

UDO-CC6
A TEXT AMENDMENT PROPOSED BY PLANNING AND DEVELOPMENT SERVICES STAFF TO AMEND SECTION 12.2 OF THE UNIFIED DEVELOPMENT ORDINANCES RELATING TO TRAFFIC IMPACT STUDY STANDARDS

Be it ordained by the _____, North Carolina, that the Unified Development Ordinances is hereby amended as follows:

Section 1. Section 12.2 Traffic Impact Standards is amended as follows:

12.2 TRAFFIC IMPACT STUDY STANDARDS

A. INTENT

~~In accordance with G.S. 160A-174(a), "a city may by ordinance define, prohibit, regulate, or abate acts, omissions, or conditions, detrimental to the health, safety, or welfare of its citizens and the peace and dignity of the city, and may define and abate nuisances." NC Gen. Stat. 160A-174(a) (hereinafter the General Statutes will be cited as G.S.). The comparable county statute is G.S. 153A-121; which provides counties are not authorized to regulate or control vehicular or pedestrian traffic on a street or highway under the control of the Board of Transportation. However, G.S. 153-A-341 and our local act provide that zoning regulations shall be designed to lessen congestion in the streets and to facilitate the adequate provision of transportation.~~

1. These standards are intended to provide the City-County Planning Board, and all other local elected and appointed boards located within Forsyth County the information necessary to make informed decisions regarding planned development impacts to traffic on their roads.
2. By adopting these standards the City-County Planning Board seeks to ensure that:
 - a. All decisions regarding traffic impacts due to development are based upon technical study, and
 - b. Needed improvements are made in a cost effective and efficient manner.

B. APPLICABILITY

1. ~~The City-County Planning Department~~ **Board** (CCPB) **staff**, ~~and the Winston-Salem Department of Transportation (WSDOT) and/or the North Carolina Department of Transportation (NCDOT) may review all-proposed development plans for traffic impacts and these agencies are considered staff to the Winston-Salem Board of Aldermen, Forsyth County Board of Commissioners, the City-County Planning Board, and all other local elected and appointed boards. The WSDOT and/or the NCDOT still have the ultimate responsibility for resolving questions concerning traffic impact studies. To facilitate the determination of adequacy of adjoining public transportation facilities these~~ **These** agencies may recommend that a traffic impact study be performed for any proposed **commercial, industrial or institutional development that meets the trip generation threshold of this ordinance.** ~~or non-residential single family subdivision.~~
2. It is recommended that before anyone performs **Anyone performing** a traffic impact study in Forsyth County they **shall** contact the WSDOT and/or the NCDOT to determine the traffic concerns of each

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agency and/or jurisdiction or to request a ~~pre-study conference~~ multi-agency meeting. These standards are intended to define study limits and analysis procedures acceptable to the WSDOT and/or the NCDOT. Any suggestion for additional analyses will be made at the time of initial contact, at the multi-agency meeting or by the mitigation plan (see Sections 20 and 21).

3. These standards are intended to provide structure for the traffic study preparer, where **Individual** study recommendations will be determined on a case by case basis. If the traffic impact study submitted does not adhere to the established standards, then a revised study may be requested based on suggestions by the WSDOT and/or the NCDOT officials and should be prepared by the applicant for submission.
4. All traffic impact studies should conform to sound engineering principles and are subject to review by the WSDOT and/or the NCDOT. ~~Three copies of the~~ **The** study should be submitted **electronically** to the Planning Department, who will, upon receipt, distribute one copy each to the Winston-Salem Department of Transportation and the appropriate NCDOT Division 9 Engineer. ~~When other jurisdictions and/or agencies are within the study area, additional copies of the study may be requested by that other jurisdiction (see item 4) and/or NCDOT (see item 5).~~
5. All methods used for analysis other than those mentioned in these standards ~~should~~ **shall** be explained, ~~(include references),~~ and their limitations described in an appendix to the traffic impact study. It should also be noted that for planning purposes, the planning department in consultation with the WSDOT and/or NCDOT has the final authority over the number and location(s) of driveways for any proposed development. NCDOT/WSDOT, in cooperation with the local planning department, will determine the engineering adequacy of any proposed driveways.

C. BASIS FOR REQUESTING A TIS

1. A traffic impact study may ~~shall~~ be **required** requested during the contact and/or multi-agency meeting according to any of the following:
 - a. Any proposed development petitioned ~~s~~ **Special Use District Rezoning, Planning Board Review, or subdivision** that will increase the approach traffic volumes at intersections or roadways by 150 or more vehicles in the peak hour.
 - b. Proposed development is in the vicinity of areas previously identified as having levels of service "E" or "F", hazardous locations, or other **similar** adequacy concerns ~~(as determined by NCDOT, MPO, County, or City of Winston-Salem agencies).~~
 - c. Where a reduction in safety is expected at intersections or roadways. A traffic signal warrant study may still be requested by NCDOT or WSDOT even if a traffic impact study is not.
- ~~2. In the land planning and development process a study may be recommended, based on the following:

A contact or multi-agency meeting will address the recommendations for and scope of the proposed study. The contact or multi-agency meeting provides a means to discuss the traffic concerns expressed by the developer, reviewing agencies and jurisdictions responsible for traffic operations in the vicinity of the proposed project site.

The traffic impact study may be performed and completed and due to City County Planning Board along with a filing for special use district rezoning, and/or non-residential subdivision.~~

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- d. ~~In those instances where~~ **Where** a proposed development ~~or non-residential subdivision project~~ has been approved by the City-County Planning Board or any other elected board in Forsyth County based on recommendation from an acceptable traffic impact study and that project has not been completed ~~after~~ **within** two (2) years of the date of approval, an updated traffic impact study may be ~~required~~ **recommended**. If changes are made to the pre-approved site plan ~~or non-residential subdivision plan~~ that will require a new approval from the City-County Planning **Board** or other elected ~~or appointed~~ board, ~~in Forsyth County then~~ a new and/or updated traffic impact study may be ~~required~~ **recommended**.
3. ~~This recommendation may be waived by the Director of WSDOT and/or the Division Engineer of NCDOT Division 9 upon written request by the petitioner providing upon adequate justification for such waiver. The WSDOT and/or NCDOT shall respond in writing. Both letters shall be submitted with the proposed development petition.~~

D. STANDARDS FOR REVIEW

- 1.4. A Traffic Impact Study ~~can~~ **shall** only be performed by a Professional Engineer licensed by the North Carolina Board of Registration for Engineers and Land Surveyors, to practice engineering in North Carolina, ~~and~~ with experience in the preparation of traffic impact studies.
5. ~~When performing a Traffic Impact Study in Forsyth County consideration should be given to the City-County Planning Board, the Winston-Salem Board of Aldermen, Forsyth County Board of Commissioners and/or other jurisdictions.~~
- ~~The City-County Planning Board has the authority to review and approve non-residential subdivision plans within their respective jurisdictions. The Winston-Salem Board of Aldermen and the Forsyth County Board of Commissioners have the authority to approve or disapprove of proposed developments within their respective jurisdictions. It is recommended that the contact and/or multi-agency meeting for proposed developments within multiple jurisdictions include a representative from each jurisdiction that is familiar with traffic issues concerning each jurisdiction (see the appendix for elected and appointed Boards meeting times, and locations, and phone numbers for each jurisdiction's contact person).~~
- ~~Other government agencies (both state and local) may be requested by the Director of Planning to review any traffic impact study. When reviewing a traffic impact study in this capacity, other government agencies are to be considered as staff subordinate to the staff of the Planning Board recommending the traffic impact study.~~
6. ~~Considerations should also be given to the NCDOT to eliminate any duplication of study recommendations, arrangements will be made by the City-County Planning Board to have a representative from the appropriate NCDOT Division 9 office present at the multi-agency meeting (or send their recommendations). This representative should indicate the NCDOT recommendations for a traffic impact study.~~
- 2.7. The following areas of investigation ~~will~~ **shall** generally be included in a Traffic Impact Study ~~(The exact parameters may be defined at the contact and/or multi-agency meeting conference.):~~
- An examination of traffic flows, exclusive of the site being studied, defined as "background traffic";
 - An examination of projected traffic flows when site traffic is added, defined as "total traffic";

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- c. A discussion of mitigation measures (if such measures are recommended);
 - d. An examination of projected traffic flows after **the** site is developed and mitigation measures are implemented.
- 3.8.** Traffic ~~should~~ **shall** be examined as follows:
- a. From data collected by persons or agencies within the defined study area which is no more than two years old at the time of **study preparation** ~~the pre-study conference~~;
 - b. From traffic counts obtained by the applicant based on the specification established at the pre-study conference (~~see item 13~~).
- 4.9.** The study area ~~should~~ **shall** be determined as follows:
- ~~As a minimum standard, the~~ **The** study area should include each intersection with a major thoroughfare highway which can be considered as a logical travel path between the site and the major thoroughfare highway network. Major thoroughfare highways are so designated by the Winston-Salem/Forsyth County Thoroughfare (or Transportation) Plan. **The study area(s) should be reviewed and approved by WSDOT or NCDOT prior to preparing the study.**
- Additional intersections between the site and the major thoroughfare intersection(s) as well as those intersections that are rationally identified as being impacted by a development ~~should~~ **shall** be included in the study area.
- 5.10.** The design hour ~~should~~ **shall** be determined by:
- a. The period for the proposed development which will generate/attract the highest traffic volumes; and/or
 - b. The period of highest traffic volumes on the traffic facilities within the study area.
- 6.11.** The forecast year ~~should~~ **shall** be determined ~~at the contact or multi-agency meeting~~ according to some or all of following criteria:
- a. A scheduled phase or the completion of the project (for this and other projects);
 - b. The Winston-Salem/Forsyth County Comprehensive Plan (~~Legacy~~);
 - c. Locally adopted Transportation or Thoroughfare plan or capital improvement program schedule, or Transportation Improvement Program;
 - d. Major transportation system changes.
- 7.12.** The following technical procedures and guidelines ~~should~~ **shall** be used:
- Roadways and intersections ~~should~~ **shall** be analyzed using the appropriate analysis method as depicted in the latest edition of the Highway Capacity Manual, Transportation Research Board. Additional analyses may ~~or may not~~ be recommended depending on the traffic concerns expressed at the pre-study conference.
- 8.13.** The minimum standard for traffic operations is defined as follows:
- Level of service "D" is the lowest level of service that should be considered adequate for intersections and roadway approaches to intersections in Winston-Salem and Forsyth County. ~~However, n~~ **No** development should bring a level of service down by more than one level without implementing roadway improvements.
- 9.14.** Background traffic ~~should~~ **shall** be determined by:
- ~~Background traffic on roads in the study area should be determined by~~ thoroughfare classification, as per the most current locally adopted Winston-Salem/Forsyth County Transportation or Thoroughfare Plan document:

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- a. By historic and/or projected traffic increase rates on roads classified as being major thoroughfares (arterial or major collectors); and
- b. By developments/trips that have been approved (recorded) on roads classified as minor thoroughfares or streets (minor collectors or local roads).

~~Existing zoning activity information is available at the City-County Planning Department, at 336-727-2548. Average Daily Traffic (ADT) information is available from the Winston-Salem Department of Transportation at 336-727-2707 and/or the NCDOT Division 9 Traffic Engineering Office at 336-631-1375.~~

10.15. Trip Generation, Distribution and Assignment ~~should~~ **shall** be determined by:

~~Trip generation should be determined by~~ using the following:

- a. The latest edition of the Trip Generation Manual, Institute of Transportation Engineers, ~~(cite land use code and page number);~~ or
- b. Documented local trip generation rates, (as determined through previous or current studies).

Trip distribution ~~should~~ **shall** be determined by using the following:

- ~~c.a.~~ Gravity model;
- ~~d.b.~~ Trip assignment of the traffic demand forecasting model;
- ~~e.c.~~ Utilization of demographic data leading to trip purpose and trip tables;
- ~~f.d.~~ Current directional distribution only if no future changes to land use and no improvements to transportation facilities are expected until the design year;
- g.e.** Trips should be assigned to the study area network during the study's design hour.

11.16. Pass-by Trips ~~should~~ **shall** be determined by using either of the following:

- a. The Institute of Transportation Engineers pass-by trip rates; or
- b. Documented local pass-by trip rates, (as determined through previous or current studies).

12.17. Traffic ~~should~~ **shall** be apportioned to the proposed project in the following manner:

- a. First, the projected level of service for the study area is forecast without the proposed project.
- b. Second, the projected level of service is forecast with the addition of the proposed project. ~~Then~~ **The** two forecasts are **shall be** evaluated to determine whether the traffic projected to be generated by the proposed development will lower the projected Levels of Service (LOS) within the study area to below LOS "D" or one level below the current level of service.

13.18. When a traffic impact study projects that the intersection(s) or roadway(s) in the study area will be inadequate ~~then the following occurs:~~ **meet the level of service standard**

~~Once a plan has met the level of service standard, and other~~ **identified** recommendations **have been addressed,** ~~identified in consultation or in the multi-agency meeting no further approval for traffic impact is to be recommended by the City-County Planning staff~~ **shall make no further traffic impact recommendations** Department. However, it is possible that the NCDOT Division Engineer or the Winston-Salem Department of Transportation may still recommend additional analyses and/or improvements.

14.19. When a traffic impact study projects that the intersection(s) or roadway(s) in the study area will be inadequate then ~~either of the following alternatives may be considered by the City-County Planning:~~

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- a. The project is deferred or reduced in scope so that the level of service standard is not exceeded, or
- b. A mitigation plan is submitted for review by Planning ~~the CCPB, the WSDOT and/or the NCDOT staff~~. The mitigation plan together with the recommendations of ~~the departments staff~~ are presented to the Planning Board and elected body, where required ~~subsequently to the appropriate elected board with a recommendation from the City-County Planning Board~~. The elected body has the authority to either approve or disapprove those projects ~~solely under its jurisdiction~~.
 - i. A mitigation plan is:
 - 1. An addition to a traffic impact study, (the recommendation for which is identified by preliminary study results);
 - 2. Intended to identify specific causes of lowered levels of service (traffic impacts);
 - 3. Recommends improvements that will moderate the effects of projected traffic impacts;
 - 4. Recommends transportation demand management options.
 - 5. Examples of possible mitigation plan improvements may include, but are not limited to: construction of new roads, road improvements, traffic signals, ridesharing programs, off-site parking facilities and para-transit, signal timing/phasing changes, channelization modifications, changes in ingress/egress points, reducing the number of entrances, and/or lane widening.
 - ii. Mitigation Plan improvements may be phased and shall be sensitive to the following:
 - 1. Timing of short-term and long-term network improvements that are already planned, scheduled and/or funded;
 - 2. Time schedules of adjacent developments;
 - 3. Size and timing of individual phases of development;
 - 4. Right-of-way needs and availability of additional right-of-way within appropriate time frames;
 - 5. Local priorities for transportation improvements and funding;
 - 6. Local priorities for transportation demand management strategies;
 - 7. Necessary lead time for additional design and construction;
 - 8. That the sum of improvements are proportional to the projected Impact.
Analysis of traffic needs by development phase should provide the information needed to determine the appropriate sequence of improvements.
 - iii. ~~€~~ The improvements recommended in the mitigation plan are the sole responsibility of the developer to implement unless 100% of construction costs for the projected improvements are in the subject budget year of the seven year Transportation Improvement Program or the local Government's Capital Improvements Program.
- c. ~~d.~~ The developer may agree to pay fees to fund the necessary improvements by written agreement with ~~the~~ WSDOT and/or NCDOT.

19A.

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- d. If the existing level of service is inadequate (i.e., "E" or "F"), or the existing plus the background growth (not including the site) causes an inadequate level of service, then the developer shall will be expected to mitigate only the traffic to be generated by the proposed project.

19B.

- e. If the proposed development is of significant economic importance it may be recommended that the developer be granted an exception and/or waiver where improvements are scheduled or included in either the NCDOT TIP or locally approved Capital Improvements Program.

20. A mitigation plan is:

- ~~a. An addition to a traffic impact study, (the recommendation for which is identified by preliminary study results);~~
- ~~b. Intended to identify specific causes of lowered levels of service (traffic impacts);~~
- ~~c. Recommends improvements that will moderate the effects of projected traffic impacts;~~
- ~~d. Recommends transportation demand management options.~~

~~Where legally allowed, examples of possible mitigation plan improvements may include, but are not limited to: construction of new roads, road improvements, traffic signals, ridesharing programs, off-site parking facilities and para-transit, signal timing/phasing changes, channelization modifications, changes in ingress/egress points, reducing the number of entrances, and/or lane widening.~~

21. Mitigation Plan improvements may be phased and shall be sensitive to the following:

- ~~a. Timing of short term and long term network improvements that are already planned, scheduled and/or funded;~~
- ~~b. Time schedules of adjacent developments;~~
- ~~c. Size and timing of individual phases of development;~~
- ~~d. Right of way needs and availability of additional right of way within appropriate time frames;~~
- ~~e. Local priorities for transportation improvements and funding;~~
- ~~f. Local priorities for transportation demand management strategies;~~
- ~~g. Necessary lead time for additional design and construction;~~
- ~~h. That the sum of improvements are proportional to the projected impact.~~

~~Analysis of traffic needs by development phase should provide the information needed to determine the appropriate sequence of improvements.~~

15.22. Additional analyses, with references, may be recommended, typical examples including but not limited to Sight Distance Analysis, Signal Warrant Analysis, Environmental Analysis, and Traffic Signal Progression Analysis with references are as follows:

~~Sight Distance Analysis, Improvement Plan for Geometric Conditions, – A Policy on Geometric Design of Highways and Streets, American Association of State Highway Transportation Officials, 1990.~~

~~Signal Warrant Analysis, Traffic Control Plan During Construction – Manual of Uniform Traffic Control Devices, Federal Highway Administration, 1988.~~

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~~Traffic Signal Progression Analysis – any recognized software application (i.e., PASSER 11 or TRANSYT 7F).~~

~~Local Trip Generation Study, Pass-By and Diverted Linked Trip Analysis – ITE Trip Generation Manual, latest edition.~~

~~Accident Analysis, Transit Analysis, Pedestrian Analysis, Parking Analysis – Traffic Engineering Handbook, Institute of Transportation Engineers.~~

~~Environmental Analysis – For specific treatments contact the local and NCDOT Environmental Agencies.~~

23. Findings, Conclusions and Recommendations of the traffic impact study may be presented and documented in the following manner:

The following format (as depicted below) is recommended to be used as a guide for the presentation of those items as required in the pre-study conference:

~~Chapter I Executive Summary~~

~~A. Development description~~

~~B. Pre-study contact/multi-agency meeting work scope, site location & study area (w/map).~~

~~C. Principal findings with Level of Service Map~~

~~D. Conclusions~~

~~E. *Mitigation Plan Summary~~

~~Chapter II Description of All Proposed Developments in Study Area~~

~~A. Off-site approved future developments in the area (w/map).~~

~~B. On-site developments & phasing to include build-out year (w/map)~~

~~Chapter III Existing Conditions~~

~~A. Site accessibility~~

~~B. Traffic Volumes Map & Level of Service Map~~

~~C. Illustration of existing road & intersection lane use configurations~~

~~Chapter IV Projected Conditions without Proposed Development During Build-out Year~~

~~A. Site accessibility~~

~~B. Projected Background and Regional Traffic Volumes Map & Level of Service Map~~

~~C. Illustration of projected road and intersection lane use configurations~~

~~Chapter V Projected Conditions with Proposed Development at Projected Completion~~

~~A. Site accessibility~~

~~B. Projected Traffic Volumes Map & Level of Service Map~~

~~C. Illustration of projected road & intersection lane use configurations (if different than Chapter IV, part C).~~

~~Chapter VI* Mitigation Plan/or Additional Analysis Recommended Appendix~~

~~A. * Description of analysis method(s).~~

~~B. * Statement of method(s) limitations~~

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~~C. Count Data~~

~~D. Software Work Sheets~~

~~*Optional items that are required during the contact/multi-agency meeting or included by the person(s) performing the traffic impact study.~~

24. ~~Level of Service (LOS) Descriptions~~

~~LOS A Free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent. Turning movements are easily made.~~

~~LOS B Upper range of stable operation, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.~~

~~LOS C Mid range of stable flow, but is the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream, but not objectionably so. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. Back-ups may develop behind turning vehicles. The general level of comfort and convenience declines noticeably at this level.~~

~~LOS D High density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level. Delays to vehicles approaching signalized intersections may be substantial peak hours.~~

~~LOS E Unacceptable, operations near capacity. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.~~

~~LOS F Unacceptable, forced or breakdown flow, representing jammed conditions. The amount of traffic approaching an intersection cannot be accommodated adequately.~~

Section 2. This ordinance shall be effective upon adoption.

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