

SECTION 4

TRAFFIC IMPACT STUDIES

- 4-1 GENERAL** - The City of Grass Valley has established the following guidelines for the preparation of traffic studies to ensure consistency of analysis and adequacy of information to aid City staff and decision makers in the consideration of project approval with regard to impacts to the City's transportation system.
- 4-2 PURPOSE OF TRAFFIC IMPACT STUDIES** - Traffic impact studies are an important tool in the overall development planning process (residential, commercial, industrial, institutional, etc.) for the City. They provide the necessary information to allow an assessment of the potential traffic impacts associated with proposed projects as they relate to transportation policies established by the City. Traffic impact studies are also used to identify appropriate mitigation and/or recommendations where practicable to offset project impacts.
- 4-3 REQUIREMENT FOR TRAFFIC IMPACT STUDIES** - The City utilizes on-call transportation services with approved transportation Consultants for the preparation of all city-required transportation studies. Traffic impact studies, when required by the City, shall adequately assess the impacts of a development proposal on the existing and/or planned street system.

Applicants should contact the Engineering Division as early as possible and provide a site plan with proposed land use and associated square footages so that the City can evaluate the traffic study requirements. Traffic studies shall be required for all development applications if any of the criteria listed below has been met:

- A. Project is not consistent with the 2020 General Plan or City-wide traffic model relative to land use, and generation of higher traffic projections;
- B. Project generates more than 50 PM Peak Hour Trips. The City may evaluate and apply other non-PM peak periods, such as the noon hour, based on the location of the site or a unique traffic demand of the development. However, developments within 10% of these criteria could be required to prepare a traffic study at the discretion of the City Engineer;
- C. Project may create a hazard to public safety;
- D. There is not an existing or planned mitigation measure to address the impacts generated by the project on a critical intersection(s). An existing or planned mitigation measure is defined as an improvement for the intersection that is listed in the Grass Valley Transportation Impact Fee Program or in the Regional Transportation Mitigation Fee program.

Should it be determined that a traffic study will be required, the City will provide an estimated cost, scope, and schedule for the study, and the project applicant will be required to enter into a funding reimbursement agreement with the City to proceed with the traffic study and deposit the necessary funds prior to the City commencing with the study.

Note: The City will not accept traffic studies prepared directly by an applicant's traffic/transportation Consultant.

- 4-4 PREPARATION AND SUBMITTAL REQUIREMENTS** - Traffic studies shall be prepared and stamped by a Registered Traffic Engineer or a Registered Civil Engineer with demonstrated competence and adequate experience in Transportation Engineering.

Initially, an electronic copy of the Volume/Capacity Analysis (VCA) shall be submitted to the Public Works Department from the City chosen Consultant for review and comment.

The Public Works Department will review the VCA study data, methods and findings. Upon completing their review, the City will provide the Consultant with comments and discuss revisions or responses to be incorporated into a revised VCA or a Comprehensive Traffic Study (CTS). The CTS will also be reviewed and the Public Works Department will either provide the Consultant with comments and discuss revisions or responses, or will accept the study.

4-5 GENERAL TRAFFIC IMPACT STUDY INFORMATION -

- A.** The City's Traffic Model must be used as the base of all analysis and will be provided to all City traffic consultants.
- B.** All intersections that are currently at LOS D, E, or F are determined to be critical intersections and are considered to be operating at an unacceptable level.
- C.** Trip counts are only valid for one year. All trip counts, unless stated otherwise in this policy, shall be taken at typical weekday PM peak hours between 4:00 p.m. to 6:00 p.m. during the normal school period (i.e. September to May). Based on the location of the site or a unique traffic demand, the City may require a traffic report to evaluate other potential peak demand periods of the day such as the noon hour. Please note that the California Department of Transportation may require additional traffic analysis if the projected traffic would impact a State of California facility.
- D.** All traffic reports shall show the average delay versus the worst leg of the intersection as part of their analysis. In all cases, the overall LOS for the intersection to be reported shall be based on the average delay for all vehicles.
- E.** Contact the Engineering Division for the latest approved project list.
- F.** Existing (current year of report) and cumulative (year 2030) timeframes are required for a VCA and CTS, respectively. Other timeframes may be necessary based upon the unique characteristics of the project.

4-6 TYPES OF TRAFFIC IMPACT STUDIES - The City requires the completion of a VCA by a City selected consultant to determine if a CTS is necessary or not.

- A. VCA -** A VCA is required of every project requiring a traffic study. The VCA shall include, as a minimum, PM peak hour trip generation, distribution, assignment, in/out percentage and project location (relative to critical intersections), the additional delay or the increase in the volume to capacity (v/c) ratio (if applicable) that will be created by the proposed project on a critical intersection(s) or other intersection as determined by the City and tied to the following time frames: existing plus approved projects, and existing plus approved projects plus proposed projects. A VCA shall use and evaluate the traffic conditions at the PM Peak hour unless otherwise directed by the City. The VCA will determine if a CTS is required if any of following criteria are met:
 - 1.** The project is not consistent with the 2020 General Plan or the City-wide Traffic Model relative to land use and generation of higher traffic projections.
 - 2.** There are no projects (mitigation measures) identified in the Grass Valley Transportation Impact Fee Program or in the Regional Transportation Mitigation Fee program to reduce the impact of the project to less-than-significant levels.

3. A studied roadway/intersection operating at an acceptable LOS will deteriorate to unacceptable levels of “D” or worse because of the proposed project’s traffic.
 4. Project traffic volumes at a critical intersection causes the following:
 - A. An increase of the volume-to-capacity ratio (v/c) by more than **.02 (2.0%) for signalized intersections.**
 - B. An increase in the average intersection delay by more than **2.0 seconds for unsignalized intersections.**
- B. CTS** - A CTS shall reference and incorporate the associated VCA. Analysis for a CTS shall include, at a minimum, the additional delay, or the increase in the volume to capacity (v/c) ratio (if applicable) of critical and other intersections as identified in the VCA that will be created by the proposed project. This applies to any critical intersection where the proposed project generates more than 10 PM peak hour trips and any intersection where the project generates more than 50 PM peak hour trips. The City Engineer could also require an analysis of the capacity of any adjoining or connecting roadway. The CTS shall identify the extent of the traffic impacts created by the proposed project and shall include recommended measures to mitigate such impacts to an acceptable level of service or a volume-to-capacity level below .02 (2%) for critical signalized intersections and 2.0 seconds for critical unsignalized intersections. A CTS shall use and evaluate traffic conditions at the PM Peak hour. Based on the location of the site or a unique traffic demand, the City may require the CTS to evaluate other times of the day such as the AM Peak Hour and/or the noon hour. The following time frames must be analyzed: Cumulative (existing plus approved projects projected to year 2030), Cumulative plus project (existing plus approved projects plus proposed project projected to year 2030). Projects affecting intersections requiring long lead time improvements for mitigation will require an interim analysis. Generally this will be a 5-year analysis.

Note: All previous traffic studies that are more than two years old and of which the improvements have not been constructed, or the project has not been approved, will generally be required to be updated unless the Public Works Department determines that conditions have not changed significantly.

4-7 TRAFFIC STUDY FORMAT - In order to provide consistency and to facilitate staff review, the following format shall be used in the preparation of such studies by transportation consultants:

- A. **Project Data** - The project data portion of the report shall be included in the VCA and CTS and contain the following:
 1. A brief description of the size of the land parcel, general terrain features, the location within the City and the region, shall be included in this section. In addition, roadways that afford access to the site and those that are included in the study area shall be identified. General terrain features within the study area should also be described.

The exact limits of the study area should be based on engineering judgment and an understanding of existing traffic conditions surrounding the site. In all instances, however, the study area limits shall be subject to approval of the Public Works Department. A vicinity map that shows the site and the study area boundaries in relation to the surrounding transportation system shall be included.

2. The existing and proposed uses of the site shall be identified in terms of the various zoning categories of the City. In addition, the specific use for which the request is being made shall be

identified, if known, since a number of uses may be permitted under existing zoning. Parcels in the vicinity of the site shall also be identified with respect to the zoning, land use, and specific uses. This information shall include square footage of the various uses or the number and size of the units proposed. All driveways in the vicinity of the project that could affect operations of any proposed driveways shall also be shown.

It shall be the intent of the traffic study to evaluate the worst-case impacts for the proposed development allowed by zoning unless specific use/users are identified by the applicant. If several different uses are permitted by the zoning, the land use with the greatest overall traffic impact shall be assumed for the study.

- B. Project Trip Generation** - Project Trip Generation shall be included in the VCA. A summary table listing each specific use, the size involved, the trip generation rates used (total daily traffic and AM/PM peak hours), and the resultant total trips generated shall be provided for the project site. In general, the peak hour trip generation shall be that of a typical weekday and shall coincide with the peak hour of the roadway system (not the peak hour of the project); however, there may be instances where a unique project use requires an analysis during different time frames, such as a weekend.

This section shall also include a discussion on how the project's trip generation rate compares with typical trip generation rates for the site's existing General Plan land use category. If the proposed project represents only a portion of a larger overall site, such as a phased project, then the traffic study shall discuss the degree to which both the initial phase and the ultimate development impact the roadway network.

Trip generation shall be calculated based on data contained within the latest edition of the Institute of Transportation Engineer's (ITE) Trip Generation Manual approved for use by the City or more appropriate local data as approved by the Public Works Department. Any internal trip reductions, or modal split assumptions, will require analytical support to demonstrate how the figures were derived.

Pass-by trip factors may be used to reduce the estimated additional traffic to streets serving a proposed development; however, the percentage of pass-by traffic shall be documented and referenced as to the source of the assumptions (e.g., ITE Trip Generation Manual, ITE Journal article, local study, etc.). Pass-by rates are not to be applied to reduce turning movement volumes at driveways serving the proposed development.

- C. Traffic Analysis Methodology** - A discussion about the methodology(ies) used to do the analysis must be provided in both the VCA and the CTS. The methodology for analyzing signalized intersections shall be the Intersection Capacity Utilization (ICU) 2000. The methodology for analyzing unsignalized intersections shall be the Highway Capacity Manual (HCM) 2000. Intersections may require different methodologies than those described above based on the proximity of other intersections or the geometry of the intersection. In these cases, the traffic consultant shall identify and use the most correct methodology of the profession.
- D. Existing Plus Approved Projects** - Discussion under this section shall be included in the VCA. Within the study area, the traffic study shall describe and provide volumes for existing roadways, intersections, and driveways including geometric and traffic signal control as well as improvements that have been proposed by government agencies and other development projects. The study shall identify roadway improvements within the study area that are planned to be constructed by the City as part of the Grass Valley Transportation Impact Fee Program or the Regional Transportation Mitigation Fee program. Existing conditions must include traffic volumes of approved but not yet

built projects within the City which contribute 25 or more PM, AM, or other determined time period (whichever time period is required to be analyzed by the proposed project) peak hour trips to the transportation system. A Table of Existing plus Approved Projects Intersection Levels of Service shall be provided identifying the LOS and volume-to-capacity ratio of each critical and required intersection. The report shall include a discussion of assumptions made in the above calculations, such as saturation flow rates, peak hour factors, and lane configurations. Full documentation of the LOS calculations shall be provided in an appendix.

Note: The City will provide copies of current traffic count information, where available; however, the Consultant is ultimately responsible to provide up-to-date traffic volume count information for all study locations.

- E. Existing Plus Approved Projects Plus Proposed Project** - Discussion under this section shall be included in the VCA. The directional distribution of trips entering and departing the proposed project site shall be clearly identified on a figure. The methodology of distribution shall be discussed in the study. A Table of Existing plus Approved Projects Plus Proposed Project Intersection Levels of Service shall be provided identifying the LOS and volume-to-capacity ratio of each critical and required intersection. The assignment of site-generated traffic onto the area's street system shall be clearly depicted on a map/figure. The traffic assignment shall consider the general trip distribution, logical routing, turn movement restrictions, available and projected roadway capacities, and travel times. The technical analysis steps, basic methods, and assumptions used in this work shall be clearly stated.

A discussion on how the proposed site access compares with the City's access standards as described in these Design Standards shall be provided. Some of the topics that must be included in the traffic study are: number of driveways serving a parcel or site, right turn deceleration lane or right turn curb flares for driveways, left turn deceleration lane for driveways, storage requirements for turn lanes, minimum offset for opposing driveways, restricted turning movements for driveways, and sight distance. Each site access point shall be discussed separately. If the proposed site access does not meet the City's standards, then the traffic study shall identify what modifications to the proposed site access would be necessary to meet City standards and explain why these modifications are not proposed. The report shall include a discussion of assumptions made in the above calculations, such as saturation flow rates, peak hour factors, and lane configurations. Full documentation of the LOS calculations shall be provided in an appendix.

- F. Cumulative (Existing plus approved projects projected to year 2030)** - Discussion under this section shall be included in the CTS. A Table of Cumulative (Existing plus approved projects projected to year 2030) Intersection Levels of Service shall be provided identifying the LOS and volume-to-capacity ratio of each critical and required intersection. The report shall include a discussion of assumptions made in the above calculations, such as saturation flow rates, peak hour factors, and lane configurations. Full documentation of the LOS calculations shall be provided in an appendix.
- G. Cumulative (Existing plus approved projects plus proposed project projected to year 2030)** - Discussion under this section shall be included in the CTS. A Table of Cumulative (Existing plus approved projects plus proposed project projected to year 2030) Intersection Levels of Service shall be provided identifying the LOS and volume-to-capacity ratio of each critical and required intersection. The report shall include a discussion of assumptions made in the above calculations, such as saturation flow rates, peak hour factors, and lane configurations. Full documentation of the LOS calculations shall be provided in an appendix.

H. Graphics - Both the VCA and CTS shall include graphics that show traffic volumes for private access points, study intersections and roadway segments, as required:

1. Existing PM peak hour plus approved projects directional roadway traffic volumes including turning movements at intersections.
2. The data in item 1 above plus projected site traffic volumes for the development scenario being analyzed. Include projected turning movements at driveways. It is acceptable to combine items 1 and 2 into one graphic.
3. Future PM peak hour plus approved projects directional roadway traffic volumes including turning movements at intersections without the project.
4. The data in item 3 above plus projected site traffic volumes. Include projected turning movements at driveways. It is acceptable to combine items 3 and 4 into one graphic

Other peak hours that are determined by the City to be critical to site traffic and the street system in the study area shall be included and shall show the same information as is provided for above. Examples of other peak hours are AM peak, noon peak, and project peak.

I. Traffic Accidents - Both the VCA and the CTS shall consider traffic accident data for affected streets and/or intersections. The study period will normally be three (3) years and the locations shall be specified by the Public Works Department. It shall be the Consultant's responsibility to obtain accident data.

Estimates of increased or decreased accident potential shall be evaluated for the development, particularly if the proposed development might impact existing traffic safety problems in the study area. Safety improvements shall be recommended where necessary.

J. Traffic Signals - The VCA and CTS will evaluate intersections with traffic signals. The need for a new traffic signal will be evaluated in the CTS and shall be based on warrants contained in the latest edition of the State Traffic Manual or other approved source identified by the Public Works Department.

If a new traffic signal is being proposed and the signal installation would be closely located to adjacent intersections, then the study shall include a signal progression analysis. The section of roadway to be analyzed for signal progression shall be determined by the Public Works Department and will include all existing and planned future signalized intersections.

Those intersections that would reduce the optimum bandwidth if a traffic signal were installed may be required to remain unsignalized and have turning movements limited by access design or median islands. All site access driveways not controlled by traffic signals shall have a stop sign installed on the driveway.

K. On-Site Circulation - The VCA and the CTS, where applicable, will discuss the Consultants review and evaluation of the site plan with respect to vehicular and non-vehicular circulation and safety. All recommendations shall be clearly documented in the report.

L. Impacts and Mitigation - Discussion under this section shall be included in the CTS. If the proposed project is shown to cause degradation of intersection LOS to worse than "C" ("D" or lower), or as described above after considering any improvements already planned by the City or County, then the

traffic study shall recommend feasible mitigation measures to bring the intersection LOS within acceptable standards. The Consultant shall obtain planned roadway and intersection improvements from the Public Works Department.

Impacts should be identified and mitigations described and analyzed, whether already occurring via the Grass Valley Transportation Impact Fee Program or the Regional Transportation Mitigation Fee program or a newly proposed mitigation.

If an impact cannot be mitigated as required by this section, an EIR can be prepared to evaluate it. If mitigation is required under the existing conditions plus the project impact or the cumulative conditions plus project impact, the following is allowed:

1. If an intersection improvement project is fully funded and programmed to be constructed as part of the Grass Valley Transportation Impact Fee program or in the Regional Transportation Mitigation Fee program, then payment of the Grass Valley Transportation Impact Fee program or Regional Transportation Mitigation Fee program fees is sufficient mitigation.
2. If an intersection improvement project is not fully funded and not programmed/projected to be constructed as part of the Grass Valley Transportation Impact Fee program or the Regional Transportation Mitigation Fee program, the developer will be 100% responsible for funding the improvements. At the option of the developer and with approval of the City Council, the developer may create, at their own expense, a Benefit Assessment District to seek reimbursement for the improvements minus their fair share, or they may be entitled to reimbursement and will need to enter into a reimbursement agreement with the City.
3. If an intersection improvement is not identified in the Grass Valley Transportation Impact Fee program or Regional Transportation Mitigation Fee program, then the developer will be 100% responsible for constructing and funding the necessary improvements. At the option of the developer and with approval of the City, the developer may create, at their own expense, a Benefit Assessment District to seek reimbursement for the improvements minus their fair share, or they may be entitled to reimbursement and will need to enter into a reimbursement agreement with the City.

M. Executive Summary - Both the VCA and CTS shall include an executive summary. The VCA executive summary shall provide a clear and concise description of the project scope and purpose, findings, and conclusion as to if a CTS is required or not and if modifications have been identified to the project onsite and/or offsite plans. The CTS executive summary shall provide a clear and concise description of the project scope and purpose, findings, conclusion, and mitigation measures and recommendations.

Technical publications, calculations, data reporting and detail design shall not be included in the executive summary. The executive summary should be short, complete in itself and not dependent on supplementary data included by reference. The applicant shall satisfy any mitigation measures and/or design elements identified in the traffic study as being needed or recommended for the project.