# *TRAFFIC IMPACT ANALYSIS GUIDELINES*

***ADOPTED AUGUST 24, 2004***

*Prepared by:*
*City of Irvine*
*Public Works Department*

# TRAFFIC IMPACT ANALYSIS GUIDELINES

Prepared by:

City of Irvine

Public Works Department

August 24, 2004

# TRAFFIC IMPACT ANALYSIS GUIDELINES

## TABLE OF CONTENTS

Exhibits:

1. Traffic/Limited Scope Traffic Study Outline
2. Traffic Study vs. Limited Scope Traffic Study Requirements
3. Expansion of Use Assumptions Matrix
4. Congestion Management Program (CMP) Monitoring Checklist: Land Use Coordination Component
5. CMP Traffic Impact Analysis Exempt Projects
6. Mitigation Mechanism Examples (Impact Fees)

Appendices:

A. Spectrum Trip Reduction Policy
B. LOS 'E' Policy for the Northern Sphere Area Developments
C. City Council Ordinance – Advanced Transportation Management Systems (ATMS)

# TRAFFIC IMPACT ANALYSES

## WHY A TRAFFIC IMPACT ANALYSIS IS REQUIRED

A hierarchy of federal and state laws requires the correlation of the Land Use Element building intensities in the General Plan with the Circulation Element capacity (i.e., Government Code 65302(C), Congestion Management Program (CMP), California Environmental Quality Act (CEQA), and Measure M). The traffic impact analysis serves as a test of this correlation during the development review process. Within the City, traffic impact analyses are categorized as traffic studies and limited scope traffic studies. The following outlines the criteria for when each type of analysis is applied.

## WHEN IS A TRAFFIC/LIMITED SCOPE TRAFFIC STUDY REQUIRED?

A traffic study shall be required for:

- Discretionary projects which produce 50 or more peak hour trips during the AM peak period or the PM peak period. This traffic study trip threshold requirement shall be calculated using the City's approved land use trip generation rates. If the City approved Irvine Transportation Analysis Model (ITAM) land use trip generation rates do not correlate to the use(s) proposed, the Director of Public Works will approve the use of another rate.

A traffic study may be required for:

- Projects pursuant to the California Environmental Quality Act (CEQA) guidelines, Congestion Management Program (CMP) requirements or as otherwise required by City Ordinances/resolutions.

A limited scope traffic study is required for:

- Discretionary projects generating between 1 and 49 trips from a project site where no budget/trip cap has been established for the site and/or Planning Area; or

- Discretionary projects which exceed the established trip cap for the project site and/or Planning Area by 1 to 49 trips. If the project exceeds the established trip cap by 50 or more trips, see the requirements for a traffic study above. This limited scope traffic study trip threshold requirement shall be calculated using the City's approved land use trip generation rates. If City approved land use trip generation rates do not correlate to the use(s) proposed, the Director of Public Works will approve the use of another rate.

In cases where projects are within approved budget/trip caps and zoning, but are proposing new or altering existing access points, the site access analysis procedures outlined on Page 15 of the Special Issues section shall be followed in order to design and locate access points.

Exhibit 2 highlights the key differences between a Traffic Study and a Limited Scope Traffic Study.

Transfer of Development Rights (TDRs) and Intensity Shifts

- Within the Irvine Business Complex (IBC), TDRs are permitted. Outside of the IBC, transfer of development (intensity shifts) may be allowed, if permitted by the zoning ordinance and/or land use regulations. If a TDR or an intensity shift is proposed, City approved land use trip rates shall be used in determining whether a traffic study or limited scope traffic study is required. If the project involves a TDR or intensity shift of 50 peak hour trips or more, a traffic study will be required. If the project involves a TDR or intensity shift of between 1 and 49 peak hour trips, a limited scope traffic study will be required. In either case, a cumulative impact analysis that may include all known applications of this nature on file with the City at the time of the subject project's scope of work approval will be required (see Page 11 for Cumulative Impact Analysis).

The use of an existing traffic/limited scope traffic study for a project can be considered by the Director of Public Works if the land use assumptions, background conditions, and character of traffic analyzed in the existing study are not significantly changed in the proposed project. The determination of the longevity of an existing study will be consistent with CEQA Guideline 15162.

## METHODOLOGY OF SUBMITTAL

Prior to beginning any study, the applicant and/or his/her transportation consultant shall meet with City staff. This meeting is considered the "Pre-Application Conference". The purpose of the Pre-Application Conference is to establish assumptions and the process of preparing the study. When interjurisdictional impacts are anticipated, appropriate representatives from the affected agencies will be informed in writing of the agreed upon assumptions by the Director of Public Works.

In order to establish a Pre-Application Conference, the applicant shall submit to the Director of Community Development a Pre-Application. For information on the submittal of the Pre-Application, the applicant is referred to the "Pre-Application" Information Sheet provided at the Community Development front counter.

The following points will be discussed and methodology established at the Pre-Application Conference regarding traffic:

Site Plan and Development Assumptions
Access Points
Committed Roadway Improvements[1]
Trip Generation
Trip Distribution
Trip Assignment
Preliminary Study Area
Background Traffic (Ambient Growth and Approved Developments)

[1]See definition in the Committed Improvements section.

Development Time Frame and Phasing
Processing Schedule
Other Pertinent Factors

Additional planning issues, submittal requirements, etc. may also be addressed at this Pre-Application Conference, as identified and deemed appropriate by Development Services staff.

The schedule shall be determined in accordance with the overall schedule associated with the type of application being requested or with CEQA requirements. The Pre-Application Conference shall also identify information which will be supplied by the City.

**Scopes of Work**

Based on the agreements reached at the Pre-Application Conference, a scope of work shall be prepared by the applicant's traffic consultant and approved prior to commencement of the study. Waiver of portions of these guidelines for a project may be approved by the Director of Public Works. Studies will not be accepted unless the traffic study/limited scope traffic study of work has been approved by the Director of Public Works.

The City Council reserves the right to approve traffic study scopes of work. Once approved by the City Council, they will be processed in the same manner as if approved by the Director or Public Works.

An approved scope of work is valid for twelve months. Prior to commencing the study, the applicant shall confirm with the City the appropriate version of ITAM to utilize. The study must be submitted for the first screen check review within twelve months of the scope of work approval. A new scope of work is required if the twelve month period expires without a submittal.

**Approval**

The Director of Public Works shall review a traffic study and determine if the traffic study is consistent with the approved scope of work. If deemed consistent, the Director of Public Works shall approve and advance the traffic study with any recommendations to the next reviewing/approval body for appropriate action.

Limited scope traffic studies are reviewed and approved at the staff level only.

**Miscellaneous Submittal Requirements**

Four (4) copies of the screen check draft study shall be submitted in conjunction with the remainder of the development application package. It should be noted that no development application for which a study is required, will be accepted without the appropriate number of copies of that study. Once finalized, 10 copies of the final study shall be provided to staff for use in Commission packets and files. If City Council approval of the project is required, a total of 16 copies of the final study shall be provided.

The applicant shall be responsible for the study and all costs associated with it. This may include, but is not limited to, preparation of the scope of work, preparation of the study, including consultant fees and computer model runs, review of the study by City staff and Commissions/Committees/Council.

All studies must be prepared under the supervision of and signed, stamped and dated by a Registered Traffic or Civil Engineer with appropriate transportation engineering and/or planning credentials.

## OBJECTIVES OF A TRAFFIC/LIMITED SCOPE TRAFFIC STUDY

The study has three basic objectives, as outlined below:

1. To provide a tool to analyze a specific project as it relates to the General Plan (long term).

2. To provide a means to identify specific short term circulation, operational and access needs.

3. To provide a basis for equitable impact mitigation.

## TRAFFIC/LIMITED SCOPE TRAFFIC STUDY FORMAT

In order to provide consistency and facilitate staff review of studies, the format identified below and in the approved scope of work must be followed. Under each heading, the content and methodologies to be utilized are discussed. An outline of the study is attached as Exhibit 1.

### Executive Summary

The Executive Summary of the report shall be a clear, concise description of the study findings. It shall include a general description of all data, project scope and purpose, findings, conclusions, mitigation measures, and recommendations.

Technical publications, calculations, documentation, data reporting, and detailed design should not be included in this section. The Executive Summary should be concise, complete in itself, and not dependent on supplementary data included by reference.

### Introduction

The Introduction shall supply the reader with a general description of the project. This description shall include the size of the parcel, general terrain features, and the existing and proposed uses of the site (including phasing) based on the zoning and general plan categories outlined in the City's Zoning Ordinance and the General Plan. In addition, specific uses for which the request is being made must be identified, as a number of uses may be permitted under the same Zoning or General Plan Category. This information shall include the square footage of each use or number and size of units proposed.

The intent of the study is to evaluate traffic impacts for the most probable case or maximum entitlement permitted for the development or parcel proposed by the Map Level, Zoning Ordinance or the General Plan. If several different uses are permitted, the land use with the greatest overall traffic impact shall be assumed in the study, unless the applicant specifies the uses for the site. This most probable case analysis may be waived by the Director of Public Works only if the development is conditioned for the specific uses analyzed in the study.

In addition, the location of the project site shall be described. As part of this description, a vicinity map shall be provided. The map shall include roadways, which afford access to the site and are included in the study area.

For projects which are reviewed in accordance with CEQA requirements, the required alternatives to the project shall be analyzed. The proposed alternatives shall be defined in the Introduction section.

The limits of the study area for the traffic study shall be based on the potential impact of the proposed project on the City's existing and ultimate street network, and the existing traffic conditions surrounding the site. In all instances, however, the study area limits must include areas with significant impacts based on the approved Performance Criteria (see the Performance Criteria section). If an agreement cannot be reached on an appropriate study area boundary, the Director of Public Works may require that a preliminary study area be established through a "select zone" analysis of Irvine's Transportation Analysis Model (ITAM). This preliminary study area shall be expanded or reduced, as appropriate, to meet the Performance Criteria or impacts by phase of the development.

The study area boundary for a limited scope traffic study is limited to all project access points and immediately adjacent intersections.

**Existing Conditions**

The study must identify the existing conditions in the vicinity of the project site, including a description of the area to be affected by the development. This is to provide a comparison of the impacts over time on land use and circulation.

Existing roadway conditions shall include the following:

- Existing Roadway Network
- Number of Existing Lanes
- Intersection Configurations
- Traffic Control (i.e., signal, stop sign, etc.) - For signalized intersections, where split phasing or right turn overlap is in place, this information shall be provided in the study
- Traffic Counts[2,3]
  - Average Daily Traffic
  - Peak Hour Intersection Volumes Both A.M. and P.M. (Turning Movements)
- Pedestrian Activity/Circulation (identification of pedestrian activity, trails, sidewalks in the project area)
- Level of Service Calculations Both Daily and Peak Hour

**Existing Conditions with Proposed Development**

In order to assess the existing environmental setting as it exists at the time of the notice of preparation for a proposed development, existing conditions with the project in place must be analyzed. Existing traffic conditions based on the current circulation system shall represent the existing environmental setting.

Existing plus project projections shall be developed through the use of Irvine's Transportation Analysis Model (ITAM). The proposed land uses for the project site and any project-related circulation improvements shall be added to the ITAM database and ITAM model runs with and without the project shall be used to determine the traffic model impact of the project on the existing circulation system.

**Future Traffic Without Proposed Development**

Projected Traffic

Future traffic without the proposed development's impact is also called "background" traffic or "baseline" traffic. This baseline traffic consists of three components:

- Regional traffic - Through traffic which has neither origin nor destination within

[2]Counts for intersections on the CMP Highway System (i.e., Irvine Blvd., Irvine Center Drive, Jamboree Road, and Laguna Canyon Road) shall be conducted on at least three separate days (not necessarily consecutive). An average of three counts will be used for existing LOS in the Level of Service calculation.

[3]Count data must have been collected within the previous one year period from the approval date of the scope of work during the AM (generally between 7-10 AM) and PM (generally between 3:30-6:30 PM) peak period. However, traffic counts cannot be older than 18 months from the date of the first screen check traffic/access study submittal. For access analysis purposes, midday peak hour counts may be requested by the City depending on where the project is located in relation to certain intersections. Counts should be conducted on a Tuesday, Wednesday or Thursday during weeks not containing a holiday. Current counts which have been performed by the City will be made available at the request of the applicant. However, if the City does not have counts or if the counts are not current, the applicant will be required to perform the counts. Should concerns or discrepancies arise regarding the traffic count data collected, the City may request additional counts.

Orange County.

- Sub-Regional traffic - Through traffic which has neither origin nor destination within the City of Irvine.

- Other development traffic - Traffic generated by all other development with either origin or destination within the City of Irvine. If the proposed project involves a TDR, General Plan intensity modification or intensity shift, the development traffic of project applications on file with the City will be assumed in a cumulative impact analysis (see Page 11 - Cumulative Impact Analysis for details). A list of all said projects shall be included as an attachment in the approved scope of work

Within the City of Irvine, background traffic is generally estimated using Irvine's Transportation Analysis Model (ITAM).

The following horizon years are required to be analyzed:

- Existing
- Interim Year (short term, typically a 5-year horizon), assumptions include committed roadway improvements by this timeframe and tolled corridor facilities
- Interim Year (long term, typically 20 to 25 year horizon), assumptions include committed improvements by this timeframe and tolled corridor facilities
- Buildout of City, assumptions include full buildout of adopted General Plan and Master Plan of Arterial Highways and tolled corridor facilities

The database shall be modified to include only those uses for the project site which exist at the time of application (i.e., existing land use - if vacant, the database shall have zero land use for that site) or, in the case of legally vested development, that amount of land use which is vested. Documentation of the vesting of land uses will be required of the applicant with the application. Computer model runs will then be performed for all horizon years. These runs will represent the background traffic volumes against which the "with project" analyses will be compared to develop mitigation measures. In an expansion project, the expansion and any existing development to be expanded will be considered the "with project" scenario (see Exhibit 3).

For limited scope traffic studies, the horizon year by which time the project will be built out will be the only horizon year analyzed.

The study shall specify the volumes and levels of service associated with the daily A.M. and P.M. peak hour conditions. Daily information shall be shown in a graphic format. Peak hour information shall be summarized in a table which identifies the levels of service (volume-to-capacity ratios from the Intersection Capacity Utilization {ICU} worksheets). In addition, ICU worksheets shall be attached as an appendix.

Committed Improvements

For interim conditions, improvements funded by government agencies (i.e., in the Capital

Improvement Project {CIP}) or other development (as approved by the Director of Public Works) shall be identified. This list would include the nature of the improvement project, its extent, implementation schedule, and the agency or funding source responsible. An official list of these "committed improvements" shall be obtained from the City. A list shall be provided showing the location of such facilities or projects.

The currently approved General Plan Arterial Highway Designation (General Plan Exhibit D-5) and the Orange County Master Plan of Arterial Highways (MPAH - for adjacent Cities' roadways, as appropriate) shall be the basis for roadway improvements considered to be in place for the buildout analysis. The network assumptions for the analysis years will be discussed in the report.

**Proposed Project Impacts**

Definition of Impact

Impacts of development on the circulation network shall be mitigated compared to the existing land use of the site at the time of submittal for development approval or, in the case of vested development, that amount of land use which is vested. Documentation of the vesting of land use will be required of the applicant with the application.

Model Trip Generation

The calculation of traffic volumes used to determine impacts of the development shall be based on the latest plans submitted for planning areas or on land use intensity allowed (including a trip cap adopted by the City) under the existing (or proposed) Zoning Ordinance or the General Plan. For proposed mixed-use developments, the analysis will assume the plan presented by the developer and any trip cap established for the area. When a zone change is requested that proposes to increase the trip cap, the traffic impact analysis for the proposed use will assess the impacts of the project by comparing the new proposal to a no project condition. To achieve the new project to no project comparison, the analysis will add project mitigation at the end of the analysis versus keeping previous mitigations in from the beginning.

Trip generation rates shall be based on the most recently approved socioeconomic data based trip rates. These rates are included in the technical documentation for the Irvine Transportation Analysis Model (ITAM).

Land use trip generation rates will be based on the most recent edition of Institute of Transportation Engineers utilized by ITAM (at the time of this publication ITE 6$^{th}$ Edition was used).

Land use information will be converted to the following socioeconomic variables:

- Single-Family Residential
- Multi-Family Residential
- Population
- Employed Residents
- Retail Employment

- Service Employment
- Other Employment
- K1 to K12 Students
- University Students

The conversion shall be based on the most recently approved land use to socioeconomic data conversion factors. These factors are included in the technical documentation for the Irvine Transportation Analysis Model (ITAM).

Additional information, such as income or special generators, shall be based on the most recent regional model, Orange County Transportation Analysis Model (OCTAM) or as otherwise approved by the City.

Non-ITE land use trip generation rates may be used, based on recognized local resources or rates based on three-day traffic counts taken for three similar and preferably local sites, if available, at the discretion of the Director of Public Works. The detailed recommended rate methodology shall be included in the scope of work and approved by the Director of Public Works.

A summary table listing each type of land use, corresponding size or number of units (square feet, dwelling units, beds, etc.) for the project site for all horizon years of model runs shall be provided. The table should include:

- AM peak hour, PM peak hour and daily vehicle trips based on socioeconomic data for each use, if feasible, otherwise for the project.
- AM peak hour, PM peak hour and daily vehicle trips based on land use trip rates for each use.
- A comparison of the project trip generation and land uses versus the zoning level trip cap allocation available on the site.

Adjustments to Trip Generation

The City will examine the feasibility of implementing a policy which would allow applicants a reduction in trip generation rates for the subject project's study. When the City establishes such a program, a reduction in trip generation can be granted by the City, at the applicant's request, for the project. The City may require, at a minimum, that the following information be included in the request and corresponding study: 1) demonstration of the ability to achieve the specific levels of trip reduction assumed; and 2) documentation of a monitoring and compliance program to ensure the success of its Transportation Demand Management (TDM) program. The City may require additional mitigation or the payment of fees if the project generates trips in excess of the levels approved through the study. Additional information regarding TDM is provided in the Transportation Demand Management section.

Where applicable, the Spectrum Trip Reduction Policy approved as part of the Northern Sphere developments (see Appendix A) and the IBC Trip Reduction Program shall be utilized.

Trip Distribution and Trip Assignment

Traffic generated by the site must be distributed and assigned to the roadway network in order to determine the project's impacts. Trip distribution refers to the direction a vehicle will take to access or leave the project site and can vary depending on:

- Type of proposed development surrounding the site;
- Similar land uses in the vicinity;
- Size of the proposed development; and
- Conditions on the roadway network in the vicinity.

For each horizon year, the distribution of project trips shall be shown in graphic format using percentages of project traffic by geographical direction. Trip distribution shall be based on model output. Adjustments to the model output may be necessary. However, any adjustments shall be approved by the Director of Public Works prior to the submittal of the study. The text should describe the methodology and assumptions which are used in the determination of trip distribution.

Trip assignment identifies the actual routes taken by project traffic to and from the site. The identification of the project assignment shall be performed utilizing Irvine's Transportation Analysis Model (ITAM). Graphic presentations, as well as discussions of the analysis and results in text of the trip assignment, shall be provided in the report.

Phased Projects

This section discusses phased construction of developments, trips they will generate, and phased mitigations planned. Studies for projects planned to be developed in phases must document impacts as the phases develop (i.e., Phase 1 impacts separately, Phase 2 impacts would include Phase 1 impacts).

Traffic generation for the project phases shall be determined as outlined earlier in the report based on the applicant's phasing proposal. The development shall be conditioned to adhere to the phasing schedule, as building permits shall be conditioned to be tied to the approved phasing plan.

Projections of future traffic, both with and without the project, shall be determined as outlined above. If the year of buildout of the phase does not have an existing database, alternate methods of projecting traffic may be utilized, with the approval of the Director of Public Works.

**Future Traffic with Proposed Development**

In order to develop mitigation measures for development, conditions with the project in place must be known. These future conditions with the proposed development are based on computer model runs for horizon years which include the project's proposed land use.

As in "Future Traffic Without Proposed Development" above, traffic projections shall be

developed through the use of Irvine's Transportation Analysis Model (ITAM). The assumed land use for the project shall be based on the proposed land uses for the site. This information shall be added to the database. This will represent the "with project" condition.

**Cumulative Impact Analysis**

A cumulative impact analysis is required if a proposed project involves a Transfer of Developer Rights (TDR), General Plan intensity modification or intensity shift from one development area to another. Further, if a project does not involve one of the above conditions, but other pending applications for projects within the traffic study area do involve one of the above conditions, the Director of Public Works may require that the cumulative impact analysis described below be performed. The cumulative impact analysis will include, in addition to those scenarios outlined and discussed on Pages 7 and 10 ("Future Traffic Without Proposed Project" and "Future Traffic with Proposed Project" sections), a "baseline plus cumulative projects without project" and a "baseline plus cumulative projects with project" scenario for each horizon year. The cumulative impact analysis is one that analyzes a project with projects currently on file with the City that are likely and foreseeable at the time of the project scope of work approval. For a cumulative impact analysis, a project to be included as a cumulative project is defined as one that also involves a TDR, General Plan intensity modification or intensity shift from one development area to another that also requires a traffic impact analysis. The analysis may consider the inclusion of all project applications (also requiring a traffic impact analysis) on file with the City at the time of the scope of work approval. At a minimum, the projects within the study area boundary shall be included in the cumulative impact analysis. Projects outside the study area boundary will be included in the analysis as determined by the Director of Public Works. A list of all these projects to be assumed as part of the cumulative impact analysis shall be included as an attachment in the approved traffic study scope of work. If the cumulative impact analysis yields potential deficiencies, mitigation will be based on a fair share contribution.

**Analysis**

Level of Service (LOS) Analyses

Level of Service (LOS) E shall be considered acceptable for links and intersections in accordance with the City's General Plan Objective B-1 and as approved in the Level of Service E Policy for the Northern Sphere Area developments (see appendix B). LOS D shall be considered acceptable for all other areas of the City.
In general, levels of service are defined in the City of Irvine General Plan as follows:

Level of Service A: The volume/capacity ratio ranges from 0.0 to 0.60. At this LOS, traffic volumes are low and speed is not restricted by other vehicles. All signal cycles clear with no vehicles waiting through more than one original cycle.

Level of Service B: The volume/capacity ratio ranges from 0.61 to 0.70. At this LOS, traffic volumes begin to be affected by other traffic. Between one and ten percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.

Level of Service C: The volume/capacity ratio ranges from 0.71 to 0.80. At this LOS, operating speeds and maneuverability are closely controlled by other traffic. Between 11 and 30 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.
Level of Service D: The volume/capacity ratio ranges from 0.81 to 0.90. At this LOS, traffic will operate at tolerable operating speeds, although with restricted maneuverability.

Level of Service E: The volume/capacity ratio ranges from 0.91 to 1.00. Traffic will experience restricted speeds, vehicles will frequently have to wait through two or more cycles at signalized intersections, and any additional traffic will result in breakdown of the traffic carrying ability of the system.

Level of Service F: Long queues of traffic, unstable flow, stoppages of long duration with traffic volumes and traffic, speed can drop to zero. Traffic volumes will be less than the volume which occurs at Level of Service E.

For existing and future conditions, Levels of Service at intersections shall be calculated using the Intersection Capacity Utilization (ICU) method. All calculations shall recognize special phasing arrangements, where applicable. In addition, the lane capacity used in the ICU calculations shall be 1,700 vehicles per hour, per lane. Adjustment factors for this value shall consist of the following:

- A lost time of 0.05 shall be added to the ICU calculation.

- If the distance from the edge of the outside through lane is at least 19 feet and parking is prohibited during the peak period, right turning vehicles may be assumed to utilize this "unofficial" right turn lane. Otherwise, all right turn traffic shall be assigned to the outside through lane. If a right turn lane exists, right turn on red may be assumed, if not prohibited at that location. However, the assumption of the number of vehicles turning right on red must be reasonable and not conflict with any other critical movements. If a free right turn lane exists (right turns do not have to stop for the signal), a flow rate of 1,700 vehicles per hour, per lane may be assumed. The V/C ratio of the right turn lane should be reported but not included in the sum of the critical V/C ratios.

Pedestrian adjustments shall be performed on a case-by-case basis and assessed according to procedures outlined in Chapter 16 of the latest version of the Highway Capacity Manual (HCM) for those intersections which have more than 100 existing pedestrians per peak hour, per intersection leg. No adjustment is required for pedestrian volumes less than 100 per peak hour.

Link LOS shall be determined using the volume-to-capacity (V/C) ratios. Values of V/C associated with the various levels of service are stated below:

| LEVEL OF SERVICE | V/C |
|---|---|
| A | 0.00 - 0.60 |
| B | 0.61 - 0.70 |
| C | 0.71 - 0.80 |

| | |
|---|---|
| D | 0.81 - 0.90 |
| E | 0.91 - 1.00 |
| F | > 1.00 |

The capacities to be used to determine V/C ratios for roadway links shall be those approved by the City of Irvine. They are outlined below, subject to future revisions:

| **Facility Type** | **Number of Lanes** | **Capacity** | |
|---|---|---|---|
| | | LOS D | LOS E |
| Freeways | 10 | 189,000 | 210,000 |
| | 8 | 158,400 | 176,000 |
| | 6 | 121,500 | 135,000 |
| | 4 | 81,000 | 90,000 |
| Freeway Ramps | 2 | 19,800 | 22,000 |
| | 1 | 14,400 | 16,000 |
| Expressway | 6 | 121,500 | 135,000 |
| Major Highway | 8 | 64,800 | 72,000 |
| | 6 | 48,600 | 54,000 |
| Primary Highway | 4 | 28,800 | 32,000 |
| Secondary Highway | 4 | 25,200 | 28,000 |
| Commuter | 2 | 11,700 | 13,000 |
| Commuter (Rural) | 2 | 16,200 | 18,000 |

Roadway facility types shall be based on the General Plan Circulation Element's Exhibit D-5, Arterial Highway Designation. If not listed on the above table, facility/number of lanes/capacity will be interpolated.

****NOTE: Intersections and roadway links shall be analyzed and meet the performance criteria on an individual basis. Grouping and screen line calculations will not be accepted.**

**Performance Criteria**

Performance criteria are established in order to determine what mitigation measures would be required of the development based on its impacts.

If the roadway link or intersection in question exceeds the acceptable LOS in the baseline condition and the impact of the development is:

Intersections (Citywide)

Greater than or equal to 0.02, rounded to the second decimal place, then project mitigation will be required back, at a minimum, to baseline as determined in "Definition of Impact" on Page 8.

Intersections projected to be deficient in the most recent Circulation Phasing Analysis Report. **Criteria to be applied in the interim year (short term) only**

Greater than or equal to 0.01, rounded to the third decimal place, then project mitigation

will be required back, at a minimum, to baseline as determined in "Definition of Impact" on Page 8 or contribution of fair share towards a mitigation back to an acceptable level of service. If mitigation back to baseline condition is not feasible by determination of the Director of Public Works, then the contribution of fair share towards a mitigation will be considered.

Roadway Links

Greater than or equal to 0.02, rounded to the second decimal place, project mitigation will be required back, at a minimum, to baseline as determined in "Definition of Impact" on Page 8. Mitigation opportunities include capacity augmentation, in accordance with the provisions of Objective D-1, Implementing Action (m) of the Circulation Element.

Peak Hour Link Analysis

A Peak Hour Link Analysis (PHLA) will be required for all links which exceed the defined Level-of-Service (LOS) standards when comparing the forecast average daily traffic (ADT) volume-to-roadway capacities, as defined by the City. The PHLA shall be consistent with the December 16, 1996, Transportation and Infrastructure action approving the "Revised Peak Hour Link Analysis Methodology".

The PHLA will determine directional AM and PM volume-to-capacity (V/C) ratios for each link which is projected to exceed LOS standards. The peak hour capacity will be determined by multiplying the midblock number of lanes for each direction by a lane capacity of 1,600 vehicles per hour. Where the distance between controlled intersections is one or more miles, the midblock number of lanes shall be multiplied by a lane capacity of 2,000 vehicles per hour.

If the V/C ratio results do not meet City LOS standards, additional lanes will be needed for each deficient direction consistent with the Master Plan of Arterial Highways. The added lane(s) may function either as an auxiliary lane (does not go through the down stream intersection) or a through lane, as determined by the ICU analyses of the downstream intersections.

When the study area boundary, arterials and intersections fall under the jurisdiction of agencies outside the City of Irvine, all applicable performance criteria and practices for those jurisdictions will be considered.

**Special Analyses/Issues (Optional)**

Every project is unique and, therefore, may have special issues which require discussion and analysis. In many instances, concerns are raised regarding issues, which though transportation related, are not always included in studies. These include, but are not limited to, site access, traffic signals, stacking/queuing analyses and pedestrian circulation. The inclusion of any or all of the special issues analyses shall be determined by the Director of Public Works prior to approval of the scope of work. The scope of work shall outline the extent and type of analyses required. Analysis of these issues shall be provided in the manner outlined below.

Site Access Analysis

The project's impact to access points and on-site circulation will be analyzed. The analysis will, as appropriate, include the following:

- number of access points needed without negatively impacting traffic flow along the arterials, deceleration lanes into the site
- spacing between driveways and intersections
- signalization of driveways
- shared access
- turn conflicts/restrictions
- adequate sight, distance/corner clearance
- driveway improvements
- any other operational characteristics

If the proposed project is a residential use with privacy gates or a non-residential use with controlled access gates, the applicant shall provide a stacking analysis for review and approval. If the proposed project is a non-residential use with security gates, a stacking analysis is not required unless required by the Director of Community Development (per City Zoning Ordinance). The adequacy of the interface with the arterial network may be analyzed and necessary improvements to adjacent intersections may be required.

The site access analysis shall comply with adopted City standards and utilize, as appropriate, the City's Transportation Guidelines (dated July 30, 1993).

The City's Transportation Analysis Model will be used to determine the project's trip distribution. The trips shall be manually reallocated to the access points based on the latest ITE land use trip generation rates for the site.

Any existing trips or trips associated with other approved uses, utilizing the same access points as the proposed project's trips, will be added in order to capture the full impacts to the access points.

When details of a project site may not be available, such as at the zoning level, access points and their locations are considered conceptual in nature. The final placement of such access points shall be finalized and approved as part of the subsequent development application or when the project details have been refined.

Independent of traffic/limited scope traffic study requirements and thresholds, when a project is within approved trip budget/caps and zoning and is only altering existing or proposing new access points, the discussion outlined in this Site Access Analysis section is the only applicable section of the document.

The scope of work for and the approval of a site access analysis that is independent of a traffic study or limited scope traffic study are the purview of the Director of Public Works. All site access analyses that are part of a larger traffic study or limited scope traffic study shall be approved as part of the larger study consistent with the parameters discussed in this document.

Traffic Signals

The need for new traffic signals shall be based on warrants outlined in the latest edition of the State of California Department of Transportation (Caltrans) Traffic Manual, the United States Department of Transportation Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), or any additional warrants established by the National or California Committee on Uniform Traffic Control Devices.

The application of signal warrants, including the appropriate warrants, figures and assumptions (ex: roadway speed) to be utilized shall be clearly outlined and identified in the study's scope of work.

In determining the location of a new signal on an arterial street, traffic progression is of paramount importance. Impacts on the progression for arterial network may be analyzed using procedures deemed appropriate by the City's Traffic Engineer. Currently, the City uses SYNCHRO software for signal progression purposes. The applicant shall contact the City Traffic Engineer prior to commencement of a signal progression analysis to discuss the study and appropriate signal progression methodology and assumptions.

Pedestrian Circulation

The City places special emphasis on the protection of pedestrians, especially school children on their way to and from school. The study shall identify all existing and future pedestrian interface locations affected by the project, pedestrian facilities within a project and explore the need for appropriate traffic control devices. City General Plan Objective B-3: Pedestrian Circulation shall be the goal of every project. In addition, to the extent applicable, the study shall address the project's conformance to City General Plan Objectives B-4: Bicycle Circulation and B-5: Riding and Hiking Trail Networks.

Other special issues and the appropriate analyses required to address said issues shall be identified by the City at the pre-application conference.

**Congestion Management Program (CMP) Consistency/Requirements**

In June 1990, California voters approved Proposition 111 which established a nine cent per gallon gas tax, staged over a 5-year period, for the purpose of funding transportation related improvements statewide. In order to be eligible for the revenues associated with Proposition 111, Congestion Management Program (CMP) legislation (AB 471 amended to AB 1791) requires urbanized counties in California to adopt a Congestion Management Program. The goal of CMP is to promote a more coordinated approach to land use and transportation decisions. As part of the requirements for CMP, a traffic impact analysis may be required of certain developments. The City of Irvine requires that all roadways, including those on the CMP Highway System, be analyzed as outlined below. Completion of the City of Irvine "CMP Monitoring Checklist: Land Use Coordination Component" (Exhibit 4) shall be required of the applicant or his/her consultant, as outlined in the Congestion Management Program (CMP) Consistency/Requirements section. The completed checklist shall be submitted with the application for development.

As part of the study, the applicant shall be required to demonstrate that roadways on the CMP network will not deteriorate due to the development below the requirements for CMP purposes. Exemptions from the requirements for CMP are outlined in Exhibit 5. Exemption from the completion of a CMP traffic impact analysis does not exempt the applicant from the completion of a traffic impact analysis based on the City of Irvine requirements.

Within the City of Irvine, the following roadways are on the CMP Highway System:

- Irvine Boulevard
- Jamboree Road
- Irvine Center Drive
- Laguna Canyon Road/SR-133
- Tollways: SR-133, SR-241, SR-261, SR-73
- Freeways: I-5, I-405

For these roadways and specifically any intersections on these roadways, the completion of the "CMP Monitoring Checklist: Land Use Coordination Component" for the City of Irvine (Exhibit 4) is required. Any future additions to the CMPHS will be subject to the same CMP requirements outlined in this section.

**Required Mitigation Measures/Recommendations**

Improvement Needs

Mitigation measures, improvements to the roadway network (including intersections) required due to the project, shall be identified for all portions of the network which meet the Performance Criteria outlined above. The recommendations section shall include:

Proposed Recommended Improvements: This section shall describe the location, nature, and extent of proposed improvements to assure sufficient roadway capacity. Mitigation measures shall be identified for all years analyzed above. A plan drawing of each improvement may be required in the study illustrating the length, width, and other pertinent geometric features of the proposed improvements.

The determination of whether a plan is needed shall be made by the Director of Public Works.

Level of Service Calculations: A table illustrating the effectiveness of the improvement for all years analyzed shall be provided. The table shall include the LOS for the "with" project scenario without proposed mitigations, and the "with" project scenario with proposed mitigations.
The application of an Advanced Transportation Management Systems (ATMS) credit may be considered as an alternative mitigation measure. Such consideration will be made only if the City maintains an appropriately adopted ATMS policy and implementation methodology, and such ATMS consideration is made in full compliance with both. (See Appendix C - City Council Ordinance 03-08 adopted March 25, 2003)