City of St. Albert
Cultivate Life

Transportation Impact Assessment Guidelines



August 2018

Version 1.0

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Table of Contents

SECTION			PAGE NO.
Table of Contents			i
Glossary			iii
1	Introduction		1
	1.1	TIA Definition	1
	1.2	Purpose of the guidelines	1
2	Basic Requirements		2
	2.1	Need for TIA	2
	2.2	Qualifications to Conduct TIA	2
	2.3	Consultation with the City	3
3	TIA Types		4
	3.1	Type A	4
	3.2	Type B	4
	3.3	Type C	4
	3.4	Type D	4
4	TIA Components		4
5	Site and Area Context Identification		6
	5.1	Site Location Plan and Study Area	6
	5.2	Existing Infrastructure	6
	5.3	Land Use	6
6	Network Connectivity		7
	6.1	Street Network	7
	6.2	Functional Plans	7
	6.3	Transit Route and Stop Plans	7
	6.4	Active Transportation Circulation Plan	8
7	Site Design		11
	7.1	Site Access	11
	7.2	Driveway Design and Placement	11
	7.3	Vehicle Parking	11
	7.4	Bicycle Parking	12
	7.5	Accessibility	12
	7.6	Drive-Throughs	12

	7.7	Truck Circulation	12
8	Traffic Operations		13
	8.1	Analysis Method and Software	13
	8.2	Traffic Analysis Periods	13
	8.3	Existing Transportation Conditions	13
	8.4	Data Collection	14
	8.5	Traffic Analysis Horizons and Development Staging	14
	8.6	Background Traffic Growth	14
	8.7	Site-Generated Traffic Impacts	15
	8.8	Intersection/Corridor Mitigation Plans	18
9	Community Safety and Wellbeing		18
	9.1	Geometric Design and Sight Distance	18
	9.2	collision History	18
	9.3	Traffic Calming	19
	9.4	Traffic Noise and Mitigation	19
10	Temporary Impacts		20
	10.1	Construction TRaffic and NUISANCE Management	20
	10.2	Temporary Traffic Accommodation	21
	10.3	Public Communications	21
11	Recommendations		21
12	Documentation and Reporting		22
13	Duration of TIA Validity		22

Appendix A - Acceptable Software Packages

Glossary

ASP	Area Structure Plan
ARP	Area Redevelopment Plan
City	The City of St. Albert
Development	May include, but is not limited to, the extents of a new or amended Area Structure Plan or Area Redevelopment Plan, or any land use change, development permit, or building permit application.
Driveway Access	An area that serves as the physical connection between a site and a public roadway for motor vehicles.
GDG	*Geometric Design Guide for Canadian Roads* (Transportation Association of Canada)
Greenfield Development	Development that is not infill development.
HCM	*Highway Capacity Manual* (Transportation Research Board)
Infill Development	As defined in the Land Use Bylaw
ITE	Institute of Transportation Engineers
Proponent	Those proposing a Development. This may include, but is not limited to, an applicant, developer, group of developers, and/or their engineers or agents.
Land Use	Any of the types of development described in The City of St. Albert Land Use Bylaw
MES	City of St. Albert Municipal Engineering Standards
TAC	Transportation Association of Canada
TIA	Transportation Impact Assessment
TGM	*Trip Generation Manual* (Institute of Transportation Engineers)
TTAP	Temporary Traffic Accommodation Plan

1 Introduction

1.1 TIA DEFINITION

A Transportation Impact Assessment is a study to estimate and assess the effects of proposed development and redevelopment on the transportation network. The study identifies infrastructure needs to ensure that the transportation network will remain at acceptable levels of service, be well connected and safe for all modes of travel and support the long-term needs of the community.

A TIA allows Developers and the City of St. Albert to:

- Identify existing transportation network operational levels (pre-development).
- Assess the implications of proposed Developments on mobility patterns for all modes of travel.
- Ensure that proposed Developments are safely and effectively connected to active transportation and public transit facilities.
- Evaluate and propose on- and off-site infrastructure improvements necessary to support the Development, while also considering growth beyond the boundaries of the Development.
- Ensure that proposed Developments are appropriately accommodated for access, parking and on-site circulation.
- Establish a basis for negotiating funding for transportation infrastructure improvements.

1.2 PURPOSE OF THE GUIDELINES

The purpose of the TIA Guidelines is to provide applicants, land owners, developers, and their consultants with the required content, presentation, and analysis methods which should be used for the completion of reports submitted to the City of St. Albert.

The following information provides guidance regarding the process for preparing and submitting TIAs and outlines the minimum details that should be contained within the study.

Sections 2 through 4 describe the requirements and component of a TIA for various types of land use. Sections 5 through 9 describes the analysis required for a TIA. Section 10 describes the process for construction planning to address construction impacts including temporary traffic accommodation. The remaining sections describe the types of recommendations that are expected and the corresponding documentation that is required.

It is acknowledged that developments vary, and certain sections of these Guidelines may, or may not, be required for each specific study. Additional analysis or details may also be requested by the City, to support the proposed Development.

The contents of these guidelines may be updated from time to time as required.



2 Basic Requirements

2.1 NEED FOR TIA

A TIA is required for:

- Any development adding more than 100 hourly vehicle trips;
- Any development where a new driveway access directly connecting to an arterial street is proposed;
- Any development where a new public roadway is proposed or a closure of any portion of an existing public roadway is proposed;
- Any proposed new school: elementary, secondary, post-secondary, or commercial school, community hall, indoor recreation centre, or stadium as defined in the Land Use Bylaw;
- Any development that has the potential to include a drive-through business or gas bar, as defined in the Land Use Bylaw; or,
- Any development with the potential to create adverse operational or safety issues to any road user group.

A TIA is not required for:

- Individual site one- or two-unit residential construction on land already zoned (districted) for that purpose.
- Renovations, including expansions of existing buildings, if:
  - No change of Land Use is proposed;
  - No changes to site access, public roadways, or trails are proposed;
  - No new drive-through or gas bar is proposed; and
  - The additional gross floor area does not exceed 25% of the original gross floor area or 500 square metres, whichever is less.

The onus shall be on the Proponent to demonstrate that a TIA is not required and shall do so through written communication.

2.2 QUALIFICATIONS TO CONDUCT TIA

A Transportation Impact Assessment shall be completed by an experienced Professional Engineer qualified to conduct traffic operations engineering in the Province of Alberta. The final TIA report shall be sealed by a qualified Professional Engineer licensed to practice in Alberta.

2.3 CONSULTATION WITH THE CITY

Applicants are advised to contact the City of St. Albert prior to beginning work on any Transportation Impact Assessment, to confirm details of required scope, content, and collect any background traffic information the City may be able to provide.

To initiate discussions, the Proponent should have available key considerations, including but not limited to:

- Site Location;
- Current Development (land use, access, layout);
- Preliminary trip generation rates and estimates;
- Proposed Development (land use, access, layout);
- Available information on relevant existing transportation infrastructure; and
- Available information relating to the sensitivity of the surrounding community to the proposed Development.



The results of preliminary consultation with the City will confirm:

- The scope of the study area;
- Data requirements and their availability;
- Parameters of trip generation and distribution;
- Planning horizons; and
- Analysis method.

The Proponent is encouraged to discuss anticipated analysis not included in these guidelines to ensure appropriateness. This can help in establishing a suitable scope and scale for the TIA, and the collection of necessary background information and data that may be available from the city.

3 TIA Types

Different sizes of developments will have different requirements for TIAs. The descriptions of TIA types below are not exhaustive, and some TIAs may require special consideration.

3.1 TYPE A

Type A TIAs are intended to address large scale development plans in primarily greenfield areas. A Type A TIA is required for Area Structure Plans or major ASP amendments.

3.2 TYPE B

Type B TIAs are intended to address large scale, long term development plans in existing areas: sometimes referred to as brownfield, greyfield, or infill development. A Type B TIA is required for Area Redevelopment Plans or major ARP amendments.

3.3 TYPE C

Type C TIAs are intended to address moderate-scale developments, which may include land use changes, development permit applications, direct control districts, and minor amendments to ARPs or ASPs. A TIA will be required when:

- There is a change in Land Use;
- There is a noticeable increase in development density for residential, commercial or industrial Development;
- A proposed Land Use has unique trip generating characteristics (such as concert venues, or sports centres);
- A major commercial or institutional Development is proposed (i.e. a big-box discount retailer); or
- A mixed-use Development is proposed.

3.4 TYPE D

Type D TIAs are intended to address small-scale developments in new or existing areas that will have negligible impact on the traffic network, or whose impact on the transportation network has already been studied under a larger scale TIA. This type of TIA is expected to be a brief memorandum that:

- Compares proposed site design (access, layout, parking,) to previous applications and current approved development reports.
- Compares proposed site generated traffic to current or previously-forecasted traffic volumes to show that no additional interventions are required to the vehicular transportation network.
- Describes how pedestrians, cyclists, and transit users will access the development, and demonstrates that network connectivity is safe, effective, and efficient.
- Describes how truck loading and unloading functions, including garbage pickup, will be accommodated, including demonstrating that no commercial vehicles will be required to back up onto a public roadway.

4 TIA Components

TIAs can include various components as appropriate for the size and complexity of a development. **Table 1** highlights the appropriate components associated with the type of TIA. Developments vary in size and complexity. This table summarizes key components and considerations; however, it is not exhaustive and is not expected to cover every potential Development type. Consultation with the City is advised to ensure that all TIA components are appropriate for a proposed Development.

Table 1
TIA Components

	Type A	Type B	Type C	Type D
Site and Area Context Identification				
Site Location Plan and Study Area	P	P	P	P
Existing Infrastructure	P	P	D	D
Land Use	P	P	D	D
Network Connectivity				
Street Network	P	P		
Functional Plans	P	P	D	
Transit Route and Stop Plan	A/P	P		
Active Transportation Circulation Plan	P	P	P	D
Site Design				
Site Access		P	P	D
Driveway Design and Placement			P	D
Vehicle Parking	D	A/P	A/P	D
Bicycle Parking	D	D/P	P	D
Accessibility Ramp Location			P	D
Truck Circulation	P	A/P	A/P	D
Traffic Operations				
Trip Generation	A	A	A	A
Trip Distribution and Assignment	A	A	A	D
Traffic Operations Analysis	A	A	A	D
Intersection/Corridor Mitigation Plans	P	P	D	
Community Safety and Wellbeing				
Geometric Design and Sight Distance	A	A	D	
Collision History	A	A		
Traffic Calming	A/P	A/P	D	
Traffic Noise and Mitigation	A/P	A/P		
Temporary Impacts				
Construction Traffic and Nuisance Management	P	P	P	
Temporary Traffic Accommodation	P	P	D	
Public Communications	P	P	D	

A: Analysis required
P: Plans required
D: Description sufficient if no issues to mitigate

5 Site and Area Context Identification

5.1 SITE LOCATION PLAN AND STUDY AREA

The site location plan(s) shall illustrate the location of the Development within the region, city, and/or neighbourhood, as appropriate for the context. It should identify relevant transportation facilities such as roadways, trails, transit routes, and transit stops, and relevant civic amenities such as parks, recreation centres, and schools.

The study area should contain all municipal and provincial roadways and trails that will be significantly affected by the traffic generated by the proposed Development. The City reserves the right to establish the study area as it deems necessary. In general, the study area should include all streets or intersections where the development-generated vehicular traffic will comprise at least 10% of the traffic volume.

For pedestrians, cyclists, and transit users, the study area should be sufficiently broad as to ensure connectivity and accessibility to existing walking and cycling routes and transit stops.

A combination of maps, figures and text can be used to accurately describe the study area with the relevant information.

5.2 EXISTING INFRASTRUCTURE

The Proponent shall identify via text and diagram any relevant existing transportation infrastructure and infrastructure that is planned for construction. This shall include, but is not limited to, roadway cross-sections, intersection geometry including lane designation, sidewalks, trails, on-street parking, and transit stops.

5.3 LAND USE

The Proponent shall provide a description of the Land Uses within and near the Development, including maps, figures, and/or text descriptions of all proposed Land Uses within the Development and any Land Uses that currently exist and are being replaced.

The description or maps should include:

- Total development area
- Area of each Land Use
- Anticipated phasing

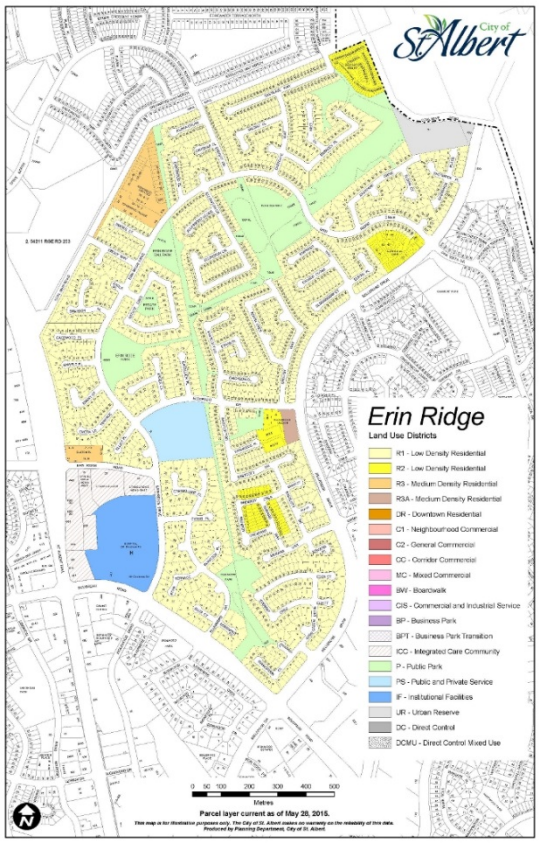


Figure 1
Example of Land Use Map

6 Network Connectivity

6.1 STREET NETWORK

The Proponent shall identify the proposed street network within the Development area. Arterial and collector street alignments and all intersection locations on arterial and collector streets shall be identified. Modifications to alignment of intersections on arterial and collector streets shall require separate approval from the City. The Proponent may be required to update all or part of the TIA to support the proposed changes.

Local street alignments and intersections between local streets may be provided for information or clarity, but are not required, except as they relate to connectivity for walking, cycling, or transit access.

6.2 FUNCTIONAL PLANS

The Proponent shall identify the proposed typical cross-section of any new street or street proposed to be reconstructed. This may include reference to an applicable typical cross section in the Municipal Engineering Standards and Complete Street Guidelines (2018). The Proponent shall also identify the layout of any new intersection or intersection proposed to be reconstructed.

6.3 TRANSIT ROUTE AND STOP PLANS

Further to the requirements outlined in the Area Structure & Redevelopment Plans Technical Report Terms of Reference, the following guidelines shall be used to assist with identifying the proposed transit routes and stop locations within the Development.

The Proponent shall:

- Ensure route layout and stop locations achieve the coverage targets identified by St Albert Transit and the Area Structure & Redevelopment Plans Technical Report Terms of Reference.
- Identify how the proposed transit routes will integrate with existing transit routes, including identifying whether the proposed routes can operate as extensions of existing routes without increasing travel time for existing transit users.
- Identify whether the proposed transit routes could be extended to future neighbourhoods on subsequent expansion of the city, if applicable.
- Estimate the transit running time through the Development area, using an average speed of 25 km/h or as otherwise provided by the City.
- Identify terminal stops, and other stops suitable for use as a timepoint stop on bus routes. Timepoint and terminal stops shall be located such that the noise and exhaust caused by idling buses shall minimize nuisance to adjacent residents and stopped buses shall not obstruct through traffic.



If all or part of a proposed transit route is proposed to be a one-way loop, the Proponent shall identify the approximate running time of the loop and estimate the worst-case reverse-direction travel time for transit customers boarding near the beginning, or alighting near the end, of the one-way loop portion. Reverse-direction travel time is defined for this purpose as the difference in travel time between travelling *from* and travelling *to* the nearest stop or station common to both directions of travel. One-way loops generally include a terminal stop; an assumed recovery time of 5 minutes shall be included in the estimate of reverse-direction travel time, unless otherwise provided by the City.

Transit routes other than one-way loops shall be planned such that both directions of operation occur on the same street. Split routing is to be avoided.

The Proponent is encouraged to work with St. Albert Transit to prepare the requirements of this section.

6.4 ACTIVE TRANSPORTATION CIRCULATION PLAN

The Proponent shall identify the Active Transportation Circulation Plan including pedestrian and cyclist access points and connectivity to adjacent pedestrian and cycling infrastructure, existing and future transit stops, and future LRT stations.

The Proponent should accommodate pedestrians and cyclists through the most direct route available: in many cases, pedestrians and cyclist access is most suitable at the corners of the Development. Landscaping should be designed to facilitate, not impede, access for pedestrians and cyclists from each direction.

The Proponent shall identify existing pedestrian crossing facilities and identify necessary upgrades to these crossings based on the City of St. Albert Pedestrian Crossing Warrant. For existing signalized crossing locations, confirmation should be made that pedestrians are appropriately accommodated, including confirming whether signal timings are appropriate for any potential demographic requirements for the users of the Development (mobility challenged, seniors, children).

Connections identified in a TIA report to meet the requirements of this section form an essential component of the TIA. Once approved by the City, subsequent modifications to identified connections shall require separate approval from the City. The Proponent may be required to update all or part of the TIA to support the proposed changes. This includes but is not limited to local street alignments, sidewalks, and trails identified as internal circulation and connections for walking, cycling, or transit access.

The Active Transportation Circulation Plan shall identify existing and proposed sidewalks and trails including sidewalk accessibility ramp locations, as well as identifying any crosswalks that are not accessible. The Proponent shall address any identified connectivity gaps.

For Type C and Type D TIA's the Proponent shall provide a Pedestrian Circulation Plan which identifies:

- All pedestrian linkages through, within and around the perimeter of the Development including connections to adjacent sites, through parking areas and to local transit amenities.
- How and where the needs of a pedestrian are accommodated throughout the site, including persons walking, cycling and those with mobility challenges.
- The location and materials to be used for all pedestrian linkages.

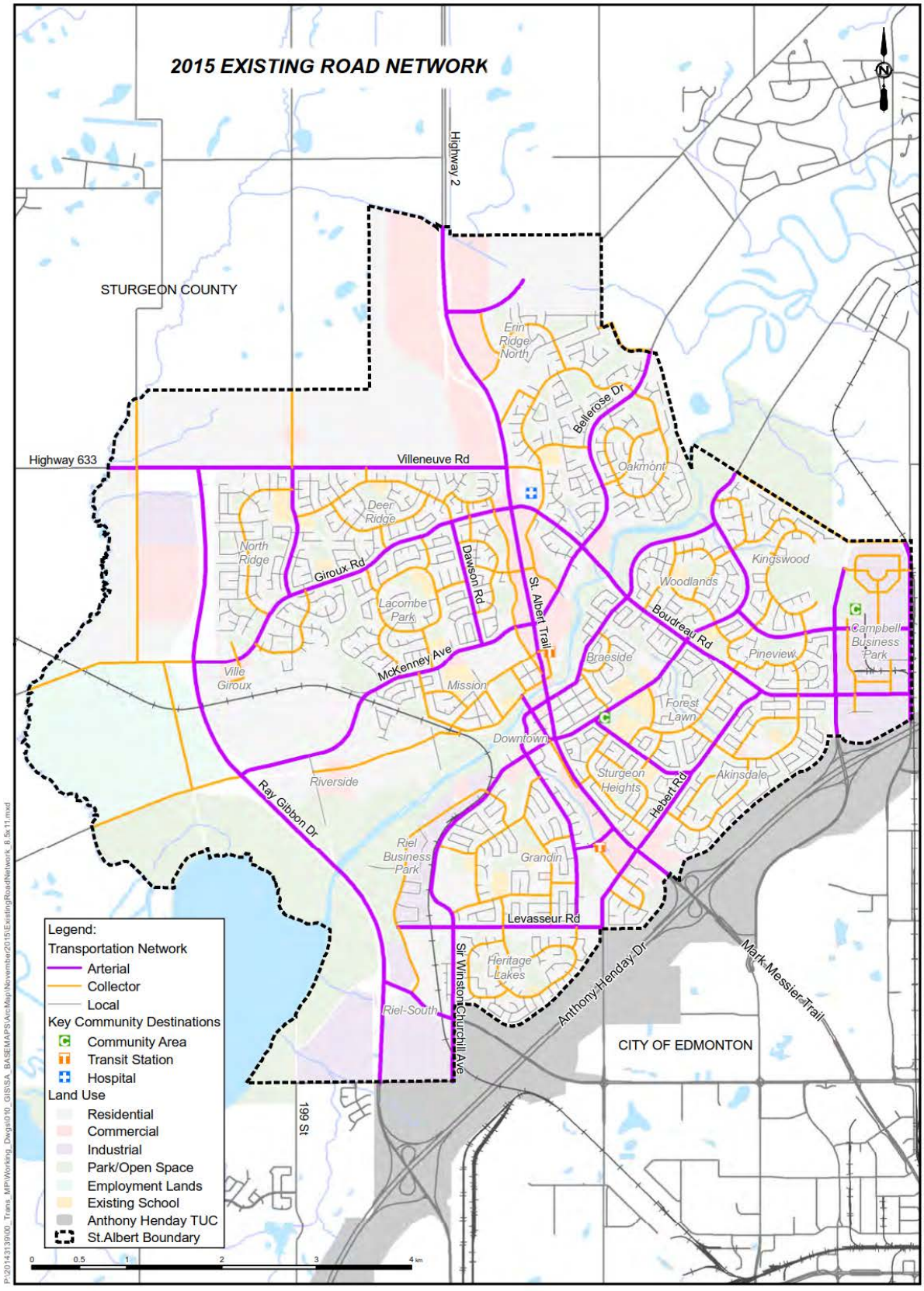
Where a trail is identified as a cycling connection, the Proponent shall confirm whether suitable curb ramps exist or are proposed at all roadway crossings. The Proponent should refer to the GDG to confirm whether an appropriate bicycle turning radius is accommodated on paths intended for bicycles. Bicyclists should not be expected to ride on sidewalks, grass, or other soft landscaping. The Proponent is advised to pay particular attention to locations where trails are not directly aligned with curb ramps.

For Type D TIAs, the Proponent shall identify the nearest existing transit stop and describe if there are any barriers to access for people walking, using a wheelchair, or cycling between the transit stop and the Development.

6.4.1 Educational Facilities

If the proposed Development is an educational facility, the Proponent shall consult the Safe Journeys to School Plan. The Safe Journeys to School Plan was designed to minimize the risk of collisions and injuries involving students by identifying specific strategies and programs. Pedestrian and cyclist safety will be prioritised above traffic efficiency. Facilities that will be required for consideration include upgrading on-site bus circulation facilities, mechanisms to reduce jaywalking in front of schools, traffic calming, enhanced pedestrian and cycling routes, on-site routing for pedestrians and parking, and pick-up/drop-off zones.




2015 EXISTING ROAD NETWORK
STURGEON COUNTY
CITY OF EDMONTON
Highway 2
Highway 633
Villeneuve Rd
Giroux Rd
McKenney Ave
Dawson Rd
St. Albert Trail
Boudreau Rd
Bellerose Dr
Ray Gibbon Dr
Levasseur Rd
Hebert Rd
Sir Winston Churchill Ave
Anthony Henday Dr
Mark Messier Trail
199 St
Erin Ridge North
Oakmont
Deer Ridge
North Ridge
Lacombe Park
Ville Giroux
Mission
Downtown
Riverside
Riel Business Park
Grandin
Heritage Lakes
Riel-South
Woodlands
Kingswood
Braeside
Pineview
Campbell Business Park
Forest Lawn
Sturgeon Heights
Akinsdale
Legend:
Transportation Network
Arterial
Collector
Local
Key Community Destinations
Community Area
Transit Station
Hospital
Land Use
Residential
Commercial
Industrial
Park/Open Space
Employment Lands
Existing School
Anthony Henday TUC
St.Albert Boundary
0 0.5 1 2 3 4 km

7 Site Design

7.1 SITE ACCESS

Accesses to the Development from public streets will require evaluation in design, operation, and performance. Should a proposed access adversely impact adjacent roads, appropriate corrective measures may be proposed and evaluated. Evaluation shall include pedestrian, cyclist, and motor vehicle access.

7.2 DRIVEWAY DESIGN AND PLACEMENT

The Proponent shall identify the number and location(s) of Driveway Accesses and other accesses to the Development. The number of Driveway Accesses should be kept to the minimum required to avoid negatively impacting the flow of traffic along adjacent streets. Driveway Accesses directly connecting to arterial streets should be avoided; Driveway Accesses should connect to lower classification streets where feasible. The Proponent shall provide justification for any Development with more than one Driveway Access; this justification must be based on traffic engineering, and not site layout design preference.

The Proponent shall ensure that proposed Driveway Accesses meet engineering standards as described in the MES and GDG. Driveway Accesses must be spaced appropriately from adjacent streets and other Driveway Accesses. The GDG shall be used as a reference to determine appropriate spacing. The geometry of the Driveway Access should be appropriate for the estimated trips generated by the proposed Development.

The Proponent shall provide sufficient throat distances to ensure motor vehicle traffic entering the Development will not queue onto adjacent streets.

7.3 VEHICLE PARKING

For Type A TIAs, the Proponent shall describe the general strategy for motor vehicle parking, to the extent that it is applicable and available.

For Type B TIAs, the Proponent shall determine the incremental parking demand of the proposed redevelopment and describe the strategy for accommodating that demand. If site planning is sufficiently scaled, the Proponent shall identify the location and capacity of motor vehicle parking areas.

For Type C and D TIAs, the Proponent shall identify the location and capacity of motor vehicle parking areas within the Development site. For Type D, a text description is usually sufficient.

The Proponent shall refer to the Land Use Bylaw for further information on vehicle parking requirements. Nothing in these guidelines is intended to relieve the Proponent from the obligations outlined in the Land Use Bylaw.



7.4 BICYCLE PARKING

For Type A and B TIAs, the Proponent shall describe the general strategy for bicycle parking, to the extent that it is applicable and available.

For Type C and D TIAs, the Proponent shall identify the location and capacity of bicycle parking racks within the Development site. For Type D, a text description is usually sufficient.

The Proponent shall refer to the Land Use Bylaw for further information on bicycle parking requirements. Nothing in these guidelines is intended to relieve the Proponent from the obligations outlined in the Land Use Bylaw.



7.5 ACCESSIBILITY

The Proponent shall identify the location and dimensions of designated parking stalls and accessibility ramps within the site.

7.6 DRIVE-THROUGHS

The Proponent shall identify the location of all drive-throughs. The Proponent shall demonstrate that the typical daily maximum queue will be accommodated within an area designated for drive-through queuing, and that queues will not restrict circulation at site access points or impact adjacent streets. Where pedestrian or cyclist desire lines cross the designated queuing area, the site plan shall safely accommodate the crossing: this may include evaluating sight lines, installing crosswalks, signage, and ramps.

7.7 TRUCK CIRCULATION

The Proponent shall identify the location of all loading zones, loading docks, and waste bins within the site plan. The Proponent shall identify the planned routes that delivery trucks and garbage trucks will use to access these facilities. This analysis may be completed using AutoTurn software. Circulation paths shall be designed such that trucks are not required to reverse on public right of way or through areas of high pedestrian, cyclist, or vehicular traffic within the site.



8 Traffic Operations

8.1 ANALYSIS METHOD AND SOFTWARE

Traffic analysis should be conducted using the methods described in the most recent edition of the Highway Capacity Manual, unless otherwise approved by the City.

Approved software options are described in **Appendix A.**

Where a Proponent is updating a previous TIA or providing a comparison with a TIA completed under a previous edition of the HCM or a previous version of a software package, the Proponent shall ensure the same analysis method and software are used for any comparisons. This may include either updating the old analysis to the new method or completing the new analysis using the old method.

If a Development can reasonably be expected to have only a negligible impact during one or more peak hours, a statement explaining this assumption may be provided in lieu of analysis. For example: a restaurant that does not serve breakfast would likely have a negligible impact during the AM peak hour.

The Proponent should confirm all assumptions regarding analysis periods and horizons with the City prior to undertaking the analysis.



8.2 TRAFFIC ANALYSIS PERIODS

For most developments, the analysis period should be the weekday morning and weekday afternoon peak hours, as defined in the TGM.

Normally, the Proponent should analyse based on the peak hour(s) of the adjacent street. However, the peak hour(s) of the Development should also be analysed if:

- The Development is expected to be the main contributor to traffic volumes in the study area, or;
- The Development is expected to have a traffic pattern that does not align with typical weekday commuter patterns.

8.3 EXISTING TRANSPORTATION CONDITIONS

The Proponent shall describe the existing transportation conditions using appropriate text and diagrams including, but not limited to:

- Existing traffic volumes;
- Turning movements;
- Heavy truck movements;
- Transit movements;
- Pedestrian and cyclist movements;
- Existing traffic control;
- Existing transportation facilities.

8.4 DATA COLLECTION

The City collects data following a set annual schedule. If traffic volume data are available in the study area, the City may provide them upon request. The Proponent is responsible for collecting any additional data required to complete the study. Traffic volumes from external sources should be confirmed with the City prior to use. If data is not available from the City or other acceptable sources, the Proponent shall undertake traffic surveys at their own expense.

Traffic data older than two years should not be used for analysis without prior confirmation from the City.

All traffic count data obtained by the Proponent are expected to be provided to the City and may then become publicly accessible.

8.5 TRAFFIC ANALYSIS HORIZONS AND DEVELOPMENT STAGING

For Type A and B TIAs, the analysis horizon shall be 20 years or to full build-out and occupancy of the Development, whichever is greater. The Proponent shall identify interim horizons related to the Development staging plan corresponding to five to seven-year increments. The Proponent will be expected to complete any required infrastructure improvements resulting from one stage prior to opening subsequent stages of the Development.

For Type C and D TIAs, the analysis horizon shall be five years after the anticipated full build-out and occupancy of the Development. The Proponent may also provide analysis for interim stages of development, if desired. Where no analysis is provided for interim stages, the Proponent will be expected to complete any required infrastructure improvements prior to the Development opening.

8.6 BACKGROUND TRAFFIC GROWTH

The Proponent shall estimate the background traffic growth, unrelated to the subject Development. The Proponent shall provide an explanation of the method used for background growth estimation. It is encouraged that the Proponent discuss their anticipated method with the City prior to undertaking detailed analysis.

Appropriate methods of estimating background traffic growth may include one or more of the following:

- The City's travel demand model (for Type A and Type B TIAs);
- Extrapolation of recent population or traffic volume growth trends;
- Quantified growth based on other plans and studies in the vicinity.

The Proponent shall account for traffic impacts related to other approved development, whether completed or in progress, and changes to the transportation network that are in progress or planned within the analysis horizon.

For Type C and Type D TIAs, the Proponent may request information from the City's transportation demand model but should generally not rely on its use for this scale of development. Other methods of background traffic forecasting should be used.

The Proponent should take care to ensure that the estimation of background changes in traffic does not double-count the same effect from two sources. For example, background traffic estimates obtained from the City's travel demand model may include the effect of planned changes to the transportation network.

8.7 SITE-GENERATED TRAFFIC IMPACTS

8.7.1 Trip Generation

For each land use in the Development, the Proponent will identify an appropriate trip generation rate, and the source of the rate. If necessary, additional discussions with the City may be required to determine an appropriate rate.

Some developments may require adjustment to the trip generation rate, depending on the situation, to account for:

- Internal capture (i.e. mixed-use Developments, retail and residential mixed-use buildings).
  - ➢ If appropriate, internal trips may be subtracted from trip generation estimates;
- Pass-by trips (i.e. trips which are intermediary stops on a trip).
  - ➢ These trips will have site access movements, but may not add to traffic volumes already on the network;
- Trips generated by the current land use, that will be replaced by the proposed Development.
  - ➢ These trips are already accounted for on the transportation network and may be subtracted from the trip generation estimates.

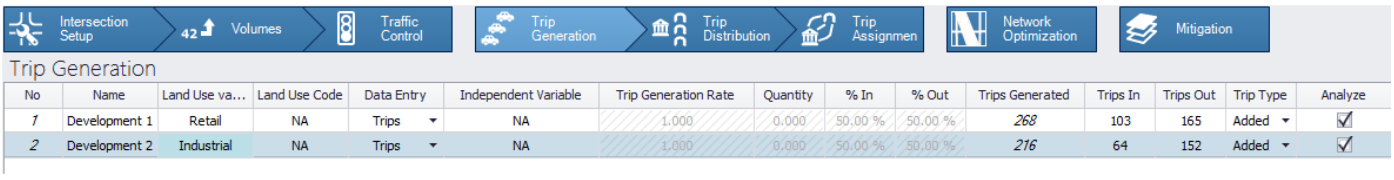
All trip generation assumptions must be documented and justified. If necessary, sensitivity assessments should be conducted when values cannot be easily identified. Appropriate sources for trip generation rates may include:

- ITE trip generation rates;
- Trip generation surveys from similar developments in the city, provided that conditions are similar to the proposed Development;
- City of Edmonton custom trip generation rates, which can be found in the City of Edmonton Transportation Impact Assessment Guidelines;
- Calculations of rates based on first principles (e.g. based on number of employees)

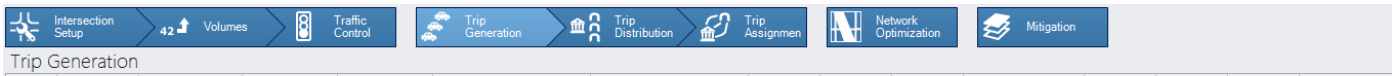
Site generated traffic volumes should be clearly shown.

- For Type A and Type B TIAs: hourly and daily volume projections are required.
- For Type C and Type D TIAs: peak hour traffic projections are normally sufficient. The City may require daily volume projections.

Trip generation rates should be adjusted as necessary to account for a reasonable, site-specific modal split.



No	Name	Land Use va...	Land Use Code	Data Entry	Independent Variable	Trip Generation Rate	Quantity	% In	% Out	Trips Generated	Trips In	Trips Out	Trip Type	Analyze
1	Development 1	Retail	NA	Trips	NA	1.000	0.000	50.00 %	50.00 %	268	103	165	Added	☑
2	Development 2	Industrial	NA	Trips	NA	1.000	0.000	50.00 %	50.00 %	216	64	152	Added	☑



No	Name	Land Use variables	Land Use Code	Data Entry	Independent Variable	Trip Generation Rate	Quantity	% In	% Out	Trips Generated	Trips In	Trips Out	Trip Type	Analyze
1	Development	Country Residential	210	Rate	Dwelling Unit	0.600	83.000	25.00 %	75.00 %	50	12	38	Added	☑

8.7.2 Trip Distribution and Assignment

The trips generated by the proposed Development shall be distributed and assigned to the transportation network to estimate the impacts. The methodology used for trip distribution and assignment shall be outlined in the TIA and may require consultation with the City.

The method selected for trip distribution and assignment may be informed by:

- Origin-destination surveys;
- The City's travel demand model;
- Existing traffic patterns;
- Current traffic capacity of the road network.

Trips assigned to the network should be clearly illustrated on the proposed final road network with each movement shown at each intersection.

For Type A, Type B, and Type C TIAs, the Proponent shall provide diagrams clearly showing current traffic volumes, future background (without development) traffic volumes, and future (with development) traffic volume for each movement at each intersection in the study area.

Trip assignment is not generally required for Type D TIAs but may be requested by the City.

Site generated traffic may have effects on both signalized and unsignalized intersections. Analysis should include:

- Volume/capacity ratios;
- Average and 95th percentile queues lengths;
- Average delays.

These analyses should be presented for each scenario: current traffic, future background (without development), and future (with development).

Documentation of the results and assumptions should be provided in an appendix. Assumptions to be included are lane configuration, pedestrian activity, saturation flows, traffic signal cycle length, phasing and timing, inter-green phases, and other relevant parameters. Current signal timings should be used for analysis of existing intersections, as changes to signal timings may be considered as a capacity increasing measure. The City will provide current traffic signal timing plans.



8.7.3 Desirable Traffic Parameters

The Desirable Traffic Parameters are as follows:

- The maximum volume-to-capacity ratio shall be 0.85 for the intersection overall, and 0.90 for any individual movement.
- The level of service shall be D or better for the intersection overall, and E or better for each individual movement.
- Turning lanes shall accommodate the 95th percentile queue within the available storage space.

The Desirable Traffic Parameters will apply to all greenfield locations. For infill locations, the Desirable Traffic Parameters will also apply, unless one or more of these thresholds is already not achieved under background conditions. In this case, the Proponent should describe the effect of the proposed Development and outline any proposed mitigation measures. Mitigation measures may include roadway or intersection improvements; however, the Proponent should also provide strategies and detailed plans to encourage access by means other than driving.

The City reserves the right to deny approval for any infill Development where the Desirable Traffic Parameters are not achieved, however, the intent of these guidelines is not to prevent redevelopment in existing neighbourhoods.

Intersection Setup | Volumes | Traffic Control | Trip Generation | Trip Distribution | Trip Assignment | Network Optimization | Mitigation

Traffic Control

Number	1											
Intersection	Highway and Intersecting Road											
Control Type	Two-way stop											
Analysis Method	HCM 6th Edition											
Name	Intersecting Road			Intersecting Road			Highway			Highway		
Show Name	☐			☐			☐			☐		
Approach	Eastbound			Westbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	1	25	3	7	10	5	4	183	1	2	276	3
Total Analysis Volume [veh/h]	2	40	5	49	17	9	6	280	14	4	423	5
Intersection Settings												
Priority Scheme	Stop			Stop			Free			Free		
Flared Lane	☑			☑								
Storage Area [veh]	2			2			0			0		
Two-Stage Gap Acceptance	☐			☐								
Number of Storage Spaces in Median	0			0			0			0		
Analyze Intersection?	☑											
Analysis Period	15 minutes											
Population < 10000 (Signal Warrants)	☐											
Capacity Analysis												
Movement, Approach, & Intersection Results												
V/C, Movement V/C Ratio	0.01	0.12	0.01	0.17	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	17.79	16.79	12.00	20.09	18.25	12.59	8.17	0.00	0.00	7.82	0.00	0.00
d_Rank1, Delay to Rank 1 Vehicle [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.03	0.03
Movement LOS	C	C	B	C	C	B	A	A	A	A	A	A
Critical Movement	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
95th-Percentile Queue Length [veh]	0.42	0.42	0.42	0.81	0.81	0.81	1.06	1.06	1.06	1.51	1.51	1.51
95th-Percentile Queue Length [m]	3.17	3.17	3.17	6.15	6.15	6.15	8.06	8.06	8.06	11.49	11.49	11.49
d_A, Approach Delay [s/veh]	16.32			18.77			0.16			0.07		
Approach LOS	C			C			A			A		
V/C_I, Worst Movement V/C Ratio	0.17											
d_I, Worst Movement Control Delay [s/veh]	20.09											
d_I, Intersection Delay [s/veh]	2.64											
Intersection LOS	C											

8.8 INTERSECTION/CORRIDOR MITIGATION PLANS

The Proponent shall identify any proposed measures to mitigate the anticipated impacts of the Development. The Proponent shall provide plans of the proposed measures unless the measures are minor and can be described using text.

For Type A and Type B TIAs, daily traffic volume forecasts shall be used to assist with identifying the appropriate functional classification for each roadway in the study area. Proponents shall refer to the MES and GDG for guidance.

Proponents shall also refer to the GDG and other industry best practice publications for guidance in determining mitigation measures, such as additional lanes or turning lanes.

9 Community Safety and Wellbeing

9.1 GEOMETRIC DESIGN AND SIGHT DISTANCE

The Proponent shall identify any apparent geometric design deficiencies on existing infrastructure within the study area.

New streets and intersections shall be designed in accordance with the MES and GDG. Sight distance requirements shall apply to all roadway classifications.

When a new Driveway Access is proposed, the Proponent shall assess the sight distance for vehicles using the Driveway Access.

9.2 COLLISION HISTORY

The City or Proponent may identify an area as having existing traffic safety concerns. When a proposed Development is adjacent to an area with previously identified traffic safety concerns, the Proponent shall review traffic collision data and assess the need for potential safety improvements.

Other safety or operational issues, such as merging, weaving, and sight distance require review to ensure the proposed Development will not adversely affect the safety of the local road network.

The Proponent shall include an assessment of impacts to existing safety concerns as identified by the City or the Proponent. The Proponent should ensure that existing concerns are not exacerbated. The Proponent shall also assess whether the proposed Development is likely to generate new safety concerns, and proactively mitigate such potential issues.

Transportation system improvements may be deemed warranted through a Safe System approach to roadway design or identified as a requirement due to capacity reasons. The Proponent shall consider and comment on the net effect to the safety of all road users, including cyclists and pedestrians. Motor vehicle capacity improvements that risk degrading safety for vulnerable road users should be identified and discussed with the City. The Proponent may make recommendations on alternate mitigation measures, or if the safety risk cannot reasonably be mitigated, the Proponent may recommend that the City tolerate capacity constraints to achieve a higher level of safety for all road users. However, only the City, at its sole discretion, may waive any improvements deemed required under these guidelines.

9.3 TRAFFIC CALMING

Traffic calming is "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users" as defined by the Institute of Transportation Engineers. Proposed Development within or adjacent to neighbourhood roadways shall explore the effect of the increased traffic generation on the nearby community, and present options for traffic calming measures.

The Proponent should refer to the City's Municipal Engineering Standards Manual and the latest edition of the Canadian Guide to Neighbourhood Traffic Calming for guidance on applying traffic calming interventions.



9.4 TRAFFIC NOISE AND MITIGATION



The City or Proponent may identify that a Development will increase noise impacts to adjacent residents. The City may, at its discretion, request that the Proponent conduct a noise study to determine the impact and required mitigation measures.

10 Temporary Impacts

When a proposed Development is expected to temporarily impact nearby streets, sidewalks, trails, or private properties during its construction, the Proponent shall identify these impacts.

The City recognizes that the information required under this section may not yet be available during preparation of the remainder of the TIA. The Proponent is encouraged to discuss submission schedules with the City. A TIA submitted to the City lacking the requirements of this or any other section will be considered incomplete unless the Proponent has previously received approval from the City for a staged submission schedule.

10.1 CONSTRUCTION TRAFFIC AND NUISANCE MANAGEMENT

Although temporary in nature, Development construction can negatively impact surrounding areas, neighbours and communities through noise, parking, lane, road, trail, or sidewalk closures, equipment staging, and tracking of debris or material from the site to in-service roadways. The Proponent shall provide the City a detailed plan to manage temporary traffic, parking, and noise impacts and mitigate issues that may be generated through construction activity. This shall be submitted at the Development Permit stage prior to construction occurring. Considerations and areas to be addressed within the Construction Management Plan include, but are not limited to:

10.1.1 Construction Parking and Staging

The Proponent shall estimate the required parking demand and space requirements for workers, equipment, and materials. The Proponent shall outline a plan to accommodate the parking demand and space requirements for various stages of construction. Accommodating this demand within the Development site is preferred.

If on-site parking or staging is impractical, the Proponent shall identify any off-site location(s) expected to be impacted.

10.1.2 Construction Traffic and Noise

The Proponent shall adhere to the requirements of the Noise Bylaw at all times. As part of the plans required under this section, the Proponent shall identify construction activity schedules and allowable hours of work for activities that may:

- Generate additional heavy traffic on residential streets, or
- Create noise or vibration impacts for adjacent properties.

The Proponent shall attempt to mitigate impacts, including through scheduling such activities to minimize nuisance.

10.1.3 Construction Debris

The Proponent shall attempt to minimize or eliminate the spread of construction debris, such as mud, construction materials, or litter, onto surrounding roadways, sidewalks, trails, and private property. The Proponent shall identify an inspection schedule, which shall include inspecting the area surrounding the Development, and describe remedial actions to be undertaken to address and debris-related impacts.



10.2 TEMPORARY TRAFFIC ACCOMMODATION

10.2.1 Temporary Traffic Accommodation Plans

The Proponent shall provide the City with a Temporary Traffic Accommodation Plan for each stage of work. The TTAP shall identify sidewalk closures, pedestrian and cyclist detours, closed or relocated transit stops, roadway or lane closures, driveway impacts, and any other impact to the transportation system.

The TTAP shall outline the accommodation and mitigation measures used to address each impact and be tailored to the site-specific requirements. Any traffic control devices used (signs, pavement markings, pylons, delineators, signals, etc.) shall be based on best practices including reference to the TAC Manual of Uniform Traffic Control Devices for Canada.

10.2.2 Note

A City of St. Albert On-Street Construction Permit is required for any work impacting a public roadway, sidewalk, or trail. Submission or approval of a TIA does not replace the need to obtain all applicable permits. For information on obtaining an On-Street Construction Permit go to the City's website under Public Services then Applications, Licences and Permits or https://stalbert.ca/city/approvals/oscp.

10.3 PUBLIC COMMUNICATIONS

The Proponent shall notify any affected residents, business owners, and property owners, either directly or indirectly through the City. The notification plan shall be agreed to and approved by the City in advance or any work taking place.

In some cases, at the discretion of the City, public consultation on temporary impacts will be required in advance. Specific requirements and timelines should be discussed with the City.

11 Recommendations

The Proponent may make a number of recommendations to mitigate the transportation impacts of a proposed Development. When developing the recommendations, the Proponent needs to be conscious of:

- Short- and long-term planned network improvements;
- Time schedule of adjacent developments;
- Phasing of the proposed Development;
- Local priorities for transportation funding;
- Cost-effectiveness of implementation of improvements.



12 Documentation and Reporting

The Proponent should confirm submission requirements with the City at the start of the project. Reports shall be submitted in both portable document (pdf) format and printed.

- For Type A and B TIAs, six printed copies are normally required. One printed copy of technical appendices is normally sufficient, along with an electronic copy.
- For Type C and D TIAs, one printed copy is normally sufficient.

One printed master copy shall be signed and sealed by a Professional Engineer.

The City may also request technical analysis files (Synchro, Sidra, etc.).

The final report will become publicly accessible upon presentation to City Council. However, copyright will remain with the author. Requests for copies of completed TIA reports must be made to the report owner.

13 Duration of TIA Validity

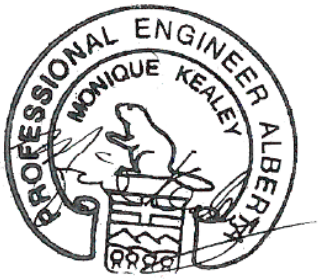
TIAs are expected to be valid for a period of five years. The period of validity can be reduced as a result of changes to the information or data used in the TIA evaluation, such as:

- Noticeable variances between previously-projected traffic volumes and actual traffic volumes
- Major Land Use amendments within or near the study area.
- New development in or near the study area.
- Changes to the transportation network within the study area

Type A and Type B TIAs cover long term development plans. It is not the intent of these guidelines to require a TIA update after 5 years; however, if a Type C or Type D TIA is required within the same area more than 5 years after the larger scale TIA was approved, the Proponent shall confirm whether the assumptions and analysis within the larger-scale TIA remain valid.

The services provided by Associated Engineering Alberta Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,
Associated Engineering Alberta Ltd.



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Division Manager, Transportation

ASSOCIATED ENGINEERING
QUALITY MANAGEMENT SIGN-OFF
Signature:
Date: 2018-08-10
APEGA Permit to Practice P 3979

Appendix A - Acceptable Software Packages

- Trafficware Synchro Studio
- SIDRA Intersection
- PTV Vision Suite
- Highway Capacity Software (HCS)

Use of other industry-accepted traffic analysis software may also be permitted if approved by the City.