



**Transportation Concept Report**  
**State Route 104**  
**District 10**  
**September 2015**



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**California Department of Transportation**

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

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## **ABOUT THE TRANSPORTATION CONCEPT REPORT (TCR)**

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) (California Government Code (CGC) §65086) by evaluating conditions and proposing enhancements to the SHS. Through System Planning, Caltrans focuses on developing an integrated multimodal transportation system that meets Caltrans' goals of safety and health; stewardship and efficiency; sustainability, livability and economy, system performance, and organization excellence.

The System Planning process comprises four parts: the District System Management Plan (DSMP), the DSMP project list, the TCR, and the Corridor System Management Plan (CSMP). The district-wide DSMP is a strategic policy and planning document that focuses on maintaining, operating, managing, and developing the transportation system. The TCR is a planning document that identifies the existing and future route conditions as well as future needs for each route on the SHS. The CSMP is a complex, multi-jurisdictional planning document that identifies future needs within corridors experiencing or expected to experience high levels of congestion. The CSMP serves as a TCR for segments covered by the CSMP. The 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 CGC §65086 and as necessitated by the public, stakeholders, and system users. The purpose of the TCR is to evaluate current and projected conditions along the route and communicate the vision for the development of each route in each Caltrans District during a 20-25 year planning horizon. The TCR is developed with the goals of increasing safety, improving mobility, providing excellent stewardship, and meeting community and environmental needs along the corridor through integrated management of the transportation network, including the highway, transit, pedestrian, bicycle, freight, operational improvements and travel demand management components of the corridor.

## **STAKEHOLDER PARTICIPATION**

The State Route (SR) 104 TCR employed an outreach strategy consistent with local Metropolitan Planning Organization (MPO) and Regional Transportation Planning Agency (RTPA) outreach conducted with the development of the Overall Work Program (OWP). This strategy avoids duplicative effort, and reduces public confusion as to the aims of local and regional transportation planning. As the OWP intends to meet federal requirements outlined in Volume 23 Code of Federal Regulations section 450.314, and in the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21), external stakeholder needs can be addressed by local partner outreach efforts related to the OWP. Development of the TCR includes initial outreach to internal partners—these would be traffic operations, traffic safety, project management, maintenance, environmental support, as well as others.

## EXECUTIVE SUMMARY

SR 104 links Amador County to SR 99 as a major collector or minor arterial. Currently, SR 104 provides a secondary commute route to work in place of SR 88 or SR 16. As SR 104 is an advisory truck route along the segments west of SR-88, the route has a diminished role as a potential goods movement corridor connecting Amador County to the National Truck Network (NTN). SR 104 provides a short and direct connection to SR 99, compared to other state routes serving Amador County, and with future improvements could serve as the County’s primary truck corridor, as well as a commuter route into Sacramento County.

SR 104 lacks the legislative designations of being on the Interregional Road System (IRRS) and the Freeway and Expressway System (FES), such that from a State planning perspective, the ultimate facility would not include access control, and would be conventional highway throughout. Current design practices require replacement of conventional highway facilities with expressway if a new alignment is proposed. However, the portion of SR 104 west of lone has set aside right of way consistent with a four lane expressway, including access control and frontage roads acquired and built in the 1960s. This effort to create an access controlled highway appears to have not extended into Sacramento County.

SR 104 accesses lone, a small city of 7,000, of which almost half of the population are incarcerated in a penal institution. As a commute generator, most work trips out of lone are local, with the primary interregional work commute to San Joaquin County (Stockton and Lodi).

Base year (BY) traffic volume (2013) on SR 104 is light compared to other routes on the SHS in District 10. Low traffic volume is responsible for a facility that currently meets its Concept Level of Service (LOS) of D, with the exception of segments 4 through 6 where the posted speed limit is 25 miles per hour (MPH). Forecast increases in future traffic volume for the horizon year (HY) of 2035 result in a facility with a future need for four lanes on existing alignment (possibly two on new expressways) from the Preston Road intersection to SR 88 (segments 4 through 7). The only proposed improvement to the route is the West lone Interim Bypass which would improve segments 3 through 6.

### Concept Summary

CONCEPT SUMMARY					
Segment	Segment Description	Existing Facility	20-25 Year Capital Facility Concept	20-25 Year System Operations and Management Concept	Post-25 Year Concept
1	Sacramento County Line to Michigan Bar	2E	2E	N/A (see text)	2-lane Expressway
2	Michigan Bar to Five Mile Dr.	2E	2E	N/A (see text)	2-lane Expressway
3	Five Mile Dr. to Castle Oaks	2E	2E	N/A (see text)	2-lane Expressway
4	Castle Oaks to N JCT SR 124	2C	4C/2E	N/A (see text)	2-lane Expressway
5	JCT N SR 124 to S JCT SR 124	2C	4C/2E	N/A (see text)	2-lane Expressway

CONCEPT SUMMARY (Continued)					
Segment	Segment Description	Existing Facility	20-25 Year Capital Facility Concept	20-25 Year System Operations and Management Concept	Post-25 Year Concept
6	S JCT SR 124 to Foothill Blvd.	2C	4C/2E	N/A (see text)	2-lane Expressway
7	Foothill Blvd. to W JCT SR 88	2C	4C/2E	N/A (see text)	2-lane Expressway
8	East JCT SR 88 to SR 49	2C	2C	N/A (see text)	2-lane Expressway
9	Un-built from SR 49 to SR 88	N/A	N/A	N/A (see text)	N/A

### Concept Rationale

Segments 4 through 7 of SR 104 will be deficient by 2035. This presumes an accurate future forecast. The current Amador County Regional Transportation Plan (RTP) projected a local population for 2010 of 7,782 for Lone and 44,335 for the County as a whole,<sup>1</sup> which appears to be an underestimate for Lone, as the 2010 population was 7,918, with a prison population of 3,535, and an over estimate for the County with a population of 38,091 for 2010.<sup>2</sup> A recent urban growth model (UPLAN) that incorporated current Department of Finance population projections for Amador County, projects a growth in Average Annual Daily Traffic (AADT) of 1.06% for SR 104, about a third lower than projected in the 2004 model.<sup>3</sup>

With exception of Segments 8 and 9, Lone performs as the traffic generator and attractor for SR 104, and directly influences changes in traffic volume on SR 104. As the population forecast appears to be an underestimate, the need for expansion to four lanes appears accurate for Segments 4 through 7. This would only apply if the share of the work commute grew disproportionately on Segments 1 through 5. Currently, it is estimated that half of the workers in Lone work within Lone, with about 30% working elsewhere in Amador County,<sup>4</sup> it may be assumed that much of the growth in traffic originating from Lone will be interregional, and would split equally between the Sacramento County commute concentrated upon segments 1 through 4 and the San Joaquin County commute concentrated upon SR 124 between Lone and SR 88.

For Segment 8 (Segment 9 remains un-built), the Cities of Sutter Creek, Amador City, and Plymouth would perform as traffic generators for interregional commutes to San Joaquin County. Currently, approximately 2% of all work commutes generated by these communities would use Segment 8 for interregional travel.<sup>5</sup>

Given the underlying trip distribution and trip assignment, there is a strong likelihood that Segments 4 through 7 would merit facility expansion to four lanes. The probability for Segments 1 through 3 and 8 to require a similar expansion, relies upon a shift in the work commute for new residents and workers in the corridor away from a

<sup>1</sup> Amador County Transportation Commission, Regional Transportation Plan (RTP), 2004 p. iv-2

<sup>2</sup> US Census, 2010; Department of Corrections and Rehabilitation, Weekly Population Report for April 28, 2010, May 5, 2010

<sup>3</sup> UPLAN ver. 4.0, Draft 2014 Amador County RTP Technical Appendices p. 41; 44

<sup>4</sup> Census Transportation Planning Products—Five Year Database 2005-2010 (CTPP)

<sup>5</sup> CTPP—Five Year Database 2005-2010

within Amador County work commute to a strong interregional work commute into Sacramento and San Joaquin Counties.

System preservation and maintenance of the existing SR 104 will remain the primary planning emphasis for the period between 2014 and 2035. The relative insignificance of SR 104 compared to other routes for purposes of commuting and goods movement, with the resultant lower emphasis in both State and local planning, has led to reduced outlays of public monies towards improving the route. This focus may change if the trend for lone to exceed forecast population growth continues.

The only proposed capacity improvement for SR 104 is the Interim West lone Bypass,<sup>6</sup> a fiscally unconstrained project, which is third in priority for Amador County,<sup>7</sup> but appears unlikely to be funded and constructed by the HY.

Although solutions for segments with deficient LOS often include increasing capacity or operation improvements, it may not be the case for SR 104. Posted speed limits well below the optimal 55 MPH speed limit have resulted in deficient LOS for segments within the City of lone (Segments 3 through 6) and may be addressed by two lane facilities on new alignments with a reduced number of access points. Terrain appears to influence the LOS for Segments 2 and 3, as the route moves through several vertical and horizontal curves, and may be better addressed through operational actions reducing the severity of curves, but appears unjustified given current traffic volumes.

### **Proposed Projects and Strategies**

Currently, there are no programmed projects to address conditions on SR 104. There are no planned projects either. The only project is the proposed West lone Interim Bypass which would address deficiencies on Segments 4 through 7, but is listed as Tier II:

*The Interim West Bypass involves the construction of a roadway (arterial or collector) to serve some local traffic and to route truck traffic around the downtown area. The route includes use of a North-South road proposed west of Castle Oaks Drive and a new segment of roadway between SR 104 and Old Stockton Road. It may also include improvements to existing Buena Vista Road from SR 88 to SR 124. While the City of lone has determined that a bypass is necessary to eliminate illegal and unsafe truck travel on SR 104 and SR 124 through the downtown area, peak hour traffic congestion is also a growing concern.<sup>8</sup>*

Operational improvements such as an access management plan may address further deterioration of LOS upon urban segments within lone. However, the 25 MPH speed limit through much of lone likely produces the deficiency regardless of traffic volume, and reflects the limits of the modeling analysis to establish future deficiencies.

A local transit initiative could provide service to Mule Creek State Prison to reduce trips on SR 104. Given the security concerns at this facility, such a solution could only be pursued by the California Department of Corrections and Rehabilitation (CDCR).

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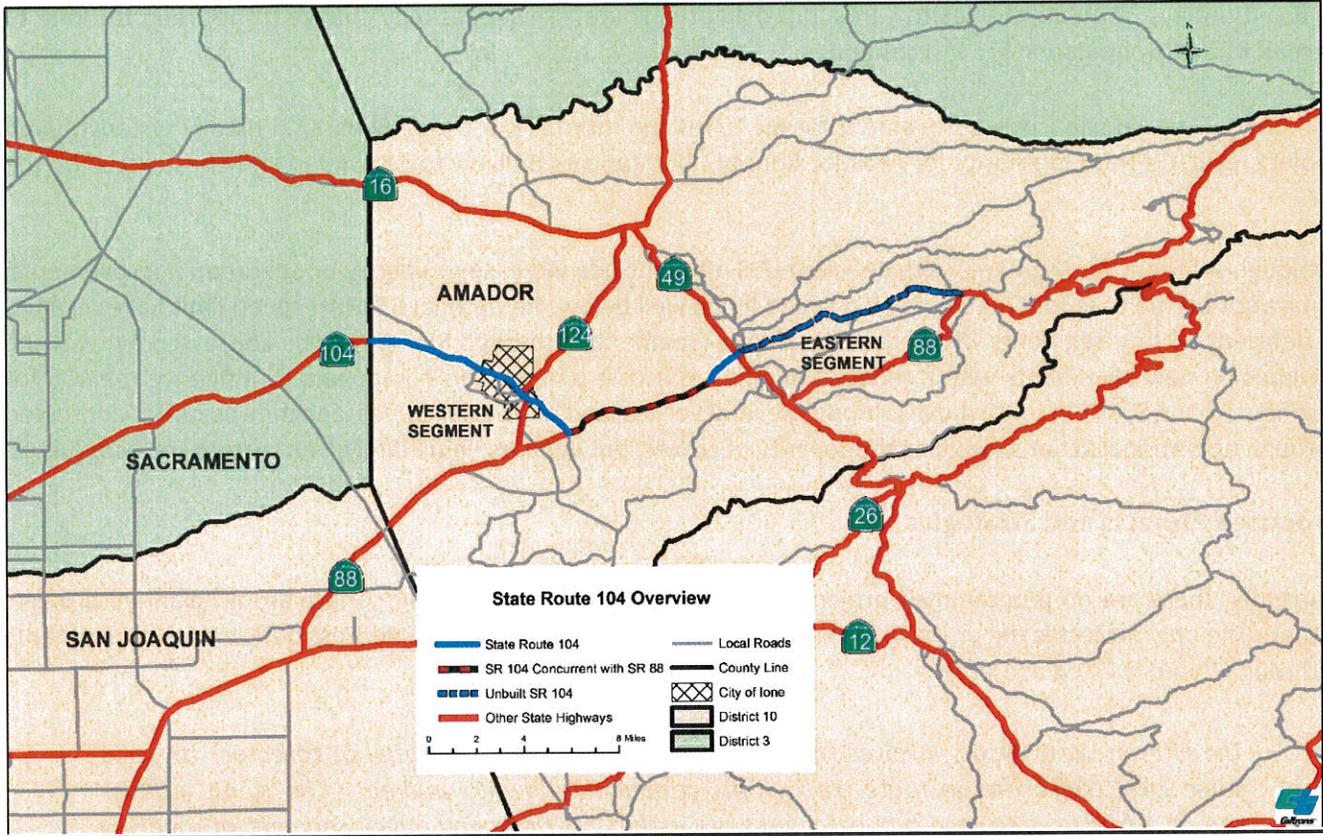
<sup>6</sup> RTP, 2004, p.v-4

<sup>7</sup> RTP, 2004, p.vii-4

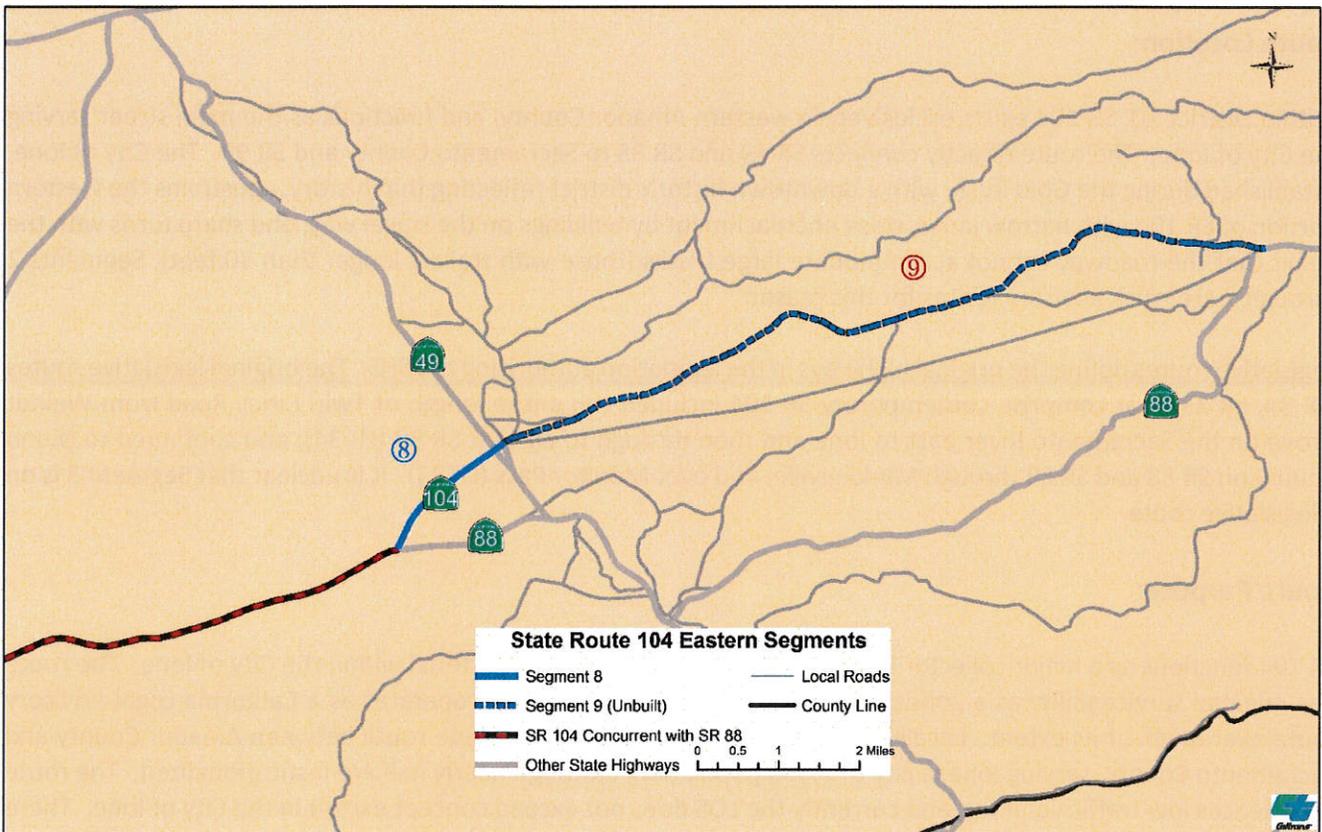
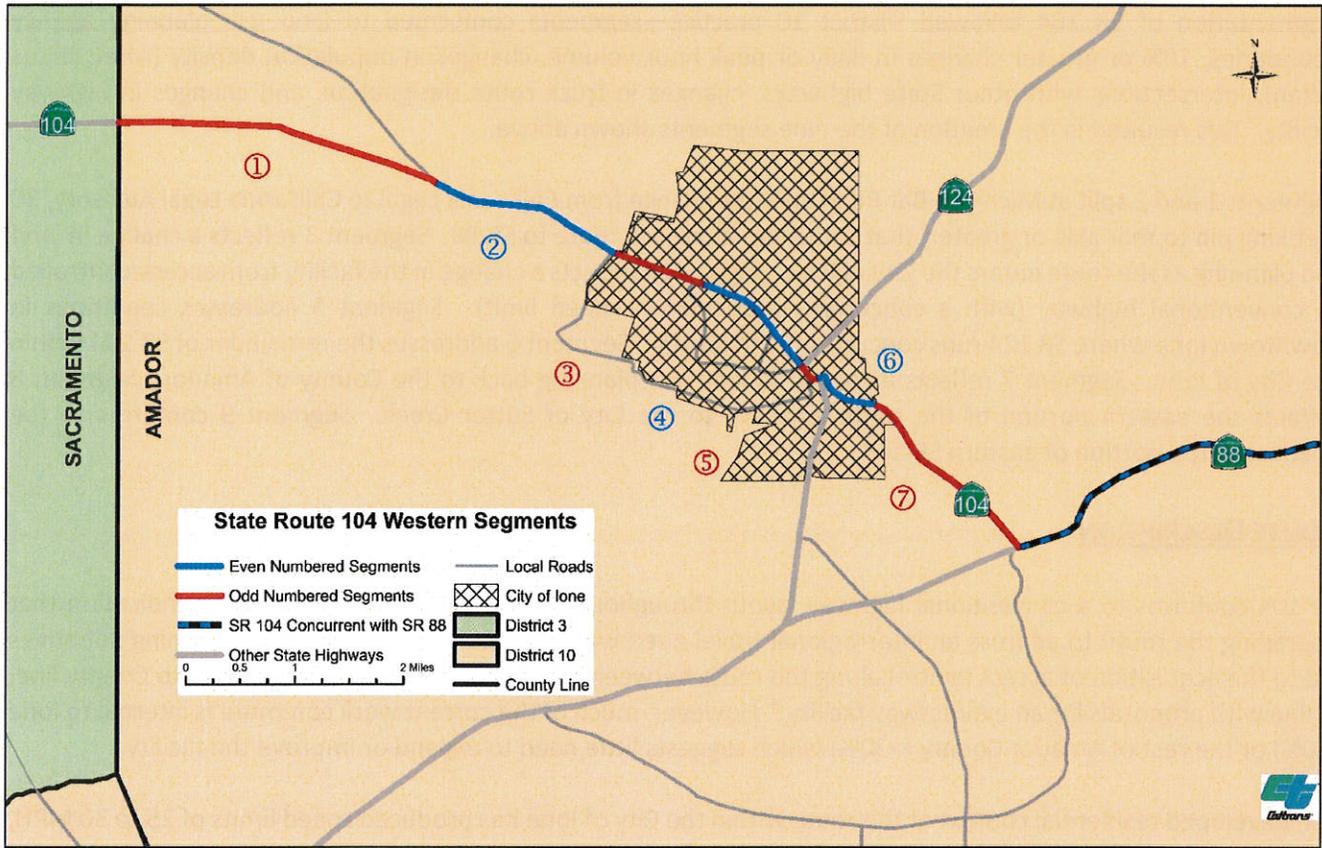
<sup>8</sup> RTP, 2004 p. v-4

# CORRIDOR OVERVIEW

## ROUTE SEGMENTATION



Route Segmentation			
Segment	Location Description	County_Route_Beg. PM	County_Route_End PM
1	Sacramento County Line to Michigan Bar Rd.	Ama_104_PM 0.000	Ama_104_PM 2.407
2	Michigan Bar Rd. to Five Mile Dr.	Ama_104_PM 2.407	Ama_104_PM 3.995
3	Five Mile Dr. to Castle Oaks Dr.	Ama_104_PM 3.995	Ama_104_PM 4.971
4	Castle Oaks Dr. to N JCT SR 124	Ama_104_PM 4.971	Ama_104_PM 5.766
5	N JCT SR 124 to S JCT SR 124	Ama_104_PM 5.766	Ama_104_PM 5.960
6	S JCT SR 124 to Foothill Blvd.	Ama_104_PM 5.960	Ama_104_PM 6.550
7	Foothill Blvd. to W JCT SR 88	Ama_104_PM 6.550	Ama_104_PM 8.200
8	E JCT SR 88 to SR 49	Ama_104_PM 8.386	Ama_104_PM 10.072
9	SR 49 to SR 88 (un-built)	Ama_104_PM 10.072	Ama_88_PM 22.690



Segmentation of SR 104 followed District 10 practice—segments conformed to land use planning agency boundaries, 10% or greater changes in daily or peak hour volume, changes in population density (rural versus urban), intersections with other State highways, changes in truck route designation, and changes in highway facility. This resulted in the creation of the nine segments shown above.

Segments 1 and 2 split at Michigan Bar Road due to a change from California Legal to California Legal Advisory, 30 feet king pin to rear axle or greater, that continues along the route to SR 88. Segment 3 reflects a change in land use planning as the route enters the City of Ione. Segment 4 reflects a change in the facility from access-controlled to conventional highway (with a concurrent reduction in speed limit). Segment 5 addresses conditions in downtown Ione where SR 124 runs concurrent with SR 104. Segment 6 addresses the remainder of SR 104 within the City of Ione. Segment 7 reflects a change in land use planning back to the County of Amador. Segment 8 reflects the eastern portion of the route adjacent to the City of Sutter Creek. Segment 9 conforms to the unconstructed portion of eastern SR 104.

## **ROUTE DESCRIPTION**

SR 104 conforms to a conventional highway layout throughout Amador County. There is little indication that upgrading the route to address an interregional travel need would be warranted. Past local planning initiatives led to the acquisition of access control along the route between the City of Ione and the Sacramento County line, in line with proposals for an expressway facility.<sup>9</sup> However, much of the current work commute is internal to Ione (50%) or the rest of Amador County (>30%) which suggests little need to expand or improve the facility.

The developed residential context of the route within the City of Ione has produced speed limits of 25 to 30 MPH, consistent with local travel use.

### **Route Location:**

Within District 10, SR 104 exists exclusively in western Amador County, and functions as the main street serving the City of Ione. The route directly connects SR 49 and SR 88 to Sacramento County and SR 99. The City of Ione, established during the Gold Rush, with a downtown historic district reflecting that history, constrains the western portion of SR 104 with narrow lanes, close encroachment by buildings on the travel way, and sharp turns with the result that the roadway cannot accommodate large trucks (those with trailers longer than 30 feet). Segments 2 through 7 are truck advisory routes for this reason.

Legislative routes define the original highways in the legislation authorizing the SHS. The original legislative routes (LR 34, LR 23) that comprise contemporary SR 104 included the entire length of Twin Cities Road from Walnut Grove on the Sacramento River east to Ione and then through to current SR 88 (LR 34), and continued to Mono County on SR 88 and SR 89 through Markleeville, and over Monitor Pass (LR 23). It is unclear that Segment 8 is on a legislative route.

### **Route Purpose:**

SR 104 functions as a major collector in its rural context and as a minor arterial within the City of Ione. The route has minimal serviceability as a goods movement corridor as it primarily operates as a California Legal Advisory route over much of its extent. Locally, it functions as a secondary commute route between Amador County and Sacramento County, serving Ione, a city of 7,000 population, although nearly half are institutionalized. The route experiences low traffic volumes, and currently the LOS does not exceed concept except in the City of Ione. There is little need to expand the facility to four lanes, though projections of future growth appear to require this.

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<sup>9</sup> District 10 right of way records report access control, but the route lacks designation as part of the Freeway or Expressway System.

The low population density along the SR 104 corridor, and its distance from urban employment centers, creates a condition where commuting by a mode other than automobile does not appear to justify expenditures for multimodal improvements. There is one fixed transit route along a portion of the corridor (Segments 4 through 8). SR 104 is a Class III bicycle facility; it does not connect into any regional bike lanes other than those in the City of Ione.<sup>10</sup> Pedestrian facilities are limited to within the City Limits of Ione.<sup>11</sup>

Current planning in adjoining Sacramento envisions a Class II bicycle lane on SR 104.<sup>12</sup> Consistent efforts in Amador County are currently lacking to connect and create an interregional bicycle network other than the existing Class III designation.

Unlike other routes that serve the Mother Lode, SR 104 lacks the recreational draw for weekend traffic, and is overshadowed by SR 16 and SR 88 which serve important recreation attractors (Shenandoah Valley wine country, Kirkwood Ski Resort, and Grover Hot Springs State Park). In the future, the District may consider the possibility of relinquishing the route to the County, and having them administer it as a local road.

Preservation and retention of adequate right of way and access control will permit the rural segments of SR 104 to address future traffic demands. Retaining existing network connectivity for points of access, without the addition of newer roads or driveways will reduce future congestion and lessen travel delay.

**Major Route Features:**

SR 104 is a lightly travelled corridor lacking in prominent recreational, commuter, or goods movement traffic.

**Route Designations and Characteristics:**

Route Designations and Characteristics <sup>13</sup>									
Segment #	1	2	3	4	5	6	7	8	9
Freeway & Expressway	No	No	No	No	No	No	No	No	N/A
National Highway System	No	No	No	No	No	No	No	No	N/A
Strategic Highway Network	No	No	No	No	No	No	No	No	N/A
Scenic Highway	No	No	No	No	No	No	No	No	N/A
Interregional Road System	No	No	No	No	No	No	No	No	N/A
High Emphasis	No	No	No	No	No	No	No	No	N/A
Focus Route	No	No	No	No	No	No	No	No	N/A
Federal Functional Classification	Major Collector	Major Collector	Minor Arterial	Minor Arterial	Minor Arterial	Minor Arterial	Major Collector	Major Collector	N/A
Goods Movement Route	No	No	No	No	No	No	No	No	N/A
Truck Designation	CA Legal	CA Legal--Advisory	CA Legal--Advisory	CA Legal--Advisory	CA Legal-Advisory	CA Legal-Advisory	CA Legal	Terminal Access	N/A

<sup>10</sup> Amador County Bicycle and Pedestrian Plan, 2006, p. 1

<sup>11</sup> Amador County Bicycle and Pedestrian Plan, 2006, p. 1

<sup>12</sup> Transportation Corridor Concept Report, State Route 104, 2012 p. 7

<sup>13</sup> Acronyms--RTPA: Regional Transportation Planning Agency; ACTC: Amador County Transportation Commission; APCD: Air Pollution Control District

Route Designations and Characteristics (Continued)									
Rural/Urban/ Urbanized	Rural	Rural	Urban	Urban	Urban	Urban	Rural	Rural	N/A
RTPA	ACTC	ACTC	ACTC	ACTC	ACTC	ACTC	ACTC	ACTC	ACTC
Local Agency	Amador County	Amador County	City of lone	City of lone	City of lone	City of lone	Amador County	City of Sutter Creek/ Amador County	N/A
Tribes	Buena Vista Rancheria of Me Wuk Indians, lone Band of Miwok Indians, Jackson Rancheria Band of Mi-Wuk Indians								
Air District	Amador APCD	Amador APCD	Amador APCD	Amador APCD	Amador APCD	Amador APCD	Amador APCD	Amador APCD	N/A
Terrain	Flat	Rolling	Rolling	Flat	Flat	Flat	Flat	Flat	N/A

## **COMMUNITY CHARACTERISTICS**

The City of lone and environs are the only urban area in Amador County designated by the Federal Highways Administration. Its population is 7,918, of which 3,746 live in households, and 4,160 are institutionalized.<sup>14</sup> The 2,946 inmates at the Mule Creek State Prison make up the majority of the institutionalized population<sup>15</sup>. The racial composition of the overall population is 73.6% White, 10.4% African American, 2.2% Native American, 1.4% Asian, 0.3% Pacific Islander, 8.6% other races, and 23.6% two or more races. Of the total, 25.1% identified themselves as Hispanic or Latino.<sup>16</sup>

For the period of 2005 to 2010, it is estimated approximately 1,105 workers commute from lone. Of these, 480 traveled within lone, with an additional 350 commuting elsewhere in Amador County. Assignment of this population to State highways that access lone results in 345 traveling by SR 104 E, 100 by SR 104 W, 25 by SR 124 E, and 115 by SR 124 W.<sup>17</sup> The high number of commuters within lone likely work at the correctional facilities (Mule State Prison, Preston School), the local California Department of Forestry and Fire Protection (CDFFP) training facility, or one of the local public schools. Within Amador County, the county seat in Jackson, the Jackson Rancheria Casino, and the numerous retail outlets in Martell are likely commute attractors.

CDCR is proposing expansion of the existing facility at Mule Creek State Prison to better accommodate overcrowding, under a recent court order regarding medical treatment of inmates. The proposed expansion of 1,587 beds should increase the number of personnel at the prison by 375, and would increase the AADT of SR 104

<sup>14</sup> Census, 2010

<sup>15</sup> CDCR, Monthly Population Report, August 1, 2014:

<sup>16</sup> Census, 2010.

<sup>17</sup> CTPP, the numbers obtained (840) exceed those of the Amador County Short-Range Transit Development Plan (596), 2014-2019 p. 17

which is the prison's primary access.<sup>18</sup> The work commute is likely to originate from Galt, Lone, Jackson, and locations in eastern Amador County.

**LAND USE**

Land Use	
Segment	Place Type
1	Open space, mining and farming
2	Open space, mining and farming
3	Open space, State land and facilities
4	Residential, commercial
5	Commercial
6	Residential, commercial
7	Open space, mining and farming
8	Open space, mining and farming
9	N/A

Land use along SR 104 is managed by four general plans (GP). The Amador County GP addresses Segments 1 through 3 and 7 through 9. These areas are underdeveloped, employed for open space, mining (more historic than current), and farming (primarily grazing) with interspersed residential parcels. The segments in this area function largely as expressways, though not all meet expressway design standards. These land uses pose little challenge for either expansion or modifications to the existing facility as to either the costs for improvements, or to increase the number of or intensity of nuisances to human populations. The CDCR GP applies to the Mule Creek State Prison, and the CDFFP GP applies to the Cal Fire Training Facility in Segments 3 and 4. The Lone GP addresses Segments 4 through 6, as well as the southern portion of Segment 3 (this is where the Castle Oaks subdivision may be found). These areas are developed, mostly for residential and recreation use, though commercial uses are evident in Segment 5. Here SR 104 functions as a residential collector with low speed limits and narrow lanes. The land uses in this area pose significant challenges to expansion or modification to the existing facility, as right of way acquisition would entail large costs, and encroach upon an historic district--downtown lone (Segment 5).

Important developments in the City of Lone include the Wildflower Development. The development includes 276 single family residences that will likely adjoin the south side of Segments 6 and 7. The affect of this development is not expected to be included in the future forecast for traffic volumes as its approval postdates the most recently approved RTP and Traffic Demand Model.

**SYSTEM CHARACTERISTICS**

SR 104 presents a diversity of system characteristics within a single corridor. The existing facility of SR 104 reflects land use and planning decisions made in the 1960's resulting in an access control highway for Segments 1 through 3 and a portion of segment 4.<sup>19</sup> Access control on State highways often follows from legislative mandate, by either inclusion in the FES or IRRS, but for SR 104 it has arisen from independent local planning decisions. Because not all segments of SR 104 are subject to access control, changes in land use or population growth projections may have led to abandonment of the practice in later years. Upgrade of the existing highway to expressway remains a local option within the near term. The 'post twenty five years design facility' indicates the fact that upgrade to conform with current design standards may require upgrade to expressway, consistent with Highway Design

<sup>18</sup> CDCR, (Jan 2 2014) press release, <http://cdcrtoday.blogspot.com/2014/01/cdcr-to-build-new-housing-units-at-two.html>

<sup>19</sup> Amador 104 Freeway Agreement, June 12, 1966, PM 0.0/PM5.4

Manual standards. Light interregional travel on the facility conforms with a general absence of multimodal functionality and connectivity with the exception of transit. SR 104 lacks connectivity with proposed bicycle routes in Sacramento County. Integration of ITS detectors and other elements into the Performance Measurement System has been underway.

System Characteristics <sup>20</sup>									
Segment #	1	2	3	4	5	6	7	8	9
<b>Existing Facility</b>									
Facility Type	E	E	E	C	C	C	C	C	N/A
General Purpose Lanes	2	2	2	2	2	2	2	2	N/A
Lane Miles	4.814	3.176	1.59	0.388	1.18	3.3	3.372	0.388	N/A
Centerline Miles	2.407	1.588	0.795	0.194	0.59	1.65	1.686	1.686	N/A
Managed Lanes	None	None	None	None	None	None	None	None	N/A
<b>20 to 25 Year Facility</b>									
Facility Type	E	E	E	C/E	C/E	C/E	C/E	E	N/A
General Purpose Lanes	2	2	2	4/2	4/2	4/2	4/2	2	N/A
Lane Miles	9.628	6.352	3.904	3.18	0.776	2.36	6.6	6.744	N/A
Centerline Miles	2.407	1.588	0.976	0.795	0.194	0.59	1.65	1.686	N/A
Managed Lanes	None	None	None	None	None	None	None	None	N/A
<b>Post 25 Year Facility</b>									
Facility Type	E	E	E	E	E	E	E	E	N/A
General Purpose Lanes	2	2	2	4	4	4	4	2	N/A
Lane Miles	9.628	6.352	3.904	3.18	0.776	2.36	6.6	6.744	N/A
Centerline Miles	2.407	1.588	0.976	0.795	0.194	0.59	1.65	1.686	N/A
Managed Lanes	None	None	None	None	None	None	None	None	N/A
ROW Needs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Transportation Management System Elements</b>									
TMS Elements (BY)	TMS	TMS					TMS		
TMS Elements (HY)	TMS	TMS	TMS		TMS	TMS	TMS		

## BICYCLE FACILITY

Throughout SR 104, the bicycle facility is unsigned Class III. A future Class II route in Sacramento County has been proposed, but no Class II connections from the bicycle network in Amador County have been proposed.<sup>21</sup> Intersecting bicycle facilities to SR 104 can only be found on Shakeley Lane east of the intersection of SR 104 and SR 124 East, running from Oak Drive to Fairway Drive.<sup>22</sup> Proposed improvements are to include a Class I following SR 104 from Sutter Lane west to Irish Hill Road, and a Class II along SR 104 from Sutter Lane to SR 124 West.<sup>23</sup>

<sup>20</sup> Abbreviations-- E: expressway; C conventional highway; TMS: traffic monitoring station

<sup>21</sup> SR 104 TCR, District 3, 2012, Amador County Pedestrian and Bicycle Transportation Plan (2006), City of Ione General Plan Circulation Element (2009)

<sup>22</sup> City of Ione General Plan Circulation Element (2009) p. 4-5

<sup>23</sup> City of Ione General Plan Circulation Element (2009) p. 4-12

Bicycle Facility											
Segment	Post Mile	Location Description	Bicycle Access Prohibited	Facility Type	Paved Shoulder (ft)	Facility Description	Distressed Shoulder Pavement	Vol.	Role	Posted Speed Limit	Parallel Facility
1	0.000-2.407	On Route	No	Class III	2-8	Conventional Highway	N/A	N/A	N/A	55 mph	No
2	2.407-R3.995	On Route	No	Class III	8	Conventional Highway	N/A	N/A	N/A	55 mph	No
3	R3.995-R4.971	On Route	No	Class III	8	Conventional Highway	N/A	N/A	N/A	55 mph	No
4	R4.971-R5.776	On Route	No	Class III	8	Conventional Highway	N/A	N/A	N/A	55 mph	No
5	R5.776-R5.960	On Route	No	Class III	8	Conventional Highway	N/A	N/A	N/A	55 mph	No
6	R5.960-R6.550	On Route	No	Class III	8	Conventional Highway	N/A	N/A	N/A	55 mph	No
7	R6.550-R8.200	On Route	No	Class III	8	Conventional Highway	N/A	N/A	N/A	55 mph	No
8	8.386-10.072	On Route	No	Class III	4	Conventional Highway	N/A	N/A	N/A	55 mph	No
9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## PEDESTRIAN FACILITY

Pedestrian facilities on SR 104 occur only within the City of Lone. A continuous sidewalk on both sides of the highway runs from the entrance to the Preston School and Sutter Lane intersection south and east to the Foothill Road intersection. Ramps are present at intersections, with marked crosswalks on the highway at major intersections, and stop limit lines on local street intersections. Pedestrian use is light. Potential pedestrian attractors do not run along SR 104 but across it, and use may be inhibited in part by periods of high traffic volumes coinciding with periods of high pedestrian demand.

Pedestrian Facility														
Segment	Post Mile	Location Description	Ped. Access Prohibited	Sidewalk Present	Sidewalk Width (ft)	Crossing Distance (ft)	Facility Description	Role	Vol	Junction				Alt. Facility
										Location	Role	Type	Large Corner Radii	
1-3	N/A	N/A	No	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	R5.360-R5.766	Sutter Ln. to SR-124	No	Yes	4-10	24	Complete	Local Travel	Low	N/A	N/A	N/A	N/A	N/A
5	R5.766-R5.960	Both sides of segment	No	Yes	6-8	24	Complete	Tourism	Low	N/A	N/A	N/A	N/A	N/A
6	R5.960-R 6.650	Both sides of segment	No	Yes	6-8	24	Complete	Local travel	Low	N/A	N/A	N/A	N/A	N/A
7-9	N/A	N/A	No	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## TRANSIT FACILITY

Transit Facility													
Segment	Mode & Collateral Facility	Name	Route End Points	Ridership (yr.)	Headway	Operating Period	ITS & Technology	Stations		Amenities	Bikes Allowed on Transit	Location Description	# Parking Spaces
								Cities	Postmiles				
1	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Local Bus	Rte 7	Transit Center to Castle Park	6733	N/A	07:45 to 16:49	N/A	N/A	N/A	None	yes	N/A	N/A
4	Local Bus	Rte 7	Transit Center to Castle Park	6733	N/A	07:45 to 16:49	N/A	N/A	N/A	None	yes		
	Park & Ride Lots	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Near Main and Sacramento Sts.	20
5	Local Bus	Rte 7	Transit Center to Castle Park	6733	N/A	07:45 to 16:49	N/A	N/A	N/A	None	yes	N/A	N/A
6	Local Bus	Rte 7	Transit Center to Castle Park	6733	N/A	07:45 to 16:49	N/A	N/A	N/A	None	yes	N/A	N/A
7	Local Bus	Rte 7	Transit Center to Castle Park	6733	N/A	07:45 to 16:49	N/A	N/A	N/A	None	yes	N/A	N/A
8	Local Bus	Rte 7	Transit Center to Castle Park	6733	N/A	07:45 to 16:49	N/A	N/A	N/A	None	yes	N/A	N/A
9	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Route 7, a fixed service route provided by Amador Transit, completes three daily round trips from the Sutter Creek Transit Center to Castle Park in lone. Travel is limited to Segments 3 through 8, with stops upon Segments 4 and 5. A single locally maintained park and ride lot is located off of Segment 4 near downtown lone. From the Sutter Creek Transit Center, connections may be made to five other transit routes, including interregional transit service to Sacramento. Currently, service times do not readily coincide with the standard work schedule (8:00 A.M. to 5:00 P.M), the emphasis is to provide local transit needs within lone, along with a regional and interregional commute. Currently, the Route 7 bus contributes approximately 10% of the total ridership on Amador Transit (The share of riders originating from lone may be even higher given transfers to the Sacramento or Calaveras connecting transit lines)<sup>24</sup>

## FREIGHT

SR 104 is among three routes in District 10 that have insignificant roles for goods movement on the SHS. SR 104 is an advisory truck route from Michigan Bar Road west to SR 88. The percentage of trucks to AADT (ranging from 2350 to 10350 vehicles per day (VPD) is approximately 7.5% (ranging from 117 to 641 VPD) with approximately 4% (ranging from 77-289 VPD) reported as being five axle or greater.<sup>25</sup> Possible truck destinations are the rock quarries located off of Segments 1 and 7. No manufacturing or warehousing operations are reported to exist in lone.

<sup>24</sup> See Amador County Short-Range Transit Development Plan, 2014, Table 10, p.25

<sup>25</sup> Truck data available for 2011, with percentages extrapolated to 2012 traffic volumes.

**ENVIRONMENTAL CONSIDERATIONS**

Environment Considerations										
Segment	Cultural Resources	Floodplain	Hazardous Materials	Naturally Occurring Asbestos	Air Quality				Waters and Wetlands	Special Status Species
					Ozone	PM		CO		
						2.5	10			
1	High	100 year floodplain	Low	Moderate	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Moderate	Low
2	High	100 year floodplain	Low	Moderate	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Moderate	Low
3	High	100 year floodplain	Low	Moderate	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Moderate	Low
4	High	100 year floodplain	High	Moderate	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Moderate	Low
5	High	100 year floodplain	High	Moderate	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Low	High
6	High	N/A	High	Moderate	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Low	High
7	High	N/A	High	Moderate	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Low	High
8	High	N/A	High	Moderate	Non-attainment	Non-attainment	Non-attainment	Non-attainment	Low	Low
9	N/A	N/A	N/A	N/A	Non-attainment	Non-attainment	Non-attainment	Non-attainment	N/A	N/A

Environmental issues for SR 104 reflect that lone rests within a floodplain for both Jackson and Dry Creeks, along with affiliated species of special concern and affiliated historical human settlement. Studies to evaluate the presence of and mitigation for special status species and cultural resources would increase projects costs and schedules. These costs reflect the presence of a downtown historical district, of a dense and lengthy settlement history of Native American peoples, and of threatened and endangered species associated with ephemeral water sources—fairy shrimp, amphibians, and plants. Hazardous materials issues center upon underground storage tanks associated with the development of lone. Upland presence of exposures of Mariposa Slate and Serpentine may result in the presence of heavy metals and naturally occurring asbestos (NOA) in soils and flood deposits.

## CORRIDOR PERFORMANCE

Corridor Performance									
Segment #	1	2	3	4	5	6	7	8	9
<b>Basic System Operations</b>									
AADT (BY)	2350	4150	4325	6340	10350	7500	6850	5850	N/A
AADT (HY)	4845	10818	12719	14643	15796	12310	14662	9781	N/A
VMT (BY)	5656.45	6590.2	4221.2	5040.3	2007.9	4425	11302.5	9863.1	N/A
VMT (HY)	11661.9	17179.0	12413.7	11641.2	3064.4	7262.9	24192.3	16490.8	N/A
Daily Vehicle Hours of Delay (35 MPH) (BY)	0.084	0.084	0.084	0.084	0.084	0.084	0.084	N/A	N/A
<b>Truck Traffic</b>									
Average Annual Daily Truck Traffic (AADTT) (BY)	177	312	325	477	641	480	288	410	N/A
Trucks (% of AADT) (BY)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	N/A
5+ Axle Average Annual Daily Truck Traffic (AADTT) (BY)	92	162	169	248	289	208	77	178	N/A
5+Axle Trucks (as % of AADT) (BY)	4	4	4	4	4	4	4	4	N/A
<b>Bottlenecks Data</b>									
Bottleneck Existing:	Unclear	N/A	N/A						
Bottleneck Location	Unclear	N/A	N/A						
Bottleneck Queue (length):	N/A	N/A							
Bottleneck Causality:	Unclear	N/A	N/A						
<b>Peak Hour Traffic Data</b>									
Peak Period Length	0.5 Hr.	N/A							
Peak Hour Direction:	EB	N/A							
Peak Hour Time of Day	1600	1600	1600	1600	1600	1600	1600	1600	N/A
Peak Hour VMT (BY):	517.5	603.4	370.9	572.4	189.2	362.9	1072.5	859.9	N/A
Peak Hour VMT (HY):	11750.6	13686.0	8394.3	12980.7	4257.4	8187.1	24399.6	19461.7	N/A
Peak Hour Avg. Speed (mph)(BY):	N/A	N/A							
Peak Hour Vehicle Hours of Delay (35mph) (BY)	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	N/A
Peak Hour Vehicle Hours of Delay (35mph) (HY)	N/A	N/A							

The precision and accuracy of three variables underlie the accuracy of measurement of corridor performance. These are the peak hour factor (PHF), the proportion of Peak Hour to AADT (K), and the Directional Split (D). Over time, the expectation on highways on the SHS is to have a PHF within a range of 0.88 to 0.92, and to have that PHF increase through time with local development and population growth; to have an increasing AADT; to have a decreasing K (e.g. the rate of growth for AADT will exceed that for peak hour traffic volumes, typically because of the peak period of travel exceeding one hour); and, to have a decreasing D. For SR 104 most of these variables have followed this general pattern, but there has been great variability in the measurement of D over the last

twenty years. In the present year (2013) measurements returned a value of 0.89, which exceeds values obtained in the previous decade, and a value closer to previous values (0.65), was employed for 2035.

LOS employs a qualitative measure of traffic congestion that relies in part upon both subjective, though repeatable observations of congestion as well as the ratio of the volume of traffic to the full capacity of a highway lane at a particular speed (V/C). Congestion is better measured by the underlying quantitative ratio of V/C. Because of this, LOS best serves as a comparison to a performance standard such as concept LOS, rather than as a performance measure as the V/C might be quite variable between two segments though both share the same LOS.

As no actions are proposed to address SR 104 corridor needs for the planning period between 2014 and 2019,<sup>26</sup> use of V/C possesses little value as a performance measure. Employing V/C can only measure changes in traffic conditions over time, rather than the intended purpose to evaluate the effectiveness of particular undertakings or strategies. What is notable for SR 104 is there is no change in LOS over the period of twenty two years for any of the segments with the exceptions of Segment 1, which will still retain an LOS better than D, and Segments 5 and 6 which change from D to E. Growth in traffic volume and congestion along the corridor remaining relatively static seems to support the lack of planned fiscal outlays for route maintenance or preservation.

Although LOS has been employed as a State standard by which congestion impacts may be measured for the California Environmental Quality Act (CEQA), the Federal Highway Administration currently emphasizes delay as a more appropriate highway performance measure. Both of these standards might reflect initial conditions of uninterrupted flow consistent with freeways and expressways, rather than conventional highways, and of speed limits in the range of 40 to 55 MPH. There may also be an underlying assumption that no through trips occur within the segment analyzed (e.g. interregional traffic that includes stops at markets, schools, service stations etc.) that affect travel time.

For SR 104, evaluation of delay is hampered by the density of traffic detectors along the route. Three sensors are present within SR 104 in District 10, and treat Segments 2 through 7 with complete coverage, and Segment 1 with partial coverage. Thus average daily delay (35 MPH) is reported with the same value for these seven segments, although the actual location contributing to the delay might be a singular bottleneck within any of the segments. Also likely, the reduced speed limits below 35 MPH within segments 4-6 may be a contributor.

Similar conditions apply to analysis of bottlenecks, only four bottleneck events are reported for the period September 1, 2013 to August 31, 2014, all appearing within Segment 1, and are thought to be artifacts of the lack of a leading detector located at the Sacramento County line.

Nothing remarkable may be stated about annual volumes or daily peak hours. These are consistent with a rural route serving a small population center. Highest volumes associate with segments that serve or connect to schools, post offices, and grocery markets, and may show peak hours outside of regular commute times. For 2013, the peak hour was obtained at the Junction of SR 104 with W SR 124, and measured the portion of Segment 6, that includes a portion of the downtown area. The record reported peaks at 7 AM and 4 PM on weekdays.

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<sup>26</sup> 2019 is the presumed year for an update to this TCR consistent with a 2040 horizon year, assuming a five year period between RTP updates for RTPAs.

## KEY CORRIDOR ISSUES

To summarize from the findings of this TCR, the key corridor issues are:

- The SR 104 corridor lacks a consistent future concept throughout all its segments—portions of the corridor are laid out as expressway or conventional highway.
- As a component of SHS, SR 104 has a minor role in facilitating interregional travel and goods movement.
- It is questionable that the future facility of SR 104 and its role on the SHS will change.

# **CORRIDOR CONCEPT**

## **CONCEPT RATIONALE**

Forecast growth in traffic volumes for SR 104 indicates a need for expansion of the facility to four lanes upon segments serving the City of Lone (Segments 4 through 7). Expansion is constrained by the surrounding housing and commercial development, to where a two lane bypass outside the current city limits should be a consideration. However, there are no planned or programmed capital projects to address this need, and, what exists is a Tier II project, the West Lone Interim Bypass, that is unfunded and without schedule.

For the future facility, a two lane expressway on new alignment is proposed for Segments 3 through 7, although this appears infeasible given current local funding priorities, and is a potential reality for the post 25 year facility.

Performance deficiencies point to the same urban segments as needing operational improvement. Posted speed limits of 25 MPH hinder interregional travel (such that it is), and can only be elevated to more appropriate speeds with route relocation. An access management plan would not improve conditions along the affected corridor, as access has already been developed and maximized along the route. The current LOS on the remaining segments will not exceed concept LOS for the period 2013 to 2035, and may continue to remain within tolerance, so that an access management plan may not be needed, and a future design to expressway would eliminate this need as access rights would be purchased and controlled.

## **PLANNED AND PROGRAMMED PROJECTS AND STRATEGIES**

As of fall 2014, there are no programmed projects for SR 104 in the District 10 Schedule of Projects, and there are no fully or partially fiscally constrained projects in the Amador County RTP. The strategy to achieve concept LOS for Segments 4 through 7 can only be attained through the as yet unfunded Tier II project, the West Lone Interim Bypass.

Deficient segments possess conditions that cannot achieve concept if the current alignment is retained. Concept LOS is achieved with a transportation corridor in which traffic flow is uninterrupted, and moving at speeds above 40 MPH. Current deficient segments have interrupted traffic flow with posted speed limits well below 40 MPH.

# APPENDIX

## APPENDIX A GLOSSARY OF TERMS AND ACRONYMS

### Acronyms

**AADT:** Annual Average Daily Traffic  
**ACTC:** Amador County Transportation Commission  
**BY:** Base Year  
**CALTRANS:** California Department of Transportation  
**CDCR:** California Department of Corrections and Rehabilitation  
**CDFFP:** California Department of Forestry and Fire Prevention  
**CFR:** Code of Federal Regulations  
**CEQA:** California Environmental Quality Act  
**CGC:** California Government Code  
**CO:** Carbon Monoxide  
**CSMP:** Corridor System Management Plan  
**CSS:** Context Sensitive Solutions  
**D:** Directional Split  
**DSMP:** District System Management Plan  
**FES:** Freeway and Expressway System  
**GP:** General Plan  
**HY:** Horizon Year  
**IRRS:** Interregional Road System  
**ITS:** Intelligent Transportation System  
**K:** ratio of peak hour volume to AADT  
**LOS:** Level of Service  
**LR:** Legislative Route  
**MAP-21:** Moving Ahead for Progress in the 21<sup>st</sup> Century, current federal highway transportation legislation  
**MPH:** Miles per Hour  
**MPO:** Metropolitan Planning Organization  
**N/A:** Not Available, or Not Applicable  
**NCCP:** Natural Community Conservation Plan  
**NEPA:** National Environmental Policy Act  
**NHS:** National Highway System  
**NOA:** Naturally Occurring Asbestos  
**NTN:** National Truck Network  
**OWP:** Overall Work Program  
**PHF:** Peak Hour Factor  
**RTP:** Regional Transportation Plan  
**RTPA:** Regional Transportation Planning Agency  
**SHS:** State Highway System  
**SR:** State Route  
**TCR:** Transportation Concept Report  
**TDM:** Transportation Demand Management  
**TMS:** Transportation Management System or Traffic Monitoring Station  
**UPLAN:** name of a planning software implemented at University of California at Davis  
**US:** United State Highway  
**V/C:** Volume (of traffic) to Capacity  
**VMT:** Vehicle Miles Traveled

## Definitions

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

**Base year** – The year that the most current data is available to the Districts.

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

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

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

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

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

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

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

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

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

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

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

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

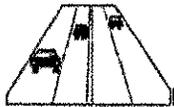
**Headway** – The time between two successive vehicles as they pass a point on the roadway, measured from the same common feature of both vehicles.

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

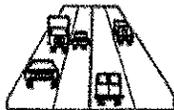
**Intermodal Freight Facility** – Intermodal transport requires more than one mode of transportation. An intermodal freight facility is a location where different transportation modes and networks connect and freight is transferred (or “transloaded”) from one mode, such as rail, to another, such as truck.

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

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



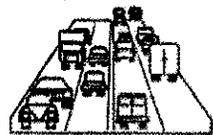
**LOS A** describes free flowing conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway.



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



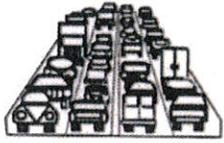
**LOS C** represents a range in which the influence of traffic density on operations becomes marked. The ability to maneuver with the traffic stream is now clearly affected by the presence of other vehicles.



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



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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Segment** – A portion of a facility between two points.

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

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

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

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

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



