# Transportation Concept Report

## State Route 160
## District 3
## August 2014

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 3 Office of System and Freight Planning* makes every effort to ensure the accuracy and timeliness of the information contained in the TCR. The information in the TCR does not constitute a standard, specification, or regulation, nor is it intended to address design policies and procedures.

**California Department of Transportation**

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

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**Further Transportation Concept Report Information:**

Caltrans District 3 Website - http://www.dot.ca.gov/dist3/departments/planning
(Select System and Freight Planning, then Transportation Concept Reports)

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# ABOUT THE TRANSPORTATION CONCEPT REPORT

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

The System Planning process is primarily composed of four parts: the District System Management and Development Plan (DSMDP), the Transportation Concept Report (TCR), the Corridor System Management Plan (CSMP), and the DSMDP Project List. The district-wide **DSMDP** 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 included within the CSMP. The **DSMDP Project List** is a list of planned and partially programmed transportation projects used to recommend projects for funding. These System Planning products are also intended as resources for stakeholders, the public, and partner, regional, and local agencies.

## TCR Purpose

California's State Highway System needs long-range planning documents to guide the logical development of transportation systems as required by CA Gov. Code §65086 and as necessitated by the public, stakeholders, and system users. The purpose of the TCR is to evaluate current and projected conditions along the route and communicate the vision for the development of each route in each Caltrans District during a 20-25 year planning horizon. The TCR is developed with the goals of increasing safety, improving mobility, providing excellent stewardship, and meeting community and environmental needs along the corridor through integrated management of the transportation network, including the highway, transit, pedestrian, bicycle, freight, operational improvements and travel demand management components of the corridor.

# STAKEHOLDER PARTICIPATION

Stakeholder participation was sought throughout the development of the State Route (SR) 160 TCR. Outreach involved internal and external stakeholders, and regional and local agencies. During the initial information resource gathering for the TCR, stakeholders were contacted for their initial input related to their particular specializations, and to verify data sources used and data accuracy. As the document was finalized, stakeholders were asked to review the document for comments, edits, and for consistency with the intent of existing plans, policies, and procedures. Written comments were received and incorporated into the final document. The process of including and working closely with stakeholders adds value to the TCR, allows for outside input and ideas to be reflected in the document, increases credibility, and helps strengthen public support and trust.

# STATE AND LOCAL RESPONSIBILITY

Improvements to the SHS are the responsibility of both Caltrans and local agencies. Developments that add cumulative impacts to this route and the regional State Highway System may necessitate that local jurisdictions provide nexus based, proportional fair-share funding for future highway improvements. Developments or local circulation changes that will have significant traffic impacts to the highway should provide improvements to mitigate those impacts.

# EXECUTIVE SUMMARY

State Route (SR) 160 is a 49.65 centerline mile facility located in both Contra Costa (1.4 centerline miles) and Sacramento (48.25 centerline miles) Counties. Within Sacramento County in District 3, SR 160 is a two-lane conventional highway for its entire length until the break in route north of Freeport. This portion of the route parallels the Sacramento River and serves agricultural land uses and small rural communities in the Sacramento River Delta. Segments 1-3 have scenic highway designation. When the route begins again in Sacramento by the American River Bridge, it is an urban freeway of four to six lanes and provides access to SR 51 and downtown Sacramento. SR 160 serves the rural communities of Rio Vista, Isleton, Ryde, Walnut Grove, Courtland, Hood, and Freeport, as well as the urban City of Sacramento. This route is included in the Interregional Road System.

## Concept Summary

The SR 160 TCR evaluates recent traffic conditions along the route using 2012 as a base year and the projected conditions for the route within the 20-year planning horizon for a concept year of 2032. For the purposes of analysis for this document the route is broken down into four segments based on logical termini. Table 1 provides a summary of the existing facility, build facility (20-year concept), and ultimate facility (post 20-year concept) for SR 160. The build facility scenario is the existing facility plus planned and programmed SHS projects with future traffic volumes. The ultimate facility is the facility needed to meet the concept Level of Service (LOS) standards for the route.

*Table 1: SR 160 Concept Summary*

| Segment # | Segment Description | Existing Facility | Build Facility | Ultimate Facility |
|---|---|---|---|---|
| **1** | Antioch Bridge/Contra Costa County Line to SR 12 | 2C | 2C, Maintain Only | 2C, Maintain Only |
| **2** | SR 12 to Isleton Bridge | 2C | 2C, Maintain Only | 2C, Maintain Only |
| **3** | Isleton Bridge to north of Freeport city limits | 2C | 2C, Maintain Only | 2C, Maintain Only |
| **Break in Route** | | | | |
| **4** | American River Bridge to SR 51 | 4 – 6F | 4 - 6F, Increased Operational & ITS Improvements | 4-6F, Increased Operational & ITS Improvements |

Note: F = Freeway, E = Expressway, C = conventional

## Concept Rationale

Caltrans District 3 Concept Rationale is based on the concept Level of Service (LOS) standards for acceptability in rural, urban clusters, and urbanized areas. Traditionally, concept LOS has been used in Caltrans TCRs to reflect the minimum level or quality of operations acceptable for each route segment within the 20-year planning period. District 3 LOS standards are as follow: LOS D in rural areas (population less than 2,500), LOS E in urban cluster (population 2,500 to 49,999), and LOS E urbanized areas (population over 50,000). There is no significant growth expected in the next 20 years. However, improvements as identified below are essential to providing and maintaining a sustainable, safe, integrated, and efficient transportation system that will enhance California's economy and livability.

During the TCR 20-year planning horizon, no significant growth or development is anticipated in the rural areas served by SR 160, and the rural portions of the route are expected to continue as a two-lane conventional highway (2C), serving relatively low traffic volumes. The concept for these areas is to maintain the existing

facility with no major capacity improvements planned. This concept of "Maintain Only" for Segments 1 – 3 was based on its functional classification, relatively low traffic volumes, and the number of higher priority routes in the district. Maintenance, rehabilitation, and safety projects will continue as necessary. Segment 4, the urban segment, is expected to see continued traffic growth as development continues in Sacramento. The concept for this facility is to remain a freeway and improve operational performance through projects such as ramp metering or interchange improvements.

### Proposed Projects and Strategies

Proposed projects that affect SR 160 come in two main types: those on SR 160 and those off it. The projects on SR 160 are located in the Sacramento area on Segment 4 where most growth on the facility will occur there. These projects are the construction of a split-diamond interchange at Exposition Boulevard (Blvd.) and the installation of ramp metering at three locations. Those projects off SR 160 are located in the Freeport area and consist of the Freeport Shores Pedestrian and Bicycle Path, which will cross SR 160, and the I-5 interchange at Consumnes River Blvd., which will create more direct access to SR 160 from I-5.

# CORRIDOR OVERVIEW

## ROUTE SEGMENTATION

For the purpose of analysis, SR 160 is broken into four segments. These segments are identified in Table 2 and illustrated in Figure 2. In between Segment 3 and Segment 4, there is a 9 mile break in route from the Sacramento City limit at Freeport Blvd. to the American River Bridge approach starting at Richards Blvd.

*Table 2: SR 160 Route Segmentation*

| Segment # | Location Description | County, Route, Beginning Postmile (PM)* | County, Route, End PM* |
|---|---|---|---|
| 1 | Antioch Bridge/Contra Costa County Line to SR 12 | SAC_L0.00 | SAC_L10.78/R0.00 |
| 2 | SR 12 to Isleton Bridge | SAC_R0.00 | SAC_5.95 |
| 3 | Isleton Bridge to north of Freeport, Sacramento City limits | SAC_5.95 | SAC_35.045 |
| 4 | American River Bridge to SR 51 | SAC_44.456 | SAC_47.05 |

*Beginning and end postmiles for each segment are derived from the Caltrans Transportation System Network (TSN) Highway Sequence Listing[1] using route breaks and district, county, and urban/rural boundaries.

*Figure 1: SR 160, south of Sacramento in the Freeport community*

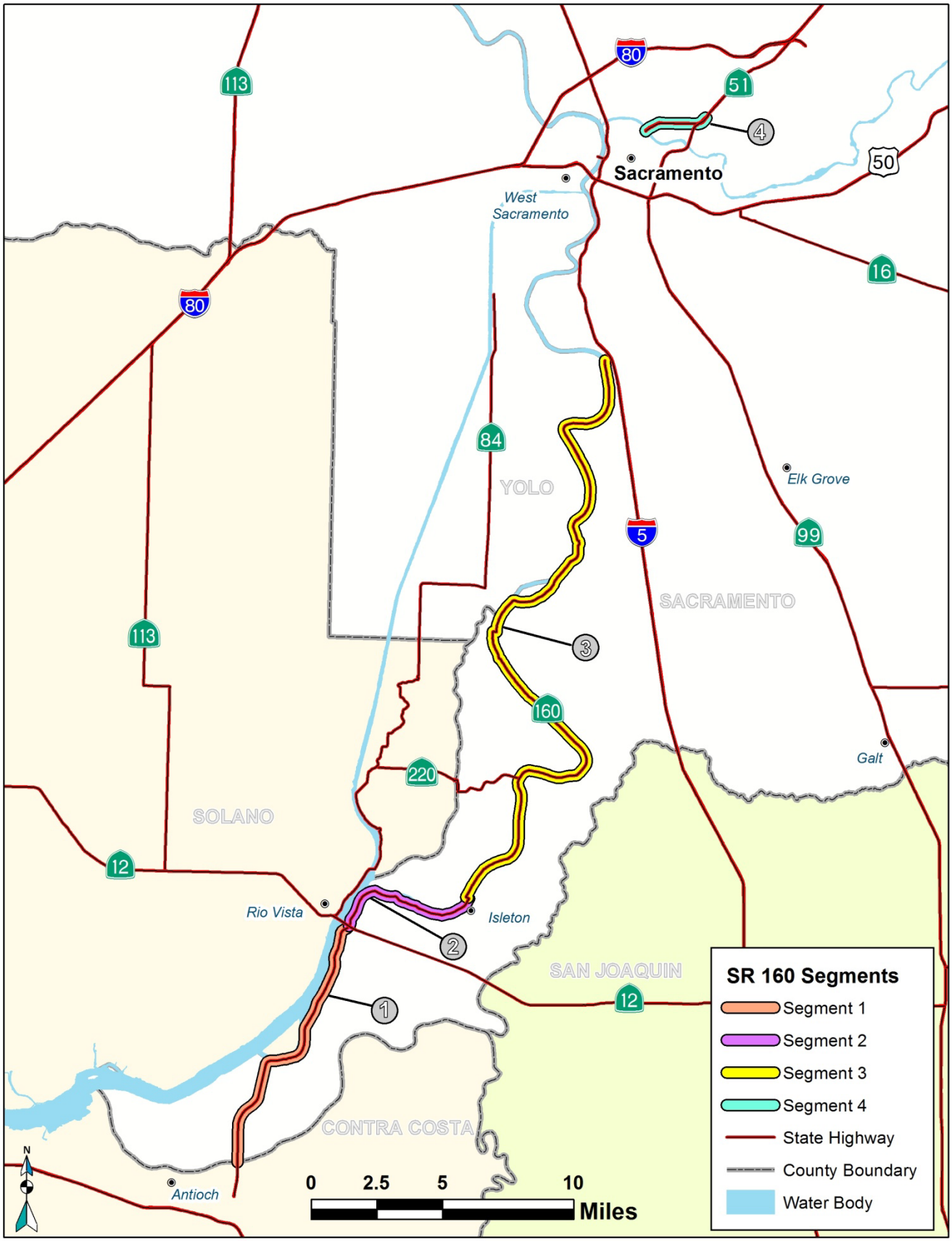



*Figure 2: SR 160 Route Segmentation Map*

## ROUTE DESCRIPTION

SR 160 traverses both Sacramento and Contra Costa counties. The route begins at the SR 4/SR 160 junction (Contra Costa PM 0.000) in Contra Costa County then traverses north to Sacramento County (PM L0.00) over the Antioch Bridge. The District 3 portion (Segment 1) then arrives on land on Sherman Island, continuing in a northwest direction along the Sacramento River on Brannan Island until the junction with SR 12 (PM L10.78/R0.00). The route continues (Segment 2) along the river through the City of Isleton until it reaches the Isleton Bridge to cross the river to Grand Island (PM 5.95). The route (Segment 3) continues on Grand Island, passing by Walnut Grove, and continuing on through the island and crossing the river to the mainland near Paintersville. The route continues through agricultural land to Freeport, where there is a break (PM 35.045). SR 160 (Segment 4) then continues at the American River Bridge (SR 44.456) in the City of Sacramento, crosses the American River, and passes through commercial and residential land uses until it ends at SR 51 (PM 47.05). A beakdown of each segment's designation and characteristics is identified in Table 3 below.

*Table 3: SR 160 Route Designations and Characteristics*

| Segment # | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Freeway & Expressway | No | No | No | Yes |
| National Highway System[2] | Yes | No | No | Yes |
| Strategic Highway Network | Yes | No | No | Yes |
| Scenic Highway[3] | Yes | Yes | Yes | No |
| Interregional Road System[4] | Yes | Yes | Yes | No |
| High Emphasis[5] | No | No | No | No |
| Focus Route[6] | No | No | No | No |
| Federal Functional Classification[7] | Other Principal Arterial | Major Collector | Major Collector | Other Freeway or Expressway |
| Goods Movement Route[8] | Terminal Access (STAA) | Terminal Access (STAA) | California Legal Advisory Route to PM 21.1; California Legal Network to PM 35.044 | California Legal Network |
| Truck Designation | Terminal Access (STAA) | Terminal Access (STAA) | California Legal Advisory Route to PM 21.1; California Legal Network to PM 35.045 | California Legal Network |
| Rural/Urban/Urbanized | Rural | Rural | Rural | Urban |
| Metropolitan Planning Organization[9] | Sacramento Area Council of Governments | | | |
| Regional transportation Planning Agency | N/A | | | |
| Congestion Management Agency | N/A | | | |
| County Transportation Commission | N/A | | | |
| Local Agency | Sacramento County | Sacramento County, City of Isleton | Sacramento County | City of Sacramento |
| Air District | Sacramento Metropolitan Air Quality Management District | | | |
| Terrain | Flat and low in elevation | | | |

## COMMUNITY CHARACTERISTICS AND LAND USE

There are two incorporated communities and several small unincorporated communities located along SR 160. Through Segment 1 and most of Segment 2, the route flows through farmland in the Delta until the City of Isleton. Isleton is a small community with 800 residents as of the 2010 Census[10] and a low median household income of $30,795. The route meanders along the Sacramento River and passes through several small towns such as Courtland (pop. 355), Freeport (pop. 38), and Hood (pop. 271). These small unincorporated towns have lower than average median household incomes (Courtland $46,000, Freeport $43,000, and Hood $48,000) compared to the Sacramento County median of $56,553. Walnut Grove is an exception, with 1,542 residents and a median household income of $65,000, higher than the county median. By contrast, the City of Sacramento (Segment 4) is the sixth largest city in California at 467,000 and a diverse community. Its median income is $51,000, higher than the small communities but lower than the County median. The freeway segment of SR 160 travels through five separate neighborhoods of varying socio-economic level. There are also several different sources of employment along this segment. Within the immediate vicinity of the facility there are government offices, light manufacturing and warehousing, large retailers and wholesalers, and medical and other business offices. SR 160 also offers access to several major employment opportunities in downtown Sacramento and at Sacramento State.

Land uses along the rural portion of SR 160 consist primarily of agricultural cropland with some limited recreational uses near the river in the Delta. In Isleton, Courtland, Hood, and Freeport, there are limited residential and commercial uses to serve the small populations. In Isleton there is limited tourism related to the Delta and recreational fishing and hunting. There is also the Isleton Chinese and Japanese Commercial Districts, a historic district, which is listed on the national register of historic places.

*Table 4: Land Use*

| Segment # | Land Use Pattern |
|---|---|
| *1* | *Agriculture with outdoor sport activities* |
| *2* | *Agriculture with minor residential and commercial uses in Isleton* |
| *3* | *Agriculture with minor residential and commercial uses in Walnut Grove* |
| *4* | *Urbanized uses, such as commercial, office, industrial, and residential* |

SR 160 is a vital transportation corridor for the communities and land uses along the Sacramento River and elsewhere in the Delta because it provides regional connectivity to Sacramento and other major population centers. Without SR 160's vital connectivity, agricultural products could not reach markets as easily, and the Delta would be isolated from the rest of the region.

*Figure 3: SR 160 passing through the Courtland community*

## System Characteristics

For the purpose of analysis, SR 160 is divided into four segments based on junctions with other facilities and community boundaries. Figures 4, 5, 8 and 9 show the location of Segments 1 through 4. Table 5 below identifies the System Characteristics for all segments within SR 160. The following summarizes the characteristics of each segment:

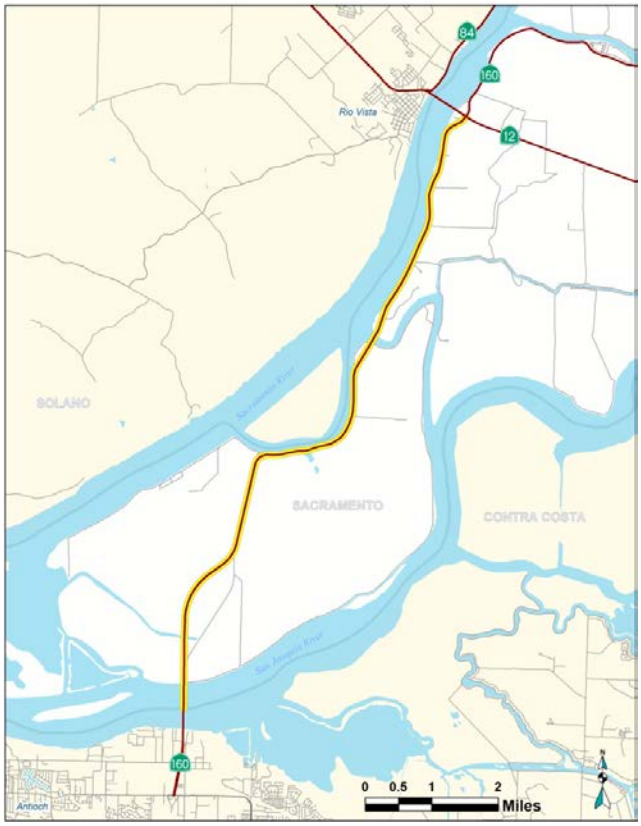



*Figure 4: Segment 1 Map*

*Figure 5: Segment 2 Map*

**Segment 1** is currently a two-lane conventional highway containing approximately 10.79 centerline miles. Facility expansions or capacity increases are not envisioned before 2032. In the Sacramento County General Plan Circulation Element, SR 160 is proposed to be expanded to a 4-lane arterial, but no projects are in the SACOG Metropolitan Transportation Plan (MTP) to implement this.[11]

*Figure 6: Existing levee limits amount of shoulder width on SR 160*

**Segment 2** is currently a two-lane conventional highway containing approximately 5.95 centerline miles. The Segment travels through the City of Isleton and serves as its Main Street (St.). No significant facility expansions are envisioned within the 20-year planning horizon.

*Figure 7: SR 160 in City of Isleton*

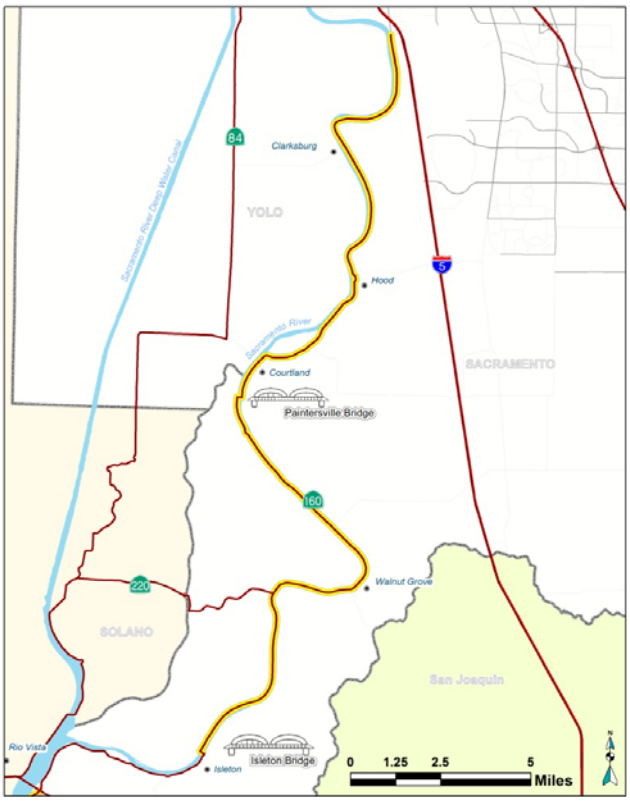



*Figure 8: Segment 3 Map*

*Figure 9: Segment 4 Map*

**Segment 3** is also a two-lane conventional highway of 28.9 centerline miles. The Segment serves the small unincorporated communities of Courtland, Hood, and Freeport and the large amounts of agricultural land that depend on the facility. For Segments 1 – 3, the Route is surrounded by agricultural uses, and no major land use changes are anticipated in the foreseeable future except for the Delta Shores development. The proposed Delta Shores development covers 800 acres between SR 99, I-5, and SR 160 and includes 5,222 residential units and 1.5 million square feet of retail, hospitality, and service-oriented office use. Although major access to this development will be from a future I-5/Consumnes River Blvd. interchange, there will be minor access to SR 160 from Stonecreek Avenue (Av.) in Freeport, which may add a significant number of trips to the facility and could impact operations on the route.

*Figure 10: SR 160 Sacramento River Bridge*

**Segment 4** varies from four to six lanes of freeway, spanning a total of 2.59 centerline miles. The Route begins at the American River Bridge, crossing north of it to North Sacramento. In North Sacramento it passes through densely built urban environment with a mix of residential, commercial, and industrial uses. This segment is important as it provides one of a few ways across the American River, opening up another connection between Downtown Sacramento and North Sacramento. While no significant facility expansions are proposed for within the 20-year planning horizon, a ramp metering project and an interchange upgrade are planned and will improve facility operations.

*Figure 11: Freeway portion of SR 160 between downtown Sacramento and SR 51*

*Table 5: SR 160 System Characteristics and Concept Facility*

| Segment # | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Existing Facility** | | | | |
| **Facility Type*** | C | C | C | F |
| **General Purpose Lanes** | 2 | 2 | 2 | 4 lanes 2.14 miles<br>5 lanes 0.27 miles<br>6 lanes 0.134 miles |
| **Centerline Miles*** ** | 10.79 | 5.95 | 28.9 | 2.59 |
| **Lane Miles** | 21.58 | 11.9 | 57.8 | 10.71 |
| **Intelligent Transportation System (ITS) Elements**** | -- | -- | -- | 1-RMS (non-op.),<br>2-TMS |
| **Build Facility** | | | | |
| **Facility Type*** | C | C | C | F |
| **General Purpose Lanes** | 2 | 2 | 2 | 4 lanes 2.18 miles<br>5 lanes 0.27 miles<br>6 lanes 0.134 miles |
| **Centerline Miles** | 10.79 | 5.95 | 28.9 | 2.59 |
| **Lane Miles*** ** | 21.58 | 11.9 | 57.8 | 10.71 |
| **ITS Elements**** | -- | -- | -- | 1-RMS (non-op.),<br>2-TMS |
| **Ultimate Facility** | | | | |
| **Facility Type*** | C | C | C | F |
| **General Purpose Lanes** | 2 | 2 | 2 | 4 lanes 2.18 miles<br>5 lanes 0.27 miles<br>6 lanes 0.134 miles |
| **Centerline Miles** | 10.79 | 5.95 | 28.9 | 2.59 |
| **Lane Miles** | 21.58 | 11.9 | 57.8 | 10.71 |
| **ITS Elements**** | -- | -- | -- | 6-RMS, 2-TMS,<br>1-CCTV |

* F = Freeway, E = Expressway, C = Conventional
** ITS Elements: RMS=Ramp Metering Stations, TMS=Traffic Monitoring Station, CCTV=Closed Circuit Television
*** Lane Miles equals Centerline Miles times number of Lanes

*Figure 12: Scenic Highway portion of SR 160*

## BICYCLE FACILITIES

There are currently no designated bicycle routes on SR 160. For Segments 1 – 3, bicyclists utilize roadway shoulders, or share the road with automotive traffic. For almost the entire length of Segments 1 – 3, the facility is at or near sea level with a flat terrain. Segment 1 has wide shoulders. Segment 2 and substantial portions of Segment 3, however, have narrow shoulders because they were mostly built on levees, and this makes widening expensive and environmentally constrained. Segment 4 is a Freeway that is prohibited to bicyclists. However, there are existing parallel bicycle facilities within the City of Sacramento in Segment 4 on Del Paso Blvd., Fee Drive, Arden Way, and Tribute Road. Table 6 summarizes the existing conditions of bicycle facilities along SR 160.

Currently, there is one programmed bicycle related project along SR 160 in Segment 3 sponsored by the City of Sacramento in conjunction with the Freeport Shores project. There are no other bicycle related projects are programmed for construction along SR 160; however, there are several planned bicycle related projects. The *2013 Sacramento Area Council of Governments Bicycle-Pedestrian-Trials Master Plan*[12] identifies a proposed multi-use Class I* Bicycle Path in Segment 2 along SR 160 and the Sacramento River in the City of Isleton. In addition, this Plan identifies a Sacramento County proposed Class II* Bike Lane for the entire length of SR 160 in Segment 1, a Class I* Bicycle Path along SR 160 from the community of Hood north to the Sacramento City limit in Segment 2, and a Class II* Bike Lane from Walnut Grove to north of Freeport at the Sacramento City limit on SR 160 in Segment 3. The Caltrans District 3 *2013 State Highway Bicycle Facility Plan* (SHBF Plan)[13] does not recommend any classification changes to the route.

***Table 6: SR 160 Bicycle Facilities Existing Conditions***

| Segment # | County Post Mile | Location Description | Bicycle Access Prohibited | Outside Paved Shoulder Width | Facility Type* |
|---|---|---|---|---|---|
| **1** | SAC_160_L0.00 - L10.78 | Beginning of facility to junction SR 12. | No | 4 - 8 feet | Non-Designated |
| **2** | SAC_160_R0.00 - 5.95 | Junction SR 12 to Isleton Bridge | No | 0 - 4 feet | Non-Designated |
| **3** | SAC_160_5.95 - 35.045 | Isleton Bridge to north of Freeport. | No | 0 - 2 feet with a few portions 2 - 4 feet | Non-Designated |
| **4** | SAC_160_R44.456 - 47.05 | In City of Sacramento, Richards Blvd. to end of facility. | Yes | Varies | Closed to bicycles. Parallel facilities nearby exist. |

*Please see Appendix A, Glossary of Terms, for definitions of bicycle facility types under "Bikeways".

***Figure 13: Bicycle rider in distance on SR 160 near marina***

## PEDESTRIAN FACILITY

Table 7 below identifies pedestrian facilities along SR 160. There are no sidewalks within Segments 1 and 3. Shoulders are unpaved and widths vary from wide to nonexistent. Shoulder widths are wider in sections near residential housing. There are sidewalks present for a small section of SR 160 in Isleton of almost 700 feet. There are no planned or programmed projects for the route that focus on improving pedestrian connections between facilities.

*Table 7: SR 160 Pedestrian Facilities Existing Conditions*

| Segment # | County Post mile | Location Description | Pedestrian Access Prohibited | Sidewalk Present |
|---|---|---|---|---|
| 1 | SAC_160_L0.00 - L10.78 | Beginning of facility to junction with SR 12. | No | No |
| 2 | SAC_160_R0.00 - 4.585 | Junction with SR 12 to A St. in Isleton. | No | No |
| 2 | SAC_160_4.585 - 4.724 | A St. to 2nd St. in Isleton. | No | Yes |
| 2 | SAC_160_4.724 - 5.95 | 2nd St. in Isleton to Isleton Bridge. | No | No |
| 3 | SAC_160_5.95 - 35.045 | Isleton Bridge to north of Freeport. | No | No |
| 4 | SAC_160_R44.456 - 47.05 | In City of Sacramento, Richards Blvd to end of facility. | Yes | No |

*Figure 14: SR 160 heading north by the City of Isleton*

## TRANSIT FACILITIES

There are no transit facilities within Segments 1, 2, and 3. The rural and agricultural conditions of the area, low pedestrian and traffic counts, and limited right-of-way are not ideal for transit facilities or fixed route stops. Segment 4, however, passes through heavily populated sections of Sacramento and is served by three Sacramento Regional Transit routes: Bus Routes 15 and 29 and Light Rail Blue Line. Table 8 provides a summary of transit services available within the SR 160 corridor.

*Table 8: SR 160 Transit Facilities Existing Conditions*

| Segment # | Mode & Collateral Facility | Operator Name | Route End Points |
|---|---|---|---|
| **4** | Traditional Bus | Sacramento Regional Transit Route 15 | Downtown Sacramento, Arden/Del Paso Light Rail Station, Watt/I-80 Light Rail Station |
| **4** | Traditional Bus | Sacramento Regional Transit Route 29 | Downtown Sacramento, Arden Fair Mall (Arden Transit Center), Fair Oaks, Citrus Heights |
| **4** | Light Rail | Sacramento Regional Transit Blue Line | Meadowview Neighborhood of Sacramento, Downtown Sacramento, and North Sacramento |

## FREIGHT

Freight movement along SR 160 on Segments 1 through 3 is comprised primarily of truck traffic that transports agricultural commodities grown or processed in the area. Segments 1 and 2 are Terminal Access (STAA) routes, meaning STAA trucks can use the route for their destination. Segment 3 from its beginning until PM 21.1 is a California Legal Advisory Route. This route designation means that California Legal Trucks are allowed, but are not advised to take the route if the Kingpin to Rear Axle (KPRA) length is over the posted maximum value. The advisory length is 30 feet in Segment 3. California Legal Trucks must meet certain requirements, such as a maximum length of 65 ft for single trailers and 75 ft for double trailers. Segment 4 is important for providing another means of accessing downtown Sacramento and SR 51. Several industrial and warehousing uses are on the corridor and benefit from access to SR 160. Existing freight facilities are identified in Table 9 and the existing freight network is delineated in Figure 17 below.

### District 3 Goods Movement Plan

In 2013, Caltrans District 3 was fully underway in creating a district-wide Goods Movement Plan. The Plan will synthesize the findings of other goods movement related plans in the District and State, conduct a district-wide assessment of the District 3 Goods Movement network, propose a prioritization framework to identify and prioritize projects, and propose a list of prioritized projects for potential funding that will sustain or improve goods movement throughput. The plan will require significant outreach, collaboration, and consensus with stakeholders, including public agencies such as the Sacramento Area Council of Governments (SACOG), and the private sector entities such as the California Trucking Association. Findings from the study will be included in the California Freight Mobility Plan (CFMP), and will be transferrable to other Caltrans Districts statewide for implementation. The *District 3 Goods Movement Plan* is scheduled to be finished in 2015. More information can be found at: https://sites.google.com/site/d03goodsmovement/.

### Table 9: SR 160 Freight Facilities Existing Conditions

| Segment # | Facility Type/Freight Generator | Location | Mode | Name | Major Commodity/ Industry | Comments/Issues |
|---|---|---|---|---|---|---|
| 1 | Highway | Sacramento County, Terminal Access (STAA) | Truck | SR 160 (Terminal Access) | Agriculture; | -Narrow Shoulders<br>-Limited Passing Sight Distance |
| 2 | Highway | Sacramento County, Terminal Access (STAA) to PM 5.9, California Legal Advisory Route to PM 5.95 | Truck | SR 160 (Terminal Access) | Agriculture | -Narrow Shoulders<br>-Limited Passing Sight Distance |
| 3 | Highway | Sacramento County, California Legal Advisory Route | Truck | SR 160 (CA Legal Advisory) | Agriculture | -Narrow Shoulders<br>-Limited Passing Sight Distance |
| 4 | Freeway | Sacramento County, California Legal to End of Route | Truck | SR 160 (CA Legal Advisory) | Commerce and Industry | - |

Figure 15: Terminal Access Route

Figure 16: Trucks typically transport aggregates or crops on SR 160

## AIRPORT FACILITY

There are 2 municipal airports within in 5 miles of SR 160, Rio Vista and Sacramento Executive Airport.

The **Rio Vista Airport** serves as a regional functional class. The airport serves the community's corporate and business needs, agriculture, tourism, ultra-light, and sport flying. Airport services include: aircraft fuel sales, search and rescue, disaster/emergency services, flight training, aircraft rental, and air medical evacuation. There are 48 aircraft based there, and 35,000 operations for the 12 month period ending January 31, 2013. The airport is the home base for the Travis Air Force Base Aero Club.

The **Sacramento Executive Airport** was Sacramento's first commercial airport, it currently provides services to corporate and business general aviation, and offers convenient access to the City of Sacramento. The airport provides a variety of airport services including fuel, maintenance, flight training, charter, rental car, and medical air evacuation services. It has 340 based aircraft, and reported 91,866 operations over the 12 month period ending October 31, 2013. The airport is close to public transit

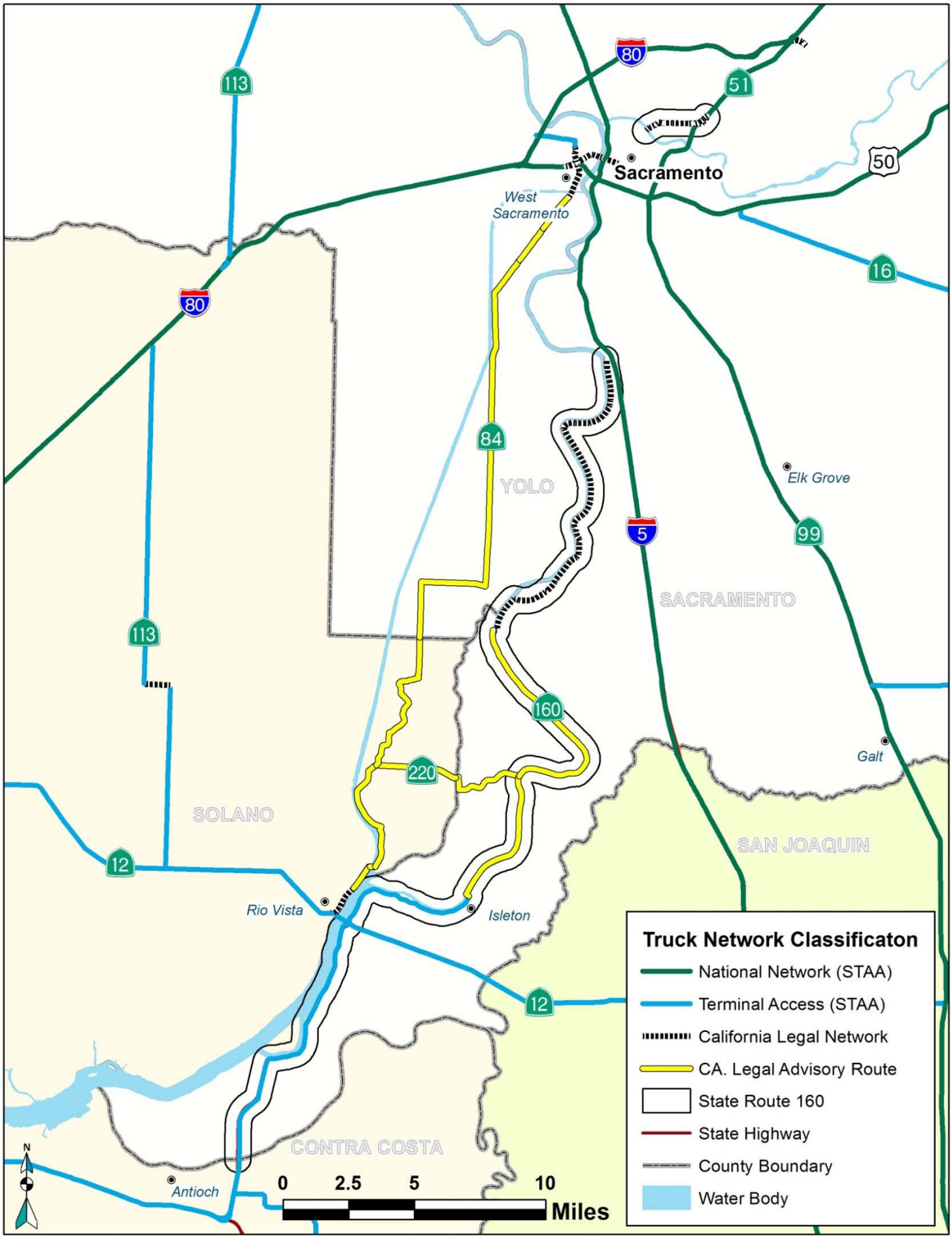



*Figure 17: SR 160 Freight Network Map*

# CORRIDOR PERFORMANCE

The performance measures used for the highway facility in this TCR include Level of Service (LOS), Vehicle Miles Traveled (VMT), Peak Hour Volume over Capacity (V/C), and Peak Hour VMT. The data inputs used to determine the performance measures include Average Annual Daily Traffic (AADT), Average Annual Daily Truck Traffic (AADTT), Percent of Trucks, 5+ Axle AADTT, and 5+ Axle Truck Percentage of AADT. The definitions, applicability, and sources of the baseline performance measures data used in this TCR corridor are identified in Appendix A. This data is given for both the Base Year of 2012 and Horizon Year of 2032 for both a "No Build" and "Build" scenarios where applicable. Basic system operation, truck traffic, and peak hour traffic performance data is discussed below and summarized in Table 10.

The future LOS for each segment of SR 160 is projected to decrease over the 20-year horizon period because of projected increases in vehicle miles traveled. LOS is a qualitative measure describing operational conditions within a traffic stream and perception of condition by users. Operational conditions are defined in terms of speed, travel time, freedom to maneuver, traffic interruption, comfort, and convenience. LOS is defined into six levels with letter designations from A to F. LOS A represents the best operating conditions wherein there is ample maneuverability, no speed restrictions and no delay, while LOS F represents the worst operating conditions with traffic congestions, significant delays and restricted maneuverability.

Caltrans has set a minimum LOS standard of LOS D in rural areas (population less than 2,500), LOS E in urban cluster (population 2,500 to 49,999), and LOS E urbanized areas (population over 50,000). However, these standards may vary depending on the unique corridor conditions. A local agency may set a higher LOS threshold standard consistent with community wishes and local concerns. Since Caltrans Concept LOS defines the minimum acceptable level of service established by Caltrans as the owner and operator of the facility, the threshold standard LOS established by the local agency should not be lower than the Caltrans Concept LOS.[14] . The ultimate facility concept LOS reflects the improvements and strategies necessary for a particular segment to meet the District's minimum acceptable LOS particularly in cases where the build facility falls below this minimum.

**Segment 1** has the second 2012 highest base year average annual daily traffic (AADT) out of all segments because it also receives traffic from SR 12 in San Joaquin and Solano Counties, and from the City of Antioch in Contra Costa County heading to the community of Rio Vista in Solano County. The base year AADT for this segment is 12,200 trips with a LOS of E. Of these trips, 1,395 are truck traffic with 922 of those trips generated by 5+ axle trucks. The base year peak hour volume/capacity (V/C) ratio is 0.51 and is projected to reach 0.73 in the No Build horizon year. No capacity expansion projects have been identified for this segment and, therefore, there is not a Build scenario for the horizon year. Overall, the segment's capacity is projected to increase over the 20-year horizon period to a maximum AADT of 17,896 and LOS E in the No Build scenario.

**Segment 2** carried a base year AADT of 3,950 trips with a LOS of E. Truck traffic accounted for 378 of these trips and 89 were from 5+ axle trucks. The base year peak hour V/C ratio is 0.20 and is projected to reach 0.27 in the No Build horizon year. No capacity expansion projects have been identified for this segment and, therefore, there is not a Build scenario for the horizon year. Overall, the segment's capacity is projected to increase over the 20-year horizon period to a maximum AADT of 5,385 and LOS E in the No Build scenario.

**Segment 3** received the lowest amount of traffic out of all segments with a base year AADT of 3,100 trips and a LOS of D. Truck traffic accounted for 226 of these trips and 127 were from 5+ axle trucks. The base year peak hour V/C ratio is 0.16 and is projected to reach 0.23 in the No Build horizon year. No capacity expansion projects have been identified for this segment and, therefore, there is not a Build scenario for the horizon year. Overall,

the segment's capacity is projected to increase over the 20-year horizon period to a maximum AADT of 4,669 and LOS E in the No Build scenario.

**Segment 4** has the highest traffic volume within the route with a base year AADT of 43,500 trips with a LOS of D. Truck traffic accounted for 2,010 of these trips, but only 167 were from 5+ axle trucks. The base year peak hour V/C ratio is 0.84 and is projected to reach 1.10 in the No Build horizon year. No capacity expansion projects have been identified for this segment and, therefore, there is not a Build scenario for the horizon year. Overall, the segment's capacity is projected to increase over the 20-year horizon period to a maximum AADT of 57,207 and LOS F in the No Build scenario.

While LOS D is the Ultimate Concept LOS standard for rural highway segments, highway expansion projects that would be needed to re-attain or maintain LOS D on Segments 1, 2, and 3 would be difficult to construct in the 20 year planning horizon due to physical constraints (highway built on levees), limited vertical and horizontal sight distance, and environmental constraints (habitat sensitivity). Figures 18 and 19 depict these constraints. The Ultimate Concept LOS E standard for the urbanized area of Segment 4 is also not feasible during the 20 year planning horizon due to physical limitations, which prevents any lane additions.

*Figure 18: Widening constrained by being on elevated levee*

*Figure 19: Limited horizontal sight distance on SR 160*

### Table 10: SR 160 Corridor Performance Measures

| BASIC SYSTEM OPERATIONS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Segment # | County, PM | Average Annual Daily Traffic (AADT) | | | Level of Service (LOS) | | | | Vehicle Miles Traveled (VMT) | | |
| | | Base Year (BY) | No Build Horizon Year (HY) | Build (HY) | BY | No Build (HY) | Build (HY) | Ultimate Concept | BY | No Build (HY) | Build (HY) |
| 1 | SAC_L0.000/L10.780 | 12,200 | 17,896 | - | E | E | - | D | 131,516 | 193,329 | - |
| 2 | SAC_R0.000/5.950 | 3,950 | 5,385 | - | E | E | - | D | 23,503 | 31,964 | - |
| 3 | SAC_5.950/35.045 | 3,100 | 4,669 | - | D | E | - | D | 58,479 | 88,303 | - |
| Break in Route | | | | | | | | | | | |
| 4 | SAC_44.456/47.050 | 43,500 | 57,207 | - | D | F | - | E | 79,615 | 105,092 | - |

| TRUCK TRAFFIC DATA | | | | | |
|---|---|---|---|---|---|
| Segment # | County, PM | Average Annual Daily Truck Traffic (AADTT) (BY) | Total Trucks (% of AADT) (BY) | 5+ Axle AADTT (BY) | 5+ Axle Total Truck (% of AADT) (BY) |
| 1 | SAC_L0.000/L10.780 | 1,395 | 9.30% | 922 | 6.15% |
| 2 | SAC_R0.000/5.950 | 378 | 9.56% | 89 | 2.25% |
| 3 | SAC_5.950/35.045 | 226 | 7.30% | 127 | 4.10% |
| Break in Route | | | | | |
| 4 | SAC_44.456/47.050 | 2,010 | 6.00% | 167 | 0.50% |

| PEAK HOUR TRAFFIC DATA | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Segment # | County, PM | Volume | | | Directional Split | | | Volume/Capacity (V/C) | | | VMT | | |
| | | BY | No Build (HY) | Build (HY) | BY | No Build (HY) | Build (HY) | BY | No Build (HY) | Build (HY) | BY | No Build (HY) | Build (HY) |
| 1 | SAC_L0.000/L10.780 | 1,150 | 1,691 | - | 65% | 65% | - | 0.51 | 0.73 | - | 12,397 | 18,224 | - |
| 2 | SAC_R0.000/5.950 | 440 | 598 | - | 65% | 65% | - | 0.20 | 0.27 | - | 2,618 | 3,560 | - |
| 3 | SAC_5.950/35.045 | 350 | 528 | - | 65% | 65% | - | 0.16 | 0.23 | - | 6,316 | 9,537 | - |
| Break in Route | | | | | | | | | | | | | |
| 4 | SAC_44.456/47.050 | 4,550 | 6,006 | - | 74% | 74% | - | 0.84 | 1.1 | - | 8,973 | 11,844 | - |

*Corridor Performance Measures table is based on 2012 traffic data and estimates a horizon year of 2032. Base Year Average and Peak Hour Volumes, and Directional Split are based on the *2012 Caltrans Traffic Volumes on California State Highway Capacity Manual*. Average Peak Hour speeds are based on Tach Run data and/or HCS Two lane highway analysis. Tach Runs were completed in April and May of 2012 during Tuesday, Wednesday, and Thursday PM Peak Hours.

# KEY CORRIDOR ISSUES

A number of significant issues provide challenges for the SR 160, including meeting the LOS Ultimate Concept standards, as well as the complicated physical, environmental, and regulatory setting of the highway, which limits widening or adding travel lanes.

The physical and environmental aspects of SR 160 are preeminent issues in long-term system planning for the facility. Much of Segments 1, 2, and 3 has been built on levees next to the Sacramento River. The levees shift, settle, and crack to a degree that affects the highway pavement condition and necessitates frequent repairs by Caltrans. A long-term maintenance preservation solution has not been identified.

The levees are owned primarily by levee districts. This makes adding new lanes or turn pockets, any expansion of the facility, problematic as the levees would also need to be widened, which is a very costly undertaking. In addition, most parts of SR 160 have little Right of Way (ROW) available for expansion even when not on levees. Purchasing new ROW would be prohibitively expensive in many areas and also challenging due to the sensitive environment of the Delta. Because the Delta is so important for habitat species, water quality, and farming, any construction of roads on Delta land would face difficulties in environmental document approval.

Additionally, several aging draw bridges located within Segments 1, 2, and 3 have narrow lanes and outdated electrical components, which require continued operation and maintenance.

SR 160 may also be threatened with difficulties from climate change and sea level rise. The Cal Adapt Sea Level Rise tool predicts which areas will likely be inundated during a 100-year flood event. While no areas on SR 160 were identified as being threatened with flooding, there is considerable uncertainty associated with climate change. Future projects for SR 160 should take sea level rise into consideration.

A very large water conveyance project of Statewide significance sponsored by the State Department of Water Resources is currently under environmental study and engineering development. This *Bay Delta Conservation Plan* project will construct water intake, underground tunnels, and pumping facilities immediately adjacent to and crossing SR 160 within Segment 3 that will require extensive changes to the alignment of the highway and major reconstruction of the roadbed at a number of locations between the communities of Clarksburg and Ryde. Caltrans will work closely with the water project team to provide continued mobility and access during the extended construction period and to ensure that when the water project is completed, access points and turning radii for trucks and other large vehicles are maintained at current conditions or improved.

Development on or near SR 160, especially in the Freeport area, could put additional trips on SR 160 and degrade facility performance. The facility is two lanes with little room to expand due to historic buildings. A parallel road network or innovative solutions may be necessary if large amounts of development are to come to SR 160.

In Segment 4, the Ultimate Concept of LOS E is not feasible due to physical limitations, which prevents any lane additions. All efforts should be made to provide sufficient ROW for future improvements to the bridge structures, interchanges, and on and off ramps, as well as other operational and ITS enhancements. Caltrans and the City of Sacramento have discussed potential relinquishment of this freeway segment to the City, which could result in substantial improvements to this freeway segment. However, there does not appear to be any interest from the City to pursue relinquishment at this time.

# CORRIDOR CONCEPT

## CONCEPT RATIONALE

SR 160 is an important transportation facility for the communities of the Delta and downtown Sacramento. Goods movement along SR 160 is vital for the livelihood and the vitality of those communities, allowing goods to reach markets and the agricultural industry to thrive. SR 160 also provides interregional connectivity to other communities within the Delta region. To preserve the vitality of those communities, this TCR proposes a facility concept that balances mobility of those communities, the cost of improvements, maintenance of the community character, and preservation of the routes scenic qualities. In Segment 4 within the urbanized area of the City of Sacramento, the freeway concept is more appropriate because the facility there serves as to link several areas of Sacramento to downtown. In the rural Segments 1, 2, and 3, which experience lower traffic and provide access to properties, the conventional highway concept is appropriate due to its lesser impact on operations and the community. The concept of Complete Streets[15] should be considered and implemented in future design and construction of improvements in the urban cluster and small communities to the SR 160 Corridor, whenever feasible.

All four Segments of SR 160 cannot be improved to perform at the Ultimate LOS Concept. This is because no capacity increasing projects have been proposed that would have resulted in an acceptable Build LOS Concept. As a consequence, projects such as targeted operational improvements, intelligent transportation systems, transportation demand management, active multimodal corridor management strategies, and reduction of travel demand on the highway facility by increased use of transit in urban areas and development of parallel facilities in developing and rural areas will be considered to help attain the Ultimate Concept.

## PROJECTS AND STRATEGIES

Projects and strategies to achieve the facility concept have two categories of funding status: fiscally constrained and fiscally unconstrained.

**Fiscally constrained projects and strategies** are projects that can be implemented using committed, available, or reasonably available revenue sources.[16]

**Fiscally unconstrained projects and strategies** are conceptual transportation improvements without an identified funding source and may be funded if reasonable additional resources become available.[17]

In addition to the funding status categories, there are three types of transportation improvements or actions: programmed, planned, and conceptual. Projects and strategies to achieve SR 160 facility concept are grouped into (1) planned and programmed projects, and (2) conceptual projects.

### Planned and Programmed Projects and Strategies

**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.

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

At this time, suitable planned or programmed projects that will help SR 160 meet the Ultimate LOS Concept have not been identified. In general, most of the planned or programmed projects are maintenance related. A list of Planned and Programmed projects and strategies is contained in Table 11 below.

*Table 11: SR 160 Planned and Programmed Projects and Strategies*

| Segment # | Description | Planned or Programmed | Location, County, PM | Lead Agency | Source* | Purpose | Total Cost Estimate* ($1,000) | Proposed Completion Year* |
|---|---|---|---|---|---|---|---|---|
| **1** | Overlay from Antioch Bridge #28-0009 to Sherman Island Rd. | Programmed | South of Rio Vista, SAC, L1.2-L4.4 | Caltrans | 2035 SACOG MTP/SHOPP | Pavement Preservation | 4,240 | 2015 |
| **1** | Overlay from Sherman Island Rd. to SR 12 | Programmed | South of Rio Vista, SAC, L4.4-L10.8 | Caltrans | 2035 SACOG MTP/SHOPP | Pavement Preservation | 3,850 | 2016 |
| **1** | Paint entire bridge | Programmed | Near Isleton, Three Mile Slough Bridge #24-121, SAC, L7.0-L7.0 | Caltrans | 2035 SACOG MTP/SHOPP | Bridge Preservation | 12,175 | 2016 |
| **1** | Improve and repair portion of the levee | Programmed | Sherman Island, SAC, L4.1-L5.4 | Caltrans | 2035 SACOG MTP/SHOPP | Levee Repair | 385 | 2017 |
| **2, 3** | Rehab. Pavement from SR 12 to 0.5 mile north of SR 220 in Ryde | Programmed | Near Rio Vista, SAC, R0.0-12.0 | Caltrans | 2035 SACOG MTP/SHOPP | Pavement Rehabilitation | 8,340 | 2016 |
| **3, 4** | On SR 160 at Sacramento Bridge #24-0053 and North Sacramento Undercrossing #24-0111L | Programmed | SAC, 20.9-45.1 | Caltrans | 2035 SACOG MTP/SHOPP | Seismic Retrofit on 4 bridges | 10,463 | 2018 |

* Total Cost Estimate and Proposed Completion Year are from listed source. Additional project details and programming information can be found in the listed source. Note, RTPs included separate fiscally unconstrained section. Please see Appendix B-Resources for more information regarding the listed source.

## Conceptual Projects and Strategies

**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.

Caltrans District 3 is currently developing the *Caltrans District 3 Intelligent Transportation Systems/Operational Improvement (ITS/Ops) Plan.* This plan will provide critical guidance to optimize the State Highway System within the District by identifying and managing ITS and other operational strategies that yield a very high return on investment. Further information on the planning and deployment of ITS and operational improvements within District 3 can be reviewed in the *District 3 ITS/Ops Plan* (forthcoming) and the *District 3 Concept of Operations Plan* (anticipated completion in 2015). For more information visit: http://www.dot.ca.gov/dist3/departments/planning/.

Conceptual projects and strategies that will help SR 160 meet the Ultimate LOS Concept are listed in Table 12.

### Table 12: SR 160 Projects and Strategies to Achieve Concept

| Segment # | Description | Location, County, PM | Lead Agency | Source* | Purpose | Total Cost Estimate* ($1,000) | Proposed Completion Year* |
|---|---|---|---|---|---|---|---|
| 1 | Widen SR 160 to 4 lanes | Antioch Bridge/Contra Costa County Line to SR 12, SAC, L0.0-L10.8/R0.0 | County of Sacramento | Sac. County 2010 General Plan, Circulation Element | Capacity Expansion | N/A | 2035 |
| 1 | Construct Class II Bike Lane from SR 12 to Contra Costa County Line | SR 12 to Antioch, SAC, L0.0-L10.8 | County of Sacramento | 2013 SACOG Bicycle/Pede-strian/ Trails Master Plan | Bike/Ped. Improvement | 3,290 | 2035 |
| 2 | Construct Class I Delta Trail along river | SAC 4.3-5.5 | City of Isleton | 2013 SACOG Bicycle/Pede-strian/ Trails Master Plan | Bike/Ped. Improvement | N/A | 2035 |
| 3 | Extend Sacramento River Class 1 Bike Path from Hood/ Franklin Rd. to Sac. City Limit | Parallel to SR 160, SAC, 26.3-34.9 | County of Sacramento | 2013 SACOG Bicycle/Pede-strian/ Trails Master Plan | Bike/Ped. Improvement | 6,437 | 2035 |
| 3 | Construct Class II Bike Lane from Hood/Franklin Rd. to Walnut Grove | SAC, 14.4-26.3 | County of Sacramento | 2013 SACOG Bicycle/Pede-strian/ Trails Master Plan | Bike/Ped. Improvement | 598 | 2035 |
| 4 | Add an Eastbound (EB) on-ramp and a westbound (WB) off-ramp | Northgate Blvd., SAC, 44.6-45.0 | Caltrans | 2010 SR 160 TCR | Ramp modification | 18,100 | 2035 |
| 4 | Construct split-diamond interchange | Exposition Blvd., SAC, 46.1 | City of Sacramento | SACOG 2035 MTP | Interchange Modification | 58,000 | 2035 |
| 4 | Construct new Sutter's Landing 4-lane arterial & SR 51 interchange on new alignment between SR 160 and SR 51 | Richards Blvd./American River Bridge, SAC, R44.5 | City of Sacramento | SACOG 2035 MTP | Capacity Expansion | 206,300 | 2035 |
| 4 | Widen Arden Way interchange to 6 lanes | Arden Way, SAC, 46.9 | Caltrans/City of Sacramento | 2010 SR 160 TCR | Operational Improvement | N/A | 2035 |
| 4 | Install ramp metering | Canterbury Rd, Royal Oaks Dr, Tribute Rd, Arden Way (EB&WB), SAC, 45.4-47.0 | Caltrans | 2013 Ramp Meter Development Plan | Ramp Metering | 660 (per meter) | 2035 |
| 4 | Upgrade all interchanges to accommodate bicycles and pedestrians | SAC, 44.5-47.0 | Caltrans/City of Sacramento | 2010 SR 160 TCR | Bike/Ped. Improvement | N/A | 2035 |

* Total Cost Estimate and Proposed Completion Year are from listed source. Additional project details and programming information can be found in the listed source. Note, RTPs included separate fiscally unconstrained section. Please see Appendix B-Resources for more information regarding the listed source.

# APPENDICES

## APPENDIX A: GLOSSARY OF TERMS AND ACRONYMS

### Acronyms

**AADT -** Annual Average Daily Traffic
**ADT -** Average Daily Traffic
**BY -** Base Year
**CALTRANS -** California Department of Transportation
**CLA** – California Legal Advisory
**CLN** – California Legal Network
**CMA** – Congestion Management Agencies
**CSMP -** Corridor System Management Plan
**DSMP -** District System Management Plan
**DSMDP** – District System Management and Development Plan
**DU -** Density Unit
**FHWA -** Federal Highway Administration
**GHG** - Green House Gas
**HCM -** Highway Capacity Manual
**HY -** Horizon Year
**I** - Interstate
**ITS -** Intelligent Transportation System
**ITSP -** Interregional Transportation System Plan
**KPRA** – Kingpin to Rear-Axle Ratio
**LOS -** Level of Service
**MPO -** Metropolitan Planning Organization
**MTIP -** Metropolitan Transportation Improvement Program
**MTP -** Metropolitan Transportation Plan
**PID** - Project Initiation Document
**PM -** Post Mile
**PSR** - Project Study Report
**ROW** – Right of Way
**RTP** – Regional Transportation Plan
**RTIP** - Regional Transportation Improvement Program
**RTPA -** Regional Transportation Planning Agencies
**SAC** – Sacramento
**SACOG -** Sacramento Area Council of Governments
**SHBFP** – State Highway Bicycle Facility Plan
**SHOPP -** State Highway Operation and Protection Program
**SHS -** State Highway System
**SR -** State Route
**STAA -** Surface Transportation Assistance Act
**STIP** – State Transportation Improvement Program
**TA** – Terminal Access
**TCR** – Traffic Concept Report
**TDM** – Transportation Demand Management
**TMS** - Transportation Management System
**TSN**- Transportation System Network
**V/C** – Volume Capacity

**VHD** – Vehicle Hours of Delay
**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 locations 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 pedestrians or motor vehicle traffic.

**California Legal Truck** – A truck tractor-semitrailer (or double) that can travel on virtually any route in California, as described below:

California Legal Truck Tractor – Semitrailer
Semitrailer length: no limit
KPRA : 40 feet maximum for two or more axles,
38 feet maximum for single-axle trailers
Overall length : 65 feet maximum

California Legal Truck Tractor - Semitrailer - Trailer (Doubles)
Option A
Trailer length : 28 feet 6 inches maximum (each trailer)
Overall length : 75 feet maximum
Option B
Trailer length : 28 feet 6 inches maximum (each trailer)
Overall length : 75 feet maximum

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

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

**Facility Concept** – Describes the facility and strategies that may be needed within 20-25 years. This can include capacity increasing, State Highway, bicycle facility, pedestrian facility, transit facility, non-capacity increasing operational improvements, new managed lanes, conversion of existing managed lanes to another managed lane type or characteristic, TMS field elements, transportation demand management and incident management.

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

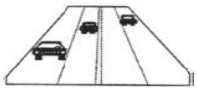
**Freight Generator** – Any facility, business, manufacturing plant, distribution center, industrial development, or other location (convergence of commodity and transportation system) that produces significant commodity flow, measured in tonnage, weight, carload, or truck volume.

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

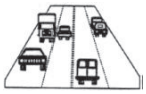
**Horizon Year** – The year that the future (20-25 years) data is based on.

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

**LOS** – Level of Services 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-flowing 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.

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

**System Operations and Management Concept** – Describes the system operations and management elements that may be needed within 20-25 years. This can include non-capacity increasing operational improvements (auxiliary Lanes, channelizations, turnouts, etc.), conversion of existing managed lanes to another managed lane type or characteristics (e.g., High Occupancy Vehicle lane to High Occupancy 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.

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

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

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

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

**Rural** – Fewer than 2,500 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.

Interstate "STAA" Truck Tractor – Semitrailer
Semitrailer length: 48 feet maximum
KPRA : no limit
Overall length : no limit

Semitrailer length: over 48 feet up to 53 feet maximum
KPRA : 40 feet maximum for two or more axles,
: 38 feet maximum for single-axle trailers
Overall length : no limit

Interstate "STAA" Truck Tractor–Semitrailer–Trailer (Doubles)
Trailer length : 28 feet 6 inches maximum (each trailer)
Overall length : no limit

**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.

**Ultimate Concept** - In general, this is also called the Post 20-Year concept that could provide the maximum reasonable and foreseeable roadway needed beyond a 20-year horizon. The ultimate concept can be used to identify potential widening, realignments, future facilities, and rights-of-way required to complete the development of each corridor.

**Urban Cluster** – 2,500 to 49,999 in population designates an urban cluster. Limits are based upon population density as determined by the U.S. Census Bureau.

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

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

## APPENDIX B: RESOURCES

California Department of Transportation, District 3, *Draft Complete Streets Inventory.* June 2012. Website: http://www.dot.ca.gov/dist3/departments/planning/communityplanning1.htm

California Department of Transportation, District 3, *District System Management and Development Plan*, January 2013. Website: http://www.dot.ca.gov/dist3/departments/planning/systemplanningDSMDP.htm

California Department of Transportation, District 3, *District System Management Plan Project List*, July 2013. M:\Plan\Shared\File Structure Project\System Planning\DSMDP\2012-13 Update\DSMP Project List

California Department of Transportation, District 3, *Goods Movement Study*. Website: http://www.dot.ca.gov/dist3/departments/planning/systemplanning.htm or https://sites.google.com/site/d03goodsmovement/

California Department of Transportation, District 3, *Intelligent Transportation Systems/Operational Improvement (ITS/Ops) Plan*, (draft) 2013. Website: http://www.dot.ca.gov/dist3/departments/planning/systemplanningITS_OPS.htm

California Department of Transportation, District 3, *State Highway Bicycle Facility Plan*, June 2013. Website: http://www.dot.ca.gov/dist3/departments/planning/systemplanning.htm

California Department of Transportation: District 3, *Transportation Corridor Concept Report State Route 160,* 2010

California Transportation Commission, *2010 California Regional Transportation Plan Guidelines*, April 2010. Website: http://www.dot.ca.gov/hq/tpp/offices/orip/rtp/

City of Sacramento *2030 General Plan*

Sacramento Area Council of Governments *2035 Metropolitan Transportation Plan*

Sacramento Area Council of Governments *2013 Bicycle-Pedestrian-Trails Master Plan*

Sacramento County *2030 General Plan*, adopted November 9, 2011

U.S. Census Bureau (2010), *Interactive Population Search*. Website: https://www.census.gov/2010census/popmap/ipmtext.php?fl=06

http://www.per.saccounty.net/PlansandProjectsIn-Progress/Documents/General%20Plan%202030/UPDATED_FINAL_DRAFT_W_CITIES_sm_050512.

http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml

http://cal-adapt.org/sealevel/

## APPENDIX C: DATA RESOURCES

Base Year ADT: 2012 Caltrans Traffic Volumes on California State Highways Book
LOS: Used HCS in conjunction with data from this table
Base Year VMT: 2012 Caltrans Traffic Volumes on California State Highways Book (Link Based)
Horizon Year Volumes and VMT based on SACSIM model growth and SHI growth factors
Truck Data: 2012 Annual Average Daily Traffic on California State Highways Book
Base Year Peak Hour Volumes and Directional Split: 2011 Caltrans Traffic Volumes on California State Highways Book
Peak Hour VMT: 2012 Caltrans Traffic Volumes on California State Highways Book (Link Based)
Horizon Year Directional Splits based on SACSIM model projections in conjunction with 2012 Caltrans Traffic Volumes on California State Highways Book
V/C: HCS used in conjunction with data from this table

### End Notes

[1] http://onramp.dot.ca.gov/tsi/ohsip/tasas/seqlisting.html

[2] http://www.dot.ca.gov/hq/tsip/hseb/map21nhs.html

[3] http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

[4] http://www.leginfo.ca.gov/cgi-bin/displaycode?section=shc&group=00001-01000&file=163-164.56

[5] http://www.dot.ca.gov/hq/tpp/corridor-mobility/documents/library/Caltrans_High_Emphasis_Routes_HER.doc

[6] http://www.dot.ca.gov/hq/tpp/corridor-mobility/documents/library/List_of_Focus_Routes.doc

[7] http://www.dot.ca.gov/hq/tsip/hseb/crs_maps/

[8] http://www.dot.ca.gov/hq/traffops/engineering/trucks/truckmap/truckmap-d03.pdf

[9] http://www.dot.ca.gov/hq/tpp/offices/orip/index_files/Updated%20Files/MPO_RTPA_Map_June_2012.pdf

[10] 2010 US Census, www.census.gov

[11] http://www.per.saccounty.net/PlansandProjectsIn-Progress/Documents/General%20Plan%202030/GP_Trans%20Plan%20Update_Combo_SMall_110311.pdf and http://www.sacog.org/2035/files/MTP-SCS/appendices/A-1%20Project%20List.pdf

[12] Sacramento Area Council of Governments *2013 Bicycle-Pedestrian-Trails Master Plan*, http://www.sacog.org/bikeinfo/download_bike_ped_trails_mp.cfm

[13] http://www.dot.ca.gov/dist3/departments/planning/bike/D3SHBFP_June2013.pdf

[14] January 2013. Caltrans District 3 District System Management and Development Plan, p. 33

[15] http://www.dot.ca.gov/hq/tpp/offices/ocp/complete_streets.html

[16] 2010 California Regional Transportation Plan Guidelines, California Transportation Commission, p. 97-99 http://www.dot.ca.gov/hq/tpp/offices/orip/rtp/index_files/2010%20RTPGuidelines_Jan2011_Technical_Change.pdf

[17] ibid