

TRANSPORTATION IMPACT ANALYSIS PROCEDURES MANUAL

INTRODUCTION

The Town of Harrisburg is committed to establishing an interconnected, multimodal transportation system that increases mobility, safety, connectivity, health, and quality-of-life for its citizens and business owners. A Transportation Impact Analysis (TIA) is one important tool for evaluating the incremental impacts that new development may have on the surrounding transportation system and it helps local decision-makers evaluate whether a development is appropriate for a site or identify mitigation measures that are necessary to maintain the integrity of the transportation system.

A TIA varies in detail and complexity depending on various factors such as project size, type, location, scope, recent development in the area, and other project-specific considerations. During the pre-submittal meeting for any new development, Town staff will determine the need for a TIA. If warranted, the transportation consultant assigned by the Town shall prepare the TIA to the requirements set forth herein and any other policies adopted by the Town Council for fostering a sustainable transportation system. At the discretion of the North Carolina Department of Transportation (NCDOT) and the Town, a technical memorandum, in lieu of a full TIA report, may be allowed for some developments.

Payment for completing the transportation impact analysis is solely the responsibility of the applicant.

PURPOSE

The intent of this procedures manual is to provide a consistent basis by which the Town, in coordination with the NCDOT, evaluate transportation impacts within the Harrisburg community. Included in this manual are minimum development thresholds that require a TIA, procedures for completing the TIA process, and requirements for data collection, analysis methodology, and report format. A TIA submitted in conformance with this procedures manual shall satisfy the Town's requirements for identifying off-site mitigation; however, the NCDOT reserves the right to request additional information and/or subsequent analyses to satisfy their review requirements independent of the Town of Harrisburg.

USING THIS MANUAL

This procedures manual moves from the general to the specific for completing a TIA in the Town of Harrisburg. The document is organized into two main sections: 1) general information for the applicant within the development review process and 2) expected content and methodologies to be used in the TIA. All users are expected to be generally familiar with the information presented herein; however, the applicant for the development and the assigned transportation consultant are required to consult in detail those sections of the document most applicable to their roles in preparing the TIA.

SECTION 1: GENERAL INFORMATION FOR THE APPLICANT

The following information provides a general framework for TIAs in the Town of Harrisburg.

RESPONSIBILITY FOR STUDIES

Town staff shall determine whether a TIA is required as a part of the development review and approval process. When required, the TIA must be prepared for the applicant by a duly qualified and registered professional engineer in the State of North Carolina chosen by the Town of Harrisburg. The applicant has input in the selection of an approved consultant when a TIA is required; however, the final decision on

selection is made by Town staff. The transportation consultant shall not have had any involvement with the specific development within the 12 months prior to the TIA scoping meeting.

The TIA must be approved by Town Staff and NCDOT before the development application or a rezoning application can be submitted to the Town.

MINIMUM THRESHOLDS FOR TIAS

A TIA shall be required for any site specific development plan expected to generate traffic volumes that will significantly impact the capacity and/or safety of the transportation system. For the purposes of this document, significant impacts are defined for various levels of development activity – rezoning, preliminary and final plats, conditional use permit, or site plan – using expected gross trip generation defined and calculated using data published in the most recent edition of the ITE Trip Generation Manual.

A TIA shall be required to accompany a site specific concept plan when expected gross trip generation is 1000 trips or more (entering/exiting combined) in a 24-hour period. A TIA shall also be required for any proposed residential development which generates 75 trips or more, or for any other proposed development which generates 100 trips or more (entering/exiting combined) during either the adjacent road’s peak hour(s) or the development’s peak hour(s).

Due to the variety of special circumstances associated with redevelopment, expansion, upfits, and/or change of use applications, staff will determine the appropriate TIA trip generation threshold calculation method for each case. In general, trip generation shall be measured as the net new base trips generated by the proposed use as compared to trips generated by the current, active use(s) on the site within the most recent six months. Development approvals within the most recent five year period will be included in the trip generation for the current application unless a separate TIA was performed for the previously approved development. Notwithstanding the threshold values above, a TIA shall be required for a site specific development plan if Town staff determines that one or more of the following conditions exist:

- Traffic generated from a non-residential development will significantly impact adjacent residential neighborhoods.
- Traffic operation problems for current and/or future years on nearby streets are expected to be substantially aggravated by traffic generated by the proposed new development.
- Affected major thoroughfares and minor thoroughfares identified in the Cabarrus Rowan Metropolitan Planning Organization’s Comprehensive Transportation Plan are experiencing noticeable delay.
- Traffic safety issues exist at intersections or streets that would serve the proposed new development.
- The proposed land use differs significantly from that contemplated in the adopted Harrisburg Area Land Use Plan.
- The internal street or access system is not anticipated to accommodate the expected traffic generation.
- The amount or character of traffic is significantly different from an earlier approved study or more than 24 months have passed since completion of the previous transportation study.

MANDATORY SCOPING MEETING

A mandatory scoping meeting is required, prior to beginning the TIA, to discuss the requirements and strategies for a TIA specific to the site and the proposed development program. Town and NCDOT staff, the transportation consultant assigned by the Town, and the applicant are required to attend the mandatory scoping meeting. The applicant may invite members of his development team as needed.

Prior to the meeting, the applicant shall provide a copy of any previous transportation studies prepared for the site and a sketch plan showing the site location and land use(s), proposed internal circulation, and access point(s) in relation to adjacent properties and public roads. Approximate timelines for project phasing should also be communicated. The information provided will be the basis for discussion during the scoping meeting.

During the scoping meeting, discussion will include confirmation of land use, project phasing, internal circulation, and site access; general distribution of project traffic to the site; proposed internal capture or pass-by capture rates; proposed multi-modal split (if appropriate); determination of the study intersections and the base condition assumptions for the future year, including committed development and transportation projects; and available traffic data and studies.

A memorandum of understanding (MOU) shall be prepared by the transportation consultant assigned by the Town documenting the understood scope of the project. The MOU shall be signed by the applicant, Town staff, and the NCDOT Division 10, District 1 Engineer, or his designee, before the assigned transportation consultant can begin work on the TIA. Failure by the applicant to provide accurate information or failure by the assigned transportation consultant to follow the MOU shall result in disapproval of the TIA or a request for additional information.

STUDY FEE

After the mandatory scoping meeting, the transportation consultant assigned by the Town shall submit an estimate of consultant fees for preparing the TIA to Town staff who will then forward the cost proposal to the applicant. Upon the applicant's agreement and payment in full to the Town for the projected cost estimate, the Town shall release the work to the consultant. Any additional services incurred by the transportation consultant in addition to the MOU must be approved by Town staff, and agreed to and paid for by the applicant, prior to performance of the additional work.

MITIGATION MEASURES AGREEMENT

Upon completion of the TIA by the transportation consultant, if mitigation is part of an approved TIA, Town Staff will prepare the Mitigation Measure Agreement to summarize the development plan, phasing, and site access and the improvements required to adequately mitigate the site-specific impacts to the public transportation system. Any ongoing or additional considerations for the development as it moves forward shall be described in this document. The agreement shall be signed by the applicant, Town staff, and the NCDOT Division 10, District 1 Engineer, or his designee, which completes of the Town's TIA process.

Any deviation from the development features as described in the final TIA, including but not limited to land uses and site access, must be submitted to Town Staff in writing who will then determine if a TIA revision will be required.

All mitigation measures included in the executed Mitigation Measure Agreement must be implemented prior to receipt of any certification of occupancy or final plat approval, whichever is appropriate, unless otherwise provided for in a phasing plan that is included in the approved TIA.

SECTION 2: CONTENTS AND METHODOLOGIES FOR A TIA

The following outline shall be used for all TIA reports submitted to the Town of Harrisburg. All of the required data and information must be clearly identified in the appropriate sections of the report. Text contained in the required chapters shall be comprehensive and complete.

A detailed summary of the expected content and methodologies to be used in the TIA are discussed below. The MOU shall be included in the appendix of the TIA report.

I. Signature Page

The Signature Page summarizes the name of the project, project location, name of the applicant, contact information for the applicant, and date of the study. The name, contact information, registration number, signature, and seal of a duly qualified and registered professional engineer in the State of North Carolina are also required to appear on this page.

II. Table of Contents

The Table of Contents shall provide a list of all section headings, figures, tables, and appendices included in the TIA report. Page numbers shall denote the location of all information, excluding appendices, in the TIA report.

III. Executive Summary

The Executive Summary of the report represents a clear, concise description of the study findings. It should include a general description of the project scope, study horizon years, probable impacts of the project, and mitigation measure recommendations. Technical publications, calculations, documentation, data reporting, and detailed design should not be included in this section. This section should be no longer than two pages.

IV. Introduction

The Introduction to the report identifies the applicant’s request. A scalable, 11” x 17” site plan illustrating the project as proposed at full build-out shall be included with the TIA report. Information presented in the TIA report shall be identical in every respect to the site plan submitted for development approval.

Project Description

The Project Description is a detailed description of the development, including the size of the parcel, development size, existing and proposed uses for the site, anticipated completion dates (including phasing). This information should include the square footage of each use or the number and size of dwelling units proposed.

Site Description

The Site Description should describe project location within the Town and region, the planning jurisdiction, existing zoning and use (and proposed use if applicable), and key physical characteristics of the site, including general terrain and environmentally sensitive or protected areas.

Site Access

A complete description of the ingress/egress of the site should be explained and depicted. It should include number of driveways, their locations, distances between driveways and intersections, types of

driveways (two-way, one-way, etc.), traffic controls, etc. Internal streets, parking lots, sidewalks and bicycle lanes, and designated loading/unloading areas should also be described. Similar information for adjacent properties should be provided to evaluate opportunities for internal connections.

The design, number, and location of access points to collector and arterial roadways immediately adjacent to the site must be fully analyzed. The number of access points should be kept to a minimum and designed to be consistent with the type of roadway facility.

Driveways serving the site should be designed in accordance with the NCDOT's Policy on Street and Driveway Access to North Carolina Highways (see Recommended Treatment for Turn Lanes, pgs. 78-9) and/or the Town's standards, as applicable.

V. Study Area

The limits of the Study Area shall be based on the location, size and extent of the proposed project, and an understanding of existing and future land uses and traffic conditions surrounding the site. The limits of the study area for the TIA shall be reviewed and approved by Town staff and NCDOT staff at the mandatory scoping meeting. At a minimum, the study area should include all streets and intersections where site traffic estimated for build-out of the project will constitute 10% or more of any intersection approach during the peak hour. Due to related impacts or current operational problems, Town and/or NCDOT staff may require other intersections be included in the study area.

A narrative describing the study area should identify the location of the proposed project in relation to the existing transportation system and list the specific study intersections and/or segments. Any unique transportation plans or policies applicable to the area should be mentioned. A site location map shall be provided and should identify natural features, major and minor roadways within the study area, study intersections, and a boundary of the site under consideration.

VI. Existing Conditions

A description of the Existing Conditions for the transportation system within the study area shall include a narrative and map that presents AM and PM peak hour turning movement volumes for all study intersections (signalized and unsignalized).

Traffic volumes shall be 15-minute interval weekday turning movement counts (Tuesday through Thursday) and no more than twelve months old. Typically, the required count timeframes are from 7:00-9:00 a.m. and 4:00-6:00 p.m., however site-specific conditions may necessitate different traffic counting hours or requirements. For example, 12-hour turning movement counts shall be required to complete the analysis if a traffic signal warrant analysis is required as part of the TIA. Town staff will determine if additional peak hours or weekend analyses shall be included in the TIA at the mandatory scoping meeting.

Traffic volumes should also represent weeks that have no observed federal, state, or local holidays and periods of the year when local schools are in session. Traffic volumes may not be used when collected during a week with local race activities. The source of existing traffic volume information should be explicitly stated (e.g., Town counts, new counts collected by the applicant, NCDOT counts, etc.). Summary sheets for existing turning movement counts should be included in the appendix of the TIA report.

A separate narrative and map shall be prepared to describe the characteristics of surrounding major roadways, including functional classification, number of lanes, posted speed limit, existing average

daily traffic volumes, typical cross section, intersection control (signalized or unsignalized), and lineal distance between major roadways. Field notes for the existing conditions investigation may be included in the appendix of the TIA report.

VII. Future Year Conditions

Future Year Conditions for a single phase development is built out year + 1 year. If the development plan indicates that a multiple phase TIA is necessary, the scenarios should be completed in order, with any improvements specified by development included in the subsequent build scenarios. Specific analysis periods to include in the study shall depend greatly upon the development program, proposed project phasing plan, and significant improvements programmed for the transportation system.

The committed development and transportation projects to be included in the base Future Year Conditions for the transportation system within the study area shall be determined during the scoping meeting. Transportation improvements assumed in the base future year conditions analysis may include those with an expected completion date concurrent with that of the development and funded through either the Town of Harrisburg Capital Improvements Plan, State of North Carolina Transportation Improvement Program, or indicated as a required condition of approval from another nearby development application. Only projects approved by the Town staff at the scoping meeting may be included in the analysis as future existing infrastructure. Those improvements committed by other projects must be clearly identified in the report as approved offsite development road improvements. Adjacent development traffic information used in the development of the base Future Year condition should be included in the appendix of the TIA report. Unfunded, planned infrastructure projects may be mentioned but the description should specifically identify that these project are not included in the base condition.

Future year traffic volumes shall be forecasted using historical growth rate information, regional models, and/or TIA reports for development approved by the Town but not yet built. A narrative and map shall be prepared that presents turning movement volumes for each peak hour for all intersections (signalized and unsignalized) identified for study. Future year base volumes, other development volumes, and site traffic volumes should be clearly separated, and combined, in the map.

VIII. Project Traffic

Project Traffic shall be generated for the proposed development program using the traditional three step process of trip generation, distribution, and assignment. These steps are described in detail below.

Trip Generation

Base trip generation for the proposed land use(s) should be calculated using the latest data published in the Institute of Transportation Engineers' (ITE) Trip Generation Manual. Data limitations, data age, choice of peak hour or adjacent street traffic, choice of independent variable, and choice of average rate versus equation shall be discussed at the mandatory scoping meeting.

Local trip generation rates may be acceptable if appropriate validation is provided by the applicant to support them. Any deviation from ITE trip generation rates shall be discussed in the mandatory scoping meeting and documented in the MOU if approved by Town staff and NCDOT.

The NCDOT Municipal School Transportation Assistance (MSTA) calculator should be used to calculate projected trip generations for school sites.

Internal Capture

Base generation may be reduced by rate of internal capture when two or more land uses are proposed using methodology recommended in the most current Trip Generation Handbook published by the Institute of Transportation Engineers. Reductions greater than 10% require consultation and acceptance by the Town staff and NCDOT. The internal capture reduction should be applied before pass-by trips are calculated.

Pass-by Trips

Pass-by trips are those made as intermediate trips between an origin and primary destination (i.e., home to work, home to shopping, etc.). However, pass-by trips are not diverted from another roadway. Base trip generation may be reduced by rate of pass-by capture using methodology recommended in the most current Trip Generation Handbook published by the Institute of Transportation Engineers. Pass-by trips associated with the development program may not exceed 10% of the existing volume reported for the adjacent public street. A trip generation table shall summarize all trip generation calculations for the project.

Trip Distribution

External trip distribution shall be determined on a project-by-project basis using one of several sources of information available to transportation professionals. Potential sources for determining project trip distribution may include the regional travel demand model, market analysis, existing traffic patterns, or professional judgment. Regardless of methodology, the procedures followed and logic for estimating trip distribution percentages must be well-documented in the TIA. Trip distribution percentages proposed for the surrounding transportation network should be discussed during the mandatory scoping meeting and shall be approved by Town Staff and NCDOT before proceeding with the TIA.

A map showing the percentage of site traffic on each street included in the study area should be included in the TIA.

Trip Assignment

Project traffic shall be distributed to the surrounding transportation system based on the site's trip generation estimates and trip distribution percentages. Future year traffic forecasts (i.e., future year background traffic plus project traffic) shall be presented in both tabular and graphic formats for AM and PM peak hour conditions at all intersections included in the study area. If the project will be built in phases, traffic assignments shall be reported for each phase. Pass-by traffic shall be included at the driveways and access points for evaluating driveway volumes.

IX. Capacity Analysis

The primary measurement for impacts to the transportation system is level of service (LOS), as defined by the most current edition of the Highway Capacity Manual. Levels of service for signalized intersections shall be determined using existing signal timing plans provided by either the Town of Harrisburg or the NCDOT. Existing signal timing plans should be included in the appendix of the TIA report. If a traffic signal is part of a coordinated system it must be analyzed as such under all conditions. Other standard practices and default input values for evaluating signalized intersections should be consistent with guidelines published by the North Carolina Department of Transportation, Traffic Engineering and Safety Systems Branch, Congestion Management Unit ("Capacity Analysis Guidelines"). Town staff may also require safety, traffic simulation, gap and/or other analyses

appropriate for evaluating a development application. Additional analyses required for the TIA shall be identified during the mandatory scoping meeting.

Capacity analyses shall be conducted to determine levels of service in each peak hour for all intersections (signalized and unsignalized) identified for study using methodologies contained in the most current edition of the Highway Capacity Manual. Capacity calculations should be included for existing, future year no build + 1 year, future year build phase(s), and future year build-out + 1 year conditions for all project phases. Impacts from the proposed project shall be measured by comparing the Future year build + 1 year and the Future year no-build + 1 year conditions. Unless otherwise approved by Town Staff and NCDOT, the proposed project shall not degrade the overall intersection level of service for signalized intersections, or level of service for the critical movement of unsignalized intersections. Further, signalized or unsignalized intersections operating at LOS E or F within the study area may not experience increased delay (measured in seconds) as a result of the proposed project.

All TIA reports submitted to the Town of Harrisburg shall use Synchro Software, for signalized and unsignalized intersections, or Sidra Software, for roundabouts, consistent with policies released by the NCDOT. A narrative, table, and map shall be prepared that summarizes the methodology and measured conditions at the intersections reported in level of service (LOS A – F), approach delay for unsignalized intersections or intersection signal delay for signalized intersections, and 95th percentile queue lengths for all intersections. Capacity analysis worksheets and turn lane warrants should be included in the appendix of the TIA report.

X. Queuing Analysis

95th percentile and simulation analysis of future year queues shall be consistent with NCDOT's Traffic Engineering and Safety Systems Branch, Congestion Management Unit current practices and published Capacity Analysis Guidelines. Turn lanes for unsignalized driveways serving the site shall be identified using volume thresholds published in the NCDOT's Policy on Street and Driveway Access to North Carolina Highways (see Warrant for Left- and Right-Turn Lanes Nomograph, pg. 80). Recommendations for left and right turn lanes serving the site shall be designed to meet future year capacity needs identified in the TIA report.

For projects that include drive-through facilities or entrance gates, a queuing analysis may be required by Town staff to ensure that vehicle stacking will not adversely impact the public transportation system. The queuing analysis must be performed using accepted transportation engineering procedures approved by Town staff. This analysis shall be required for all fast-food drive-through uses

If a TIA is required for a new school site, the consultant must model the internal circulation and ingress/egress of the site using a "dummy signal" in the Synchro software as prescribed by NCDOT Municipal School Transportation Assistance (MSTA) department.

XI. Collision Analysis

A summary of crash data (type, number, and severity) for the most recent 3-year period at each study location is required. Traffic Engineering Accident Analysis System reports will be provided by Town staff and should be included in the appendix of the TIA report. For locations with prevalent crash types and/or frequency, a discussion shall be included describing factors that may be contributing to the incidents.

At a minimum, the proposed development features shall not contribute to factors potentially involved in collision rates. If contributing factors are identified, recommendations to eliminate these features shall be included.

XII. Traffic Signal Warrants

Town staff and NCDOT may consider potential signal locations at the mandatory scoping meeting. However, traffic flow progression is of paramount importance when considering a new traffic signal location. A new traffic signal should not cause an undesirable delay to the surrounding transportation system.

Installation of a traffic signal at a new location shall be based on the application of warrants criteria contained in the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD) and engineering judgment. Traffic signal warrants should be included in the appendix of the TIA report. Additionally, spacing of traffic signals within the Town of Harrisburg must adhere to guidelines published in NCDOT requirements. Pedestrian movements must be considered in the evaluation and adequate pedestrian clearance provided in the signal cycle split assumptions.

If a signal warrant analysis is recommended in the TIA, the Town and/or NCDOT may decide to defer a signal warrant analysis until after the development has opened in order to use actual turning movement counts at an intersection. The TIA recommendations must clearly state that this analysis shall occur at a specified date following the opening of the development. The applicant must issue a bond or letter of credit in the name of the Town for the estimated cost of the signal warrant analysis and resulting signal prior to final approval of the TIA. The cost shall be established based on an engineer's estimate provided by the engineer of record for the applicant, however final approval of the dollar amount rests with the Town.

XIII. Mitigation Measure Recommendations

This section of the report shall provide a clear, concise description of the study's findings regarding impacts of the proposed project on the existing and proposed transportation system and describe the location, nature, and extent of all mitigation measures recommended to the applicant to improve and/or maintain the future year no build level of service (LOS) conditions through phasing and build-out of the project. The applicant is only required to mitigate transportation deficiencies for their development and not unacceptable background conditions or other deficiencies caused by offsite development within the defined study area.

For multi-phase developments, the capacity analyses scenarios shall address the phasing of improvements required to provide an acceptable level of service with each phase. A narrative and table shall be prepared that summarizes the methodology and measured conditions at the intersections reported in level of service (LOS A – F) and seconds of stop delay. A narrative and map shall also be prepared that describes and illustrates recommended mitigations, by phase if necessary, for maintaining the integrity of the transportation system.

Timing, scope, and transportation consultant cost of any deferred analysis should be clearly described and payment of the consultant analysis fee is solely the responsibility of the applicant prior to final approval of the TIA report.

The recommendation should end with a statement by the duly qualified and registered professional engineer in the State of North Carolina responsible for the TIA that indicates whether or not the proposed project will meet minimum standards described herein through build-out of the project

Town staff and NCDOT will review the recommendations in the final version of the TIA and will have the ultimate determination in the scope of the required mitigation measures. The TIA shall be approved if the recommendations from the report will adequately mitigate the site-specific impacts to the public transportation system.

Final mitigation measures shall be the responsibility of the applicant unless otherwise determined by Town staff and NCDOT.

XIV. Compliance with Adopted Transportation Plans

All TIA reports must include a statement of compliance with plans, programs, and policies adopted by the Town of Harrisburg for maintaining a safe and efficient multimodal transportation system. Town staff shall provide the applicant with information to consider for improving bicycle and pedestrian circulation and/or access to the site at the mandatory scoping meeting.

XV. Appendices

The Appendix of the TIA shall contain in following information (if applicable), in the order provided below:

- Approved Memorandum of Understanding (MOU) from the mandatory scoping meeting
- Traffic Counts Worksheets
- Field Investigation Notes
- Adjacent Development Traffic Information
- Traffic Signal Plans
- Capacity Analysis Worksheets
- Turn Lane Warrants
- Traffic Engineering Accident Analysis System (TEAAS) Report
- Traffic Signal Warrants
- Email and Written Correspondence

EXHIBIT 1 – TIA MEMORANDUM OF UNDERSTANDING

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TIA MEMORANDUM OF UNDERSTANDING**

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Project Information

Applicant Information

Project Name: _____ Applicant Name: _____

Project Location: _____ Applicant Telephone: _____

Project Owner: _____ Applicant Address: _____

Case Number: _____ Applicant Email: _____

Application Request: _____
(eg. rezoning, preliminary plat, conditional use permit, site plan, etc.)

The Town of Harrisburg and the applicant hereby agree that the information documented herein accurately and completely describes the information to be used in the development of the transportation impact analysis (TIA) report to be prepared by , the transportation consultant. All sections are required unless otherwise noted. The analysis methodologies and report format shall comply with the requirements in the Town of Harrisburg Transportation Impact Analysis Procedures Manual.

I. Signature Page

Include the name of the project, location, applicant information, and date of the study as well as the name, registration number, signature, and seal of a duly qualified and registered professional engineer in the State of North Carolina responsible for the TIA.

II. Table of Contents

Include a list of all section headings, figures, tables, and appendices included in the TIA report. Pages numbers will denote the location of all information, excluding appendices, in the TIA report.

III. Executive Summary

Include a clear, concise description of the study findings. It should include a general description of the project scope, study horizon years, existing conditions, probable impacts of the project, and mitigation measure recommendations.

IV. Introduction

Identify the applicant’s request and attach a scalable, 11” x 17” site plan illustrating the project as proposed at full build-out to this Memorandum of Understanding.

Parcel Size: _____ Development Size: _____

Existing land use(s): _____

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Proposed development program (include the square footage of each use or the number and size of dwelling units proposed):

Anticipated Build-Out: _____ Project Phasing: _____

Site Description

Include details of the project location within the Town and region, the planning jurisdiction, existing zoning and use (and proposed use if applicable), and, including general terrain, and environmentally sensitive or protected areas.

Existing Zoning: _____

Proposed Zoning: _____

Key Physical Characteristics of the Site: _____

Environmentally Sensitive or Protected Areas: _____

Site Access

Inventory and describe the ingress/egress of the site including number driveways, their locations, distances between driveways and intersections, types of driveways (two-way, one-way, etc.), and traffic controls serving the driveways. Internal streets, parking lots, sidewalks and bicycle lanes, and designated loading/unloading areas should also be described.

Special data collection and/or analysis requirements:

V. Study Area

Identify study intersections and segments to be included in the capacity, queuing, and collision analysis:

Unique transportation plans or policies applicable to the study area:

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VI. Existing Conditions

Include peak hour turning movement volumes for all study intersections (signalized or unsignalized). Traffic volumes shall be collected in weeks that have no observed federal, state, or local holidays and periods of the year when local schools are in session. Traffic volumes may not be used when collected during a week with local race activities.

Required 15-minute interval weekday turning movement counts for the following Peak Hour(s) (e.g. AM 7-9 and PM 4-6) and Locations (e.g. all study intersection):

Special data collection requirements (e.g., weekend counts, vehicle classification counts, etc.):

Existing Count Data available? _____

VII. Future Year Conditions

Include a description of the future year(s) transportation system within the study area. Future year traffic volumes shall be forecasted using historical growth rate information and transportation impact analysis reports for development approved by the Town but not yet built. Transportation improvements assumed in the future conditions analysis shall include those with an expected completion date concurrent with that of the development and funded through either the Town of Harrisburg Capital Improvements Plan, State of North Carolina Transportation Improvement Program, or indicated as a condition of approval from another nearby application.

Committed transportation improvements within the study area (type, location, and year for start of construction):

List of approved developments to include as committed project traffic in the TIA:

Method and source of information for growing existing background traffic volumes:

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VIII. Project Traffic

Generate project traffic for each phase of the proposed development program using the traditional three step process of trip generation, distribution, and assignment.

Trip Generation

Include the ITE trip generation rates used for the TIA, including choice of peak hour or adjacent street traffic, choice of independent variable, and choice of average rate versus equation. If local trip generation rates are used, provide documentation to the satisfaction of the Town staff for supporting such rates.

Is NCDOT Municipal School Transportation Assistance (MSTA) calculation required? YES NO

If any trip reductions are to be incorporated into the trip generation calculations (e.g., internal capture, pass-by capture, mode split, etc.), describe the methodology and supporting documentation for making such trip reductions:

Town staff and NCDOT must approve the trip generation prior to capacity analysis.

Trip Distribution

Include trip distribution for each phase of the proposed for the surrounding transportation network.

Describe the methodology that will be used in the TIA to determine trip distribution percentages:

Town staff and NCDOT must approve the trip distribution prior to capacity analysis.

Trip Assignment

Distribute project traffic, for each phase, to the surrounding transportation system based on the site's trip generation estimates and trip distribution percentages. Traffic forecasts for all peak hour conditions at all intersections in the study area shall be included. If the project will be built in phases, traffic assignments shall be reported for each phase. Pass-by traffic shall be included at the driveways and access points for evaluating driveway volumes.

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IX. Capacity Analysis

Conduct capacity analyses for all study area intersections for existing, future year (no build+1 year), future year (project phase(s)), and future year (build-out+1 year) conditions.

The TIA report shall use Synchro Software v. _____ for measuring level of service at signalized and unsignalized intersections.

Additional analyses required for the TIA (e.g., safety, traffic simulation, etc.):

X. Queuing Analysis

Include future year queuing analysis to determine turn lane impacts using NCDOT’s Traffic Engineering and Safety Systems Branch, Congestion Management Unit current practices and published Capacity Analysis Guidelines.

Does the project include drive-through facilities and/or entrance gates or for a new school site which requires additional queuing analysis to ensure peak period stacking is accommodated onsite?

Additional data needs:

XI. Collision Analysis

Provide a summary of crash data (type, number, and severity) for the most recent 3-year period at each study location is required. For locations with prevalent crash types and/or frequency, include a discussion describing factors that may be contributing to the incidents.

Special data collection and/or analysis requirements:

XII. Traffic Signal Warrants

Required

Not Required

Town staff and NCDOT may consider potential signal locations. However, traffic flow progression is of paramount importance when considering a new traffic signal location. A new traffic signal should not cause an undesirable delay to the surrounding transportation system. Installation of a traffic signal at a new location shall be based on the application of warrants criteria contained in the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD) and engineering judgment.

Special data collection and/or analysis requirements:

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XIII. Mitigation Measure Recommendations

Provide a clear, concise description of the study’s findings regarding impacts of the proposed project on the existing and proposed transportation system and describe the location, nature, and extent of all mitigation measures recommended to the applicant to improve and/or maintain future year nobuild level of service (LOS) conditions through phasing and build-out of the project.

The applicant is only required to mitigate transportation deficiencies for their development and not unacceptable background conditions or other deficiencies caused by off-site development within the defined study area.

Town staff and NCDOT will have the ultimate determination in the scope of the required mitigation measures.

Special data collection and/or analysis requirements:

XIV. Compliance with Adopted Transportation Plans

Include a statement of compliance with plans, programs, and policies adopted by the Town of Harrisburg for maintaining a safe and efficient multimodal transportation system.

Relevant transportation adopted plans or applicable to the study area:

XV. Appendices

Include applicable appendices:

- Approved Memorandum of Understanding (MOU) from the mandatory scoping meeting
- Traffic Counts Worksheets
- Field Investigation Notes
- Adjacent Development Traffic Information
- Traffic Signal Plans
- Capacity Analysis Worksheets
- Turn Lane Warrants
- Traffic Engineering Accident Analysis System (TEAAS) Report
- Traffic Signal Warrants
- Email and Written Correspondence

Additional information to be included:

TOWN OF HARRISBURG, NORTH CAROLINA
TIA MEMORANDUM OF UNDERSTANDING

Page 7 of 8

Submittal Requirements and Schedule

The transportation consultant will submit the transportation impact analysis (TIA) report for concurrent review by the Town staff and the NCDOT.

Submittal	Anticipated Duration	Town Staff	NCDOT	Applicant
Final TIA Review		_____ electronic _____ hardcopy	_____ electronic _____ hardcopy	_____ electronic _____ hardcopy
Final TIA Review and Approval	30 days			

The TIA shall be approved if the recommendations from the report will adequately mitigate the site-specific impacts to the public transportation system.

Additional Comments:

**TOWN OF HARRISBURG, NORTH CAROLINA
TIA MEMORANDUM OF UNDERSTANDING**

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Agreement by All Parties

The undersigned agree to the contents and methodology described in this Memorandum of Understanding (MOU) for completing the required transportation impact analysis (TIA) supportive of the development application identified herein. Any changes to the above methodology contemplated by the applicant or transportation consultant must be submitted to the Town Staff in writing and a revised MOU executed before such changes will be accepted for the TIA report. Any additional services incurred by the transportation consultant in addition to the MOU must be approved by Town staff, and processed between the applicant and the transportation consultant.

Agreed to this _____ day of _____, 20____.

APPLICANT

(Signature) (Print Name)

TOWN ENGINEER

(Signature) (Print Name)

Reviewed and approved by the North Carolina Department of Transportation, Division 10, District 1 on this _____ day of _____, 20____.

DISTRICT ENGINEER

(Signature) (Print Name)

Transportation Consultant Conflict of Interest Statement

Officers, employees, shareholders, and subconsultants of _____, the transportation consultant assigned to perform this transportation analysis, have had no interest in the prior 12 months and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed herein.

TRANSPORTATION CONSULTANT

(Signature) (Print Name)

(Date)

EXHIBIT 2 – TIA MITIGATION MEASURES AGREEMENT

**TOWN OF HARRISBURG, NORTH CAROLINA
MITIGATION MEASURES AGREEMENT**

Page 1 of 3

Project Information

Applicant Information

Project Name: _____ Applicant Name: _____

Project Location: _____ Applicant Telephone: _____

Project Owner: _____ Applicant Address: _____

Case Number: _____ Applicant Email: _____



The Town of Harrisburg, with concurrence from the North Carolina Department of Transportation, and the applicant hereby agree that the information documented herein accurately and completely describes the development project and mitigation measures required to adequately mitigate the site-specific impacts to the public transportation system. The applicant is responsible for the complete implementation of the mitigation measures as a condition of development.

Development Information

Parcel Size: _____ Development Size: _____

Proposed development program (include the square footage of each use or the number and size of dwelling units proposed):

Project Phasing and Anticipated Build-Out:

Site Access

Inventory and description of ingress/egress of the site including number driveways, their locations, distances between driveways and intersections, types of driveways (two-way, one-way, etc.), and traffic controls serving the driveways. Internal streets, parking lots, sidewalks and bicycle lanes, and designated loading/unloading areas should also be described. Attach a plan if necessary.

**TOWN OF HARRISBURG, NORTH CAROLINA
MITIGATION MEASURES AGREEMENT**

Page 2 of 3

Mitigation Measures

Describe the location, nature, extent, and phasing of all transportation improvements required of the applicant by Town staff and NCDOT to improve and/or maintain future year nobuild level of service (LOS) conditions through phasing and build-out of the project. Attach additional pages if needed.

Location: _____

Required Mitigation(s): _____

Phasing: _____

Location: _____

Required Mitigation(s): _____

Phasing: _____

Bonding Requirements

The applicant must issue a bond or letter of credit in the name of the Town for the estimated cost of analysis and implementation for any deferred requirements. Attach additional pages if needed.

Deferred Mitigation(s) _____

Date of Completion: _____ Bonded Amount: _____

Deferred Mitigation(s) _____

Date of Completion: _____ Bonded Amount: _____

Additional Conditions

Describe additional items to be coordinated through the development process.

**TOWN OF HARRISBURG, NORTH CAROLINA
MITIGATION MEASURES AGREEMENT**

Page 3 of 3

Agreement by All Parties

The undersigned agree that the final mitigation measures described herein adequately mitigate the site-specific impacts to the public transportation system for the development identified herein and the applicant is responsible for complete implementation of all mitigation measures as a condition of development approval. Any deviation from the development features as described in the final TIA, including but not limited to land uses and site access, must be submitted to the Town Staff in writing who will then determine if a revised TIA will be required.

Agreed to this _____ day of _____, 20____.

APPLICANT

(Signature) (Print Name)

TOWN ENGINEER

(Signature) (Print Name)

Concurrence by the North Carolina Department of Transportation, Division 10, District 1 on this _____ day of _____, 20____.

DISTRICT ENGINEER

(Signature) (Print Name)