



CAPITAL SOUTHEAST CONNECTOR JPA

PROJECT DESIGN GUIDELINES

VERSION 2.0 - MARCH 2013

The Project Design Guidelines document has been prepared with the support and collaboration from the member jurisdictions of the Capital SouthEast Connector JPA. The member jurisdictions that participated in the development process of these guidelines approve of this document and the information contained herein.

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_____ <i>Director, Public Works City of Folsom</i>	_____ <i>Date</i>
_____ <i>Director, Public Works City of Rancho Cordova</i>	_____ <i>Date</i>
_____ <i>Director, Transportation County of El Dorado</i>	_____ <i>Date</i>
_____ <i>Director, Transportation County of Sacramento</i>	_____ <i>Date</i>
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- Capital SouthEast Connector Stakeholder Advisory Committee (SAC) Involvement Summary Memorandum

Acronyms and Abbreviations List

AASHTO	American Association of State Highway and Transportation Officials
ADA	U.S. Department of Transportation's Americans with Disabilities Act
BRT	bus rapid transit
CA	California
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
Connector	Capital SouthEast Connector
EIR	environmental impact report
ETW	edge of traveled way
FHWA	Federal Highway Administration
ft	feet
HDM	Caltrans Highway Design Manual
HMA	hot-mix asphalt
I-5	Interstate 5
in	inch
ITS	Intelligent Transportation System
JPA	Joint Powers Authority
LED	light-emitting diode
MPH	miles per hour
MUTCD	California Manual of Uniform Traffic Control Devices
NACTO	National Association of City Transportation Officials
NPDES	National Pollutant Discharge Elimination System
PCCP	Portland cement concrete pavement
PDPM	Caltrans Project Development Procedures Manual
PUE	Public Utility Easement
R	radius
ROW	right-of-way
R-value	resistance values
SAC	Stakeholder Advisory Committee
SCC	Sustainability Concept Committee
SCIS	Sacramento County Improvement Standards
Se	superelevation (E _{max} = maximum superelevation)
SR 99	State Route 99
SSD	stopping sight distance
SSHCP	South Sacramento Habitat Conservation Plan
STAA	Surface Transportation Assistance Act
TAC	Technical Advisory Committee
UPRR	Union Pacific Rail Road
US 50	United States Highway 50
VC	vertical curve

Policies

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I. Introduction

In December 2006, the Cities of Elk Grove, Rancho Cordova, and Folsom, and Counties of Sacramento and El Dorado (member agencies) collaborated to form the Capital SouthEast Connector Joint Powers Authority (JPA) to facilitate the Capital SouthEast Connector Project (also known as the “Connector”). The project is a 35-mile-long multi-modal transportation facility, extending between Interstate 5 (I-5) and U.S. Highway 50 (US 50), that will link communities in Sacramento and El Dorado Counties, including Elk Grove, Rancho Cordova, Folsom, and El Dorado Hills. See Figure 1 for the project vicinity. When completed, the proposed project would be a roadway of four to six traffic lanes with limited access points that would accommodate a variety of regional transportation needs. The Connector will achieve the following:

- Relieve demand on local streets and roads and regional freeway facilities (US 50, State Route [SR 99], and I-5).
- Provide options for a variety of travel modes throughout the project corridor.
- Provide transportation options that enable flexibility among automobile, transit service, bicycle, and pedestrian uses, while incorporating Intelligent Transportation System (ITS) elements where possible.
- Discourage growth in areas not designated for growth as determined by local jurisdiction general plans.

A program-level environmental impact report (EIR) has been prepared for the Connector. The program-level EIR acts as the first-tier analysis for subsequent, more detailed project-specific environmental review. Use of a tiered EIR allowed the selection of a maximum 800-foot-wide corridor. The subsequent, project-specific environmental documents for corridor segments will incorporate by reference the previously prepared EIR, and concentrate solely on the issues specific to the environmental analysis prepared for a project segment.

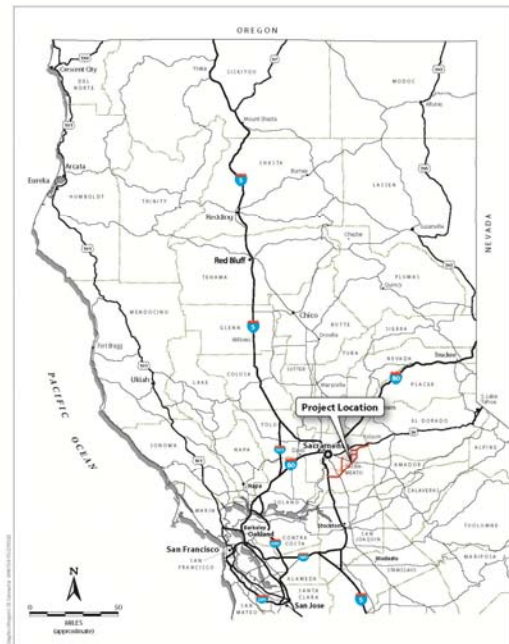


Figure 1 – Project Vicinity

The Connector project consists of a combination of existing and new roadway alignments through rural and urban environments. The development of the Connector project is anticipated to be accomplished in phases (noted as segments in this Project Design Guidelines) that will be generally consistent with these environments. Also, planned projects within the Connector corridor are in various stages of design and construction by state and local agencies that will construct portions of the Connector. The order of implementing the various segments is not determined at this time. It will be subject to funding availability and existing and future traffic demand.

The JPA is responsible for selecting the Connector corridor and is the California Environmental Quality Act (CEQA) lead agency for the purpose of conducting environmental review. Sacramento County, El Dorado County, and the Cities of Elk Grove, Rancho Cordova, and Folsom may carry out future development of specific projects that would be a part of the Connector and, therefore, are responsible agencies under CEQA.

II. Purpose

This Project Design Guidelines has been prepared to establish one guidance document to enable consistent planning and design of the Connector. They provide for the development of the Connector project such that it has the following characteristics:

- Is uniform in character, appearance, facilities provided, and blends with the communities.
- Is positioned effectively with the surroundings to minimize impacts.
- Provides effectively located access to maximize the efficiency of the corridor.
- Integrates other modes of travel and provides a high level of service.
- Provides well-coordinated, efficient traffic operations.
- Implements sustainable solutions.
- Maintains the integrity of the regional transportation systems.
- Allows cost-effective implementation of the project.

The Project Design Guidelines is a technical tool used for development of a facility to provide clarity in scope, shape, and appurtenant features. In addition, the guidelines and the final program environmental impact report (FPEIR) will provide supporting documentation to the JPA and the local jurisdictions for the general plan amendment process to incorporate the Connector project.

The process of developing the Connector Project Design Guidelines has included the attention and input from three committees formed to represent key stakeholder focus areas: Technical, Sustainability, and Community. These committees were organized to focus on their subject matter expertise as follows:

- The Technical Advisory Committee consisted of representatives from each of the five member jurisdictions and other transportation related agencies and planning organizations. This advisory committee, with expertise in the technical application of engineering policy, planning, and design guidelines, provided input to the JPA on the Project Design Guidelines for the Connector corridor.
- The Sustainability Concept Committee (SCC) consisted of business/industry, agency, program, and advocacy representatives with focused interest and expertise in sustainability (also referred to as the “Triple Bottom Line” for economy, people, and environment). This advisory committee, consisting of individuals with an understanding and expertise in the application and implementation of sustainable solutions, provided input to the JPA through the successful completion of a sustainability assessment process to identify concepts and opportunities to apply to the Connector corridor.
- The Stakeholder Advisory Committee (SAC) consisted of members from the community, regional organizations, and business or property owners. This advisory committee provided input from the perspective of the eyes, ears, and pulse of the community regarding community elements and broader issues of the Connector corridor.

The Connector JPA Sustainability Assessment Update Memorandum and Capital Southeast Connector SAC Involvement Summary Memorandum are included in the appendix to these Project Design Guidelines.

III. Project Design Guidelines

These guidelines provides sufficient criteria to allow for the planning and development of the Connector corridor at a preliminary engineering level with detail necessary for the general plan amendment

process with the local jurisdictions and for project-level environmental documentation activities during project development.

These guidelines establish design guidance for the preliminary planning and are intended to help designers as follows:

- Establish street configurations.
- Identify and plan appurtenant facilities.
- Identify anticipated project right-of-way (ROW).
- Identify areas of ownership/responsibility.
- Maintain continuity between project segments.
- Maintain continuity with the communities.

The level of detail included is commensurate with the phase of project development. The guidelines are intended to be updated periodically as additional clarification is made and future phases of the project(s) begin.

Where guidelines conflict or information is missing, the designer should bring it to the attention of the JPA for resolution. The JPA will maintain ownership of the project design guidelines and will provide periodic updates at their discretion. Changes to the guidelines will require review and approval by the JPA Board of Directors before being used on the project. For policy guidance on guideline updates and review process, see Policies section of these guidelines.

IV. Project Documents

The following list of documents has been prepared for the planning, environmental clearance, and design of the Connector project. The Connector and its project segments should maintain consistency with the requirements, mitigations, recommendations, and conclusions of the following documents unless superseded by a more recently approved document or directed by the JPA:

- FPEIR for the Capital SouthEast Connector Project, revised February 2012
- Functional Guidelines, dated November 8, 2006
- Integrated Modes Policy

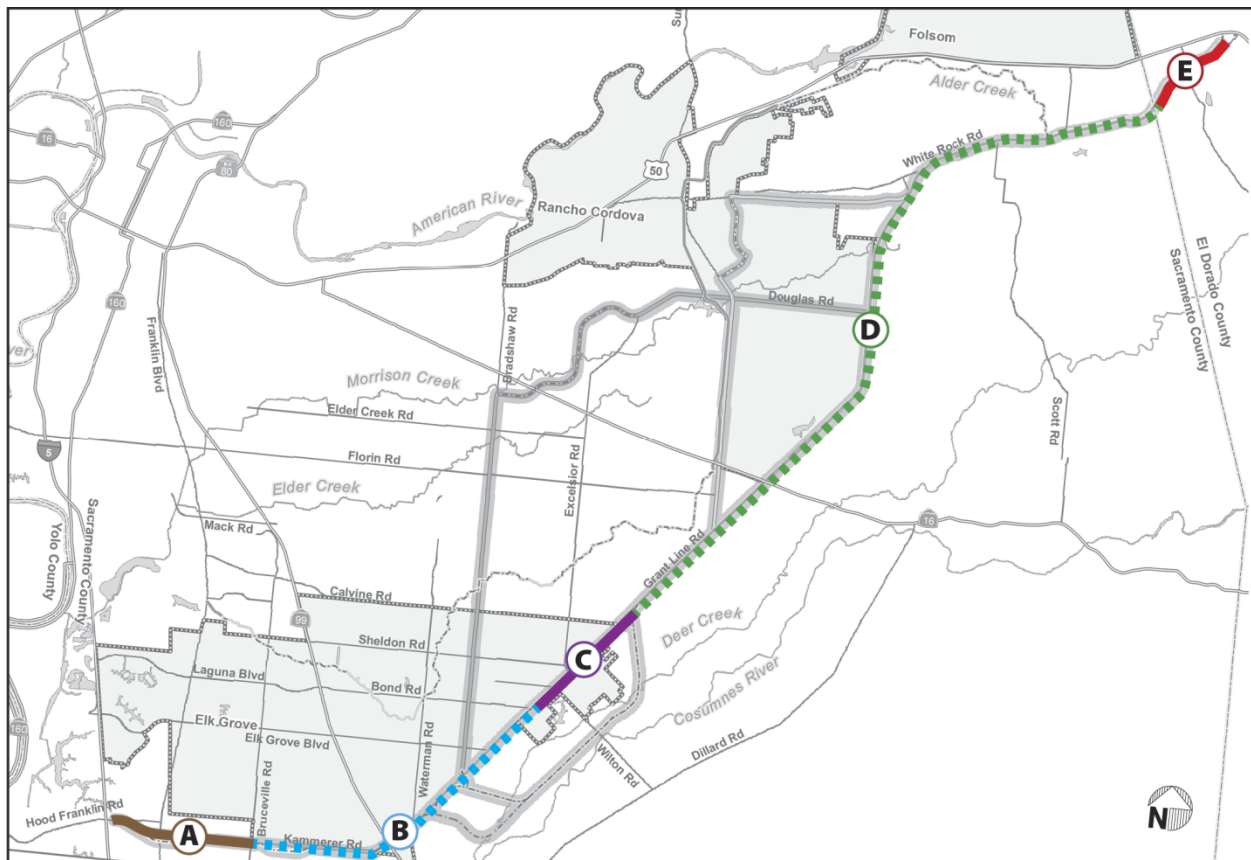
Change in the areas surrounding the Connector will occur. Changes that are proposed within a local jurisdiction that affect the Connector and the approved PFEIR may require separate studies and approvals. The proposed changes should be investigated by the local agency and/or the project proponent to determine the impact on the Connector. Any action(s) requiring a change should include the affected portion of the Connector, and separate documentation and approvals obtained by the parties involved, including the modifications to the Connector.

V. Route Description

The 35-mile-long Connector corridor identified in the EIR traverses the southern Sacramento Valley and eastern foothills through the Cities of Elk Grove, Rancho Cordova, and Folsom, and Counties of Sacramento and El Dorado, via Kammerer Road, Grant Line Road, and White Rock Road, with connections to I-5 at Hood-Franklin Road Interchange, SR-99 at Grant Line Road, SR-16/Jackson Road at Grant Line Road, and US 50 at the Silva Parkway Interchange. Table 1 lists and describes the five segments of the Connector corridor along with the Route Segment Map shown in Figure 2.

Segment	Description	Local Jurisdiction
A	Four-lane expressway, on Kammerer Road from the I-5/Hood-Franklin Road Interchange to Bruceville Road	Elk Grove, Sacramento County
B	Four- to Six-lane thoroughfare, on Kammerer Road and Grant Line Road from Bruceville Road to Bond Road	Elk Grove, Sacramento County
C	Four-lane roadway, on Grant Line Road from Bond Road to Calvin Road (Sheldon Area)	Elk Grove, Sacramento County
D	Four- to Six-lane expressway, on Grant Line Road and White Rock Road from Calvin Road to the Sacramento-El Dorado County line	Rancho Cordova, Sacramento County, Folsom
E	Four- to Six-lane thoroughfare, on White Rock Road from the County line to US 50/Silva Valley Parkway Interchange	Folsom, El Dorado County

Table 1 – Connector Project Segments



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Figure 2 – Route Segment Maps

VI. Design Standards

Standards should be applied to the Connector and the associated improvements, to provide uniformity to the regional transportation network, in the following order:

- Connector mainline, interchanges, and intersections
- Local jurisdiction cross streets, frontages, and adjacent street modifications
- Connectivity to the state highway facilities

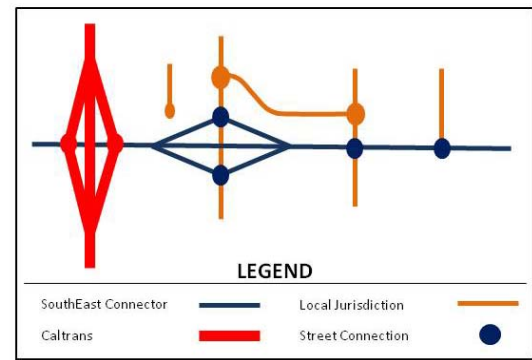


Figure 3 – Application of Standards

A. Application of Standards

The order in which standards are applied should maintain this continuity (see Figure 3).

SouthEast Connector

Planning and design of the Connector should be in accordance with American Association of State Highway and Transportation Officials (AASHTO) "A Policy on Geometric Design of Highways and Streets," dated 2004 (Green Book), and these design guidelines.

Connector Intersections

Where the Connector intersects with the cross streets identified in these Project Design Guidelines, the improvements at the intersection should be designed in accordance with the Sacramento County Improvement Standards (SCIS), dated October 6, 2006, or an approved equivalent, and these guidelines, for all facilities within the planned ROW footprint and access control limits of the Connector and the intersection.

Caltrans State Highways

Where connections are made to I-5, SR-16, SR 99 and US 50, the improvements should be planned and designed in accordance with the California Department of Transportation (Caltrans) Highway Design Manual (HDM), most current edition, for all facilities within the ROW and control of access for the highway or interstate (see Figure 3).

Local Jurisdiction

Where local street improvements are made to accommodate the Connector, including intersecting cross streets, adjacent local roads, and frontage roads, the improvements should be designed in accordance with the improvement standards of the local jurisdiction and these Project Design Guidelines.

Design manuals and criteria to be used on the project are as follows:

- AASHTO Geometric Design of Highways and Streets, 2004
- AASHTO Roadside Design Guide, 3rd Edition 2006 with updated Chapter 6
- AASHTO Guide for Development of Bicycle Facilities, 1999
- County of Sacramento County, Municipal Services Agency, Improvement Standards, dated October 1, 2006
- Sacramento County Volume 2 Hydrology Standards, December 1996
- City of Elk Grove Improvement Standards, dated June 1999
- City of Elk Grove Rural Road Improvement Policy, dated November 14, 2007

- City of Elk Grove Rural Road Improvement Standards, dated November 14, 2007
- City of Elk Grove Trails Master Plan, dated January 10, 2007
- City of Folsom Design and Procedure Manual and Improvement Standards, dated May 22, 2003
- County of El Dorado Design and Improvement Standards, dated May 18, 1990
- El Dorado County Standard Plans, 2011 (Draft – pending adoption)
- County of El Dorado Drainage Manual, March 1995
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide, Current Edition
- U.S. Department of Transportation's Americans with Disabilities Act (ADA) Standards for Transportation Facilities, 2006 and updated by the Department of Justice's 2010 ADA Standards for Accessible Design
- Federal Highway Administration (FHWA), Equestrian Design Guidebook for Trails, Trailheads and Campgrounds, December 2007
- Caltrans Highway Design Manual, Current Edition
- Caltrans Project Development Procedures Manual (PDPM), Current Edition
- Caltrans ROW Manual, Current Edition
- Caltrans Traffic Manual, Current Edition
- California Manual of Uniform Traffic Control Devices (MUTCD), Current Edition
- Caltrans Bridge Design Procedures and Design Aids, Current Edition(s)
- National ITS Architecture – Version 7.0 (<http://www.iteris.com/itsarch/>)
- Regional ITS Architecture for Sacramento area
- FHWA Rule 940
- FHWA Systems Engineering Guidebook for ITS (<http://www.fhwa.dot.gov/cadiv/segb/>)
- FHWA Freeway Management and Operations Handbook (http://www.ops.fhwa.dot.gov/freewaymgmt/publications/frwy_mgmt_handbook/)
- Institute of Transportation Engineers Manual of Traffic Signal Design
- Caltrans Highway Performance Monitoring System

B. Design Exceptions

Where criteria established in these Project Design Guidelines are not met, a design exception will be required. The criteria to be met should be the minimum standard design values established by these guidelines.

For policy guidance on the exception process, see Policies section in these guidelines.

Existing SouthEast Connector Segments

The existing Kammerer Road, Grant Line Road, and White Rock Road street system is extensively developed. At certain locations, the existing street may be consistent with all or a portion of the proposed Connector identified in the FPEIR. At these locations, the roadway, ROW, and public utility easements established, and drainage, traffic, utility, and integrated modes infrastructure already in place.

Where this condition exists, the infrastructure may not conform to the criteria defined in these guidelines, and making modifications may create excessive impacts to the existing infrastructure and adjacent properties. Under these conditions, a design exception may be requested for the standards not met.

The intent of an exception for the existing street conditions is to effectively use existing sections of the roadways that materially and functionally conform to the defined Connector project. It is not intended to exclude sections of the roadway system or specific features from improvement.

The following areas have tentatively been identified:

Segment A

- The I-5/Hood-Franklin Road Interchange

Segment B

- Grant Line Road, from Lent Ranch Parkway to Mosher Road
- SR 99/Grant Line Road Interchange
- Grant Line Road/Union Pacific Railroad (UPRR) Grade Separation project, pending completion of design and construction

Segment E

- White Rock Road, from Carson Crossing to Post Street
- US 50/Silva Valley Parkway Interchange project, pending completion of design and construction

Other improvements identified as part of the Connector that can be accommodated within the location under consideration should be provided for, including, but not limited to, the following:

- Median and intersection channelization
- Lighting, traffic, and ITS improvements
- Landscape, transit, and non-motorized facilities

Each location should be accessed for impacts on the ultimate project and any phased conditions under consideration. Approval of a design exception for an early phase of the project does not apply to the ultimate Connector project unless specifically stated. Separate design exception approval should be obtained for each location being considered.

VII. SouthEast Connector and Cross Street Facility Types

The Connector project is a significant connection between the urban areas along the corridor and, in accordance with AASHTO, is defined as an “Urban Principal Arterial.” The Connector has been described as three different types of roadways – expressway, thoroughfare, and rural roadway – depending on the segment location and accessibility requirements. For these guidelines, the facility type is further defined by segment as follows.

A. Segment A – Kammerer Road from the I-5/Hood-Franklin Road Interchange to Bruceville Road

Intent – Provide a high-speed connection to I-5 with limited cross street connections.

Consideration – The Connector would join two existing streets, Hood-Franklin Road and Kammerer Road. The alignment is through farmlands and rural properties (natural terrain) except where it meets

with Hood-Franklin Road at I-5. Currently, local access uses the adjacent street system and is not reliant on the Connector alignment for traffic circulation and property access, except at the I-5 connection.

Facility Type: Expressway – A high-speed, fully divided, urban arterial.

B. Segment B – Kammerer Road and Grant Line Road from Bruceville Road to Bond Road

Intent – Provide an urban arterial street that is consistent with the existing developed street and maintains identified cross street connections.

Consideration – These streets currently serve as an urban arterial roadway leading into and through the southern limits of Elk Grove. The roadway is on the existing street alignment and currently provides access to residential and commercial properties through individual driveways, local road intersections, and to SR 99 at the Grant Line Road Interchange.

Facility Type: Thoroughfare – An urban arterial with raised median.

C. Segment C – Grant Line Road from Bond Road to Calvine Road (Sheldon Area)

Intent – Provide an urban arterial street that is consistent with the rural arterial setting of the existing developed street and maintains identified cross street connections.

Consideration – Grant Line Road currently serves as a rural roadway through Sheldon and passes through its business district. The roadway is on the existing alignment and currently provides access to closely spaced residential and commercial properties through individual driveways and local road intersections.

Facility Type: “Special Section” – To Be Determined – Urban arterial with divided median and rural arterial setting.

D. Segment D – Grant Line Road and White Rock Road from Calvine Road to the Sacramento-El Dorado County Line

Intent – Provide a high-speed arterial street with limited cross street connections.

Consideration – These connecting streets currently serve as a rural roadway between Elk Grove and the El Dorado Hills Community. The alignment is on the existing roadway and currently runs along rural properties (natural terrain) with widely spaced driveways and road intersections. Local access is provided by the roadway.

Facility Type: Expressway – A high-speed, fully divided, urban arterial.

E. Segment E – White Rock Road from the County Line to US 50/Silva Valley Parkway Interchange

Intent – Provide an urban arterial street that is consistent with the existing developed street, maintains identified cross street connections, and accommodates key local access locations.

Consideration – White Rock Road currently serves as an urban arterial through the El Dorado Hills Community. The alignment is developed as a limited-access facility over the majority of its length. Local access is through the connecting street intersections. Residential and commercial driveway accesses are along its length. It will also provide access to US 50 through the US 50/Silva Valley Parkway project, which will construct a new interchange on US 50 and develop the easternmost end of the Connector project between Valley View Parkway and US 50.

Facility Type: Thoroughfare – An urban arterial with raised median.

F. Cross Streets

Intent – Provide arterial street connections to the Connector that are consistent with the facility type identified for that arterial by the local jurisdiction.

Consideration – The cross streets that intersect or cross the Connector are defined by the local jurisdiction as part of their transportation system and vary in type and width. In some cases, the street system is already developed. The current definition of the street type and width should be maintained to enable regional roadway continuity. The SCIS have been used to develop the Connector thoroughfare segments and will be used to develop the intersections on the Connector alignment.

Facility Type: To Be Determined.

On the basis of the FPEIR traffic studies, the cross streets identified to provide access to the Connector include the following intersection types: interchanges, signalized intersections, and unsignalized controlled-access intersections consisting of right-in/right-out or left-in/right-out connections. See FPEIR Table 16-3 and Figure 16-6 in the Appendix for a complete listing of cross street locations and intersection details.

VIII. Roadway Design

Planning and design of the Connector and cross streets should be in accordance with AASHTO Green Book Chapter 2, “Design Controls,” Chapter 3, “Design Elements,” Chapter 4, “Cross Section Elements,” and the following:

- Segments A and D – Expressway, AASHTO Chapter 7 for a high-speed, divided, urban arterial
- Segments B and E – Thoroughfare, SCIS or equivalent, and AASHTO Chapter 7 for a high-speed urban arterial
- Segment C – Special Section to be determined, SCIS or equivalent, Elk Grove Rural Road Improvement Standards, and AASHTO Chapter 7 for an urban arterial
- Cross street intersections – Thoroughfare, SCIS or equivalent

Planning and design of the cross streets, local roads, and frontages should be planned and designed in accordance with the local jurisdiction standards.

The following additional criteria modify or add to the above guidelines and standards and are provided for the planning and design of the Connector project.

A. Segments A and D – Expressway

The expressway segments are planned to provide a fully divided facility, with grade-separated interchanges or signalized intersections, and frontage improvements. The following figures are typical sections for the 6- and 4-lane facilities. See Figures 4-1, 4-2, and 4-3.

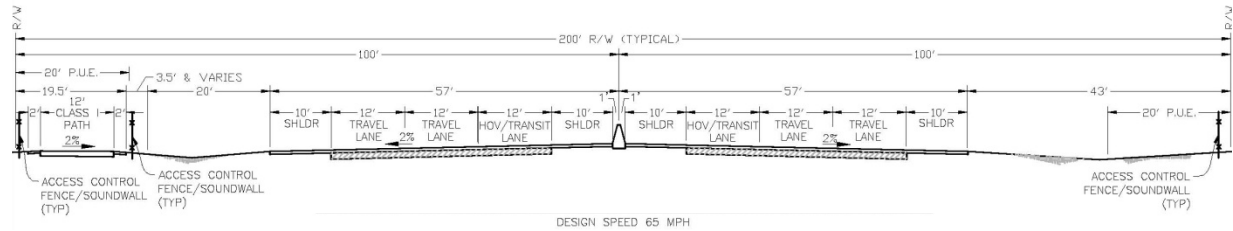


Figure 4-1 – Six Lane Expressway with Multi-Use Path on One Side

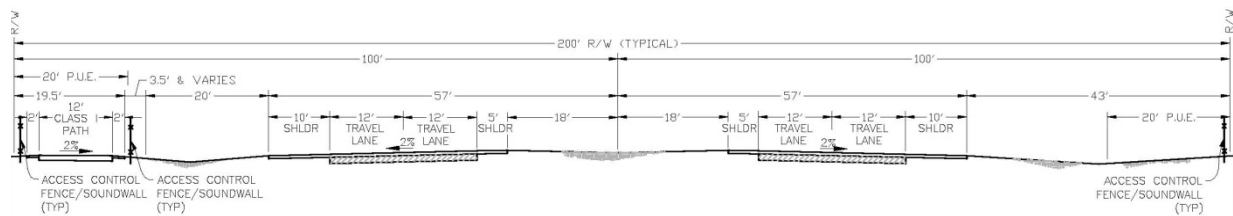


Figure 4-2 – Four Lane Expressway with Multi-Use Path on One Side

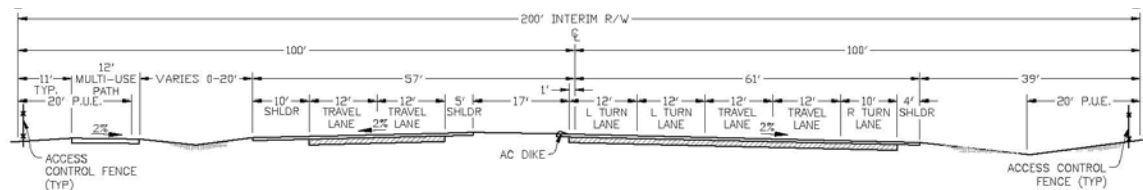


Figure 4-3 – Four Lane Expressway at Signalized Intersection

Design Controls

- Segment A, terrain conditions = flat.
- Segment D, south of Grant Line Rd/White Rock Rd, terrain conditions = flat.
- Segment D, north of Grant Line Rd/White Rock Road, terrain conditions = rolling hills.
- Design speed = 65 miles per hour (MPH).
- Posted speed = 55 MPH.
- Design vehicle on the Connector and cross streets intersections =STAA Design Vehicle.

Design Elements

- Minimum stopping sight distance (SSD) = 645 feet (ft).
- Minimum horizontal radius (R) = 2,000 ft; 3,000 ft preferred.
- Superelevation (Se) = use Method 5.
- Se, E max = 6 percent, AASHTO Exhibit 3-26.
- Standard cross slope, lanes and shoulders = 2 percent.
- Cross slopes on existing streets = 1.5 percent minimum to 3 percent maximum.
- Vertical grades, maximum grade = 5 percent; 4 percent preferred.
- Vertical grades, minimum grade = 0.35 percent; 0.5 percent preferred.

- Vertical curves (VC) = Crest and sag VC lengths should be based on minimum K-values for the design speed.
- VC length, mainline = 200 ft minimum.
- Vertical alignment, maximum grade break, Connector = 0.5 percent.
- Construction alignments should be set at the centerline of the ultimate roadway for plan, profile, and Se.

Cross Section Elements

- Connector lane requirements = four to six lanes; subject to traffic studies.
- Lane width, mainline and auxiliary = 12 ft.
- Lane width, high-occupancy vehicle = 12 ft (6-lane mainline only).
- Lane width, left turn = 12 ft (signalized intersection only).
- Lane width, right turn = 10 ft (signalized intersection only).
- Shoulder width, outside = 10 ft.
- Shoulder width at right turn lane, outside = 4 ft (signalized intersection only).
- Shoulder widths, inside = 5 ft (4-lane mainline); 10 ft (6-lane mainline).
- Median = fully divided, graded (4-lane mainline); barrier separated (6-lane mainline).
- Median width, 4-lane = 46 ft.
- Median width, 6-lane = 22 ft.
- Median slope = 6:1 or flatter.
- Graded shoulder width between edge of shoulder and hinge point, outside and inside = minimum 3 ft at -5 percent.
- Roadway side slopes = 6:1 or flatter preferred, 4:1 or flatter (fill condition), maximum 2:1 (cut condition and structure approaches).
- Horizontal clear recovery zone, mainline = Design in accordance with AASHTO Roadside Design Guide; 30 ft preferred.
- Vertical clearance = 16 ft 6 inch (in) minimum over the traveled way of the Connector and cross streets.
- Vertical clearances = 16 ft 6 in over Caltrans facilities and 23 ft 6 in over UPRR facilities. Clearance requirements should be confirmed for each crossing location and for minor structures.
- A Class I multi-use path should be provided adjacent to the ROW. In high-demand areas, a path on each side of the expressway may be required. A minimum separation of 30 ft (or a minimum distance equal to or greater than the width of the clear recovery zone) from the nearest edge of traveled way (ETW) should be provided, where feasible, or barrier separation provided.

Other Considerations

- A standard crown cross section of -2 percent (no Se) with sufficient curve radii to comply with design standards is preferred.
- Where possible, partially or fully depress the Connector at interchange locations.
- In areas of sensitive habitat, position the Connector alignment horizontally and vertically to protect/preserve wildlife passage.
- Provide grade separation structures across railroad crossings where they have been identified to remain in service.
- All roadway treatments within the clear zone are to conform to the roadside safety provisions in the AASHTO Roadside Design Guide.
- Access control barriers should be provided at the ROW and at the Class I multi-use path. Barriers include fencing, sound walls, or other approved types.

- Consider retaining walls to reduce ROW width requirements from excessive side slopes.
- Interchanges, signalized intersections, and limited-access intersections are allowed on expressways at identified cross street locations.
- Direct connection of driveways and local roads, not identified as a cross street in Table 16-13 in the Appendix, may be allowed as a phased condition only. Where connections are necessary, they should be consolidated to the greatest extent practical. Use of frontage and local access road connections to the adjacent street system is preferred.

B. Segments B and E – Thoroughfare

Thoroughfare segments should be planned in accordance with the typical section, channelization, and striping details for a 96-ft ROW thoroughfare in SCIS. It should provide a partially divided facility with signalized intersections, limited-access street connections, and frontage improvements. The following Figure 4-4 is a typical section for the 4- and 6-lane thoroughfare.

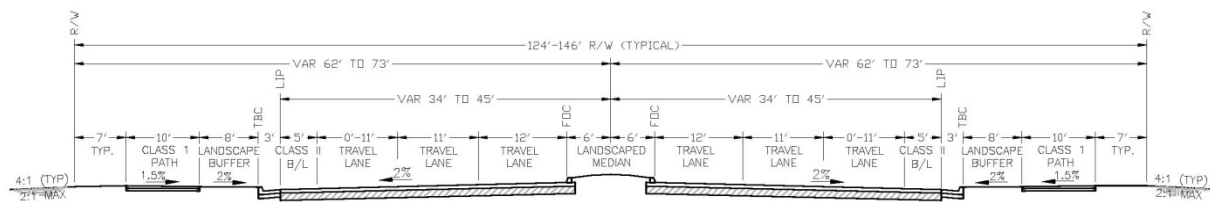


Figure 4-4 – Thoroughfare

Design Controls

- Segment B terrain conditions = flat.
- Segment E terrain conditions = rolling hills.
- Design speed = 50 MPH.
- Posted speed = 40 MPH.
- Design vehicle on the Connector and major arterial cross streets intersections = STAA Design Vehicle.

Design Elements

- Minimum SSD = 425 ft.
- Segment B, minimum horizontal R = 2,000 ft; 3,000 ft preferred.
- Segment E, minimum horizontal R = 1,000 ft; 2,000 ft preferred.
- Se = use Method 5.
- Se, E max = 4 percent, AASHTO Exhibit 3-25.
- Standard cross slope, lanes, and shoulders = 2 percent.
- Cross slopes on existing streets = 1.5 percent minimum to 3 percent maximum.
- Vertical grades, maximum grade = 6 percent; 5 percent preferred.
- Vertical grades, minimum grade = 0.35 percent; 0.5 percent preferred.
- VCs = Crest and sag VC lengths should be based on minimum K-values for the design speed.
- VC length, mainline = 100 ft minimum.
- Vertical alignment, maximum grade break, Connector = 0.5 percent.
- Construction alignments should be set at the centerline of the ultimate roadway for plan, profile, and Se.

Cross Section Elements

- Connector lane requirements = four to six lanes; subject to traffic studies.
- Lane widths, mainline = 12 ft/11 ft (see SCIS for 96 ft thoroughfare).
- Lane widths, left turn = 10 ft.
- Lane widths, right turn = 10 ft.
- Shoulder widths, outside = 5 ft, ETW to lip of curb and gutter, for Class II bicycle lane.
- Shoulder widths, inside = 0 ft (at face of median curb).
- Median = 6-in raised curb median with landscape or hardscape surface treatment.
- Median width = 12 ft minimum on mainline, 2 ft at intersections.
- Median openings = for left turns at signalized intersections and at limited-access intersections for left-in movements.
- Roadway side slopes = 6:1 or flatter preferred, 4:1 or flatter (fill condition), maximum 2:1 (cut condition and structure approaches).
- Curb, gutter, and sidewalk = Provide Type 2 curb and gutter (SCIS) with a separated 10 ft Class I multi-use path and 8 ft landscape buffer on both sides of the roadway.
- Horizontal clear recovery zone, mainline = Design in accordance with AASHTO Roadside Design Guide for urban conditions with barrier curb protection.
- Vertical clearance = 16 ft 6 in minimum over the traveled way of the Connector and cross streets.
- Vertical clearances = 16 ft 6 in over Caltrans facilities and 23 ft 6 in over UPRR facilities. Clearance requirements should be confirmed for each crossing location and for minor structures.

Other Considerations

- Connector horizontal and vertical alignments should follow the existing alignments to the greatest extent practical to minimize impacts to the surrounding properties.
- A standard crown cross section of -2 percent (no Se) with sufficient curve radii to comply with design standards is preferred.
- In areas of sensitive habitat, position the Connector alignment horizontally and vertically to protect/preserve wildlife passage.
- Equestrian paths may be required in areas adjacent to Segment C. See Segment C and equestrian criteria in these guidelines.
- Provide grade separation structures across railroad crossings where they have been identified to remain in service.
- All roadway treatments within the clear zone are to conform to the roadside safety provisions in the AASHTO Roadside Design Guide.
- Access control barriers should be provided at the ROW where necessary. Barriers include fencing, sound walls, or other approved types.
- Consider retaining walls to reduce ROW width requirements from excessive side slopes.
- Signalized intersections for identified cross streets have 1 mile preferred spacing, except in areas with existing cross streets where 0.5 mile minimum spacing is allowed.
- Limited-access intersections, including right-in/right-out and left-in/right-out connections, should be allowed where identified in Table 16-13 in the Appendix. Connections should meet the minimum intersection spacing requirements wherever possible.
- Other local road connections, not identified as cross streets in Table 16-13 in the Appendix, may be allowed as a phased condition if the relocation creates excessive impacts to the adjacent properties. Connections should be consolidated to the greatest extent practical.

- Direct connection of driveways may be allowed subject to the intersection spacing requirements. Individual driveways where allowed should connect no closer than 750 ft to the signalized intersection and should be right-in/right-out only.

C. Segment C – Sheldon Area

The Sheldon Section will be planned to provide a partially divided facility, with signalized intersections, limited-access street connections, driveway accesses without cross median access, and frontage improvements. The following Figure 4-5 is a typical section for the 4-lane Special Section.

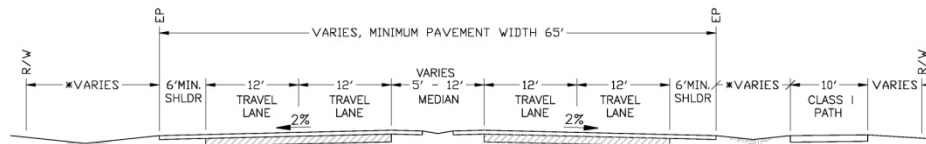


Figure 4-5 – Four Lane Typical Section for Sheldon Area

Design Controls

- Segment C, terrain conditions = flat.
- Design speed = 50 MPH.
- Posted speed - 40 MPH.
- Design vehicle on the Connector and cross streets intersections = STAA Design Vehicle.
- Design vehicle on local streets, frontage roads, and driveway connections – Sheldon Area – to be determined = WB40 minimum (i.e., Design Vehicle with 40-ft wheel base).

Design Elements

- Minimum SSD = 425 ft.
- Minimum horizontal R = 850 ft; 2,000 ft preferred.
- Se = use Method 5.
- Se, E max = 4 percent, AASHTO Exhibit 3-25.
- Standard cross slope, lanes, and shoulders = 2 percent.
- Cross slopes on existing streets = 1.5 percent minimum to 3 percent maximum.
- Vertical grades, maximum grade = 6 percent; 5 percent preferred.
- Vertical grades, minimum grade = 0.35 percent; 0.5 percent preferred.
- VCs – Crest and sag VC lengths should be based on minimum K-values for the design speed.
- VC length, mainline = 100 ft minimum.
- Vertical alignment, maximum grade break, Connector = 0.5 percent.
- Construction alignments should be set at the centerline of the ultimate roadway for plan, profile, and Se.

Cross Section Elements

- Connector lane requirements = four or five lanes; subject to traffic studies.
- Lane widths, mainline = 12 ft.
- Lane widths, left turn = 10 ft.
- Lane widths, right turn = 10 ft.
- Shoulder widths, outside = 6 ft, for Class III bicycle route.
- Shoulder widths, inside = 0 ft (at face of median curb).

- Median = 6-in raised curb median with landscaped or paved surface treatment. Median curb can be eliminated where sufficient median separation is provided.
- Median width = 12 ft preferred (5 ft minimum) on mainline, 2 ft at intersections.
- Median openings = for left turns at signalized intersections and at limited-access intersections for left-in movements.
- Graded shoulder width between edge of shoulder and hinge point, minimum 3 ft at -5 percent.
- Roadway side slopes = 6:1 or flatter preferred, 4:1 or flatter (fill condition), maximum 2:1 (cut condition and structure approaches).
- Horizontal clear recovery zone, mainline = Design in accordance with the AASHTO Roadside Design Guide.
- Vertical clearance = 16 ft 6 in minimum over the traveled way of the Connector and cross streets.
- Vertical clearances = 23 ft 6 in over railroad facilities. Clearance requirements should be confirmed for each crossing location and for minor structures.
- Equestrian Trail = Design in accordance with the Elk Grove Trails Master Plan.
- Class I multi-use path – Design in accordance with the Elk Grove Trails Master Plan.

Other Considerations

- Connector horizontal and vertical alignments should follow the existing alignments to the greatest extent practical to minimize impacts to the surrounding properties.
- A standard crown cross section of -2 percent (no Se) with sufficient curve radii to comply with design standards is preferred.
- In areas of sensitive habitat, position the Connector alignment horizontally and vertically to protect/preserve wildlife passage.
- Where the multi-use path or equestrian trail is contiguous with the roadway, a minimum separation distance equal to or greater than the width of the clear recovery zone from nearest ETW should be provided, or barrier curb installed.
- Provide grade separation structures across railroad crossings where they have been identified to remain in service.
- Where curb and gutter is not required, drainage swales should be used along the outside edge of roadways.
- All roadway treatments within the clear zone are to conform to the roadside safety provisions in the AASHTO Roadside Design Guide.
- Access control barriers should be provided at the ROW where necessary. Barriers include fencing, sound walls, or other approved types.
- Signalized intersections for identified cross streets have a 1-mile preferred spacing, except in areas with existing cross streets where 0.5-mile minimum spacing is allowed.
- Limited-access intersections, including right-in/right-out and left-in/right-out connections, should be allowed where identified in Table 16-13 in the Appendix. Connections should meet the minimum intersection spacing requirements wherever possible.
- Other local road connections, not identified as cross streets in Table 16-13 in the Appendix, may be allowed as a phased condition or if the relocation creates excessive impacts to the adjacent properties. Connections should be consolidated to the greatest extent practical.
- Direct connection of driveways may be allowed subject to the intersection spacing requirements. Connections should be consolidated to the greatest extent practical. Use of frontage and local access road connections to the adjacent street system is preferred wherever possible.

- Individual driveways, where allowed, should connect no closer than 750 ft to the signalized intersection and should be right-in/right-out only.

D. Cross Streets

Cross streets identified in Table 16-13 in the Appendix should be planned and designed in accordance with local jurisdiction standards for the facility type and width established by the agency. In the absence of specific local jurisdiction standards and to encourage consistency in the design standards along the Connector corridor, the following guidelines may be considered.

Where the cross street is planned to intersect the Connector via an interchange or a signalized intersection, the cross street should meet the minimum requirements identified by the local jurisdiction for the type of facility involved. Where the identified facility type is found to be insufficient for the Connector project traffic demand, the facility provided should conform to the provisions as specified in Section VII under, Segments B and E – Thoroughfare, of these guidelines and the following.

Design Elements

- In Sacramento County – minimum horizontal R = 2,000 ft.
- In El Dorado County – minimum horizontal R = 1,000 ft.
- VC length = 50 ft minimum.
- Vertical alignment, maximum grade break = 1.5 percent.

Cross Section Elements

- Lane requirements = subject to traffic studies.
- Curb, gutter, and sidewalk = Provide curb, gutter, and sidewalk consistent with the existing street design to provide continuity to the existing condition.
- Class I multi-use path = Provide accommodation for a path at locations where the existing street provides a Class I path. The planned path should be consistent with the existing facility. Where there is no path or the existing path is determined to be outside the project limits, connect the multi-use path to the existing pedestrian and bicycle facilities on the existing street.
- PUE corridors and landscape buffers should be provided to match with the existing street.

Other Considerations

- Direct connection of individual driveways and streets is allowed outside the Connector control of access.

E. Other Roadways

Other roadways not identified in Table 16-13 in the Appendix that are necessary for the project include the following:

- New public frontage roads – These are new roadways located generally along the Connector ROW, are used to consolidate existing street and driveway access, and do not currently exist as part of the local street network. A facility type should be identified in conjunction with the local jurisdiction that meets the project need and maintains continuity with the surrounding street network.
- Existing public streets – These streets are either new or existing streets requiring modification as part of the project and are part of the local jurisdiction street network. The facility type identified by the local jurisdiction should be followed.
- Private driveways and streets – These driveways and streets are privately owned accesses that require modification to maintain access to the existing or proposed street network.

These improvements should be planned and designed in accordance with the appropriate local jurisdiction standards. In the absence of specific local jurisdiction standards and to encourage consistency in the design standards along the Connector corridor, the following guidelines may be considered.

Design Controls

- Design and posted speed = to be determined.

Design Elements

- Vertical grades, maximum grade = 6 percent; 5 percent preferred.
- Vertical grades, minimum grade = 0.35 percent; 0.5 percent preferred.
- VCs – Crest and sag VC lengths should be based on minimum K-values for the design speed.
- VC length = 50 ft minimum.
- Vertical alignment, maximum grade break = 2 percent.

Cross Section Elements

- Lane requirements = subject to adjacent street system and traffic studies.
- Roadway side slopes = 6:1 or flatter preferred, 4:1 or flatter (fill condition), maximum 2:1 (cut condition and structure approaches).
- New frontage road ROW width = 50 ft minimum.

Other Considerations

- A half street widening may be used in accordance with the local standards.
- Proposed street improvements that are part of a planned development may be impacted by the Connector design. Where this occurs, the Connector will be designed consistent with the requirements of the Project Design Guidelines and to accommodate the revisions to the planned development. Modifications required to the planned development to accommodate the Connector will remain the responsibility of the planned development area.

F. Interchanges and Intersections

Interchanges and intersections should be provided at the locations listed in Table 16-13, “Assumed Travel Lanes and Access to Connector for Proposed Project,” in the Appendix.

In general, the connecting streets will be limited to the following:

- 1 mile preferred, 0.5 mile minimum spacing on the expressways
- 0.5 mile minimum spacing on thoroughfares and in the Sheldon Area

Interchanges

The preferred intersection connection type for expressways is the interchange, as follows:

- Interchanges should be designed at the locations identified in Table 16-13.
- Caltrans HDM, Chapter 500, should be the basis of design for the interchanges and ramps.
- The interchange type selected should be determined through detailed analysis of the applicability of the interchange to the project conditions, including standard interchange design requirements, traffic demand, existing and future site conditions, and project phasing. Uniformity in the types of interchanges included along the Connector should also be considered.
- The preferred interchange type should be a Type L-1 “compact (narrow) diamond” configuration, subject to confirmation of its applicability.

- Every effort should be made to minimize the footprint of the selected interchange type.
- Where access beyond the Connector is not desirable because of environmental conditions or to limit development, a Tee interchange-type connection should be considered to limit the extension of the roadway beyond the Connector.
- Spacing between ramp intersections should be based on storage length requirements for left-turn movements and channelization for the storage pockets. Side-by-side left-turn lanes that extend the entire distance between ramp intersections are acceptable, but the lanes should not extend through the intersections.
- The design of the interchanges and ramps should provide for the future accommodation of ramp metering and auxiliary lanes.
- Ramps should intersect the cross street at a preferred 90 degree angle, but not less than 75 degrees.
- Ramps should have 12 ft lanes, 4 ft left and 8 ft right shoulders.
- Ramp intersections should be designed to comply with current ADA requirements.
- Provisions for bus stops are not allowed on the cross street between ramp intersections.
- Side slopes and graded shoulders should match the conditions of the Connector and the connecting roadway.
- Interchanges and ramp design should accommodate a Class I multi-use path and/or PUE at the ROW line.
- Where traffic studies show that a signalized intersection will operate at a Level of Service C or better at the expressway intersection in lieu of the interchange, the footprint for the interchange should be established for the ROW based on the preferred Type L-1 diamond configuration, and a signalized intersection should be designed as a phased improvement.
- Where existing intersections cannot be economically relocated to accommodate the required interchange spacing, a right-in/right-out connection or a signalized intersection meeting the minimum spacing requirements may be considered as a phased condition. Any connection considered should be analyzed to enable acceptable traffic operations for the proposed connection.
- No driveway or street connections should be allowed within the interchange control of access.
- Street and driveway connections to the interchange cross street that are within 500 ft of a planned ramp intersection should be right-in/right-out only.

Signalized Intersections

The preferred connection type for thoroughfares and for the Sheldon Area is the signalized intersection, as follows:

- Signalized intersections should be provided at the locations identified in Table 16-13.
- Planning and design of signalized intersections should conform to the requirements in SCIS for a 96-ft-wide thoroughfare and in AASHTO Green Book, Chapter 9, "Intersections."
- Where traffic studies indicate the proposed signalized intersection cannot meet the LOS C or better criteria, an alternative intersection configuration that can meet the criteria should be identified. An interchange may be considered subject to meeting minimum spacing requirements.
- Cross streets should intersect at a preferred 90 degree angle, but not less than 75 degrees.
- Intersection channelization should accommodate the design vehicles specified for the connecting streets.
- Intersections should be designed to comply with current ADA requirements.

- Profile grades of the larger street should govern over the smaller connecting street. The smaller street profile should connect at the projected lip of gutter of the larger street (larger street determined by higher volume/higher standard).
- No driveway or street connections will be allowed within the cross street control of access.
- Street and driveway connections to the cross street that are within 500 ft of a planned intersection should be right-in/right-out only.

Other Intersection Types

The following unsignalized intersection connections have been identified in Table 16-13 in the Appendix, to provide limited access to the Connector:

- Right-in/Right-out Tee intersection
- Left-in and Right-in/Right-out Tee intersection

Where these connections are included, they should provide for the following:

- Speed-change lanes and transitions on the Connector alignment of sufficient length to accommodate traffic operations
- Intersection channelization using raised medians and islands to discourage wrong-way movements
- Passage of pedestrian, bicycle, and equestrian traffic, where present

Alternate intersection designs may be considered, where appropriate and improvement to the Connector traffic operations is realized, subject to approval by the JPA.

G. Integrated Travel Modes

Integrated travel modes, including transit, bicycle, pedestrian, and equestrian, should be considered when planning and designing the Connector.

Transit

The Connector project will coordinate with transit providers to coordinate transit services and facilities needs to better use the corridor in accordance with the Integrated Modes Policy and the Functional Guidelines as follows:

- Work with transit providers to plan transit services and provide facilities that maximize transit route and service planning for new/modified local fixed route, express bus, and bus rapid transit (BRT) with the transit operators including City of Elk Grove, Folsom Stage Lines, El Dorado Transit, and Sacramento Regional Transit.
- Help provide ROW and/or facilities to create meaningful travel time improvement for transit routes within the Connector corridor.
- May support strategic, cost-effective transit improvements such as queue jumps and signal priority/ITS equipment on other roadway segments, especially on parallel routes that show strong potential for successful, well-used service.
- Where identified, expressway segments should provide more than four lanes, the fifth and sixth lanes should be high-occupancy vehicle/transit unless the traffic analyses show unacceptable traffic operations for a segment.
- Encourage connectivity between different travel modes; that is, help provide park and ride lots and transit centers at strategic locations within the corridor accessible by pedestrian, bicycle, bus, and auto travel modes.
- Encourage smart growth with developers/jurisdictions to provide transit-friendly development within Connector corridor.

Pedestrians and Bicycles

The Connector will provide continuous, uniform bicycle and pedestrian facilities with access and connectivity to the roadway, transit, and other bicycle/pedestrian facilities. The alignments and access points will be coordinated between the Connector facilities and the following:

- Existing and future development of the off-corridor multi-use trail system
- Locations where local/regional trails intersect
- Local development access within 0.5 mile of the corridor
- Existing and future transit facilities
- Existing and future equestrian facilities

Planning and design of the Class I path should be in accordance with the Elk Grove Trail Master Plan and, as referenced, Caltrans HDM, Chapter 1000. Where information is not available, the design should conform to the NACTO Urban Bikeway Design Guide, as follows:

- On expressways, the paths should be 12 ft wide with graded shoulders a minimum of 2 ft.
- On thoroughfares and off-corridor locations, the path should be 10 ft wide graded shoulders a minimum of 2 ft.
- Class I paths should connect to cross streets at the nearest signalized intersection.
- Where bicycle and pedestrian volumes along the Connector are high and may adversely affect the cross street operations, a grade-separated crossings of the affected cross street(s) should be considered.
- Where spacing between intersections is greater than 0.5 mile and where bicycle and pedestrian crossing demand is anticipated to be high, a protected crossing should be provided. The following types should be considered, subject to safe traffic and crossing operations:
 - A grade-separated structure
 - Pedestrian signals with raised median refuge – thoroughfares only
 - As a phasing option, separate paths on both sides of the Connector with access via planned cross streets
- Where grade-separated structures are proposed, both overcrossing and undercrossing structures should be considered.
- On expressways, access control fencing should be installed between the path and traveled way. The fence height should be a minimum of 54 in and should not be a hazard to the drivers or bicyclists. Where installations are necessary within the expressway clear recovery zone, it should be designed integrally with the protective barrier.
- On thoroughfare Segments B and E, protective-barrier curb and a landscape buffer should be provided between the roadway and path, and access fencing will not be required.
- On Segment C – Sheldon Area, when an off-corridor alignment is not used, barrier protection should be provided if the separation from the roadway is less than the horizontal clear recovery zone.
- Class I paths should intersect frontage roads and driveways as close to a 90 degree angle as possible, with no connection less than 75 degrees.
- Street and driveway crossings should meet ADA standards for grade and cross slope.
- Transportation Management Plans and traffic control plans should consider pedestrians, equestrians, and bicyclists through construction work zones.

Equestrian

The Connector will provide equestrian facilities to maintain continuity of the existing equestrian trail systems near the communities of Sheldon and Wilton in Segment C. The alignments and access points will be coordinated between the Connector facilities and the following:

- Planned bicycle and pedestrian facilities
- Existing and future development of the off-corridor multi-use trail system
- Locations where local/regional trails intersect
- Local development access within 0.5 mile of the corridor

Planning and design of the trail should be in accordance with the Elk Grove Trail Master Plan. Where information is not available, the FHWA Equestrian Design Guidebook for Trails, Trailheads and Campgrounds will be used, including the following guidance:

- The trail may be located either immediately adjacent to the roadway ROW or off-corridor along a separate trail or local roadway system.
- If the location is close to the Connector, sufficient separation should be provided to eliminate the need for barrier protection. If insufficient separation is available, barrier curb separation will be required at the edge of roadway.
- Where a Class I multi-use path is planned, the equestrian trail may be located jointly with the path, as shown on Figure 5 of the Elk Grove Trails Master Plan.
- The trail should provide connections to the existing trail system where appropriate.
- The trail should provide the trail connectivity identified in the master plan through Segment C.

IX. Structural Section

Planning and design of roadway structural sections should be in accordance with Caltrans HDM, Chapter 600, "Pavement Engineering," methodology. Traffic indices and soils resistance values (R-value) for each roadway in each segment of the Connector will be developed as follows:

- The traffic index for each roadway will be developed based on volumes from the traffic report. At a minimum, the following values should be used for each type of roadway unless the traffic data show a larger value is necessary:
 - I-5, SR 99, and US 50 – coordinate with Caltrans
 - Expressway and thoroughfare segments – traffic index = 10
 - Cross streets, frontage roads, and local roadways and driveways – coordinate with local jurisdiction standards
- R-values will be established, based on project-specific soils reports, for all segments of the Connector and all major arterial cross streets.
- On local streets and frontage roads, a minimum R-value of 5 may be used in lieu of a soils report with JPA approval.
- New roadway structural sections should consist of one of the following:
 - Hot-mix asphalt (HMA), aggregate base, and subbase materials (where necessary)
 - Portland cement concrete pavement (PCCP)
- Life-cycle cost analysis should be done for HMA vs. PCCP surfacing.
- Where R-values are low and highly variable, stabilization/treatment of the subgrade materials with cement, lime, geotextile materials, or others soil-strengthening methods, will be considered.
- Alternate road-building materials may be used, as recommended by the geotechnical engineer as follows:
 - Subgrade stabilizing, isolating geotextiles, and grids
 - Pavement stress-absorbing layers
 - Subgrade add mixtures
 - Recycled materials
 - Rubberized asphalt concrete (AC)

- Subbase drainage facilities
- Where roadways are planned to be constructed in phases, either by the project or in coordination with future development, the interim (temporary) street structural section should be planned and designed to provide the full structural section for future widening.
- In transition areas between street standards, the stronger structural section should be used in the transition area.

X. Drainage

Drainage within the corridor is a mix of natural drainage ways and culvert crossings in the rural or undeveloped areas of Segments A, B, C, and D, and closed-conduit curb and gutter sections in the developed areas in Segments B and E. Areas of flooding and creek influences are on the Connector corridor. To provide a consistent approach to the design and construction of drainage and stormwater infrastructure, the following design approach, standards, and design criteria should be used for construction of the project. The drainage design should achieve the following:

- Maintain existing drainage flow patterns and incorporate existing drainage infrastructure as much as possible, given the existing physical constraints.
- Minimize diversions from one watershed to another.
- Provide low-impact development and stormwater treatment best management practices to treat the pavement runoff to the maximum extent practicable in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permit requirement.
- Improve water quality of stormwater runoff leaving the ROW.
- Protect stormwater quality from the impacts of the project.
- Control flows to minimize erosion and sedimentation downstream.
- Reduce water pollution from construction activities.

A. Hydrologic and Hydraulic Design Standards

The following design manuals and permits should be used to perform hydrologic and hydraulic analysis and design of drainage features for the project, and are incorporated by reference.

For projects within Caltrans' ROW, the following design standards and manuals should be used:

- HDM, Chapter 800
- Stormwater Quality Handbook, Project Planning Design Guide
- California Bank and Shore Protection Manual

For projects within Sacramento County, the Sacramento City/County Drainage Manual, Volume 2: Hydrology Standards should be used.

For projects within the County of El Dorado, the County of El Dorado Drainage Manual should be used.

Where local and state design manuals do not provide adequate design criteria, other available engineering design manuals may be used; for example, the following:

- FHWA Hydraulic Engineering Circulars
- FHWA Hydraulic Design Series
- United States Army Corps of Engineers Engineering Manuals
- City of Sacramento Design and Procedures Manual, Section 11 – Storm Drainage Design Standards

- Design and Construction of Urban Stormwater Management Systems (American Society of Civil Engineers Manual of Practice No. 77)

The following standard design criteria should be applied for the Connector project:

- All roadway drainage facilities design should be based on a 10-year, 25-year, and 100-year storm events, dependent on the facility involved.
- Drainage systems for Segments A and D – expressways and Segment C – Sheldon Area should consist of open-swale systems and cross culverts/structures to convey stormwater from the corridor to its natural water course.
- Drainage systems for Segments B and E – thoroughfares should be closed-conduit systems, matching the existing conditions, with inlets, laterals, manholes, and storm drain mainlines connecting to existing water courses.
- The Connector drainage systems should be planned and designed based upon the drainage needs of the ultimate conditions.
- The Connector is an emergency route and should be designed to be above the 100-year flood event.
- Where established waterway crossings occur, the design of the crossing should consider wildlife passage in the area when selecting the crossing structure. Types include the following:
 - Bridges
 - Open-bottom concrete box culverts or arches
 - Reinforced concrete box culverts
 - Pipe culverts
- Maintenance access roads should be provided where required for upkeep of the facilities. The preferred locations of the maintenance access connections are at the cross streets.

B. Stormwater Quality Analysis and Design Standards

The following design manuals and permits should be used to perform stormwater quality analysis and design:

- Projects within the cities of Folsom, Elk Grove, and Rancho Cordova are subject to the Sacramento Areawide NPDES Municipal Stormwater Permit (Order No. R5-2008-0142). For projects within the cities of Folsom, Elk Grove, and Rancho Cordova, use the Sacramento Stormwater Quality Partnership Stormwater Quality Design Manual, 2007.
- Projects within Caltrans ROW are subject to Caltrans' Statewide NPDES permit (Order No. 99-06-DWQ). This permit is anticipated to be renewed in 2012, and Caltrans is expected to reissue its Stormwater Quality Handbook. For projects within Caltrans ROW, use the Caltrans Stormwater Quality Handbook, Project Planning Design Guide, 2010.
- Projects within the unincorporated areas of El Dorado and Sacramento Counties are subject to Order No. 2003-0005-DWQ. This permit is anticipated to be renewed in 2012, with new requirements. Projects within the unincorporated areas of El Dorado and Sacramento Counties should comply with the most current version of this permit.

Projects should incorporate low-impact design to slow down runoff and reduce peak flows and volumes. Preference is given toward design measures that rely on evapotranspiration, infiltration, and rainwater harvesting. Specific examples of stormwater treatment best management practices include the following:

- Bioretention areas
- Extended detention basins

- Flow-through planter boxes
- Infiltration trenches and basins
- Media filters
- Tree well filters
- Vegetated buffer strips
- Vegetated swales
- Green roofs
- Pervious paving

Where required by the NPDES permits, projects should also incorporate hydromodification management measures that promote infiltration or otherwise minimize the change in the rate and flow of runoff, when compared to the predevelopment condition.

C. Construction Stormwater Standards

Construction of any project will be subject to the requirements of the Construction General Permit (Order No. 2009-0009-DWQ) plus amendments (Order No. 2010-0014-DWQ). Projects constructed within Caltrans ROW will also be subject to Caltrans' Statewide NPDES Permit (Order No. 99-06-DWQ). This permit is currently being considered for renewal by the State Water Resources Control Board. A draft permit is under review and subject to public review and comment period. The new permit is anticipated to be issued in 2012.

XI. Right-of-Way, Utilities, and Railroad Facilities

The existing roadways that make up the Connector are established public ROW and utility corridors. The ROW ownerships include federal, state, local, and private lands. The utilities include both public and privately owned facilities that are located in various types of property ownerships and easements. They often share the ROW or are built and maintained in easements adjacent to transportation facilities and include water, wastewater, stormwater, and sewer systems; solid waste management systems; petroleum pipelines; natural gas; electrical; and telecommunications services.

The ROW and utility corridors will be maintained, modified, and/or supplemented with new ROW and utility easements/corridors as part of the Connector project. ROW and utility planning, design, and relocation activities will be done in accordance with the Caltrans ROW Manual and the following.

A. Right-of-Way

- For policy guidance on Right-of-Way, see Policies section of these guidelines.

B. Utilities

- For policy guidance on Utilities, see Policies section of these guidelines.

C. Railroad Facilities

Several identified railroad facilities are within the segments as follows:

- Segment A – UPRR railroad east of Franklin Boulevard
- Segment B – UPRR railroad west of Waterman Road
- Segment C – Sacramento Northern, east of Aleilani Lane
- Segment D – Sacramento Placerville Transportation Corridor

These facilities are planned to be grade separated at the Connector crossings where the facility is identified to remain in operation. The crossings should be planned in conjunction with the local jurisdiction, the Public Utilities Commission, and the railroad company requirements.

Where Connector roadways, paths, and trails cross the railroad ROW, they should be grade separated in the ultimate condition. Use of at-grade railroad crossings as a phase of the project is subject to the railroad company approval.

XII. Structures

A. Bridges

Roadway bridge crossings and planned railroad grade separation are within the project limits. Locations of the current facilities, either in design or constructed, are as follows:

- US 50/Silva Parkway (proposed)
- UPRR/Grant Line Road (proposed)
- SR 99/Grant Line Road
- I-5/Hood-Franklin Road
- UPRR/Franklin Road

These structure types are typical of the roadway bridge structures in the region, consisting of cast-in-place concrete box structures.

New crossing structures are anticipated at following locations:

- Interchanges on expressways – Roadway overcrossings or undercrossings
- Railroads – Grade separations over or under the railroad tracks
- Creeks and streams – Roadway bridges or culvert crossings over the drainage
- Paths and trails – Bridges or culvert crossings over or under the Connector or cross streets

B. Retaining Walls

Retaining wall locations are to be determined.

Where bridge and retaining wall structures are required, the structures should be planned and designed in accordance with Caltrans Bridge Design Standards and Design Aids, including project structure design requirements for the following:

- Design loads
- Minimum clearances (during both construction and operation)
- Material requirements
- Design life
- Durability standards
- Geotechnical assessments and potential foundation types
- Standard design details

All structures proposed on the project should follow the Caltrans structure type selection process for approval by the JPA. To maintain continuity throughout the corridor, structure types should consider the following:

- The existing character of structures and facilities across the segment should be considered to achieve a consistent design aesthetic, rather than a series of disconnected and random structures.
- New construction should be of the same design family as existing facilities.
- Individual projects should be considered as part of the larger context of the Connector facilities.

Construction-related studies should include staging approaches, potential traffic management approaches during construction over existing operating roadways and railways, and approaches for widening existing bridges. Staging of structures at major interchanges with I-5, SR 99, and US 50 should be studied to determine potential impacts on structures types and feasibility of construction.

A consistent aesthetic should be maintained for the bridges, walls, and other structures along the length of the corridor. Visual quality standards that address forms, textures, details, and other design features should be developed in conjunction with the project public involvement program and allow for community preferences.

XIII. Traffic

A. Pavement Delineation and Signing

Pavement delineation and signing should be planned and designed in accordance with the following:

- Expressways – Caltrans Traffic Manual, California MUTCD
- Thoroughfares – SCIS, California MUTCD
- Cross streets, local roads, and frontages – Local jurisdiction standards, California MUTCD

In addition to these guidelines, the FPEIR, Functional Guidelines, and Integrated Modes Policy specify the following:

- Proposed project signing should minimize the visual impact on the Connector corridor.
- Signalized intersections should have marked cross walks on all four corners.
- School cross walks should be marked where crossing guards are provided.
- At unsignalized uncontrolled intersections, marked cross walks and safety enhancements (such as, medians and curb extensions) should be provided.
- Marked cross walks may be installed at other high-volume locations without median or curb extensions if a traffic study shows a benefit.

B. Signals, Lighting, and Intelligent Transportation System

The Connector is a mix of free-flowing expressways with interchanges, high-speed urban arterials with signal control, rural arterials with signal control, and intermittent unsignalized limited-access control connections. In addition, there are six different agencies with jurisdiction over the regional system that the Connector serves.

These facilities should be coordinated, through the use of a combination of effective traffic signing and pavement delineation, signalization of intersections and crossings, and ITS solutions to provide an efficient transportation system.

Traffic signals and lighting on the Connector should comply with the SCIS. Where the signal and lighting are part of a State highway facility, the traffic signal and lighting and any required modifications should

comply with Caltrans standards. Where the traffic signal lighting is on a cross street or other local roadway, it should comply with the requirements of the local jurisdiction.

Items for consideration during the planning and implementation of traffic signals include the following:

- Provide traffic signals at Connector intersections.
- Provide pedestrian and bicycle push button and loop detector facilities at all signalized crossings.
- Provide railroad signal and crossing gate systems where at-grade crossings are allowed.
- Provide interchange ramp metering signals where required.
- Consider signalized mid-block pedestrian crossings on thoroughfares, where appropriate.
- Consider transit signal priority, where appropriate.

Items for consideration during the planning and implementation of lighting systems include the following:

- Provide roadway lighting systems for the Connector interchanges and intersections.
- Provide street lighting systems for the cross streets and local streets.
- Provide lighting systems for the Class I multi-use paths, where appropriate. Consider continuous lighting.
- Provide continuous street lighting along thoroughfare segments.
- Provide lighting fixtures that are the same or similar throughout the Connector corridor.
- Provide lighting facilities that are uniform and meet current energy star requirements.
- Provide lighting fixtures that are “Dark Star”-compliant.
- Low energy lighting systems, such as light-emitting diode (LED) fixtures, should be evaluated for application.

Items for consideration during the planning and implementation of ITS systems and solutions include the following:

- Provide ITS systems to interconnect traffic signal systems on the Connector to efficiency of moving traffic through the major intersections.
- Consider providing ITS systems to interconnect the Connector signal systems with the local jurisdiction traffic signal network.
- Consider other ITS solutions to maximize efficiency and safety of the Connector and adjacent street network.

XIV. Landscaping, Aesthetics, and Community

Aesthetics is how we translate our visual appeal with respect to the appearance of our surroundings to a project. We think about and design the aesthetics features of a project to look appealing or pleasing in a particular setting. Aesthetics are usually accomplished by employing the shape, texture, color, type of material, symmetry, and simplicity of repeated patterns used in the design. For the Connector, aesthetics should be included in the development of the project. The aesthetic features should include the following:

- Application of a common thematic design to enable uniformity to the Connector as a single facility.
- Application of unique thematic detail to represent the character of individual communities.
- Incorporation of the urban, rural, natural environmental and historical settings that surround the Connector corridor.

- Strategic placement of facilities to blend with the surroundings.
- Minimization of visual obstructions through lowered profile designs and undergrounding of overhead infrastructure.

Landscaping and aesthetics includes the application of shape, texture, and color to roadway bridges, retaining walls, barriers, fencing, sound walls, and the inclusion of vegetation, surface treatments, and materials selection into the roadsides, urban and rural streetscapes, and other infrastructure improvements to aid in the blending of the Connector with the surroundings.

The JPA, through the SAC has provided initial guidance on project aesthetics. The results of their efforts are included in the Capital Southeast Connector SAC Involvement Summary Memorandum included in the Appendix.

The purpose and role of the SAC is as follows:

- To represent the pulse of the users and communities within the project area.
- To provide a community perspective and input on the aesthetic elements for the Project Design Guidelines.
- To identify and collaborate on themes that can translate throughout the project.
- To work with the project team to better understand how people circulate within the communities along the Connector and the region, considering various integrated modes of transportation.

Their work has provided initial community input on thematic principles for the Connector, for the individual communities, and for the environments. This work will be continued in subsequent efforts to be incorporated in the Connector project.



Figure 5 – Thematic Image Concept

Figure 5 is an image concept developed to memorialize the SAC's contribution and support for defining and enhancing the beauty, character, and functionality of the Connector. This image is intended to illustrate the regionally and historically significant oak tree leaf blending into the Connector roadway in a natural color scheme.

Working with the community through a series of SAC meetings and an aesthetics workshop, project Fact Sheets were developed which summarize the SAC perspectives and input that are unique to each segment yet thematically contiguous along the corridor. See Figures 6 through 10 which represent the SAC input on local mobility, aesthetics, and theme by each segment along the corridor.

In addition, the Connector project, as part of FPEIR, Functional Guidelines, and the Integrated Modes Policy, has identified features that should be considered as part of the project development process. These are summarized as follows:

- High-canopy trees and landscaping should be considered as a buffer and for shading on the Class I path where space allows.
- Where appropriate, include landscaping; quality materials; treatments for medians; pedestrian areas; and adjacent facilities, barriers, and buffer zones.

- Aesthetics need to consider users and adjacent properties.
- Landscape buffer may be used between the roadway and the Class I path.
- Consider using native, noninvasive, drought-tolerant plant species.
- Consider using plants that will not pose a safety hazard to the corridor.
- Consider a layering concept based on the appropriate clear zone for the roadway segment.
- Consider vegetative bioswales for filtration of road runoff.
- Where landscape and aesthetic concepts are implemented, they should be consistent and uniform in color and design throughout the corridor.

Character and Theme through Eyes of the Community

How We Move...

Current mobility needs identified through mobility mapping with the SAC

Motorized Movements

- East Franklin residential area is using Bruceville Rd on the east.
- Majority of residential area on west is using Hood Franklin Blvd for a back route into/out of Elk Grove.
- Hood Franklin community has concerns about traffic through their community.
- Majority of the traffic generated in the southg area of Elk Grove uses SR99.
- The two existing access points could get really congested.
- Ranchers with farm machinery are accessing these narrow roads.
- Industrial area is limited in access points.

Bicycle and Pedestrian Movements

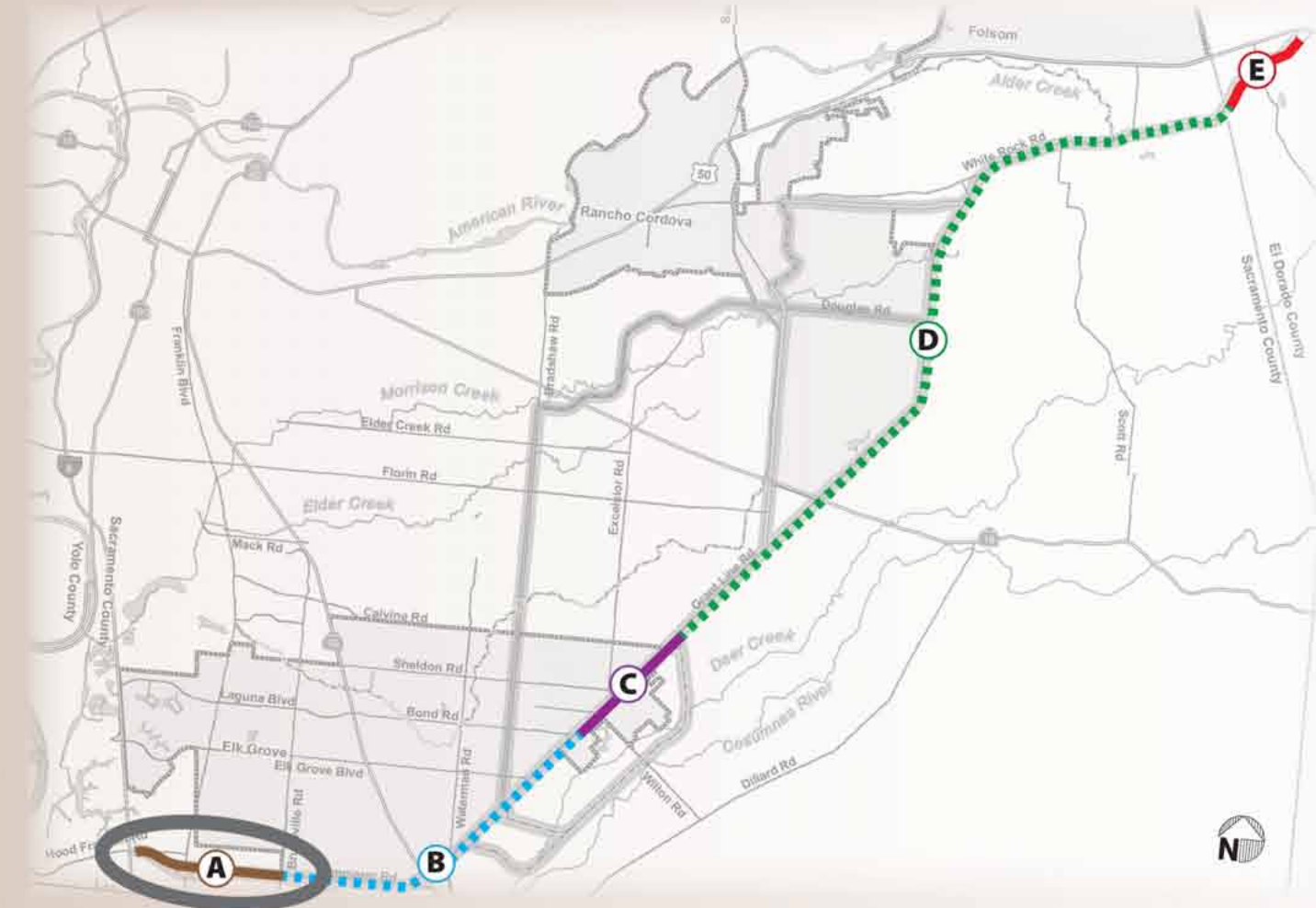
- Not aware of any current bike/pedestrian movements.
- A pathway towards and along the river would be a draw.
- A bike trail would probably get a lot of recreational use.
- Very few people would use for work, only recreational use.
- It is rare that you see people running or biking since Kammerer Road is so narrow.
- People are not cycling or walking, but if it were built, they would use it.
- Bike commuters won't go west.
- No one wants to recreationally ride on such a busy highway.

Transit and Commute Movements

- Parking at SR-99 and I-5 for commuters.

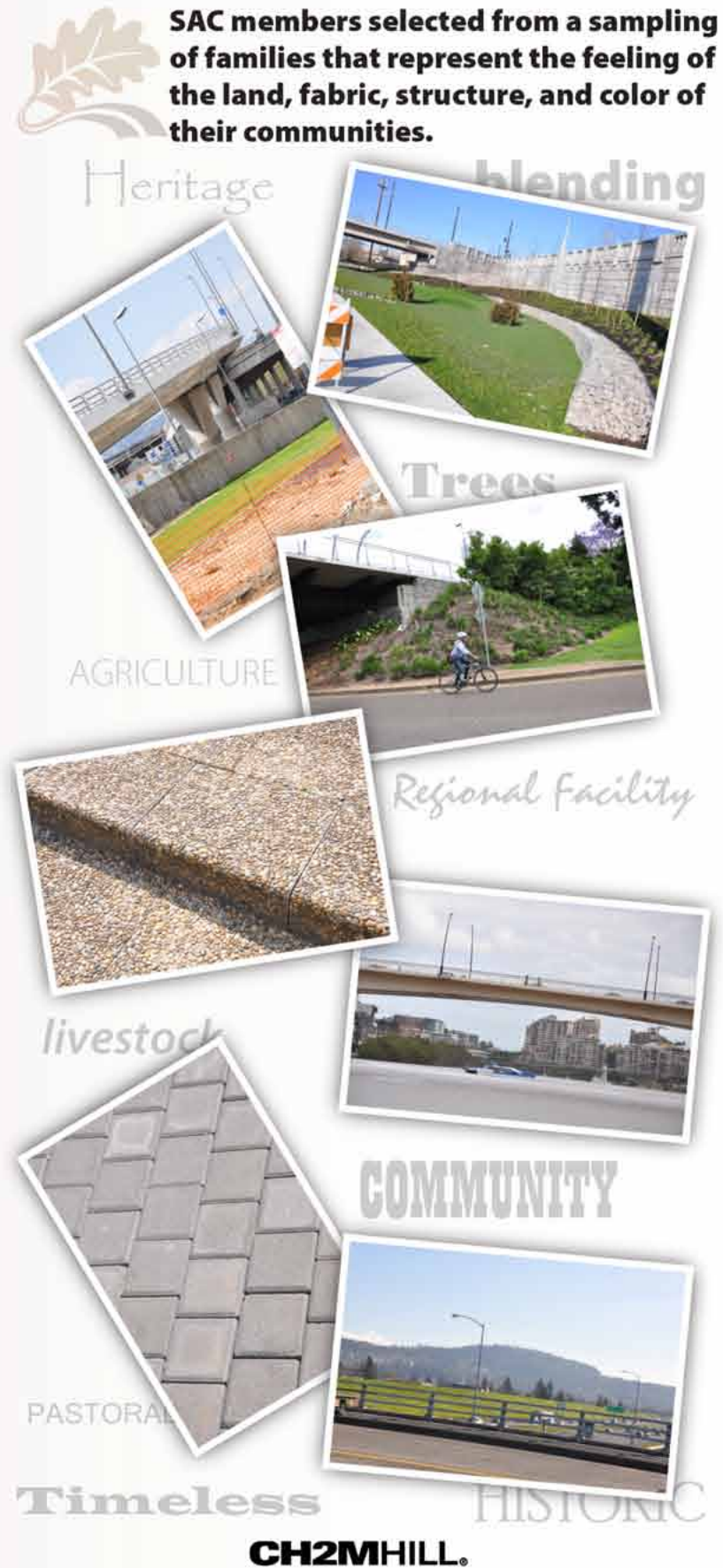
Future Planned Development Projects

- There have been discussions about a college with dorms coming into the area.
- Tolling will be a problem if the goal is to attract businesses to this area. We can't tell these businesses their only access is a toll road.



How It Feels...

SAC members selected from a sampling of families that represent the feeling of the land, fabric, structure, and color of their communities.



SEGMENT A

Four lane expressway, on Kammerer Road from the I-5/Hood Franklin Interchange to Bruceville Road

Aesthetic Continuum

Each segment falls within different levels of intensity along the aesthetic continuum.

SEGMENT	1 LESS PASTORAL	2	3	4 MORE PASTORAL	5 HERITAGE
A	West of RR			More Pastoral	Some
	East of RR	Suburban Area			
B	West of Waterman				
	East of Waterman				
C	Transition				
	Sheldon Area				
	Transition				
D	West End				
	East End				
E	El Dorado Hills				

INTENT

Provide a high speed connection to I-5 with controlled access.

CONSIDERATION

The Connector joins two existing streets, Hood-Franklin Road and Kammerer Road. The alignment is along farmlands and rural properties (natural terrain) except where it meets with Hood-Franklin at I-5. Currently, local access uses the adjacent street system and is not reliant on the Connector alignment for traffic circulation and property access, except at the I-5 connection.

FACILITY TYPE

EXPRESSWAY – A high speed, fully divided, urban arterial.



Character and Theme through Eyes of the Community

How We Move...

Current mobility needs identified through mobility mapping with the SAC

Motorized Movements

- Lots of farm equipment and agricultural access from SR-99 east on Grant Line Road.
- Residents use Waterman Road south and north into and out of Elk Grove.
- Residents use Bradshaw Rd, Elk Grove Blvd and Bond Rd as main access in and out of Elk Grove.
- Parcels south of Grant Line Road use Wilton Rd to Dillard Rd to access farming land and SR-99 and traffic is increasing.
- Levee Road is not heavily used.

Bicycle and Pedestrian Movements

- Potential recreational trail use through Southeast Policy Area following creek bed.
- Transit and Commute Movements
- Park and Ride at Grant Line Rd and SR-99.
- Transit destination at W. Stockton Blvd. and Promenade Parkway where there is heavy commercial development.
- Long-term light rail (bus rapid transit) will eventually be built through Southeast Policy Area into the Sterling Meadows Development.

Future Planned Development Projects

- West of SR99: Southeast Policy Area, Sterling Meadows, Lent Ranch.
- East of SR99 to UPRR: Industrial.
- East of UPRR: Industrial, residential, rural use.



How It Feels...

SAC members selected from a sampling of families that represent the feeling of the land, fabric, structure, and color of their communities.

SEGMENT B

4 to 6 lane thoroughfare, on Kammerer Road and Grant Line Road from Bruceville Road to Bond Road

Aesthetic Continuum

Each segment falls within different levels of intensity along the aesthetic continuum.

SEGMENT	1	2	3	4	5	HERITAGE
	LESS PASTORAL	← →			MORE PASTORAL	
A						
B	West of Waterman	Industrial				
	East of Waterman		Suburban Area	Some Pastoral		
C	Transition					
	Sheldon Area					
D	Transition					
	West End					
E	East End					
	El Dorado Hills					

INTENT

Intent – Provide an urban arterial street that is consistent with the existing developed street speeds and maintains major street connections.

CONSIDERATION

These connecting streets currently serve as an urban arterial roadway leading into and through the southern limits of Elk Grove. The roadway is on the existing street alignment and currently provides access to residential and commercial properties through individual driveways, through local road intersections, and to SR-99 at the Grant Line Road Interchange

FACILITY TYPE

THOROUGHFARE - An urban arterial with raised median.



Character and Theme through Eyes of the Community

How We Move...

Current mobility needs identified through mobility mapping with the SAC

Motorized Movements

- The circulation issue is property owners need access. There are about 100 owners between Calvine and Bond.
- There is limited existing property access.
- The main issue is property owners only have one way to get in and out. They turn directly onto/off of Grant Line Rd from their property.
- People like the way it works now.
- As more traffic happens, it will eventually be an issue, but currently ok as-is.

- Customers of the local businesses come from all over, not just local customers.
- Most local trips, but there are regional trips to/from the commercial core.
- There is a school on Pleasant Grove School Road that uses Grant Line Rd for access.

Bicycle and Pedestrian Movements

- People are walking on other roads but no one is walking to the businesses.
- There are bikes and pedestrians along the commercial core area. Bikes and pedestrians need to cross Grant Line Rd.

Equestrian Movements

- There is an equestrian trail that follows the old railroad line.
- There is limited equestrian parking. It is needed for local business access along Grant Line Rd between Sloughouse and Bond roads.
- There are a dozen equestrian centers within a 10-mile radius in the area.
- People ride their horses to/from the commercial core and leave them outside to do business.

Transit and Commute Movements

- None noted.

Future Planned Development Projects

- None noted.



How It Feels...

SAC members selected from a sampling of families that represent the feeling of the land, fabric, structure, and color of their communities.



SEGMENT C

Four lane roadway, on Grant Line Road from Bond Road to Calvine Road (Sheldon Area)

Aesthetic Continuum

Each segment falls within different levels of intensity along the aesthetic continuum.

SEGMENT	Aesthetic Continuum				
	1 LESS PASTORAL	2	3	4 MORE PASTORAL	5 HERITAGE
A	West of RR				
	East of RR				
B	West of Waterman				
	East of Waterman				
C	Transition		Some Pastoral		Some
	Sheldon Area				More
	Transition		Some Pastoral		Some
D	West End				
	East End				
E	El Dorado Hills				

INTENT

Provide a rural arterial street that is consistent with the existing developed street system and maintains major street connections.

CONSIDERATION

Grant Line Road currently serves as a rural roadway for the communities of Sheldon and Wilton. It passes through the center business district of Sheldon. The roadway is on the existing alignment and currently provides access to closely spaced residential and commercial properties through individual driveways and through local road intersections.

FACILITY TYPE

"SPECIAL SECTION" - A rural arterial.

Character and Theme through Eyes of the Community

How We Move...

Current mobility needs identified through mobility mapping with the SAC

Motorized Movements

- This is a high speed area.
- High truck volumes on Grant Line Rd to Sunrise Blvd.
- Commuters use Grant Line Rd to Sunrise Blvd from Elk Grove.
- Lots of through traffic in this area from Rancho Cordova.
- Lots of people in Elk Grove go to Folsom area for work.
- Lots of farm equipment along Grant Line Rd.
- People use Dillard Rd as an alternative to Grant Line Rd.
- Lone/Jackson commuters use Jackson Road to get to US 50.
- Lots of truck traffic to/from landfill east of Kiefer Blvd.
- High volumes at White Rock Rd and Grant Line Rd.

Transit and Commute Movements

- Teichart Gravel pit has high truck volumes.
- Prairie City Rd sees high volumes especially during ski season when US 50 is at capacity.
- El Dorado Hills residents take Prairie City Rd to Scott Rd to White Rock Rd and vice versa.

Bicycle and Pedestrian Movements

- High year-round volumes at Prairie City State Vehicular Recreation Area.
- More bike/pedestrian potential further to west and south.
- There is a planned bike/pedestrian pathway east of Prairie City Rd.
- Minimal bike/pedestrian demand between White Rock Rd and Calvine Rd.
- Multiple planned bike trails including underpass at the Connector to tie into the trail near Deer Creek Hills.

Future Planned Development Projects

- High commute segment with need for Park and Ride (Sunrise Blvd and Jackson Rd)
- High commute area at White Rock Rd and Grant Line Rd.
- Significant development planned along Prairie City Rd.
- Folsom Planning Area shows more access locations at Grant Line Rd.



How It Feels...

SAC members selected from a sampling of families that represent the feeling of the land, fabric, structure, and color of their communities.

SEGMENT D

4 to 6 lane expressway, on Grant Line Road and White Rock Road from Calvine Road to the Sacramento-El Dorado County line

Aesthetic Continuum

Each segment falls within different levels of intensity along the aesthetic continuum.

SEGMENT	Aesthetic Continuum				
	1 LESS PASTORAL	2	3	4 MORE PASTORAL	5 HERITAGE
A	West of RR				
	East of RR				
B	West of Waterman				
	East of Waterman				
C	Transition				
	Sheldon Area				
D	West End	Some Suburban		More Pastoral	
	East End	Some Industrial	Suburban Area		
E	El Dorado Hills				

INTENT

Provide a high speed arterial street with limited access.

CONSIDERATION

These connecting streets currently serve as a rural roadway between Elk Grove and the El Dorado Hills Community. The alignment is on the existing roadway and currently runs along rural properties (natural terrain) with widely spaced driveways road intersections. Local access is provided by the roadway.

FACILITY TYPE

EXPRESSWAY – A high speed, fully divided, urban arterial.



Character and Theme through Eyes of the Community

How We Move...

Current mobility needs identified through mobility mapping with the SAC

Motorized Movements

- White Rock Rd to Placerville Rd to US 50 is a high volume route.
- High trip volume on Latrobe to White Rock Rd to and from business park.
- High volumes of El Dorado Hills residents crossing US 50 to get to shopping and services on the south side of US 50.
- The public parking on Latrobe and White Rock Rd is totally full. People are parking outside the public parking area.
- Four Seasons will become an island surrounded by traffic.
- Highly developed commercial business park cannot accommodate all parking.
 - Senior housing, schools, medical offices, swim school, day care
- A lot of service businesses in this area.

Sunday traffic due to large church. The church has many activities throughout the week, not just on Sundays.

- Fire department
- Heavy traffic because coffee shop and In and Out Burger opened. There have been several collisions.

Bicycle and Pedestrian Movements

- El Dorado Hills is a big bike area.
- Bikers take Iron Point Rd to the America River Trail.
- High bike volumes along White Rock Rd from Latrobe Rd to Payen Rd.
- People are walking to shopping centers (Target, Nugget) from Serrano Parkway.
- People are walking to shopping from the Carson Crossing area to Latrobe Rd.
- Heavily traveled area for bike users from the County line to Placerville Rd is horrible.

- No sensors on traffic signals that pick up bike riders.
- Not enough time to walk across Latrobe Rd at White Rock Rd.
- Not an equestrian area.

Transit and Commute Movements

- High commute volumes to/from business park using Latrobe and back streets to White Rock Rd.
- Commuters use White Rock Rd to Scott Rd and Prairie City Rd to get to US 50.
- Park and Ride opportunities in this area.

Future Planned Development Projects

- Fire Department is building a new training facility in the business park area.



How It Feels...

SAC members selected from a sampling of families that represent the feeling of the land, fabric, structure, and color of their communities.



SEGMENT E

4 to 6 lane thoroughfare, on White Rock Road from the County line to US 50/Silva Valley Pkwy IC

Aesthetic Continuum

Each segment falls within different levels of intensity along the aesthetic continuum.

SEGMENT	Aesthetic Continuum				
	1 LESS PASTORAL	2	3	4 MORE PASTORAL	5 HERITAGE
A	West of RR				
	East of RR				
B	West of Waterman				
	East of Waterman				
C	Transition				
	Sheldon Area				
D	West End				
	East End				
E	El Dorado Hills	Suburban Area			

INTENT

Provide an urban arterial street that is consistent with the existing developed streets, maintains major street connections and accommodates key local access locations.

CONSIDERATION

White Rock Road currently serves as an urban arterial through the El Dorado Hills Community. The alignment is developed as a limited access facility over the majority of its length. Local access is through the connecting street intersections. There are a few remote residential and commercial driveways along its length. It will also provide access to US-50 via the US-50/Silva Valley Parkway project, which will construct a new interchange on US-50 and develop the eastern-most end of the Connector project between Latrobe Road and US-50.

FACILITY TYPE

THOROUGHFARE – An urban arterial with raised median.



XV. Phasing

The Connector project is anticipated to be planned, designed, and constructed in phases to accommodate funding conditions, logical termini of facilities, and design and construction constraints. The Connector project delivery and phasing plan will be a function of the Plan of Finance and the General Plan amendment process in coordination with the local jurisdictions.

As stated in the FPEIR, the JPA or individual jurisdictions may move forward with project-level design and environmental review to implement specific project components. Improvements could take place where design and planning has advanced or where funding will become available. Phasing of the Connector will be planned and coordinated with the local jurisdictions.

There are locations where improvements are necessary on the proposed Connector alignment, or directly adjacent to the corridor, prior to any improvements proposed as part of the project. These include the following:

- Traffic operations and safety improvements at intersections
- New or modified property access from individual properties
- Proposed development projects that will affect Grant Line Road or White Rock Road public ROW or create access to/from adjacent development

The public project improvements will be coordinated with the JPA and Connector improvements to minimize future reconstruction costs. If possible, the improvements should be located to accommodate the Connector.

Access at individual properties will be coordinated with the JPA and Connector improvements to minimize consolidation.

Proposed development improvements should be coordinated with the JPA and the Connector.

XVI. Sustainability

The JPA, through the SCC has provided an initial assessment of a best practice approach to integrate sustainability into planning, design, and construction of the Connector. The results of their efforts are included in the Connector JPA Sustainability Assessment Update Memorandum included in the Appendix.

The purpose and role of the SCC is as follows:

- To provide input/feedback on the sustainability assessment process.
- To help identify sustainable solutions that can make the project more sustainable.
- To provide guidance on technical aspects of sustainable solutions.
- To integrate sustainability into the project.

Their work will be continued in subsequent efforts to be incorporated in the Connector project.

In addition, the Connector project, as part of FPEIR, Functional Guidelines, and the Integrated Modes Policy and a separate sustainability assessment, has identified sustainable design and construction practices that should be considered throughout the corridor as part of the project development process. These are summarized as follows:

- Recycled materials (pavement, Poly-pipe, etc.)

- Noninvasive native, drought-tolerant plant species for landscaping
- Oversized drainage structures to improve ecological connectivity, where practical
- Roadway lighting or luminaires that meet current energy star requirements
- Solar panels to offset energy requirements for illuminated signs, etc.
- Permeable pavement in the shoulders and/or multi-use paths
- Quiet pavement for the travel lanes
- Vegetative bioswales or natural drainage systems for treatment of water runoff, where appropriate
- Reduction of fossil fuel requirement for the non-road construction equipment fleet and required use of biofuel or biofuel blends as a replacement for fossil fuel in a percent (?) of the construction equipment
- Use of local materials
- Warranty for the pavement structure

XVII. Environmental

Environmental impacts and mitigations have been identified as part of the FPEIR in Table S-1, “Summary of Environmental Effects of the Capital SouthEast Connector Project.” This information will be refined as part of the project-level environmental documents. The design of the Connector project segments and adjacent facilities should take identified impacts into consideration and strive to lessen the impacts and associated mitigations required.

A. Sound Barriers

The corridor passes through a mix of open lands, urban commercial, and urban and rural residential areas. The existing facilities along the established street sections of the corridor consist of masonry block fencing at the property lines. These residential areas and other new locations may require mitigation for noise-level increases based on noise studies performed during the Tier II environmental process. In the areas where noise attenuation is identified, sound barriers should be planned and designed as follows:

- Sound barriers should be planned and designed in accordance with Caltrans PDPM, Chapter 30, “Highway Traffic Noise Abatement,” and the Caltrans Memo To Designers, 22-1 “Soundwall Design Criteria.”
- Sound-barrier materials considered should include the following:
 - Masonry block
 - Precast concrete panel
 - Other concrete, timber, steel, plastic, composite, or recycled material designs
- Additional information on the above material types are included in the FHWA, Noise Barrier Design Handbook, Chapter 5, “Noise Barrier Materials and Surface Treatments.”
- Wherever possible, the use of earthen berms should be considered, as follows:
 - Where the Connector profile is depressed
 - Where ROW is not constrained
 - Where wall heights would be considered excessive
 - Where a wall would not be consistent with the corridor aesthetics
- The dimensions of the earthen berms should be determined on a location by location basis.
- Where there are existing walls adjacent to the proposed location(s), the same or similar wall type and aesthetic treatment should be maintained.
- Wall types used should be consistent throughout each location. If multiple locations are in proximity, the wall type used for the series of locations should also be consistent.

- Sound barriers should be located at the ROW line unless the noise study identifies additional need or an alternate location to improve attenuation.
- Vegetation should be used in barrier design, where appropriate for both aesthetic appeal and to discourage graffiti.

B. Wildlife Crossings

The project corridor traverses through widely varied wildlife habitats and terrain conditions. To incorporate the corridor into these surroundings, animal crossings have been identified as potential mitigation. No specific locations are established.

Crossings will vary widely to accommodate the types of terrain and degree of development, including rural, urban, farmland, river, creeks, rolling foothill, and other conditions. Crossings should consider the following:

- Species and size of animal
- Type and location of habitat crossing
- Development – existing and future conditions
- At-grade surface crossings
- Grade-separated crossings
- Modification of existing roadway and drainage crossing locations to accommodate wildlife crossings
- Combined wildlife crossings, subject to compatibility:
 - Drainage/stream
 - Equestrian/pedestrian
 - Connector and cross street roadway structures
- Appurtenances for effective crossing control, including fencing and advanced warning signage

Following the assessment of potential locations for crossings, further study should be conducted into appropriate crossing configurations and geometric requirements.

Where crossings are identified to be included in the project, the planning and design of the crossing infrastructure should be in accordance with the following:

- Chapter 4, “Selecting Avoidance, Minimization, or Compensatory Mitigation Measures,” Wildlife Crossings Guidance Manual, Caltrans, Version 1.0, October 2007
- Chapter 4 – “Design, Toolboxes, Guidelines, and Practical Applications,” Wildlife Crossing Structure Handbook, Design and Evaluation in North America, FHWA Central Federal Lands, Publication No. FHWA-CFL/TD-11-003, March 2011

C. South Sacramento Habitat Conservation Plan

The Connector is included in the South Sacramento Habitat Conservation Plan (SSHCP) as a covered project. The SSHCP is currently under preparation; an administrative draft was prepared in July 2010 (Sacramento County, 2010a, <<http://www.southsachcp.com/Documents>>). The SSHCP will protect plants and wildlife, vernal pool, wetland, and stream habitats that are subject to the federal Clean Water Act, California's Porter-Cologne Water Quality Control Act, and Streambed Alteration Agreement requirements under Fish and Game Code Sections 1600, et seq. The SSHCP will be carried out through an Implementation Agreement among SSHCP participants that include Sacramento County, City of Elk Grove, City of Galt, City of Rancho Cordova, Sacramento County Water Agency, Sacramento Regional Sanitation District, Sacramento Area Sewer District, and the JPA. The Connector design should be consistent with the SSHCP.

APPENDIX

Revised Table 16-13. Assumed Travel Lanes and Access to Connector for Proposed Project

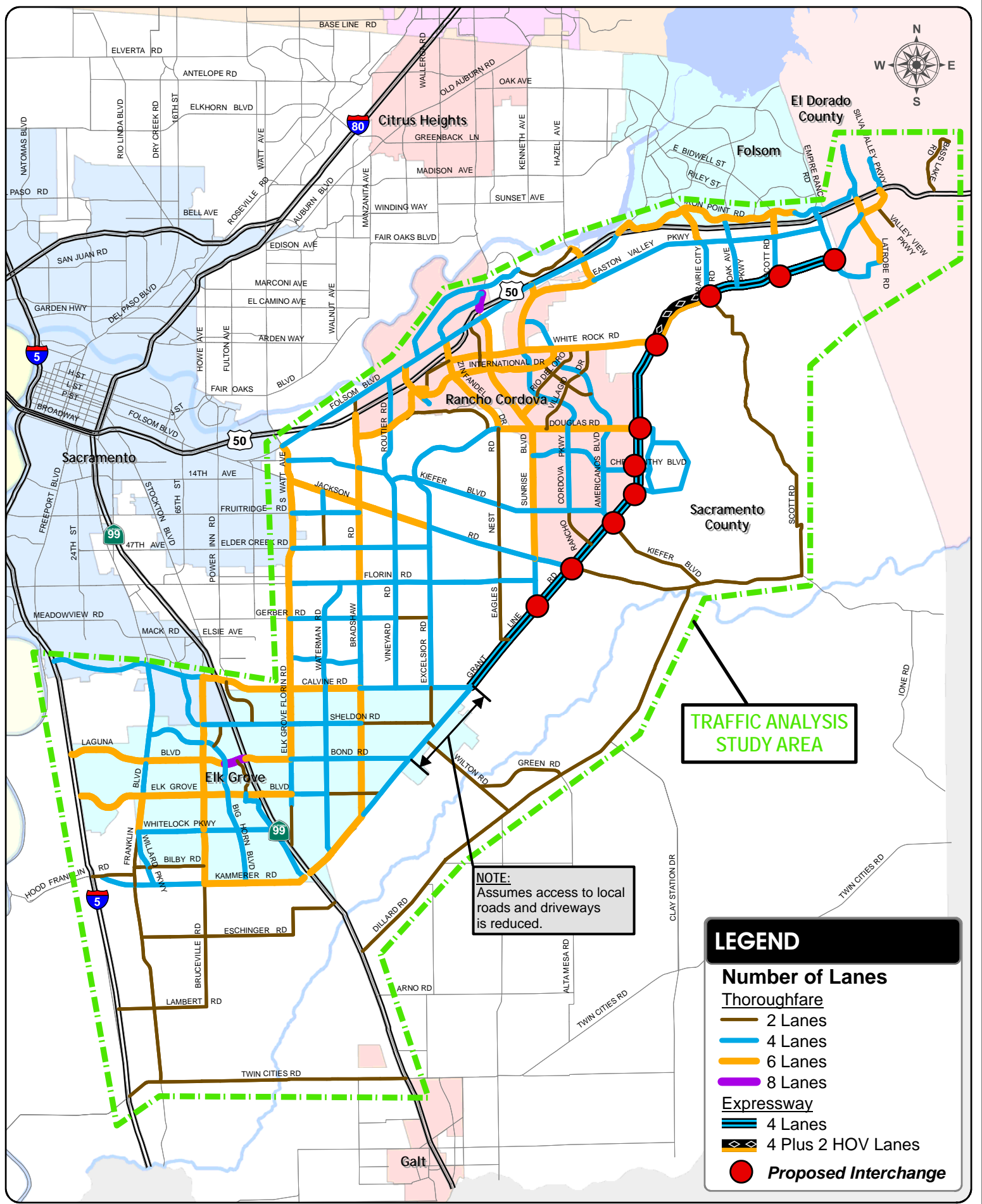
Connector Roadway	Cross Street	Future without Project			Future with Project				
		Lanes - Facility Type	Traffic Signal	Comments on Assumed Access	Lanes - Facility Type	Traffic Signal	Interchange	Comments on Assumed Access ¹	
White Rock Road	US 50 EB Ramps	4-T	1		4-T	1			
	Vine/Valley View Pkwy		1			1			
	Sunset			Right in/out					Right in/out
	Keables Lane								
	Monte Verde Dr			Left in/Right out					Left in/Right out
	Post St								
	Latrobe Road		1			1			
	Windfield Way		1			1			
	Manchester Drive		1			1			
	Bailey Circle			Right in/out					Right in/out
	Stonebriar/ Four Seasons		1			1			
	Carson Crossing		1			1			
	Empire Ranch Road		1				1		
	Placerville Rd/Payen Rd		1					1	
	RR Crossing		At-Grade Crossing				Right in/out		
	Scott Road (E)	1				1	At-Grade Crossing		
	Collector		Right in/out				1		
	Oak Avenue Pkwy	1				1		No connection	
	Scott Rd (W)	1						Acceptable 2035 LOS as signalized intersection	
	Collector		Right in/out					Existing access eliminated and realigned with Prairie City Rd Interchange	
Prairie City Rd	1					1	No connection		
OHV Park East Ent		Right in/out (except events)					Connected to realigned Scott Rd (W) with access to Prairie City Rd Interchange		
OHV Park West Ent/ Aerojet Rd	1				1				

¹ Other connections will only be allowed along the Proposed Project if the JPA determines that the design would ensure an acceptable LOS and meet performance standards for the Connector.

Connector Roadway	Cross Street	Future without Project			Future with Project				
		Lanes - Facility Type	Traffic Signal	Comments on Assumed Access	Lanes - Facility Type	Traffic Signal	Interchange	Comments on Assumed Access ¹	
Grant Line Road	Grant Line Rd	4-T	1		4-E		1		
	Teichert Entrance			Realign across from either North Douglas access or White Rock Rd				No access between White Rock Rd and Centennial	
	North Douglas Access (future Centennial)		1	Centennial extension post-2035		1		Future interchange with interim signal	
	Douglas Rd		1				1	Potential Right in/out access for residence north of Douglas Rd	
	Glory Lane			Access through Cordova Hills or Right in/out				Frontage road to Douglas Road, or other potential design option that ensures an acceptable LOS and meets performance standards for the Connector, as determined by the JPA)	
	Cordova Hills		1						
	Chrysanthy Blvd		1					1	
	University		1					1	
	Kiefer Blvd		1					1	
	Rancho Cordova Pkwy		1	Rt in/RT out to driveways			1		Acceptable 2035 LOS as signalized intersection
	Jackson Rd		1					1	Frontage road to Michlen Ct for driveway access north of Jackson Rd
	Sunrise Blvd		1					1	Frontage road connecting existing six driveways on SE side to single right in/ out access; access to residence near Sunrise Blvd via frontage road
	Eagles Nest Rd/ Sloughhouse Rd		1				1		Right in/out for residence

Connector Roadway	Cross Street	Future without Project			Future with Project			
		Lanes - Facility Type	Traffic Signal	Comments on Assumed Access	Lanes - Facility Type	Traffic Signal	Interchange	Comments on Assumed Access ¹
Grant Line Road	Calvine Rd	4-T	1	Rt in/RT out to driveways	4-T	1		Three field entrances connected via frontage road with one access point; Residence access Calvine Rd via frontage road; North private drive access via frontage road to Sloughhouse Rd
	Farm Road			All driveways and local roads remain open. Median with Right in/out (except signalized intersections)				<p><u>High Access Roadway:</u> Maintain access to all driveways and local roads with Right in/ out with signals at same locations as Baseline</p> <p><u>Reduced Access Roadway:</u> Reduce the number of driveways and local road connections along Grant Line Road and provide access to properties via alternative access</p> <p><u>Deer Creek Causeway:</u> No access on causeway. Maintain access to all driveways and local roads along Grant Line Road</p>
	Richert Lane							
	Poppy Seed Lane							
	Spanish Grant Rd							
	Public Road							
	Bradley Ranch Rd							
	Beitzel Rd							
	Graybill Lane							
	Oak Pond Lane							
	Sheldon Woods Way							
	Sheldon Rd		1					
	Mooney Rd							
	Siefker Ct		1					
	Aleilani Lane		1					
	Wilton Road		1					
	Pleasant Grove School Rd					Right in/out		
	De Souza Lane					Realign with Sherman Oaks		
	Sherman Oaks Ct		1			Right in/out for all driveways and local roads		
	Upton Ct							
Menlo Oaks Ct								
Clark Lake Lane								
Bond Road		1			1			

Connector Roadway	Cross Street	Future without Project			Future with Project				
		Lanes - Facility Type	Traffic Signal	Comments on Assumed Access	Lanes - Facility Type	Traffic Signal	Interchange	Comments on Assumed Access ¹	
Grant Line Road	Equestrian Dr	4-T		All driveways and local roads remain open				Cul-de-sac; access to Wrangler Dr.	
	Pavich Lane						Right in/out		
	Freeman Rd					4-T		Right in/out	
	Jetmar Way							Realigned to Elk Grove Blvd	
	Elk Grove Blvd		1		Left in (no LT out) could be considered at some local roads		1		Driveway access via frontage roads to Bradshaw Rd and Elk Grove Blvd
	Bradshaw Rd	1		1					
	Mosher Rd	6-T	1	Grade separated	6-T	1		One access for 2 residents on NW side; frontages roads to Mosher & Bradshaw	
	Waterman Road		1				1		
	UPRR								Grade separated
	E. Stockton Blvd		1				1		Driveways routed to E. Stockton/Survey
	SR 99 NB Ramps		1				1		
Kammerer Road	SR 99 SB Ramps	6-T	1	3 existing right in/ out access points	6-T	1		Existing right in/out access points maintained	
	W Stockton Blvd		1				1		
	Lent Ranch Pkwy		1				1		
	Lotz Pkwy		1	3 existing right in/ out access points		1		Existing right in/ out access points maintained	
	Collector		1			1			
	Big Horn Blvd		1			1			
	Rau Road			Right in/out				Frontage road to Bruceville or Big Horn	
	Collector 2		1			1		No access to Kammerer Bypass Option	
	Bruceville Rd		1			1			
	Willard Pkwy		1			1			
	UPRR	4-T		Grade separated	4-E			Grade separated	
	Franklin Blvd		1			1			
	Hood Franklin Rd			Right in/out				Right in/out	
	I-5 NB Ramps		1			1			
Red = Future Roadways	Total	49		Total	34-36	10	Bold = Major Cross-Streets		
Source: DKS Associates 2010.		T = Thoroughfare E = Expressway		3 additional signals with Sheldon No Build Option					



TRAFFIC ANALYSIS STUDY AREA

NOTE:
Assumes access to local roads and driveways is reduced.

LEGEND

Number of Lanes

- Thoroughfare
- 2 Lanes
- 4 Lanes
- 6 Lanes
- 8 Lanes

Expressway

- 4 Lanes
- 4 Plus 2 HOV Lanes

Proposed Interchange