes	0	0	0	0	0
ROW Needs	150’	150’	150’	150’	150’
TMS Elements					
TMS Elements (Base Year)	Mainline Detection, RM	Mainline Detection, RM	Mainline Detection, RM	Mainline Detection, RM	Mainline Detection, RM
TMS Elements (Horizon Year)	Mainline Detection, RM,CCTV, EMS, TMS	Mainline Detection, RM,CCTV, EMS, TMS	Mainline Detection, RM,CCTV, EMS, TMS	Mainline Detection, RM,CCTV, EMS, TMS	Mainline Detection, RM,CCTV, EMS, TMS

Table 7. SOL I-680 System Characteristics Data Table
PM=Post Mile, F=Freeway, H=High Occupancy Vehicle Lane

Bicycle Facility

The Solano I-680 bicycle network consists of State, county and local systems including Class 1 (multi-use bikeway), Class 2 (bike lane), Class 3 (bike route), and shared travel lane facilities. Along State right-of-way bicycles are allowed along the Class 1 bikeway which connects the Benicia-Martinez Bridge to the City of Benicia local bicycle network. The City of Benicia bicycle network consists of shared roads and Class II bicycle facilities beginning on Park Road and continuing north on 2nd Street before ending at Lake Herman Road. The remainder of the network continues on Lopes Road as a shared road and Class II facility that runs parallel to Solano I-680 before ending at the I-80/I-680 interchange and heads north east into Fairfield. Future improvements listed in the STA Solano Countywide Bicycle Plan, along with locally approved plans, focus on reducing or eliminating existing gaps and barriers in the network. Table 8 below lists the current State, county and local bicycle network along the Solano I-680 corridor.

SOL I-680 Bicycle Facilities																
	State Bicycle Facility											Parallel Bicycle Facility				
Segment	Segment	Post Mile	Location Description	Bicycle Access Prohibited	Facility Type	Outside Paved Shoulder Width	Facility Description	Distressed Pavement	Volume	Role	Posted Speed Limit	Parallel Facility Present	Segment	Name	Location Description	Classification
1	*A*	*0.000-1.002*	*CC-SOL County Line to Bayshore Road*	*No*	*Bike Path*	*>8 ft.*	*Class I*	*NA*	*Low*	*Bike/Ped Access – connector to Park Avenue*	*65 mph*	*Yes*	*1*	*Class-1/Park Road*	*Class 1 to Bayshore Road*	*1/ Shared*
2	*B*	*1.002-1.461*	*Bayshore Road to Industrial Way*									*Yes*	*2*	*Park Road*	*Bayshore Road to Industrial Way*	*Shared*
3	*C*	*1.461-2.819*	*Industrial Way to Lake Herman Road*									*Yes*	*3*	*Park Rd./2nd Street*	*Industrial Way to Lake Herman Road*	*Shared*
4	*D*	*2.819-8.170*	*Lake Herman Road to City of Fairfield*									*Yes*	*4*	*Lopes Road*	*Lake Herman Road to City of Fairfield*	*2/ Shared*
5	*E*	*8.170-R13.13*	*City of Fairfield to I-80*									*Yes*	*5*	*Lopes Road*	*City of Fairfield to I-80.*	*2/ Shared*

Table 8. SOL I-680 Bicycle Facilities

Pedestrian Facility

The Solano Countywide Pedestrian Plan, prepared by STA, describes an existing Pedestrian Network consisting of small locally accessible nodes, short direct access routes, and multi-use trail (MUT) facilities. MUTs provide pedestrian access to and from the Benicia – Martinez Bridge while local and county pedestrian infrastructure and corridor interchanges provide pedestrian access across Solano I-680. Barriers to expanding the pedestrian network include auto-oriented low density land uses, surrounding geographical and built features, and transportation system infrastructure. Gaps in the pedestrian network exist due to a lack of connectivity between the hierarchy of existing pedestrian facilities including MUTs, interregional and local facilities and the existing built landscape. As mentioned in the Bicycle Facilities section, future improvements listed in the Solano Countywide Pedestrian Plan focus on reducing or eliminating existing gaps and barriers in the pedestrian network. Table 9 below lists the present State, county and local pedestrian networks along the Solano I-680 corridor.

SOL I-680 Pedestrian Facilities															
										Junction					
Segment	Ped. Segment	Post mile	Location Description	Ped. Access Prohibited	Sidewalk Present	Sidewalk Width	Facility Description	Role	Volume	Location	Role	Type	Large Corner Radii	Crossing Distance	Alt. Facility
1	F1	0.000 To 0.203	Benicia-Martinez Bridge	No	Yes	>8 ft.	Class I	Bridge Crossing	Med	Benicia-Martinez Bridge	Major	Class I	Yes	NA	N
	F2	0.203 to 1.002	I-780 to Bayshore Road	No	No	NA	No sidewalk / crosswalk	Over pass	Low	Bayshore Road	Major	Grade separated, not signalized	No	30 ft.	Y
2	G	1.002 to 1.461	Bayshore Road to Industrial Way	Yes	No	NA	No sidewalk / crosswalk	Over pass	Low	Industrial Way	Major	Grade separated, not signalized	Yes	30 ft.	Y
3	H	1.461 to 2.819	Industrial Way to Lake Herman Road	Yes	No	NA	No sidewalk / crosswalk	Under pass	Low	Lake Herman Road	Major	Grade separated, not signalized	Yes	30 ft.	Y
4	I1	2.819 to 8.170	Lake Herman Road to City of Fairfield	Yes	No	NA	No sidewalk / crosswalk	Under pass	Low	Lake Herman Road	Major	Grade separated, not signalized	Yes	30 ft.	Y
	I2			Yes	No	NA	No sidewalk / crosswalk	Under pass	Low	Parish Road	Major	Grade separated, not signalized	Yes	30 ft.	Y
	I3			Yes	No	NA	No sidewalk / crosswalk	Under pass	Low	Marshview Road	Major	Grade separated, not signalized	Yes	30 ft.	Y
5	J1	8.170 to R13.13	City of Fairfield to I-80	Yes	No	NA	No sidewalk / crosswalk	Under pass	Low	Gold Hill Road	Major	Grade separated, not signalized	Yes	30 ft.	Y
	J2			Yes	No	NA	No sidewalk / crosswalk	Inter change	Low	I-80	Major	Grade separated, not signalized	NA	30 ft.	Y

Table 9. SOL I-680 Pedestrian Facilities

Transit Facility

STA coordinates directly with a coalition of transit operators including Solano Transit (SolTrans) and Fairfield and Suisun Transit (FAST) to provide intercity and commute express bus services which connect transit riders with regional economic and employment centers in Solano County. Intercity service is available six days a week between Fairfield, Vacaville, Benicia and Vallejo. Transit headways vary between peak hour and daytime service. Commuter bus service is available weekdays between Fairfield, Benicia and Vallejo, Capital Corridor/Amtrak Stations at Fairfield-Suisun City and Martinez as well as the Bay Area Rapid Transit District (BART) stations in Pleasant Hill and Walnut Creek. FAST and SolTrans vehicles are equipped with bike racks on buses and each is capable of carrying two or more bicycles depending on circumstances. Capitol Corridor/Amtrak regional rail service between San Jose and Auburn is available from the Fairfield-Suisun City and Martinez intermodal stations. Rail service is available seven days a week with headways varying from thirty minutes during weekday peak periods to 2.5 hours during off peak hours and weekends. Most trains feature facilities for bicycles however, capacity varies depending upon rolling stock and differing policies between Capitol Corridor and Amtrak. Future planned system expansion of Capitol Corridor service includes reduced headways during weekday peak periods, weekend service incentives and construction of an intermodal station in the vicinity of Lake Herman Road in Benicia. Lastly, transit connections to various park and ride facilities located in Fairfield, Benicia, Suisun City and Martinez furnish commuters with the option to car pool or use transit. Table 10 below displays present transit options in the Solano I-680 corridor.

SOL I-680 Transit Service												
Segment	Mode & Collateral Facility	Name	Route End Points	Headway	Operating Period	ITS & Technology	Stations		Amenities	Bikes Allowed on Transit	Location Description	# Parking Spaces
							Cities	Post miles				
1-5	Rail	Amtrak: Capitol Corridor	San Francisco to Chicago	Long	Daily	ETA-ETD	Martinez	0.00 to R13.13	WIFI, Sleeper Service	Y	NA	110
		Amtrak: Capitol Corridor	San Jose to Auburn	Long	Daily	ETA-ETD	Suisun City	0.00 to R13.13	Bike Racks, WIFI	Y	NA	245
2	Park & Ride	Caltrans	NA	NA	Daily	NA	Benicia	1.002	Bike Racks, WIFI	NA	E. 2nd Street/ I-780	15
2	Express Bus/BRT	SolTrans Transit 78	Vallejo to WC/PH BART	Med-Long	M-S	ETA-ETD	Vallejo, Benicia,	0.00 to 0.203	Bike Racks, WIFI	3	NA	NA
1-5	Express Bus/BRT	FAST transit 40	Fairfield to WC/PH BART	Med	M-F	ETA-ETD	Fairfield Suisun City, ,	0.00 to R13.13	Bike Racks, WIFI	3	Bayline Ferry Service	NA
5	Park & Ride	Caltrans	NA	NA	NA	NA	Fairfield	NA	Bike Racks, WIFI	3	Red Top Rd./I-80	214
5	Park & Ride	Caltrans	NA	NA	NA	NA	Fairfield	NA	Bike Racks, WIFI	3	Green Valley Rd./I-80	59

Table 10. SOL I-680 Transit Service

Freight

Solano I-680 serves as a gateway for the flow of commerce and economic activity across regional and interstate transportation networks. National commodities such as electronics, manufactured products and agricultural goods traveling to and from the Port of Oakland utilize the Solano I-680 corridor. The privately owned and operated Port of Benicia specializes in the handling of agricultural products and motor vehicle importing. Amports USA Company processes up to 100,000 vehicles each year which arrive from Toyota, Hyundai and Kia manufacturing facilities in Japan and Korea. Interstate and regional truck traffic accounts on average for about 5 percent of total traffic with about 51 percent of those trucks being five-axle vehicles. It is anticipated that over the 20-year planning horizon, five-axle Average Annual Daily Truck Traffic (AADT) will increase between 18 and 25%. The Benicia Industrial Park, located in segment 2, is served by Union Pacific Railroad (UPRR) which operates two rail facilities. The first rail facility provides transcontinental Trailer on Flat Car services, while the second provides direct access to the UPRR mainline through siding and tie-ins. Future improvement projects include the Bahia-Benicia Crossover project just north of Martinez Bridge which will improve operational efficiency and help reduce travel times for both passenger and freight carriers. Table 11 below and Figure 3 on the following page display current regional freight facilities along Solano I-680.

SOL I-680 Freight Facilities					
Facility Type/Freight Generator	**Location**	**Mode**	**Name**	**Major Commodity/ Industry**	**Comments/Issues**
Port	*Benicia*	*Ship, rail, truck*	*Port of Benicia*	*Bulk -Agriculture Products, Automobiles*	*Shipping and UPRR Intermodal Freight Facility*
Rail Line	*Benicia*	*Rail*	*Burlington Northern Santa Fe Railway (BNSF) (Class I)*	*Electronics, Manufactured Products, Agriculture*	*Bahia-Benicia Crossover Project*
Intermodal Freight Facility / Rail Line	*Benicia*	*Rail*	*Union Pacific Railroad (UPRR) (Class I)*	*Automobiles, Agricultural Goods*	*Trailer On Flat Car – Intermodal - Bahia-Benicia Crossover Project*
Highway	*Fairfield*	*Truck*	*I-80 (National Network)*	*Electronics, Manufactured Products, Agriculture*	*State IRRS High Emphasis Route - STAA National Network*
Weigh-in-motion scales	*Fairfield*	*Truck*	*I-80 Eastbound Cordelia Truck Scales. Serves I-680/I-80 & SR 12 .*	*Electronics, Manufactured Products, Agriculture*	*Relocated @EB PM/ 1.538 in order to eliminate queuing on mainline I-80 while improving I-680 to EB I-80 weaving issue.*

Table 11. SOL I-680 Freight Facilities

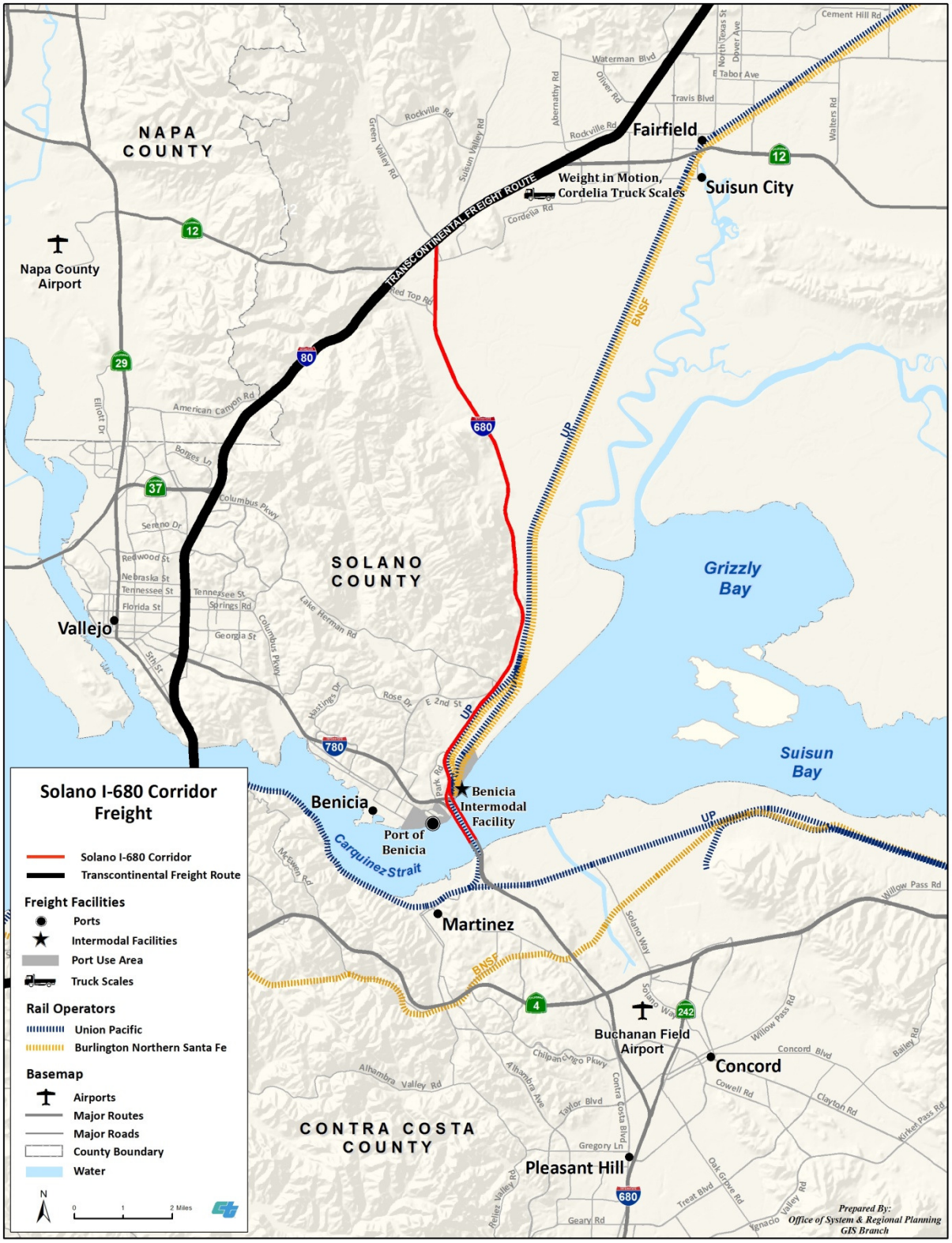


Figure 3. SOL I-680 Freight Facilities Map

Environmental Considerations

The purpose of this environmental scan is to conduct a high level identification of potential environmental factors that may require future analysis in the project development process. This information does not represent all environmental considerations that may exist within the route vicinity. The environmental factors have been categorized based on a scale of High - Medium - Low probability of an environmental resource issue and was established by District 4 Transportation Planning staff. Table 12 below lists the environmental factors present in the Solano I-680 corridor and their categorical impact probability. A summary of the environmental factors included in this scan are also displayed in Figure 4 on page 21.

SOL I-680 Environmental Factors Probability																					
Segment	Recreational and Protected Lanes	Coastal Zone	Farmland/ Timberland	Environmental Justice	Cultural Resources	Visual Aesthetics	Geology/Soils/ Seismic	Floodplain	Climate Change/ Sea Level Rise	Hazardous Materials	Naturally Occurring Asbestos	Air Quality				Noise	Waters and Wetlands	Wild and Scenic Rivers	Special Status Species	Fish Passage	Habitat Connectivity
												Ozone	PM 2.5	PM 10	CO						
1	Low	Low	Low	Low	Low	Low	Med	Low	Low	Low	Low	Nonattainment	Nonattainment	Nonattainment/Unclassified	Attainment/Unclassified	Low	High	Low	Low	Low	Low
2	Med				Med		Med		Low								Low	Low			
3							High		High								Med	Low	Med		
4	High							Med	Low	High						Med	High	Low			
5				Med					High									Low	Low		

Table 12. SOL I-680 Environmental Factors Probability

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

- **Recreational and Protected Lands** - Segment 1 travels over Suisun Bay which is within the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC). The remaining vessels of the United States Naval Defense Reserve Fleet (aka Mothball Fleet) maintained by the United States Maritime Administration (MARAD) are located offshore to the east of Segments 1 and 2 in Suisun Bay. Sensitive habitats and species are found in the California Department of Fish and Wildlife's Grizzly Island Wildlife Area located east of the corridor. A network of recreational areas east of Segments 3, 4, and 5 offer hunters and anglers opportunities to hunt and fish year round. Along the coastal foothills west of Segments 3, 4, and 5 lie the Tri City and County Cooperative Planning Area and the Western Hills Priority Conservation Area (PCA). Impacts to these lands should be a consideration during operational activities and/or design and construction of transportation projects within the segment.

- **Environmental Justice** - There is a significant Latino population in both Fairfield and Suisun City. No Solano I-680 projects are identified within the corridor which would likely displace or disproportionately affect any minority populations. However, these groups should be contacted prior to public outreach to allow for full participation in Transportation Planning efforts within the corridor.

- **Cultural Resources** - Cultural resources have been identified within or adjacent to the corridor and include prehistoric and historic archaeological sites and built Cultural resources. More focused cultural resource studies should be conducted during development of transportation projects within the corridor.

- **Geology/Soils/Seismic** - The Concord - Green Valley Fault is the easternmost strike-slip fault of the San Andreas Fault System in the Bay Area. This fault line begins just west of Mount Diablo in Contra Costa County, travels north under the Suisun Bay and across Green Valley before ending roughly 10 miles east of Napa. United States Geological Survey mapping of the Suisun and Grizzly Bays suggest that soil liquefaction could occur during a significant seismic event. The susceptibility of the route to seismic activity should be considered during the design and construction of transportation projects within the corridor and also during maintenance activities.

- **Flood Plain** - Segments 1 and 2 include areas that could be subject to inundation during a 100-year flood and/or tsunami event. In Segment 1 this includes the rugged coast line of the Suisun Bay as well as the lowlands of the Port of Benicia cargo facility. Segment 2 also features the boundary where the low lying tidal lands of Green Valley meet Suisun and Grizzly Bays. The California Emergency Management Agency identifies these lands within their flood overlay area.

- **Climate Change and Sea Level Rise Vulnerability** – Figure 5 on page 22 displays locations along the Solano I-680 corridor that could be affected by a 55-inch rise in the sea level. Executive Order (EO) S-13-08 (November 2008) and the State Of California Sea-Level Rise Interim Guidance Document (October 2010) directs all State agencies planning construction projects in areas vulnerable to sea level rise to begin planning for potential impacts by considering a range of sea level rise scenarios for the years 2050 and 2100. Project Initiation Documents (PID) will investigate whether future projects may need to avoid or mitigate any identified risks associated with climate change. Although EO S-13-08 allows for some exemptions for routine maintenance projects and or projects programmed for construction through 2013, the intent is to plan ahead to assess project vulnerability and reduce anticipated risks associated with sea level rise.

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

- **Noise** – The California Department of Transportation (Caltrans) Traffic Noise Protocol (March 2011) requires noise abatement for new highway construction, reconstruction and retrofit

barrier projects. It describes a scientific process that combines levels of noise abatement with the noise sensitivity of adjacent land uses. Immediate low noise sensitive industrial land uses as well as peripheral high noise sensitive land uses are present along Segments 1 through 3 while immediate high noise sensitive land uses such as protective lands and residential housing occupy the land adjacent to segments 4 thru 5. Noise sensitive land uses should be addressed during design and construction of transportation projects within the corridor.

- **Special Status Species** - The California Natural Diversity Database (CNDD) identifies special status species in close proximity to the route to include the American peregrine falcon (*Falco peregrine*), suisun thistle (*Cirsium hydrophilum var. hydrophilum*) and the Swansons hawk (*Buteo swainsoni*). The California Department of Fish and Wildlife Grizzly Island, Hill Slough and Point Edith Wildlife Areas protect habitat for many special status and at-risk species found within the in the County.

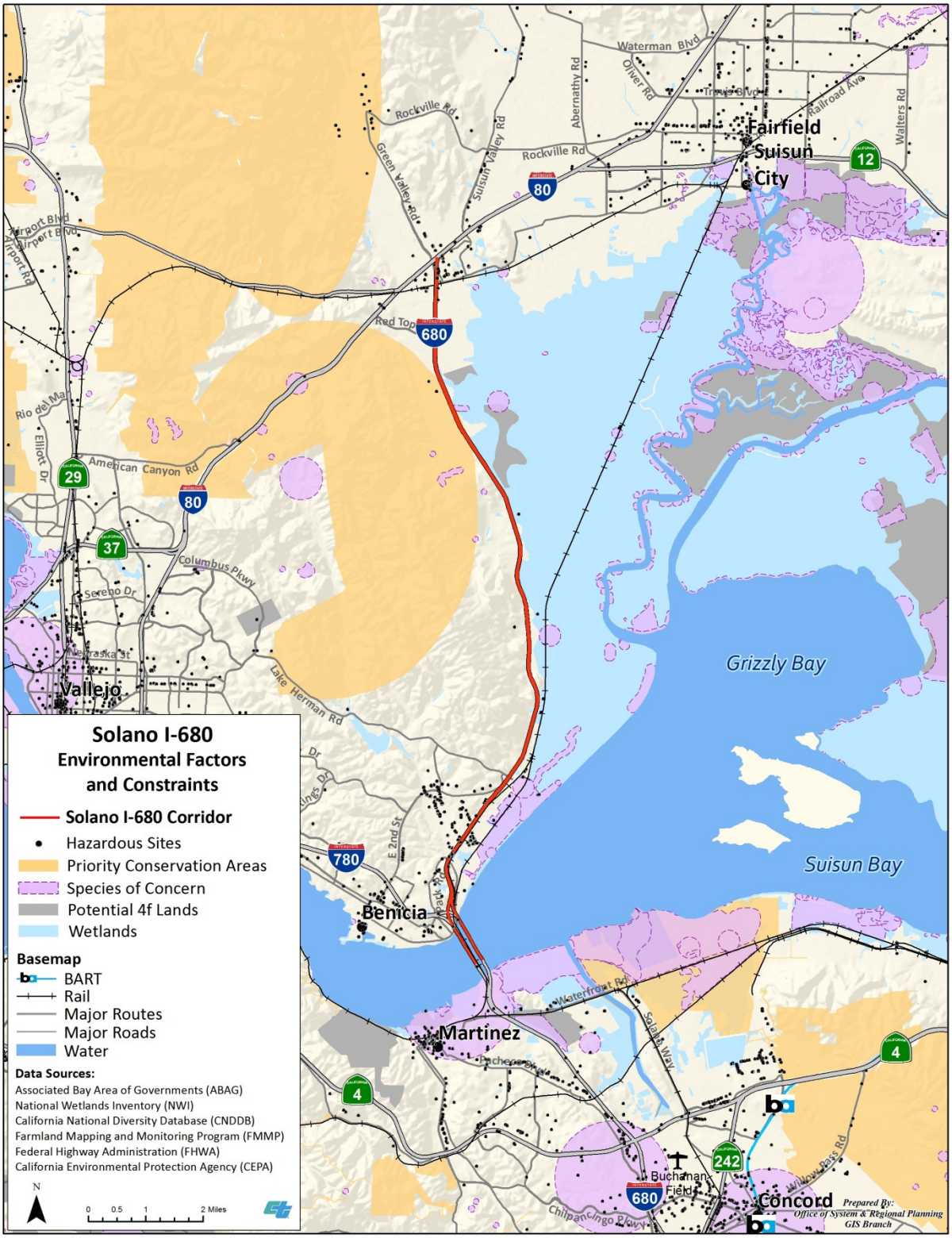


Figure 4. SOL I-680 Environmental Factors Map

Figure 5. SOL I-680 Sea Level Rise Map

CORRIDOR PERFORMANCE

The SOL I-680 Corridor Performance table below displays travel demand model performance and volume data for Base Year (BY) 2010 and Horizon Year (HY) 2030. The model uses ABAG 2009 projections to forecast HY population and job levels and their impact on the performance of SOL I-680. According to the data, Annual Average Daily Traffic (AADT) will grow at a yearly rate between 1.06 and 1.14 percent between 2010 and 2030. 2030 AADT forecasts suggest moderate to large growth in interregional trips resulting in AADT volumes varying between 22 and 23 percent in Segments 1, 2, 3 and 5 and between 21 and 22 percent in segments 4 and 5. The 2030 Volume-to-Capacity (V/C) ratio forecast the largest gains in the future saturation of available facility capacity will take place in segments 1 and 3 while the remaining segments will experience moderate gains. Construction of the Bay Area Express Lane Network will increase Vehicle Miles Traveled (VMT) along Solano I-680 corridor segments 2 through 5 when the lanes are opened to drivers. Segment 1 will continue to operate as a nine lane mixed flow facility.

SOL I-680 Corridor Performance					
Segment #	1	2	3	4	5
Basic Systems Operations*					
AADT (Base Year)	69,000–98,000	59,000	63,000	61,000	62,000
AADT (Horizon Year)	89,000–127,000	76,000	80,000	79,000	79,000
AADT: Growth Rate/Year	1.12%–1.14%	1.11%	1.06%	1.13%	1.07%
VMT (Base Year)	20,000–55,000	27,000	86,000	326,000	307,000
VMT (Horizon Year)	26,000–71,000	35,000	109,000	423,000	392,000
Truck Traffic Data					
Total Average Annual Daily Truck Traffic (AADTT) (BY)**	3091	3091	3162	3162	3282
Total Trucks (% of AADT) (BY)**	5.33%	5.33%	5.33%	5.36%	5.21%
5+ Axle Average Annual Daily Truck Traffic (AADTT)(BY)*	1900–3500	1600	1800	1500	1500
5+ Axle Trucks (as % of AADTT)(BY)**	55.31%	55.31%	55.31%	47.93%	47.93%
5+ Axle Average Annual Daily Truck Traffic (AADTT)(HY)*	2500–4600	2100	2200	2000	2000
Bottleneck Data***					
Bottleneck Existing	Y	N	N	N	Y
Bottleneck Location	PM 0.50	NA	NA	NA	PM 13.129
Bottleneck Queue (length)	0.25 mi	NA	NA	NA	0.25 mi
Bottleneck Causality	Bridge	NA	NA	NA	I-80 I/C
Peak Hour Traffic Data*					
AM Peak Hour Directional Split SB/NB (BY)	SB 62%–54% NB 38%–46%	SB 58% NB 42%	SB 60% NB 40%	SB 63% NB 37%	SB 57% NB 43%
PM Peak Hour Directional Split NB/SB (BY)	NB 55% SB 45%	NB 58% SB 42%	NB 60% SB 40%	NB 61% SB 39%	NB 59% SB 41%
Peak Hour Volume/Capacity (BY)	0.70–1.00	0.65	0.70	0.70	0.68
Peak Hour Volume/Capacity (HY)	0.90–1.30	0.85	0.90	0.90	0.85

Table 13. SOL I-680 Corridor Performance

*District 4, Modeling-Forecasting Branch

**Caltrans Traffic Data Branch (online)

*** Solano Highway Operations Study (SHOS)

KEY CORRIDOR ISSUES

Operations

Improving mobility and mitigating future congestion are key factors for the Solano I-680 corridor. Conclusions and forecasts drawn from the Solano Highway Operations Study (SHOS) suggest near free flow conditions will continue to prevail in the near term. As a result the corridor experiences a moderate Vehicle to Capacity saturation with some congestion near the southbound approach to the Benicia-Martinez Bridge during the AM peak period. For mid-year 2015, the SHOS Study forecasts interchange on-ramp and mainline volumes will exceed capacity and bottlenecks will emerge downstream of each of the corridor interchanges. Continuing into the Horizon Year (HY) of 2030, the SHOS Study forecasts that as congestion continues the previously described bottlenecks will begin to merge together as their queue lengths begin to overlap creating congestion that spills into the Contra Costa segment of I-680. As Solano I-680 demand builds over the 20-year planning horizon, additional study of potential impacts to adjacent local roads may be needed for continued management of the corridor. The forecast progression of AM/PM peak hour congestion along the Solano I-680 corridor is displayed in Figure 6 on page 25.

Bay Area Express Lane Network

The Project Study Report for the Bay Area Express Lanes Network (September, 2011) describes the segment of I-680 between the Benicia Martinez Bridge Toll Plaza and I-780 as a gap in the proposed Regional Express Lanes Network. At the time of the Bay Area Express Lanes Network PSR completion, no planned improvements had been identified to include this segment of I-680 in the system. Additionally, other structures along the corridor such as the Benicia Viaduct may require modification and/or replacement as a result of the proposed Solano I-680 Express Lane Project.

Traffic Operation System (TOS) Deficiencies

The Freeway Performance Measurement System (PeMS) reports there is a network of 42 Mainline Vehicle Detection System (MVDS) induction loops and ramp detector located along the Solano I-680 corridor. Many of these MVDS and ramp detectors are inoperable and/or in need of repair. Until these MVDS and ramp detectors are repaired there is little data being collected or accessible for review in the PeMS database.

Right of Way Availability

Solano I-680 features standard lane and shoulder widths for most of its length. Right of Way mapping indicates there are locations along the corridor where mainline and ramp widening could present challenges due to limitations in available Caltrans right of way. Existing structures such as the Benicia Viaduct and non-Caltrans right of way, located in close proximity to Solano I-680, may also represent a challenge. Any improvements requiring new right of way within the corridor would likely be cost prohibitive and/or require extensive environmental mitigation.

Bicycle- Pedestrian Network

The interchanges along Solano I-680 are essential to the passage of bicyclists and pedestrians across the route. Many of these interchanges lack sidewalks or the width to accommodate them, feature narrow crossings without shoulders and large corner radii which may hinder the access and mobility for bicyclists and pedestrians.

SOL I-680 Congestion

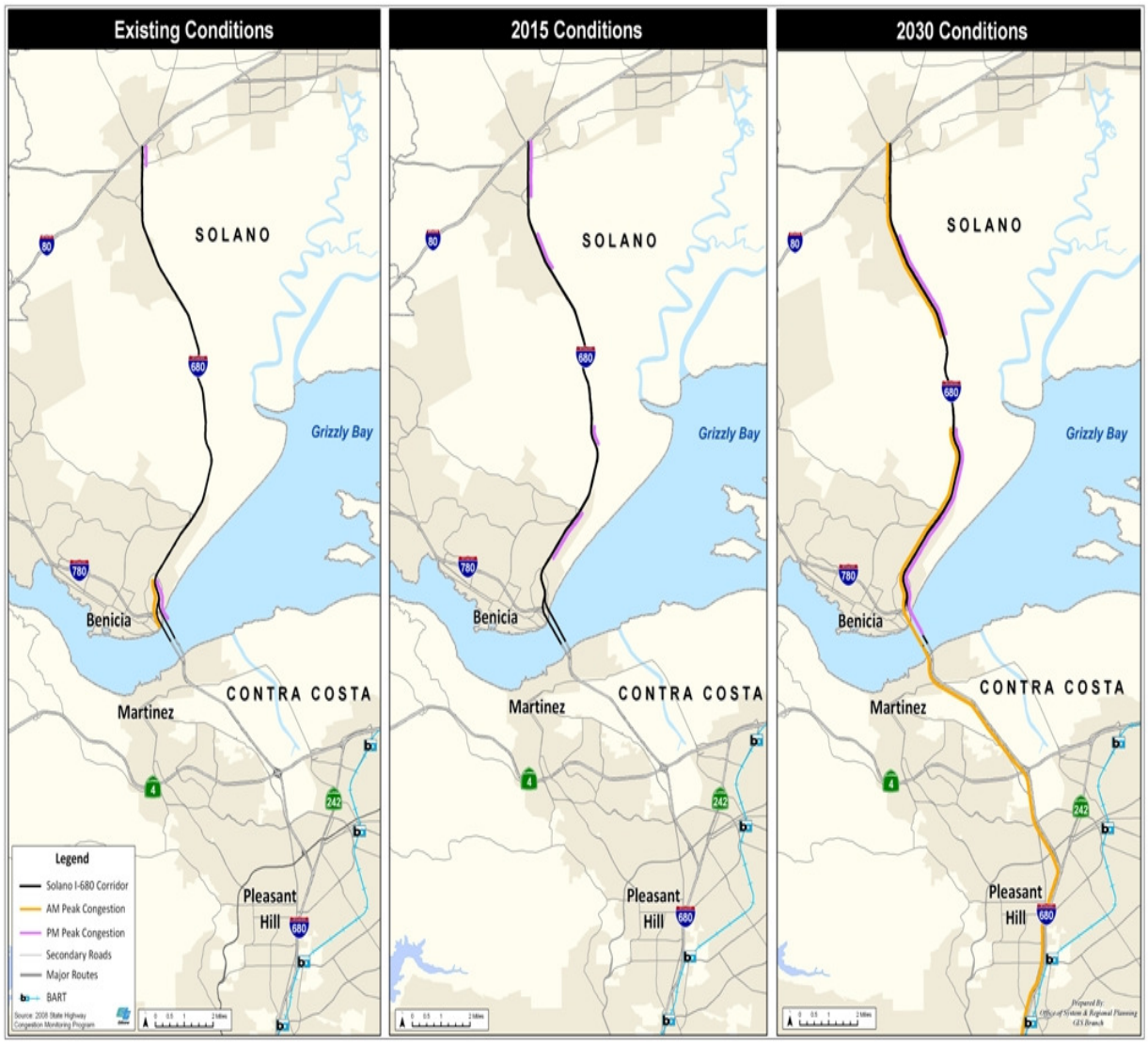


Figure 6. SOL I-680 Congestion
Source, Solano Highway Operations Study (SHOS)

CORRIDOR CONCEPT

Concept Rationale

The Corridor Concept conveys the Caltrans vision for a route with respect to corridor capacity and operations for a 20-year planning horizon. The concept takes into account factors that create interregional, regional, and local travel demand, including commuting, freight, recreation and land use. Moderate growth and development is anticipated along all segments of Solano I-680 justifying the need for a 20-year route concept which recommends improvements to capacity combined with an operational strategy. The 2030 route concept for the corridor is based on planned and programmed projects listed in the 2013 Regional Transportation Plan (RTP). The 2030 corridor concept envisions a facility including express lanes in each direction, a reconstructed I-80/I-680/SR 12 Interchange including a new interchange at Red Top Road, direct HOV connector ramps between I-80 and Solano I-680 and a connection with State Route 12 (Jameson Canyon). A diagram of the planned I-80/I-680/SR-12 Interchange is provided on Page 45, Appendix C. The 20-year system operations and management concept for the route includes continued use of open road tolling at the toll plaza, completion and upgrading existing MVDS, ramp metering and detection equipment, implementation of Traffic Operations Systems (TOS) components, corridor adaptive ramp metering and connector to connector metering once the Regional Express Lanes Network project is complete. Table 14 below lists, by segment, the 20-year corridor concept for Solano I-680.

Concept Summary					
Segment	**Post Miles**	**County**	**Segment Description**	**Existing Facility**	**25-yr Concept:**
1	(PM 0.00 to R1.002)	Solano	CC – SOL County Line to Bayshore Road	9F–4F	9F–6F(2H)
2	(PM R1.002 to R1 .461)	Solano	Bayshore Road to Industrial Way	5F	5F–7F(2H)
3	(PM R1.461 to R2.819)	Solano	Industrial Way to Lake Herman Road	4F	6F(2H)
4	(PM R2.819 to R8.170)	Solano	Lake Herman Road to Fairfield City Limit	4F	6F(2H)
5	(PM R8.170 to R13.13)	Solano	Fairfield City Limit to I-80.	4F	6F(2H)

Table 14. SOL I-680 Concept Summary
PM=Post Mile, F=Freeway, H=High Occupancy Vehicle Lane

In the next 20 years, as travel demand builds in the corridor, it is important that Solano I-680 continues to function as a port access route and regional gateway for goods movement. Additionally, infrastructure investments in rail modal technology, operational improvements and Travel Demand Management (TDM) strategies will improve travel time reliability for trucks and possibly reduce their numbers along the Solano I-680 corridor.

Enhancing and maintaining multi modal choices and connectivity is important for the sustainability of the 20-year facility concept. Modal choices could be enhanced by improving multimodal access, most notably, increasing transit service connections to BART. Connectivity between modes could also be enhanced by increasing Capitol Corridor service frequency during peak demand periods, providing timed transfers between transit modes and additional boarding location opportunities such as at the planned rail station in Benicia.

Implementation of the STA's Countywide Bicycle and Pedestrian Plans will improve local access and mobility to destinations within the county. The MTC Regional Bicycle Plan 20-year concept for Solano I-680 suggests closing local and regional network gaps and reducing the barriers to active transportation options. Recommended improvements that could be studied include minimizing turn radii, marked crossings at interchanges, and upgrading existing transportation infrastructure to provide pedestrian and bicycle access, curb ramps as well as reducing existing gaps and barriers within the network. The tables below list the planned and programmed projects for Solano I-680 as identified in MTC's current 2013 RTP as well as additional projects and strategies needed to realize this 20-year corridor concept.

SOL I-680 Planned / Programmed Projects					
Segment	**Description**	**Planned or Programmed**	**Location**	**Source**	**Purpose**
1-5	I-680 in Solano County from Benicia-Martinez Bridge to I-80 — widen to add express lanes in each direction	Planned	PM 0.35-13.6	MTC 2040 RTP ID # 230686	Capacity/ Operational
5	Widen I-680/I-80 interchange for express lanes in each direction.	Planned	PM 13.6	MTC 2040 RTP ID # 230687	Capacity/ Operational
5	Improve I-80/I-680/Route 12 interchange (Phase 1), includes widen I-80 and I-680 and improve direct freeway to freeway connections (SR 12-Jamieson Canyon).	Planned	PM 13.6	MTC 2040 RTP ID # 230326	Capacity/ Operational

Table 15. SOL I-680 Planned and Programmed Projects

SOL I-680 Projects and Strategies to Achieve Concept				
Segment.	**Description**	**Location**	**Source**	**Purpose**
1-5	Implement ramp metering on all Solano I-680 NB and SB on ramps. As necessary, add additional storage and /or through lanes to maximize the efficiency of ramp meters.	PM 0.35 - 13.6	Solano Highways Operations Study	Operational Improvement
1-5	Install ITS elements (detectors, CCTV, CMS & EMS Infrastructure) on Solano I-680 in both directions	PM 0.35 - 13.6	Solano Highways Operations Study	Operational Improvement
1-5	Extend the NB express lane to the I-780 interchange. Provide a new express lane direct connector from I-680 NB to I-80 EB	PM 13.6	Solano Highways Operations Study	Operational Improvement
1-5	SOL 680 from CC line to I-80: Install TMS elements	PM 0.35 - 13.6	2011 10 Year SHOPP	Operational Improvement
1-4	Roadway Rehabilitation (FY 14-15)	PM 0.0 - 3.4	2011 10 Year SHOPP	Operational Improvement
1-2	Ramp meter the I-680NB and I-680 SB connectors to/EB I-780	R0.41 - 0.68	District 4 2011 Ramp Meter Development Plan	Planned
2	Ramp meter the I-680 SB On ramp at Bayshore Road	R0.83	District 4 2011 Ramp Meter Development Plan	Planned
3	Ramp meter the I-680 NB On ramp at Industrial Way	R1.46	District 4 2011 Ramp Meter Development Plan	Planned
4-5	Ramp Meter the I-680 SB and NB , Lake Herman, Parish, Marshview and Gold Hill Road on ramps	R2.66 - R2.79	District 4 2011 Ramp Meter Development Plan	Planned
2	Multi Modal Transfer Station (TEU/Auto Carrier)	R0.203 - R1.002	Caltrans District 4	Conceptual
1-5	Improved bicycle-pedestrian access-infrastructure when widening of SOL I-680 for express lanes.	R2.819 - R13.2	Caltrans District 4	Conceptual

Table 16. SOL I-680 Projects and Strategies to Achieve Concept

APPENDIX

Appendix A
ACRONYMS AND GLOSSARY OF TERMS

Acronyms

AADT - Annual Average Daily Traffic
AADTT - Annual Average Daily Truck Traffic
AB - Assembly Bill
ABAG - Association of Bay Area Governments
ADA - Americans with Disabilities Act of 1990
ADT - Average Daily Traffic
BART - Bay Area Rapid Transit District
BCDC - San Francisco Bay Conservation and Development Commission
BNSF - Burlington Northern Santa Fe
BY - Base Year
Cal EPA - California Environmental Protection Agency
Caltrans - California Department of Transportation
CARB - California Air Resources Board
CCTV - Closed Circuit Television
CDD - Caltrans Deputy Directive
CEQA - California Environmental Quality Act
CMA - Congestion Management Agencies
CMS - Changeable Message Sign
CNDD - California Natural Diversity Database
CO - Carbon Monoxide
CRS - California Road System
CSMP - Corridor System Management Plan
CSS - Context Sensitive Solutions
CTP - California Transportation Plan
DSMP - District System Management Plan
EMS - Extinguishable Message Signs
EO - Executive Order
EPA - Environmental Protection Agency
FAST - Fairfield and Suisun Transit
FHWA - Federal highway Administration
FSP - Freeway Service Patrol
FSR - Feasibility Study Report
FSTIP - Federal Statewide Transportation Improvement Program
FTIP - Federal Transportation Improvement Program
GHG - Greenhouse Gas
GIS - Geographic Information System
HCP - Habitat Conservation Plan
HOT - High occupancy toll lane
HOV - High occupancy vehicle lane
HY - Horizon Year
IGR - Intergovernmental Review
IRRS - Interregional Road System

ITS - Intelligent Transportation System
LOS - Level of Service
MARAD - US Department of Transportation Maritime Administration
MPO - Metropolitan Planning Organizations
MTC - Metropolitan Transportation Commission
MUT - Multi-use Trail
MVDS - Mainline Vehicle Detection System
NOA - Naturally Occurring Asbestos
NCCP- Natural Community Conservation Plan
NEPA - National Environmental Policy Act
NN - National Network
OBAG - One Bay Area Grant
PCA - Priority Conservation Area
PDA - Priority Development Area
PeMS - Freeway Performance Measuring System
PID - Project Initiation Document
PM - Particulate Matter
PSR - Project Study Report
RHNA - Regional Housing Needs Allocation
RTP - Regional Transportation Plan
RTIP - Regional Transportation Improvement Program
RTPA - Regional Transportation Planning Agencies
SAFETEA-LU - Safe, Accountable, Flexible and Efficient Transportation Equity Act, a Legacy for Users
SB - Senate Bill
SCS - Sustainable Community Strategies
SHOPP- State Highway Operation Protection Program
SHOS - Solano Highways Operations Study
SHS - State Highway System
SolTrans - Solano Transit
STA - Solano Transportation Authority
STAA – Surface Transportation Assistance Act
STIP - State Transportation Improvement Program
SR - State Route
TCR - Transportation Concept Report
TEA-21 - Transportation Equity Act for the 21st Century
TEU - Twenty Foot Equivalent Unit
TDM - Transportation Demand Management
TMS - Transportation Management System
TOS - Traffic Operation System
TSDP - Transportation System Development Plan
TSN - Transportation System Network
UPRR - Union Pacific Railroad
V/C - Volume-to-Capacity (ratio)
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.

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

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

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

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

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

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

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

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

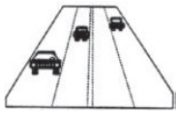
Headway – The time between two successive vehicles as they pass a point on the roadway, measured from the same common feature of both vehicles.

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

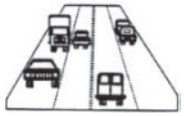
Intermodal Freight Facility – Intermodal transport requires more than one mode of transportation. An intermodal freight facility is a location where different transportation modes and networks connect and freight is transferred (or "transloaded") from one mode, such as rail, to another, such as truck.
ITS – Intelligent Transportation System improves transportation safety and mobility and enhances productivity through the integration of advanced communications technologies into the transportation infrastructure and in vehicles. Intelligent transportation systems encompass a broad range of wireless and wire line communications-based information and electronics technologies to collect information, process it, and take appropriate actions.

Large Radii Corner – A corner radii allowing faster vehicle corner speeds reducing access and safety to pedestrians

LOS – Level of Service is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in terms of speed, travel time, freedom to maneuver, traffic interruption, comfort, and convenience. Six levels of LOS can generally be categorized as follows:



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



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

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

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

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

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

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

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

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

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

Peak Period – Is a part of the day during which traffic congestion on the road is at its highest. Normally, this happens twice a day, once in the morning and once in the evening; the time periods when the most people commute. Peak Period is defined for individual routes, not a District or statewide standard.

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

Post-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.

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.

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.

Railroad Class I – The Surface Transportation Board (STB) defines a Class I railroad in the U.S. as a carrier having annual operating revenues of $250 million or more. This class includes the nation's major railroads. In California, Class I railroads include Union Pacific Railroad (UP) and Burlington Northern Santa Fe Railway (BNSF).

Railroad Class II – STB defines a Class II railroad in the U.S. as having annual carrier operating revenues of less than $250 million but more than $20 million. Class II railroads are considered mid-sized freight-hauling railroad in terms of operating revenues. They are considered "regional railroads" by the Association of American Railroads.

Railroad Class III – Railroads with annual carrier operating revenues of $20 million or less. The typical Class III is a short line railroad, which feeds traffic to or delivers traffic from a Class I or Class II railroad.

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

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

Segment – A portion of a facility between two points.

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

TMS – Transportation Management System is the business processes and associated tools, field elements and communications systems that help maximize the productivity of the transportation system. TMS includes, but is not limited to, advanced operational hardware, software, communications

systems and infrastructure, for integrated Advanced Transportation Management Systems and Information Systems, and for Electronic Toll Collection System.

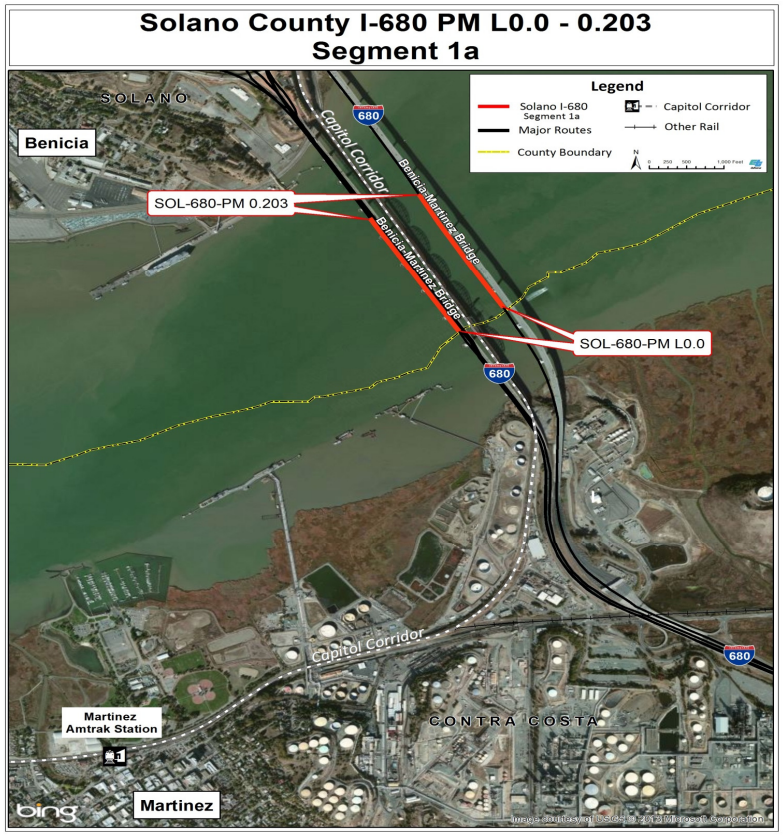
Urban – 5,000 to 49,999 in population designates an urban area. Limits are based upon population density as determined by the U.S. Census Bureau.

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

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

APPENDIX B
Solano I-680 Segment Fact Sheets

SOL I-680 Segment 1a Fact Sheet	
Features	**Data**
County, City	Solano County, City of Benicia
Facility Type	Freeway
Existing Facility	9F
25- Year Concept	9F
Segment Characteristics	
Segment Limits	Contra Costa –Solano Countyline /I-780 off-ramp
Begin/ End Post Mile	0.0-R 0.203
Length	0.203
Terrain	Flat to rolling
HOV Lanes (PM to PM)	none
Percent Grade (PM to PM)	0-3%
Truck Weigh Station	none
Truck Parking	none
TOS Element	Ramp meters (installed, not operational), Mainline Detection
Multi Modal	
Bicycle Facilities	Class I MUT on Benicia-Martinez Bridge between Martinez and Benicia
Priority Development Areas	Benicia Downtown Area.
Park and Ride	East 2nd St. and I-780. (15 spaces)
Traffic Data*	
AADT 2010 (Average Annual Daily Traffic)	98,000
AADT 2030	127,000
Vehicle Miles Traveled 2010/2030	20,000 / 26,000
Peak Hour Volumes 2010 (AM/PM)	(NB) AM: 2,600 PM:4,000 (SB) AM: 4,300 PM: 3,200
Peak Hour Volumes 2030 (AM/PM)	(NB) AM: 3,300 PM: 5,200 (SB) AM: 5,600 PM: 4,100
V/C Ratio 2010	(NB) AM: 0.65 PM: 1.00 (SB) AM:1.08 PM: 0.80
V/C Ratio 2030	(NB) AM: 0.83 PM: 1.30 (SB) AM: 1.40 PM: 1.03
LOS 2010 (Level of Service)	AM Peak NB : D SB: F PM Peak NB: F SB: D
Truck Volumes 2011	7,968
Truck Percentage	6.81% (33.57% is 5+ Axle)
Accident Data (Jul. 2008-Jun. 2011)**	
Fatality + Injury Rate	0.15
Statewide Fatality + Injury Rate	0.26
Total Accident Rate	0.48
Statewide Total Accident Rate	0.79



* District 4 Forecasting / Modeling Branch.

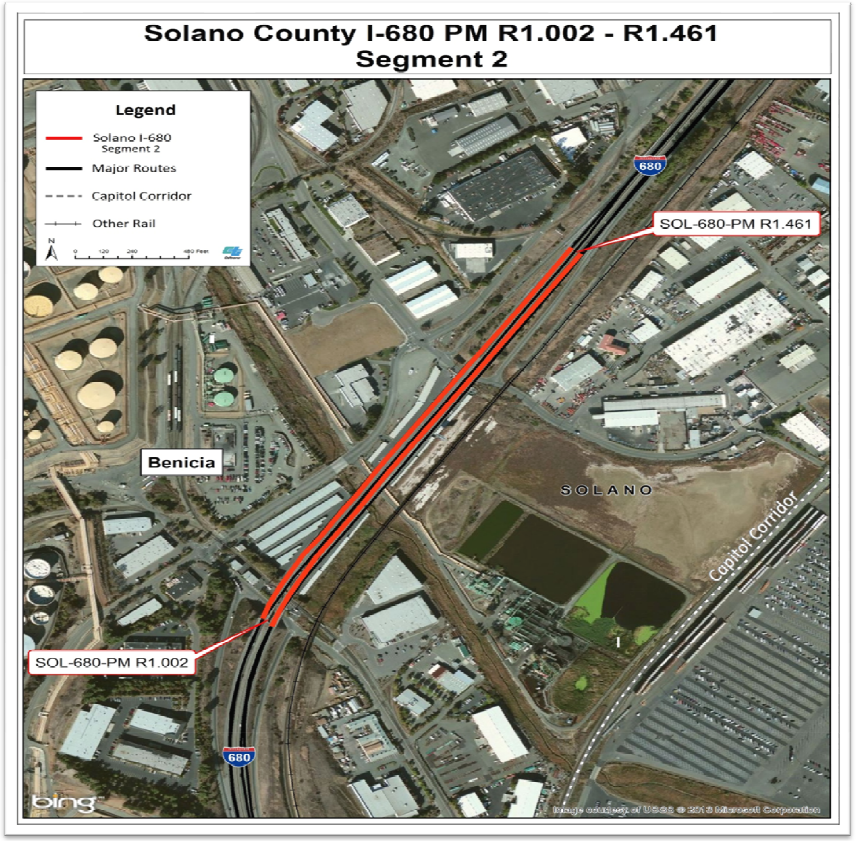
** District 4 Transportation Systems Network (TSN) Reports-Traffic Accident Surveillance and Analysis System (TASAS)

SOL I-680 Segment 1b Fact Sheet	
Features	**Data**
County, City	Solano County, City of Benicia
Facility Type	Freeway
Existing Facility	5F
25- Year Concept	5F -7F(2H)
Segment Characteristics	
Segment Limits	I-780 to Bayshore Rd.
Begin/ End Post Mile	R 0.203-R1.002
Length	0.899
Terrain	Flat to rolling
HOV Lanes (PM to PM)	none
Percent Grade (PM to PM)	0-3%
Truck Weigh Station	none
Truck Parking	none
TOS Element	Ramp meters (installed, not operational), Mainline Detection
Multi Modal	
Bicycle Facilities	Class I MUT Benicia-Martinez Bridge, Class III 2nd/Park St.
Priority Development Areas	Benicia Downtown Area.
Park and Ride	East 2nd St. and I-780. (15 spaces)
Traffic Data*	
AADT 2010 (Average Annual Daily Traffic)	69,000
AADT 2030	89,000
Vehicle Miles Traveled 2010/2030	55,000 / 71,000
Peak Hour Volumes 2010 (AM/PM)	(NB) AM: 2,200 PM: 2,800 (SB) AM: 2,600 PM: 2,200
Peak Hour Volumes 2030 (AM/PM)	(NB) AM: 2,800 PM: 3,360 (SB) AM: 3,400 PM: 2,900
V/C Ratio 2010 *	(NB) AM: 0.55 PM: 0.70 (SB) AM: 0.65 PM: 0.55
V/C Ratio 2030 *	(NB) AM: 0.70 PM: 0.90 (SB) AM: 0.85 PM: 0.73
LOS 2010 (Level of Service)	AM Peak NB : D SB: D PM Peak NB: D SB: D
Truck Volumes 2011	7,968
Truck Percentage	6.81% (33.57% is 5+ Axle)
Accident Data (Jul. 2008-Jun. 2011)**	
Fatality + Injury Rate	0.15
Statewide Fatality + Injury Rate	0.26
Total Accident Rate	0.48
Statewide Total Accident Rate	0.79

* District 4 Forecasting / Modeling Branch.

** District 4 Transportation Systems Network (TSN) Reports-Traffic Accident Surveillance and Analysis System (TASAS)

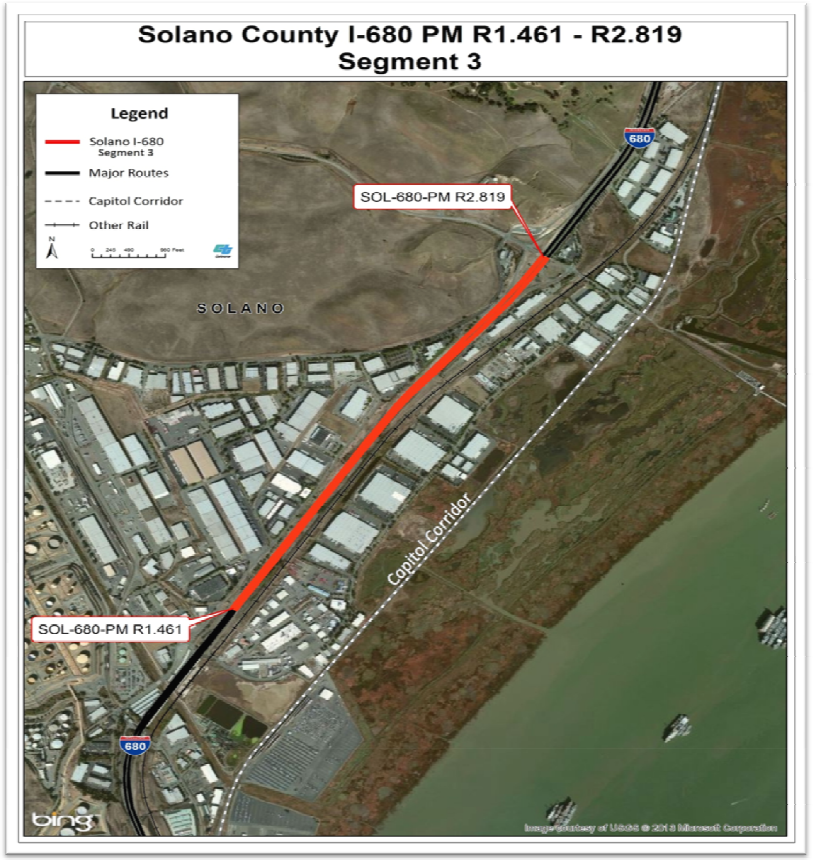
SOL I-680 Segment 2 Fact Sheet	
Features	**Data**
County, City	Solano County, City of Benicia
Facility Type	Freeway
Existing Facility	4F
25- Year Concept	6F(2H)
Segment Characteristics	
Segment Limits	Bayshore Rd. to Industrial Wy.
Begin/ End Post Mile	R 1.002-R1.461
Length	0.459
Terrain	Flat to rolling
HOV Lanes (PM to PM)	none
Percent Grade (PM to PM)	0-3%
Truck Weigh Station	none
Truck Parking	none
TOS Element	Ramp meters (installed, not operational), Mainline Detection
Multi Modal	
Bicycle Facilities	Not allowed on freeway. Parallel access on Park Rd. between Bayshore Rd. and Industrial Wy.
Priority Development Areas	Benicia Downtown Area.
Park and Ride	East 2nd St. and I-780. (15 spaces)
Traffic Data*	
AADT 2010 (Average Annual Daily Traffic)	59,000
AADT 2030	76,000
Vehicle Miles Traveled 2010/2030	27,000 / 35,000
Peak Hour Volumes 2010 (AM/PM)	(NB) AM: 1,600 PM: 2,600 (SB) AM: 2,300 PM: 1,800
Peak Hour Volumes 2030 (AM/PM)	(NB) AM: 2,100 PM: 3,400 (SB) AM: 3,000 PM: 2,400
V/C Ratio 2010 *	(NB) AM: 0.40 PM: 0.65 (SB) AM: 0.58 PM: 0.45
V/C Ratio 2030 *	(NB) AM: 0.53 PM: 0.85 (SB) AM: 0.75 PM: 0.60
LOS 2010 (Level of Service)	AM Peak NB : C SB: D PM Peak NB: D SB: C
Truck Volumes 2011	7,968
Truck Percentage	6.81% (33.57% is 5+ Axle)
Accident Data (Jul. 2008-Jun. 2011)**	
Fatality + Injury Rate	0.15
Statewide Fatality + Injury Rate	0.26
Total Accident Rate	0.48
Statewide Total Accident Rate	0.79



* District 4 Forecasting / Modeling Branch.

** District 4 Transportation Systems Network (TSN) Reports-Traffic Accident Surveillance and Analysis System (TASAS)

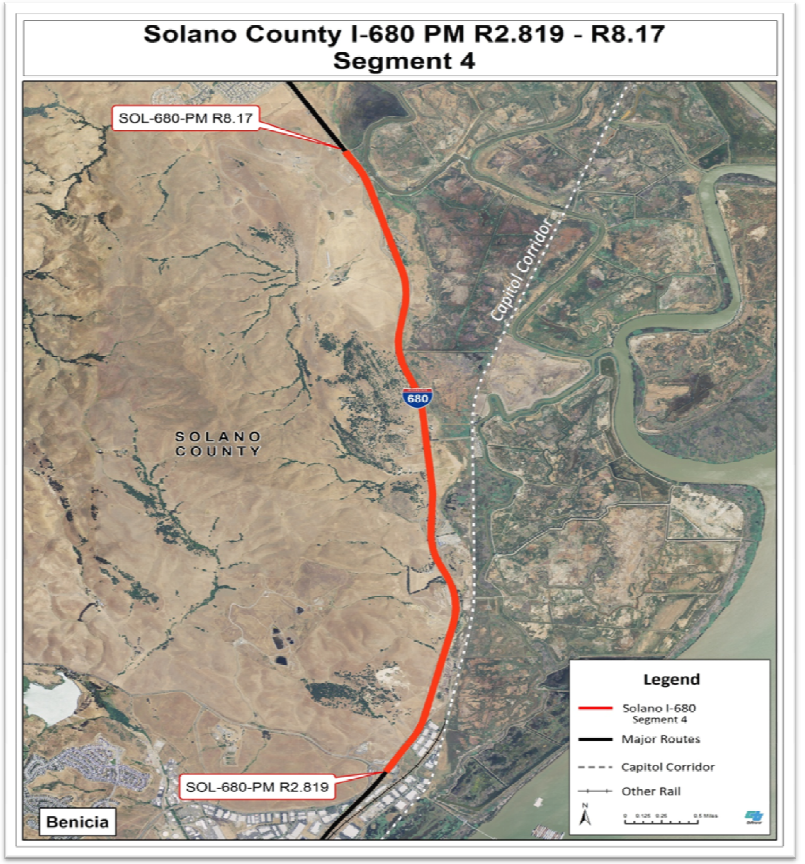
SOL I-680 Segment 3 Fact Sheet	
Features	**Data**
County, City	Solano County, City of Benicia
Facility Type	Freeway
Existing Facility	4F
25- Year Concept	6F(2H)
Segment Characteristics	
Segment Limits	Industrial Wy. To Lake Herman Rd.
Begin/ End Post Mile	R1.461-R2.819
Length	1.358
Terrain	Flat to rolling
HOV Lanes (PM to PM)	none
Percent Grade (PM to PM)	0-3%
Truck Weigh Station	none
Truck Parking	none
TOS Element	Ramp meters (installed, not operational), Mainline Detection
Multi Modal	
Bicycle Facilities	Not allowed on freeway. Parallel access on Park Rd. between Industrial Wy. And Lake Herman Rd.
Priority Development Areas	Benicia Downtown Area.
Park and Ride	East 2nd St. and I-780. (15 spaces)
Traffic Data*	
AADT 2010 (Average Annual Daily Traffic)	63,000
AADT 2030	80,000
Vehicle Miles Traveled 2010/2030	86,000 / 109,000
Peak Hour Volumes 2010 (AM/PM)	(NB) AM: 1,700 PM: 2,800 (SB) AM: 2,600 PM: 1,900
Peak Hour Volumes 2030 (AM/PM)	(NB) AM: 2,200 PM: 3,600 (SB) AM: 3,300 PM: 2,400
V/C Ratio 2010 *	(NB) AM: 0.43 PM: 0.70 (SB) AM: 0.651 PM: 0.48
V/C Ratio 2030 *	(NB) AM: 0.55 PM: 0.90 (SB) AM: 0.83 PM: 0.60
LOS 2010 (Level of Service)	AM Peak NB : C SB: D PM Peak NB: D SB: C
Truck Volumes 2011	7,968
Truck Percentage	6.81% (33.57% is 5+ Axle)
Accident Data (Jul. 2008-Jun. 2011)**	
Fatality + Injury Rate	0.02
Statewide Fatality + Injury Rate	0.23
Total Accident Rate	0.18
Statewide Total Accident Rate	0.71



* District 4 Forecasting / Modeling Branch.

** District 4 Transportation Systems Network (TSN) Reports-Traffic Accident Surveillance and Analysis System (TASAS)

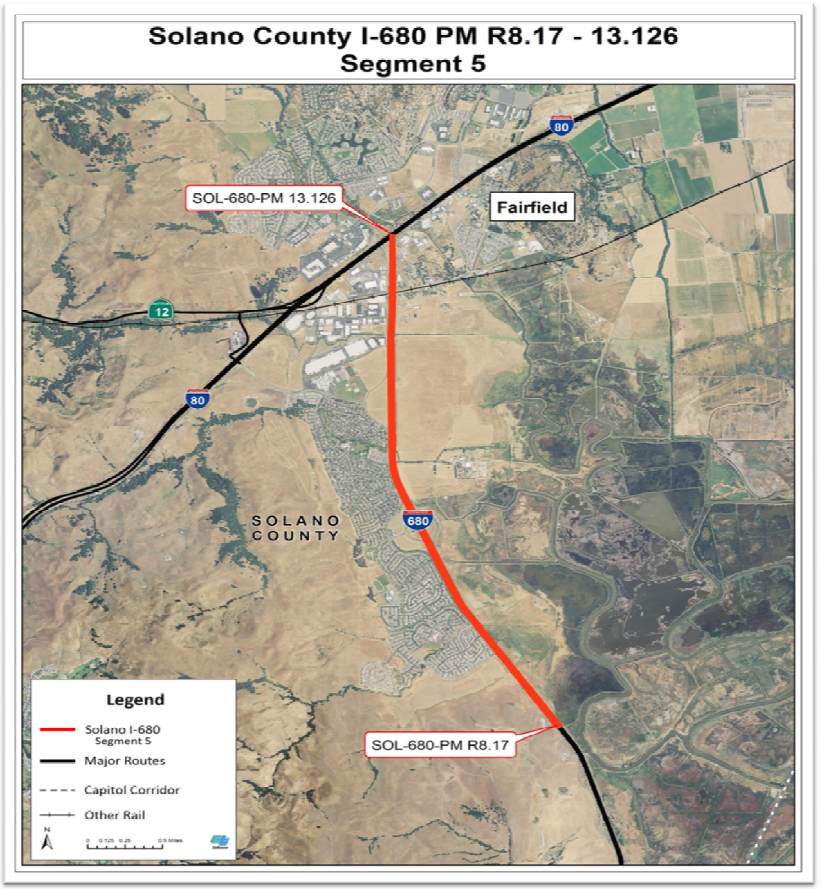
SOL I-680 Segment 4 Fact Sheet	
Features	**Data**
County, City	Solano County, City of Fairfield
Facility Type	Freeway
Existing Facility	4F
25- Year Concept	6F(2H)
Segment Characteristics	
Segment Limits	Lake Herman Rd. to the City of Fairfield
Begin/ End Post Mile	R2.819-8.170
Length	5.351
Terrain	Flat to rolling
HOV Lanes (PM to PM)	none
Percent Grade (PM to PM)	0-3%
Truck Weigh Station	none
Truck Parking	none
TOS Element	Ramp meters (installed, not operational), Mainline Detection
Multi Modal	
Bicycle Facilities	Not allowed on freeway. Parallel access on Lopes Rd. between Lake Herman Rd. and I-80 Fairfield
Priority Development Areas	Fairfield Downtown, Train Station, N +W Texas Streets
Park and Ride	
Traffic Data*	
AADT 2010 (Average Annual Daily Traffic)	61,000
AADT 2030	79,000
Vehicle Miles Traveled 2010/2030	326,000 / 423,000
Peak Hour Volumes 2010 (AM/PM)	(NB) AM: 1,600 PM: 2,800 (SB) AM: 2,700 PM: 1,700
Peak Hour Volumes 2030 (AM/PM)	(NB) AM: 2,000 PM:3,600 (SB) AM: 3,500 PM: 2,300
V/C Ratio 2010 *	(NB) AM: 0.40 PM: 0.70 (SB) AM: 0.68 PM: 0.43
V/C Ratio 2030 *	(NB) AM: 0.50 PM: 0.90 (SB) AM: 0.88 PM: 0.58
LOS 2010 (Level of Service)	AM Peak NB : C SB: D PM Peak NB: D SB: C
Truck Volumes 2011	3,162
Truck Percentage	5.36% (51.84 % is 5+ Axle)
Accident Data (Jul. 2008-Jun. 2011)**	
Fatality + Injury Rate	0.1
Statewide Fatality + Injury Rate	0.2
Total Accident Rate	0.27
Statewide Total Accident Rate	0.57



* District 4 Forecasting / Modeling Branch.

** District 4 Transportation Systems Network (TSN) Reports-Traffic Accident Surveillance and Analysis System (TASAS)

Solano I-680 Segment 5 Fact Sheet	
Features	**Data**
County, City	Solano County, City of Fairfield
Facility Type	Freeway
Existing Facility	4F
25- Year Concept	6F(2H)
Segment Characteristics	
Segment Limits	City of Fairfield to I-80
Begin/ End Post Mile	R8.170-13.126
Length	4.956
Terrain	Flat to rolling
HOV Lanes (PM to PM)	none
Percent Grade (PM to PM)	0-3%
Truck Weigh Station	none
Truck Parking	none
TOS Element	Ramp meters (installed, not operational), Mainline Detection
Multi Modal	
Bicycle Facilities	Not allowed on freeway. Parallel access on Lopes Rd. between Lake Herman Rd. and I-80 Fairfield
Priority Development Areas	Fairfield Downtown, Train Station, N +W Texas Streets
Park and Ride	Green Valley Rd. and I-80. (59 spaces)
Traffic Data*	
AADT 2010 (Average Annual Daily Traffic)	62,000
AADT 2030	79,000
Vehicle Miles Traveled 2010/2030	307,000 / 392,000
Peak Hour Volumes 2010 (AM/PM)	(NB) AM: 1,900 PM: 2,700 (SB) AM: 2,600 PM: 1,800
Peak Hour Volumes 2030 (AM/PM)	(NB) AM: 2,400 PM: 3,400 (SB) AM: 3,300 PM: 2,300
V/C Ratio 2010 *	(NB) AM: 0.32 PM: 0.46 (SB) AM: 0.72 PM: 0.51
V/C Ratio 2030 *	(NB) AM: 0.60 PM: 0.85 (SB) AM: 0.83 PM: 0.58
LOS 2010 (Level of Service)	AM Peak NB :D SB: D PM Peak NB: C SB: D
Truck Volumes 2011	3,282
Truck Percentage	5.21% (47.93 % is 5+ Axle)
Accident Data (Jul. 2008-Jun. 2011)**	
Fatality + Injury Rate	0.14
Statewide Fatality + Injury Rate	0.27
Total Accident Rate	0.34
Statewide Total Accident Rate	0.82



* District 4 Forecasting / Modeling Branch.

** District 4 Transportation Systems Network (TSN) Reports-Traffic Accident Surveillance and Analysis System (TASAS)

Appendix C:
Additional Corridor Data

SOL I-680 Freeway Agreements

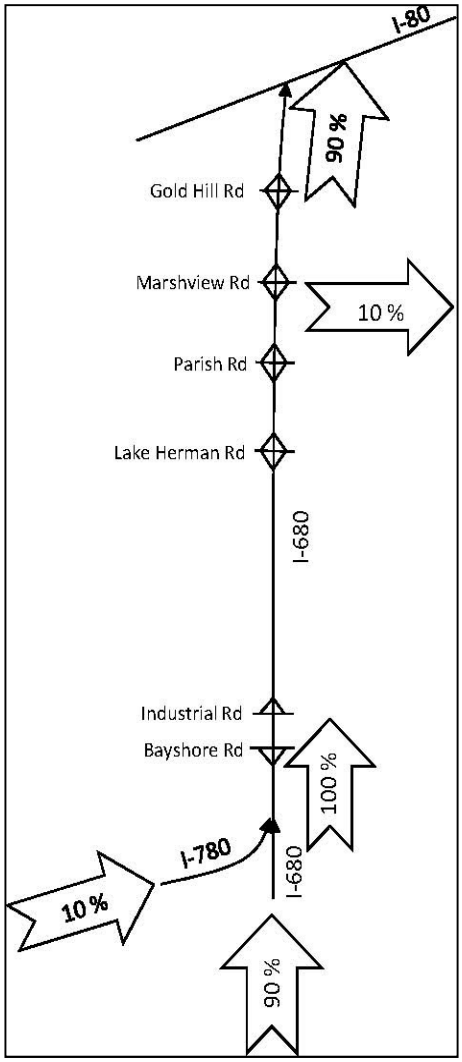
A Freeway Agreement documents the understanding between Caltrans and the local agency relating to the planned traffic circulation features of the proposed facility. Agreements are often executed many years before construction is anticipated and they form the basis for future planning, not only by Caltrans but by public and private interests in the community.

The legislative intent for requiring Freeway Agreements is to obtain local agency support of local road closures, changes to the local circulation system, and to protect property rights and assure adequate service to the community. The agreements may be modified at any time by mutual consent of the parties involved as may become necessary. Table C1 is a listing of current Freeway Agreements on the Solano I-680 corridor.

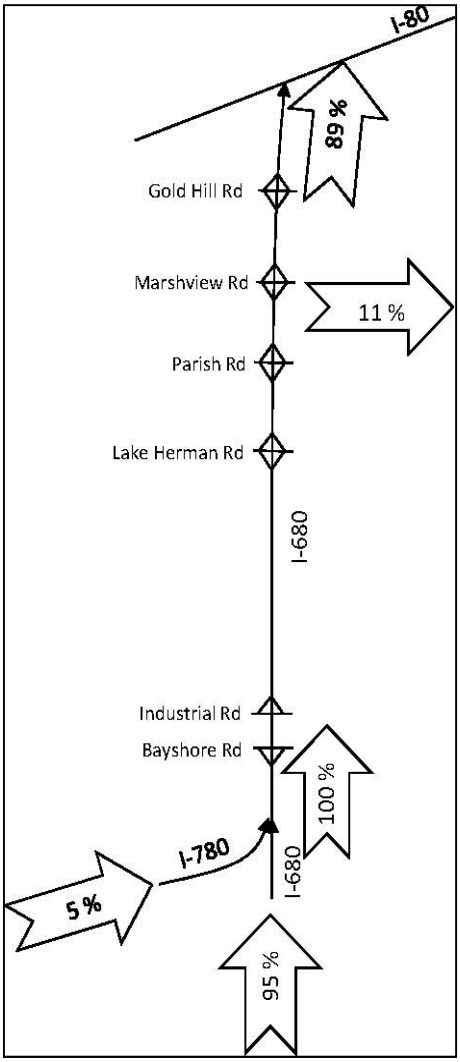
Adopted Date	County	Post Miles	Description	Agreement With
08/12/97	SOL	0.00-0.04	CC/SOL County line to I-780 connector Martinez-Benicia Bridge	Solano County
10/16/73	SOL	0.40-0.70	I-780 Connector to S. of Bayshore Dr.	City of Benicia
10/16/73	SOL	0.68-1.70	S. of Bayshore Drive to N. of Industrial Way.	City of Benicia
10/22/63	SOL	1.70-2.6	N. of Industrial Way to S. of Lake Herman Rd.	Solano County
05/07/63	SOL	2.6 – 12.0	S. of Lake Herman Rd. to S. of Cordelia Rd.	Solano County
10/21/58	SOL	12.0-13.0	S. of Cordelia Rd. to End of Route	Solano County

SOL I-680 2009/2030 Northbound PM Peak Origin and Destination Traffic

2009
SOL I-680 PM Peak northbound Origin and Destination traffic
expressed in percentages



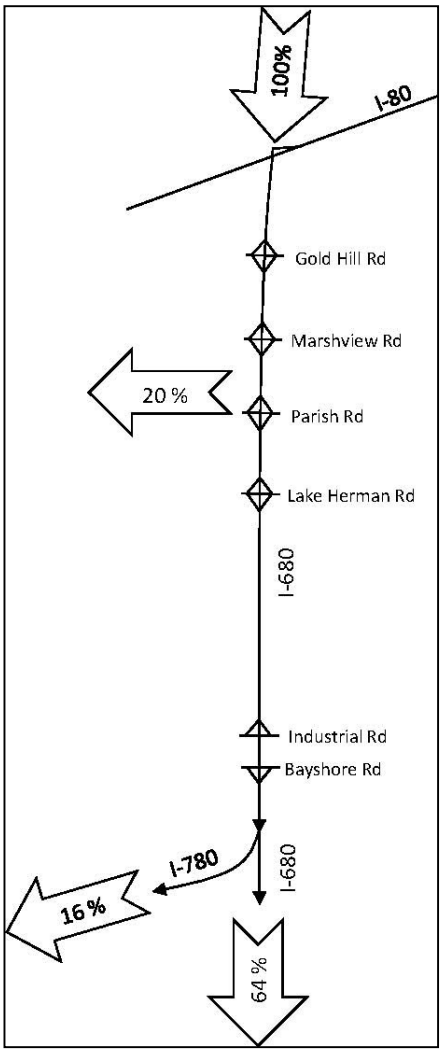
2030
SOL I-680 PM Peak northbound Origin and Destination traffic
expressed in percentages



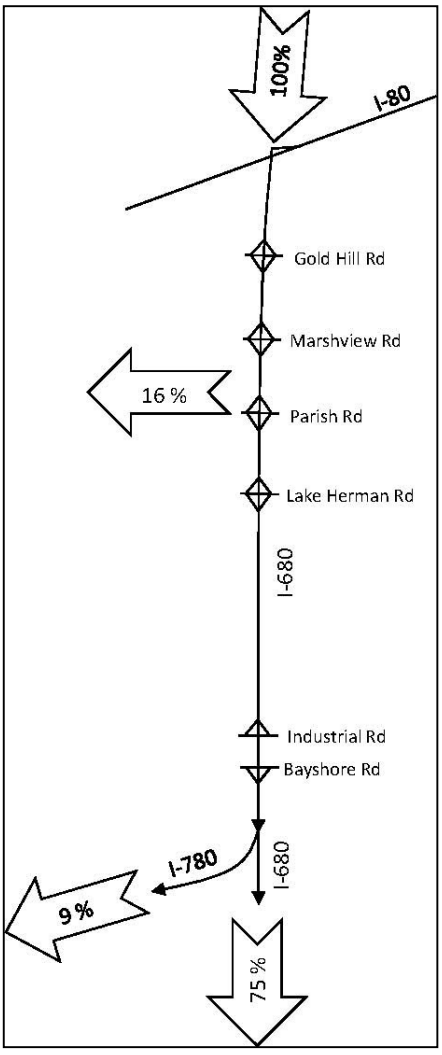
Caltrans, District 4 Forecast/Modeling Branch

SOL I-680 2009/2030 Southbound AM Peak Origin and Destination Traffic

2009
SOL I-680 AM Peak southbound Origin and Destination traffic
expressed in percentages

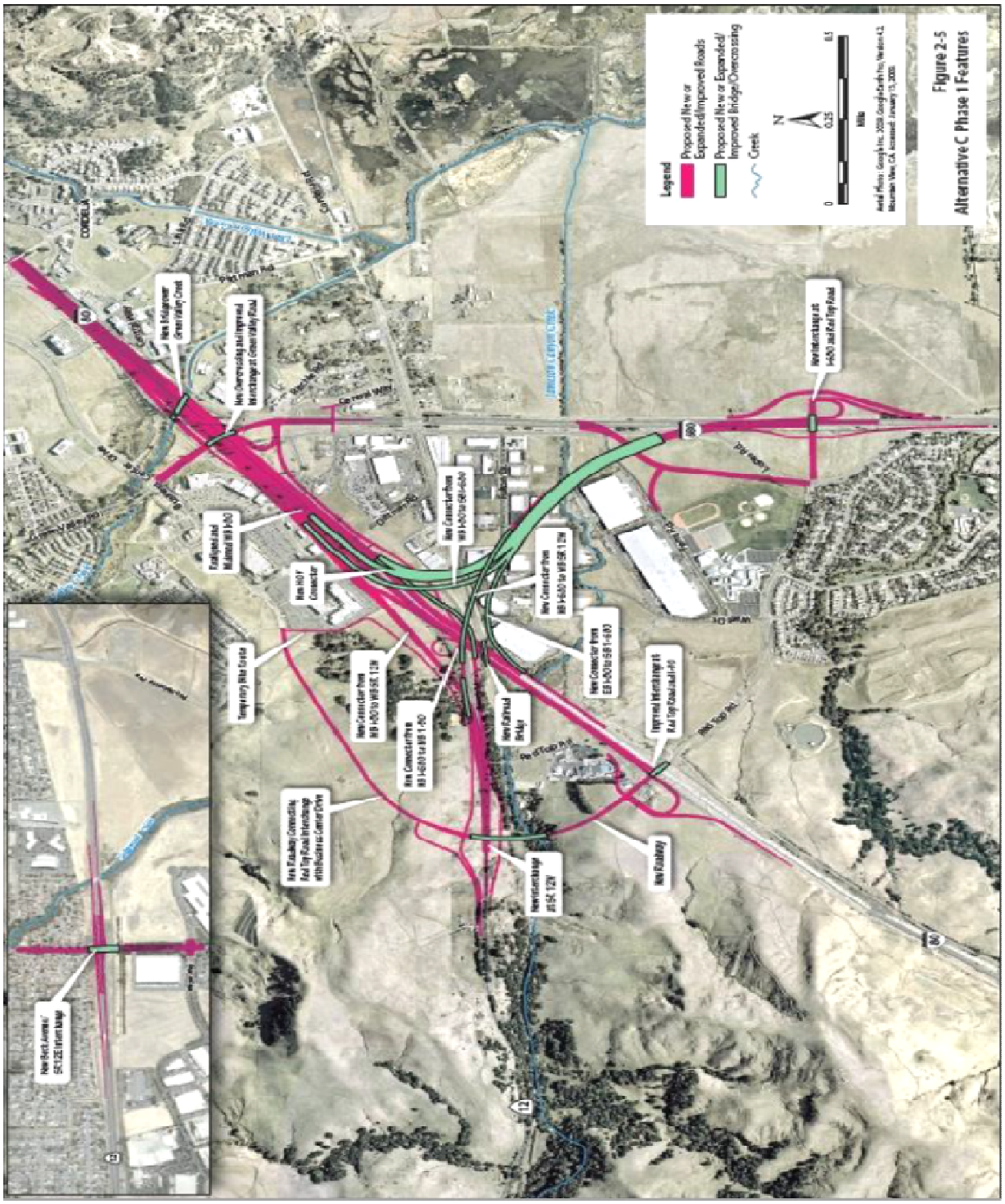


2030
SOL I-680 AM Peak southbound Origin and Destination traffic
expressed in percentages

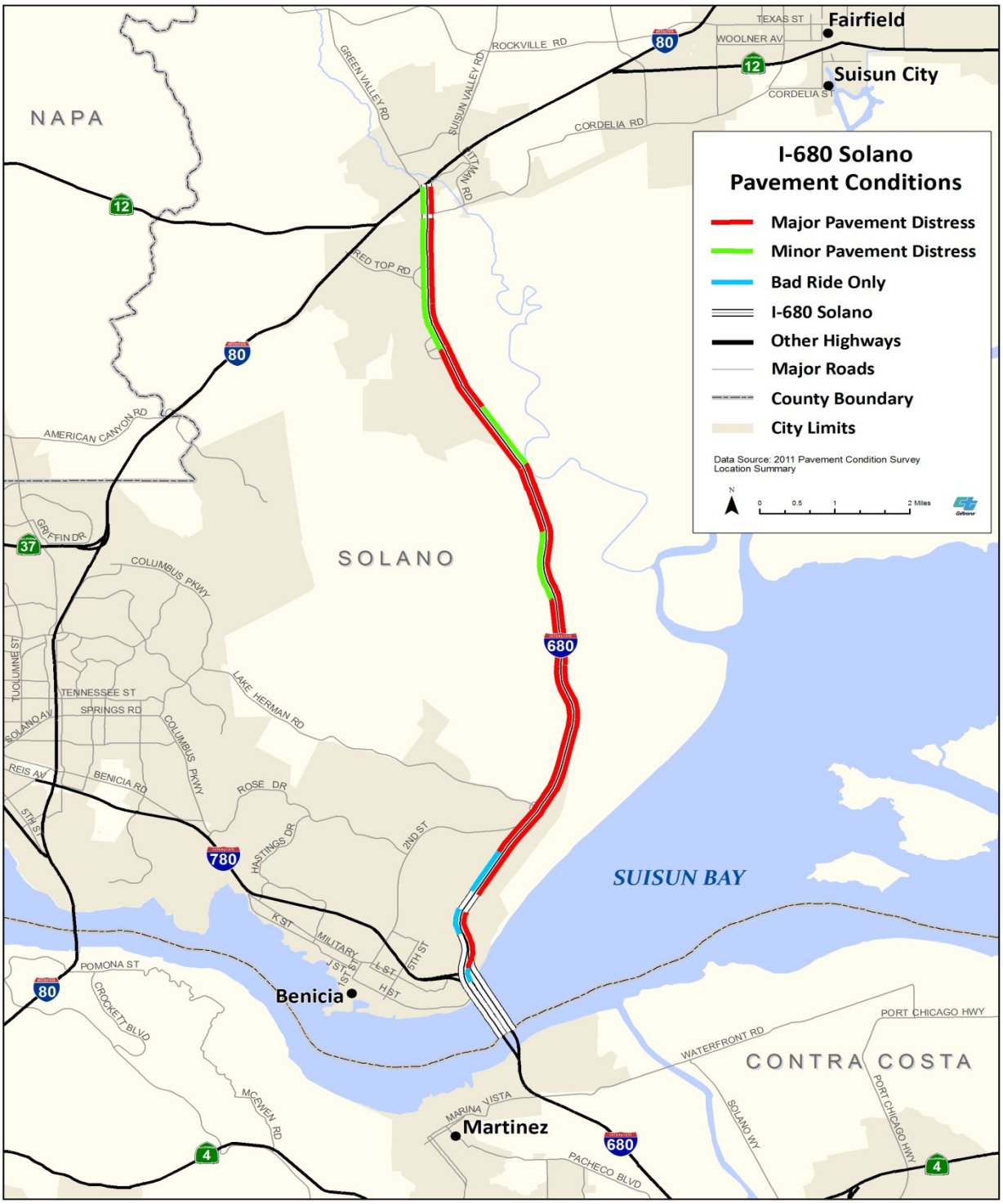


Caltrans, District 4 Forecast/Modeling Branch

I-80 / I-680 / SR 12 Interchange Project – Preferred Alternative



SOL I-680 Distressed Pavement



APPENDIX D

RESOURCES

Amtrak California, Capital Corridor,
http://www.amtrak.com/ccurl/912/315/Capitol-Corridor-Schedule-20120810,0.pdf

Association of Bay Area Governments, Bay Area FOCUS, Solano County Priority Development Areas
http://www.bayareavision.org/pda/solano-county/

Bay Conservancy & Development Commission,
http://www.bcdc.ca.gov/

Benicia Industrial Park Association
< http://beniciaipa.org/>

California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, *Solano County Important Farmland*, 2010
ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/sol10.pdf

California Department of Fish and Game, Grizzly Island Wildlife Area
http://www.dfg.ca.gov/lands/wa/region3/grizzlyisland/

California Department of Fish and Game, California Natural Diversity Database, Quickviewer,
<http://imaps.dfg.ca.gov/viewers/cnddb_quickviewer/app.asp>

California Department of Fish and Game, Biogeographic Information and Observation System (BIOS),
<http://imaps.dfg.ca.gov/viewers/biospublic/app.asp>

California Natural Diversity Database (CNDD)
http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf

California Department of Transportation, 2010 Smart Mobility Handbook, Ch 3: Applying the Smart Mobility to Place Types. http://www.dot.ca.gov/hq/tpp/offices/ocp/smf_files/SmMblty_v6-3.22.10_150DPI.pdf

California Department of Transportation, Office of Freight Mobility, Port of Benicia Fact Sheet
http://www.dot.ca.gov/hq/tpp/offices/ogm/ships/Fact_Sheets/Port_of_Benicia_Fact_Sheet_073012.pdf

California Department of Transportation District 4, Highway Operations Division, Park and ride
http://www.dot.ca.gov/dist4/highwayops/parkandride/documents/park_ride_lots_master_list_12_14_09.pdf

California Department of Transportation, Division of Transportation System Information, California Road System ((CRS) Maps 5K44 & 5K15. http://dot.ca.gov/hq/tsip/hseb/crs_maps/

California Department of Transportation, Division of Transportation System Information, California Road System ((CRS)and Maps, 6J and 5J, <http://www.dot.ca.gov/hq/tsip/hseb/crs_maps/>

California Department of Transportation, Interregional Transportation Strategic Plan (ITSP), June 1998
http://www.dot.ca.gov/hq/transprog/ocip/te/itsp.pdf

California Department of Transportation (Caltrans) Traffic Noise Protocol dated March 2011
http://www.dot.ca.gov/hq/env/noise/pub/ca_tnap_may2011.pdf

California, Department of Transportation, Traffic Operations Division, Traffic and Vehicle Data Systems
http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2010all/Route505-980.html

California Department of Transportation, Truck Network on California State Highways, District 4 Map 1 of 1,
http://www.dot.ca.gov/hq/traffops/trucks/truckmap/truckmap-d04.pdf

California Department of Transportation, Truck Map Legend Truck Lengths and Routes,
<http://www.dot.ca.gov/hq/traffops/trucks/truckmap/truck-legend.pdf>

California Department of Transportation, Truck Network on California State Highways, District 3 Map 3 of 12, 2011,
<http://www.dot.ca.gov/hq/traffops/trucks/truckmap/truckmap-d03.pdf>

California Emergency Management Agency, Benicia Quadrangle, Tsunami Inundation for Emergency Planning <http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/Solano/Documents/Tsunami_Inundation_Benicia_Quad_Solano.pdf

The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) State Area Designation Maps: Maps: Ozone: http://www.arb.ca.gov/desig/adm/2011/state_o3.pdf
The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) State Area Designation Maps: PM2.5: http://www.arb.ca.gov/desig/adm/2011/state_pm25.pdf
The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) State Area Designation Maps: PM 10: http://www.arb.ca.gov/desig/adm/2011/state_pm10.pdf
The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) State Area Designation Maps: Carbon Monoxide: http://www.arb.ca.gov/desig/adm/2011/state_co.pdf
The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) National Area Designation Maps: 8 Hour Ozone: http://www.arb.ca.gov/desig/adm/2011/fed_o3.pdf
The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) National Area Designation Maps: PM 2.5: http://www.arb.ca.gov/desig/adm/2011/fed_pm25.pdf
The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) National Area Designation Maps: PM 10: http://www.arb.ca.gov/desig/adm/2011/fed_pm10.pdf
The California Environmental Protection Agency (CEPA), Air Resources Board (ARB) National Area Designation Maps: Carbon Monoxide: http://www.arb.ca.gov/desig/adm/2011/fed_co.pdf
The California Streets and Highways Code, Division 1, Chapter 2, Article 3; The State Highway Routes, Section 620 http://www.leginfo.ca.gov/cgi-bin/displaycode?section=shc&group=00001-01000&file=300-635
California Sea-Level Rise Interim Guidance Document http://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20110311/12.SLR_Resolution/SLR-Guidance-Document.pdf
County of Solano, 2008 *Countywide General Plan, Ch 2 Land Use LU*-7, Figure LU-1 http://www.co.solano.ca.us/civicax/filebank/blobdload.aspx?blobid=6492
County of Solano, 2008 *Countywide General Plan, Ch 3 Agriculture AU*-7, Figure AU-1: http://www.co.solano.ca.us/civicax/filebank/blobdload.aspx?blobid=6493
County of Solano, 2008 *Countywide General Plan, Ch 5Public Health and Safety,* Policy HS.P-32, page HS-55 http://www.co.solano.ca.us/civicax/filebank/blobdload.aspx?blobid=6495
National Railroad Passenger Corporation: Amtrak http://www.amtrak.com/servlet/ContentServer?pagename=am/am2Station/Station_Page&code=MTZ
The San Francisco *Bay Area* Water Emergency Transportation Authority http://www.baylinkferry.com/directions/index.php
Solano Transportation Authority, Countywide Transportation Plan http://www.sta.ca.gov/docManager/1000002350/STA%20SoHIP%20FULL%20draft%20Public%20Release.pdf
Solano Transportation Authority, Countywide Bicycle Plan http://www.sta.ca.gov/docs.php?oid=1000002942&ogid=1000000947
Solano Transportation Authority, Countywide Pedestrian Plan http://www.sta.ca.gov/docManager/1000003176/Final%20Ped%20Transportation%20Plan%2001-11-12.pdf
Solano Transportation Authority, Solano-Napa County Transit Information, http://www.soltransride.com/
Tri City and County Cooperative Planning Area Western Hills Priority Conservation Area (PCA) http://www.bayareavision.org/initiatives/PDFs/FOCUS_Brochure_12-08.pdf
U.S. Census Bureau, United States Census 2010, State and County QuickFacts, City of Fairfield, http://quickfacts.census.gov/qfd/states/06/0623182.html
U.S. Census Bureau, United States Census 2010, State and County Quick Facts, City of Benicia, http://quickfacts.census.gov/qfd/states/06/0605290.html

U.S. Geological Survey National Earthquake Hazards Reduction Program FINAL TECHNICAL REPORT
Digital Database for the Concord and Green Valley faults
http://earthquake.usgs.gov/research/external/reports/05HQGR0029.pdf
United State Geological Survey, Liquefaction Hazard Map,
http://earthquake.usgs.gov/regional/nca/qmap/
United States Maritime Administration(MARAD),United States Naval Defense Reserve Fleet
http://www.marad.dot.gov/ships_shipping_landing_page/national_security/ship_operations/national_defense_reserve_fleet/national_defense_reserve_fleet.htm