

Article 14, Appendix B:
CRITERIA FOR TRAFFIC IMPACT ASSESSMENTS

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A. Purpose and Intent

In urban communities throughout the Virginia, transportation planning is becoming an ever increasing consideration in the evaluation of private land development projects. Increasingly, local ordinances are requiring developers to fully document the impacts of traffic and the capacity of existing road systems in conjunction with planning applications. Traffic impact assessments are a much needed “tool” in the Town’s growth management approach. It is the purpose of this section to outline the recommended process for conducting traffic evaluations and to provide an efficient means for the incorporation of transportation systems analysis for future development projects, including redevelopment activities in Smithfield.

Transportation issues typically reach their point of “maximum controversy” at the time when new development proposals are submitted to the Town. More often than not, land development proposals are submitted for appropriately zoned parcels for which only subdivision and/or site plan approval is required. At this stage, the ability of the Planning Commission to substantially alter the course of traffic and street improvements is diluted given the ministerial nature of the plat and plan approval process. In such cases, the Town has a relatively narrow platform upon which to engage the developer as to how his project relates to: (1) existing street deficiencies, (2) Comprehensive Plan traffic and transportation recommendations, (3) coordinated on-site circulation systems, (4) coordinated off-site improvements and (5) fiscal and financial obligations to implement necessary improvements in conjunction with development activities.

The planning and programming of future residential streets within Smithfield will be a responsibility of private landowners and developers as new subdivisions and site development is undertaken. It shall be incumbent upon the Town to assure that new residential developments are designed to ensure:

1. *properly-scaled internal hierarchies of street layouts,*
2. *pavement widths, curbing and right-of-way improvements compatible with planned residential density levels,*
3. *adequate access to collector streets and minor arterioles in order to optimally distribute internal traffic generation,*
4. *new streets conform to contemporary residential street geometry and intersectional design criteria,*
5. *sufficient on-street parking is provided to serve residents and guests,*

6. *high quality street signage, signals and lighting provisions for vehicular and pedestrian safety,*
7. *adequate provisions of sidewalks and accommodation of pedestrian needs,*
8. *the feasibility of special vehicular movements, such as fire equipment and snow plowing, and*
9. *incorporation of street plantings and other buffer-oriented landscaping.*

One step in the right direction is to integrate transportation impact evaluations into the Town's growth management process, particularly by establishing a process by which the developer is held more accountable to the public sector in the analysis, planning and implementation of road improvements necessitated by the development proposal. Prior to this time, the Town has not required traffic impact assessments for major rezonings or special use permits. Also, no traffic analysis has been required by ordinance for subdivision and site plan submissions, and there have been no standards and criteria established for the use of traffic studies.

B. General Requirements for Traffic Impact Assessments

Traffic impact standards are recommended for use in all new land development and redevelopment activities which could potentially generate a sufficient level of traffic adversely impacting the Town street system . Development plans with densities of a certain "threshold" size should be required to submit a Traffic Impact Assessment (TIA), prepared by a registered professional engineer, unless this requirement is waived by the Planning Commission. In addition, TIA studies may also be needed where constraints are present on the existing roadway system, where the proposed development would require modifications to the off-site roadways in the area or where future road rights of way may be impacted by the new development. Generally, if any uncertainty exists regarding the need for such a study, it is advisable that one be required. Thus, unless otherwise directed, traffic impact assessments shall be required for all subdivision and site development activities at the sole discretion of the Planning and Zoning Administrator or the Planning Commission.

The TIA normally includes a description of the scope and intensity of the planned project, a summary of the projected impacts and any required mitigation measures. The TIA should consist primarily of an analysis of critically impacted on- and off-site intersections during the evening and site peak hour periods, as well as a description of the transportation characteristics of the site circulation plan of the proposed use. This would also include circulation plans of existing uses.

TIA studies should be submitted well in advance of finalization of the applicant's site plan or final subdivision plat. Significant transportation issues, including the review and acceptance of traffic studies, must be resolved prior to the date of the scheduled public hearing. Consequently, traffic

analyses should generally be submitted roughly six to eight weeks prior to the Planning Commission hearing in order to allow for review and coordination among Town Staff and the Virginia Department of Transportation (VDOT), if required.

By following the study and assessment format presented herein, it is anticipated that substantial efficiencies in Town Staff review can be achieved, with the additional benefit of ensuring consistency among various studies. Compliance with these recommendations will result in significant reductions in staff review time required. As a result, the identification of issues requiring further study should be greatly facilitated, and the overall efficiency of reviewing development applications greatly enhanced.

The staff review and assessment of a TIA should be primarily concerned with the Level of Service (LOS), operational and safety impacts of a transportation scheme proposed by a developer and by the introduction of the site-generated traffic to the public street and road systems. The assessment should consider the need for such improvements as additional through lanes, acceleration/deceleration lanes, left turn lanes, signage, traffic calming, signage and signalization. Recommendations should be included pertaining to design guidelines for engineering geometries, as well as off-site improvements necessitated by the development of the planned project.

The geographical area to be studied will vary with the quantity and quality of site-generated traffic and the excess capacity of the existing road network. The impact analysis should extend as far as the site-generated traffic has a significant impact. VDOT should be consulted in establishing the study area boundary for each project. Normally this evaluation would be limited to the points of access, adjacent intersections, and on divided highways, the points where "U-turns" to and from the development would be made. However, for large developments the analysis may extend a considerable distance from the site.

In general, the typical TIA report should contain the following information:

1. *A brief description of the proposed development and the proposed access scheme.*
2. *A formal traffic study evaluating discrete land use alternatives and transportation networks in separate sections.*
3. *A formal traffic analysis evaluating the proposed land uses. The land use and transportation network components of each analysis should include the following evaluations:*
 - A. *No Build/Existing Conditions: site development (existing network, committed network, modifications of network)*

- B. *Comprehensive Plan Conditions: Existing zoning/existing planning (existing network, committed network, modifications of network with application)*
 - C. *Proposed Project Conditions: Future land use, as proposed in the developer's application (existing network, committed network, modifications of network with application)*
4. *A quantitative estimate of the volume and distribution pattern of site-generated traffic for the hours of maximum impact on the local and regional road networks (incorporating Institute of Transportation Engineers (ITE) rates unless better information is available).*
 5. *An estimate of background traffic and projections of future background traffic based on the adopted land uses in the Smithfield Comprehensive Plan, regional transportation planning studies and commonly accepted demographic projections developed for establishing projections and growth rates.*
 6. *Existing and projected Levels of Service for background traffic.*
 7. *Estimated Levels of Service, based on the use of Highway Capacity Manual calculation techniques, with the addition of future site-generated traffic on the existing Town roadway configurations and configurations proposed by the developer for the existing year and for the future years.*
 8. *Recommendations for transportation system improvements to ameliorate the impacts of the site-generated traffic.*

C. Guidelines for TIA Preparation

The following is intended as a guide for the preparation of traffic impact assessment studies. Since the guide cannot feasibly cover all situations, some reports will require additional information. The traffic consultant should discuss the project scope with the Planning and Zoning Administrator in advance of preparing the study to determine the physical boundaries of the area of analysis, the intersections to be studied, the trip distribution method to be used and any additional study elements will be required by the Town.

1. Project Description

- A. Type of project
- B. Square footage by use (i.e. office, retail, medical, etc.), number of dwelling units or other appropriate units to indicate the size of the project
- C. Project density (FAR, du/ac, etc.)
- D. Location maps
- E. Site plan(s) showing:
 - 1. Auto, transit, pedestrian and service vehicle access
 - 2. Parking facilities (number of spaces, dimensions, circulation pattern, conformity to code)
 - 3. Truck loading areas (number of spaces, dimensions)
 - 4. Proposed sidewalks/street improvements
 - 5. Relationship and responsiveness to the adopted Comprehensive Plan and to other applicable transportation plans and studies.

2. Existing Conditions

- A. Study Area
 - 1. Location maps
 - 2. Approved but not completed or occupied projects
- B. Street System
 - 1. Number of travel lanes
 - 2. Bike lanes
- C. Traffic Conditions
 - 1. Map showing the Average Daily Traffic (ADT) levels on major streets (based on VDOT counts, adjusted for current year volumes)
 - 2. Diagrams showing AM/PM peak hour turning movements at study intersections (based on current counts and/or counts taken by traffic consultant.)
 - 3. Peak hour level of service at study intersections (utilizing techniques prescribed in the Highway Capacity Manual)
- D. Transit System
 - 1. Map showing locations of existing or planned transit lines and/or bus stops
 - 2. Peak hour/midday frequency of service

3. Analysis of Existing Conditions

- A. Traffic Characteristics (Tables and diagrams to be included in TIA)
 - 1. Daily/peak hour trip generation, in/out ratio and turning movements from the proposed development for each land use/transportation network combination required (using information from the ITE Traffic Generation Manual or other accepted documentation).
 - 2. Daily/peak hour trip generation, in/out ratio from approved but not completed or occupied developments in the project area (Use information from the Future Land Use Plan and approved development plans and apply the ITE Trip Generation Manual).
 - 3. Trip distribution, with map showing geographical distribution and direction of approach (incorporating data from regional traffic studies and models).
 - 4. Assignment (volumes and turning movements) to each link in the network analyzed.
 - 5. Traffic assignment, with map showing turning movements attributable to the project site at analysis intersections.
 - 6. Level of Service Analysis for each major intersection affected (analyze for each alternative). Include lane geometry, assumed signal phasing and critical volumes for each phase.
 - 7. Scale drawing showing the existing and proposed intersection geometry for any intersection to be improved in conjunction with the application.
- B. Traffic Impact
 - 1. Peak hour level of service and Velocity to Road Capacity (V/C) ratios and Level of Service at critical intersections calculated by techniques prescribed in the Highway Capacity Manual for signalized and un-signalized intersections for the following conditions:
 - (1) existing,
 - (2) existing plus approved development plus project and
 - (3) cumulative development with project (cumulative traffic forecasts require use of Comprehensive Plan.
 - 2. Evaluate warrants and other related needs for traffic signals at un-signalized intersections.

- C. Access and Circulation Analysis
 - 1. Identification of driveway location and spacing
 - 2. Delineation of sight distance at driveways and intersections
 - 3. Evaluation of maneuvering/docking impacts
 - 4. Analysis of curbside loading zone impacts
- D. Parking Analysis
 - 1. To include a parking generation needs analysis using ITE's parking generators data or other accepted research.
- E. Signalization Warrants Analysis
 - 1. Develop a formal signalization warrants analysis per VDOT regulations.

4. Recommended Transportation Improvements and Mitigation Measures

- A. Proposed/suggested measures and improvements for mitigating adverse transportation impacts of the planned development. (Mitigation is normally required for any intersection with a projected cumulative V/C ratio of greater than 0.85, and the mitigation strategy should reduce the V/C ratio to 0.85 or lower.)
- B. Peak hour level of service and V/C ratios at critical intersections calculated by techniques prescribed in the Highway Capacity Manual and tabulated for the mitigated condition.
- C. Characteristics of recommended transportation improvements to provide adequate service levels and to mitigate projected traffic impacts. To include the following:
 - 1. On-site circulation systems, including geometry and lane requirements
 - 2. Off-site and street frontage traffic improvements, including geometry and lane requirements
 - 3. Signalization
 - 4. Signage
- D. Discuss the prospects for the application of Traffic Safety Measures (TSM's) to reduce the potential number of vehicular accidents in the area.
- E. Discuss the prospects for the application of Traffic Calming measures.
- F. Discuss the prospects for the application of formal car pooling programs and for the availability of public transportation opportunities.
- G. Discuss compatibility with local and state plans, such as thoroughfare plans, six year improvements plan, future land use plan, official map, official zoning map, and/or overlay district maps.

5. Phasing

- A. If portions of (or the entirety of) required on-site circulation systems and/or off-site frontage and road improvements are not planned to be constructed in the initial phase of the planned development, the adequacy of the road improvements to be constructed with each phase of development should be demonstrated.
- B. An implementation program for on-site and off-site transportation improvements shall be provided along with an acceptable financing plan and proffer.
- C. The relationship of the project to the Capital Improvements Plan including formal cash proffer considerations shall be permitted.

6. Acronyms and Definitions

The following acronyms appear frequently in this section:

ADT:	Average Daily Traffic
DU/AC	Dwelling Unit Per Acre
FAR:	Floor Area Ratio
ITE:	Institute of Transportation Engineers
LOS:	Level of Service
TIA:	Traffic Impact Assessment
TSM:	Transportation Safety Measures
V/C:	Volume to Road Capacity Ratio