Transportation Concept Report

State Route 2

District 8

Disclaimer: The information and data contained in this document are for planning purposes only and should not be relied upon for final design of any project. Any information in this Transportation Concept Report (TCR) is subject to modification as conditions change and new information is obtained. Although planning information is dynamic and continually changing, the District 8 System Planning Division makes every effort to ensure the accuracy and timeliness of the information contained in the TCR. The information in the TCR does not constitute a standard, specification, or regulation, nor is it intended to address design policies and procedures.

California Department of Transportation

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

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TABLE OF CONTENTS

ABOUT THE TRANSPORTATION CONCEPT REPORT

System Planning is the long-range transportation planning process for the California Department of Transportation (Caltrans). The System Planning process fulfills Caltrans' statutory responsibility as owner/operator of the State Highway System (SHS) (Gov. Code §65086) by evaluating conditions and proposing enhancements to the SHS. Through System Planning, Caltrans focuses on its mission to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability.

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

TCR Purpose

California's State Highway System needs long-range planning documents to guide the logical development of transportation systems as required by CA Gov. Code §65086 and as necessitated by the public, stakeholders, and system users. The purpose of the TCR is to document the evaluation of current and projected conditions along the route and to communicate the vision for the development of the route in each Caltrans District during a 20-25 year planning horizon. The TCR is developed with the goals of increasing safety and health; providing good stewardship and system efficiency; making Smart Mobility decisions that sustainably improve the environment and a vibrant economy; and providing reliable and accessible mobility options through an integrated management of the transportation network, including the highway, transit, pedestrian, bicycle, freight, operational improvements, and travel demand management components of the corridor.

STAKEHOLDER PARTICIPATION

The State Route 2 TCR involved a collaboration between agency staff as well as outside stakeholders from local, county, and regional public agencies; advocacy organizations; nonprofits; and community members at large. Feedback from the stakeholders helped solidify the findings of the performance assessment, bottleneck identification, and causality analysis given their intimate knowledge of local conditions. Moreover, stakeholders have provided support and insight, and shared valuable field and project data without which this study would not have been possible. The stakeholders included representatives from the following organizations: the Southern California Association of Governments, San Bernardino Associated Governments, County of San Bernardino, and Native American tribes.

EXECUTIVE SUMMARY

State Route 2 (SR-2) is a west-east highway that begins at the western edge of Los Angeles City Limits and runs east through the City of Los Angeles. The route crosses the mountains through Angeles National Forest and enters District 8 at the San Bernardino County Line. The route terminates at the junction of State Route 138 (SR-138). SR-2 provides access to the rural community of Wrightwood. Visitors from the metropolitan region use SR-2 to access recreational activities such as skiing and hiking. During the winter season, traffic is generated on SR-2 from tourists flocking to local ski resorts. Shoulders are narrow and there are no sidewalks along the length of the route in District 8. Tourism with year-round residents is the main economy of the area.

CONCEPT SUMMARY

Seg.	Segment Description	Existing Facility	2035 Capital Facility Concept	2035 System Operations and Management Concept	No-Build		Planned SCAG-RTP		Minimum to attain LOS "D"
1	LA/SBD County Line to SR-138	2L, C	2L, C	N/A	2 MF		2 MF		2 MFE
					V/C	LOS	V/C	LOS	
					0.44	D	0.44	D	

Source: Caltrans District 8 District System Management Plan Update, 2016

C = Conventional Highway
L = Number of mainline lanes

MF = Mixed-Flow Lane
V/C = Volume to Capacity Ratio
LOS = Level of Service
MFE = Mixed-Flow Equivalent Lane

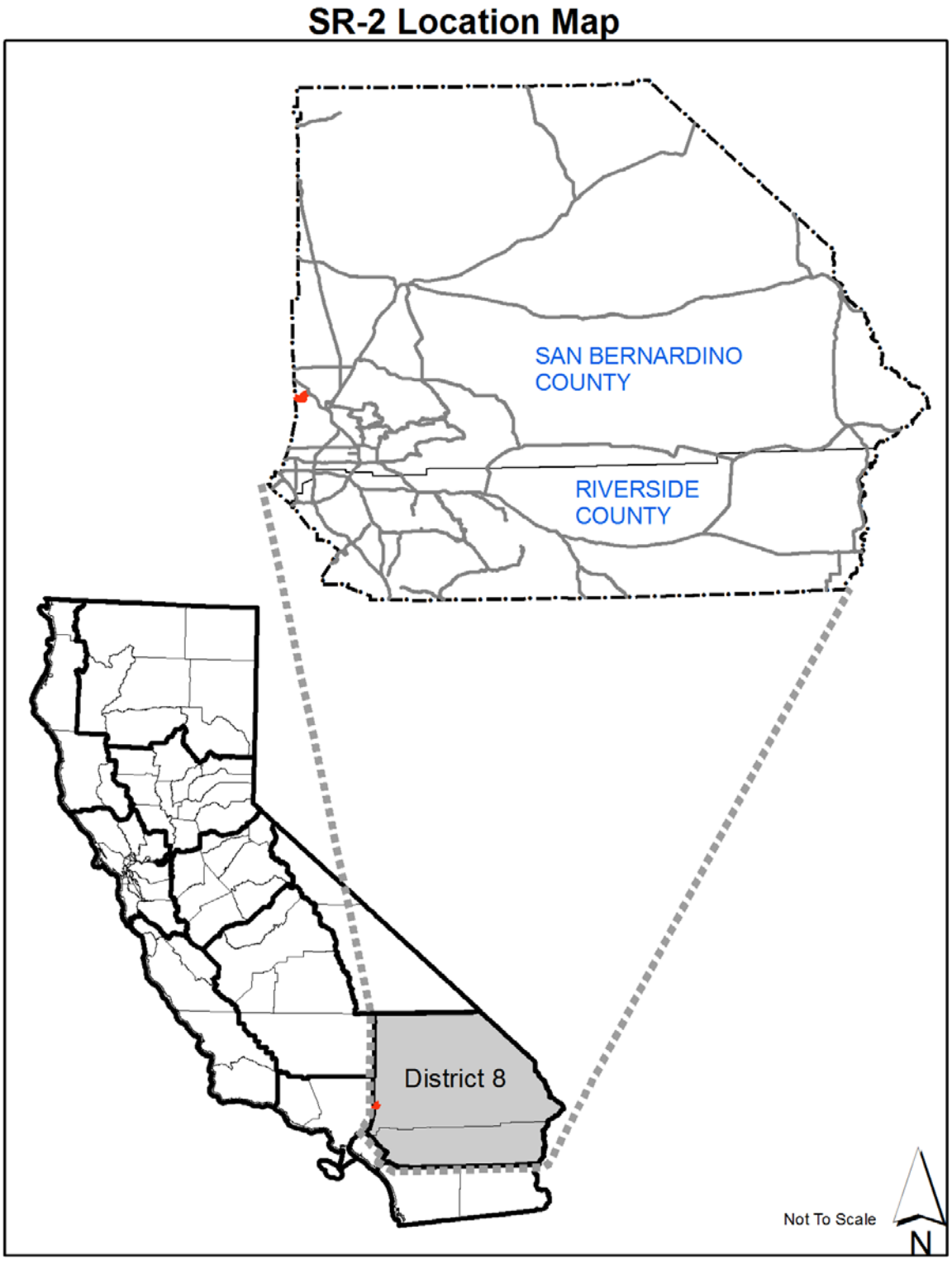
CONCEPT RATIONALE

The corridor concept serves as a guide for long range planning of route improvements. Since SR-2 is not expected to experience significant traffic growth in the future, no capacity increasing or major operational improvements are needed to maintain the concept LOS "D" through 2035. Aside from the high volume of traffic during the winter season, the average daily traffic is relatively low during the remainder of the year. SR-2 may need other projects to achieve strategic plan goals such as providing adequate shoulders for bicycle and pedestrian travel along the route.

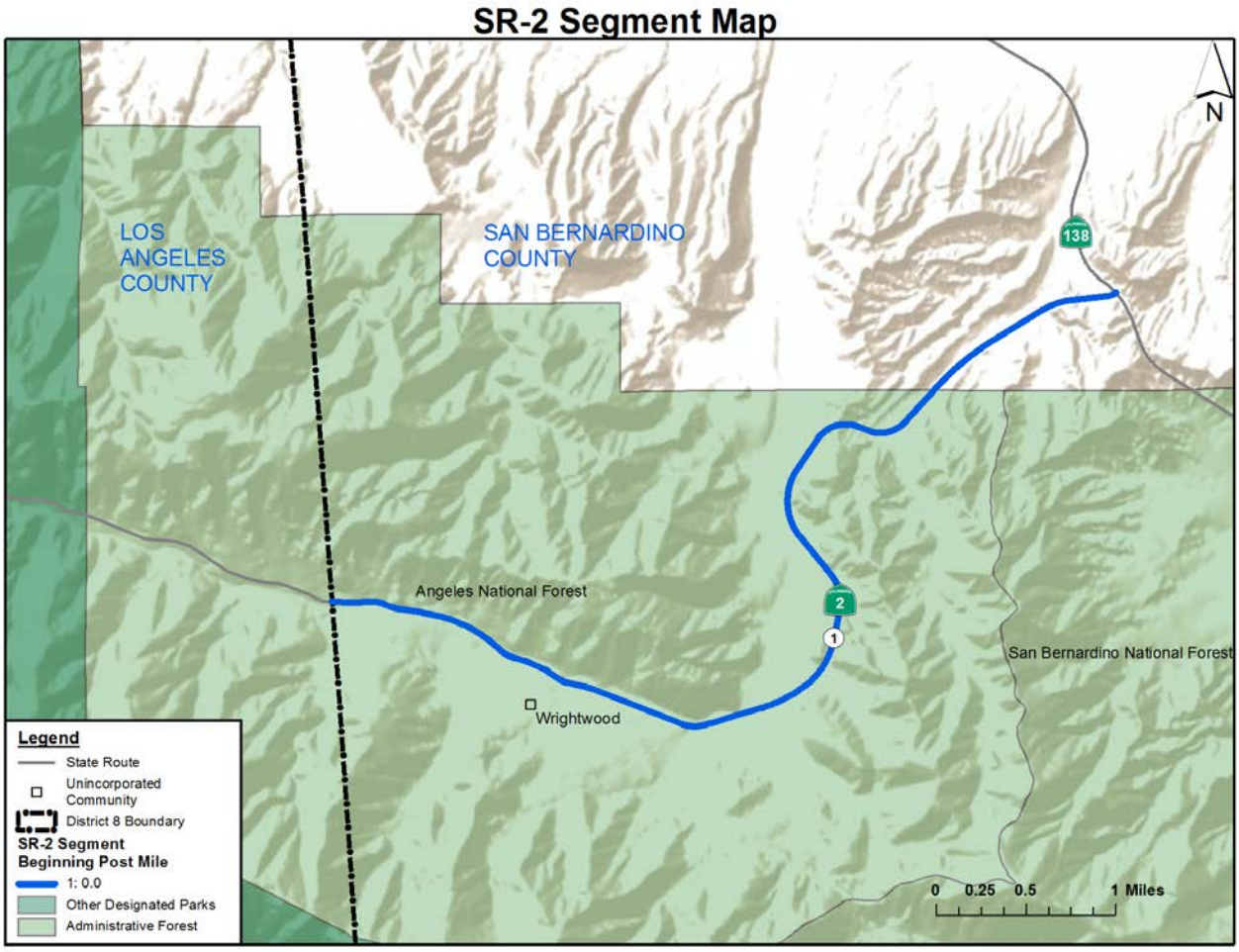
PROPOSED PROJECTS AND STRATEGIES

No capacity or major operational projects or strategies proposed for SR-2 in District 8.

CORRIDOR OVERVIEW



ROUTE SEGMENTATION



Segment	Location Description	County_Route_ Begin PM	County_Route_ End PM
1	Los Angeles/San Bernardino County Line to SR-138	SBd_2_0.0	SBd_2_6.4

ROUTE DESCRIPTION

Route Location

SR-2 is 87 miles long located in Southern California. The route begins in District 7 at the Santa Monica-Los Angeles City Limits and runs east on through the cities of Los Angeles and Beverly Hills. The route traverses the Angeles National Forest crossing into District 8 at the San Bernardino County Line. SR-2 terminates at its junction with State Route 138 (SR-138). The District 8 portion of SR-2 is 6.4 miles long.

Route Purpose

Within District 8, the route currently serves as access for visitors heading to and from ski resorts and other recreational activities in the Angeles National Forest. The route also connects fulltime residents of the

rural community of Wrightwood to the Urbanized Areas of Victorville-Hesperia-Apple Valley to the north and Riverside-San Bernardino to the south.

Major Route Features
SR-2 in District 8 is a two-lane conventional highway. Center turn lanes are present in Wrightwood. SR-2 is hilly and traverses mountainous terrain. There are no signalized intersections in District 8 except at its junction with SR-138.

Route Designations and Characteristics

Segment #	1
Freeway & Expressway System	No
National Highway System	No
Strategic Highway Network	No
Scenic Highway	No
Interregional Road System	Yes
High Emphasis	No
Focus Route	No
Federal Functional Classification	Minor Arterial
Goods Movement Route	No
Truck Designation	Terminal Access/Legal Advisory Route
Rural / Urban / Urbanized	Rural
Metropolitan Planning Organization	SCAG
Regional Transportation Planning Agency	SCAG
Congestion Management Agency	SANBAG
County Transportation Commission	SANBAG
Local Agency	San Bernardino County
Tribes	San Manuel Band of Mission Indians
Air District	Mojave Desert AQMD
Terrain	Mountainous

COMMUNITY CHARACTERISTICS

SR-2 traverses the undeveloped areas of the San Gabriel Mountains in the Angeles National Forest and serves as the main access for the community of Wrightwood. Wrightwood is an unincorporated community with approximately 5,000 residents. Land uses within Wrightwood include residential and commercial. Immediately east of Wrightwood, three ski resorts are located within Los Angeles County that attract many tourists to the area during the winter season. Businesses and hotels that serve tourists are the main economy of the community.

LAND USE

Most of the land along SR-2 is within the Angeles National Forest. The Angeles National Forest is managed by the USDA Forest Service. There is no major anticipated growth expected in the area. SR-2 is economically significant because it provides direct access to recreation activities for the nearby metropolitan region.

SYSTEM CHARACTERISTICS

Segment #	1
Existing Facility	
Facility Type	C
General Purpose Lanes	2
Lane Miles	12.8
Centerline Miles	6.4
HOV Lanes	0
HOT/ Express Lanes	0
Concept Facility 2035	
Facility Type	C
General Purpose Lanes	2
Lane Miles	12.8
Centerline Miles	6.4
HOV Lanes	0
HOT/ Express Lanes	0
TMS Elements	
TMS Elements 2008	N/A
TMS Elements 2035	N/A

C = Conventional Highway

SR-2 within District 8 is a two-lane conventional highway without center turn lanes except in the community of Wrightwood.

BICYCLE FACILITY

Segment #	Bicycle Access Prohibited	Facility Type
1	No	No designated facility

Shoulders are narrow in width along most of the route and vary from one to four feet.

PEDESTRIAN FACILITY

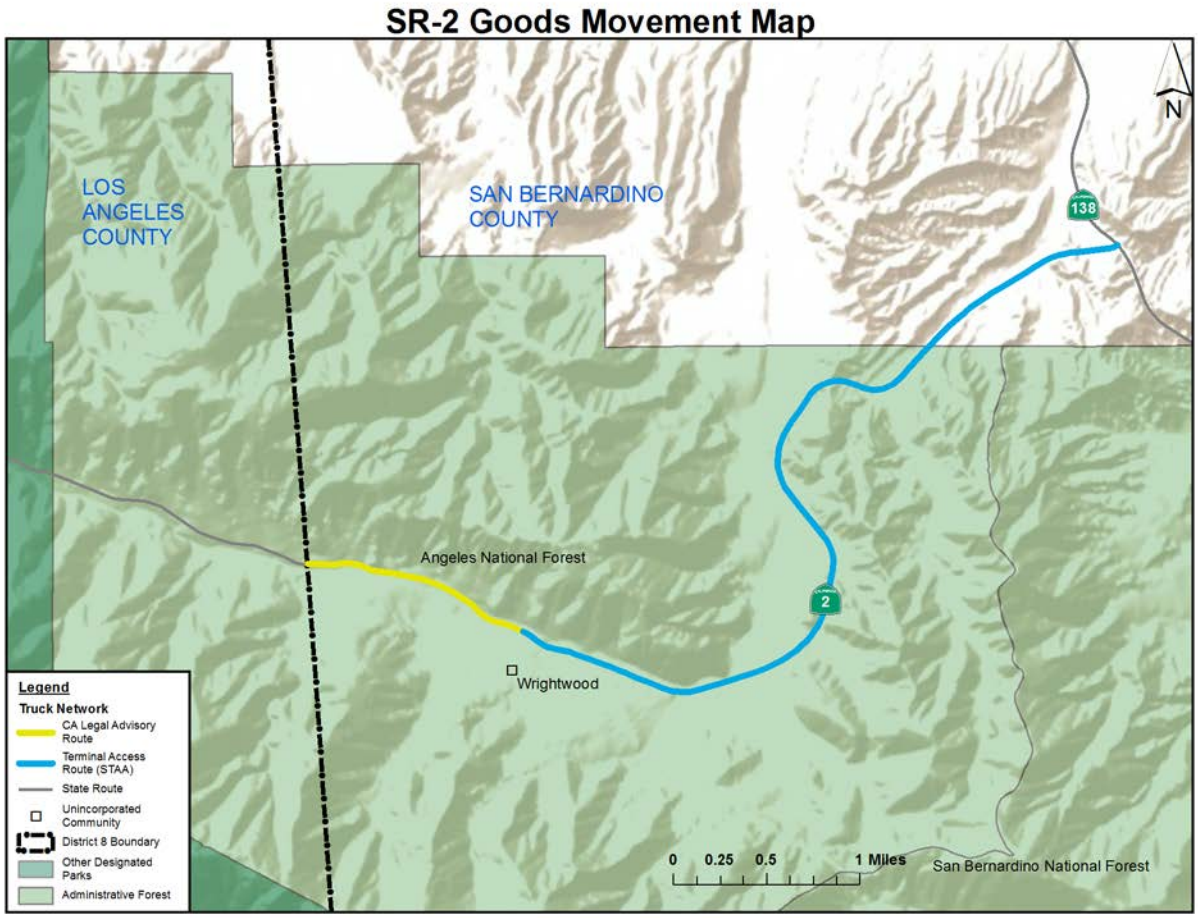
Segment #	Pedestrian Access Prohibited	Sidewalk Present
1	No	No

Because it is a rural route, sidewalks are not present along SR-2. Pedestrians may walk along the shoulders.

TRANSIT FACILITY

There is no transit service along SR-2 in District 8.

FREIGHT



Freight generators, terminals, and/or inter-modal facilities are not present on SR-2 within District 8. However, SR-2 is the primary route for shipping goods to the community of Wrightwood and the local ski resorts.

CORRIDOR PERFORMANCE

Traffic volumes on SR-2 are expected to increase slightly over the next 20 years. Even with the forecasted increase in traffic volumes, LOS is expected to remain satisfactory.

Segment #	1
Basic System Operations	
AADT 2008	4,700
AADT 2035	6,600
LOS Method	HCM
LOS 2008	D
LOS 2035	D
LOS Concept	D
VMT 2008	29,900
VMT 2035	42,000
Truck Traffic	
Total Average Annual Daily Truck Traffic (AADTT) 2008	190
Total Average Annual Daily Truck Traffic (AADTT) 2035	340
Total Trucks (% of AADT) 2008	4.0%
Total Trucks (% of AADT) 2035	5.1%
5+ Axle Average Annual Daily Truck Traffic (AADTT) 2008	18
5+ Axle Trucks (% of AADT) 2008	0.4%
Peak Hour Traffic Data	
Peak Hour Directional Split 2008	56%
Peak Hour Directional Split 2035	53%
Peak Hour % 2008	20%
Peak Hour % 2035	17.7%
Peak Hour V/C 2008	0.36
Peak Hour V/C 2035	0.44

Source: Caltrans District 8 Forecast Unit forecast based on SCAG 2012 RTP traffic model

KEY CORRIDOR ISSUES

SR-2 serves the local residents, businesses, and visitors of the quiet, closed-knit community of Wrightwood. Wrightwood, nestled in the San Gabriel Mountains experiences minimal traffic delays. However, during the course of peak winter season, when the area receives snow fall, recreational traffic using SR-2 and the adjoining SR-138 can experience congestion.

CORRIDOR CONCEPT

CONCEPT RATIONALE

The corridor concept serves as a guide for long-range planning of route improvements. Since SR-2 is not expected to experience significant traffic growth in the future, no capacity increasing or major operational improvements are needed to maintain the concept LOS “D” through 2035. Aside from the higher volume

of traffic during the winter season, the average daily traffic is relatively low during the rest of the year. SR-2 may need other projects to achieve strategic plan goals such as providing adequate shoulders for bicycle and pedestrian travel along the route.

PLANNED AND PROGRAMMED PROJECTS AND STRATEGIES

No major capacity or operational improvements are planned or programmed for SR-2.

PROJECTS AND STRATEGIES TO ACHIEVE CONCEPT

No projects or strategies are proposed for SR-2.

APPENDICES

APPENDIX A: GLOSSARY OF TERMS AND ACRONYMS

Acronyms

AADT – Annual Average Daily Traffic
ADT – Average Daily Traffic
AQMD – Air Quality Management District
Caltrans – California Department of Transportation
CMA – Congestion Management Plan
CSS – Context Sensitive Solutions
FHWA – Federal Highway Administration
GHG – Green House Gas
HCM – Highway Capacity Manual
HCP – Habitat Conservation Plan
HCS – Highway Capacity Software
HOV – High Occupancy Vehicle Lane (2 or more occupants per vehicle)
HOT – High Occupancy Toll Lane
IC – Interchange
ITS – Intelligent Transportation System
LOS – Level of Service
MF – Mixed-Flow Lane
MFE – Mixed-Flow Lane Equivalent
ML – Managed Lane
MPO – Metropolitan Planning Organizations
NOA – Naturally Occurring Asbestos
NCCP – Natural Community Conservation Plan
OC – Overcrossing
PID – Project Initiation Document
PM – Post Mile
PSR – Project Study Report
RCTC – Riverside County Transportation Commission
Riv – Riverside County
RTP – Regional Transportation Plan
RTIP – Regional Transportation Improvement Program
RTPA – Regional Transportation Planning Agency
SANBAG – San Bernardino Associated Governments
SBd – San Bernardino County
SCAG – Southern California Association of Governments
SCS – Sustainable Community Strategies
SHOPP – State Highway Operation Protection Program
STIP – State Transportation Improvement Program
T – Truck Lane
TDM – Transportation Demand Management
TMS – Transportation Management System
TSN – Transportation System Network

Acronyms

UC – Undercrossing
V/C – Volume to Capacity Ratio
VMT – Vehicle Miles Traveled

Definitions

Annual Average Daily Traffic (**AADT)** – Annual Average Daily Traffic is the total volume for the year divided by 365 days. The traffic count year is from October 1st through September 30th. Traffic counting is generally performed by electronic counting instruments moved from location throughout the State in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present. Annual ADT is necessary for presenting a statewide picture of traffic flow, evaluating traffic trends, computing accident rates, planning and designing highways, and other purposes.

Bikeway Class I (Bike Path) – Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with cross flow by motorists minimized.

Bikeway Class II (Bike Lane) – Provides a striped lane for one-way bike travel on a street or highway.

Bikeway Class III (Bike Route) – Provides for shared use with pedestrian or motor vehicle traffic.

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

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

Concept LOS – The minimum acceptable level of service over the next 20-25 years.

Conceptual Project – A conceptual improvement or action is a project that is needed to maintain mobility or serve multimodal users, but is not currently included in a financially constrained plan and is not currently programmed. It could be included in a General Plan or in the unconstrained section of a long-term plan.

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

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

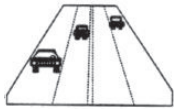
Facility Type – The facility type describes the state highway facility type. The facility could be freeway, expressway, conventional, or one-way city street.

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

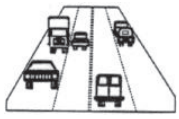
Headway – The time between two successive vehicles as they pass a point on the roadway, measured from the same common feature of both vehicles.

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

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

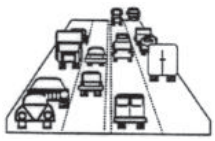


LOS A describes free flowing conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway.



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

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



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

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

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

Mainline – Includes travelway for through traffic but not freeway to freeway interchanges, local road interchanges, ramps, or auxiliary lanes.

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

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

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

PeMS – Caltrans Performance Measurement System is an archived data user service that provides over ten years of data for historical analysis. PEMS provides access to real-time and historical performance data which conducts assessment of freeway performance, base operational decisions on knowledge of the current state of the freeway network, and identifies congestion bottlenecks.

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

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

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

"mile post equations" are introduced at the end of each relocated portion so that mile posts on the reminder of the route within the county will remain unchanged.

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

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

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

RTP Model – Forecasting model developed by Southern California Association of Governments (SCAG) prepares travel demand model approximately every 4 years in conjunction with the Regional Transportation Plan Project List. SCAG's trip based model is structured on a four-step gravity model, which includes trip generation, trip distribution, mode choice, and trip assignment.

Segment – A portion of a facility between two points.

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

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

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

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

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

Vehicle Miles Traveled (VMT) – Is the total number of miles traveled by motor vehicles on a road or highway segments.

APPENDIX B: FACTSHEETS

There are no factsheets available for this route.

APPENDIX C: ADDITIONAL CORRIDOR DATA

There is no additional corridor data for this route.

APPENDIX D: RESOURCES

- California State Transportation Improvement Program Project List 2014
- Caltrans District 8 District System Management Plan Update, 2016
- Caltrans Earth: http://earth.dot.ca.gov/
- Caltrans TASAS Highway Sequence Listing for Caltrans District 8
- Census 2010: http://www.census.gov/2010census/
- Focus Routes: http://www.dot.ca.gov/hq/tpp/corridor-mobility/documents/library/List_of_Focus_Routes.doc
- GIS Data Library: http://www.dot.ca.gov/hq/tsip/gis/datalibrary/gisdatalibrary.html
- High Emphasis Routes: http://www.dot.ca.gov/hq/tpp/corridor-mobility/documents/library/Caltrans_High_Emphasis_Routes_HER.doc
- Interregional Transportation Strategic Plan 2015
- Metropolitan Planning Organizations and RTPAs Map: http://www.dot.ca.gov/hq/tpp/offices/orip/index_files/Updated%20Files/MPO_RTPA_Map_June_2012.pdf
- Regional Transportation Planning Contacts: http://www.dot.ca.gov/hq/tpp/offices/orip/list/agencies_files/regional_6-12.xls
- SCAG FY 2011-2012 Annual Listing of Obligated Projects for State and Local Highways
- SCAG 2012 Regional Transportation Plan: http://rtpscs.scag.ca.gov/Pages/2012-2035-RTP-SCS.aspx
- SCAG 2012 Regional Transportation Plan Level of Service Model
- Scenic Highway Routes: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/scenic_hwy.htm
- Streets and Highways Code §250-257: http://www.leginfo.ca.gov/cgi-bin/displaycode?section=shc&group=00001-01000&file=250-257
- Truck Route List and Truck Network Maps: http://www.dot.ca.gov/hq/traffops/trucks/truckmap/

APPENDIX E: SYSTEM PLANNING FLOW CHART