
Traffic Impact Analysis Guidelines

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1 Introduction

The City of Redding has established guidelines for the preparation of Traffic Impact Analysis (TIA) reports. The purpose of these guidelines is to streamline development review and approval by promoting consistent and adequate traffic analyses. A TIA is prepared for a project before a discretionary action is approved such as a land use zoning change, subdivision map, use permit, or other development application. By providing clear assumptions, methods, and format, these guidelines help to speed the creation and review of TIA reports consistent with requirements of the California Environmental Quality Act (CEQA), Subdivision Map Act, and Redding Municipal Code (RMC).

It is important for the report to be prepared in close coordination with City transportation and planning staff and other affected agencies.

Coordination should include:

- ❑ A pre-application meeting, including a discussion of the requirements for the TIA
- ❑ Development of an approved scope of work, including the study area, appropriate scenarios, data and analysis requirements, and any special issues
- ❑ Review of all traffic assumptions and existing conditions
- ❑ Review of the draft report

Supplemental analysis may be required after the draft TIA is submitted based on review by City staff and comments from citizens and other affected agencies, the Planning Commission, or the City Council.

2 Basic Requirements

All final TIA reports submitted to the City shall be prepared and stamped by a professional traffic engineer holding a valid license issued by the state of California. An example of the report format is provided in Appendix A.

2.1 When a TIA is required- A TIA is required when a project would potentially cause a substantial increase in traffic in relation to the traffic levels and capacity of the street system. This is often the case when a project would add thirty-five (35) or more new vehicle trips (one-way) to City streets during a peak hour. Generally, developments larger than those shown in Table 2.1 would generate this level of traffic and would require a TIA report.

A TIA may also be required in areas where any amount of additional traffic may impact a congested location, or when specific site access issues are of concern. These determinations will be made during preparation of the study scope.

The California Department of Transportation provides additional guidance for projects affecting state facilities in Caltrans' *Guide for the Preparation of Traffic Impact Studies*.

**TABLE 2.1
Development Sizes Typically Requiring a TIA**

General Industrial (ITE #110)	36,000 sq. ft. or more
Single Family Home (ITE #210)	35 homes or more
Apartment (ITE #220)	56 units or more
Hotel (ITE #310)	59 rooms or more
Office Building (ITE #710)	12,000 sq. ft. or more
General Retail (ITE #820)	8,000 sq. ft. or more
Sit-down Restaurant (ITE #932)	3,000 sq. ft. or more
Fast Food w/ Drive-Through (ITE #934)	650 sq. ft. or more

Note: ITE # Indicates the Institute of Transportation Engineers land use code number

2.2 When to update an existing TIA- CEQA requires a TIA to be updated if a proposed project is changed in a way that increases the project trips. Additionally, if a proposed project undergoes other significant changes or scheduling delays after the TIA has been prepared, the TIA shall be supplemented or updated as shown in Table 2.2:

**TABLE 2.2
Guidelines for Updating or Supplementing an Existing TIA**

Criteria	Guideline
If the project trips increase	Revise the TIA
If the TIA is older than 2 years	Provide a Technical Memorandum confirming the same conclusions – or – Revise the TIA
If the Project access or distribution has significantly changed	Provide a Technical Memorandum confirming the same conclusions – or – Revise the TIA

2.3 Submittals and Review- The project applicant shall submit **3 bound copies** of the draft TIA report, including appendices, to the City. An example of the study format is provided in Appendix A. A **preliminary review** will determine if the draft report is consistent with these guidelines. A copy of the preliminary review form is provided in Appendix F. If significant deviations are identified, the draft TIA shall be considered incomplete and the City will forward a notice of technical deficiencies to the preparer.

Upon submittal of a draft TIA report consistent with these guidelines, the City will conduct a **final review**. If additional information is needed to clarify or support the findings in the TIA, a written request for revisions will be forwarded to the preparer. Following completion of the final review, the engineer shall revise and submit **5 bound copies** of the final TIA. The City may require additional copies of the final report. A copy of the complete final TIA report and appendices shall be provided in electronic format as required in the TIA scope. Development applications can not be deemed complete until the City receives the final approved TIA. All materials submitted to the City are part of the public record and become the property of the City of Redding.

3 Scope of Analysis

To facilitate development review, the applicant and the applicant's traffic engineer should meet with City transportation and planning staff, as well as other affected agencies as appropriate, to determine the study scope. A standard scoping form is provided in Appendix B for use during this scoping meeting. Preparation of the draft traffic study should not begin until after the City approves the study scope. The planner assigned to the project will provide a letter to the applicant approving the scope of the TIA. The approved scope governs in the event of any discrepancy with these guidelines.

The scope of analysis will vary with each study. No study will require all of the items listed below. Considerations for the study scope may include the following:

3.1 General Information

A) Study Area- The study limits are based on the proposed development size, the land use, existing traffic conditions, and discussion with City and other affected agency staff. The TIA shall describe the basis for selecting the study area.

B) Scenarios- The scope should consider the following existing scenarios:

- Existing
- Project Only
- Existing + Proposed Project

The scope should consider the following cumulative scenarios:

Either:

- Existing + Approved/Pending Project List
- Existing + Approved/Pending Project List + Proposed Project

Or:

- 2030 Shasta County Travel Demand Model (SCTDM) without Proposed Project
- 2030 SCTDM + Proposed Project

The scope for multi-phased projects may include evaluation of the estimated conditions one year after full occupancy of each development phase and may also include determination of the timing of recommended project improvements.

C) Approved and Pending Project List- When required by the City, a list of approved and pending projects, assumed to be constructed and fully occupied in the analysis, will be developed as part of the early coordination with City transportation and planning staff. City staff will provide a copy of any existing traffic studies.

D) Analysis Periods- Commercial projects should evaluate each scenario during weekday PM and Saturday mid-day peak hours, or as otherwise determined in the scope. Residential, office, and industrial projects should evaluate each scenario for weekday AM and PM peak hours, or as determined in the scope.

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- E) General Plan Amendments-** When a project includes a General Plan amendment that would increase the potential traffic generation compared to the existing land use designation, the study scope may require analysis based on the existing land use as well as the proposed new land use.
- F) Programmed Transportation Improvements-** The future roadway network (without the project) is assumed to include all programmed transportation facility improvements within the study area, as reflected in the City's most recently adopted Capital Improvement Plan or as established with other project approvals. A list of programmed improvements will be developed as part of the early consultation with City transportation and planning staff and other affected agencies.
- G) Changes to the Traffic Model-** The TIA shall clearly describe and document changes made to the SCTDM to accommodate the analysis of the proposed project. Documentation shall identify the original source model files, revisions to the road network, revisions to Traffic Analysis Zones (TAZ), and revisions to land use. Appendix C provides an example table for documenting changes to the model.

3.2 Study Data- Data required by the study scope shall be collected in accordance with the methods listed in section 4.1.

- A) Traffic Counts-** The scope of work shall require new counts to be collected at each of the study intersections and/or study roadway segments. Locations for truck counts, when required, shall also be identified in the study scope.

Existing traffic count data provided by the City or data from other projects' approved traffic studies may be used if the count data is less than 2 years old and no significant project development has occurred in the surrounding area.

- B) Pedestrian Counts-** The study scope may require new pedestrian counts at identified intersections.
- C) Other Data-** The City and Caltrans can provide other available data, including existing traffic signal timing data and collision data if needed. The preparer should request available data when the scope of work is finalized.

3.3 Intersection Analysis- Intersection analysis required by the study scope shall be in accordance with the methods listed in section 4.5.

- A) Intersections-** The scope shall identify study intersections to be evaluated for potential traffic impacts, including all project access locations. At each identified study intersection, the report appendix shall include analysis worksheets that provide average delay, Level of Service (LOS), v/c ratios, and 95th percentile Queue Lengths. At two-way stop controlled intersections, the report appendix shall provide these parameters for the worst-case movements.
- B) Signal Warrants-** The report shall provide the peak-hour volume warrant for each unsignalized intersection having a deficient LOS in each scenario.

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- C) **Turn Lane Storage-** The report shall identify and disclose turn lane storage deficiencies at each study intersection where project traffic causes queues to exceed the available storage length or spill over into adjacent intersections, based on estimated 95th percentile queue lengths.
- D) **Closely Spaced Intersections-** The analysis shall account for interaction between individual intersections, saturated flow metering, and queue spillback between intersections.

3.4 Roadway Segment Analysis- Roadway segment analysis required by the study scope shall be in accordance with the methods listed in section 4.5.

- A) **Roadways-** The scope may require roadway segment LOS analysis to identify potential traffic impacts on study roadway segments. When roadway segment analysis is required, the scope shall also identify which analysis method (detailed in section 4.5.E) to use.
- B) **Local Streets and Residential Collectors-** For any type of development, the scope may require identification of local streets and residential collectors, internal and adjacent to the project, which are estimated to exceed the acceptable levels of traffic for these facilities, with the addition of project traffic. The scope may require recommendations to reduce these volumes where feasible, including additional project access routes, traffic calming, and other recommendations.
- C) **State Facilities-** The scope may require freeway mainline, weaving, and/or ramp merge/diverge LOS analysis on affected Caltrans facilities.
- D) **Speed Survey-** The scope may require a speed survey on identified roadway segments to determine the average and 85th percentile speeds using either radar or traffic hoses as specified in the scope.
- E) **Floating Car Runs-** The scope may require floating car runs to determine the existing average travel speed and LOS along a corridor.
- F) **Cut Through Traffic-** The scope may require a cordon license plate survey or another definitive data collection method to determine existing cut-through traffic.

3.5 Project Analysis- Project trips shall be determined in accordance with the methods listed in section 4.2.

- A) **Project Driveways and Access-** The scope may require evaluation of each proposed project access point for safety of ingress and egress to include:
 - Minimum sight distance requirements
 - Turn lane configuration, minimum required throat depth, 95th percentile queue lengths, and disclosure of turn lane spill-over
 - Shared driveways and access management (right-in / right-out, etc.)
 - Impacts to other driveways and intersections
 - Conformance to RMC 18.41.140 and 150 for entrances and setbacks

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A signal warrant analysis shall be provided for any new signal proposed at a project access, according to the method described in section 4.5.B. When required in the scope, cumulative analysis of project driveways shall include the effect of traffic loading from the build-out of vacant properties that would take future access directly opposite the project access points.

- B) On-site Parking and Circulation-** The scope may require an evaluation of the adequacy of on-site parking per RMC 18.41 and identification of impacts to off-site parking. It may also require an evaluation of on-site circulation, including truck loading and turning radii, based on the design vehicle identified in the scope.
- C) Drive-Thru Facilities-** The scope may require a queuing analysis for proposed on-site drive-thru facilities.
- D) Project Phasing-** The scope may require certain projects to complete a phasing analysis to relate potential traffic impacts to specific phases of the proposed project.
- E) Analysis of Recommended Project Mitigations-** The study shall provide LOS analysis of recommended project mitigations. The study scope may also require:
 - The cumulative pro-rata fair share percentage for improvements, based on Caltrans methodology (see Appendix G)
 - A preliminary cost estimate for improvements
 - A schematic scaled drawing or a preliminary design to show the feasibility of the recommended mitigations and geometric improvements, including right of way needs for significantly impacted facilities

3.6 Other Analysis

- A) Bicycle and Pedestrian Facilities-** The scope may require determination of consistency with the *Parks, Trails and Open Space Master Plan* and identification of potential impacts to existing or planned bicycle and pedestrian facilities. The scope may require determination of pedestrian and bicycle generation and an evaluation of on-site pedestrian and bicycle circulation.
- B) Transit-** The study shall identify all bus routes having a stop within ¼ mile of the project and evaluate pedestrian access routes from the project to the stops.
- C) Safety-** The scope may require a qualitative evaluation of potential traffic safety impacts caused by additional project traffic, design features or incompatible land uses. It may require recommendations for project improvements to address potentially increased hazards.
- D) Community Input-** When required, reasonable requests generated by the community should be addressed in the study, at the discretion of City staff.
- E) Supplemental Documentation-** The study scope may require other focused traffic analyses relative to the proposed development including traffic calming, safe routes to schools, emergency routes, traffic index for pavement sections, etc.

4 Methods

In order to ensure the adequacy of traffic analysis, the TIA shall be based on the following standard methods:

4.1 Data Collection Method

- A) **Traffic Counts-** Turning movement counts for the weekday morning and evening peak hours shall be collected from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., respectively, at 15-minute intervals. Saturday mid-day counts shall be conducted from 11:00 a.m. to 1:00 p.m. at 15-minute intervals. Traffic counts for other time periods will be required if the peak hour trips for the project fall outside these time ranges, for example, schools, theaters, and churches.

Weekday average vehicle counts should be conducted on Tuesdays, Wednesdays, and Thursdays in dry weather conditions.

Data shall not be collected during holidays, days immediately before or after holidays, or during the last two weeks in December. Data should not be collected at times when spring break or summer break could significantly alter the data.

Historical traffic counts may not be used if more than two years old.

4.2 Project Trip Generation Method

- A) **Land Use-** Professional judgment should be used in determining appropriate land use categories from the current edition of *ITE Trip Generation*. When ITE data is not available or if it is inadequate for a specific project, other data sources may be acceptable, such as San Diego Trip Generation, *ITE Journal* articles, or local trip generation rates based on a local trip generation study, following the procedures prescribed in *ITE Trip Generation*. Appropriate supporting information and pre-approval is required for the use of these other data sources.

- B) **Trip Generation-** Trip generation for the proposed project and for all approved/pending projects shall be based on the latest edition of *ITE Trip Generation*, with the exceptions listed above. The time period selected should generally reflect peak travel periods on adjacent streets. The guidance provided in chapter three of the latest edition of *ITE Trip Generation Handbook* shall be used to determine the appropriate use of either the average rates or rates from the fitted curve equations given for each land use.

On projects that include a general plan amendment, the potential trip generation for the existing land use, when required, shall be based on the average intensity allowed by the existing zoning for the project site.

- C) **Trip Reduction-** Potential reductions in project trip generation may be considered, when approved by the City in advance. Reductions to trip generation shall be based

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on the guidance provided in the latest edition of ITE's *Trip Generation Handbook*. The potential reductions are:

- 1) Existing project site trips may be deducted in the analysis if those trips are included in new traffic counts of existing conditions and the existing traffic distribution is similar to that for the proposed project.
 - 2) Pass-by trip adjustments may be applied to commercial developments. Pass-by trips are existing trips which, when passing the site on an adjacent street with direct access to the site, are attracted to the project. The traffic impact study shall provide justification for reductions greater than 15%. Refer to chapter 5 of the most recent edition of the *ITE Trip Generation Handbook* for pass-by percentages and adjustment method. Analysis of turning movements at project access points generally shall include the pass-by trips.
 - 3) Internal or captured trips are trips that do not enter or leave the driveways of a project within a mixed-use development's boundaries. Reductions greater than 5% require justification in the study. Refer to chapter 7 of the most recent edition of the *ITE Trip Generation Handbook*.
- D) Trip Distribution-** Trip distribution assumptions are to be clearly stated in the report, including the distribution at all project access points. Directional trip distribution should be estimated based on the SCTDM, existing traffic patterns, market analysis, applied census data, and professional judgment. The trip distribution shall be presented for each phase if changes in roadway network, access, or land use are proposed. Final acceptance of the trip distribution assumption is subject to approval of the City Traffic Engineer.

4.3 Traffic Forecast Method- The current version of the SCTDM shall be used as the basis for projecting future traffic volumes. Projections shall be based on the growth-increment method (see the Transportation Research Board National Cooperative Highway Research Program (NCHRP) Report 255, Ch. 8). Any negative increments shall be justified and explained. The report shall evaluate the land use assumptions and model roadway network in the study area and make adjustments as necessary.

The SCTDM does not include a midday Saturday or Sunday component. When the study scope requires a weekend analysis, the following method shall be used to forecast traffic:

1. Use the SCTDM to develop weekday daily traffic growth factors for individual roadways (approach and departure).
2. Apply these weekday growth factors to existing weekend peak hour roadway counts to develop future weekend peak hour roadway volumes.
3. Convert the future weekend peak hour roadway volumes to intersection turning movements by applying the iterative method provided in NCHRP Report 255.

4.4 Level of Service (LOS) Standard- The minimum LOS standard to be used in the analysis shall be consistent with City of Redding General Plan Policy T1A:

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- ❑ *LOS “C”- for most arterial streets and their intersections.*
- ❑ *LOS “D”- for the Downtown area.*
- ❑ *LOS “D”- for streets within the State highway system and interchanges.*
- ❑ *LOS “D”- for river-crossing street corridors whose capacity is affected by adjacent intersections.*

For two-way stop controlled intersections, the minimum LOS standard is LOS “C” for the worst-case movement. See section 5.4 for the significance threshold for two-way stop controlled intersections.

For state-owned facilities, Caltrans’ *Guide for the Preparation of Traffic Impact Studies* states: “Caltrans endeavors to maintain a target LOS at the transition between LOS “C” and LOS “D” on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE (measure of effectiveness) should be maintained.” Projects impacting state facilities will be subject to review by Caltrans.

4.5 Assumptions and Analysis Methods

- A) Assumptions-** The technical parameters shown in Figure 4.5 shall be assumed in the analysis, unless specified otherwise in the study scope:

FIGURE 4.5

- ❑ *Analysis period 0.25 hr*
- ❑ *Peak Hour Factor 0.92*
- ❑ *Flat Grade*
- ❑ *Heavy Vehicles- on state facilities, obtain the actual existing % heavy vehicles. Otherwise, assume 2% as provided in the HCM*
- ❑ *25 ft. assumed vehicle length for stacking and queues*
- ❑ *Cycle length- 80 sec min., 150 sec max. (optimize the signal timing)*
- ❑ *Coordinated Cycle Length- use the actual existing coordinated cycle length provided by the City or Caltrans*
- ❑ *Total lost time per signal phase- 4 seconds (24 sec max. for 8-phase)*
- ❑ *Ideal saturation flow rate- 1,900 vph or 1,710 vph as provided in the HCM*
- ❑ *Pedestrian calls- 5 per hour*
- ❑ *Pedestrian Speed- 3.5 ft/s walking and 10 mph for bicycles*

- B) Intersection Analysis-** LOS analysis for signalized and stop controlled intersections in the study area shall be based on the latest edition of the Highway Capacity Manual (HCM). The Operational Methodology of the HCM shall be used for signalized intersections. Roundabout intersections should be analyzed using SIDRA or RODDEL software.

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C) Signal Warrants- Evaluation shall be based on the peak hour volume warrant (warrant #3) in the latest edition of the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD).

D) Closely Spaced Intersections- Micro simulation using the average of multiple runs (minimum of 5) shall be used in evaluating the compound effects of closely spaced intersections when the distance between intersections is less than 300 feet or when the estimated 95% queue lengths exceed the distance between intersections. The distance between intersections does not include any area within the intersections themselves.

E) Urban Street and Roadway Segment Analysis-

1. For collectors, arterials, and expressways, the study scope shall identify one of the following analysis methods:

Method 1 is based on average travel speed and the methods presented in chapter 15 of the HCM. This method is not intended for application to a short roadway segment. While this method determines the directional LOS for each individual segment along a roadway, only the over-all directional LOS shall be used for identifying project impacts. The results for individual segments along the overall roadway shall be provided for information only.

Method 2 uses the following peak hour service volume table:

TABLE 4.5.E

Roadway Type	Maximum Peak Hour Volume per Lane					
	LOS:	A	B	C	D	E
1 Expressway-High Access Control		570	660	760	850	950
2 Expressway-Moderate Access Control		520	610	700	790	870
3 Divided Arterial (w/ LTL)		500	560	650	730	810
4 Undivided Arterial (no LTL)		410	470	540	610	680
5 Collector		270	340	410	470	540

Based on HCM 2000 Ch. 10.

One-way streets shall be evaluated by an LOS analysis of selected intersections.

2. For local streets and some residential collector streets, access and livability are of primary importance. A capacity-based LOS analysis is not appropriate for evaluating project impacts. Instead, the objectives for the amount of traffic these streets may carry are:

- ❑ Local Streets: 2,000 vehicles per day and 180 peak hour vehicles
- ❑ Residential Collectors: 4,000 vehicles per day and 360 peak hour vehicles

The residential collector limit applies to collector streets having individual access from single-family lots. City staff will work with the preparer of the TIA to ensure the proper street classification is identified.

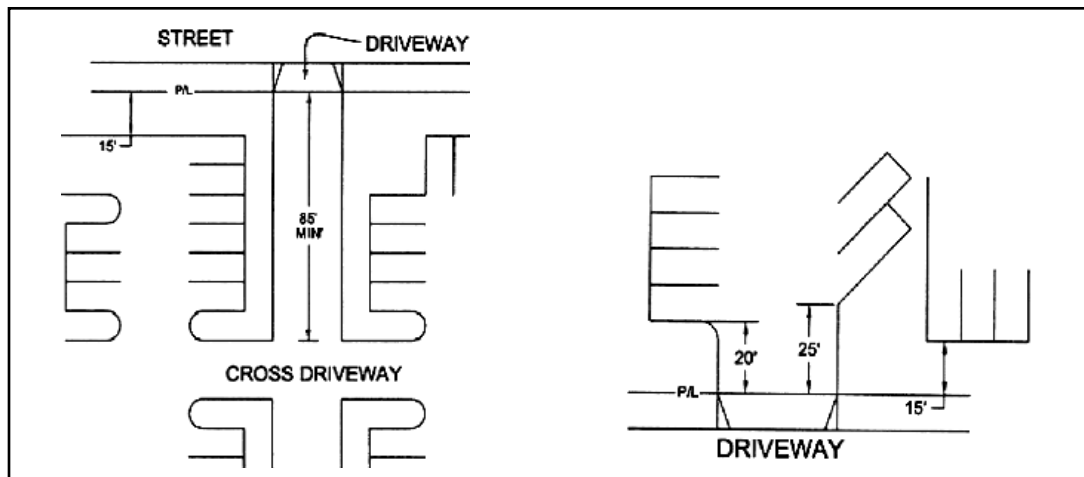
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- F) Project Access-** Minimum sight distances shall be in accordance with Exhibit 3-1 in AASHTO's *A Policy on Geometric Design of Highways and Streets*.

The minimum required throat depth shall not be less than the on-site 95th percentile queue length. Additionally, primary driveways to a facility having more than one hundred fifty parking spaces shall have a minimum setback distance of eighty-five feet behind the property line, as provided in RMC 18.41.140.D, but in no case less than the 95th percentile queue length.

For smaller off-street parking areas, ninety-degree angled parking spaces shall have a minimum setback of twenty feet behind the property line. Similarly, parking spaces with less than a ninety-degree angle toward the street, shall maintain a twenty-five-foot setback. An additional five-foot setback shall be required where the street does not have a parking lane, as provided in RMC 18.41.150.

FIGURE 4.5.F



- G) State Facilities-** State facilities included in the study scope shall be analyzed using methods consistent with the latest version of Caltrans *Guide for the Preparation of Traffic Impact Studies*. Highway weaving analysis shall be consistent with Caltrans' *Highway Design Manual* section 504.7 methodology. Ramp merge and ramp diverge analysis shall be in accordance with the latest HCM methodology.
- H) Fair Share-** Fair share shall be based on Caltrans methodology as provided in Caltrans' *Guide for the Preparation of Traffic Impact Studies*. The fair share for a significant impact that is triggered in more than one peak hour shall be determined using the peak hour volumes for the most significant impact.
- I) Multiple TIA Consistency-** When two separate TIA reports are prepared concurrently by different consultants and they each study the same unsignalized intersection, the two analyses of that intersection shall be consistent and directly comparable. Traffix or HCS software shall be used to analyze the overlapping unsignalized intersection in this case. TIA reports by different consultants that do not overlap may use any HCM based analysis software.

5 Significant Impact and Mitigation Thresholds

A nexus exists between a proposed development and a significant traffic impact when the development causes any of the following thresholds to be exceeded in any scenario:

5.1 Signalized Intersections

- The project causes an acceptable LOS to decline to an unacceptable LOS, or
- The project increases the average delay by more than 5 seconds per vehicle at an intersection having an unacceptable LOS without project traffic

5.2 All-Way Stop Intersections

- The project causes an acceptable LOS to decline to an unacceptable LOS, or
- The project increases the overall average delay by more than 5 seconds per vehicle at an intersection that has an unacceptable LOS without the project and the intersection also meets the peak hour volume signal warrant

5.3 Two-Way Stop Intersections

- The project causes the following to occur for the worst-case movement:
 - The LOS declines to an unacceptable LOS, and
 - The volume to capacity ratio exceeds 0.75, and
 - The 95th percentile queue exceeds 75 feet (3 vehicles), or
- The project causes the worst-case movement's acceptable LOS to decline to an unacceptable LOS and the peak hour volume signal warrant is met, or
- The project increases the average delay for the worst-case movement by more than 5 seconds per vehicle at an intersection that has an unacceptable LOS without the project and the intersection also meets the peak hour volume signal warrant

5.4 Roadways

- The project causes an acceptable LOS to decline to an unacceptable LOS, or
- The project causes the V/C ratio to increase by more than 0.05 on a roadway having an unacceptable LOS without project traffic
- The project causes the amount of traffic on a local street to exceed 2,000 daily vehicles or 180 peak hour vehicles; or adds any amount of traffic to a local street which exceeds these limits without the project
- The project causes the amount of traffic on a residential collector, having individual access to single family lots, to exceed 4,000 daily vehicles or 360 peak hour vehicles; or adds any amount of traffic to a residential collector which exceeds these limits without the project

5.5 Site Access

- The project causes traffic at site access points to interfere with traffic flow on public streets

5.6 Bicycles and Pedestrians

- The project adversely affects an existing bikeway or pedestrian facility, or
- The project interferes with implementation of a planned bikeway as shown in the Parks, Trails and Open Space Master Plan

6 Recommended Project Mitigation

The report shall make feasible recommendations that reduce the project's significant impacts to a less-than-significant level. The report shall clearly identify responsibility for implementing each recommendation, as provided below. The timing for implementation of specific recommendations shall be identified in the report, either by estimated year or by development threshold.

The report shall provide LOS analysis of recommended project mitigations and shall summarize the results in a map figure of the study area. An example of the Mitigation Map Figure is provided in Appendix E.

6.1 Impacts in Existing plus Project Conditions- It is the project's responsibility to install the project's recommended improvements at the time of development in order to mitigate impacts to a less-than-significant level. The project is 100% responsible for these improvements.

6.2 Impacts in Cumulative Conditions-

- A.** If the project's fair share of a cumulative impact is 25 percent or more, then the recommended improvements shall be installed at the time of development, subject to a reimbursement agreement. If the recommended improvement is included in the current list of Traffic Impact Fee (TIF) projects, reimbursement will be in the form of either TIF credit or payment from the TIF.
- B.** If the project's fair share of a cumulative impact is less than 25 percent, then the project will be required to pay its fair share of the cost of the improvements to be constructed later by others, prior to the realization of the impact. If the recommended improvement is included in the current list of TIF projects, then payment of the project's TIF fee will be considered mitigation for the impact.

7 Appendix

- A) Example Study Format**
- B) Standard Scoping Form**
- C) Traffic Model Changes**
- D) Example Impact Summary Tables**
- E) Example Mitigation Map Figure**
- F) Preliminary Review Form**
- G) On-Line Reference Links**
- H) Acronyms**

Appendix A- Example of Study Format

The content and scope of Traffic Impact Analysis (TIA) reports will vary with the needs for each project. As determined in the scope of the TIA, the following information should be included in the report:

1. Cover sheet including name and location of project, developer name and address, traffic engineer name and address, traffic engineer's stamp and signature, and date
2. Table of Contents, including list of Figures and Tables
3. Executive Summary: a brief stand-alone summary of the study findings, including a description of the project, study scope, and recommended project improvements. The executive summary includes "Impact Summary Tables" and a "Mitigation Map Figure," as provided in Appendix D & E.
4. Introduction, purpose and scope
5. Description of the proposed development including:
 - ❑ Location map showing study area land use and streets
 - ❑ Site plan showing internal circulation, parking, driveways, access locations
 - ❑ Proposed uses with existing and proposed zoning requirements
 - ❑ Phasing plan including proposed dates of project phase completion
6. Setting: describe the existing roadway system within and around the project area; describe the programmed roadway improvements; describe location and routes of nearby public transit service; describe location and routes of the nearest bicycle and pedestrian facilities serving the project. Provide maps.
7. References to other related traffic impact studies
8. Clearly stated assumptions and thresholds of significance
9. Analysis of Existing Conditions:
 - ❑ Land use / Zoning, study intersections, and roadway segments
 - ❑ Lane geometry, daily volumes and peak hour turning movements
 - ❑ Level of Service (LOS)
 - ❑ Signal warrants; signal phasing and coordination
 - ❑ Queue analysis
 - ❑ Collision history and collision rate analysis
 - ❑ On-Street Parking
 - ❑ Pedestrian & Bicycle Facilities and counts, and Transit Services
10. Trip Generation and Distribution
11. Analysis of Project Only Conditions:
 - ❑ Project access, on-site circulation, and parking
 - ❑ Trip Generation table showing rates and clearly showing any trip discounts
 - ❑ Trip distribution percentages figure

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- ❑ Project trip assignment figure showing project-only trips at all study intersections, roadway segments and project driveways.
12. Analysis of Existing + Project Conditions:
- ❑ Daily volumes and peak hour turning movements
 - ❑ Level of Service (with and without recommended project improvements)
 - ❑ Signal warrants
 - ❑ Queue analysis (with and without recommended project improvements)
 - ❑ Qualitative Traffic Safety
13. Traffic forecast
14. Analysis of Cumulative Conditions without the project:
- ❑ Daily volumes and peak hour turning movements
 - ❑ Level of Service
 - ❑ Signal warrants
 - ❑ Queue analysis
15. Analysis of Cumulative Conditions with the project:
- ❑ Daily volumes and peak hour turning movements
 - ❑ Level of Service (with and without recommended project improvements)
 - ❑ Signal warrants
 - ❑ Queue analysis (with and without recommended project improvements)
 - ❑ Qualitative Traffic Safety
16. Transit, bicycle, and pedestrian Analysis
17. Traffic Impacts and Recommended Project Improvements:
- ❑ Summary table of daily and peak hour LOS, with and without project improvements (see Appendix D)
 - ❑ Findings for short term and cumulative impacts and special analysis
 - ❑ Responsibility for mitigation of short term and cumulative impacts
 - ❑ Mitigation measure phasing plan
 - ❑ Project's fair share costs
 - ❑ Cost estimates for mitigation and financing plan
 - ❑ Map or aerial photo identifying proposed improvements (see Appendix E)
18. Technical Appendices:
- ❑ Detailed worksheets for all LOS analysis (including project improvements), Signal Warrants, Queuing analysis calculations, and Fair share calculations
 - ❑ Raw traffic count data
 - ❑ Collision data
 - ❑ Other back-up data
19. Final TIA report and all appendices provided in electronic format, including both PDF and native file formats, as specified in the scope.

Appendix B- Standard Scoping Form

Scope for Traffic Impact Analysis

Date: _____ Application No.: _____
Project Name: _____
Project Description: _____
Developer: _____
Traffic Consultant: _____

Traffic Impact Analysis for the above listed project shall encompass this scope, in accordance with the City of Redding’s Traffic Impact Analysis Guidelines.

1 General Information and Assumptions

A. Study Area Limits: _____

B. Scenarios to be studied (check if applicable):

- Existing (Year: _____)
- Project Only
- Existing + Proposed Project

Either:

- Cumulative (Existing + Approved/Pending Project List)
- Cumulative (Existing + Approved/Pending Project List + Proposed Project)

Or:

- Cumulative (Shasta County Travel Demand Model (SCTDM) without Project)
- Cumulative (SCTDM + Proposed Project)

Assumed Cumulative Model Year: _____

C. Approved and Pending Projects List: _____

D. Analysis Periods (check if applicable):

- Weekday AM peak hour
- Weekday PM peak hour
- Weekday Mid-day peak hour
- Saturday mid-day peak
- Sunday mid-day peak hour
- Other: _____

E. General Plan Amendment (check if applicable):

- Provide analysis based on the existing land use, assuming average intensity, in addition to analysis based on the proposed new land use with the project.

F. Programmed Transportation Improvements: _____

G. Forecast Approval: Project trip generation, reductions, distribution, and any traffic model changes shall be submitted for pre-approval prior to submitting the draft traffic report, consistent with sections 4.2 and 4.3 of the Traffic Impact Analysis Guidelines.

H. Assumed Year of Project Completion: _____

I. Assumed Project Phasing (units/phase and years): _____

J. Technical Assumptions: The technical parameters shown in Figure 4.5 of the Redding Traffic Impact Analysis Guidelines shall be assumed in the analysis, unless specified otherwise: _____

2 Study Data Requirements

A. Data Collection (check if applicable):

- Peak hour turning movements at study intersections
- Directional daily traffic on study roadway segments
- Truck Counts- location(s): _____
- Pedestrian counts- location(s): _____
- Speed Survey- location(s): _____
 _____ () Radar () Tube
- Floating car runs- arterial segment(s): _____
- License plate survey for cut-thru traffic- location(s): _____

- Determine actual grade(s) location(s): _____
- Other Data Collection: _____

B. Recent/Available Traffic Studies and Data: _____

3 Intersection Analysis

Study Intersections:

1) -all project driveways- ^Q	8)	15)
2)	9)	16)
3)	10)	17)
4)	11)	18)
5)	12)	19)
6)	13)	20)
7)	14)	21)

Q- Designates locations where Queuing and turn lane storage analysis is required.

T- Designates locations where Truck counts are required in addition to total counts.

4 Roadway Segments

Study Roadway Segments:

1)	from:	to:
2)	from:	to:
3)	from:	to:
4)	from:	to:

5 Project Analysis Elements

A. Project Driveways, Access, and on-site circulation (check if applicable):

For All Projects:

- ✓ Project Only Trips
- ✓ LOS analysis of each recommended project mitigation
- Impact analysis for each development phase of the project

For Projects with Driveway Access:

- ✓ Minimum sight distance requirements at project driveways
- ✓ Project Access Queue and LOS, including:
 - ✓ Minimum required throat depth at project driveways
 - ✓ 95th percentile queue lengths at driveways and turn lane spill-over
 - ✓ Conformance to RMC 18.41.140 and 150 for entrances and setbacks
- ✓ Review for shared driveways and access management (right-in / right-out, etc.)
- ✓ Impacts to other driveways and intersections
- On-site parking and circulation
- Signal warrant analysis (CA-MUTCD warrant 3) for any new signal proposed at a project access
- Evaluate adequacy of on-site parking and identify impacts to off-site parking
- Evaluate on-site circulation, including truck loading and turning radii
Design Vehicle = ()WB-67 ()STAA ()WB-62 ()WB-50
- Queuing analysis of on-site drive-thru facilities

B. Traffic Analysis (check if applicable):

- | | |
|---|--|
| ✓ Intersection Level of Service (LOS) | □ Coordinated corridor analysis |
| ✓ Closely spaced intersection analysis | □ Average and 85 th percentile speeds |
| □ Queue analysis (see item 3 note Q) | □ Drive-thru queuing analysis |
| □ Signal warrants (CA-MUTCD warrant 3) | □ Collision history and rate analysis |
| □ Roadway segment analysis: | □ On-Street Parking |
| □ Peak Hour Volume method, or | □ Freeway LOS: _____ |
| □ HCM Chapter 15 method | □ Cumulative fair share calculation |
| □ Identify Local Residential Streets internal or adjacent to the project estimated to exceed acceptable traffic levels and make recommendations | □ Traffic calming recommendations |
| | □ Cost estimates for mitigation |
| | □ Financing plan for improvements |

- Weaving section LOS location(s): _____
- Ramp merge and diverge LOS: _____
- Ramp Meter Analysis: _____

6 Other Analysis Elements

A. Other Analysis (check if applicable):

- Transit Services within ¼ mile and pedestrian access routes
- Preliminary design to demonstrate feasibility of proposed mitigation(s)
- Existing and planned Pedestrian & Bicycle Facilities: Bike Plan consistency, on-site circulation, trip generation, and potential impacts
- Qualitative evaluation of traffic safety related to the addition of project traffic
- Recommendations for Safe Routes to School
- Other Analysis: _____

7 Submittal Requirements

A. Draft TIA document:

- Number of bound copies _____
- _____ Copies of Study Appendix, including calculation worksheets

B. Final TIA document (check if applicable):

- Number of bound copies _____
- Electronic report and Appendices, including PDF and native file formats:
 - CD, or
 - Preparer's FTP site, or
 - Email to: _____
 - Other: _____

Persons and Agencies present during project scoping:

SIGNED: _____ Date: _____
 Applicant or Consultant

SIGNED: _____ Date: _____
 City of Redding Representative

Appendix C- Traffic Model Changes

The Shasta County travel demand model (SCTDM) is a conventional travel demand forecasting model similar in structure to most current area-wide models used for traffic forecasting. The model uses land use, socioeconomic, and road network data to estimate travel patterns, roadway traffic volumes and transit volumes.

Traffic Impact Studies which make use of the SCTDM shall provide documentation of the use and modifications to the model files, similar to the following:

1. Model Files Provided: The model runs used in this study are based on “Version 0802: February 2008” of the Shasta County Travel Demand Model as provided by the Shasta County RTPA.

2. Model Revisions: The model files were revised to create these new scenarios:

- ❑ Existing + approve/pending projects + project
- ❑ Cumulative 2030 + project

Modifications to the model files affected only the project area. No modifications were made outside of the immediate project area.

3. Road Network Revisions: The Shasta County travel model uses coded representations of the region’s existing and future roadway networks. A “master network” was developed for the 2005 update of the model. The master network contains information on the years that various road improvement projects are programmed for implementation. The master network can be used to generate the model road network for any study year starting with 2004.

Changes to the Master Network (SH_080208.NET):

- ❑ Road coded as 4-lane 45 mph major arterial from I-5 to Bechelli Lane
- ❑ Road coded on current alignment as 35 mph minor arterial
- ❑ ...

Changes to a specific Scenario Network (SHxx.NET):

- ❑ Road coded as 4-lane 45 mph major arterial from I-5 to Bechelli Lane
- ❑ Road coded on current alignment as 35 mph minor arterial
- ❑ ...

4. Traffic Analysis Zone (TAZ) Revisions: The Traffic Analysis Zones (TAZ assigned to the project area were reallocated to best represent the proposed site layout:

- ❑ TAZ 71 remains unchanged, representing the existing and potential highway commercial uses on the east side of Churn Creek Road.
- ❑ TAZ 78 was reallocated to represent the area east of Churn Creek Road and north of Hartnell Avenue, which was previously designated for commercial

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development but would be open space under the current development proposal.

- TAZ 80 was reallocated to represent the golf course.
- TAZ 81 was reallocated to represent the proposed project.

5. Land Use Revisions: Land use assumptions are contained in the land use database stored in an Excel workbook. The workbook produces the trip generation inputs to the model. The land use inputs for TAZs within the project area were modified to represent the land uses that are proposed as part of the proposed project.

The following changes were made to the Land Use Database (SHxx_TripGen_{Date}.XLS) for the “Existing + Approved/Pending Projects” scenario and for the “Cumulative Conditions: 2030 without Proposed Project”:

- TAZ 71 7.2 acres highway commercial
- TAZ 78 12 acre park
- TAZ 80 105 acres private recreation
- TAZ 81 180 multi family residential units

6. Other Revisions:

Reallocation of Local Intersection Volumes. The traffic model often aggregates multiple individual land uses into larger traffic analysis zones that are represented as single points. As a result, all traffic to and from each land use within a zone is assumed to use the identical routes when the reality is that traffic will follow more specific local access routes to logically arrive at a specific destination within the zone. The following manual reassignments were made to correct for aggregation of trips within a TAZ:

- Intersection / access point list and manual adjustments made
- ...
- ...

Appendix D- Example Impact Summary Tables

FIGURE D-1
Intersection Impact Summary

	1 Shasta View Dr & Western Oak Dr				2 Shasta View Dr & Hartnell Ave				3 Shasta View Dr & Rancho Rd				4 Rancho Rd & Airport Rd			5 Rancho Rd & Victor Ave				6 Hartnell Ave & Victor Ave					
Control Type	AWSC				TWSC				TWSC				Signal			TWSC				Signal					
Target LOS	C				C				C				C			C				C					
AM PEAK HOUR	LOS	Delay	Pk Hr Signal Warrant	Q ₉₅ Storage	LOS	Delay	v/c	Pk Hr Signal Warrant	Q ₉₅ Storage	LOS	Delay	v/c	Pk Hr Signal Warrant	Q ₉₅ Storage	LOS	Delay	Q ₉₅ Storage	LOS	Delay	Pk Hr Signal Warrant	Q ₉₅ Storage	LOS	Delay	Q ₉₅ Storage	
Existing	C	21.2	-	-	B	12.1	0.40	-	-	B	12.1	0.39	-	-	C	21.2	-	-	C	21.2	-	-	C	21.2	-
Existing Plus Project	D	29.8	Yes	Not OK	F	57.0	0.91	Yes	Not OK	C	29.0		No	OK	C	24.0	-	-	C	24.1	-	-	C	24.1	-
Increase Due to Project		8.6				44.9					16.9					2.8				2.9				2.9	
Significant Impact	Yes				Yes				No				No			No				No					
With Mitigation	C	21.2	-	-	B	12.1	0.40	-	-	B	12.1	0.39	-	-	C	21.2	-	-	C	21.2	-	-	C	21.2	-
Cumulative without Project	C	24.1	-	-	B	19.0	0.2	-	-	B	19.0	0.2	-	-	D	36.0	-	-	C	24.1	-	13.4	C	24.1	24.1
Cumulative Plus Project	D	30.4	Yes	OK	F	47.0	0.9	Yes	Not OK	C	24.0	0.6	No	OK	E	56.0	Not OK	-	C	24.9	-	241.0	C	24.9	30.4
Increase Due to Project		6.3				28.0					5.0					20.0				0.8				0.8	
Significant Impact	Yes				Yes				No				Yes			No				No					
With Mitigation	C	24.1	-	-	B	19.0	0.2	-	-	B	19.0	0.2	-	-	C	34.0	-	-	C	24.1	-	13.4	C	24.1	24.1
PM PEAK HOUR	LOS	Delay			LOS	Delay				LOS	Delay				LOS	Delay	Delay	LOS	Delay	Delay		LOS	Delay	Delay	
Existing	C	21.2	-	-	B	12.1	0.40	-	-	B	12.1	0.39	-	-	C	21.2	-	-	C	21.2	-	-	C	21.2	-
Existing Plus Project	D	29.8	No	Not OK	F	57.0	0.91	Yes	Not OK	C	29.0		No	OK	C	24.0	-	-	C	24.1	-	-	C	24.1	-
Increase Due to Project		8.6				44.9					16.9					2.8				2.9				2.9	
Significant Impact	Yes				Yes				No				No			No				No					
With Mitigation	C	21.2	-	-	B	12.1	0.40	-	-	B	12.1	0.39	-	-	C	21.2	-	-	C	21.2	-	-	C	21.2	-
Cumulative without Project	C	24.1	-	-	B	19.0	0.2	-	-	B	19.0	0.2	-	-	C	34.0	-	-	C	24.1	-	13.4	C	24.1	24.1
Cumulative Plus Project	D	30.4	Yes	OK	F	47.0	0.9	Yes	Not OK	C	24.0	0.6	No	OK	D	36.0	Not OK	-	C	24.9	-	241.0	C	24.9	30.4
Increase Due to Project		6.3				28.0					5.0					2.0				0.8				0.8	
Significant Impact	Yes				Yes				No				Yes			No				No					
With Mitigation	C	24.1	-	-	B	19.0	0.2	-	-	B	19.0	0.2	-	-	C	34.0	-	-	C	24.1	-	13.4	C	24.1	24.1
FAIR SHARE	n/a				n/a				-				11%			-				-					

LEGEND:

AWSC - All way stop control

TWSC - Two way stop control

LOS - Level of Service

Delay - Average delay for AWSC; Worst-case movement delay for TWSC, seconds/vehicle

v/c - volume to capacity ratio

Pk Hr Signal Warrant - Peak Hour Signal Warrant met = "Yes", not met = "No"

Q₉₅ Storage - If available storage length is adequate for the worst-case 95th percentile queue length then "-", otherwise "Not OK".

Traffic Impact Analysis Guidelines

FIGURE D-2

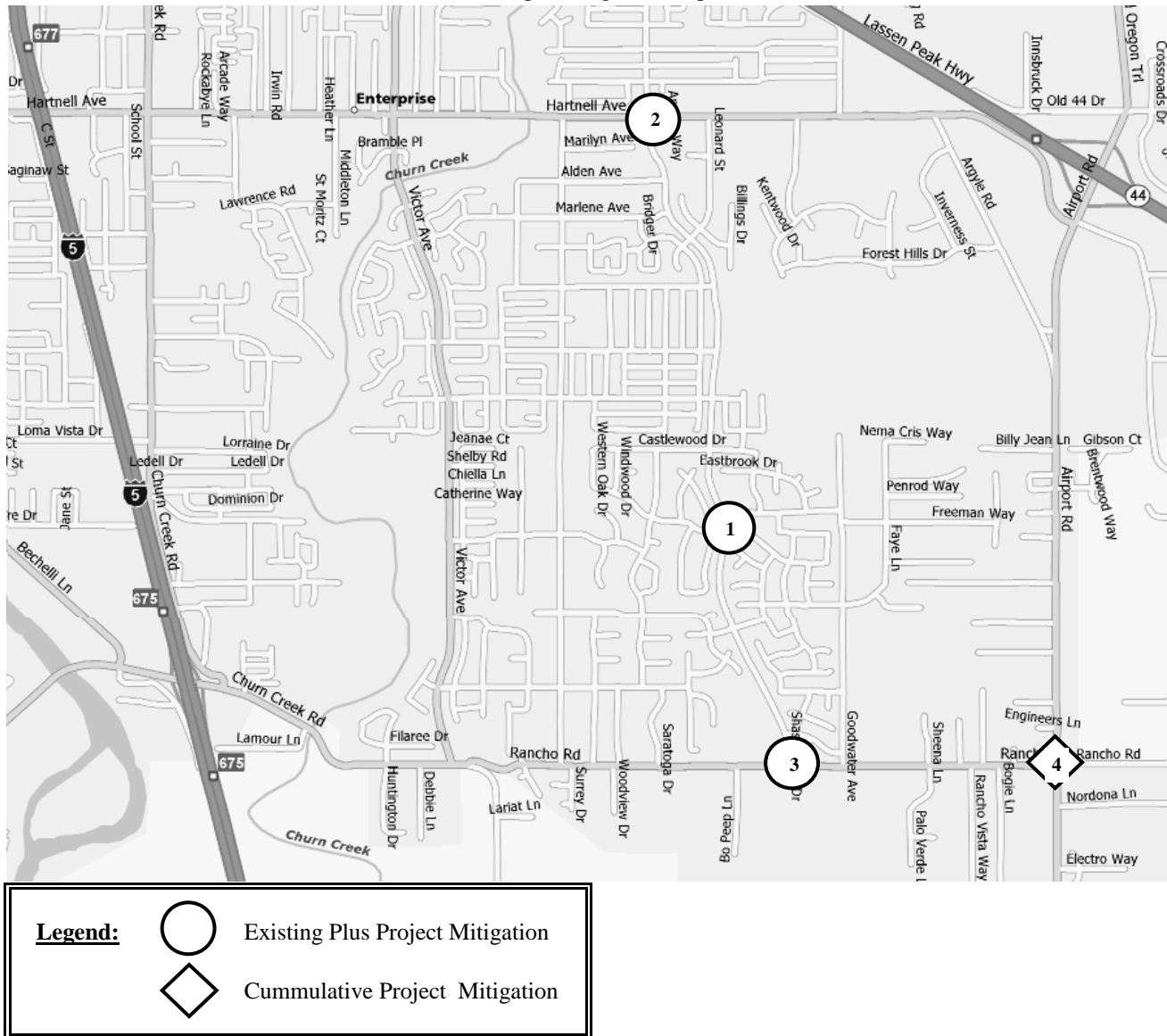
Roadway Impact Summary

		1		2		3		4	
		Rancho Rd- Victor Ave to Airport Rd		Shasta View Dr- Rancho Rd to Hartnell Ave		Hartnell Ave- Victor Ave to Airport Rd		Airport Rd- Hartnell Ave to Rancho Rd	
Target LOS		C		C		C		C	
Arterial Class		II		III		II		II	
Posted Speed Limit		40		35		45		45	
Direction	Peak Hr	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	Northbound	Southbound
Roadway Operations		Speed LOS	Speed LOS	Speed LOS	Speed LOS	Speed LOS	Speed LOS	Speed LOS	Speed LOS
Existing	AM	37.6 A	37.1 A	37.6 A	37.1 A	37.6 A	37.1 A	37.6 A	37.1 A
	PM	37.5 A	37.1 A	37.5 A	37.1 A	37.5 A	37.1 A	37.5 A	37.1 A
Existing Plus Project	AM	34.7 B	34.3 B	34.7 A	34.3 A	34.7 B	34.3 B	34.7 B	34.3 B
	PM	37.5 A	37.2 A	37.5 A	37.2 A	37.5 A	37.2 A	37.5 A	37.2 A
Cumulative without Project	AM	31.4 B	31.1 B	31.4 A	31.1 A	21.0 D	31.1 B	31.4 B	31.1 B
	PM	34.6 B	34.2 B	34.6 A	34.2 A	20.7 D	34.2 B	34.6 B	34.2 B
Cumulative Plus Project	AM	23.4 C	23.1 C	23.4 C	23.1 C	18.0 D	23.1 C	23.4 C	23.1 C
	PM	33.4 B	33.1 B	27.9 B	28.7 B	18.3 D	33.1 B	33.4 B	33.1 B

Appendix E- Example Mitigation Map Figure

FIGURE E-1

Example Mitigation Map



Recommended Project Mitigation:

1. Shasta View Dr. at Western Oak Dr: Construct separate EB left turn lane and separate WB left turn lane under short-term plus project conditions.
2. Shasta View Dr. at Hartnell Ave: Place NB left turn lane striping under short-term plus project conditions.
3. Rancho Rd. at Shasta View Dr: Install new traffic signal under short-term plus project conditions.
4. Rancho Rd at Airport Rd: Modify existing signal for second NB left turn lane under cumulative plus project conditions. Project has an 18% fair share.

Appendix F- Preliminary Review Form

Date: _____ Application No.: _____
Project Name: _____
Project Description: _____
Developer: _____
Traffic Consultant: _____

The draft Traffic Impact Analysis report for the above listed project shall be prepared in consistent with the study scope, in accordance with the City of Redding's Traffic Impact Analysis Guidelines.

Preliminary Review Checklist:

	<u>Consistency with Scope and Guidelines</u>	
1. Executive Summary	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
2. Executive Summary Tables	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
3. Project Site Plan	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
4. Scenarios	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
5. Approved / Pending Project List	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
6. Analysis Periods	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
7. Technical Parameters	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
8. Existing Lane Configurations	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
9. Existing Road Network	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
10. Intersection Analysis	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
11. Roadway Segment Analysis	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
12. Project Trip Generation	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
13. Project Trip Reductions	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
14. Project Trip Distribution	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
15. Approved/Pending Trip Generation	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
16. Approved/Pending Reductions	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
17. Approved/Pending Distribution	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
18. Project Only Trip Figure	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
19. Significance Threshold	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
20. Project Access Ques & LOS	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
21. On-site drive-thru Ques	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
22. Intersection LOS	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
23. Roadway Segment LOS method	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
24. Fair Share Calculation	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
25. Traffic Calming Recommendation	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
26. Potential Impacts Identified	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
27. Appropriate and adequate mitigation	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
28. Responsibility for mitigation	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
29. Appendix included	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*
30. Other	<input type="checkbox"/> OK	<input type="checkbox"/> Needs Revision*

* See separate list for details of needed revisions.

Appendix G- On-Line Reference Links (subject to change)

City of Redding:

General Plan:

<http://ci.redding.ca.us/devserv/planning/genplan/genplan.html>

Capital Improvement Plan:

http://www.ci.redding.ca.us/documents/2007_2013cip.pdf

Record Drawing Manager for as-built plans:

<http://epayments.ci.redding.ca.us/rdmonline/rdmsearch.aspx>.

Construction Standards:

<http://www.ci.redding.ca.us/devserv/eng/pwstdsearch.html>

Municipal Code:

<http://municipalcodes.lexisnexis.com/codes/redding/index.htm>

Parks, Trails and Open Space Master Plan:

<http://www.ci.redding.ca.us/CommunityServices/masterplan.html>

Redding Traffic Impact Analysis Guidelines:

[\(tbd\)](#)

Redding Area Bus Authority (RABA):

<http://www.ci.redding.ca.us/raba/rabahome.htm>

Shasta County RTPA:

<http://www.scrtpa.org/RThome.htm>

Caltrans:

Guide for the Preparation of Traffic Impact Studies:

<http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf>

Highway Design Manual Section 504.7 (Weaving Sections):

<http://www.dot.ca.gov/hq/oppd/hdm/pdf/english/chp0500.pdf>

California Manual on Uniform Traffic Control Devices:

http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/ca_mutcd.htm

Appendix H- Acronyms

CA-MUTCD: California Manual on Uniform Traffic Control Devices

CEQA: California Environmental Quality Act

HCM: Highway Capacity Manual

ITE: Institute of Transportation Engineers

LOS: Level of Service

NCHRP: National Cooperative Highway Research Program

RMC: Redding Municipal Code

TAZ: Traffic Analysis Zone

TIA: Traffic Impact Analysis

TIF: Traffic Impact Fee