



# Locust City Council Meeting Agenda Joel Huneycutt Community Room

6:00 PM

December 16, 2025

**City Council Mayor & P&Z Board Chair**

**Mayor Steve Huber and Board Chair Tim Fesperman**

**Council Members and P&Z Board Members**

Mayor Pro-Tem Larry Baucom, Mandy Watson, Roger Hypes, De Dee Nathan, Mike Haigler, Barry Sims, Rusty Efird, James Baucom, Matthew Sanford, Chuck Cowherd, Amanda Pasquarello, Joe Abbatiello, Jeff Claiborne and Jarvis Williams

[IGNORE\_INDENT]

Call to Order:

- |  |             |
|--|-------------|
| 1. Call to Order                                 | Mayor Huber |
| 2. Presentation of Colors, Prayer                | Mayor Huber |
| 3. Adopt Agenda                                  |             |
| 4. Planning & Zoning                             |             |
| • Traffic Impact Analysis (TIA) Ordinance Update |             |
| 5. Board Closing Comments                        |             |
| 6. Adjourn                                       |             |

# City of Locust TIA ORDINANCE UPDATE

**Presented to:**



**Presented by:**

**Kimley»»Horn**

## What is a TIA?

A TIA is a tool that identifies improvements to mitigate the incremental transportation impacts on the surrounding transportation network caused by a new development or redevelopment.

# TIA Components

- Existing, background/no-build, build-out scenarios
- **Traffic volume development**
  - Existing: Peak-hour field traffic counts (TMCs)
  - Background: Existing + growth + AD traffic
  - Build-out: Background + site traffic (trip generation and distribution/assignment)
- **Analysis**
  - Capacity (LOS)
  - Turn Lane Warrants (safety)
  - Queuing
  - Crash history
  - Multimodal
- **Mitigation recommendations-** compare background vs build-out
  - New lanes
  - Control Type (stop sign, signal, RIRO, etc.)

# TIA Background

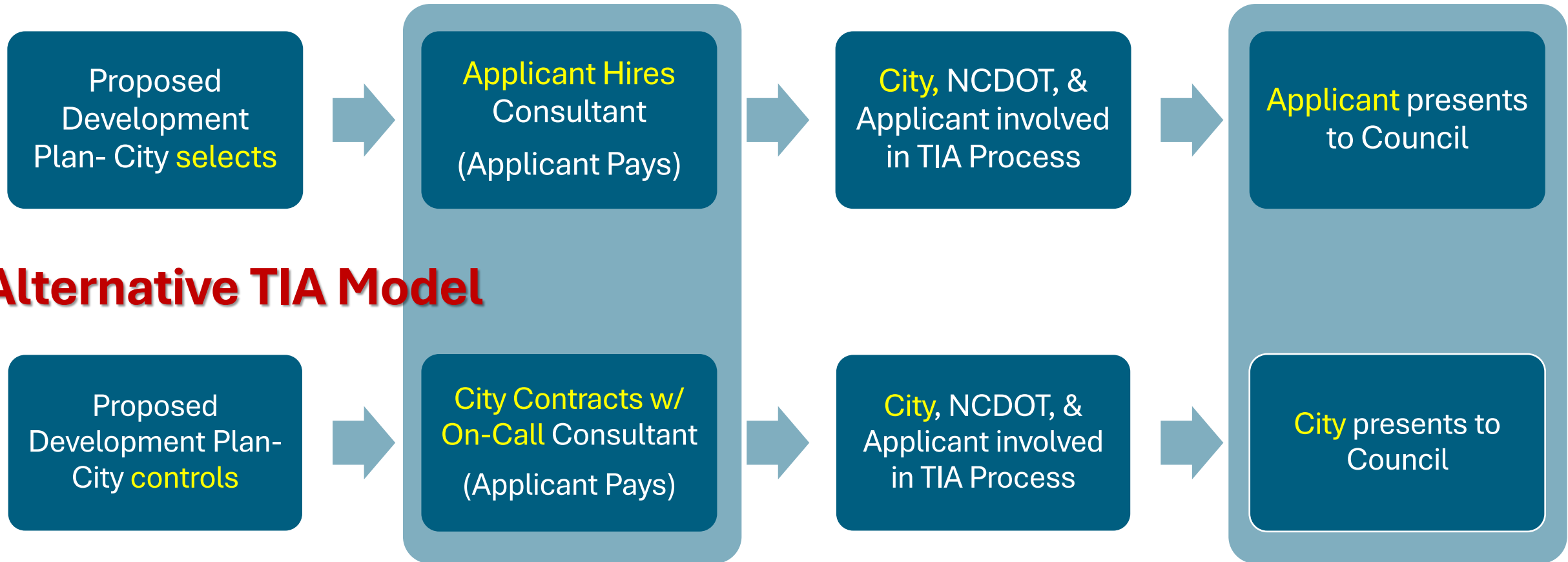
## 2019 TIA Ordinance Update

- Trip generation thresholds for requiring TIA (1000 daily trips)
  - Lower threshold for residential (75 peak trips vs 100 commercial peak trips)
- Other reasons for requiring TIA
- Developer hires consultant at City discretion
- Developer covers all TIA costs

## 2025 TIA Ordinance Update

- Continue to raise the bar on how development occurs
  - Keeping residential vs commercial threshold variance (mixed-use clarification)
  - More detailed TIA standards from prior update
  - More stringent than basic NCDOT requirements
- Consider allowing for more City control over process
  - City hires consultant, while developer still covers all TIA costs as pass-through

## Existing TIA Model



# Benefits of One Consultant

- **Consistency & Efficiency**
  - Personnel
  - Knowledge/background
  - Between studies
  - Between developers
  - Deliverables
- **Advocacy/perception**
- **Upholds City Ordinance & Goals**
- **Extension of Staff**

# TIA Process

1. Overall MSA
  - Only needed 1<sup>st</sup> time
2. TIA scoping fee paid by developer up front (TIA request form)
3. Individual project scope (City, NCDOT, Applicant)
4. Develop contracts
5. Prepare TIA
6. Review by City (& then NCDOT, if needed)
  - Then coordinate with Applicant
7. Phasing analysis as applicable
8. Mitigation Concepts as applicable (feasibility/implementation)
9. Transportation Mitigation Agreement

# Transportation Impact Analysis (TIA) Ordinance

## ACADEMIC

### Standard Components

1. TIA Determination
3. Scoping Meeting
4. Scoping Document
5. Fees
6. TMA
- 7a-f. TIA Contents
- 7j. Trip Generation
- 7k. Trip Distribution
- 7l. Trip Assignment
- 7n. Queuing Analysis
- 7o. Crash Analysis
- 7p. Traffic Signal Warrants
- 7s. Compliance

## SUBJECTIVE

### Components Selected by the City

2. **Minimum Thresholds**
- 7g. Study Area  
*Intersections*
- 7h. Existing Conditions  
*Count timeframes*
- 7i. Future-Year Conditions  
*Scenarios*
- 7m. Operations Analysis  
*Multi-modal considerations*
- 7q. **Mitigation Measure Recommendations**
- 7r. Payment-in-Lieu

7g. Study Area (Intersections)	
Intersection Control	Criteria
Signalized	<ul style="list-style-type: none"> <li>- 1-mile radius</li> <li>- Site contributes 10% of AADT</li> <li>- <b>City discretion</b></li> </ul>
Unsignalized	As directed by City

7h. Count Timeframes	
Peak Hour	Proposed Timeframes
AM	6:30 – 9:00 AM
PM	2:00 – 6:00 PM

7i. Scenarios
<ul style="list-style-type: none"> <li>○ Existing</li> <li>○ Horizon Year Background (No-Build)</li> <li>○ Horizon Year Build-out</li> <li>○ Build-out+5 (City discretion, not for mitigation)</li> </ul>

7r. Payment-in-Lieu
<ul style="list-style-type: none"> <li>○ City discretion</li> <li>○ Offsite ROW acquisition</li> <li>○ Overlap with publicly funded project</li> </ul>

7m. Multimodal Analysis
<ul style="list-style-type: none"> <li>○ City discretion</li> <li>○ Multimodal assessment</li> <li>○ Pedestrian analysis</li> </ul>

# Metro Area Municipalities

## 2. Minimum TIA Thresholds (daily/peak)

### NC (3,000 daily)

- Locust (1,000/75 res-100 comm/mixed)
- Waxhaw (1,000/100)
- Belmont (1,000/100\*)
- Mt. Holly (1,000/100)
- Cramerton (1,000/100)
- Harrisburg (1,000/100)

- Stallings (1,000/100)
- Troutman (1,000/100)
- Boone (1,500/80\*)

### SC (100 peak)

- Fort Mill (400/100)

### 7q. Mitigation

NCDOT (Waxhaw/Belmont/Mount Holly similar)

#### Mitigate if:

- the total average delay at an intersection or individual approach increases by 25% or greater, while maintaining the same level of service,
- the Level of Service degrades by at least one level,
- or Level of Service is “F”

### City of Locust

#### Mitigate if:

- the total average delay at an intersection or individual approach increases by 25% or greater, while maintaining the same LOS,
- the LOS degrades by at least one level,
- or the LOS is “E” or worse in background conditions and the project shows negative impact. (Mitigate only the impact caused.)

# Summary of Changes

- **TIA performed FOR City, but still paid for by developer**
- **Naming conventions**
  - Transportation (v. Traffic) Impact Analysis
  - Scoping Document (v. MOU)
  - Transportation Mitigation Agreement (v. Agreement of Mitigation form)
- **Field traffic count timeframes to capture school drop-off/pick up in addition to commuter peaks**
  - AM peak period 6:30-9 (v. 7-9)
  - PM peak period 2-6 (v. 4-6)
- **Study area-** 1 mile radius and 10% rule
- **Scenarios-** Added build-out +5 (City discretion)
- **Crash analysis-** 5 years of data rather than 3
- **Multimodal Assessment/Pedestrian Analysis** (City discretion)
  - Frontage, widening areas
  - Interconnectivity with adjacent properties
- **Payment-in-lieu** (City discretion)- offsite ROW acquisition, overlap with public project

# Considerations

- **Development community**
  - Different process
  - Schedule
  - Cost
  - Communication
- **Differences from NCDOT requirements/process**

### **e. Transportation Impact Analysis (TIA)**

The City of Locust anticipates continued growth in residential and commercial development, and this growth pressure should be balanced with sustainable mobility. Therefore, transportation impacts, and how to mitigate them, are an important consideration for our community when a development is proposed. Public policy makers, citizens, and developers all have a stake in understanding and responding to additional demands on the transportation system. A Transportation Impact Analysis (TIA) is a tool used to evaluate the incremental impacts on the surrounding transportation infrastructure and how to mitigate them to maintain safe traffic and transportation operations.

1. **TIA Determination** - The City shall determine the need for a TIA upon receipt of any development application (by-right or rezoning) accompanied by a site plan. Types of development applications could include but are not limited to; multi-family developments, single family developments, commercial/mixed-use developments, or industrial developments. If warranted, the transportation consultant assigned by the City shall prepare the TIA. At the discretion of the North Carolina Department of Transportation (NCDOT) and the City, a Transportation Technical Memorandum (TTM), in lieu of a full TIA report, may be allowed for some developments. If proposed street and/or multimodal connections are not consistent with adopted plans, then an explanation or proposed transportation mitigation alternative that is equal or better shall be discussed in the study. NCDOT and the City will be responsible for determining whether the alternative mitigation plan meets and/or exceeds the performance standards of the proposed street connections in the adopted plans.
2. **Minimum Thresholds for TIAs** - A TIA will be required to accompany the site plan when expected gross trip generation is **1,000 total trips or more in a 24-hour period, 75 trips during identified peak hours for a residential development of any kind (including multifamily), and/or 100 total peak-hour trips for a commercial/mixed-use development (prior to any trip reductions applied). The gross trip generation will be calculated by the City or its consultant based on the proposed project summary and site plan provided by the applicant, and the final determination for requiring the TIA will be made by the City.** The City may also determine the need for a TIA or TTM based on special circumstances associated with the development, even if the gross trips fall below this threshold. This may be due to location, an intersection or thoroughfare nearby that is at or above capacity, the nature of the use, or one of the following:
  - a. Traffic generated from a non-residential development that could potentially significantly impact adjacent residential neighborhoods.
  - b. Traffic operation issues for current and/or future years on nearby streets are expected to be significantly worsened by traffic generated from the proposed new development.
  - c. Major and minor thoroughfares near the site are experiencing significant/unacceptable delays.
  - d. Traffic safety issues exist at the intersection or street that would serve the proposed new development.
  - e. The proposed land use differs significantly from the adopted Locust Land Use Plan.
  - f. The internal street or access system is not anticipated to accommodate the expected traffic generation.

- g. The proposed development project includes a drive-through facility, or other uses such as schools that require significant on site circulation that may have an off-site impact to adjoining roads and/or intersections.
- h. The amount, behavior and/or assignment of traffic is significantly different from a previously approved TIA, or more than 24 months have passed since completion of previous TIA.
- i. NCDOT requires a TIA or TTM.

A TTM will be required for any proposed development when the conditions above are not met. In this case, the City and its consultant will determine what the TTM will address.

3. Scoping Meeting – A mandatory Scoping Meeting is required prior to beginning the TIA or TTM to discuss the requirements and strategies for a TIA/TTM specific to the site and the proposed development. Detailed information shall be submitted by the applicant and shall include intended phasing scheme, proposed build-out year, and a site plan showing proposed access points, proposed land use and densities, structure and parking envelopes. The City, the transportation consultant assigned by the City, and the applicant(s) are required to attend the mandatory scoping meeting. Representatives from the NCDOT District office will be invited and encouraged to attend as needed. The applicant should invite support staff of their development team as needed.
4. Scoping Document – A Scoping Document, in the form of NCDOT Checklist or other, detailing the understood scope and parameters of the TIA, shall be prepared by the transportation consultant assigned by the City. The Scoping Document shall be signed by the applicant and the City before the consultant can begin work on the TIA. Review by the NCDOT District Engineer will also be required if access to a state road is involved or if state road(s) within the identified study area will be impacted by the project's traffic. Failure by the applicant to provide accurate information or failure by the assigned transportation consultant to follow the Scoping Document shall result in disapproval of the TIA. If significant changes are made to the parameters outlined in the Scoping Document, a revised Scoping Document will be required.
5. Fees – Prior to the scoping meeting, the transportation consultant assigned by the City shall submit a summary of consultant fees to the City to perform the scoping portion of the TIA/TTM. The applicant shall agree to provide payment in full to the City for these services prior to scheduling of the Scoping Meeting.

After the Scoping Meeting, the transportation consultant assigned by the City shall submit a summary of consultant fees for preparing the TIA/TTM to the City. These fees will be in addition to the work completed throughout the scoping process. The applicant shall agree to provide payment in full to the City for preparation of the TIA/TTM per the Scoping Document, so that the City can release the work to the consultant. Any additional services incurred by the transportation consultant in addition to the Scoping Document, including changes by the applicant which require updates, must be approved by the City and agreed to and paid for by the applicant prior to performance of the additional services.

6. Transportation Mitigation Agreement (TMA) – Upon completion of the TIA or TTM, certain on- or off-site transportation mitigation measures may be required as

recommended by the TIA. If so, the City shall prepare a Transportation Mitigation Agreement (TMA) with assistance by the transportation consultant assigned by the City, which will summarize the following:

- a. Site plan
- b. Phasing and timing of development (if applicable)
- c. Site access and points of ingress/egress
- d. On and off-site improvements required consistent with the TIA or as dictated by City staff and/or NCDO including pedestrian and bicycle improvements in addition to vehicular
- e. Trigger points and deadlines for construction of any improvements

The TMA must be signed by the applicant and City. NCDOT review may be required if the mitigation involves a state roadway. All off-site right-of-way area shall be acquired and dedicated prior to approval of construction documents and required mitigation measures must be implemented prior to final Certificate of Occupancy (CO) or prior to the issuance of the first Zoning Permit for residential developments as identified in the TIA/TTM phasing plan or the applicant shall provide a payment in-lieu in accordance with Section 7.r.

7. TIA Outline and Contents – The outline and contents of what is required to be included in the TIA will be discussed at the Scoping Meeting and included in the Scoping Document. A detailed summary of the expected content and methodologies to be used in the TIA is discussed below.
  - a. Cover/Signature page – Includes the project name, 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.
  - b. Table of Contents – Includes 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.
  - c. Executive Summary – Includes a description of the study findings, a general description of the project scope, study horizon years, expected transportation impacts of the project, and mitigation measure recommendations. Technical publications, calculations, documentation, data reporting, and detailed design should generally not be included in this section.
  - d. Project Description – Includes 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 if/as applicable). It shall also include the square footage of each use and/or the number and size of dwelling units proposed, and a map and copy of the site plan provided by the applicant.
  - e. Site Description – Includes a description of the project location within the City and region, 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.

- f. Site Access – A complete description of the ingress/egress of the site shall be explained and depicted. It shall include number of driveways, their locations, distances between driveways and intersections (provided by applicant), proposed access control (full-movement, leftover, right-in/right-out, etc.) types of driveways (two-way, one-way, etc.), traffic controls, etc. Internal streets (lanes, flow, and queuing), parking lots, sidewalks, bicycle lanes, and designated loading/unloading areas shall also be described. Similar information for adjacent properties, including topographic grade relationship, shall be provided by applicant to inform opportunities for internal connections. The number of access points shall be kept to a minimum and designed to be consistent with the type of roadway facility. Driveways serving the site from state roads shall be designed in accordance with the NCDOT's Policy on Street and Driveway Access and/or the City standards, as applicable.
  
- g. 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 or TTM shall be reviewed and approved by the City and NCDOT staff at the mandatory Scoping Meeting. At a minimum, the study area shall include all signalized intersections within a one-mile radius of the proposed site, unless otherwise noted by City/NCDOT staff, and/or where site traffic estimated for build-out of the project will constitute 10% or more of any signalized intersection approach or associated segment. During the Scoping Meeting, staff may reduce or increase the radius due to conditions specific to the site and supported with valid reasoning. Should study area intersections outside of the City be identified, adjacent municipalities and/or County will be notified as applicable. Unsignalized intersections may be added to the scope as directed by the City. Based on the proposed development program submitted by the applicant, a preliminary trip generation analysis and distribution/assignment will be performed within the area surrounding the site and compared to the base volumes. Related impacts or current operational issues may dictate that other intersections be included in the study area as determined by City and/or NCDOT staff. A narrative describing the study area shall identify the location of the proposed project in relation to the existing transportation system and list the specific study intersections. Unique transportation plans or policies applicable to the area (e.g., Comprehensive Pedestrian Plan, Comprehensive Transportation Plan, CATS/SCUSA bus services) shall be mentioned. A site location map shall be provided and shall identify natural features, major and minor roadways within the study area, study intersections, and a boundary of the site under consideration.
  
- h. Existing Conditions – Shall include a narrative and map that represents the peak-hour turning-movement volumes for the study area intersections. Traffic volumes shall represent 15-minute interval weekday turning-movement counts (TMCs) collected Tuesday through Thursday, to include

heavy-vehicle, pedestrian, and bicycle counts, and shall be collected during periods of the year when local schools are in regular session. The required count timeframes are from 6:30-9:00 AM and 2:00-6:00 PM. The count timeframes are expected to cover peaking characteristics caused by local school drop-off and pick-up/dismissal times, as well as typical employment peaking characteristics; however, site-specific conditions may necessitate additional or different traffic counting hours and/or days depending on the development program and location within the City. These unique circumstances will be determined and directed by the City. The City will determine if modified peak hours or weekend analyses shall be included in the TIA at the mandatory Scoping Meeting. For example, expanded TMCs will be required if a full traffic signal warrant analysis is required as part of the TIA. The source of existing traffic volume information shall be explicitly stated (e.g., City counts, new counts collected by the applicant, NCDOT counts, etc.). If previous counts were obtained, only counts collected within one year of the Scoping Meeting will be deemed acceptable unless otherwise approved. Summary sheets for existing turning movement counts shall 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/typical cross section, posted speed limit, existing average daily traffic volumes, and intersection control. Field notes for the existing conditions observation may be included in the Appendix of the TIA report.

- i. Future Year Conditions – Unless otherwise approved by the City, future year conditions for a single-phase development shall be analyzed for the year the development is expected to be at full occupancy (build-out year); in addition, a five-year horizon scenario (build-out + 5) may be required at the discretion of City staff. For multiple-phased developments, the scenarios may be completed in order, with any improvements specified by development included in the subsequent build scenario(s), including five years after the full build-out year (build-out + 5) if applicable. Specific analysis periods to include in the study shall depend upon the development program, proposed project phasing plan, and significant improvements programmed for the surrounding transportation system. The approved offsite developments and transportation projects to be included in the future-year background conditions for the transportation system within the study area shall be determined during the Scoping Meeting. Transportation improvements assumed in the future-year background conditions analysis may include those with an expected completion date concurrent with that of the development and funded either by the City, NCDOT, or indicated as a committed improvement by an approved offsite development. Only projects approved by the City 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. Approved offsite development traffic information used in the development of the future-year background traffic volumes shall be included in the Appendix of the TIA report. Unfunded, planned infrastructure projects may be mentioned in the TIA, but the description shall specifically identify that these projects are not

included in the background condition. Future-year background traffic volumes shall be forecasted using historical growth rate information, regional models, and/or TIA reports for development approved by the City but not yet built. A narrative and map shall be prepared that presents turning movement volumes for each peak hour for all identified study area intersections. Future-year existing plus historical growth traffic volumes, approved development volumes, and site traffic volumes shall be clearly separated and combined in the maps.

- j. Trip Generation – Base trip generation for the proposed land use(s) shall be calculated using data published in the latest version of the Institute of Transportation Engineers' (ITE) Trip Generation Manual accepted by NCDOT and the City. Data limitations, data age, choice of peak hour of 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 Scoping Document if approved by the City and NCDOT. The NCDOT Municipal School Transportation Assistance (MSTA) calculator shall be used to calculate projected trip generations for school sites.
- Internal Capture – Base trip 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 ITE or research published by the National Cooperative Highway Research Program (NCHRP) Transportation Research Board. Reductions for internal capture shall be applied to multi- or mixed-use sites only. The internal capture reduction shall 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 ITE. Pass-by trips associated with the development program may not exceed 10% of the peak-hour volume reported for the adjacent public street network. This network shall include the streets that provide primary access to/from the site. For example, if a site access drive that connects to a low-volume local street, which its primary access is to a major collector road, the traffic on the major collector shall be used as the adjacent street for pass-by calculation purposes. Evaluation of diverted trips may apply depending on the specifics of each site. A trip generation table shall summarize all trip generation calculations for the project.

- k. Trip Distribution – External trip distribution shall be determined on a project-by-project basis using one of several sources of information available to transportation and land planning professionals. Potential sources for determining project trip distribution may include the regional travel demand model, market analysis, existing traffic patterns, and/or professional judgment. At the City’s direction, multiple trip distributions may be required for differing land use types. Regardless of methodology, the procedures followed and logic for estimating trip distribution percentages should be documented in the TIA. Trip distribution percentages proposed for the surrounding transportation network shall be discussed during the Scoping Meeting and shall be approved by the City and NCDOT before proceeding with the TIA. A map showing the percentage of site traffic on each street included in the study area shall be included in the TIA.
- l. Trip Assignment – Site traffic shall be distributed to the surrounding transportation system based on the site’s trip generation estimates and trip distribution percentages. Future year build-out traffic forecasts (i.e., future-year background traffic plus site traffic) shall be represented in graphic formats for AM and PM peak-hour conditions at all study area intersections. If the project will be built in phases, traffic assignments shall be reported for each phase. Pass-by traffic shall be included at the proposed access points. Multiple assignment scenarios may be required if the traffic control at the accesses has the potential to vary (i.e., right-in/right-out vs. stop controlled vs. signalized).
- m. Operations Analysis – The TIA shall include vehicular operations analyses. Level-of-Service (LOS) and delay is the primary measures of effectiveness for impacts to the transportation system and is defined by the most current edition of the Highway Capacity Manual (HCM). Operations analyses shall be performed for the required existing and future-year scenarios. Impacts from the proposed project shall be measured by comparing the future year background conditions to the future year build-out conditions. Requirements for mitigation are described in Section 7.q.
- Vehicular Capacity Analysis – Unless otherwise noted, Synchro LOS and delay shall be reported for all signalized intersections and approaches identified in the study area. Based on HCM, LOS for unsignalized intersections is not defined as a whole; instead, only the individual approaches shall be reported based on the HCM results determined through the Synchro analysis. Existing signalized intersections shall be modeled based on available existing signal timing plans provided by either the City or NCDOT. Existing signal timing plans shall 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 shall be consistent with the most recent guidelines published by the NCDOT, Transportation Mobility and Safety Division, Traffic Management Unit, Congestion Management Section (“Capacity Analysis Guidelines -- Standards”). The City may also require safety, traffic simulation, gap and/or other analyses appropriate for

evaluating a development application. Additional analyses and/or traffic capacity or simulation tools (such as VISSIM or Transmodeler) required for the TIA shall be identified during the Scoping Meeting. All TIA reports submitted to the City shall use Synchro, SimTraffic, VISSIM, and/or Transmodeler analysis software for signalized and unsignalized intersections and Synchro and/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 LOS (LOS A – F), the intersection and approach signal delay for signalized intersections, the approach delay for unsignalized intersections, and 95th percentile queue lengths for all movements. Capacity analysis worksheets and NCDOT auxiliary turn-lane warrants for unsignalized intersections shall be included in the Appendix of the TIA report.

- Multimodal Analysis – the TIA/TTM may provide a multimodal assessment and/or pedestrian capacity analysis at the discretion of the City.
  - Multimodal Assessment – If required, a field inventory and documentation of the existing pedestrian, bicycle, and/or transit infrastructure will be performed. Review of the Comprehensive Pedestrian Plan and other available plans will be performed. Specific recommendations for site/property frontage, offsite roadway widening areas, and/or interconnectivity with adjacent properties will be made as applicable.
  - Pedestrian Capacity Analysis – If required and unless otherwise noted, the latest edition of the HCM or other agreed upon methodology shall be used to evaluate pedestrian LOS for the intersections identified in the study area.
  
- n. Queuing Analysis – 95th percentile and simulation analysis of future-year queues shall be consistent with NCDOT’s Transportation Mobility and Safety Division, Traffic Management Unit, Congestion Management Section current practices and published Capacity Analysis Guidelines -- Standards. Turn lanes and storage lengths for the major street (uncontrolled) approaches at unsignalized driveways 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 account for both the NCDOT warrants described above and to meet future-year capacity needs identified through the capacity analyses. For projects that include drive-through facilities, pick-up/drop-off areas, or entrance gates, a queuing analysis may be required by the City 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 the City. If a TIA is required for a new school site, the internal circulation and ingress/egress of the site shall be modeled using a “dummy signal” in the Synchro software as prescribed by NCDOT MSTAD department.

- o. Crash Analysis – A summary of crash data (type, number, and severity) for the most recent five-year period at each existing study intersection is required. Traffic Engineering Accident Analysis System reports will be provided by the City and/or NCDOT and shall 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 the existing crash rates. If contributing factors are identified, recommendations to eliminate or mitigate these features shall be included.
  
- p. Traffic Signal Warrants – City staff and/or NCDOT may consider potential traffic signal locations at the Scoping Meeting. However, traffic flow progression is of paramount importance when considering a new traffic signal location. A new traffic signal shall not cause an undesirable delay to the surrounding transportation system. Approval for traffic signal installation at a new location shall be based on the application of warrant criteria contained in the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD) and engineering judgment. Traffic signal warrants shall be included in the Appendix of the TIA report. Additionally, spacing of traffic signals must adhere to NCDOT requirements. If a full signal warrant analysis is recommended in the TIA, the City and/or NCDOT may decide to defer a signal warrant analysis until after the development has opened to allow use of actual turning movement counts at an intersection. The TIA recommendations must clearly state that this analysis shall occur at a specified timeframe or phase following the opening of the development. The applicant must issue a bond or letter of credit in the name of the City for the estimated cost of the signal warrant analysis and resulting signal as part of the TMA. The cost shall be established based on an engineer’s estimate provided by the consultant identified by the City.
  
- q. Mitigation Measure Recommendations – This section of the TIA report shall provide a description of the study’s findings regarding impacts of the proposed project on the existing and future transportation system and describe the location, nature, and extent of all mitigation measures recommended for the applicant to improve and/or maintain the future-year background LOS conditions through phasing and ultimate build-out of the project. This mitigation will be identified by measuring the impact between the future-year background conditions and the future-year build-out conditions. The applicant is required to mitigate transportation deficiencies caused solely by the projected impact of their proposed development, and not unacceptable background conditions or other deficiencies caused by offsite development within the defined study area.

The applicant shall be required to identify mitigation improvements to the transportation network if at least one of the following conditions exists when

comparing the operations analyses of future year background conditions to future year build-out conditions:

- the total average delay at an intersection or individual approach increases by 25% or greater, while maintaining the same LOS,
- the LOS degrades by at least one level,
- or the LOS is “E” or worse in the background conditions and the proposed project shows a negative impact on the intersection or approach.

If the background LOS (intersection or approach) is “E”, or “F”, the applicant will be expected to mitigate only the impact caused by the proposed project. For example, if the background LOS of an approach is LOS F with 85 seconds of delay, and the project traffic increases the delay to 95 seconds at LOS F, the applicant will be required to mitigate the added 10 seconds of delay on the approach, not the inadequate background delay. City and NCDOT staff will review the recommendations in the TIA and will have the ultimate determination in the scope of the required mitigation measures.

For multi-phase developments, the capacity analysis scenarios shall address the phasing of improvements for each phase of development. The build-out + 5 scenario will require the analysis of only five years beyond the full build-out year. The build-out + 5 scenario analysis is not used for mitigation purposes. A narrative and table shall be prepared that summarizes the methodology and measured conditions at the intersections reported in LOS (LOS A–F) and average control delay for each intersection and approach.

A narrative and map shall also be prepared that describes and illustrates recommended improvements, by development phase if necessary, for mitigating the projected impact of the proposed development.

A TMA as outlined in Section 6 may apply if mitigation requirements are needed.

- r. Payment-in-Lieu of Transportation Improvements – The applicant may request consideration of payment-in-lieu of required transportation improvements if the following conditions exist:
- The developer is unable to secure the needed right-of-way (ROW) for off-site transportation improvements.
  - Funded transportation projects overlap with the improvements associated with the development’s recommended mitigation.

For multi-phase projects, requests for payment-in-lieu consideration at the time of plan approval shall be limited to the first phase of development.

All payment-in-lieu requests shall include opinion of probable construction cost (OPCC) calculations prepared by the applicant that meet the following standards:

- All OPCC calculations must be prepared by a professional engineer licensed in the NC.
- OPCCs shall be based on a minimum of **15% engineered roadway design plans** per City of Locust Construction Standards and NCDOT Roadway Design Guidelines.
- The calculation shall include costs associated with remaining design needed, ROW acquisition, utilities, construction for the associated improvements, construction engineering and inspection, contingency (40%), and any other related soft cost that may be incurred by the project.

Any requests for payment-in-lieu received following a plan approval and/or associated TMA shall be considered an amendment to the approved plans.

If City Council, at its discretion, agrees to accept payment-in-lieu of transportation improvements for a development, the exact payment amount shall be verified at the time of construction plan review and shall meet the following standards:

- All OPCC calculations must be updated by a professional engineer.
- OPCCs shall be based on a minimum of **25% engineered roadway design plans** per City of Locust Construction Standards and NCDOT Roadway Design Guidelines.
- The calculation shall include costs associated with remaining design needed, ROW acquisition, utilities, construction for the associated improvements, construction engineering and inspection, contingency (30%), and any other related soft cost that may be incurred by the project.

All calculated cost estimates shall not be more than one year old at the time of acceptance by the City, and payment must be received prior to approval of the associated construction plans.

- s. Compliance with Adopted Transportation Plans – All TIA reports must include a statement of compliance with plans, programs, and policies adopted by the City of Troutman for maintaining a safe and efficient multi-modal transportation system.

7. Any street constructed, improved, or connecting to a state-maintained roadway shall conform to the specifications of the North Carolina Department of Transportation (NCDOT) and obtain approval from NCDOT prior to beginning construction.

**b. Permits and Fees**

1. No person, firm, or corporation shall remove, alter, or construct any street or perform any other improvement on any public street or dedicated street right-of-way without permits authorizing such improvements.

2. Driveways connecting to City streets or public right-of-way shall require a permit prior to installation and inspection by the City during construction of the driveway.

**c. Submittal Requirements**

1. Construction plans shall be submitted to the City as outlined in the Code of Ordinance for the City of Locust. Construction plans shall adhere to the specifications set forth by the City.

**d. Protecting the Public from Injury**

1. Whenever any person shall do or undertake to do any of the activities set forth in this Manual, it shall be the responsibility of such person to protect from harm and damage all persons who may be using any street or sidewalk or other public place where such activity is in progress. To that end, such person shall erect and maintain suitable signs, lights, barricades, and other traffic control devices at the proper location where such work is in progress. These safeguards shall be applied in accordance with the current (NCDOT) Work Zone Traffic Control, Section 1101-1180.

**e. Traffic Impact Analysis (TIA)**

1. A TIA shall be prepared by Professional Engineer registered in the state of North Carolina.

2. The City and the Developer will discuss possible firms to prepare the TIA. The City shall make the final decision of the firm preparing the TIA.

3. A TIA may be required to support the proposed improvements associated with a new development.

4. Once staff has determined a TIA is required, a scoping meeting shall be required to outline specific data to be included in the TIA. City staff, NCDOT, and the Developer are required at the scoping meeting. The Developer should invite the needed support staff of their design team.

5. During the scoping meeting, a Memorandum of Understanding shall be prepared by the City to specify the scope of work to be performed in the TIA.

6. All costs associated with the preparation of a TIA shall be encumbered by the developer.

7. The review of the TIA shall be the responsibility of the City of Locust and/or the NCDOT.

8. Adoption of specified improvements listed in the TIA shall be agreed upon by the City of Locust, NCDOT, and the developer prior to plan approval. An Agreement of Mitigation form

outlining the prescribed measures of improvement shall be executed by all entities listed above and/or responsible party with the proposed development.

9. All improvements agreed to be performed for the development shall be completed prior to acceptance of the Final Plat and/or Certificate of Occupancy unless otherwise noted in the executed agreement.

10. All costs of the improvements shall be the responsibility of the Developer unless otherwise noted.

11. Any TIA prepared for developments within the jurisdictional limits of the City of Locust shall follow the criteria and methodology of the ITE Trip Generation Manual.

12. A TIA shall be required when the following criteria is met or exceeded:

- a. 1,000 trips for site specific developments (within a 24-hour period).
- b. 75 trips for residential developments during peak hours.
- c. 100 trips for other developments on adjacent roads and development roads during peak hours.
- d. Upfits, redevelopment, expansion, and/or change of use projects will be evaluated by staff for the need and requirements of a TIA.
- e. For the purpose of this document, Peak Hours shall be defined as 7:00AM to 9:00AM and 4:00PM to 6:00PM.

13. Expansions, upfits, and/or change of use applications will require the staff to determine the appropriate TIA trip generation threshold for each use. Trip generations for the proposed site shall be compared to the trip generations of the current site within the past six-month period. Development approvals within the most recent five-year period will be included in the trip generation unless a separate TIA has been performed for the previously approved development. Notwithstanding the values above, a TIA shall be required for a site-specific development plan if City staff determines one of the following conditions exist:

- a. Traffic generated from a non-residential development will significantly impact adjacent residential neighborhoods.
- b. 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.
- c. Traffic safety issues exist at intersections or streets that would serve the new development.
- d. The proposed land use differs significantly from that contemplated in the adopted Locust Land Use Plan.
- e. The internal street or access system is not anticipated to accommodate the expected traffic generation.
- f. 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.

14. The capacity analysis included in the TIA shall utilize the Highway Capacity Manual and signalized intersections shall incorporate information from the City of Locust and/or NCDOT.

15. For developments with multiple phases, the TIA shall account for traffic counts of each phase as they are completed, as well as the cumulative traffic counts at the completion of the development.

16. Crash data within the scope of the project limits shall be included for a 3-year period for the following criteria:

- a. Type
- b. Number
- c. Severity

17. Level of Service (LOS) shall show no signs of degradation or further delays on intersections with a current LOS of E or F.

18. The NCDOT Municipal School Transportation Assistance (MSTA) calculator should be used to calculate the projected trip generation for school sites. School sites may need to be sent to NCDOT MSTA in Raleigh for review as part of the review process.

#### **f. Administrative Controls**

1. The City of Locust recognizes that not all streets will be able to conform to every standard set in this Manual. Any street needing special attention due to exceptional conditions will be handled on a case-by-case basis. City of Locust reserves the right to override the standards set forth in this Manual should the street necessitate such action. If, based on sound engineering judgment, there is a question as to whether or not a site will qualify for a variance in any standard documented in this Manual, The City of Locust Public Works should be contacted to discuss that potential variance.

#### **4.2.2 Bonding**

The following list contains information regarding the bonding process including minimum amounts, duration, and security type.

1. Release of the final subdivision plat will not occur until the improvements required for the area of the final plat is constructed and a final inspection has been performed and found to be in conformance with the plans approved by the City.

2. Securities shall be posted for a minimum of six months with a two (2) year maximum. The security shall be posted and remain in force until the construction is complete and found to be in conformance with the plans approved by the City. The security will be reevaluated when an extension to the security is being considered.

3. Upon receipt of a notice from the bond holder, a final inspection will be made by the Director of Public Works, or a designated representative to check completeness of the project.

4. One type of security may be replaced by another type of security in certain situations. The amount of the replacement security will be based on the Director of Public Works estimate of the work remaining. If the estimate of work results in a lower amount, the replacement security will be treated as a reduction. Certain situations will require an increase in a security and in such cases the replacement security shall be required to equal the higher amount.