

TRANSPORTATION IMPACT STUDIES REQUIREMENTS

**CITY OF BLUE SPRINGS, MISSOURI
DESIGN CRITERIA**

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1. TRANSPORTATION IMPACT STUDIES

a. Responsibilities for Transportation Impact Studies

Transportation impact studies may be required by the City in order to adequately assess the impacts of a development proposal on the existing and/or planned street system. The primary responsibility for assessing the traffic impacts associated with a proposed development will rest with the developer. The City serves in a review capacity.

This study will be the responsibility of the applicant and shall be prepared by a licensed professional engineer in the State of Missouri, (defined as a Member or Fellow of the Institute of Transportation Engineers (ITE)) who has specific training in traffic and transportation engineering.

Upon submission of a sealed traffic study, the City will review the study data sources, methods, and findings. Comments will be provided in a written form. The developer and the project engineer will then have an opportunity to incorporate necessary revisions and resubmit a final report. All studies shall be approved by the City before acceptance.

A transportation impact study shall be performed, unless waived by the City. A written study meeting the City criteria shall be required for a development proposal when trip generation during the peak hour is expected to exceed 50 vehicles.

The following development submittals shall require traffic studies:

- 1) All developments with a trip generation during the peak hour in excess of 50 vehicles.
- 2) Any change of use which would increase the trip generation during the peak hour in excess of 50 vehicles.
- 3) A rezoning application when the proposed zoning will increase the trip generation during the peak hour in excess of 50 vehicles.
- 4) If a project is located in the vicinity of the intersection of two arterial, collector, or some combination of streets, or the project will impact an intersection as determined by the City Engineer.
- 5) If a project is anticipated to generate controversy or opposition.
- 6) When an additional access from a City or State roadway to an existing use is being requested and the City or State does not consider the access necessary for safe and efficient movement of traffic. In this case, the developer shall be responsible for providing the City or State the necessary transportation engineering study justifying the need for such access.

- 7) A project impacts an existing congested or high-accident location, or where specific site access and safety issues, or to protect the traffic flow characteristics of a corridor are of concern.

A waiver of the transportation impact study may be granted by the City Engineer under the following conditions:

- 1) Where sufficient data exist within the Engineering Division files to prevent the need for such study, or
- 2) Where a similar development exist which is approximately the same size and/or character, which has previously, within two years, completed a transportation impact study, or
- 3) Where no specific site access or safety issues exists for the site.
- 4) Where the suggestions made by the City of Blue Springs Public Works Department are incorporated into the plans.

At a minimum, the following subject/locations shall be studied:

- Site access driveways
- On-site circulation
- Roadway(s) adjacent to the project
- Pedestrian and bicycle circulation
- Consistency with City plans and policies
- Intersections impacted by the project
- If available, transit (bus) accessibility to the project site
- Any intersection where the major street is controlled by a traffic control device (e.g. stop sign or traffic signal) on which the project will add 50 or more peak hour project trips.

All previous traffic studies relating to the development that are more than two years old, must be updated, unless the City determines that conditions have not changed significantly.

Where access points are not defined or a site plan is not available at the time the traffic study is prepared, additional traffic work may be required when a site plan becomes available or the access points are defined.

The applicant will be notified if a traffic study will be required, provided sufficient information is available for the City to determine whether the trip generation criterion has been met. If insufficient information is available but the property appears to involve a sufficiently intense land use, the applicant will be informed that a traffic study is required.

Transportation consultants are required to discuss projects with the City prior to starting the study. As a minimum, topics for possible discussion at such meetings will include trip generation, directional distribution of traffic, trip assignment, definition of the study area, intersections requiring critical lane analysis, and methods for projecting build-out volume. This will provide a firm base of cooperation and communication between the City, the owner or developer, and the project's consultants in creating future traffic characteristics which realistically define traffic movement associated with the proposed development. Specific requirements will vary depending on the site location.

b. Traffic Study Contents

A typewritten report outlining the findings and conclusions of the study, including exhibits illustrating the site plan, traffic volumes (current and projected), and existing street conditions. The city recognizes consulting firms may have a standard format that has previously been used. The following format provides a recommendation in the preparation of such studies by transportation consultants. Sections that are not applicable to the specific study are not required.

i. Cover Letter and Introduction

- *Land Use, Site and Study Area Boundaries*

A brief description of the size of the land parcel, general terrain features, the location with the jurisdiction and the region. In addition, the roadways that afford access to the site and are included in the study area, should be identified.

The exact limits of the study area should be based on engineering judgment, and an understanding of existing traffic conditions surrounding the site. Generally, the study area will extend to the nearest collector or arterial street in each direction along streets bordering the development site. In all instances, however, the study area limits shall be mutually agreed upon by the Developer, their engineer, and the City. These limits will usually result from initial discussions with staff. A vicinity map that shows the site and the study area boundaries, in relation to the surrounding transportation system, should be included.

- *Existing and Proposed Site Uses*

Identify the existing and proposed uses of the site. In addition, the specific use for which the request is being made shall be identified if known as a number of uses may be permitted under the existing ordinances.

- *Existing and Proposed Uses in Vicinity of Site*

A complete description (including a map) of the existing land uses. In addition, all vacant land within the study area and its assumed future uses should be identified. This latter item is especially important where large tracts of undeveloped land are in the vicinity of the site, and

within the prescribed study area. Generally, much of this information can be obtained from the City's Planning Department staff.

ii. Trip Generation and Design Hour Volumes

Provide a summary table listing each type of land use, the size involved, the average trip generation rates used (total daily traffic and a.m./p.m. peaks), and the resultant total trips generated.

Trip generation shall be calculated from the latest data contained within the Institute of Transportation Engineer's (ITE) Trip Generation Manual.

The calculation of design hour volumes used to determine study area impacts must be based on:

- 1) Peak hour trip generation rates as published in the ITE Trip Generation Summary.
- 2) NCHRP Report 365, where justified.
- 3) Traffic volume counts for similar existing uses, if no published rates are available.
- 4) Additional sources from other jurisdictions if acceptable to the City.

Use of rates in the latest edition of the ITE Manual to account for passerby and diverted traffic shall be mutually agreed upon with the City. Internal trip reductions and modal split assumptions will require analytical support to demonstrate how the figures were derived and will require approval by the City.

iii. Trip Distribution

The estimates of percentage distribution of trips from the proposed development to destinations in the city should be clearly stated in the report using the north, south, east, west compass points. Market studies and information concerning origin of trip attractions to the proposed development may be used to support these assumptions where available.

iv. Trip Assignment

The direction of approach of site generated traffic via the area's street system will be presented in this section. The technical analysis steps, basic methods, and assumptions used in this work shall be clearly stated and agreed to by the City. The assumed trip distribution and assignment shall represent the most logically traveled routes for drivers accessing the proposed development. These routes can be determined by observation of travel patterns to existing land uses in the study area.

v. Existing and Projected Traffic Volumes

Provide graphics showing the following traffic impacts for private access points, intersections and streets:

- A.M. peak hour site traffic (in and out) including turning movements.
- P.M. peak hour site traffic (in and out) including turning movements.
- A.M. peak hour total traffic including site generated traffic (in and out). These volumes shall include through and turning movement volumes for current conditions and a separate set of numbers that also include 20 year projections or build out (whichever is specified by the City).
- P.M. peak hour traffic total including site generated traffic (in and out). These volumes shall include through and turning movement volumes for current conditions and a separate set of numbers that also include 20 year projections or build out (whichever is specified by the City).
- Midday and “School-Release” peak hours – As directed by the City of Blue Springs.
- Any other peak hour which may be critical to site traffic and the street system in the study area should be included in the graphics and show the same information as is provided for the A.M./P.M. peak hours.
- Data for existing traffic conditions shall be collected for the project using the following guidelines:
 - i. Peak period turning movement counts at all study intersections and driveways including bicycle and pedestrian counts at intersections with high non-automotive use.
 - ii. Traffic counts shall not be used if more than one (1) year old without prior city approval.
 - iii. Traffic data shall not be collected on weeks that include a holiday and non-school session time periods.
 - iv. Traffic data shall not be collected between Thanksgiving and the first week of the new year without prior City approval
 - v. Generally, traffic counts should be conducted on Tuesdays, Wednesdays, or Thursdays. Some developments generate their highest traffic volumes during the Saturday peak hour and may require data collection during this period.
- Projected total daily traffic for the street system in the study area based on traffic from the proposed development and counts of existing daily traffic.

Provide all raw traffic count data (including peak hour turning movements) and analysis worksheets. Computer techniques, and the associated printouts, may be used as part of the report.

vi. Level of Service

The recommended minimum levels of service (LOS) that would guide the need for improvements are LOS D on arterial streets and LOS C on all other streets. This standard would apply to peak hour conditions typically experienced during the early morning and late afternoon peak periods of a typical weekday. This standard would also apply to other peak conditions associated with a proposed development.

vii. Capacity Analysis

A capacity analysis will be conducted for all public street intersections impacted by the proposed development and for all private property access points to streets adjacent to the proposed development as specified in the traffic study requirements form and within the limits of the previously defined study area. The a.m., p.m., and any other possible peak period will be tested to determine which peak hours need to be analyzed. Capacity calculations should also include an analysis for 20th year projections or study area build out conditions. Intersection analysis shall be performed using the latest version of the Transportation Research Board, Highway Capacity Manual (HCM) methodology.

Signalized and unsignalized intersections shall be analyzed using the Highway Capacity Manual. All intersection analysis should be completed using Synchro software or equivalent.

viii. Traffic Signals

The need for new traffic signals will be based on warrants contained in the Manual on Uniform Traffic Control Devices, warrants contained herein, and any additional warrants established by the National Committee on Uniform Traffic Control Devices. In determining the location of a new signal, traffic progression is of paramount importance. Therefore, the City shall approve all new traffic signal locations in order to minimize impacts to traffic progression. The spacing of traffic signals is important to achieve good speed, capacity, and optimum signal progression. Pedestrian movements shall be considered in the evaluation and adequate pedestrian clearance provided in the signal cycle split assumptions.

To provide flexibility for existing conditions and ensure optimum two-way signal progression, an approved traffic engineering analysis shall be made to properly locate all proposed accesses that may require signalization. The section of roadway to be analyzed for signal progression will be determined by the City and will include all existing and possible future signalized intersections.

The City of Blue Springs has adopted Category 902 of the Missouri Department of Transportation's (MoDOT) Engineering Policy Guide. Those intersections which would reduce

the optimum bandwidth if a traffic signal were installed may be required by the City to remain unsignalized and have turning movements limited by access design or median islands.

ix. Safety and Operation Improvement Analysis

The Transportation Assessment should analyze existing roadway conditions to determine if safety and/or operational improvements are necessary due to an increase in traffic from the project or cumulative projects. The following improvements shall be analyzed:

- Addition of through lane(s), right turn lane(s), and left turn lane(s).
- Left and/or right turn lane pocket length (queue length)
- Parking restrictions on adjacent streets
- Free right turn lane
- Traffic signal coordination – For new or modified traffic signals, the City Engineer may require traffic simulation and coordination timing plans using the latest Synchro software. The traffic simulation and coordination timing plan shall include signalized intersections as identified by the City Engineer. A copy of the Synchro files shall be made available to the City for review.
- Bicycle circulation – Identify and implement bike lane facilities adjacent to the project site in accordance with the City’s master planning documents.

x. Site Access Analysis

The following analysis should be performed to improve the project access circulation and to limit driveways and local street access on arterial and collector streets:

- Intersection Sight Distance – All on-site intersections, project access driveways or streets to public roadways shall provide adequate sight distance per the latest edition of the American Association of State Highway and Transportation Officials (AASHTO).
- Driveway Length– Primary project driveways shall have a throat of sufficient length to allow vehicles to enter the project area without causing subsequent vehicles to back out on the City street system
- Limit Driveway Impacts – Driveways and local streets access on arterial and collector streets shall be limited to minimize the impacts on these streets. Whenever possible, driveways shall be consolidated with adjacent properties.
- Corner Clearance – A driveway should be a sufficient distance from a signalized intersection so that right-turn egress movements do not interfere with the right-turn queue at the intersection. In addition, every effort should be made to provide right-turn egress movements with sufficient distance to enter the left-turn pocket at the adjacent intersection.

- Right and left turns at drives – If required, the length of right and left turn lanes should be sufficient to allow a vehicle traveling at the posted speed to decelerate before entering the driveway as outlined in the Highway Capacity Manual.

xiii. Conclusions

It is anticipated that this conclusion chapter will serve as an executive summary including a clear, concise description of the study findings.

xiv. Recommendations

In the event that analysis indicates unsatisfactory levels of service on study area roadways, a description of proposed improvements to remedy deficiencies should be included. These proposals would include projects by the City or the Missouri Department of Transportation for which funds have been appropriated and obligated. The use of all future roads in an analysis will require approval from the City. In general, the recommendation section should include:

- Proposed Recommended Improvements - This section should describe the location, nature, and extent of proposed improvements to assure sufficient roadway capacity. A sketch of each improvement should be provided showing the length, width and other pertinent geometric features of the proposed improvements.
- Volume/Capacity Analysis at Critical Points - Another iteration of the volume/capacity analysis must be described, which demonstrates the anticipated level of service as a result of making these improvements.
- Traffic Volume Proportions - Percentages based on the traffic impact analysis may be required by the City to determine the proportion of traffic using various public improvements (both existing and proposed) from several developments within the study area.

c. Revisions to Traffic Study

Revisions to the traffic study shall be provided as required by the City. The need to require revisions will be based on the completeness of the traffic study, the thoroughness of the impact evaluation and the compatibility of the study with the proposed access and development plan.

