

# Manteca Transportation Impact Analysis Guidelines

## Introduction

In order to maintain an acceptable level of mobility and access for all travel modes, the City of Manteca requires that all land use development projects consider impacts to the transportation system. This document provides the following:

1. Guidance on when a Transportation Impact Analysis (TIA) is required.
2. Definition of when transportation impacts are considered significant based on a CEQA analysis.
3. Guidance on potential mitigation measures.

## Scope of the Transportation Analysis

This section provides guidance on the conditions that trigger the need for a TIA and defines the geographic scope of the study area/study facilities. Note that depending on the nature and location of the proposed project, City staff may determine that TIA may be required even if none of the conditions below are met. In addition, City staff may determine that certain study facilities (i.e., congested locations, high accident locations, etc.) may also be included in a TIA, even if they do not meet the thresholds below.

## Initial Assessment

To determine whether a TIA is required, the project applicant shall fill out and submit the Initial Assessment Form (included in the Appendix) to Community Development Department staff. Based on the information in the Initial Assessment Form, Public Works Department staff will make a determination as to the need for a TIA. The need for a TIA is primarily based on the vehicle trip generation of the project. In general, only projects that are expected to generate more than 100 AM or PM weekday peak hour vehicle trips will require a TIA; although smaller projects may require a TIA at the discretion of the Public Works Department if the project is located in a congested area or when specific site access or safety issues are of concern.

Certain projects may be exempt from a TIA, or may qualify for a TIA of reduced scope if the project is part of a larger development for which a TIA has already been prepared. In this instance, the project applicant must demonstrate that the project's impacts are adequately considered in the previous study. The Public Works Department will make the final determination about the sufficiency of the existing TIA.

### What is a Transportation Impact Analysis (TIA)?

A TIA is a document that discloses the impacts of land use development projects on the operations and condition of the transportation system. Potential impacts include:

- Increasing delays for vehicles
- Failing to accommodate walking and biking
- Preventing or limiting transit service
- Causing unsafe conditions

These documents also identify mitigation measures that can help reduce the significance of any identified

## Study Scenarios

If the Public Works Department determines that a TIA is required, the following study scenarios shall be analyzed:

- Existing Conditions
- Existing Plus Project Conditions
- Cumulative Conditions
- Cumulative Plus Project Conditions

The time frame for Cumulative Conditions will be established by City Staff, but this condition generally represents the horizon year of the General Plan. Additional scenarios may be required if the project is expected to develop in phases. City staff will determine if any additional scenarios are necessary. Examples of additional scenarios may include a Background Conditions (year of construction) and Background Plus Project Conditions analysis.

Traffic counts/forecasts for the study scenarios shall be collected/developed for weekday AM and PM peak hour conditions, unless otherwise directed by City staff. However, depending on the type of land use and localized travel conditions, City staff may decide to exclude certain analysis time periods and include new time periods (e.g., weekend midday peak hour conditions). Cumulative Conditions traffic forecasts shall be developed using a calibrated/validated travel demand forecasting model.

### *Plus Project Traffic Generation*

The latest version of *Trip Generation* (Institute of Transportation Engineers) shall be the primary source for trip generation rates in the TIA. The Public Works Department may approve trip generation rates for similar developments from other sources as well as mixed-use trip generation rates and pass-by trip data for certain commercial land uses. Pass-by factors are to be used where deemed appropriate by Public Works to reduce the estimated “new” trip generation of the project. Project trip generation and trip distribution information shall be clearly presented and approved by Public Works Department staff before the impact analysis portion of the TIA is begun. As shown in Table 1 on the following page, gross daily and peak hour trip generation shall be shown in table format, along with any internalization or pass-by adjustments. Project trip distribution shall be described in the document, or for more complex distribution patterns, shown in a figure.

## Study Facilities

The number and location of study facilities to be included in the TIA will ultimately be defined by City staff. The following criteria will be considered by City staff in defining the study facilities:

*Freeway Segment, Ramp Merge, Diverge, and Weaving Analysis* – If a project is consistent with existing zoning and General Plan land use designations, the freeway analysis is not required since freeway impacts have been identified as part of the General Plan EIR. For projects seeking a zoning change, General Plan amendment, or annexation into the City, freeway segments shall

be included based on the latest version of Caltrans *Guide for the Preparation of Traffic Impact Studies*.

TABLE 1 - TRIP GENERATION EXAMPLE							
Land Use	Quantity	Trip Rate <sup>1</sup>			Trips		
		Daily	AM Pk. Hr.	PM Pk. Hr.	Daily	AM Pk. Hr.	PM Pk. Hr.
High-Cube Warehouse	1,465 ksf	1.44	0.09	0.10	2,109	132	146
Light Industrial	275 ksf	6.96	0.84	0.86	1,911	231	236
Auto/Truck Parts/Service	92 ksf	17.10	1.35	1.93	1,565	124	177
Retail	162 ksf	50.43	1.09	4.81	8,150	176	777
Gross Trips					13,735	663	1,336
Industrial-to-Retail Internalization <sup>2</sup>					-335	-29	-34
Retail Pass-by Trips <sup>3</sup>					-1,197	-24	-190
New Trips					12,203	610	1,112
Notes:							
<sup>1</sup> Trip rates for retail use from ITE <i>Trip Generation</i> (2008) best fit curve. Trip rates for light industrial and high-cube warehouse based on average rates published in <i>Trip Generation</i> . Trip rates for auto/truck parts/service land use category based on data in <i>San Diego Traffic Generators</i> , SANDAG, 1998.							
<sup>2</sup> 3% of retail trips assumed to be internalized with industrial uses.							
<sup>3</sup> Retail pass-by rate assumed to be 15 percent for daily and AM peak hour conditions and 25 percent for PM peak hour conditions.							

*Intersection Analysis* – An intersection may be considered for inclusion in the TIA if any of the following requirements are met:

- 1) The proposed development project is estimated to add 25 or more peak hour vehicle trips per lane to any intersection movement. Intersection analysis will generally be restricted to intersections of existing and planned arterial/collector streets. Intersections with driveways or local streets may be included based on a decision by City staff.
- 2) The intersection is immediately adjacent to the proposed project.
- 3) Based on engineering judgment, City of Manteca staff determines that the intersection/driveway should be included in the analysis.

**How to determine if an intersection meets the 25 vehicle threshold?**

In general, TIA preparers are encouraged to use analytical techniques (e.g., project-only traffic assignment from a validated travel demand model) to determine which intersections will satisfy the above volume thresholds. However, manual methods may be appropriate for small or straightforward projects.

The 25 or more vehicle per lane requirement applies to any intersection movement (left-turn, through or right-turn). If a movement uses a shared lane, the shared lane shall be considered a full lane.

*Roadway Segment Analysis* – At the City’s discretion, roadway segment analysis may be requested in lieu of, or in addition to, intersection analysis. In general, roadway segment analysis is appropriate for sub-area, general plan, and other types of programmatic analyses where intersection level of detail may not be appropriate. City staff will determine the extent of roadway segment analysis; however, in general, roadway segments where the project or proposed action would increase daily traffic volume by more than 250 trips may be considered for evaluation.

*Transit Analysis* – The TIA shall discuss all bus routes or other transit services that have, or will have a station or stop within ¼ mile of the project. The TIA shall evaluate and discuss any potential negative impacts to transit circulation or service due to the proposed project. Negative impacts may include, but are not limited to, interruption or disruption (rerouting, removal of a stop, etc.) of service due to construction or ongoing activities at the site or significant new transit trip generation that would exceed the capacity of the transit vehicles. Any onsite transit amenities (e.g., bus turnouts, transit shelters) shall also be discussed in the TIA.

*Bicycle Analysis* – The TIA shall provide a discussion any existing or planned bikeway facilities that are within ¼ mile of the project and shall identify those that would be modified or adversely impacted by the project. Any onsite bicycle amenities (e.g., bike racks, bike lanes, bike paths, bike lockers) shall also be discussed in the TIA.

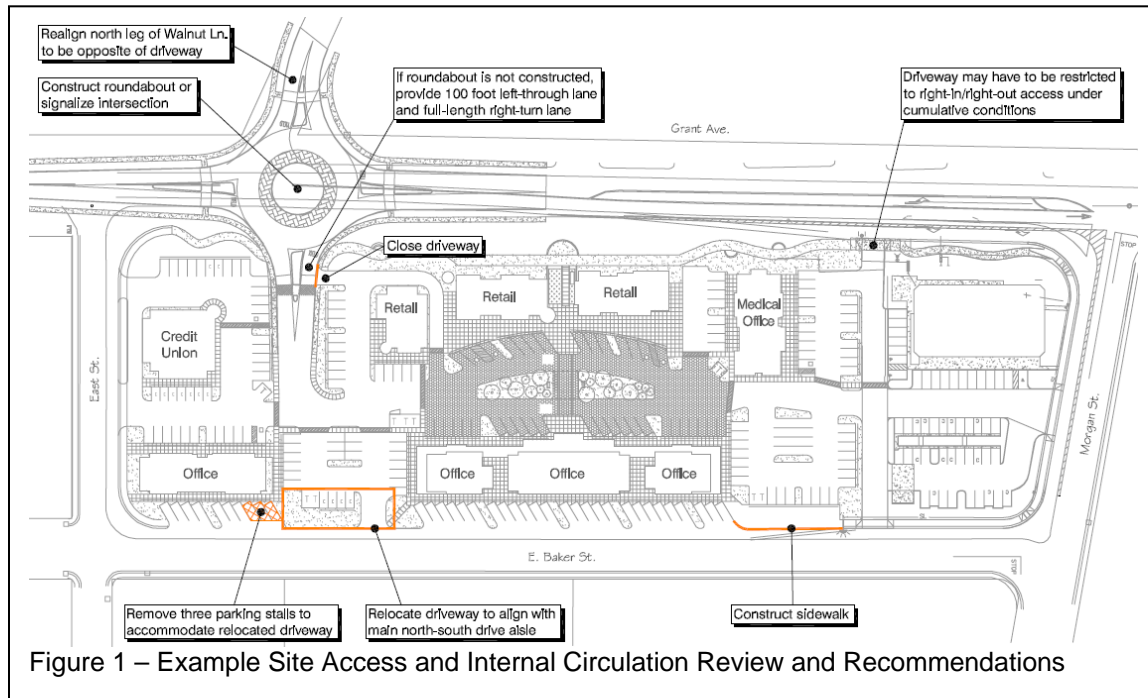
*Pedestrian Analysis* – The TIA shall provide a discussion of any pedestrian facilities (sidewalks, crosswalks, pathways, trails, etc.) that are in the immediate vicinity of the project. The TIA shall also identify any pedestrian facilities that will be negatively affected by the project. Any onsite pedestrian amenities beyond sidewalks and crosswalks (e.g., pedestrian access routes between adjacent properties, benches/seating, pedestrian-scaled lighting) shall also be discussed in the TIA.

*At-grade Railroad Crossing Analysis* – The TIA may include an analysis of at-grade railroad crossings near the project site. The determination of which at-grade crossing to include in the TIA will be made by City staff, but in general, crossings with ¼ mile of the project will be studied.

*Parking Analysis* – The TIA shall only provide a parking analysis if the proposed project is a mixed use development seeking to construct fewer than the minimum number of parking spaces require in the City Code. In this case, the TIA may be required to include a shared parking analysis consistent with the methodologies described in the most recent version of *Shared Parking* (Urban Land Institute) to demonstrate that the proposed parking supply will adequately accommodate demand.

*Site Access and Internal Circulation Analysis* – The TIA shall include a review of the project’s proposed site access and internal circulation. This access and circulation review shall consider vehicle circulation conflicts in parking lots (long drive aisles with no turn around points, queuing/blocking issues at internal intersections, storage areas of drive-through windows), vehicle access to the site (turn pocket length, corner radii, sight distance assessment, need for

deceleration lane/taper, potential, need for turn restrictions, etc.) pedestrian accommodations throughout the site (presence of crosswalks and sidewalks), and other site design issues. See the figure on the following page for an example.



### Analysis Methodology

For intersection analysis, traffic operations shall be analyzed using software that employs the methodologies defined in the most recent version of the *Highway Capacity Manual* (e.g., Synchro/SimTraffic). As part of the analysis, the following factors (at a minimum) must be considered and documented:

- Peak hour factors
- Heavy vehicle percentage
- Traffic signal timing

If traffic microsimulation is used (e.g., SimTraffic, Vissim), the TIA must include a discussion of how the microsimulation model was calibrated to match field conditions.

If an analysis of ramp terminal intersections is required, the 95<sup>th</sup> percentile queue for the off-ramp approach shall be measured to ensure that traffic exiting the freeway does not back onto the

mainline. City of Manteca staff may specify that particular analysis software (e.g., Synchro, SimTraffic, SIDRA, Vissim) be used to obtain reasonable queuing results.

For freeway segment analysis, traffic operations shall be analyzed using either the daily traffic/level of service threshold shown in Table 2 or using software capable of evaluating AM and PM peak hour level of service consistent with *Highway Capacity Manual* methodologies (e.g., HCS). City staff will determine the type of freeway analysis to be conducted (i.e., daily or peak hour analysis). Factors such as heavy vehicle percentage and high occupancy vehicle percentage (if applicable) should be considered and discussed in the TIA.

TABLE 2 - MANTECA DAILY FREEWAY LOS THRESHOLDS					
Number of Lanes	Maximum Daily Traffic Volume at...				
	LOS A	LOS B	LOS C	LOS D	LOS E
4	27,600	45,200	63,600	77,400	86,400
6	41,400	67,800	95,400	116,100	129,600
8	55,200	90,400	127,200	154,800	172,800
10	69,000	113,000	159,000	193,500	216,000

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Roadway segment operations shall be analyzed using the LOS thresholds defined in Table 3 below, which were developed by the Florida Department of Transportation using the methods defined in the *Highway Capacity Manual*.

TABLE 2 - MANTECA DAILY ROADWAY SEGMENT LOS THRESHOLDS					
Number of Lanes	Maximum Daily Traffic Volume at...				
	LOS A	LOS B	LOS C	LOS D	LOS E
2	8,400	9,300	11,800	14,700	17,300
4	18,600	20,600	26,000	32,500	38,200
6	28,800	32,000	40,300	50,400	59,300
8	38,100	42,300	53,300	66,600	78,400

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Transit, bicycle, or pedestrian facility conditions shall be described in a qualitative manner such that decision makers and the public can understand the operations and quality of the facilities. Based on the discretion of City staff, quantitative analysis techniques (such as those based on the methodologies in the latest version of the *Highway Capacity Manual*) may be selected to describe the level of service for these modes.

At-grade railroad crossings shall be evaluated using quantitative techniques like random arrival delay calculations or traffic operations software like Synchro, SimTraffic, or Vissim, which are set

up to simulate periodic train crossing events. Impacts will be assessed by calculating vehicle delay and equating the delay to HCM signalized delay LOS thresholds. Collision history at the crossing shall also be collected and compared to average collision rates other at-grade crossings.

As described above, a parking analysis is only required if the project is seeking to construct fewer spaces than specified in the City Code. Any parking analysis shall use clearly describe the methodology being used. For situations in which the expected parking demand may be difficult to predict, the TIA preparer may conduct a parking survey of similar uses in the area. For mixed use projects, the TIA preparer should use the methodologies and factors described in the current edition of *Shared Parking* (Urban Land Institute).

The site access and internal circulation analysis shall be described in a qualitative manner and potential issues shall be determined using engineering judgment and application of typical engineering standards (e.g., standards defined by the City, Caltrans, or AASHTO).

## **Impact Criteria**

The previous section defined scope of the TIA in terms of study facilities, study scenarios, and analysis methodology. This section defines the criteria of what constitutes a significant project-related impact.

*Roadway Facilities* – Manteca’s General Plan defines the City’s roadway level of service (LOS) thresholds for acceptable and unacceptable conditions. Based on the General Plan LOS thresholds, an impact is defined as follows:

Facilities that operate at an acceptable LOS without the project: For these locations, an impact is defined if the project causes the LOS on a study facility (freeway segment, intersection, etc.) to change from an acceptable LOS under “No Project” conditions to an unacceptable LOS under “With Project Conditions.” This criterion is applicable for Existing and Cumulative conditions.

For facilities determined to operate at an unacceptable LOS under Existing or Cumulative No Project conditions (i.e., facilities with existing or forecast deficiencies without the project), a separate threshold shall be used. Under these conditions a project is said to impact the facility if the results of the analysis indicate that the project will cause LOS to deteriorate by a given threshold amount. The threshold amounts for each of the facility types and analysis techniques are described below:

- 1) Freeway Segments (AM or PM peak hour LOS analysis): In general, Caltrans latest impact thresholds, defined in the *Guide for the Preparation of Traffic Impact Studies* shall be used to define impacts to freeway segments. At the time this document was prepared, Caltrans defines an impact to a freeway segment operating at an unacceptable LOS under Existing or Cumulative No Project Conditions, if *the addition of project traffic increases the peak hour density by 0.1 passenger car equivalents per mile per lane (pc/mi/lh).*

- 2) Freeway Segments (Daily LOS analysis): Caltrans does not have a daily freeway segment LOS impact threshold freeway segments that operate at an unacceptable LOS under Existing or Cumulative No Project Conditions. If this approach is used, the TIA preparer and the City shall define an appropriate impact threshold.
- 3) Ramp Segments: Caltrans latest impact thresholds shall be used to define impacts to freeway ramps. At the time this document was prepared, Caltrans defines an impact to a ramp merge or diverge segment operating at an unacceptable LOS under Existing or Cumulative No Project Conditions, if *the addition of project traffic increases the peak hour density by 0.1 pc/mi/ln.*
- 4) Weaving Segments: Caltrans does not have an impact threshold for weaving segments that operate at an unacceptable LOS under Existing or Cumulative No Project Conditions. If a weaving analysis is performed, the TIA preparer and the City shall define an appropriate impact threshold.
- 5) Intersections: A project is said to impact an intersection operating at an unacceptable LOS under Existing or Cumulative No Project Conditions, if:
  - The addition of project traffic increases the average vehicle delay for a signalized intersection by five seconds or more, or
  - The addition of project traffic increases the average delay for an all-way stop-controlled intersection by five seconds or more and the intersection meets the one hour peak hour signal warrant, or
  - The addition of project traffic increases the highest delayed side-street movement for a side-street stop-controlled intersection by five seconds or more and the intersection meets the one hour peak hour signal warrant.
- 6) Roadway Segments: A project is said to impact a roadway segment operating at an unacceptable LOS under Existing or Cumulative No Project Conditions, if the project increases the daily volume-to-capacity (v/c) ratio by more than 0.1. Note that capacity for a roadway segment is defined at the LOS E threshold.

*Ramp Terminal Intersection Queuing* – A project is defined to have a significant impact if it causes either of the following to occur:

- The addition of project traffic causes the 95<sup>th</sup> percentile on an off-ramp to extend beyond the off-ramp gore point.
- The addition of project traffic increases the length of the 95<sup>th</sup> percentile queue on an off-ramp that extended beyond the gore point under No Project Conditions.

*Transit Facilities* – A project is defined to have a significant impact to the transit system if implementation of the project would:

- Eliminate existing or planned transit service.

- Remove an existing bus stop.
- Cause a substantial rerouting of existing or planned bus service.

*Bicycle Facilities* – A project is defined to have a significant impact to the bicycle facilities if implementation of the project would:

- Eliminate existing or planned bike paths, lanes, or routes.
- Result in an unsafe condition for bicycles, including but not limited to, unsafe bicycle/vehicle or bicycle/pedestrian conflicts or bicycle facility pavement degradation.

*Pedestrian Facilities* – A project is defined to have a significant impact to the pedestrian facilities if implementation of the project would:

- Eliminate existing or planned pedestrian facilities.
- Degrade existing or planned pedestrian facilities. Examples of degradation include, but are not limited to, reduction of sidewalk/path width to less than the standards shown in the City's standard plans, removal of a crosswalk, or removal of a landscape buffer.
- Create a highly circuitous pedestrian circulation pattern that would discourage walking to local destinations or transit facilities.
- Result in unsafe conditions for pedestrians, including unsafe bicycle/pedestrian or pedestrian/motor vehicle conflicts.

*At-Grade Rail Crossings* – A project is defined to have a significant impact to an at-grade rail crossing if implementation of the project would:

- Cause motorists to incur delays corresponding to LOS E or F conditions due to preemptions caused by train crossings<sup>1</sup>.
- Add traffic to an at-grade railroad crossing that has a demonstrated record of having an above-average rate of accidents.

*Parking* – Parking impacts are no longer part of the CEQA guidelines.

*Site Access and Internal Circulation* – A project is defined to have a significant site access and internal circulation impact if implementation of the project would:

- Lead to an unsafe condition. Examples of unsafe conditions include, but are not limited to queues which extend into city streets and lack of sight distance.
- Fail to accommodate bike and pedestrian modes, consistent with General Plan Circulation Element policies. Examples include, but are not limited to, inadequate sidewalks and crosswalks and lack of bicycle parking facilities.

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<sup>1</sup> As described in the Methodology section, the LOS is defined using the HCM signalized delay-LOS thresholds.

## **Mitigation Measures**

For every significant impact, the TIA shall identify and discuss mitigation measures at a conceptual level that will be implemented by the proposed development. The TIA shall identify a mitigation measure or a range of measures for each impact. Mitigation measures shall be specific and feasible actions that will improve the identified transportation deficiencies. 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, or rectify an impact and shall be consistent with local plans and policies. If the mitigation measures do not reduce impacts to a less than significant level, an Environmental Impact Report (EIR) is required.

Mitigation measures may include traffic control devices, transit improvements, bicycle/pedestrian facility improvements, roadway design features, parking facilities, and parking control devices (parking meters, time-limited parking spaces). The design of traffic control devices and parking control devices shall conform to engineering standards and traffic engineering rules and regulations. Mitigation measures may also include travel demand management solutions or transportation system management recommendations; however, ongoing monitoring programs may be required for these measures to be considered effective.

The City has the Public Facilities Fee (PFF) Program to fund certain transportation system improvements. While this fee program may contain measures to address identified impacts, it does not necessarily eliminate the need for a TIA or implementation of mitigation measures by the project applicant.