

TRAFFIC AND SAFETY NOTE 607C

SUBJECT: Traffic Impact Studies

PURPOSE: To Define Requirements and Procedures for Traffic Impact Studies

COORDINATING UNIT: Geometric Design Unit

INFORMATION: A traffic impact study is a complete analysis and assessment of traffic generated by a proposed development and of the impact a proposed development would have on the surrounding transportation system.

A traffic impact study is required for any proposed development expected to generate over one hundred (100) peak hour directional trips or at the discretion of the Region/TSC Traffic and Safety Engineer. The study shall be completed and sealed by a licensed professional engineer. The consulting firm shall be prequalified by MDOT to do Traffic Capacity Analysis and Geometric Studies. If the study includes the review of potential signal operations, a prequalified Traffic Signal Operations consultant must be used (see <http://mdotwas1.mdot.state.mi.us/public/psvr/index.cfm> for a list of prequalified traffic impact consultants). The attached table on page 3 gives examples of land use that is expected to meet or exceed the 100 peak hour directional trip threshold. Lansing Traffic and Safety, as well as the Region, should review these studies.

Region Review:

1. The Region/TSC Utilities and Permits Section reviews all proposed access plans, and then forwards the plans to the Region Traffic and Safety Engineer with their recommendations. Region Traffic and Safety will notify the Utilities and Permits Engineer if a traffic impact study is required from the developer before the access permit can be issued.
2. The Utilities and Permits Engineer will inform the developer of the required impact study.
3. If an access management corridor team has been established in the vicinity of said development, the draft impact study will be submitted to the corridor team for advisory input prior to awarding a MDOT permit.

A traffic impact study should include:

1. A disclaimer which indicates that the opinions, findings, and conclusions expressed in this TIA are those of the authors and not necessarily those of the MDOT.

2. A narrative summary at the beginning of the report, including, but not limited to:
 - a. The applicant and project name.
 - b. A location map with dimensions with references to state trunklines.
 - c. The size and type of development.
 - d. Generated traffic volumes based on type and size of land use which are compatible with those listed in the Institute of Transportation Engineers (ITE) publication, Trip Generation (current edition).
 - e. A disclaimer indicating why the TIA is being completed.
 - f. A location for MDOT (Lansing Traffic and Safety and the Region) to indicate they reviewed the TIA and accept/reject the assessment.
3. Project phasing identifying the year of development activities per phase and proposed access plan for each phase.
4. A transportation system inventory, which describes the physical, functional and operational characteristics of the study area highway system, and where appropriate, locate transit services. The description should provide, where pertinent, data on:
 - a. peak-hour volumes for each individual traffic movement (existing and projected)
 - b. number of lanes
 - c. cross-section
 - d. intersection traffic signals and configuration
 - e. traffic signal progression
 - f. percentage of heavy trucks
 - g. adjacent access point locations
 - h. jurisdiction
 - i. grades
5. Plan showing proposed roadway per phase for each access. The plan needs to be in scale and show lane configurations, drives, traffic signals, and other geometric information pertinent to the study. Driveway design and roadway improvements shall meet Michigan Department of Transportation standards and guides.
6. Capacity analysis shall be performed at each access point. The Department software preference is Synchro. Default values shall not be used when actual values are reasonably available or obtainable. Every effort should be made to obtain accurate values, or good, justifiable estimates. The interaction of conflicting traffic movements shall be addressed in the traffic impact study. Any proposed signalized access within 1 mile (1.6 km) of an existing signalized intersection shall be

analyzed in coordination with the existing signal timing along the entire signalized corridor. An electronic file of the SYNCHRO analysis for the corridor MUST BE provided on electronic media with the submittal or loaded on the Division of Operations' FTP website. E-mail submittals of the SYNCHRO analysis will not be accepted. A time-space diagram should also be included.

7. A traffic impact study on the trunkline shall be analyzed with and without the proposed development on the existing system, and with the proposed development for both existing and projected traffic volumes.

The traffic volumes for the development shall assume a total build out. If desired, the traffic volumes generated by each individual phase may be provided as well.

If the development is at or near a major intersection or interchange, then traffic generated for the site should also be shown relative to movements into and/or through the intersection or interchange. Large developments should indicate expected market area such as a shopping mall.

The completed analysis shall be summarized in a table showing all the Measures of Effectiveness (MOE) for each individual traffic movement for all of the above conditions.

8. Required operational changes and/or other mitigation measures shall be part of the permit approval process.
9. The consultant and the Department should strive to reach an agreement on the assumptions and methodology of the traffic impact study. In areas where an agreement can not be reached, the Department may provide a response to the traffic impact study that will be made part of the final study and included in the appendix.

For information on intersection operations see the Michigan Intersection Guide.

TABLE
Examples of Land Use Size Thresholds
Based on Trip Generation Characteristics

<u>Land Use</u>	<u>100 Peak Hours Directional</u>	<u>Metric</u>
Residential:		
Single Family	150 units	150 units
Apartments	245 units	245 units
Condominiums/Townhouses	295 units	295 units
Mobile Home Park	305 units	305 units
Shopping Center (GLA) ⁽³⁾	15,500 sq. ft.	1,440 m ²
Fast Food Restaurant w/drive-in (GFA)	5,200 sq. ft. ⁽⁴⁾	480 m ²
Convenience Store w/gas (GFA) ^(3,5)	1,300 sq. ft. or 5 pumps	120 m ² or 5 pumps
Banks w/drive-in (GFA)	4,400 sq. ft.	410 m ²
Hotel/Motel	250 rooms	250 rooms
General Office	55,000 sq. ft. ⁽⁴⁾	5,110 m ²
Medical/Dental Office	37,000 sq. ft.	3,440 m ²
Research & Development	85,000 sq. ft.	7,900 m ²
Light Industrial	115,000 sq. ft.	10,680 m ²
Manufacturing	250,000 sq. ft.	23,225 m ²

NOTES:

1. Rates/equations used to calculate the above thresholds are from Trip Generation, 5th Edition, 1991, by the Institute of Transportation Engineers. This table will likely need updating as future editions provided additional information.
2. For example, a full traffic impact study should be completed (100 peak hour, peak direction trips generated) if 150 or more single family units are proposed for a site.
3. GLA – Gross Leasable Area; GFA – Gross Floor Area.
4. Using AM peak-hour rates/equations would provide a lower threshold. However, adjacent roadway volumes are usually higher during the PM peak hour.
5. Uses both “Service Station with Market” and “Convenience Market with Pumps” data.
6. For further trip generation characteristics of the above land uses, or of other uses not illustrated above, refer to the latest version of Trip Generation.