City of Stockton
Transportation Impact Analysis Guidelines

City of Stockton
Public Works Department
Engineering Division
425 N. El Dorado Street
Stockton, CA 95202
(209) 937-8411

Table of Contents

Appendices

1. Introduction

The City of Stockton desires to provide a safe and efficient transportation system for its residents and businesses. The purpose of a Transportation Impact Analysis (TIA) is to provide decision makers with sufficient information concerning the impacts of a project on the transportation system and to determine appropriate mitigation measures where impacts exist. A TIA is an important tool that identifies the need for any improvements to a transportation system to reduce congestion, improve safety, provide adequate site access, and mitigate impacts associated with the project.

A TIA must meet the requirements of the California Environmental Quality Act (CEQA). A TIA may be required for any type of development such as residential, commercial, office, industrial or mixed use. As part of the development review process for the City, a TIA needs to be prepared on behalf of a project before a discresionary action (land use zoning change, subdivision map, development application, site plan, new driveways, etc) is approved.

The Transportation Impact Analysis Guidelines shall be used by Consultants for the preparation of all TIAs. The intent of these guidelines is to help assure the conistency and quality of the work product.

2. Scope of the Transportation Impact Analysis

Initial Assessment

A project applicant shall complete and submit Section 1 and Section 2 of Transportation Impact Analysis: Initial Assessment (Form 1, included in Appendix A) at the time that the project application is initally submitted to the Community Development Department. With this information, the Public Works Department will determine the need to prepare a TIA based on an initial assessment of trip generation and transportation impacts. For trip generation, the threshold is 100 or more vehicle trips during the A.M. or P.M. peak hour generated by the project. This condition is generally met if "Yes" is answered to any of the questions in Section 2. Although an individual element of a project may not meet these trip generation thresholds, a TIA may still be required if the project as a whole would generated 100 or more A.M. or P.M. peak hour trips.

A TIA may be required at the discretion of the Public Works Department for sensitive areas where a project may impact an already congested or high-accident location, or when specific site access and safety issues are of concern.

A TIA may not be required if the project is part of a larger development for which a TIA has already been prepared for the City of Stockton. In this instance, it is the project applicant's responsibility to sufficiently demonstrate to the Public Works Department that the project's impacts are consistent with the previously prepared TIA. The Public Works Department shall make the final determination on the sufficency of an existing TIA.

The City is currently updating its General Plan and its long-term roadway needs analysis based on city-wide buildout conditions. Once this analysis is adopted by the City, it may allow for a reduction in the scope of work for some TIA that met certain criteria. In general terms, these criteria would be as follows:

- That the proposed project was the same or similar land use as the land use assumed in the General Plan buildout needs analysis.
- That the proposed project would generate the same or fewer trips as that assumed in the he proposed project was the same or similar land use as the land use assumed in the General Plan buildout needs analysis.
- That the TIA for the proposed project was being conducted within five years after the General Plan buildout needs analysis and revalidation of the Citywide travel demand model.

The State of California Department of Transportation (Caltrans) has jurisdiction over several facilities within the City. These facilities include freeway segmants, ramps, ramp terminals, plus some signalized intersections, unsignalized intersections and urban street segments. Caltrans may require the project applicant to prepare a separate study on traffic impacts to their facilities. Caltrans requirements will be included in the TIA whenever feasible. Generally, Caltrans uses the following criteria as a starting point in determining whether a traffic impact study is needed:

- Project generates over 100 peak hour trips on a State Highway Facility
- Project generates 50 to 100 peak hour trips on a State Highway Facility operating at LOS "C" or LOS "D"
- Project generates 1 to 49 peak hour trips on a State Highway Facility operating at LOS "E" or LOS "F".

Who can conduct a TIA

Only a Professional Civil Engineer or Traffic Engineer, currently registered and in good standing with the California State Board of Professional Engineers and Land Surveyors, may prepare a TIA for the City of Stockton.

The City intends to establish a pre-qualified list of Transportaion Consultants for preparing TIAs to ensure consistency and quality, as well as to limit the time spent by City staff in guiding and reviewing the work by consusltants. Once that list is established, only Consultants on that list can prepare a TIA unless an exception is granted by the Public Works Department.

Scope of Work

Based on the project application materials and Transportation Impact Analysis: Initial Assessment (Form 1), the Public Works Department, in consultation with the Community Development Department and project applicant, will determine the "general" scope of work

for a TIA using the Transportation Impact Analysis: General Scope of Work (Form 2, included in Appendix B.)

Based on this form, the applicant's Consultant shall prepare a draft of a detailed TIA work scope for review by the City. This draft work scope shall be discussed during the TIA scoping meeting.

Prior to starting work on any TIA, a scoping meeting shall be held with the City staff, the Consultant and the project applicant to discuss the project, potential traffic/transporation issues and the scope of the TIA. This scoping meeting is an important forum for the City and project applicant. Typically, the following issues will be discussed:

- What are the potential transportation improvements needed to serve the traffic generated by the project?
- How large of a study area might be appropriate for the TIA?
- Will the project impact traffic on any existing residential streets and how might those impacts be mitigated?
- Will the project aggravate any existing safety hazards or create new ones? If so, how might those hazards be corrected?
- Are there any negative impacts to existing transit, bicycle and/or pedestrian services or facilities?
- Can the proposed development be served by public transportation and does the design encourage transit use?
- Is the design of the development friendly toward bicyclists and pedestrians who need to access the development or who need to pass through or by the development?
- Is the on-site parking sufficient or is there an opportunity to share parking with other adjacent uses?
- How many driveways are needed, and how shall they be designed? Is there a long enough throat for each driveway to accommodate queued vehicles without blocking parking spaces and other cross aisle traffic? Will deceleration lanes be needed?
- For any driveway proposed to be signalized, is the traffic signal warranted and can on-site circulation handle the traffic that will be queuing to wait for a green light?
- Is there sufficient capacity in the roadway link or turn bay to accommodate the anticipated 95% queue? What will be the effect of queue spillback on other movements or upstream intersections?
- Is the development designed to incorporate traffic calming measures or how can it be modified to include this?

While many of the answers to these questions will not be known at the time of the scoping meeting, the Consultant will need to include an analysis of all identified issues in the TIA.

Based on the discussions at the scoping meeting, the Consultant will revise the draft scope of work for the TIA prior to beginning the TIA for the Applicant.

During the course of preparing the TIA, the Consultant shall discuss any additional significant issues identified by the Consultant but not covered in the scope of work with the Public Works Department.

3. Transportation Data

The transportation data (counts, etc.) used in the TIA should be gathered within a one-year period prior to the completion of the TIA, unless an exception is granted by the Public Works Department. Collection of new traffic counts on mainline freeway segments is not expected, but the most recent traffic volume data for freeways that is available from Catrans data sources should be used. Some recent traffic volume data, speed surveys, traffic signal timing plans, and traffic collision data, etc. may be available from the Public Works Department. Past transportation impact analyses, development conditions of approval, and transportation improvement project plans are available for review.

For identified study intersections, turning movement counts shall be conducted on an average Tuesday through Thursday for a 2-hour AM peak period (7 AM to 9 PM) and a 2-hour PM peak period (4 AM to 6 PM) excluding weeks with a holiday. If possible, the counts should be conducted on days when schools are in session. . Intersection counts should be sumarized by 15 minute periods so that the highest one hour period during these peak periods can be identified.

4. Traffic Forecasts

Analysis Scenarios, Peak Hours and Study Area

The basic scenarios for forecasting traffic volumes and analyzing study area intersections and arterials in a TIA are:

1. *Existing Conditions*: Existing traffic volumes based on recent count data.
2. *EPAP Conditions (Existing plus Approved Projects)*: Projected traffic volumes reflecting changes to existing traffic volumes due to relevant approved developments.
3. *EPAP with Proposed Project Conditions (Existing plus Approved Projects plus Project)*: Projected traffic volumes reflecting changes" to EPAP traffic volumes due to the Proposed Project.
4. *Cumulative No Project Conditions:* Projected traffic volumes based on the City's Travel Demand Model under General Plan Build Out Conditions.
5. *Cumulative Plus Proposed Project Conditions:* Projected traffic forecasts reflecting changes in the Cumulative No Project traffic volumes due to the Proposed Project.

Additional scenarios and/or project alternatives may be requested at the discretion of the Public Works Department, such as:

- Phases of a large, multi-phase project
- Project Alternatives warranted under CEQA guidelines (such as a "reduced project" scenario) to reduce or mitigate project impacts.
- Other scenarios to reflect uncertainty about key No Project conditions, such as the existance of a proposed roadway or development near the Proposed Project.

Forecasts should be developed for daily and peak hour conditions. Typical study hours for the level of service analysis are the average Tuesday through Thursday A.M. peak hour and P.M. peak hour. The AM and PM peak hour should be higheat hour between 7 AM and 9 AM and 4 Pm and 6 PM, respectively, based on traffic count data. Analysis of another hour(s) (i.e. weekend peak hour, Friday P.M. peak hour, project peak hour, etc) may be requested at the discretion of the Public Works Department for unique land uses or project sites.

In general, forecasts and level of service analysis should be prepared for all signalized intersections with 10 or more vehicle trips per lane on one or more intersection approach due to the project. All significant access points to the project site shall be analyzed. Major unsignalized intersections in the project vicinity may also require analysis, including a traffic signal warrant analysis. The Public Works Department shall make the final determination of the intersections to be included in the analysis.

Proposed Project Traffic

"Trip Generation," Institute of Transportation Engineers (ITE), is the primary source for trip generation rates for the TIA. When available, the formulas in this source will be utilized to determine the trips generated by the project. The Public Works Department may approve trip generation rates for similar developments from other sources as well as pass-by trip data for some commercial land uses. Pass-by factors are to be used where deemed appropriate by Public Works to reduce the estimated additional total daily traffic to streets serving a proposed development. They are not to be applied directly to reduce overall trip generation and turning-movement volumes at driveways or intersections serving the proposed development. Appendix E provides a definition of pass-by and non-pas-by trips and how they can be handled in the TIA.

Trip generation, trip distribution, and trip assignment for project trips shall be clearly presented. Daily and peak hour trip generation volumes shall be shown in table format. Trip distribution and trip assignment shall be shown with figures.

Existing Plus Approved Projects Conditions (EPAP)

The Consultant shall obtain a list of relevant approved projects from the Public Works Department for the EPAP Conditions scenario. Trip generation, trip distribution, and trip assignment for approved project trips shall be clearly presented. Daily and peak hour trip generation volumes shall be shown in table format. Trip distribution and trip assignment shall

be shown with figures. Changes in traffic volumes under EPAP Conditions may need to reflect near-term changes in the surrounding roadway system.

Cumulative Conditions

The Consultant shall obtain the City's most recent version of the General Plan Buildout Model to forecast Cumulative Conditions. The land use assumptions in the vicinity of the project should be verified at the Transportation Analysis Zone (TAZ) level by comparing the model assumptions with the project assumptions and other sources (general plan, specific plans, etc.). As needed, the model should be disaggregated in the vicinity of the proposed project to provide sufficient detail to appropriately analyze study area facilities. All model assumptions and modifications should be documented. No modifications other than documented land use or roadway network assumptions should be made to the travel demand model without approval of the Public Works Department.

5. Technical Analysis

Level of Service

A level of service (LOS) analysis shall be conducted for all study intersections identified in consultation with the Public Works Department. At a minimum, levels of service shall be calculated for the AM and PM peak hour on an average Tuesday through Thursday under EPAP and Cumulative conditions with and without the project.

The LOS analysis for signalized and unsignalized intersections should use the latest version for the "Highway Capacity Manual" (HCM), Transportation Research Board (TRB), which bases service levels on average vehicle delay. The LOS analysis, especially for signalized intersections using the HCM operations method, can yield substantially different delay calculations depending on input assumptions. Therefore, the City has established some default assumptions for the LOS analysis (see Appendix D).

Under existing conditions, current signal timing should be used. For EPAP and cumulative conditions, signal timing can be modified to reflect changes in traffic volumes or signal phasing. Modified signal timing can be based on optimized "splits" (except were directed by the City Traffic Engineer) but shall not exceed maximum cycle lengths.

The various LOS analysis software using HCM methods and their optimizing routines can provide somewhat different estimates of delay and LOS. This is due to the complexity and detail required in the calculation and the slightly different interpretations of the HCM method among available analysis software. Therefore, the City has chosen to standardize the LOS analysis software for TIAs and directs that the latest version of TRAFFIX (Dowling Associates) shall be used. The reasons this software was selected are:

- TRAFFIX can calculate the LOS for signalized intersection using 2000 Highway Capacity Manual (HCM) operations method including "optimal" signal timing (green

times and cycle lengths) and maximum queue lengths to assist in evaluating signalized intersection operations.

- TRAFFIX can calculate the intersection level of service for yield, two-way stop, and all-way stop controlled intersections according to the 2000 HCM methods.
- This software has kept pace with updates to the HCM.
- TRAFFIX allows the "batch processing" of numerous intersections at one time.
- TRAFFIX contains a traffic forecasting module for traffic impact studies that stores and utilizes assumptions for trip generation, trip distribution and assignment "paths" on a schematic network.

All parameters used in LOS analysis must be provided in the appendix of the TIA by providing the detailed LOS output reports from TRAFFIX. The latest version of TRAFFIX should be used. The following TRAFFIX reports should be included: "Level of Service Summary Report," "LOS Base Compute Report," and "LOS Base Detail Report." If zones were selected to generate trips, the appendix should also include: "Trip Generation Report," "Trip Distribution Report," "LOS Future Compute," and "LOS Future Detail Report." The "Signal Warrant Report" should also be provided if unsignalized inters4ections are analyzed to determine whether or not they meet peak hour signal warrants.

Under conditions where a LOS analysis needs additional detail to incorporate the efforts of coordination on a signal system, the Synchro HCM delay calculation may be used with approval of the Public Works Department.

Roundabout analysis (if needed) shall use the FHWA Method (available in Traffix).

Queuing

The evaluation of study area intersections and driveways shall also include an analysis of queue spillbacks and capacity of turning movement storage bays. The analysis shall include the effect of queue spillback onto other movements and upstream intersections. The back of queue shall be determined at the 95% confidence level.

Signal Warrants

The TIA should determine whether or not any unsignalized intersections near the project site would meet signal warrants under existing or buildout conditions with or without the project. At a minimum, peak hour signal warrants shall be evaluated.

Traffic Share Analysis

For any identified mitigation measure (beyond improvements fully covered by the City's traffic impact fees or funded fully by other sources), the project's share of the total traffic flowing through that improvement shall be calculated. The percentage of project traffic using a facility shall be based on the total PM peak hour volumes under Cumulative (City Buildout) Conditions. For roadway widenings (i.e. from two lanes to four lanes), the percentage share should be based on the two-way directional peak hour volume on that segment of roadway. If

the mitigation measure is an additional right-turn or left-turn lane at an intersection, the percentage share should be based solely on the volume using that additional lane during the PM peak hour. The Public Works Department shall be consulted about methods used to estimate a project's share of unusual improvements. A table detailing the traffic proportion share calculations should be included in the TIA report.

Schools

For any proposed project that contains a school site, even if that school will be developed by others, the TIA shall include an analysis of parking and drop-off/pick-up circulation at the site to ensure that the site, once developed, can adequately accommodate school traffic circulation. This school site analysis shall be coordinated with the associated public or private school district.

Transit

The TIA will discuss all bus routes or other transit opportunities that have, or will have a station or stop within 1/4 mile of the project. The TIA shall evaluate and discuss any potential adverse impacts to transit circulation or service due to the Proposed Project.

Bicycles

The TIA should identify any existing or planned bikeway facilities that are within 1/4 mile of the project and shall identify those that would be modified or adversely impacted by the project.

Pedestrians

The TIA shall identify any significant pedestrian facilities (sidewalks, crosswalks, pathways, trails, etc.) that will be affected by the project.

Trucks

For industrial projects, the TIA shall identify the number of truck trips that will be generated and identify accommodations necessary to support these trucks.

Parking

For retail, office, recreational/entertainment and institutional projects, parking demand shall be calculated for a design day.

Traffic Calming

The TIA shall identify opportunities for traffic calming features based on the City's Traffic Calming Guidelines (adoption anticipated late-2003).

Access Management

The TIA will determine if the proposed driveway spacing and location, as well as mitigation necessary for new accesses/driveways, meet the access provisions being established within the new Development Code (adoption anticipated late-2003).

Sight Distance

For any proposed driveway or local roadway intersection where the potential for inadequate sight distance is identified, an evaluation of the available sight distance shall be conducted based on field measurements and Caltrans' Highway Design Manual.

Park & Ride

The TIA shall identify the amount of park-and-ride demand generated by the proposed project. This estimated demand will be used to determine the project's share of city-wide demand for new park-and ride facilities.

Compliance with Policies

The TIA shall determine if the project is in compliance with City plans and policies including Specific Plan (Precise Plan) provisions (i.e. right-of-way and lane width, access provisions/restrictions and associated analysis).

6. Standards of Significance for Transportation System

The following standards and criteria shall be used in the TIA to determine if a project has a significant impact. These criteria may be modified or expanded for unique project circumstances or to reflect policies adopted by the City at the discretion of the Public Works Department.

City of Stockton Intersections

The City of Stockton's General Plan has a LOS "D" standard for its roadway system. Intersections and roadway segments operating at LOS "A", "B", "C", or "D" conditions are consisdered acceptable, while those operating at LOS "E" or "F" conditions are consisdered unacceptable.

For a City intersection, a transportation impact for a project is considered significant if the addition of project traffic would cause an intersection that would function at LOS "D" or better without the Project to function at LOS "E" or "F".

For City intersections with a LOS "E" or "F" conditions without the project, a transportation impact for a project is considered significant if the addition of project traffic causes an increase of greater than 5 seconds in the average delay for the intersection.

Caltrans Facilities

Facilities under the jurisdiction of Caltrans, including freeway segmants (multi-lane and two lane highways), ramps, ramp terminals, signalized intersections, unsignalized intersections and urban streets, shall utilize the current Caltrans standard to determine project traffic impact.

Transit

A significant impact to the transit system would occur where project generated ridership, when added to existing or future ridership, exceeds available or planned system capacity. Capacity is defined as the total number of passengers the system of busses and light rail vehicles can carry during the peak hours of operation.

Bikeways

A significant bikeway impact would occur if the project hindered or eliminated an existing designated bikeway, or if the project interfered with implementation of a proposed bikeway.

A significant bikeway impact could occur if the project were to result in unsafe conditions for bicyclists, including unsafe bicycle/pedestrian or bicycle/motor vehicle conflicts.

Pedestrian Circulation

A significant pedestrian circulation impact would occur if the project were to result in unsafe conditions for pedestrians, including unsafe increases in pedestrian / bicycle or pedestrian / motor vehicle conflicts.

Local Vehicular Circulation

A significant impact to the local pedestrian, bicycle, automobile, and/or transit circulation would occur if the normal operations of automobile and truck access to the project site would adversely impact adjacent streets or sidewalks.

Safety

A significant impact to the safety of drivers would occur if there is inadequate sight distance from a project driveway to view approaching vehicles.

7. Mitigation Measures

For every significant impact, the TIA must identify and discuss mitigation measures at a conceptual level that will be implemented by the proposed development. The TIA may identify a mitigation measure or develop a range of mitigation measures for each impact to improve the performance of the transportation system. Mitigation measures shall be specific and feasible actions that will actually improve adverse transportation conditions. The mitigation measures shall improve conditions or correct capacity deficiencies to acceptable levels of service. The TIA should discuss whether the measure reduces the impact to a less-than-significant level, and should report the conditions after the implementation of the mitigation measure.

An effective mitigation measure shall adequately avoid, minimize, rectify, or compensate an impact. It shall be consistent with local plans and policies. If the mitigation measures do not reduce impacts to less than significant, an environmental impact report is required.

Mitigation measures may include traffic control devices, roadway design features and parking control devices. The Consultant shall determine the need for new traffic control devices, parking control programs/devices, and roadway design features (including traffic calming measures) based on the City's traffic engineering policies and procedures and Caltrans' "Traffic Manual". The installation of traffic control devices and parking control devices and construction of roadway design features shall conform to engineering standards and traffic engineering rules and regulations.

In addition, mitigation measures shall address vehicular queues, progression quality, and other factors that affect traffic conditions that are not part of the LOS analyses. They shall consider traffic operations at intersections, driveways, interchanges, and ramp meters.

For mitigation measures, the TIA must discuss any improvements and programs (objectives and specifics) needed to reduce a project impact plus the implementation schedule for these measures. The implementation schedule shall match the proposed mitigation measures with an easily identifyable milestone of project completion.

The City has developed a traffic impact fee program to fund certain transportation system improvements. This fee program does not necessarily eliminate the need for a TIA or implementation of mitigation measures by the project applicant.

8. Documentation

For consistency, the TIA report shall follow the City's format (See Appendix C). The Public Works Department and Community Development Department staff will review and comment on the draft TIA report. The Consultant shall make the necessary revisions and submit the final TIA report to the Public Works Department for approval. The Consultant shall furnish copies of the draft and final TIA report to the City.

The report shall meet the following requirements:

1. The report shall clearly state its purpose and objectives.
2. The report shall be presented in a clear and logical sequence. It shall lead the reader step-by-step through the various stages of the process and to the resulting conclusions and recommendations. It shall include graphics, tables and charts to clearly identify the project, the project location, proposed project phasing, impacts, issues and solutions. Purely technical data (i.e. turning movement counts, LOS calculations, etc.) shall be included in appendices with a summary within the body of the report.
3. All maps and graphics involving mitigation improvements must be drawn to scale with roadway geometrics appropriately dimensioned (e.g. road width, lane width, 95% confidence level queue length etc.). The intent of such graphics is to assist in determining the feasibility of a proposed mitigation. Therefore, graphic must include adajcent structures/uses, parking areas, bus stops, pedestrian crosswalks, driveways, etc.

4. All computerized analysis output sheets and supporting raw-count data (hose counts and intersection turning movement) and intersection delay/LOS calulations shall be submitted as an appendix to the draft report for review. All assumptions used in the calculations must be referred to the appropriate table, chart or page in approved publication. Calculations must be comprehensive and clear.
5. The TIA shall identify traffic congestion, safety problems and/or other deficiencies of the existing and future transportation system (for vehicle, transit, bicycle and pedestrian travel), with and without the proposed development, including identified transportation improvements being planned by other public or private organizations that are expected to be in operation by the future years under study.
6. Where build-out roadway and intersection configurations are different from those currently existing, they must be based on approved projects as determined by the Public Works Department.
7. Description of on-site issues including number and location of driveways, parking needs, parking layout, circulation, bicycle and pedestrian facilities, truck access and operations, transit and safety shall be presented.
8. The report shall cover the potential measures needed to mitigate the impact of the Proposed Project to the level defined by local and state policies. The "Standards of Significance" listed in these TIA Guidelines may need to be supplemented to reflect unique issues or policies.
9. The TIA shall contain recommendations for site access and transportation improvements needed to maintain traffic flow to, from, within, and past the site at an acceptable and safe level of service. Improvements typically include roadway widening, additional turn lanes, traffic signal installations and modifications, bicycle, pedestrian and transit amenities, and safety measures.
10. Description of coordination efforts with other affected jurisdictions impacted by the development shall be included.
11. The Consultant shall provide the City with all relavant electronic files used to forecast traffic with the City's travel demand model.
12. The cover page of the traffic study is required to be stamped and signed by a Professional Engineer (Traffic or Civil).

CITY OF STOCKTON
TRANSPORTATION IMPACT ANALYSIS GUIDELINES

APPENDICES

APPENDIX A
TIA: INITIAL ASSESSMENT (FORM 1)

SECTION 1: PROJECT AND APPLICANT INFORMATION (*TO BE COMPLETED BY APPLICANT*)

PROJECT TITLE	PROJECT LOCATION	APPLICATION NO.
APPLICANT	APPLICANT CONTACT	APPLICANT PHONE

SECTION 2: APPLICATION TYPE AND PROJECT DESCRIPTION (TO BE COMPLETED BY APPLICANT)

TYPE OF APPLICATION	(check)		(check)
ZONING		AMENDMENT TO DEVELOPMENT APPROVAL	
TENTATIVE MAP		NEW DEVELOPMENT / CONSTRUCTION	
USE PERMIT		OTHER:	

PROJECT DESCRIPTION

PROPOSED LAND USE	(check)	Answer the corresponding question regarding the proposed project:	**Yes**	**No**
RESIDENTIAL		Is the proposed residential project greater than 100 dwelling units?		
COMMERCIAL		Is the proposed commercial project building larger than 1,500 sq. ft.?		
		Does the proposed commercial project have a fast-food restaurant?		
OFFICE		Is the proposed office project building larger than 15,000 sq. ft.?		
INDUSTRIAL		Is the proposed industrial project building larger than 20,000 sq. ft.?		
OTHER: (please describe)				

TRAFFIC GENERATION (AVERAGE WEEKDAY)

ITE Land Use Code	**Size**	**Unit Name (e.g. sq ft, apts)**

Total Vehicle trips	_____	Vehicle trips per day		
Peak Hour Trips		A.M. Peak Hour		P.M. Peak Hour
* New vehicle trips	_____	Vehicle trips per hour	_____	Vehicle trips per hour
* Pass-by vehicle trips	_____	Vehicle trips per hour	_____	Vehicle trips per hour
* Total vehicle trips	_____	Vehicle trips per hour	_____	Vehicle trips per hour
Total trips IN	_____	Vehicle trips per hour	_____	Vehicle trips per hour
Total trips OUT	_____	Vehicle trips per hour	_____	Vehicle trips per hour

Submitted by

_____ _____

Signature of Applicant Date

REMAINING SECTIONS TO BE COMPLETED BY CITY

SECTION 3: TRANSPORTATION IMPACT EVALUATION

Transportation / Circulation Could the proposed project:	NO	MAYBE	YES
Cause a substantial increase in traffic (100 peak hour trips) in relation to the existing traffic load and capacity of the street system?			
Cause any public or private street intersection to function below level of service specified in the City of Stockton General Plan?			
Pose a potential vehicle safety hazard (i.e. unsafe sight distance, etc.)			
Pose a potential traffic hazard to pedestrians or bicyclists?			
Adversely affect vehicle, bicycle or pedestrian access to surrounding uses?			

SECTION 4: DETERMINATION

On the basis of this initial assessment for significance:

I have determined that a Transportation Impact Analysis on the proposed project ___WILL NOT BE required.

I have determined that a Transportation Impact Analysis on the proposed project ___WILL BE required as part of an environmental document.

_____ _____

Public Works Department Date

APPENDIX B
TIA: GENERAL SCOPE OF WORK (Form 2)

PROJECT TITLE	PROJECT LOCATION	APPLICATION NO.
APPLICANT	TRAFFIC CONSULTANT	CITY DEPARTMENT
APPLICANT CONTACT	CONSULTANT CONTACT	CITY CONTACT
APPLICANT PHONE	CONSULTANT PHONE	CITY PHONE
APPLICANT E-MAIL	CONSULTANT E-MAIL	CITY E-MAIL

ANALYSIS AREA BOUNDARIES	NORTH	SOUTH
	EAST	WEST

KEY TRANSPORTATION SYSTEM IMPROVEMENTS	
EXISTING PLUS APPROVED PROJECT CONDITIONS	
CUMULATIVE CONDITIONS	

TRANSPORTATION SYSTEM IMPROVEMENTS		
ITEMS FOR ANALYSIS	*(check)*	*Comments/Locations*
QUEUE SPILLBACKS		
ACCESS MANAGEMENT (INCLUDES DRIVEWAYS)		
TRANSIT/ BICYCLE/ PEDESTRIAN ACCESS		
SITE CIRCULATION AND PARKING		
NEIGHBORHOOD TRAFFIC & PARKING MANAGEMENT		
TRAFFIC SAFETY		
PUBLIC SCHOOLS		
OTHER		

TIA: General Scope of Work (Form 2 cont'd)

ANALYSIS SCENARIOS

❑ EXISTING CONDITIONS ❑ EXISTING PLUS APPROVED PROJECT (EPAP) CONDITIONS ❑ EPAP WITH PROJECT CONDITIONS ❑ CUMULATIVE (GENERAL PLAN BUILDOUT) NO PROJECT CONDITIONS ❑ CUMULATIVE WITH PROJECT CONDITIONS ❑ OTHER _____	❑ PROJECT ALTERNATIVES: _____ _____ _____

ANALYSIS PERIODS

❑ A.M. PEAK HOUR ❑ P.M. PEAK HOUR	❑ OTHER _____

ANALYSIS LOCATIONS

INTERSECTIONS	**ARTERIAL and FREEWAY SEGMENTS**

APPENDIX C
TIA: REPORT FORMAT AND CONTENTS

I. PROJECT DESCRIPTION
- a. Location & Map
- b. Square footage by use (i.e. office, retail, residential, etc.), staging
- c. Site Plan showing, if available:
    1. Auto, transit, pedestrian, service access
    2. Parking facilities (number of spaces, dimensions, circulation)
    3. Any proposed sidewalk improvements

II. EXISTING CONDITIONS (in vicinity of the project)
- a. Street System
    1. Number of lanes and any transit/bike lanes on major streets & access streets
    2. Traffic volumes on major streets
    3. Peak hour level of service at critical intersections
- b. Other Travel Modes
    1. Bicycle facilities (routes, lanes), if any near project site
    2. Transit service, if any near project site
    3. Pedestrian facilities, if any near project site
- c. Miscellaneous
    1. Curbside truck loading zones on project block, if any near project site
    2. Railroad crossings, if any near project site
    3. Any other issues

III. IMPACT ANALYSIS
- a. Method of Analysis
    1. Overview of analysis
    2. Scenarios and alternatives evaluated
    3. Standards of significance
- b. Trip Generation and Distribution of Project
    1. Average daily traffic and PM peak hour trip generation
    2. Geographic distribution by percent
- c. Existing Plus Approved Project (EPAP) Conditions
    1. Trip generation of approved projects and baseline growth
    2. traffic volumes and LOS
- d. Project Traffic Impacts under EPAP Conditions
    1. Traffic volumes with project
    2. Peak hour level of service at critical intersections
    3. Critical corridor analysis including ramp termini capacities
    4. Delay/signal warrants and LOS/other controls at critical unsignalized intersections
    5. Parking impacts
    6. Pedestrian flows/LOS for critical crosswalks and/or sidewalk areas

7. Delays/changes at existing RR crossings
8. Emergency vehicles access
9. Service vehicle impacts (maneuvering/docking and curbside loading zone impacts)

e. Cumulative No Project Conditions
   1. Build out land use and roadway system assumptions
   2. Overview of Citywide Travel Demand Model
   3. Traffic volumes under build out conditions
   4. LOS under build out conditions

f. Project Traffic Impacts under Cumulative Conditions
   1. Traffic volumes with project
   2. Peak hour level of service at critical intersections
   3. Critical corridor analysis including ramp termini capacities
   4. Delay/signal warrants and LOS/other controls at critical non-signalized intersections
   5. Delays/changes at existing RR crossings

g. Transportation Impacts of Construction, if any
   1. Street/sidewalk closures
   2. Circulation Impacts
   3. Parking Impacts

h. Policy Implications
   1. Consistency of Project with City Plans/Policy

IV. ALTERNATIVES

a. Traffic/parking impacts of selected alternatives to proposed project

V. MITIGATION MEASURES

a. Propose/suggested measures for mitigating adverse transportation impacts of project. Levels of service and other appropriate parameters to be estimated, where applicable, for each mitigation measure.

APPENDIX D
TIA: DEFAULT ASSUMPTIONS FOR LEVEL OF SERVICE ANALYSIS

Peak Periods

- Weekday peak periods in the City are:
  - 7:00 A.M. to 9:00 A.M. for A.M. peak period
  - 4:00 P.M. to 6:00 P.M. for P.M. peak period

HCM Parameters for LOS Analysis in Stockton

Default TRAFFIX values and assumptions should generally be used, with adjustments, as appropriate to reflect local conditions.

- METHOD: 2000 HCM Operations Method for signalized and unsignalized intersections
- Design Queue method - select as default.
  Clearance Time is 5 seconds. (4 seconds permitted for through movements.)
- LOSS TIME: Based upon assumed number of phases and signal control
- Maximum Cycle Lengths: The City of Stockton currently has no standard for maximum cycle lengths. Most signals run cycle lengths of 130 seconds or less.
- Minimum green times should accommodate pedestrian timings at 4.0 feet per second at fixed time signals without pedestrian signal buttons (at some downtown locations)
- Grades in Stockton are generally considered to be 0%
- Area Type: Use Other or CBD, as appropriate. Downtown Stockton, bounded by A, B, C and D Streets, should use the "CBD Area Type"
- Arrival type main street: 4
- Arrival type side street: 4
- Calc HCM Sat Adj: Yes (except where warning errors suggested it be turned off, in oversaturated conditions)
- Coordinated Systems: Study intersections on the following streets should be checked prior to analysis, as they may be coordinated with other signals: March Lane, Pacific Avenue, Hammer Lane, Pershing Avenue, El Dorado Street, Airport Way, and Wilson Way.
- Unsignalized Intersections: Report average overall intersection delay. Determine impacts based upon added seconds delay to overall intersection (not worst case movement).

APPENDIX E
PASS-BY AND NON-PASS-BY TRIPS IN TRIP GENERATION ANALYSIS

The ITE has developed a recommended practice to establish a basis for consistency in traffic impact studies, with the primary purpose of providing reliable guidance for site access, on-site circulation, and off-site improvement planning in accommodating site and other traffic safely and efficiently. [1] The sections that follow have been extracted from the industry-standard reference *Trip Generation Handbook, An ITE Recommended Practice*.

The trip generation rates and equations contained in ITE's *Trip Generation* represent vehicles entering and exiting a site at its driveways. These volumes are appropriate for determining the total traffic to be accommodated by the project site's driveways. There are land use types, however, for which the total number of trips generated by the site is different from the amount of new traffic added to the street system by the proposed project. Certain land uses, e.g. retail, restaurants, banks, among others, attract motorists already on the street. These sites attract a portion of their trips from traffic passing the site on the way from an origin to an ultimate destination. Hence, the impacts of a proposed project on an adjacent street may be less than the full trip estimates using ITE trip generation rates.

Trip-making can be broken down into two major categories: pass-by trips and non-pass-by-trips. In some traffic impact study applications, the subdivision of non-pass-by trips might be appropriate and could be broken into primary trips and diverted linked trips.

1. **Pass-By Trips:** trips that are made as intermediate stops on the way from an origin to a primary trip destination without a route diversion. They are attracted from passing the site on an adjacent street or roadway that offers direct access to the project site. Pass-by trips are not diverted from another roadway. These trips are closely linked to the size of the development and to the volumes of traffic on the adjacent street that can deliver the pass-by trip.

    a. Driveway Improvements. Pass-by trips are drawn from the passing stream, but are always included in the site driveway movements. Summation of driveway volumes must equal the total external site trip generation (i.e., the sum of primary, pass-by, and diverted linked trips).

    b. Adjacent Volumes. Pass-by trips are not included in (and thus, subtracted from) the through-volumes passing a given site access point on an adjacent road. The *Trip Generation Handbook, An ITE Recommended Practice* provides recommended guidelines and data sets useful in selecting a pass-by percentage to appropriately reduce estimated traffic volumes.

[1] *Transportation Impact Studies, Advancing the Land Development Process* (Brochure), Institute of Transportation Engineers

c. Multi-Use Development. Before applying the pass-by reduction for multi-use development, the internal trips should be removed from the total number of trips generated by the multi-use site. Pass-by trips are only applicable to trips that enter or exit the site, not internal trips.

2. **Non-Pass-By Trips:** simply all trips generated by a project site that are not pass-by trips. The trip generation estimation for all new or proposed development projects must include the summation of primary trips and diverted linked trips.

a. Primary Trips: trips made for the specific purpose of visiting the generator. The stop at the generator is the primary reason for the trip. The trip typically goes from origin to generator and then returns to the origin, e.g., home-to-shopping-to-home combination of trips.

b. Diverted Linked Trips: trips that are attracted from the traffic volume on roadways within the vicinity of the generator but that require a diversion from that roadway to another roadway to gain access to the site.

i. i). Diverted linked trips add traffic to streets adjacent to a project site, but may not add traffic to the area's major travel routes, such nearby major highways or freeways.

ii. ii). Because diverted linked trips are often difficult to identify, these trips should be treated similarly to primary trips, unless: (1) all three (primary, pass-by, and diverted linked) categories are being analyzed and processed separately, and (2) the travel routes for diverted link trips can be clearly established.

iii. iii). Standard methodologies for assessing traffic impacts of site development typically require that diverted linked trips be included as additional trips within the confines of local impact assessment studies.

iv. Diverted linked trips represent a change in local area travel patterns but constitute no new increase on a macroscopic scale. Within the immediate study area, however, diverted linked trips do represent additional traffic on individual streets and should be analyzed that way.

APPENDIX F
TIA: LIST OF ACRONYMS

ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPAP	Existing plus Approved Projects
HCM	Highway Capacity Manual
HOV	High Occupancy Vehicle
ITE	Institute of Transportation Engineers
LOS	Level of Service
NEPA	National Environmental Policy Act
PNR	Park and Ride
PSR	Project Study Report
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SOV	Single Occupant Vehicle
SRTP	Short Range Transit Plan
STIP	State Transportation Improvement Program
TAZ	Transportation Analysis Zone
TCM	Transportation Control Measure
TCRP	Transportation Congestion Relief Program
TDA	Transportation Development Act
TDM	Transportation Demand Management
TIA	Transportation Impact Analysis
TIP	Transportation Improvement Program
TOS	Traffic Operation System
TRB	Transportation Research Board
TSM	Transportation Systems Management
V/C	Volume/Capacity

APPENDIX G
TIA: REFERENCES

State of California:

- California Vehicle Code
- Traffic Manual
- Highway Design Manual
- Caltrans Guide for the Preparation of Traffic Impact Studies
- Traffic Volumes on State Highways

City of Stockton:

- Municipal Code
- General Plan
- Specific Plans (Roadway and Land Use)
- Street Improvement Fee program
- Capital Improvement Program
- Short Range Transit Plan
- Bikeway Plan
- Other Transportation Impact Analyses