



COMMUNITY DEVELOPMENT AGENCY

LONG RANGE PLANNING

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Date: September 1, 2015

To: El Dorado County Planning Commissioners

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Subject: ***Traffic Information requested at August 27, 2015 Planning Commission Hearing on the Targeted General Plan Amendment – Zoning Ordinance Update (TGPA-ZOU) Project and Final Environmental Impact Report (FEIR)***

At the end of the Planning Commission hearing on August 27, 2015, the Chairman asked for information in response to public comments received on the County's Travel Demand Model and the traffic study prepared for the TGPA-ZOU, including:

1. Clarification regarding how intersections and interchanges were addressed in the traffic study for the TGPA-ZOU
2. Public comment that the traffic study used the average volume of both directions
3. Public comment that the traffic study did not include key roads
4. Further clarification regarding level of service (LOS) on Highway 50, including an explanation regarding why Caltrans and the County arrive at different conclusions

Responses to these comments are provided below.

1. *Clarification regarding how intersections and interchanges were addressed in the traffic study for the TGPA-ZOU.* This question was previously posed by Rural Communities United (RCU) and has been labeled as question O-1-390 and O-Recirc-1-43. Responses were given for each of the questions as well as providing additional information in Master Response 1: Specificity of Environmental Review and Master Response 14: Traffic Analysis Methodology, Travel Demand Model and U.S. Highway 50 Level of Service Calculations. Additional information is attached to this memo (Exhibit 1) regarding how the County monitors for acceptable LOS at intersections and interchanges.
2. *Public comment that the traffic study used the average volume of both directions.* This question was previously posed by RCU and has been labeled as question O-1-400, O-Recirc-1-57 and O-Recirc-1-86. Responses were given for each of the questions as well as providing additional information in Master Responses 1 and 14.
3. *Public comment that the traffic study did not include key roads.* This question was previously posed by RCU as a portion of question O-1-403 and again as question O-Recirc-1-89. Responses were given for each of the questions.
4. *LOS on Highway 50.* A similar question was previously posed by RCU as O-Recirc-1-63; a response was given for the question. Caltrans questioned the LOS on U.S. Highway 50 in comments S-6-11 and S-Recirc-3-6. Responses were given and included in S-Recirc-3-6; Caltrans states that an existing LOS D is appropriate for this analysis. Additional information is also included in Master Response 14. Additional information is attached to this memo regarding traffic analysis methodology, the County's TDM, and US Highway 50 Westbound LOS Results (Exhibit 2).

Exhibit 1: Level of Service (LOS) at Intersections and Interchanges

General Plan policy TC-Xa states:

- Traffic from single-family residential subdivision development projects of five or more parcels of land shall not result in, or worsen, Level of Service F (gridlock, stop-and-go) traffic congestion during weekday, peak-hour periods on any highway, road, interchange or intersection in the unincorporated areas of the county.
- Developer-paid traffic impact fees combined with any other available funds shall fully pay for building all necessary road capacity improvements to fully offset and mitigate all direct and cumulative traffic impacts from new development upon any highways, arterial roads and their intersections during weekday, peak-hour periods in unincorporated areas of the county.

General Plan Policy TC-Xd states:

- ...Level of Service will be as defined in the latest edition of the Highway Capacity Manual (Transportation Research Board, National Research Council) and calculated using the methodologies contained in that manual. Analysis periods shall be based on the professional judgment of the Department of Transportation which shall consider periods including, but not limited to, Weekday Average Daily Traffic (ADT), AM Peak Hour, and PM Peak hour traffic volumes.

The traffic analysis prepared for the TGPA-ZOU was conducted consistent with these policies, the Highway Capacity Manual (HCM) 2010, and widely accepted industry standards.

The County monitors for acceptable LOS at intersections and interchanges through a comprehensive process that includes, but is not limited to:

- Monitoring traffic volumes on County roadways. The County collects traffic counts on major roadways each year. In 2014, the Transportation Division collected traffic counts on 72 roadways, with most roadways counted in multiple different locations. The traffic counts typically include 1-2 weeks of data for each location. The traffic counts include the average daily traffic (ADT), AM peak hour, and PM peak hour volumes. The traffic counts are available on our website: <http://edcapps.edcgov.us/dot/trafficcounts.asp>.
- Utilizing an integrated pavement management system to evaluate and manage the condition of County roadways. This information is stored and analyzed in a GIS based computer system. The "Street Saver" software implements modern industry standard technology to evaluate the condition of the roadways, predict their future wear and tear, and models various alternative maintenance strategies.
- Monitoring the accident data within the unincorporated County as provided by the California Highway Patrol. The County's Traffic Operations group produces an annual report which informs the Maintenance, Design and Long Range Planning Divisions. The report includes an analysis of collision data, including the identification of high-accident locations and locations requiring additional review.
- Implementing and routinely updating the County's Capital Improvement Program (CIP) and Traffic Impact Mitigation (TIM) Fee Program. The County's CIP and TIM fee program are created and implemented consistent with the County's General Plan and the Mitigation Fee Act (AB 1600) to ensure that acceptable LOS is maintained. The County's CIP is a planning document that identifies all capital improvement projects (e.g., roads and bridges) the County intends to build, replace or improve over the next 20 years. The CIP provides key information for each project, including delivery schedule, cost and revenue sources. The County's TIM Fee is

levied to ensure that new development pays for “all necessary road capacity improvements to fully offset and mitigate all direct and cumulative traffic impacts from new development upon any highways, arterial roads and their intersections during weekday, peak-hour periods in unincorporated areas of the county” as required by the General Plan. Since 1984, the County has adopted and updated various fee programs to ensure that new development on the western slope pays to fund its fair share of the costs of improving County and state roads necessary to serve that new development over a 20-Year horizon. El Dorado County’s Capital Improvement Program and TIM Fee Program are extremely robust: over the last 10 years, the County has invested approximately \$370 Million on local road and intersection improvements, highways, freeways and interchanges. Approximately \$161 Million of the funding for the improvements has been TIM Fees.

- Implementing the Intersection Needs Prioritization Process (see Attachment A for details). The County uses the traffic count and accident information for the intersection needs process. The intersection needs process evaluates the potential locations for a traffic signal installation or other intersection capacity improvements and is considered during the annual update of the CIP.
- Analyzing the potential impacts of proposed development projects, including but not limited to residential subdivision development projects of five or more parcels of land, and requiring appropriate mitigation measures as necessary pursuant to the California Environmental Quality Act, the County’s General Plan, and the County’s Transportation Impact Study Guidelines (Attachment B). Traffic analyses conducted for proposed development projects apply the HCM 2010 operational analysis methodology, whereas the TGPA-ZOU applied the HCM 2010 planning method for analyzing circulation impacts of the proposed project. The County solicits Caltrans comments on transportation impact studies for proposed development projects near Caltrans facilities. The County works with Caltrans to identify appropriate mitigation measures for State facilities.
- For the state highway system, the County relies on Caltrans data via the Caltrans Performance Measurement System (PeMS) in addition to traffic volume data provided by Caltrans. This data is available for public use at: <http://pems.dot.ca.gov>. Typically, Caltrans requires encroachment permits for collection of count data on their facilities and their preference is to provide local jurisdictions with their count data. Additional Caltrans data is available on their general website.
- Caltrans has an extensive process to determine the appropriate improvements for their facilities. For a Caltrans facility improvement such as an interchange, Caltrans requires a Project Study Report-Project Development Support - Project Initiation Document (PSR-PDS-PID). The development of a PSR-PDS-PID provides a key opportunity for Caltrans and involved regional and local agencies to achieve consensus on the purpose and need, scope, and schedule of a project. The PSR-PDS is only one type of PID. The purpose for using the PSR-PDS document is to gain approval for the project studies to move into the Project Approval and Environmental Document (PA&ED) phase. The Plans, Specifications and Estimates phase (PS&E) cannot be completed without an approved environmental document. Each document can take a year or more to complete and requires extensive engineering and analysis. The County has completed PSR’s for the following interchanges: El Dorado Hills Blvd., Silva Valley Parkway, Cameron Park Drive, Ponderosa Road/South Shingle Springs Road, El Dorado Road and Missouri Flat Road. If actual construction is not started within a reasonable timeframe after the completion of the environmental document, Caltrans can require an update to the PSR-PDS-PID and the environmental document. For example, the Silva Valley Parkway Interchange project required updates. The Silva Valley Parkway Interchange original EIR was completed in 1991, a supplemental EIR was completed in 2011 and the interchange is currently under construction.



COMMUNITY DEVELOPMENT AGENCY

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Intersection Needs Prioritization Process

INTRODUCTION

The El Dorado County Community Development Agency (CDA) uses the prioritization process in the update of its annual Capital Improvement Program (CIP). CDA's Long Range Planning (LRP) administers this process. CDA's Transportation Division (e.g., Maintenance and Design) provide information and expertise as needed. The CDA's Transportation Division was formerly known as the El Dorado County Department of Transportation or DOT.

Traffic signals determine who has the right-of-way at an intersection or crossing. They facilitate orderly traffic flow, allow pedestrians to cross, and provide cross-street traffic a chance to enter an intersection. When installed at appropriate locations, traffic signals can increase the capacity of an intersection, reduce the frequency of collisions, and provide better minor street access. Because traffic signals are expensive to install (approximately \$350,000 per signal) and may create safety problems if not appropriately placed, the Transportation Division's goal is to install signals where they will clearly improve safety and make intersections operate more efficiently.

GOALS AND POLICIES

The intersection needs prioritization process is consistent with the following 2004 El Dorado County General Plan goals:

- GOAL TC-1: To plan for and provide a unified, coordinated, and cost-efficient countywide road and highway system that ensures the safe, orderly, and efficient movement of people and goods.
- GOAL TC-X: To coordinate planning and implementation of roadway improvements with new development to maintain adequate levels of service on County roads.
- GOAL TC-3: To reduce travel demand on the County's road system and maximize the operating efficiency of transportation facilities, thereby reducing the quantity of motor vehicle emissions and the amount of investment required in new or expanded facilities.
- GOAL TC-4: To provide a safe, continuous, and easily accessible non-motorized transportation system that facilitates the use of the viable alternative transportation modes.
- GOAL TC-5: To provide safe, continuous, and accessible sidewalks and pedestrian facilities as a viable alternative transportation mode.

PROCESS DESCRIPTION

The intersection needs prioritization process consists of five steps. Step 1 is performed once to create an initial list of potential intersection mitigation location candidates that is then culled and prioritized using Steps 2 through 5. Steps 2 through 5 are repeated as new signal location/intersection needs candidates are identified as part of an annual update process (see separate description at end of this document). For locations already on the intersection needs priority list, new data is gathered and locations are re-evaluated approximately every four years.

Step 1

In 2010, Transportation Division staff created a “superset” list with possible locations of signals or improvements that may need to be constructed within the 20 year General Plan and TIM Fee Program timeframe. The attached map of the County road system includes all General Plan TC-1 roads, existing signals, and any signal or intersection improvement projects already included in CDA’s CIP. Staff developed this superset list by using a variety of resources, including, but not limited to:

- Suggestions from the DOT Maintenance Division’s Traffic Operations Unit;
- Suggestions from the DOT Transportation Planning & Land Development Division’s Discretionary Review Unit;
- Suggestions from the DOT Design Unit;
- Suggestions from the public; and
- A review of all roads and their associated intersections on the General Plan’s Circulation Map. (e.g., General Plan roads intersected by side roads that will eventually be widened to four lanes or more should automatically be added to the superset list.)

Step 2

Review the data in the Transportation Division’s annual count summary to group the superset list into 3 tiers:

- Tier 1: Potential to meet more than one Planning level traffic signal warrant or to address a potential safety issue that can be mitigated by minor intersection improvements.
- Tier 2: Monitor for movement to Tier 1
- Tier 3: Long term planning only

Tier 2 includes locations that do not meet planning level warrants now but may in the future. Tier 2 should contain a maximum of 10 locations, unless specific funding becomes available for the collection of peak period turning movement counts, pedestrian and bicycle counts. Locations that don’t meet planning level warrants now or in the future are grouped into Tier 3 and do not require any further analysis.

Step 3

Collect additional data for each of the Tier 1 and Tier 2 locations:

<u>Collisions:</u>	The most recent three calendar years of reported collision history. Collision types that are correctable with a signal are noted.
<u>Traffic Volumes:</u>	Twenty-four hour volume counts with an hourly listing of each approach direction for the minor street volumes, the major street approach volumes, and a total for the entire intersection. Peak period (a.m. and p.m.) turning and through movement manual traffic volume counts, with an hourly listing of each approach.
<u>Pedestrian/Bicycle:</u>	Pedestrian and/or bicycle counts will only be collected in areas identified as high multi-modal locations, such as school zones or pedestrian friendly commercial areas. If the pedestrian and bicycle peak hour differs from the vehicular peak hour, a separate manual count is conducted.
<u>Existing Controls:</u>	The current type of control (e.g., two-way stop, an all-way stop, etc.).

Step 4

Use the information gathered in Step 3 to determine whether locations meet any of the following eight traffic signal warrants as described in the California Manual on Uniform Traffic Control Devices (CAMUTCD).

A warrant is a set of criteria which can be used to define the relative need for, and appropriateness of, a particular traffic control device (e.g., STOP or YIELD sign, traffic signal, etc.). Warrants are usually expressed in the form of a numerical requirement such as the volume of vehicular or pedestrian traffic. A warrant normally carries with it a means of assigning priorities among several alternative choices.

Warrants should be viewed as guidelines, not as absolute values. The warrant analysis process is just one of the tools to be used in determining if a traffic signal is necessary. Satisfaction of one or more warrants does not in itself require the installation of a traffic signal. However, a traffic signal should not be installed if it does not satisfy any of the following warrants:

Warrant 1 – Eight-Hour Vehicular Volume

The Minimum Vehicular Volume, or Condition A for Warrant 1, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The Interruption of Continuous Traffic, or Condition B for Warrant 1, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Warrant 2 – Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Warrant 3 – Peak Hour

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

Warrant 4 – Pedestrian Volume

The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Warrant 5 – School Crossing

The School Crossing signal warrant is intended for application where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.

Warrant 6 – Coordinated Signal System

Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

Warrant 7 – Crash Experience

The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

Warrant 8 – Roadway Network

Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network.

Step 5

Use the warrants analyses in Step 4 to rank the possible intersection needs location candidates. When a signal warrant is met, it indicates that existing conditions would potentially be improved in terms of decreased congestion, or a decrease in collisions attributed to a traffic signal.

Apply the following criteria to the locations that meet one or more of the CA MUTCD warrants in order to rank the Tier 1 intersections (there is no maximum score).

In the case of a tied score, the locations are ranked in order first by the Collisions score, then by the Pedestrian/Bicycles score, the Peak Hour Traffic Volumes score, the Special Conditions score, Average Daily Traffic (ADT) Volumes score, and the Speed score. (Note: staff has created a spreadsheet that accepts the data collected below and calculates points for each project.)

1. Collisions

(Max Points: No limit)

Assign points for each reported collision that occurred during the previous three years that could have been prevented with intersection signalization, as follows:

Type of Collision	Points per Occurrence
Fatal	24
Injury	12
Property Damage Only	6

Divide the total points for the previous three years by three to determine a yearly average that is then assigned to the proposed signal location.

2. Pedestrians/Bicycles

(Max. Points: 30)

Assign points for each of the following:

(A) Pedestrians (General)

(Max. Points: 10)

Assign points based on the number of pedestrians crossing the higher volume street during the four highest traffic hours, as follows:

Pedestrians	Points	Pedestrians	Points
> 100	10	40-49	4
90-100	9	30-39	3
80-89	8	20-29	2
70-79	7	10-19	1
60-69	6	0- 9	0
50-59	5		

(B) Pedestrians (Schools)

(Max. Points: 10)

Assign 10 points if the Caltrans School Warrant #4, located at <http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd/CAMUTCD-Part4.pdf> is met.

(C) Bicycles**(Max. Points: 10)**

Assign 10 points if the location is identified in the El Dorado County Bicycle Transportation Plan – 2010 update and is constructed, (the plan is located at <http://www.edctc.org/3/CountyBikePlan2010.htm>). Assign 5 points if the location is only identified in the El Dorado County Bicycle Transportation Plan – 2010 Update, but not constructed.

3. Average Daily Traffic (ADT) Volumes**(Max. Points: 10)**

Assign points based on a comparison of the average daily traffic (ADT) volumes on the intersecting streets, as follows:

SIDE STREET (ADT)	MAIN STREET (ADT)					
	<2,000	2,001-5,000	5,001-10,000	10,001-15,000	15,001-20,000	>20,000
<2,000	0	1	2	3	4	5
2,001-5,000	1	2	3	4	5	6
5,001-10,000	2	3	4	5	6	7
10,001-15,000	3	4	5	6	7	8
15,001-20,000	4	5	6	7	8	9
>20,000	5	6	7	8	9	10

4. Peak Hour Traffic Volumes**(Max. Points: 10)**

Assign points based on a comparison of side street traffic volume to main street traffic volume during the peak hour, as follows:

SIDE STREET (Pk Hr Vol)	MAIN STREET (Peak Hour Volumes)							
	<400	400-600	601-800	801-1,000	1,001-1,200	1,201-1,400	1,401-1,600	>1,600
<100	0	0	1	2	3	4	5	6
101-200	0	1	2	3	4	5	6	7
201-300	1	2	3	4	5	6	7	8
301-400	2	3	4	5	6	7	8	9
>400	3	4	5	6	7	8	9	10

5. Speed**(Max. Points: 5)**

Assign points in this category to account for the difficulty that a motorist may have judging gaps in traffic on high-speed streets. More points are assigned for higher speed streets, as follows:

Posted Speed (mph)	Points
50+	5
40-49	4
35-39	3
30-34	2
25-29	1
<25	0

6. Special Conditions**(Max. Points: 15)**

Add points based on special conditions related to the benefits or drawbacks of signaling an intersection as determined by the County Engineer or LRP's Designated Engineer. Although the sum under each of the three categories below may total more than five points for a candidate location, no more than five points are assigned per category.

(A) Activity Centers**(Max. Points: 5)**

Assign one point for each of the following activity centers that generate pedestrian or emergency vehicle traffic and are within 1,000 feet of the candidate traffic signal location:

- School
- Park
- Library
- High Density Residential (Multi-Family Dwellings)
- Senior Center
- Commercial Center
- Fire Station
- Hospital

(B) Other Safety Concerns**(Max. Points: 5)**

Assign up to five points when restricted sight distance is a concern, intersection geometrics are unusual, or there is a favorable condition for signal coordination, etc.

(C) Development Potential**(Max. Points: 5)**

Assign up to five points if there is a potential in the area for near term development, possibly creating related traffic problems. Transportation Division's Land Development Senior Civil Engineer will provide input on the potential signal locations that might be affected by future development.

Once the list of locations is ranked by points, the LRP Traffic Engineer will request a peer review by the Traffic Superintendent of the analysis and resultant prioritized list. When agreement is reached on the prioritized list, staff will present recommendations to the Assistant

Director of CDA and the Director of Transportation, and ultimately, to the CDA Director. Once approved by the CDA Director, the list will be included in CDA's CIP as funding allows, preferably in order of highest to lowest score. Factors such as availability of funding and Transportation Division's Design staff's workload will dictate the number of signals that can be included in the CIP. Staff may make adjustments to the timing of projects to account for funding constraints and project management issues. Staff may move intersections to an "Intersection Operational Improvement" priority list if the Transportation Division Traffic Operations section identifies mitigation measures that will improve the intersection operations without signalization.

After the CDA Director approves the prioritized list, staff will initiate an annual update process. The annual update process is outlined in the next section.

ANNUAL UPDATE PROCESS

Each year, LRP and Transportation Division Traffic Operations will identify and evaluate new locations for potential intersection improvements. New locations are identified through traffic impacts analyses, traffic safety investigations, collision analysis, resident requests, development projects, Supervisor requests, etc. New locations are analyzed by implementing Steps 2 through 5 described above. For locations already on the intersection needs priority list, new data is gathered and locations are re-evaluated approximately every four years.

Phase 1. Research/identify possible candidates to add to the Signal Priority List

Approx. timing: *February 1st through March 15th*

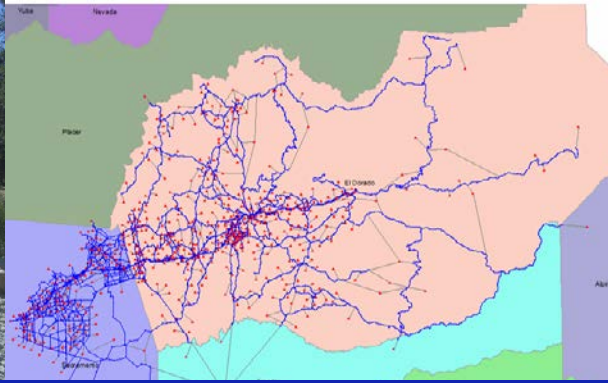
LRP staff will review annual accident data, traffic count data, and gather input from Transportation Division's Traffic Operations, Design and Discretionary Review staff to identify and analyze potential intersections to add to the signal priority list. LRP staff will also update the superset location list and maps to add the new locations as part of this step.

Phase 2. Analyze list of potential new intersections for signalization or other capacity improvements following Steps 2 through 5 described above.

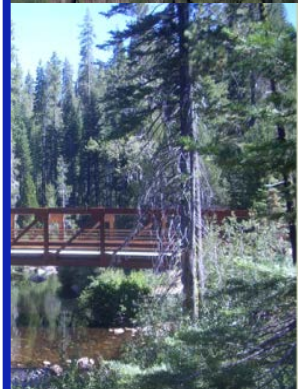
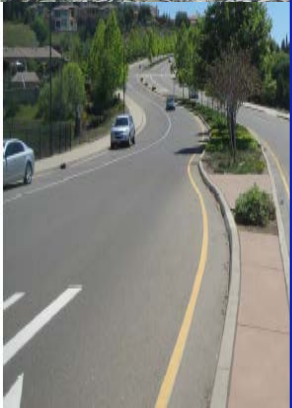
Approx. timing: *March 15th through May 15th*

LRP staff will analyze and summarize results, and review the updated analysis with the LRP Senior Civil Engineer and the Traffic Superintendent. The two managers jointly decide which new signals or improvements should be on the priority list and how they should be ranked. They review their results with the Assistant Director of CDA and the Director of Transportation. The summarized final recommendations, identifying any changes needed to the CIP, are presented in a memo to the CDA Director.

Once the recommendations are approved by the CDA Director, LRP staff will update maps and the intersection needs priority list, and incorporate new improvements into the annual CIP update as funding allows.



ATTACHMENT A - Exhibit 2



Transportation Impact Study Guidelines

El Dorado County
Community Development Agency
Long Range Planning

November 2014



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Cover photographs courtesy of El Dorado County Photo Library; Green Valley Road Final Corridor Analysis Report October 2014; El Dorado County Community Development Agency Capital Improvement Program June 24, 2014; and www.dreamstime.com, accessed 1/8/15

I. INTRODUCTION

This set of protocols and procedures has been developed by El Dorado County's Community Development Agency (CDA) to assist applicants in the preparation of a transportation impact study (TIS), also known as a traffic impact study or traffic impact analysis, for proposed projects within unincorporated areas of El Dorado County. These guidelines are intended to ensure that the traffic impacts of proposed development projects are addressed in a manner that is consistent with the policies set forth in the Transportation and Circulation Element of the **2004 El Dorado County General Plan; A Plan for Managed Growth and Open Roads; A Plan for Quality Neighborhoods and Traffic Relief** (General Plan) and any applicable Specific Plan. The guidelines enable the County to conduct transportation and circulation impacts review of development proposals pursuant to the requirements of the California Environmental Quality Act (CEQA).

The County expects these guidelines to result in studies that provide comprehensive and accurate analysis of potential transportation impacts to County facilities and services. A TIS is a stand-alone document that could be replicated by a peer consultant or County staff based on information provided in the document. It is not a persuasive document; it is a factual document utilizing state of the practice and industry technical analyses.

This guide is intended to be used for proposed development projects which are consistent with the El Dorado County General Plan land use designations and zoning densities applicable at the time an application for County review of the project is submitted. Any application for a project that seeks to amend existing land use designations or zoning densities or that may result in concentrated residential development that will require a General Plan Amendment will be reviewed by the CDA's Long Range Planning (LRP), Development Services Division, and Transportation Division and the transportation impact study requirements for such projects may vary from those presented herein.

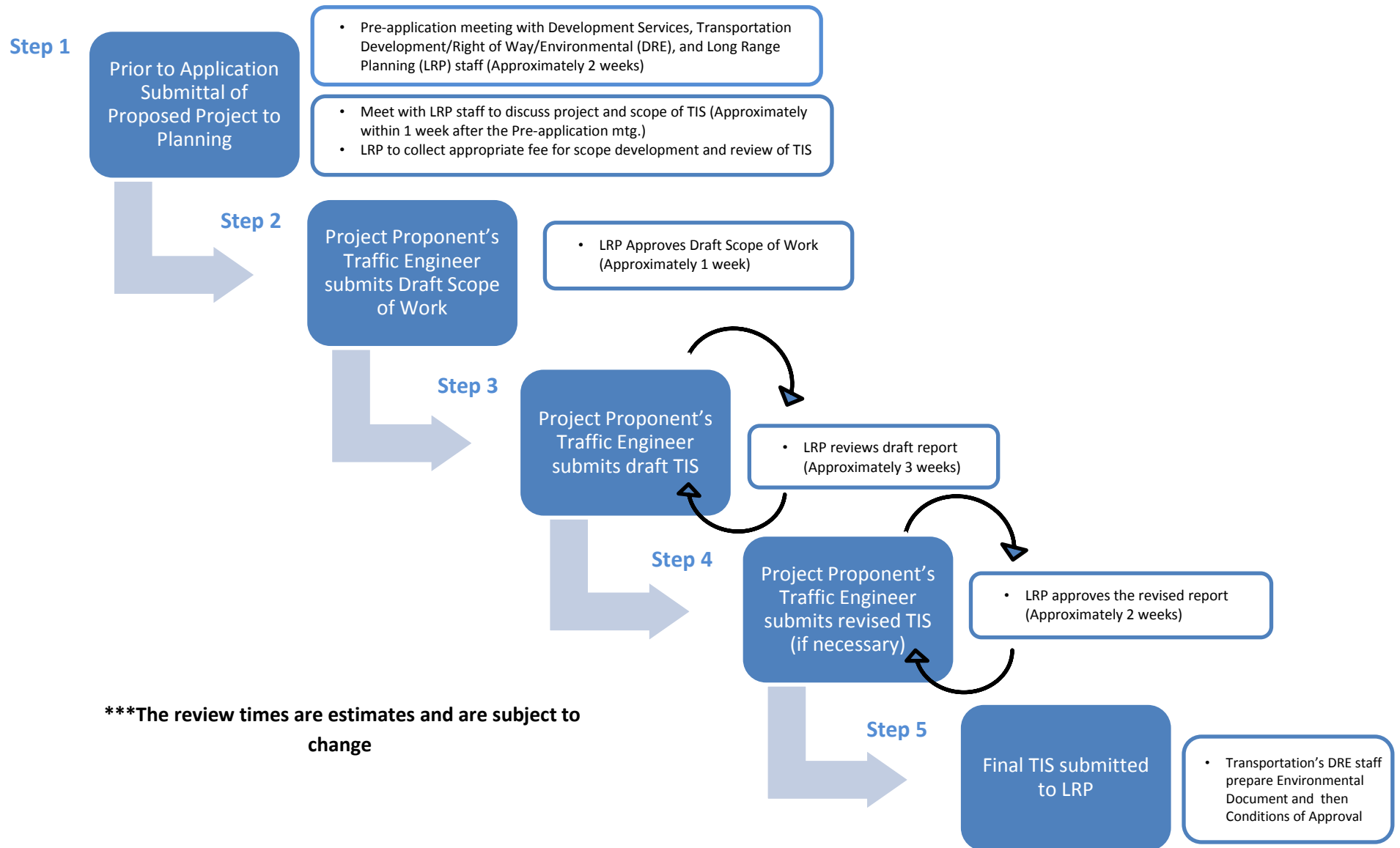
The El Dorado County's updated Travel Demand Model (TDM) is housed in LRP and is maintained by LRP's Traffic Engineer and Transportation Planner. A dynamic TDM is essential to provide consistent baseline and forecast information for the County's transportation system.

What is a Transportation Impact Study?

A Transportation Impact Study (TIS) evaluates the potential effects of proposed projects on surrounding and supporting transportation infrastructure and services.

A TIS determines if the project's effects constitute significant impacts, and if so, how the significant impacts can be mitigated.

Figure 1. Transportation Impact Study (TIS) Process



A. Project Considerations

The following types of projects, which involve development activity in El Dorado County and affect the County's transportation system, may require a TIS:

- Transportation infrastructure modification or expansion, including capital improvement projects (CIP) on county roads and state highways
- Land use entitlements requiring discretionary approval by El Dorado County, which includes annexations, general plan amendments, specific plans, zoning changes, conditional use permits, commercial parcel maps, and tentative maps
- Land use activity advanced by agencies other than El Dorado County that is subject to jurisdictional review under state and federal law or that will require a General Plan Amendment

Section II identifies specific project parameters or "triggers" that may necessitate a TIS.

B. Intent of Study Guidelines

These guidelines address key elements required for preparing and reviewing transportation impact studies in El Dorado County. This document is intended to be a resource applied in concert with professional judgment. The following major issues are addressed in this document:

- Situations and thresholds that commonly trigger the need for a TIS
- Scope and extent of the required study
- Transportation impact analysis methods
- Criteria to determine if the transportation-related impacts of the proposed project are significant under the California Environmental Quality Act (CEQA)
- Mitigation measure requirements
- Guidelines for documentation of the findings, conclusions, and recommendations
- Review of site specific circulation plan

El Dorado County will primarily review transportation impact studies and reports based on the guidelines presented in this document. However, each project is unique, and TIS guidelines are not intended to be prescriptive beyond practical. Not all criteria and analyses in this document will apply to every project. Early and consistent communication with the CDA's LRP, Development Services and Transportation Divisions are encouraged to confirm the type and level of analysis required on a case-by-case basis. The County reserves the right to modify the procedures and requirements defined in this document to more accurately and consistently identify the impacts of a given project.

C. General Plan Context

The Transportation and Circulation Element of the **2004 El Dorado County General Plan, A Plan for Managed Growth and Open Roads; A Plan for Quality Neighborhoods and Traffic Relief** (General Plan), identifies the need to plan for and provide a countywide road and highway system that ensures the safe, orderly and efficient movement of people and goods. The concurrency of transportation improvements are codified in Goal TC- X and Policies TC-Xa – TC-Xi. The applicable General Plan Goals and Policies are listed in Appendix A.

II. TRIGGERS REQUIRING AN IMPACT STUDY

Unless explicitly waived by the County, a TIS is required when any one of the following conditions is met, per General Plan Policies TC-Xa and TC-Xe:

- The project has the potential to increase traffic during the weekday a.m. peak hour or weekday p.m. peak hour, or daily period by two (2) percent or more
- The project has the potential to add 100 or more daily trips
- The project has the potential to add 10 or more trips during the weekday a.m. or weekday p.m. peak hour
- The project has the potential to create a significant environmental impact under CEQA
- The project is a General Plan Amendment which proposes changes to the land use designation

In general, a previously performed TIS is applicable as long as the traffic volumes in the vicinity of the project have not changed significantly. After two or more years of inactivity, new counts should be collected to determine if the TIS should be updated, as determined by LRP staff.

In some instances, a master TIS may be prepared for a larger development. If the master TIS fully address development phasing and a subsequent phase or project is consistent with the larger development plan, specific phases will generally not require supplemental transportation impact studies.

At a minimum, an On-Site Transportation Review is required for every project. The following information shall be evaluated and the findings stamped by a registered Traffic Engineer or Civil Engineer, and shall be included with the project submittal:

1. Existence of any current traffic problems in the local area such as a high-accident location, non-standard intersection or roadway, or an intersection in need of a traffic signal
2. Proximity of proposed site driveway(s) to other driveways or intersections
3. Adequacy of vehicle parking relative to both the anticipated demand and zoning code requirements
4. Adequacy of the project site design to fully satisfy truck loading demand on-site, when the anticipated number of deliveries and service calls may exceed 10 per day
5. Adequacy of the project site design to provide at least a 25' minimum required throat depth (MRTD) at project driveways. Include calculation of the MRTD
6. Adequacy of the project site design to convey all vehicle types
7. Adequacy of sight distance on-site
8. Queuing analysis of "drive-through" facilities

If a TIS is required, the On-Site Transportation Review shall be included under the Other Transportation Related Impacts and Mitigation Considerations Section.

An accurate project description will help determine if a TIS is required based on potential significant environmental impacts or trip generation. The TIS must address the final proposed project. **It is important to note that if the proposed project is modified in any way following the initiation of the TIS and/or the County's review of the project, the scope of the work and the study area may be changed.**

III. SCOPE OF THE STUDY

The contents and extent of a TIS depend on the location and size of the proposed development (Project), the prevailing conditions in the surrounding area, and the technical questions being asked by decision makers and the public.

The applicant's traffic engineer shall prepare a draft "scoping" memorandum to define the scope and content of the project-specific traffic analysis. CDA's LRP staff shall review and approve the scoping memorandum prior to the commencement of work on the TIS. The applicant's engineer will then prepare a draft "assumptions" memo to identify all relevant land use and operational assumptions including traffic study modeling inputs and requirements. CDA's LRP staff will review and modify the proposed assumptions, as necessary.

Transportation Impact Study (TIS) Required Elements

CDA's LRP staff is responsible for working with the applicant's traffic engineer to create a scope of work. After the scope of work has been approved by CDA's LRP staff, a draft copy of the TIS for the Project shall be submitted. The report shall include appropriate text, tables, maps, and drawings to fully document the required elements of the traffic analysis and results. Copies of all traffic counts and level of service (LOS) calculations shall be provided in an appendix accompanying the main report. Electronic copies of the LOS calculations and any simulation program files shall be included with the submittal. CDA's LRP staff will review the report and prepare written comments to the applicant team indicating any necessary revisions to the report. During its review, CDA's LRP staff may request a meeting with the applicant team to discuss any comments, questions, or apparent deficiencies in the report. The applicant will then make the necessary changes to the report and if necessary the supporting analysis and will provide the final version of the TIS Report to CDA's LRP staff. The final TIS shall be signed and stamped by a registered Civil Engineer or Traffic Engineer, licensed and in good standing with the State of California Board of Professional Engineers, Land Surveyors, and Geologists.

A TIS in El Dorado County shall consist of the following elements:

1. Executive Summary
2. Project Description
3. Study Area (Zone of Impact Identification)
4. Analysis Methodology Description
5. Impact Significance Criteria Definition
6. General Plan Consistency Considerations for Cumulative Impact Analysis
7. Traffic Impact Analyses Scenarios
 - a. Existing Conditions
 - b. Existing Plus Project Conditions
 - c. Near-term (+ 10 years) Conditions
 - d. Near-term Plus Project Conditions
 - e. Cumulative Conditions (when required)
 - f. Cumulative Plus Project Conditions (when required)
8. Transportation Impact Mitigation Identification
9. Other Transportation-Related Impacts and Mitigation Considerations
10. Technical Appendices

See Appendix B for the TIS Report Format Outline.

IV. ELEMENTS

A. Executive Summary

The transportation analysis shall include an executive summary that includes the findings of the TIS.

B. Project Description

The applicant shall provide a project description that, at a minimum, includes the following:

- A discussion of the specific land uses intended for the site
- Identification of the current land use designation(s) as defined by the El Dorado County General Plan of the project area
- A statement confirming the project's consistency with the current land use designation(s),
- Traffic Analysis Zone(s) (TAZ) where the project is located
- Site access alternatives
- Project location map which shows the proposed project location in relation to surrounding communities, roadways/highways, major water courses, and delineation of the TAZ's in which the project will be located
- Project boundary map which shows the site location, off-site roadways and other transportation features, including any proposed transit, bicycle and pedestrian facilities, within the surrounding area
- Site plan showing the proposed layout of the internal site traffic circulation system, parking configuration, and any transit, bicycle and/or pedestrian facilities. The site plan shall also include the location and configuration of access and egress connections to the local street network
- A tabular listing of the types of development and/or land use included in the proposed project and the quantity or amount of units, floor area gross square footage, acreage, number of employees, or other appropriate measure of the size of the project
- Description of the proposed construction and operational activities forecasted for the proposed project, including a schedule for completion and development phasing, if applicable
- Documentation to inform the county whether the project will affect off-site transportation facilities or services including transit, roadways, bikeways, and sidewalks
- Size or intensity of the proposed development (e.g., square footage, acreage, dwelling units, etc.)
- Assessor Parcel Number (APN)
- Initial estimate of the weekday average daily traffic (ADT), AM and PM peak hour traffic generation. Include documentation to inform the County whether the project generated 100 or more vehicle trips per day. Refer to Appendix C for typical project trip generation categories

C. Study Area (Zone of Impact Identification)

How is the study area determined?

Defining a study area needs to be done through a process that results in substantial evidence (facts, analysis, etc.) that supports the study area delineation. The boundary should extend as far as any potential transportation impact might occur. CDA's LRP staff must approve study locations before traffic data collection and analysis commences. Careful consideration of all modes and facilities (i.e., transit,

pedestrian, bicycle, vehicle, etc.) is required when selecting the study area boundary. The extent of the study area should be determined according to the following guidelines:

- All intersections and road segments contiguous to the project site,
- All intersections and road segments where the project would potentially “worsen” traffic conditions, per General Plan Policy TC-Xe, beyond the acceptable level of service “E” in Community Regions, or level of service “D” in Rural Centers and Rural Regions,
- All intersections and road segments which are currently level of service “F”, as defined by General Plan Policy TC-Xd, and which would be impacted by project traffic,
- All State Highway intersections and interchange ramps in the area impacted by the project.

The applicant shall also consult with the State of California Department of Transportation (Caltrans) to determine the CEQA levels of significance with regard to traffic impacts on Caltrans freeway facilities. The consultation shall also include a determination of Caltrans requirements for the study of traffic impacts to its facilities and the mitigation of any such impacts shall be considered when scoping and determining impacts on Caltrans’ controlled facilities. This analysis must follow the most current *Caltrans Guide for the Preparation of Traffic Impact Studies*, which can be obtained from <http://www.dot.ca.gov>. The initial consult meeting shall be coordinated with CDA’s LRP staff. Any correspondence with Caltrans shall be provided to the CDA’s LRP staff.

D. Analysis Methodology

What time periods need to be analyzed?

1. Analysis Time Periods

Traffic impacts shall be analyzed using standard or state-of-the-practice professional procedures. General Plan Policy TC-Xd states in part that, “...Level of Service will be defined in the latest edition of the *Highway Capacity Manual* (Transportation Research Board, National Research Council) and calculated using the methodologies contained in that manual. Analysis periods shall be based on the professional judgment of CDA’s LRP staff which shall consider periods including, but not limited to, Weekday Average Daily Traffic (ADT), AM Peak Hour and PM Peak Hour traffic volumes.”

Based on the land use of the proposed project and upon consultation with the CDA staff, the study shall analyze traffic operations during the peak hour of the following time periods:

- Weekday morning peak (6:00 – 9:00 AM)
- Weekday evening peak (4:00 – 7:00 PM)

For some projects, the County may substitute or require additional peak hour analysis for the following time periods:

- Weekday afternoon peak (2:00 – 4:00 PM)
- Weekday midday peak (11:00 AM – 1:00 PM)

The determination of study time periods should be made separately for each proposed project based upon the peaking characteristics of project-generated traffic and peaking characteristics of the adjacent street system and land uses. The time period(s) that should be analyzed are those that exhibit the maximum combined level of project-generated traffic and adjacent street traffic.

Analysis parameters (e.g., signal phasing, conflicting pedestrian volumes, lane configurations, etc.) for Existing and Existing Plus Project conditions shall be based on field measurements taken during traffic count collection or field observation. This typically applies to Existing Plus Approved Projects and Existing Plus Approved Projects Plus Project analysis.

2. Trip Generation

All applicants are required to submit a trip generation analysis that identifies the number of new daily and peak hour vehicle-trips added by the proposed project. The trip generation estimation for all new or proposed development projects shall include the summation of primary trips, internal trips, diverted link trips, and pass-by trips. See Appendix C for examples.

The estimation of new trips generated by the proposed development project may include credit for trips associated with existing uses on the site. Existing uses are those actively present on the project site at the time data is gathered for the traffic impact study or at the time of the Notice of Preparation (NOP) is released for CEQA studies.

The final estimate of new daily and peak-hour trips associated with a proposed development project should represent the net contribution of the proposed project. The County will review the trip generation analysis and determine if additional analysis is required.

Trip generation for the project shall be estimated for each specified time period using the most recent version of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. If multiple trip generation rate sources exist, the study shall provide a comparison and use the rates that best reflect local conditions and applicable regulatory constraints. Potential reductions (i.e. pass-by, internal trips) in project trip generation may be considered, when approved by CDA's LRP staff in advance. Reductions to trip generation should be based on the guidance outlined in the latest edition of ITE's *Trip Generation Manual's User's Guide and Handbook*.

If the *Trip Generation Manual* does not provide a rate for the particular land use type or the applicant desires to base the analysis on other trip generation data, the applicant shall provide CDA's LRP staff with a justification for the use of the data. The project trip generation rate cannot be based solely on one nearby or similar land use facility. The sample used for non-standard trip generation rates shall include at least three similar facilities in El Dorado County or neighboring jurisdictions with similar characteristics.

If the study involves comparable sites located in other communities, the applicant must demonstrate to the satisfaction of CDA's LRP staff that the sites and uses to be studied are reasonably equivalent to the site and use proposed within the County.

A tabular summary of the final trip generation rate calculation shall be provided. Appendix D provides sample trip generation calculations.

3. Trip Distribution

The trip distribution of the proposed project trips shall be developed using at a minimum the following sources:

- Existing travel patterns based on existing traffic counts
- Traffic assignment using the El Dorado County Travel Demand Model (TDM)
- Project access and internal circulation

The applicant team shall document all assumptions regarding the distribution of project related trips on the street network, indicating how the trips would be distributed and providing a rationale for the distribution assumptions. The trip distribution will be reviewed and approved by CDA's LRP staff. The assigned trips from the project shall be added to the observed traffic count data to create an existing plus project scenario.

Trip distribution assumptions may vary by analysis scenario (i.e. Existing Plus Project may be different than Cumulative Plus Project). If so, the trip distribution for each analysis scenario shall be identified.

4. Analysis Tools

a. Forecasts

The El Dorado County TDM forecasts for the year 2035 shall be the basis of all traffic impact studies. The County TDM will be used to develop the background growth forecasts to be used in the development of the Near-term Scenarios and Cumulative Scenarios.

The scenarios shall be analyzed using the El Dorado County TDM forecasts for the year 2035 for the 2004 General Plan "with improvements" alternative as provided by CDA's LRP staff.

To ensure consistency among traffic impact studies, CDA's LRP staff will either 1) provide the forecasted peak hour volumes for the key road segments near the proposed project via loaded highway network files in electronic CUBE 6 format with the post-processor spreadsheet or 2) provide the latest updated CUBE catalog with the post-processor spreadsheet for AM and PM peak hours to those consultants requesting them. Consultants and project proponents must sign a disclaimer and model users form in order to receive any TDM files. The following scenarios can be provided:

1. Existing 2010
2. Near-term, 10 years after project submittal
3. Cumulative 2035

For intersections where the current road configuration is unchanged between the current year and 2035, the TDM forecasted growth between the current year and the forecast year shall be applied to current year turning movement counts to arrive at future year turning movement counts. A Furness factoring process or other procedure approved by CDA's LRP staff shall be used to balance the forecasted inbound and outbound traffic for each intersection.

For intersections where the road configuration is expected to change between the current year and 2035 (for example, when a freeway interchange is reconstructed in a new configuration), then the model forecasted 2035 turning movements shall be used (after adjustment for any validation error between the model's year 2010 estimated volume and year 2010 traffic counts, if available). The engineer may submit an alternative method for approval by CDA's LRP staff.

The engineer conducting the traffic modeling should review the forecasted turning movements for reasonableness and make any necessary adjustments. A description of and justification for any manual adjustments to the forecasts must be included in the traffic report. Any negative increments shall be justified and explained in the traffic report.

b. Level of Service

Traffic operations analysis shall be conducted using tools and methods approved by El Dorado County. General Plan Policy TC-Xd defines the LOS threshold policy for El Dorado County and dictates the use of the latest version of the *Highway Capacity Manual* for LOS computations. As delineated in the *Highway Capacity Manual*, the LOS for signalized intersections and all-way stop control intersections are based on the average control delay for the entire intersection. For intersections with side-street stop-control, the LOS is evaluated separately for each individual movement. The LOS for road segments is defined below in Table 1.

Applicants are required to verify LOS thresholds for study area intersections and roadway segments. The General Plan states that LOS exceptions may be allowed for segments listed in Table TC-2 of the General Plan. Further, individual Specific Plans may have specific LOS thresholds. Applicants with a project within one of these plan areas should confirm applicable LOS thresholds with CDA's LRP staff.

El Dorado County Vehicle LOS Threshold Policy

General Plan Policy TC-Xd: Level of Service (LOS) for County maintained roads and state highways within the unincorporated areas of the county shall not be worse than LOS E in the Community Regions or LOS D in the Rural Centers and Rural Regions except as specified in Table TC-2.

Table 1: El Dorado County Peak Hour Roadway Segment LOS Criterion

Code	Functional Class Codes (Updated to HCM 2010)	HCM 2010 Planning Level Volumes ¹				
		A	B	C	D	E
2A	Two-Lane Arterial	-	-	850	1,540	1,650
4AU	Four-Lane Arterial, Undivided	-	-	1,760	3,070	3,130
4AD	Four-Lane Arterial, Divided	-	-	1,850	3,220	3,290
6AD	Six-Lane Arterial, Divided	-	-	2,760	4,680	4,710
4M	Four-Lane Multi-Highway (Two Dir.)	-	2,240	3,230	4,250	4,970
2F	Two Freeway Lanes (One Dir.)	-	2,070	2,880	3,590	4,150
2FA	Two Freeway Lanes + Auxiliary Lane (One Dir.)	-	2,610	3,630	4,520	5,230
3F	Three Freeway Lanes (One Dir.)	-	3,100	4,320	5,380	6,230
3FA	Three Freeway Lanes + Auxiliary Lane (One Dir.)	-	3,640	5,070	6,320	7,310
4F	Four Freeway Lanes (One Dir.)	-	4,140	5,760	7,180	8,310
¹ Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor of 0.09, and D-factor of 0.60						
2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor, and D-factor of 0.6						
Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed 45 mi/h						
Volumes are for both directions unless noted						

The traffic analysis methodologies for the facility types indicated below will be accepted without prior consultation:

- Signalized Intersections – Latest version of the *Highway Capacity Manual* (HCM) using Highway Capacity Software (HCS), Synchro, TRAFFIX, or other software approved by the CDA's LRP staff
- Unsignalized Intersections – Latest version of the HCM using HCS, SimTraffic, TRAFFIX, or other software approved by the CDA 's LRP staff
- Signal Warrants – Latest version of the *Manual of Uniform Traffic Control Devices (MUTCD California Version)*
- Road Segments – Latest version of the HCM using HCS, Table 1 above

The LOS analysis must consider the existing and potential impacts of peak hour factors (PHF), heavy vehicles, upstream/downstream queuing at nearby intersections, queue overflow interference with intersection operations (such as left turn pocket overflows), minimum pedestrian crossing times (if appropriate), uneven lane utilization in the vicinity of freeway ramps, and unusual platoon dispersion or compression between intersections. Should any of these factors impact intersection operations, the computed LOS should be corrected accordingly. A description of each of these factors and associated adjustments to the computation must be included in the TIS. Micro-simulation of the study area, using software such as SimTraffic, may be necessary as determined by the CDA's LRP staff. See Appendix D, Recommended Procedures for Synchro and SimTraffic Analysis.

State facilities shall be analyzed in accordance with Caltrans standards and the requirements of El Dorado County's General Plan.

c. Capital Improvement Projects

The transportation analysis shall identify the capital improvement project (CIP) list and/or improvement projects that are being assumed. In addition, the TIS shall address if the funding has been identified and provide reference documentation with applicable pages from the document included in an appendix as well as approximate time frame of construction of the assumed improvements. A listing of El Dorado County's CIP projects can be found on the CDA Transportation website at <http://www.edcgov.us/Government/DOT/CIP.aspx>.

E. IMPACT SIGNIFICANCE CRITERIA

1. Level of Service (LOS) Significance

LOS impacts of a proposed project shall be determined based on the methods described above and shall be identified within the TIS as either "significant" or "less-than-significant".

General Plan Circulation Policy TC-Xd provides Level of Service standards for County roads as follows:

Level of Service (LOS) for County-maintained roads and state highways within the unincorporated areas of the county shall not be worse than LOS E in the Community Regions or LOS D in the Rural Centers and Rural Regions except as specified in Table TC-2.

2. The volume to capacity ratio of the roadway segments listed in Table-TC-2 as applicable shall not exceed the ratio specified in that table.

If a project causes the peak hour LOS or volume/capacity ratio on a county road or state highway that would otherwise meet the County standards (without the project) to exceed the values listed in the above tables and text, then the impact shall be considered significant.

If any county road or state highway fails to meet the above listed county standards for peak hour LOS or volume/capacity ratios without the proposed project, and the project will worsen conditions on the road or highway, then the impact shall be considered significant. The term, worsen is defined for the purpose of this paragraph according to General Plan Policy TC-Xe as follows:

- A. A two (2) percent increase in traffic during the a.m. peak hour, p.m. peak hour, or daily, or
- B. The addition of 100 or more daily trips, or
- C. The addition of 10 or more trips during the a.m. peak hour or the p.m. peak hour

When a project identifies an impact on the County's roadway network for a scenario with or without the project, a separate analysis must be done to identify what improvements are needed for mitigation and when the improvements must be in place. The timing of the proposed mitigation must be in compliance with General Plan Policy TC-Xf:

At the time of approval of the tentative map for a single family residential subdivision of five or more parcels that worsens (defined as a project that triggers Policy TC-Xe [A] or [B] or [C]) traffic on the County road system, the County shall do one of the following: (1) condition the project to construct all road improvements necessary to maintain or attain Level of Service standards as detailed in this Transportation and Circulation Element based on existing traffic plus traffic generated from the development plus forecasted traffic growth at 10-years from project submittal; or (2) ensure the commencement of construction of the necessary road improvements are included in the County's 10-year CIP.

For all other discretionary projects that worsen (defined as a project that triggers Policy TC-Xe [A] or [B] or [C]) traffic on the County road system, the County shall do one of the following: (1) condition the project to construct all road improvements necessary to maintain or attain Level of Service standards as detailed in this Transportation and Circulation Element; or (2) ensure the construction of the necessary road improvements are included in the County's 20-year CIP.

Projects that have impacts to Caltrans facilities shall use Caltrans LOS standards and significance thresholds in conjunction with the requirements of El Dorado County General Plan Circulation Policy TC-Xd.

2. Queuing Analysis Significance

The level of service analysis must consider the existing and potential impacts of upstream/downstream queuing at nearby intersections, and queue overflow interference with intersection operations (such as left turn pocket overflows). If the proposed project causes a queue overflow interference with intersection operations, the impact may be considered significant.

3. Senate Bill (SB) 743 and SB 375

If applicable, all TIS's prepared for CEQA documents shall address the requirements of SB 743 and SB 375 (amended California Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587 and 65588). The TIS shall contain an analysis of where SB 743 or SB 375 applies within the study area. If either SB 743 or SB 375 does apply to the study area, the TIS shall contain the appropriate analysis and impact statements. The applicant team shall coordinate with CDA's LRP staff to determine appropriate significance thresholds and mitigation measures, if needed.

F. GENERAL PLAN CONSISTENCY CONSIDERATIONS FOR CUMULATIVE IMPACT ANALYSIS

Cumulative impact analysis must comply with CEQA. Land use development and infrastructure projects that are consistent with the General Plan, are expected to rely on the General Plan cumulative traffic analysis and EIR and Supplemental EIR conclusions. Projects that are part of a Specific Plan may require updated cumulative traffic analysis consistent with the following definitions:

- The cumulative scenario is required per CEQA Guidelines Section 15130
- The general definition of cumulative as a scenario is that it represents past, present, and reasonably foreseeable actions regarding land use development and the transportation network (see CEQA Guidelines Section 15355)

The General Plan Environmental Impact Report (EIR) and the *Traffic Impact Mitigation Fee Program Supplement to the El Dorado County General Plan Environmental Impact Report*, March 2006, analyzed residential and employment growth, and the traffic impacts associated with that growth using theoretical achievable development of the General Plan at the conclusion of the "planning horizon" used in the General Plan for 2025. The General Plan Policy TC-Xb and Implementation Measures TC-A and TC-B require major five year updates to the CIP and traffic fee programs. These updates have established a new "planning horizon" of 2035. In addition, the Targeted General Plan Amendment Draft Environmental Impact Report has also pushed the "planning horizon" to 2035. The updated analysis will generally cover the cumulative traffic effects of consistent development projects. However, over time,

it is likely that general plan amendments or regional growth will influence background traffic volumes. If this occurs, individual projects may be required to conduct a project-specific cumulative analysis based on the determination of CDA's LRP staff.

G. TRAFFIC IMPACT ANALYSES SCENARIOS

The potential traffic impact analysis scenarios are listed below. Most isolated or small projects consistent with the General Plan will be required only to complete the Existing Conditions analysis as determined by CDA's LRP staff. Larger projects and projects near other potential development projects may be required to analyze both Existing and Near-Term Project Conditions.

How many traffic analysis scenarios are required?

The following scenarios shall be evaluated for each location.

1. Existing Conditions

- **Existing Conditions** represented by transportation conditions in the study area based on recent field observations. Peak period (3 hours or more) turning movement counts shall be conducted at each study location for the specified time periods. Weekday counts shall be performed during typical traffic conditions on a Tuesday, Wednesday, or Thursday with clear weather, when school is in session, if possible. With CDA's LRP staff authorization, traffic counts which have been conducted by others may be utilized if they are less than two years old and have been increased at a growth rate of 1.03% per year.
- **Existing Plus Project Conditions** represented by project changes to existing transportation conditions for all travel modes in the study area. Traffic volume forecasts for roadway analysis should reflect existing conditions plus traffic generated by the proposed project. For re-use or conversion projects, this will involve accounting for any existing use of the site that remains or will be discontinued.

The peak hour traffic generation of the project shall be estimated for each of the specified time periods using the trip generation rates from the latest edition of the *ITE Trip Generation Manual*. If the Manual does not provide a rate for the particular land use type or the applicant desires to base the analysis on other trip generation data, the applicant shall provide CDA's LRP staff with a justification for the use of the data.

The applicant team shall document all assumptions regarding the distribution of project related trips on the street network, indicating how the trips would be distributed and providing a rationale for the distribution assumptions. The assigned trips from the project shall be added to the observed traffic count data to create an existing plus project scenario.

2. Near-Term Conditions With and Without Project

- The study shall analyze conditions with and without the proposed project ten years from the current year calculated using a straight line interpolation from existing traffic levels to the County's TDM 2035 traffic projections. The traffic network to be evaluated in this scenario will include all applicable projects in the County's Ten Year CIP.

3. Future Conditions

- **Cumulative No Project Conditions** represented by transportation conditions in the study area reflecting all approved projects plus pending projects or expected development of other areas of the County designated for growth. In most cases, the project site will likely be vacant under this scenario. In some cases though, this scenario may need to account for any existing uses on the site that could continue and potential increases in development allowed by ministerial approvals only. The transportation network to be evaluated in this scenario will include projects in the County's current 20-year CIP.
- **Cumulative Plus Project Conditions** represented by Cumulative Conditions plus changes to these conditions caused by the proposed project. The EDC TDM shall be used to determine project trip distribution for the cumulative plus project scenario. This scenario needs to account for whether the project is changing any existing or planned land uses on the site.

Additional analysis scenarios may be required in the TIS dependent on project conditions and setting. For example, other scenarios may be needed to test phasing or other interim conditions, at the discretion of the County.

The study will involve review of the year 2035 traffic analyses from the Targeted General Plan Amendment traffic study to determine if the proposed project would worsen traffic conditions in the year 2035. Projects which are found to be consistent with the General Plan land use designations and zoning densities and the traffic evaluation assumptions used for the General Plan traffic study typically will not be required to conduct a separate 2035 analysis and may be allowed to tier from the General Plan EIR Cumulative Traffic Analysis. Documentation of this consistency review shall be included within the TIS and confirmation by CDA's LRP staff shall be obtained to confirm that a separate cumulative evaluation will not be required for the project. In the event it is determined that a separate cumulative impact analyses is required, the land use and transportation improvement assumptions to be used in this analysis shall be developed in coordination with CDA's LRP staff. See General Plan Consistency Considerations for Cumulative Impact Analysis for additional discussion of cumulative impact considerations.

H. TRAFFIC IMPACT MITIGATION IDENTIFICATION

Mitigation measures must be developed for all significant impacts identified according to the criteria in the previous section for the following scenarios: the "Existing Plus Project" scenario, the "Near Term Plus Proposed Project" scenario, and the "Future Cumulative With Proposed Project (2035)" scenario.

The mitigation measures must comply with General Plan Policy TC-Xf, TC-Xg, and TC-Xh.

In any case where the project results in a significant impact the applicant team must identify appropriate project design changes and traffic improvements beyond those already included in CDA's approved CIP to fully mitigate the impacts to a less than significant level. Specific improvements proposed to mitigate direct impacts must be identified in the traffic impact study.

Potential mitigation measures may include project re-design, traffic signal improvements, physical road improvements, street re-striping, parking prohibitions, fair share contributions toward identified and scheduled projects, and transportation demand management programs. All traffic impact mitigation proposals must be supported by analysis of the mitigated project to illustrate the effectiveness of the proposed mitigation at reducing impacts to levels of less-than-significant. The applicant team shall

consult with CDA's LRP staff to determine if proposed mitigation is acceptable. If mitigation is proven effective and approved by CDA's LRP staff, the mitigation shall be incorporated as an element of the proposed project. All CEQA review necessary for implementation of the mitigation required to be implemented by the applicant shall be included within the CEQA review of the proposed project.

I. OTHER TRANSPORTATION-RELATED IMPACTS AND MITIGATION CONSIDERATIONS

The TIS shall also include documentation as to how the project will impact and mitigate its impacts related to the following issues and General Plan goals:

- Emergency Vehicle Access
- Deliveries of Goods and Services
- Access to Public Transit Services consistent with General Plan Circulation Element Goal TC-2: "To promote a safe and efficient transit system that provides service to all residents, including senior citizens, youths, the disabled, and those without access to automobiles that also helps to reduce congestion, and improves the environment."
- Transportation System Management consistent with General Plan Circulation Element Goal TC-3: "To reduce travel demand on the County's road system and maximize the operating efficiency of transportation facilities, thereby reducing the quantity of motor vehicle emissions and the amount of investment required in new or expanded facilities."
- Non-Motorized Transportation consistent with General Plan Circulation Element Goal TC-4: "To provide a safe, continuous, and easily accessible non-motorized transportation system that facilitates the use of the viable alternative transportation modes."
- On-Site Transportation Review, see section II for details
- Complete street implementation shall be considered wherever possible

J. TECHNICAL APPENDICES

The technical appendices shall include all traffic count data, Synchro printouts, SimTraffic printouts, or any other documentation to support the findings in the TIS. The appendices shall be in the same order as the analysis scenarios.

Appendix A:
Applicable El Dorado County General Plan Goals and Policies

TRANSPORTATION AND CIRCULATION ELEMENT

GOAL TC-1: To plan for and provide a unified, coordinated, and cost-efficient countywide road and highway system that ensures the safe, orderly, and efficient movement of people and goods.

Policy TC-1a: The County shall plan and construct County-maintained roads as set forth in Table TC-1. Road design standards for County-maintained roads shall be based on the American Association of State Highway and Transportation Officials (AASHTO) standards, and supplemented by California Department of Transportation (Caltrans) design standards and by County Department of Transportation standards. County standards include typical cross sections by road classification, consistent with right-of-way widths summarized in Table TC-1.

TABLE TC-1 GENERAL ROADWAY STANDARDS FOR NEW DEVELOPMENT BY FUNCTIONAL CLASS				
Functional Class	ACCESS CONTROL		CROSS SECTION	
	Public Roads Intersections (Or interchanges)	Abutting Property Driveways and Private Roads	ROW	Roadway Width
Six-Lane Divided Road	½ mile minimum spacing	Restricted	130'	108'
Four-Lane Divided Road	½ mile minimum spacing	Limited	100'	84'
Four-Lane Undivided Road				
Community Region	½ mile minimum spacing	Limited	80'	64'
Rural Centers and Rural Regions	½ mile minimum spacing	Limited	80'	64'
Major Two-Lane Road				
Community Region	¼ mile minimum spacing	Limited	60'	40'
Rural Centers and Rural Regions	¼ mile minimum spacing	Permitted	60'	40'
Local Road	¼ mile minimum spacing	Permitted	60'	Varies
Notes:				
1. Access control and cross sections are desired standards. Details and waiver provisions shall be incorporated to the Design and Improvement Standards Manual (El Dorado County, 1990).				
2. Notwithstanding these highway specifications, additional right-of-way may be required for any classification when a road coincides with an adopted route for an additional public facility (e.g., transit facilities, bikeways, or riding and hiking trails), or a scenic highway.				
3. The County may deviate from the adopted standards in circumstances where conditions warrant special treatment of the road. Typical circumstances where exceptions may be warranted include:				
a. Extraordinary construction costs due to terrain, roadside development, or unusual right-of-way needs; or				
b. Environmental constraints that may otherwise entirely preclude road improvement to the adopted standards, as long as environmental impacts are mitigated to the extent feasible.				
4. Travel ways for all highways should be 12 feet wide. Turning lanes should be 12 feet wide, but may be reduced to 10 feet based on topographical or right-of-way constraints. All travel ways on roads should be paved.				

Policy TC-1b: In order to provide safe, efficient roads, all roads should incorporate the cross sectional road features set forth in Table TC-1.

Policy TC-1p: The County shall encourage street designs for interior streets within new subdivisions that minimize the intrusion of through traffic on pedestrian and residential uses while providing efficient connections between neighborhoods and communities.

Policy TC-1t: The County shall identify locations of needed future road rights-of-way, consistent with Figure TC-1, through analysis and adoption of road alignment plan lines where appropriate. Circumstances where road alignment plan line analysis and adoption are acceptable shall include the following:

- A. Where major roads or corridors are expected to require additional through lanes within a 20-year planning horizon;
- B. Where the future alignment is expected to deviate from the existing alignment, or to be developed asymmetrically about the existing section or centerline;
- C. Where the adjacent properties are substantially undeveloped, so that property owners may benefit from prior knowledge of the location of rights-of-way of planned roads before constructing improvements or developing property in a way that may ultimately conflict with identified transportation needs; and
- D. Future facilities as identified in Figure TC-1.

Policy TC-1u: The County shall amend the circulation diagram to include a new arterial roadway from the west side of the El Dorado Hills Business Park to U.S. 50.

Policy TC-1v: The County shall consider modification of the circulation diagram to include a frequent transit service operating on exclusive right-of-way to the El Dorado Hills Business Park from residential communities in El Dorado County and from the City of Folsom.

Policy TC-1w: New streets and improvements to existing rural roads necessitated by new development shall be designed to minimize visual impacts, preserve rural character, and ensure neighborhood quality to the maximum extent possible consistent with the needs of emergency access, on street parking, and vehicular and pedestrian safety.

Policy TC-1y: Development through 2025, within Traffic Analysis Zones 148 and 344, shall be conditioned so that a cap of 10,045 full-time employees is not exceeded, unless it can be demonstrated that a higher number of employees would not violate established level of service standards.

GOAL TC-X: To coordinate planning and implementation of roadway improvements with new development to maintain adequate levels of service on County roads.

Policy TC-Xa: The following policies shall remain in effect until December 31, 2018:

1. Traffic from single-family residential subdivision development projects of five or more parcels of land shall not result in, or worsen, Level of Service F (gridlock, stop-and-go) traffic congestion during weekday, peak-hour periods on any highway, road, interchange or intersection in the unincorporated areas of the county.
2. The County shall not add any additional segments of U.S. Highway 50, or any other roads, to the County's list of roads that are allowed to operate at Level of Service F without first getting the voters' approval or by a 4/5ths vote of the Board of Supervisors.
3. Developer-paid traffic impact fees combined with any other available funds shall fully pay for building all necessary road capacity improvements to fully offset and mitigate all direct and cumulative traffic impacts from new development upon any highways, arterial roads and their intersections during weekday, peak-hour periods in unincorporated areas of the county.

TABLE TC-2 EL DORADO COUNTY ROADS ALLOWED TO OPERATE AT LEVEL OF SERVICE F¹ (Through December 31, 2018)		
Road Segment(s)		Max. V/C²
Cambridge Road	Country Club Drive to Oxford Road	1.07
Cameron Park Drive	Robin Lane to Coach Lane	1.11
Missouri Flat Road	U.S. Highway 50 to Mother Lode Drive	1.12
	Mother Lode Drive to China Garden Road	1.20
Pleasant Valley Road	El Dorado Road to State Route 49	1.28
U.S. Highway 50	Canal Street to junction of State Route 49 (Spring Street)	1.25
	Junction of State Route 49 (Spring Street) to Coloma Street	1.59
	Coloma Street to Bedford Avenue	1.61
	Bedford Avenue to beginning of freeway	1.73
	Beginning of freeway to Washington overhead	1.16
	Ice House Road to Echo Lake	1.16
State Route 49	Pacific/Sacramento Street to new four-lane section	1.31
	U.S. Highway 50 to State Route 193	1.32
	State Route 193 to county line	1.51
Notes: ¹ Roads improved to their maximum width given right-of-way and physical limitations. ² Volume to Capacity ratio.		

Policy TC-Xb: To ensure that potential development in the County does not exceed available roadway capacity, the County shall:

- A. Every year prepare an annual Capital Improvement Program (CIP) specifying expenditure for roadway improvements within the next 10 years. At least every five years prepare a CIP specifying expenditures for roadway improvements within the next 20 years. Each plan shall contain identification of funding sources sufficient to develop the improvements identified;
- B. At least every five years, prepare a Traffic Impact Mitigation (TIM) Fee Program specifying roadway improvement to be completed within the next 20 years to ensure compliance with all applicable level of service and other standards in this plan; and
- C. Annually monitor traffic volumes on the county's major roadway system depicted in the Circulation Diagram.

Policy TC-Xd: Level of Service (LOS) for County-maintained roads and state highways within the unincorporated areas of the county shall not be worse than LOS E in Community Regions or LOS D in the Rural Centers and Rural Regions except as specified in Table TC-2. The volume to capacity ratio of the roadway segments listed in Table TC-2 shall not exceed the ratio specified in that table. Level of Service will be as defined in the latest edition of the Highway Capacity

Manual (Transportation Research Board, National Research Council) and calculated using the methodologies contained in that manual. Analysis periods shall be based on the professional judgment of the Department of Transportation which shall consider periods including, but not limited to, Weekday Average Daily Traffic (ADT), AM Peak Hour, and PM Peak hour traffic volumes.

Policy TC-Xe: For the purposes of this Transportation and Circulation Element, “worsen” is defined as any of the following number of project trips using a road facility at the time of issuance of a use and occupancy permit for the development project:

- A. A 2 percent increase in traffic during the a.m. peak hour, p.m. peak hour, or daily, or
- B. The addition of 100 or more daily trips, or
- C. The addition of 10 or more trips during the a.m. peak hour or the p.m. peak hour.

Policy TC-Xf: At the time of approval of a tentative map for a single family residential subdivision of five or more parcels that worsens (defined as a project that triggers Policy TC-Xe[A] or [B] or [C]) traffic on the County road system, the County shall do one of the following: (1) condition the project to construct all road improvements necessary to maintain or attain Level of Service standards detailed in this Transportation and Circulation Element based on existing traffic plus traffic generated from the development plus forecasted traffic growth at 10-years from project submittal; or (2) ensure the commencement of construction of the necessary road improvements are included in the County’s 10-year CIP.

For all other discretionary projects that worsen (defined as a project that triggers Policy TC-Xe [A] or [B] or [C]) traffic on the County road system, the County shall do one of the following: (1) condition the project to construct all road improvements necessary to maintain or attain Level of Service standards detailed in this Transportation and Circulation; or (2) ensure the construction of the necessary road improvements are included in the County’s 20-year CIP.

Policy TC-Xg: Each development project shall dedicate right-of-way and construct or fund improvements necessary to mitigate the effects of traffic from the project. The County shall require an analysis of impacts of traffic from the development project, including impacts from truck traffic, and require dedication of needed right-of-way and construction of road facilities as a condition of the development. For road improvements that provide significant benefit to other development, the County may allow a project to fund its fair share of improvement costs through traffic impact fees or receive reimbursement from impact fees for construction of improvements beyond the project’s fair share. The amount and timing of reimbursements shall be determined by the County.

Policy TC-Xh: All subdivisions shall be conditioned to pay the traffic impact fees in effect at the time a building permit is issued for any parcel created by the subdivision.

Policy TC-Xi: The planning for the widening of U.S. Highway 50, consistent with the policies of this General Plan, shall be a priority of the County. The County shall coordinate with other affected agencies, such as the City of Folsom, the County of Sacramento, and Sacramento Area Council of Governments (SACOG) to ensure the U.S. Highway 50 capacity enhancing projects are coordinated with these agencies with the goal of delivering these projects on a schedule to meet the requirements of the policies of this General Plan.

GOAL TC-2: To promote a safe and efficient transit system that provides service to all residents, including senior citizens, youths, the disabled, and those without access to automobiles that also helps to reduce congestion, and improves the environment.

Policy TC-2b: The County shall promote transit services where population and employment densities are sufficient to support those transit services, particularly within the western portion of the county and along existing transit corridors in the rural areas.

Policy TC-2d: The County shall encourage the development of facilities for convenient transfers between different transportation systems (e.g., rail-to-bus, bus-to-bus).

GOAL TC-3: To reduce travel demand on the County's road system and maximize the operating efficiency of transportation facilities, thereby reducing the quantity of motor vehicle emissions and the amount of investment required in new or expanded facilities.

Policy TC-3a: The County shall support all standards and regulations adopted by the El Dorado County Air Quality Management District governing transportation control measures and applicable state and federal standards.

Policy TC-3b: The County shall consider Transportation Systems Management measures to increase the capacity of the existing road network prior to constructing new traffic lanes. Such measures may include traffic signal synchronization and additional turning lanes.

Policy TC-3c: The County shall encourage new development within Community Regions and Rural Centers to provide appropriate on-site facilities that encourage employees to use alternative transportation modes. The type of facilities may include bicycle parking, shower and locker facilities, and convenient access to transit, depending on the development size and location.

Policy TC-3d: Signalized intersections shall be synchronized where possible as a means to reduce congestion, conserve energy, and improve air quality.

GOAL TC-4: To provide a safe, continuous, and easily accessible non-motorized transportation system that facilitates the use of the viable alternative transportation modes.

Policy TC-4a: The County shall implement a system of recreational, commuter, and inter-community bicycle routes in accordance with the County's *Bikeway Master Plan*. The plan should designate bikeways connecting residential areas to retail, entertainment, and employment centers and near major traffic generators such as recreational areas, parks of regional significance, schools, and other major facilities, and along recreational routes.

Policy TC-4b: The County shall construct and maintain bikeways in a manner that minimizes conflicts between bicyclists and motorists.

Policy TC-4c: The County shall give priority to bikeways that will serve population centers and destinations of greatest demand and to bikeways that close gaps in the existing bikeway system.

Policy TC-4e: The County shall require that rights-of-way or easements be provided for bikeways or trails designated in adopted master plans, as a condition of land development when necessary to mitigate project impacts.

Policy TC-4g: The County shall support development of facilities that help link bicycling with other modes of transportation.

Policy TC-4h: Where hiking and equestrian trails abut public roads, they should be separated from the travel lanes whenever possible by curbs and barriers (such as fences or rails), landscape buffering, and spatial distance. Existing public corridors such as power transmission line easements, railroad rights-of-ways, irrigation district easements, and roads should be put to multiple use for trails, where possible.

Policy TC-4i: Within Community Regions and Rural Centers, all development shall include pedestrian/bike paths connecting to adjacent development and to schools, parks, commercial areas and other facilities where feasible. In Rural Regions, pedestrian/bike paths shall be considered as appropriate.

GOAL TC-5: To provide safe, continuous, and accessible sidewalks and pedestrian facilities as a viable alternative transportation mode.

Policy TC-5a: Sidewalks and curbs shall be required throughout residential subdivisions, including land divisions created through the parcel map process, where any residential lot or parcel size is 10,000 square feet or less.

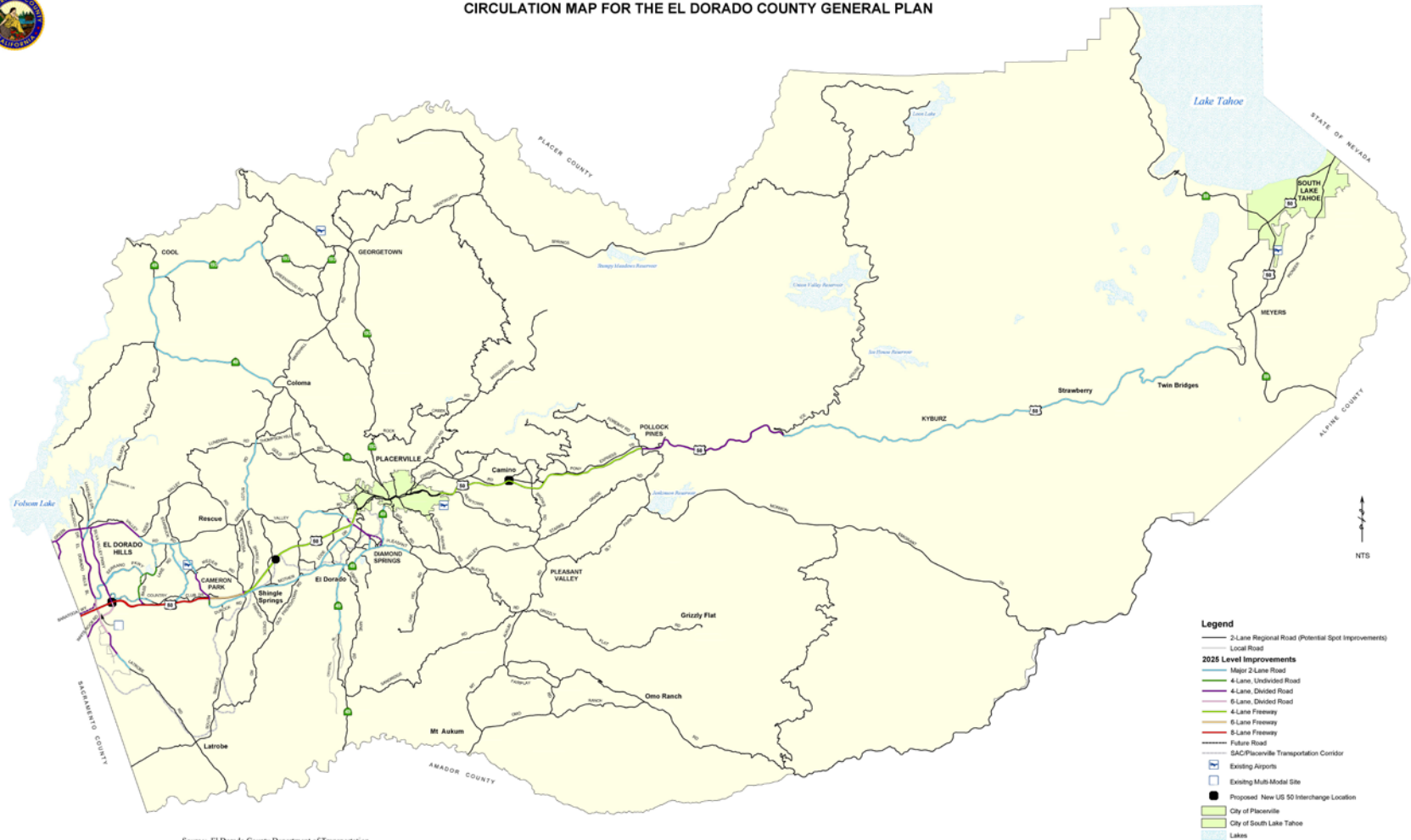
Policy TC-5b: In commercial and research and development subdivisions, curbs and sidewalks shall be required on all roads. Sidewalks in industrial subdivisions may be required as appropriate.

Policy TC-5c: Roads adjacent to schools or parks shall have curbs and sidewalks.

The El Dorado County Bicycle and Pedestrian Plan can be accessed on the El Dorado County Transportation Commission's website: <http://www.edctc.org/3/CountyBikePlan2010.html>



Figure TC - 1
CIRCULATION MAP FOR THE EL DORADO COUNTY GENERAL PLAN



Source: El Dorado County Department of Transportation
July, 2004

Note: This is a reduced version of the Circulation Map provided for reference purposes.
The official Circulation Map is on file and available for review at the Department of Transportation.

Appendix B:
Traffic Impact Study Format Outline

I. Introduction

- A. Title Page – signed and sealed by a registered California Civil or Traffic Engineer
- B. Table of Contents, List of Figures, and List of Tables
- C. Executive Summary

II. Background

- A. Project Description
- B. Type and size of development
- C. Site plan (include proposed driveways, roadways, traffic control, parking facilities, emergency vehicle access, and internal circulation)
- D. Location map (include major streets and study intersections)

III. Existing Conditions

- A. Existing roadway system within project site and surrounding area
- B. Figure of study intersections with peak hour turning movement counts, lane geometries, and traffic control
- C. Map of study area showing ADT of study roadways
- D. Table of Existing intersection peak hour average vehicle delays and LOS

IV. Existing Plus Project Conditions

- A. Table of trip generation for project (See Appendix D)
- B. Figure/map of trip distribution (in percent)
- C. Maps of study area with applicable peak hour turning movements (Project Only and Existing Plus Project)
- D. Table of Existing and Existing Plus Project intersection peak hour average vehicle delay and LOS
- E. Table of Existing and Existing Plus Project intersection queue analysis
- F. Table of Existing and Existing Plus Project road segment volumes and LOS
- G. Traffic signal and other warrants
- H. Finding of project impacts

V. Near-Term Conditions

- A. Identify Approved Projects included in the analysis
- B. Map of study area with applicable peak hour turning movements (Existing Plus of Approved)
- C. Table of intersection peak hour average vehicle delay and LOS
- D. Table of intersection peak hour queue analysis
- E. Table of road segment volumes and LOS
- F. Traffic signal and other warrants

VI. Near-Term Plus Project Conditions

Similar content to Existing Plus Project Conditions

VII. Cumulative and Cumulative Plus Project Conditions

- A. Figure/map of trip distribution (in percent)
- B. Map of study area with Cumulative No Project peak hour turning movements
- C. Map of study area with Cumulative Plus Project peak hour turning movements
- D. Table of Cumulative and Cumulative Plus Project intersection peak hour average vehicle delay and LOS
- E. Table of Cumulative and Cumulative Plus Project intersection queue analysis
- F. Traffic signal and other warrants
- G. Findings of project impacts

VIII. Findings of Impacts and Mitigation Measures

- A. Summary of the Findings of Impacts and Mitigations Measures
- B. Mitigation measures for project impacts
- C. Implementation responsibility of mitigation measures
- D. Impacts of mitigation measures, if any
- E. El Dorado County Initial Study Environmental (CEQA) Checklist and discussion for Transportation/Traffic

IX. Appendices

Appendix C:

Sample Trip Generation Estimates and Calculations

How do I determine how many
vehicle trips my project will
generate?

Table 1: Typical Daily Trip Generation Estimates

(*Trip Generation Manual*, 9th Edition, Institute of Transportation Engineers, 2012)

Proposed Development Type	ITE Land Use Number	ITE Daily Trip Generation ¹
Single Family Detached Housing	210	9.52 per DU
General Office Building	710	11.03 per KSF Gross Floor Area
Specialty Retail Center	814	64.03 per KSF Gross Floor Area
General Light Industrial	110	6.97 per KSF Gross Floor Area
Fast-Food with Drive-Through Window	934	496.12 per KSF Gross Floor Area
¹ Value does not consider pass-by trips. KSF = 1,000 square feet DU = Dwelling Unit		

The following figure describes the trip types relevant to trip generation and the difference between the total trips generated by the project versus new trips added by the project. Information in the figure is based on data from the *ITE Trip Generation Manual, 9th Edition*, volume 1.

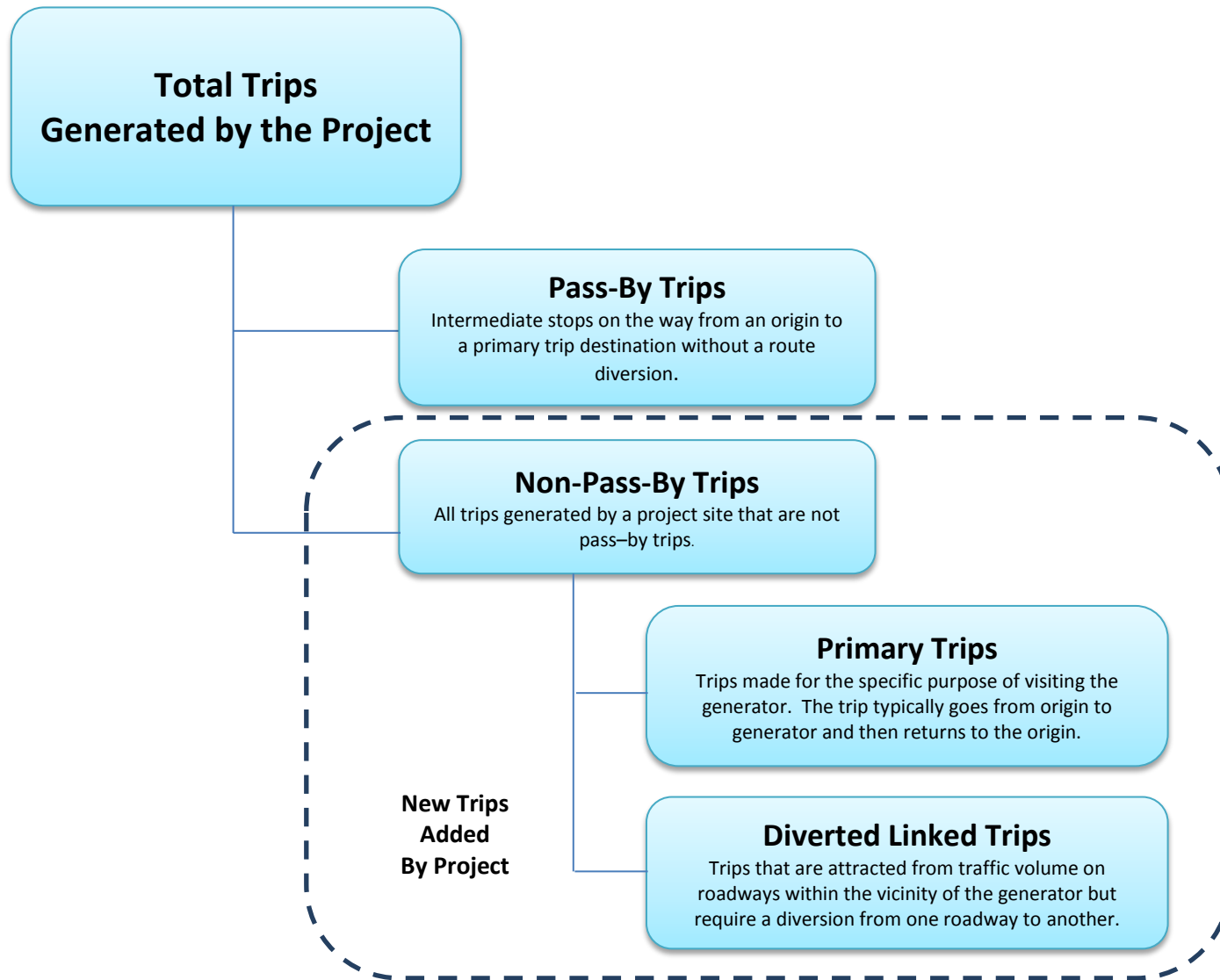


Table 2: SAMPLE ESTIMATED PROJECT TRIP GENERATION

Land Use	Size	Unit	Daily		Trip Rates						Trips					
			Rate	Trips	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Residential																
Single Family ¹	500	DU	9.26	4,629	0.18	0.54	0.72	0.56	0.33	0.89	90	270	360	281	165	446
Apartments ²	100	DU	7.3	730	0.11	0.42	0.53	0.47	0.26	0.73	11	42	53	47	26	73
Commercial																
Commercial ³	100	ksf	67.9	6,789	0.97	0.59	1.56	2.89	3.13	6.02	97	59	156	289	313	602

¹ Trip generation based on Institute of Transportation Engineers (ITE), *Trip Generation Manual*, (9th Edition) regression equations for Single-Family Detached Housing (Land Use Code 210)
Daily: $\ln(T) = 0.92 \ln(X) + 2.72$ (50% Inbound, 50% Outbound)
AM Peak Hour: $T = 0.70(X) + 9.74$ (25% Inbound, 75% Outbound)
PM Peak Hour: $\ln(T) = 0.91 \ln(X) + 0.51$ (63% Inbound, 37% Outbound)
Where: T = trips generated, X = dwelling units, Ln = natural log

² Trip generation based on Institute of Transportation Engineers (ITE), *Trip Generation Manual*, (9th Edition) regression equations for Apartments (Land Use Code 220)
Daily: $T = 6.06(X) + 123.56$ (50% Inbound, 50% Outbound)
AM Peak Hour: $T = 0.49(X) + 3.73$ (20% Inbound, 80% Outbound)
PM Peak Hour: $T = 0.55(X) + 17.65$ (65% Inbound, 35% Outbound)
Where: T = trips generated, X = dwelling units, Ln = natural log

³ Trip generation based on Institute of Transportation Engineers (ITE), *Trip Generation Manual*, (9th Edition) regression equations for Shopping Center (Land Use Code 820)
Daily: $\ln(T) = 0.65 \ln(X) + 5.83$ (50% Inbound, 50% Outbound)
AM Peak Hour: $\ln(T) = 0.61 \ln(X) + 2.24$ (62% Inbound, 38% Outbound)
PM Peak Hour: $\ln(T) = 0.67 \ln(X) + 3.31$ (48% Inbound, 52% Outbound)
Where: T = trips generated, X = dwelling units, Ln = natural log

Notes:

DU = dwelling units; ksf = 1,000 square-feet

Survey data or the most recent version of ITE *Trip Generation Manual* should be used to calculate trip generation.

Pass-by reductions should be considered for commercial uses where applicable.

Mixed use developments, internalization should be considered. Internalization can be calculated using ITE's *Trip Generation Handbook* or EPA's MXD methodology.

Appendix D:
Recommended Procedures For Synchro and SimTraffic Analysis

This section contains the recommended procedures for Synchro and SimTraffic. Since each project is different, these procedures should be used as a guideline. Deviation from the recommended procedures below should be based on field observations and data collected. Please contact CDA's LRP staff with any questions.

Synchro vs. SimTraffic

Both Synchro and SimTraffic use HCM methodology to analyze intersection operations. SimTraffic should be used to analyze traffic operations when the following conditions exist (or could exist in the future):

- Closely spaced intersections
- Over-capacity conditions (queues spill out of storage pockets)
- Uneven lane utilization
- Unusual lane configurations or alignment
- Unusual platoon dispersion or compression

For example, SimTraffic should be used at interchanges, such as Missouri Flat Road and El Dorado Hills Boulevard. If upstream or downstream intersections affect the traffic operations of a study intersection, SimTraffic should be used for analysis. Synchro should be used to analyze isolated intersections without unusual lane configurations or constraints.

Please consult with CDA's LRP staff to confirm the appropriate methodology for the study area. All electronic Synchro and SimTraffic files should be submitted to the County with the draft traffic impact study.

Recommended Synchro Procedures

The following is a guideline of inputs for building a Synchro network. Since each project is different, these procedures should be used as a guideline. Deviation from the recommended procedures below should be based on field observations and data collected.

- Peak hour counts, peak hour factors, and heavy vehicle percentages should be entered from recent count data (i.e. less than two years old)
- A minimum of 2% heavy vehicles should be used for most locations
- Volumes should be balanced between intersections, where appropriate
- Pedestrian and bicycle counts should be entered per count data, where appropriate. A minimum of 2 pedestrian calls per hour should be used for most signalized locations
- Signal timings should be obtained from the County and Caltrans and entered into Synchro

- Signal timings should include the appropriate signal phasing, phase timings, pedestrian crossing times, right-turn treatments, recall modes, etc. If signal timings are not available, field observations should be conducted to gather signal timing information
- The posted speed limit should be entered for all links
- Lane configurations and lane utilization should be verified by field observations
- When adding lanes to an intersection (for future roadway improvements or mitigation testing), the pedestrian clearance times should be increased appropriately
- For cumulative conditions, the above discussed parameters shall be maintained, as appropriate. Traffic signal timings may be optimized appropriately.

Recommended SimTraffic Procedures

The recommended Synchro procedures above apply to SimTraffic. In addition, the following SimTraffic procedures should be applied:

- SimTraffic results should be based on the 10 “most average” runs of 20 simulation runs
- For planning-level studies, use one 15-minute recording period with the PHF Adjust set to “Yes”
- For operations-level studies, use four 15 minute recording intervals with the PHF Adjust set to “Yes” for the second recording interval and “No” for the other three recording intervals
- The seeding period should be set to the approximate time it takes to drive through the study area
- Mandatory and Positioning distances should be adjusted if uneven lane utilization is observed
- At interchanges, Link Origin-Destination Volumes should be edited
- For existing conditions models, queue lengths should match field observations

Models should be calibrated to account for the appropriate vehicle and driver parameters.

Appendix E:
California Environmental Quality Act (CEQA) Information

The following information can be accessed in its entirety at:

[http://resources.ca.gov/ceqa/docs/2014 CEQA Statutes and Guidelines.pdf](http://resources.ca.gov/ceqa/docs/2014%20CEQA%20Statutes%20and%20Guidelines.pdf)

FREQUENTLY ASKED QUESTIONS ABOUT CEQA

What is CEQA?

When and why was it enacted?

Who must comply with CEQA?

If it applies, what are the basic requirements of environmental review under CEQA?

What are the CEQA Guidelines?

How are the Guidelines crafted?

How often are the Guidelines amended?

Who enforces CEQA? What role does the Resources Agency have in enforcement of CEQA?

What aspects of CEQA compliance is the Secretary for Resources responsible?

What is CEQA?

CEQA, or the California Environmental Quality Act, is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

When and why was it enacted?

The impetus for CEQA can be traced to the passage of the first federal environmental protection statute in 1969, the National Environmental Policy Act (NEPA). In response to this federal law, the California State Assembly created the Assembly Select Committee on Environmental Quality to study the possibility of supplementing NEPA through state law. This legislative committee, in 1970, issued a report entitled *The Environmental Bill of Rights*, which called for a California counterpart to NEPA. Later that same year, acting on the recommendations of the select committee, the legislature passed, and Governor Reagan signed, the CEQA statute.

Who must comply with CEQA?

CEQA applies to certain activities of state and local public agencies. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment.

Most proposals for physical development in California are subject to the provisions of CEQA, as are many governmental decisions which do not immediately result in physical development (such as adoption of a general or community plan). Every development project which requires a discretionary

governmental approval will require at least some environmental review pursuant to CEQA, unless an exemption applies.

If it applies, what are the basic requirements of environmental review under CEQA?

The environmental review required imposes both procedural and substantive requirements. At a minimum, an initial review of the project and its environmental effects must be conducted. Depending on the potential effects, a further, and more substantial, review may be conducted in the form of an environmental impact report (EIR). A project may not be approved as submitted if feasible alternatives or mitigation measures are able to substantially lessen the significant environmental effects of the project.

What are the CEQA Guidelines?

The Guidelines are the regulations that explain and interpret the law for both the public agencies required to administer CEQA and for the public generally. They are found in the California Code of Regulations, in Chapter 3 of Title 14. The Guidelines provide objectives, criteria and procedures for the orderly evaluation of projects and the preparation of environmental impact reports, negative declarations, and mitigated negative declarations by public agencies. The fundamental purpose of the Guidelines is to make the CEQA process comprehensible to those who administer it, to those subject to it, and to those for whose benefit it exists. To that end, the Guidelines are more than mere regulations which implement CEQA as they incorporate and interpret both the statutory mandates of CEQA and the principles advanced by judicial decisions.

How are the Guidelines crafted?

The Governor's Office of Planning and Research prepares and develops proposed amendments to the Guidelines and transmits them to the Secretary for Resources. The Secretary for Resources is responsible for certification and adoption of the Guidelines and amendments thereto. Prior to final certification and adoption, and pursuant to the procedures in the Administrative Procedure Act, the Secretary for Resources makes the proposed language available to members of the public, provides for at least a 45 day written comment period, and provides public hearings in which to receive oral testimony on the proposals. All public comments, whether received in writing or orally at a public hearing, are considered by the Secretary in determining whether to adopt the proposed amendments prepared by the Office of Planning and Research. Once edited and enriched by the practical experience and wisdom of individual public comments, amendments are adopted and sent to the Office of Administrative Law (OAL) for review and final approval. Guidelines approved by OAL are deposited with the Secretary of State and go into immediate effect.

How often are the Guidelines amended?

Revision of the CEQA Guidelines is an on-going process. By statute, the Secretary of Resources is required to review and consider amendments to the Guidelines every two years. Annual changes to CEQA and evolving case law make revision to the Guidelines necessary on a continual basis. By the time one revision is completed, another one begins. Because the subject is so large and complex, a definitive, one-time revision is not possible. The actual process of amending the Guidelines is governed by the Administrative Procedure Act and is the same as that described above in "How are the Guidelines crafted?"

Who enforces CEQA? What role does the Resources Agency have in enforcement of CEQA?

CEQA is a self-executing statute. Public agencies are entrusted with compliance with CEQA and its provisions are enforced, as necessary, by the public through litigation and the threat thereof. While the Resources Agency is charged with the adoption of CEQA Guidelines, and may often assist public agencies in the interpretation of CEQA, it is each public agency's duty to determine what is and is not subject to CEQA. As such, the Resources Agency does not review the facts and exercise of discretion by public agencies in individual situations. In sum, the Agency does not enforce CEQA, nor does it review for compliance with CEQA the many state and local agency actions which are subject to CEQA.

What aspects of CEQA compliance is the Secretary for Resources responsible?

In addition to adopting the CEQA Guidelines and amendments thereto, the Secretary for Resources possesses the following responsibilities:

- 1) Makes findings that a class of projects given categorical exemptions will not have a significant effect on the environment;
- 2) Certifies state environmental regulatory programs which meet specified standards as being exempt from certain provisions of CEQA;
- 3) Receives and files notices of completion, determination, and exemption; and
- 4) Provides assistance in interpreting the provisions of CEQA and the CEQA Guidelines.

California Environmental Quality Act

The following are excerpts from the California Environmental Quality Act, California Public Resources Code, Division 13, Environmental Quality Statute, as amended in 2013, and is not intended to represent the CEQA requirements in its entirety.

[The 15130. DISCUSSION OF CUMULATIVE IMPACTS

An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. (1) As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR. (2) When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency's conclusion that the cumulative impact is less than significant. (3) An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The lead agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable. (b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute

to the cumulative impact. The following elements are necessary to an adequate discussion of significant cumulative impacts: (1) Either: (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or (B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency. (2) When utilizing a list, as suggested in paragraph (1) of subdivision (b), factors to consider when determining whether to include a related project should include the nature of each environmental resource being examined, the location of the project and its type. Location may be important, for example, when water quality impacts are at issue since projects outside the watershed would probably not contribute to a cumulative effect. Project type may be important, for example, when the impact is specialized, such as a particular air pollutant or mode of traffic. (3) Lead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used. (4) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and (5) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects. (c) With some projects, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by project basis. (d) Previously approved land use documents, including, but not limited to, general plans, specific plans, regional transportation plans, plans for the reduction of greenhouse gas emissions, and local coastal plans may be used in cumulative impact analysis. A pertinent discussion of cumulative impacts contained in one or more previously certified EIRs may be incorporated by reference pursuant to the provisions for tiering and program EIRs. No further cumulative impacts analysis is required when a project is consistent with a general, specific, master or comparable programmatic plan where the lead agency determines that the regional or areawide cumulative impacts of the proposed project have already been adequately addressed, as defined in section 15152(f), in a certified EIR for that plan. (e) If action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in Section 15183(j). a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in Section 15183(j)..

- (a) **Note:** Authority cited: Sections 21083, 21083.05, Public Resources Code. Reference: Sections 21003(d), 21083(b), 21093, 21094 and 21100, Public Resources Code; *Whitman v. Board of Supervisors*, (1979) 88 Cal. App. 3d 397; *San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 151 Cal.App.3d 61; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692; *Laurel Heights Homeowners Association v. Regents of the University of California* (1988) 47 Cal.3d 376; *Sierra Club v. Gilroy* (1990) 220 Cal.App.3d 30; *Citizens to Preserve the Ojai v. County of Ventura* (1985) 176 Cal.App.3d 421; *Concerned Citizens of South Cent. Los Angeles v. Los Angeles Unified Sch. Dist.* (1994) 24 Cal.App.4th 826; *Las Virgenes Homeowners Fed'n v. County of Los Angeles* (1986) 177 Cal.App.3d 300; *San Joaquin Raptor/Wildlife Rescue Ctr v. County of Stanislaus* (1994) 27 Cal.App.4th 713; *Fort Mojave Indian Tribe v. Cal. Dept. Of Health Services* (1995) 38 Cal.App.4th 1574; *Santa Monica Chamber of Commerce v. City of Santa Monica* (2002) 101 Cal.App.4th 786; *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98; and *Ass'n of Irrigated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383.

15355. CUMULATIVE IMPACTS

"Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. (a) The individual effects may be changes resulting from a single project or a number of separate projects. (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely

related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Section 21083(b), Public Resources Code; *Whitman v. Board of Supervisors*, 88 Cal. App. 3d 397, *San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 151 Cal. App. 3d 61, Formerly Section 15023.5.

Association of Environmental Professionals 2014 CEQA Guidelines

Appendix G Excerpt

Appendix G of the CEQA Guidelines provides a sample checklist form that may be tailored to satisfy individual agencies needs and project circumstances. The sample questions are intended to encourage thoughtful assessment of impacts, and do not necessarily represent thresholds of significance.

The sample questions posed for Transportation/Traffic in Appendix G are included in the El Dorado County Initial Study Environmental Checklist. The Transportation/Traffic portion of the El Dorado County Environmental Checklist and the instructions is inserted below. The checklist and discussion questions should be addressed in the “Findings of Impacts and Mitigation Measures” chapter of the TIS.

El Dorado County Initial Study Environmental Checklist

(Transportation/Traffic Section)

COUNTY OF EL DORADO PLANNING SERVICES 2850 FAIRLANE COURT PLACERVILLE, CA 95667				
INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM				
Project Title:				
Lead Agency Name and Address: County of El Dorado, 2850 Fairlane Court, Placerville, CA 95667				
Contact Person:	Phone Number: (530) 621-5355			
Property Owner's Name and Address:				
Project Applicant's Name and Address:				
Project Agent's Name and Address:				
Project Engineer's / Architect's Name and Address:				
Project Location:				
Assessor's Parcel Number(s):				
Zoning:				
Section:	T: R:			
General Plan Designation:				
Description of Project:				
Surrounding Land Uses and Setting: <table><tr><td><u>Zoning</u></td><td><u>General Plan</u></td><td><u>Land Use</u> (e.g., Single Family Residences, Grazing, Park, School)</td></tr></table> Site: North: East: South: West: <u>Briefly Describe the environmental setting:</u>		<u>Zoning</u>	<u>General Plan</u>	<u>Land Use</u> (e.g., Single Family Residences, Grazing, Park, School)
<u>Zoning</u>	<u>General Plan</u>	<u>Land Use</u> (e.g., Single Family Residences, Grazing, Park, School)		
Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):				

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

	Aesthetics		Agriculture Resources		Air Quality
	Biological Resources		Cultural Resources		Geology / Soils
	Hazards & Hazardous Materials		Hydrology / Water Quality		Land Use / Planning
	Mineral Resources		Noise		Population / Housing
	Public Services		Recreation		Transportation/Traffic
	Utilities / Service Systems		Mandatory Findings of Significance		

DETERMINATION

On the basis of this initial evaluation:

- ☐ I find that the proposed project **COULD NOT** have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A **MITIGATED NEGATIVE DECLARATION** will be prepared.
- ☐ I find that the proposed project **MAY** have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT** is required.
- ☐ I find that the proposed project **MAY** have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect: 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards; and 2) has been addressed by mitigation measures based on the earlier analysis as described in attached sheets. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects: a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION, pursuant to applicable standards; and b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: _____ Date: _____

Printed Name: _____ For: El Dorado County

Signature: _____ Date: _____

Printed Name: _____ For: El Dorado County

EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is a fair argument that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level.
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
 - a. Earlier Analysis Used. Identify and state where they are available for review.
 - b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c. Mitigation Measures. For effects that are "Less Than Significant With Mitigation Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used, or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
 - a. the significance criteria or threshold, if any, used to evaluate each question; and
 - b. the mitigation measure identified, if any, to reduce the impact to less than significant.

Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less Than Significant Impact	No Impact
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XV. TRANSPORTATION/TRAFFIC. <i>Would the project:</i>				
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?				
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				
e. Result in inadequate emergency access?				
f. Result in inadequate parking capacity?				
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				

Discussion:

A substantial adverse effect on Traffic would occur if the implementation of the project would:

- Result in an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system;
- Generate traffic volumes which cause violations of adopted level of service standards (project and cumulative); or
- Result in, or worsen, Level of Service "F" traffic congestion during weekday, peak-hour periods on any highway, road, interchange or intersection in the unincorporated areas of the county as a result of a residential development project of 5 or more units.

Exhibit 2: Traffic Analysis Methodology, Travel Demand Model (EDC TDM), and US Highway 50 Westbound Level of Service (LOS) Results

The following summarizes the traffic analysis methodology used in preparation of the Targeted General Plan Amendment and Zoning Ordinance Update (TGPA/ZOU) transportation chapter of the Environmental Impact Report, the background of the development of the El Dorado County Travel Demand Model (EDC TDM) update, and the source data and assumptions used to calculate the Level of Service (LOS) for US Highway 50 at the El Dorado County/Sacramento County line.

Traffic Analysis Methodology

The county applied the *Highway Capacity Manual* (HCM) 2010 planning method for analyzing circulation impacts of the proposed project. This level of analysis was specifically developed by the Highway Capacity Committee for programmatic level application, such as adoption of a general plan.^{1,2,3} The Institute of Transportation Engineers (ITE) *Traffic Engineering Handbook*, 6th Edition, also supports the use of planning level analysis for large scale or “big picture” projects. In practice, this level of analysis is “used to produce estimates of operation conditions in the early planning states of projects. This level of analysis provides a reasonable assessment of future capacity for situations in which forecasted traffic volumes have limited accuracy and is helpful to assess potential levels of delay and the ability of a road system to accommodate anticipated future development. Because planning-level analyses are used for broad estimate purposes, the input data requirements are less detailed than for operational analyses (ITE Traffic Handbook, 6th Edition, Chapter 4).”

Use of operational methods for informing the design of roadway facilities is preferred at the design level of analysis that is applied to site-specific development projects, but it is inappropriate at the programmatic stage where individual project-level factors are unknown.

The EDCTDM can generate the projected volume as two-directional (addition of volumes for each direction) or for each direction separately. The two-lane highway analysis using directional segments

El Dorado County Travel Demand Model (EDC TDM)

The El Dorado County Travel Demand Model (EDC TDM) has been extensively reviewed and found to be the appropriate tool for the County's long-range planning tasks. Throughout 2012 and 2013, numerous presentations and regular updates were given to the Board of Supervisors at their scheduled public meetings, including requests for input and direction on major assumptions of the model, including the roadway network used, updated traffic analysis zones, and direction on the growth scenarios (see Legistar numbers: 12-0475, six different meetings; 12-1578; 13-1218, five different meetings; 13-1219; 14-0245). Throughout the review process, updated information was also made available to the public via the Travel Demand Model Phase I webpage. A final presentation on the EDC TDM was made to the Board of Supervisors during a special meeting on February 24, 2014 (see Legistar number 14-0245).

The EDC TDM was peer reviewed in 2013 by an independent traffic consultant. Their findings were included in the February 24, 2014 staff report and their memorandum is attachment F to Legistar item 14-0245. County staff had been working with both the Sacramento Area Council of Governments (SACOG) travel demand modeling staff, and Caltrans travel forecasting and modeling staff on the TDM from the very beginning. This included the scope of work required to update the TDM in 2011. After the independent traffic consultant completed their peer review in May of 2013, County staff began

evaluating growth scenarios at the direction of the Board of Supervisors, while continuing to address SACOG and Caltrans comments on the TDM as well as addressing public comments.

Both SACOG and Caltrans staff provided input on the scope and other technical assumptions for the update of the TDM. These inputs were garnered through several meetings, at least five meetings of which were dedicated to discussion of the TDM towards the request for a letter of concurrency and to achieve an understanding of the differences between the various models. Minutes of the meetings detailing specific LOS discussions are attached to El Dorado County Board of Supervisors update item number 32 on December 3, 2013 (see Legistar number 13-1218). The collaboration with Caltrans and SACOG also included approximately 30 email exchanges, and multiple letters between Caltrans and County staff beginning in August of 2012 through August 2014. SACOG staff participated in most of the meetings with Caltrans staff as well as independent meetings with County staff to address specific SACOG concerns.

The coordination with SACOG and Caltrans resulted in the County receiving a letter dated February 3, 2014 from SACOG (see Attachment A), which states that they concur that the EDC TDM conforms to state-of-practice in subarea travel demand modeling, meets traffic assignment validations standards suggested by FHWA and Caltrans, and it is an appropriate tool for staff to analyze and forecast traffic for the County's long-range transportation planning. County staff received an initial letter of concurrence from Caltrans on February 14, 2014 (see Attachment B) and continued to work with Caltrans through the aforementioned meetings, email exchanges and letters to obtain a similar concurrency letter dated September 22, 2014 (see Attachment C).

Comparison of US Highway 50 Westbound Level of Service (LOS) Results

The following summarizes the source data and assumptions used to calculate the Level of Service (LOS) for US Highway 50 at the El Dorado County/Sacramento County line. On Friday, April 3, 2015, Caltrans staff provided the Highway Capacity Software (HCS) output (see Attachment D) with the various inputs and assumptions used by Caltrans in the production of the *Transportation Concept Report and Corridor System Management Plan, United States Route 50*, June 2014. According to the data resources cited in the report's Appendix C, the base year used for the report was 2011. To provide an "apples-to-apples" comparison, many of the inputs and assumptions used by Caltrans were utilized for further analysis by Long Range Planning (LRP) staff. All of the LOS calculations described below contain the same assumptions for the peak hour factor, heavy vehicle percentages, terrain, free flow speed, and other inputs.

Caltrans Methodology & Count Book Volumes

Caltrans staff analyzed the LOS based on the volume contained in the Caltrans *Traffic Volumes on California State Highways* document, also known as the "Count Book".

On the Caltrans webpage (<http://traffic-counts.dot.ca.gov/>) with the traffic count data, AADT and Peak Hour are discussed/defined as (**emphasis added**):

Annual Average Daily Traffic (Annual ADT)

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. Very few locations in California are actually counted continuously. 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.

Peak Hour

Included is an **estimate of the "peak hour" traffic** at all points on the state highway system. This value is useful to traffic engineers in estimating the amount of congestion experienced, and shows how near to capacity the highway is operating. Unless otherwise indicated, peak hour values indicate the volume in both directions. A few hours each year are higher than the "peak hour", but not many. In urban and suburban areas, the peak hour normally occurs every weekday, and 200 or more hours will all be about the same. On roads with large seasonal fluctuations in traffic, the peak hour is the four near the maximum for the year but excluding a few (30 to 50 hours) that are exceedingly high and are not typical of the frequency of the high hours occurring during the season.

The 2008 through 2013 count books indicate the peak hour two-way volume at the County line is 8,600 vehicles. Based on the following information in the table below, received from Caltrans staff on April 3, 2015, Caltrans assumed that 65% of all traffic is travelling in the peak direction and approximately 1,000 vehicles are travelling in the High Occupancy Vehicle (HOV) lane. According to these assumptions, the peak hour volume is 4,590 vehicles in the peak direction in the general purpose lanes.

Mode Description and Location	Peak Hour Volume ¹	D% ²	HOV Flow Adjust ³	HCS Directional Input Volume ⁴	T% ⁵	T% Used ⁶
Sacramento/El Dorado County Line to Latrobe Road	8,600	65%	-1000	4590	6.4%	4%
1 Source: 2011 Caltrans Traffic Volumes on California State Highways Book						
2 Source: PeMS						
3 HOV Volume deduction						
4 PHV * D% - HOV Volume = Mixed Flow Volume						
5 2011 Annual Average Daily Traffic on California State Highways Book						
6 Peak Hour Truck % = Approx. 2/3 Daily T%						

Caltrans staff had stated that they use the highest peak hour volume from the count book in the analysis.

Caltrans staff assumed that the peak hour is westbound in the morning. Therefore, the LOS analysis assumes only two general purpose lanes, resulting in LOS F (see Attachment D). However, Caltrans Performance Measurement System (PeMS) data and subsequent count data indicates that the peak hour for this location is eastbound in the evening. PeMS displays real-time traffic data collected from a series of over 39,000 individual detectors (inductive loops, magnetometers and radar) along the state's freeway system. The data collected includes number of vehicles (flow or volume), incidents and lane closures. See Attachment E for maps of all the PeMS mainline Vehicle Detector Stations (VDS) in El Dorado County. The VDS are located between the El Dorado County/Sacramento County line and the City of Placerville along US Highway 50. The eastbound direction operates as three general purpose lanes. When accounting for the additional lane (while holding all other inputs constant), this section of US 50 operates at LOS C in the PM peak hour (see Attachment F).

2010 PeMS Volumes

The table below summarizes the various results from the Basic Freeway Segment LOS Operation Analysis that were reviewed for the TGPA/ZOU (see Attachment G). Attachment H is a sample HCS 2010 Basic Freeway Segments Operational Analysis output sheet, with all input data highlighted. Caltrans staff, in their letter dated May 5, 2015 (see Attachment I), supplied the Spring (March – May)/Fall (September – October) 2010 and 2012 peak hour volumes for the westbound direction of the segment

of U.S. Highway 50 between El Dorado Hills Blvd./Latrobe Road and the County line. Using the information provided and supplementing the data with 2014 volumes (see Attachment J for PeMS Data), County staff ran the Highway Capacity Software (HCS) 2010 for the Basic Freeway Segment Operational Analysis with inputs and assumptions identical to those used by Caltrans for the 2014 TCR/CSMP, changing only the volume input. The results from the various volumes are summarized below. As shown, six of the seven outcomes result in an LOS below Caltrans' recommended or preferred LOS of "E", including Caltrans' recommended volume for the segment of 3,200 vehicles per hour (vph) which results in an LOS of "D". Using the volume of 4,590 vph, which was derived from the Caltrans 2011 Count Book, is the only scenario that leads to an LOS of "F". The County disagrees with Caltrans that the 2011 volume of 4,590 vph from the 2011 Count Book accurately reflects this U.S. Highway 50 Westbound segment (i.e., El Dorado Hills Blvd./Latrobe Road to County line General Purpose Lanes) during the AM Peak Hour (7:00 AM – 7:59 AM) west of Latrobe Mainline Station 316653. The volume 4,590 is substantially different from the other volumes observed and calculated for this segment, and the volume is less reliable because the 2011 Count Book does not specify the direction of travel or peak hour that this volume represents.

Results of Basic Freeway Segment LOS Operational Analysis U.S. Highway 50 Westbound, El Dorado Hills Blvd./Latrobe Road to County line General Purpose Lanes – AM Peak Hour (7:00 AM – 7:59 AM) W. of Latrobe Mainline Station 316653					
Year	Volume	Source	Density	LOS	Notes:
2010	2,860	PeMS (March 2010)	23.7	C	(E. of Scott Road mainline Station 316993) Initial volumes used in RDEIR (total of general purpose lanes and HOV lane volume)
2010	2,955	PeMS	24.7	D	Updated volume used in FEIR based on Caltrans comment letter (see discussion below)
?	3,200	?	27.4	D	Caltrans recommended volume for segment (Caltrans' May 5, 2015 letter)
2010	3,348	PeMS (4-15-10)	29.3	D	Caltrans supplied PeMS data (highest 2010 Spring/Fall volume)
2012	3,393	PeMS (5-15-12)	29.8	D	Caltrans supplied PeMS data (highest 2012 Spring/Fall volume)
2014	3,012	PeMS (9-8-14)	25.3	C	Highest 2014 Spring/Fall volume
2011	4,590	Caltrans 2011 Count Book	54.3	F	Caltrans volume used in various State Reports. Unclear if this was for the westbound direction, or which Peak Hour
Note: All calculations used the same PHF, terrain type, % trucks, Driver Population factor, and flow rate as the Caltrans analysis					

County's Updated Volume

In regards to the appropriate base year volume to be used, Caltrans' May 5, 2015 letter (see Attachment I) stated, "Caltrans would typically choose a higher volume for the peak hour analysis (30th to 200th highest hour annually), however in this case choosing a more representative volume (85th percentile) is more reasonable."

The HCM 2010 states, “In urban areas, there is usually little difference between the 30th and 200th highest hours of the years, because of recurring morning and afternoon commute patterns.” (HCM2010, Chapter 3). The U.S. Highway 50 segment from El Dorado Hills Boulevard/Latrobe Road interchange to the County Line functions as an urban area given its recurring morning and afternoon commute patterns. The County updated the general purpose lane volumes using an average of the 30th to 200th highest hour volumes (2,955) for the segment of U.S. Highway 50 westbound between El Dorado Hills Boulevard/Latrobe Road and the County Line during the AM peak hour (see Attachment K). This methodology is supported by both Caltrans, as stated in their May 5, 2015 letter and the ITE Traffic Engineering Handbook where it is stated that at a planning level analysis it is sufficient to use an aggregate as overall average measure of traffic conditions³. The County has not found a reference that supports use of an 85th percentile volume in this situation; the 85th percentile is typically used in reference to speeds while setting an enforceable speed limit (CVC Section 21400). The updated volume (2,955) results in LOS D using the County’s planning level volume thresholds (see Attachment L). Caltrans’ May 5, 2015 letter also states that “using the 3,200 vph [vehicles per hour] will result in an existing LOS D, which is appropriate for this analysis.”

¹ “Planning analyses are applications of the HCM generally directed toward broad issues such as initial problem identification (e.g., screening a large number of locations for potential operations deficiencies), long-range analyses, and state wide performance monitoring. An analyst often must estimate the future times at which the operation of the current and committed systems will fall below a desired LOS” (HCM 2010, Chapter 2).

² “Planning and preliminary engineering analyses typically involve situations in which not all of the data needed for the analysis are available. Therefore, both types of analyses frequently rely on default values for many analysis inputs. Planning analyses may default nearly all inputs – for example, through the use of generalized service volume tables” (HCM 2010, Chapter 2).

³ “When studying traffic, it is also important to define the framework of the analysis. At times, the needs of engineers and planners can be addressed with an understanding of large-scale or “big picture” view of traffic. For example, when a road improvement such as a lane addition is under study, it is often sufficient to have aggregate or overall average measures of traffic conditions, such as an hourly rate of vehicles or a mean traffic speed during the peak hour. In such cases, a macroscopic framework of the flow conditions is appropriate” (ITE Traffic Engineering Handbook, 6th Edition, Chapter 4).

\\CDADData\CDA-Long Range Planning\Land Use\TGPA-ZOU\Transportation Memo\Info for PC 9-1-15



February 3, 2014

Kimberly A. Kerr
Acting Community Development Agency Director
Community Development Agency
2850 Fairlane Court
Placerville, CA 95667

Dear Ms. Kerr:

This is in response to your letter of November 7, 2013 regarding the El Dorado County Travel Demand Model. We appreciated the collegial spirit in which your agency engaged with SACOG over the course of the EDCTDM development. SACOG's involvement over the course of the development has been: providing parcel-level base year and future year land use data; providing documentation, data files, and programs from SACOG's pre-2007 travel demand model, SACMET07; and periodic staff check-ins opportunities to review and comment on the project.

We understand that all of the base year data and other files provided by SACOG have been thoroughly reviewed and revised by your agency staff and your consultant for the project. The land use data was for all intents and purposes rebuilt entirely over the course of the project, and the future year land use data will be based on "achievable development" at "reasonably expected intensity" based on the County General Plan land use categories. Significant detail was added to the base year highway network and zone system, to allow for trip generation, distribution and assignment to be assessed for very small land areas. Also, the SACMET07 programs were revised to include a "5D's" post-processing adjustment, among other things.

We understand that the EDCTDM is intended primarily for County staff to analyze and forecast traffic for the County long-range transportation plan, the transportation improvement program, and other local studies. We appreciate that your agency understands that other travel demand models, such as SACOG's SACSIM regional travel demand model, are needed for planning studies and analyses which cover a larger area than the EDCTDM does, and that those models will be used for those studies and analyses instead of the EDCTDM. Good examples of such plans and studies are the Metropolitan Transportation Plan/Sustainable Community Strategy, and the emissions and air quality analysis which goes along with that. For all base year land use and network data for El Dorado County in SACOG models, we will continue to share and coordinate with your staff to ensure that the representation of the county in both models is consistent.

With all this in mind, we concur that:

- The EDCTDM conforms to state-of-practice in subarea travel demand modeling
- The EDCTDM model meets traffic assignment validation standards suggested by FHWA and Caltrans
- The EDCTDM is an appropriate tool for the County's intended purposes

This concurrence is based on the ongoing dialog we have had with County staff, and review of the published documentation.

We also firmly believe that all TDM's, including the EDCTDM, are not static, unchanging, fixed tools—they are not “set-it-and-forget-it” in any way. TDM's must be maintained, updated, and improved over time to remain useful and relevant planning tools. In that regard: One of the significant improvements of the current EDCTDM over the prior version was the inclusion of a “buffer area” to the west of El Dorado County, including Folsom and parts of Orangevale and Rancho Cordova. This buffer area allows for better modeling of the dynamic relationship between El Dorado County and areas outside the County. SACOG periodically updates both its base year and future year land use data, and hopes that those updates are incorporated into the buffer area over time. Additionally, because so much of the region is external to the EDCTDM, travel demands at the gateways (i.e. the edges of the model area) should be periodically updated, and we would like to be consulted when updates occur.

Sincerely



Mike McKeever
Chief Executive Officer

MM:BG:pm

S:/Projects 13-14/Long-RangeTranspoPlan/Ltr to Kimberly Kerr 2-3-14

DEPARTMENT OF TRANSPORTATION

DISTRICT 3
703 B STREET
MARYSVILLE, CA 95901
PHONE (530) 741-4233
FAX (530) 741-4245
TTY 711
www.dot.ca.gov/dist3



*Flex your power!
Be energy efficient!*

February 14, 2014

Kimberly A. Kerr, Acting Director
El Dorado County Community Development Agency
2850 Fairlane Court
Placerville, CA 95667-4197

Dear Ms. Kerr:

Thank you for the opportunity to review and comment on the El Dorado County (County) Travel Demand Model Update. Caltrans appreciates the cooperative relationship that El Dorado County has extended throughout the update process.

Over the past year, we have been involved closely in the review process of the draft base year model. The County incorporated several suggestions made by Caltrans staff that included adding a peer review process for independent validation of the model and adding a "buffer area" to the west to allow for more dynamic modeling between the County and other areas outside of their boundaries. At this point in the process, Caltrans concurs that the model validation and calibration largely follows the standards suggested by the Federal Highway Administration Calibration and Adjustment of System Planning Models (1990) and the 2010 California Regional Transportation Plan (RTP) Guidelines, with the exception of the vehicle miles traveled (VMT) calculations, as described below.

Per the RTP Guidelines, the County is considered to be in group "E" for travel model requirements. Most of the requirements for this grouping have been followed. Requirement 10 states that VMT shall be used as part of the calibration tools for the travel demand model. The Highway Performance Monitoring System or locally developed counts may be used to develop VMT. However, the VMT calibration is not documented in any of the technical memorandums, therefore, we are unable to determine if this requirement has been met. In addition, Caltrans encourages the County to pursue RTP Guideline recommendations to develop formal microeconomic land use model and a tour/activity-based travel model in future updates of this model.

Again, thank you for your continued coordination with Caltrans throughout this iterative process. We understand that the County will continue to improve the model and address the comments documented in this letter in future updates. In the meantime, we look forward to the opportunity to review the final draft base year model and documentation that incorporates our

Kimberly A. Kerr
February 14, 2014
Page 2

comments sent on February 5, 2014, as well as the final draft future year model. In the meantime, if you have any questions, please contact Susan Zanchi, Chief, Office of Travel Forecasting and Modeling at (530) 741-4199 or via email at susan.zanchi@dot.ca.gov.

Sincerely,

A handwritten signature in cursive script that reads "Jody Jones".

JODY JONES
District Director

c: Dave Defanti, Assistant Director of Community Development Agency
Claudia Wade, CDA Long Range Planning Division
Natalie Porter, CDA Long Range Planning Division
Marlon Flournoy, Caltrans
Sharon Scherzinger, EDCTC
Bruce Griesenbeck, SACOG

DEPARTMENT OF TRANSPORTATION**DISTRICT 3**

703 B STREET

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PHONE (530) 741-4337

FAX (530) 741-4245

TTY 711

www.dot.ca.gov/dist3

*Serious drought.
Help save water!*

September 22, 2014

Steve Pedretti, Director
El Dorado County Community Development Agency
2850 Fairlane Court
Placerville, CA 95667

Dear Mr. Pedretti:

Thank you for addressing our concerns regarding the El Dorado County Travel Demand Model (EDCTDM). With the recent modifications, the EDCTDM conforms to the state-of-practice in travel demand modeling; meets overall traffic assignment validation standards suggested by FHWA and Caltrans; and is an appropriate tool for the County's long range planning purposes.

While the EDCTDM as a whole is acceptable and meets industry standards, please keep in mind when used for future specific projects, a subarea validation will be necessary for approval of traffic impact studies. Additionally, some areas of the model may exceed validation standards and/or generate unexpected outputs, which will require further model improvements and post processing to achieve acceptable results.

If you have any questions, please contact Nicholas Deal, Chief, Office of Travel Forecasting and Modeling at (530) 741-5151 or via email at nicholas.deal@dot.ca.gov.

Sincerely,

for A handwritten signature in black ink, appearing to read "Marlon A. Flournoy".

MARLON A. FLOURNOY
Deputy District Director
Planning & Local Assistance

- c: Dave Defanti, Assistant Director of Community Development Agency
Claudia Wade, CDA Long Range Planning Division
Natalie Porter, CDA Long Range Planning Division
Amarjeet S. Benipal, District 3 Director, Caltrans
Sharon Scherzinger, EDCTC
Mike McKeever, SACOG

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Jas
Agency or Company: Caltrans
Date Performed: 3/11/2014
Analysis Time Period:
Freeway/Direction: US 50
From/To: SEG 8R
Jurisdiction: ED County
Analysis Year: 2012 Base
Description: CSMP/TCR 50

Flow Inputs and Adjustments

Volume, V	4590	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	1221	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	2588	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

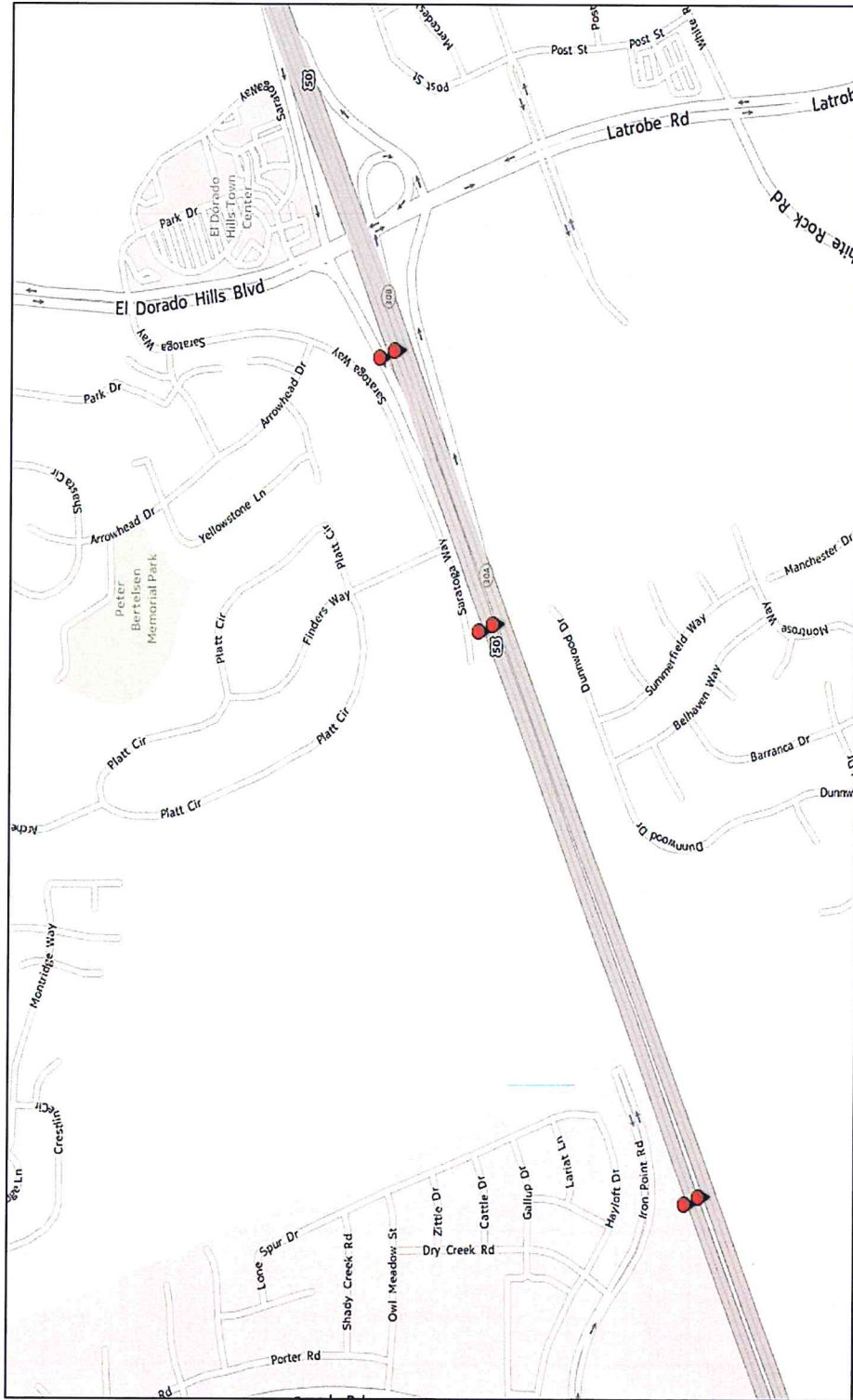
LOS and Performance Measures

Flow rate, vp	2588	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	47.7	mi/h
Number of lanes, N	2	
Density, D	54.3	pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.



From: Caltrans PeMS website inventory. 2015



Locations of Caltrans Performance Measurement System (PeMS) Mainline Vehicle Detector Stations (VDS) near El Dorado County Line

From: Caltrans PeMS website inventory, 2015

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: NKP
Agency or Company: CDA
Date Performed: 4/6/2015
Analysis Time Period:
Freeway/Direction: US 50
From/To: EDH-Latrobe/Countyline
Jurisdiction: EDC
Analysis Year: 2011
Description: Caltrans info using EB number of lanes

Flow Inputs and Adjustments

Volume, V	4590	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	1221	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1725	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1725	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	25.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: NKP
Agency or Company: CDA
Date Performed: 4/16/2015
Analysis Time Period: AM Peak Hr
Freeway/Direction: US 50 WB
From/To: EDH-Latrobe/Countyline
Jurisdiction: EDC
Analysis Year: 2010
Description: EDC 2010 General Purpose with HOV lanes

Flow Inputs and Adjustments

Volume, V	2860	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	761	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1613	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1613	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	68.0	mi/h
Number of lanes, N	2	
Density, D	23.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: NKP
 Agency or Company: CDA
 Date Performed: 4/16/2015
 Analysis Time Period: AM Peak Hr
 Freeway/Direction: US 50 WB
 From/To: EDH-Latrobe/Countyline
 Jurisdiction: EDC
 Analysis Year: 2010
 Description: EDC 2010 average between 30th and 200th highest hours

Flow Inputs and Adjustments

Volume, V	2955	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	786	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1666	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1666	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.5	mi/h
Number of lanes, N	2	
Density, D	24.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: NKP
Agency or Company: CDA
Date Performed: 6/12/2015
Analysis Time Period: AM Peak Hr
Freeway/Direction: US 50 WB
From/To: EDH-Latrobe/Countyline
Jurisdiction: EDC
Analysis Year:
Description: Caltrans recommended volume

Flow Inputs and Adjustments

Volume, V	3200	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	851	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1804	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1804	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	65.8	mi/h
Number of lanes, N	2	
Density, D	27.4	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: NKP
 Agency or Company: CDA
 Date Performed: 4/16/2015
 Analysis Time Period: AM Peak Hr
 Freeway/Direction: US 50 WB
 From/To: EDH-Latrobe/Countyline
 Jurisdiction: EDC
 Analysis Year: 2010
 Description: Caltrans Highest PeMS (Spring/Fall)

Flow Inputs and Adjustments

Volume, V	3348	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	890	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1816	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1816	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	65.6	mi/h
Number of lanes, N	2	
Density, D	27.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: NKP
 Agency or Company: CDA
 Date Performed: 4/13/2015
 Analysis Time Period: AM Peak Hr
 Freeway/Direction: US 50 WB
 From/To: EDH-Latrobe/Countyline
 Jurisdiction: EDC
 Analysis Year: 2012
 Description: Caltrans Highest PeMs (Spring/Fall 2012)

Flow Inputs and Adjustments

Volume, V	3393	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	902	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1913	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1913	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	64.1	mi/h
Number of lanes, N	2	
Density, D	29.8	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: NKP
Agency or Company: CDA
Date Performed: 4/16/2015
Analysis Time Period: AM Peak Hr
Freeway/Direction: US 50 WB
From/To: EDH-Latrobe/Countyline
Jurisdiction: EDC
Analysis Year: 2014
Description: Highest PeMS (Spring/Fall)

Flow Inputs and Adjustments

Volume, V	3012	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	801	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1698	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
EFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1698	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.1	mi/h
Number of lanes, N	2	
Density, D	25.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: NKP
Agency or Company: CDA
Date Performed: 4/16/2015
Analysis Time Period: AM Peak Hr
Freeway/Direction: US 50 WB
From/To: EDH-Latrobe/Countyline
Jurisdiction: EDC
Analysis Year: 2010
Description: EDC 2010 General Purpose with HOV lanes

Yellow highlighting
indicates input
variables

Flow Inputs and Adjustments

Volume, V	2860	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	761	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1613	pc/h/ln

Blue highlighting
indicates output
values (calculated
by HCS software)

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1613	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	68.0	mi/h
Number of lanes, N	2	
Density, D	23.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
2379 GATEWAY OAKS DRIVE, STE 150 - MS 19
SACRAMENTO, CA 95833
PHONE (916) 274-0635
FAX (916) 263-1796
TTY 711



*Serious drought.
Help save water!*

May 5, 2015

032015-ELD-0008
03-ELD Various/PM Various
SCH#2012052074

Ms. Shawna Purvines
Long Range Planning
El Dorado County
2850 Fairlane Court, Building C
Placerville, CA 95672

**Targeted General Plan Amendment and Zoning Ordinance Update (TGPA-ZOU) – Partially
Recirculated Draft Environmental Impact Report (PRDEIR)**

Dear Ms. Purvines:

Thank you for including the California Department of Transportation (Caltrans) in the review process for the County of El Dorado Targeted General Plan Amendment and Zoning Ordinance Update (TGPA-ZOU) PRDEIR. We also appreciate the County meeting with us to discuss this project on April 1, 2015. The project proposes amendments to existing policies and regulations and establishes new policies and regulations regarding land use and transportation within the unincorporated parts of El Dorado County. Several proposed policy changes associated with the project, including the consideration of increasing allowed densities in the residential component of a mixed use project on commercial land in conformance with Senate Bill (SB) 375 – the Sustainable Communities and Climate Protection Act of 2008 may influence future development throughout the County. The following comments, based on the PRDEIR, concern the analysis and implications of these changes, so that impacts to the State Highway System (SHS) are disclosed and adequately mitigated for, protecting interregional travel throughout the County. This letter replaces our previous letter from March 16, 2015 and Caltrans redacts the prior letter.

Caltrans' new mission, vision, and goals signal a modernization of our approach to California's transportation system. We review this local development project for impacts to the State Highway System in keeping with our mission, vision, and goals for sustainability/livability/economy, and safety/health. We provide these comments consistent with the State's smart mobility goals that support a vibrant economy, and build communities, not sprawl.

Ms. Purvines - Long Range Planning, El Dorado County
 May 5, 2015
 Page 2

Comments

- 3.9.1 Existing Conditions, Table 3.9-1 (Pages 3.9-5, 3.9-6) – Table 3.9-1 is missing the “20-Year Build Level of Service (LOS)” for Segment 6.
- 3.9.2 Environmental Impacts, Methods of Analysis, Table 3.9-3, Level of Service Typical Traffic Volumes (Page 3.9-28-3.9-29) – Table 3.9-3 is used to calculate the LOS values reported in Tables 3.9-13, 5.2, and 5.3 (page 3.9-58, 5-12, 5-14). Table 3.9-3 homogenizes Highway Capacity Manual (HCM) freeway segment inputs, such as truck percentages, peak hour factor, physical geometry, and terrain, which impact LOS calculations.

The conclusions derived from using this methodology contradict the intent of the table. The project analysis attempts to make operational and design determinations (facility build-out design and significantly impacted locations) for the State Highway System (SHS) based on the build-out of the proposed project. See Table 3.9-3 note (page 3.9-29):

“Note: The planning thresholds shown in this table are provided for the purpose of assisting in the identification of locations where operational problems may exist and are based on information provided in the 2010 HCM and other industry sources. These values are not appropriate for making detailed or final determinations regarding operational or design considerations. Those determinations should only be made after a detailed operational analysis, consistent with current HCM procedures, and/or other design evaluations are completed.”

Caltrans suggests that the LOS calculations for US 50 reported in the PRDEIR be calculated using the Operational Analysis for Basic Freeway Segments.

- 3.9.2 Environmental Impacts, Methodology Selected for This Analysis (Page 3.9-31) – This section references the concurrence letter Caltrans provided to El Dorado County regarding the El Dorado County Travel Demand Model (EDCTDM) used for the project analysis:

The TDM used to model traffic in the DEIR was revised in response to comments received during review of the Draft EIR. The County received formal Caltrans concurrence on the TDM on September 22, 2014. In its letter, Caltrans states that the TDM conforms to the state-of-practice in travel demand modeling, meets overall traffic assignment validation standards suggested by Caltrans and the Federal Highways Administration, and is an appropriate tool for the County’s long range planning purposes. The revised TDM was re-run for all of the scenarios with the updated network requested by Caltrans.

Caltrans’ concurrence letter solely addresses the base year model, thus only supports the results of the base year model. Caltrans did not comment on or review future/cumulative scenario (2035) TDMs, therefore the future scenario models used in this document do not have an associated concurrence letter from Caltrans. References to Caltrans’ concurrence letter within the PRDEIR should be limited to the base year model only.

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Caltrans suggests the following language be included in the FEIR to clarify the reference to the Caltrans' concurrence letter contained in the PRDEIR:

Caltrans was not requested to concur with the County's growth forecast and/or model results stemming from the County's growth forecast, as local land use planning is outside of Caltrans' responsibility and authority.

Also, note that Caltrans' concurrence letter indicated that there are areas of the base year model where the traffic assignment outputs do not reflect existing conditions:

While the EDCTDM as a whole is acceptable and meets validation standards, please keep in mind when used for future specific projects, a subarea validation will be necessary for approval of traffic impact studies. Additionally, some areas of the model may exceed validation standards and/or generate unexpected outputs, which will require further model improvements and post processing to achieve acceptable results.

In such cases, the TDM requires calibration and validation to generate verifiable results.

- 3.9.2 Environmental Impacts, Tables 3.9-8 (Page 3.9-39) and 3.9-12 (page 3.9-44) – Consistent with the 2014 US 50 CSMP/TCR, the minimum LOS for segments 5, 6, 9, 13 and 14 should be listed as LOS E.
- 3.9.2 Environmental Impacts, Project Impacts, Table 3.9-13 LOS Summary Table (Page 3.9-58) – The LOS values reported for the existing conditions scenario differ from expected values on US 50. For example, according to PeMS the westbound US 50 segment between El Dorado Hills Boulevard/Latrobe Road and the El Dorado/Sacramento County line, currently operates at LOS F during the AM peak hour due to the high density of vehicles on US 50 and the weaving/merging traffic from the El Dorado Hills Boulevard/Latrobe Road on-ramp. Table 3.9-13 indicates that this segment currently operates at LOS C. While the existing LOS of this segment may change slightly from day to day, reporting the existing LOS as C significantly underestimates the traffic at this location (as detailed below) and adversely impacts the reasonableness of the future scenario analysis. Caltrans recommends the existing LOS analysis for this segment, and any others with lower than expected LOS for US 50, be recalculated using more appropriate input volumes. Attachment 1 shows existing PeMS volumes (AM peak hour, Monday-Thursday, spring and fall of 2010 and 2012) for the westbound US 50 segment between El Dorado Hills Boulevard/Latrobe Road and the El Dorado/Sacramento County line. The data shows that the general purpose lane peak hour volume used in the PRDEIR of 2,240 vehicles per hour (vph) (Segment 2, existing conditions – AM peak hour) is significantly lower than the reported general purpose lane count peak hour volumes in PeMS. Of the 170 days of PeMS peak hour volumes data attached, the PRDEIR volume of 2,240 vph is the second lowest count volume (see attached table). Furthermore, the data for this segment show that the 2035 build-out projection general purpose lane peak hour volumes are lower than existing PeMS volumes. Additionally, Attachment 2 shows PeMS volumes from the westbound US 50 detector station used in the PRDEIR (E. of Scott Rd mainline station 316993, March 2010). The data shows that

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the detector operated at 0 percent observed during the reported count times. This indicates that no vehicles were counted at this location and the listed volumes are estimates derived by PeMS. Caltrans recommends the County use a general purpose lane peak hour volume of 3,200 for this segment and recalculate the LOS for the existing conditions and all other scenarios. Caltrans would typically choose a higher volume for the peak hour analysis (30th to 200th highest hour annually), however in this case choosing a more representative volume (85th percentile) is more reasonable. Using the above mentioned 3,200 vph will result in an existing LOS D, which is appropriate for this analysis.

The LOS analysis for the future scenarios, particularly scenarios 2, 5, and 6 (2035 land use build-out), underestimates future traffic conditions on US 50. While most of the future LOS analysis will be corrected and acceptable once the existing volumes are adjusted to the recommended volumes above, the impact of the cumulative conditions in 2035 (Scenario 6) on US 50 is underestimated in this analysis. Table 3.9-13 indicates that this segment will operate at LOS D in scenarios 2 and 5, and LOS B in scenario 6. These LOS calculations imply that the 2035 travel demand on this segment will reduce to lower levels than current demand, even with an additional 15,949 residential units included in the 2035 build-out projections as shown in Table 3.9-6 (Scenarios 2 and 6). El Dorado County is a net exporter of commuters, according to 2011 US Census data used in the Western El Dorado County Short and Long Range Transit Plan, and similar commuting trends are expected to continue into the future given existing and future large job centers in Sacramento, Rancho Cordova, Folsom, and Roseville, as well as the limited planned parallel capacity due to development planned around said capacity.

- 5.1 Cumulative Impacts, Table 5.1 Cumulative Projects (Page 5-2) – On page 5-2 PRDEIR states:

The County is currently considering applications for the approval of five large residential developments proposed in the western portion of the county (i.e., Central El Dorado Hills Specific Plan, Dixon Ranch, Lime Rock Valley Specific Plan, San Stino, and Village of Marble Valley Specific Plan). These are not part of the project but are being considered in this cumulative impact analysis pursuant to CEQA case law's interpretation of the phrase 'probable future projects'... This cumulative impact analysis assumes approval takes these projects impacts into consideration solely in order to meet the intent of State CEQA Guidelines Section 15130 for a worst case scenario perspective.

While the proposed developments referenced (in addition to the Folsom South of US 50 project), which include a total of 18,050 to 21,340 new residential units, are not part of the project, they are considered in the cumulative impact analysis.

Caltrans acknowledges that these projects are not included in this project as it is a program-level EIR. However, given the projected significant cumulative impact of these projects (page 5-11), Caltrans may require that these developments be included in relevant project-level traffic impact studies provided by the County in support of development proposals. Furthermore, this analysis

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may be a condition of encroachment permit approvals where an encroachment permit is necessary to comply with mitigation requirements.

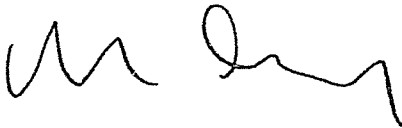
Additionally, Caltrans requests that the County preserve an adequate amount of right-of-way to accommodate the ultimate design configuration of SHS interchanges impacted by the proposed developments included in the cumulative impact analysis.

- 5.1.10 Transportation and Traffic, Project Impacts, Table 5-3 Cumulative Significant Impacts on El Dorado County Roadway Segments (Page 5-14-5-26) – Bass Lake Road, south of US 50, is not included in Table 5.3 Cumulative Significant Impacts (super cumulative no project).

Please provide our office with copies of any further actions regarding this project. We would appreciate the opportunity to review and comment on any changes related to this project.

If you have any questions regarding these comments or require additional information, please contact Eileen Cunningham, Intergovernmental Review Coordinator, at (916) 274-0639 or by email at eileen.cunningham@dot.ca.gov.

Sincerely,



MARLON FLOURNOY
Deputy District Director
Planning and Local Assistance

c: Scott Morgan, State Clearinghouse

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Attachment 1: PeMS Peak Hour Counts

W. of Latrobe Mainline Station 316653
 Spring/Fall 2010 and 2012 Volumes
 7:00 am Monday-Thursday, No weekends or holidays
 No HOV Lane Volumes
 Sorted Highest to Lowest Volume

Hour	Flow (Veh/Hour)	% Observed	Hour	Flow (Veh/Hour)	% Observed
4/15/2010 7:00	3348	100	5/15/2012 7:00	3393	100
4/22/2010 7:00	3339	100	5/14/2012 7:00	3385	100
3/11/2010 7:00	3330	100	5/1/2012 7:00	3362	100
4/19/2010 7:00	3304	100	3/6/2012 7:00	3351	100
3/9/2010 7:00	3298	100	4/24/2012 7:00	3335	100
3/1/2010 7:00	3293	100	3/27/2012 7:00	3327	100
3/23/2010 7:00	3275	100	5/10/2012 7:00	3327	100
4/8/2010 7:00	3268	100	4/30/2012 7:00	3322	100
4/6/2010 7:00	3235	92	5/2/2012 7:00	3320	100
3/24/2010 7:00	3233	100	5/9/2012 7:00	3317	100
3/16/2010 7:00	3231	100	9/5/2012 7:00	3314	100
4/7/2010 7:00	3214	100	4/10/2012 7:00	3305	100
3/8/2010 7:00	3186	100	4/25/2012 7:00	3304	100
4/13/2010 7:00	3174	100	10/30/2012 7:00	3295	100
10/27/2010 7:00	3169	100	9/27/2012 7:00	3279	100
3/17/2010 7:00	3148	100	3/7/2012 7:00	3273	100
3/25/2010 7:00	3144	100	3/21/2012 7:00	3273	100
3/18/2010 7:00	3142	100	10/17/2012 7:00	3273	100
10/28/2010 7:00	3128	100	9/6/2012 7:00	3271	100
10/26/2010 7:00	3105	100	3/5/2012 7:00	3264	100
4/21/2010 7:00	3099	100	5/8/2012 7:00	3264	100
5/19/2010 7:00	3080	100	3/8/2012 7:00	3259	100
5/12/2010 7:00	3066	100	4/17/2012 7:00	3257	100
9/14/2010 7:00	3066	100	5/3/2012 7:00	3257	100
9/1/2010 7:00	3064	100	9/17/2012 7:00	3255	100
5/17/2010 7:00	3060	100	10/4/2012 7:00	3254	100
5/25/2010 7:00	3052	100	5/7/2012 7:00	3252	100
10/19/2010 7:00	3051	100	3/29/2012 7:00	3251	100
9/2/2010 7:00	3042	100	10/3/2012 7:00	3247	100
9/9/2010 7:00	3038	100	5/17/2012 7:00	3245	100

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Hour	Flow (Veh/Hour)	% Observed
9/15/2010 7:00	3033	100
10/20/2010 7:00	3032	100
4/12/2010 7:00	3029	100
10/13/2010 7:00	3029	100
9/8/2010 7:00	3027	100
3/22/2010 7:00	3025	100
9/21/2010 7:00	3025	100
3/4/2010 7:00	3024	100
3/15/2010 7:00	3022	0
5/18/2010 7:00	3020	100
10/5/2010 7:00	3001	100
3/3/2010 7:00	2998	100
9/16/2010 7:00	2994	100
10/6/2010 7:00	2990	100
3/2/2010 7:00	2987	100
9/22/2010 7:00	2982	100
10/14/2010 7:00	2979	100
4/20/2010 7:00	2968	100
10/7/2010 7:00	2961	100
5/13/2010 7:00	2960	100
9/23/2010 7:00	2957	100
10/21/2010 7:00	2956	100
9/29/2010 7:00	2955	100
9/7/2010 7:00	2948	100
5/11/2010 7:00	2947	100
9/13/2010 7:00	2943	100
3/10/2010 7:00	2934	100
10/12/2010 7:00	2931	100
5/20/2010 7:00	2929	100
9/27/2010 7:00	2929	100
4/5/2010 7:00	2923	100
9/20/2010 7:00	2922	100
9/30/2010 7:00	2916	100
10/25/2010 7:00	2903	100
5/10/2010 7:00	2902	100
10/18/2010 7:00	2895	100

Hour	Flow (Veh/Hour)	% Observed
4/19/2012 7:00	3236	100
4/26/2012 7:00	3231	100
10/31/2012 7:00	3229	100
3/22/2012 7:00	3225	100
4/18/2012 7:00	3223	100
4/23/2012 7:00	3223	100
5/21/2012 7:00	3222	100
5/29/2012 7:00	3222	100
3/20/2012 7:00	3219	100
4/16/2012 7:00	3218	100
10/11/2012 7:00	3213	100
3/12/2012 7:00	3212	100
10/1/2012 7:00	3210	100
9/19/2012 7:00	3208	100
9/20/2012 7:00	3207	100
10/25/2012 7:00	3207	100
10/15/2012 7:00	3205	100
3/13/2012 7:00	3202	100
5/22/2012 7:00	3200	100
10/10/2012 7:00	3193	100
5/23/2012 7:00	3181	100
9/18/2012 7:00	3175	100
5/16/2012 7:00	3172	100
9/25/2012 7:00	3168	100
4/11/2012 7:00	3167	100
9/24/2012 7:00	3165	100
5/30/2012 7:00	3150	100
10/18/2012 7:00	3147	100
5/24/2012 7:00	3140	100
9/26/2012 7:00	3137	100
9/13/2012 7:00	3136	100
10/29/2012 7:00	3129	0
9/10/2012 7:00	3127	100
3/26/2012 7:00	3123	100
10/9/2012 7:00	3121	100
4/9/2012 7:00	3117	100

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Hour	Flow (Veh/Hour)	% Observed
10/4/2010 7:00	2886	100
5/26/2010 7:00	2875	100
5/24/2010 7:00	2849	33
5/27/2010 7:00	2794	100
5/5/2010 7:00	2784	100
5/4/2010 7:00	2762	100
4/29/2010 7:00	2749	100
9/28/2010 7:00	2739	100
4/28/2010 7:00	2724	100
4/1/2010 7:00	2723	100
4/27/2010 7:00	2717	100
3/30/2010 7:00	2707	100
3/29/2010 7:00	2704	100
4/26/2010 7:00	2578	100
5/3/2010 7:00	2568	100
4/14/2010 7:00	2500	100
3/31/2010 7:00	2347	100
5/6/2010 7:00	1670	96

Hour	Flow (Veh/Hour)	% Observed
3/1/2012 7:00	3107	100
3/15/2012 7:00	3104	100
3/19/2012 7:00	3103	100
10/16/2012 7:00	3103	100
10/2/2012 7:00	3087	100
9/12/2012 7:00	3074	100
5/31/2012 7:00	2988	100
9/11/2012 7:00	2974	100
9/4/2012 7:00	2972	100
10/22/2012 7:00	2967	100
10/24/2012 7:00	2960	100
3/14/2012 7:00	2953	100
10/23/2012 7:00	2942	100
4/3/2012 7:00	2904	100
4/12/2012 7:00	2881	100
3/28/2012 7:00	2842	100
4/4/2012 7:00	2811	100
4/5/2012 7:00	2809	100
4/2/2012 7:00	2798	100

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Attachment 2: PeMS Peak Hour Counts

E. of Scott Mainline Station 316993
 March 2010, 7:00 - 7:59 am, Monday-Friday
 No weekends or holidays
 No HOV Lane Volumes

Hour	Flow (Veh/Hour)	% Observed
3/1/2010 7:00	2765	0
3/2/2010 7:00	2561	0
3/3/2010 7:00	2598	0
3/4/2010 7:00	2794	0
3/5/2010 7:00	2522	0
3/8/2010 7:00	2753	0
3/9/2010 7:00	2791	0
3/10/2010 7:00	2730	0
3/11/2010 7:00	2727	0
3/12/2010 7:00	2466	0
3/15/2010 7:00	1100	0
3/16/2010 7:00	2679	0
3/17/2010 7:00	2652	0
3/18/2010 7:00	2653	0
3/19/2010 7:00	2396	0
3/22/2010 7:00	2971	0
3/23/2010 7:00	2734	0
3/24/2010 7:00	2682	0
3/25/2010 7:00	2770	0
3/26/2010 7:00	2689	0
3/29/2010 7:00	2354	0
3/30/2010 7:00	2859	0
3/31/2010 7:00	2714	0

W of Latrobe Rd, Mainline Station 316653
 2011 Count Data, Greater than 75% Observed
 7:00 AM Monday - Thursday, No weekends or holidays
 No HOV Lane Volumes
 Sorted Highest to Lowest

Hour	Flow (Veh/Hour)	% Observed
3/1/2011 7:00	3397	83
3/10/2011 7:00	3355	100
1/18/2011 7:00	3319	100
4/12/2011 7:00	3310	100
2/28/2011 7:00	3300	100
2/9/2011 7:00	3296	100
3/22/2011 7:00	3295	100
5/10/2011 7:00	3294	100
3/8/2011 7:00	3282	100
2/22/2011 7:00	3281	100
2/15/2011 7:00	3265	100
2/2/2011 7:00	3258	100
2/10/2011 7:00	3258	100
5/12/2011 7:00	3246	100
3/29/2011 7:00	3245	100
3/30/2011 7:00	3242	100
3/3/2011 7:00	3241	100
1/27/2011 7:00	3239	100
1/5/2011 7:00	3228	100
2/7/2011 7:00	3221	100
1/20/2011 7:00	3219	100
1/12/2011 7:00	3215	100
1/11/2011 7:00	3213	100
1/4/2011 7:00	3209	100
2/8/2011 7:00	3207	92
5/2/2011 7:00	3201	100
5/16/2011 7:00	3201	100
4/11/2011 7:00	3198	100
1/26/2011 7:00	3192	100
3/15/2011 7:00	3191	100
4/6/2011 7:00	3184	100
4/4/2011 7:00	3175	100
1/19/2011 7:00	3161	100
5/4/2011 7:00	3156	100
2/23/2011 7:00	3155	100
4/26/2011 7:00	3151	100
4/27/2011 7:00	3149	100
1/25/2011 7:00	3148	100
4/14/2011 7:00	3147	100
4/28/2011 7:00	3146	100
4/13/2011 7:00	3143	100
5/24/2011 7:00	3142	100
5/19/2011 7:00	3140	100
1/13/2011 7:00	3136	100
1/24/2011 7:00	3132	100
5/5/2011 7:00	3127	100
4/7/2011 7:00	3125	100

2/24/2011 7:00	3121	100
4/5/2011 7:00	3115	100
6/23/2011 7:00	3112	100
7/12/2011 7:00	3111	100
5/11/2011 7:00	3109	100
5/3/2011 7:00	3108	100
3/16/2011 7:00	3103	92
3/31/2011 7:00	3098	100
3/17/2011 7:00	3097	100
6/28/2011 7:00	3095	100
3/24/2011 7:00	3092	100
2/17/2011 7:00	3088	100
2/3/2011 7:00	3078	92
3/9/2011 7:00	3076	100
1/31/2011 7:00	3075	100
5/26/2011 7:00	3073	100
2/1/2011 7:00	3071	83
3/23/2011 7:00	3060	100
6/15/2011 7:00	3044	100
3/21/2011 7:00	3043	100
3/28/2011 7:00	3031	100
7/11/2011 7:00	3030	100
3/14/2011 7:00	3027	100
5/17/2011 7:00	3026	100
6/2/2011 7:00	3024	100
3/7/2011 7:00	3007	100
2/16/2011 7:00	2996	100
6/27/2011 7:00	2992	100
7/13/2011 7:00	2988	100
4/25/2011 7:00	2986	100
5/25/2011 7:00	2986	100
6/9/2011 7:00	2985	100
6/14/2011 7:00	2971	100
1/6/2011 7:00	2969	100
6/7/2011 7:00	2969	100
6/22/2011 7:00	2968	100
7/19/2011 7:00	2967	100
8/9/2011 7:00	2967	100
7/14/2011 7:00	2956	100
6/30/2011 7:00	2954	100
7/6/2011 7:00	2951	100
7/27/2011 7:00	2948	100
7/25/2011 7:00	2937	100
5/9/2011 7:00	2931	100
6/29/2011 7:00	2928	100
5/31/2011 7:00	2926	100
6/8/2011 7:00	2926	100
7/7/2011 7:00	2914	100
7/18/2011 7:00	2911	100
8/8/2011 7:00	2909	100
2/14/2011 7:00	2904	100
8/4/2011 7:00	2891	100
6/16/2011 7:00	2888	100
5/18/2011 7:00	2885	100
6/21/2011 7:00	2883	100

6/13/2011 7:00	2878	100
7/20/2011 7:00	2868	100
7/26/2011 7:00	2850	100
3/2/2011 7:00	2849	100
7/28/2011 7:00	2837	100
8/3/2011 7:00	2821	100
6/6/2011 7:00	2816	100
8/1/2011 7:00	2809	100
7/5/2011 7:00	2803	100
1/3/2011 7:00	2800	100
7/21/2011 7:00	2774	100
4/18/2011 7:00	2750	100
8/2/2011 7:00	2749	100
4/19/2011 7:00	2688	100
4/20/2011 7:00	2678	100
4/21/2011 7:00	2557	100
11/9/2011 7:00	2353	100
11/16/2011 7:00	2326	100
11/8/2011 7:00	2311	100
11/15/2011 7:00	2274	100
9/21/2011 7:00	2265	100
11/17/2011 7:00	2262	100
9/8/2011 7:00	2249	100
10/11/2011 7:00	2247	100
9/7/2011 7:00	2233	100
9/27/2011 7:00	2216	100
9/29/2011 7:00	2216	100
11/7/2011 7:00	2210	100
10/4/2011 7:00	2208	100
9/13/2011 7:00	2203	100
11/2/2011 7:00	2201	100
11/10/2011 7:00	2201	100
10/6/2011 7:00	2194	100
10/25/2011 7:00	2186	100
12/13/2011 7:00	2183	100
9/15/2011 7:00	2182	100
10/19/2011 7:00	2182	100
10/20/2011 7:00	2179	100
10/18/2011 7:00	2174	100
9/6/2011 7:00	2172	100
11/3/2011 7:00	2162	100
12/14/2011 7:00	2156	100
10/3/2011 7:00	2142	100
9/20/2011 7:00	2138	100
10/12/2011 7:00	2132	100
9/22/2011 7:00	2131	100
12/8/2011 7:00	2130	100
12/7/2011 7:00	2128	100
8/29/2011 7:00	2120	100
10/17/2011 7:00	2118	100
8/25/2011 7:00	2117	100
8/18/2011 7:00	2113	100
9/14/2011 7:00	2111	100
12/1/2011 7:00	2103	100
8/23/2011 7:00	2101	100

10/27/2011 7:00	2100	100
10/26/2011 7:00	2099	100
9/19/2011 7:00	2097	100
10/5/2011 7:00	2094	100
11/14/2011 7:00	2093	100
11/28/2011 7:00	2093	100
9/12/2011 7:00	2088	100
8/17/2011 7:00	2088	100
10/24/2011 7:00	2086	100
12/12/2011 7:00	2073	100
8/24/2011 7:00	2065	100
8/22/2011 7:00	2064	100
12/5/2011 7:00	2050	100
10/31/2011 7:00	2048	100
11/1/2011 7:00	2043	100
12/15/2011 7:00	2038	100
10/13/2011 7:00	2032	100
8/31/2011 7:00	2032	100
8/30/2011 7:00	2018	100
9/28/2011 7:00	1998	100
8/11/2011 7:00	1998	100
9/26/2011 7:00	1982	100
9/1/2011 7:00	1964	100
8/10/2011 7:00	1913	100
11/21/2011 7:00	1900	100
11/30/2011 7:00	1900	100
8/16/2011 7:00	1834	100
12/21/2011 7:00	1833	100
11/22/2011 7:00	1832	100
12/20/2011 7:00	1822	100
12/19/2011 7:00	1813	100
11/29/2011 7:00	1743	100
12/22/2011 7:00	1637	100
11/23/2011 7:00	1519	100
12/29/2011 7:00	1359	100
12/27/2011 7:00	1357	100
12/28/2011 7:00	1352	100

W of Latrobe Rd, Mainline Station 316653
 2014 Count Data, Greater than 75% Observed
 7:00 AM Monday - Friday, No weekends or holidays
 No HOV Lane Volumes
 Sorted Highest to Lowest

Hour	Flow (Veh/Hour)	% Observed
8/12/2014 7:00	3241	100
8/18/2014 7:00	3070	92
9/8/2014 7:00	3012	75
8/14/2014 7:00	2988	100
8/11/2014 7:00	2975	92
7/31/2014 7:00	2956	92
8/7/2014 7:00	2913	100
7/30/2014 7:00	2903	100
8/6/2014 7:00	2895	100
8/13/2014 7:00	2882	100
8/4/2014 7:00	2876	100
1/28/2014 7:00	2847	100
8/28/2014 7:00	2824	100
9/4/2014 7:00	2820	100
12/16/2014 7:00	2820	100
2/25/2014 7:00	2810	100
10/8/2014 7:00	2801	100
2/18/2014 7:00	2800	100
2/19/2014 7:00	2786	100
3/18/2014 7:00	2782	100
10/9/2014 7:00	2773	100
5/15/2014 7:00	2772	92
8/19/2014 7:00	2768	92
11/18/2014 7:00	2765	100
2/5/2014 7:00	2758	100
9/18/2014 7:00	2753	92
2/11/2014 7:00	2753	100
3/3/2014 7:00	2744	100
3/5/2014 7:00	2744	100
1/22/2014 7:00	2741	100
2/13/2014 7:00	2740	100
4/3/2014 7:00	2732	100
5/22/2014 7:00	2728	92
3/6/2014 7:00	2727	100
9/16/2014 7:00	2726	100
3/17/2014 7:00	2725	100
4/8/2014 7:00	2722	100
5/21/2014 7:00	2721	100
2/20/2014 7:00	2720	100
4/29/2014 7:00	2718	100
3/19/2014 7:00	2716	100
3/4/2014 7:00	2715	100
3/11/2014 7:00	2713	100
8/27/2014 7:00	2712	100
9/17/2014 7:00	2710	100
10/7/2014 7:00	2710	100
1/14/2014 7:00	2709	100

5/13/2014 7:00	2706	100
3/20/2014 7:00	2702	100
4/10/2014 7:00	2701	100
1/27/2014 7:00	2700	100
1/29/2014 7:00	2699	100
3/25/2014 7:00	2697	100
3/27/2014 7:00	2697	100
12/9/2014 7:00	2696	100
8/20/2014 7:00	2696	75
9/2/2014 7:00	2694	100
10/6/2014 7:00	2693	100
12/1/2014 7:00	2693	100
11/20/2014 7:00	2692	100
11/19/2014 7:00	2691	100
1/30/2014 7:00	2691	100
4/9/2014 7:00	2689	100
3/13/2014 7:00	2687	100
4/7/2014 7:00	2687	100
12/18/2014 7:00	2686	100
5/12/2014 7:00	2682	100
4/28/2014 7:00	2681	100
2/26/2014 7:00	2679	100
1/13/2014 7:00	2678	100
1/23/2014 7:00	2677	100
5/27/2014 7:00	2674	100
5/7/2014 7:00	2667	100
1/16/2014 7:00	2666	100
2/12/2014 7:00	2666	100
1/7/2014 7:00	2659	100
3/24/2014 7:00	2655	100
5/14/2014 7:00	2654	100
5/6/2014 7:00	2650	100
1/15/2014 7:00	2644	100
4/2/2014 7:00	2640	100
4/22/2014 7:00	2639	100
3/12/2014 7:00	2634	100
5/5/2014 7:00	2632	100
5/1/2014 7:00	2629	100
2/6/2014 7:00	2624	100
4/30/2014 7:00	2623	100
4/24/2014 7:00	2620	100
4/23/2014 7:00	2610	100
12/4/2014 7:00	2595	100
5/28/2014 7:00	2591	83
5/20/2014 7:00	2582	100
3/7/2014 7:00	2580	100
12/15/2014 7:00	2579	100
1/8/2014 7:00	2577	100
7/15/2014 7:00	2567	100
7/21/2014 7:00	2565	100
12/17/2014 7:00	2563	100
10/3/2014 7:00	2560	100
1/6/2014 7:00	2552	100
4/1/2014 7:00	2551	100
9/5/2014 7:00	2549	92

1/9/2014 7:00	2544	100
12/10/2014 7:00	2542	100
12/3/2014 7:00	2536	75
3/26/2014 7:00	2535	100
7/8/2014 7:00	2533	92
2/10/2014 7:00	2527	100
9/19/2014 7:00	2526	100
4/4/2014 7:00	2523	100
6/11/2014 7:00	2523	92
6/30/2014 7:00	2522	100
7/24/2014 7:00	2508	92
5/16/2014 7:00	2507	100
4/11/2014 7:00	2488	100
5/8/2014 7:00	2487	100
7/9/2014 7:00	2482	92
7/14/2014 7:00	2482	92
6/26/2014 7:00	2480	100
7/1/2014 7:00	2475	100
7/22/2014 7:00	2475	100
5/29/2014 7:00	2468	100
9/12/2014 7:00	2467	92
9/3/2014 7:00	2464	100
6/25/2014 7:00	2457	92
6/3/2014 7:00	2456	100
7/23/2014 7:00	2452	83
6/9/2014 7:00	2446	100
3/14/2014 7:00	2445	100
7/16/2014 7:00	2441	100
7/28/2014 7:00	2441	100
7/10/2014 7:00	2433	100
4/15/2014 7:00	2429	100
5/2/2014 7:00	2427	100
5/9/2014 7:00	2426	100
6/2/2014 7:00	2415	100
7/17/2014 7:00	2413	75
3/28/2014 7:00	2408	100
4/16/2014 7:00	2406	100
3/31/2014 7:00	2398	100
4/14/2014 7:00	2398	100
6/17/2014 7:00	2386	83
6/19/2014 7:00	2383	92
4/17/2014 7:00	2382	100
6/10/2014 7:00	2382	100
7/2/2014 7:00	2376	100
6/5/2014 7:00	2373	100
6/12/2014 7:00	2368	92
3/10/2014 7:00	2359	100
4/25/2014 7:00	2351	100
6/16/2014 7:00	2332	100
6/4/2014 7:00	2318	100
5/23/2014 7:00	2302	100
5/30/2014 7:00	2284	100
12/22/2014 7:00	2205	100
7/3/2014 7:00	2193	83
1/2/2014 7:00	2057	83

12/23/2014 7:00	2041	100
11/26/2014 7:00	2016	100
4/18/2014 7:00	2010	100
12/30/2014 7:00	1950	100
12/29/2014 7:00	1905	100
12/11/2014 7:00	1877	100
12/31/2014 7:00	1665	100
12/24/2014 7:00	1436	100

W of Latrobe Rd
 Mainline Station 316653
 2010 All Hours
 No HOV Lane Volumes
 Sorted Highest to Lowest

Methodology:

Eliminated Hours with less than 80% observed

Found the following:

30th Highest Hour: 3169 10/27/2010 7:00

200th Highest Hour: 2786 2/17/2010 8:00

Average between 30th & 200th: 2955

Hour	Flow (Veh/Hour)	% Observed	Rank (Highest Hour)
12/1/2010 7:00	3467	100	1
4/15/2010 7:00	3348	100	2
2/16/2010 7:00	3344	100	3
4/22/2010 7:00	3339	100	4
3/11/2010 7:00	3330	100	5
2/22/2010 7:00	3309	100	6
12/2/2010 7:00	3309	100	7
4/19/2010 7:00	3304	100	8
3/9/2010 7:00	3298	100	9
2/2/2010 7:00	3293	100	10
3/1/2010 7:00	3293	100	11
3/23/2010 7:00	3275	100	12
2/23/2010 7:00	3268	100	13
4/8/2010 7:00	3268	100	14
1/25/2010 7:00	3250	100	15
4/6/2010 7:00	3235	92	16
3/24/2010 7:00	3233	100	17
2/4/2010 7:00	3232	100	18
3/16/2010 7:00	3231	100	19
2/11/2010 7:00	3221	100	20
4/7/2010 7:00	3214	100	21
11/30/2010 7:00	3214	100	22
1/21/2010 7:00	3208	100	23
11/29/2010 7:00	3195	100	24
11/9/2010 7:00	3188	100	25
11/15/2010 7:00	3188	100	26
3/8/2010 7:00	3186	100	27
11/8/2010 7:00	3183	100	28
4/13/2010 7:00	3174	100	29
10/27/2010 7:00	3169	100	30
11/3/2010 7:00	3159	100	31
1/14/2010 7:00	3156	100	32
3/17/2010 7:00	3148	100	33
3/25/2010 7:00	3144	100	34
2/8/2010 7:00	3143	100	35
1/6/2010 7:00	3142	100	36
3/18/2010 7:00	3142	100	37
12/7/2010 7:00	3136	100	38
2/17/2010 7:00	3133	100	39
10/28/2010 7:00	3128	100	40

11/10/2010 7:00	3128	100	41
11/1/2010 7:00	3118	100	42
11/16/2010 7:00	3112	100	43
11/18/2010 7:00	3107	100	44
10/26/2010 7:00	3105	100	45
1/27/2010 7:00	3101	100	46
4/21/2010 7:00	3099	100	47
1/26/2010 7:00	3093	100	48
11/17/2010 7:00	3091	100	49
12/14/2010 7:00	3086	100	50
2/24/2010 7:00	3084	100	51
1/20/2010 7:00	3082	100	52
5/19/2010 7:00	3080	100	53
1/12/2010 7:00	3073	100	54
5/12/2010 7:00	3066	100	55
9/14/2010 7:00	3066	100	56
9/1/2010 7:00	3064	100	57
1/7/2010 7:00	3061	100	58
2/1/2010 8:00	3061	100	59
5/17/2010 7:00	3060	100	60
11/2/2010 7:00	3059	100	61
8/31/2010 7:00	3058	100	62
2/25/2010 8:00	3055	100	63
2/3/2010 7:00	3054	100	64
5/25/2010 7:00	3052	100	65
10/19/2010 7:00	3051	100	66
12/13/2010 7:00	3048	100	67
1/19/2010 7:00	3044	100	68
9/2/2010 7:00	3042	100	69
9/9/2010 7:00	3038	100	70
11/4/2010 7:00	3038	100	71
12/6/2010 7:00	3038	100	72
9/15/2010 7:00	3033	100	73
8/30/2010 7:00	3032	100	74
10/20/2010 7:00	3032	100	75
2/3/2010 8:00	3030	100	76
8/17/2010 7:00	3030	100	77
2/26/2010 7:00	3029	100	78
4/12/2010 7:00	3029	100	79
10/13/2010 7:00	3029	100	80
9/8/2010 7:00	3027	100	81
2/9/2010 7:00	3026	100	82
3/22/2010 7:00	3025	100	83
9/21/2010 7:00	3025	100	84
3/4/2010 7:00	3024	100	85
12/16/2010 7:00	3023	100	86
5/18/2010 7:00	3020	100	87
2/18/2010 7:00	3012	100	88
6/7/2010 7:00	3011	100	89

8/26/2010 7:00	3006	100	90
10/5/2010 7:00	3001	100	91
3/3/2010 7:00	2998	100	92
8/24/2010 7:00	2995	100	93
9/16/2010 7:00	2994	100	94
10/6/2010 7:00	2990	100	95
12/9/2010 7:00	2990	100	96
3/2/2010 7:00	2987	100	97
6/8/2010 7:00	2986	100	98
9/22/2010 7:00	2982	100	99
10/14/2010 7:00	2979	100	100
12/15/2010 7:00	2976	100	101
1/5/2010 7:00	2975	100	102
3/5/2010 7:00	2970	100	103
2/22/2010 8:00	2968	100	104
4/20/2010 7:00	2968	100	105
3/26/2010 7:00	2967	100	106
1/13/2010 7:00	2965	100	107
10/7/2010 7:00	2961	100	108
5/13/2010 7:00	2960	100	109
11/19/2010 7:00	2958	100	110
9/23/2010 7:00	2957	100	111
10/21/2010 7:00	2956	100	112
9/29/2010 7:00	2955	100	113
8/18/2010 7:00	2949	100	114
9/7/2010 7:00	2948	100	115
3/22/2010 8:00	2947	100	116
5/11/2010 7:00	2947	100	117
8/10/2010 7:00	2946	100	118
2/10/2010 7:00	2944	100	119
6/15/2010 7:00	2943	100	120
9/13/2010 7:00	2943	100	121
8/25/2010 7:00	2941	100	122
3/10/2010 7:00	2934	100	123
6/10/2010 7:00	2932	100	124
10/12/2010 7:00	2931	100	125
8/9/2010 7:00	2930	100	126
5/20/2010 7:00	2929	100	127
9/27/2010 7:00	2929	100	128
4/16/2010 7:00	2924	100	129
4/5/2010 7:00	2923	100	130
9/20/2010 7:00	2922	100	131
7/6/2010 7:00	2919	100	132
9/30/2010 7:00	2916	100	133
1/4/2010 7:00	2914	100	134
2/24/2010 8:00	2912	100	135
6/2/2010 7:00	2912	100	136
10/25/2010 7:00	2903	100	137
5/10/2010 7:00	2902	100	138

6/14/2010 7:00	2900	100	139
3/18/2010 8:00	2897	100	140
4/9/2010 7:00	2896	100	141
10/18/2010 7:00	2895	100	142
11/29/2010 8:00	2893	100	143
12/16/2010 8:00	2892	100	144
2/5/2010 7:00	2888	100	145
4/12/2010 8:00	2888	100	146
8/23/2010 7:00	2888	100	147
10/4/2010 7:00	2886	100	148
6/24/2010 7:00	2885	100	149
6/9/2010 7:00	2883	100	150
6/16/2010 7:00	2883	100	151
8/11/2010 7:00	2878	100	152
5/26/2010 7:00	2875	100	153
11/5/2010 7:00	2875	100	154
2/9/2010 6:00	2870	100	155
3/9/2010 8:00	2867	100	156
4/21/2010 8:00	2867	100	157
12/17/2010 7:00	2865	100	158
6/3/2010 7:00	2860	100	159
3/11/2010 8:00	2856	100	160
12/6/2010 8:00	2856	100	161
4/15/2010 8:00	2855	100	162
3/23/2010 8:00	2853	100	163
8/5/2010 7:00	2851	100	164
6/1/2010 7:00	2848	100	165
6/30/2010 7:00	2848	100	166
11/12/2010 7:00	2846	100	167
4/19/2010 8:00	2845	100	168
3/8/2010 8:00	2839	100	169
2/18/2010 8:00	2838	100	170
2/2/2010 8:00	2836	100	171
10/22/2010 7:00	2836	100	172
12/1/2010 8:00	2836	100	173
2/25/2010 7:00	2835	100	174
7/20/2010 7:00	2833	100	175
3/12/2010 7:00	2832	100	176
3/17/2010 8:00	2832	100	177
10/11/2010 7:00	2831	100	178
10/29/2010 7:00	2831	100	179
8/19/2010 7:00	2828	100	180
1/12/2010 8:00	2826	100	181
11/23/2010 7:00	2826	100	182
6/29/2010 7:00	2822	100	183
11/30/2010 8:00	2822	100	184
3/1/2010 8:00	2816	100	185
1/19/2010 8:00	2814	100	186
3/16/2010 8:00	2811	100	187

7/27/2010 7:00	2810	100	188
12/10/2010 7:00	2809	100	189
3/9/2010 6:00	2806	100	190
8/3/2010 7:00	2805	92	191
3/19/2010 7:00	2805	100	192
10/1/2010 7:00	2805	100	193
4/7/2010 8:00	2803	100	194
6/22/2010 7:00	2803	100	195
12/7/2010 8:00	2796	100	196
5/27/2010 7:00	2794	100	197
8/2/2010 7:00	2791	100	198
11/2/2010 8:00	2787	100	199
2/17/2010 8:00	2786	100	200

Table 3.9-3. Level of Service Typical Traffic Volumes

Operational Class ^a	Class Code	Peak-Hour LOS Traffic Volumes ^d				
		A	B	C	D	E
Minor Two-Lane Highway ^b	2R, W20, W18	-	330	710	1,310	2,480
Major Two-Lane Highway ^b	2U	-	330	710	1,310	2,480
Two-Lane Arterial ^a	2A	-	-	850	1,540	1,650
Four-Lane Arterial, Undivided	4AU	-	-	1,760	3,070	3,130
Four-Lane Arterial, Divided	4AD	-	-	1,850	3,220	3,290
Six-Lane Arterial, Divided	6AD	-	-	2,760	4,680	4,710
Two Freeway Lanes ^c	2F	-	2,070	2,880	3,590	4,150
Two Freeway Lanes + Auxiliary Lane ^c	2FA	-	2,610	3,630	4,520	5,230
Three Freeway Lanes ^c	3F	-	3,100	4,320	5,380	6,230
Three Freeway Lanes + Auxiliary Lane ^c	3FA	-	3,640	5,070	6,320	7,310
Four Freeway Lanes ^c	4F	-	4,140	5,760	7,180	8,310

Source: Kimley-Horn and Associates 2014.

^a Roadways are classified based on their operational characteristics which do not necessarily correspond to their functional definition.

^b Only roadways meeting the HCM criteria, including those related to signal spacing, for Two-Lane Highways are designated as such.

^c Service volumes are for a single direction.

^d Some LOS thresholds may not be determinable/achievable depending on facility type.

Note:

The planning thresholds shown in this table are provided for the purpose of assisting in the identification of locations where operational problems may exist and are based on information provided in the 2010 HCM and other industry sources. These values are not appropriate for making detailed or final determinations regarding operational or design considerations. Those determinations should only be made after a detailed operational analysis, consistent with current HCM procedures, and/or other design evaluations are completed.