



Guide for the Submittal of Traffic Statements and Traffic Impact Analysis to the City of Glendale

The City of Glendale has developed this guide to standardize the submittal of traffic studies to the city.

It is the responsibility of Glendale to ensure that all traffic impacts resulting from new developments or from the redevelopment of properties are addressed adequately and fairly.

Traffic studies provide information during the planning and design phases of projects. These studies help determine the impact of proposed developments on the existing and projected traffic networks in the city. They also provide recommendations on access (type, number, and location) and the required offsite system improvements to mitigate impacts from proposed developments.

The goal of the document is to strike a balance between economic development, mobility, and street network safety.

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Date

1) General

A traffic engineering evaluation shall be required for all land development or redevelopment projects that may directly or indirectly impact a city's roadway system. This document outlines the specific traffic study process that shall be followed to address the traffic engineering evaluation requirements tied to new development or redevelopment projects. The traffic engineering evaluation requirement may be waived by the City Traffic Engineer, or their designee when considering a request for access to a development.

The extent of the traffic engineering evaluation is directly related to the intensity of the development, the roadway classification that the development is adjacent to, and the number of access point that is requested.

2) Purpose

The purpose of memo is to standardize the requirements of Traffic Statements and Traffic Impact Analysis. The memo also identifies the required level of analysis that needs to be submitted to the City in conjunction of the submittal of permit for new development, or for the redevelopment of existing parcels within the City of Glendale.

The traffic study determines the potential traffic impacts of a proposed development on the existing and projected street network

3) Type of Traffic Studies

The following describes three levels of standard traffic studies. One of these three study types will be required in conjunction with all new development or the redevelopment of existing parcels. They are as follows:

A. Traffic Site Assessment

This is a screening-level analysis to determine if additional traffic analysis is required. The traffic threshold for this type of assessment is less than 25 vehicles during the peak period.

The engineering consultant will prepare a one-page summary outlining the minimal impact resulting from the development.

B. Traffic Statement (TS)

The TS assesses site-specific impacts of a proposed development on the adjacent street network. The process consists of an engineering evaluation and the preparation of a traffic study report.

In general, a TS is required to address localized impacts that include proposed access driveways and the first adjacent major intersection, signalized or unsignalized, in each direction along the proposed development.

The TS is required when the development is expected to generate between 25 and 100 peak-hour total trips.

This type of study requires analysis of the following time periods:

- a. Existing Year conditions
- b. Implementation Year without the proposed development
- c. Implementation Year with the proposed development

C. Traffic Impact Analysis (TIA)

The TIA represents a detailed traffic impact analysis of all traffic operations, access and safety impacts within the prescribed study area for a proposed development. It consists of an engineering evaluation and the preparation of a traffic study report.

A TIA is required when the proposed development is expected to generate 100 or more peak-hour total trip.

The TIA study area should be defined based on the location and scope of the proposed development and should progressively expand with the size and intensity of proposed development. The TIA study area should be defined at the traffic analysis kick-off/scoping meeting. The study area, along with the proposed site traffic distribution along the roadway network, **shall be approved** by the City Traffic Engineer before any work on the study is performed. The number of signalized and unsignalized intersections that will be analyzed as part of the study will be identified at the meeting.

This type of study requires analysis of the following time periods:

- a. Existing Year condition
- b. Implementation Year without the proposed development
- c. Implementation Year with the proposed development
- d. Horizon Year without the proposed development - the horizon year should be the implementation year plus ten years
- e. Horizon Year with the proposed development

The traffic engineering studies shall be performed by a registered engineer, licensed to perform engineering work in the state of Arizona. All reports shall be sealed and signed on the cover by the registered Professional Civil Engineer.

4) Kick-off/Scoping Meeting

Prior to commencing any work on a traffic study, the consultant shall schedule a meeting with the City's Transportation staff to define the parameters for the study.

The developer shall provide the following items on or before the meeting date:

- A. Project location
- B. Development site plan
- C. Proposed access plan
- D. Proposed land use and occupancy details that may include building area, number of employees, leasable tenant space, acreage, etc.
- E. Information on if the development will be phased

The following is a list of items that will be discussed at the meeting:

- A. The level of Traffic study that will be required: Traffic Site Assessment, Traffic Statement (TS), or Traffic Impact Analysis (TIA)
- B. The study area limits (at a minimum):
 - a. Less than 100 trips: development site access point(s) and the nearest intersection to around the proposed development.
 - b. 101 to 500 trips: limits to extend to any traffic signals 1 mile of either side of the development.
 - c. 501 to 1000 trips: limits to extend to any traffic signals 2 mile of either side of the development.
 - d. Greater than 1000 trips: limits to extend to signalized intersections within a 3-mile radius of the development property.
- C. Software that will be used to perform the analysis. The city's preference is the latest edition of Synchro
- D. Traffic data: the data collection method, duration, and window will be agreed to at the meeting.
 - a. Existing traffic counts older than 2 years will not be allowed.
- E. Horizon year
- F. Background traffic growth rate: the growth rates that will be used to project future traffic volumes based on current traffic data. The City Traffic Engineer, or their designee, shall review and approve the proposed growth rates before commencing work on the study.

Future year growth rates may be provided by the City Traffic Engineer or their designee. If provided by the City, the rates shall be used in the study.

- G. Proposed access location(s), number, and type (full access, partial access, right in - right out, right in - right out- left in, emergency access only, etc.).
- H. Trip generation: the number of trips expected to be generated by the development will be estimated based on data from the latest edition of the ITE Trip generation manual.

When the land use categories of the Trip Generation Manual clearly do not apply or the rates are not appropriate for a proposed development, locally derived trip generation rates should be used. Trip generation rates that are based on local conditions should be developed according to the methodology described in the Trip Generation Manual.
- I. Basis for trip distribution: identify the parameters for distributing the site generated traffic within the adjacent roadway network. The City Traffic Engineer, or their designee, shall review and approve the proposed traffic distribution patterns before commencing work on the study.
- J. Horizon year
- K. Saturation flow rate
- L. Peak Hour Factor (PHF)
- M. Truck percentage
- N. Safety assessment
- O. Traffic data from nearby approved developments that should be included in the study
- P. Allowable bypass trip reduction and internal capture: any reduction factors that are proposed to be used in the analysis shall be pre-approved by the City Traffic Engineer or their designee before any of the analysis is conducted.
- Q. The traffic analysis will take into consideration all approved projects (near term and projects within the horizon year) and studies related to other developments within the study area.
- R. Cycle Length: the cycle length at signalized intersections used in the analysis needs to be based on the existing cycle length especially if the analyzed intersection is part of a coordinated system.
- S. Other: specific requirements not outlined above

5) Phased Developments

If the development is to be constructed in phases, the traffic study should consider the build out of the development. Offsite improvements may be assigned to specific phases as per the recommendations of the City Traffic Engineer or their designee.

6) Displays

The traffic study documentation should contain the following:

- A. Vicinity map showing all arterial and collector roadways within a reasonable influence area of the development
- B. Study area map denoting all intersections included in the analysis
- C. Site plan that details the site access location(s) and internal circulation patterns
 - a. The site plan should include dimensions to adjacent property boundaries and to adjacent access points along the site frontage and should indicate locations of access points along the frontage on the opposite side of the highway.

7) Software

The consultant is required to use the latest version of Synchro. Other software may be considered, but its use must be approved by the City Traffic Engineer or their designee prior to the start of the study.

Default factors within the software, such as but not limited to saturation flow rate, peak hour factors (PHF), grades, percentage of trucks etc. must be reviewed and its use will only be allowed if they are substantiated by the data that is collected. It is recommended that these factors be discussed with the study reviewer before the analysis is performed.

8) Level of Service

The desired level of service for the City of Glendale is Level of Service D.

Where existing condition or future-year base condition (i.e., no-build) levels of service are below LOS D, mitigation is required to maintain level of service at existing/base condition levels, at a minimum.

9) Data collection

Forty-eight continuous traffic hour counts will be required for all studies. Traffic data representing typical weekday conditions should be obtained on Tuesday, Wednesday, or

Thursday for weeks not containing a holiday, roadway construction within a 2-mile radius, and in favorable weather conditions. There are times where the City may ask for the counts to be collected during weekend periods as peak hours may occur outside the traditional times.

Turn movement counts should be conducted for a total of ten hours. The ten-hour count should be comprised of three-hour counts during the morning peak (07:00 AM to 10:00 AM), mid-day peak (11:00 AM to 2:00 PM) and evening peak (3:00 PM to 7:00 PM) periods. The time frames may be adjusted with concurrence of the City Traffic Engineer or their designee when the peak travel periods are expected to occur earlier or later than the time frames listed above.

The data should be compiled, and the AM, Mid-day and PM peak should be clearly identified in the report.

When collecting traffic data for Traffic Signal Warrant Analysis, a minimum of 12 hours of turning movement traffic count data for a representative day shall be obtained. More information on the Traffic Signal Warrant Analysis requirements is provided in Section 15.

Traffic count data representing the existing condition may be adjusted for seasonal, monthly or daily variations using adjustment factors that are obtained from Maricopa Association of Governments (MAG) or from the City.

Prior to performing any analysis, the consultant shall ensure that the traffic volumes which are collected and loaded into the traffic network are balanced.

10) Analysis Period

When performing the analysis, the following time periods shall be analyzed at a minimum, and depending on the analysis type (additional periods may be required - see Section 3 above):

- A. Base year
- B. Opening year
 - a. Without the proposed development
 - b. Without the proposed development but including any future/planned roadway improvements
 - c. With the proposed development
- C. Horizon year
 - a. Without the proposed development using existing roadway network
 - b. Without the proposed development but including any future/planned roadway improvements
 - c. With the proposed development

11) Horizon Year

The Horizon year for developments shall be as follows:

- A. Traffic Statement: Opening year
- B. Traffic Impact analysis:
 - a. *Less than 500 trips:* 5 years
 - b. *501 to 999 trips:* 10 years
 - c. *Greater than 1000 trips:* 20 years

12) Traffic Projections

Implementation year traffic projections should include background traffic growth, trips generated by other known development projects in the study area, and trips generated by the proposed development.

13) Required Output

The following data should be included in the traffic studies:

- A. Intersection Level of Services (LOS) for signalized and unsignalized intersections
 - a. LOS should be identified by each approach and for the entire intersection
- B. Delay
- C. Queue (95% and 50%)- queue calculations will be provided for the following movements at all intersections that are analyzed:
 - a. Through movements
 - b. Left turn movements
 - c. Right turn movements

If the projected 95% queue length exceeds the length of the existing turn lane, the developer will be required to mitigate the proposed impact.

14) Safety Assessment

If an area has been identified as a high crash location within the City, the City Traffic Engineer or their designee may require that a safety assessment be included as part of the traffic study.

Three years crash history should be reviewed for the major study area intersections. Intersection collision diagrams should be prepared showing the number of crashes, crash type, date and time of each crash, and crash severity. The intersection crash rate per million entering vehicles (acc/MEV) should be indicated on the collision diagram. The safety assessment should include a field review of the site.

The safety assessment should also analyze pedestrian and bicycle crashes. Recommendations should be included in the report.

Finally, the report should include a review of the internal site circulation to make sure that site considers vehicular, pedestrian and bicycle safety in the layout of the site.

15) Mitigation Measures/Offsite Improvements

Proposed offsite improvements shall be listed in the report. The improvements may be as minimal as signing and striping, but may also include turn lanes, traffic signals, pedestrian and bicycle facilities, etc.

The following requirements are associated with turn lane and traffic signal designs:

A. Right and left turn lanes:

- a. The minimum length of proposed turn lanes shall be 150 feet, not including the required taper (Typically 100 feet). The actual turn lane length will be determined based on the predicted vehicle queueing (95% queueing). Recommended storage lengths shall be included in the report.
- b. Turn lane measurements shall be taken from the radius return of the street intersection or driveway.

B. Signal warrants:

- a. If it is determined that a signal would be needed, a Traffic Signal Warrant Analysis shall be conducted. Traffic signals may only be installed when they satisfy warrants in the MUTCD and are approved by the City Traffic Engineer. When analyzing the intersection for warrants, the following represents the minimum warrants to be analyzed for all traffic signals: Warrant 1 (8-hour), Warrant 2 (4-hour), Warrant 3 (Peak hour), and Warrant 7 (crash warrant). If the warrants are not met for the opening year, they should be evaluated for a 5-year horizon.
- b. Typical spacing for signals in Glendale is at ½ mile intervals. In rare situations, the City may approve signals at ¼ mile spacing and possibly other spacing for unique situations.
- c. The applicant is responsible for the cost of traffic signal installations warranted by their development.

16) Report Content and Format requirements

The report should include the following content and format:

- A. Purpose of the study
- B. Description of the proposed development
- C. Study area
- D. Land use description
- E. Existing roadway conditions
- F. Background traffic growth
- G. Trip generation
- H. Traffic distribution on the roadway network
- I. Traffic projections
- J. Traffic analysis, including traffic signal warrants (when applicable)
- K. Impact assessment
- L. Proposed site circulation
- M. Access design requirements and specifications
- N. Safety Assessment
- O. Summary of deficiencies and proposed mitigation measures to correct the deficiencies
- P. Backup documentation (software runs)

17) Validity of the Approved Traffic Study

Approved traffic studies should remain valid for a period of one-year following approval of the of the study. The validity period may be extended an additional year for no more than two years if approved by the City Traffic Engineer or their designee.

A study may require updating if the following occur:

- A. It is more than 1 year for statements or 2 years for large scale developments since the report was approved
- B. Change to the proposed land use have been made
- C. Significant changes to the area adjacent to the development have occurred

- D. Change in proposed access number, location, and/or type

18) Submittal requirements

When submitting studies to the city, the study should be submitted to the project planner assigned to the development. The assigned planner will submit it to the Transportation Department for review. Studies that neighbor or impact neighboring jurisdictions will need to be submitted to said jurisdiction for review and approval before Glendale will approve.

The items listed below will be required when submitting a draft or final version of the study:

- A. 2 copies of the printed report. The report will include:
 - a. A detailed site plan
 - b. A printout of all the software runs
- B. 1 electronic version of the report on PDF format
- C. A USB drive that contains all the Synchro software files and the output runs that were performed as part of the study