

# Traffic Impact Analysis Preparation Guide



**October 2013**

## 1.0 INTRODUCTION

The City of Murrieta requires that the traffic and circulation impacts of proposed development projects, General Plan Amendments, and Specific Plans be analyzed. The traffic impacts of proposed developments are to be analyzed through the preparation of a Traffic Impact Analysis (TIA) prepared in conformance with the City of Murrieta Engineering Department requirements. The Traffic Impact Analysis must be prepared, signed and sealed by a Traffic Engineer or a Civil Engineer registered in the State of California, qualified to practice traffic engineering (“Engineer”). This Traffic Impact Analysis Preparation Guide identifies the required format and methodology that is generally required to be utilized in the study preparation, subject to the review and approval of the City of Murrieta Traffic Engineer.

## 2.0 PURPOSE

The Traffic Impact Analysis is to be prepared to assess the following:

- **Tracts, Development Plans, Public Use Permits, Conditional Use Permits, etc.:** Will the Level of Service required by the General Plan be maintained at all affected intersections with the addition of traffic from the proposed project? If not, what mitigation measures will be necessary in order to provide the required Level of Service? If mitigation measures are necessary, are they feasible to implement? Will the project deteriorate traffic operations or safety?
- **General Plan Amendments and Specific Plans:** Will the ultimate circulation system planned for the area be able to provide the required Level of Service, even with the additional traffic impact of the proposed land use changes? If not, what will be required in order to provide the required Level of Service?

## 3.0 TRAFFIC IMPACT ANALYSIS EXEMPTIONS

Certain types of projects, because of their size, nature, or location, are exempt from the requirement of preparing a TIA. The types of projects that are generally exempt from preparing a TIA are described in Exhibit A.

The City of Murrieta Engineering Department, at its discretion, may require that a TIA be prepared for any development, regardless of size, if there are concerns over safety, operational issues, or if located in an area heavily impacted by traffic.

## **4.0 COORDINATION WITH ENGINEERING DEPARTMENT**

In order to streamline the TIA preparation and review process, the Engineer shall solicit input and approval from the City of Murrieta Engineering Department prior to the preparation and submittal of a draft document. A TIA “Project Scoping Form”, attached as Exhibit B, shall be prepared by the Engineer and submitted to the City of Murrieta Engineering Department for approval prior to the preparation of a draft TIA. The Project Scoping Form provides for agreement of the following key points before initiating the TIA:

- Determination of study area, intersections, and roadway links to be analyzed.
- Project trip generation, distribution, and assignment.
- Use of other approved projects for background traffic, traffic growth assumptions, or integration with the City Traffic Model.
- For projects within one mile of a state highway, or any project that may create a significant impact on the state highway, the Engineer shall also coordinate with Caltrans.
- For Those projects located within a City’s Sphere of Influence or adjacent to another city or county, the Engineer shall also solicit comments on the above from the other agency. The Engineer shall submit all comments received to the City of Murrieta Engineering Department for review and consideration.

## **5.0 REQUIRED METHODOLOGY**

### **5.1 Intersection Analysis**

The City of Murrieta Engineering Department requires the use of the Transportation Research Board - Highway Capacity Manual (HCM), most recent release. Unsignalized intersections are to be analyzed using Chapter 17 of the Highway Capacity Manual. Signalized intersection Level of Service shall be analyzed using the Operational Method as described in Chapter 16, Section II. Refer to Exhibit C for default input parameters. For default values not specifically provided in Exhibit C, the Engineer shall refer to the HCM or most recent release.

### **5.2 ADT Analysis**

The City of Murrieta Engineering Department may require that analysis of Average Daily Traffic (ADT) be conducted in certain cases, such as when intersection analyses are not the controlling factor or for general planning purposes.

## 6.0 AREA TO BE STUDIED

In general, the minimum area to be studied shall include any intersection of “Collector” or higher classification street, with “Collector” or higher classification streets, at which the proposed project will add 50 or more peak hour trips, not exceeding a 5-mile radius from the project site. The City of Murrieta Engineering Department may require deviation from these requirements based on area conditions.

## 7.0 ANALYSIS SCENARIOS

### 7.1 Tracts, Development Plans, Use Cases, etc.

The TIA shall include the following analysis scenarios:

- 1) **Existing Traffic.** Existing traffic will be counted to determine current conditions. This constitutes the environmental setting for a CEQA analysis at the time that the hearing body reviews the project. Traffic count data shall be new or recent. In some cases, data up to one year old may be acceptable with the approval of the City of Murrieta Engineering Department. Any exception to this must be requested prior to approval of the scoping agreement.
- 2) **Project Completion (existing + ambient + project).** Traffic conditions prior to the time that the proposed development is completed will be estimated by increasing the existing traffic counts by an appropriate growth rate to be provided by City of Murrieta Engineering Department staff, projected to the year that the project is estimated to be completed. Traffic generated by the proposed project will then be added, and the impacts on the circulation system will be analyzed. This will be the basis for determining project-specific impacts, mitigation, and conditions of approval.
- 3) **Cumulative (existing + ambient + project + cumulative).** Traffic generated by other approved projects in the study area shall be identified and added to the Project Completion traffic identified in Scenario 2. This may also include projects that are proposed and in the review process, but not yet fully approved. This scenario will be analyzed, and a determination made if improvements funded through an approved funding mechanism (TUMF, DIF, CFD, etc.) can accommodate the cumulative traffic at the target Level of Service (LOS) identified in the General Plan. If the “funded” improvements can provide the target LOS, payment into the fee program will be considered as cumulative mitigation through the conditions of approval. Other improvements needed beyond the “funded” improvements (such as localized improvements to non-TUMF facilities) should be identified as such.
- 4) **Project Phasing.** Traffic conditions at each project phase completion are to be analyzed using the same approach as for the project completion year, if applicable. Traffic associated with each previous project phase shall be included in the analyses of each successive phase of the proposed project.

## **7.2 Land Use or Circulation General Plan Amendments or Specific Plans**

Development proposals that also include a General Plan Amendment, Specific Plan, Zone Change or other approval that increases traffic beyond what was approved in the General Plan will also be required to perform a Build-out Analysis to assess long-term impacts. This analysis will determine if the Circulation Element of the General Plan is adequate to accommodate projected traffic at the target LOS, or if additional mitigation is necessary. A phasing plan for all Specific Plans that identifies mitigation for each development phase is required.

## **8.0 FUTURE TRAFFIC FORECASTS**

### **8.1 Background Traffic for Tracts, Plot Plans, Use Cases and Project Phasing**

All projects within the study area that have received approvals for development (approved development plans, approved tentative tracts, approved conditional use permits, etc.) shall be identified, and their traffic generation included as cumulative traffic in the study. Proposed projects in the study area that have been submitted to the City for processing, but not yet approved, may also be included at the discretion of the City of Murrieta Engineering Department. The Engineering Department will also specify an ambient growth rate to be applied to existing volumes to account for other general traffic growth in and around the study area.

The traffic from the other approved projects shall be added to the existing traffic plus the ambient growth rate (Analysis Scenario 2) plus the proposed project to determine future projected traffic at Opening Year of the project, or any subsequent phase.

### **8.2 Build-Out Studies for General Plan Amendments and Specific Plans**

Traffic projections for Build-out scenarios shall utilize the City's traffic model or other approved model. The Engineer shall use the model projections as the basis for determining turning-movement volumes for the required intersection analysis. A manual assignment of the project traffic added to the Build-out traffic may typically be used to determine total future traffic, as approved by the City of Murrieta Engineering Department.

Certain large-scale Specific Plans and General Plan Amendments have the potential to create traffic impacts that are significantly greater than the traffic projections used in the City's Traffic Model, and which also affect the modeling assumptions. For these projects, the City of Murrieta Traffic Engineer may request that the Build-out analysis utilize the City's Traffic Model or other model approved by the City Traffic Engineer to develop more detailed focused model runs in order to determine the projected Build-out traffic. The following are guidelines of projects considered to be significant and subject to the revised modeling requirements:

- 1,500 dwelling units or greater
- 25 acres of commercial or greater
- 150 acres of industrial or greater
- any project producing 15,000 daily trips or greater

## **9.0 CEQA COMPLIANCE AND DOCUMENTATION**

The following types of traffic impacts are considered to be “significant” under CEQA:

- 1) When existing traffic conditions (Analysis Scenario 1) exceed the General Plan target LOS.
- 2) When project traffic, when added to existing traffic (Analysis Scenario 2), will deteriorate the LOS to below the target LOS, and impacts cannot be mitigated through project conditions of approval.
- 3) When cumulative traffic (Analysis Scenario 3) exceeds the target LOS, and impacts cannot be mitigated through existing infrastructure funding mechanisms.

The General Plan allows the City Council to approve development projects even in instances where the target LOS is exceeded, if the project has overriding benefits. Examples include projects that provide jobs in a local area, projects that provide needed transportation improvements that otherwise would not be constructed, projects that provide habitat conservations, projects that implement non-motorized transportation systems, or projects that provide some unique benefits to the City which outweigh the traffic impacts. These projects are required to mitigate traffic impacts to the extent that it is economically feasible as determined by the Engineering Department, based on a value engineering analysis. Projects that have a significant traffic impact and require a finding of overriding benefits may be required to prepare an Environmental Impact Report. The need to prepare an EIR shall be determined through consultation between the Engineering Department, Planning Department, and the City Attorney.

## **10.0 TRAFFIC IMPACT ANALYSIS FORMAT**

The format and required elements to be included in the TIA are specified in Exhibit D. Deviations from this format require the approval of the City of Murrieta Traffic Engineer.

The TIA will generally include the following major components, as shown in more detail in Exhibit D and described herein:

- Level of Service analysis
- Proposed mitigation measures
- Traffic signal warrant analysis
- On-site circulation analysis
- Identification of safety and operational improvements

In addition to the above, General Plan Amendments and Specific Plans shall include the following:

- Specific Plan signalization analysis
- General Plan conformance review
- Identification of regional funding mechanisms that are applicable to the project

Projects that involve special uses, such as truck-intensive projects or special events (i.e. mass grading projects), may also be required to perform additional analysis to determine project impacts.

### **10.1 Level of Service Analysis**

The City of Murrieta's General Plan has established minimum Level of Service (LOS) standards for developments. These minimums may vary according to the area involved. The Traffic Impact Analysis shall address whether or not the required Levels of Service will be achieved after the proposed project is constructed. Level of Service calculations shall be included with the TIA for all intersections studied. For intersections or roadway links not meeting the required Level of Service, the intersection or roadway link's Level of Service must be recalculated using the proposed mitigation measures to verify that the required Level of Service will be achieved. For sites with heavy truck usage, Passenger Car Equivalents (PCE's) as approved by the City of Murrieta Engineering Department shall be utilized in the analysis.

The City's Level of Service standards, as published in the City's General Plan, Chapter IV, are LOS C for roadway segments and LOS D for peak hour intersection operations.

### **10.2 Proposed Mitigation Measures**

All studies that propose increasing the number of travel lanes on a road or intersection as mitigation measures, either beyond existing conditions or for General Plan conditions beyond what is planned for that level of roadway shall clearly identify the environmental impacts associated with such an improvement. Identification of funding mechanisms available to fund the improvements and exhibits showing the lane configuration must be provided in the report.

### **10.3 Traffic Signal Warrant Analysis**

The Engineer shall review intersections within the study area, including the project access points, to determine if signal warrants are met for any of the study year scenarios (existing, opening year with and without project, General Plan Buildout, etc.) The signal warrant analysis shall be performed utilizing the methodology in the latest version of the California Manual on Uniform Traffic Control Devices (MUTCD). The warrant analysis worksheets shall be included in the study appendices.

### **10.4 On-site Circulation**

The TIA shall examine the proposed on-site circulation for the project and address its adequacy. This includes identifying the desired level of traffic control at project driveways and/or intersections.

### **10.5 Safety and Operational Analysis**

The TIA shall examine existing roadway conditions to determine if safety and/or operational improvements are necessary due to increase in traffic from the project or cumulative projects. The types of improvements to be identified may include, but are not limited to:

- Need for turning lanes (see Section 10.6)
- Intersections needing sight distance studies
- Parking restrictions

- Measures to reduce cut-through project traffic in adjacent residential areas
- Potential impacts to adjacent schools
- Queue lengths and impacts to adjacent intersections
- Need for signal interconnect systems

### **10.6 Right-Turn Lane/Deceleration Lane Analysis**

Right-turn lanes/deceleration lanes shall be installed at any intersection or driveway where any of the following conditions exist:

- Developments with more than two hundred (200) parking stalls, that are located on an Arterial or a larger street shall provide deceleration lanes adjacent to their major entry per City standards (Municipal Code Section 16.10.030.B.3.b).
- The installation of a driveway creates a weaving condition with an adjacent intersection along an Arterial roadway.
- Right-turn lane requirements are met per Exhibit E.

Right-turn lane requirements are subject to the approval of the City Engineer.

### **10.7 Specific Plan Signalization Analysis**

For traffic signals that are found to be warranted within or bordering a Specific Plan, the TIA shall identify, after consultation with the Engineering Department, which of these signals are the responsibility of development within the Specific Plan and which are covered under the City-wide Signal Mitigation Program.

### **10.8 General Plan Conformance**

The TIA shall identify if the roadway system proposed in the Circulation Element of the General Plan is adequate to accommodate traffic from the project, or if changes to the General Plan are proposed as part of the project approval.

### **10.9 Regional Funding Mechanisms**

Identify if the project is located within an existing Assessment District, or identified in another regional funding mechanism.

### **10.10 Special Uses**

- **Truck Intensive Uses (Conditional Use Permits, Mass Grading Permits, etc.)**  
In addition to the standard TIA requirements, or if the standard TIA requirements are waived, projects that are “truck intensive” (distribution centers, surface mining permits, etc.) may be required to submit a study addressing the truck access routes, adequacy of the existing streets to be used (in terms of geometry and structural section), safety issues relating to the truck traffic, and the impacts of the truck traffic on existing residences or businesses.



- **Special Event Uses**

Special event land uses that do not exhibit typical trip generation characteristics may require unique analysis, including weekend and off-peak scenarios. Examples of such uses would be sports stadiums, racetracks or uses that exhibit substantial traffic peaking associated with special events that are scheduled on a periodic basis. The traffic analysis for such uses shall include a traffic management plan to control traffic impacts associated with the special events. Adequate circulation shall be provided to the site and all impacts shall be alleviated to the maximum extent possible.

## **11.0 SUBMITTAL REQUIREMENTS AND PROCEDURE**

- a) A project scoping form must be submitted for approval prior to preparation of the traffic study. Identification of a Planning case number must be included in order to process the agreement. A Traffic Study Submittal Form, shown as Exhibit F, shall be completed and submitted at the time of scoping along with the appropriate fee.
- b) Upon approval of the scoping agreement and completion of the traffic study report, submit two bound copies of the Traffic Impact Study report to the City of Murrieta case planner. Clearly identify the project case number on the cover of the report. Copies of the approved scoping agreement and cumulative projects list as provided by the City of Murrieta shall be included with the copies of the traffic impact study.
- c) If revisions to the Traffic Impact Analysis are necessary, re-submit two (2) complete bound copies along with a copy of the comments provided by the City of Murrieta case planner.

# Traffic Impact Analysis Preparation Guide

## Exhibits

- A. Traffic Impact Analysis Exemptions
- B. Scoping Agreement for Traffic Impact Analysis
- C. Signalized Intersection Analysis Input Parameters
- D. Traffic Impact Analysis Format
- E. Right-Turn Lane Requirements
- F. Traffic Impact Analysis Submittal Form
- G. Transportation Consultants

## ***EXHIBIT A***

### **TRAFFIC IMPACT ANALYSIS EXEMPTIONS**

The following types of development proposals are generally exempt from Traffic Impact Analysis requirements:

1. Residential Parcel Maps.
2. Single Family Residential Tracts of less than 50 lots.
3. Apartments and other Multiple Family projects of less than 75 units.
4. Cases for projects of one acre or less.
5. Mini Storage Yards
6. Congregate Care Facilities that contain significant special services, such as medical facilities, dining facilities, recreation facilities and support retail facilities.
7. Level 1 projects (100-200 peak hour trips) in areas where a comprehensive traffic analysis has been performed and road improvement infrastructure funding mechanisms are in place. The Engineering Department may, however, require a traffic impact analysis study for projects that exhibit potential adverse impacts to the circulation system.
8. Any use which can demonstrate, based on the most recent edition of the Trip Generation Report published by the Institute of Transportation Engineers (ITE) or other approved trip generation data, trip generation of less than 50 vehicle trips during the peak hours.

These exemptions will apply **in most cases**; however, the City of Murrieta Engineering Department reserves the right to require a traffic impact analysis for any development regardless of size and/or type. The level of analysis shall be determined on an individual basis. The following are examples of conditions under which an exemption would not be granted.

- a. The presence of an existing or potential safety problem.
- b. The location of the development in an environmentally or otherwise sensitive area, or in an area that is likely to generate public controversy.
- c. The presence of a nearby substandard intersection or street. This is normally considered to be an existing Level of Service "D" or worse or substandard improvements.
- d. The need for a focused study for access/operational issues.
- e. A request from an affected agency, such as Caltrans or an adjacent city, which is deemed by the City of Murrieta Engineering Department to be reasonable and rational.

## Exhibit B

### SCOPING AGREEMENT FOR TRAFFIC IMPACT ANALYSIS

This letter acknowledges the City of Murrieta Engineering Department requirements for traffic impact analysis of the following project. The analysis must follow the City of Murrieta Public Works Department Traffic Study Guidelines dated October 2013.

Case No. (Required for submittal) \_\_\_\_\_  
 Related Cases - \_\_\_\_\_  
 SP No. \_\_\_\_\_  
 EIR No. \_\_\_\_\_  
 GPA No. \_\_\_\_\_  
 CZ No. \_\_\_\_\_  
 Project Name: \_\_\_\_\_  
 Project Address: \_\_\_\_\_  
 Project Description: \_\_\_\_\_

	Consultant	Developer
Name:	_____	_____
Address:	_____	_____
Telephone:	_____	_____

**A. Trip Generation Source:** (ITE 9th Edition or other)

Current GP Land Use _____	Proposed Land Use _____
Current Zoning _____	Proposed Zoning _____

	Current Trip Generation			Proposed Trip Generation		
	In	Out	Total	In	Out	Total
AM Trips	_____	_____	_____	_____	_____	_____
PM Trips	_____	_____	_____	_____	_____	_____

Internal Trip Allowance	<input type="checkbox"/> Yes	<input type="checkbox"/> No	( _____ % Trip Discount)
Pass-By Trip Allowance	<input type="checkbox"/> Yes	<input type="checkbox"/> No	( _____ % Trip Discount)

A pass-by trip discount of up to 25% is allowed for appropriate land uses. The pass-by trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

**B. Trip Geographic Distribution:** N\_\_\_%    S\_\_\_%    E\_\_\_%    W\_\_\_%  
 (attach exhibit for detailed assignment)

**C. Background Traffic**

Project Build-out Year: \_\_\_\_\_ Annual Ambient Growth Rate: % \_\_\_\_\_

Phase Year(s) \_\_\_\_\_

Other area projects to be analyzed: \_\_\_\_\_  
\_\_\_\_\_

Model/Forecast methodology: \_\_\_\_\_  
\_\_\_\_\_

**D. Study intersections:** (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- |          |           |
|----------|-----------|
| 1. _____ | 6. _____  |
| 2. _____ | 7. _____  |
| 3. _____ | 8. _____  |
| 4. _____ | 9. _____  |
| 5. _____ | 10. _____ |

**E. Study Roadway Segments:** (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- |          |           |
|----------|-----------|
| 1. _____ | 6. _____  |
| 2. _____ | 7. _____  |
| 3. _____ | 8. _____  |
| 4. _____ | 9. _____  |
| 5. _____ | 10. _____ |

**F. Site Plan** (please attach reduced copy)

**G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline)** (To be filled out by Engineering Department)

**H. Existing Conditions**

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.

Date of counts \_\_\_\_\_

**Recommended by:**

\_\_\_\_\_  
Consultant's Representative

\_\_\_\_\_  
Date

Scoping Agreement Submitted on \_\_\_\_\_

Revised on \_\_\_\_\_

**Approved Scoping Agreement:**

\_\_\_\_\_  
City Of Murrieta Engineering  
Department

\_\_\_\_\_  
Date

## *Exhibit C*

### SIGNALIZED INTERSECTION ANALYSIS INPUT PARAMETERS

<b>PARAMETER</b>	<b>VALUE</b>		
Base Saturation Flow Rate	1900 pc/hr/ln		
Heavy Vehicle factor	Determine % heavy vehicle in existing traffic stream based on count data or consultation with City Engineering Dept. projects with truck intensive uses must convert project rips to passenger car equivalents (PCE=2). Truck intensive uses include heavy industrial, warehousing or as determined by the Engineering Department.		
Grade	Include as appropriate		
Exclusive Left- Turn Lane	Peak hour volume > 100		
Exclusive Right-Turn Lane	See Section 10.6		
Dual Left-Turn Lanes	Peak hour volume > 300		
Protected Left Turn Phasing	Left turn volume > 240 vph		
Minimum Green Time	7 seconds each movement in areas of light pedestrian activity. In areas of heavy pedestrian activity, the minimum green shall be calculated based on the methodology in the HCM.		
Cycle Length	60 sec to 120 sec		
Lost Time	Per HCM Exhibit 10-17 (below)		
<b>Major street</b>	<b>Minor Street</b>	<b>Number of Phases</b>	<b>L (s)</b>
Protected	Protected	4	16
Protected	Permitted	3	12
Permitted	Protected	3	12
Permitted	Permitted	2	8

\* Any deviation from these parameters requires prior approval from City of Murrieta Engineering Department. Refer to the HCM for any default values not specifically identified here.

Intersection analyses should be conducted utilizing acceptable software based on HCM methodology. Closely spaced intersections are to be analyzed using analysis tools capable of accounting for turn lane storage, queue length, coordination, blockage, etc. such as Synchro.

Actual signal timing and peak hour factors should be collected in the field and utilized in the existing and near-term analyses. In cases where traffic is added from a significant number of cumulative projects, the consultant shall use their engineering judgment in the application of peak hour factors to maintain consistency with the existing conditions analyses. A peak hour factor of 1.0 shall be applied to buildout traffic conditions.

## ***Exhibit D***

### **Traffic Impact Analysis Format**

The Traffic Impact Analysis shall generally include the following items, unless waived by the City of Murrieta Engineering Department. Required ***Exhibits*** and ***Tables*** are indicated.

#### **I) Introduction**

- a) Purpose of the TIA and Study Objectives
- b) Site location and study area (**Exhibit 1**)
- c) Development project identification – City of Murrieta Case Number and related case numbers, i.e. S.P.A. amendment number, E.I.R. number, etc.
- d) Development project description
  - 1) Project size and description
  - 2) Existing land use and zoning
  - 3) Proposed land use and zoning
  - 4) Site plan of proposed project (reduced) (**Exhibit 2**)
  - 5) Proposed project opening year
  - 6) Any proposed project phasing
  - 7) Indicate if project is within a City Sphere of influence

#### **II) Area Conditions**

- a) Identify Study Area and Intersections
- b) Existing traffic controls and intersections geometrics (**Exhibit 3**) – include descriptions of existing roads (number of lanes, etc.)
- c) Existing traffic volumes – AM and PM peak hour turning movements and roadway links (if required) (**Exhibit 4A – AM and Exhibit 4B – PM**)
- d) Existing delay and level of Service at Study intersections/roadway links (**Table 1**)
- e) Provide copy of General Plan Circulation Element in the project vicinity (**Exhibit 5**)
- f) Indicate if Transit service is available in the area and along which routes

### III) Projected Future Traffic

- a) Project Traffic and Project Phasing (each study year)
  - 1) Ambient growth rate
  - 2) Project Trip generation (**Table 2**) – the latest edition of the institute of Transportation Engineers (ITE) Trip Generation Report. Other Sources require prior approval by the City of Murrieta Engineering Department.
  - 3) Project Trip distribution and assignment (**Exhibit 6**)
  - 4) Other factors affecting trip generation (identify any factors used to adjust trip generation, such as pass-by trips, internal trips, or model choice). Use of any factors requires prior approval by the City of Murrieta Engineering Department and should be based on accepted traffic engineering documentation, such as trip generation manual or other.
  - 5) Project peak hour turning movement traffic (**Exhibit 7A & 7B – AM and PM**)
  - 6) Project completion or phase completion traffic volumes (**Exhibits 8A and 8B – AM or PM, for project or Phase I completion, 8C and 8D for Phase II, etc.**)
- b) Cumulative Traffic (background)
  - 1) Ambient growth rate
  - 2) Identify location of other approved or proposed development projects (**Exhibit 9**)
  - 3) Trip generation from other approved projects (**Table 3**)
  - 4) Trip distribution and assignment of other approved development projects (**Exhibits 9A, 9B, etc.**)
  - 5) Total background peak hour turning movement volumes (**Exhibits 10A & 10B – AM and PM**)

### IV) Traffic Analysis

- a) Capacity and Level of Service and Improvement Analysis
  - 1) Delay and Level of Service for existing traffic conditions without project, with existing improvements (**Table 4**)
  - 2) Delay and Level of Service at study years with project, with existing and committed improvements (funded for construction) (**Table 5**)
  - 3) Delay and level of service at study years with additional improvements (**if required to achieve the General Plan required Level of Service**) (**Table 6**)



- 4) Delay and Level of service under Cumulative conditions, with existing and committed improvements (funded for construction) and without and with additional improvements (**Tables 7 and 8**)

## **V) Findings and Recommendations**

- a) Traffic Impacts and Level of Service Analysis
  - 1) Proposed mitigation measures to achieve LOS at impacted intersections (**list as Table 9 and also show graphically as Exhibit 11**). Identify if improvements are scheduled for construction, funded for future implementation by a regional mechanism or not funded.
- b) Traffic signal warrant analysis – indicate intersections found to meet signal warrants at study year and share of project traffic contribution (**use peak hour for existing intersections and daily for new intersections**).
- c) Circulation recommendations
  - 1) On-site
  - 2) Area wide – provide exhibit showing roadway improvements and signal locations (**Exhibit 12**)
  - 3) Phasing (if appropriate)
- d) Safety and operational improvements
- e) Specific Plan signalization analysis (**for Specification Plans only**)
- f) General Plan Conformance (for specific Plans and General plan amendments only) (**show any Proposed General Plan Amendments as Exhibit 13**)
- g) Identify existing or proposed Regional funding mechanisms

**Exhibit E**  
**Right-Turn Treatment**

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM  
REPORT

**279**

**INTERSECTION CHANNELIZATION  
DESIGN GUIDE**

**TIMOTHY R. NEUMAN**  
Jack E. Leisch & Associates  
Evanston, Illinois

RESEARCH SPONSORED BY THE AMERICAN  
ASSOCIATION OF STATE HIGHWAY AND  
TRANSPORTATION OFFICIALS IN COOPERATION  
WITH THE FEDERAL HIGHWAY ADMINISTRATION

AREAS OF INTEREST:

FACILITIES DESIGN  
OPERATIONS AND TRAFFIC CONTROL  
(HIGHWAY TRANSPORTATION)

**TRANSPORTATION RESEARCH BOARD**  
NATIONAL RESEARCH COUNCIL  
WASHINGTON, D.C.

NOVEMBER 1985

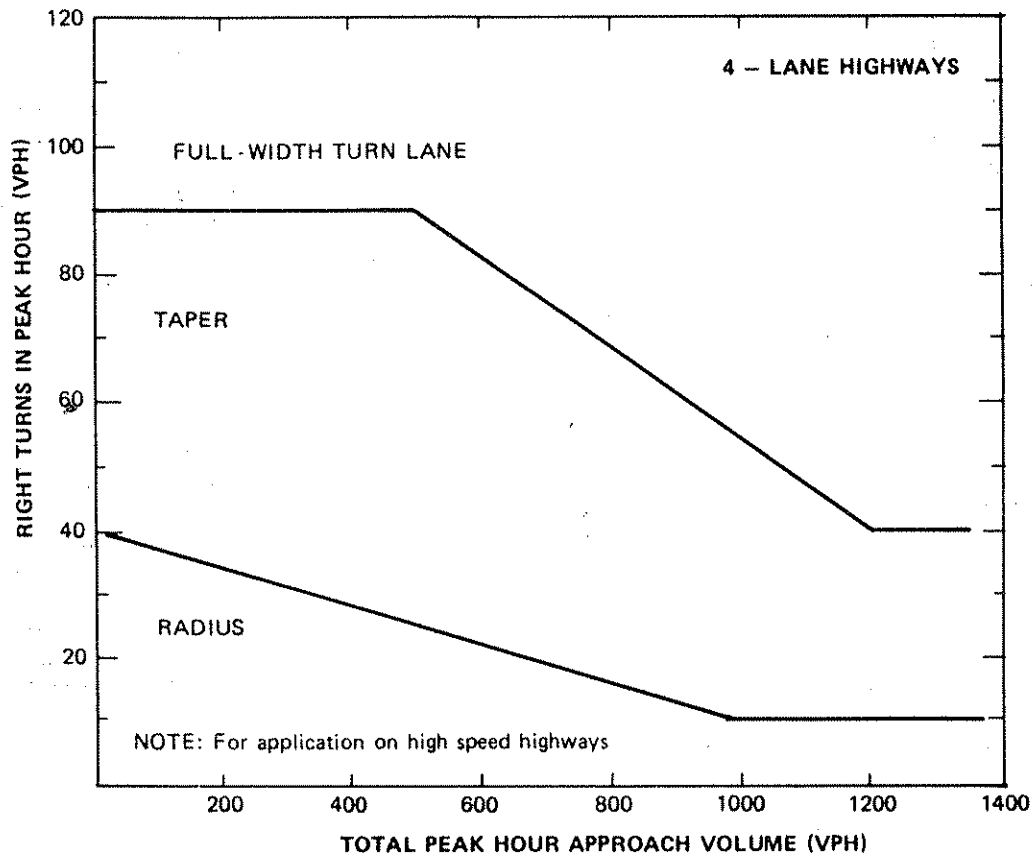
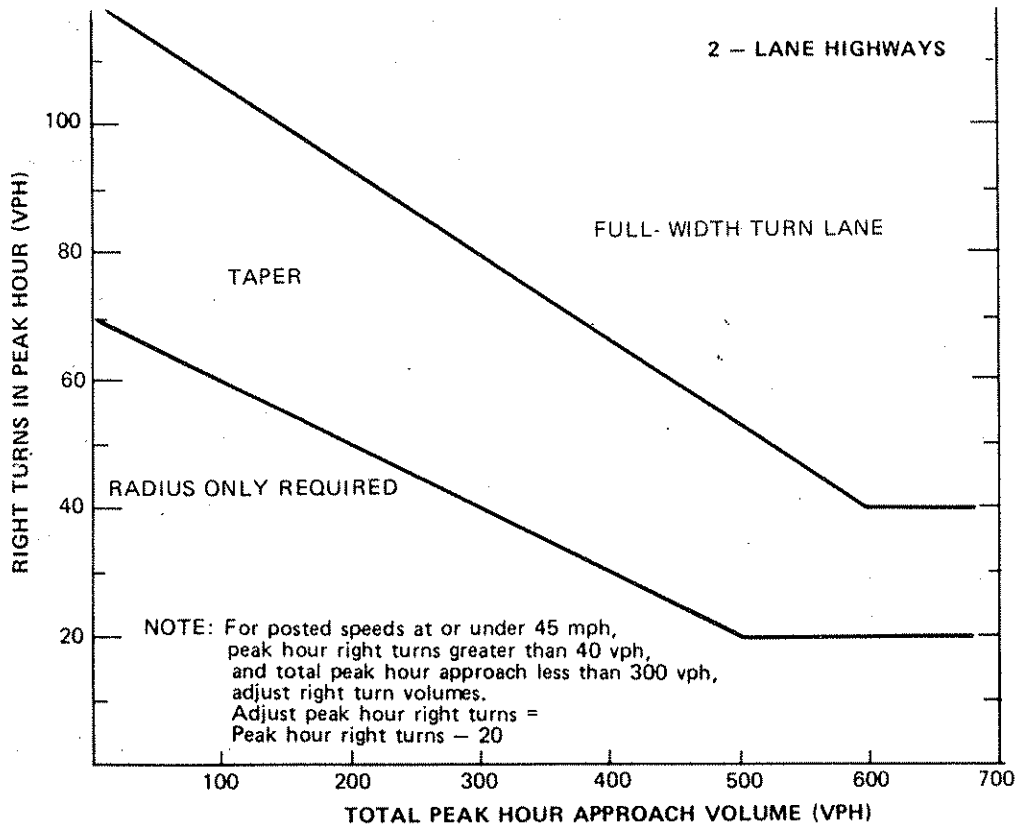


Figure 4-23. Traffic volume guidelines for design of right-turn lanes. (Source: Ref. 4-11)

*Exhibit F*

**TRAFFIC STUDY SUBMITTAL FORM**

**Date** \_\_\_\_\_

**Fast Track Authorization** \_\_\_\_\_

(If Applicable)

**Case#** \_\_\_\_\_

**ST #** \_\_\_\_\_

(Department Use Only)

**Related Cases** \_\_\_\_\_

**APN #** \_\_\_\_\_

(If Applicable)

---

**OWNER**

Name \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

**APPLICANT**

Name \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

**ENGINEER**

Name \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

**PROJECT**

Description \_\_\_\_\_

Location \_\_\_\_\_

Land Use \_\_\_\_\_

Section(s) \_\_\_\_\_ Township \_\_\_\_\_ N/S Range \_\_\_\_\_ E/W

Supervisorial District \_\_\_\_\_ Road Book Page/Grid \_\_\_\_\_ Thomas Bros Page/Grid \_\_\_\_\_

Nearest Major Intersection \_\_\_\_\_

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**The Traffic Study, this submittal Form and check need to be submitted to the Planning Department case planner. If mailed, please mail to 1 Town Square, Murrieta, CA 92562**

***Exhibit G***  
**TRANSPORTATION CONSULTANTS**

The following firms are recognized by the City of Murrieta Engineering Department as competent, professional traffic engineering and/or transportation planning entities that have done work in Riverside County. This list is provided for informational purposes only and does not constitute a requirement to use consultants only on this list.

1. ADVANTEC Consulting Engineers  
21700 Copley Drive, Suite 350  
Diamond Bar, CA 91765  
(909) 860-6222
2. Albert Grover & Associates  
211 E. Imperial Highway, Suite 208  
Fullerton, CA 92835  
(714) 992-2990
3. Robert Crommelin & Associates, Inc.  
73255 El Paseo, #9  
Palm Desert, CA 92260  
(760) 568-6838
4. Darnell & Associates  
2870A 4<sup>th</sup> Avenue  
San Diego, CA 92103  
(619) 233-9373
5. DKS Associates  
2677 North Main Street, Suite 520  
Santa Ana, CA 92705  
(714) 597-8060
6. Endo Engineering  
28811 Woodcock Drive  
Laguna Niguel, CA 92677  
(949) 362-0020
7. Kimley-Horn and Associates, Inc.  
765 The City Drive, Suite 200  
Orange, CA 92868  
(714) 939-1030
8. KOA Corporation  
2141 W. Orangewood Avenue, Suite A  
Orange, CA 92868  
(714) 573-0317
9. Krueper Engineering & Associates, Inc.  
568 N. Mountain View Avenue, #2  
San Bernardino, CA 92401  
(909) 884-2159
10. Kunzman Associates  
1111 Town & Country, Suite 34  
Orange, CA 92868  
(714) 973-8383
11. LIN Consulting, Inc.  
4858 Mercury Street, Suite 207  
San Diego, CA 92111  
(858) 278-4800
12. Linscott Law & Greenspan Engineers  
4542 Ruffner Street, Suite 100  
San Diego, CA 92111  
(858) 300-8800
13. LSA Associates, Inc.  
1500 Iowa Avenue, Suite 200  
Riverside, CA 92507  
(909) 781-9310
14. P&D Consultants, Inc.  
999 Town & Country Road, Suite 400  
Orange, CA 92868  
(714) 835-4447
15. Parson Brinkerhoff  
505 S. Main Street, Suite 900  
Orange, CA 92868  
(714) 973-4880
16. RBF Consulting  
14725 Alton Parkway  
Irvine, CA 92618  
(949) 472-3505

17. REM Associates  
1833 E. 17th Street, Suite 111  
Santa Ana, CA 92701  
(714) 541-2054
18. Rick Engineering Company  
5620 Friars Road  
San Diego, CA 92110  
(619) 291-0707
19. RK Engineering Group, Inc.  
4000 Westerly Place, Suite 280  
Newport Beach, CA 92660  
(949) 474-0809
20. Stantec  
38 Technology Drive, Suite 100  
Irvine, CA 92618  
(949) 923-6000
21. TEP  
P.O. Box 18355  
Irvine, CA 92623  
(760) 360-5389
22. TJW Engineering, Inc.  
540 N. Golden Circle Drive, Suite 104  
Santa Ana, CA 92705  
(949) 878-3509
23. Traffic Safety Engineers  
3100 E. Marywood Drive  
Orange, CA 92867  
(714) 974-7863
24. Trames Solutions  
100 E. San Marcos Boulevard, Suite 400  
San Marcos, CA 92069  
(760) 291-1400
25. TransCore  
79424 Tobago Court  
Bermuda Dunes, CA 92201  
(760) 360-5389
26. Urban Crossroads  
41 Corporate Park, Suite 300  
Irvine, CA 92606  
(949) 660-1994
27. URS  
1320 South Simpson Circle  
Anaheim, CA 92806  
(714) 399-1500
28. Albert A. Webb Associates  
3788 McCray Street  
Riverside, CA 92506  
(951) 686-1070
29. Wilbur Smith Associates  
111 Academy Way, Suite 150  
Irvine, CA 92617  
949) 752-5452
30. Willdan  
2401 E. Katella Avenue, Suite 450  
Anaheim, CA 92806  
(714) 978-8200
31. Wilson & Company  
5694 Mission Center Road, Suite 602-147  
San Diego, CA 92108  
(619) 952-2936