HISTORIC
FRANKLIN
TENNESSEE

Traffic Impact Analysis (TIA) Requirements

City of Franklin

HISTORIC
FRANKLIN
TENNESSEE

Table of Contents

HISTORIC
FRANKLIN
TENNESSEE

TRAFFIC IMPACT ANALYSIS (TIA) REQUIREMENTS FRANKLIN, TENNESSEE

INTRODUCTION

Welcome to the City of Franklin's Traffic Impact Analysis (TIA) Requirements. To provide a safe and efficient transportation system, it is necessary to understand how a development will affect the transportation network in and around the City. These instructions outline the requirements for the TIA. Please read and understand this document before arriving for a TIA scoping meeting with the City. A thorough understanding of this document will help to facility a productive discussion.

TRAFFIC IMPACT ANALYSIS (TIA) GUIDELINES

The requirement to provide a TIA, also defined as a traffic impact study in the Zoning Ordinance, shall be made through meeting or exceeding the Transportation and Street Technical Standards minimum trip generation requirements, or from direction by the City Engineer. Should a TIA be required, this document outlines the guidelines and methodologies for the creation of a TIA study for the City of Franklin. For reference, all places within this document that states 'City' or 'City Engineer' shall be defined as 'City Engineer or their designated representative'. The City Engineer shall have the authority to adopt and amend administrative regulations to effectuate the intent of the TIA Guidelines. A PDF copy of a completed and stamped TIA should be submitted to the City Engineer and in the City of Franklin's IDT system.

Transportation Impact Analysis

The purpose of a TIA is to provide City staff with sufficient information concerning transportation impacts of a project, including determining appropriate mitigation measures for the project. The TIA shall consider traffic capacity and service, traffic controls, intelligent transportation systems (ITS), multi-modal accommodations and safety issues in accordance with the following guidelines.

TIA INITIATION

The developer shall be responsible for preparing and submitting the TIA. The City of Franklin reserves the right to use a City-retained consultant to complete the TIA unless otherwise approved by the City Engineer or his designee. If the TIA is not completed by a City-retained consultant, a third-party consultant, as designated by the City, shall review the developer submitted TIA on the City's behalf. Regardless of who completes the work, the TIA shall be prepared by a registered Tennessee Professional Engineer (P.E.) using the standard format specified by the Institute of

Transportation Engineers (ITE) publication *Traffic Access and Impact Studies Transportation Impact Analyses for Site Development*, in accordance with this document and subsequent updates including multimodal aspects for site development impacts.

Initial Meeting (Scoping Meeting)

Prior to the preparation of a TIA, the preparer shall review the following with the City Engineering Department or its designee:

- Project to be studied, phasing, trips generated, trip reductions, etc.
- Study methodologies and assumptions;
- The study area, including internal project traffic impacts (if required by City);
- The study horizon year;
- The time periods to be analyzed;
- Other approved developments or which a TIA has been completed or requested; and
- Planned or on-going relevant roadway projects.

This is not an extensive list and other topics may be included at either the consultant or City's request. At the end of the scoping meeting, a summary of the discussion (minutes) and assumptions for the study shall be provided by the preparer with a signed Memorandum of Understanding (MOU) sent to City Staff for approval and signatures.

STUDY AREA BOUNDARIES

The extent of the study area for the TIS depends upon the location and size of the proposed development and the prevailing conditions of the surrounding area. For example, if an existing LOS E or F intersection may be affected by the project but be located outside the study area boundary mileage as directed in Table 1, the City reserves the right to include said failing intersection(s) within the study area if traffic for the development will be utilizing said failing intersection(s). Along with including existing failed intersections within the study boundary, the nearest project interchange(s) may also be included in the study boundary, even if its outside the Table 1 guidelines.

The minimal study area is defined in Table 1. The distances described below are to be measured from the property boundaries and include those intersections within the identified area and as discussed and approved by the City. These boundary thresholds are based on the base trip generation numbers before reductions are taken.

STUDY AREA BOUNDARIES	
Trip Generation	Minimal Study Area
One hundred (100) - Two hundred fifty (250) peak hour trips	One-half (1/2) mile plus any intersection on which at least seven percent (7%) of any traffic movement approach volume is anticipated to be generated by the proposed project.
More than Two hundred fifty (>250) peak hour trips	One (1) mile plus any intersection on which at least seven percent (7%) of any traffic movement approach volume is anticipated to be generated by the proposed project.

Table 1 Study Area Minimal Criteria

HORIZON YEAR

The horizon year for the TIA depends upon the location, the size of the proposed development, and the prevailing conditions of the surrounding area. The horizon year is defined in Table 2. Each study shall include the anticipated development completion year and may require an additional analysis based on the size of the development and/or phasing. The study horizon year can be adjusted at the City's request based on expected phasing and completion of the development. These horizon year thresholds are based on the base trip generation numbers before reductions are taken.

HORIZON YEAR	
Trip Generation	Horizon Year
One hundred (100) - Two hundred fifty (250) peak hour trips	Anticipated development completion year, assuming full build-out and occupancy
More than two hundred fifty (>250) – One Thousand (1,000) peak hour trips	Anticipated development completion year, assuming full build-out and occupancy Five years after development completion year
More than one thousand (>1,000) peak hour trips	Anticipated development completion year, assuming full build-out and occupancy 10 years after development completion year

Table 2 Horizon Year Criteria

FUTURE DEVELOPMENT

It is important to include all known projects in the TIA to provide an accurate and useful document that depicts expected future conditions of the area. Any known developments currently being studied, even if the traffic study is not complete at the time of scoping, shall be included in the TIA as determined by the City Engineer. Development projects to include, that have not been completed to date, should be discussed during the scoping meeting. The City will provide all necessary studies and counts related to these developments to the study preparer.

DATA COLLECTION

The preparer shall collect traffic data at all scoped study intersections. This data shall include at a minimum both the AM and PM peak hours. Midday peaks may also be required, especially in heavy retail/ commercial areas. A 24-hour count may also be required at the request of the City and for recommendations such as signal coordination or other peak hours to study. Previously collected data for study intersections may be used with permission from the City Engineer. These previous counts shall be no older than 24 months (2 years) and must be factored to account for growth that has occurred during the elapsed time. Additional traffic counts may be required at the City's request. Typical time periods are 7-9 AM and 4-6 PM. Time frames may differ from development to development.

There are intersections within city limits that have significant congestion where traffic signal cycle failures occur. Typical data collection efforts only count intersection throughput and not demand. In cases where such congestion exists (i.e. existing LOS D – F), a queue study shall be performed, and counts adjusted. City staff can help to identify some of these locations during a scoping meeting however, it is the responsibility of the preparer to conduct a queue study when and were needed based on site observations.

There are various conditions that may affect traffic counts during the peak hours. Traffic counts shall be conducted during weekdays (Tuesday, Wednesday, or Thursday), unless otherwise requested by the City. Counts shall not be performed on holidays nor a weekday that is before or after a holiday. Data that includes the influence of a vehicle crash, special event, inclement weather, etc. should not be used. These conditions may be changed at the City's request.

The preparer shall request the latest signal timing data from the City's Traffic Operations Center (TOC) to be include in the study (if applicable). The preparer is also responsible to inventory intersection characteristics, such as lane configuration, speed limits, crash history, and any other applicable information necessary to complete the TIA and study model.

The preparer may request previously completed projects' software models from the City, if available. It is the responsibility of the preparer to ensure that all setting and inputs to a model are correct when preparing the TIA.

PROPOSED DEVELOPMENT PLAN

A location map and development plan shall be included in the TIA. Relevant details for the proposed development need to be stated in the TIA, such as type, size, dwelling units, and square feet. Phasing of the development and an approximate completion timeline of each phase is also required. Proposed access points shall be shown on the development plan. Approximate distances between access points shall be labeled on the development plan as well as locations of adjacent driveways and intersections to verify proper spacing. Streets or driveways in close proximity to other streets or driveways may be required to align for on- or off-site circulation.

With new connections to adjacent developments, additional trips may occur. Cut through traffic shall be accounted for whenever new connections are made to adjacent developments or whenever travel patterns change due to the development. These additional trips due to connections shall be discussed and quantified in the scoping meeting and stated clearly in the TIA for potential impacts and mitigation.

Items that also may be included are projected hours of operation, on-site circulation, alternative transportation infrastructure for transit, bicycles, pedestrians, and multi-modal access.

Trip Generation Standards

Trip generation data for each project shall be based upon the most current edition of the Institute of Traffic Engineers' Trip Generation Manual. If requested, and by approval of the City Engineer, other sources of trip generation data (e.g., local data or studies) may be used.

Trips generated may also take into account pass-by trips, internal trip capture for integrated mixed-use projects, and any proposed transportation demand management (TDM) concepts (see TDM strategies in Minimal Level of Service Standards below). Any proposed TDM shall provide adequate guarantees to the City to ensure that such TDM concept shall function as claimed for the life of the project. When calculating a Mixed-use reduction percentage, the City of Franklin requires the use of the current ITE adopted methodology. All trip reductions shall be discussed and approved by the City Engineer or appointee before proceeding with the study. Figures illustrating any pass-by reductions are required in the TIA.

Trip Distributions and Assignment

There are many factors that should be considered when determining the trip distribution and assignment data. Engineering judgement with City input shall be used to assist in this step. Factors such as proximity to major roadways, ease of access to the site, existing congestion and travel patterns, should all be considered during this process. Third-party resources such as Origin/Destination software may assist to determining travel patterns and distribution. The City may require the use of such third-party data resources in some cases to determine travel patterns and distribution.

The TIA shall include maps or figures showing project trip distribution percentages (inbound and outbound) at all study intersections and access points. Depending on the size of the development, inbound and outbound percentages at various access points may be different, such as a Right In Right Out (RIRO) being used to exit the development and another access point for reentry. All vehicles calculated in the trip generation calculations shall be included. Trip distribution must be discussed and approved by City staff before starting the TIA.

CAPACITY ANALYSIS

Each study should analyze each of the study intersections in various conditions. Each study should include an analysis of:

1) The current year existing traffic conditions (Existing)
2) The future build year with approved development (Background)
3) The future build year with existing and approved development and the proposed development (Project)
4) The future horizon year with and without project

TIAs will require these capacity analyses in addition to the horizon year based on the Horizon Year section.

The AM and PM peak hour conditions are required as a minimum with a midday peak hour analysis as requested by the City. Nonstandard peak hours maybe required if requested by the City. For example, a 24-hour count that indicates a deviation to the normal peak hours, or the land use type/development plans require non-standard peak hours. Future funded transportation projects shall be considered for any future scenarios. Only roadway projects that are planned and funded by the horizon year shall be included in the study results. The developer shall consult with the City on any known improvements outlined in other City studies within the project area that may be unfunded by the City but of which may be required with the project. Any and all assumptions shall be clearly stated and explained in the report.

Because signal timing is updated every 3-5 years, for existing signalized intersection timing, the preparer shall update the City's signal timing data accordingly for Background and Project scenarios for build years 5 years or greater based on volume data. Signal timing data that was assumed or calculated in a previous TIA should be used and modified as appropriate by the project TIA. Minor street movements should not be penalized in favor of the main street movements to improve LOS. Signals that are currently coordinated shall remain coordinated in future horizon years. Cycle lengths for coordinated corridors shall have the same cycle length or a ½ cycle length. No other fractions of the whole cycle length are allowed to improve LOS at various intersections along a corridor. Cycle lengths must remain consistent along a corridor. Minimum green time and clearance intervals shall by calculated using TDOT's Traffic Design Manual. All appropriate tables/figures/images are required for this section. In areas with closely spaced intersections that largely influence each other, the City may request that a simulation of the area in question be completed to confirm study intersection outputs, mitigation measures, and to evaluate weaving. All traffic models shall be provided to the City Engineer or his appointee for review at the time of the TIA submission.

Background Traffic Growth

Future background traffic volumes should be based on available traffic data from relevant and documented traffic projection sources. Volumes from TIAs prepared for nearby developments, or historical traffic volume trends analyses, and MPO projected volumes may be used to assist in the development of future study volumes. Projected traffic volumes shall include adjustments, as necessary, to reflect other adjacent future development and seasonal trends. All future growth rates shall be presented to and approved by the City.

Sources and background growth rates shall be clearly identified in the TIA. Figures depicting the background traffic volumes and daily and peak hour turning movement are required in the TIA for each horizon year.

Minimum Level of Service Standards.

The TIA shall make recommendations to mitigate substandard LOS. The following minimum levels of service shall be maintained before, during, and after new development or redevelopment in accordance with the following.

a) Roadway and Intersection Operation. (i.e. total intersection LOS)

All intersections shall maintain a minimum Level of Service D in any peak hour, as defined by the latest version of the Highway Capacity Manual (HCM).

b) Intersection Turning Movements. (i.e. individual turning movement LOS)

Lanes used for turning movements within intersections shall maintain a minimum Level of Service E in the peak hour. Where forecasted conditions without the site traffic indicate levels of service below this acceptable minimum threshold, the developer shall ensure existing levels of service and delay are met through improvements to the intersection with the development site traffic added.

c) Substandard Levels of Service.

When the Level of Service D is not achievable by the project, or current LOS D or better does not exist for current (existing) peak hour conditions and cannot be improved by the project, the following conditions shall apply:

i. In addition to requiring dedication of right-of-way, the City Engineer or their designee shall require an applicant to construct or fund all or a portion of system improvements required to mitigate the traffic impacts of a proposed development proportionate to the traffic impacts of a proposed development.

ii. If a proposed development does not require a TIA per the Street and Transportation Technical Standards criteria, the City Engineer, at their discretion, may require a TIA to be submitted by the applicant and at a minimum require construction or funding of system improvements as described in the TIA.

iii. (A) The City Engineer or their designee may require system improvements to assist in mitigating the traffic impacts of the proposed development and promote other modes of transportation. Examples of these system improvement may include:

1. sidewalks and curb ramps;
2. traffic signs, markings, and upgrades to signal infrastructure;
3. traffic calming devices;
4. bike lanes or upgrades to bike facilities;
5. rectangular rapid flashing beacons;
6. pedestrian refuge islands;
7. pedestrian hybrid beacons;
8. urban trail improvements;
9. right-of-way dedications;
10. transit stops and shelters; and
11. measures to limit transportation demand.

(B) System improvements required under this section may be located:

1. within the boundaries of the development for which they are required or;
2. no farther from the proposed development than:

a. one-half mile; or
b. one mile, for an improvement required to provide access between the proposed development and a school, bus stop, transit center public space, or major roadway as designated under the transportation plan.

iv. If a proposed development requires a TIA the City Engineer or their designee shall, at a minimum, require an applicant to construct or fund system improvements identified by the TIA

v. To the extent possible, the total cost of system improvements required under this section shall be proportionate to the traffic impact of the development, except when the Level of Service of an impacted intersection is determined to be an E or an F, and roadway widening mitigation measures cannot improve the LOS. When an intersection is Level of Service E or F with no possible roadway widening alternatives to mitigate the failure, the City Engineer, or their designee may designate mitigation measures that reduce overall trip generation of the development. This may include the following:

(A) Reduced Density
(B) Alternate Intersection Design
(C) Implement Travel Demand Management (TDM) strategies for the Development including:

1. Carpool/Vanpool Programs
2. Telecommute/Remote Work Directives
3. Alternative Transportation Mode Incentives
4. Priced Parking
5. Transit Facilities

(D) Enhanced roadway cross sections that promote other modes of transportation, such as walk/bike facilities

These mitigation measures do not guarantee recommendation of a development but may be used to assist in reducing overall trips and/or improving Levels of Service where deemed applicable to the development.

Queueing Results

Many intersections in the city have some level of congestion during study periods that will cause queues. A 95th percentile queue length table and/or figure shall be included with the report for all approaches and movements when requested. The table and/or figure shall illustrate problem areas of concern; driveways/streets that will be blocked, queue lengths interfering with

downstream signals, etc. When queue lengths cannot be determined for one reason or another, contact the City to discuss alternative means of calculation or explanation before submitting the TIA for review.

Capacity Analysis Tools

Traffic capacity analysis for local roadways and the state highway shall be conducted using tools and methods approved by the City. Recommended analysis tools for Traffic Impact Studies include Synchro, SimTraffic, and Vistro. Reporting data must be in Highway Capacity Manual (HCM) format. Other tools or methods may be used upon receiving approval from the City Engineer.

PEDESTRIAN, BIKE, AND TRANSIT FACILITIES

The TIA shall discuss the existing and proposed transit, bicycle, and pedestrian facilities that encourage alternative modes of transportation. This includes current and proposed features (nearest bus stops, distance to bicycle lanes/routes, off-road shared-use paths, public sidewalk connections). The TIA shall provide any recommendations to improve the safety and efficiency for these multimodal facilities.

SAFETY ANALYSIS

A safety analysis shall be performed for all TIA's. They shall include all study intersections and/or roadway segments, within the study boundaries. Crash data from the last 3 years shall be used to identify any hot spots, or high-risk areas, within the study area. If needed, accident records can be obtained from the City of Franklin Police Department, the Tennessee Department of Public Safety, or the Tennessee Department of Transportation. Crash data for individual roadway segments and locations not provided by one of the agencies listed above will not be accepted.

Mitigation measures shall be recommended if a high-risk area, intersection or segment, are found in the study area. A summary of crashes, broken out by intersection and/or segment, with appropriate tables and figures with crash attributes shall be included in the body of the report. Detailed crash data, including but not limited to type, time, factors, weather, etc. shall be included in the appendix. All recommendations shall provide details on how it will be implemented and the anticipated reductions. A development shall not add trips to a high-risk area unless mitigation measures are proposed to mitigate the safety issue.

INTERNAL CIRCULATION ANALYSIS

An internal circulation analysis shall be completed if the development is classified as mixed-use and/or if any of the following conditions are met:

- Greater than 10,000 Daily Trips,
- An arterial, collector, or high-volume local road is located within the project boundaries
- A single access that will carry over 80 percent of the daily vehicles and serves more than 6,000 daily trips.

The City reserves the right to require an internal circulation analysis even when the above criteria are not met. The above thresholds are based on the base trip generation numbers before reductions are taken.

An internal circulation study shall analyze conflict points, parking, potential sight distance issues, intersection control, intersection alignments, cross access easements, pedestrian and bicycle facilities, parking structures' access/exit, queueing, turn lanes, any proposed traffic calming measures, etc. Additional items may be required at the City's request.

RECOMMENDATIONS / MITIGATION MEASURES

All recommended on-site or off-site improvements required to mitigate future projected traffic congestion or safety issues shall be identified and analyzed.

Recommendations for signals shall include a signal warrant analysis based on the latest edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). If a signal is recommended that is not on the Traffic Signal Master Plan, a study shall be completed to determine how it may affect progression and capacity through the corridor. No signal shall be recommended without first recommending additional turn lanes, right or left, if applicable. Recommended signals shall have at least two minor (side street) approach lanes for the development.

Recommended turn lane storage lengths shall be based off the 95th percentile queue length. Auxiliary lanes shall include full deceleration lengths as per the AASHTO Green Book in addition to the recommended storage lengths. Full deceleration lengths maybe waived for roadways with a speed limit of 30 mph or less with City Engineers approval. Right-of-way impacts for all improvements shall be identified.

RESUBMITTALS

Resubmittals of the TIA may be required for various reasons. Any TIA resubmittal shall incorporate comments and/or respond to comments from the City and 3rd party reviewer. Where

questions or comments remain, a summarized memorandum with those questions and comments shall be submitted to the City for clarification and consideration. A final TIA incorporating all comments to the satisfaction of the City shall be submitted.

During the development process, if for any reason the City deems it necessary for the development's TIA to be revised and resubmitted, the City shall notify the developer and preparer of such requirement for revision. The resubmittal shall include the most up to date site plans including revisions to any building types, units, square footage, etc. The final TIA shall be completed using the approved plans from the Site Plan stage of the review process.

STUDY FEE

City Prepared TIA Consultant Fee:

After the TIA scoping meeting, the City's consultant shall prepare an estimate of consulting fees for the TIA for the project. Upon receipt of payment of fees from the applicant in the amount of ninety percent (90%) of the projected cost estimate, the City shall release the work to a consultant for analysis. After completion of the analysis, the City shall evaluate the actual costs incurred for the study and will reimburse to the applicant any remaining balance of the fee paid.

Developer Prepared TIA Consultant Fee:

The developer shall pay the TIA third party review fee directly to the third-party consultant and as specified in City of Franklin Municipal Code; Appendix A- Comprehensive Fees and Penalties.

EXPIRATION OF TIA

The TIA shall expire after three (3) years from the approval date.

APPEAL OF TIA METHODOLOGY

Applicants shall have the option to appeal the determination of the TIA by submitting a formal appeal to the City Engineer. If the City Engineer does not approve the appeal and supports the findings of the TIA the Applicant shall have the option to appeal the determination of the TIA and City Engineer by submitting an application to the Building and Streets Standards Board of Appeals as Defined in Municipal Code Chapter 12 Sec. 12.1201.

ADMINISTRATIVE NOTES

Administrative changes can be made to this document without the need to receive permission from the Board of Alderman and Mayor.

REPORT FORMAT

The following is an example format of a TIA that is acceptable to the City of Franklin. This list is not all inclusive and additional items may be necessary to fulfill the TIA requirements.

Introduction and Summary

a) Title page
b) Table of contents and list of figures and tables
c) Introduction and executive summary

- Site location and study area
- Development description
- Findings
- Conclusions and recommendations

Existing Study Area Conditions

a) Physical characteristics

- Roadway characteristics (number of lanes, classification, speed limit, etc.)
- Traffic control devices
- Transit services
- Pedestrian/bicycle facilities
- Nearby driveways

b) Traffic volumes

- Daily, morning, evening, other counts as required

c) Future developments

- Occupancy assumptions

Proposed Development and Traffic

a) Site location
b) Land use and intensity
c) Site plan (copy must be legible)
d) Development phasing and timing
e) Anticipated trip generation

- Trip reduction

f) Trip assignment and distribution

Traffic Operational Analysis

a) Traffic growth assumptions

- Background year
- Future horizon year

b) Level of service analysis

- Existing
  - Without project
- Future build-out year
  - Without project
  - With project
  - With project and recommendations
- Horizon year (5 or 10 years)
  - Without project
  - With project
  - With project and recommendations

c) Roadway improvements

- Improvements borne by the developer

d) Queueing results

- Tables and/or figures

e) Safety element

- Sight Distance
- Acceleration./deceleration lanes (left- or right-turns)
- Access spacing/corner clearances/etc.

f) Speed considerations

- Traffic calming needs

g) Traffic control needs

h) Traffic signal needs

- Warrants
- Effect on signal progression (if applicable)
- Travel lane alignments

Pedestrian, Bike, and Transit Facilities

a) Existing facilities
b) Proposed facilities
c) Recommendations

Safety Analysis

a) Crash history
b) Hot spots
c) Recommendations

Internal Project Site Circulation

a) Conflict points
b) Design features
c) Queueing
d) Turn lanes

Recommendations and Mitigation Measures

a) Roadway improvements
b) Site access
c) Internal circulation
d) Safety analysis
e) Other

Appendices

The appendix shall contain all supporting documentation required to complete the TIA.

Exhibits

All figures and exhibits shall be clear and legible. Figures and/or Exhibits should be placed in the body of the report in their respective locations.