

GUIDELINES FOR A TRAFFIC IMPACT STUDY

A. Purpose

A traffic impact study assesses the impact of a proposed development, zoning change, or special use approval on the transportation system. Its purposes are (1) to ensure that proposed developments or zoning changes do not adversely affect the transportation network, (2) to identify any traffic problems associated with access from the site to the existing transportation network, (3) to delineate solutions to potential problems, and (4) to present improvements to be incorporated into the proposed development.

The traffic Impact study guidelines contained herein are subject to modification by the City as necessary, and as per modifications made by VDOT. These guidelines have been developed in order to provide for the consistent preparation of traffic impact studies. The guidelines will greatly enhance the efficiency of staff review and, at the same time, will provide the applicant with “accepted” technical procedures and methodologies. The City will review each development application on a case-by-case basis and may make recommendations that differ from the guidelines.

B. Responsibilities for Traffic Impact Studies

The primary responsibility for assessing the traffic impacts associated with a proposed development rests with the applicant, with the City serving in a review capacity. This is consistent with the approach followed for other civil engineering aspects of zoning and subdivision applications. The City should specify whether a traffic impact study is required, the extent of the study area, and any specific issues that should be addressed (i.e., safety, accidents, truck traffic). This determination should be made in the rezoning application, preliminary plat submittal, or preliminary site plan stage.

If a traffic impact study is required, the applicant will be responsible for submitting a formal traffic impact report. The applicant will also be responsible for all data collection efforts required in preparing a traffic impact study, including current peak period turning movement counts. Current peak period turning movement counts is defined as those counts that have been collected within one year of the zoning, subdivision, or site development application. The City, at its discretion, may request the applicant to adjust the peak hour turning movement counts in order to account for seasonal variations in traffic or other localized factors. In addition, the applicant will be responsible for ensuring that any submitted site plans meet the minimum state and local standards for geometric design. The study should be conducted only by an individual or firm that could be qualified as an expert in traffic engineering.

Upon submission of a draft traffic impact analysis report, the City will review the study data sources, methods, and findings and provide comments. The applicant will then have the opportunity to incorporate necessary revisions prior to submitting a final report. Accompanying the applicant's submission will be the written comments of the City staff. This information will then be used to reach a decision regarding the zoning, subdivision, or site development.

C. Determining the Need for a Traffic Impact Study

The reviewing City Engineering Division should have the discretion to determine when a traffic impact study is needed. The need for a traffic impact study should be evaluated based on conditions surrounding the individual location being considered for zoning, subdivision, or site development. The site specific conditions that should be considered include:

1. The potential impact upon the local and regional road networks.
2. The minimum site distances at intersections shown on the plans.
3. The capacity and level of service of the existing roadways to be entered.
4. Roadway geometrics.
5. The type and size of the proposed location.
6. Traffic operations of one or more intersections.
7. Issues of safety and/or traffic operation within the public Right-of-Way.

The City should consider requesting that a group of developers jointly sponsor a traffic impact study on a section of road network where multiple independent developments are planned.

D. Traffic Impact Study Contents and Specifications

The contents were primarily adopted from VDOT "Guidelines for Traffic Impact Study – Final Report," prepared by Simpson and Curtin, April 1979, and "Guidelines for Traffic Impact Studies in James City County."

1. Format – A traffic impact study prepared for a specific location and use (i.e. zoning, subdivision, or site development) should follow the chapter format detailed in section D3. Wherever additions or modifications are appropriate for a specific location, they should be made.
2. Capacity and Level of Service Analysis
 - a. All capacity analysis shall be conducted utilizing the procedures in the current Highway capacity Manual (Special Report 209). Transportation Research Board.

For capacity analysis and level of service determinations, the most recent Federal Highway Administration software package should be used for the different types of analysis required (i.e., signalized intersections, freeways, ramps). CARCALC 85 may also be used for analyzing intersections. Regardless of which software package is used, the results should be reviewed for reasonableness. Other software, if approved by the City in advance, may be used.

Firms may use any number of software packages available for capacity analysis. They should provide the input data as well as the results of the capacity analysis so that the City may check the results with its own analysis. Where a great number of intersections or road sections are analyzed, a sample of those should be checked by performing an independent analysis and comparing results. Where differences occur,

the firm should be required to explain the differences, to the satisfaction of the City, and all intersections and road sections should be reviewed closely.

- b. Level of Service – Level of Service C will be the design objective, and under no circumstances will less than Level of Service D for all approaches of an intersection be accepted for on-site and off-site traffic. This criterion, however, may be modified by the City on a case-by-case basis, depending on traffic conditions in the proposed site vicinity.
- c. Use of the Results of Level of Service Studies
 - i. The primary function of a level of service study is the determination of the geometrics required to provide a desired level of service in a design year.
 - ii. The number of lanes required on either a through road or at an intersection can be determined, and the need for auxiliary lanes, as well as their length, can be established.
 - iii. The need for signalization can be determined from the projected traffic volumes and the signal warrants in the Manual on Uniform Traffic Control Devices for Street and Highways (MUTCD).
 - iv. The level of service study can indicate where on-street parking will have to be eliminated or restricted in order to achieve a desired level of service.
 - v. When a development in a given area is projected to be phased over a long period of time, stage construction should be considered and a level of service study used to determine when the various stages must be completed.

3. Narrative – A brief narrative for each chapter of the traffic impact study follows.

a. Chapter 1 – Introduction

- i. Site and Study Area Boundaries – Include a brief description of and a map displaying the size of the land parcel, the general terrain features, and the location within the jurisdiction and region. In addition, identify the roadways that afford access to the site and are included in the study area. The exact limits of the study area should be based on engineering judgment and an understanding of the existing traffic conditions in the site vicinity. In all instances, however, the study area limits will be discussed with the applicant and his traffic engineer, and will be determined by the City staff. The definition of the study area should result, subsequent to the initial staff review of a developer’s rezoning application, subdivision preliminary plat application, or preliminary site plan, at which time a traffic impact study will be required. If the project is being completed in phases, describe the total project and the phases. The study should address the appropriate phase.
- ii. Existing and Proposed Site Uses – Identify the existing and proposed uses of the site in terms of the various zoning categories. In addition, identify the number and the type of residential units, and type and amount of commercial, industrial, or office uses in accordance with ITE trip generation categories.

- iii. Existing and Proposed Nearby Uses – Include a complete description of the existing land uses in the vicinity of the site, as well as their current zoning. Also state the proposed developments of adjacent land using the City's comprehensive land use plan. This is especially important where large tracts of underdeveloped land are in the vicinity of the site and are within a prescribed study area.
- iv. Existing and Proposed Roadways and Intersections – Describe and provide diagrams of the existing roadways and intersections (including road geometrics, land usage, traffic control, and intersection condition diagrams) within the study area, as well as improvements contemplated by the City or state. This includes the nature of the improvement project, its extent, the implementation schedule, and the agency or funding source responsible.

b. Chapter 2 – Analysis of Existing Conditions

- i. Daily and Peak Hour(s) Traffic Volumes – Present diagrams depicting daily and peak hour traffic volumes for roadways within the study area. Present turning movement and mainline volumes for the three peak hour conditions (a.m., p.m., and site-generated). Present only mainline volumes to reflect daily traffic volumes. Also present the source and/or the method of computation for all traffic volumes.
- ii. Capacity Analysis at Critical Points – Utilizing techniques as described in the current Highway Capacity Manual, assess the relative balance between roadway volumes and capacity. Analyze existing conditions (roadway geometrics and traffic signal control) for all peak hours.
- iii. Level of Service at Critical Points – Based on the results obtained in the previous section, determine and present levels of service (A through F). Include a description of typical operating conditions at each level of service.

c. Chapter 3 – Analysis of Future Conditions Without Development

Describe the anticipated traffic volumes in future and the ability of the roadway network to accommodate this traffic without the proposed zoning, subdivision, or development. The future year(s) for which projections are made will be specified by the City staff and will depend on the timing of the proposed development.

- i. Future Daily and Peak Hour(s) Traffic Volumes – Indicate clearly the method and assumptions used to forecast future traffic volumes, so that the City staff can replicate these calculations.
- ii. Capacity Analysis at Critical Locations – Describe the ability of the existing roadway system to accommodate future traffic (without development) for all peak hours, using the current Highway Capacity Manual. If roadway improvements or modifications are committed for implementation, present the capacity analysis for these conditions.
- iii. Levels of Service at Critical Points – Based on the results obtained in the previous section, determine the level of service (A through F).

d. Chapter 4 – Trip Generation

Present and diagram the amount of traffic generated by the location (rezoning, subdivision, or development) for daily and three peak hour conditions. Trip generation Rates to be used should be those presented in Trip Generation, 4th edition, Institute of Transportation Engineers. Deviation from these rates must be justified and documented to the satisfaction of the City.

e. Chapter 5 – Trip Distribution

Present and diagram the direction of approach for site-generated traffic for the appropriate time periods. The basic method and assumptions used must be clearly stated so that the City can replicate these results.

f. Chapter 6 Traffic Assignment

Describe the utilization of study area roadways by site-generated traffic. Combine the proposed traffic volumes with the anticipated traffic volumes from Chapter 3 to describe and diagram mainline and turning movement volumes for future conditions with the proposed rezoning, subdivision, or site development. Clearly state the basic method and assumptions used.

g. Chapter 7 - Analysis of Future Conditions with Zoning, Subdivision, or Development

- i. Future Daily Peak Hour(s) Traffic Volumes – Present and diagram mainline and turning movement volumes for the highway network in the study area, as well as driveways and internal circulation roadways for all time periods.
- ii. Capacity Analysis at Critical Points – Perform a capacity analysis for all peak hours for future conditions with the site developed as proposed using the current Highway Capacity Manual.
- iii. Levels of Service at Critical Points – As a result of the capacity analysis, compute and describe the level of service on the study area roadway system.

h. Chapter 8 – Recommended Improvement

In the event the analysis indicates that unsatisfactory levels of service will occur on the study area roadways, describe the improvements proposed to remedy deficiencies. The proposals would identify committed projects by the City and the State that were described in Chapter 1 and reflected in the analysis contained in Chapters 2 and 3, and/or any improvements required of the applicant.

- i. Proposed Recommended Improvements – Clearly describe and diagram the location, nature, and extent of the proposed improvements to ensure sufficient roadway capacity. Accompanying this list of improvements should be preliminary cost estimates, source of funding, timing, and likelihood of implementation.

- ii. Capacity Analysis at Critical Points – Describe the anticipated results of making these improvements.
- iii. Levels of Service at Critical Points – As a result of the revised capacity analysis presented in the previous section, present the levels of service for the roadway system with improvements.

- i. Chapter 9 – Conclusion

The last chapter of the report should be a clear concise description of the study findings. This concluding chapter should serve as an executive summary.