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Ministry of Transportation

General Guidelines
for the Preparation of
Traffic Impact Studies

December 2009

1.0 Introduction

The main purpose of a Traffic Impact Study (TIS) is to demonstrate how the transportation impacts of a proposed development or redevelopment can be mitigated and addressed in a manner that is consistent with the objectives of the Ministry of Transportation. The TIS also serves as the basis for the identification and evaluation of transportation related improvements or measures to be included as a condition of access approval for the development or redevelopment.

Any proposal/expansion of a development that falls within the Ministry of Transportation's (MTO) permit control area, **as defined by Sections 31, 34 and 38 of the Public Transportation and Highway Improvement Act (PTHIA)** may require that a TIS be submitted to the MTO for review and approval. The ministry's regional Corridor Control offices should be contacted if there are any questions as to whether a TIS is required in support of an application for access to a provincial highway.

The Ministry of Transportation has prepared these guidelines to provide guidance to developers and consultants in the preparation of a TIS and the details required in a TIS that would be considered acceptable to the ministry. Following these guidelines and contacting appropriate Ministry staff in the preliminary stages of the development planning process will provide for a more consistent and efficient review process.

Evaluation of traffic impacts of proposed development depends upon a number of assumptions about the type, amount and patterns of traffic expected to be produced from and attracted to the site. MTO staff are available for pre-submission communication to confirm key assumptions and parameters through the Regional Planning and Design Section (referred to as Corridor Management office in Central Region only). Depending upon the complexity of the proposed development, this may reduce or negate the need for study revisions following submission of the completed study. A list of possible discussion items is attached for reference.

For clarification on any matters related to the submission, contact the appropriate Regional Planning and Design Section (Corridor Management Section in Central Region only) provided below. For services in French, contact HSBTrafficOffice@ontario.ca.

Northwestern Region	1-807-473-2000 or 1-800-465-5034
Northeastern Region	1-705-472-7900 or 1-800-461-9547
Eastern Region	1-613-544-2200 or 1-800-267-0295
Central Region	1-416-235-5385
Southwestern Region	1-519-873-4100

It is the proponent's responsibility to retain a qualified transportation consultant experienced in the preparation of TISs. Effective January 1, 2010, all TISs shall be undertaken by a firm approved under the Ministry of Transportation's consultant Registry, Appraisal and Qualification System (RAQS) under the Traffic Impact Analysis specialty category. Also effective January 1, 2010, TISs shall be signed and stamped by a Professional Engineer registered in the Province of Ontario taking responsibility for the TIS contents.

MTO will accept the use of Highway Capacity Software (HCS) 2000 and Synchro/Sim Traffic Simulation Software Version 5 (or higher) for intersection capacity/operational analysis. The consultant will require prior approval from MTO to use any software other than those listed above and may be requested to submit an electronic copy of the files. If the proposed development directly impacts freeway operations there may be a need to undertake microsimulation to assess these impacts. The ministry's regional Corridor Control offices should be contacted if there are any questions as to these requirements.

A minimum of three copies of the TIS shall be submitted to MTO for review. All supporting information such as the traffic analysis outputs, trip generation/distribution data source, etc., shall be submitted for review with the TIS.

1.1 References

The following references are recommended but not limited to:

- ITE Trip Generation Manual and Handbook (*most recent edition*)
- Geometric Design Standards for Ontario Highways Manual (*most recent edition*)
- Highway Capacity Manual (*most recent edition*)
- Roadside Safety Manual (*most recent edition*)
- All Ontario Traffic Manual (OTM) Books
- ITE Traffic Access and Impact Studies for Site Development: A Recommended Practice
- MTO Directives PLNG-B-05, PLNG-B-06, PLNG-B-08, PLNG-B-169 (available from MTO)
- Transportation Tomorrow Survey (TTS)

Note: these technical documents are available in English only.

2.0 Submission Requirements

2.1 Executive Summary

- Contains key findings, conclusions and recommendations of the TIS and should be located at the front of the TIS.

2.2 Introduction

- Includes the purpose for submitting the TIS;
- Contains a brief description of the project;
- Contains a description of the components of the TIS.

2.3 Existing Conditions

- Describes the road jurisdictions, road classifications, existing land use type, speed limits, lane configurations, street names, signalized and/or unsignalized intersections and their locations. This information should be provided on detailed maps and diagrams.

2.4 Study Area

- Contains a description and a map of the study area including but not limited to the site location, land use type of the surrounding and subject development lands;
- The study area should extend far enough to contain all highways, interchanges and intersections that will be affected by the traffic generated by the proposed development.

2.5 Development Land Use Type & Site Plan

- Contains a description of the type of land uses proposed and a detailed site plan showing structures, parking, access and site circulation;
- Identifies existing road edges, entrances, pavement markings and traffic control for roads adjacent to the proposed development, shown to scale.

- 2.6 Development Size**
- Describes the size of the proposed development, such as property size (area), number of residential units, industrial gross floor area, number of employees, number of hotel rooms, commercial gross leasable floor area, etc.
- 2.7 Development Stages**
- Identifies the phasing schemes of the development;
 - Identifies the expected dates of full and partial completion/occupancy, estimated length of construction and opening dates if available, for each phase.
- 2.8 Other Development & Planned Road Improvements**
- Identifies other developments in the study area that are under construction, approved or in the approval process that will impact the provincial facility or proposed access;
 - Identifies any road improvements that are planned or currently under construction within the defined study area.
- 2.9 Study Horizons**
- Includes the opening date of the development, 5 and 10 years from the opening date;
 - Where applicable, each major phase in a multi-phased development should be assessed separately and the 5 and 10 year horizons beyond full build-out of the site.
- 2.10 Traffic Analysis**
- Impacts on the road network should be evaluated for A.M. and P.M. peak hours and the site peak generation hour;
 - Depending upon the study area and proposed land or building uses, there may be a need to consider specific seasons, days of week, or non-typical peak periods;
 - The peak hour analysis should be undertaken for full development and for interim stages if applicable (with and without the relevant transportation improvements) as well as:
 - Existing traffic conditions
 - Existing traffic conditions plus background growth
 - Existing traffic conditions plus background growth plus site generated traffic
 - Heavy/Commercial vehicles should be accounted for in the traffic analysis.
- 2.11 Turning Movement Counts**
- MTO data are preferred; however, counts from the local municipality or consultant counts may be acceptable, once approved by the MTO;
 - Only data collected within three years of the study shall be used. Historical and recent AADT volume information for provincial highways can be obtained from the Ministry of Transportation website (<http://www.mto.gov.on.ca/english/pubs/trafficvolumes.htm>);
 - See section 2.10 regarding the need for data for specific seasons, days of week, or non-typical peak periods.
- 2.12 Background Traffic Forecasts (non-site traffic)**
- Describes the method and assumptions for determining non-site future traffic, including growth rates plus size and expected build out years for approved developments in the study area.
- 2.13 Trip Generation**
- Describes source and details of trip generation rates or equations used;

- Local data collection may be acceptable provided that conditions are similar to those for the proposed development or that differences are accounted for. A minimum of three comparable studies should be provided.

2.14 Trip Distribution/Assignment

- Describes methods and assumptions for distribution and route assignment of traffic;
- Assumptions for trip distribution should be supported by one or more of the following:
 - Transportation Tomorrow Survey (TTS) data
 - Origin-destination Surveys
 - Comprehensive Travel Surveys
 - Planning models
 - Market studies
- Assumptions for route assignment should be supported by:
 - Existing travel patterns
 - Expected future travel patterns

2.15 Trip Pass-by/Interaction Rates (on-site Synergy)

- Describes source, method and assumptions for adjusting gross trip generation for pass-by trips or site interaction rates.

2.16 Evaluation of Impacts

- Describes methodologies and parameters used in evaluation;
- All signalized and relevant unsignalized intersections in the study network shall be evaluated. At signalized intersections, movements with a v/c ratio greater than 0.85 are deemed to be “critical” in terms of operations. Movements that experience a v/c ratio of 0.85 or greater would be consideration for geometric improvement. For ramp terminals a v/c ratio for ramp approaches with a value greater than 0.75 would be deemed critical and considered for geometric improvement;
- All proposed new traffic signals should be evaluated for conformance to MTO best practices, proximity to other adjacent traffic signals, traffic signal progression and any impacts on the corridor;
- All exclusive turn lanes should be designed as per the GDSOH manual;
- Any traffic improvements or operational concerns that cannot be adequately mitigated to MTO standards should be identified;
- Forecast and analyze traffic for the opening day of the development, 5 and 10 years beyond the opening date;
- In the case of a multi-phased development, volume projections are required for the opening year of each phase including full build-out, 5 and 10 years beyond full build-out. Include other approved developments within the study area as background traffic;
- All volumes should be shown in exhibits.

2.17 Signal Justification

- The need for traffic signals and/or underground provisions should be reviewed at all locations affected by the proposed development and for each proposed development stage(s). Refer to OTM – Book 12 to determine when traffic signals or provisions for signals are warranted.

2.18 Geometric Improvements

- The need for geometric improvements should be reviewed at all locations in the study area and for each proposed development stage(s). The TIS should clearly identify

transportation impacts by movement, the transportation system improvements that are needed to mitigate these impacts and the timing of these improvements;

- All geometric improvements should be shown on a functional plan identifying lane arrangements and intersection improvements for each horizon year;
- The illumination needs required as result of any proposed geometric improvements to accommodate the proposed development shall be assessed in accordance with MTO Directives PLNG-B-05 and PLNG-B-06.

2.19 Conclusions and Recommendations

- Summary of key findings on the impacts of the proposed development on the highway corridor;
- Summary of recommended improvements. This should include but is not limited to type of access, entrance design, highway improvement including right/left turn lanes, tapers, visibility triangles, signalization and signage, etc.;
- If one TIS is prepared for both provincial and municipal consideration, break down the summary of impacts and improvements by road authority.

All diagrams, drawings and figures contained in the TIS must be of a sufficient scale to be legible. All drawings, tables, and exhibits/figures included in the TIS must be appropriately labelled and listed at the front of the TIS (after the Table of Contents) under the appropriate headings.

3.0 Disclaimer

Notwithstanding the above, each Regional Planning and Design Section and/or Traffic Section may require additional information and analysis, depending on the complexity of the proposal and the anticipated traffic impacts.

**Attachment –
List of Possible Items for Discussion during Pre-submission Communication**

- Road jurisdictions and responsibilities where more than one road authority is involved
- Extent of study area, including specific interchanges and intersections to include in analysis
- Appropriate study horizon years to consider for multi-staged development
- Appropriate analysis periods for proposed development (for example AM peak, PM peak, Saturday peak, summer weekday, etc.)
- Suitability of non-MTO data sources
- Suitability of rates for forecasting background traffic growth
- Developments that need to be included in background traffic forecasts
- Site plan considerations such as access locations
- Trip generation data source and estimation method (for example *ITE Trip Generation* rate vs. *ITE Trip Generation* equation vs. locally observed rate) for less typical uses
- Trip distribution and route assignment prediction methods and assumptions for more complex developments or road networks
- Sources and assumptions for trip pass-by or interaction rates where the complexity of the development requires these
- Methodology for predicting signal justification for forecast traffic volumes
- Software to use for capacity analysis, and assumptions and parameters to apply for the agreed upon software tool
- Methodology and/or software to use for evaluating storage lane length requirements
- Potential MTO work projects, preliminary design studies, planning studies, in the study area
- Access management best practices