

Transportation-System Impact Study (TIS) Guidelines

Transportation Branch
Infrastructure Services
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APPROVED

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TRANSPORTATION-SYSTEM IMPACT STUDY GUIDELINES

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1.0 INTRODUCTION

- 1.1 The Transportation Branch has developed a policy on conducting a Transportation-System Impact Study (TIS) in order to assist the Saskatoon development industry and its consultants with the following main considerations:
- defining when a TIS is required;
 - documenting the information available for conducting these studies;
 - identifying the process that is to be used for conducting these studies;
 - establishing the information to be contained in a TIS report.
- 1.2 All costs associated with the preparation of a TIS will be borne by the applicant.
- 1.3 These guidelines will assist developers and their consultants in undertaking TIS in support of development applications.
- 1.4 The purpose of the guidelines is to standardize the scope and format of TIS, and to reduce the time involved in the preparation and review of TIS reports.
- 1.5 It is a goal that the City's roadway system capacity will be highly used during the weekday peak periods of travel but not result in substantial delays to traffic or low travel speeds. Transportation engineers generally describe this condition as an operating level of service "D".
- 1.6 The consultant conducting the TIS needs to be a qualified **transportation engineer** as approved by the City of Saskatoon.

2.0 WHEN IS A TIS REQUIRED?

- 2.1 A TIS is generally required under any the following conditions:
- the development will generate over 100 vehicles per hour (vph) in the peak direction of travel (**for examples, see Table 1**); **and/or**
 - the development **may** result in safety, operational or design issues that require mitigation through study; **and/or**
 - the development **is a** result of a change in land use designation or is infill into an existing neighbourhood; **and/or**
 - **major developments within existing, or adjacent to existing neighbourhoods may require a TIS to identify and develop mitigation measures to minimize the potential downstream impacts of additional traffic (i.e. "shortcutting").**



- 2.2 In cases where the anticipated impact will be less than 100 vph in the peak direction of travel, a letter addressed to the Transportation Branch stating the anticipated trip generation will typically be sufficient. **This letter should describe the anticipated development, identify the appropriate ITE Trip Generation categories and the scale of the development (dwelling units, square feet, parking spaces and so on).**
- 2.3 Each development is different due to location, size, use, etc. Specific requirements for the TIS should be discussed with the Transportation Branch (Infrastructure Services Department) and Planning & Development Branch (Community Services Department) prior to commencing the study.

3.0 **BEFORE GETTING STARTED**

- 3.1 Developers (or their consultants) are advised to contact the City of Saskatoon's Transportation Branch to determine study requirements. The TIS should take into account the findings of previous studies and transportation system concerns pertaining to the study area. New or supplementary turning movement counts may be required to complete the TIS.
- 3.2 Adjacent sites with the potential for development within the same time horizon as the subject site will also have to be considered in the TIS.
- 3.3 The following study information **may be** available from the Transportation Branch:
- **Historical** traffic volume counts; **please see the Traffic Count Policies and Procedures**;
 - Limited information on future traffic volumes for the major arterial roadways in the City of Saskatoon. The City forecasts traffic conditions using VISUM;
 - Specific guidelines on access requirements and the installation of traffic signals and pedestrian protection;
 - Facility plans showing existing and ultimate roadway alignments and proposed roadway improvements for most arterial roadways in the city;
 - Saskatoon Road Network Plan - consistency with the council approved plan is expected.



3.4 **Depending on the size, scale and intensity of the proposed development, consideration of the most recent editions of the following Institute of Transportation Engineers (ITE) publications may be valuable for the proponent:**

- *Promoting Sustainable Transportation Through Site Design;*
- *Neighborhood Street Design Guidelines;*
- *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach.*

4.0 **INFORMATION CONTAINED IN THE TRANSPORTATION-SYSTEM IMPACT STUDY REPORT**

4.1 The purpose of a TIS report is to provide the Transportation Branch with ALL of the information necessary to understand transportation-related aspects and implications of the development proposal, as well as enable the Branch in formulating a recommendation regarding the proposal. Consultants/applicants can aid the Branch in the review of an application by ensuring that the TIS report contains all of information required to evaluate the development proposal, and that all of the information is supplied at one time.

4.2 The methodology for undertaking a TIS is outlined below:

Project

- Describe the project and study area. The extent of the study area, including number of study intersections, should be developed in consultation with **City** staff;
- Describe the proposed land use type and intensity of development;
- Identify anticipated adjacent developments;
- Identify any development phasing as planned;
- Indicate the expected dates of completion of construction.

Transportation System

- Describe the transportation system in the study area;
- Identify study intersections to be reviewed;
- Identify any road improvements planned in the study area.

Analysis

- Analysis should be consistent with the most recent edition of the Institute of Transportation Engineers (ITE) *Transportation Impact Analysis for Site Development* and the City of Saskatoon's *New Neighbourhood Design and Development Standards Manual*;
- If the development is to be carried out in phases, the analysis should be undertaken for the full site development. Any



development that does not commence within a two-year period may require an updated TIS;

- Identify the design hours selected for analysis. The selection of the design hour(s) for study, including AM peak hour, PM peak hour and/or Saturday peak hour, should reflect the proposed land use;
- Assemble existing hourly traffic volumes for the study periods;
- Estimate site-generated traffic for the design hours. The most recent edition of ITE's - *Trip Generation Manual* should be used. Where possible, the fitted curve should be used over average rates. Alternatively a site-specific survey at a surrogate development with characteristics similar to the proposed development is also satisfactory. If the developer provides the rates, then these rates are to be compared to standard ITE trip generation rates;
- Identify the site-generated trips for the proposed development;
- Identify in a table the directional split in site-generated traffic and percent pass-by trips;
- Establish trip distribution. Directional orientation of trips could be based on the surrounding area's population/employment distribution in relation to the site. Distributional proportions should be depicted as percentages for each of the four cardinal directions of travel;
- Conduct network assignment of the site-generated trips. Traffic assignment may be accomplished manually using judgment or using a micro-area travel forecasting model. In either case a sound knowledge of the road system characteristics within the area of influence of the site is required together with the ability to apply sound judgment in the trip assignment process;
- Pass-by trips are trips diverted from traffic already on the roadway system into the new development. Pass-by assignment should be performed separately and then added to the assignment of new trips;
- Assemble development-related traffic volumes for any adjacent sites, either from previous studies or by iterating the above steps;
- Identify the horizon year for the analysis. The analysis should reflect five years after the completion of the development;
- Estimate horizon year background traffic volumes on the study area road system for the selected design hours. Background traffic volumes reflect growth in traffic over time that is not related to the study site (e.g. other development proposed near the study site, general growth of trips through the study area to surrounding locations);
- **Unless analysis suggests otherwise, assume the background traffic growth rate is 2% per year (Saskatoon's population growth rate has been in excess of 2% recently);**



- Determine total traffic conditions in the study area by adding the site-generated traffic and the future background traffic volumes for the selected design hours;
- Determine intersection and turning movement level of service (LOS) and/or volume/capacity ratios at signalized and unsignalized intersections under (a) existing traffic conditions; (b) future background traffic conditions; and (c) future total traffic conditions. Accepted level of service software packages, such as VISSIM, HCS or Synchro, should be used;
- Determine if signalization is required at unsignalized intersections;
- Identify operational and geometric mitigation as required to maintain the system at LOS D **or better**, under total traffic conditions for the horizon years. Some examples of possible remedial measures include:
 - Roadway widening;
 - Geometric changes/channelization at intersections;
 - Additional or alternative access locations/types;
 - Signalization with a corresponding reduction in number of accesses;
 - Reduction in land-use density.
- Access locations should be checked for conflicts, other driveway locations, on-street weaving problems, need for acceleration / deceleration lanes;
- On site parking / circulation systems should be evaluated to demonstrate a high safety factor with respect to the possibility of queues backing on to municipal roads, etc. The site should also be reviewed to ensure emergency vehicles routing and delivery truck routing is addressed;
- Discuss accommodation of pedestrians, transit users and cyclists accessing the site:
 - **Identify the anticipated desire lines for pedestrians using the site; how the sidewalks, accessibility ramps and so on align with those desire lines;**
 - **Identify how the internal circulation system integrates with the adjacent pedestrian, bicycle and transit facilities; Identify the impact of the proposed development on existing transit stops and routes, the safety of transit users waiting, approaching and leaving transit facilities;**
 - **Identify infrastructure gaps for both pedestrians and cyclists using the proposed development;**
 - **A site plan showing sidewalks, pathways, walkways, accessibility ramps, bicycle lanes, bicycle racks should be provided with this discussion;**

Required Drawings

The following exhibits are required as part of the report:

- study area road network with site location identified;
- site plan;
- existing traffic volumes, illustrated for each design hour;
- site-generated traffic volumes, illustrated for each design hour;
- forecast background traffic volumes, illustrated for each design hour;
- total forecast traffic volumes, illustrated for each design hour.
- **signal timing plans for each signalized intersection, for each design period; as well as the ICU analysis if Synchro was used for the LOS analysis.**

5.0 DELIVERABLES

- 5.1 Submit four (4) copies of the TIS to the Transportation Branch for circulation and review. One copy is sent to the Land Development Manager (Design & Construction Branch of Infrastructure Services) where it is placed in the application file. Another copy will be used for review by the Development Review Section of the Planning & Development Branch (Community Services Department). The remaining copy is circulated to groups in the City of Saskatoon for comments on their respective areas of responsibility or kept on file.
- 5.2 **Submit one (1) digital copy (in pdf formatted files) of the TIS to the Transportation Branch.**
- 5.3 Drawings within the report need to be clear and contain large enough text so that reproductions sent to Committees of Council are legible. If drawings are in colour, proper colour selection should be considered so drawings remain understandable/legible when reproduced in black-and-white on 8 1/2 x 11 inch paper.
- 5.4 The consultant may need to be available to speak to the issue of traffic impacts at Committees of Council and/or Council.

Table 1 What Might Trigger a TIS?

Land Use	ITE Category	Predictor	100 Trips
Low density dwellings	ITE 210 Single-Family Detached Housing	Number of dwelling units	175 units
Medium density dwellings	ITE 231 Low-Rise Residential	Number of dwelling units	224 units



	Condominium/Townhouse		
High density dwellings	ITE 232 High-Rise Residential Condominium/Townhouse	Number of dwelling units	317 units
Service Station	ITE 945 Gasoline/Service Station with Convenience Market	Number of fueling stations	15 stations
Fast-food restaurant with drive-through	ITE 934 Fast Food Restaurant with Drive-Through Window	1,000 square feet gross floor area	3,577 sq ft