

STANDARD TERMS OF REFERENCE: Planning Justification Report

Reviewed and approved by:

Planning Department, Community & Development Services

1. Purpose

The purpose of this document is to provide Terms of Reference for the preparation of a Planning Justification Report when required through the mandatory pre-consultation process under the *Planning Act*. This document assists staff in reviewing the proposal and provides a rationale and policy analysis related to the proposed development.

All Planning Justification Reports shall comply with the requirements set out in this document to comprise, in part, a complete application. Failure to comply with the requirements as provided in this document may result in an application being deemed unsatisfactory and incomplete.

The overall goal of a Planning Justification Report is to:

- Provide a clear understanding of the proposal;
- Provide background context and an overview of the purpose and effect of the application(s);
- Identify and analyze all applicable legislation, regulations, policies and guidelines in a comprehensive and unbiased manner to the satisfaction of the Town;
- Justify why and how the land use and built form are appropriate; and
- Establish a professional, unbiased planning rationale for an application by demonstrating how the proposal conforms and is consistent with applicable planning policy documents and why it constitutes good planning.

Schedule J of the Town's Official Plan contains a list of additional information (such as a Planning Justification Report) which may be required to comprise a planning application complete.

2. Preparation Requirements

All reports must indicate the author of the report and be signed by a Registered Professional Planner (RPP). A Candidate Member (defined by the Professional Standards Board) or a Certified Planning Technician (CPT) may also prepare the report; however, in all cases it must be signed and reviewed by an RPP.

3. When is a Planning Justification Report Required?

A Planning Justification Report is required as part of the following applications:

- Official Plan Amendment;
- Zoning By-law Amendment;
- Draft Plan of Subdivision; and
- Draft Plan of Condominium.

A Planning Justification Report or Planning Justification Brief may be required as part of the following applications on a case-by-case basis, which shall be determined by Town and/or Agency Staff, through the mandatory pre-consultation process:

- Site Plan Approval;
- Minor Variance; and
- Consent to Sever.

4. Content Requirements

Planning Justification Reports will vary in content and detail based on the nature and complexity of the development application(s); however, all reports shall include the following general sections:

- Introduction;
- Site Context & Site Statistics;
- Description of Proposal;
- Policy and Planning Analysis;
- Integration of Supporting Studies (including scope, analysis, and conclusions, as applicable);
- Summary/Conclusion;
- Draft Official Plan Amendment and/or Zoning By-law Amendment (if applicable); and,
- Appendices/Figures/Maps/Plans.

The purpose and content of each section is outlined below:

Section	Purpose	Content
<i>Introduction</i>	Brief introduction of the proposed application(s).	<ul style="list-style-type: none"> • What consultant was retained to prepare the report, by whom and when. • Summary of the Pre-consultation meeting held by the Town, the date of the meeting and what requirements were outlined for the submission of the proposed application(s). • What studies and documents were submitted to support the proposal. • A statement for the purpose of the report.
<i>Site Context & Site Statistics</i>	Provides an understanding of the overall location of the proposal and the characteristics of the subject lands and surrounding area.	<ul style="list-style-type: none"> • A description of the location, existing uses and condition of the subject lands. Discussion regarding past uses. • A description of surrounding land uses (such as industrial, commercial, residential, etc.) and important community features such as roads and cultural, historic and/or environmental features (such as Niagara Peninsula Conversation Authority regulated features, Niagara Escarpment Commission regulated lands, etc.). This description should include rationale for the extent of surrounding lands that were considered (i.e., identify the radius used, and discuss why that radius was used). • Identify any constraints impacting the site, such as hazards, natural and/or cultural heritage features, access restrictions, servicing restrictions, etc. • Identification of development proposals impacting surrounding land uses. • Appendices which include maps, surveys, photographs, aerial imagery, and other graphics to assist in providing an overall context for the site and surrounding lands.

Section	Purpose	Content
<i>Description of Proposal</i>	Provides sufficient information to allow the reader to understand the purpose and effect of the proposed application(s).	<ul style="list-style-type: none"> • Details about proposed uses, buildings and siting. • Known planning history of the subject lands, such as previous applications or appeals. • Summary of relevant correspondence with Town, Region and external agency staff. • Where modifications to the existing zoning of the lands are proposed, a detailed concept plan will be provided showing all applicable zoning regulations, including but not limited to lot frontage, setbacks, coverage, encroachments, building height, and parking requirements (in terms of the number of spaces and size of spaces). • Where modifications to the Official Plan are proposed, a detailed description of the proposed amendment and modification should be outlined.
<i>Integration of Supporting Studies</i>	The findings of all technical and supporting studies that were identified as requirements at pre-consultation meeting will be identified and an understanding of how the conclusions of those supporting studies impact the proposal will be provided.	<ul style="list-style-type: none"> • Summarize the outcome of the study and how it relates to the overall proposal. • If the findings of any study relate to the policy analysis, integrate the findings in the Policy and Planning Analysis Section as applicable.
<i>Policy and Planning Analysis</i>	This section is the basis for establishing why the proposal should be considered for approval by the Town by demonstrating	<ul style="list-style-type: none"> • Outline applicable planning policy documents and regulatory contexts, including quoting specific policies that are relevant to the proposal. • Demonstrate the planning basis for the proposal and related application(s) by providing a detailed analysis, including a rationale and professional opinion of how

Section	Purpose	Content
	<p>through detailed analysis the rationale which supports why the proposal is appropriate in terms of addressing “good planning principles”.</p>	<p>the proposal is in conformity and is consistent with the applicable policies and legislation.</p> <ul style="list-style-type: none"> • The following Provincial policy must be addressed, where applicable: Provincial Policy Statement, A Place to Grow: Growth Plan for the Greater Golden Horseshoe, Greenbelt Plan, Niagara Escarpment Plan, and any other applicable policy statement issued under subsection 3(1) of the <i>Planning Act</i>. • The following municipal policies must be addressed, where applicable: Niagara Official Plan, Town of Niagara-on-the-Lake Official Plan, applicable Secondary Plans, Council Adopted Guidelines, and studies conducted by the Region or Town, and applicable provisions in the Town’s Zoning By-law. • Explain how the proposal addresses any individual properties or Heritage Conservation Districts designated under Parts IV or V of the <i>Ontario Heritage Act</i>, as applicable. • Provide a discussion of how the proposal provides social, cultural, economic and/or environmental benefits, how it contributes to creating complete communities, and/or how mitigation measures have been implemented to mitigate potential negative impacts. • Applications for residential uses must be accompanied by an analysis of proposed densities and unit counts compared to the requirements in applicable legislative documents and demonstrate how the proposed density is in conformity with Provincial and/or municipal plans, and compatible with the surrounding community. • In the case that applicable policies/legislation that were approved by Council are under appeal, the report will address the relevant policies, as they

Section	Purpose	Content
		<p>represent the intent of the Town and Council.</p>
<i>Summary/ Conclusion</i>	<p>Provide a summary and concluding remarks for the conducted analysis throughout the report.</p>	<ul style="list-style-type: none"> • Include the purpose and effect of the application(s) and outline why the requested amendments are required to facilitate the proposal. • Summarize key relevant plans and policies and how they are being addressed, with a clear understanding of whether the proposal conforms or not to these planning documents. • Summarize the key merits of the proposed application(s). • Final recommendations.
<i>Draft Official Plan Amendment and/or Zoning By-law Amendment</i>	<p>Draft an amendment to be considered by staff to accompany the proposed application(s).</p>	<ul style="list-style-type: none"> • The draft by-law(s) should reflect what is currently permitted on the property and what the proposed amendment is. • The draft amendment(s) should be formatted similarly to existing Town by-laws in terms of wording and structure.
<i>Appendices/ Figures/Maps/ Plans</i>	<p>Visual aids and/or appendices that accompany the analysis of the report.</p>	<ul style="list-style-type: none"> • This should include, but is not limited to: <ul style="list-style-type: none"> ○ Maps (including aerial photographs, land parcel mapping and surveys). ○ Street-level photographs and/or renderings. ○ Official plan land use designation maps. ○ Zoning maps. ○ Concept plans and/or site plans (including any floor plans, elevations, sections and construction details). ○ Proposed draft Zoning By-law Amendment and amendment sketch. ○ Proposed draft Official Plan Amendment and amendment sketch. ○ Draft plan of subdivision/condominium.

Section	Purpose	Content
		<ul style="list-style-type: none"> Supporting technical studies included with the submission of the application(s).

5. Planning Justification Briefs

In the case that a less complex application is being proposed, a Planning Justification Brief (“Brief”) may be required rather than a full Planning Justification Report, at the discretion of Town and/or Agency staff. The Brief may be included as a cover letter for the submission of a formal application, or as a short report. The Brief will give a summary of the proposal and outline the merits of the proposal based on good planning principles. For minor variance applications, the Brief will address the four tests pursuant to Section 45(1) of the *Planning Act*.

At a minimum, Planning Justification Briefs shall include the following:

- Description of the proposal and site context;
- Summary of applicable provincial, regional and municipal policies and how the proposal meets the intent of such legislation, including policies specific to the lands;
- Summary and conclusion of how the proposal is consistent and conforms with applicable policies and constitutes good planning principles.

The requirement for a Planning Justification Brief will be determined on a case-by-case basis by Town and/or Agency Staff during the pre-consultation meeting.

6. Other Resources/Considerations:

To hire a professional planning consultant, consult the directory:

<https://ontarioplanners.ca/hire-an-rpp>

Information related to Planning Services with the Town can be found here:

<https://www.notl.com/business-development/planning-services>

The Town’s Official Plan can be found digitally here:

<https://www.notl.com/business-development/planning-services/current-official-plan>

The Town’s Comprehensive Zoning By-laws 4316-09 (urban area) and 500A-74 (rural area) can be found digitally here:

<https://www.notl.com/business-development/planning-services/zoning-laws>

All reports shall follow the Terms of this document. Failure to adhere to these Terms may result in a report or brief being considered unsatisfactory and the submitted application(s) to be deemed incomplete.

STANDARD TERMS OF REFERENCE: Functional Servicing Report

Reviewed and approved by: Public Works, Operations Department

Purpose:

A Functional Servicing Report (FSR) determines the overall impact of a land development proposal on the water, wastewater and stormwater infrastructure capacity of the area. The FSR should demonstrate the adequacy of the existing and proposed infrastructure systems to satisfy the demands of a proposed development. It will also determine the required improvements to the municipal servicing infrastructure, and any mitigation measures to minimize negative impacts.

Prepared by:

The FSR should be prepared by a registered Professional Engineer qualified in municipal engineering. All reports and drawings must be stamped, signed and dated by a P. Eng., licensed in the Province of Ontario.

When is this required?

A FSR may be required for the following types of applications under the *Planning Act*:

- Site Plan Approval
- Draft Plan of Subdivision/Condominium
- Zoning By-law Amendment
- Official Plan Amendment
- Consent to Sever

Content:

A FSR should include sufficient details for Town and Regional staff to determine the financial and infrastructure implications of servicing the proposed development. The submission should include reports, plans (e.g. engineering, drainage area, etc.), computer modeling results and design calculations relating to the designs and upgrades of municipal services as requested at the time of pre-consultation.

A FSR should include the following components:

Introduction

- Purpose of Report/Study;
- Background Information;
- Location map and description of the subject property;

- Site constraints and unique features (e.g., pipelines, environmental features, etc.);
- Information on the magnitude of the proposed development, including preliminary site design, lots and street layouts, etc.

Water Supply and Distribution

- Existing and proposed services;
- Estimated consumption, and current capacities of water systems;
- Water distribution concept plan, and phasing of development;
- Net impact due to the proposed change in land use or development, and need for expansion and upgrades.

Wastewater

- Existing and proposed services;
- Estimated discharge and current capacities of trunk systems;
- Net impact due to the proposed change in land use or development, and need for expansion and upgrades.

Stormwater Drainage

- For an Official Plan Amendment, Zoning By-law Amendment, or Site Plan Approval, see the Operations Department's Engineering Standards (November, 2020).
- For Draft Plans of Subdivision or Condominium, the storm drainage issues will be addressed in accordance with the requirements for a stormwater management report (as scoped by staff at the time of pre-consultation or prior to submission).

Utilities

- Discussion regarding existing or planned availability of other utilities including telecommunications, hydro-electric and natural gas.
- Identification of any land or other requirements to accommodate utilities (e.g., switchgear easements, setbacks, etc.).

Phasing Considerations

- If applicable, discuss phasing of infrastructure implementation with respect to development phasing.

Functional Servicing Plan

- Show conceptual grading and piping layout for watermains, sanitary and storm sewer;
- Stormwater management measures (including LID measures, if applicable);
- Major system flow routing;

- Retaining walls;
- And other applicable details.

Appendices

- Appendices including detailed calculations, modelling information, supporting documentation, etc, should be included.

Other Considerations:

A Functional Servicing Report should be based on established municipal engineering design principles, applicable guidelines (e.g. Ministry of the Environment, Conservation and Parks Guidelines), regulations and by-laws and infrastructure information available from the Town and Region.

The level of detail required depends on the type of application and the size of the proposed development. For example, a report in support of an application for an Official Plan and/or Zoning By-law Amendment will be more conceptual than a report in support of an application for a Draft Plan of Subdivision, which will include more details, such as where lot, block or right-of-way dimensions are approved in principle.

Please note that the requirements of this study/report may vary depending on the nature of the proposal. This will be determined through the pre-consultation process and in consultation with any applicable external agencies. The applicant is encouraged to discuss the scope of the study/report with Town staff prior to report commencement.

If the proposed development is revised, the study/report shall reflect the revisions by an updated report or letter from the author indicating the recommendations and conclusions are the same.

Please note that a peer review may be required. The cost of the peer review will be borne by the applicant.

An Environmental Impact Study (EIS) may also be required to address the impact of development on water resources features or functions on- and off-site.

When a development is located adjacent to a Regional roadway, then the Functional Servicing Report should also address what the impact of storm drainage from the development has on the Regional road and/or associated Regional drainage system.

All Functional Servicing Reports shall follow the guidelines of this document. Failure to adhere to these guidelines may result in a submission being considered unsatisfactory and a submitted application being deemed incomplete.

Other Resources:

Information for available Planning services with the Town can be found here:

<https://www.notl.com/business-development/planning-services>



The Town's Official Plan can be found digitally here:

<https://www.notl.com/business-development/planning-services/current-official-plan>

The Town's Comprehensive Zoning By-laws 4316-09 (urban area) and 500A-74 (rural area) can be found digitally here:

<https://www.notl.com/business-development/planning-services/zoning-laws>

Municipal Engineering Standards, November 2020

<https://www.notl.com/sites/default/files/2023-05/Municipal%20Engineering%20Standards%20-%20NOTL%20-%20November%202020.pdf>

DRAFT

NIAGARA REGION

**STANDARDIZED TERMS
OF REFERENCE**

Agricultural Impact Assessment Terms of Reference

Description

A technical report that provides a written description of the impact of a proposed development on the surrounding environment specifically the viability of agricultural uses and operations as well as mitigation measures to reduce any negative impacts.

Agricultural Impact Assessment is to be prepared by a Consultant that has a demonstrated advanced knowledge of Ontario agriculture.

When Required

An Agricultural Impact Assessment may be required to support the following applications for developments:

- Official Plan Amendment
- Zoning By-law Amendment
- Site Plan Control
- Plans of Subdivision
- Consent to Sever

During pre-application consultation, it will be determined if such a report is required and, if so, the specific requirements of the Study, based on the nature of the proposed application and the context of the study area. The requirement for an Agricultural Impact Assessment will be a condition of initial approval of the proposed development.

Rationale

The requirement of an Agricultural Impact Assessment will help in assessing the compatibility of the proposed development with the existing and/or future land uses in the surrounding area as it relates to agricultural lands and protecting them for agricultural purposes.

Required Contents

The Agricultural Impact Assessment should include the following components, but is not necessarily limited to:

Introduction

- Brief description of the proposal (what is being proposed by whom and why);
- Explanation of why an AIA is being completed (provincial and municipal requirements or as a best practice) and how these are satisfied in the AIA;
- Study methods Used (e.g., background materials, windshield surveys, field investigations such as soil survey);
- List of data, mapping and other information sources used to complete the AIA;
- Statutory and informal consultation process including pre-consultation, meetings with municipal & provincial staff as well as the local community (e.g., agricultural

advisory committee, farmers, Indigenous communities, agri-food businesses), as applicable;

- Coordination with other studies that address impacts to the agricultural system (e.g., noise, transportation, environmental impact studies);
- AIA authors and contributors, as applicable, and their qualifications and experience, demonstrating advanced knowledge of Ontario agriculture; and
- Time period over which the AIA was completed, including the timing of any field investigations.

Study Areas

- Identification of alternative primary and secondary study areas which may initially be larger than needed for the proposed use;
- Identification of primary study area—the area required for the proposed use based on avoidance or minimization of impacts to the agricultural system. Identification of secondary study area—the area of influence of the proposed use which could vary depending on the impact (e.g., noise, traffic);
- Description of the primary and secondary study areas including:
 - land use (e.g., lot and concession, aerial imagery, official plan designations and zoning);
 - transportation (e.g., traffic patterns and volumes, use by farm vehicles, modes);
 - agriculture (e.g., designated prime agricultural areas; soil type; CLI; parcel fabric; agricultural uses [i.e., crop types, livestock uses], farm buildings and structures, agri-food network elements, their connections and importance); specialty crop area potential; slope and topography; hydrology, hydrogeology and drainage [incl use of water for agriculture]);
 - general overview of economic, community and environmental contributions of agriculture.

If location alternatives are required:

- Comparison of study area alternatives in terms of impacts to the agricultural system;
- Selection and rationale for the preferred primary and secondary study area locations; and
- Additional description of the primary study area in terms of minimum distance separation formulae, type and condition of farm improvements, other land uses and features, historic severance activity, access points to farm operations and fields, proximity to settlement areas and associated considerations.

If location alternatives are not required:

- If land is to be rehabilitated back to an agricultural condition, detailed pre-development (baseline) information on the primary study area (e.g., soil survey,

soil budget, in specialty crop areas soil suitability for specialty crops and microclimatic conditions, potential to grow specialty crops, crop yields, drainage);

- Demonstration that the AIA was coordinated with work for Aggregate Resources Act approvals (if applicable); and
- Explanation of how pre-consultation and consultation influenced the identification of study areas.

Assessments of Impacts

- Consideration of potential impacts and the degree of impact in the absence of measures to avoid, minimize or mitigate impacts;
- Analysis of the Identified impacts including whether they are short- or long-term, limited to the primary study area, experienced in the secondary study area and beyond (regional perspective in the case of agri-food network elements) and cumulative considering other non-agricultural uses in the area; and
- Explanation of how consultation influenced the assessment of impacts.

Measures to Address Potential Impacts

- Consideration of the hierarchy of measures to address potential impact, with the priority on avoidance, then minimization, then mitigation (direct and indirect), plus any additional applicable measures.
- Identification of measures to address potential impacts;
- Explanation of how measures are proportional to potential impact or risk; and
- Description of how consultation influenced the identification of measures to address potential impacts.

Net Impacts

- Net impacts (i.e., impacts that will still be experienced after measures to address potential impacts are identified) are documented, along with their magnitude and extent; and
- Dependencies are clearly identified (e.g., if X measure is implemented, the result will be Y).

Recommendations and Conclusions

- Explanation of how provincial and municipal requirements/expectations are satisfied;
- Identification of anticipated net impacts of the proposed development or infrastructure to the agricultural system; and
- Recommended implementation plans for each measure to avoid, minimize and mitigate impacts, addressing who will implement the measure, how effectiveness will be determined, contingencies, and implementation timing.

Appendices

- Curricula vitae of the study team (excluding municipal staff).
- Full references for all background information sources.
- Data from field studies (e.g., soil survey).
- MDS formulae calculation forms (personal information removed)
- Individuals and groups engaged during pre-consultation and consultation.

Land Use Compatibility Study Terms of Reference

Description

A Land Use Compatibility Study is a technical report that provides a written description of the land use compatibility of sensitive land uses, where permitted or proposed adjacent to, or near to industrial uses; or within the influence area of major facilities; or in proximity to transportation and utility sources.

The report will identify any existing and potential land use compatibility issues and will identify and evaluate options to achieve appropriate design, buffering and/or separation distances between the proposed sensitive land uses and existing uses.

This report will be used to assist Regional staff in making recommendations concerning the proposed sensitive land uses, and may be peer reviewed by the Region at the cost of the applicant.

The report will:

1. Provide a written description of:
 - any potential land use compatibility impacts by type (i.e.: traffic, noise, vibration, and emissions, including dust and odour) and the severity, frequency and duration of such impacts, as may be appropriate for each type;
 - the history of any complaints received by the municipality and/or MOECP within the immediate area of the proposed development;
 - the potential land use compatibility issues the proposed development may create. Impacts shall be considered based on the potential:
 - effects on major facilities' compliance with applicable environmental policy, regulations, approvals, authorizations and guidelines, including the noise provisions of local by-laws;
 - increased risk of complaint and nuisance claims;
 - operational constraints for major facilities;
 - constraints on major facilities to reasonably expand, intensify or introduce changes to their operations;
 - constraints for new major facilities to reasonably be established on lands in proximity to the development that are designated for employment uses;
 - the extent of non-compliance with land use separation requirements for existing employment uses in the vicinity, including propane storage and distribution facilities, if applicable; and,
 - the extent to which the applicant of the proposed development and businesses within the nearby industrial, utility, transportation and/or major facilities have exchanged relevant information. This would include the written undertakings given to affected businesses that any information regarding their processes, emissions data and expansion plans not already part of the public record would be treated on a confidential basis.

2. Identify and evaluate options to achieve appropriate design, buffering and/or separation distance to prevent or mitigate potential adverse effects from traffic, noise, vibration, and emissions. This would include details on the following:
 - At-Source Mitigation: Technology that businesses in *Employment Areas* and/or major facilities may consider implementing to mitigate adverse effects;
 - Buffers: Physical structures, building design elements or distance separation that could be incorporated into the site design of the proposed sensitive land uses, including residential uses, to mitigate adverse effects and negative impacts;
 - At-Receptor Mitigation: Technologies, building materials, design features etc. that could be incorporated both on-site and within the built structure of proposed sensitive land uses, including residential uses, to mitigate negative impacts and adverse effects; and
 - Other: Any other potential techniques, strategies and approaches not identified above, including but not limited to, warning clauses, environmental easements, agreements with major facilities to secure at-source and at-receptor mitigation and classifying lands as a Class 4 Area in accordance with the requirements of the MOECP “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning Publication NPC-300”, as amended or replaced from time to time.
3. Provide details of assessment criteria.
4. Provide details regarding the methodology used and assessment locations.
5. Discuss how the proposed development is consistent with the Provincial Policy Statement, is in accordance to the *Planning Act* (as amended), and conforms to The Growth Plan for the Greater Golden Horseshoe and The Greenbelt Plan, as it applies to the planning and development of sensitive land uses in proximity to industrial, utility and transportation uses.
6. Recommended methods to secure the necessary mitigation to guarantee that such mitigation is installed, performs as intended and will be maintained to ensure land use compatibility.

The study is to be prepared on behalf of the applicant by a Consultant (or Consultants) that is/are fully accredited, qualified and/or certified in the relevant matters being evaluated and recommended (for example air quality assessments should be performed by an engineer fully accredited in such field, etc.).

When Required

A study may be required to justify sensitive land uses where permitted or proposed adjacent to or in proximity to industrial, transportation, and utility sources:

- Official Plan Amendment
- Zoning By-law Amendment
- Subdivision Application

- Site Plan Control
- Consent Application

During pre-application consultation, Regional staff will work with the applicant and the applicant's consultant(s) to determine if such a Study is required and, if so, the specific requirements of the Study, based on the nature of the proposed application and the context of the study area.

Peer Review

The objective of the peer review is to provide staff with an independent, expert, third party assessment of the potential land use compatibility issues as well as the proposed mitigation measures. The purpose is to assist in making fully informed land use planning recommendations.

The peer reviewer will provide, at the cost of the applicant, an assessment of the report and whether appropriate methodology and data have been applied to the analysis, as well as an evaluation of the recommended mitigation measures and conclusions. The peer reviewer may request updates to the study as needed to satisfy Niagara Region and the Local Area Municipality that the report is complete and adequately addresses any potential land use compatibility concerns.

TRANSPORTATION IMPACT ASSESSMENT

GUIDELINES

Monday, July 24, 2023



Engineering for **people**

These guidelines are intended to provide an understanding of traffic operations and transportation impact assessment and cover a broad range of elements that are usually encountered in practice. They are based on various factors such as safety, convenience, adjoining land use, multimodal transportation operations, adjoining roadway classification and traffic control. However, no manual can cover all contingencies or all potential cases to be encountered in the field. Therefore, field experience and knowledge of application are essential in applying the direction stated in these Guidelines.

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1 Introduction

Niagara Region recognizes the importance of all modes of transportation to its citizens and businesses and to their ability to move around and through the Region. The Niagara Region Official Plan includes a number of objectives and policies that demonstrate this. The Region's Official Plan states that there is a desire for a safe, convenient, efficient, aesthetic, and economical transportation system for its residents and businesses, including the provision of efficient transit services. It is important to ensure that new developments and redevelopments are planned with these objectives in mind as well.

As a result, the Region seeks to move away from more traditional Traffic Impact Studies (TIS), which are generally focused on the impacts of car and truck traffic and to embrace a multi-modal approach to transportation. With the adoption of this Guideline Document, the Region will now require that benefits and impacts for all modes of transportation generated by, attracted to, or altered by a new development or redevelopment be assessed in a Transportation Impact Assessment (TIA).

Rather than focusing on the travelled lanes between the curbs, the TIA shall look at all means and modes of transportation. It should be noted that it is not the intention of this guideline to be a "barrier" to developments within the Region; rather it is meant to assist all parties in identifying what is required upfront to achieve a complete TIA document that will best serve the needs of all involved.

1.1 Objectives of a Transportation Impact Assessment

The main objectives of a TIA are to:

- Identify the benefits and impacts of a proposed project/ development/ redevelopment.
- Identify how any transportation impacts associated with the proposed project/development/redevelopment can be mitigated and addressed in a manner that is consistent with the objectives of Niagara Region and the Municipality.
- Evaluate transportation related improvements or measures to be included as a condition of the project or development or redevelopment by providing safe and efficient access and traffic flow.
- Identify any existing or potential safety concerns, and apply a road safety focus and undertake the necessary technical work related to conflict analysis, road safety audit, and safe system approach; and
- Identify countermeasures to enhance the level of safety for all road users including motorists and vulnerable users.

1.2 Purpose of this Guideline

Niagara Region has prepared this document to provide a standardized approach to developers and consultants regarding the preparation and submission of a TIA. A standardized set of guidelines will assist Regional staff in reviewing TIAs and reduce revisions and resubmissions.

Following these guidelines and contacting appropriate Regional/Municipal staff in the preliminary stages of the development planning process will provide a more consistent and efficient review process. The Region will also use these guidelines for Class Environmental Assessment Studies for Capital Works Projects and for transportation analysis associated with Secondary Planning.

The TIA will provide information that identifies the impacts of proposed development on the existing transportation facilities and circulation networks and the recommended mitigation measures for the impacts identified.

The preparation of a TIA will consider the content of the Region's Official Plan, Transportation Master Plan, Complete Streets Design Manual, Access Management Guidelines, and other related transportation and planning documentation.

2 General Requirements

2.1 Need for a Transportation Impact Assessment

In general, a TIA will be required when any one of the following criteria is met:

- More than 100 new peak hour auto trips are expected to be generated as a result of the project/development/redevelopment.
- Localized safety or capacity issues already exist.
- Localized safety or capacity issues are anticipated as a result of the proposed project/development/redevelopment or other proposed developments in the area.
- There are site-specific or project-specific characteristics that warrant more detailed transportation analysis.
- The project/development/redevelopment, its access, or type of operation is not envisaged by existing land-use or transportation plans.
- The project/development/redevelopment is a large recreation or entertainment facility that would likely serve as a regional attraction.
- Any previous TIA study prepared for the same site is more than three (3) years old; or
- If a combination of environmental assessment study and proposed development application/s in the area.

Niagara Region reserves the right to require submission of a TIA as part of the development application process notwithstanding the criteria listed above.

2.2 Region/Municipal Staff Consultation

The evaluation of the impacts of a proposed project/development/redevelopment on the transportation network depends upon a number of assumptions about the type, amount, mode, and travel patterns expected to be produced from and attracted to the site.

As such, it is imperative that in the preliminary stages of the development planning process, the Developer attends a pre-consultation meeting to determine if a TIA is required. Prior to commencing work on a TIA, the Developer shall provide a draft Scope of Work to all associated agencies for their review and approval, in order to ensure that all requirements will be captured in the final TIA submitted with the formal application.

To this purpose, the Developer shall submit a proposed Scope of Work accompanied by the following information (to the best extent possible):

- A site plan that must include the following details:

- Title block including name of the applicant, project name, address, date of issue, application number(s)
- Scale
- North point
- Property lines
- Street name and number
- Location and names of adjacent roads.
- Existing right-of-way
- Future right-of-way widening if any including dimensions
- Daylighting Triangles, if required
- Existing and proposed municipal sidewalk(s)
- Location of proposed buildings and structures
- Proposed parking area layout with the maximum number of vehicles to be accommodated at one time.
- Location of existing and proposed entrances for the proposed development and the abutting properties as well as properties on the other side of the road.
- Fire access routes and waste/recycling truck routes, if required
- Existing transportation infrastructure in the access roads (i.e., Signals)
- Development details, including:
 - Type of development (i.e., residential, commercial, industrial, etc.)
 - Projected size of development (i.e., number of units, GFA, etc.)
 - Stages or phasing schemes of the development, including those in which several independent developments are considered as part of a permit application.
 - Expected buildout year.
- Traffic information:
 - Street operation (e.g. one-way vs. two-way) for all streets shown on the site plan.
 - All adjacent and affected intersections including lane configurations, lane width, and turning restrictions that will be included in analysis
 - Proposed developments in the area that they will be taken into consideration.
 - Proposed studies (i.e., EA's) that will be taken into consideration.
 - Proposal to calculate trip generations for the site.
 - Proposal to calculate trip distribution.



- Proposed traffic growth rate and rationale for the number provided.
- Analysis horizon years
- Analysis for additional requirements for pedestrian, bicycle network linkages
- Additional information – sight line study, review for signalization, vehicle turning paths, review of left turn lane requirements, etc.

After Region and/or Municipal staff have completed the review of the proposed Scope of Work, the requirements for the TIA – including suitable parameters to be used as part of the transportation impact analysis, will be formally communicated to the Developer which will proceed with the preparation of the TIA accordingly. For larger developments Regional and Municipal staff may require that prior to formal submission of the TIA, preliminary technical memorandums be prepared by the Developer and submitted for review and approval by Regional and Municipal staff to ensure that trip generation/distribution etc. are acceptable prior to the TIA being completed and submitted.

If this approach is determined suitable it will be relayed through the reviewing and commenting of the Scope of Work or at pre-consultation meeting.

2.3 Engineering Qualifications

Where a TIA is required or requested by the Region or Municipal staff, it will be the responsibility of the Developer to retain a qualified transportation consultant with experience in transportation planning, road safety and traffic engineering. The consultant must be a registered Professional Engineer licenced and in good standing in the Province of Ontario and the TIA report shall be signed and stamped by the Professional Engineer prior to final approval.

2.4 Submission Requirements

The TIA report must follow the format outlined in Section 3 of these guidelines. This format will facilitate efficient and effective review, discussion, and communication. Any variation from this format without prior consultation with the reviewing agency will result in delays to the processing of the application and in some cases the report may be denied and returned for revision.

The TIA report should consist of a main document containing the text and exhibits including summary tables, supplemented by technical appendices detailing the analysis as well as functional design drawings. Elements of the TIA report shall include those which were included in the approved Scope of Work.

All supporting information such as the traffic analysis outputs, trip generation/distribution data source, collision history, etc. shall be submitted with the TIA. All Synchro files or other traffic simulation software shall be submitted in digital form.

Developers are also reminded that approval of the TIA does not constitute approval of the development application.

2.5 Study Updates

A TIA will have a functional life of three (3) years from the date of the study. Consideration may be given to extending the functional life of the TIA should build-out not take place as expected and other major changes within the study area have not occurred (i.e., for infill developments in a mature area or new development applications). Major changes within the study area or the proposed development may reduce the applicability of the study if they were not considered in the original impact assessment and may require an update to the assessment if the development has not already begun or completed build-out.

3 Report Format and Contents

The following section outlines the typical content for the TIA. In general, the content and extent of the TIA will depend on the location, nature and size of the proposed project/development/redevelopment and the prevailing transportation network and conditions in the surrounding area. Municipality or Provincial roadway authorities may require additional information or analyses beyond the Regional requirements outlined in these guidelines.

3.1 Title Page

Contains date of submission, report version (draft or final) as well as general information about the related development application.

3.2 Executive Summary

Contains key findings, conclusions and recommendations of the TIA and should be located at the front of the document.

3.3 Introduction

The purpose for submitting the TIA shall be explicitly indicated as part of the Introduction and shall contain a brief description or overview of the project that is the subject of the TIA as well as a description of the components of the TIA.

3.4 Context

3.4.1 Study Area

The TIA shall contain a description and a map of the study area including, but not limited to, the following information:

- Site location.
- Existing and adjacent land use type.
- Road jurisdictions.
- All adjacent and nearby roads indicating the names, road classifications (using AADT), typologies, speed limits, and lane configurations.
- Signalized and/or unsignalized intersections and their locations including control type and turning restrictions.
- Transit services (routes and stop locations), parking facilities, pedestrian and cycling facilities (existing and planned).

The study area should be determined through the Scope of Work where the Region and Municipal staff reserve the right to establish the study area as may be deemed necessary.

The study area will include all municipal, regional, and provincial roads, expressways, intersections, interchanges, transit services, pedestrian and cycling facilities, etc. that Regional and Municipal Staff consider to be noticeably affected by the trips generated/attracted by the proposed project/development/redevelopment.

3.4.2 Site Plan and Proposed Land Uses

The TIA shall provide a full description of the proposed development that includes the following elements:

- The type of land uses proposed.
- Detail and size of the proposed development, expressed in units related to transportation analysis such as property size (area), number and size of residential units, industrial gross floor area, number of employees, number of hotel rooms, commercial gross leasable floor area, etc. Special attention should be paid to the correct gross versus net definitions.
- Other developments in the study area that are under construction, approved or in the approval process that have the potential to impact the regional facility or proposed access (to be confirmed by the Municipality).
- Any road improvements that are planned within the next 10-20 years plans or currently under construction within the defined study area.
- Any improvements included within existing EA documents for the study area.

The anticipated construction year for the proposed development shall also be identified. If the proposed development is to be constructed in phases, the TIA shall identify the stages or phasing schemes of the development as well as the expected dates of full and partial completion/occupancy, estimated length of construction and opening dates if available, for each phase.

A detailed site plan shall be provided showing structures, parking, access and site circulation, fire routes, waste recycling truck routes, as well as existing road edges, entrances, pedestrian and cycling facilities, pavement markings and traffic control for roads adjacent to the proposed development as described in Section 2.2.

3.5 Travel Demand

3.5.1 Horizon Year

In general, the horizon year(s) for impact analysis must be: (1) for existing conditions at the time of the preparation of the TIA; (2) at the time confirmed by the Developer in which the proposed development will be fully completed (build-out condition); and (3) five years from the anticipated build-out of the site. Where applicable, each major phase in a multi-phased development shall be assessed separately for the five-year horizon beyond full build-out of each phase.

The horizon year(s) will be confirmed by the Region and Municipal staff as part of the approved Scope of Work.

3.5.2 Time Periods of Analysis

Typically, the weekday morning AM and afternoon PM peak hour periods should be evaluated. If the site is located in a major tourism area or is expected to generate significant weekend traffic, then the weekend peak hour may also require analysis.

Selection of the most appropriate peak period – especially for those areas in which weekend peaks may be considered as most suitable scenario will be determined by the Region and Municipal staff as part of the approved Scope of Work.

3.5.3 Data Collection

The Developer is responsible for collecting, assembling, analysing, and presenting all types of data required for the study. A field observation (peak one-hour count at minimum) should be undertaken to verify that traffic volumes through an intersection reflect normal conditions and to determine the necessary adjustments to level-of-service calculation so that actual conditions are fairly represented.

Current traffic and collision data (data collected within at least three years of the study) shall be used. Turning movement count (TMC), signal timing data, historical and recent AADT volume information for regional roads, and collision data can be requested from Niagara Region for a fee: (<https://www.niagararegion.ca/living/roads/permits/traffic-data-requests.aspx>).

Additional current volume data (including pedestrian and cyclist) should be collected to supplement the available data, as necessary. Transit counts should be based on the peak points of the routes involved. Particular care should be taken in conducting/ reviewing traffic counts in congested situations to identify/account for distortions caused by capacity constraints.

Where the development is adjacent to an area with identified traffic/safety issues, existing collision data (available from the Region) should be reviewed and an assessment of the impact of the proposed development should be provided as part of the TIA.

In the event of Regional or Municipal data not being available or if the data is not current enough to be used for the study, the Developer shall undertake collection of the required data on their own. However, traffic counts that appear not to be reflecting existing conditions should be updated so they reflect current traffic levels.

3.5.1 Background Traffic Forecast

The background growth in traffic should be established in consultation with Regional and Municipal staff through one of the following methods:

- Estimation of roadway growth factors from a calibrated transportation demand model, such as the Region's EMME model.
- A growth rate based on area transportation studies.

In absence of these methods, a background traffic growth factor between 1 to 2 percent will be determined by the Region and Municipal Staff as part of the review of the Scope of Work.

The Region can also provide additional information regarding travel demand and/or unique study areas through reference to the Region's EMME model.

3.5.2 Site-Generated Traffic

3.5.2.1 Trip Generation

The volume of traffic generated by a proposed project/development/redevelopment shall be estimated using the procedures described in ITE's Trip Generation Manual. Trip generation parameters shall be selected using the guiding principles included in the ITE's Trip Generation Handbook.

If local data is available, or an alternative methodology for trip generation is proposed, including the use of proxy sites, the use of this data or methodology shall be presented as part of the proposed Scope of Work for approval by the Regional and Municipal staff. A minimum of three comparable studies should be provided.

The TIA shall present trip generation assumptions and results in a tabular form identifying the categories and quantities of land uses, with the corresponding trip generation rates or equations and the resulting number of trips.

The report should also include a description of any initiatives proposed to provide alternatives to single-occupancy vehicle use and any steps that will be taken to support transit use, walking, cycling or other forms of Transportation Demand Management.

3.5.2.2 Trip Distribution/Assignment

The TIA shall describe methods and assumptions for distribution and route assignment of traffic. Assumptions for trip distribution shall 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 shall be supported by:

- Existing travel patterns.
- Expected future travel patterns.

Assumptions for Origin/Destination and Percent Distribution shall be presented in tabular form; traffic assignment should be presented as a diagram. For each time period, include figures that summarize:

- Existing traffic/transit volumes.
- Existing plus background growth for each horizon year; and,
- Existing plus background growth plus site generated volumes for each horizon year

3.5.2.3 Pass-By and Internal Capture Trips

Pass-by trips are defined as intermediate stops made on the way from an origin to a primary destination. Methods and assumptions for adjusting gross trip generation for pass-by trips shall be in accordance with the ITE's Trip Generation Handbook.

Internal Capture trips are defined as those trips made among land uses internal to the site. The method addressed in the ITE's Trip Generation Handbook shall be followed to estimate the percentage reduction in trip generation due to internal capture.

For land uses not currently included in the ITE's Trip Generation Handbook, all trips will be considered as primary trips.

Assumptions for Pass-by and Internal Capture Trips should be presented in a tabular and graphical form.

3.6 Evaluation of Impacts

3.6.1 Traffic Operations Analysis

The evaluation of impacts shall be conducted for all time periods of each horizon year, including any interim phasing years if applicable, as established by Regional and/or Municipal staff as part of the approved Scope of Work. The peak hour analysis should be undertaken for existing, future background and future total traffic conditions as detailed below:

- Existing traffic conditions.
- Existing traffic conditions plus background growth (i.e., future background traffic conditions).
- Existing traffic conditions plus background growth plus site-generated traffic (i.e., future total traffic conditions)

Where required, separate scenarios should be developed to present findings with and without possible road/intersection improvements.

Capacity analysis shall be performed at all proposed site access points and intersections in the study area in accordance with the methodology described in the latest edition of the Highway Capacity Manual (HCM). Critical movements should be identified according to the following:

- At signalized intersections, movements with v/c ratio greater than 0.85 and/or LOS “E” or worse are deemed to be “critical” in terms of operations. Movements that exceed those thresholds shall be evaluated for possible operational improvements.
- At unsignalized intersections, movements expected to operate at LOS “D” or worse and/or where the estimated 95th percentile queue length for an individual movement exceeds the available queuing space.
- Any site accesses where entrances or egress is anticipated to be blocked by traffic queues from an upstream/downstream intersection.
- An exclusive turning movement in which the 95th percentile queue will exceed the available storage space.
- Exclusive left- and right turn lanes that are inaccessible due to the length of queues in the adjacent through lanes.



Conventional signal timing plans should be used and all proposed adjustments to traffic signal timing, phasing and cycle lengths should be evaluated in terms of pedestrian crossing time, effect on queue lengths, adequacy of existing storage and effects on the existing signal co-ordination in accordance to Niagara Region standards.

Two stages left turning movements or pedestrian crossings shall not be considered as part of the capacity analysis.

For developments in which truck trip generation and their effects on the study area have been identified in the Scope of Work, heavy/commercial vehicles shall be considered as part of the capacity analysis and the following information shall be included as part of the TIA:

- Existing conditions related to truck traffic (percentage, number of collisions).
- Relationship between land use and truck traffic (cargo, service hours, routing).
- Physical requirements (dedicated access, dedicated lanes).

The Region and Municipal staff will accept the use of Highway Capacity Software, Synchro/SimTraffic or similar simulation software for intersection/roundabout capacity, operational analysis, and geometric delay analysis. Regional and Municipal staff will confirm the approved software and the version of its packages as part of the approved Scope of Work. The Developer shall request approval from Regional and Municipal staff as part of the proposed Scope of Work to use any software and may be required to submit an electronic copy of the calculation files.

3.6.1.1 Saturation Flow Rates

A saturation flow rate represents the maximum number of vehicles per hour a traffic lane can process during a green phase. Since saturation flows vary based on driver behaviour and movement type, local saturation flow rates for different turning movements were estimated by collecting field data at multiple signalized intersections across the Region.

Selection of the most appropriate saturation flow will be determined by the Region and Municipal staff as part of the approved Scope of Work. Saturation flows others than the ones shown in **Table 1** will not be accepted unless substantiated through surveys of existing conditions can be presented for consideration by the Developer's consultant.



Table 1 Saturation Flow Rate by Jurisdiction

Variable	Saturation Flow Rate (pc/h/ln)			
	St. Catharines / Welland	Niagara Falls	Grimsby	Other Municipalities*
T	1,776	1,579	1,532	1,629
L	1,651	1,454	1,407	1,504
LT	1,375	1,178	1,131	1,228
LL	2,341	2,144	2,097	2,194
R	1,498	1,301	1,254	1,351
RT	1,535	1,338	1,291	1,388
LTR	1,630	1,433	1,386	1,483

* The survey conducted for the saturation flow rate modelling only included municipalities in St Catharines, Welland, Niagara Falls, and Grimsby. For other municipalities in the Niagara Region, the average value of estimated saturation flow rates is recommended.

3.6.2 Active Transportation Analysis

For all developments, the following information shall be included as part of the TIA:

- Existing and proposed pedestrian and cyclist facilities – including proposed if applicable.
- Measures to maintain and/or improve existing conditions, including interconnection of existing facilities.
- Any possible effects in existing or proposed facilities generated by the proposed development.

The Multi-Modal Level of Service (MMLOS) indicators as presented in the Ontario Traffic Council’s MMLOS Guideline should be used as part of the evaluation of impacts and the results presented as part of the TIA.

3.6.3 Transit Analysis

The Multi-Modal Level of Service (MMLOS) indicators as presented in the Ontario Traffic Council’s MMLOS Guideline should be used as part of the evaluation of impacts and the results presented as part of the TIA. Existing transit services should be evaluated in terms of available capacity and need for increased service.

Potential transit impacts and mitigation measures to be considered as part of the TIA will be determined as part of the approved Scope of Work but the analysis may include among others the following elements:

- Pedestrian access to transit services from the proposed development shall be evaluated and desirable improvements to the site plan to facilitate access should be noted and/or recommended.
- Any impacts on transit operations caused by site-generated traffic shall be identified and suitable remedial measures noted and recommended.
- Any required relocation of transit facilities, such as bus stops, shall be identified and alternative locations determined and evaluated regarding their effect on traffic and transit operations.

3.6.4 Safety Impact Analysis

Potential safety or operational issues associated with the following, as applicable, should be identified:

- Weaving maneuver.
- Merging conflicts.
- Transit operational conflicts.
- Corner clearances.
- Sight distances.
- Vehicle-pedestrian and vehicle-cyclist conflicts.
- Traffic infiltration.
- Access conflicts.
- Cyclist movements.
- Heavy truck volumes and consideration (e.g., turning paths) and size of the trucks.
- Speeding.

The safety impact analysis should include but is not limited to:

- A road safety review of existing conditions including any remedial measures to address unusual collision patterns that are identified through the Scope of Work.
- An estimate of the impacts that the development will have on collision patterns.

Where the development is expected to contribute to speeding or other road safety issues, the Developer will be required to review existing speed and traffic data (available from the Region) and propose road safety countermeasures, in consultation with Regional staff,

appropriate for regional roads. Implementation of the identified and approved countermeasures will be the responsibility of the developer/owner.

The TIA shall include consideration of the safety of vulnerable users, including the identification of pedestrian desire lines and areas of potential conflicts between motorized vehicles and cyclists, motorized vehicles and pedestrians, and cyclists and pedestrians, as well as the need for pedestrian and/or cycling controlled crossings.

3.6.5 Site Access and Access Management

Site access location and design shall be determined based on the results of the traffic impact analysis in accordance with the Region's Access Management Guidelines. In general, any new access should be designed to restrict the inbound and outbound left turns if they conflict with an expected queue on the main road.

3.6.6 Transportation Demand Management

Transportation demand management (TDM) refers to various strategies that change travel behavior (how, when, and where people travel) in order to increase the efficiency of transport and parking systems in alignment with planning objectives.

Depending on the size and the type of the proposed development, the context, need and opportunity for transportation demand management measures should be presented by the Developer in the TIA.

At minimum the Developer needs to consider the implementation of TDM measures, such as electric vehicle charging stations, bicycle parking, pedestrian treatment within the development to provide safe access for pedestrians to/from the development, transit connections, carpool parking spaces, etc., that can increase the travel options available for residents, employees and costumers of the proposed development; manage travel demand along the roadway network servicing the proposed development and reduce traffic congestion generated by the proposed development.

3.7 Potential Improvements

All physical and operational road network deficiencies identified during the Evaluation of Impacts shall be addressed. The need for improvements shall be reviewed at all locations in the study area and for each proposed development stage, as required. The TIA should clearly identify transportation impact by mode, the transportation improvements that are needed to mitigate these impacts, timing of any recommended improvements, as well as a high-level cost estimate of the recommended improvements.

Improvements that are required for the proposed development/redevelopment will be identified through the application and will be responsibility of the developer/owner and will require a legal agreement including letters of credit with the Region.

3.7.1 Geometric Improvements

All geometric improvements should be shown on a functional plan indicating dimension, required pavement widening, required right-of-way widening, traffic control and other significant characteristics including the location of all driveways/intersections/points of access opposite the property being developed. All geometric improvements must be in accordance with the Niagara Region Complete Street Design Manual and Roadway Design Standards.

Where the need for pedestrian and/or cycling supporting infrastructure exist, treatments shall be considered in accordance with guidelines from Ontario Traffic Manual Book 15 – Pedestrian Crossing Treatments, Book 12A – Bicycle Traffic Signals and Book 18 – Cycling Facilities.

When improvements to an intersection are proposed, the design plans should show all legs of the intersection so that turning paths and lane continuity can be reviewed. The design requirements for traffic signals are outlined in the Region of Niagara Traffic Signal Standards.

3.7.2 Traffic Signal Justification

Refer to OTM Book 12 to determine when traffic signals or provisions for signals are warranted following OTM Book 12 Traffic Signal Justifications. All proposed new traffic signals should consider the requirements described in the Region's Access Management Guidelines regarding their proximity to other adjacent traffic signals and any impacts on the corridor. If a traffic signal is justified, then a screening to determine the suitability of a roundabout may be required by the Region and Municipal staff.

The need for traffic and pedestrian signals and/or underground provisions (conduits) should be reviewed at all locations affected by the proposed development and for each proposed development stage(s).

All assumptions concerning lane configurations, pedestrian activity, cycle lengths, signal phasing and signal timings shall be documented. The Developer's consultant shall confirm that any assumptions are in conformance with the Region of Niagara and/or corresponding Municipal standards and/or practices.

3.7.3 Roundabout Feasibility

If a traffic signal is justified, then a screening to determine the suitability of a roundabout may be required by the Region and Municipal staff. Potential use of a roundabout(s) instead of signalized intersection(s) should be identified as part of the proposed Scope of Work.

However, if this did not occur, the Region shall be contacted at the moment that the potential need is identified. To this purpose, a Microsoft Excel spreadsheet containing the Roundabout Screening Form can be requested from Niagara Region.

3.7.4 Other Improvements

The results of the Multimodal Level of Service evaluation should be used to determine the need for improvements to pedestrian, cycling and transit supporting infrastructure. Niagara Region will work with the local Municipality to ensure that there is proper integration between pedestrian walkways, cycling paths and transit routes and vehicular access to development. Niagara Region will also support any Municipal initiatives to encourage and increase safety for pedestrians and cyclists as well as ridership of current and future transit services.

The design of new road networks and subdivisions should include built in features that will ensure vehicle speeds remain below acceptable speeding thresholds and reduce or even eliminate the need for expensive retrofits.

3.8 Conclusions and Recommendations

A summary of the key findings with respect to the transportation impact of the proposed development shall be presented along with a summary of the recommended improvements if necessary as well as a high-level cost estimate of the recommended improvements.



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Niagara Region

Sun/Shadow Study

Terms of Reference

August 04, 2023

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of a Sun/Shadow terms of reference is to provide a starting point for the preparation of a sun/shadow study. These studies help plan developments by informing the design of buildings and the arrangement of buildings on sites. By understanding the nature of existing shadows and new shadows, new developments can ensure adequate access to sunlight thereby enhancing the livability and sustainability of public and private spaces.

Sun/shadow studies must demonstrate potential shadows and propose mitigation when excessive shadows result in negative impacts to their surroundings.

Contexts can vary, therefore the scope and requirements of a sun/shadow study can be adjusted by the municipality in consultation with the applicant to suit the nature of the subject proposal. The preparation of sun/shadow studies must consider local official plan policies and any relevant local design guidelines.

1.2 WHY ARE SUN/SHADOW STUDIES IMPORTANT?

Sun/shadow studies are important for several reasons:

- Knowing how the position of the sun can affect the size of the shadow cast.
- Knowing where shadows fall within and outside a site.
- Knowing where to optimally locate buildings and site elements such as landscaped spaces, parking areas, trees, amenity spaces and more.
- Knowing how shadows from new developments impact, adjacent properties, streetscapes and public spaces.

1.3 WHEN IS A SHADOW STUDY REQUIRED?

A Sun/Shadow study may be required in support of a complete application for development proposals within the urban settlement areas of the Niagara Region. A Sun/Shadow Study is prepared for buildings that are greater than 6 storeys in height. Buildings that is lower than 6 storeys may require a Sun/Shadow study where a site-specific basis is identified. Municipalities also may exempt developments above 6 storeys if the planned context or the prevailing building heights surrounding the development are more than 10 storeys. In all cases, the requirement for a sun/shadow study must conform to local official plan policies and relevant local guidelines.

1.4 WHO CAN PREPARE A SHADOW STUDY?

A Shadow Study can be prepared by a design professional such as an architect, landscape architect, urban designer, engineer, or a qualified consultant with experience in this field.

1.5 HOW IS A SHADOW STUDY PREPARED?

Shadow studies should be generated through computer software that can simulate shadows. The software must be able to geo-reference the subject site, create massing models of proposed buildings and surrounding buildings and cast shadow accordingly.

2.0 TRIGGERS FOR A SHADOW STUDY

2.1 INTRODUCTION

Shadow Studies may be requested for development proposals with building heights of 6 storeys or more. Municipal staff may request a shadow study if one or more of the following is triggered:

Building height exceeds 5 storeys; building is in proximity to shadow-sensitive areas, including but not limited to adjacent sensitive uses, civic and cultural spaces, Heritage districts or buildings, private outdoor amenity spaces, parks and open spaces, places where children play, pedestrian predominant streetscapes and/or mixed use districts, and other identified site specific and when Official Plan policies require these.

3.0 METHODOLOGY

3.1 INTRODUCTION

The dates and times for preparing a Shadow Study may differ depending on the specific Shadow Impact Criteria that is being evaluated (**section 4.0**) and other relevant factors. The study should include the following:

TABLE 1: SHADOW STUDY TIMES (Hourly intervals from 10am to 6pm)		
TEST DATES	APPROX: SUNRISE & SUNSET	TIME ZONE
• April 21	SR: 6:25AM SS: 8:05PM	• Time Zone: Eastern • Standard Time: Universal Time minus 5 hours (Winter Solstice - December 21st) • Daylight Saving Time: Universal Time minus 4 hours (Vernal Equinox - March 21st; Summer Solstice - June 21st; and Autumnal Equinox - September 21st) Universal Time (UT) is Greenwich Mean Time
• June 21	SR: 5:35AM SS: 9:00PM	
• September 21 (March 21 has the exact amount of daylight)	SR: 7:00AM SS: 7:15PM	
• December 21	SR: 7:45AM SS: 4:45PM	

4.0 SHADOW IMPACT CRITERIA

4.1 INTRODUCTION

Sun/Shadow studies must consider the unique site-specific context and the surrounding features, built-form, and land uses. Each context requires a specific level of consideration and assessment. Below are typical conditions with corresponding criteria of exposure, coverage, times, dates, and standards.

4.2 PRIVATE REALM

4.2.1 – Outdoor Residential Amenity Spaces on Adjacent Properties

To minimize the impact of shadow on existing adjacent properties from new development, adjacent residential amenity areas should receive at a minimum of 6 hours of sunlight between 10am to 6pm.

- April 21 to September 21

4.2.2 - Outdoor Residential Amenity Spaces within the proposed development

To maximize the functionality of private outdoor amenity spaces associated with new developments with rear yards, rooftop spaces, balconies, decks, and other shared common spaces, amenity areas should receive at least 4 hours of sun between 10am to 6pm.

- April 21 to September 21

4.3 PUBLIC REALM

4.3.1 – Public Outdoor Amenity Spaces

Communal Outdoor Amenity Spaces include school yards, children’s play areas, public outdoor pools, community gardens, privately owned public spaces, Civic and Cultural Spaces, and other outdoor public areas.

Shadows cast by existing buildings and shadows from proposed buildings should allow for 5 hours of full sun between 10am-6pm on:

- April 21

School yards and children’s play areas should receive at least 3hours of sun on:

- December 21st (10am to 3pm)

4.3.2 – Sidewalk areas and boulevards along the frontage of the development

Streets with residential and mixed-uses, patio spaces, trees, and where significant numbers walk, cycle, or ride transit should continue to receive a minimum of 4 hours of sun 10am to 6pm.

- April 21st (*The south sides of streets with East and West orientations may receive less sunlight*)

4.3.3 – Parks, Open spaces, and natural heritage areas

Shadows cast by existing buildings and proposed developments surrounding parks and other open spaces should not exceed 3 hours in duration between the hours of 10am to 6pm on:

- April 21st
- September 21st

(Natural heritage areas subject to an Environmental Impact Study (EIS) that requires additional sunlight should be identified).

5.0 MITIGATION MEASURE

5.1 DESIGN STRATEGIES FOR SHADOW MITIGATION

Sun/Shadow Studies should identify and describe mitigation measures taken by the proposal to limit and control impacts from shadows.

There are several design strategies that could be deployed to mitigate the impacts of shadows on neighbouring properties, public spaces, and natural features. The most effective ways to mitigate shadows involves the shaping and massing of buildings along with consideration for the placement, arrangement, and orientation of buildings on a site. A sun/shadow study can identify one or more ways and explain how these have been deployed to decrease impacts from shadow in the following ways:

Building heights:

Discuss and describe how the building is sculpted and massed to minimize the shadowing on the subject site, adjacent sites, and the public realm. Typically, building mass is reduced as building height increases. In this way the shadow coverage is reduced as a form of mitigation.

Describe setbacks and stepbacks considered through the design to reduce shadowing and optimize access to sunlight. Typically, stepback at different points of the height of buildings – for example between the podium and the tower – can reduce the coverage of shadow as a form of mitigation.

Building orientation and layout:

Discuss and describe how buildings have been placed and arranged on the subject site to minimize shadows within the subject site, adjacent sites, and the public realm. Describe how the site design optimizes exposure to sunlight.

6.0 SUBMISSION FORMAT

A Sun/Shadow study should comprise the following parts:

Part A: Project Description:

- Introduction: Description of the project
- Location: Address and site latitude and longitude.
- Surrounding uses and spaces.

Part B: Analysis

Analysis of the shadows includes preparation of drawings and identification of mitigation strategies used to minimize the shadow coverage.

B1: Drawings:

Drawings should include the following:

- Use 11x17 sheets to illustrate the shadows: At least one sheet for each test date.
- Minimum distance (i.e. coverage area) of 10 times the building height to the north, east and west of the subject property
- Minimum distance of 2 times the building height to the south of the subject property
- Drawings may be based on 2D plans showing shadows from the proposal.
- 3D illustrations may be included to supplement the 2D drawings. This can be useful for sites that include significant differences in land elevation.

The drawings should include:

- A north arrow, scale and scale bar
- Reference bearing for at least one street adjacent to the subject property
- Scale suitable to depict the entire coverage area
- Name of individual who prepared the drawings
- Shadow information:
 - Existing shadow conditions in the coverage area (Shown in a distinct colour)
 - Proposed shadow conditions of the development (Shown in a distinct colour)
 - For proposals seeking increased building heights, indicate the incremental difference between as-of-right shadows compared to shadows of proposed building height
 - Approved but unbuilt buildings within the coverage area
 - Legend, describing colour/hatch pattern for each of the shadow conditions

B2: Mitigation Strategies

Describe the design strategies used to mitigate the extent and coverage of shadows falling on private and public areas.

Part C: Conclusion

Provide a conclusion of the scale of the impacts of shadow on relevant adjacent spaces. Include recommendations that can relevant to minimization of shadows.

Template Checklist

1.General	
A. Name of the Project:	B. Date:
C. Address of Application:	D. Study Prepared by:

2.Project Description	
A. Short Description of the Project:	
B. Number of buildings for this Application:	
C. Number of Floors :	D. Height in Metres :
E. Did you submit the 3D Model for this project? (Yes or No) File Format Submitted:	
F. Coordinates Used: Longitude & Latitude	G. Solar North Matches True North? (Yes or No)

3.Massing Information	
A. Software Used	B. Terrain Corrected (Yes or No):

4.Shadow Diagrams Information	
A. Are you fully compliant with all of the technical specifications in the Terms of Reference? Yes..... No..... (If "No" explain which specifications have not been applied)	
B. Do the Shadow Diagrams use a standard metric scale?	Yes..... No.....
C. Are the Shadow Diagrams provided in Colour?	Yes..... No.....
D. Does the Shadow Diagrams use Shadow Study Drawing Standards – Colour Analysis?	Yes..... No.....
4 .Shadow Diagrams Information – Continued	
E. Date Used for Shadow Analysis: Year.....	Month.....
F. Daylight Savings Time considered?	Yes..... No.....

Noise Impact and Vibration Study Terms of Reference

Description

A technical report that provides a written description of the impact of noise generated by a proposed development on the surrounding environment, the impact of noise and/or vibration from the surrounding environment on the proposed development, both stationary and mobile sources, and the impact of noise from the proposed development on itself as well as mitigation measures to reduce any negative impacts.

In addition to a Noise Study there maybe a requirement for a Vibration Study. The Vibration Study would be combined with the Noise Study.

The Noise Impact Study or Noise and Vibration Study is to be prepared by a Consultant that is either an accredited Acoustic expert or a qualified Professional Engineer.

When Required

Noise Impact (Feasibility and/or Detailed Assessment) Studies may be required to support the following applications for developments:

- Zoning By-law Amendment
- Site Plan Control
- Plans of Subdivision
- Consent to Sever

A Noise Study is normally required, when a noise-sensitive development is proposed adjacent or in close proximity to the following potential noise sources:

- Within 500 m of a Provincial Highway/Freeway;
- Within 250 m of a Regional Road whose future traffic volume may be greater than 10,000 vehicles/day;
- Within 500 m of a railway ROW;
- Within the 25 NEF contours of an Airport;
- Within the potential zone of influence, as defined in MOE documents D-1 and D-6, of a Stationary Source of noise (industrial/commercial/institutional); a detailed noise study is required for developments within the potential influence area of stationary sources;
- Within 500 m of extensive commercial operations (loading docks of supermarkets, large commercial buildings with prominent ventilation and air conditioning equipment, automatic car washes, etc.);
- Within 500 m of aggregate operations (pits, quarries, etc.); or
- Any other noise sources not mentioned above.

A vibration study is required for all proposed developments within 75 metres of a rail corridor.

The requirement for a Noise Impact Study may be a condition of initial approval of the proposed development.

Rationale

A Noise Impact Study or Noise and Vibration Impact Study will help in assessing the compatibility of the proposed development with the existing and/or future land uses in the surrounding area as it relates to transportation and stationary noise both on site and off site.

Required Contents

During pre-application consultation, it will be determined if a report is required and, if so, the specific requirements of the Study, based on the nature of the proposed application and the context of the study area. Ultimate traffic data must be obtained from the Region and/or Local Municipality when analyzing transportation noise from Regional and Local roads. The Noise or the Noise and Vibration Study should include the following components, but is not necessarily limited to:

Introduction

- Description of the subject site and the proposed development;
- Location/context map;
- Identification of the noise source(s); and
- Description of the sound level guidelines/standards applied (methods).

Environmental Noise (and Vibration) Assessment

- Identify all stationary and transportation (road, rail, air) noise sources, including data collection and methods;
- Assessment procedure and methodology should clearly be outlined;
- Provide predicted noise level forecasts without mitigation;
- Environmental noise guidelines;
- Noise impact assessment (including low frequency noise impacts); and
- Vibration assessment, if applicable

Noise (and Vibration) Mitigation Recommendations

- Indoors: architectural requirements, ventilation requirements;
- Outdoors: at source requirements, sound barrier requirements;
- Provide tables and figures to support the recommendations of the report; and
- Warning clauses;
- Proposed mitigation measures will need to adhere to any engineering or policy guidelines that a municipality may have; and
- If a Class 4 designation is recommended the report shall discuss the mitigation measures that would be required to satisfy Class 1 or 2 standards and why the required mitigation is not feasible. Rationale must be provided for recommending a Class 4 designation.

Conclusions

Appendix A – Base Noise Level Calculations (Noise Source Data)
Appendix B – Ministry of Environment Noise Guidelines
Appendix C – Sample Sound Exposure Calculation