Sec. 6.14 / Traffic Impact Analysis

6.14.1 / Purpose

This article provides uniform guidelines for conducting traffic impact analyses for proposed development with access to an arterial or a collector street.

6.14.2 / Applicability

The Public Works Director or designee shall determine applicability based on the following factors and considerations:

A. A Traffic Impact Analysis (TIA) shall be prepared for proposed developments, or additions to existing developments, that generate more than 100 vehicle trips during the morning or afternoon peak hour period. The City shall make the final determination regarding TIA requirements and applicable category, and the impact analysis shall be in a format as described in Appendix B. The criteria for each TIA category are as follows:

1. **Category 1**
   - **a.** Developments that generate between 100 to 500 trips, during the morning or afternoon peak hour; or
   - **b.** Existing traffic situations or concerns in the local area such as, but not limited to, an offset intersection or a high number of traffic accidents; or
   - **c.** Sensitivity of the adjacent neighborhoods or other areas where the public may perceive an adverse impact; or
   - **d.** Proximity of site driveways to other driveways or intersection; or
   - **e.** Specific problems or concerns that may be aggravated by the proposed development.
2. **Category 2**
   Developments that generate 501 to 1,000 total trips during the morning or afternoon peak hour.
3. **Category 3**
   Developments that generate more than 1,000 trips during the morning or afternoon peak hour.

B. In addition to the above requirement thresholds, the Public Works Department may require a TIA when changes in land use, traffic, and roadways occur, such as:

1. Proposed property rezoning; or
2. When the original TIA is more than 2 years old; or
3. Where the projected traffic volumes increase by more than 10 percent.

6.14.3 / Engineering Qualifications

The TIA shall be prepared under the direction of a Professional Engineer (Civil) licensed to practice in the State of Arizona with specific experience in traffic engineering and the preparation of TIA reports. There shall be no deviation from these requirements.

6.14.4 / TIA Process

A. Initial Evaluation

Prior to beginning the TIA, the applicant shall contact the Public Works Department to discuss the scope of work, methodology, and level of detail required for the specific project. Following the initial meeting, the applicant shall provide an estimate of the number of vehicular trips generated by the proposed development. The estimate must be prepared using a City-approved methodology and shall be submitted to the City for review and approval. The developer may request that the City assist in estimating the number of trips.

B. Draft Outline

Following the initial evaluation, the City shall make a final determination regarding the need for a TIA and identify the applicable category. If a TIA is required, the applicant shall prepare a draft table of contents and project outline for submittal to the City. The outline will identify the proposed area of influence for the study, all intersection and roadways to be analyzed, and level of detail and methodology for gathering traffic volume information and preparation of level of service analyses. The draft shall also include a proposed trip distribution for site traffic. Following City review and approval the final TIA may be prepared.

C. Scope of Work

The TIA Scope of Work agreement between engineer and developer shall conform to the pre-approved draft table of contents and outline. The findings, conclusions and recommendations contained within the TIA document shall be prepared in accordance with appropriate professional Civil Engineering practices. (See Appendix B for Traffic Impact Analysis format.)

6.14.5 / Analytical Methodology

The procedures outlined in this policy provide the minimum requirements for a TIA, although the City reserves the right to require additional information. The TIA approach and methods shall be guided by the following criteria:

A. Study Area and Timeframe

The minimum study area and timeframe for projected analysis shall be determined by project type and size, in accordance with the criteria previously outlined. The study area or projected timeframe may be amended by the City as necessary.

1. Category 1

The minimum study area shall include all site access drives and adjacent signalized intersection and/or major unsignalized street intersection. The study's projected timeframe shall be one year from receipt of Certificate of Occupancy.

2. Category 2

The minimum study area shall include all site access drives and all signalized intersection and/or major unsignalized street intersection within 1/2 mile of the development. The study's projected timeframe shall include the 1st year

following receipt of Certificate of Occupancy and the 5 succeeding years.

3. **Category 3**
   The minimum study area shall include all site access drives and all signalized intersection and/or major unsignalized street intersection within 1/2 mile of the development. The study's projected timeframe shall include the opening year of the development, 5 years after opening and 10 years after opening.

B. Peak Hour Analysis

Both the morning (7AM to 9AM) and evening (4 PM to 6 PM) weekday peak hours shall be analyzed, unless the proposed project is expected to generate no trips, or a very low number of trips, during either peak hours. When a project's traffic generation patterns differ significantly from established patterns or when the peak traffic hours occur during a different time, all additional peak hours shall be analyzed.

C. Seasonal Adjustments

When directed by City, in cases where seasonal traffic data is available, the traffic volumes for the analysis hours shall be adjusted for the peak season.

D. Data Collection Requirements

All data shall be collected in accordance with procedures outlined in the latest edition of the Institute of Transportation Engineers (ITE) Manual of Traffic Engineering Studies, or as otherwise directed by City. At a minimum, the following data shall be collected:

1. **Turning Movement Counts**
   Manual turning movement counts shall be obtained for all existing cross-street intersection to be analyzed during the morning and afternoon peak periods. Turning movement counts may be required during other periods as directed by the City.

2. **Daily Traffic Volumes**
   The current and projected daily traffic volumes shall be presented in the report. If available, daily count data from the City may be extrapolated a maximum of 2 years with the concurrence of the City. Where daily count data is not available, mechanical counts will be required at locations agreed upon by the City.

3. **Collision Data**
   Collision data shall be obtained for the most current 3-year period available.

4. **Roadway and Intersection**
   Geometrics Roadway geometric information shall be obtained. This includes, but is not limited to, roadway width, number of lanes, turning lanes, vertical grade, location of nearby driveways, and lane configuration at intersection.

5. **Traffic Control Devices**
   The location and type of traffic controls shall be identified.

E. Trip Generation

1. The latest edition of the ITE Trip Generation Manual shall be used to identify trip generation rates. In cases where Trip Generation does not include trip rates for a specific land use category, includes only limited data; or, where local trip rates have been shown to differ from the ITE rates, other rates may be used with the approval of the City.

2. A trip generation table shall be prepared showing proposed land use, trip

rates, and vehicle trips for daily and peak hour periods and appropriate traffic volume adjustments, if applicable. Site traffic generation shall be shown for daily, morning and evening peak hour periods. Adjustments made for "passer-by" and "mixed-use" traffic volumes shall follow the methodology outlined in the latest edition of the ITE Trip Generation Manual. The "passer-by" traffic volume discount for commercial centers shall not exceed 25 percent unless approved by the City.

F. Trip Distribution and Assignment

1. Projected trip volume shall be distributed and added to the projected non-site traffic on the roadways and intersection(s) in the study area. The specific assumptions and data sources used in deriving trip distribution and assignment shall be documented in the report.
2. Future traffic volumes shall be estimated using information from transportation models, or applying an annual growth rate to the base-line traffic volumes. The future traffic volumes shall correlate to the project's specific timeframe. If the annual growth rate method is used, the City must give prior approval to the percentage used.
3. In addition, any nearby proposed or approved development projects shall be taken into consideration when forecasting future traffic volumes. The increase in traffic from proposed and approved developments, the application of an annual growth rate, or a combination of an annual growth rate and proposed and approved developments, shall be used to forecast the future traffic volumes.
4. The site-generated traffic shall be assigned to the street network in the study area based on the approved trip distribution percentages. The site traffic shall be combined with the forecast traffic volumes to show the total traffic conditions estimated at development completion. The total daily and peak period turning movement volumes for each traffic study intersection is required. In addition, the base-line volume with site-generated traffic added to the street network must also be shown. This amount will represent site-specific traffic impacts on existing conditions

G. Internal Circulation

1. Parking lot/on-site traffic circulation shall be in conformance with standards of practice as set forth by "Transportation and Land Development" (ITE, current edition).

6.14.6 / Project Analyses

A. Capacity Analysis

1. Level of service (LOS) shall be computed for signalized and unsignalized intersection in accordance with procedures contained in the latest edition of the Highway Capacity Manual.
2. The intersection LOS shall be calculated for each of the following conditions (if applicable):
   a. Existing peak hour traffic volumes ("figure" required);
   b. Existing peak hour traffic volumes including site-generated traffic ("figure" required);

c. Future traffic volumes not including site traffic ("figure" required);

d. Future traffic volumes including site traffic ("figure" required); and

e. LOS results for each traffic volume scenario ("table" required).

3. The LOS table shall include LOS results for all peak periods analyzed. The table shall show LOS conditions with corresponding vehicle delays for signalized intersection, and LOS conditions for the critical movements at unsignalized intersection. For signalized intersection, the LOS conditions and average vehicle delay shall be provided for each approach and the intersection as a whole.

4. Unless otherwise directed by the City, the capacity analysis for existing signalized intersection shall be conducted using the Highway Capacity Manual Planning Method for each study horizon year.

B. Operational Analysis Method

When directed by City, the capacity analysis shall be conducted using the Operational Analysis Method. If an operational capacity analysis method is used for existing signalized intersection, it shall include existing phasing, timing, splits, and cycle lengths as observed and measured during the peak traffic periods. For unsignalized intersection, the Highway Capacity Manual methodology shall be used.

C. Phased Projects

Where new development is to be completed in phases, the TIA shall, if directed by City, include an LOS analysis for each separate development phase in addition to the TIA for the overall project timeframe. The incremental increases in site traffic from each phase shall be included in the LOS analysis for each preceding year of development completion. A "figure" will be required for each horizon year of phased development.

D. Traffic Signal Analysis

Traffic signal needs studies shall be conducted for all proposed signals for the base year. If the warrants are not met for the base year, they shall be evaluated for each year in the 5-year horizon. Traffic signal needs studies shall be conducted by a method pre-approved by the City.

E. Collision Analysis

An analysis of 3-year collision data shall be conducted to determine if the level of safety will deteriorate due to the addition of site traffic.

F. Vehicle Speed Parameters

Vehicle speed is used to estimate safe stopping and cross corner sight distances. The posted speed limit is representative of the 85th percentile speed and may be used to calculate safe stopping and cross corner sight distances, unless directed otherwise by the City.

G. Pedestrian and Biking Analysis

The pedestrian and bike facilities, or lack thereof, within the study area shall be analyzed, with and without the proposed development, to identify any projected impacts on their use and safety. Pedestrian and bike use and safety within the study area shall not be unreasonably reduced, with the overall objective being to enhance rather than reduce biking and walking activities.

H. Roadway Improvement Analysis

The roadways and intersections within the study area shall be analyzed, with and

without the proposed development, to identify any projected impacts on both level of service and safety. Where the highway will operate at Level of Service "C" or better without the development, the traffic impact of the development on the roadways and intersection within the study area shall be mitigated to Level of Service "C". Mitigation to Level of Service "D" may be acceptable with City approval. Particular attention shall be directed to potential need for separate right turn or left turn lanes. A section of the TIA shall provide discussion regarding this requirement.

I. On-Site Circulation Analysis

The TIA shall include an analysis of the adequacy of the on-site circulation plan.

6.14.7 / Report Format

Specific requirements for TIA formats are located in Appendix B, and are based upon the type of TIA. Deviations from format requirements must receive prior approval of the City.