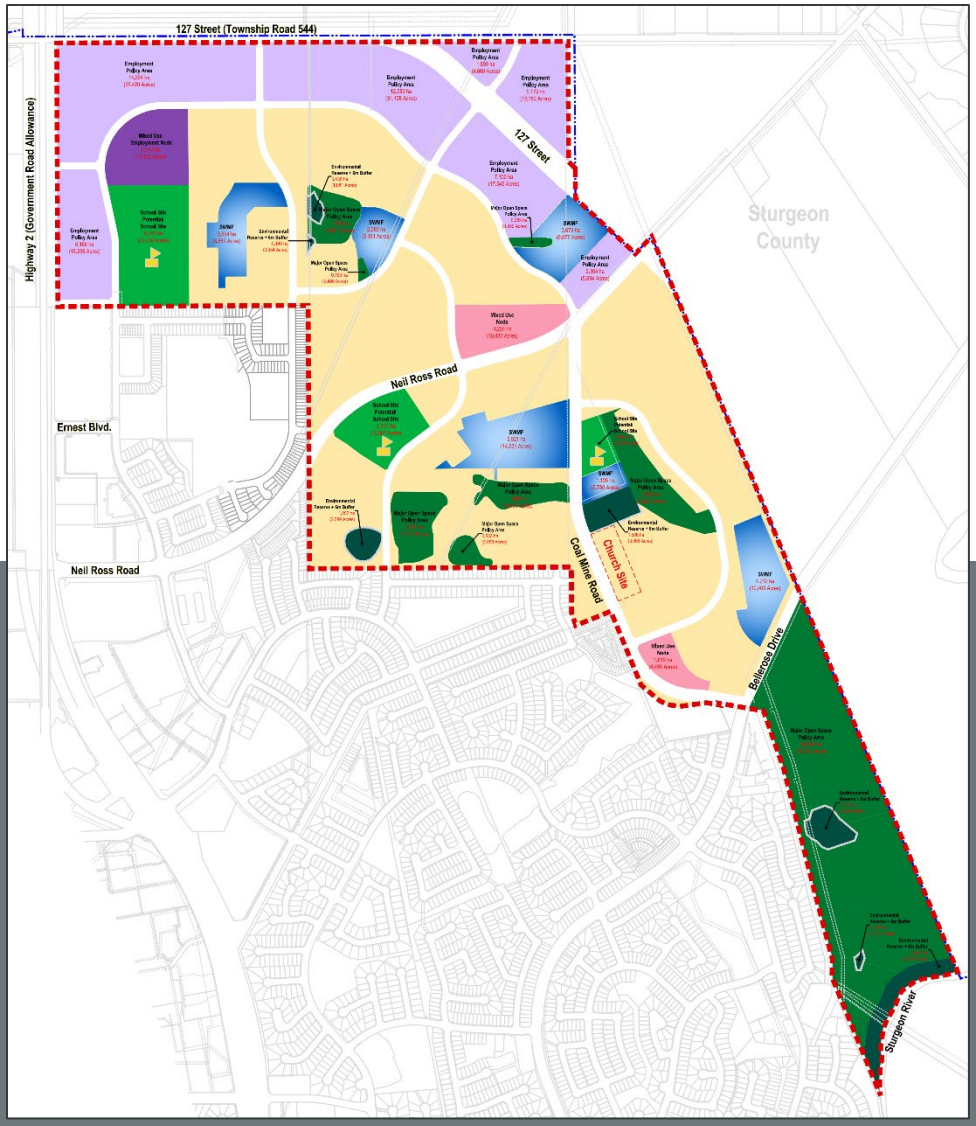
Landrex Hunter Ridge Inc.

Draft Traffic Impact Assessment

St. Albert Northeast (Dauphinais) Area Structure Plan

City of St. Albert



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16 November 2023

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Draft Traffic Impact Assessment

St. Albert Northeast (Dauphinais) Area Structure Plan

City of St. Albert

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Confidentiality and Ownership

Table of Contents

1. Introduction 1

1.1 Background 1
1.2 Context & Purpose 1
1.3 Methodology 1

2. Site Context 2

2.1 Site Location 2
2.2 Existing Transportation System 2
2.2.1 Roadway Network 2
2.2.2 Intersections 6
2.2.3 Traffic Volumes 8
2.2.4 Transit Routing 8
2.2.5 Truck Routing 8
2.3 Future Transportation System 11
2.3.1 St. Albert Trail (Highway 2) 11
2.3.2 127 Street (Township Road 544) 11
2.3.3 Neil Ross Road / Fowler Way 12
2.3.4 Bellerose Drive 12
2.3.5 Element Drive / Coal Mine Road 12
2.3.6 Eastview Street North 12
2.3.7 Future Traffic Volumes 12

3. Proposed Land Use Concept 15

3.1 Dauphinais Area Structure Plan Land Uses 15
3.1.1 Non-Residential Land Uses 17
3.1.2 Residential Land Uses 18
3.2 Dauphinais ASP Roadway Network 18
3.2.1 Boulevard, Crosstown and Connector Streets 18
3.2.2 Neighbourhood Streets 19
3.2.3 Local Streets 19

4. Development Traffic 20

4.1 Trip Generation Assumptions 20
4.1.1 Non-Residential Land Uses 20
4.1.2 Residential Land Uses 20
4.2 Gross Trip Generation 22
4.3 Net Trip Generation 24
4.3.1 Non-Residential Trips 24
4.3.2 Total Trips 26
4.3.3 Trip Distribution 26
4.3.4 Trip Assignment 26

5. Roadway Network Assessment 29

5.1 Assessment Assumptions 29
5.2 Boulevard / Boulevard Intersections 30
5.2.1 St. Albert Trail / 127 Street 30

5.3 Boulevard / Crosstown Intersections....31
5.3.1 St. Albert Trail / Neil Ross Road / Fowler Way....31
5.3.2 Neil Ross Road / 127 Street....33
5.3.3 127 Street / Bellerose Drive....34
5.4 Boulevard / Neighbourhood Intersections....35
5.4.1 St. Albert Trail / Neighbourhood A....35
5.4.2 St. Albert Trail / Neighbourhood B....36
5.4.3 St. Albert Trail / Ernest Boulevard....37
5.4.4 127th Street / Neighbourhood C....38
5.4.5 127th Street / Neighbourhood D....39
5.5 Boulevard / Local Intersections....40
5.5.1 St. Albert Trail / Right-In-Right-Out....40
5.5.2 127th Street / Local A....41
5.5.3 127th Street / Local B....42
5.6 Crosstown / Neighbourhood / Connector Intersections....43
5.6.1 Neil Ross Road / Element Drive....43
5.6.2 Neil Ross Road / Neighbourhood G....44
5.6.3 Neil Ross Road / Neighbourhood E....45
5.6.4 Neil Ross Road / Element Drive / Coal Mine Road....46
5.6.5 Bellerose Drive / Coal Mine Road....47
5.6.6 Coal Mine Road / Neighbourhood F N....48
5.6.7 Coal Mine Road / Neighbourhood F S....49
5.7 Neighbourhood / Neighbourhood Intersections....50
5.7.1 Element Drive / Ernest Boulevard....50
5.7.2 Element Drive / Neighbourhood A....51
5.7.3 Element Drive / Neighbourhood B....52
5.7.4 Element Drive / Neighbourhood C....53
5.7.5 Element Drive / Neighbourhood D....54
5.7.6 Neighbourhood C / Neighbourhood D....55
5.7.7 Neighbourhood D / Neighbourhood E....56
5.7.8 Neighbourhood E / Neighbourhood G....57
5.8 Roundabout Alternatives....58
5.8.1 Neil Ross Road / Neighbourhood E....58
5.8.2 Neil Ross Road / Element Drive / Coal Mine Road....59
5.9 Daily Service Volumes....60

6. Other Considerations....62

7. Conclusions and Recommendations....63

7.1 Summary....63
7.2 Key Findings....63
7.3 Recommendations....63

List of Tables

Table 1 – Trip Generating Land Uses 15
Table 2 – Commercial Gross Floor Areas 17
Table 3 – Remaining Non-Residential Land Uses 17
Table 4 – Anticipated School Site Statistics 18
Table 5 – Residential Land Uses 18
Table 6 – Non-Residential Trip Generation Rates 21
Table 7 – Residential Trip Generation Rates 22
Table 8 – Full Build-Out Gross Trip Generation 23
Table 9 – Internal Trip Capture Rates 25
Table 10 – Pass-by Trip Capture Rates 25
Table 11 – Net Non-Residential Trips 25
Table 12 – Total External Trips 26
Table 13 – Trip Distribution Ratio 26
Table 14 – St. Albert Trail / 127 Street Intersection Analysis Summary 30
Table 15 - St. Albert Trail / Neil Ross Road / Fowler Way Intersection Analysis Summary 32
Table 16 – Neil Ross Road / 127 Street Intersection Analysis Summary 33
Table 17 – 127 Street / Bellerose Drive Intersection Analysis Summary 34
Table 18 – St. Albert Trail / Neighbourhood A Intersection Analysis Summary 35
Table 19 – St. Albert Trail / Neighbourhood B Intersection Analysis Summary 36
Table 20 – St. Albert Trail / Ernest Boulevard Intersection Analysis Summary 37
Table 21 – 127th Street / Neighbourhood C Intersection Analysis Summary 38
Table 22 – 127th Street / Neighbourhood D Intersection Analysis Summary 39
Table 23 – St. Albert Trail / Right-In-Right-Out Intersection Analysis Summary 40
Table 24 – 127th Street / Local A Intersection Analysis Summary 41
Table 25 – 127th Street / Local B Intersection Analysis Summary 42
Table 26 – Neil Ross Road / Element Drive Intersection Analysis Summary 43
Table 27 – Neil Ross Road / Neighbourhood G Intersection Analysis Summary 44
Table 28 – Neil Ross Road / Neighbourhood E Intersection Analysis Summary 45
Table 29 – Neil Ross Road / Element Drive / Coal Mine Road Intersection Analysis Summary 46
Table 30 – Bellerose Drive / Coal Mine Road Intersection Analysis Summary 47
Table 31 – Coal Mine Road / Neighbourhood F N Intersection Analysis Summary 48
Table 32 – Coal Mine Road / Neighbourhood F S Intersection Analysis Summary 49
Table 33 – Element Drive / Ernest Boulevard Intersection Analysis Summary 50
Table 34 – Element Drive / Neighbourhood A Intersection Analysis Summary 51
Table 35 – Element Drive / Neighbourhood B Intersection Analysis Summary 52
Table 36 – Element Drive / Neighbourhood C Intersection Analysis Summary 53
Table 37 – Element Drive / Neighbourhood D Intersection Analysis Summary 54
Table 38 – Neighbourhood C / Neighbourhood D Intersection Analysis Summary 55
Table 39 – Neighbourhood D / Neighbourhood E Intersection Analysis Summary 56

Table 40 – Neighbourhood E / Neighbourhood G Intersection Analysis Summary 57
Table 41 – Neil Ross Road / Neighbourhood E Roundabout Analysis Summary.....58
Table 42 – Neil Ross Road / Element Drive / Coal Mine Road Roundabout Analysis Summary 59
Table 43 – Daily Service Volumes.....60

List of Figures

Figure 1 - St. Albert North Location 9
Figure 2 – Existing Traffic Volumes 10
Figure 3 – Functional Plan for 127 Street. 11
Figure 4 – 2045 Background Traffic Volumes.....14
Figure 5 – Proposed Land Use Concept.....16
Figure 6 – Site Generated Traffic.....27
Figure 7 – Total Traffic Volumes.....28

List of Appendices

Appendix A – Land Use Figure & Statistics
Appendix B – Detailed Synchro and Sidra Analysis Reports – Full Build Out
Appendix C – City Supplied Model Data

1. Introduction

1.1 Background

In early 2021, CIMA+ was retained by Invistec Consulting on behalf of Landrex Hunter Ridge Inc. to prepare a Transportation Impact Assessment (TIA) in support of the St. Albert Northeast (Dauphinais) Area Structure Plan (ASP).

The Dauphinais ASP serves to describe the land use concept, development policies, and objectives for the community, including establishing a framework for services, transportation, parks and open spaces, and commercial and residential land uses. The ASP intends to guide future development of a complete community that facilitates attractive, efficient, and orderly development that is compatible and connected with existing and future environment.

The TIA has been developed in alignment with the City of St. Albert's August 2023 edition of the Area Structure Plan and Neighbourhood Plan Terms of Reference (ASP TOR). The analysis aims to provide a plausible development scenario within the constraints of the new ASP TOR, with further analysis and refinement anticipated to be required at the Neighbourhood Structure Plan (NSP) stage as land use assumptions are further clarified.

1.2 Context & Purpose

Located in the northern areas of the City of St. Albert (COSA) and expected to incorporate lands in the process of being annexed from Sturgeon County, the Dauphinais Area Structure Plan encompasses multiple parcels totaling approximately 299.4 hectares in area. The ASP is bounded by 127 Street (Township Road 544) on the north and east, Highway 2 (St. Albert Trail) on the west, and the existing communities of Erin Ridge and Erin Ridge North in St. Albert on the south. The ASP includes a mix of residential, commercial, educational, employment, and other land uses, in addition to park space and natural areas.

The purpose of this study is to confirm the transportation network necessary to support the development of the plan area, with a focus on the arterial roadway intersections bounding the plan area, including those along St. Albert Trail (Highway 2), Neil Ross Road and 127 Street.

1.3 Methodology

The TIA was undertaken using the following methodology:

- Examination of existing conditions and roadway configurations
- Review of the future anticipated roadway network and traffic volumes
- Completion of trip generation and assignment / distribution based on the ASP land uses
- Analysis of the operation of study intersections to identify lane requirements, capacity constraints, and overall traffic impacts associated with this development.
- Identification of potential roadway improvements required to support the development while maintaining acceptable level of service at the study intersections.
- Identification of additional transportation network elements for consideration during future studies

2. Site Context

2.1 Site Location

The Dauphinais area is located in the north of the City of St. Albert, comprising of approximately 299.4 hectares of land as shown in **Figure 1**. The lands are bounded by 127 Street (Township Road 544) on the north and east, St. Albert Trail (Highway 2) on the west, and the existing communities of Erin Ridge and Erin Ridge North in St. Albert on the south.

2.2 Existing Transportation System

2.2.1 Roadway Network

The existing roadway network adjacent to the ASP is highlighted in Figure 1, and includes:

- **St. Albert Trail (Highway 2)** – is a paved north-south four lane divided highway with a combination of urban and rural cross sections. Within the City of St. Albert, it is classified as a Boulevard roadway. The posted speed is 60 km/h north of Neil Ross Road and towards the COSA boundary with Sturgeon County. North of this boundary, the posted speed on Highway 2 is 100 km/h. The road has streetlighting south of Element Drive. St. Albert Trail connects the City of St. Albert to Sturgeon County. The City of St. Albert is currently in the process of upgrading and urbanizing St. Albert Trail through a three phase project between north of Coal Mine Road, including widening to three core lanes in each direction, turn bay improvements, signalization upgrades, active modes facilities, and landscaping enhancements.

St. Albert Trail South (left) and North (right) of Neil Ross Road (Source : Google Maps)

+ **Township Road 544** – is a paved east-west rural two lane roadway with no shoulders, and has a posted speed limit of 80 km/h. There are no pedestrian accommodations or streetlighting along Township Road 544. Township Road 544 connects to Range Road 260 in the west and old Coal Mine Road in the east.

Township Road 544 West of Highway 2 (Source : Google Maps)

+ **Neil Ross Road** – is a paved east-west four lane Crosstown roadway, possessing an urban cross section with a raised median. The posted speed limit on the road is 60 km/h. Sidewalks and streetlight are provided along both sides of the roadway. Neil Ross Road runs east from St. Albert Trail before terminating at Element Drive.

Neil Ross Road east of St. Albert Trail (Source : Google Maps)

+ **Element Drive** – is a paved north-south two lane Neighbourhood roadway, possessing an urban cross section with curbside parking on both sides. Sidewalks are provided on both sides of Element Drive while street lighting is provided on the west side only. Element Drive extends south from Neil Ross Road before terminating at Everitt Drive.

Element Drive South of Neil Ross Road (Source : Google Maps)

+ **Bellerose Drive** – is a paved north-south Crosstown roadway. North of Oakmont Drive and extending into the ASP area, Bellerose Drive has been constructed as the first two-lane stage of an ultimate four lane divided cross section. A multi-use pathway is provided on the west side of Bellerose Drive while street lighting is provided on both sides of the road. Bellerose Drive extends north from St. Albert Trail and into Sturgeon County where it terminates at Range Road 251. East of Coal Mine Road, Bellerose Drive transitions to two lane rural cross section, with one lane in each direction and shoulders with no pedestrian or active modes accommodation or streetlighting.

Bellerose Drive North of Empress Way (Source : Google Maps)

+ **East View Street North**– is a paved north-south Local roadway, possessing an urban cross section with curbside parking on both sides. Sidewalks are provided on both sides of the road. East View Street North extends north from Everitt Drive and terminates at the boundary with Sturgeon County.

East View Street North, North of Everitt Drive (Source : Google Maps)

+ **Range Road 253 –** is a paved north-south Local roadway, possessing a rural cross section with one lane in each direction. It intersects Coal Mine Road within the current City boundary and extends north into Sturgeon County. There are no sidewalks or on-street parking allowance or streetlighting along the road.

Range Road 233, North of Coal Mind Road (Source : Google Maps)

- **Coal Mine Road –** is a paved east-west Local roadway with a two lane rural cross section with one lane in each direction. It intersects with Bellerose Drive and extends west where it terminates at the intersection with Range Road 233. There are no sidewalks or on-street parking allowance or streetlighting along the road.

Coal Mind Road, West of Bellerose Drive (Source : Google Maps)

2.2.2 Intersections

Existing intersections adjacent to the plan area include:

- **St. Albert Trail / Neil Ross Road** – is a signalized three-leg intersection with the following approach geometry:
  - Westbound: two left turn lanes, one channelized right turn lane
  - Northbound: two through lanes, one channelized right turn lane
  - Southbound: one left turn lane, two through lanes

St Albert Trail / Neil Ross Road Intersection Looking North from St. Albert Trail (left) and West from Neil Ross Road (right) (Source : Google Maps)

- **Highway 2 / Township Road 544** – is an unsignalized four-leg intersection with stop control on Township Road 544. Left turn and right turn flaring treatments are provided for northbound Highway 2, while only left turn flaring treatment is provided for southbound Highway 2.

Highway 2 / Township Road 544 Intersection Looking North from Highway 2 (left) and East from Township Road 544 (Source : Google Maps)

+ **St. Albert Trail / Element Dr** – is an unsignalized four-leg intersection with stop control on Element Drive and the opposing unpaved access road. Left turn and right turn flaring treatments are provided for both directions of Highway 2.

St. Albert Trail / Element Drive Intersection Looking West from Element Drive (Source : Google Maps)

+ **Coal Mine Road / Range Road 253 –** is a former unsignalized T-intersection, with the west leg of the intersection barricaded where it extends into the Erin Ridge neighbourhood, creating a sharp forced turn situation.

Coal Mine Road / Range Road 253 Intersection Looking West from Coal Mind Road (Source: Google Maps)

+ **Coal Mine Road / Bellerose Drive –** is an unsignalized three-leg intersection with stop control on Coal Mine Road. Sidewalks are provided on both sides of Bellerose Drive south of Coal Mine Road, while there is also a multi-use pathway connection to the east of the intersection.

Coal Mine Road / Bellerose Drive Intersection Looking South from Bellerose Drive (Source: Google Maps)

2.2.3 Traffic Volumes

Existing traffic volumes were collected from a variety of sources, including historic City of St. Albert and Alberta Transportation count and volume data, as well referencing the background volumes for previously completed TIAs for Erin Ridge North, Hunter Ridge, Jensen Lakes and Badger Lands. Where available, existing traffic count information is summarized in **Figure 2**.

2.2.4 Transit Routing

St. Albert Transit currently operates Route A14 servicing Erin Ridge North and passing through St. Albert Trail, Neil Ross Road and Element Drive. The route makes a stop on Element Drive south of Neil Ross Road, as well as route A7 along portions of Erin Ridge Drive south of the plan area.

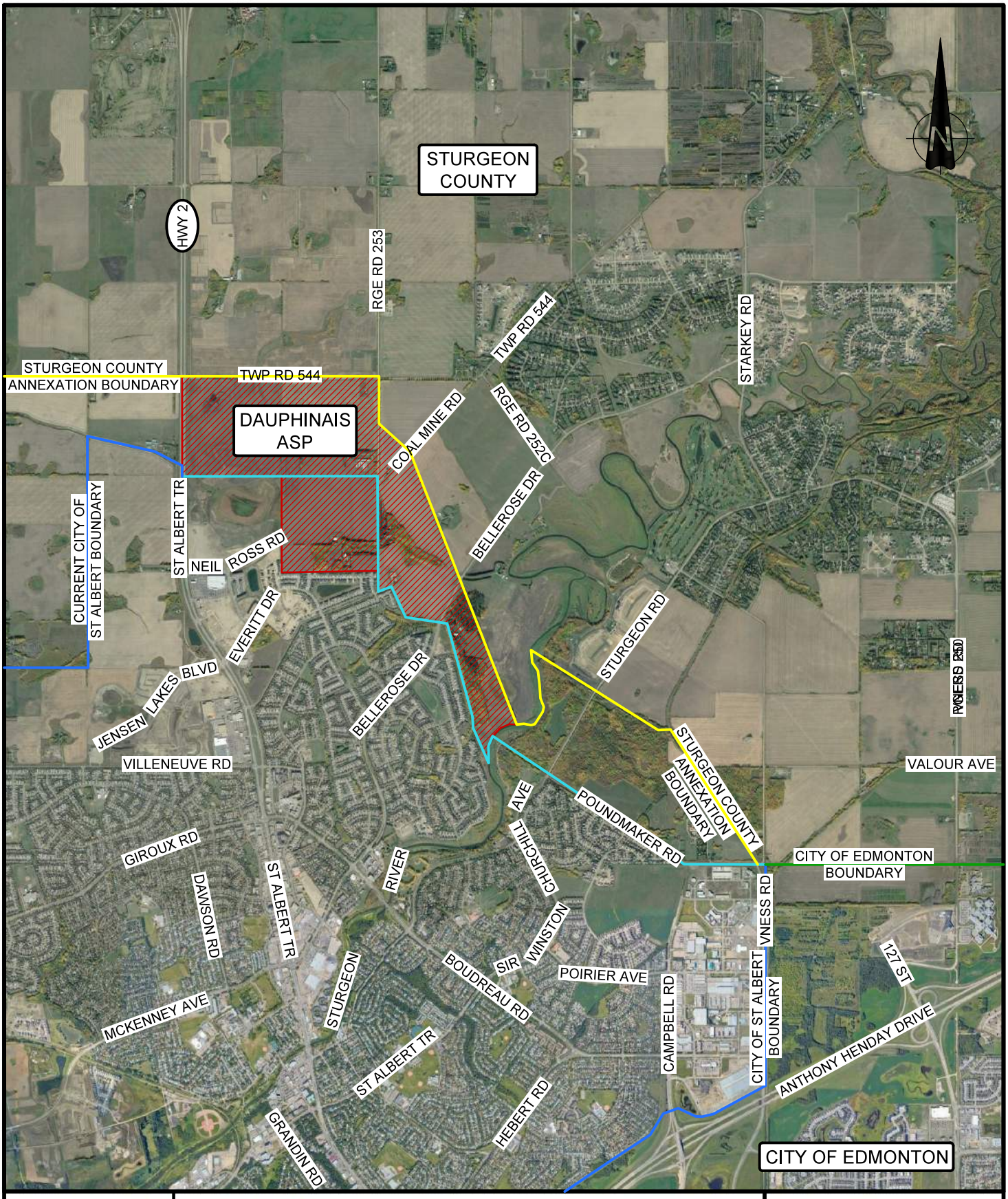
St. Albert has no Light Rail Transit (LRT) service at this time. However, long term plans call for an extension of the Metro Line LRT from the City of Edmonton through the City of St. Albert along St. Albert Trail with a terminus station south of Neil Ross Road.

Sturgeon County currently does not operate any transit service routing in the plan area at this time, though this may be revised through the implementation of the Regional Transit Commission.

2.2.5 Truck Routing

As shown in the City of St. Albert Transportation Master Plan (TMP), St. Albert Trail (Highway 2) is designated as a 24 Hour Dangerous Goods Truck Route. 127 Street (Township Road 544) east of Highway 2 will also be designated as a 24 Hour Dangerous Goods Truck Route once it is constructed. Both Neil Ross Road and Bellerose Drive are designated as Restricted Truck Routes under the Plan.

A 24 Hour Dangerous Good Truck Route accommodates travel by dangerous goods vehicles on a permanent year-round basis. Restricted truck routes are intended to provide connection between industrial areas and access to main commercial areas within the community. As per the Provincial Traffic Safety Act, commercial vehicles using a Restricted Truck Route must stay on the route until taking the shortest route to their final destination.



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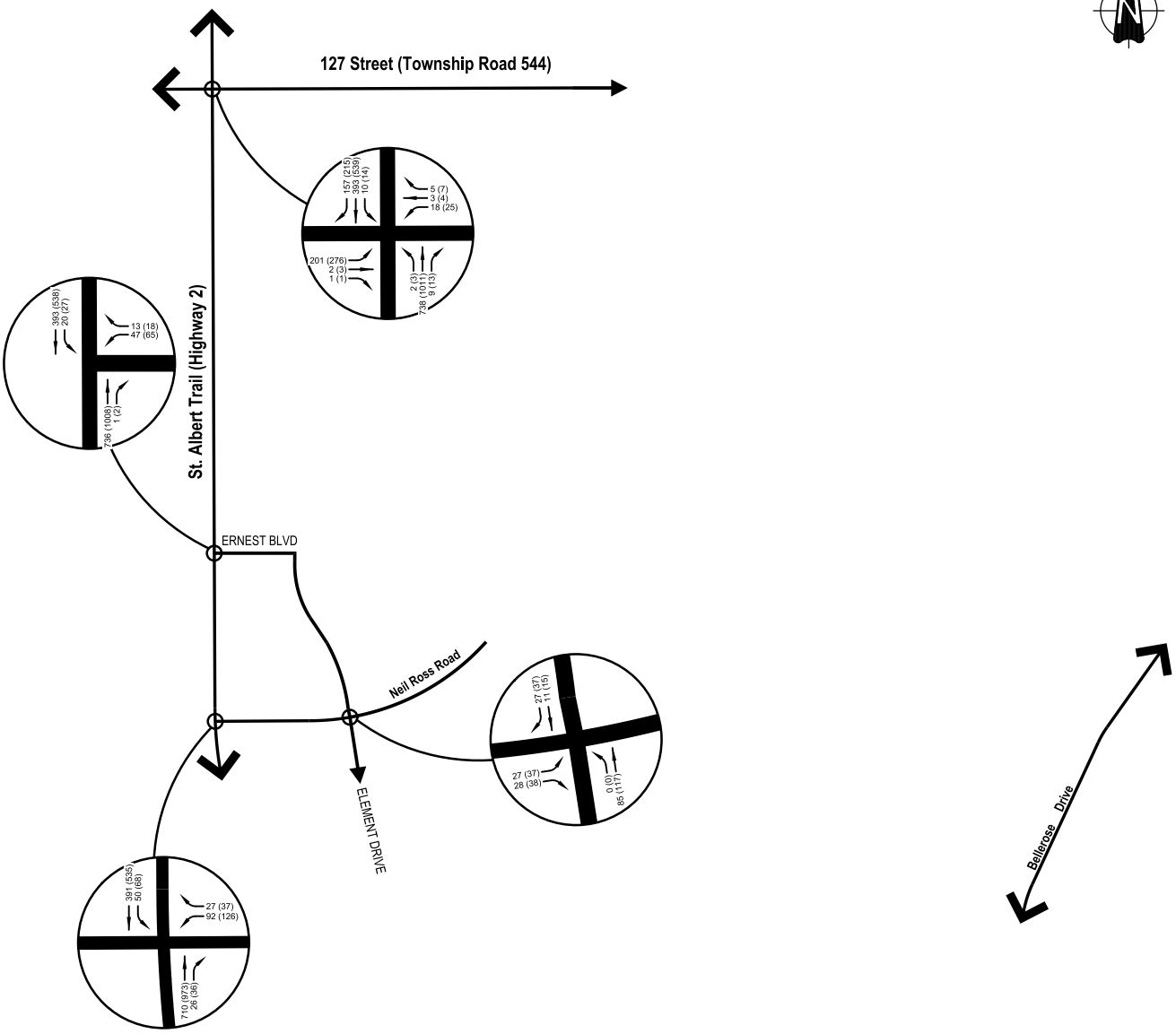
DAUPHINAIS AREA STRUCTURE PLAN

CONTEXT MAP

FIGURE 1

SCALE	FILE	DATE	REPORT	PLAN
NTS	E00781A	NOV 2023		



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EXISTING TRAFFIC VOLUMES

FIGURE 2

SCALE	FILE	DATE	REPORT	PLAN
NTS	E00781A	NOV 2023		

2.3 Future Transportation System

The City of St. Albert Transportation Master Plan (TMP), along with a number of functional planning studies which have been undertaken for the roadways adjacent to the plan area, provide insight into the future state of the transportation network surrounding and within the Dauphinais area. The preliminary land use concept outlined in the ASP was also reviewed to identify the future transportation system.

2.3.1 St. Albert Trail (Highway 2)

Within the TMP, St. Albert Trail is ultimately envisioned as a community road that supports comfortable facilities for all transportation modes, and is designated as a Boulevard roadway. This is in contrast to its current status as a wide car-friendly road acting as both a regional thoroughfare and local arterial. The transition of St. Albert Trail into a community road will be facilitated by development of regional infrastructure like 127 Street, Ray Gibbon Drive and the LRT, which will divert and reduce traffic volumes along St. Albert Trail. Upgrades to, and urbanization of, St. Albert Trail between Villeneuve Road and the City limit are currently underway, in alignment with the recommendations of the TMP and associated functional planning study. The upgrades include urbanization and widening to three core lanes in each direction, along with provision of turning lanes, signal improvements, active modes infrastructure, and landscaping enhancements. As of November 2023, Phase 1 and 2 of major construction along St. Albert Trail to north of Everitt Drive is substantially complete, with Phase 3 expected to commence in 2024.

The TMP includes a conceptual sketch for St. Albert Trail in 2042 that shows a four-lane urban cross section as well as two LRT tracks (one in each direction). However, the LRT alignment is expected to terminate south of Neil Ross Road. From south of Neil Ross Road and towards the city limits, St. Albert Trail is expected to possess a six-lane urban cross section per the North St. Albert Integration Plan.

In addition to the existing intersections, the ASP proposes two future Neighbourhood streets that will connect to St. Albert Trail from the east. These Neighbourhood streets will provide direct access to commercial and mixed-use developments.

2.3.2 127 Street (Township Road 544)

Sturgeon County and the City of St. Albert commissioned a Functional Planning Study for 127 Street, which recommended a four-lane semi-urban cross section with a raised median for the road. The proposed alignment for 127 Street extends east from Highway 2 before continuing southeast and breaking off from the existing alignment, as shown in **Figure 3**. 127 Street intersects with Neil Ross Road and Bellerose Drive as it continues further southeast along the ASP boundary. Ultimately, 127 Street connects to Anthony Henday Drive within the City of Edmonton.

Figure 3 – Functional Plan for 127 Street.

127 Street is classified as a Boulevard roadway under Complete Streets classification), since it connects between St. Albert Trail, Neil Ross Road, and Bellerose Drive, all of which are either Highways or Arterials. Additionally, the ASP identifies two Local street and two Neighbourhood street connections to 127 Street. Three of these connections are located in the Business Employment area within the Dauphinais community.

2.3.3 Neil Ross Road / Fowler Way

The TMP identified a future extension of Neil Ross Road to the northeast to intersect with 127 Street, as well as an extension west of St. Albert Trail (as Fowler Way) eventually connecting to Villeneuve Road. These extensions are expected to accommodate the development of Neil Ross Road into a Crosstown roadway which will allow users to travel across the City without changing corridors. Additionally, the ASP identified three Neighbourhood street connections to Neil Ross Road.

While the City initiated a planning study for the alignment of Neil Ross Road through the plan area, the study was put on hold while land use plans were established. The Dauphinais ASP recommends an alignment for Neil Ross Road which differs from what was considered previously, connecting to Range Road 253 instead of Coal Mine Road in the north of the plan area.

2.3.4 Bellerose Drive

Twinning of Bellerose Drive was identified as an action item under the TMP's Recommended 10 Year Roads Plan. Approximately 1.7 km of roadway is to be twinned from the City Limit extending into the community of Oakmont. Twinning is expected to provide additional capacity to access Erin Ridge Drive and residential developments.

Within the Dauphinais ASP area, Bellerose Drive will connect to a Coal Mine Road that extends north to Neil Ross Road, becoming Element Drive.

2.3.5 Element Drive / Coal Mine Road

The ASP identified an extension of Element Drive north of Neil Ross Road where it loops east and connects south again to Neil Ross Road. South of the east intersection with Neil Ross Road, Element Drive becomes an extension of Coal Mine Road. The ASP additionally identifies connections to five Neighbourhood streets with Element Drive / Coal Mine Road.

Element Drive / Coal Mine Road will serve as a Residential Neighbourhood Road / Connector Street that provide direct access to properties within the ASP area.

2.3.6 Eastview Street North

The ASP identified an extension of Eastview Street North up to Neil Ross Road, where it loops northwest until it reaches another planned Neighbourhood Road.

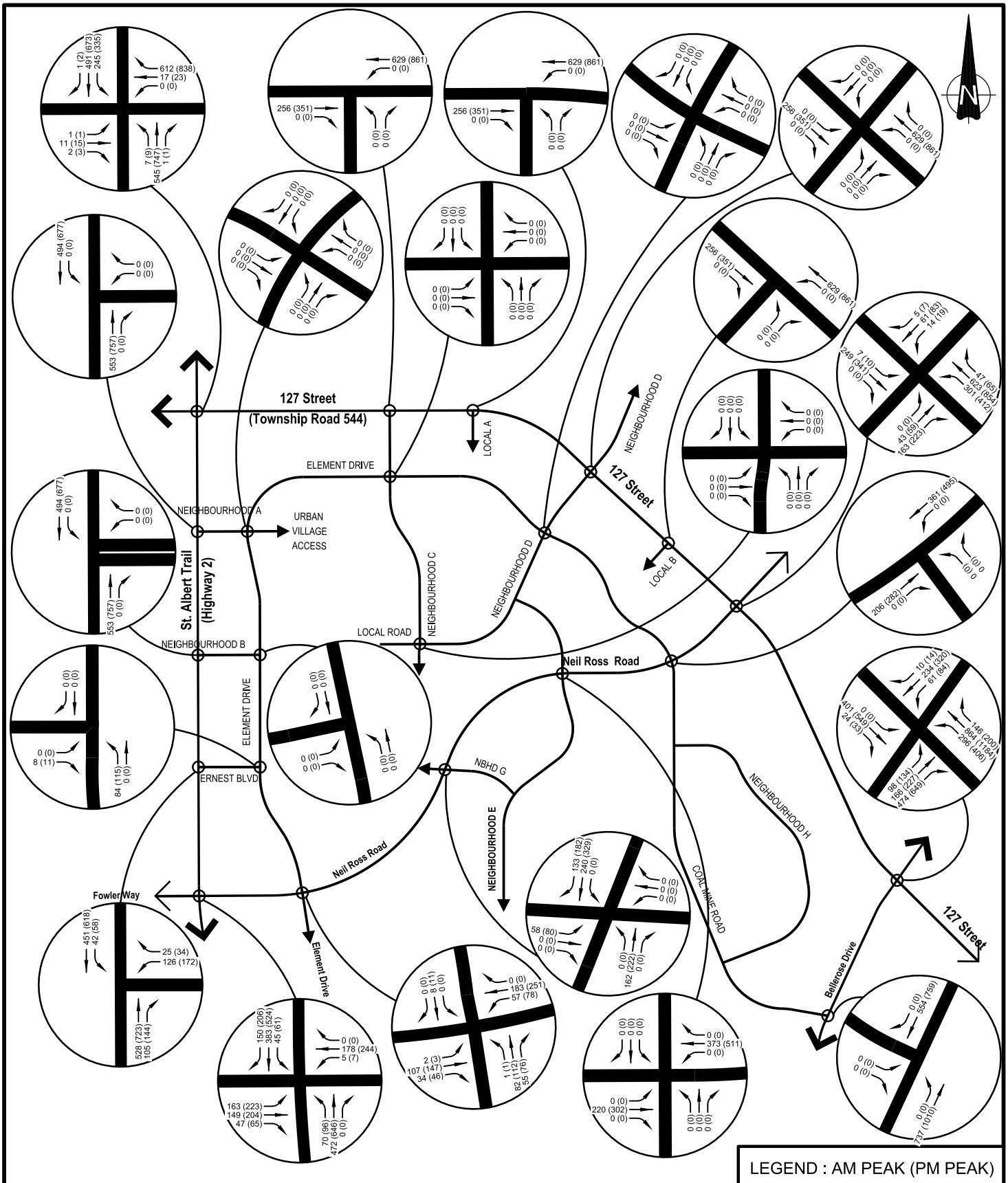
2.3.7 Future Traffic Volumes

Background traffic volumes on the adjacent roadway network were established based on outputs from the City's Travel Demand Model 2045 horizon. Anticipated future background traffic volumes are presented in **Figure 4** for the 2045 horizon.

The Jensen Lakes and Badger Lands areas west of St. Albert Trail and southwest of the Dauphinais area are slated for development including residential, school and commercial land uses. TIA analysis for these areas assumed a 2042 full build-out horizon year.

Further development of Erin Ridge North to the south boundary of the Dauphinais area will include a mix of commercial and residential land uses. Full build-out of these lands is expected for 2024. The long term transportation impacts of these land uses also assumed a 2042 horizon year.

It should be noted that the City's Travel Demand Model, which produced the background volumes used in this TIA, assumes that Erin Ridge North, Jensen Lakes and Badger Lands are not fully built out by 2045.



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2045 BACKGROUND TRAFFIC VOLUMES

FIGURE 4

SCALE	FILE	DATE	REPORT	PLAN
NTS	E00781A	NOV 2023		

3. Proposed Land Use Concept

3.1 Dauphinais Area Structure Plan Land Uses

The Dauphinais land use concept and statistics provided by Invistec Consulting Ltd dated November 7, 2023 were used in the preparation of this Transportation Impact Assessment, as shown in **Figure 5**.

The planned land use includes a mixture of residential, commercial, employment, mixed use, and school/park uses, in addition to stormwater management facilities and natural areas. The plan includes an extended 127 Street which will serve as a Boulevard between St. Albert Trail, Neil Ross Road and Bellerose Drive along the east and north boundary of the plan area.

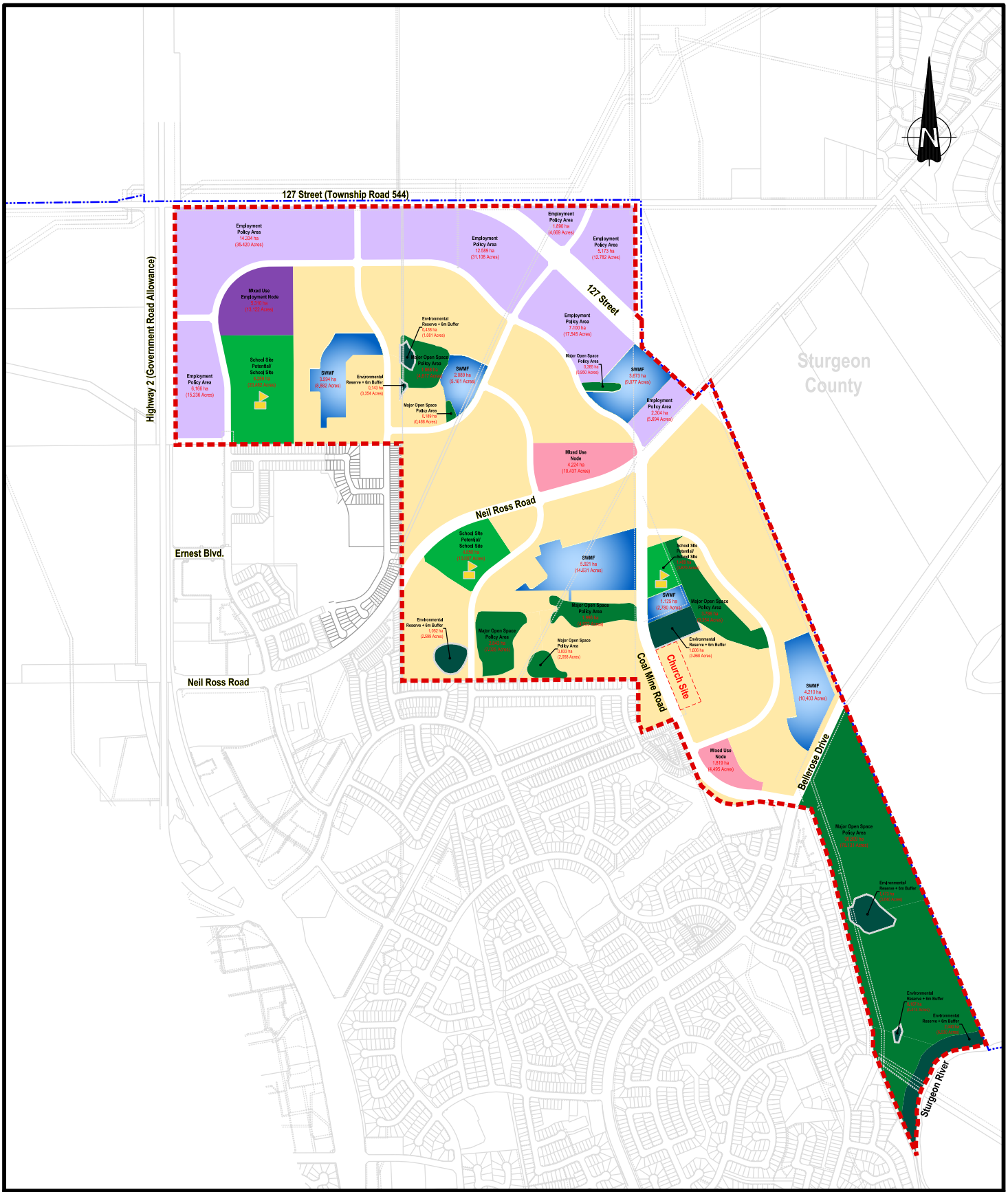
The plan includes employment policy areas adjacent to St. Albert Trail along the northwest side of the plan area, consisting of a mix of commercial and office building developments. Several mixed use and neighbourhood commercial sites are also included internal to the neighbourhood in the central portion of the plan area. A mixed use employment node will be located in the northwest portion of the plan area, anticipating uses such as a community centre, library, offices and neighbourhood commercial. An employment policy area, consisting of a mix of commercial and light industrial developments, will be located in the north portion of the plan area.

The Dauphinais area also includes three school sites – a high school located in the northwest portion of the plan, and two K-9 schools located in the central portion of the plan area. Also included are various parks and natural areas.

The trip generating land uses for the plan area are summarized in **Table 1**. The complete land use figure and statistics used in the preparation of this document are included in **Appendix A**.

Table 1 – Trip Generating Land Uses

Development Type	Area (ha)
Non-Residential Land Uses	
Employment Policy Area – Commercial	29.22
Employment Policy Area – Office Building	5.12
Employment Policy Area – Light Industrial	20.34
Mixed Use Employment – Recreational Community Centre	3.72
Mixed Use Employment – Office Building	0.53
Mixed Use Employment – Library	0.53
Mixed Use Employment – Neighbourhood Commercial	0.53
Neighbourhood Policy Area – Neighbourhood Commercial	9.75
Mixed Use – Neighbourhood Commercial	6.04
Schools	13.83
Residential Land Uses	
Neighbourhood Policy Area – Low Density Residential	80.41
Neighbourhood Policy Area – Row Housing	21.93
Neighbourhood Policy Area – Medium Density Residential	9.75
Mixed Use - Residential Component	6.04



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DEVELOPMENT CONCEPT

FIGURE 5

SCALE	FILE	DATE	REPORT	PLAN
NTS	E00781A	NOV 2023		

3.1.1 Non-Residential Land Uses

For commercial uses in the neighbourhood policy area, a Floor to Area Ratio (FAR) of 0.25 relative to the site area was assumed to calculate the gross floor area for trip generation purposes. The neighbourhood policy area was assumed to be 8% commercial. The the 127th Street employment policy area was assumed to be 30% commercial and 70% light industrial, both with a FAR 0.5. For the employment policy area along St. Albert Trail, it was assumed that 100% of the land would be developed as commercial with an FAR of 0.4, with an additional 25% of the lands developed with second storey commercial office space above ground floor commercial, adding a FAR of 0.25 FAR of office space. For neighborhood commercial uses within mixed use node, an FAR of 0.75 was assumed, and it was assumed that the entire site would be developed as main floor neighborhood commercial with multifamily housing above.

For the mixed use employment node, 70% was assumed to be dedicated to a recreation centre, with the remaining 30% split evenly between neighbourhood commercial, office space and a Library; all at a FAR of 0.5.

The total gross floor areas for commercial uses are summarized in **Table 2**. The neighbourhood is expected to have a total of 1,605,022 square feet of shopping centre commercial uses split between employment policy areas along St. Albert Trail and 127th Street, and two sites in the central plan area beside Neil Ross Road. Up to 290,866 square feet of neighbourhood commercial is expected within the neighbourhood policy area and mixed use employment node.

Table 2 – Commercial Gross Floor Areas

Development Type	Area (ha)	FAR	GFA (sq. ft)
Employment Policy Area 127th Street- Commercial	8.72	0.25	882,630
Employment Policy Area St. Albert Trail- Commercial	20.50	0.40	234,564
Mixed Use Employment Node - Neighbourhood Commercial	0.53	0.50	28,580
Mixed Use Node - Commercial	6.04	0.75	487,828
Neighbourhood Policy Area - Neighbourhood Commercial	9.75	0.25	262,286

The remaining non-residential land uses discussed above are listed in **Table 3**.

Table 3 – Remaining Non-Residential Land Uses

Development Type	Area (ha)	FAR	GFA (sq. ft)
Employment Policy Area 127th Street- Light Industrial	20.34	0.50	1,094,632
Employment Policy Area St. Albert Trail- Office Space	5.12	0.25	137,911
Mixed Use Employment Node – Recreational Community Centre	3.72	0.50	200,058
Mixed Use Employment Node – Office Space	0.53	0.50	28,580
Mixed Use Employment Node - Library	0.53	0.50	28,580

Three school sites are planned for the area, including a high school with up to 1500 students, and two Kindergarten to Grade 9 (K-9) schools with up to 950 students each, as shown in **Table 4**.

Table 4 – Anticipated School Site Statistics

Development Type	# Students
High School	1500
K-9 School	950
K-9 School	950

3.1.2 Residential Land Uses

Residential land uses within the St. Albert Northeast area are expected to include a variety of low and medium density residential development, including detached, row housing, and multifamily housing. Mixed use nodes within the neighbourhood are anticipated to dedicate 100% of its land above all commercial towards medium density multifamily residential development.

As shown in **Table 5**, approximately 5,184 dwelling units are expected to be developed in the St. Albert area, with an equivalent residential density of approximately 44 dwelling units per hectare (du/ha). Low density development is anticipated to occur at 30 du/ha, row housing at 40 du/ha, and medium density and multifamily mixed use residential at 120 du/ha.

Table 5 – Residential Land Uses

Development Type	Area (ha)	Density (du/ha)	Units (du)
Low Density Residential	80.41	30	2,412
Row Housing	21.93	40	877
Medium Density Residential	9.75	120	1,170
Mixed Use - Residential Component	6.04	120	725
Total	118.13	44	5,184

3.2 Dauphinais ASP Roadway Network

The Dauphinais ASP includes various transportation mobility options for residents made possible through a range of transportation infrastructure. The area will include a hierarchy of Local and Neighbourhood streets connecting into the Connector, Crosstown, and Boulevard road network that bound the neighbourhood. Currently, only lands to the south of the plan area are undergoing development and do not have any accesses to Township Road 544, Range Road 253, Coal Mine Road or other portions of the future 127 Street alignment. The other adjacent lands are not currently under development, nor do they have active statutory planning underway at the time of the preparation of this document. Therefore, in many instances access to the adjacent roadways from the Dauphinais area can be established without interfering with existing intersections.

3.2.1 Boulevard, Crosstown and Connector Streets

St. Albert Trail represents the dominant Boulevard adjacent to the plan area, and also forms part of the Provincial highway network. 127th Street is also anticipated to be classified as a Boulevard. Neil Ross Road and Bellerose Drive are Crosstown streets, which support local and regional travel and provides for commercial / large load movement and public transit connectivity. Coal Mine Road is expected to be classified as a Connector street.

Dedicated road right of way will be required along all of Neil Ross Road, Bellerose Drive, 127 Street and Coal Mine Road within the plan area to facilitate construction of their ultimate roadway cross sections. Additional right of way may also be required along St. Albert Trail, depending on the ultimate cross section requirements.

3.2.2 Neighbourhood Streets

Seven Neighbourhood streets have been identified that provide direct access to, and around a neighbourhood. One of these is an extension of Eastview Street further north into the ASP area. The proposed Neighbourhood road network is designed to provide convenient access to the adjacent lands through the neighbourhood to key destinations, and are also able to accommodate public transit buses.

Neighbourhood streets may incorporate a combination of on-street parking, sidewalks, pathways, on-street bike lanes, pedestrian crossings, bulb-outs, transit accommodation, and street lighting, and will generally conform to the City of St. Albert's municipal design standards.

3.2.3 Local Streets

The Local streets network will facilitate access to adjacent developments. Local streets are anticipated to accommodate a combination of on-street parking, sidewalks, pathways, on-street bike lanes, pedestrian crossings, and street lighting, and will generally conform to the City of St. Albert's municipal design standards. The Local streets network will be explored in more detail as part of future neighbourhood level planning, with the final layout to be determined at the subdivision stage.

For analysis purposes, it is assumed there will be two Local street connections to 127 Street within the ASP lands, with one connection on each end of the Business Employment Area in the northeast of the plan area.

4. Development Traffic

4.1 Trip Generation Assumptions

The Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition formed the basis for AM peak, PM peak, and Daily trip generation rates used in this assessment. The methodology for how site generated trips were established is discussed in the sections below.

4.1.1 Non-Residential Land Uses

The plan area is anticipated to include a range of commercial, office, and industrial uses, split between the employment policy area, mixed use employment node, and mixed use nodes. Non-commercial uses are also expected from the school sites and mixed use employment node.

For this analysis, City of Edmonton Neighbourhood Commercial Trip Generation Rates were applied within the neighbourhood policy area, the mixed use employment node, and for any other commercial sites between 22,000 and 40,000 sqft. Remaining commercial sites <22,000 sqft or between 40,000-108,000 sqft use COE average values and fitted curve equations where available to better reflect the scale of development. Any remaining commercial sites larger than 108,000 sqft used LUC's 820 and 821. Daily trip generation rates for all commercial land uses were taken from the ITE trip generation manual.

Trip generation for the recreational centre portion of the mixed use employment node utilizes the ITE LUC 495 – Recreational Community Centre. The Library portion of this node used ITE LUC 590 – Library, and the office space ITE LUC 730 – Government Office Building.

Trip generation for the light industrial portion of the business employment area utilizes ITE LUC 110 – General Light Industrial.

The plan area includes three school sites, whose peak hours of operation may not coincide with the peak hour of demand of the adjacent roadway network. Furthermore, and particularly for the K-9 schools, the trips generated by the schools are expected to be internal trips. ITE LUC 525 and 520 were applied to the high school and K-9 school, respectively.

The AM peak, PM peak, and daily trip generation rates for the non-residential land uses are summarized in **Table 6**.

4.1.2 Residential Land Uses

Residential trip generation rates were assumed based on the following ITE LUCs:

- Low Density Residential – ITE LUC 210
- Row Housing – ITE LUC 215
- Medium Density Residential – ITE LUC 221
- Mixed Use Multifamily Residential – ITE LUC 221

A custom trip generation rate for the neighbourhood policy area balancing ITE LUC 210, 215 and 221 was created. The anticipated residential trip generation rates are summarized in **Table 7**.

Table 6 – Non-Residential Trip Generation Rates

Land Use	Size (ha)	Units-GFA (1000 sq ft)	Source	AM Peak Hour	PM Peak Hour	Daily
Employment Policy Area Commercial Site #1	6.17	265.5	ITE LUC 820	2.87 trips/Unit	4.09 trips/Unit	37.01 trips/Unit
Employment Policy Area Commercial Site #2	14.33	617.2	ITE LUC 820	2.87 trips/Unit	4.09 trips/Unit	37.01 trips/Unit
Employment Policy Area Commercial Site #3	3.78	101.6	COE CSC 50,000 to 108,000 sq ft	4.02 trips/Unit	18.51 trips/Unit	67.52 trips/Unit
Employment Policy Area Commercial Site #4	0.57	15.3	COE CSC >22,000 sq ft	1.99 trips/Unit	0.38 trips/Unit	54.45 trips/Unit
Employment Policy Area Commercial Site #5	1.55	41.8	COE CNC	5.62 trips/Unit	16.08 trips/Unit	67.52 trips/Unit
Employment Policy Area Commercial Site #6	2.13	57.3	COE CSC 50,000 to 108,000 sq ft	4.02 trips/Unit	16.68 trips/Unit	67.52 trips/Unit
Employment Policy Area Commercial Site #7	0.69	18.6	COE CSC >22,000 sq ft	2.78 trips/Unit	0.51 trips/Unit	54.45 trips/Unit
Mixed Use Commercial Site #1	4.22	341.0	ITE LUC 820	2.87 trips/Unit	4.09 trips/Unit	37.01 trips/Unit
Mixed Use Commercial Site #2	1.82	146.9	ITE LUC 8201	2.87 trips/Unit	4.09 trips/Unit	37.01 trips/Unit
Mixed Use Employment Site Commercial	0.53	28.6	COE CNC	5.62 trips/Unit	15.59 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #1	1.05	28.3	COE CNC	5.62 trips/Unit	15.58 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #2	1.16	31.1	COE CNC	5.62 trips/Unit	15.69 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #3	1.21	32.5	COE CNC	5.62 trips/Unit	15.74 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #4	0.76	20.4	COE CNC	5.62 trips/Unit	15.30 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #5	0.65	17.6	COE CNC	5.62 trips/Unit	15.20 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #6	0.12	3.3	COE CNC	5.62 trips/Unit	14.69 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #7	1.64	44.1	COE CNC	5.62 trips/Unit	16.17 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #8	2.15	57.9	COE CNC	5.62 trips/Unit	16.70 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #9	0.02	0.6	COE CNC	5.62 trips/Unit	14.60 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #10	0.13	3.5	COE CNC	5.62 trips/Unit	14.70 trips/Unit	54.45 trips/Unit
Neighbourhood Policy Area Commercial Site #11	0.83	22.2	COE CNC	5.62 trips/Unit	15.36 trips/Unit	54.45 trips/Unit

Land Use	Size (ha)	Units-GFA (1000 sq ft)	Source	AM Peak Hour	PM Peak Hour	Daily
Neighbourhood Policy Area Commercial Site #12	0.03	0.8	COE CNC	5.62 trips/Unit	14.61 trips/Unit	54.45 trips/Unit
Mixed Use Employment Site Rec Community Centre	3.72	200.1	ITE LUC 495	1.85 trips/Unit	2.53 trips/Unit	28.82 trips/Unit
Mixed Use Employment Site Office Space	0.53	28.6	ITE LUC 730	3.69 trips/Unit	3.19 trips/Unit	22.59 trips/Unit
Mixed Use Employment Site Library	0.53	28.6	ITE LUC 590	6.25 trips/Unit	8.53 trips/Unit	72.05 trips/Unit
Employment Policy Area – Light Industrial	20.34	1,094.6	ITE LUC 110	0.91 trips/Unit	0.80 trips/Unit	4.87 trips/Unit
Employment Policy Area – Office Space	5.12	137.9	ITE LUC 712	2.61 trips/Unit	3.15 trips/Unit	14.39 trips/Unit
High School	1500 students		ITE LUC 525	0.51 trips/Unit	0.32 trips/Unit	1.94 trips/Unit
K-9 School	950 students		ITE LUC 520	0.75 trips/Unit	0.45 trips/Unit	2.27 trips/Unit
K-9 School	950 students		ITE LUC 520	0.75 trips/Unit	0.45 trips/Unit	2.27 trips/Unit

Table 7 – Residential Trip Generation Rates

Land Use	Source	AM Peak Hour	PM Peak Hour	Daily
Low Density Residential	Custom from ITE LUC 210, 215 and 221	0.68 trips/unit	0.86 trips/unit	8.75 trips/unit
Mixed Use – Multifamily Residential	ITE LUC 221	0.35 trips/unit	0.39 trips/unit	4.54 trips/unit

4.2 Gross Trip Generation

The gross AM peak, PM peak, and daily trips anticipated to be generated by the Dauphinais area at full build-out are summarized in **Table 8**. The area is anticipated to generate 14,608 trips in the AM peak, 22,183 trips in the PM peak, and 150,944 daily trips.

Table 8 – Full Build-Out Gross Trip Generation

Land Use	Units-GFA (1000 sq ft)	AM Peak		PM Peak		Daily	
		In	Out	In	Out	In	Out
Employment Policy Area Commercial Site #1	265.5	419	343	543	543	4913	4913
Employment Policy Area Commercial Site #2	617.2	974	797	1262	1262	11421	11421
Employment Policy Area Commercial Site #3	101.6	217	192	903	978	3431	3431
Employment Policy Area Commercial Site #4	15.3	20	10	3	3	415	415
Employment Policy Area Commercial Site #5	41.8	129	106	322	349	1410	1410
Employment Policy Area Commercial Site #6	57.3	122	108	459	497	1935	1935
Employment Policy Area Commercial Site #7	18.6	35	17	5	5	506	506
Mixed Use Commercial Site #1	341.0	538	440	697	697	6310	6310
Mixed Use Commercial Site #2	146.9	539	498	714	714	4958	4958
Mixed Use Employment Site Commercial	28.6	88	72	214	232	778	778
Neighbourhood Policy Area Commercial Site #1	28.3	87	72	211	229	770	770
Neighbourhood Policy Area Commercial Site #2	31.1	96	79	234	254	846	846
Neighbourhood Policy Area Commercial Site #3	32.5	100	82	245	266	884	884
Neighbourhood Policy Area Commercial Site #4	20.4	63	52	150	162	556	556
Neighbourhood Policy Area Commercial Site #5	17.6	54	45	129	139	480	480
Neighbourhood Policy Area Commercial Site #6	3.3	10	8	23	25	90	90
Neighbourhood Policy Area Commercial Site #7	44.1	136	111	342	370	1200	1200
Neighbourhood Policy Area Commercial Site #8	57.9	179	146	464	503	1576	1576
Neighbourhood Policy Area Commercial Site #9	0.6	2	1	4	4	16	16
Neighbourhood Policy Area Commercial Site #10	3.5	11	9	25	27	95	95
Neighbourhood Policy Area Commercial Site #11	22.2	69	56	164	178	605	605
Neighbourhood Policy Area Commercial Site #12	0.8	3	2	6	6	23	23
Mixed Use Employment Site Rec Community Centre	200.1	233	137	238	268	2883	2883
Mixed Use Employment Site Office Space	28.6	58	47	39	52	323	323
Mixed Use Employment Site Library	28.6	88	91	127	117	1030	1030

Land Use	Units-GFA (1000 sq ft)	AM Peak		PM Peak		Daily	
		In	Out	In	Out	In	Out
Employment Policy Area – Light Industrial	1,094.6	867	129	158	718	2665	2665
Employment Policy Area – Office Space	137.9	216	144	183	252	992	992
High School	1500 students	520	245	154	326	1455	1455
K-9 School	950 students	385	328	197	231	1078	1078
K-9 School	950 students	385	328	197	231	1078	1078
Total Non-Residential Land Uses		6,643	4,696	8,410	9,639	54,721	54721
Neighbourhood Policy Area - Custom	4,459 Units	778	2237	2436	1415	19104	19104
Mixed Use - Residential Multifamily	725 Units	66	188	170	113	1646	1646
Total Residential Land Uses		844	2425	2605	1528	20,750	20,750
Total Gross Traffic		7,487	7,120	11,016	11,167	75,472	75,472
		14,608		22,183		150,944	

4.3 Net Trip Generation

The gross trip generation represents the total number of trips which can be expected to be generated by the potential land uses in the plan area, however, not all trips will result in additional vehicle trips being added to the transportation network. For commercial sites in particular, the gross trips include not only new primary trips that would otherwise not have been made on the network, but also diverted/pass-by trips (i.e. those that exist on the network regardless of the commercial development, but whose travel patterns are altered to include pass-by destinations within the plan area where the primary origin or destination is not in the plan area), as well as internal trips (those that both originate and terminate within the plan area as a result of interactions between land uses). The gross trip generation was adjusted to account for the pass-by and internal trip captures.

4.3.1 Non-Residential Trips

The first adjustment to non-residential trips applies to internal capture within policy areas and nodes, which include both commercial and other components. These captured trips will not effect adjacent intersections within the plan area and can be deducted from subsequent analysis of the plan area intersections.

The internal trip rates decided on in discussion the City of St. Albert and using ITE guidance are shown in Table 9. As all sites are assumed to have the same relative distribution of residential and commercial uses, or office and commercial uses at the early planning stages; rates consistent across all sites were used to determine AM peak, PM peak and daily internal capture.

Table 9 – Internal Trip Capture Rates

Mixed Use Site	AM Peak	PM Peak	Daily
Employment Policy Area #1 and #2(Commercial)	28%	20%	20%
Mixed Use Nodes #1 and #2 (Commercial)	15%	10%	10%
Neighbourhood Policy Areas #1 through #12 (Commercial)	15%	10%	15%

The second adjustment required to non-residential trips is to account for pass-by trip capture. This represents trips which will be made on the network regardless of the non-residential development, but which have diverted and made a stop at the non-residential development before reaching their ultimate destination. As the plan area roadway network has yet to be built, pass-by trips will include diversions of existing trips on existing roadways such as Neil Ross Road outside of the plan area. Pass-by trips will also include future trips generated by residential development elsewhere in the plan area and diverting into the non-residential developments.

For the purposes of this assessment, the ITE Trip Generation Handbook 3rd Edition, combined with previous experience and discussion with the City of St. Albert, was used to determine pass-by trip capture rates, as summarized in **Table 10**. In general, pass-by trip rates were assumed to be higher for the neighbourhood commercial and mixed-use developments due to their location, smaller size, and services generally geared towards neighbourhood residents. Pass-by trips were also identified for the commercial portions of the mixed use employment and employment policy areas.

Table 10 – Pass-by Trip Capture Rates

Commercial Site	AM Peak	PM Peak	Daily
Employment Policy Area (Commercial)	25%	35%	30%
Mixed Use Employment (Commercial)	30%	40%	35%
Mixed Use (Commercial)	30%	40%	35%
Neighbourhood Policy Area (Commercial)	30%	40%	30%

The above adjustments were then applied to the gross non-residential trip generation less the internal trips as summarized in **Table 11**. The non-residential uses are anticipated to generate 8,139 trips in the AM peak, 11,161 trips in the PM peak, and 69,170 daily trips.

Table 11 – Net Non-Residential Trips

	AM Peak		PM Peak		Daily	
Trip	In	Out	In	Out	In	Out
Total Gross Trips	6,643	4,696	8,410	9,639	54,721	54,721
Total Internal Trips	673	559	702	718	5,464	5,464
Total Pass-by Trips	1,072	895	2,673	2,796	13,319	13,319
	4,898	3,241	5,036	6,125	35,937	35,937
Net External Trips	8,139		11,161		69,170	

4.3.2 Total Trips

As summarized in **Table 12**, the Dauphinais ASP is anticipated to generate 11,408 trips in the AM peak, 15,294 trips in the PM peak, and 113,376 daily trips.

Table 12 – Total External Trips

	AM Peak		PM Peak		Daily	
Trip	In	Out	In	Out	In	Out
Total Non-Residential	4,898	3,241	5,036	6,125	35,937	35,937
Total Residential	844	2,425	2,605	1,528	20,750	20,750
Total External Trips	5,742	5,666	7,641	7,653	56,688	56,688
	11,408		15,294		113,376	

4.3.3 Trip Distribution

External trip distribution was undertaken based on results from the 2018 St. Albert Municipal Census "Employment and Work Location" data, combined with the location of employment areas within the City of St. Albert and the adjacent metropolitan region. Additionally, previously completed TIAs for the surrounding developments were referenced to estimate trip distribution. Trip distribution ratios are summarized under **Table 13**.

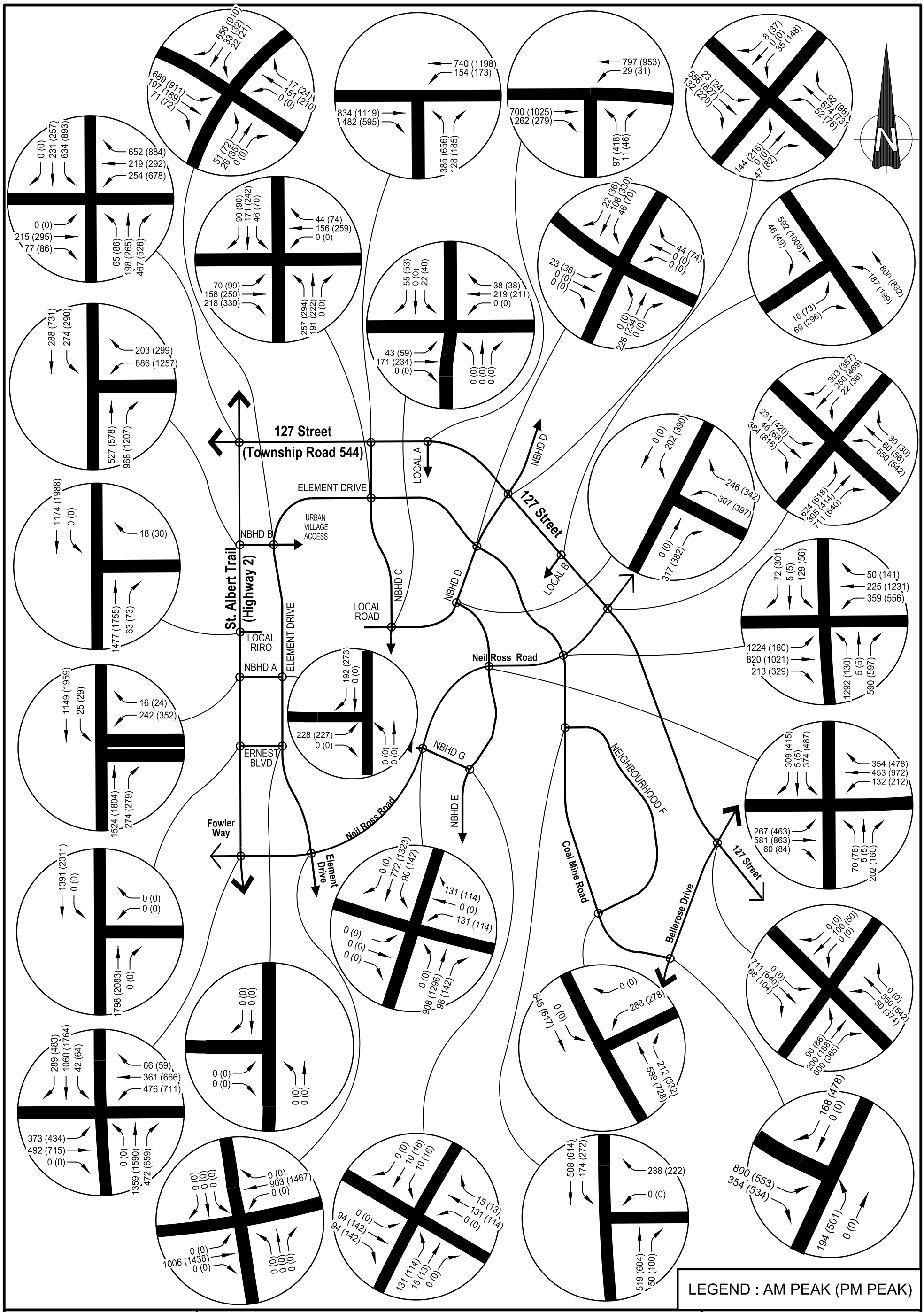
Table 13 – Trip Distribution Ratio

Trip Origin / Destination	Ratio
North	15%
West	20%
South & Southeast (to City of Edmonton)	55%
Northeast	10%

4.3.4 Trip Assignment

Trips were assigned to the network based on the trip distribution, combined with proximity of land uses to the plan area roadway network. Trip routes were chosen based on shortest route and anticipated movements. Commercial sites along St. Albert Trail were assumed to have no direct access to St. Albert Trail except for on Right-In-Right-Out intersection at employment policy area #1. All other traffic is expected to enter/exit via the adjacent Neighbourhood streets. Internal trips within mixed used sites were not assigned to the network as they will be contained within the site. Similarly, pass-by trips were not assigned to any of the intersections as they primary impact the accesses into developments, which is not within the scope of this TIA. A portion of the pass-by trips would be expected to impact the arterial intersections, such as diverting on and off St. Albert Trail, however they would constitute a small portion of the overall traffic volume and was excluded from the analysis.

Full build-out traffic site generated volumes are provided in **Figure 7**, with total traffic volumes provided in **Figure 8**.



LEGEND : AM PEAK (PM PEAK)

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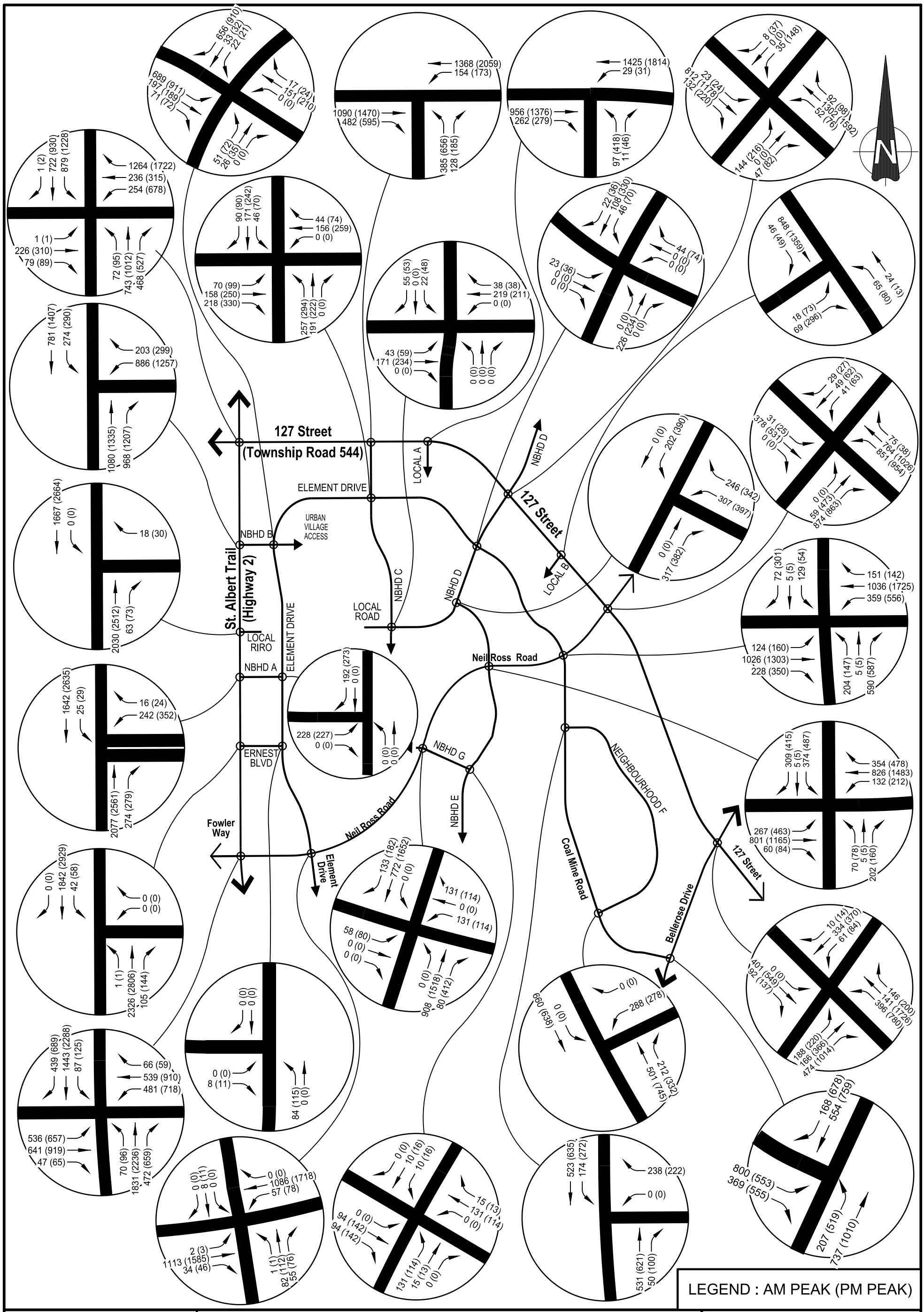
CIMA+

2045 SITE GENERATED TRAFFIC VOLUMES

FIGURE 6

SCALE	FILE	DATE	REPORT	PLAN
NTS	E00781A	NOV 2023		



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CIMA+

2045 TOTAL TRAFFIC VOLUMES

FIGURE 7

SCALE	FILE	DATE	REPORT	PLAN
NTS	E00781A	NOV 2023		

5. Roadway Network Assessment

5.1 Assessment Assumptions

Intersection capacity analysis was undertaken using Synchro Studio 11 software which is consistent with the Highway Capacity Manual. Reporting includes information on Level of Service (LOS), volume to capacity ration (v/c), movement delay (in seconds), and 95th percentile queue lengths. Where information for an intersection movement is unavailable or not applicable, a "-" symbol is used to indicate as such. Additionally, the reported queue lengths are further distinguished using "#" to indicate queues may exceed the reported value due to multiple cycle delays.

Within the assessment summary tables, left turn movements are denoted using "L", through movements using "T", and right turn movements using "R". Separate lanes are demarcated using " / ". Signal cycle lengths are also provided, along with identification of any protected only left turns ("prot").

In general, intersection operations in the long term should meet an overall Level of Service "D" or better for the intersection, with LOS of E and v/c ratios of 0.90 or better for individual movements.

Additionally, proposed intersections which requires signalization and are internal to the ASP area were also analyzed as roundabouts to determine if such alternatives are feasible from a traffic operations perspective. Roundabout analysis was conducted using Sidra Intersection 9 software and reports similar information including LOS, v/c, movement delay and 95th percentile queue lengths.

Detailed traffic analysis results using the Synchro Studio 11 and Sidra Intersection 9 software are provided in **Appendix B**.

5.2 Boulevard / Boulevard Intersections

Intersection capacity analysis was undertaken for the boulevard / boulevard intersection adjacent to the plan area. The analysis assumptions and results are discussed in the sections on the following pages.

5.2.1 St. Albert Trail / 127 Street

The St. Albert Trail / 127 Street intersection is assumed to be signalized, with the following geometry:

- Eastbound: two through lanes, one left turn bay, one channelized right turn bay
- Westbound: two through lanes, two left turn bays, two channelized right turn bays (add 1 lane)
- Northbound: three through lanes, one left turn bay, one channelized right turn bay
- Southbound: three through lanes, two left turn bays, one channelized right turn bay

As shown in **Table 14** below, the intersection is expected to operate with moderate delays in the AM peak hour, and more significant delays in the PM peak hours. Movements will reach LOS D/E with v/c under 0.9 in the AM Peak, which are still within the desirable range for intersection operations. In the PM peak hour, the westbound and southbound left turning movements, however, are expected to reach LOS F and v/c ratios >1.0. While this intersection should be analyzed in more detail once land use assumptions are confirmed at the Neighbourhood Structure Plan TIA, current analysis indicates that the intersection may not be able to accommodate the desired development densities within the employment policy areas, particularly when combined with the function of 127 Street as an informal east bypass of the City of St. Albert combined with the prominence of St. Albert Trail as a north-south commuter corridor through the City. Congestion at this intersection could mitigated somewhat through additional motivation for mode shift (such as enhanced transit service and the provision of active modes facilities) as the traffic analysis does not contemplate any trip reductions due to transit or active modes.

Table 14 – St. Albert Trail / 127 Street Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	127th Street			127th Street			St. Albert Trail			St. Albert Trail		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (150s Cycle, WB and SB LT prot)												
Geometry	L/T/T/R			L/L/T/T/R/R			L/T/T/T/R			L/L/T/T/T/R		
Volume	1	226	79	254	236	1264	72	743	468	879	722	1
v/c	0.01	0.63	0.25	0.66	0.27	0.75	0.26	0.43	0.58	0.82	0.23	0
Delay (s)	59	72.8	6.6	72.2	46.1	24.2	44.7	40.8	28.2	55.3	14.9	0
LOS	E	E	A	E	D	C	D	D	C	E	B	A
95th Queue (m)	2.3	50.1	8.9	53.6	41.4	156.5	31	86.6	133.6	158.2	51.4	0
Intersection Delay (s)						37	**Intersection LOS**					D
PM Peak – Signalized (150s Cycle, WB and SB LT prot)												
Geometry	L/T/T/R			L/L/T/T/R/R			L/T/T/T/R			L/L/T/T/T/R		
Volume	1	310	89	678	315	1722	95	1012	527	1228	930	2
v/c	0.01	0.75	0.34	1.20	0.29	0.94	0.61	0.7	0.66	1.19	0.29	0
Delay (s)	58	76.3	13.9	157.1	39.9	35.5	65.9	51.6	30.8	138.7	13.8	0
LOS	E	E	B	F	D	D	E	D	C	F	B	A
95th Queue (m)	2.3	67.1	16.7	#172.3	52.2	#329.4	#50.2	121.7	153.4	#288.2	57.4	0
Intersection Delay (s)						67	**Intersection LOS**					E

5.3 Boulevard / Crosstown Intersections

Intersection capacity analysis was undertaken for the boulevard / crosstown intersections adjacent to the plan area. The analysis assumptions and results are discussed in the sections on the following pages.

5.3.1 St. Albert Trail / Neil Ross Road / Fowler Way

The St. Albert Trail / Neil Ross Road / Fowler Way intersection is assumed to be signalized with the following geometry.

- Eastbound: two through lanes, two left turn bays, one right turn bay channelized
- Westbound: two through lanes, two left turn bays, one right turn bay channelized
- Northbound: three through lanes, one left turn bay, one channelized right turn bay
- Southbound: three through lanes, one left turn bay, one right turn bay channelized

As shown in **Table 15** below, the intersection is expected operate with significant delays across the AM and PM peak hours. In the AM, several movements operate at LOS E/F with v/c greater than 0.9, which is not desirable. In the PM, several movements operate at LOS F with v/c greater than 1.0, which is highly undesirable. Overall, this suggest that the intersection is unable to accommodate the development density desired by the City without significant congestion along St. Albert Trail. The addition of employment lands along the north boundary of the ASP results in a high volume of southbound traffic along St. Albert Trail in the PM peak coinciding with high northbound volumes attributed to the residential and commercial land uses. While this intersection should be analyzed in more detail once land use assumptions are confirmed at the Neighbourhood Structure Plan TIA, it is anticipated that an approximately 30% reduction in commercial, office, and light industrial use intensities within the employment policy area would be required to achieve acceptable operations at this intersection. Congestion at this intersection could also be somewhat reduced through additional motivation for mode shift (such as enhanced transit service and the provision of active modes facilities) as the traffic analysis does not contemplate any trip reductions due to transit or active modes.

Table 15 - St. Albert Trail / Neil Ross Road / Fowler Way Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Fowler Way			Neil Ross Road			St. Albert Trail			St. Albert Trail		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (170s Cycle, EB and WB LT prot)												
Geometry	L/L/T/T/R			L/L/T/T/R			L/T/T/T/R			L/T/T/T/R		
Volume	536	641	47	481	539	66	70	1829	472	87	1443	439
v/c	0.97	0.85	0.08	0.86	0.70	0.11	0.24	0.91	0.47	0.36	0.77	0.44
Delay (s)	102.1	75.1	0.6	84.2	66.4	2.5	36.8	56.9	13.7	61.8	51.1	11.1
LOS	F	E	A	F	E	A	D	E	B	E	D	B
95th Queue (m)	#138.6	135.4	0.9	#120.4	113.0	4.7	29.2	#270.4	90.7	35.0	185.6	66.6
Intersection Delay (s)						56.6	**Intersection LOS**					E
PM Peak – Signalized (170s Cycle, EB and WB LT prot)												
Geometry	L/L/T/T/R			L/L/T/T/R			L/T/T/T/R			L/T/T/T/R		
Volume	657	919	65	719	910	60	96	2236	659	125	2285	689
v/c	0.82	0.99	0.04	0.89	0.98	0.04	0.71	1.27	0.70	0.93	1.30	0.43
Delay (s)	71.0	89.6	0.0	77.6	87.4	0.1	60.9	172.8	20.1	96.7	184.2	0.8
LOS	E	F	A	E	F	A	F	F	C	F	F	A
95th Queue (m)	138.5	#221.3	0.0	153.7	#217.8	0.0	#52.9	#394.1	147.3	#79.8	#406.8	0.0
Intersection Delay (s)						117.1	**Intersection LOS**					F

5.3.2 Neil Ross Road / 127 Street

The Neil Ross Road / 127 Street intersection is assumed to be signalized with the following geometry:

- Eastbound: two through lanes, one left turn bay, one right turn bay channelized (add 1 lane)
- Westbound: two through lanes, two left turn bays, one right turn bay
- Northbound: two through lanes, two left turn bays, one channelized right turn bay
- Southbound: two through lanes, one left turn bay, one right turn bay

As shown in **Table 16** below, the intersection is expected to operate with moderate delays within both the AM and PM peak hours. Some movements have reached an LOS of D/E and v/c ratios near or above 0.9, however, the intersection as a whole operates within acceptable parameters.

Table 16 – Neil Ross Road / 127 Street Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	127th Street			127th Street			Neil Ross Road			Neil Ross Road		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (120s Cycle, WB and NB LT prot)												
Geometry	L/T/T/R			L/L/T/T/R			L/L/T/T/R			L/T/T/R		
Volume	237	295	360	851	683	77	648	345	874	36	310	307
v/c	0.78	0.52	0.22	0.89	0.72	0.12	0.73	0.27	0.84	0.16	0.59	0.48
Delay (s)	66.9	50.8	0.3	54.6	44.8	2.7	46.2	27.8	14.8	24.5	53.0	22.4
LOS	E	D	A	D	D	A	D	C	B	C	D	C
95th Queue (m)	#96.7	49.1	0.0	#139.7	103.0	5.7	97.3	43.6	105.7	11.4	53.9	66.3
Intersection Delay (s)						36.8	**Intersection LOS**					D
PM Peak – Signalized (120s Cycle, WB and NB LT prot)												
Geometry	L/T/T/R			L//L/T/T/R			L/L/T/T/R			L/T/T/R		
Volume	430	409	816	954	910	95	618	473	863	55	452	364
v/c	0.94	0.69	0.51	0.89	0.98	0.15	0.91	0.41	0.88	0.24	0.76	0.64
Delay (s)	63.3	53.7	1.2	57.9	70.7	5.4	61.6	50.8	33.9	27.1	56.8	10.2
LOS	E	D	A	E	E	A	E	D	C	C	E	B
95th Queue (m)	#151.4	68.7	0.0	#152.5	#163.3	11.0	90.6	64.9	141.6	17.1	76.1	28.3
Intersection Delay (s)						45.4	**Intersection LOS**					D

5.3.3 127 Street / Bellerose Drive

The 127 Street / Bellerose Drive intersection is assumed to be signalized with the following geometry:

- Eastbound: two through lanes, one left turn bay, one right turn bay
- Westbound: two through lanes, two left turn bays, two signalized right turn bay
- Northbound: one through lane, one left turn bay, and one right turn lane drop
- Southbound: two through lanes (one exclusive, one thru-right), one left turn bay

As shown in **Table 17** below, the intersection is expected to operate well within the AM peak hour. The intersection is expected to operate overcapacity for some movements within the PM peak hour, with movements reaching an LOS of E/F and v/c ratio greater than 0.9. Of note, during the Neighbourhood Structure Plan development for this area, an additional connection from the neighbourhood to 127 Street could be considered to better distribute traffic volumes entering and exiting the neighbourhood. This could eliminate the need for some of the dual turning lanes noted in the current analysis.

Table 17 – 127 Street / Bellerose Drive Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	127th Street			127th Street			Bellerose Drive			Bellerose Drive		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (90s Cycle, WB LT and NB RT prot)												
Geometry	L/T/T/R			L/L/T/T/R			L/T/R			L/T/TR		
Volume	0	401	92	346	1414	146	188	366	1074	61	334	10
v/c	0.00	0.44	0.18	0.47	0.76	0.16	0.48	0.53	0.57	0.34	0.55	0.02
Delay (s)	0.0	29.9	2.5	33.6	20.3	2.4	24.3	25.9	8.4	38.4	37.6	0.1
LOS	A	C	A	C	C	A	C	C	A	D	D	A
95th Queue (m)	0.0	46.1	4.7	42.0	128.9	8.7	40.1	79.1	60.9	22.1	45.6	0.0
Intersection Delay (s)						20.5	**Intersection LOS**					C
PM Peak – Signalized (140s Cycle, WB LT and NB RT prot)												
Geometry	L/T/T/R			L/L/T/T/R			L/T/R			L/T/TR		
Volume	5	1189	137	780	1726	200	220	415	1014	14	370	84
v/c	0.08	0.99	0.22	0.98	0.80	0.19	0.73	0.67	0.60	0.09	0.55	0.21
Delay (s)	36.6	69.7	9.2	81.6	25.4	2.3	51.2	46.9	19.7	47.5	53.8	7.6
LOS	D	E	A	F	C	A	D	D	B	D	D	A
95th Queue (m)	4.9	#231.7	20.2	#160.6	228.1	11.2	#75.4	143.2	123.5	10.2	73.1	11.7
Intersection Delay (s)						43.0	**Intersection LOS**					D

5.4 Boulevard / Neighbourhood Intersections

Intersection capacity analysis was undertaken for the boulevard / neighbourhood intersections adjacent to the plan area. The analysis assumptions and results are discussed in the sections on the following pages.

5.4.1 St. Albert Trail / Neighbourhood A

The St. Albert Trail / Neighbourhood A intersection is assumed to be signalized with the following geometry.

- Eastbound: none
- Westbound: one left turn bay, one right turn bay channelized
- Northbound: two through lanes, one channelized right turn bay
- Southbound: two through lanes (one exclusive, one thru-left turn bay)

As shown in **Table 18** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 18 – St. Albert Trail / Neighbourhood A Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	-			Neighbourhood A			St. Albert Trail			St. Albert Trail		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (45s Cycle)												
Geometry	-			L/R			T/T/T/R			L/T/T/T		
Volume				242		16		2077	274	25	1642	
v/c				0.53		0.04		0.21	0.17	0.31		
Delay (s)				18.1		10.5		0	0.1	6.3		
LOS				B		B		A	A	A		
95th Queue (m)				28.1		3.5		0	0	57.8		
Intersection Delay (s)						3.5	**Intersection LOS**					A
PM Peak – Signalized (45s Cycle)												
Geometry	-			L/R			T/T/T/R			L/T/T/T		
Volume				352		24		2561	279	29	2635	
v/c				0.64		0.05		0.26	0.17	0.54		
Delay (s)				18.4		9.3		0.1	0.2	9.7		
LOS				B		A		A	A	A		
95th Queue (m)				38.6		4.3		0	0	106.5		
Intersection Delay (s)						5.6	**Intersection LOS**					A

5.4.2 St. Albert Trail / Neighbourhood B

The St. Albert Trail / Neighbourhood B intersection is assumed to be signalized with the following geometry.

- Eastbound: none
- Westbound: one left turn lane, one left turn bay, one right turn bay channelized (add lane)
- Northbound: two through lanes, one channelized right turn bay (add lane)
- Southbound: two through lanes, one left turn bay

As shown in **Table 19** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 19 – St. Albert Trail / Neighbourhood B Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	-			Neighbourhood B			St. Albert Trail			St. Albert Trail		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (65s Cycle)												
Geometry	-			L/L/R			T/T/T/R			L/T/T/T		
Volume				886		203		1080	968	274	781	
v/c				0.89		0.13		0.11	0.6	0.82	0.4	
Delay (s)				35.3		0.2		0	1.7	33.7	9.5	
LOS				D		A		A	A	C	A	
95th Queue (m)				#86.3		0		0	0	#56.4	39.6	
Intersection Delay (s)						11.8	**Intersection LOS**					B
PM Peak – Signalized (90s Cycle)												
Geometry	-			L/L/R			T/T/T/R			L/T/T/T		
Volume				1257		299		1335	1207	290	1407	
v/c				0.89		0.19		0.13	0.75	0.82	0.83	
Delay (s)				34.3		0.3		0	3.3	40.2	26.7	
LOS				C		A		A	A	D	C	
95th Queue (m)				133.2		0		0	0	#75.6	148.3	
Intersection Delay (s)						16.6	**Intersection LOS**					B

5.4.3 St. Albert Trail / Ernest Boulevard

The St. Albert Trail / Ernest Boulevard intersection is assumed to be signalized with the following geometry.

- Eastbound: one shared left-thru-right lane
- Westbound: one shared left-thru lane, one left turn bay, one right turn bay
- Northbound: three through lanes, one left turn bay, one right turn bay
- Southbound: three through lanes (two exclusive, one thru-right), one left turn bay

As shown in **Table 20** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 20 – St. Albert Trail / Ernest Boulevard Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Ernest Boulevard			Ernest Boulevard			St. Albert Trail			St. Albert Trail		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (90s Cycle, WB LT prot)												
Geometry	LTR			L/LT/R			L/T/T/T/R			L/T/T/TR		
Volume	0	0	0	126	0	25	1	2326	105	42	1842	0
v/c	0			0.16	0.17	0.04	0.01	0.75	0.07	0.3	0.52	
Delay (s)	0			26.5	25.8	7	13	20.6	0.6	41	9.5	
LOS	A			C	C	A	B	C	A	D	A	
95th Queue (m)	0			19.8	19.5	4.8	1	#188.4	2.6	18	75.6	
Intersection Delay (s)						18.5	**Intersection LOS**					B
PM Peak – Signalized (110s Cycle, WB LT prot)												
Geometry	LTR			LTR			LTR			L/T/T/TR		
Volume	0	0	0	172	0	34	1	2806	114	58	2929	0
v/c	0			0	0	0.44	0.41	0.08	0.01	0.81	0.11	0.39
Delay (s)	0			0	0	52.3	50.1	16.8	10	17.3	0.6	54.8
LOS	A			A	A	D	D	B	A	B	A	D
95th Queue (m)	0			0	0	35.1	34.7	9.6	0.9	228.1	3.7	25.5
Intersection Delay (s)						13.5	**Intersection LOS**					B

5.4.4 127th Street / Neighbourhood C

The St. Albert Trail / Neighbourhood C intersection is assumed to be signalized with the following geometry.

- Eastbound: two through lanes, one right turn bay
- Westbound: two through lanes, one left turn bay
- Northbound: two left turn bays, one right turn lane
- Southbound: none

As shown in **Table 21**, the intersection is expected operate well within both the AM and PM peak hours.

Table 21 – 127th Street / Neighbourhood C Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	127th Street			127th Street			Neighbourhood C			-		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (55s Cycle)												
Geometry	T/T/R			L/T/T			L/L/R			-		
Volume		1090	482	154	1368		385		128			
v/c		0.48	0.3	0.58	0.6		0.61		0.33			
Delay (s)		6.1	0.5	17.5	7.3		25.4		8.8			
LOS		A	A	B	A		C		A			
95th Queue (m)		36.6	0	#35	51.5		31.1		13.1			
Intersection Delay (s)						8.4	**Intersection LOS**					A
PM Peak – Signalized (80s Cycle)												
Geometry	T/T/R			L/T/T			L/L/R			-		
Volume		1470	595	173	2059		656		185			
v/c		0.78	0.46	0.73	0.87		0.89		0.31			
Delay (s)		19.1	3	31.2	16.1		47		17.2			
LOS		B	A	C	B		D		B			
95th Queue (m)		121.8	22.5	#40.2	159.1		#82.9		33.5			
Intersection Delay (s)						19.9	**Intersection LOS**					B

5.4.5 127th Street / Neighbourhood D

The St. Albert Trail / Neighbourhood D intersection is assumed to be signalized with the following geometry.

- Eastbound: one shared left-thru-right lane
- Westbound: one shared left-thru-right lane
- Northbound: two through lanes (one left-thru, one thru-right)
- Southbound: two through lanes (one left-thru, one thru-right)

As shown in **Table 22**, the intersection is expected operate well within both the AM and PM peak hours.

Table 22 – 127th Street / Neighbourhood D Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neighbourhood D			Neighbourhood D			127th Street			127th Street		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (60s Cycle)												
Geometry	LTR			LTR			LT/TR			LT/TR		
Volume	144	0	47	35	0	8	52	1302	92	23	812	132
v/c	0.32			0.07			0.78			0.52		
Delay (s)	14.7			8.6			14.9			14.6		
LOS	B			A			B			B		
95th Queue (m)	27.9			7			88.7			58.3		
Intersection Delay (s)						14.7	**Intersection LOS**					B
PM Peak – Signalized (65s Cycle)												
Geometry	LTR			LTR			LT/TR			LT/TR		
Volume	216	0	82	148	0	37	76	1592	98	24	1178	220
v/c	0.55			0.34			0.88			0.72		
Delay (s)	21.5			17.4			19.5			12.6		
LOS	C			B			B			B		
95th Queue (m)	50.4			30.8			#137.5			83.4		
Intersection Delay (s)						16.9	**Intersection LOS**					B

5.5 Boulevard / Local Intersections

Intersection capacity analysis was undertaken for the boulevard / local intersections adjacent to the plan area. The analysis assumptions and results are discussed in the sections on the following pages.

5.5.1 St. Albert Trail / Right-In-Right-Out

The St. Albert Trail / Right-In-Right-Out intersection is assumed to be a yield condition for WB traffic with the following geometry.

- Eastbound: none
- Westbound: one right turn lane
- Northbound: two through lanes, one right turn bay
- Southbound: two through lanes

As shown in **Table 23** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 23 – St. Albert Trail / Right-In-Right-Out Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	-			Local RIRO			St. Albert Trail			St. Albert Trail		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - Yield WB												
Geometry				R			T/T/T/R			T/T/T		
Volume						18		2030	63		1667	
v/c						0.03		0.6	0.04		0.49	
Delay (s)						12.1		0	0		0	
LOS						B		A	A		A	
95th Queue (m)						0.9		0	0		0	
Intersection Delay (s)						0.1	**Intersection LOS**					A
PM Peak - Yield WB												
Geometry				R			T/T/T/R			T/T/T		
Volume						30		2512	73		2664	
v/c						0.05		0.74	0.04		0.78	
Delay (s)						11.5		0	0		0	
LOS						B		A	A		A	
95th Queue (m)						1.3		0	0		0	
Intersection Delay (s)						0.1	**Intersection LOS**					A

5.5.2 127th Street / Local A

The 127th Street / Local A intersection is assumed to be signalized (due to significant capacity concerns when unsignalized) with the following geometry.

- Eastbound: two through lanes (one exclusive, one thru-right)
- Westbound: two through lanes (one exclusive, one left-thru)
- Northbound: one left turn lane, one right turn bay
- Southbound: none

As shown in **Table 24** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 24 – 127th Street / Local A Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	127th Street			127th Street			Local A			-		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (60s Cycle)												
Geometry	T/TR			LT/T			L/R			-		
Volume		956	262	29	1425		97		11			
v/c		0.64		0.75			0.18		0.02			
Delay (s)		10.7		19.4			16.3		8.5			
LOS		B		B			B		A			
95th Queue (m)		61.2		385.7			17.8		3			
Intersection Delay (s)						15.4	**Intersection LOS**					B
PM Peak – Signalized (75s Cycle)												
Geometry	T/TR			LT/T			L/R			-		
Volume		1376	279	31	1814		418		46			
v/c		0.77		0.85			0.86		0.1			
Delay (s)		13.7		17.1			45.2		7.5			
LOS		B		B			D		A			
95th Queue (m)		111.2		140.5			#107.9		7.3			
Intersection Delay (s)						18.5	**Intersection LOS**					B

5.5.3 127th Street / Local B

The 127th Street / Local B intersection is assumed to be stop controlled on the north leg with the following geometry.

- Eastbound: two through lanes (one exclusive, one thru-right)
- Westbound: two through lanes (one exclusive, one left-thru)
- Northbound: one left turn bay, one right turn lane
- Southbound: none

As shown in **Table 25** below, the intersection is expected operate moderately well within both the AM and PM peak hours. The only exception is the northbound left turn which operates at an LOS of F and v/c ratio greater than 0.9 (PM). Platoons forming from adjacent intersections are expected to reduce expected wait times for this movement, but it may be a candidate for signalization in the future. Operations at this intersection should be confirmed at the Neighbourhood Structure Plan TIA once land uses are further refined.

Table 25 – 127th Street / Local B Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	127th Street			127th Street			Local B			-		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - TWSC (E)												
Geometry	T/TR			LT/T			L/R			-		
Volume		848	46	187	1428		18		69			
v/c		0.36	0.21	0.26	0.61		0.25		0.1			
Delay (s)		0	0	6.2	0		65.1		10.4			
LOS		A	A	A	A		F		B			
95th Queue (m)		0	0	8.3	0		7.2		2.7			
Intersection Delay (s)						2.3	**Intersection LOS**					A
PM Peak - TWSC (E)												
Geometry	T/TR			LT/T			L/R			-		
Volume		1359	49	199	1693		73		296			
v/c		0.58	0.32	0.43	0.72		1.57		0.4			
Delay (s)		0	0	13.2	0		463.2		12.5			
LOS		A	A	B	A		F		B			
95th Queue (m)		0	0	17.1	0		60.2		15.6			
Intersection Delay (s)						12.9	**Intersection LOS**					B

5.6 Crosstown / Neighbourhood / Connector Intersections

The Crosstown/Neighbourhood/Connector intersections providing access into the plan area were also analyzed. The analysis assumptions and results are discussed in the sections below.

5.6.1 Neil Ross Road / Element Drive

The Neil Ross Road / Element Drive intersection is assumed to be signalized, with the following assumed lane configuration:

- Eastbound: two through lanes, one left turn bay, one right turn bay
- Westbound: two through lanes, one shared thru-right turn bay, one left turn bay
- Northbound: one shared thru-right lane, one left turn bay
- Southbound: one shared left-thru-right lane

As shown in **Table 26** below, the intersection is expected operate well within the AM and PM peak hours.

Table 26 – Neil Ross Road / Element Drive Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neil Ross Road			Neil Ross Road			Element Drive			Element Drive		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (120s Cycle)												
Geometry	L/T/T/R			L/T/T/TR			L/TR			LTR		
Volume	2	1113	34	57	183	5	100	82	55	5	8	50
v/c	0.00	0.55	0.04	0.17	0.06		0.32	0.32		0.15		
Delay (s)	6.0	17.6	1.1	6.0	7.6		41.8	33.4		14.6		
LOS	A	B	A	A	A		D	C		B		
95th Queue (m)	1.0	106.3	2.0	7.4	8.3		37.5	41.7		14.5		
Intersection Delay (s)						18.4	**Intersection LOS**					B
PM Peak – Signalized (120s Cycle)												
Geometry	L/T/T/R			L/T/T/TR			L/TR			LTR		
Volume	110	1585	46	78	1718	5	100	112	76	5	11	5
v/c	0.80	0.67	0.04	0.33	0.44		0.45	0.63		0.08		
Delay (s)	57.0	14.0	1.3	8.0	4.2		53.2	51.2		36.5		
LOS	E	B	A	A	A		D	D		D		
95th Queue (m)	#59.2	138.2	2.9	5.3	40.2		41.1	64.1		11.1		
Intersection Delay (s)						13.5	**Intersection LOS**					B

5.6.2 Neil Ross Road / Neighbourhood G

The Neil Ross Road / Neighbourhood G intersection is assumed to be signalized, with the following geometry:

- Eastbound: two through lanes, one left turn bay, one channelized right turn bay
- Westbound: two through lanes, one left turn bay, one right turn bay
- Northbound: one thru-right lane, one left turn bay
- Southbound: one thru-right lane, one left turn bay

As shown in **Table 27** below, the intersection is expected operate well within the AM and PM peak hours.

Table 27 – Neil Ross Road / Neighbourhood G Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neil Ross Road			Neil Ross Road			Neighbourhood G			Neighbourhood G		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (60s Cycle)												
Geometry	L/T/T/R			L/T/T/R			L/TR			L/TR		
Volume	120	1070	98	90	1012	133	131	5	131	58	5	50
v/c	0.55	0.56	0.11	0.45	0.53	0.15	0.30	0.24		0.15	0.10	
Delay (s)	30.7	18.4	6.0	18.0	10.4	2.0	18.0	9.1		15.9	6.3	
LOS	C	B	A	B	B	A	B	A		B	A	
95th Queue (m)	43.8	125.5	17.7	19.0	50.9	6.3	23.8	16.0		12.3	6.9	
Intersection Delay (s)						14.2	**Intersection LOS**					B
PM Peak – Signalized (120s Cycle)												
Geometry	L/T/T/R			L/T/T/R			L/TR			L/TR		
Volume	100	1518	142	5	1652	182	114	5	114	80	5	50
v/c	0.57	0.63	0.11	0.03	0.81	0.16	0.36	0.35		0.29	0.18	
Delay (s)	34.3	13.5	0.9	12.2	24.3	1.4	40.4	16.8		38.6	15.2	
LOS	C	B	A	B	C	A	D	B		D	B	
95th Queue (m)	28.3	121.0	4.9	2.5	195.5	7.4	39.3	23.0		29.4	13.1	
Intersection Delay (s)						18.9	**Intersection LOS**					B

5.6.3 Neil Ross Road / Neighbourhood E

The Neil Ross Road / Neighbourhood E intersection is assumed to be signalized, with the following assumed lane configuration:

- Eastbound: two through lanes, one left turn bay, one right turn bay
- Westbound: two through lanes, one left turn bay, one channelized right turn bay
- Northbound: one through lane, one right turn bay
- Southbound: one left-thru lane, two left turn bays, one channelized right turn bay

As shown in **Table 28** below, the intersection is expected to operate near capacity within both the AM and PM peak hours. Some movements will reach LOS E and/or a v/c above 0.9. Of note, the northbound approach could be configured as a L / T / R to better align lanes through the intersection and reduce any negative offsets impacting sightlines for left turns. This intersection is considered a candidate for a roundabout.

Table 28 – Neil Ross Road / Neighbourhood E Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neil Ross Road			Neil Ross Road			Neighbourhood E			Neighbourhood E		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (75s Cycle, EB and SB LT prot)												
Geometry	L/T/T/R			L/T/T/R			LT/R			L/L/T/R		
Volume	27	801	60	132	826	354	70	5	202	374	5	309
v/c	0.93	0.66	0.09	0.53	0.95	0.54	0.22		0.37	0.89	0.01	0.30
Delay (s)	71.5	24.3	0.3	21.9	49.5	6.3	24.9		5.2	57.8	12.6	6.6
LOS	E	C	A	C	D	A	C		A	E	B	A
95th Queue (m)	#83.3	72.0	0.0	20.7	#101.1	19.6	20.0		13.4	#52.8	2.3	28.5
Intersection Delay (s)						32.7	**Intersection LOS**					C
PM Peak – Signalized (150s Cycle, EB and SB LT prot)												
Geometry	L/T/T/R			L/T/T/R			LT/R			L/L/T/R		
Volume	463	1165	84	212	1483	478	78	5	160	487	0	415
v/c	1.05	0.66	0.10	0.60	1.03	0.57	0.49		0.48	1.00	0.00	0.55
Delay (s)	101.6	31.0	4.1	53.5	74.6	12.5	72.2		13.3	103.7	0.0	7.0
LOS	F	C	A	D	E	B	E		B	F	A	A
95th Queue (m)	#213.2	166.8	9.4	65.8	#304.8	68.5	43.5		22.4	#118.7	0.0	29.8
Intersection Delay (s)						54.3	**Intersection LOS**					D

5.6.4 Neil Ross Road / Element Drive / Coal Mine Road

The Neil Ross road / Element Drive / Coal Mine Road intersection is assumed to be signalized with the following geometry:

- Eastbound: two through lanes, one left turn bay, one channelized right turn bay
- Westbound: two through lanes, two left turn bays, one right turn bay
- Northbound: one thru-right lane. two left turn lane bays
- Southbound: one through lane, one left turn bay, one channelized right turn bay

As shown in **Table 29** below, the intersection is expected to operate near capacity within both the AM and PM peak hours. Some movements will reach LOS E and/or a v/c near/just above 0.9. The proposed intersection has a large amount of lanes required for a crosstown street; this intersection is expected to be a strong candidate for a roundabout.

Table 29 – Neil Ross Road / Element Drive / Coal Mine Road Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neil Ross Road			Neil Ross Road			Coal Mine Road			Element Drive		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (90s Cycle, WB and NB LT prot)												
Geometry	L/T/T/R			L/L/T/T/R			L/L/TR			L/T/R		
Volume	124	1026	228	359	1036	151	204	5	590	129	5	72
v/c	0.58	0.91	0.14	0.89	0.83	0.23	0.82	0.74		0.80	0.01	0.10
Delay (s)	26.4	47.4	0.2	64.6	33.7	4.6	67.1	19.6		65.4	22.0	4.3
LOS	C	D	A	E	C	A	E	B		E	A	A
95th Queue (m)	#23.9	#136.1	0.0	#58.6	115.6	12.5	#37.9	100.2		#54.0	3.2	7.5
Intersection Delay (s)						36.9	**Intersection LOS**					D
PM Peak – Signalized (120s Cycle, WB and NB LT prot)												
Geometry	L/T/T/R			L/L/T/T/R			L/L/TR			L/T/R		
Volume	160	1303	350	556	1725	142	147	5	597	56	5	301
v/c	0.85	0.91	0.22	0.95	0.97	0.14	0.53	1.00		0.41	0.01	0.51
Delay (s)	63.2	44.1	0.3	76.8	44.2	4.0	60.2	61.5		38.5	38.8	21.6
LOS	E	D	A	E	D	A	E	E		D	D	C
95th Queue (m)	#62.4	#202.5	0.0	#101.1	#264.8	6.6	29.4	#169.7		20.0	4.7	61.0
Intersection Delay (s)						45.3	**Intersection LOS**					D

5.6.5 Bellerose Drive / Coal Mine Road

The Bellerose Drive / Coal Mine Road intersection is assumed to be signalized with the following geometry:

- Eastbound: one left turn lane, one right turn lane
- Westbound: none
- Northbound: two through lanes, one left turn bay
- Southbound: two through lanes, one channelized right turn bay

As shown in **Table 30** below, the intersection is expected operate moderately well within the AM and PM peak hours. The intersection is expected to operate near capacity for some movements, reaching LOS D/E and/or a v/c near/at 0.9. Overall, the intersection operates within acceptable parameters.

Table 30 – Bellerose Drive / Coal Mine Road Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Coal Mine Road			-			Bellerose Drive			Bellerose Drive		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (120s Cycle)												
Geometry	L/R						L/T/T			T/T/R		
Volume	800		369				207	737			554	168
v/c	0.66		0.33				0.47	0.84			0.63	0.32
Delay (s)	14.5		7.6				42.8	52.8			44.1	7.1
LOS	B		A				D	D			D	A
95th Queue (m)	146.4		44.2				68.5	#116.8			84.3	17.7
Intersection Delay (s)						31.0	**Intersection LOS**					C
AM Peak – Signalized (120s Cycle)												
Geometry	L/R			-			L/T/T			T/T/R		
Volume	553		555				519	1010			759	478
v/c	0.89		0.63				0.90	0.49			0.83	0.63
Delay (s)	55.9		7.5				51.1	15.8			51.7	7.3
LOS	E		A				D	B			D	B
95th Queue (m)	#196.5		39.5				#171.4	90.1			118.5	28.6
Intersection Delay (s)						31.1	**Intersection LOS**					C

5.6.6 Coal Mine Road / Neighbourhood F N

The Coal Mine Road / Neighbourhood F N intersection is assumed to be all-way stop controlled with the following geometry:

- Eastbound: none
- Westbound: one shared left-right lane
- Northbound: two through lanes, one channelized right turn bay
- Southbound: one exclusive through lane, one left-thru shared lane

As shown in **Table 31** below, the intersection is expected to operate well within the AM and PM peak hours.

Table 31 – Coal Mine Road / Neighbourhood F N Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	-			Neighbourhood F			Coal Mine Road			Coal Mine Road		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - AWSC												
Geometry				LR			T/T/R			LT/T		
Volume				5		238		531	50	174	523	
v/c				0.39				0.46	0.04	0.61	0.59	
Delay (s)				12.6				13.4	5.1	17.5	16.1	
LOS				B				B	A	C	C	
95th Queue (m)				-				-	-	-	-	
Intersection Delay (s)						14.6	**Intersection LOS**					B
PM Peak - AWSC												
Geometry	-			LR			T/T/R			LT/T		
Volume				5		222		621	100	272	635	
v/c				0.39				0.57	0.09	0.87	0.73	
Delay (s)				13.1				16.7	5.3	37.9	23.1	
LOS				B				C	A	E	C	
95th Queue (m)				-				-	-	-	-	
Intersection Delay (s)						22.6	**Intersection LOS**					C

Note: 95th queue lengths could not be calculated for this intersection due to limitations in the HCM methodology. However, based on other service measures it is expected that actual queue lengths will not reach the adjacent neighbourhood street intersections.

5.6.7 Coal Mine Road / Neighbourhood F S

The Coal Mine Road / Neighbourhood F S intersection is assumed to be signalized with the following geometry:

- Eastbound: none
- Westbound: one shared left-right lane
- Northbound: two through lanes (one exclusive, one shared thru-right)
- Southbound: two through lanes (one exclusive, one shared left-thru)

As shown in **Table 32** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 32 – Coal Mine Road / Neighbourhood F S Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	-			Neighbourhood F			Coal Mine Road			Coal Mine Road		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak – Signalized (60s Cycle)												
Geometry	-			LR			T/TR			LT/T		
Volume				288		5		501	212	5	660	
v/c				0.42				0.43		0.43		
Delay (s)				15.5				9.3		12.0		
LOS				B				A		B		
95th Queue (m)				41.7				27.8		37.6		
Intersection Delay (s)						11.5	**Intersection LOS**					B
PM Peak – Signalized (60s Cycle)												
Geometry	-			LR			T/TR			LT/T		
Volume				278		5		745	332	5	638	
v/c				0.49				0.57		0.36		
Delay (s)				19.6				9.4		9.1		
LOS				B				A		A		
95th Queue (m)				-				-		-		
Intersection Delay (s)						10.7	**Intersection LOS**					B

5.7 Neighbourhood / Neighbourhood Intersections

Intersection capacity analysis was undertaken for all Neighbourhood/Neighbourhood intersections adjacent to the plan area. These intersections provide further access from the Neighbourhood road network into the ASP area. The analysis assumptions and results are discussed in the sections on the following pages.

5.7.1 Element Drive / Ernest Boulevard

The Element Drive / Ernest Boulevard intersection is assumed to be stop controlled on the eastbound approach with the following geometry:

- Eastbound: one left-right turn lane
- Westbound: none
- Northbound: one shared left-thru lane
- Southbound: one shared thru-right lane

As shown in **Table 33** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 33 – Element Drive / Ernest Boulevard Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Ernest Boulevard			-			Element Drive			Element Drive		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - TWSC (E)												
Geometry	LR			-			LT			TR		
Volume	0		8				84	0			0	0
v/c	0.01						0.05				0	
Delay (s)	8.3						7.3				0	
LOS	A						A				A	
95th Queue (m)	0.2						1.3				0	
Intersection Delay (s)						7.4	**Intersection LOS**					A
PM Peak - TWSC (E)												
Geometry	LR			-			LT			TR		
Volume	0		11				115	0			0	0
v/c	0.01						0.07				0	
Delay (s)	8.4						7.4				0	
LOS	A						A				A	
95th Queue (m)	0.2						1.8				0	
Intersection Delay (s)						7.5	**Intersection LOS**					A

5.7.2 Element Drive / Neighbourhood A

The Element Drive / Neighbourhood A intersection is assumed to be stop controlled on the eastbound approach with the following geometry:

- Eastbound: one shared left-right lane
- Westbound: none
- Northbound: one shared left-thru lane
- Southbound: one shared thru-right lane

As shown in **Table 34** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 34 – Element Drive / Neighbourhood A Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neighbourhood A			-			Element Drive			Element Drive		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - TWSC (E)												
Geometry	L/R			-			LT			TR		
Volume	228		0				0	0			0	192
v/c	0.25						0				0.11	
Delay (s)	10.3						0				0	
LOS	B						A				A	
95th Queue (m)	8						-				-	
Intersection Delay (s)						5.6	**Intersection LOS**					A
PM Peak - TWSC (E)												
Geometry	L/R			-			LT			TR		
Volume	227		0				0	0			0	273
v/c	0.26						0				0.16	
Delay (s)	10.7						0				0	
LOS	B						A				A	
95th Queue (m)	8.5						0				0	
Intersection Delay (s)						4.9	**Intersection LOS**					A

5.7.3 Element Drive / Neighbourhood B

The Element Drive / Neighbourhood B intersection is assumed to be all-way stop controlled with the following geometry:

- Eastbound: one through lane, one left turn lane, one right turn bay channelized
- Westbound: one shared left-thru-right lane
- Northbound: one shared thru-right lane, one left turn bay
- Southbound: one shared left-thru lane, one right turn bay channelized (add lane)

As shown in **Table 35** below, the intersection is expected operate well within both the AM and PM peak hours, with the exception of the eastbound left-turn movements which operate at an LOS of F and v/c ratio >1.0. It is anticipated that traffic will shift their route to other access points (which have excess capacity) to avoid left-turning congestion at this intersection.

Table 35 – Element Drive / Neighbourhood B Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neighbourhood B			Neighbourhood B			Element Drive			Element Drive		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - AWSC												
Geometry	L/T/R			LTR			L/TR			LT/R		
Volume	389	197	71	0	151	17	51	26	0	22	33	656
v/c	1.09	0.28	0.06	0.27			0.11	0.05		0.11		0.58
Delay (s)	85.3	9.1	5.2	11			10.2	9.2		10.8		10.6
LOS	F	A	A	B			B	A		B		B
95th Queue (m)	-	-	-	-			-	-		-		-
Intersection Delay (s)						37.1	**Intersection LOS**					E
PM Peak - AWSC												
Geometry	L/T/R			LTR			L/TR			LT/R		
Volume	911	189	72	0	210	24	72	35	0	21	32	910
v/c	1.5	0.28	0.06	0.39			0.15	0.07		0.11		0.81
Delay (s)	248.7	9.4	5.2	12.7			10.8	9.5		11.1		18.1
LOS	F	A	A	B			B	A		B		C
95th Queue (m)	-	-	-	-			-	-		-		-
Intersection Delay (s)						100.9	**Intersection LOS**					F

Note: 95th queue lengths could not be calculated for this intersection due to limitations in the HCM methodology. However, based on other service measures it is expected that actual queue lengths will not reach the adjacent neighbourhood street intersections.

5.7.4 Element Drive / Neighbourhood C

The Element Drive / Neighbourhood C intersection is assumed to be all-way stop controlled with the following geometry:

- Eastbound: two through lanes (one exclusive lane, one shared left-thru bay), one right turn bay channelized
- Westbound: two through lanes (one shared left-thru lane, one shared thru-right bay)
- Northbound: one shared thru-right lane, one left turn bay
- Southbound: two through lanes (one shared left-thru lane, one shared thru-right lane)

As shown in **Table 36** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 36 – Element Drive / Neighbourhood C Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Element Drive			Element Drive			Neighbourhood C			Neighbourhood C		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - AWSC												
Geometry	LT/T/R			LT/TR			L/TR			LT/TR		
Volume	70	158	218	0	156	44	257	191	0	46	171	90
v/c	0.24	0.2	0.19	0.15		0.23	0.49		0.33	0.25		0.3
Delay (s)	11.3	10.4	5.8	10		10.5	14.9		11.3	10.7		10.6
LOS	A	A	A	B		B	B		B	B		B
95th Queue (m)	-	-	-	-		-	-		-	-		-
Intersection Delay (s)						10.7	**Intersection LOS**					B
PM Peak - AWSC												
Geometry	LT/T			LT/TR			L/TR			LT/TR		
Volume	9	250	330	0	259	74	294	222	0	70	242	90
v/c	0.41	0.37	0.29	0.29		0.43	0.65		0.46	0.42		0.43
Delay (s)	15.6	14.2	6.3	12.9		15.3	23.6		15.6	15.3		14.8
LOS	C	B	A	B		C	C		C	C		B
95th Queue (m)	-	-	-	-		-	-		-	-		-
Intersection Delay (s)						14.8	**Intersection LOS**					B

Note: 95th queue lengths could not be calculated for this intersection due to limitations in the HCM methodology. However, based on other service measures it is expected that actual queue lengths will not reach the adjacent neighbourhood street intersections.

5.7.5 Element Drive / Neighbourhood D

The Element Drive / Neighbourhood D intersection is assumed to be stop-controlled on the northbound and southbound approaches with the following geometry:

- Eastbound: one shared left-thru-right lane
- Westbound: one shared left-thru-right lane
- Northbound: one shared left-thru-right lane
- Southbound: one shared left-thru-right lane

As shown in **Table 37** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 37 – Element Drive / Neighbourhood D Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Element Drive			Element Drive			Neighbourhood D			Neighbourhood D		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - TWSC (N/S)												
Geometry	LTR			LTR			LTR			LTR		
Volume	23	0	0	0	0	44	0	226	0	46	108	22
v/c	0.02			0			0.32			0.26		
Delay (s)	7.3			0			11.7			11.5		
LOS	A			A			B			B		
95th Queue (m)	0.4			0			10.8			8.2		
Intersection Delay (s)						10.3	**Intersection LOS**					B
PM Peak - TWSC (N/S)												
Geometry	LTR			LTR			LTR			LTR		
Volume	36	0	0	0	0	74	0	234	0	70	330	36
v/c	0.03			0			0.36			0.67		
Delay (s)	7.4			0			12.8			19.5		
LOS	A			A			B			C		
95th Queue (m)	0.6			0			12.9			40.8		
Intersection Delay (s)						15.1	**Intersection LOS**					C

5.7.6 Neighbourhood C / Neighbourhood D

The Neighbourhood C / Neighbourhood D intersection is assumed to be stop-controlled on the eastbound and westbound approaches with the following geometry:

- Eastbound: one shared left-thru-right lane
- Westbound: one shared left-thru-right lane
- Northbound: one shared left-thru-right lane
- Southbound: one shared left-thru-right lane

As shown in **Table 38** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 38 – Neighbourhood C / Neighbourhood D Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neighbourhood D			Neighbourhood D			Neighbourhood C			Neighbourhood C		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - TWSC (E/W)												
Geometry	LTR			LTR			LTR			LTR		
Volume	43	171	0	0	219	38	0	0	0	22	0	55
v/c	0.9			0.32			0			0.01		
Delay (s)	11.8			11.4			0			2.1		
LOS	B			B			A			A		
95th Queue (m)	9.6			10.9			0			0.3		
Intersection Delay (s)						10.3	**Intersection LOS**					B
PM Peak - TWSC (E/W)												
Geometry	LTR			LTR			LTR			LTR		
Volume	59	234	0	0	211	38	0	0	0	48	0	53
v/c	0.43			0.33			0			0.03		
Delay (s)	14.3			12			0			3.6		
LOS	B			B			A			A		
95th Queue (m)	17.4			11.4			0			0.7		
Intersection Delay (s)						11.7	**Intersection LOS**					B

5.7.7 Neighbourhood D / Neighbourhood E

The Neighbourhood D / Neighbourhood E intersection is assumed to be all-way stop controlled with the following geometry:

- Eastbound: one shared thru-right lane
- Westbound: one shared left-thru lane
- Northbound: one left-turn lane, one right turn bay
- Southbound: none

As shown in **Table 39** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 39 – Neighbourhood D / Neighbourhood E Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neighbourhood D			Neighbourhood D			Neighbourhood E			-		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - AWSC												
Geometry	TR			LT			L/R					
Volume		0	317	202	0		307		246			
v/c		0.45		0.34			0.55		0.36			
Delay (s)		12.1		12			15.8		9.9			
LOS		B		B			C		A			
95th Queue (m)		-		-			-		-			
Intersection Delay (s)						12.7	**Intersection LOS**					B
PM Peak - AWSC												
Geometry	TR			LT			L/R					
Volume		0	382	390	0		397		342			
v/c		0.64		0.72			0.81		0.58			
Delay (s)		18.8		25.3			33.7		16.1			
LOS		C		D			D		C			
95th Queue (m)		-		-			-		-			
Intersection Delay (s)						23.8	**Intersection LOS**					C

5.7.8 Neighbourhood E / Neighbourhood G

The Neighbourhood E / Neighbourhood G intersection is assumed to be stop-controlled on the eastbound and westbound approaches with the following geometry:

- Eastbound: one shared left-thru-right lane
- Westbound: one shared left-thru-right lane
- Northbound: one shared left-thru-right lane
- Southbound: one shared left-thru-right lane

As shown in **Table 40** below, the intersection is expected operate well within both the AM and PM peak hours.

Table 40 – Neighbourhood E / Neighbourhood G Intersection Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neighbourhood G			Neighbourhood G			Neighbourhood E			Neighbourhood E		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak - TWSC (E/W)												
Geometry	LTR			LTR			LTR			LTR		
Volume	0	94	94	0	131	15	131	15	0	10	10	0
v/c	0.26			0.25			0.08			0.01		
Delay (s)	11.6			13.2			6.7			3.7		
LOS	B			B			A			A		
95th Queue (m)	8.2			7.9			2.1			0.2		
Intersection Delay (s)						10.3	**Intersection LOS**					B
PM Peak - TWSC (E/W)												
Geometry	LTR			LTR			LTR			LTR		
Volume	0	142	142	0	114	13	114	13	0	16	16	0
v/c	0.38			0.21			0.07			0.01		
Delay (s)	12.8			12.6			6.7			3.7		
LOS	B			B			A			A		
95th Queue (m)	14.4			6.4			1.8			0.2		
Intersection Delay (s)						10.9	**Intersection LOS**					B

5.8 Roundabout Alternatives

Two Crosstown / Neighbourhood intersections along Neil Ross Road were evaluated as roundabouts as an alternative to signalization. The analysis assumptions and results are discussed in the sections below.

5.8.1 Neil Ross Road / Neighbourhood E

The Neil Ross Road / Neighbourhood E roundabout is assumed to have two circulating lanes with the following geometry:

- Eastbound: two approach lanes (one shared left-thru, one shared thru-right)
- Westbound: two approach lanes (one shared left-thru, one shared thru-right)
- Northbound: two approach lanes (one shared left-thru, one right)
- Southbound: two approach lanes (one shared left-thru-right, one right)

As shown in **Table 41** below, the roundabout would function well in the AM peak hour but exceed capacity in the PM peak hour. Poor performance is primarily due to the high volumes on Neil Ross Road

Table 41 – Neil Ross Road / Neighbourhood E Roundabout Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neil Ross Road			Neil Ross Road			Neighbourhood E			Neighbourhood E		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak												
Geometry	LT/TR			LT/TR			LT/R			LTR/R		
Volume	267	801	60	132	826	354	70	5	202	374	5	309
v/c	0.82	0.82	0.82	0.80	0.80	0.80	0.32	0.32	0.58	0.81	0.81	0.76
Delay (s)	17.4	13.1	14.0	12.3	8.2	9.2	16.4	12.3	13.6	19.9	15.8	16.1
LOS	B	B	B	B	A	A	B	B	B	B	B	B
95th Queue (m)	91.1	91.9	91.9	87.3	87.3	87.3	11.7	11.7	11.7	60.6	60.6	49.2
Intersection Delay (s)						12.9	**Intersection LOS**					B
PM Peak												
Geometry	LT/TR			LT/TR			LT/R			LTR/R		
Volume	463	1165	84	212	1483	478	78	5	160	487	0	415
v/c	1.28	1.28	1.28	1.48	1.48	1.48	0.38	0.38	0.54	1.3	1.3	1.3
Delay (s)	144.4	140.1	141.0	227.0	222.8	223.8	18.6	14.4	15.4	158.0	153.9	157.1
LOS	F	F	F	F	F	F	B	B	B	F	F	F
95th Queue (m)	635.1	651.0	651.0	1075.9	1089.2	1089.2	1.9	1.9	3.4	388.1	388.1	388.1
Intersection Delay (s)						173.8	**Intersection LOS**					F

5.8.2 Neil Ross Road / Element Drive / Coal Mine Road

The Neil Ross Road / Element Drive / Coal Mine Road roundabout is assumed to have two circulating lanes with the following geometry:

- Eastbound: two approach lanes (one shared left-thru, one shared thru-right)
- Westbound: two approach lanes (one shared left-thru, one shared thru-right)
- Northbound: one shared left-thru-right approach lane, one right turn approach lane
- Southbound one shared left-thru approach lane, one right turn bay

As shown in **Table 42** below, the roundabout would exceed capacity in both the AM and PM peak hours, primarily due to the high volumes on Neil Ross Road

Table 42 – Neil Ross Road / Element Drive / Coal Mine Road Roundabout Analysis Summary

	Eastbound			Westbound			Northbound			Southbound		
Road Name	Neil Ross Road			Neil Ross Road			Coal Mine Road			Element Drive		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak												
Geometry	LT/TR			LT/TR			LTR/R			LT/R		
Volume	124	1026	228	359	1036	151	204	5	590	129	5	72
v/c	1.00	1.00	1.00	0.91	0.91	0.91	1.19	1.19	1.19	0.45	0.45	0.45
Delay (s)	40.5	36.2	37.1	17.4	13.2	14.3	113.3	109.1	108.2	15.7	11.6	13.4
LOS	F	F	F	D	D	D	F	F	F	B	B	B
95th Queue (m)	222.0	224.7	224.7	145.8	145.8	145.8	231.5	231.5	265.6	20.6	20.6	13.2
Intersection Delay (s)						41.5	**Intersection LOS**					D
PM Peak												
Geometry	LT/TR			LT/TR			LTR/R			LT/R		
Volume	160	1303	350	556	1725	142	147	5	597	56	5	301
v/c	1.3	1.3	1.3	1.36	1.36	1.36	1.0	1.0	1.0	0.46	0.46	1.25
Delay (s)	151.2	147.0	147.9	172.8	168.7	167.7	50.5	46.3	45.4	26.9	22.8	147.2
LOS	F	F	F	F	F	F	F	F	F	C	C	F
95th Queue (m)	698.8	709.7	709.7	1032.8	11032.8	1032.8	114.9	114.9	126.7	16.6	16.6	234.2
Intersection Delay (s)						142.0	**Intersection LOS**					F

5.9 Daily Service Volumes

Daily volumes for the roadway network were developed using the same methodology as in the peak hour analyses. Estimates of daily volumes can be used to confirm road classification consistent with the City's Complete Streets Guidelines, as shown in **Table 43**. Where applicable, a range of values have been provided for each road to represent the variation in daily volumes across different segments.

Table 43 – Daily Service Volumes

Complete Streets Classification	Daily Service Volumes (Two-way)
Boulevards (Expressway)	
St. Albert Trail	15,000 – 35,000
127 Street	14,300 – 26,500
Crosstown (Divided Arterial)	
Neil Ross Road	8,500 – 31,900
Bellerose Drive	4,500 – 10,500
Connector Roadway (Minor Arterial)	
Coal Mine Road	9,100 – 18,100
Neighbourhood (Collector)	
Element Drive	650 – 15,600
Ernest Boulevard	400
Neighbourhood A	4,000 – 5,600
Neighbourhood B	18,000 – 25,000
Neighbourhood C	1,500 – 12,400
Neighbourhood D	3,600 – 6,400
Neighbourhood E	400 – 11,400
Neighbourhood F	3,800 – 4,700
Neighbourhood G	1,900 – 3,700
Local Employment	
Local A	1,900
Local B	1,500

As the City's Complete Streets Guidelines does not prescribe daily service volume thresholds, the TAC Geometric Design Guide was used as a reference to confirm road classifications. Equivalent TAC road classifications were derived using Table 5.1 of the City's Complete Streets Guidelines. For St. Albert Trail and 127th Street, which are Boulevard streets, daily volumes may accumulate to more than 35,000. This is in line with TAC expressway standards. For the Crosstown Streets, daily volumes of just over 31,000 may be expected, which just exceeds the TAC thresholds for Divided Arterials. Coal Mine Road is expected to accumulate volumes over 18,000 and meets the TAC threshold for a Minor Arterial. Neighbourhood Streets generally have daily volumes under 8,000, which is consistent with equivalent TAC collector road classifications. Segments of Element Drive, Neighbourhood C, and Neighbourhood E which have daily volumes exceeding 8,000 but are less than approximately 12,000, are consistent with the thresholds for collector commercial roads. Neighbourhood B, providing access to the mixed use employment node, employment policy area and neighbourhood policy area has volumes ranging from 18,000-25,000. Due the high daily volumes, it's classification and use as a neighbourhood street may need to be reconsidered or alternative access points in the area may need to be proposed. The two Local Employment streets have daily volumes that are under 2,000, well below the 3,000 threshold for the TAC equivalent industrial/commercial local roads.

6. Other Considerations

The preceding analysis is based on several factors which could influence the future operation of the roadway network, including:

- **Transit and Active Transportation** – the development generated volumes reflected in the analysis assumes no reduction due to transit, walking and cycling mode splits. This represents a conservative estimate of operations and reflects current travel patterns in St. Albert where there is relatively low transit and active transportation usage, particularly in fringe suburban communities where long travel distance make such trips less convenient. However, the provision of improved transit and active transportation has the potential to decrease single occupancy vehicle trips and influence trip distribution and traffic patterns.
- **Re-routing of Traffic to 127 Street and Ray Gibbons Drive** – volumes from the City's Travel Demand Model used in the analysis assumes that a significant portion of the background traffic along St. Albert Trail will re-route to 127 Street and Ray Gibbon Drives by 2045. As such, the validity of analysis may be impacted if the extensions of 127 Street and Ray Gibbons Drive to St. Albert Trail is not implemented by 2045.
- **Build-out of Emerging Communities** – volumes from the City's Travel Demand Model used in the analysis assumes that the emerging communities of Erin Ridge North, Jensen Lakes and Badger Lands would not be fully built-out by 2045. As development timelines evolve, additional analysis may be needed to determine traffic impacts from these communities on the adjacent road network.
- **Refinement of Land Uses** – the City's new processes for Area Structure Plans intentionally create less defined land uses to provide more flexibility in subsequent stage of land use planning. The process groups development into "policy areas", without defining exact locations of differing land uses or land use intensities. Land use assumptions, including intensity of employment policy area development, utilized in this TIA were developed based on input form the City of St Albert on aspirational development intensity. Further refinement of land uses will occur during the Neighbourhood Structure Plan planning phase, and is expected to impact the traffic assumptions and associated intersection operations.

7. Conclusions and Recommendations

7.1 Summary

The St. Albert Northeast (Dauphinais) Area Structure Plan Transportation Impact Assessment was prepared to examine network impacts of the proposed development on the adjacent arterial roadway network, including at connection points into the neighbourhood, as well as operations within the internal roadway network. The analysis included generation of anticipated vehicle trip estimates, assignment of trips to the network, and analysis to determine the required intersections treatment and confirm roadway classifications.

The assumed full build-out transportation network used in the analysis was based on the latest available draft of the Dauphinais Area Structure Plan. Full development of the plan area will require coordination between the City of St. Albert and Alberta Transportation, given that St. Albert Trail transitions into Highway 2 within the plan area. Similarly, coordination would be needed between the City of St. Albert and Sturgeon County to ensure that Township Road 544, currently under the jurisdiction of the County, could be incorporated into the City as 127 Street.

The analysis assumes that the emerging communities of Erin Ridge North to the south and Jensen Lakes and Badger Lands to the southwest would be not fully built-out at the analysis timeframe.

7.2 Key Findings

At full build-out, the Dauphinais plan area is anticipated to generate a net of 11,408 two way trips in the AM peak, 15,294 two way trips in the PM peak, and 113,376 daily trips on a typical weekday.

The overall roadway network is generally anticipated to operate within acceptable levels, with two notable exceptions – the intersections at St. Albert Trail / 127 Street and at St. Albert Trail / Neil Ross Road / Fowler Way. At this time, the analysis suggests that these intersections may not be able to accommodate the desired development densities within the employment policy areas, particularly when combined with the function of 127 Street as a defacto east bypass of the City of St. Albert and the prominence of St. Albert Trail as a north-south commuter corridor through the City.

These two intersections should be analyzed in more detail once land use assumptions are confirmed at the Neighbourhood Structure Plan level as the analysis completed as part of this TIA makes high level blanket assumptions regarding the employment policy area land uses. As these land uses are clarified through the refinement of the land use planning process, it is possible that the intersection operations will trend within acceptable limits.

Furthermore, congestion at these intersection could mitigated somewhat through additional motivation for mode shift (such as enhanced transit service and the provision of active modes facilities), particularly as the traffic analysis does not currently contemplate any trip reductions due to transit or active modes.

7.3 Recommendations

The full build-out of the Dauphinais plan area in 2045 is assumed to coincide with the implementation of LRT service along St. Albert Trail. A six lane divided cross section for St. Albert Trail from south of Neil Ross Road to the city limits would generally be adequate to support traffic growth and is consistent with long-term corridor plans, though some congestion, particularly for left turning traffic, is expected.

Additionally, both 127 Street and Neil Ross Road should be extended through the plan area with a four lane divided cross section. Signalization would be required at accesses to the Neighbourhood roads along St. Albert Trail, 127 Street and Neil Ross Road. This would be accompanied by the provision of additional through and turning lanes to existing intersections such St. Albert Trail / Neil Ross Road.

Roundabouts were also considered as an alternative to signalization for the intersection of Neil Ross Road / Neighbourhood E and Neil Ross Road / Element Drive / Eastview Street. For both intersections, roundabouts are anticipated to operate well with relatively low delays and queues. However, the feasibility of implementing roundabouts should consider accommodation for heavy vehicles, pedestrians and cyclists. This is particularly relevant for the intersection of Neil Ross Road / Neighbourhood E, which would be situated near a K-9 school where children walking to and from school may constitute a significant portion of pedestrians.

The internal intersections between Neighbourhood streets are anticipated to operate well with stop control and would not require signalization. Based on their expected daily service volumes, a two lane cross section optimized for either residential or commercial/industrial usage would be appropriate for the Neighbourhood streets. The required intersection geometry and controls for the full build-out horizon are summarized in **Appendix D**.

As development plans and timelines evolve for Dauphinais and the adjacent communities of Erin Ridge North, Jensen Lakes and Badger Lands, additional traffic analysis may be needed to reflect updated trip generation, trip distribution and traffic patterns. Furthermore, effective community traffic calming measures should be implemented to discourage shortcutting through Dauphinais and allow the internal neighbourhood roadways to maintain reasonable daily service volumes.

A

Appendix A
Land Use Figures and Statistics

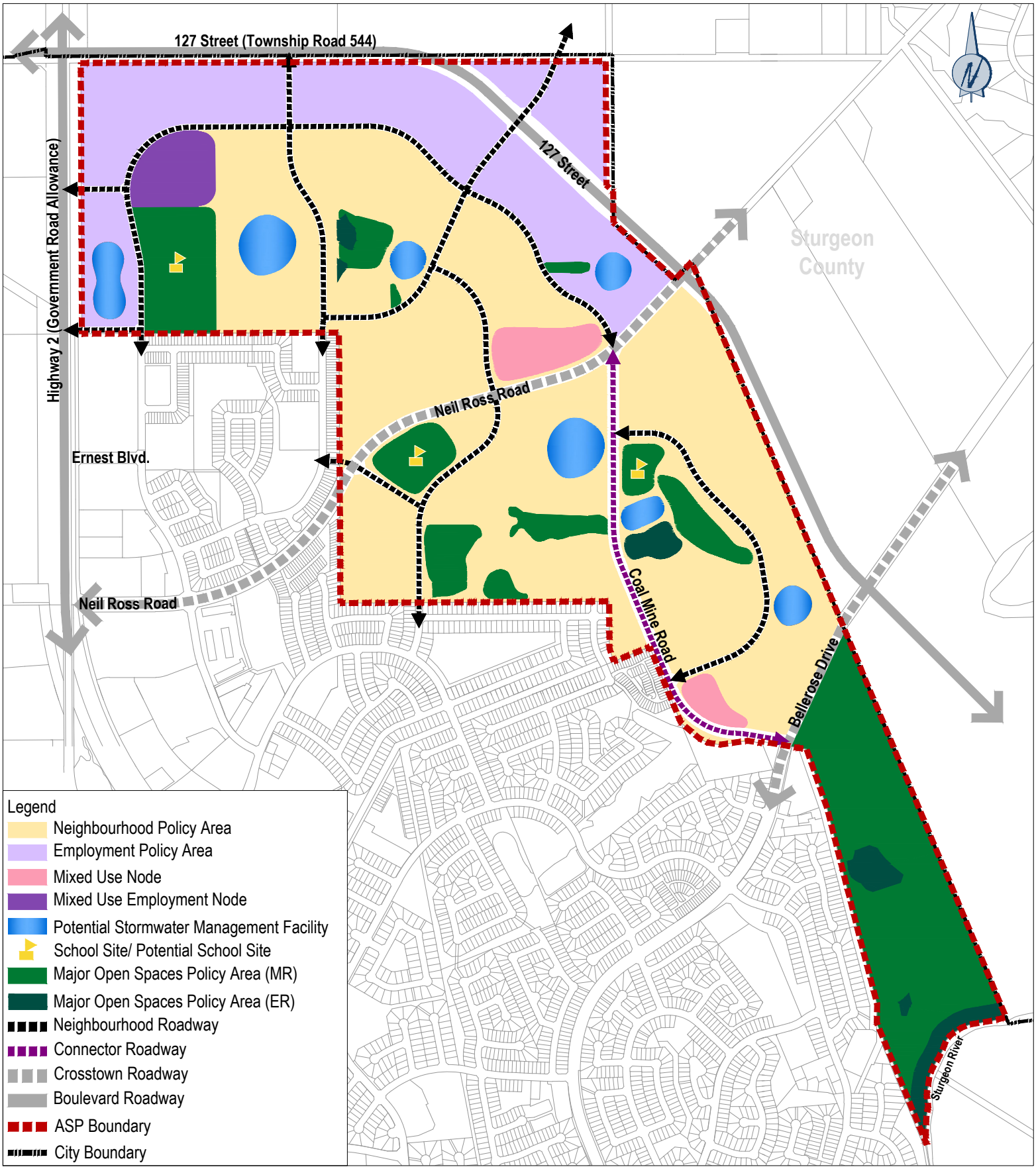


Figure 6
Land Use Concept

Landrex Hunter Ridge Inc.

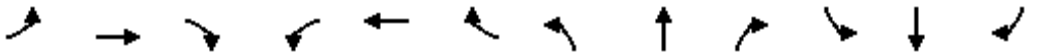
October 2023

Invistec

NE St. Albert Area Structure Plan

B

Appendix B
Detailed Synchro and Sidra Analysis Reports – Full Build Out

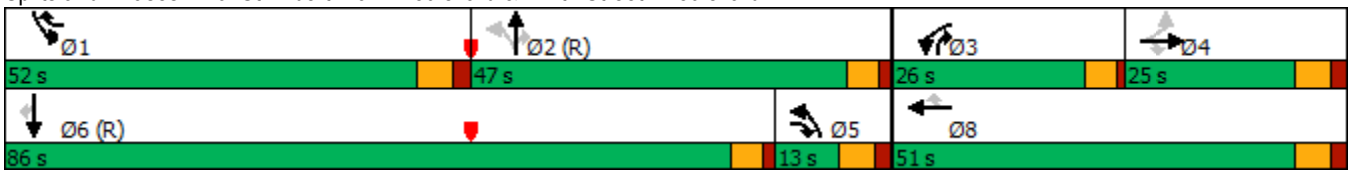


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	11	2	0	17	612	7	545	1	245	491	1
Future Volume (vph)	1	226	79	254	236	1264	72	743	468	879	722	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	100.0		100.0	100.0		100.0
Storage Lanes	1		1	2		2	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	3471	3579	2818	1789	5142	1601	3471	5142	1601
Flt Permitted	0.605			0.950			0.366			0.950		
Satd. Flow (perm)	1139	3579	1601	3471	3579	2818	689	5142	1601	3471	5142	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			58			65			98
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		398.2			618.6			397.2			258.7	
Travel Time (s)		23.9			37.1			23.8			15.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	226	79	254	236	1264	72	743	468	879	722	1
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	Perm
Protected Phases		4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4			8	2		2			6
Detector Phase	4	4	5	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	12.0	12.0	7.0	5.0	12.0	7.0	7.0	15.0	5.0	7.0	15.0	15.0
Minimum Split (s)	25.0	25.0	13.0	9.5	25.0	13.0	13.0	46.0	9.5	13.0	46.0	46.0
Total Split (s)	25.0	25.0	13.0	26.0	51.0	52.0	13.0	47.0	26.0	52.0	86.0	86.0
Total Split (%)	16.7%	16.7%	8.7%	17.3%	34.0%	34.7%	8.7%	31.3%	17.3%	34.7%	57.3%	57.3%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	4.0	3.5	3.5	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.5	1.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.5	6.0	6.0	6.0	5.0	4.5	6.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	22.0	16.6	36.1	88.3	49.7	50.7	72.3	46.2	89.9	89.9
Actuated g/C Ratio	0.10	0.10	0.15	0.11	0.24	0.59	0.33	0.34	0.48	0.31	0.60	0.60
v/c Ratio	0.01	0.63	0.25	0.66	0.27	0.75	0.26	0.43	0.58	0.82	0.23	0.00
Control Delay	59.0	72.8	6.6	72.2	46.1	24.2	44.7	40.8	28.2	55.3	14.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	72.8	6.6	72.2	46.1	24.2	44.7	40.8	28.2	55.3	14.9	0.0
LOS	E	E	A	E	D	C	D	D	C	E	B	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		55.7			34.1			36.4			37.0	
Approach LOS		E			C			D			D	
Queue Length 50th (m)	0.3	36.4	0.0	40.1	32.0	147.0	16.1	67.5	92.8	128.1	36.5	0.0
Queue Length 95th (m)	2.3	50.1	8.9	53.6	41.4	156.5	31.0	86.6	133.6	158.2	51.4	0.0
Internal Link Dist (m)		374.2			594.6			373.2			234.7	
Turn Bay Length (m)	100.0		100.0	100.0		100.0	100.0		100.0	100.0		100.0
Base Capacity (vph)	144	453	312	497	1073	1711	279	1737	855	1104	3081	998
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.50	0.25	0.51	0.22	0.74	0.26	0.43	0.55	0.80	0.23	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 37.0		Intersection LOS: D	
Intersection Capacity Utilization 58.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: St. Albert Trail - Boulevard & 127th Street - Boulevard



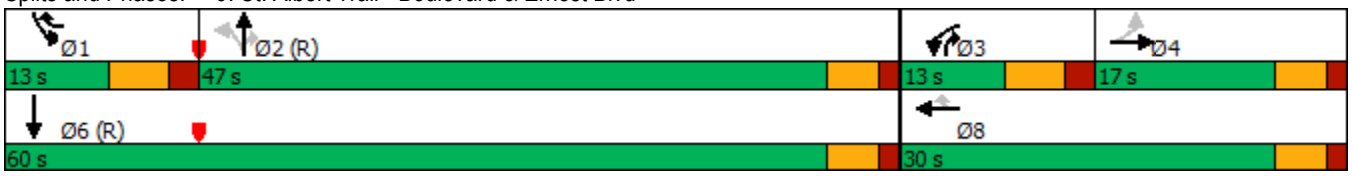
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	126	0	25	1	528	105	42	451	0
Future Volume (vph)	0	0	0	126	0	25	1	2326	105	42	1842	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	60.0		60.0	100.0		100.0	100.0		100.0
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1883	0	1700	1700	1601	1789	5142	1601	1789	5142	0
Flt Permitted				0.950	0.950		0.106			0.950		
Satd. Flow (perm)	0	1883	0	1700	1700	1601	200	5142	1601	1789	5142	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						24			105			
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		161.0			207.3			452.8			356.5	
Travel Time (s)		14.5			18.7			27.2			21.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	63	63	25	1	2326	105	42	1842	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Prot	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	
Protected Phases		4		3	8	1		2	3	1	6	
Permitted Phases	4					8	2		2			
Detector Phase	4	4		3	8	1	2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	7.0	15.0	15.0	7.0	7.0	15.0	
Minimum Split (s)	17.0	17.0		13.0	17.0	13.0	23.0	23.0	13.0	13.0	20.0	
Total Split (s)	17.0	17.0		13.0	30.0	13.0	47.0	47.0	13.0	13.0	60.0	
Total Split (%)	18.9%	18.9%		14.4%	33.3%	14.4%	52.2%	52.2%	14.4%	14.4%	66.7%	
Yellow Time (s)	3.5	3.5		4.0	3.5	4.0	3.5	3.5	4.0	4.0	3.5	
All-Red Time (s)	1.5	1.5		2.0	1.5	2.0	1.5	1.5	2.0	2.0	1.5	
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0		6.0	5.0	6.0	5.0	5.0	6.0	6.0	5.0	
Lead/Lag	Lag	Lag		Lead		Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None		None	None	None	C-Max	C-Max	None	None	C-Max	
Act Effct Green (s)				20.6	20.0	31.0	54.2	54.2	78.6	7.0	62.0	
Actuated g/C Ratio				0.23	0.22	0.34	0.60	0.60	0.87	0.08	0.69	
v/c Ratio				0.16	0.17	0.04	0.01	0.75	0.07	0.30	0.52	
Control Delay				26.5	25.8	7.0	13.0	20.6	0.6	41.0	9.5	
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay				26.5	25.8	7.0	13.0	20.6	0.6	41.0	9.5	
LOS				C	C	A	B	C	A	D	A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					23.0			19.7			10.2	
Approach LOS					C			B			B	
Queue Length 50th (m)				9.1	9.0	0.1	0.1	145.3	0.0	7.5	67.5	
Queue Length 95th (m)				19.8	19.5	4.8	1.0	#188.4	2.6	18.0	75.6	
Internal Link Dist (m)		137.0			183.3			428.8			332.5	
Turn Bay Length (m)				60.0		60.0	100.0		100.0	100.0		
Base Capacity (vph)				389	378	567	120	3096	1411	139	3542	
Starvation Cap Reductn				0	0	0	0	0	0	0	0	
Spillback Cap Reductn				0	0	0	0	0	0	0	0	
Storage Cap Reductn				0	0	0	0	0	0	0	0	
Reduced v/c Ratio				0.16	0.17	0.04	0.01	0.75	0.07	0.30	0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 15.8		Intersection LOS: B	
Intersection Capacity Utilization 47.5%		ICU Level of Service A	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: St. Albert Trail - Boulevard & Ernest Blvd



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	553	0	0	493
Future Volume (vph)	242	16	2077	274	25	1642
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0	0.0		100.0	100.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Satd. Flow (prot)	1789	1601	3579	1601	0	*10000
Flt Permitted	0.950					
Satd. Flow (perm)	1789	1601	3579	1601	0	*10000
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		1	*10000			
Link Speed (k/h)	40		60			60
Link Distance (m)	104.4		356.5			201.3
Travel Time (s)	9.4		21.4			12.1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	242	16	2077	274	0	1667
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Turn Type	Prot	Perm	NA	pm+ov		NA
Protected Phases	8		2	8		6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	8	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	11.4	11.4	0.0	45.0		24.6
Actuated g/C Ratio	0.25	0.25	0.00	1.00		0.55
v/c Ratio	0.53	0.04	0.21	0.17		0.31
Control Delay	18.1	10.5	0.0	0.1		6.3
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	18.1	10.5	0.0	0.1		6.3
LOS	B	B	A	A		A

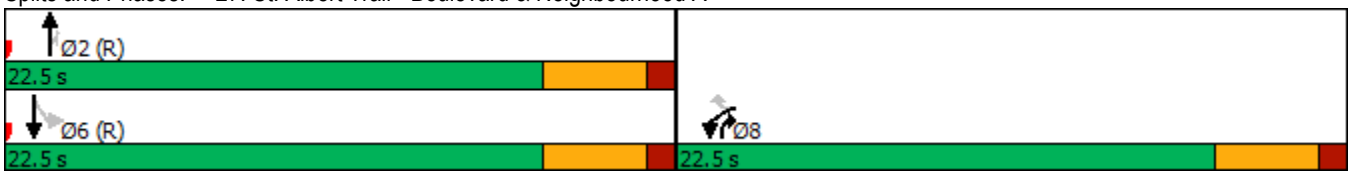
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Approach Delay	17.6					6.3
Approach LOS	B					A
Queue Length 50th (m)	17.3	0.9	0.0	0.0		33.4
Queue Length 95th (m)	28.1	3.5	0.0	m0.0		57.8
Internal Link Dist (m)	80.4		332.5			177.3
Turn Bay Length (m)	60.0			100.0		
Base Capacity (vph)	715	641	10000	1581		5457
Starvation Cap Reductn	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0		0
Storage Cap Reductn	0	0	0	0		0
Reduced v/c Ratio	0.34	0.02	0.21	0.17		0.31

Intersection Summary			
Area Type:	Other		
Cycle Length: 45			
Actuated Cycle Length: 45			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 3.5		Intersection LOS: A	
Intersection Capacity Utilization 19.0%		ICU Level of Service A	
Analysis Period (min) 15			

* User Entered Value

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 27: St. Albert Trail - Boulevard & Neighbourhood A

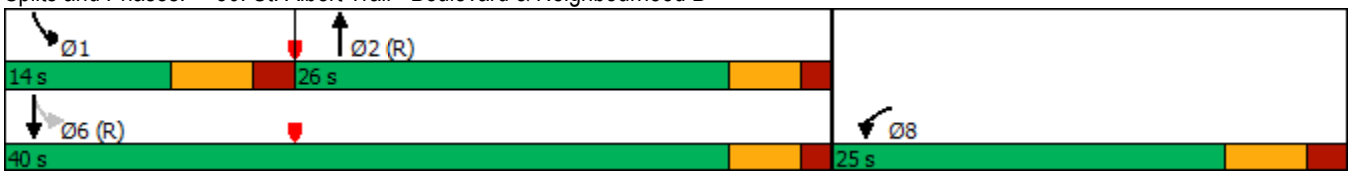


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	553	0	0	493
Future Volume (vph)	886	203	1080	968	274	781
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0	0.0		100.0	100.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				7.5	
Satd. Flow (prot)	3471	1601	3579	1601	1789	3579
Flt Permitted	0.950				0.147	
Satd. Flow (perm)	3471	1601	3579	1601	277	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		203	*10000	814		
Link Speed (k/h)	40		60			60
Link Distance (m)	69.2		219.6			397.2
Travel Time (s)	6.2		13.2			23.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	886	203	1080	968	274	781
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Turn Type	Prot	Free	NA	Free	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		Free	6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	12.0		15.0		7.0	15.0
Minimum Split (s)	18.0		25.0		13.0	20.0
Total Split (s)	25.0		26.0		14.0	40.0
Total Split (%)	38.5%		40.0%		21.5%	61.5%
Yellow Time (s)	4.0		3.5		4.0	3.5
All-Red Time (s)	2.0		1.5		2.0	1.5
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	6.0		5.0		6.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		C-Max		None	C-Max
Act Effct Green (s)	18.6	65.0	0.0	65.0	34.4	35.4
Actuated g/C Ratio	0.29	1.00	0.00	1.00	0.53	0.54
v/c Ratio	0.89	0.13	0.11	0.60	0.82	0.40
Control Delay	35.3	0.2	0.0	1.7	33.7	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	0.2	0.0	1.7	33.7	9.5
LOS	D	A	A	A	C	A

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Approach Delay	28.8		0.8			15.8
Approach LOS	C		A			B
Queue Length 50th (m)	54.5	0.0	0.0	0.0	18.0	28.1
Queue Length 95th (m)	#86.3	0.0	0.0	0.0	#56.4	39.6
Internal Link Dist (m)	45.2		195.6			373.2
Turn Bay Length (m)	30.0			100.0	100.0	
Base Capacity (vph)	1014	1601	10000	1601	336	1947
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.13	0.11	0.60	0.82	0.40

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 19.5%		ICU Level of Service A	
Analysis Period (min) 15			
* User Entered Value			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 30: St. Albert Trail - Boulevard & Neighbourhood B



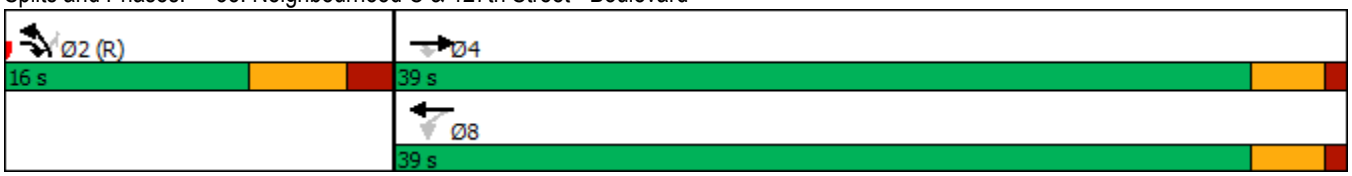
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	256	0	0	628	0	0
Future Volume (vph)	1090	482	154	1368	385	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		100.0	100.0		0.0	0.0
Storage Lanes		1	1		2	1
Taper Length (m)			7.5		7.5	
Satd. Flow (prot)	3579	1601	1789	3579	3471	1601
Flt Permitted			0.222		0.950	
Satd. Flow (perm)	3579	1601	418	3579	3471	1601
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						113
Link Speed (k/h)	60			60	40	
Link Distance (m)	618.6			437.0	66.3	
Travel Time (s)	37.1			26.2	6.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1090	482	154	1368	385	128
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.0			6.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		15	25		25	15
Turn Type	NA	pm+ov	Perm	NA	Prot	Perm
Protected Phases	4	2		8	2	
Permitted Phases		4	8			2
Minimum Split (s)	22.0	13.0	16.0	16.0	13.0	13.0
Total Split (s)	39.0	16.0	39.0	39.0	16.0	16.0
Total Split (%)	70.9%	29.1%	70.9%	70.9%	29.1%	29.1%
Yellow Time (s)	3.0	4.0	3.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.0	1.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)	35.0	55.0	35.0	35.0	10.0	10.0
Actuated g/C Ratio	0.64	1.00	0.64	0.64	0.18	0.18
v/c Ratio	0.48	0.30	0.58	0.60	0.61	0.33
Control Delay	6.1	0.5	17.5	7.3	25.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	0.5	17.5	7.3	25.4	8.8
LOS	A	A	B	A	C	A
Approach Delay	4.4			8.3	21.3	
Approach LOS	A			A	C	
Queue Length 50th (m)	25.6	0.0	7.6	36.2	19.3	1.3
Queue Length 95th (m)	36.6	0.0	#35.0	51.5	31.1	13.1

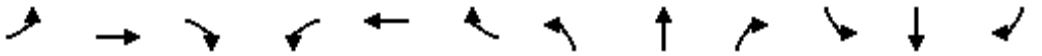
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (m)	594.6			413.0	42.3	
Turn Bay Length (m)		100.0	100.0			
Base Capacity (vph)	2277	1601	266	2277	631	383
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.30	0.58	0.60	0.61	0.33

Intersection Summary			
Area Type:	Other		
Cycle Length: 55			
Actuated Cycle Length: 55			
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 8.4		Intersection LOS: A	
Intersection Capacity Utilization 20.7%		ICU Level of Service A	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 35: Neighbourhood C & 127th Street - Boulevard



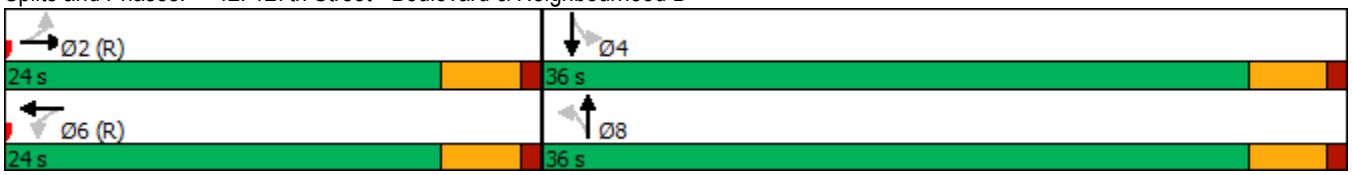


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	628	0	0	256	0
Future Volume (vph)	144	0	47	35	0	8	52	1302	92	23	812	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		100.0	0.0		100.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1756	0	0	1765	0	0	3536	0	0	3503	0
Flt Permitted		0.964			0.961			0.998			0.999	
Satd. Flow (perm)	0	1756	0	0	1765	0	0	3536	0	0	3503	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			27			17			44	
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		150.6			177.1			323.8			409.7	
Travel Time (s)		13.6			15.9			19.4			24.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	0	0	43	0	0	1446	0	0	967	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			6.0			6.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type		NA			NA			NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	24.0	24.0		24.0	24.0		36.0	36.0		36.0	36.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		19.5			19.5			31.5			31.5	
Actuated g/C Ratio		0.32			0.32			0.52			0.52	
v/c Ratio		0.32			0.07			0.78			0.52	
Control Delay		14.7			8.6			14.9			14.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.7			8.6			14.9			14.6	
LOS		B			A			B			B	
Approach Delay		14.7			8.6			14.9			14.6	
Approach LOS		B			A			B			B	
Queue Length 50th (m)		13.7			1.2			63.4			39.2	
Queue Length 95th (m)		27.9			7.0			88.7			58.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (m)		126.6			153.1			299.8			385.7	
Turn Bay Length (m)												
Base Capacity (vph)		590			591			1864			1859	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.32			0.07			0.78			0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.7		Intersection LOS: B	
Intersection Capacity Utilization 21.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 42: 127th Street - Boulevard & Neighbourhood D

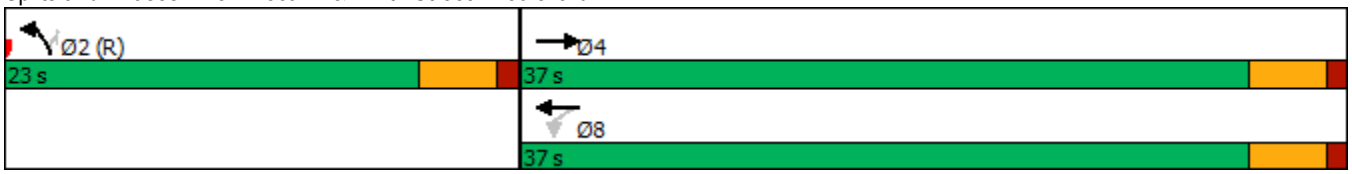


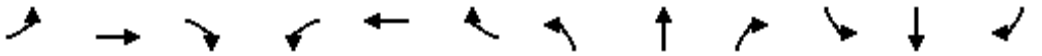
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	256	0	0	628	0	0
Future Volume (vph)	956	262	29	1425	97	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3464	0	0	3575	1789	1601
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	3464	0	0	3575	1789	1601
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	90					11
Link Speed (k/h)	60			60	40	
Link Distance (m)	437.0			409.7	56.0	
Travel Time (s)	26.2			24.6	5.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1218	0	0	1454	97	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.0			6.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	37.0		37.0	37.0	23.0	23.0
Total Split (%)	61.7%		61.7%	61.7%	38.3%	38.3%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)	32.5			32.5	18.5	18.5
Actuated g/C Ratio	0.54			0.54	0.31	0.31
v/c Ratio	0.64			0.75	0.18	0.02
Control Delay	10.7			19.4	16.3	8.5
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.7			19.4	16.3	8.5
LOS	B			B	B	A
Approach Delay	10.7			19.4	15.5	
Approach LOS	B			B	B	
Queue Length 50th (m)	42.8			74.0	8.1	0.0
Queue Length 95th (m)	61.2			96.8	17.8	3.0
Internal Link Dist (m)	413.0			385.7	32.0	
Turn Bay Length (m)						
Base Capacity (vph)	1917			1936	551	501

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.64			0.75	0.18	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 21.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 57: Local A & 127th Street - Boulevard



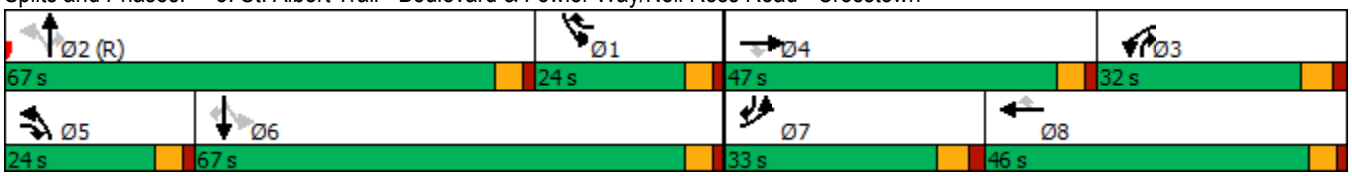


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	536	641	47	481	539	66	70	1829	472	87	1443	439
Future Volume (vph)	536	641	47	481	539	66	70	1829	472	87	1443	439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		0.0	100.0		100.0	100.0		100.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			35.0		
Satd. Flow (prot)	3471	3579	1601	3471	3579	1601	1789	5142	1601	1789	5142	1601
Flt Permitted	0.950			0.950			0.093			0.093		
Satd. Flow (perm)	3471	3579	1601	3471	3579	1601	175	5142	1601	175	5142	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			83			187			234
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		387.7			377.0			898.7			452.8	
Travel Time (s)		23.3			22.6			53.9			27.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	536	641	47	481	539	66	70	1829	472	87	1443	439
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8	2		2	6		6
Total Split (s)	33.0	47.0	24.0	32.0	46.0	24.0	24.0	67.0	32.0	24.0	67.0	33.0
Total Lost Time (s)	6.0	5.0	5.0	6.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	6.0
Act Effct Green (s)	27.0	36.0	59.5	27.5	36.6	55.6	66.4	66.4	99.0	62.0	62.0	94.0
Actuated g/C Ratio	0.16	0.21	0.35	0.16	0.22	0.33	0.39	0.39	0.58	0.36	0.36	0.55
v/c Ratio	0.97	0.85	0.08	0.86	0.70	0.11	0.24	0.91	0.47	0.36	0.77	0.44
Control Delay	102.1	75.1	0.6	84.2	66.4	2.5	36.8	56.9	13.7	61.8	51.1	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.1	75.1	0.6	84.2	66.4	2.5	36.8	56.9	13.7	61.8	51.1	11.1
LOS	F	E	A	F	E	A	D	E	B	E	D	B
Approach Delay		84.0			70.4			47.7			42.6	
Approach LOS		F			E			D			D	
Queue Length 50th (m)	99.4	116.4	0.0	85.2	91.9	0.0	16.4	233.8	55.3	20.7	166.6	39.8
Queue Length 95th (m)	#138.6	135.4	0.9	#120.4	113.0	4.7	29.2	#270.4	90.7	35.0	185.6	66.6
Internal Link Dist (m)		363.7			353.0			874.7			428.8	
Turn Bay Length (m)	100.0		100.0	100.0			100.0		100.0	100.0		100.0
Base Capacity (vph)	551	884	614	570	863	579	291	2009	1003	244	1875	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.73	0.08	0.84	0.62	0.11	0.24	0.91	0.47	0.36	0.77	0.44

Intersection Summary		
Area Type:	Other	
Cycle Length: 170		
Actuated Cycle Length: 170		
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.97		
Intersection Signal Delay: 56.6	Intersection LOS: E	
Intersection Capacity Utilization 96.8%	ICU Level of Service F	
Analysis Period (min) 15		

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: St. Albert Trail - Boulevard & Fowler Way/Neil Ross Road - Crosstown

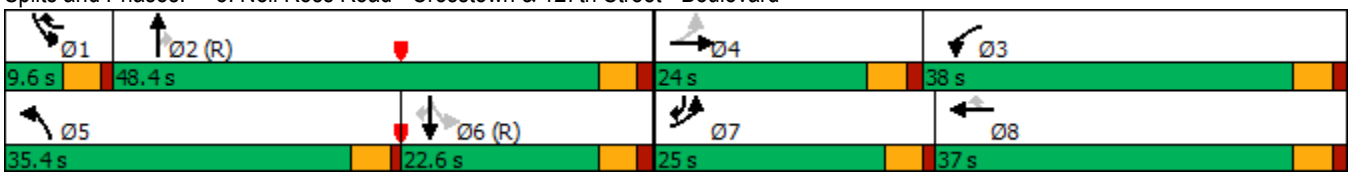


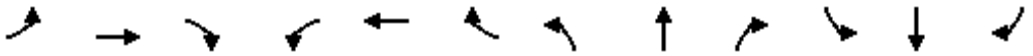
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	237	295	360	851	683	77	648	345	874	36	310	307
Future Volume (vph)	237	295	360	851	683	77	648	345	874	36	310	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	100.0		110.0	100.0		100.0
Storage Lanes	1		1	2		1	2		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	3471	3579	1601	3471	3579	1601	1789	3579	1601
Flt Permitted	0.000			0.950			0.950			0.545		
Satd. Flow (perm)	0	3579	1601	3471	3579	1601	3471	3579	1601	1026	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			360			105			723			100
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		329.3			1111.4			265.2			385.4	
Travel Time (s)		19.8			66.7			15.9			23.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	237	295	360	851	683	77	648	345	874	36	310	307
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.0			6.0			6.7			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Free	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases	4		Free			8			2	6		6
Total Split (s)	25.0	24.0		38.0	37.0	9.6	35.4	48.4	48.4	9.6	22.6	25.0
Total Lost Time (s)	4.5	5.0		5.0	5.0	4.5	4.5	5.0	5.0	4.5	5.0	4.5
Act Effct Green (s)	20.5	19.0	120.0	33.0	32.0	42.1	30.9	43.4	43.4	23.2	17.6	43.1
Actuated g/C Ratio	0.17	0.16	1.00	0.28	0.27	0.35	0.26	0.36	0.36	0.19	0.15	0.36
v/c Ratio	0.78	0.52	0.22	0.89	0.72	0.12	0.73	0.27	0.84	0.16	0.59	0.48
Control Delay	66.9	50.8	0.3	54.6	44.8	2.7	46.2	27.8	14.8	24.5	53.0	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	50.8	0.3	54.6	44.8	2.7	46.2	27.8	14.8	24.5	53.0	22.4
LOS	E	D	A	D	D	A	D	C	B	C	D	C
Approach Delay		34.7			48.0			28.1			37.1	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	58.9	34.8	0.0	104.6	80.9	0.0	75.8	31.5	31.0	5.0	38.2	38.8
Queue Length 95th (m)	#96.7	49.1	0.0	#139.7	103.0	5.7	97.3	43.6	105.7	11.4	53.9	66.3
Internal Link Dist (m)		305.3			1087.4			241.2			361.4	
Turn Bay Length (m)	100.0		100.0	100.0		100.0	100.0		110.0	100.0		100.0
Base Capacity (vph)	305	566	1601	954	954	629	893	1294	1040	230	524	639
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.52	0.22	0.89	0.72	0.12	0.73	0.27	0.84	0.16	0.59	0.48

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 93.9 (78%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.89		
Intersection Signal Delay: 36.8	Intersection LOS: D	
Intersection Capacity Utilization 80.4%	ICU Level of Service D	
Analysis Period (min) 15		

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Neil Ross Road - Crosstown & 127th Street - Boulevard

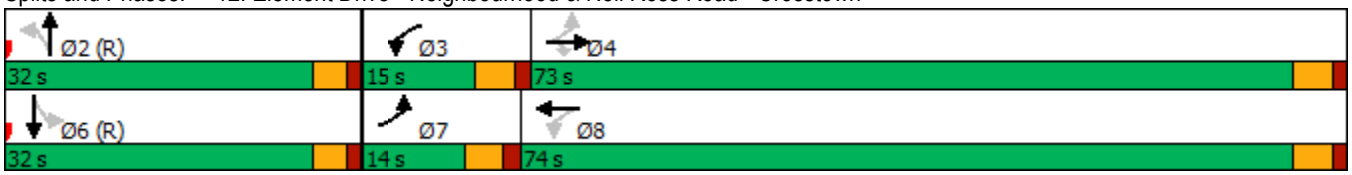




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1113	34	57	183	5	100	82	55	5	8	50
Future Volume (vph)	2	1113	34	57	183	5	100	82	55	5	8	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		100.0	60.0		100.0	0.0		80.0	0.0		0.0
Storage Lanes	1		1	1		1	1		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	1789	5121	0	1789	1770	0	0	1675	0
Flt Permitted	0.628			0.178			0.734				0.982	
Satd. Flow (perm)	1183	3579	1601	335	5121	0	1382	1770	0	0	1652	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			59		5			26			50	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		377.0			660.6			209.7			495.4	
Travel Time (s)		22.6			39.6			18.9			44.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	1113	34	57	188	0	100	137	0	0	63	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.0			5.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	14.0	73.0	73.0	15.0	74.0		32.0	32.0		32.0	32.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		4.5	4.5			4.5	
Act Effct Green (s)	77.0	68.0	68.0	79.0	69.0		27.5	27.5			27.5	
Actuated g/C Ratio	0.64	0.57	0.57	0.66	0.58		0.23	0.23			0.23	
v/c Ratio	0.00	0.55	0.04	0.17	0.06		0.32	0.32			0.15	
Control Delay	6.0	17.6	1.1	6.0	7.6		41.8	33.4			14.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	6.0	17.6	1.1	6.0	7.6		41.8	33.4			14.6	
LOS	A	B	A	A	A		D	C			B	
Approach Delay		17.1			7.3			36.9			14.6	
Approach LOS		B			A			D			B	
Queue Length 50th (m)	0.2	86.8	0.0	2.7	3.9		20.7	22.8			2.5	
Queue Length 95th (m)	1.0	106.3	2.0	m5.6	6.4		37.5	41.7			14.5	
Internal Link Dist (m)		353.0			636.6			185.7			471.4	
Turn Bay Length (m)	90.0		100.0	60.0								
Base Capacity (vph)	804	2028	932	341	2946		316	425			417	
Starvation Cap Reductn	0	0	0	0	0		0	0			0	
Spillback Cap Reductn	0	0	0	0	0		0	0			0	
Storage Cap Reductn	0	0	0	0	0		0	0			0	
Reduced v/c Ratio	0.00	0.55	0.04	0.17	0.06		0.32	0.32			0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 12: Element Drive - Neighbourhood & Neil Ross Road - Crosstown

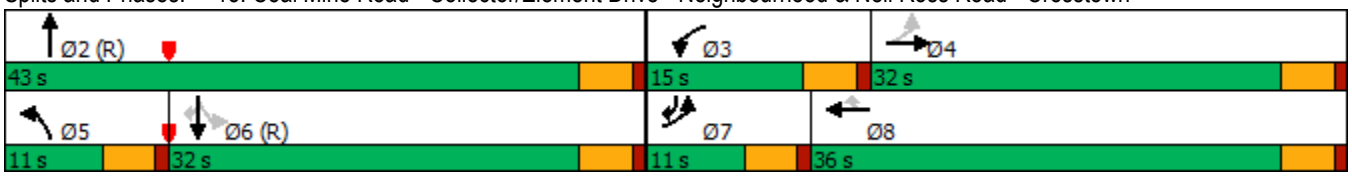


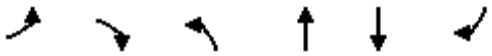
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	1026	228	359	1036	151	204	5	590	129	5	72
Future Volume (vph)	124	1026	228	359	1036	151	204	5	590	129	5	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	100.0		0.0	50.0		50.0
Storage Lanes	1		1	2		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	3471	3579	1601	3471	1603	0	1789	1883	1601
Flt Permitted	0.145			0.950			0.950			0.281		
Satd. Flow (perm)	273	3579	1601	3471	3579	1601	3471	1603	0	529	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			228			151		217				73
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		363.3			265.2			151.4			134.8	
Travel Time (s)		21.8			15.9			13.6			12.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	1026	228	359	1036	151	204	595	0	129	5	72
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.7			6.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8		5	2			6	7
Permitted Phases	4		Free			8				6		6
Total Split (s)	11.0	32.0		15.0	36.0	36.0	11.0	43.0		32.0	32.0	11.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Act Effct Green (s)	34.0	27.5	90.0	10.5	31.5	31.5	6.5	38.5		27.5	27.5	38.5
Actuated g/C Ratio	0.38	0.31	1.00	0.12	0.35	0.35	0.07	0.43		0.31	0.31	0.43
v/c Ratio	0.58	0.94	0.14	0.89	0.83	0.23	0.82	0.74		0.80	0.01	0.10
Control Delay	26.4	47.4	0.2	64.6	33.7	4.6	67.1	19.6		65.4	22.0	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	26.4	47.4	0.2	64.6	33.7	4.6	67.1	19.6		65.4	22.0	4.3
LOS	C	D	A	E	C	A	E	B		E	C	A
Approach Delay		37.7			38.0			31.8			43.0	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	12.3	95.1	0.0	33.7	89.5	0.0	19.2	56.3		21.4	0.6	0.0
Queue Length 95th (m)	#23.9	#136.1	0.0	#58.6	115.6	12.5	#37.9	100.2		#54.0	3.2	7.5
Internal Link Dist (m)		339.3			241.2			127.4			110.8	
Turn Bay Length (m)	100.0		100.0	100.0		100.0	100.0			50.0		50.0
Base Capacity (vph)	212	1093	1601	404	1252	658	250	809		161	575	726
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.58	0.94	0.14	0.89	0.83	0.23	0.82	0.74		0.80	0.01	0.10

Intersection Summary		
Area Type:	Other	
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.94		
Intersection Signal Delay: 36.9	Intersection LOS: D	
Intersection Capacity Utilization 97.5%	ICU Level of Service F	
Analysis Period (min) 15		

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Coal Mine Road - Collector/Element Drive - Neighbourhood & Neil Ross Road - Crosstown

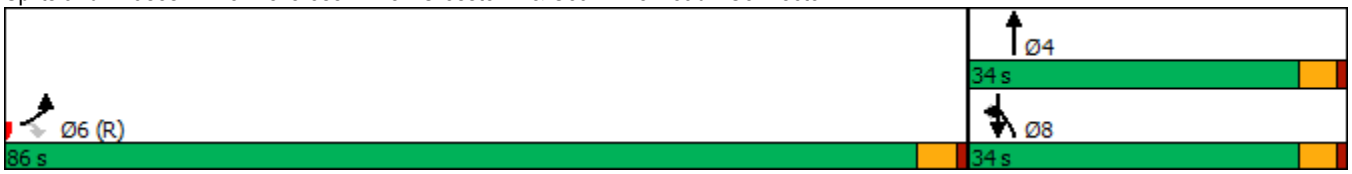




Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	800	369	207	737	554	168
Future Volume (vph)	800	369	207	737	554	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	100.0			100.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		7.5			
Satd. Flow (prot)	1789	1601	1789	3579	3579	1601
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1789	1601	1789	3579	3579	1601
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		53				168
Link Speed (k/h)	40			60	60	
Link Distance (m)	209.1			555.8	485.7	
Travel Time (s)	18.8			33.3	29.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	800	369	207	737	554	168
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	6		8!	4	8!	
Permitted Phases		6				8
Total Split (s)	86.0	86.0	34.0	34.0	34.0	34.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effct Green (s)	81.5	81.5	29.5	29.5	29.5	29.5
Actuated g/C Ratio	0.68	0.68	0.25	0.25	0.25	0.25
v/c Ratio	0.66	0.33	0.47	0.84	0.63	0.32
Control Delay	14.5	7.6	42.8	52.8	44.1	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	7.6	42.8	52.8	44.1	7.1
LOS	B	A	D	D	D	A
Approach Delay	12.3			50.6	35.5	
Approach LOS	B			D	D	
Queue Length 50th (m)	104.6	28.7	44.0	91.7	64.7	0.0
Queue Length 95th (m)	146.4	44.2	68.5	#116.8	84.3	17.7
Internal Link Dist (m)	185.1			531.8	461.7	
Turn Bay Length (m)			100.0			100.0
Base Capacity (vph)	1215	1104	439	879	879	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.33	0.47	0.84	0.63	0.32

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2: and 6:EBL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.84		
Intersection Signal Delay: 31.0		Intersection LOS: C
Intersection Capacity Utilization 82.4%		ICU Level of Service E
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
! Phase conflict between lane groups.		

Splits and Phases: 18: Bellerose Drive - Crosstown & Coal Mine Road - Connector

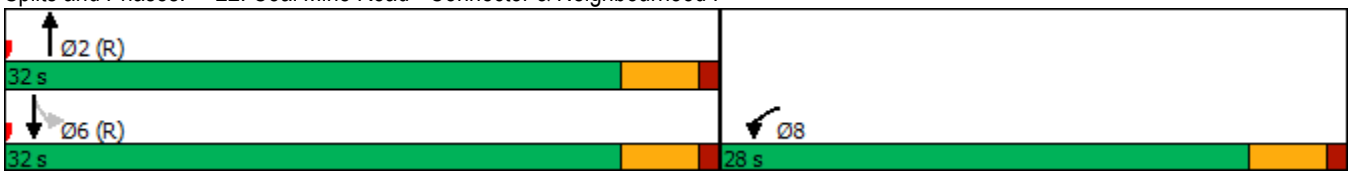


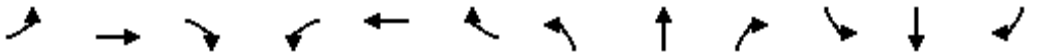
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	288	5	501	212	5	660
Future Volume (vph)	288	5	501	212	5	660
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1791	0	3418	0	0	3579
Flt Permitted	0.953					0.951
Satd. Flow (perm)	1791	0	3418	0	0	3403
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	2		144			
Link Speed (k/h)	40		40			40
Link Distance (m)	490.6		231.8			437.1
Travel Time (s)	44.2		20.9			39.3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	293	0	713	0	0	665
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Total Split (s)	28.0		32.0		32.0	32.0
Total Lost Time (s)	4.5		4.5			4.5
Act Effct Green (s)	23.5		27.5			27.5
Actuated g/C Ratio	0.39		0.46			0.46
v/c Ratio	0.42		0.43			0.43
Control Delay	15.5		9.3			12.0
Queue Delay	0.0		0.0			0.0
Total Delay	15.5		9.3			12.0
LOS	B		A			B
Approach Delay	15.5		9.3			12.0
Approach LOS	B		A			B
Queue Length 50th (m)	23.6		20.8			25.6
Queue Length 95th (m)	41.7		27.8			37.6
Internal Link Dist (m)	466.6		207.8			413.1
Turn Bay Length (m)						
Base Capacity (vph)	702		1644			1559
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.42		0.43			0.43

Intersection Summary	
Area Type:	Other

Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 45.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 22: Coal Mine Road - Connector & Neighbourhood F



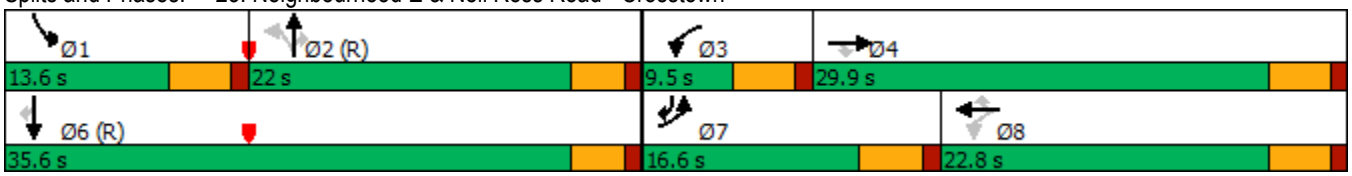


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	801	60	132	826	354	70	5	202	374	5	309
Future Volume (vph)	267	801	60	132	826	354	70	5	202	374	5	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	0.0		0.0	0.0		60.0
Storage Lanes	1		1	1		1	0		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	1789	3579	1601	0	1799	1601	3471	1883	1601
Flt Permitted	0.950			0.281				0.767		0.950		
Satd. Flow (perm)	1789	3579	1601	529	3579	1601	0	1445	1601	3471	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			354			218			22
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		519.5			363.3			159.0			235.9	
Travel Time (s)		31.2			21.8			14.3			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	801	60	132	826	354	0	75	202	374	5	309
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4		3	8			2		1	6	7
Permitted Phases			4	8		8	2		2			6
Total Split (s)	16.6	29.9	29.9	9.5	22.8	22.8	22.0	22.0	22.0	13.6	35.6	16.6
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.0	4.0	4.5	4.0	4.5
Act Effct Green (s)	12.1	25.4	25.4	23.3	18.3	18.3		18.0	18.0	9.1	31.6	47.7
Actuated g/C Ratio	0.16	0.34	0.34	0.31	0.24	0.24		0.24	0.24	0.12	0.42	0.64
v/c Ratio	0.93	0.66	0.09	0.53	0.95	0.54		0.22	0.37	0.89	0.01	0.30
Control Delay	71.5	24.3	0.3	21.9	49.5	6.3		24.9	5.2	57.8	12.6	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	71.5	24.3	0.3	21.9	49.5	6.3		24.9	5.2	57.8	12.6	6.6
LOS	E	C	A	C	D	A		C	A	E	B	A
Approach Delay		34.2			35.1			10.6			34.5	
Approach LOS		C			D			B			C	
Queue Length 50th (m)	39.7	52.6	0.0	10.8	63.7	0.0		9.0	0.0	28.7	0.4	16.6
Queue Length 95th (m)	#83.3	72.0	0.0	20.7	#100.1	19.6		20.0	13.4	#52.8	2.3	28.5
Internal Link Dist (m)		495.5			339.3			135.0			211.9	
Turn Bay Length (m)	100.0		100.0	100.0		100.0						60.0
Base Capacity (vph)	288	1212	638	248	873	658		346	549	421	793	1026
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.93	0.66	0.09	0.53	0.95	0.54		0.22	0.37	0.89	0.01	0.30

Intersection Summary		
Area Type:	Other	
Cycle Length: 75		
Actuated Cycle Length: 75		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.95		
Intersection Signal Delay: 32.7	Intersection LOS: C	
Intersection Capacity Utilization 65.8%	ICU Level of Service C	
Analysis Period (min) 15		

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

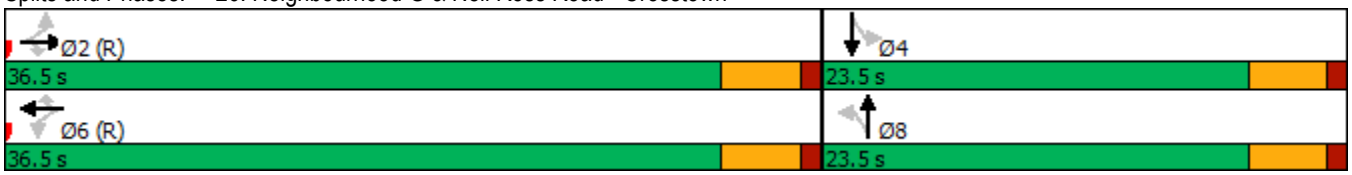
Splits and Phases: 23: Neighbourhood E & Neil Ross Road - Crosstown



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	1070	98	90	1012	133	131	5	131	58	5	50
Future Volume (vph)	120	1070	98	90	1012	133	131	5	131	58	5	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		100.0	0.0		100.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	1789	3579	1601	1789	1612	0	1789	1627	0
Flt Permitted	0.219			0.198			0.721			0.670		
Satd. Flow (perm)	412	3579	1601	373	3579	1601	1358	1612	0	1262	1627	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			133		75			50	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		660.6			519.5			262.5			64.9	
Travel Time (s)		39.6			31.2			23.6			5.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	1070	98	90	1012	133	131	136	0	58	55	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.7			6.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Total Split (s)	36.5	36.5	36.5	36.5	36.5	36.5	23.5	23.5		23.5	23.5	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	32.0	32.0	32.0	32.0	32.0	32.0	19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53	0.53	0.32	0.32		0.32	0.32	
v/c Ratio	0.55	0.56	0.11	0.45	0.53	0.15	0.30	0.24		0.15	0.10	
Control Delay	30.7	18.4	6.0	18.0	10.4	2.0	18.0	9.1		15.9	6.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	30.7	18.4	6.0	18.0	10.4	2.0	18.0	9.1		15.9	6.3	
LOS	C	B	A	B	B	A	B	A		B	A	
Approach Delay		18.6			10.0			13.5			11.2	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	20.7	98.3	5.6	5.8	36.4	0.0	11.3	4.9		4.7	0.4	
Queue Length 95th (m)	43.8	125.5	17.7	19.0	50.9	6.3	23.8	16.0		12.3	6.9	
Internal Link Dist (m)		636.6			495.5			238.5			40.9	
Turn Bay Length (m)			100.0			100.0						
Base Capacity (vph)	219	1908	899	198	1908	915	430	561		399	549	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.55	0.56	0.11	0.45	0.53	0.15	0.30	0.24		0.15	0.10	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 74.6%		ICU Level of Service D	
Analysis Period (min) 15			

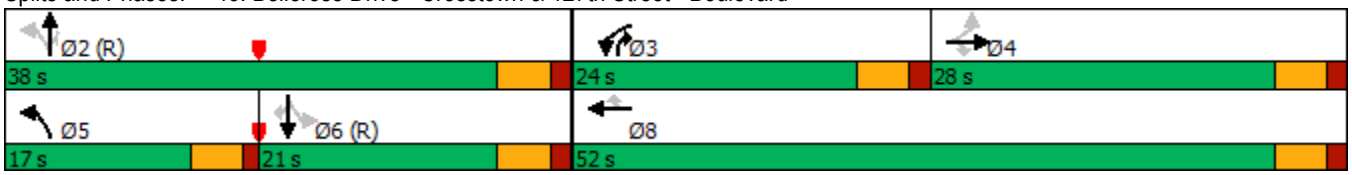
Splits and Phases: 26: Neighbourhood G & Neil Ross Road - Crosstown

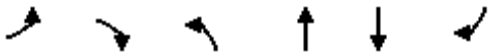


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	401	92	346	1414	146	188	366	1074	61	334	10
Future Volume (vph)	0	401	92	346	1414	146	188	366	1074	61	334	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	100.0		110.0	60.0		0.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1883	3579	1601	3471	3579	1601	1789	1883	2818	1789	3428	1457
Flt Permitted				0.950			0.332			0.543		
Satd. Flow (perm)	1883	3579	1601	3471	3579	1601	625	1883	2818	1023	3428	1457
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139			146			242			139
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1111.4			202.4			485.7			172.6	
Travel Time (s)		66.7			12.1			29.1			10.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												10%
Lane Group Flow (vph)	0	401	92	346	1414	146	188	366	1074	61	335	9
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.0			6.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Prot	NA	Perm	pm+pt	NA	pm+ov	Perm	NA	Perm
Protected Phases		4		3	8		5	2	3		6	
Permitted Phases	4		4			8	2		2	6		6
Total Split (s)	28.0	28.0	28.0	24.0	52.0	52.0	17.0	38.0	24.0	21.0	21.0	21.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)		23.0	23.0	19.0	47.0	47.0	33.5	33.0	57.0	16.0	16.0	16.0
Actuated g/C Ratio		0.26	0.26	0.21	0.52	0.52	0.37	0.37	0.63	0.18	0.18	0.18
v/c Ratio		0.44	0.18	0.47	0.76	0.16	0.48	0.53	0.57	0.34	0.55	0.02
Control Delay		29.9	2.5	33.6	20.3	2.4	24.3	25.9	8.4	38.4	37.6	0.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		29.9	2.5	33.6	20.3	2.4	24.3	25.9	8.4	38.4	37.6	0.1
LOS		C	A	C	C	A	C	C	A	D	D	A
Approach Delay		24.8			21.3			14.2			36.9	
Approach LOS		C			C			B			D	
Queue Length 50th (m)		32.2	0.0	28.6	101.3	0.0	23.6	51.5	43.0	9.8	30.8	0.0
Queue Length 95th (m)		46.1	4.7	42.0	128.9	8.7	40.1	79.1	60.9	22.1	45.6	0.0
Internal Link Dist (m)		1087.4			178.4			461.7			148.6	
Turn Bay Length (m)			100.0	100.0		100.0	100.0		110.0	60.0		
Base Capacity (vph)		914	512	732	1869	905	394	690	1873	181	609	373
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.44	0.18	0.47	0.76	0.16	0.48	0.53	0.57	0.34	0.55	0.02

Intersection Summary		
Area Type:	Other	
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.76		
Intersection Signal Delay: 20.5		Intersection LOS: C
Intersection Capacity Utilization 95.0%		ICU Level of Service F
Analysis Period (min) 15		

Splits and Phases: 43: Bellerose Drive - Crosstown & 127th Street - Boulevard

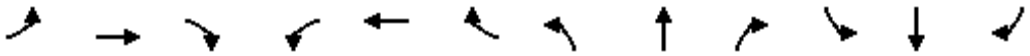




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	8	84	0	0	0
Future Volume (Veh/h)	0	8	84	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	8	84	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	168	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	95			
cM capacity (veh/h)	780	1085	1623			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	8	84	0
Volume Left	0	84	0
Volume Right	8	0	0
cSH	1085	1623	1700
Volume to Capacity	0.01	0.05	0.00
Queue Length 95th (m)	0.2	1.3	0.0
Control Delay (s)	8.3	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	8.3	7.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	70	158	218	0	156	44	257	191	0	46	171	90
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	158	218	0	156	44	257	191	0	46	171	90

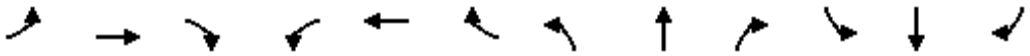
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	123	105	218	78	122	257	191	132	176
Volume Left (vph)	70	0	0	0	0	257	0	46	0
Volume Right (vph)	0	0	218	0	44	0	0	0	90
Hadj (s)	0.32	0.03	-0.67	0.03	-0.22	0.53	0.03	0.21	-0.32
Departure Headway (s)	7.2	6.9	3.2	7.0	6.7	6.8	6.3	6.7	6.2
Degree Utilization, x	0.24	0.20	0.19	0.15	0.23	0.49	0.33	0.25	0.30
Capacity (veh/h)	471	490	1121	483	501	504	548	509	554
Control Delay (s)	11.3	10.4	5.8	10.0	10.5	14.9	11.3	10.7	10.6
Approach Delay (s)	8.4			10.3		13.3		10.6	
Approach LOS	A			B		B		B	

Intersection Summary				
Delay	10.7			
Level of Service	B			
Intersection Capacity Utilization	0.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	317	202	0	307	246
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	317	202	0	307	246

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	317	202	307	246
Volume Left (vph)	0	202	307	0
Volume Right (vph)	317	0	0	246
Hadj (s)	-0.57	0.23	0.53	-0.67
Departure Headway (s)	5.1	6.0	6.4	5.2
Degree Utilization, x	0.45	0.34	0.55	0.36
Capacity (veh/h)	677	567	535	663
Control Delay (s)	12.1	12.0	15.8	9.9
Approach Delay (s)	12.1	12.0	13.2	
Approach LOS	B	B	B	

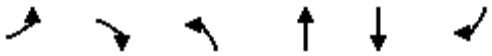
Intersection Summary			
Delay	12.7		
Level of Service	B		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	689	197	71	0	151	17	51	26	0	22	33	656
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	689	197	71	0	151	17	51	26	0	22	33	656

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	689	197	71	168	51	26	55	656
Volume Left (vph)	689	0	0	0	51	0	22	0
Volume Right (vph)	0	0	71	17	0	0	0	656
Hadj (s)	0.53	0.03	-0.67	-0.03	0.53	0.03	0.11	-0.57
Departure Headway (s)	5.7	5.2	3.2	5.8	7.5	7.0	7.0	3.2
Degree Utilization, x	1.09	0.28	0.06	0.27	0.11	0.05	0.11	0.58
Capacity (veh/h)	634	682	1121	604	462	493	493	1118
Control Delay (s)	85.3	9.1	5.2	11.0	10.2	9.2	10.8	10.6
Approach Delay (s)	63.6			11.0	9.9		10.6	
Approach LOS	F			B	A		B	

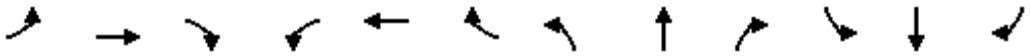
Intersection Summary				
Delay	37.1			
Level of Service	E			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	228	0	0	0	0	192
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	228	0	0	0	0	192
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96	96	192			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	96	192			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	100	100			
cM capacity (veh/h)	903	960	1381			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	228	0	192
Volume Left	228	0	0
Volume Right	0	0	192
cSH	903	1700	1700
Volume to Capacity	0.25	0.00	0.11
Queue Length 95th (m)	8.0	0.0	0.0
Control Delay (s)	10.3	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.3	0.0	0.0
Approach LOS	B		

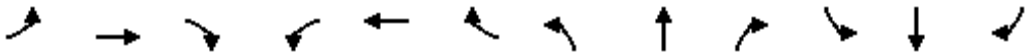
Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	23	0	0	0	0	44	0	226	0	46	108	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	0	0	0	0	48	0	246	0	50	117	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	48			0			156	98	0	197	74	24
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48			0			156	98	0	197	74	24
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	68	100	91	85	98
cM capacity (veh/h)	1559			1623			695	779	1085	569	803	1052

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	25	48	246	191
Volume Left	25	0	0	50
Volume Right	0	48	0	24
cSH	1559	1623	779	745
Volume to Capacity	0.02	0.00	0.32	0.26
Queue Length 95th (m)	0.4	0.0	10.8	8.2
Control Delay (s)	7.3	0.0	11.7	11.5
Lane LOS	A		B	B
Approach Delay (s)	7.3	0.0	11.7	11.5
Approach LOS			B	B

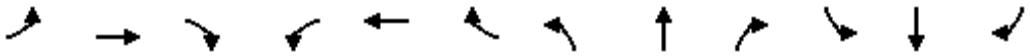
Intersection Summary				
Average Delay	10.3			
Intersection Capacity Utilization	0.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	43	171	0	0	219	38	0	0	0	22	0	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	43	171	0	0	219	38	0	0	0	22	0	55
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	219	72	28	157	99	0	55			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	219	72	28	157	99	0	55			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	79	100	100	72	96	100			99		
cM capacity (veh/h)	552	808	1048	671	780	1085	1550			1623		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	214	257	0	77
Volume Left	43	0	0	22
Volume Right	0	38	0	55
cSH	739	814	1700	1623
Volume to Capacity	0.29	0.32	0.00	0.01
Queue Length 95th (m)	9.6	10.9	0.0	0.3
Control Delay (s)	11.8	11.4	0.0	2.1
Lane LOS	B	B		A
Approach Delay (s)	11.8	11.4	0.0	2.1
Approach LOS	B	B		

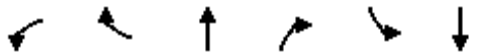
Intersection Summary				
Average Delay	10.3			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	94	94	0	131	15	131	15	0	10	10	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	94	94	0	131	15	131	15	0	10	10	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	388	307	10	448	307	15	10			15		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	388	307	10	448	307	15	10			15		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	83	91	100	76	99	92			99		
cM capacity (veh/h)	431	554	1071	387	554	1065	1610			1603		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	188	146	146	20
Volume Left	0	0	131	10
Volume Right	94	15	0	0
cSH	730	583	1610	1603
Volume to Capacity	0.26	0.25	0.08	0.01
Queue Length 95th (m)	8.2	7.9	2.1	0.2
Control Delay (s)	11.6	13.2	6.7	3.7
Lane LOS	B	B	A	A
Approach Delay (s)	11.6	13.2	6.7	3.7
Approach LOS	B	B		

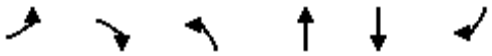
Intersection Summary				
Average Delay	10.3			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	553	0	0	493
Future Volume (Veh/h)	0	18	2030	63	0	1667
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	18	2030	63	0	1667
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			201			219
pX, platoon unblocked	0.53	0.47			0.47	
vC, conflicting volume	2864	1015			2093	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1745	0			1080	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	41	512			303	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	1015	1015	63	834	834
Volume Left	0	0	0	0	0	0
Volume Right	18	0	0	63	0	0
cSH	512	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.60	0.60	0.04	0.49	0.49
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	12.3	0.0			0.0	
Approach LOS	B					

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	18.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	628	256	0
Future Volume (Veh/h)	18	69	187	1428	848	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	75	203	1552	922	50
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				329	324	
pX, platoon unblocked	0.88	0.89	0.89			
vC, conflicting volume	2129	486	972			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1454	174	720			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	90	74			
cM capacity (veh/h)	79	747	780			

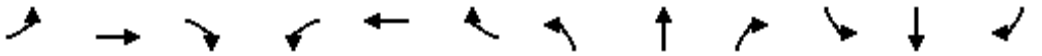
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	20	75	720	1035	615	357
Volume Left	20	0	203	0	0	0
Volume Right	0	75	0	0	0	50
cSH	79	747	780	1700	1700	1700
Volume to Capacity	0.25	0.10	0.26	0.61	0.36	0.21
Queue Length 95th (m)	7.2	2.7	8.3	0.0	0.0	0.0
Control Delay (s)	65.1	10.4	6.2	0.0	0.0	0.0
Lane LOS	F	B	A			
Approach Delay (s)	21.9		2.5		0.0	
Approach LOS	C					

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	20.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	5	238	531	50	174	523
Future Volume (vph)	5	238	531	50	174	523
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	238	531	50	174	523

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total (vph)	243	266	266	50	348	349
Volume Left (vph)	5	0	0	0	174	0
Volume Right (vph)	238	0	0	50	0	0
Hadj (s)	-0.55	0.03	0.03	-0.67	0.28	0.03
Departure Headway (s)	5.9	6.3	6.3	3.2	6.3	6.1
Degree Utilization, x	0.39	0.46	0.46	0.04	0.61	0.59
Capacity (veh/h)	582	557	557	1121	552	582
Control Delay (s)	12.6	13.4	13.4	5.1	17.5	16.1
Approach Delay (s)	12.6	12.7			16.8	
Approach LOS	B	B			C	

Intersection Summary				
Delay	14.6			
Level of Service	B			
Intersection Capacity Utilization	59.2%	ICU Level of Service		B
Analysis Period (min)	15			

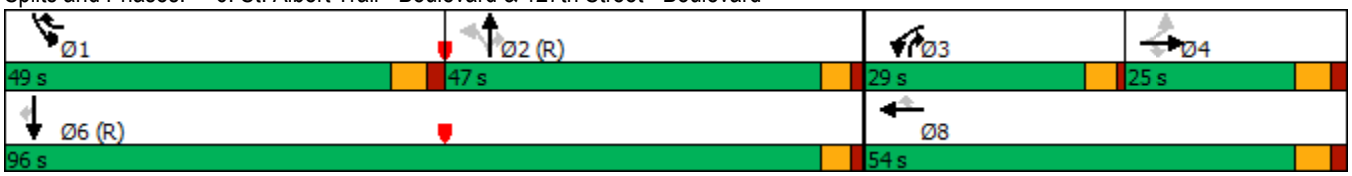


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	15	3	0	23	838	9	747	1	335	673	2
Future Volume (vph)	1	310	89	678	315	1722	95	1012	527	1228	930	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	100.0		100.0	100.0		100.0
Storage Lanes	1		1	2		2	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	3471	3579	2818	1789	5142	1601	3471	5142	1601
Flt Permitted	0.561			0.950			0.295			0.950		
Satd. Flow (perm)	1057	3579	1601	3471	3579	2818	556	5142	1601	3471	5142	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			15			65			55
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		398.2			618.6			397.2			258.7	
Travel Time (s)		23.9			37.1			23.8			15.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	310	89	678	315	1722	95	1012	527	1228	930	2
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Prot	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Perm
Protected Phases		4		3	8	1		2	3	1	6	
Permitted Phases	4		4			8	2		2			6
Detector Phase	4	4	4	3	8	1	2	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	7.0	15.0	15.0	5.0	7.0	15.0	15.0
Minimum Split (s)	25.0	25.0	25.0	9.5	25.0	13.0	46.0	46.0	9.5	13.0	46.0	46.0
Total Split (s)	25.0	25.0	25.0	29.0	54.0	49.0	47.0	47.0	29.0	49.0	96.0	96.0
Total Split (%)	16.7%	16.7%	16.7%	19.3%	36.0%	32.7%	31.3%	31.3%	19.3%	32.7%	64.0%	64.0%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	3.5	3.5	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0	2.0	1.5	1.5	1.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.5	6.0	6.0	5.0	5.0	4.5	6.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	None	C-Max	C-Max
Act Effct Green (s)	17.2	17.2	17.2	24.5	46.2	97.0	42.0	42.0	71.5	44.8	92.8	92.8
Actuated g/C Ratio	0.11	0.11	0.11	0.16	0.31	0.65	0.28	0.28	0.48	0.30	0.62	0.62
v/c Ratio	0.01	0.75	0.34	1.20	0.29	0.94	0.61	0.70	0.66	1.19	0.29	0.00
Control Delay	58.0	76.3	13.9	157.1	39.9	35.5	65.9	51.6	30.8	138.7	13.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	76.3	13.9	157.1	39.9	35.5	65.9	51.6	30.8	138.7	13.8	0.0
LOS	E	E	B	F	D	D	E	D	C	F	B	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		62.4			66.4			45.7			84.8	
Approach LOS		E			E			D			F	
Queue Length 50th (m)	0.3	49.8	0.0	~132.0	39.1	260.2	26.0	104.6	109.7	~241.3	48.2	0.0
Queue Length 95th (m)	2.3	67.1	16.7	#172.4	52.2	#329.4	#50.2	121.7	153.4	#288.2	57.4	0.0
Internal Link Dist (m)		374.2			594.6			373.2			234.7	
Turn Bay Length (m)	100.0		100.0	100.0		100.0	100.0		100.0	100.0		100.0
Base Capacity (vph)	133	453	282	566	1145	1827	155	1439	797	1035	3179	1010
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.68	0.32	1.20	0.28	0.94	0.61	0.70	0.66	1.19	0.29	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 67.0		Intersection LOS: E	
Intersection Capacity Utilization 67.9%		ICU Level of Service C	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: St. Albert Trail - Boulevard & 127th Street - Boulevard



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	172	0	34	1	723	144	58	618	0
Future Volume (vph)	0	0	0	172	0	34	1	2806	144	58	2929	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	60.0		60.0	100.0		100.0	100.0		100.0
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1883	0	1700	1700	1601	1789	5142	1601	1789	5142	0
Flt Permitted				0.950	0.950		0.055			0.950		
Satd. Flow (perm)	0	1883	0	1700	1700	1601	104	5142	1601	1789	5142	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						20			144			
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		161.0			207.3			452.8			356.5	
Travel Time (s)		14.5			18.7			27.2			21.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	86	86	34	1	2806	144	58	2929	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				pm+pt	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	
Protected Phases		4		3	8	1		2	3	1	6	
Permitted Phases	4			8		8	2		2			
Detector Phase	4	4		3	8	1	2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	7.0	15.0	15.0	7.0	7.0	15.0	
Minimum Split (s)	17.0	17.0		13.0	17.0	13.0	23.0	23.0	13.0	13.0	20.0	
Total Split (s)	17.0	17.0		13.0	30.0	13.0	67.0	67.0	13.0	13.0	80.0	
Total Split (%)	15.5%	15.5%		11.8%	27.3%	11.8%	60.9%	60.9%	11.8%	11.8%	72.7%	
Yellow Time (s)	3.5	3.5		4.0	3.5	4.0	3.5	3.5	4.0	4.0	3.5	
All-Red Time (s)	1.5	1.5		2.0	1.5	2.0	1.5	1.5	2.0	2.0	1.5	
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0		6.0	5.0	6.0	5.0	5.0	6.0	6.0	5.0	
Lead/Lag	Lead	Lead		Lag		Lead	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None		None	None	None	C-Max	C-Max	None	None	C-Max	
Act Effct Green (s)				12.6	13.6	27.8	73.8	73.8	92.6	9.2	86.4	
Actuated g/C Ratio				0.11	0.12	0.25	0.67	0.67	0.84	0.08	0.79	
v/c Ratio				0.44	0.41	0.08	0.01	0.81	0.11	0.39	0.73	
Control Delay				52.3	50.1	16.8	10.0	17.3	0.6	54.8	7.5	
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay				52.3	50.1	16.8	10.0	17.3	0.6	54.8	7.5	
LOS				D	D	B	A	B	A	D	A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					45.5			16.5			8.4	
Approach LOS					D			B			A	
Queue Length 50th (m)				19.6	19.4	2.5	0.1	155.8	0.0	12.7	89.3	
Queue Length 95th (m)				35.1	34.7	9.6	0.9	228.1	3.7	25.5	136.3	
Internal Link Dist (m)		137.0			183.3			428.8			332.5	
Turn Bay Length (m)				60.0		60.0	100.0		100.0	100.0		
Base Capacity (vph)				194	386	419	69	3450	1370	149	4039	
Starvation Cap Reductn				0	0	0	0	0	0	0	0	
Spillback Cap Reductn				0	0	0	0	0	0	0	0	
Storage Cap Reductn				0	0	0	0	0	0	0	0	
Reduced v/c Ratio				0.44	0.22	0.08	0.01	0.81	0.11	0.39	0.73	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 13.5		Intersection LOS: B	
Intersection Capacity Utilization 47.5%		ICU Level of Service A	
Analysis Period (min) 15			

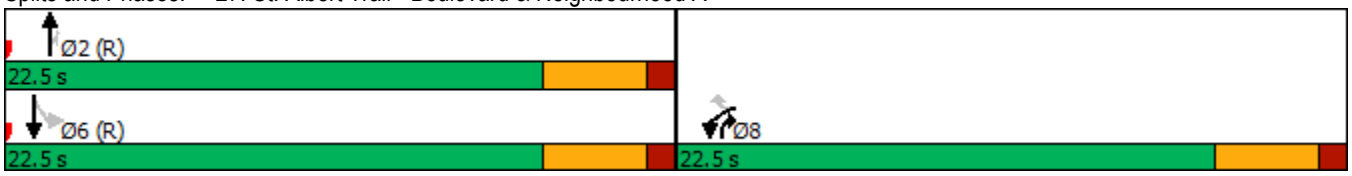
Splits and Phases: 9: St. Albert Trail - Boulevard & Ernest Blvd

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	757	0	0	676
Future Volume (vph)	352	24	2561	279	29	2635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0	0.0		100.0	100.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Satd. Flow (prot)	1789	1601	3579	1601	0	*10000
Flt Permitted	0.950					
Satd. Flow (perm)	1789	1601	3579	1601	0	*10000
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)			*10000			
Link Speed (k/h)	40		60			60
Link Distance (m)	104.4		356.5			201.3
Travel Time (s)	9.4		21.4			12.1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	352	24	2561	279	0	2664
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Turn Type	Prot	Perm	NA	pm+ov		NA
Protected Phases	8		2	8		6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	8	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	13.8	13.8	0.0	45.0		22.2
Actuated g/C Ratio	0.31	0.31	0.00	1.00		0.49
v/c Ratio	0.64	0.05	0.26	0.17		0.54
Control Delay	18.4	9.3	0.1	0.2		9.7
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	18.4	9.3	0.1	0.2		9.7
LOS	B	A	A	A		A

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Approach Delay	17.9		0.1			9.7
Approach LOS	B		A			A
Queue Length 50th (m)	24.4	1.4	0.0	0.0		85.9
Queue Length 95th (m)	38.6	4.3	0.0	0.0		106.5
Internal Link Dist (m)	80.4		332.5			177.3
Turn Bay Length (m)	60.0			100.0		
Base Capacity (vph)	715	640	10000	1575		4924
Starvation Cap Reductn	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0		0
Storage Cap Reductn	0	0	0	0		0
Reduced v/c Ratio	0.49	0.04	0.26	0.18		0.54

Intersection Summary			
Area Type:	Other		
Cycle Length: 45			
Actuated Cycle Length: 45			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 5.6		Intersection LOS: A	
Intersection Capacity Utilization 24.7%		ICU Level of Service A	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 27: St. Albert Trail - Boulevard & Neighbourhood A

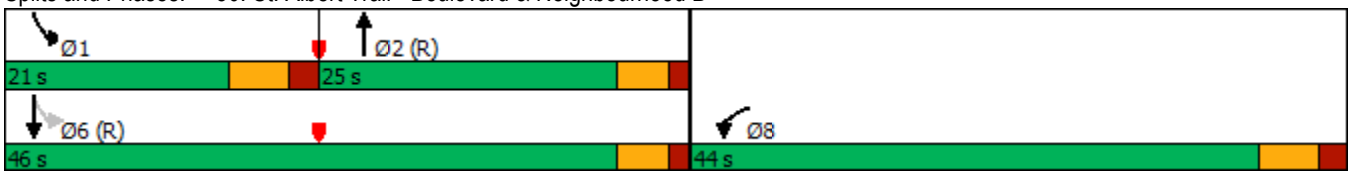


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	757	0	0	676
Future Volume (vph)	1257	299	1335	1207	290	1407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0	0.0		100.0	100.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				7.5	
Satd. Flow (prot)	3471	1601	3579	1601	1789	3579
Flt Permitted	0.950				0.139	
Satd. Flow (perm)	3471	1601	3579	1601	262	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		203	*10000	834		
Link Speed (k/h)	40		60			60
Link Distance (m)	69.2		219.6			397.2
Travel Time (s)	6.2		13.2			23.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1257	299	1335	1207	290	1407
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Turn Type	Prot	Free	NA	Free	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		Free	6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	12.0		15.0		7.0	15.0
Minimum Split (s)	18.0		25.0		13.0	20.0
Total Split (s)	44.0		25.0		21.0	46.0
Total Split (%)	48.9%		27.8%		23.3%	51.1%
Yellow Time (s)	4.0		3.5		4.0	3.5
All-Red Time (s)	2.0		1.5		2.0	1.5
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	6.0		5.0		6.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		C-Max		None	C-Max
Act Effct Green (s)	36.5	90.0	0.0	90.0	41.5	42.5
Actuated g/C Ratio	0.41	1.00	0.00	1.00	0.46	0.47
v/c Ratio	0.89	0.19	0.13	0.75	0.82	0.83
Control Delay	34.3	0.3	0.0	3.3	40.2	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	0.3	0.0	3.3	40.2	26.7
LOS	C	A	A	A	D	C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Approach Delay	27.7		1.6			29.0
Approach LOS	C		A			C
Queue Length 50th (m)	103.8	0.0	0.0	0.0	35.8	116.5
Queue Length 95th (m)	133.2	0.0	0.0	0.0	#75.6	148.3
Internal Link Dist (m)	45.2		195.6			373.2
Turn Bay Length (m)	30.0			100.0	100.0	
Base Capacity (vph)	1465	1601	10000	1601	375	1690
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.19	0.13	0.75	0.77	0.83

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 25.1%		ICU Level of Service A	
Analysis Period (min) 15			
* User Entered Value			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 30: St. Albert Trail - Boulevard & Neighbourhood B



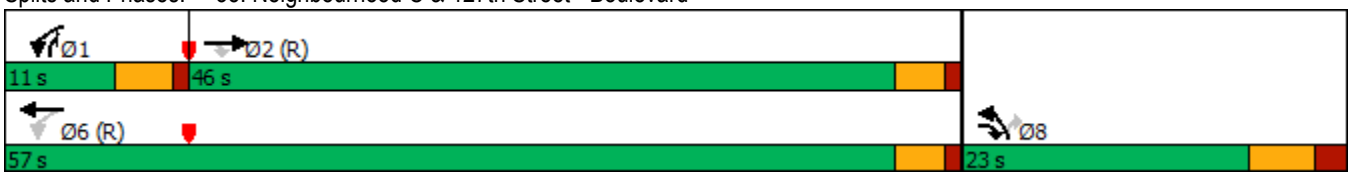
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	351	0	0	861	0	0
Future Volume (vph)	1470	595	173	2059	656	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		100.0	100.0		0.0	0.0
Storage Lanes		1	1		2	1
Taper Length (m)			7.5		7.5	
Satd. Flow (prot)	3579	1601	1789	3579	3471	1601
Flt Permitted			0.086		0.950	
Satd. Flow (perm)	3579	1601	162	3579	3471	1601
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		199				24
Link Speed (k/h)	60			60	40	
Link Distance (m)	618.6			437.0	66.3	
Travel Time (s)	37.1			26.2	6.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1470	595	173	2059	656	185
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.0			6.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		15	25		25	15
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov
Protected Phases	2	8	1	6	8	1
Permitted Phases		2	6			8
Minimum Split (s)	22.0	13.0	9.5	16.0	13.0	9.5
Total Split (s)	46.0	23.0	11.0	57.0	23.0	11.0
Total Split (%)	57.5%	28.8%	13.8%	71.3%	28.8%	13.8%
Yellow Time (s)	3.0	4.0	3.5	3.0	4.0	3.5
All-Red Time (s)	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.5	4.0	6.0	4.5
Lead/Lag	Lag		Lead			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Act Effct Green (s)	42.0	63.0	52.5	53.0	17.0	29.5
Actuated g/C Ratio	0.52	0.79	0.66	0.66	0.21	0.37
v/c Ratio	0.78	0.46	0.73	0.87	0.89	0.31
Control Delay	19.1	3.0	31.2	16.1	47.0	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	3.0	31.2	16.1	47.0	17.2
LOS	B	A	C	B	D	B
Approach Delay	14.4			17.3	40.4	
Approach LOS	B			B	D	
Queue Length 50th (m)	93.4	12.9	10.4	119.3	52.7	17.7
Queue Length 95th (m)	121.8	22.5	#40.2	159.1	#82.9	33.5

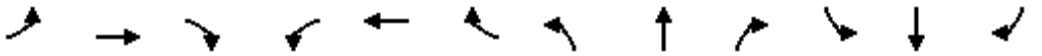
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (m)	594.6			413.0	42.3	
Turn Bay Length (m)		100.0	100.0			
Base Capacity (vph)	1878	1303	238	2371	737	605
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.46	0.73	0.87	0.89	0.31

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 19.9		Intersection LOS: B	
Intersection Capacity Utilization 27.1%		ICU Level of Service A	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 35: Neighbourhood C & 127th Street - Boulevard





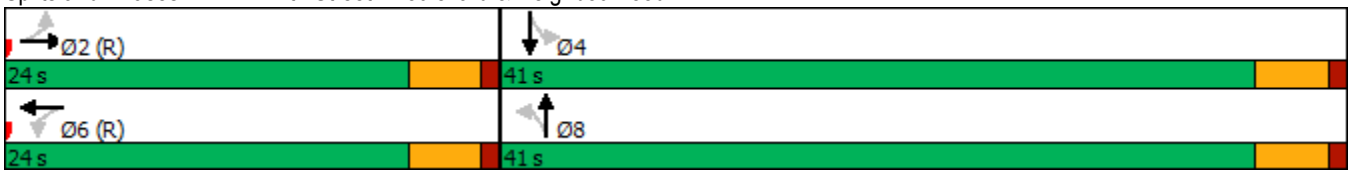
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	861	0	0	351	0
Future Volume (vph)	216	0	82	148	0	37	76	1592	98	24	1178	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		100.0	0.0		100.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1750	0	0	1763	0	0	3543	0	0	3493	0
Flt Permitted		0.965			0.962			0.998			0.999	
Satd. Flow (perm)	0	1750	0	0	1763	0	0	3543	0	0	3493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			25			15			53	
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		150.6			177.1			323.8			409.7	
Travel Time (s)		13.6			15.9			19.4			24.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	298	0	0	185	0	0	1766	0	0	1422	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			6.0			6.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type		NA			NA			NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	24.0	24.0		24.0	24.0		41.0	41.0		41.0	41.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		63.1%	63.1%		63.1%	63.1%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		19.5			19.5			36.5			36.5	
Actuated g/C Ratio		0.30			0.30			0.56			0.56	
v/c Ratio		0.55			0.34			0.88			0.72	
Control Delay		21.5			17.4			19.5			12.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.5			17.4			19.5			12.6	
LOS		C			B			B			B	
Approach Delay		21.5			17.4			19.5			12.6	
Approach LOS		C			B			B			B	
Queue Length 50th (m)		27.9			15.5			91.7			60.2	
Queue Length 95th (m)		50.4			30.8			#137.5			83.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (m)		126.6			153.1			299.8			385.7	
Turn Bay Length (m)												
Base Capacity (vph)		546			546			1996			1984	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.55			0.34			0.88			0.72	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 16.9		Intersection LOS: B	
Intersection Capacity Utilization 27.6%		ICU Level of Service A	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 42: 127th Street - Boulevard & Neighbourhood D

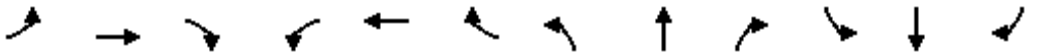


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	351	0	0	861	0	0
Future Volume (vph)	1376	279	31	1814	418	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3489	0	0	3575	1789	1601
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	3489	0	0	3575	1789	1601
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	58					46
Link Speed (k/h)	60			60	40	
Link Distance (m)	437.0			409.7	56.0	
Travel Time (s)	26.2			24.6	5.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1655	0	0	1845	418	46
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.0			6.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	50.0		50.0	50.0	25.0	25.0
Total Split (%)	66.7%		66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)	45.5			45.5	20.5	20.5
Actuated g/C Ratio	0.61			0.61	0.27	0.27
v/c Ratio	0.77			0.85	0.86	0.10
Control Delay	13.7			17.1	45.2	7.5
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	13.7			17.1	45.2	7.5
LOS	B			B	D	A
Approach Delay	13.7			17.1	41.4	
Approach LOS	B			B	D	
Queue Length 50th (m)	82.8			105.0	58.9	0.0
Queue Length 95th (m)	111.2			140.5	#107.9	7.3
Internal Link Dist (m)	413.0			385.7	32.0	
Turn Bay Length (m)						
Base Capacity (vph)	2139			2168	488	471

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.77			0.85	0.86	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Pretimed			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 27.6%		ICU Level of Service A	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 57: Local A & 127th Street - Boulevard



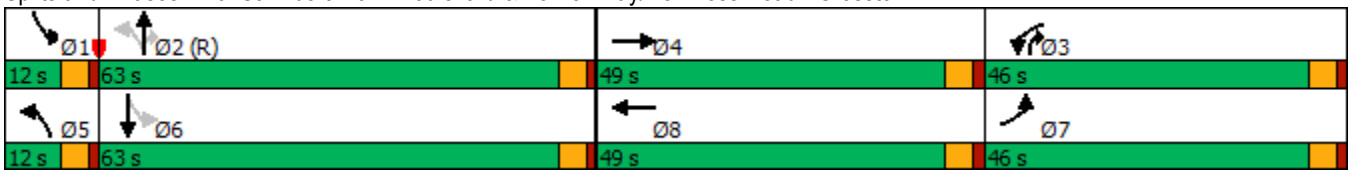
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	657	919	65	719	910	60	96	2236	659	125	2285	689
Future Volume (vph)	657	919	65	719	910	60	96	2236	659	125	2285	689
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		0.0	100.0		100.0	100.0		100.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			35.0		
Satd. Flow (prot)	3471	3579	1601	3471	3579	1601	1789	5142	1601	1789	5142	1601
Flt Permitted	0.950			0.950			0.069			0.069		
Satd. Flow (perm)	3471	3579	1601	3471	3579	1601	130	5142	1601	130	5142	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109			45			235
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		387.7			377.0			898.7			452.8	
Travel Time (s)		23.3			22.6			53.9			27.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	657	919	65	719	910	60	96	2236	659	125	2285	689
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	pm+ov	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			Free			Free	2		2	6		Free
Total Split (s)	46.0	49.0		46.0	49.0		12.0	63.0	46.0	12.0	63.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Act Effct Green (s)	39.4	44.0	170.0	39.4	44.0	170.0	66.6	58.0	97.4	66.6	58.0	170.0
Actuated g/C Ratio	0.23	0.26	1.00	0.23	0.26	1.00	0.39	0.34	0.57	0.39	0.34	1.00
v/c Ratio	0.82	0.99	0.04	0.89	0.98	0.04	0.71	1.27	0.70	0.93	1.30	0.43
Control Delay	71.0	89.6	0.0	77.6	87.4	0.1	60.9	172.8	20.1	96.7	184.2	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.0	89.6	0.0	77.6	87.4	0.1	60.9	172.8	20.1	96.7	184.2	0.8
LOS	E	F	A	E	F	A	E	F	C	F	F	A
Approach Delay		78.6			80.1			135.6			139.9	
Approach LOS		E			F			F			F	
Queue Length 50th (m)	114.2	173.5	0.0	127.7	171.3	0.0	21.2	~367.3	110.4	~31.9	~380.5	0.0
Queue Length 95th (m)	138.5	#221.3	0.0	153.7	#217.8	0.0	#52.9	#394.1	147.3	#79.8	#406.8	0.0
Internal Link Dist (m)		363.7			353.0			874.7			428.8	
Turn Bay Length (m)	100.0		100.0	100.0			100.0		100.0	100.0		100.0
Base Capacity (vph)	837	926	1601	837	926	1601	135	1754	951	135	1754	1601
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.99	0.04	0.86	0.98	0.04	0.71	1.27	0.69	0.93	1.30	0.43

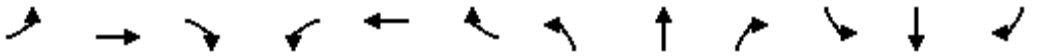
Intersection Summary	
Area Type:	Other
Cycle Length: 170	
Actuated Cycle Length: 170	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 117.1	Intersection LOS: F
Intersection Capacity Utilization 112.7%	ICU Level of Service H
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: St. Albert Trail - Boulevard & Fowler Way/Neil Ross Road - Crosstown

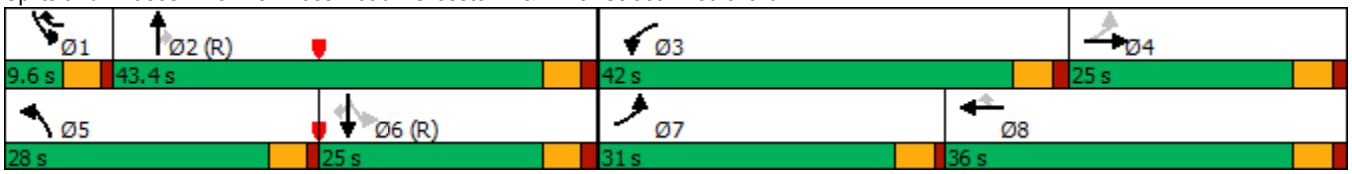


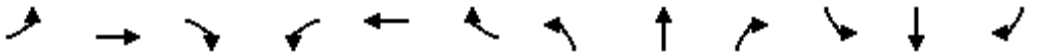


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	430	409	816	954	910	95	618	473	863	55	452	364
Future Volume (vph)	430	409	816	954	910	95	618	473	863	55	452	364
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	100.0		110.0	100.0		100.0
Storage Lanes	1		1	2		1	2		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	3471	3579	1601	3471	3579	1601	1789	3579	1601
Flt Permitted	0.200			0.950			0.950			0.481		
Satd. Flow (perm)	377	3579	1601	3471	3579	1601	3471	3579	1601	906	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			477			100			685			364
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		329.3			1111.4			265.2			385.4	
Travel Time (s)		19.8			66.7			15.9			23.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	430	409	816	954	910	95	618	473	863	55	452	364
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.0			6.0			6.7			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Free	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4		Free			8			2	6		6
Total Split (s)	31.0	25.0		42.0	36.0	9.6	28.0	43.4	43.4	9.6	25.0	25.0
Total Lost Time (s)	4.5	5.0		5.0	5.0	4.5	4.5	5.0	5.0	4.5	5.0	5.0
Act Effct Green (s)	47.0	20.0	120.0	37.0	31.0	41.1	23.5	38.4	38.4	25.6	20.0	20.0
Actuated g/C Ratio	0.39	0.17	1.00	0.31	0.26	0.34	0.20	0.32	0.32	0.21	0.17	0.17
v/c Ratio	0.94	0.69	0.51	0.89	0.98	0.15	0.91	0.41	0.88	0.24	0.76	0.64
Control Delay	63.3	53.7	1.2	51.3	70.7	5.4	61.6	50.8	31.8	27.1	56.8	10.2
Queue Delay	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0
Total Delay	63.3	53.7	1.2	57.9	70.7	5.4	61.6	50.8	33.9	27.1	56.8	10.2
LOS	E	D	A	E	E	A	E	D	C	C	E	B
Approach Delay		30.3			61.3			46.8			35.5	
Approach LOS		C			E			D			D	
Queue Length 50th (m)	87.4	50.7	0.0	116.1	118.5	0.0	84.1	59.8	113.3	8.3	56.8	0.0
Queue Length 95th (m)	#151.4	68.7	0.0	#152.5	#163.3	11.0	m90.6	m64.9	m141.6	17.1	76.1	28.3
Internal Link Dist (m)		305.3			1087.4			241.2			361.4	
Turn Bay Length (m)	100.0		100.0	100.0		100.0	100.0		110.0	100.0		100.0
Base Capacity (vph)	459	596	1601	1070	924	614	679	1145	978	230	596	570
Starvation Cap Reductn	0	0	0	0	0	0	0	0	44	0	0	0
Spillback Cap Reductn	0	0	46	89	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.69	0.52	0.97	0.98	0.15	0.91	0.41	0.92	0.24	0.76	0.64

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.98		
Intersection Signal Delay: 45.4	Intersection LOS: D	
Intersection Capacity Utilization 94.9%	ICU Level of Service F	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 8: Neil Ross Road - Crosstown & 127th Street - Boulevard

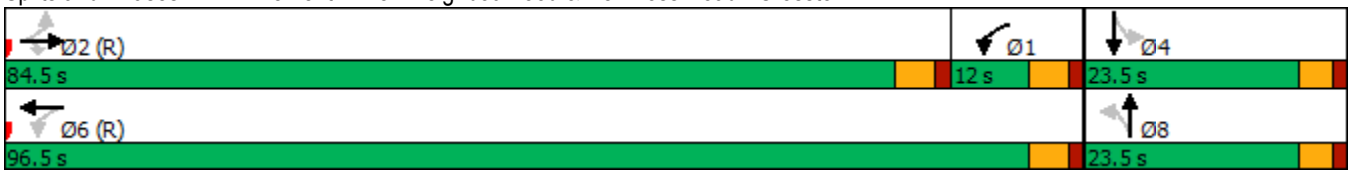




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1585	46	78	1718	5	100	112	76	5	11	5
Future Volume (vph)	110	1585	46	78	1718	5	100	112	76	5	11	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		100.0	60.0		100.0	0.0		80.0	0.0		0.0
Storage Lanes	1		1	1		1	1		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	1789	5142	0	1789	1769	0	0	1801	0
Flt Permitted	0.111			0.103			0.744				0.933	
Satd. Flow (perm)	209	3579	1601	194	5142	0	1401	1769	0	0	1701	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			59		1			24			5	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		377.0			660.6			209.7			495.4	
Travel Time (s)		22.6			39.6			18.9			44.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	1585	46	78	1723	0	100	188	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.0			5.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Total Split (s)	84.5	84.5	84.5	12.0	96.5		23.5	23.5		23.5	23.5	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		4.5	4.5			4.5	
Act Effct Green (s)	79.5	79.5	79.5	91.5	91.5		19.0	19.0			19.0	
Actuated g/C Ratio	0.66	0.66	0.66	0.76	0.76		0.16	0.16			0.16	
v/c Ratio	0.80	0.67	0.04	0.33	0.44		0.45	0.63			0.08	
Control Delay	57.0	14.0	1.3	8.0	4.2		53.2	51.2			36.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	57.0	14.0	1.3	8.0	4.2		53.2	51.2			36.5	
LOS	E	B	A	A	A		D	D			D	
Approach Delay		16.4			4.4			51.9			36.5	
Approach LOS		B			A			D			D	
Queue Length 50th (m)	17.8	114.8	0.0	3.1	31.0		22.7	38.4			3.4	
Queue Length 95th (m)	#59.2	138.2	2.9	m5.3	40.2		41.1	64.1			11.1	
Internal Link Dist (m)		353.0			636.6			185.7			471.4	
Turn Bay Length (m)	90.0		100.0	60.0								
Base Capacity (vph)	138	2371	1080	240	3921		221	300			273	
Starvation Cap Reductn	0	0	0	0	0		0	0			0	
Spillback Cap Reductn	0	0	0	0	0		0	0			0	
Storage Cap Reductn	0	0	0	0	0		0	0			0	
Reduced v/c Ratio	0.80	0.67	0.04	0.33	0.44		0.45	0.63			0.08	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 73.9%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 12: Element Drive - Neighbourhood & Neil Ross Road - Crosstown



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	1303	350	556	1725	142	147	5	597	56	5	301
Future Volume (vph)	160	1303	350	556	1725	142	147	5	597	56	5	301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	100.0		0.0	50.0		50.0
Storage Lanes	1		1	2		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	3471	3579	1601	3471	1603	0	1789	1883	1601
Flt Permitted	0.083			0.950			0.950			0.167		
Satd. Flow (perm)	156	3579	1601	3471	3579	1601	3471	1603	0	315	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			218			142		289				136
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		363.3			265.2			151.4			134.8	
Travel Time (s)		21.8			15.9			13.6			12.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	160	1303	350	556	1725	142	147	602	0	56	5	301
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.7			6.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Free	Prot	NA	pm+ov	Prot	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases	2		Free			6				4		4
Total Split (s)	13.0	52.7		24.7	64.4	9.6	14.2	33.0		9.6	28.4	13.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Act Effct Green (s)	56.7	48.2	120.0	20.2	59.9	69.5	9.7	28.5		29.0	23.9	36.9
Actuated g/C Ratio	0.47	0.40	1.00	0.17	0.50	0.58	0.08	0.24		0.24	0.20	0.31
v/c Ratio	0.85	0.91	0.22	0.95	0.97	0.14	0.53	1.00		0.41	0.01	0.51
Control Delay	63.2	44.1	0.3	76.8	44.2	4.0	60.2	61.5		38.5	38.8	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	63.2	44.1	0.3	76.8	44.2	4.0	60.2	61.5		38.5	38.8	21.6
LOS	E	D	A	E	D	A	E	E		D	D	C
Approach Delay		37.3			49.3			61.2			24.5	
Approach LOS		D			D			E			C	
Queue Length 50th (m)	22.9	157.7	0.0	74.4	205.1	2.5	18.3	~89.5		9.8	1.0	32.6
Queue Length 95th (m)	#62.4	#202.5	0.0	m#101.1	#264.8	m6.6	29.4	#169.7		20.0	4.7	61.0
Internal Link Dist (m)		339.3			241.2			127.4			110.8	
Turn Bay Length (m)	100.0		100.0	100.0		100.0	100.0			50.0		50.0
Base Capacity (vph)	189	1437	1601	584	1786	987	280	601		138	375	586
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.85	0.91	0.22	0.95	0.97	0.14	0.53	1.00		0.41	0.01	0.51

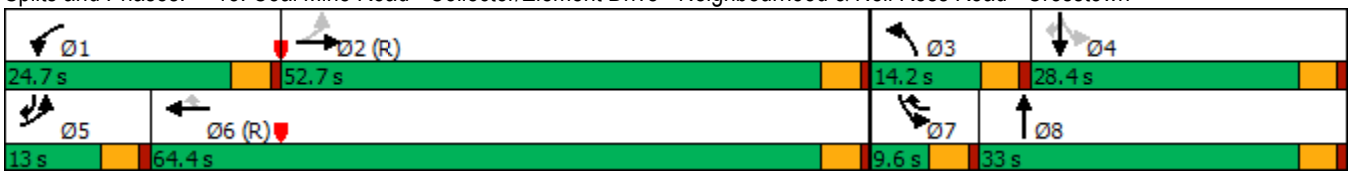
Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 45.3	Intersection LOS: D
Intersection Capacity Utilization 112.9%	ICU Level of Service H
Analysis Period (min) 15	

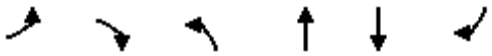
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Coal Mine Road - Collector/Element Drive - Neighbourhood & Neil Ross Road - Crosstown



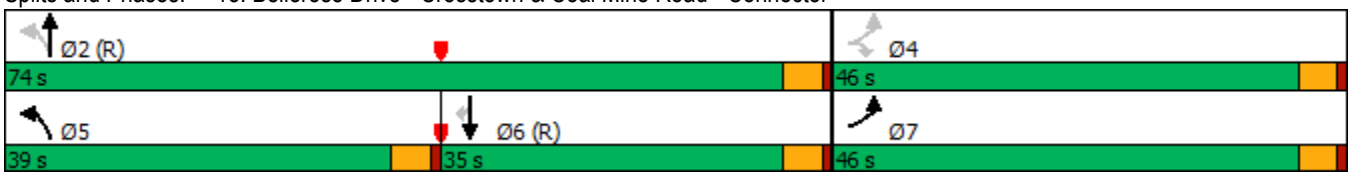


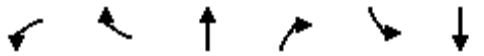
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	553	555	519	1010	759	478
Future Volume (vph)	553	555	519	1010	759	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	100.0			100.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		7.5			
Satd. Flow (prot)	1789	1601	1789	3579	3579	1601
Flt Permitted	0.950		0.114			
Satd. Flow (perm)	1789	1601	215	3579	3579	1601
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		506				478
Link Speed (k/h)	40			60	60	
Link Distance (m)	209.1			555.8	485.7	
Travel Time (s)	18.8			33.3	29.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	553	555	519	1010	759	478
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15	25			15
Turn Type	pm+pt	Perm	pm+pt	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases	4	4	2			6
Total Split (s)	46.0	46.0	39.0	74.0	35.0	35.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effct Green (s)	41.5	41.5	69.5	69.5	30.5	30.5
Actuated g/C Ratio	0.35	0.35	0.58	0.58	0.25	0.25
v/c Ratio	0.89	0.63	0.90	0.49	0.83	0.63
Control Delay	55.9	7.5	51.1	15.8	51.7	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	7.5	51.1	15.8	51.7	7.3
LOS	E	A	D	B	D	A
Approach Delay	31.7			27.8	34.5	
Approach LOS	C			C	C	
Queue Length 50th (m)	129.1	7.9	105.7	73.3	94.0	0.0
Queue Length 95th (m)	#196.5	39.5	#171.4	90.1	118.5	28.6
Internal Link Dist (m)	185.1			531.8	461.7	
Turn Bay Length (m)			100.0			100.0
Base Capacity (vph)	618	884	577	2072	909	763
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.63	0.90	0.49	0.83	0.63

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 31.1	Intersection LOS: C	
Intersection Capacity Utilization 91.6%	ICU Level of Service F	
Analysis Period (min) 15		

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Bellerose Drive - Crosstown & Coal Mine Road - Connector





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	278	5	745	332	5	638
Future Volume (vph)	278	5	745	332	5	638
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1791	0	3414	0	0	3579
Flt Permitted	0.953					0.948
Satd. Flow (perm)	1791	0	3414	0	0	3392
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	2		178			
Link Speed (k/h)	40		40			40
Link Distance (m)	490.6		231.8			437.1
Travel Time (s)	44.2		20.9			39.3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	283	0	1077	0	0	643
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Total Split (s)	24.0		36.0		36.0	36.0
Total Lost Time (s)	4.5		4.5			4.5
Act Effct Green (s)	19.5		31.5			31.5
Actuated g/C Ratio	0.32		0.52			0.52
v/c Ratio	0.49		0.57			0.36
Control Delay	19.6		9.4			9.1
Queue Delay	0.0		0.0			0.0
Total Delay	19.6		9.4			9.1
LOS	B		A			A
Approach Delay	19.6		9.4			9.1
Approach LOS	B		A			A
Queue Length 50th (m)	25.6		32.7			20.8
Queue Length 95th (m)	45.5		48.6			30.8
Internal Link Dist (m)	466.6		207.8			413.1
Turn Bay Length (m)						
Base Capacity (vph)	583		1876			1780
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.49		0.57			0.36

Intersection Summary	
Area Type:	Other

Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 10.7	Intersection LOS: B
Intersection Capacity Utilization 54.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 22: Coal Mine Road - Connector & Neighbourhood F

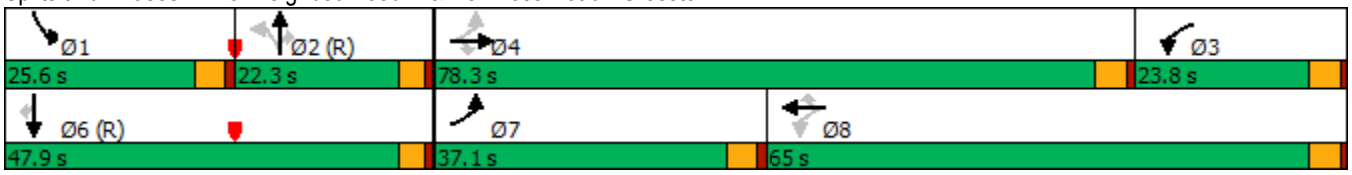
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	463	1165	84	212	1483	478	78	5	160	487	0	415
Future Volume (vph)	463	1165	84	212	1483	478	78	5	160	487	0	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	0.0		0.0	0.0		60.0
Storage Lanes	1		1	1		1	0		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	1789	3579	1601	0	1799	1601	3471	1883	1601
Flt Permitted	0.097			0.243				0.739		0.950		
Satd. Flow (perm)	183	3579	1601	458	3579	1601	0	1392	1601	3471	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84			332			160			406
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		519.5			363.3			159.0			235.9	
Travel Time (s)		31.2			21.8			14.3			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	463	1165	84	212	1483	478	0	83	160	487	0	415
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4		4	8		8	2		2			6
Total Split (s)	37.1	78.3	78.3	23.8	65.0	65.0	22.3	22.3	22.3	25.6	47.9	47.9
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.0	4.0	4.5	4.0	4.0
Act Effct Green (s)	73.8	73.8	73.8	60.5	60.5	60.5		18.3	18.3	21.1		43.9
Actuated g/C Ratio	0.49	0.49	0.49	0.40	0.40	0.40		0.12	0.12	0.14		0.29
v/c Ratio	1.05	0.66	0.10	0.60	1.03	0.57		0.49	0.48	1.00		0.55
Control Delay	101.6	31.0	4.1	53.5	74.6	12.5		72.2	13.3	103.7		7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	101.6	31.0	4.1	53.5	74.6	12.5		72.2	13.3	103.7		7.0
LOS	F	C	A	D	E	B		E	B	F		A
Approach Delay		48.8			58.9			33.4			59.2	
Approach LOS		D			E			C			E	
Queue Length 50th (m)	~141.5	141.8	0.0	44.6	~260.0	32.4		24.7	0.0	79.7		2.0
Queue Length 95th (m)	#213.2	166.8	9.4	65.8	#304.8	68.5		43.5	22.4	#118.7		29.8
Internal Link Dist (m)		495.5			339.3			135.0			211.9	
Turn Bay Length (m)	100.0		100.0	100.0		100.0						60.0
Base Capacity (vph)	439	1760	830	355	1443	843		169	335	488		755
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0		0
Reduced v/c Ratio	1.05	0.66	0.10	0.60	1.03	0.57		0.49	0.48	1.00		0.55

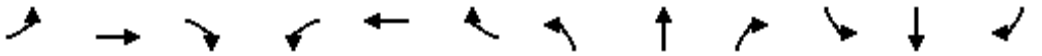
Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 54.3	Intersection LOS: D
Intersection Capacity Utilization 98.0%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 23: Neighbourhood E & Neil Ross Road - Crosstown

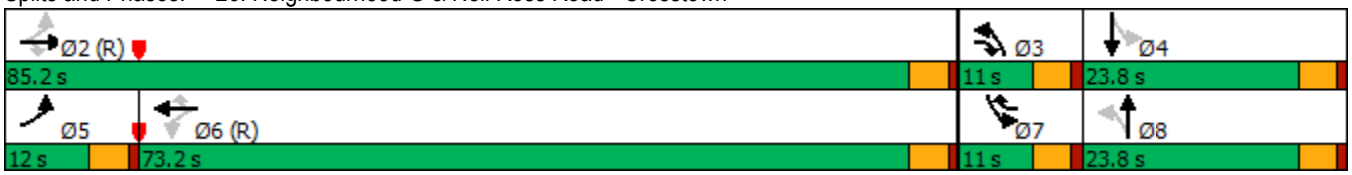




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	1518	142	5	1652	182	114	5	114	80	5	50
Future Volume (vph)	100	1518	142	5	1652	182	114	5	114	80	5	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		100.0	0.0		100.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	1789	3579	1601	1789	1612	0	1789	1627	0
Flt Permitted	0.055			0.133			0.721			0.588		
Satd. Flow (perm)	104	3579	1601	250	3579	1601	1358	1612	0	1107	1627	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142			182		93			50	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		660.6			519.5			262.5			64.9	
Travel Time (s)		39.6			31.2			23.6			5.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	1518	142	5	1652	182	114	119	0	80	55	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.7			6.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2	3		6	7	3	8		7	4	
Permitted Phases	2		2	6		6	8			4		
Total Split (s)	12.0	85.2	11.0	73.2	73.2	11.0	11.0	23.8		11.0	23.8	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	80.7	80.7	91.7	68.7	68.7	79.7	25.8	19.3		25.8	19.3	
Actuated g/C Ratio	0.67	0.67	0.76	0.57	0.57	0.66	0.22	0.16		0.22	0.16	
v/c Ratio	0.57	0.63	0.11	0.03	0.81	0.16	0.36	0.35		0.29	0.18	
Control Delay	34.3	13.5	0.9	12.2	24.3	1.4	40.4	16.8		38.6	15.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	34.3	13.5	0.9	12.2	24.3	1.4	40.4	16.8		38.6	15.2	
LOS	C	B	A	B	C	A	D	B		D	B	
Approach Delay		13.7			22.0			28.3			29.1	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	15.7	92.7	0.0	0.5	162.5	0.0	22.7	5.6		15.6	1.1	
Queue Length 95th (m)	m28.3	121.0	m4.9	2.5	195.5	7.4	39.3	23.0		29.4	13.1	
Internal Link Dist (m)		636.6			495.5			238.5			40.9	
Turn Bay Length (m)			100.0			100.0						
Base Capacity (vph)	175	2406	1256	143	2048	1124	315	337		274	303	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.63	0.11	0.03	0.81	0.16	0.36	0.35		0.29	0.18	

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.81		
Intersection Signal Delay: 18.9	Intersection LOS: B	
Intersection Capacity Utilization 76.2%	ICU Level of Service D	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 26: Neighbourhood G & Neil Ross Road - Crosstown

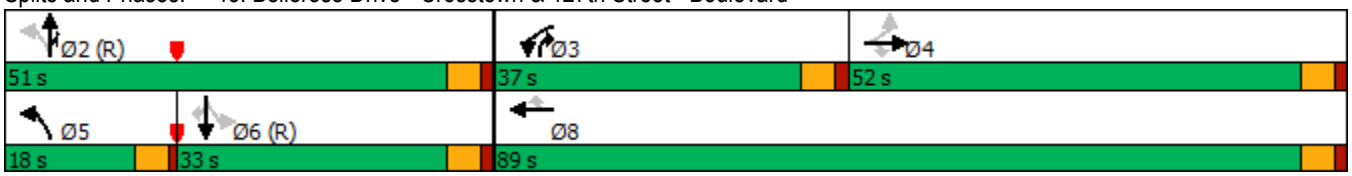


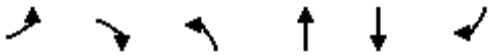
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1189	137	780	1726	200	220	415	1014	14	370	84
Future Volume (vph)	5	1189	137	780	1726	200	220	415	1014	14	370	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0		100.0	100.0		100.0	100.0		110.0	60.0		0.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1789	3579	1601	3471	3579	1601	1789	1883	2818	1789	3418	1457
Flt Permitted	0.094			0.950			0.294			0.423		
Satd. Flow (perm)	177	3579	1601	3471	3579	1601	554	1883	2818	797	3418	1457
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			114			191			16		1	90
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1111.4			202.4			485.7			172.6	
Travel Time (s)		66.7			12.1			29.1			10.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												10%
Lane Group Flow (vph)	5	1189	137	780	1726	200	220	415	1014	14	378	76
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.0			6.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	Perm	NA	Perm
Protected Phases		4		3	8		5	2	2 3		6	
Permitted Phases	4		4			8	2			6		6
Total Split (s)	52.0	52.0	52.0	37.0	89.0	89.0	18.0	51.0		33.0	33.0	33.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0		5.0	5.0	5.0
Act Effct Green (s)	47.0	47.0	47.0	32.0	84.0	84.0	46.5	46.0	83.0	28.0	28.0	28.0
Actuated g/C Ratio	0.34	0.34	0.34	0.23	0.60	0.60	0.33	0.33	0.59	0.20	0.20	0.20
v/c Ratio	0.08	0.99	0.22	0.98	0.80	0.19	0.73	0.67	0.60	0.09	0.55	0.21
Control Delay	36.6	69.7	9.2	81.6	25.4	2.3	51.2	46.9	19.7	47.5	53.8	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	69.7	9.2	81.6	25.4	2.3	51.2	46.9	19.7	47.5	53.8	7.6
LOS	D	E	A	F	C	A	D	D	B	D	D	A
Approach Delay		63.4			39.9			30.7			46.1	
Approach LOS		E			D			C			D	
Queue Length 50th (m)	1.0	181.1	4.5	117.6	195.1	1.0	48.8	104.1	100.3	3.4	54.8	0.0
Queue Length 95th (m)	4.9	#231.7	20.2	#160.6	228.1	11.2	#75.4	143.2	123.5	10.2	73.1	11.7
Internal Link Dist (m)		1087.4			178.4			461.7			148.6	
Turn Bay Length (m)	100.0		100.0	100.0		100.0	100.0		110.0	60.0		
Base Capacity (vph)	59	1201	613	793	2147	1037	303	618	1677	159	684	363
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.99	0.22	0.98	0.80	0.19	0.73	0.67	0.60	0.09	0.55	0.21

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.99		
Intersection Signal Delay: 43.0		Intersection LOS: D
Intersection Capacity Utilization 106.2%		ICU Level of Service G
Analysis Period (min) 15		

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 43: Bellerose Drive - Crosstown & 127th Street - Boulevard

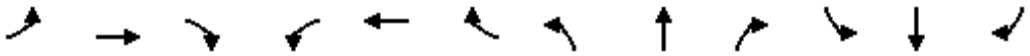




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	11	115	0	0	0
Future Volume (Veh/h)	0	11	115	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	11	115	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	230	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	230	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	93			
cM capacity (veh/h)	704	1085	1623			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	115	0
Volume Left	0	115	0
Volume Right	11	0	0
cSH	1085	1623	1700
Volume to Capacity	0.01	0.07	0.00
Queue Length 95th (m)	0.2	1.8	0.0
Control Delay (s)	8.4	7.4	0.0
Lane LOS	A	A	
Approach Delay (s)	8.4	7.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	16.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	99	250	330	0	259	74	294	222	0	70	242	90
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	99	250	330	0	259	74	294	222	0	70	242	90

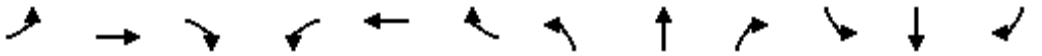
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	182	167	330	130	204	294	222	191	211
Volume Left (vph)	99	0	0	0	0	294	0	70	0
Volume Right (vph)	0	0	330	0	74	0	0	0	90
Hadj (s)	0.31	0.03	-0.67	0.03	-0.22	0.53	0.03	0.22	-0.26
Departure Headway (s)	8.2	7.9	3.2	7.9	7.7	8.0	7.5	7.9	7.4
Degree Utilization, x	0.41	0.37	0.29	0.29	0.43	0.65	0.46	0.42	0.43
Capacity (veh/h)	423	437	1113	433	449	436	466	439	468
Control Delay (s)	15.6	14.2	6.3	12.9	15.3	23.6	15.6	15.3	14.8
Approach Delay (s)	10.7			14.3		20.2		15.0	
Approach LOS	B			B		C		C	

Intersection Summary				
Delay	14.8			
Level of Service	B			
Intersection Capacity Utilization	0.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	382	390	0	397	342
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	382	390	0	397	342

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	382	390	397	342
Volume Left (vph)	0	390	397	0
Volume Right (vph)	382	0	0	342
Hadj (s)	-0.57	0.23	0.53	-0.67
Departure Headway (s)	6.0	6.7	7.4	6.1
Degree Utilization, x	0.64	0.72	0.81	0.58
Capacity (veh/h)	574	517	481	577
Control Delay (s)	18.8	25.3	33.7	16.1
Approach Delay (s)	18.8	25.3	25.6	
Approach LOS	C	D	D	

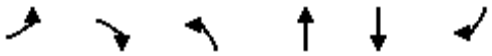
Intersection Summary			
Delay	23.8		
Level of Service	C		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	911	189	72	0	210	24	72	35	0	21	32	910
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	911	189	72	0	210	24	72	35	0	21	32	910

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	911	189	72	234	72	35	53	910
Volume Left (vph)	911	0	0	0	72	0	21	0
Volume Right (vph)	0	0	72	24	0	0	0	910
Hadj (s)	0.53	0.03	-0.67	-0.03	0.53	0.03	0.11	-0.57
Departure Headway (s)	5.9	5.4	3.2	6.0	7.6	7.1	7.2	3.2
Degree Utilization, x	1.50	0.28	0.06	0.39	0.15	0.07	0.11	0.81
Capacity (veh/h)	612	654	1121	591	453	483	471	1122
Control Delay (s)	248.7	9.4	5.2	12.7	10.8	9.5	11.1	18.1
Approach Delay (s)	195.2			12.7	10.4		17.7	
Approach LOS	F			B	B		C	

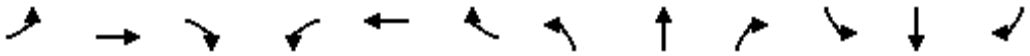
Intersection Summary				
Delay	100.9			
Level of Service	F			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	227	0	0	0	0	273
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	227	0	0	0	0	273
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	136	136	273			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	136	136	273			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	100	100			
cM capacity (veh/h)	857	912	1290			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	227	0	273
Volume Left	227	0	0
Volume Right	0	0	273
cSH	857	1700	1700
Volume to Capacity	0.26	0.00	0.16
Queue Length 95th (m)	8.5	0.0	0.0
Control Delay (s)	10.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.7	0.0	0.0
Approach LOS	B		

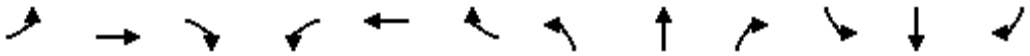
Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	36	0	0	0	0	74	0	234	0	70	330	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	0	0	0	0	80	0	254	0	76	359	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	80			0			336	158	0	245	118	40
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			0			336	158	0	245	118	40
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	64	100	85	52	96
cM capacity (veh/h)	1518			1623			365	715	1085	504	752	1031

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	39	80	254	474
Volume Left	39	0	0	76
Volume Right	0	80	0	39
cSH	1518	1623	715	712
Volume to Capacity	0.03	0.00	0.36	0.67
Queue Length 95th (m)	0.6	0.0	12.9	40.8
Control Delay (s)	7.4	0.0	12.8	19.5
Lane LOS	A		B	C
Approach Delay (s)	7.4	0.0	12.8	19.5
Approach LOS			B	C

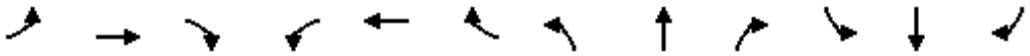
Intersection Summary				
Average Delay	15.1			
Intersection Capacity Utilization	0.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	59	234	0	0	211	38	0	0	0	48	0	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	59	234	0	0	211	38	0	0	0	48	0	53
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	266	122	26	240	149	0	53			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266	122	26	240	149	0	53			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	69	100	100	71	96	100			97		
cM capacity (veh/h)	502	745	1049	529	721	1085	1553			1623		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	293	249	0	101
Volume Left	59	0	0	48
Volume Right	0	38	0	53
cSH	679	759	1700	1623
Volume to Capacity	0.43	0.33	0.00	0.03
Queue Length 95th (m)	17.4	11.4	0.0	0.7
Control Delay (s)	14.3	12.0	0.0	3.6
Lane LOS	B	B		A
Approach Delay (s)	14.3	12.0	0.0	3.6
Approach LOS	B	B		

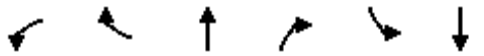
Intersection Summary				
Average Delay	11.7			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	142	142	0	114	13	114	13	0	16	16	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	142	142	0	114	13	114	13	0	16	16	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	359	289	16	502	289	13	16			13		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	359	289	16	502	289	13	16			13		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	75	87	100	80	99	93			99		
cM capacity (veh/h)	469	571	1063	316	571	1067	1602			1606		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	284	127	127	32
Volume Left	0	0	114	16
Volume Right	142	13	0	0
cSH	743	600	1602	1606
Volume to Capacity	0.38	0.21	0.07	0.01
Queue Length 95th (m)	14.4	6.4	1.8	0.2
Control Delay (s)	12.8	12.6	6.7	3.7
Lane LOS	B	B	A	A
Approach Delay (s)	12.8	12.6	6.7	3.7
Approach LOS	B	B		

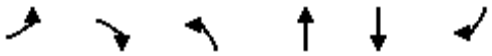
Intersection Summary				
Average Delay	10.9			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	757	0	0	676
Future Volume (Veh/h)	0	30	2512	73	0	2664
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	30	2512	73	0	2664
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			201			219
pX, platoon unblocked	0.71	0.53			0.53	
vC, conflicting volume	3844	1256			2585	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1886	0			2211	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			100	
cM capacity (veh/h)	44	570			123	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	30	1256	1256	73	1332	1332
Volume Left	0	0	0	0	0	0
Volume Right	30	0	0	73	0	0
cSH	570	1700	1700	1700	1700	1700
Volume to Capacity	0.05	0.74	0.74	0.04	0.78	0.78
Queue Length 95th (m)	1.3	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	11.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	11.7	0.0			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	861	351	0
Future Volume (Veh/h)	73	296	199	1693	1359	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	79	322	216	1840	1477	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				329	324	
pX, platoon unblocked	0.86	0.74	0.74			
vC, conflicting volume	2856	765	1530			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1563	0	1015			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	60	57			
cM capacity (veh/h)	50	803	503			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	79	322	829	1227	985	545
Volume Left	79	0	216	0	0	0
Volume Right	0	322	0	0	0	53
cSH	50	803	503	1700	1700	1700
Volume to Capacity	1.57	0.40	0.43	0.72	0.58	0.32
Queue Length 95th (m)	60.2	15.6	17.1	0.0	0.0	0.0
Control Delay (s)	463.2	12.5	13.2	0.0	0.0	0.0
Lane LOS	F	B	B			
Approach Delay (s)	101.3		5.3		0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	12.9		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	5	222	621	100	272	635
Future Volume (vph)	5	222	621	100	272	635
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	222	621	100	272	635

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total (vph)	227	311	311	100	484	423
Volume Left (vph)	5	0	0	0	272	0
Volume Right (vph)	222	0	0	100	0	0
Hadj (s)	-0.55	0.03	0.03	-0.67	0.32	0.03
Departure Headway (s)	6.2	6.6	6.6	3.2	6.5	6.2
Degree Utilization, x	0.39	0.57	0.57	0.09	0.87	0.73
Capacity (veh/h)	571	526	524	1121	548	567
Control Delay (s)	13.1	16.7	16.7	5.3	37.9	23.1
Approach Delay (s)	13.1	15.1			31.0	
Approach LOS	B	C			D	

Intersection Summary				
Delay	22.6			
Level of Service	C			
Intersection Capacity Utilization	66.6%	ICU Level of Service		C
Analysis Period (min)	15			

MOVEMENT SUMMARY

Site: 101 [Neil Ross Rd & Neighbourhood E - 2045 AM (Site Folder: General)]

Neil Ross Rd & Neighbourhood E - 2045 AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Neil Ross Rd														
3	L2	267	2.0	290	2.0	0.821	17.4	LOS B	11.8	91.1	1.00	1.36	1.57	17.3
8	T1	801	2.0	871	2.0	0.821	13.1	LOS B	11.9	91.9	1.00	1.36	1.57	31.7
18	R2	60	2.0	65	2.0	0.821	14.0	LOS B	11.9	91.9	1.00	1.35	1.56	30.6
Approach		1128	2.0	1226	2.0	0.821	14.1	LOS B	11.9	91.9	1.00	1.36	1.57	28.1
East: Neighbourhood E														
1	L2	70	2.0	76	2.0	0.320	16.4	LOS B	1.5	11.7	0.86	0.97	0.94	30.7
6	T1	1	2.0	1	2.0	0.320	12.3	LOS B	1.5	11.7	0.86	0.97	0.94	26.5
16	R2	202	2.0	220	2.0	0.576	13.6	LOS B	3.8	29.4	0.92	1.10	1.22	30.4
Approach		273	2.0	297	2.0	0.576	14.3	LOS B	3.8	29.4	0.91	1.06	1.15	30.5
North: Neil Ross Rd														
7	L2	132	2.0	143	2.0	0.797	12.3	LOS B	11.3	87.3	0.95	1.08	1.26	33.2
4	T1	826	2.0	898	2.0	0.797	8.2	LOS A	11.3	87.3	0.95	1.08	1.26	33.1
14	R2	354	2.0	385	2.0	0.797	9.2	LOS A	11.3	87.3	0.95	1.08	1.26	31.0
Approach		1312	2.0	1426	2.0	0.797	8.9	LOS A	11.3	87.3	0.95	1.08	1.26	32.7
West: Local Rd														
5	L2	374	2.0	407	2.0	0.812	19.9	LOS B	7.8	60.6	0.98	1.35	1.64	28.0
2	T1	1	2.0	1	2.0	0.812	15.8	LOS B	7.8	60.6	0.98	1.35	1.64	24.9
12	R2	309	2.0	336	2.0	0.764	16.1	LOS B	6.4	49.2	0.95	1.25	1.49	27.8
Approach		684	2.0	743	2.0	0.812	18.2	LOS B	7.8	60.6	0.96	1.30	1.57	27.9
All Vehicles		3397	2.0	3692	2.0	0.821	12.9	LOS B	11.9	91.9	0.97	1.21	1.42	30.0

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Neil Ross Rd & Neighbourhood E - 2045 PM (Site Folder: General)]

Neil Ross Rd & Neighbourhood E - 2045 PM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Neil Ross Rd														
3	L2	463	2.0	503	2.0	1.281	144.4	LOS F	82.2	635.1	1.00	4.74	6.74	8.5
8	T1	1165	2.0	1266	2.0	1.281	140.1	LOS F	84.2	651.0	1.00	4.77	6.77	15.1
18	R2	84	2.0	91	2.0	1.281	141.0	LOS F	84.2	651.0	1.00	4.79	6.79	13.2
Approach		1712	2.0	1861	2.0	1.281	141.3	LOS F	84.2	651.0	1.00	4.76	6.77	13.2
East: Neighbourhood E														
1	L2	78	2.0	85	2.0	0.379	18.6	LOS B	1.9	14.6	0.89	1.01	1.02	30.1
6	T1	1	2.0	1	2.0	0.379	14.4	LOS B	1.9	14.6	0.89	1.01	1.02	25.5
16	R2	160	2.0	174	2.0	0.541	15.4	LOS B	3.4	26.3	0.93	1.09	1.21	29.8
Approach		239	2.0	260	2.0	0.541	16.4	LOS B	3.4	26.3	0.92	1.06	1.15	29.9
North: Neil Ross Rd														
7	L2	212	2.0	230	2.0	1.476	227.0	LOS F	139.2	1075.9	1.00	6.34	8.85	9.8
4	T1	1483	2.0	1612	2.0	1.476	222.8	LOS F	140.9	1089.2	1.00	6.36	8.86	11.3
14	R2	478	2.0	520	2.0	1.476	223.8	LOS F	140.9	1089.2	1.00	6.38	8.88	7.4
Approach		2173	2.0	2362	2.0	1.476	223.4	LOS F	140.9	1089.2	1.00	6.36	8.86	10.4
West: Local Rd														
5	L2	487	2.0	529	2.0	1.303	158.0	LOS F	50.2	388.1	1.00	3.98	6.67	10.0
2	T1	1	2.0	1	2.0	1.303	153.9	LOS F	50.2	388.1	1.00	3.98	6.67	7.4
12	R2	415	2.0	451	2.0	1.303	157.1	LOS F	50.2	388.1	1.00	3.67	6.25	9.5
Approach		903	2.0	982	2.0	1.303	157.6	LOS F	50.2	388.1	1.00	3.84	6.48	9.8
All Vehicles		5027	2.0	5464	2.0	1.476	173.8	LOS F	140.9	1089.2	1.00	5.11	7.35	11.5

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Neil Ross Rd & Element Dr / Eastview Rd - 2045 AM (Site Folder: General)]

Neil Ross Rd & Element Dr / Eastview Rd - 2045 AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Eastview Rd														
3	L2	204	3.0	222	3.0	1.185	113.3	LOS F	29.7	231.5	1.00	2.95	4.88	14.3
8	T1	1	3.0	1	3.0	1.185	109.1	LOS F	29.7	231.5	1.00	2.95	4.88	10.0
18	R2	590	3.0	641	3.0	1.185	108.2	LOS F	34.1	265.6	1.00	3.11	5.09	9.9
Approach		795	3.0	864	3.0	1.185	109.5	LOS F	34.1	265.6	1.00	3.07	5.04	11.2
East: Neil Ross Rd														
1	L2	359	3.0	390	3.0	0.905	17.4	LOS D	18.7	145.8	1.00	1.30	1.57	28.2
6	T1	1036	3.0	1126	3.0	0.905	13.2	LOS D	18.7	145.8	1.00	1.30	1.57	30.5
16	R2	151	3.0	164	3.0	0.905	14.3	LOS D	18.7	145.8	1.00	1.30	1.57	27.2
Approach		1546	3.0	1680	3.0	0.905	14.3	LOS B	18.7	145.8	1.00	1.30	1.57	29.8
North: Element Dr														
7	L2	129	3.0	140	3.0	0.451	15.7	LOS B	2.6	20.6	0.91	1.04	1.08	28.0
4	T1	1	3.0	1	3.0	0.451	11.6	LOS B	2.6	20.6	0.91	1.04	1.08	27.4
14	R2	72	3.0	78	3.0	0.341	13.4	LOS B	1.7	13.2	0.89	0.95	0.97	29.9
Approach		202	3.0	220	3.0	0.451	14.8	LOS B	2.6	20.6	0.90	1.01	1.04	28.9
West: Neil Ross Rd														
5	L2	124	3.0	135	3.0	1.003	40.5	LOS F	28.5	222.0	1.00	2.17	2.77	24.4
2	T1	1026	3.0	1115	3.0	1.003	36.2	LOS F	28.8	224.7	1.00	2.17	2.77	24.1
12	R2	228	3.0	248	3.0	1.003	37.1	LOS F	28.8	224.7	1.00	2.17	2.77	23.7
Approach		1378	3.0	1498	3.0	1.003	36.8	LOS D	28.8	224.7	1.00	2.17	2.77	24.0
All Vehicles		3921	3.0	4262	3.0	1.185	41.5	LOS D	34.1	265.6	1.00	1.95	2.67	21.9

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Neil Ross Rd & Element Dr / Eastview Rd - 2045 PM (Site Folder: General)]

Neil Ross Rd & Element Dr / Eastview Rd - 2045 PM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Eastview Rd														
3	L2	147	2.0	160	2.0	1.007	50.5	LOS F	14.9	114.9	1.00	1.96	2.87	21.9
8	T1	5	2.0	5	2.0	1.007	46.3	LOS F	14.9	114.9	1.00	1.96	2.87	17.1
18	R2	597	2.0	649	2.0	1.007	45.4	LOS F	16.4	126.7	1.00	2.00	2.91	17.1
Approach		749	2.0	814	2.0	1.007	46.4	LOS D	16.4	126.7	1.00	1.99	2.90	18.3
East: Neil Ross Rd														
1	L2	556	2.0	604	2.0	1.357	172.8	LOS F	133.6	1032.8	1.00	5.35	6.74	7.4
6	T1	1725	2.0	1875	2.0	1.357	168.7	LOS F	133.6	1032.8	1.00	5.35	6.74	10.8
16	R2	142	2.0	154	2.0	1.357	169.7	LOS F	133.6	1032.8	1.00	5.35	6.74	7.2
Approach		2423	2.0	2634	2.0	1.357	169.7	LOS F	133.6	1032.8	1.00	5.35	6.74	9.9
North: Element Dr														
7	L2	56	2.0	61	2.0	0.459	26.9	LOS C	2.2	16.6	0.94	1.05	1.13	23.5
4	T1	5	2.0	5	2.0	0.459	22.8	LOS C	2.2	16.6	0.94	1.05	1.13	23.1
14	R2	301	2.0	327	2.0	1.253	147.2	LOS F	30.3	234.2	1.00	2.93	4.89	11.5
Approach		362	2.0	393	2.0	1.253	126.9	LOS F	30.3	234.2	0.99	2.62	4.25	12.3
West: Neil Ross Rd														
5	L2	160	2.0	174	2.0	1.300	151.2	LOS F	90.4	698.8	1.00	4.88	6.82	12.0
2	T1	1303	2.0	1416	2.0	1.300	147.0	LOS F	91.8	709.7	1.00	4.90	6.83	11.9
12	R2	350	2.0	380	2.0	1.300	147.9	LOS F	91.8	709.7	1.00	4.92	6.85	11.7
Approach		1813	2.0	1971	2.0	1.300	147.5	LOS F	91.8	709.7	1.00	4.90	6.83	11.8
All Vehicles		5347	2.0	5812	2.0	1.357	142.0	LOS F	133.6	1032.8	1.00	4.54	6.07	11.3

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

C

Appendix C
City Supplied Model Data

CIMA+

Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

TECHNICAL MEMORANDUM

Issue Date:	July 9, 2021	**File No.:**	2019-3677
To:	Dean Schick, C.E.T.	**Previous Issue Date:**	
From:	Ellen McLaughlin, P.Eng.	**Project No.:**	2019-3677
Client:	City of St. Albert		
Project Name:	TIA Reviews		
Subject:	Dauphinais TIA Background Traffic		

The background traffic forecast for the Dauphinais TIA is attached as requested. The intention is to use the EMME Travel Demand Model for the background traffic in the analysis. The development traffic would be determined by the Developer's Engineer using traditional ITE Trip Generation Rates or equivalent. Traffic volumes have been provided for the following scenarios:

- SC20000 is the base scenario for traffic in 2020. This should be compared with actual recent counts to determine how the model compares with existing volumes for this specific location. Manual adjustments may be needed to account for distribution of traffic from local traffic analysis zones, or where traffic volumes differ significantly. The relative difference between actual and model traffic should be applied to the growth scenarios.
- SC30003 is the forecast volume for the 2030 horizon, with planned Capital projects included in the model. This includes 0 population and 0 employees in Zones 2401, 2402, 2403, and 5003 which represent the yet-undeveloped land of Dauphinais. This is the Background Growth scenario for the 2030 time horizon.
- SC45001 is the forecast volume for the 2045 horizon, with planned Capital projects included in the model. This includes 0 population and 0 employees in Zones 2401, 2402, 2403, and 5003 which represent the yet-undeveloped land of Dauphinais. This is the Background Growth scenario for the 2045 time horizon.
- The population and employment for Zone 5002 remains populated with land use data as there is existing development in this area.

For each horizon we have provided the PM peak hour link volumes for the area and intersection turning movement volumes for:

- St. Albert Trail and Neil Ross Road
- St. Albert Trail and Ernest Boulevard
- St. Albert Trail and 127th Street (Township Road 544)
- Neil Ross Road and Element Drive
- Neil Ross Road and Edison Crescent Access (2030 and 2045 only)
- Neil Ross Road and 127th Street (Range Road 253)
- 127th Street and Bellerose Drive (2045 only)

Included in the attachments is a summary page showing the i.d. numbers for the intersections that are referenced in the subsequent pages of the document. Additional data such as number of lanes, link capacity, and volume to capacity ratio are included for each scenario as well.

The total population for St. Albert without projections for Dauphinais development is as follows:

Year	Population	Employment
2020	66,902	20,068
2030	81,904	26,688
2045	100,306	35,456

Should you have any questions about the model results you may contact:

Heather Padavell, P.Eng.
Project Manager, Transportation
Dir: 587.772.0682 | Cell: 780.235.3344 |

Prepared by:

Ellen McLaughlin, P.Eng.
Transportation Planning Engineer

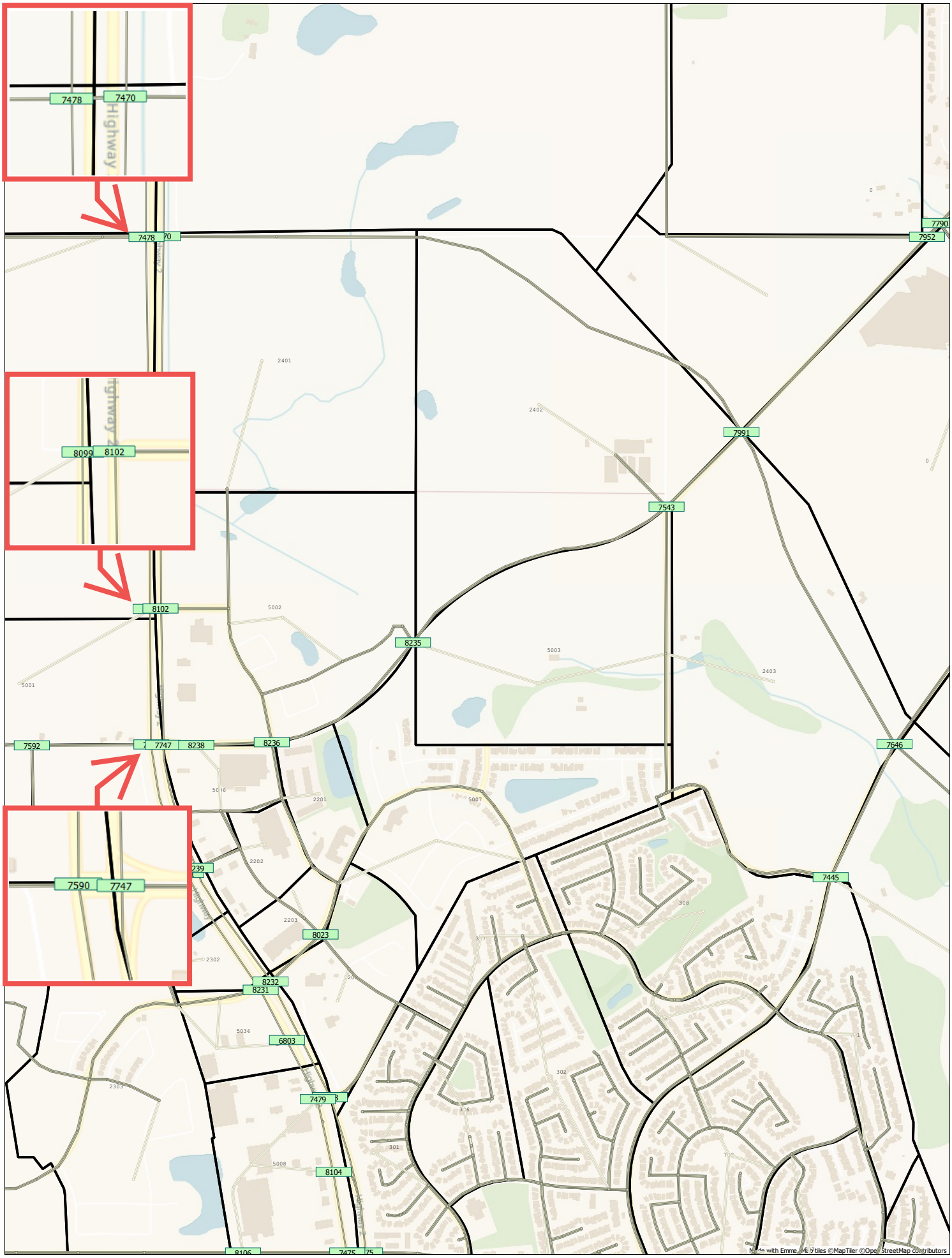
Reviewed by:

Monique Beaudry, P.Eng., RPP
Senior Transportation Planning Engineer

Attachment A – Intersection ID Numbers
Attachment B – 2020 EMME Outputs
Attachment C – 2030 EMME Outputs
Attachment D – 2045 EMME Outputs

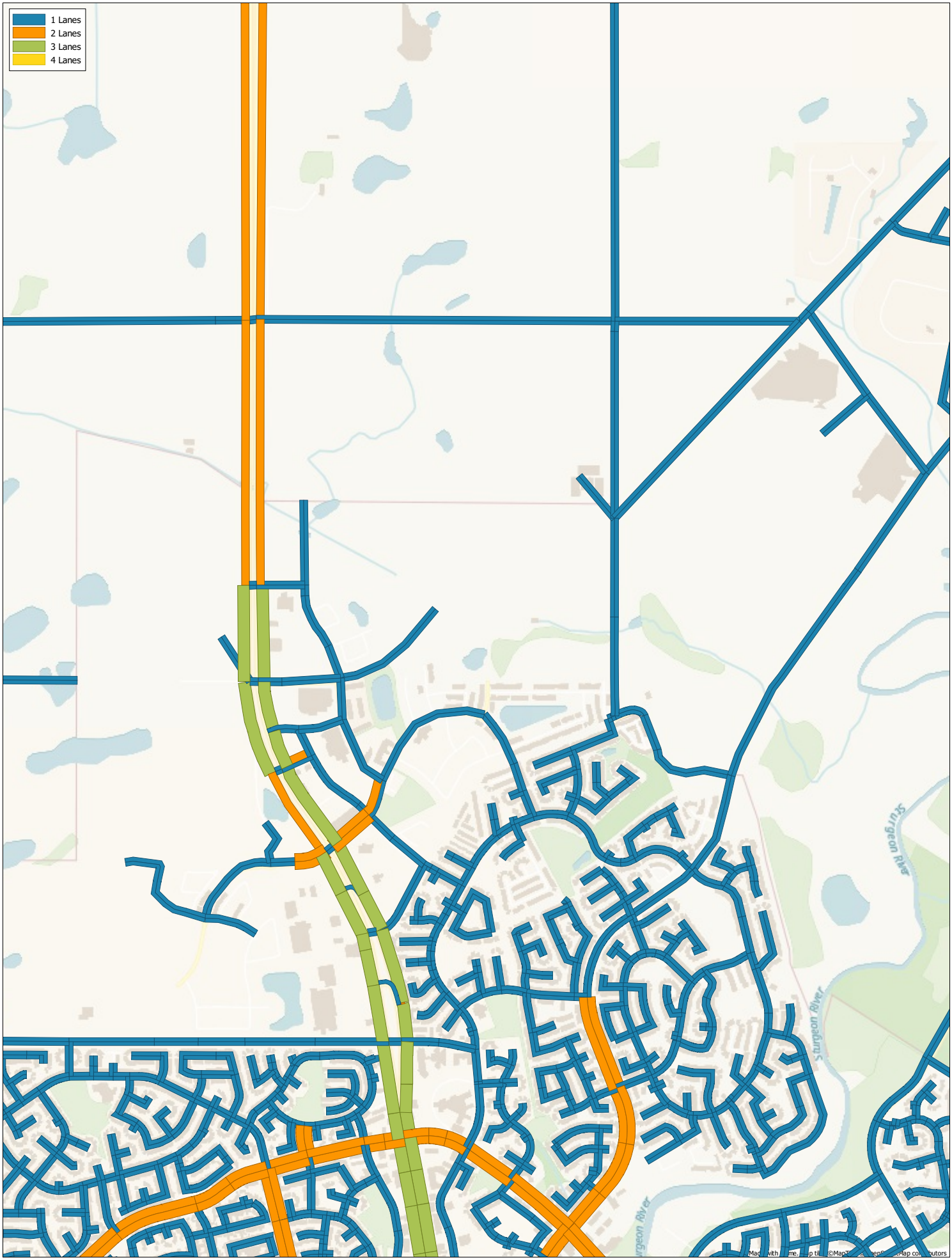
Attachment A – Intersection ID Numbers

Intersection IDs

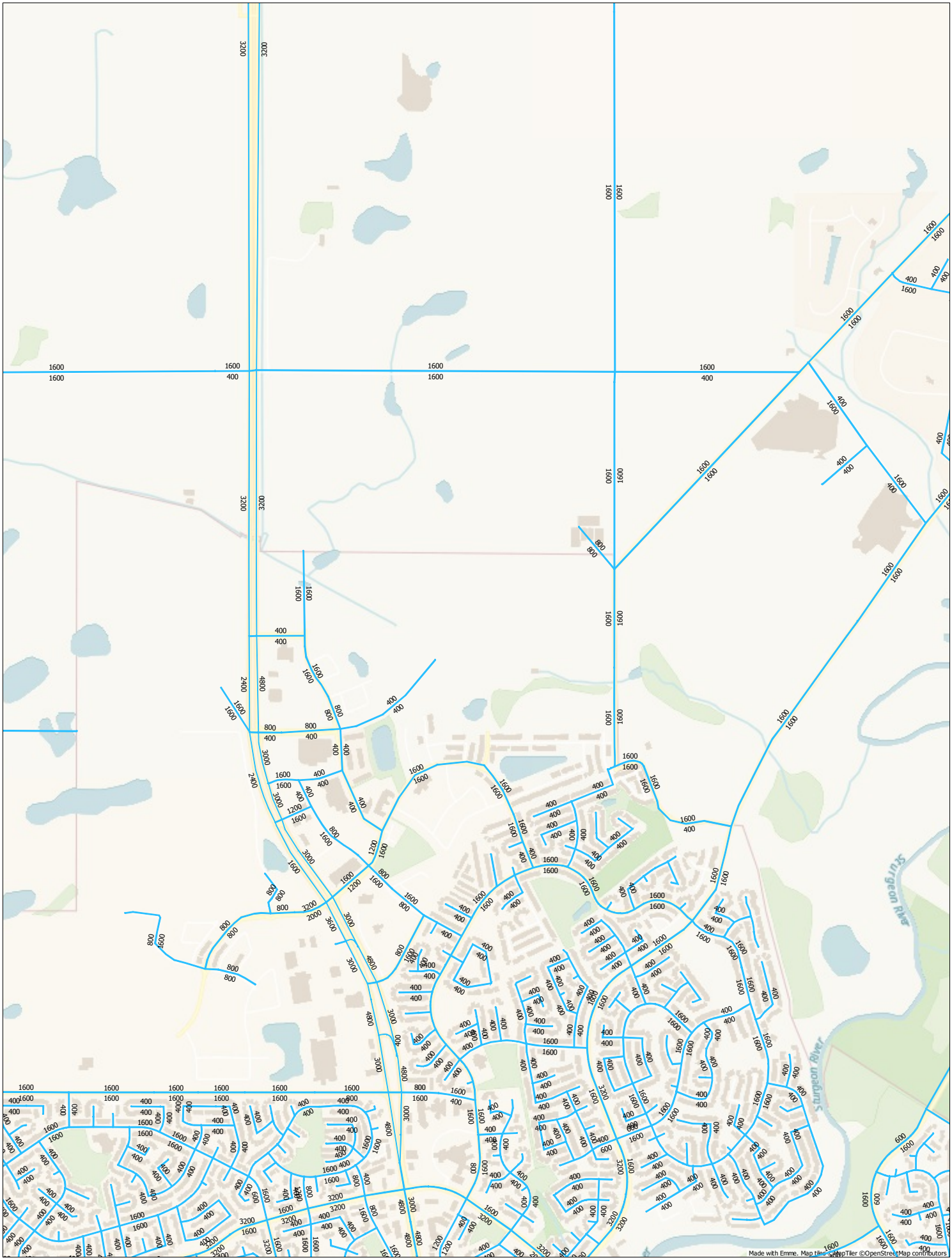


Attachment B – 2020 EMME Outputs

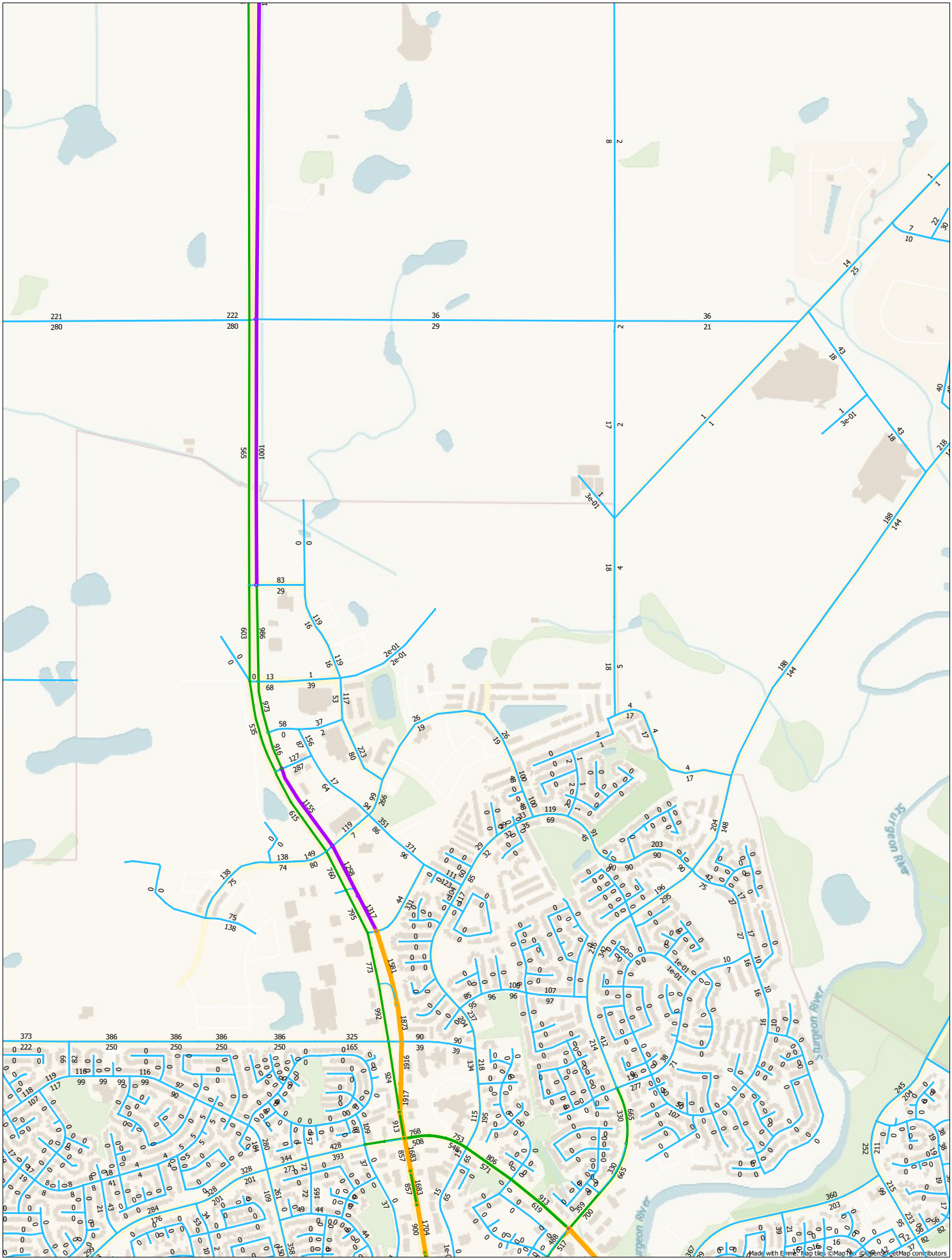
2020 - Lanes Colored

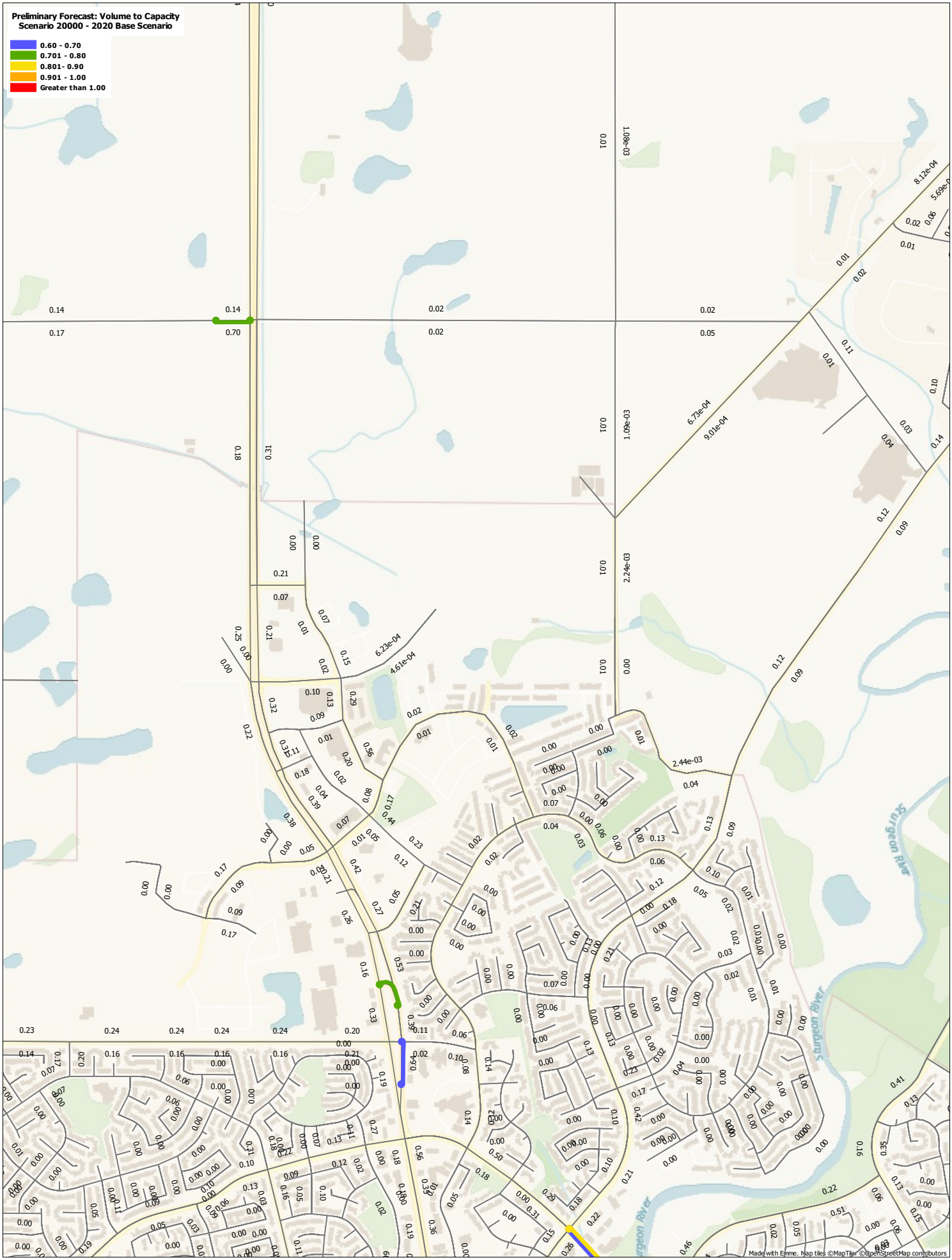


2020 - Link Capacity



2020 - Link Volumes

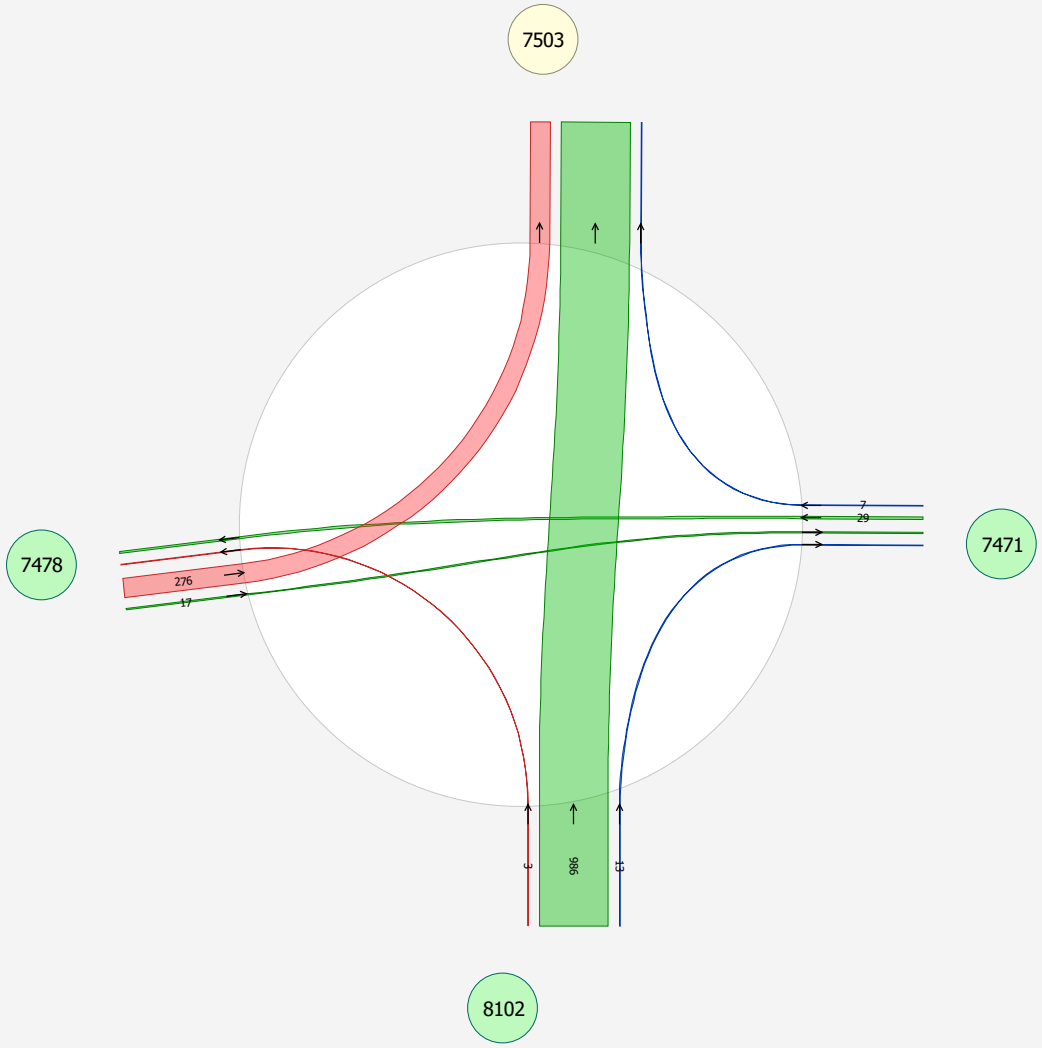



Preliminary Forecast: Volume to Capacity
Scenario 20000 - 2020 Base Scenario
0.60 - 0.70
0.701 - 0.80
0.801- 0.90
0.901 - 1.00
Greater than 1.00
Sturgeon River
Made with Emme. Map tiles ©MapTiler ©OpenStreetMap contributors

SAT and Township Road 544 - east side

Intersection node 7470:

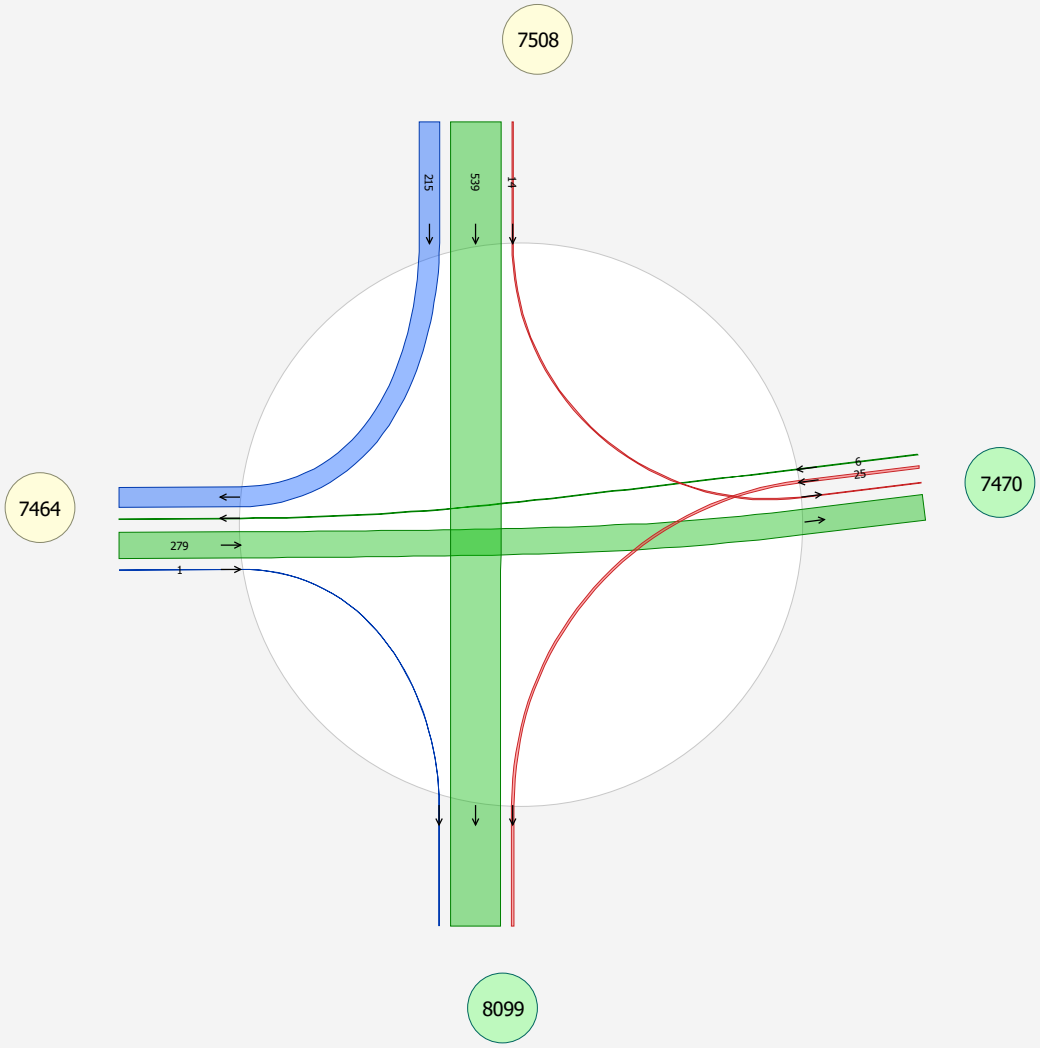
from:	to:	volau	volad
7471	7478:	29	0
7471	7503:	7	0
7478	7471:	17	0
7478	7503:	276	0
8102	7471:	13	0
8102	7478:	3	0
8102	7503:	986	0



SAT and Township Road 544 - west side

Intersection node 7478:

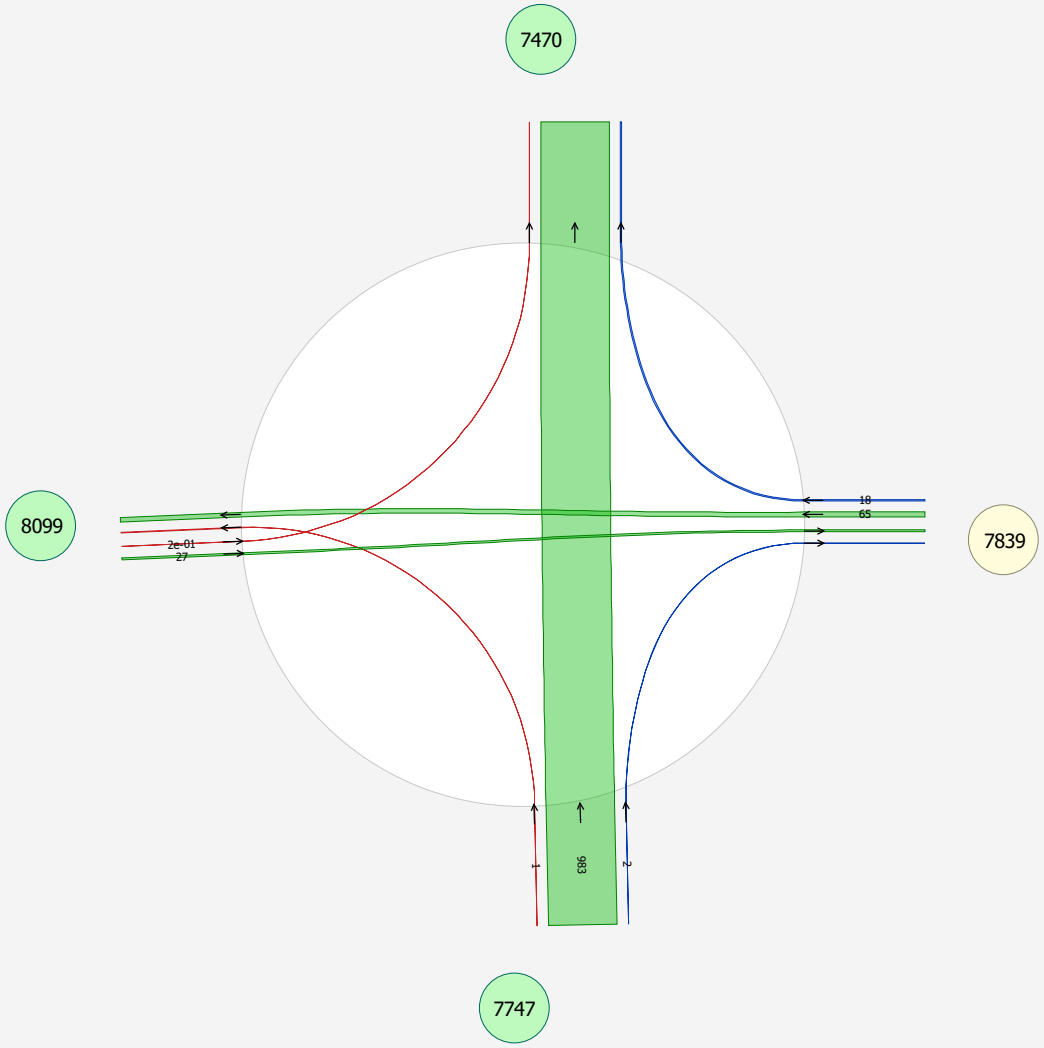
from:	to:	volau	volad
7464	7470:	279	0
7464	8099:	1	0
7470	7464:	6	0
7470	8099:	25	0
7508	7464:	215	0
7508	7470:	14	0
7508	8099:	539	0



SAT and Ernest Blvd - east side

Intersection node 8102:

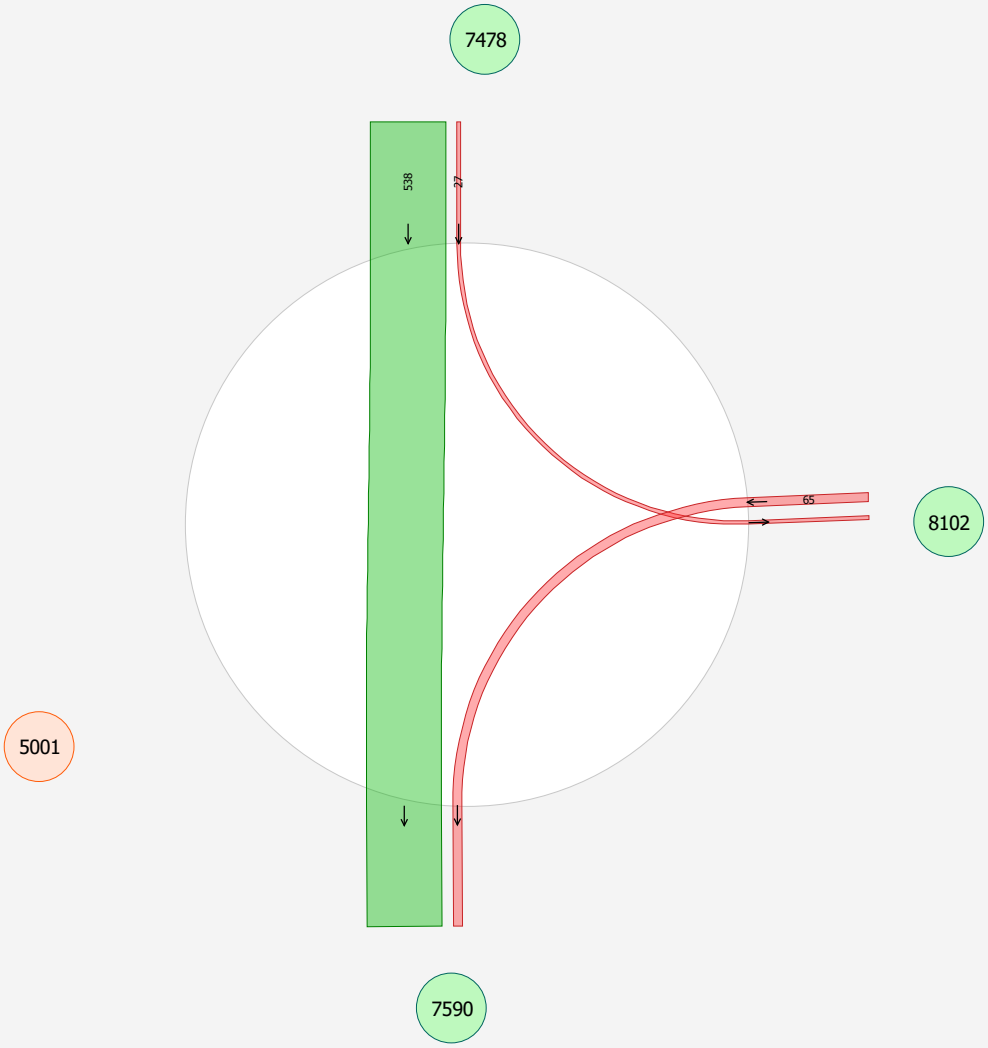
from:	to:	volau	volad
7747	7470:	983	0
7747	7839:	2	0
7747	8099:	1	0
7839	7470:	18	0
7839	8099:	65	0
8099	7470:	0	0
8099	7839:	27	0



SAT and Ernest Blvd - west side

Intersection node 8099:

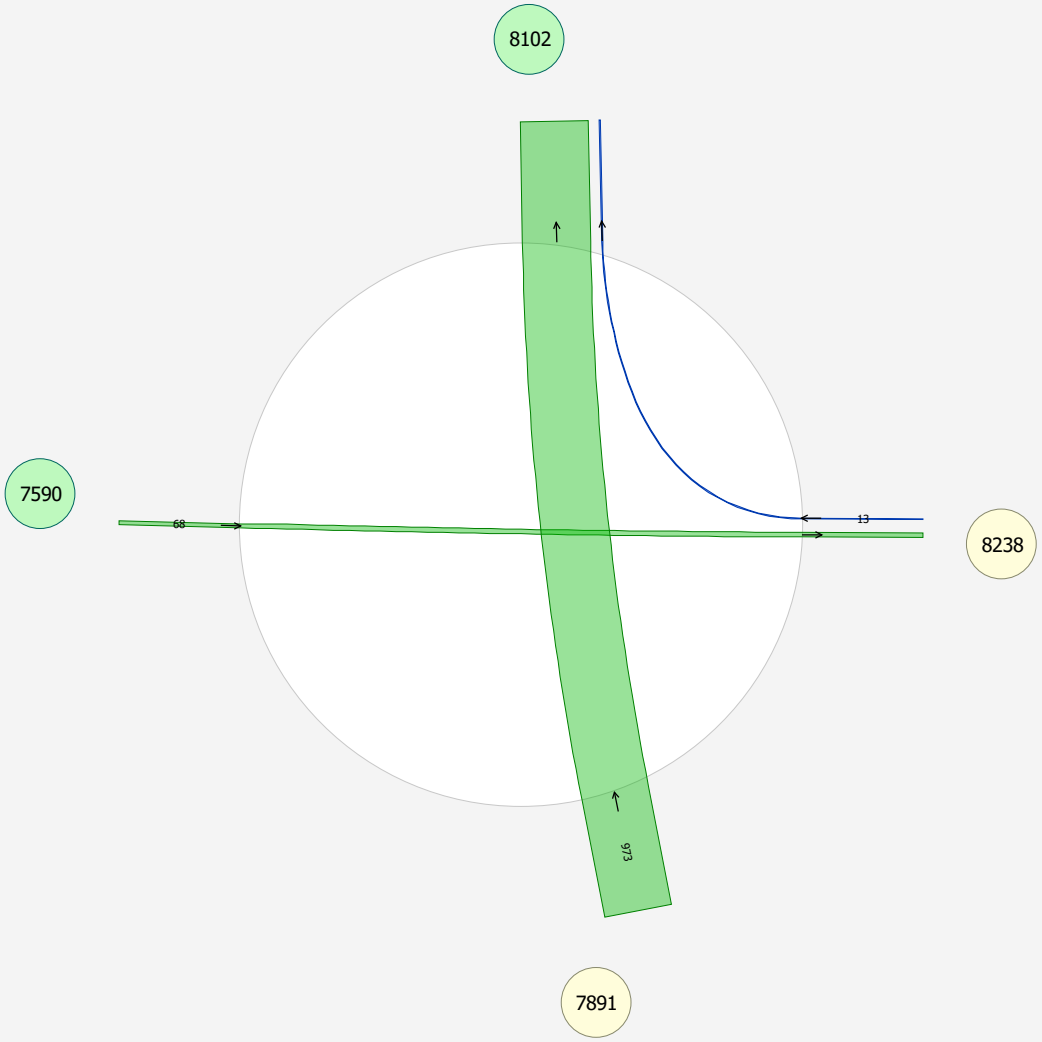
from:	to:	volau	volad
5001	7590:	1	0
5001	8102:	0	0
7478	5001:	1	0
7478	7590:	538	0
7478	8102:	27	0
8102	5001:	1	0
8102	7590:	65	0



SAT and Neil Ross Road - east side

Intersection node 7747:

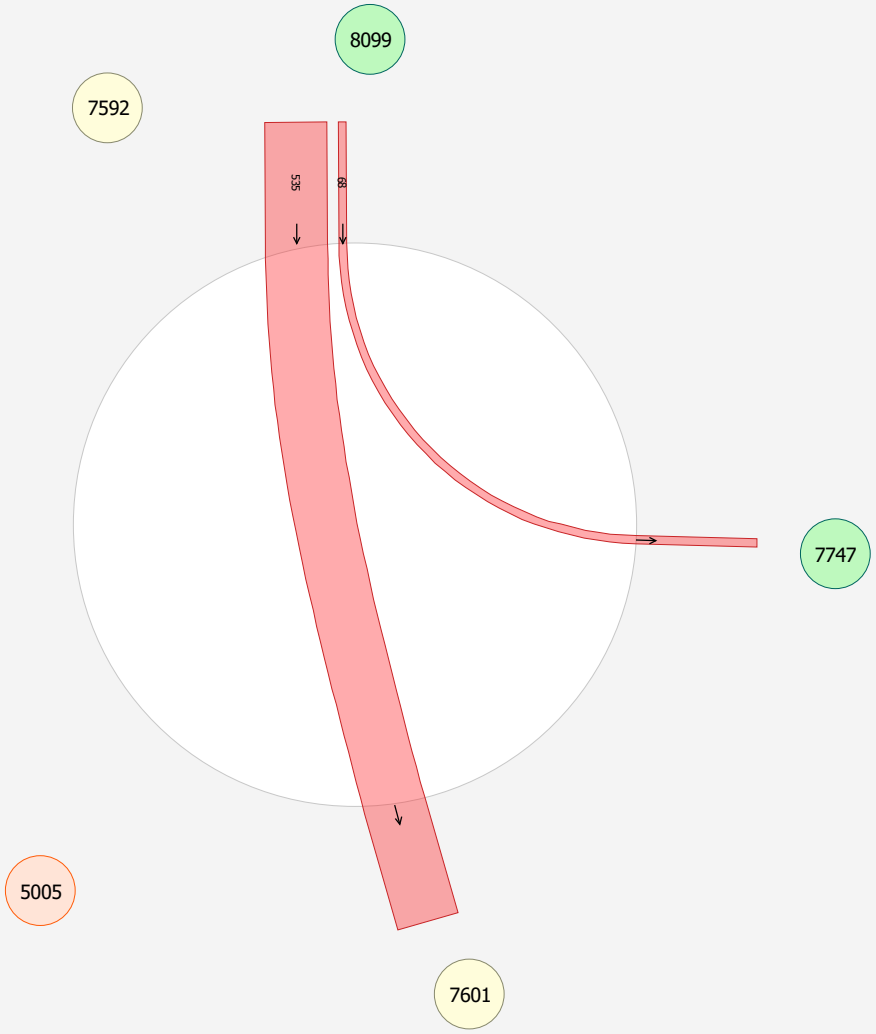
from:	to:	volau	volad
7590	8238:	68	0
7891	8102:	973	0
8238	8102:	13	0



SAT and Neil Ross Road - west side

Intersection node 7590:

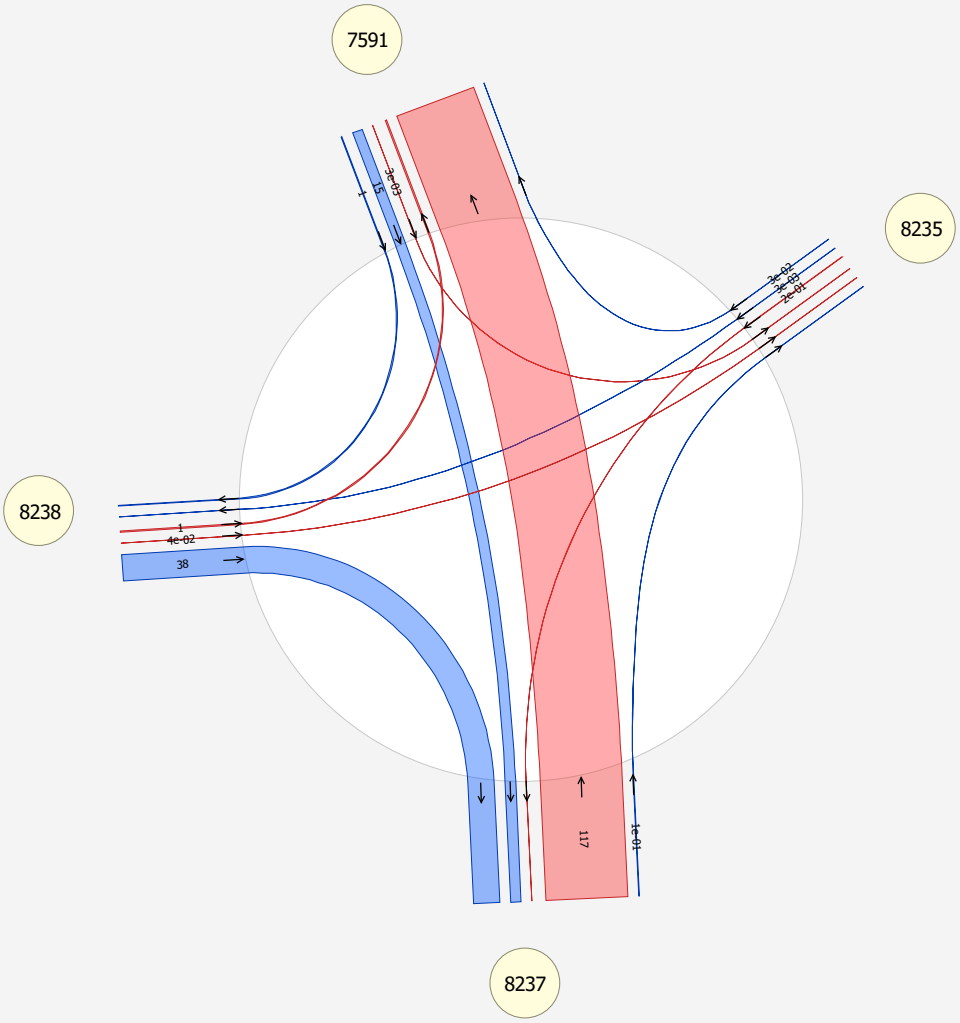
from:	to:	volau	volad
8099	7601:	535	0
8099	7747:	68	0



Neil Ross Road and Element Drive

Intersection node 8236:

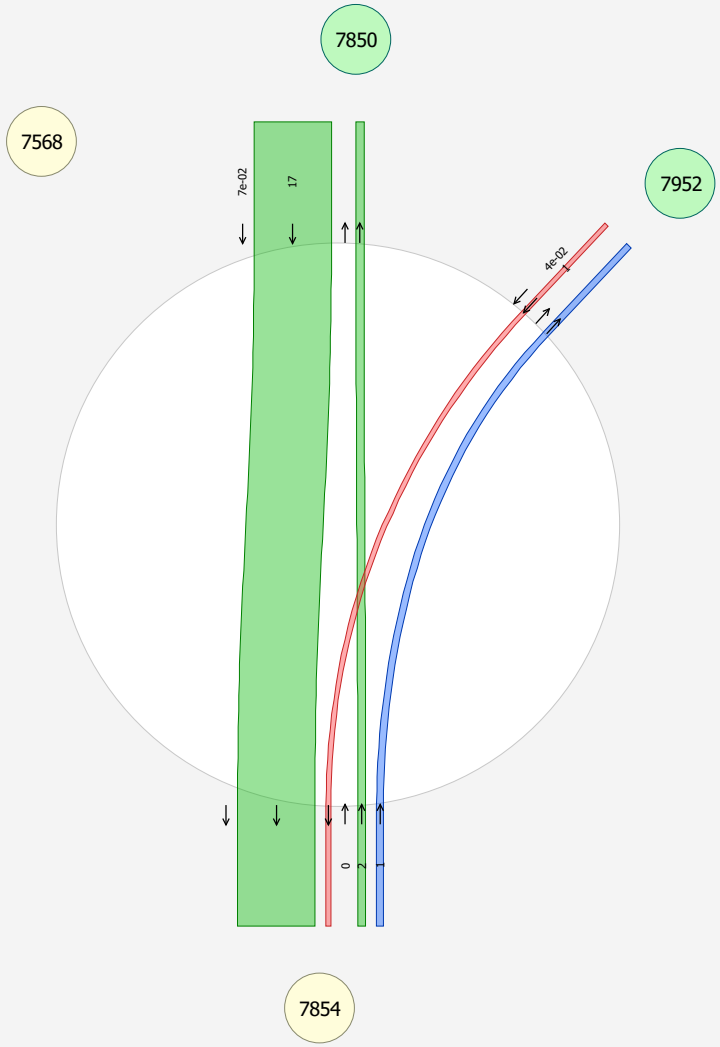
from:	to:	volau	volad
7591	8235:	0	0
7591	8237:	15	0
7591	8238:	1	0
8235	7591:	0	0
8235	8237:	0	0
8235	8238:	0	0
8237	7591:	117	0
8237	8235:	0	0
8238	7591:	1	0
8238	8235:	0	0
8238	8237:	38	0



Old Coal Mine Rd and Range Road 253

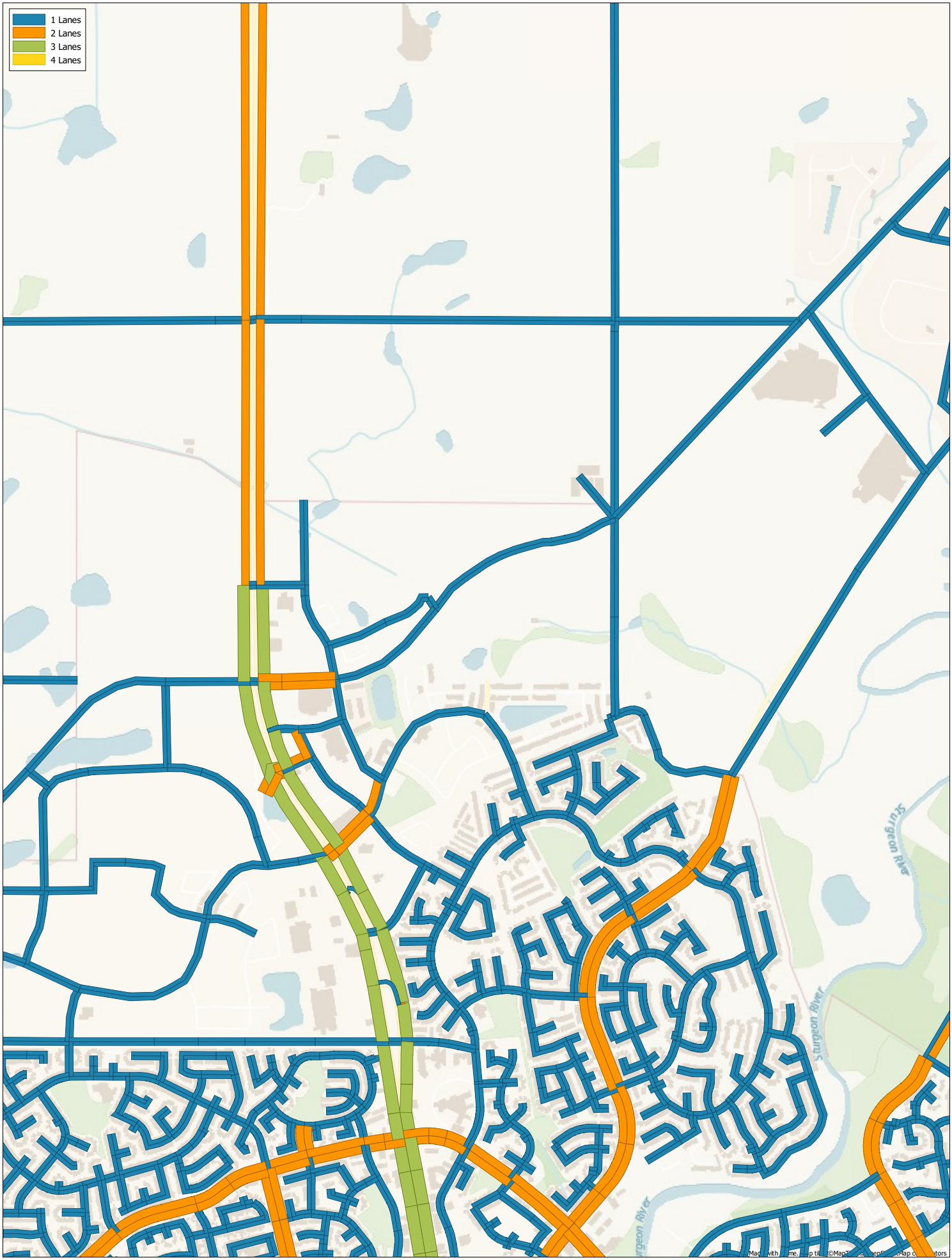
Intersection node 7543:

from:	to:	volau	volad
7568	7850:	0	0
7568	7854:	0	0
7568	7952:	0	0
7850	7568:	0	0
7850	7854:	17	0
7854	7568:	0	0
7854	7850:	2	0
7854	7952:	1	0
7952	7568:	0	0
7952	7854:	1	0

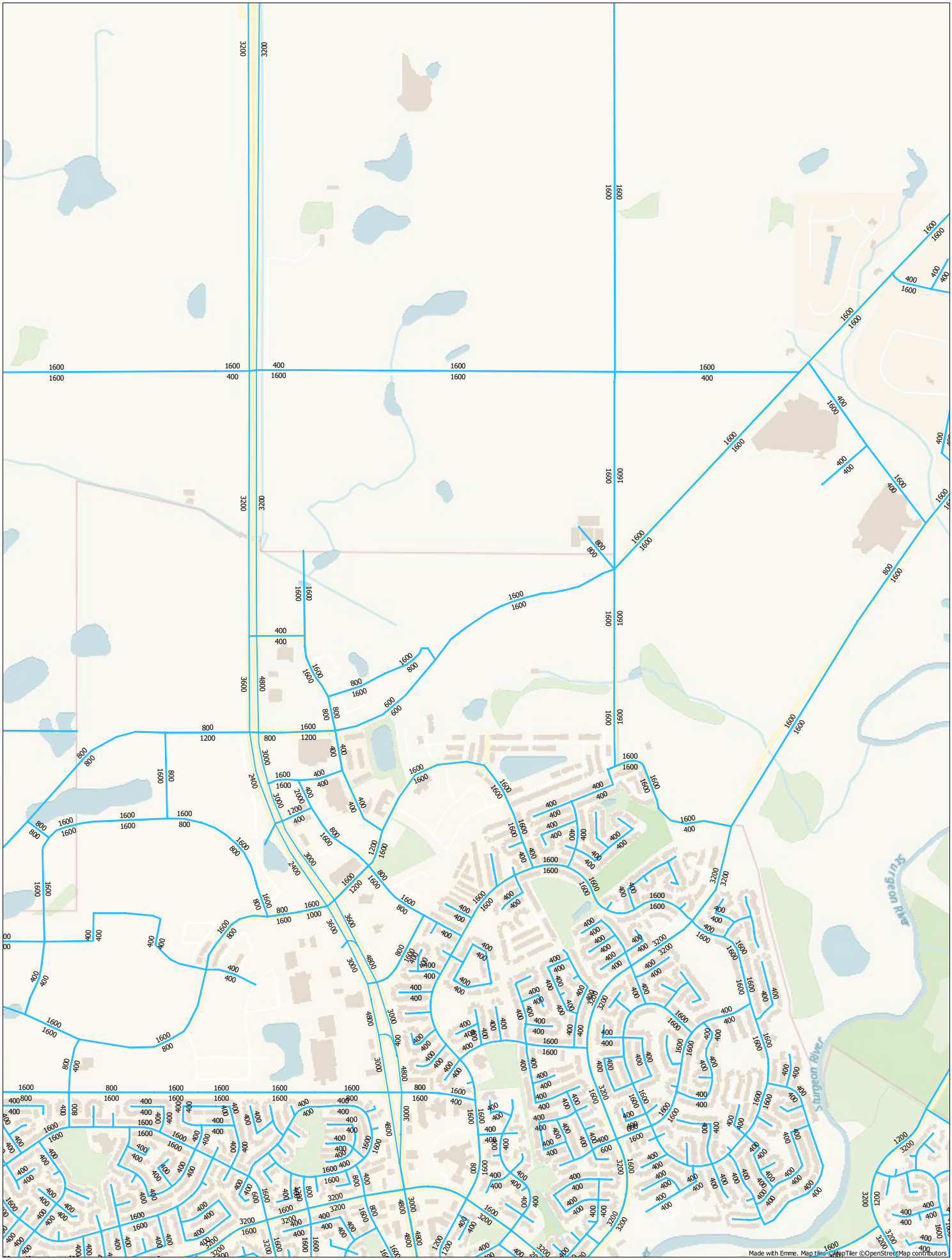


Attachment C – 2030 EMME Outputs

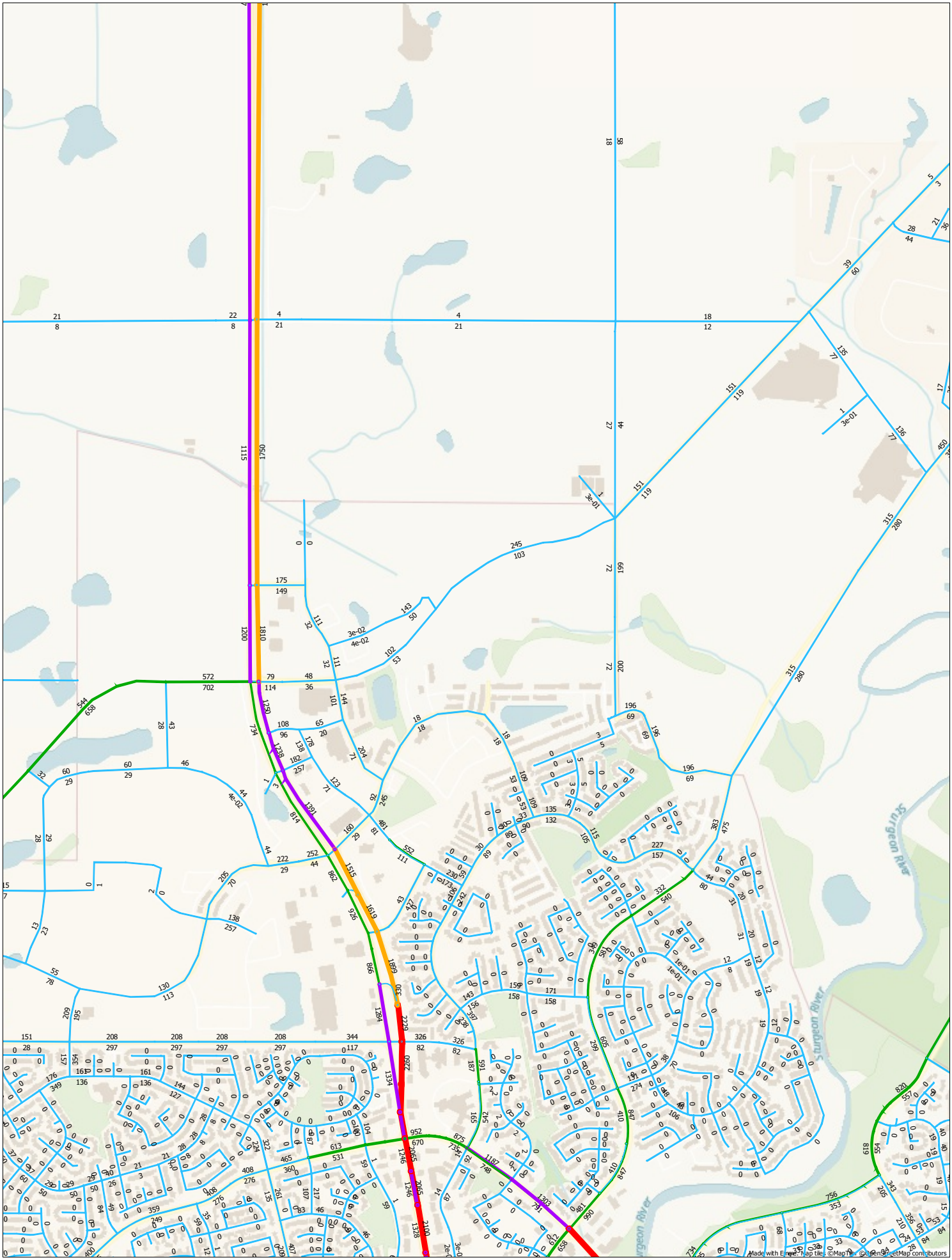
2030 - Lanes Colored

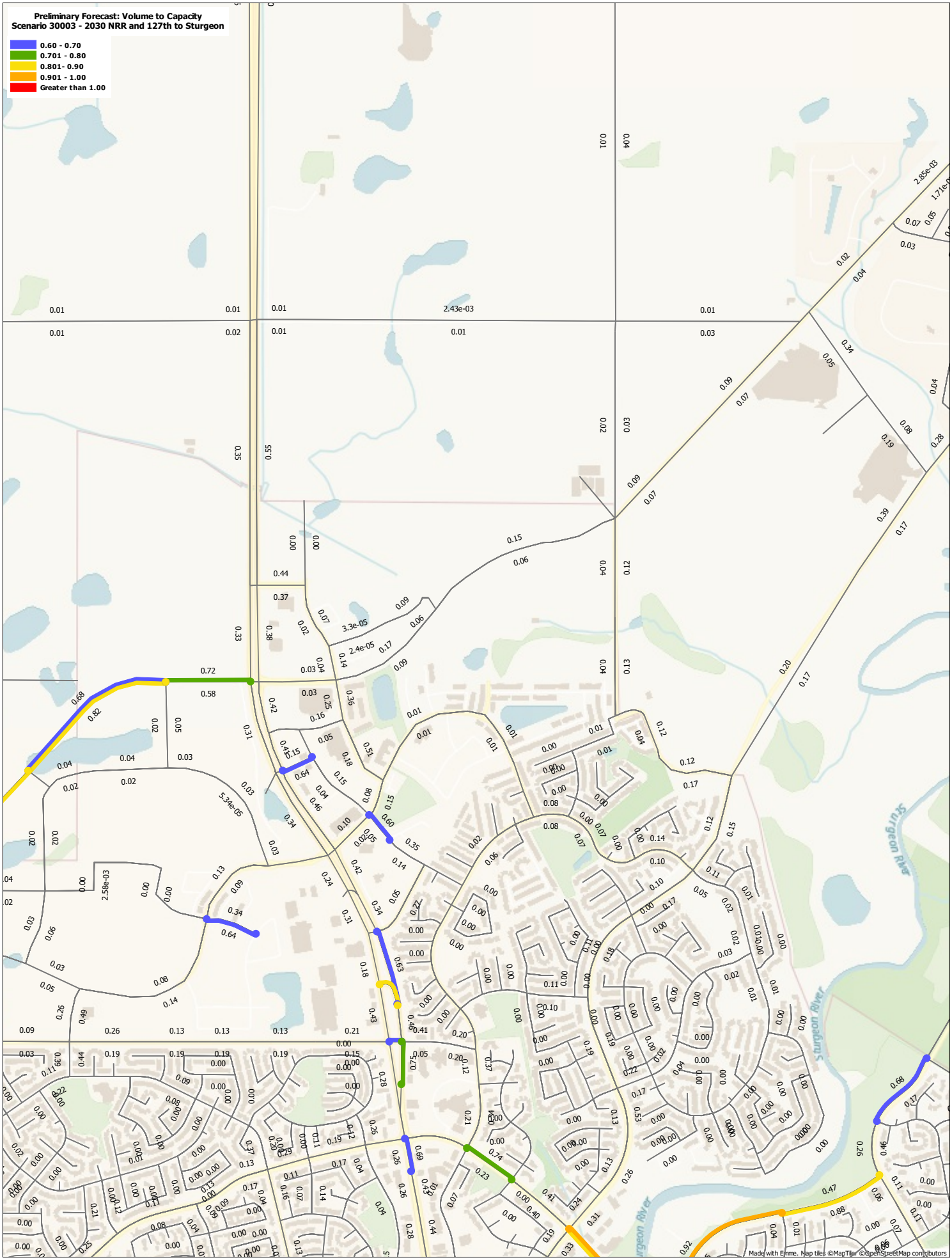


2030 - Link Capacity



2030 - Link Volumes

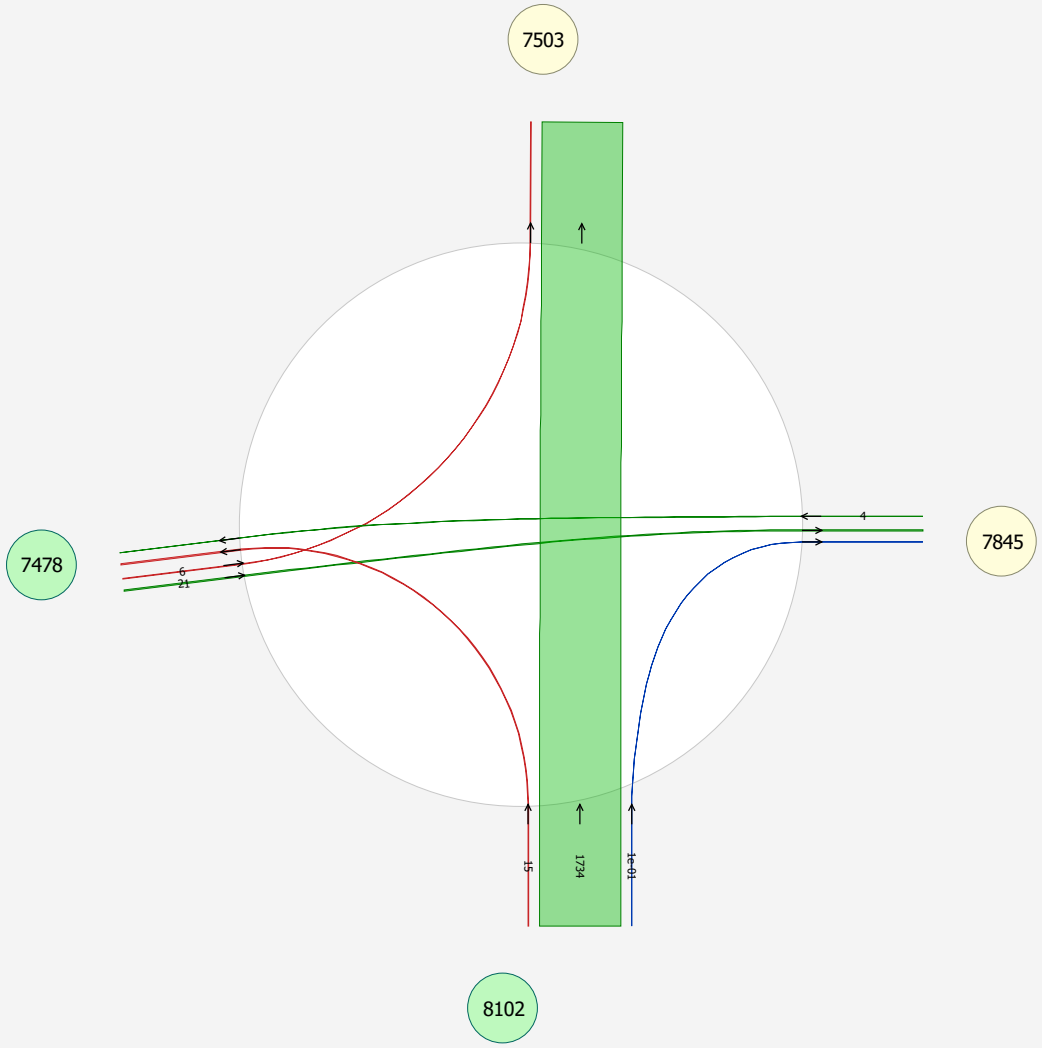



Preliminary Forecast: Volume to Capacity
Scenario 30003 - 2030 NRR and 127th to Sturgeon
0.60 - 0.70
0.701 - 0.80
0.801- 0.90
0.901 - 1.00
Greater than 1.00
Sturgeon River
Made with Esmme. Map tiles ©MapTiler ©OpenStreetMap contributors

SAT and Township Road 544 - east side

Intersection node 7470:

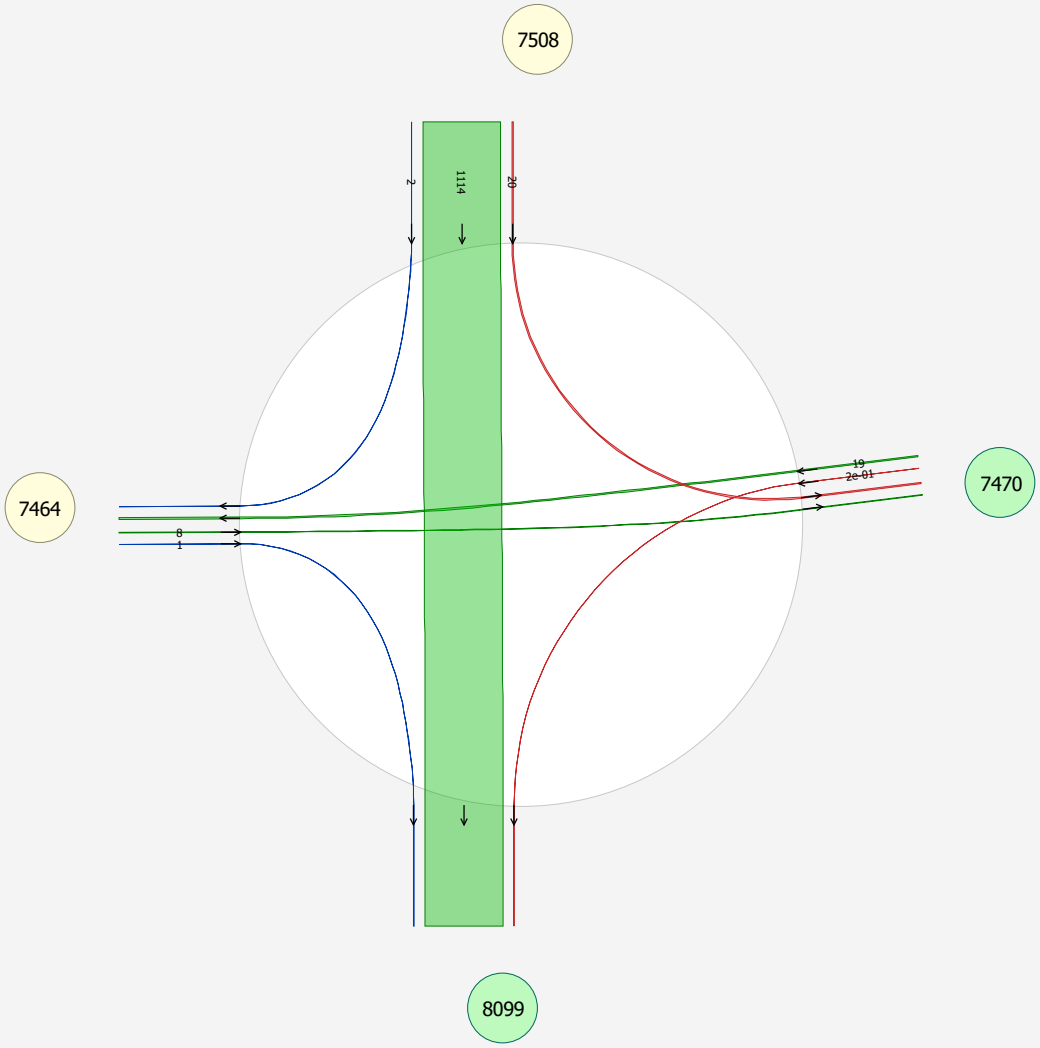
from:	to:	volau	volad
7478	7503:	6	0
7478	7845:	21	0
7845	7478:	4	0
8102	7478:	15	0
8102	7503:	1734	0
8102	7845:	0	0



SAT and Township Road 544 - west side

Intersection node 7478:

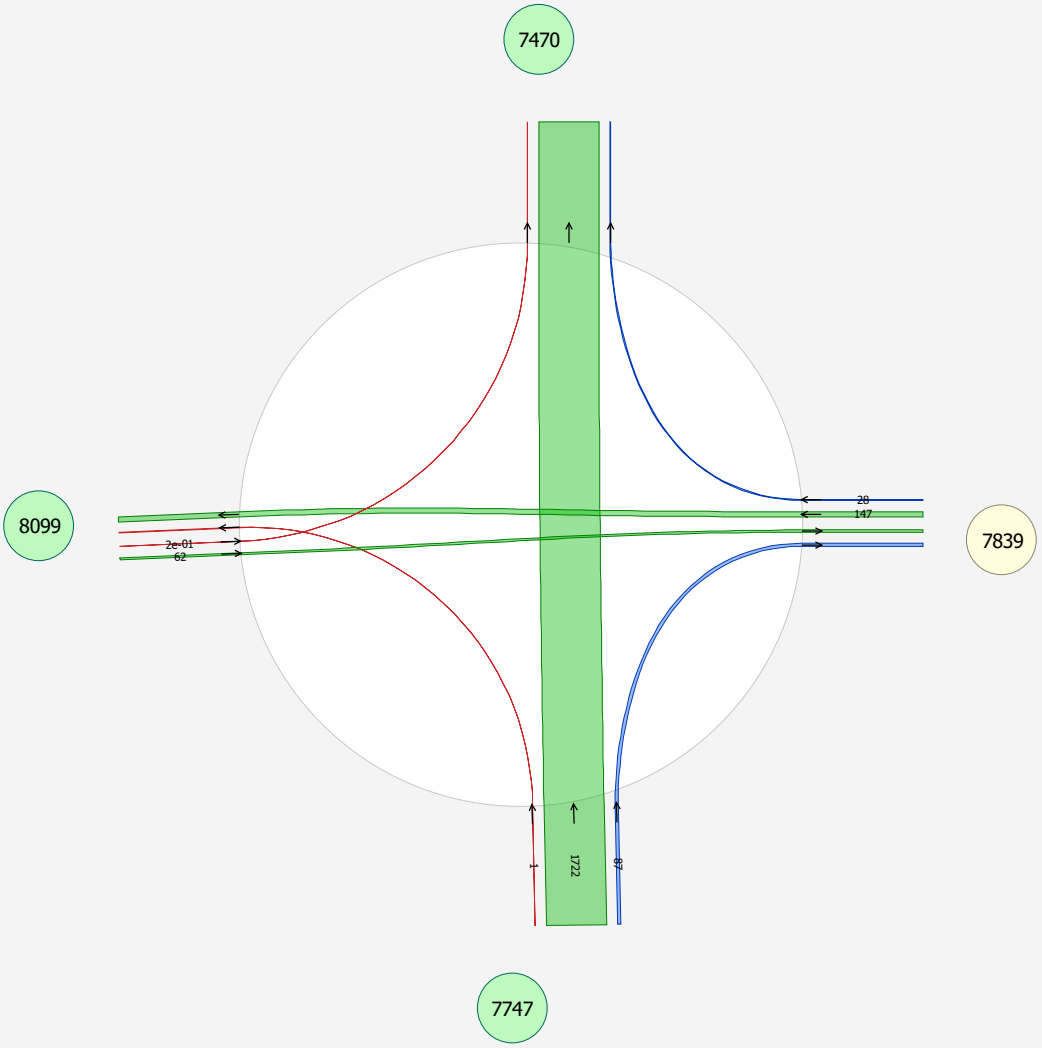
from:	to:	volau	volad
7464	7470:	8	0
7464	8099:	1	0
7470	7464:	19	0
7470	8099:	0	0
7508	7464:	2	0
7508	7470:	20	0
7508	8099:	1114	0



SAT and Ernest Blvd - east side

Intersection node 8102:

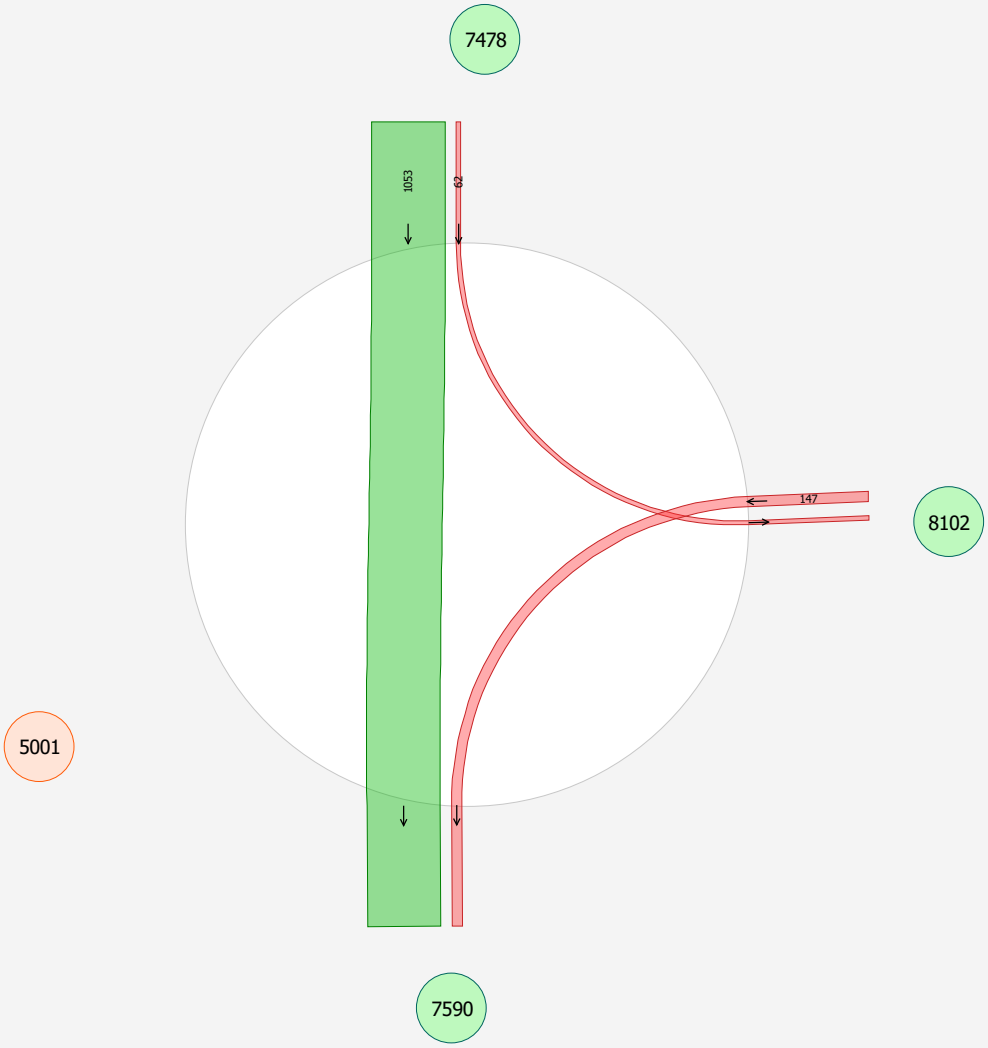
from:	to:	volau	volad
7747	7470:	1722	0
7747	7839:	87	0
7747	8099:	1	0
7839	7470:	28	0
7839	8099:	147	0
8099	7470:	0	0
8099	7839:	62	0



SAT and Ernest Blvd - west side

Intersection node 8099:

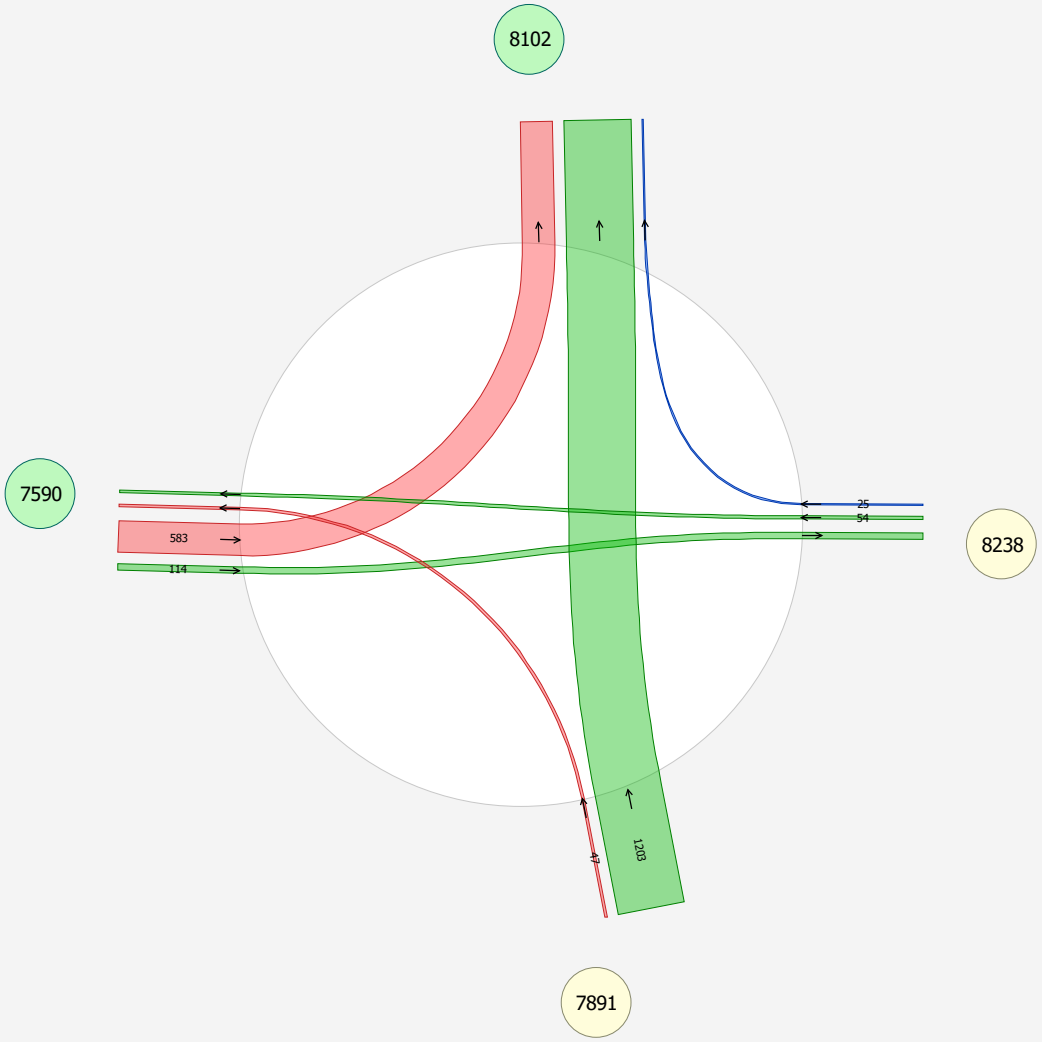
from:	to:	volau	volad
5001	7590:	1	0
5001	8102:	0	0
7478	5001:	0	0
7478	7590:	1053	0
7478	8102:	62	0
8102	5001:	1	0
8102	7590:	147	0



SAT and Neil Ross Road - east side

Intersection node 7747:

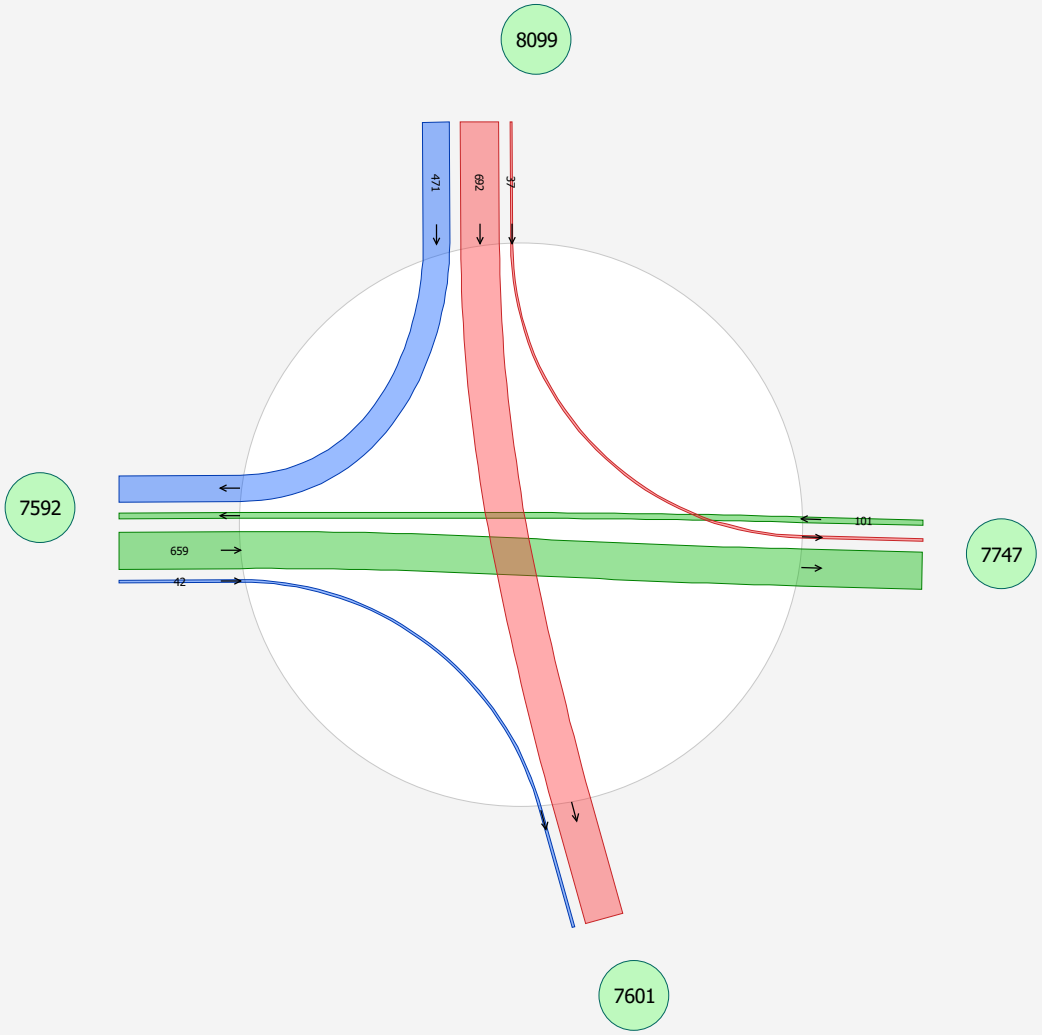
from:	to:	volau	volad
7590	8102:	583	0
7590	8238:	114	0
7891	7590:	47	0
7891	8102:	1203	0
8238	7590:	54	0
8238	7590:	25	0



SAT and Neil Ross Road - west side

Intersection node 7590:

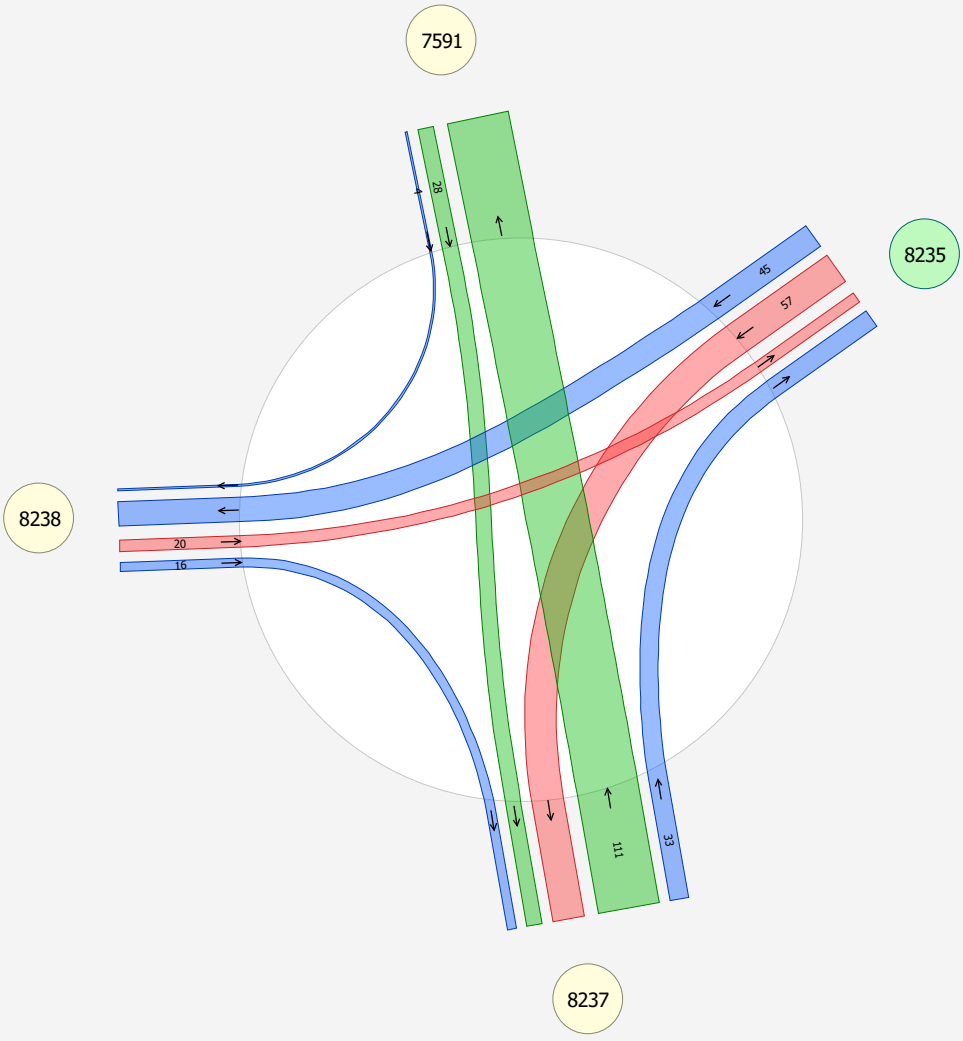
from:	to:	volau	volad
7592	7601:	42	0
7592	7747:	659	0
7747	7592:	101	0
8099	7592:	471	0
8099	7601:	692	0
8099	7747:	37	0



Neil Ross Road and Element Drive

Intersection node 8236:

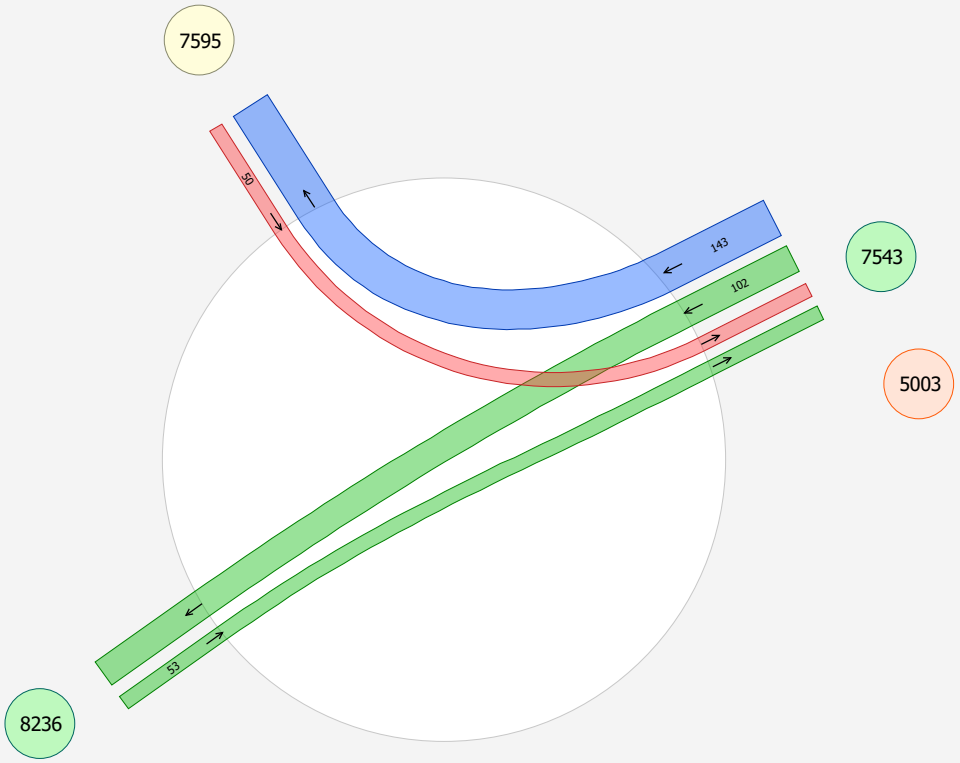
from:	to:	volau	volad
7591	8237:	28	0
7591	8238:	4	0
8235	8237:	57	0
8235	8238:	45	0
8237	7591:	111	0
8237	8235:	33	0
8238	8235:	20	0
8238	8237:	16	0



Neil Ross Road and Edison Crescent

Intersection node 8235:

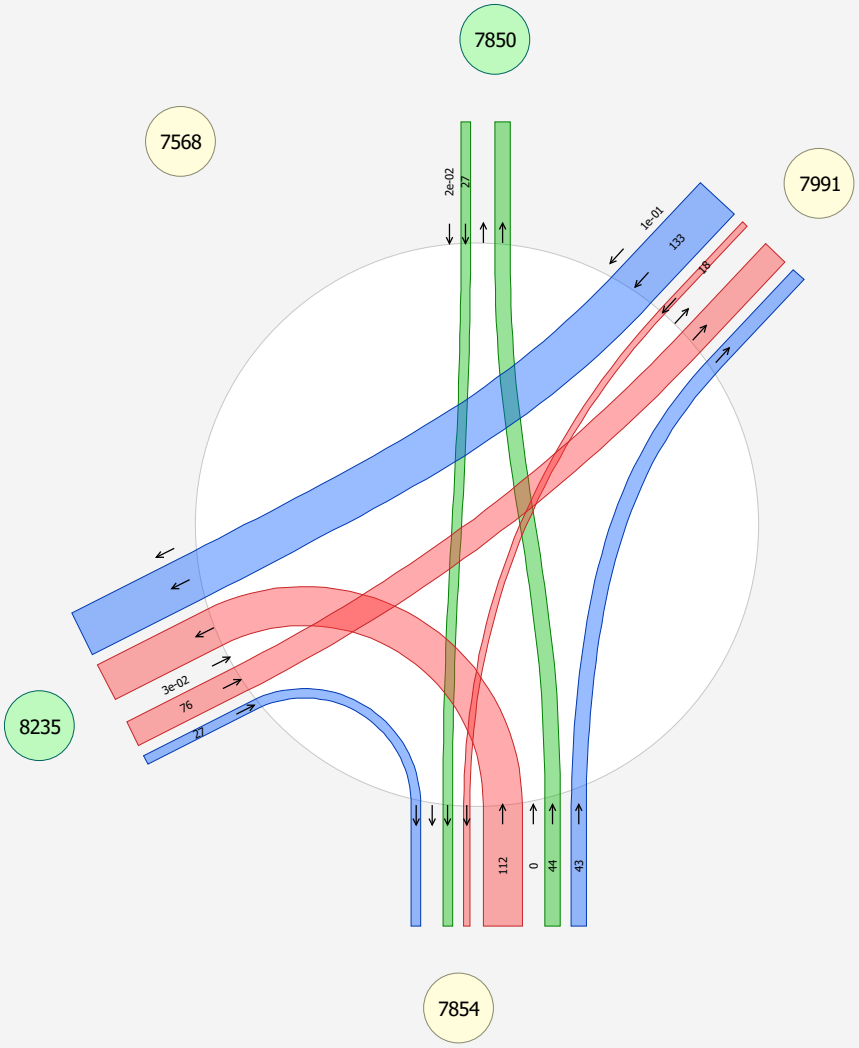
from:	to:	volau	volad
5003	7595:	0	0
5003	8236:	0	0
7543	7595:	143	0
7543	8236:	102	0
7595	5003:	0	0
7595	7543:	50	0
8236	5003:	0	0
8236	7543:	53	0



Neil Ross Road (Old Coal Mine Road) and Range Road 253

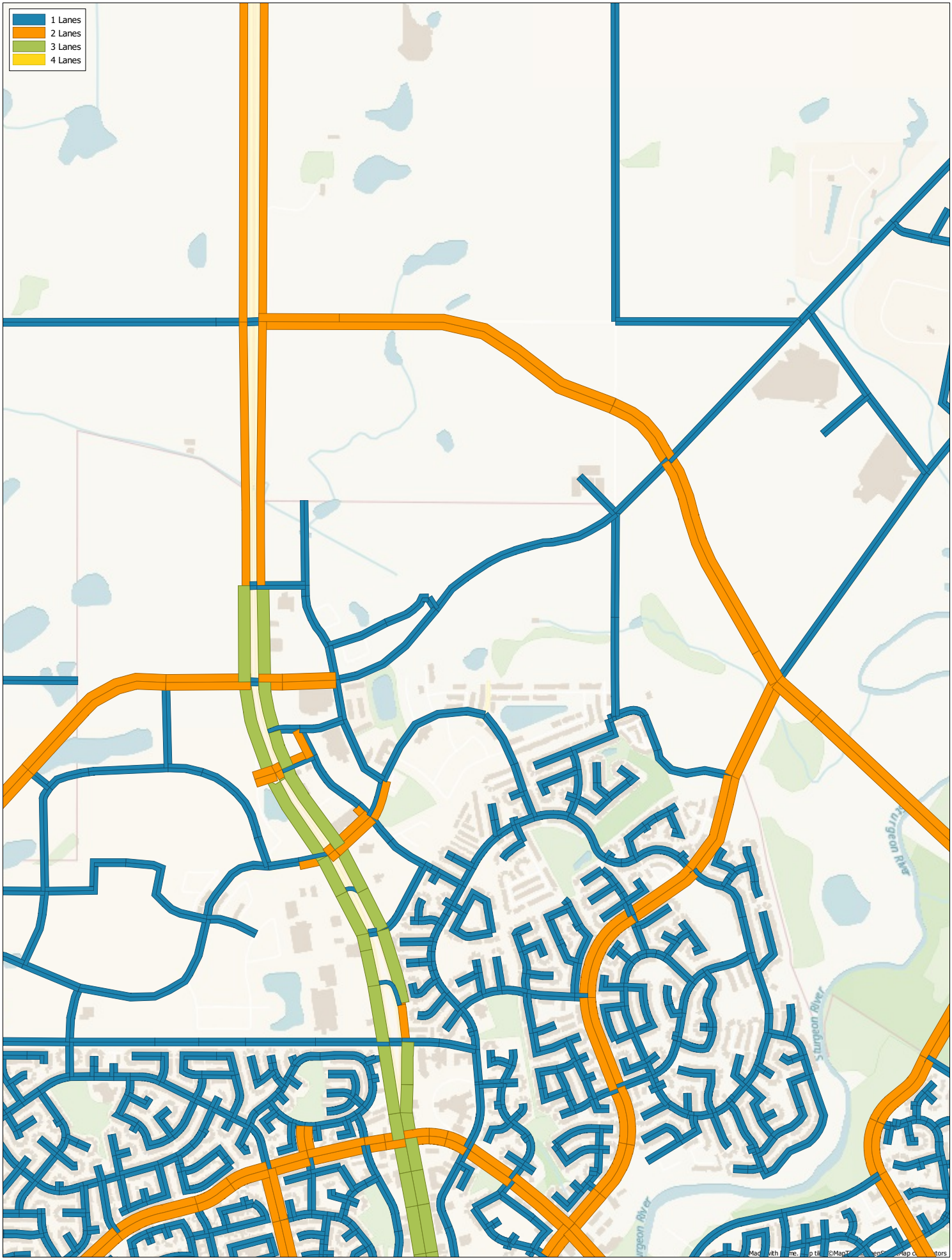
Intersection node 7543:

from:	to:	volau	volad
7568	7850:	0	0
7568	7854:	0	0
7568	7991:	0	0
7568	8235:	0	0
7850	7568:	0	0
7850	7854:	27	0
7854	7568:	0	0
7854	7850:	44	0
7854	7991:	43	0
7854	8235:	112	0
7991	7568:	0	0
7991	7854:	18	0
7991	8235:	133	0
8235	7568:	0	0
8235	7854:	27	0
8235	7991:	76	0

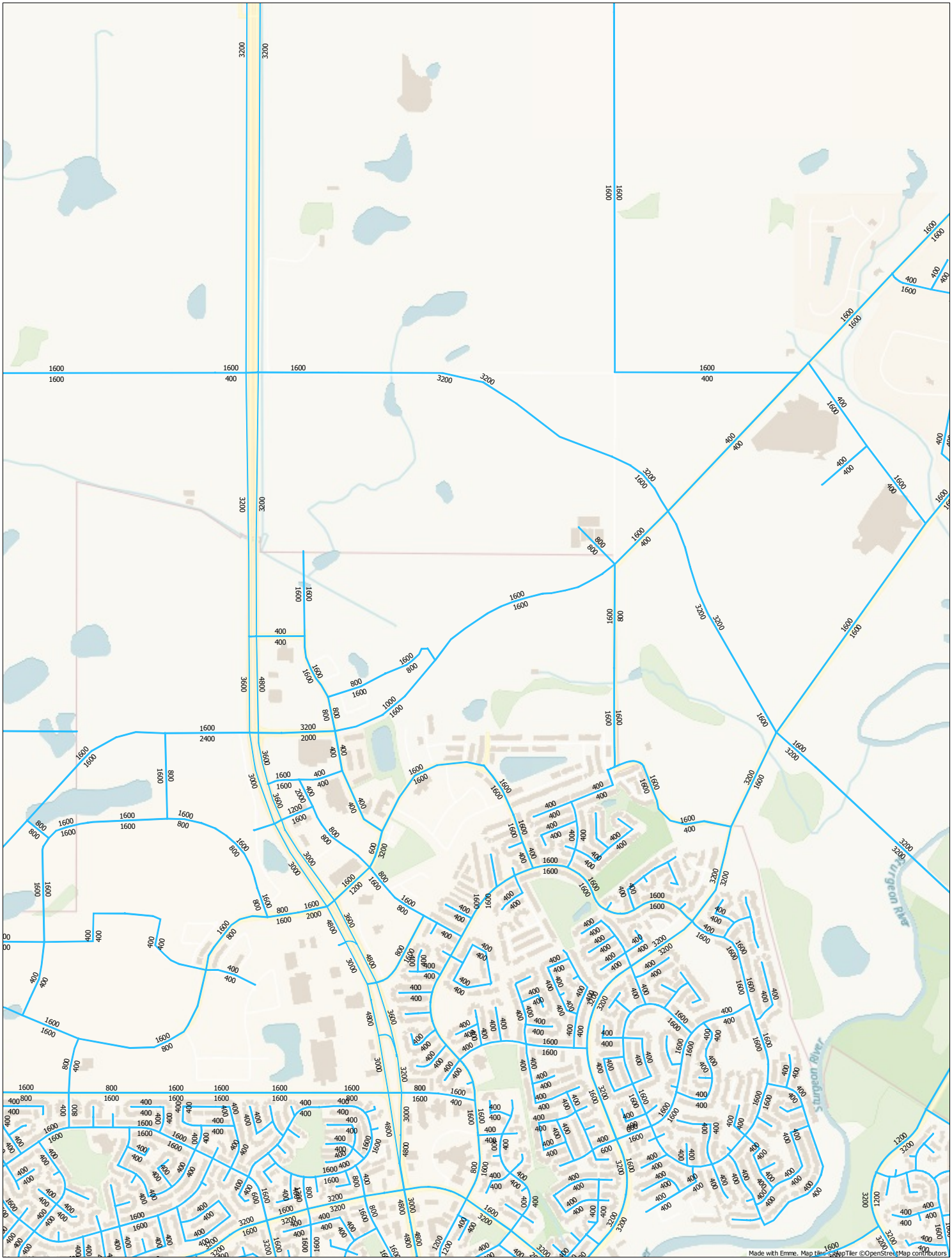


Attachment D – 2045 EMME Outputs

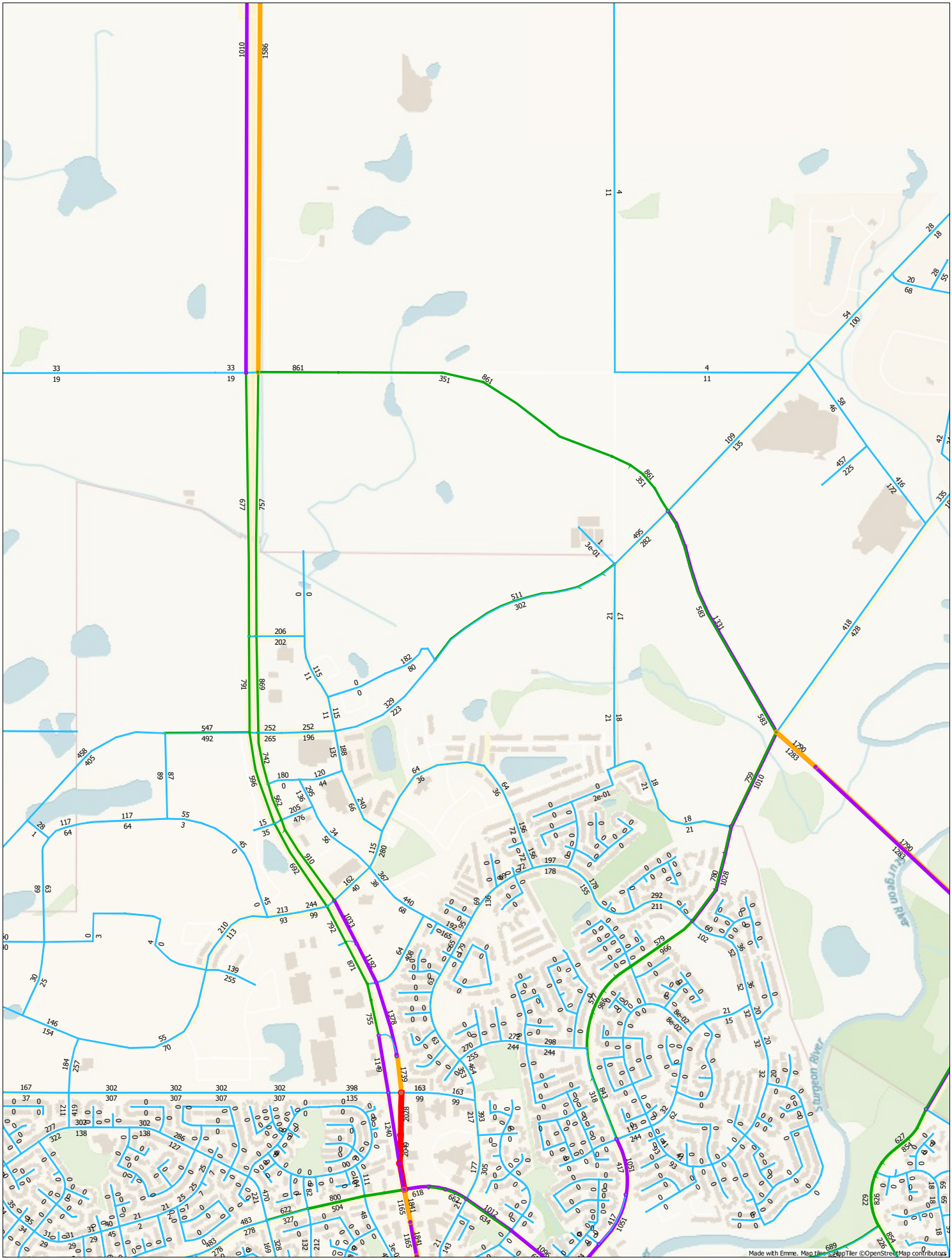
2045 - Lanes Colored

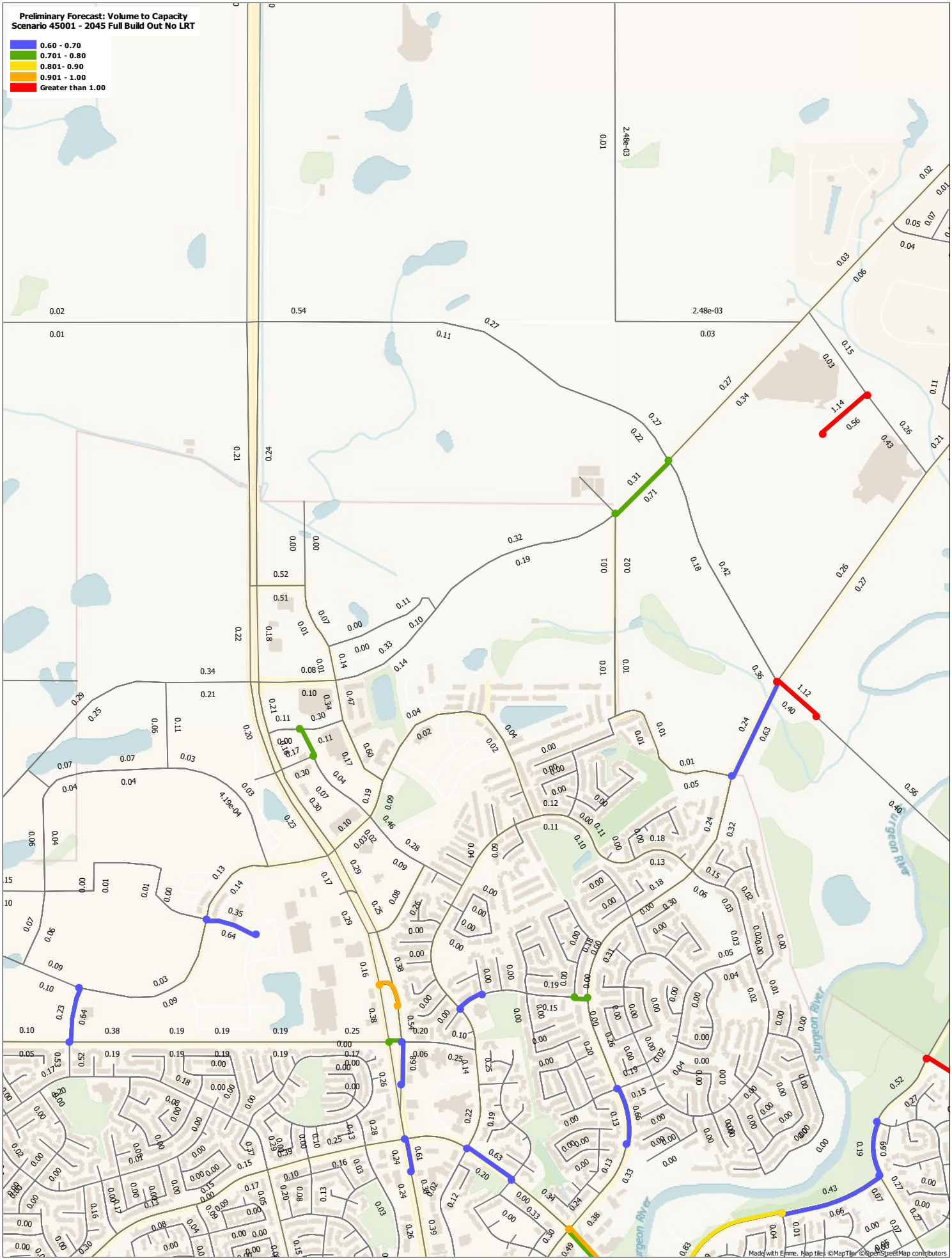


2045 - Link Capacity



2045 - Link Volumes

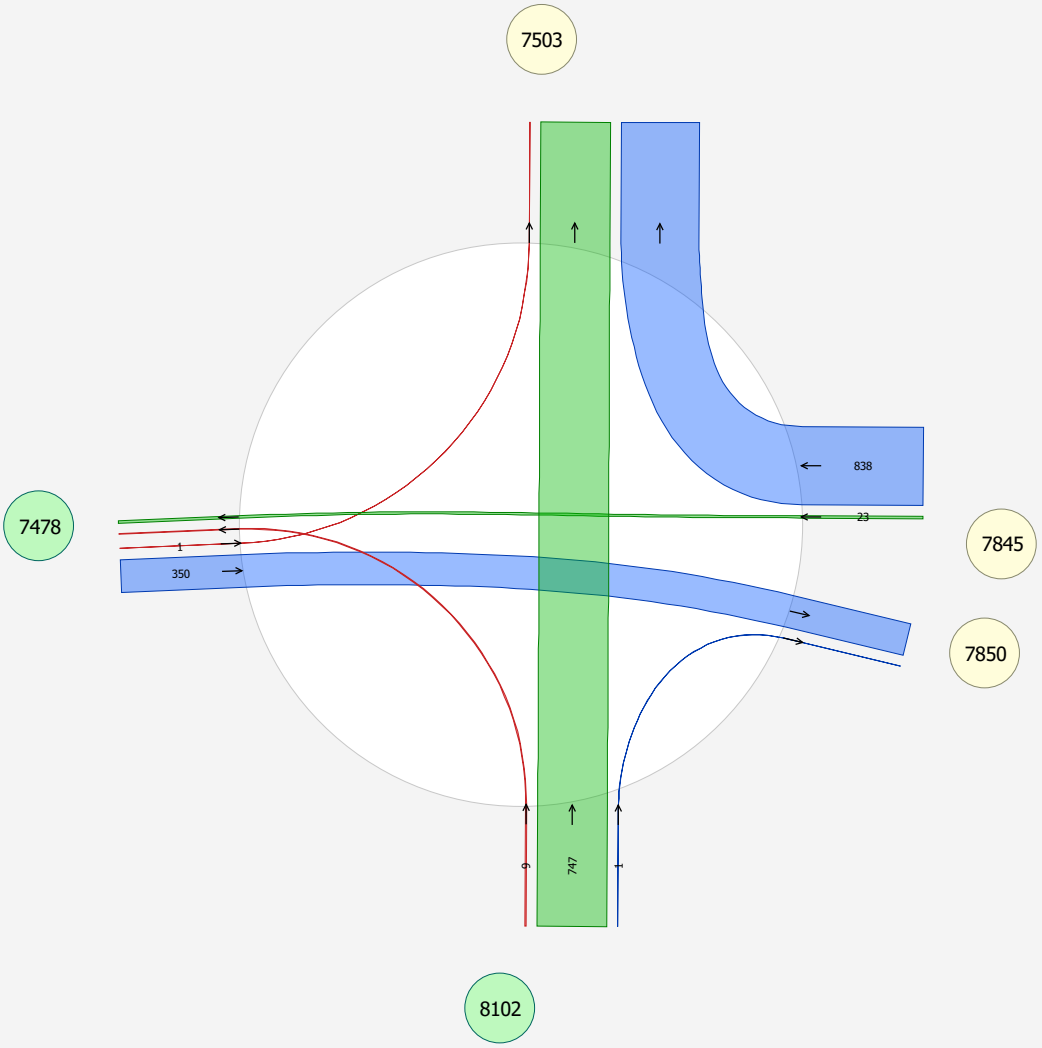



Preliminary Forecast: Volume to Capacity
Scenario 45001 - 2045 Full Build Out No LRT
0.60 - 0.70
0.701 - 0.80
0.801- 0.90
0.901 - 1.00
Greater than 1.00
Sturgeon River
Made with Esmie. Map tiles ©MapTiler ©OpenStreetMap contributors

SAT and 127th Street - east side

Intersection node 7470:

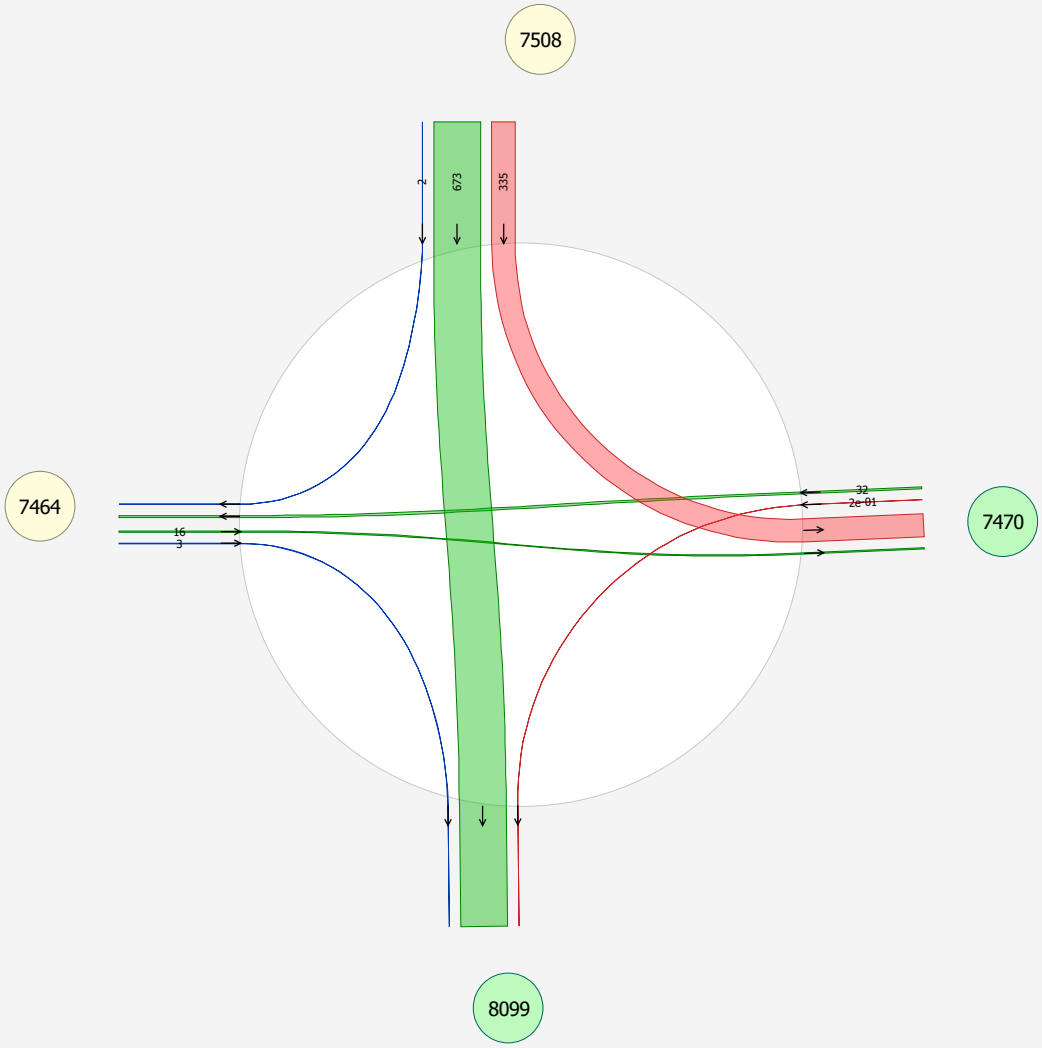
from:	to:	volau	volad
7478	7503:	1	0
7478	7850:	350	0
7845	7478:	23	0
7845	7503:	838	0
8102	7478:	9	0
8102	7503:	747	0
8102	7850:	1	0



SAT and 127th Street - west side

Intersection node 7478:

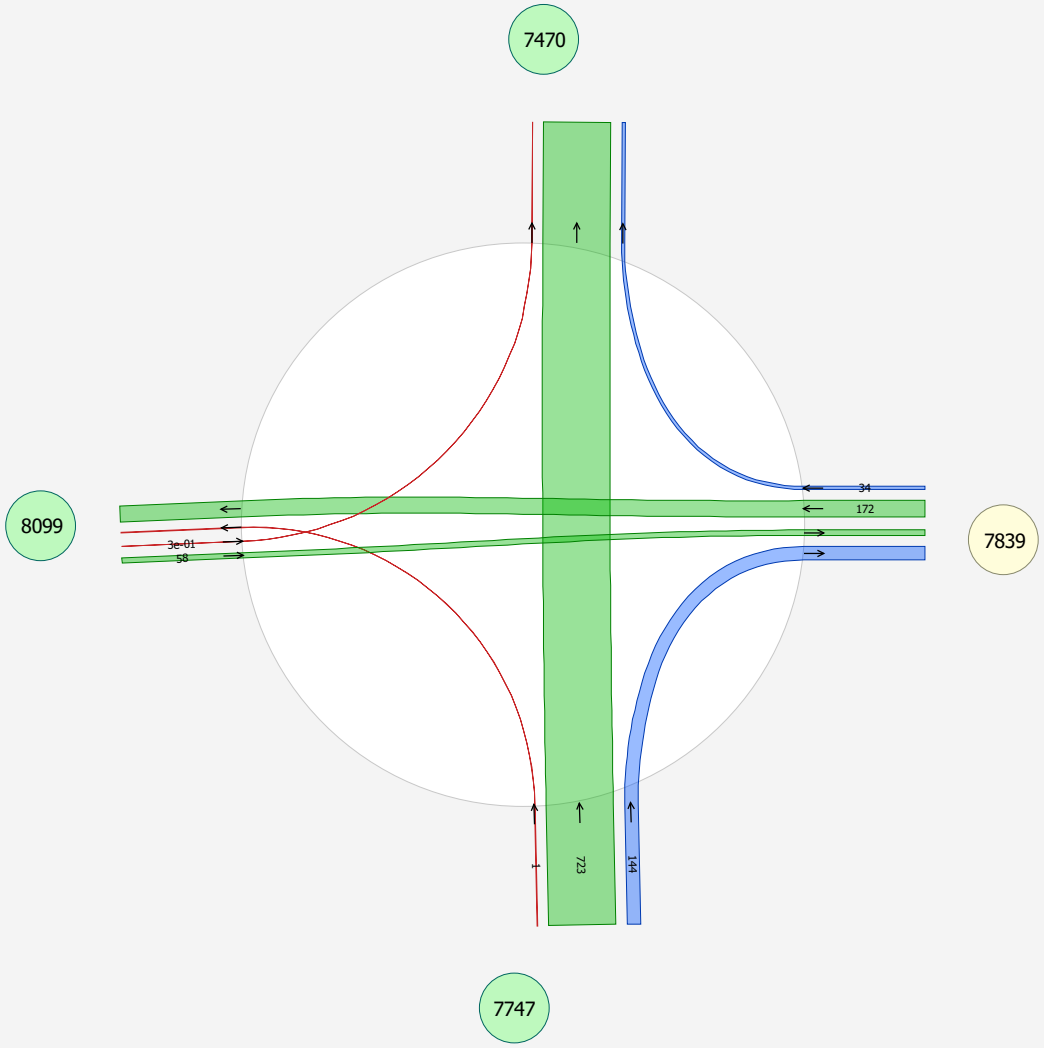
from:	to:	volau	volad
7464	7470:	16	0
7464	8099:	3	0
7470	7464:	32	0
7470	8099:	0	0
7508	7464:	2	0
7508	7470:	335	0
7508	8099:	673	0



SAT and Ernest Blvd - east side

Intersection node 8102:

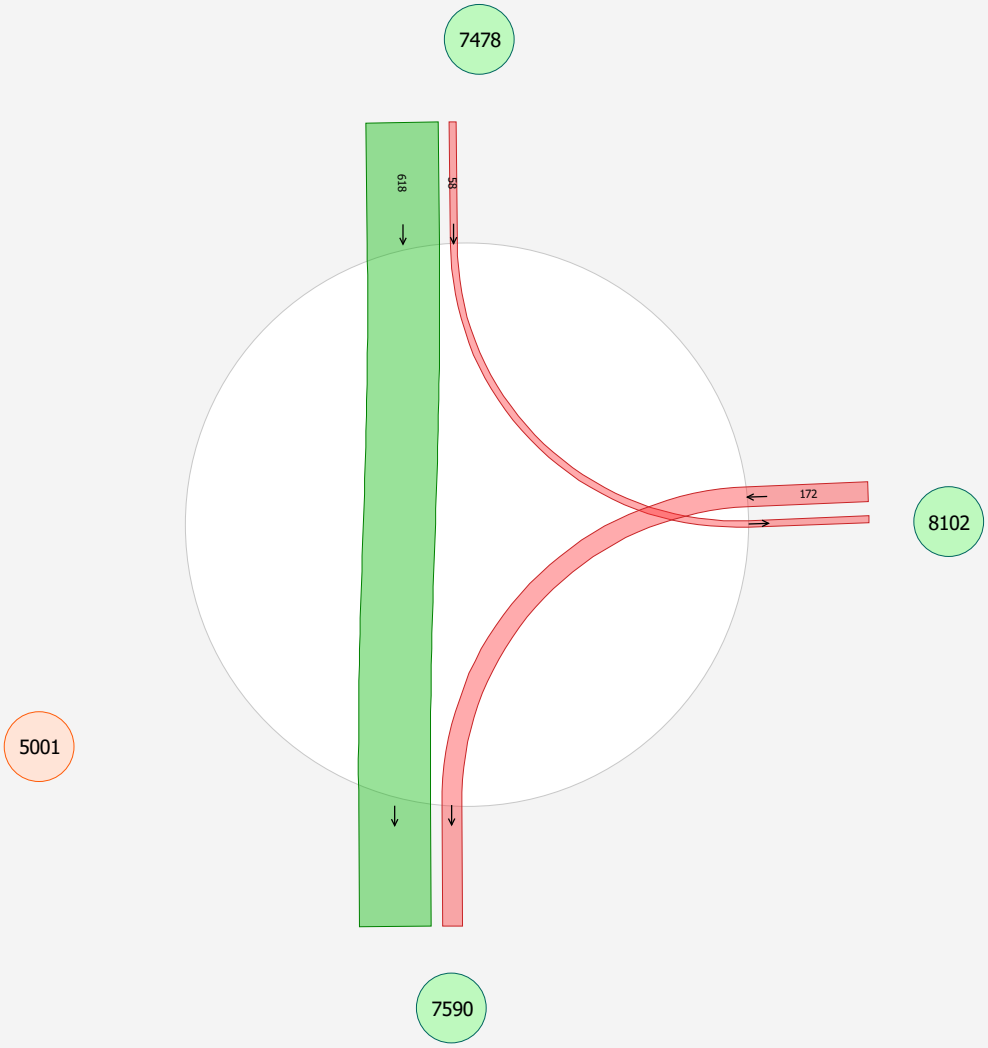
from:	to:	volau	volad
7747	7470:	723	0
7747	7839:	144	0
7747	8099:	1	0
7839	7470:	34	0
7839	8099:	172	0
8099	7470:	0	0
8099	7839:	58	0



SAT and Ernest Blvd - west side

Intersection node 8099:

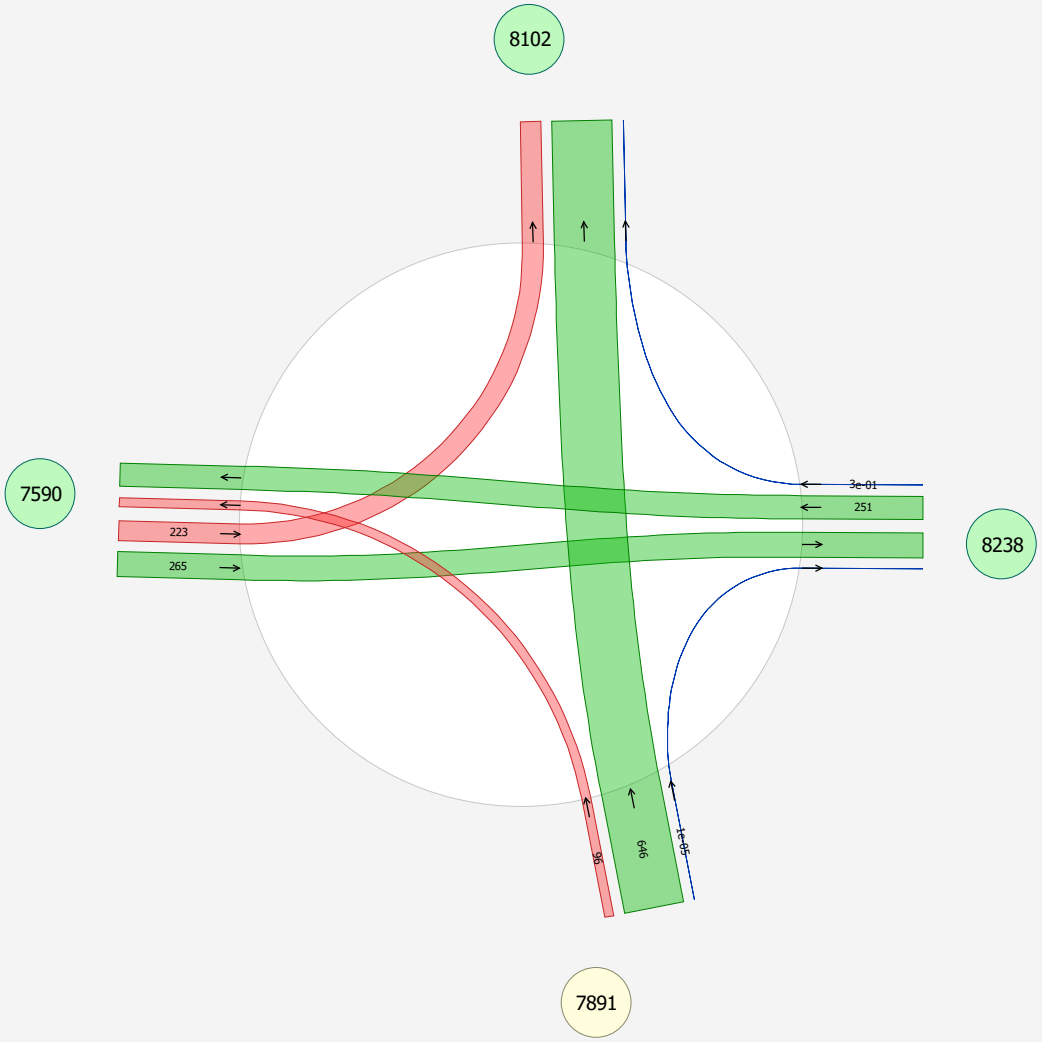
from:	to:	volau	volad
5001	7590:	1	0
5001	8102:	0	0
7478	5001:	0	0
7478	7590:	618	0
7478	8102:	58	0
8102	5001:	1	0
8102	7590:	172	0



SAT and Neil Ross Road - east side

Intersection node 7747:

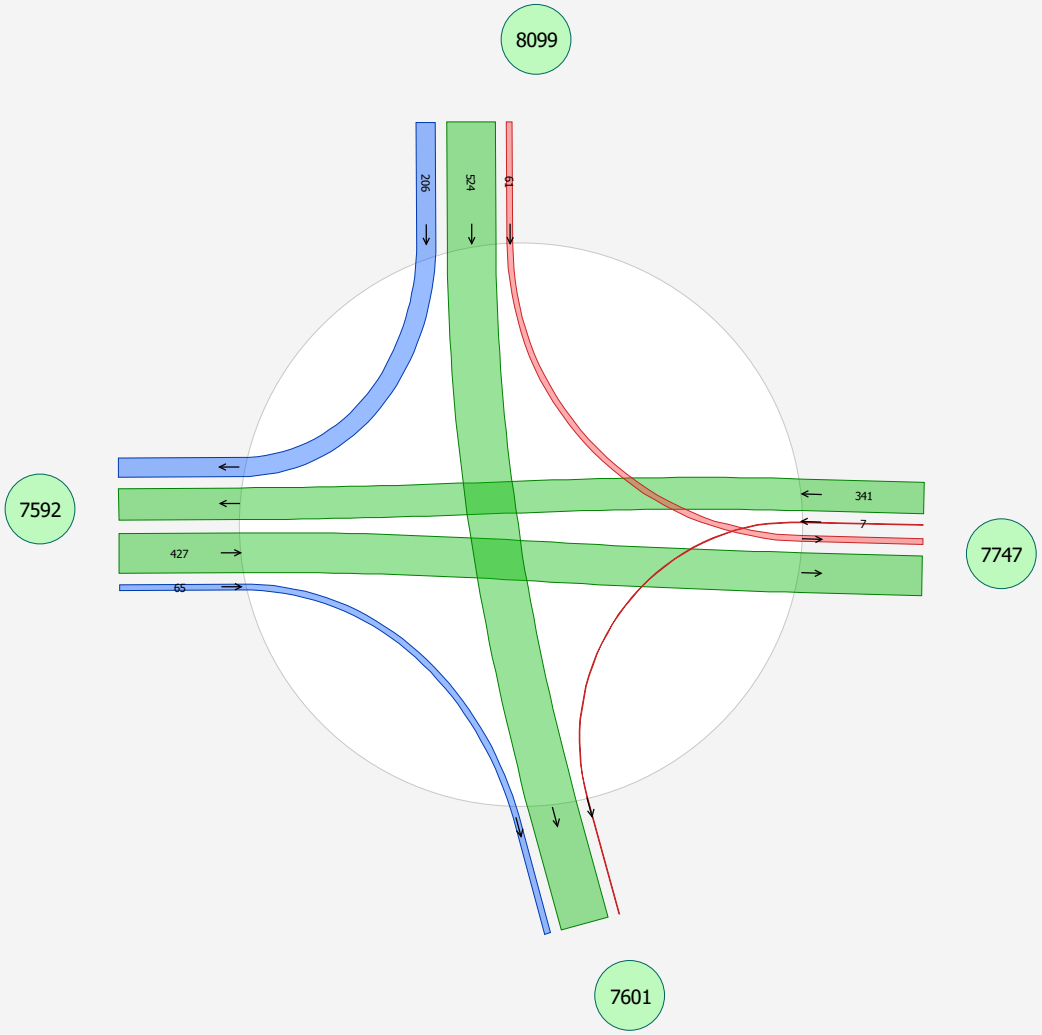
from:	to:	volau	volad
7590	8102:	223	0
7590	8238:	265	0
7891	7590:	96	0
7891	8102:	646	0
7891	8238:	0	0
8238	7590:	251	0
8238	8102:	0	0



SAT and Neil Ross Road - west side

Intersection node 7590:

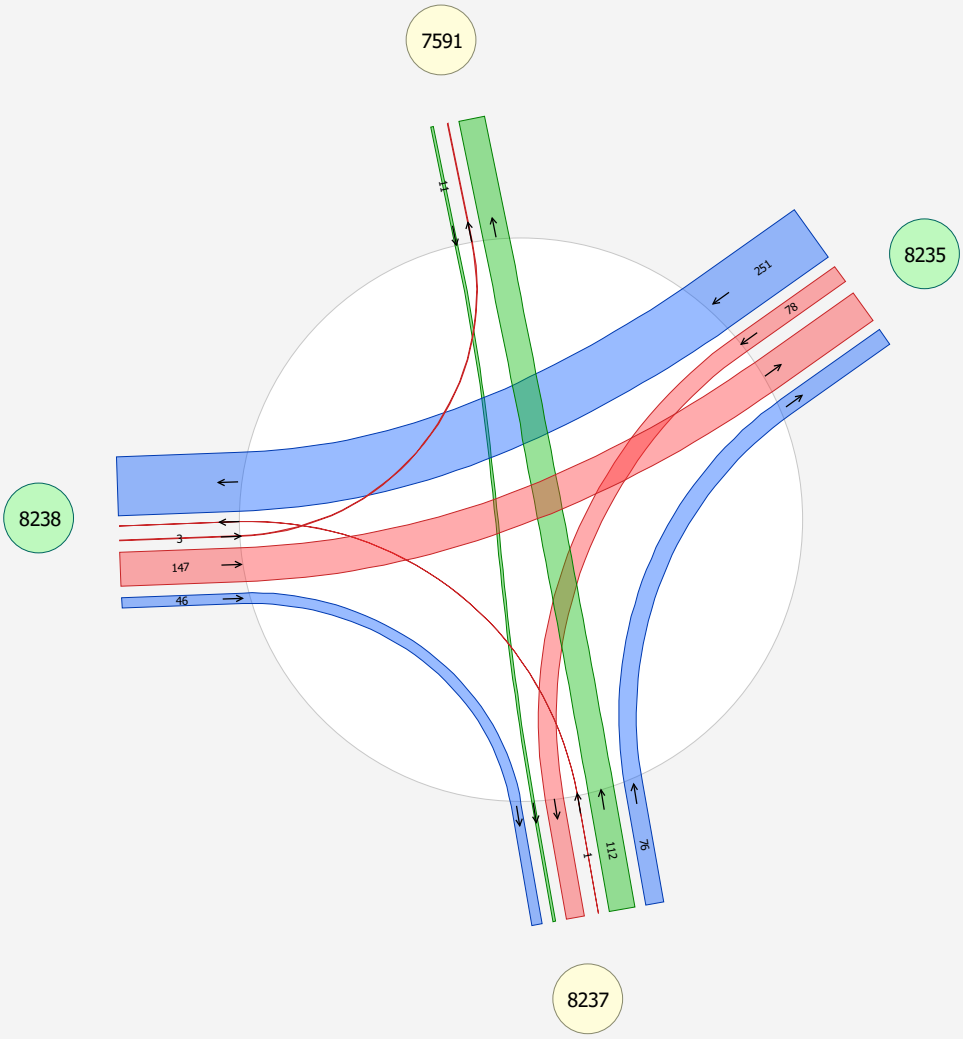
from:	to:	volau	volad
7592	7601:	65	0
7592	7747:	427	0
7747	7592:	341	0
7747	7601:	7	0
8099	7592:	206	0
8099	7601:	524	0
8099	7747:	61	0



Neil Ross Road and Element Drive

Intersection node 8236:

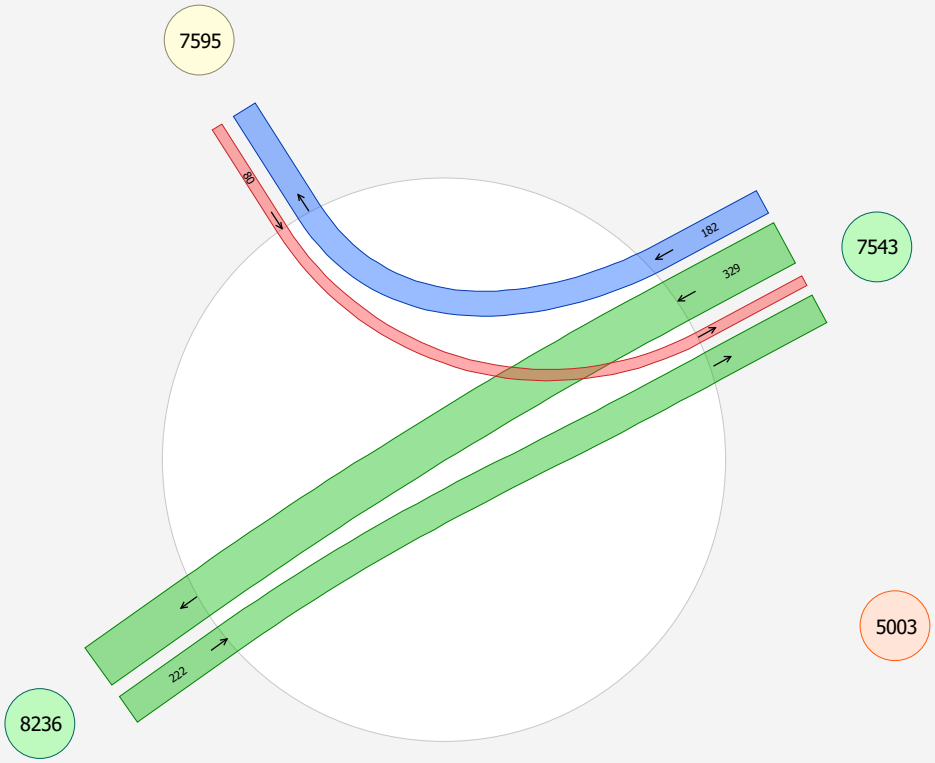
from:	to:	volau	volad
7591	8237:	11	0
8235	8237:	78	0
8235	8238:	251	0
8237	7591:	112	0
8237	8235:	76	0
8237	8238:	1	0
8238	7591:	3	0
8238	8235:	147	0
8238	8237:	46	0



Neil Ross Road and Edison Crescent

Intersection node 8235:

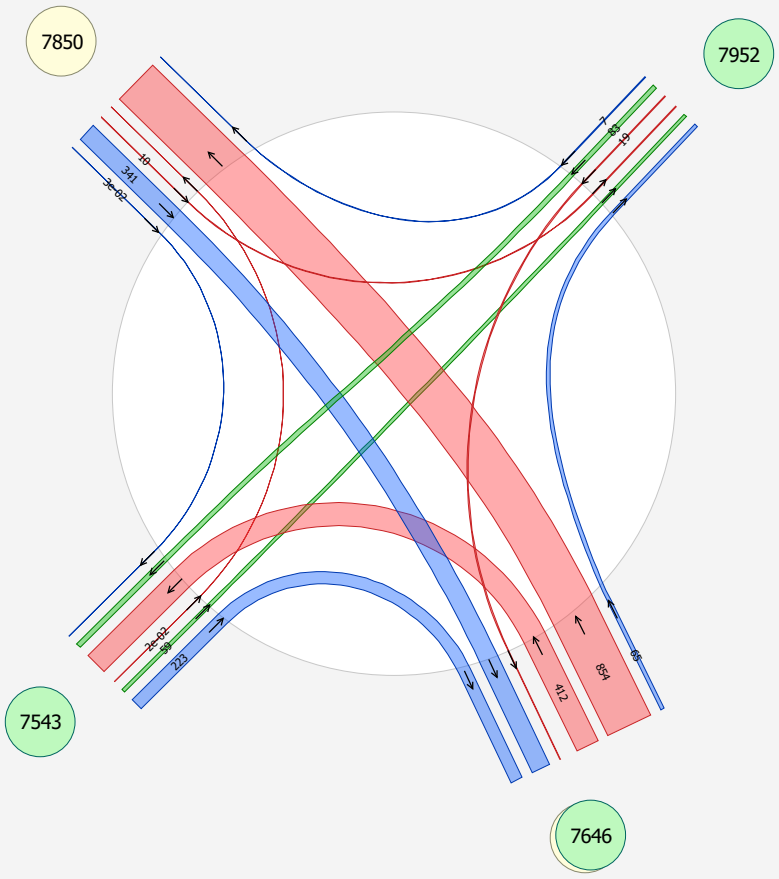
from:	to:	volau	volad
5003	7595:	0	0
5003	8236:	0	0
7543	7595:	182	0
7543	8236:	329	0
7595	5003:	0	0
7595	7543:	80	0
8236	5003:	0	0
8236	7543:	222	0



Neil Ross Road and 127th Street

Intersection node 7991:

from:	to:	volau	volad
7543	7801:	223	0
7543	7850:	0	0
7543	7952:	59	0
7646	7543:	412	0
7646	7850:	854	0
7646	7952:	65	0
7850	7543:	0	0
7850	7801:	341	0
7850	7952:	10	0
7952	7543:	83	0
7952	7801:	19	0
7952	7850:	7	0



Bellerose Drive and 127th Street

Intersection node 7646:

from:	to:	volau	volad
7445	7451:	227	0
7445	7809:	649	0
7445	7991:	134	0
7451	7445:	320	0
7451	7809:	84	0
7451	7991:	14	0
7801	7445:	33	0
7801	7451:	0	0
7801	7809:	549	0
7809	7445:	406	0
7809	7451:	200	0
7809	7991:	1184	0