
Sec. 118-46. Streets.

(y) *Traffic impact analysis.*

- (1) *Requirements.* No master plan, plat, building permit or driveway access shall be approved unless a traffic impact analysis (TIA) worksheet or TIA, as provided for in this section, is completed by the developer and approved by the city engineer. A TIA may also be required by the planning director, the commission or the city council as part of a zoning change application. If the specific land use is unknown, the TIA worksheet or appropriate level TIA shall be based on the Future Land Use Plan with consideration to existing topography and comparable properties.

A TIA Determination Form is required to be approved by the city engineer to confirm the TIA submittal type required by this chapter.

- (2) *Impact area.* The impact area is the area within which any traffic impact analysis is conducted in order to determine compliance with the level of service standards. This area shall be based on the size of the development and the PHTs projected to be generated by the proposed development. The impact areas shall be established as shown in the following table:

TIA Impact Area Table

Submittal Type	Impact Area
Level 1 or Level 2 TIA	The site and area within one-quarter mile from the boundary of the site.
Level 2 TIA	The city engineer may require the area of study to be extended up to a maximum of one mile from the boundary of the site.
Level 3 TIA	The site and area within one mile from the boundary of the site.

- (3) *Level 1 TIA.* A level 1 TIA shall be signed and sealed by a professional engineer, registered to practice in the state. The level 1 TIA shall consist of the following minimum information:

a. Impact area.

1. Land use, site and study area boundaries, as defined (provide map).
2. Existing and proposed site uses.
3. Existing land uses on both sides of boundary streets for all parcels within the study area (provide map).
4. All major driveways and intersecting streets adjacent to the property shall be illustrated in detail sufficient to serve the purposes of illustrating traffic function; this may include showing lane widths, traffic islands, medians, sidewalks, curbs, traffic control devices (traffic signs, signals, and pavements markings), and a general description of the existing pavement condition.
5. Photographs of adjacent streets of the development.

b. Peak hour trip generation.

1. The estimates of peak hour trips generated by the development during a street peak hour (provide table).

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2. Estimates for the percentage distribution of such trips from each site exit and to each site entrance (provide map).
 - c. Narrative describing mitigation measures, conclusions and recommendations consistent with this section.
- (4) *Level 2 and 3 TIA format.* A level 2 and 3 TIA shall be signed and sealed by a professional engineer, registered to practice in the state. The level 2 and 3 TIA shall consist of the following minimum information:
- a. *Impact area.*
 1. Land use, site and study area boundaries (provide map).
 2. Existing and proposed site uses.
 3. Existing and proposed land uses on both sides of boundary streets for all parcels within the study area (provide map).
 4. Existing and proposed roadways and intersections of boundary streets within the study area of the subject property, including traffic conditions (provide map).
 5. All major driveways and intersecting streets adjacent to the property will be illustrated in detail sufficient to serve the purposes of illustrating traffic function; this may include showing lane widths, traffic islands, medians, sidewalks, curbs, traffic control devices (traffic signs, signals, and pavement markings), and a general description of the existing pavement condition.
 6. Photographs of adjacent streets of the development and an arterial photograph showing the study area.
 - b. *Trip generation and design hour volumes (provide table).*
 1. A trip generation summary table listing each type of land use, the building size assumed, the average trip generation rates used (total daily traffic and a.m./p.m. street peaks), and the resultant total trips generated shall be provided.
 2. Generated vehicular trip estimates may be discounted in recognition of other reasonable and applicable modes, e.g., transit, pedestrian, bicycles. Furthermore, trip generation estimates may also be discounted through the recognition of pass by trips and internal site trip satisfaction.
 - c. *Trip distribution.* Provide the estimates of percentage distribution of trips by turning movements to and from the proposed development by site access location (provide table and figure).
 - d. *Trip assignment.* Provide the direction of approach and departure of site traffic via the area's street system (provide figure by site entrance and boundary street).
 - e. *Projected traffic volumes (provide figure for each item).* Projected traffic volumes are the numbers of vehicles, excluding the site-generated traffic, on the streets of interest during the time periods listed below, in the build-out year.
 1. A.M. street peak hour site traffic (including turning movements).
 2. P.M. street peak hour site traffic (including turning movements).
 3. A.M. street peak hour total traffic including site-generated traffic and projected traffic (including turning movements).

4. P.M. street peak hour total traffic including site-generated traffic and projected traffic (including turning movements).
 5. For special situations where peak traffic typically occurs at non-traditional times, e.g., major sporting venues, large specialty Christmas stores, etc., any other peak hour necessary for complete analysis (including turning movements).
 6. Total daily existing traffic for street system in study area.
 7. Total daily existing traffic for street system in study area and new site traffic.
 8. Total daily existing traffic for street system in study area plus new site traffic and projected traffic from build-out of study area land uses.
- f. *Capacity analysis (the applicant shall provide analysis sheets in appendices).*
1. A capacity analysis shall be conducted for all public street intersections and junctions of major driveways with public streets which are significantly impacted within the study area boundary as defined in his section as agreed to by the developer's engineer and the city engineer. A capacity analysis is required as shown below.

TIA Required Analysis Table

Volumes without and with site traffic	Boundary Street	Non-Boundary Street within Study Area
Existing conditions	Required	Required
First phase	Required	Not required
Intermediate phase	Required	Not required
Final phase	Required	Required

2. Capacity analysis will follow the principles established in the latest edition of the Transportation Research Board's Highway Capacity Manual (HCM), unless otherwise directed by the city engineer. Capacity will be reported in quantitative terms as expressed in the HCM and in terms of traffic level of service based on control delay by movement or lane group.
 3. Capacity analysis will include traffic queuing estimates for all critical applications where the length of queues is a design parameter, e.g., auxiliary turn lanes, and at traffic gates.
- g. *Conclusions and requirements.* Provide a narrative describing mitigation measures, conclusions and recommendations consistent with this section.
- (5) *Mitigation.* If the TIA's determination for roadways and intersections indicates that the proposed development would cause a reduction in the level of service for any roadway or intersection within the impact area that would cause the roadway to fall below the level of service C, the proposed development will be denied unless the developer agrees to one of the following conditions:
- a. The deferral of building permits until the improvements necessary to upgrade the substandard facilities are constructed;
 - b. A reduction in the density or intensity of development;
 - c. The dedication or construction of facilities needed to achieve the level of service required herein;
- or

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- d. Escrow with the city an amount equivalent to the cost of the improvements necessary to mitigate the adverse traffic impact.
 - e. Execute a development agreement with the city in accordance with this chapter.
 - f. Any combination of techniques identified herein that would ensure that development will not occur unless the levels of service for all roadways and intersections within the traffic impact analysis study are adequate to accommodate the impacts of such development.
- (6) *Implementation.* For phased construction projects, implementation of these traffic improvements must be accomplished no later than the completion of the project phase for which the capacity analyses show they are required. Plats for project phases subsequent to a phase for which a traffic improvement is required may be approved only if the traffic improvements are completed or secured as approved by the city engineer.
- (7) *Traffic mitigation concepts.*
- a. Voluntary efforts, beyond those herein required, to mitigate traffic impacts are encouraged as a means of providing enhanced traffic handling capabilities to users of the land development site as well as others.
 - b. Traffic mitigation concepts include, but are not limited to, pavement widening, turn lanes, median islands, access controls, curbs, sidewalks, traffic signalization, traffic signing, pavement markings, etc.
- (8) *Traffic signal warrants analysis.* A TIA that contains a traffic impact mitigation for installation of a new traffic signal location shall include a traffic signal warrants analysis satisfying the requirements of the Texas Manual of Uniform Traffic Control Devices.
- (9) *Turn lane requirements.* Turn lanes are exclusive deceleration and storage lanes that allow for vehicles to turn left and right at intersections outside the through lane. Design of deceleration lanes shall be in accordance with the latest edition of AASHTO A Policy on Geometric Design of Highways and Streets.
- a. Left and right turn lanes shall be required:
 - 1. At all driveway or street intersections with a daily entering traffic volume of 500 vehicle trips or 50 vehicle peak hour trips;
 - 2. At all driveway or street intersections on the state highway system at the option of TxDOT; or
 - 3. Based on other factors such as street classification, travel speeds, sight distance, truck traffic, crash history, and other site conditions.
 - b. The design of turn lanes shall be based on the existing centerline of the roadway. The existing and new pavement for turn lane improvements shall be designed based on the development traffic loads and may include rehabilitation. At minimum, a surface course treatment is required for the full improvements including taper and pavement marking area.
 - c. The construction of turn lanes may be limited due to topographic conditions or need to obtain right-of-way from adjacent property owners. The applicant must show that all reasonable efforts have been made to implement turn lanes required by the TIA or this chapter. This may include relocating driveways or streets to allow for the construction of turn lanes or alternate design options.