



Traffic Impact Study Requirements

County of San Mateo

Department of Public Works
Roadway Services

9/1/2013

I. Introduction

The County of San Mateo (County), Department of Public Works (Department) requires that the traffic and circulation impacts of proposed development projects be analyzed. This requirement can be satisfied through the preparation of a Traffic Impact Study (TIS). A TIS is to be prepared in conformance with Department requirements described herein. The document must be prepared by a Traffic Engineer or a Civil Engineer (Engineer) registered in the State of California qualified to practice traffic engineering. This "Traffic Impact Study Requirements" guide identifies the suggested format and methodology that is generally required to be utilized in the study preparation, and is subject to amendment without any notification. The purpose of this guide is to establish procedures to ensure consistency of analysis and the adequacy of information presented regarding a proposed development project (Project).

The primary responsibility for assessing the traffic impacts associated with a proposed development will rest with the developer, with the County serving in a review capacity.

The applicant will be notified at the pre-planning stage if a traffic study will be required, provided sufficient information is available for the County to determine whether the trip generation criterion has been met. If sufficient information is unavailable but the property appears to involve sufficiently intense land use, the applicant will be informed that a traffic study is required. It is strongly recommended that the applicant's traffic engineer consult with County staff before beginning the study to establish the scope and basic assumptions of the study and any deviations from these Guidelines to avoid unnecessary delays or revisions.

II. Purpose

The purpose of a Traffic Impact Study is to determine:

- The capacity and safety impacts a particular development will have on the Countywide transportation system;
- Whether the development will meet the County's Minimum Transportation Standards for roadway capacity and safety; and
- Mitigating measures necessary to alleviate the capacity and safety impacts so that Minimum Transportation Standards are met.

III. Requirements

Generally, Department staff is concerned with adverse impacts on traffic if:

1. Traffic generated by a project considered alone or cumulatively with other related projects, when added to existing traffic volumes, exceeds certain capacity thresholds of an intersection or roadway, contributes to an unacceptable level of service (LOS), or exacerbates an existing congested condition.
2. Project generated traffic interferes with the existing traffic flow (e.g., due to the location of access roads, driveways, and parking facilities).
3. Proposed access locations do not provide for adequate safety (e.g., due to limited visibility on curving roadways).
4. Nonresidential uses generate commuter or truck traffic through a residential area.

5. Project generated traffic significantly increases on a residential street and alters its residential character.

In addition to the conditions described above, a traffic report is generally needed if a project generates over 500 trips per day or over 100 trips during the peak hour or where other possible adverse impacts as discussed in the Analysis and Impact Section (beginning on page 3) of these Guidelines are identified. Before a full review is conducted, the County staff will check the completeness of the TIS report using the attached check list (Exhibit A). If the report is missing any of the check list items, it will be returned for revision.

Projects shall not be split into phases to avoid the TIS requirements. If an additional phase of a project, when added to the preceding phases, causes the sum of the phases to exceed the threshold, the entire project must be analyzed as a unit. The analysis must be conducted when the phases are anticipated and should not wait for later phases, even if earlier phases alone would not exceed the threshold.

All previous traffic studies relating to the development that are more than two years old will have to be updated, unless the County determines that conditions have not changed significantly. Where access points are not defined, or a site plan is not available at the time the traffic study is prepared, additional traffic work may be required when a site plan becomes available or the access points are defined.

IV. TIS Report Contents

A. Project Description

Project Location and Study Area – A brief description of the location within the County and the region shall be included in the 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 Department. A vicinity map that shows the site and the study area boundaries in relation to the surrounding transportation system must be included.

Existing and Proposed Site Uses – The existing and proposed uses of the site should be identified in terms of the various zoning categories of the County/City and also the land use codes defined by Institute of Transportation Engineers (ITE). This information shall include square footage of the various uses or the number and size of the units. All driveways in the vicinity of the project that could affect operations shall also be shown.

Existing and Proposed Uses in the Vicinity of the Site – A complete description (including a map) of the existing land uses in the study area as well as their current zoning and use must be included. In addition, all vacant land within the study area and its assumed future uses must be identified. This latter item is especially important where large tracts of undeveloped land are in the vicinity of the site, and within the prescribed study area.

B. Graphics and Data Requirements

Traffic counts, including vehicular, pedestrian, and transit counts should be less than one year old. Traffic counts must be performed for all critical time periods such as AM, Midday, PM or Saturday peak hours. Traffic counts should be performed on typical midweek days – no accidents, weather events, holidays, school closures, special events, etc.

Graphics should be included to illustrate the study area and vicinity, study intersections including photographs and lane diagrams for cross-reference, existing, background and future traffic volumes.

C. Analysis Methodology and Software Requirements

All technical analysis of transportation networks must use standards and methodology provided by the latest editions of Institute of Transportation Engineers, Highway Capacity Manual (HCM) and California Department of Transportation. It is the County's requirement that the applicant use **Synchro** software to evaluate intersections. The applicant must submit Synchro files as part of the TIS package for review. Performance measures of effectiveness shall include level of service, vehicle delay, and volume-to-capacity ratio. Among parameters input to code traffic models, standard normal ranges of saturation flow for travel lanes, general signal timing settings, normal values for percentages of heavy vehicles, peak hour factors and headway factors must be used. Any deviation from default values for parameters used in the HCM or any software packages should be clearly noted in the report and is subject to approval by the County.

Additional technical analysis requested by the County on a case-by-case basis may include:

- i. Arterial Travel Time and Delay
- ii. Site access & on-site circulation
- iii. Vehicle Classification
- iv. Parking Demand, Utilization and Turnover studies
- v. Queuing analysis
- vi. Sight distance analysis
- vii. Gap and Speed studies
- viii. Origin-Destination Studies
- ix. Traffic signal timing optimization
- x. Signal warrant analysis per Manual on Uniform Traffic Control Devices guidelines
- xi. Left turn phasing analysis for signalized intersections
- xii. Safety analysis and review of historical accident data
- xiii. Traffic Calming evaluation
- xiv. Pedestrian and Bicycle Level of Service
- xv. Transit Boarding and Alighting and Level of Service, and
- xvi. Evaluation of intersection geometry including turning radii, particularly related to freight movement

- 1) Trip Generation-** Tabulate the estimated number of daily trips and AM and PM peak-hour trips generated by the proposed project entering and exiting the site. Trip generation factors and source are to be included in the report. The trip generation rates contained in the latest edition of the Institute of Transportation Engineers Trip Generation Manual should generally be used.

Internal trip reduction can only be applied for mixed-use types of developments and pass-by trip reduction for retail/commercial types of developments. Pass-by trips are those made as intermediate stops on the way from an origin to a primary trip destination. They do not affect the driveway or site access volumes but do affect the amount of traffic added to the adjacent street system. Pass-by trips can be estimated for certain types of commercial developments using the most current version of the ITEs' Trip Generation Manual. However, until this methodology is finalized, the County must approve pass-by trip estimates for each development on a case-by-case basis, and reserves the option of not allowing pass-by trip reductions if sufficient supporting data is absent.

Internal or pass-by trip reduction assumptions will require analytical support based on verifiable actual similar developments to demonstrate how the figures were derived and will require approval by the County.

- 2) Trip Distribution-** Diagrams showing the percentages and volumes of the project and nearby project's AM and PM peak-hour trips logically distributed on the roadway system must be provided.

If it is assumed that new routes will alter traffic patterns, adequate documentation including traffic distribution maps must be provided showing how and why these routes will alter traffic patterns.

- 3) Related Projects List-** A list of related projects that are approximately within a 2.5 mile radius of the project site and would reasonably be expected to be in place by the project's build out year must be included in the report. Related projects should include all pending, approved, recorded, or constructed projects that are not occupied at the time of the existing traffic counts. The County and adjacent municipalities should be contacted to obtain the latest listings for the vicinity of the proposed development. A table and a map showing the status, project/zone change/conditional use permit/parcel map/tract number, and the location of each project must be provided.
- 4) Traffic Volume Projections-** Background traffic volumes are composed of existing volumes and an accepted general growth of traffic in the study area. An appropriate growth rate is subject to County approval and must be incorporated in the study to forecast any future volumes.
- 5) Level of Service Analysis-** The standard criterion used to define quality of traffic flow is "level of service"(LOS). This is a qualitative assessment of factors such as speed, volume, geometry, delays, and ease of maneuvering. All analysis techniques

specify the quality of operations as a letter– with ‘A’ representing the best operating condition and ‘F’ representing the worst.

LOS	Average Delay/Vehicle (sec/veh)	
	Signalized Intersection	Unsignalized intersection
A	≤10	≤10
B	>10 - 20	>10 - 15
C	>20 - 35	>15 - 25
D	>35 - 55	>25 - 35
E	>55 - 80	>35 - 50
F	>80	>50

The minimum acceptable design level of service (LOS) in the County is ‘C’. At intersections, analyses should show an overall LOS of ‘C’ with no individual movement operating at less than ‘D’ to be considered acceptable and not require mitigation measures. On occasion, level of service ‘D’ may be allowed for peak period in dense urban condition per County’s discretion.

Other than Level of Service, other factors such as delay, queue, volume/capacity ratio and other items may need to be analyzed as part of the report, as explained in section IV.C of this document.

The report should 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 must be provided in an appendix.

D. Analysis of Roadway Conditions

Analysis of roadway conditions should incorporate traffic data, roadway geometry, alternative modes of access, levels of service, delays and volume-to-capacity ratios. The analysis should be performed for the following scenarios during AM, PM peak hours for all projects and also for Midday peak hour when appropriate. Full details of the analysis must be included in the appendix. Results should be summarized in tables for cross reference and must include the following:

1. Existing Conditions

Existing traffic volumes on existing roadways

2. No Build Baseline

Existing traffic volumes on existing roadways plus project in project completion year

3. No Build Horizon Year

Existing Traffic volumes on existing (or planned and programmed) roadway system analyzed for 20 years from project completion.

If improvements/modifications to the existing roadway system are planned and programmed, County staff will provide this information to the applicant and the improved

roadway system will be used as a base for testing horizon year traffic conditions – as appropriate.

If roadway improvements or modifications beyond those formally planned or programmed are assumed in the ‘no-build’ analysis, then these improvements or modifications will be considered to be the responsibility of the applicant. If this is not the case, then the rationale for considering such improvements must be clearly described.

4. Full Build Horizon Year

Full Build Horizon Year analysis must include Existing+ Background + Site generated traffic volumes on existing (or planned and programmed) roadway system analyzed for 20 years from project completion.

If improvements/modifications to the existing roadway system are planned and programmed, County staff will provide this information to the applicant and the improved roadway system will be used as a base for testing horizon year traffic conditions – as appropriate.

If roadway improvements or modifications beyond those formally planned or programmed are assumed in the ‘no-build’ analysis, then these improvements or modifications will be considered to be the responsibility of the applicant. If this is not the case, then the rationale for considering such improvements must be clearly described.

Significant Impact Threshold

- **Intersection currently in compliance with LOS standard**

A project will be considered to have a significant impact if the project will cause the intersection to operate at a level of service that violates the standard overall LOS of ‘C’ with no individual movement operating at worse than ‘D’. On occasion, level of service ‘D’ may be allowed for peak periods in very dense urban condition per County’s discretion.

- **Intersection currently NOT in compliance with LOS standard**

A project will be considered to have a significant impact if the project will cause the intersection to operate at a level of service that violates the standard LOS mentioned above and the proposed project increases average control delay at the intersection by four (4) seconds or more.

Mitigation Measures

If it is determined that a development will have significant impact, the TIS must identify feasible mitigation measures which would mitigate the project and/or other related projects' significant impacts to a level of insignificance. Also, the TIS must identify those mitigation measures which will be implemented by others. Those mitigation measures that are assumed to be implemented by others will be made a condition of approval for the project to be in place prior to issuance of building permits.

Mitigation measures may include, but are not limited to, the following:

Traffic Engineering Techniques

- a. Locate access points to optimize visibility and reduce potential conflict.
- b. Design parking facilities to avoid queuing into public streets during peak arrival periods.
- c. Provide additional off-street parking.
- d. Dedicate visibility easements to assure adequate sight distance at intersections and driveways.
- e. Signalize or modify traffic signals at intersections.
- f. Install left-turn phasing and/or multiple turning lanes to accommodate particularly heavy turning movements.
- g. Widen the pavement to provide left- or right-turn lanes to lessen the interference with the traffic flow.
- h. Widen intersection approaches to provide additional capacity.
- i. Prohibit left turns to and from the proposed development.
- j. Restrict on-street parking during peak hours to increase street capacity.

Exemptions

The following development activities are excluded from the obligation to complete a TIS:

- Alteration or expansion of an existing structure that does not add any residential dwelling units or expand the gross floor area of nonresidential structures by more than 100 square feet
- Miscellaneous improvements, including, but not limited to, fences, walls, signs, and residential swimming pools
- Demolition or removal of a structure within the County
- Replacement of a non-residential structure with a new non-residential structure of the same size and use at the same site or lot when a completed application for the building permit for such replacement is accepted by the County within 12 months of the demolition or destruction of the prior nonresidential structure. A replacement nonresidential structure shall be considered to be the same size as the prior nonresidential structure if the gross floor area of the building will not be increased by more than 100 square feet
- Replacement of a residential structure with a new residential structure of the same number of dwelling units at the same site or lot when a completed application for the building permit for such replacement is accepted by the County within 12 months of the demolition or destruction of the prior residential structure
- Police and fire stations

V. Neighboring Jurisdictions Recommendations

When it appears that other jurisdictions will be impacted by a development, the Department will request that the involved jurisdiction also review the TIS. A written response from that jurisdiction should be provided with appropriate follow-up to the County.

Exhibit A-TIS completeness check list

- Introduction**
 - Land Use, Site and Study Area Boundaries
 - Size of parcel
 - General terrain features
 - Location w/in County
 - Adjacent roadways w/ characteristics
 - Vicinity map w/ transportation system
 - Existing and Proposed Site Uses**
 - Existing zoning categories
 - Proposed zoning categories
 - Specific proposed uses
 - Existing and Proposed Uses in Vicinity of Site w/ map**
 - Existing zoning and uses
 - Vacant land w/ future use
 - Existing and Proposed Roadways and Intersections w/ map**
 - Volumes of streets & intersections
 - Geometrics & traffic signal control
 - Future improvements w/ schedule, agency, & funding
 - Trip Generation and Design Hour Volumes**
 - Summary table
 - Each type of land use w/ size
 - Average trip rates w/ AM, PM & Midday (if applicable) peak
 - Total trips with site and streets
 - Trip Distribution**
 - % distribution in N, S, E, & W
 - Map of street distribution
 - Trip Assignment**
 - % distribution at each access & intersection
- Diagram of each access & intersection
- Related Project List**
- Existing and Projected Traffic Volumes**
 - Diagrams showing in/out & turning for each access, intersection, & street
 - AM/PM peak hour site traffic
 - AM/PM peak hour total traffic for current & 20-yr
 - Other peak hour total traffic for current & 20yr
 - Existing total daily traffic for streets
 - Projected total daily traffic for streets for current
 - Projected total daily traffic for streets for 20-yr
 - Volume projections for background traffic growth**
 - Existing daily volumes traffic based on counts not estimates**
 - LOS analyses**
 - Existing Conditions
 - No Build Baseline
 - No Build 20-yr Horizon
 - Full Build 20-yr Horizon
 - Significant Impact**
 - Significant Impact
 - No Significant Impact
 - Mitigation Measures**
 - Neighboring Jurisdiction Approval/Comments**