THE CITY OF
Hendersonville, Tennessee

TRAFFIC IMPACT STUDY (TIS) REQUIREMENTS

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TRAFFIC IMPACT STUDY (TIS) REQUIREMENTS
HENDERSONVILLE, TENNESSEE

INTRODUCTION

Welcome to the City of Hendersonville's (City) Traffic Impact Study (TIS) 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. The City strives to provide a safe and efficient transportation system to serve residents, visitors, and businesses within the community. The purpose of this Traffic Impact Study guide is to establish conditions and procedures for consistency in application to proposed projects. The Traffic Impact Study will assist the City in reviewing traffic impacts from proposed projects and facilitate meeting the goal of providing a safe and efficient transportation system. These instructions outline the requirements for the TIS. Please read and understand this document before arriving for a TIS scoping meeting with the City. A thorough understanding of this document will help to facilitate a productive discussion.

TRAFFIC IMPACT STUDY (TIS) GUIDELINES

The requirement to provide a TIS shall be made through meeting or exceeding the TIS criteria, or from direction by the City Engineer or his/her designated representative. Should a TIS be required, this document outlines the guidelines and methodologies for the creation of a TIS for the City of Hendersonville. For reference, all places within this document that states "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 TIS Guidelines. A PDF copy of a completed and stamped TIS should be submitted to the City Engineer. These guidelines are applicable to any project proposed within the City limits. Projects affecting other jurisdictions such as State or County may be subject to additional study and permitting requirements of that jurisdiction. TIS criteria are below:

> Any subdivision containing lots for 100 or more dwelling units shall be required to prepare, at the expense of the developer or individual proposing the subdivision, a traffic impact study.
>
> The following circumstances may indicate the need for a TIS:
>
> A. Residential development with one hundred (100) or more dwelling units.
> B. Non-residential development with fifty thousand (50,000) square feet of space or more.
> C. Mixed-use development that generates one hundred (100) peak hour vehicle trips or one thousand (1,000) vehicle trips.

D. The project is located at or near an intersection that currently operates or is believed to operate at a Level of Service (LOS) D or below.
E. The project is located near a location identified by the City Engineer or Traffic Engineer as a high crash incident location.
F. The project is located near an intersection or location identified by the City Engineer or Traffic Engineer as a high concern location.
G. A traffic impact study is deemed necessary by the City Engineer, Planning Commission, or the Board of Mayor and Alderman (BOMA).

The traffic study is intended to provide information as to current and proposed or projected traffic levels along all streets and intersections touching, immediately abutting, or directly impacted by the project.

A Tennessee licensed engineer shall prepare such study, at no cost to the City, in accordance with standard practices and procedures using the format specified by the Institute of Transportation Engineers (ITE) and the following:

1. The City Engineer or his/her designee may determine whether a proposed development or project is considered to be a high-profile project with significant and far-reaching impacts. Traffic impact studies for high profile projects shall be prepared by the City of Hendersonville using a consultant retained by the City. The applicant shall reimburse the City for the cost of the traffic impact study.
2. All other TIS shall be prepared by the applicant, unless the City Engineer, his/her designee or the Planning Commission specify otherwise.
3. Prior to development of the study, the applicant and/or the individual selected by the developer to prepare the study shall meet with the City Engineer for purposes of establishing scope and design parameters to be used in preparing such study. The study should differentiate between improvements determined by the approved traffic study as being required to offset the traffic impact of the project and improvements determined to be needed to improve existing or background conditions.
4. Trip generation data for each project shall be based upon the most current edition of the ITE's "Trip Generation Manual" or, at the discretion of the City Engineer, other sources of trip generation data (e.g., local data) may be used if it is deemed more representative of the proposed development use.

All traffic studies are subject to review by Staff and an independent professional to determine if recommendations are consistent with all transportation programs and needs. In the event the City Engineer or his/her designee require an independent third-party professional review, the applicant shall reimburse the City for the cost of the third-party review.

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

TIS INITIATION

The developer shall be responsible for preparing and submitting the TIS for any development meeting the criteria outlined herein. The TIS shall be prepared by a licensed Tennessee Professional Engineer (P.E.), at no cost to the City, with the standard practices and procedures using the format specified by the Institute of Transportation Engineers (ITE) publications *Trip Generation Handbook and Trip Generation Manual,* latest editions. All traffic studies are subject to review by City staff and an independent professional to determine if recommendations are consistent with all transportation programs and needs. In the event the City Engineer requires an independent thirty-party professional review, the applicant shall reimburse the City for the cost of the thirty-party review.

Initial Meeting (Scoping Meeting)

Prior to the preparation of a TIS, the preparer shall review the following with the City Engineer:

- 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 within the study area of the project for which a TIS has been completed or requested
- Planned or on-going City and/or State roadway, signalization, and/or intelligent transportation systems (ITS) projects
- Transportation Demand Management Measures (if applicable)

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 project scoping meeting, a summary of the discussion (minutes) and assumptions for the study shall be provided by the preparer with a signed project scoping form by the developer/authorized agent and submitted to City Public Works Department for review and approval.

PREPARER QUALIFICATIONS AND CONSULTANT SELECTION

Traffic impact studies submitted to the City shall be signed and stamped/sealed by a Licensed Professional Engineer (P.E.) with the State of Tennessee. The TIS shall be prepared by or under the supervision of the P.E. who shall have training and experience in transportation and traffic engineering and experience in preparing traffic impact studies for developments.

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 intersection(s) outside the study area boundary defined in Table 1 but is operating at level of service (LOS) is E or lower, is experiencing a high incidence of crashes, or is a location high concern, and may be affected by the project's generated traffic, the City reserves the right to include the intersection(s) within the study area for the development. 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 it is outside the Table 1 guidelines. The City also reserves the right to require a study, safety assessment, or additional analyses even if the project(s) forecasted trip generation falls outside of the limits identified in Table 1.

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
Less than 100 peak hour trips	Provide Trip Generation Memo for City's review and approval
One hundred (100) - Two hundred fifty (250) peak hour trips	Within One-half (1/2) mile of the property line
More than Two hundred fifty (>250) peak hour trips	Within three-fourths (3/4) mile of the property line

*These are minimum criteria. The study type and extent of the study area may be modified depending on anticipated project impacts.

Table 1 Study Area Minimal Criteria

HORIZON YEAR

The horizon year for the TIS 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
Less than 100 peak hour trips	Anticipated development completion year, assuming full build-out and occupancy
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

Including all known projects in the TIS is important 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 TIS 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:

- A 24-hour count of intersection vehicle, bicycle, and pedestrian turning movements with vehicle classifications (e.g, passenger vehicle, single unit truck, combination truck, etc.)
- Current traffic signal basic timings and coordination timing plans for existing signalized intersections
- Crash data from previous three (3) years
- Appropriate growth rates as discussed further in the background traffic growth section of this document.

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.

There are intersections within city limits that have significant congestion where traffic signal split 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 where 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 while school is in session (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 traffic signal timing data from the City's Traffic Engineer to 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 TIS 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 settings and inputs to a model are correct when preparing the TIS.

PROPOSED DEVELOPMENT PLAN

A location map and development plan shall be included in the TIS. Relevant details for the proposed development need to be stated in the TIS, such as type, size, dwelling units, and square footage. 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 TIS for potential impacts and mitigation.

Items that may also 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 and standard practices and procedures for each project shall be based upon the current editions of the Institute of Transportation Engineers (ITE) publications *Trip Generation Handbook and 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 if deemed more representative of the proposed development use.

Trips generated may also consider 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 Hendersonville 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 TIS.

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 TIS 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 TIS.

CAPACITY ANALYSIS

Each study should analyze each of the study intersections in various conditions utilizing a modern, updated traffic analysis software such as Synchro, SimTraffic, Vissim, Highway Capacity Software, or other City approved software. 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

TIS 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. All assumptions shall be clearly stated and explained in the report.

Traffic signal operations are critical to the roadway network. As such, any development tasked with operational analysis of a signalized intersection shall obtain the most up-to-date traffic signal timing plans from the City. 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 TIS. 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 for review at the time of the TIS submission. The operational analysis printouts shall include all pertinent traffic signal timing data, including but not limited to clearance intervals, pedestrian timings, phasing diagram, phase timings, offsets, etc. The reports shall also provide 95th percentile queue results.

Background Traffic Growth

Future background traffic volumes should be based on available traffic data from relevant and documented traffic projection sources. Volumes from TIS prepared for nearby developments, or historical traffic volume trends analyses, and MPO and TDOT 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 TIS. Figures depicting the background traffic volumes and daily and peak hour turning movement are required in the TIS for each horizon year.

Minimum Level of Service Standards

The TIS 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 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 TIS per the TIS criteria outlined in this guide, the City Engineer, at his/her discretion, may require a TIS to be submitted by the applicant and at a minimum require construction or funding of system improvements as described in the TIS.

iii. (A) The City Engineer 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 traffic 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
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 TIS the City Engineer shall, at a minimum, require an applicant to construct or fund system improvements identified by the TIS.

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, 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. 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 TIS 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, Vissim, or Highway Capacity Software. 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 TIS preparer shall review the City's current Bicycle and Greenway Plan and 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 TIS shall provide any recommendations to improve the safety and efficiency for these multimodal facilities. If bicycle, greenway or pedestrian facilities are identified in the current City's plan, the development shall be responsible for providing identified improvements.

SAFETY ANALYSIS

The City Engineer may determine if a safety analysis is deemed necessary as part of the TIS. The safety analysis shall include all study intersections and/or roadway segments, within the study boundaries. Crash data from the last three (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 Public Works Department, the Tennessee Department of Public Safety, or the Tennessee Department of Transportation. Crash data for individual roadways 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 the mitigation measures will be implemented and the anticipated reductions. A development shall not add trips to a high-risk area unless 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 traffic signals shall include a traffic signal warrant analysis based on the latest edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). If a traffic signal is recommended per the MUTCD warrant analysis, a study shall be completed to determine how it may affect progression and capacity through the corridor. No traffic signal shall be recommended without first recommending additional turn lanes, right or left, if applicable. Recommended traffic 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 A Policy on Geometric Design of Highways and Streets, latest edition, in addition to the recommended storage lengths. Full deceleration lengths may be waived for roadways with a speed limit of 30 mph or less with the City Engineer's approval. Right-of-way impacts for all improvements shall be identified. The TIS must include a concept sketch illustrating the recommended mitigation measures as proposed per the TIS.

RESUBMITTALS

Resubmittals of the TIS may be required for various reasons. Any TIS resubmittal shall incorporate comments and/or response to comments from the City and third-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 TIS 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 TIS to be revised and resubmitted such as the private development has significantly increased in size from the original development that would generate many more trips than previously approved in the TIS or another private development within the study area is coming in that is a known, large traffic generator using the same roadway network, 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 TIS shall be completed using the approved plans from the Site Plan stage of the review process.

STUDY FEE

City Prepared TIS Consultant Fee

After the TIS scoping meeting, the City's consultant shall prepare an estimate of consulting fees for the TIS for the project. Upon receipt of payment of fees from the applicant in the amount of one hundred percent (100%) 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 invoice or reimburse the applicant any remaining balance due or owed.

Developer Prepared TIS Consultant Fee

The developer shall pay the TIS third party review fee directly to the third-party consultant and as specified earlier in this document.

EXPIRATION OF TIS

The TIS shall expire after three (3) years from the approval date unless the TIS is attached to an approved land-use development application in which case it will remain in effect through the vesting period of that development. Major modification to an approved development may require an update to the study.

APPEAL OF TIS METHODOLOGY

Applicants shall have the option to appeal the determination of the TIS by submitting a formal appeal to the City Engineer. If the City Engineer does not approve the appeal and supports the findings of the TIS, the Applicant shall have the option to appeal the determination of the TIS and City Engineer by submitting an application for appeal to the Planning Commission.

REPORT FORMAT

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

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.

PRE-SCOPE OF WORK MEETING FORM

Information on the Project
Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting to the City no lesss than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information				
Consultant Name: Telephone: E-mail:				
Developer/Owner Name: Telephone: E-mail:				
Project Information				
Project Name:			County:	
Project Location: (Attach regional and site specific location map)				
Submission Type	☐ Comp Plan	☐ Rezoning	☐ Site Plan	☐ Subd Plat
Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)				
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	☐ Residential	☐ Commercial	☐ Mixed Use	☐ Other
	Residential Uses(s) Number of Units: _____ ITE LU Code(s): _____ _____ _____ **Commercial Use(s)** ITE LU Code(s): _____ _____ _____		Square Ft or Other Variable: _____ _____ **Other Use(s)** ITE LU Code(s): _____ _____ _____ Independent Variable(s): _____ _____ _____	
Total Peak Hour Trip Projection:	☐ Less than 100	☐ 100 – 499	☐ 500 – 999	☐ 1,000 or more

It is important for the applicant to provide sufficient information to City Public Works staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Traffic Impact Analysis Assumptions				
Study Period:	Existing Year:	Build-out Year:	Design Year:	
Study Area Boundaries: (Attach map)	North:	South:		
	East:	West:		
External Factors That Could Affect Project: (Planned road improvements, other nearby developments)				
Consistency With Comprehensive Plan: (Land use, transportation plan)				
Available Traffic Data: (Historical, forecasts)				
Trip Distribution: (Attach sketch)	Road Name:	Road Name:		
	Road Name:	Road Name:		
Annual Vehicle Trip Growth Rate:		Peak Period for Study (check all that apply)	☐ AM ☐ PM ☐ SAT	
		Peak Hour of the Generator		
Study Intersections and/or Road Segments: (Attach additional sheets as necessary)	1.	6.		
	2.	7.		
	3.	8.		
	4.	9.		
	5.	10.		
Trip Adjustment Factors:	Internal allowance: ☐ Yes ☐ No Reduction:_____% trips	Pass-by allowance: ☐ Yes ☐ No Reduction:_____% trips		
Software Methodology:	☐ Synchro ☐ HCS (v.2000/+) ☐ aaSIDRA ☐ CORSIM ☐ Other_____			
Traffic Signal Proposed or Affected: (Analysis software to be used, progression speed, cycle length)				

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PRE-SCOPE OF WORK MEETING FORM

Improvement(s) Assumed or to be Considered:	
Background Traffic Studies Considered:	
Plan Submission:	☐ Master Development Plan (MDP) ☐ Generalized Development Plan (GDP) ☐ Preliminary/Sketch Plan ☐ Other Plan type (Final Site, Subd. Plan)
Additional Issues to be Addressed:	☐ Queuing analysis ☐ Actuation/Coordination ☐ Weaving analysis ☐ Merge analysis ☐ Bike/Ped Accommodations ☐ Intersection(s) ☐ TDM Measures ☐ Other _____

NOTES on ASSUMPTIONS:

SIGNED: _____ DATE: _____
Applicant or Consultant

PRINT NAME: _____
Applicant or Consultant

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