CITY OF FORT SASKATCHEWAN
AGENDA

Regular Council Meeting
Tuesday, June 28, 2016 – 6:00 P.M.
Council Chambers – City Hall

6:00 P.M.

1. **Call to Order** — Mayor Katchur

2. **Approval of Minutes of June 14, 2016 Regular Council Meeting** — (attachment)

3. **Delegations**

   Those individuals in attendance at the meeting will be provided with an opportunity to address Council regarding an item on the agenda, with the exception of those items for which a Public Hearing is required or has been held. Each individual will be allowed a maximum of five (5) minutes.

4. **Public Hearing**

   Open Public Hearing — Mayor Katchur

   4.1 Bylaw C10-16 – Amend Land Use Bylaw C10-13 – C5 – Fort Mall Redevelopment District – Haro Developments Inc. — Katie Mahoney (verbal)

   Close Public Hearing — Mayor Katchur

5. **Business Arising from Public Hearing**

   5.1 Bylaw C10-16 – Amend Land Use Bylaw C10-13 – C5 – Fort Mall Redevelopment District – Haro Developments Inc. – 2nd & 3rd reading — Katie Mahoney (attachment)

6. **Unfinished Business**

   6.1 Southfort Transportation Study Update — Grant Schaffer (attachment)

7. **New Business**

   7.1 Sale of Old Hospital Land — Mike Erickson (attachment)

   7.2 City Land Purchase — Troy Fleming (attachment)

8. **Bylaws**

9. **Notice of Motion**

10. **Points of Interest**

11. **Councillor Inquiries**

12. **Adjournment**

CITY OF FORT SASKATCHEWAN
MINUTES
REGULAR COUNCIL
Tuesday, June 14, 2016 - 6:00 PM
Council Chambers – City Hall

Present:
Members of Council:
Mayor Gale Katchur
Councillor Birgit Blizzard
Councillor Sheldon Bossert
Councillor Frank Garritsen
Councillor Stew Hennig
Councillor Arjun Randhawa
Councillor Ed Sperling

Administration:
Kelly Kloss, City Manager
Troy Fleming, General Manager, Infrastructure & Community Services
Brenda Rauckman, General Manager, Corporate & Protective Services
Jeremy Emann, Chief Financial Officer
Brenda Molter, Director, Legislative Services
Wendy Kinsella, Director, Corporate Communications
Grant Schaffer, Director, Project Management
Richard Gagnon, (Interim) Director Infrastructure Management
Katie Mahoney, Senior Long Range Planner
Reade Beaudoin, Corporate Communications Officer
Sheryl Exley, Legislative Officer
Barb Aitken, Recording Secretary

1. Call to Order

Mayor Katchur called the regular Council Meeting of June 14, 2016 to order at 6:02 p.m.

Mayor Katchur called for a moment of silence to mourn the victims of the mass shooting in Orlando, Florida on June 12, 2016.

2. Approval of Minutes of May 24, 2016 Regular Council Meeting

R98-16 MOVED BY Councillor Hennig that the minutes of the May 24, 2016 regular Council Meeting be adopted as presented.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

3. Delegations

The following were in attendance to speak in favour of the Southfort Transportation Study Update:

- Andrew Usenik, Strata Developments
- Jim Sheasgreen Jr., Landrex Developments

4. Presentations:

4.1 Fort Saskatchewan Public Library Update

Ms. Morgan Northey, Chair, Fort Saskatchewan Public Library Board and Mr. David Larsen, Library Director were in attendance to present an update on the Fort Saskatchewan Public Library's activities, programs, and services.

Mayor Katchur thanked Ms. Northey and Mr. Larsen for their presentation.

4.2 Northern Gateway Pipelines Project Update

Mr. Sam Munckhof-Swain, Manager, Alberta Community Relations, Northern Gateway Pipelines was in attendance to present Council and Administration an update on the Northern Gateway Project.

Mayor Katchur thanked Mr. Munckhof-Swain for his presentation.

6.2 Naming of Southfort Park to the Henderson Park
Presented by: Richard Gagnon, (Interim) Director Infrastructure Management

R99-16 MOVED BY Councillor Sperling that Council approve the naming of Henderson Park located at Lot 52MR, Block 2, Plan 0722745, formerly known as Southfort Park.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

Mayor Katchur called a short recess at 6:57 p.m.

The regular Council Meeting reconvened at 7:04 p.m.

R100-16 MOVED BY Councillor Randhawa that Council having considered a presentation regarding the Northern Gateway Pipeline Project on June 14, 2016, hereby agrees to provide a letter of support to extend the sunset clause date for the commencement of the construction of the Pipeline Project to 2019.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

5. Unfinished Business

5.1 Southfort Transportation Study Update

Presented by: Grant Schaffer, Director, Project Management

R101-16 MOVED BY Councillor Bossert that Council table the Southfort Transportation Study Update to the June 28 regular Council Meeting to afford Council further time to review the Study.

In Favour: Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert

Against: Gale Katchur, Frank Garritsen, Ed Sperling

CARRIED

6. New Business

6.1 Public Auction of Land in Tax Arrears

Presented by: Jeremy Emann, Chief Financial Officer

R102-16 MOVED BY Councillor Garritsen that Council approve the reserve bid for the property on the Tax Arrears List as outlined in Schedule "A" and as attached to the June 14, 2016 report to Council.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

R103-16 MOVED BY Councillor Garritsen that the terms and conditions of sale for the tax arrears public auction be set as follows:

a) Public auction date be set for September 8, 2016 at 10:00 A.M.;
b) Property is sold on an “as is, where is” basis;
c) No warranty is made regarding the said property;
d) No consideration of pre-sale or post-sale conditions;
e) No GST will apply on sales of residential property;
f) Non-refundable deposit of 20% of the accepted bid at the time of sale, with the balance of the accepted bid due within 15 days of the date of sale of property; and
g) Payments by cash, bank draft, or certified cheque only.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

R104-16 MOVED BY Councillor Garritsen that all costs associated with tax recovery proceedings be applied to the property's tax roll.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

7. Bylaws

7.1 Bylaw C10-16 - Amend Land Use Bylaw C10-15 - C5 - Fort Mall Redevelopment District - Haro Developments Inc. - 1st reading

Presented by: Katie Mahoney, Senior Long Range Planner

R105-16 MOVED BY Councillor Hennig that Council give first reading to Bylaw C10-16 amending Land Use Bylaw C10-13, to reflect updates to the C5 - Fort Mall Redevelopment District regulations.

In Favour: Gale Katchur, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

Against: Frank Garritsen

CARRIED

7.2 Bylaw C11-16 - Amend Fees & Charges Bylaw C23-15 - 3 readings

Presented by: Brenda Molter, Director, Legislative Services

R106-16 MOVED BY Councillor Garritsen that Council give first reading to Bylaw C11-16, which amends Fees and Charges Bylaw C23-15.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

R107-16 MOVED BY Councillor Garritsen that Council give second reading to Bylaw C11-16, which amends Fees and Charges Bylaw C23-15.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

R108-16 MOVED BY Councillor Garritsen that Council provide unanimous consent to proceed with third and final reading to Bylaw C11-16, which amends Fees and Charges Bylaw C23-15.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

R109-16 MOVED BY Councillor Garritsen that Council give third reading to Bylaw C11-16, which amends Fees and Charges Bylaw C23-15.

In Favour: Gale Katchur, Frank Garritsen, Stew Hennig, Arjun Randhawa, Birgit Blizzard, Sheldon Bossert, Ed Sperling

CARRIED UNANIMOUSLY

8. Notice of Motion

None.

9. Points of Interest

Members of Council were given the opportunity to bring forward information that would be of interest to the public.

10. Councillor Inquiries

Members of Council were given the opportunity to ask questions and provide concerns and comments.

11. Adjournment

The regular Council Meeting of June 14, 2016 adjourned at 7:57 p.m.

_____
Mayor

_____
Director, Legislative Services

City of Fort Saskatchewan

Bylaw C10-16 to Amend Land Use Bylaw C10-13, C5 – Fort Mall Redevelopment District Regulations

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Motions:

1. That Council give second reading to Bylaw C10-16 to amend Land Use Bylaw C10-13, to reflect updates to the C5 – Fort Mall Redevelopment District regulations.

2. That Council give third reading to Bylaw C10-16 to amend Land Use Bylaw C10-13, to reflect updates to the C5 – Fort Mall Redevelopment District regulations.

Purpose:

To present Council with information regarding proposed amendments to the C5 – Fort Mall Redevelopment District regulations and to request consideration of second and third reading.

Background:

The site is located within the downtown limits, as outlined in the *Downtown Area Redevelopment Plan* (DARP). It was always intended that the site would be subject to the associated downtown zoning. However, as the timing of the *Downtown Land Use Bylaw* was not in keeping with the developer's timeframe, site specific zoning (C5) was created.

The C5 District regulations were approved through Bylaw C22-14 on September 9, 2014. It was expected that future amendments would be required to ensure consistency with the downtown regulations. The site was subdivided into 5 separate lots in May of 2015. Since then, redevelopment of the site has been underway including renovations to existing buildings and demolition works. Future phases include proposals for several residential projects.

On December 2, 2015 a design charrette was held with Haro Developments Inc. and Administration. The goal of the charrette was to work through some of the technical site issues that were arising from the redevelopment plans and the C5 regulations. The exercise was intended to be an all-encompassing approach to address the discrepancies, ensuring changes to the regulations could be brought forward with one amendment instead of individual corrections.

On February 2, 2016, Administration received an application to amend the C5 District. Since that time, Administration has worked closely with the applicant, to ensure that the proposed changes are appropriate. In general, the proposed amendments are in keeping with the recently approved *Downtown Land Use Bylaw*. In particular, they are similar to the regulations under the MP-D Mall Precinct District (Giant Tiger site).

Council gave first reading to Bylaw C10-16 on June 14, 2016.

In summary, the applicant has proposed the following changes:

Multi-attached Dwellings

Multi-attached dwellings include townhouses, stacked townhouses and row housing. As the DARP vision for the site included high density residential development, this use was originally listed as a "discretionary use". However, the vision did not include retention of the mall building, which has resulted in development constraints. In particular, ensuring an appropriate transition between built form and building heights. The applicant has proposed changing this use from "discretionary" to "permitted" to allow for greater flexibility for different housing types. This

permission would just apply to the periphery of the site, ensuring that any future residential development within the centre of the site is higher density. This change would also help ensure an appropriate transition between existing and future built form.

Reduced Setbacks

In an urban context, reduced setbacks are typical as they result in denser development. In addition, municipal reserve lands along the perimeter were acquired through the subdivision process. In light of this, the proposed setbacks are appropriate and are in keeping with the downtown setback regulations.

Common Amenity Area

The proposed changes reflect amenity area requirements which are in keeping with the downtown regulations. As proposed, they also allow for greater flexibility in regards to multi-attached development projects and consideration for site wide amenities. The applicant does not agree with the proposed regulation. They have put forward a request for an alternative regulation to be considered by Council. Further details can be found under Appendix D.

Built Form

In regards to building height, the applicant has proposed increasing the maximum height along 98 Avenue from 3 to 4 storeys. They indicated this would allow for greater flexibility in the design for a potential assisted living facility. It is noted that a new 4 storey maximum height would apply to any building and not just an assisted living facility. Given the distance separation between such future development and the existing residential area to the south, the proposed increase in height is appropriate.

In addition, changes were made to the regulations to provide more clarity with building height requirements.

Parking Requirements

The applicant has proposed that the recently approved downtown parking minimums apply to the district. This would not include the downtown parking overlay. As this site was always intended to have downtown zoning regulations, the proposed changes are appropriate. The parking regulations would be applied at the development permit stage. Based on a preliminary review of a new residential development, there appears to be a parking deficiency. In order to receive development permit approval, the parking requirements would have to be satisfied.

Density and Floor Area Ratio

The proposed maximum densities and floor area ratio have been updated to align with the downtown regulations. The proposed changes are appropriate as they are identical to the regulations under the MP-D Mall Precinct District (Giant Tiger site).

Definitions

In order to provide greater clarity, the definitions for residential density have been updated to exclude the downtown and C5 Districts. Further, definitions have been added for display gardens and floor area ratio.

Further details regarding the proposed regulations can found under Appendix B and C.

Plans/Standards/Legislation

The site has been designated as "Downtown" in the City's *Municipal Development Plan.* It has also been designated as "Mall Redevelopment Precinct" in the *Downtown Area Redevelopment Plan & Design Guidelines.* Appendix "D" contains the applicable policies from these documents. Applying the proposed amendments will help assist future developments better align with the goals and policies of the DARP. In particular, several polices speak to reducing parking requirements for the site. By implementing the recently approved downtown parking minimums, these policies can be addressed.

Community Feedback

Following first reading, notification letters were sent out to affected landowners. An advertisement in the local paper ran for 2 weeks as per requirements outlined in the *Municipal Government Act.*

At the time this report was written, no comments regarding the proposed changes had been received.

Financial Implications:

No financial implications are expected as a result of the proposed regulation changes.

Recommendation:

That Council give second and third reading to Bylaw C10-16 to amend Land Use Bylaw C10-13, to reflect updates to the C5 – Fort Mall Redevelopment District regulations.

Attachments:

1. Bylaw C10-16
2. Appendix A - Location Map
3. Appendix B - Amended C5 Regulations
4. Appendix C - Summary of Existing and Proposed Regulations
5. Appendix D - Applicant's Request for Amenity Area Requirement
6. Appendix E - Relevant Policies

Prepared by:	Katie Mahoney Senior Long Range Planner	Date: June 20, 2016
Approved by:	Troy Fleming General Manager, Infrastructure & Community Services	Date: June 21, 2016
Reviewed by:	Kelly Kloss City Manager	Date: June 21, 2016
Submitted to:	City Council	Date: June 28, 2016

CITY OF FORT SASKATCHEWAN

A BYLAW OF THE CITY OF FORT SASKATCHEWAN IN THE PROVINCE OF ALBERTA TO AMEND BYLAW C10-13, LAND USE BYLAW

BYLAW C10-16

WHEREAS the *Municipal Government Act, R.S.A. 2000, c.M-26* as amended or repealed and replaced from time to time, provides that a municipality has the power to amend the Land Use Bylaw;

NOW THEREFORE, the Council of the City of Fort Saskatchewan, in the Province of Alberta, duly assembled, enacts as follows:

1. This Bylaw is cited as the Amendment to Bylaw C10-13 Land Use Bylaw as amended or repealed and replaced from time to time.

2. That Schedule "A" of Bylaw C10-13 be amended as follows:

6.13 C5 – Fort Mall Redevelopment District

A) Add the following under 6.13.2 (a) C5 Permitted Uses

- Multi-attached Dwelling**

** Multi-attached Dwellings shall be limited to the Periphery Zone, as per **Figure 6.13a**

B) Delete the following under 6.13.2 (b) C5 Discretionary Uses

- Multi-attached Dwelling

C) Replace the following under 6.13.3 Site Development Regulations

	Interior or Corner Site	
c) Front Setback	Minimum	**Non-residential uses at ground floor** 0.0m (0.0ft) to 1.4m (4.6m) to achieve a continuous pedestrian zone of 3.4m (11.2ft) **Residential uses at ground floor** 3.0m (9.8ft) with display gardens **Residential uses at ground floor abutting MR** 1.0m (3.3ft) with display gardens in the MR

d) Side Setback	Minimum	0.0m (0.0ft)
e) Rear Setback	Minimum	0.0m (0.0ft) when abutting a Non-Residential Land Use District
g) FAR	Maximum	4.0
h) Unit Density	Maximum	200 units/net developable hectare for sites less than 1500.0m² 350 units/net developable hectare for sites greater than 1500.0m²
k) Private Amenity Area	Minimum	**Residential Dwellings at Grade and Above Grade** 3.0m² (32.3ft²) per dwelling unit to be provided by balconies, decks, patios or rooftop amenity area*** **Residential Dwellings Below Grade** To be provided through the common amenity area

*** Private Amenity Area shall only be provided by balconies in Apartment Dwellings

D) Add the following under 6.13.3 Site Development Regulations

		Interior or Corner Site
j) Common Amenity Area	Minimum	**Apartment Dwellings** 4.5m^2 (48.4ft^2) per dwelling unit **All other Residential Dwellings** At the discretion of the Development Authority. This can include indoor and outdoor amenities such as seating areas and roof top patios

E) Replace the following under 6.13.4 Urban Form

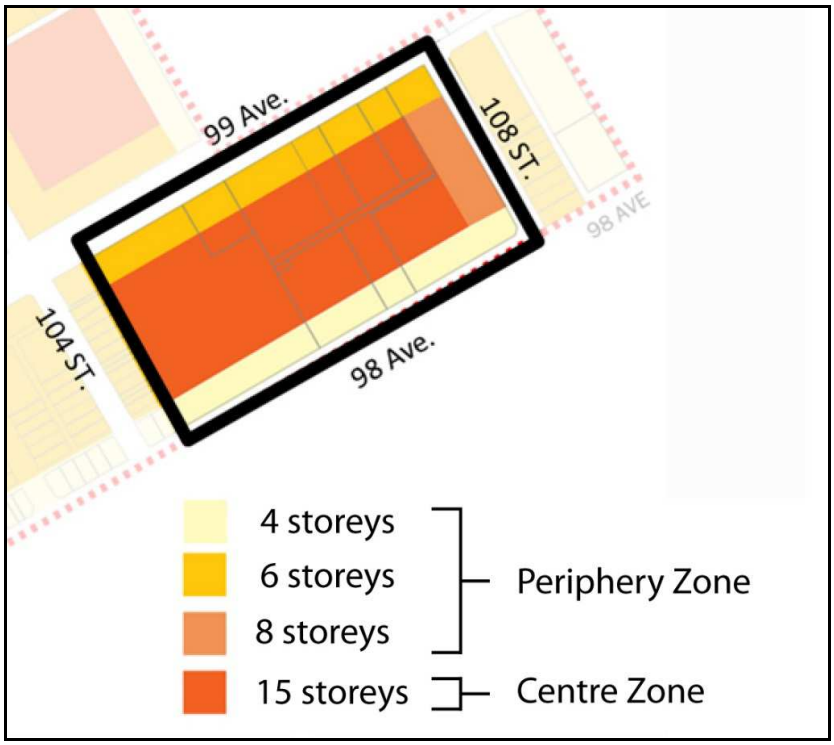
a) ii. Along 98 Avenue, new development shall have a minimum height of 2 storeys when located in the Periphery Zone, and a minimum height of 4 storeys in the Centre Zone, as per **Figure 6.13a**.

F) Add the following under 6.13.4 Urban Form

a) iii. Building heights shall be transitioned through appropriate setbacks as per **Figure 6.13a**.

G) Replace the following under 6.13.4 Urban Form

Figure 6.13a: Fort Mall Site Maximum Heights Diagram



b) The maximum building height for buildings greater than 5 storeys shall be limited by the application of a 45 degree angular plane, as per **Figure 6.13b**.

c) The maximum parapet height for all new buildings shall not exceed 1.5m (4.9ft)

d) Vents, mechanical rooms and equipment, elevator penthouses, etc. shall be integrated into the architectural treatment of building roof or screened with materials and finishes compatible with the building.

H) Replace the following under 6.13.7 Building Massing and Architectural Character

b) Buildings more than 5 storeys shall provide three distinct vertical zones, as per **Figure 6.13e**, and meet the following step back requirements:

I) Remove the following under 6.13.9 Ground Floor Treatment

a) iii. Surface and structure parking areas shall be located at the rear of the building and screened from public view.

J) Replace the following under 6.13.9 Ground Floor Treatment

b) Facade improvement or facades for newly constructed buildings with non-residential uses located on the ground floor facing a public street or public area shall provide a minimum 60% transparency on the ground floor level to encourage pedestrian interactions and safety, as per **Figure 6.13g**.

K) Replace the following under 6.13.11 Building Projections

a) Balconies on the streetwall shall be partly or fully recessed from the building face with approximately 50% of their perimeter contained by exterior walls of the building, as per **Figure 6.13i**.

L) Add the following new section: 6.13.12 General Parking Requirements

a) On-site parking should be provided at the rear or sides of buildings, within underground parkade or above-ground parking structures. Surface parking areas should not be developed adjacent to any public roadway other than a lane, unless a suitable interface with the abutting street is provided to the satisfaction of the Development Authority.

b) Corner sites may have surface parking areas located on the side of the building, facing the flanking roadway when screened from public view.

c) The Development Authority may consider granting additional Floor Area Ratio, if the applicant agrees to provide underground parking stalls to meet all parking requirements of the project.

d) Uses and developments not specified in an approved Parking Impact Assessment shall meet the Minimum Parking Requirements for Downtown, as per Table 11e.

e) Structured parking facilities shall generally be provided at locations internal to the site. If such parking facilities are located fronting a public roadway, then the following design considerations shall be utilized:

i. Ground floor shall include retail uses with multiple entrances;
ii. Entrance to the parking facility shall be designed with special architectural treatment to maintain the integrity of retail frontage; and
iii. The facade of the upper storeys of the parking facility shall be designed to reflect residential or commercial building character.

M) Remove the word “Parking” from the Section 6.13.12 heading – Parking, Circulation, Access, Loading and Waste Collection.

N) Remove the following sections under 6.13.12

a) On-site parking should be provided at the rear or sides of buildings, within underground parkade or above-ground parking structures. Surface parking areas should not be developed adjacent to any public roadway other than a lane, unless a suitable interface with the abutting street is provided to the satisfaction of the Development Authority.

e) Drive-through service should be limited.

f) Structured parking facilities shall generally be provided at locations internal to the site. If such parking facilities are located fronting a public roadway, then the following design considerations shall be utilized:
   i. Ground floor shall include retail uses with multiple entrances;
   ii. Entrance to the parking facility shall be designed with special architectural treatment to maintain the integrity of retail frontage; and
   iii. The facade of the upper storeys of the parking facility shall be designed to reflect residential or commercial building character.

g) The Development Authority may consider granting additional Floor Area Ratio, if the applicant agrees to provide underground parking stalls to meet all parking requirements of the project.

i) Designated areas for storage, temporary truck parking, waste collection, compaction, and loading shall have a minimum setback of 7.5m (24.6ft) from public roadway and a minimum separation of 25.0m (82.0ft) from residential buildings.

O) Replace the following under 6.13.14 – Additional Development Regulations for C5

a) All development and uses within this Land Use District are subject to the applicable provisions of Part 4 - General Regulations for all Land Use Districts, Sections 6.1 to 6.7 of Part 6 - Commercial Land Use Districts, Part 11 - Parking and Loading, and Part 12 – Signs.

P) Add the following under Part 13.1 – General Definitions

DISPLAY GARDENS means an area dedicated to planting that provides privacy for residential uses, and improves streetscape aesthetics.

FLOOR AREA RATIO (FAR) means the numerical value of the gross floor area on all levels of all buildings on a lot, divided by the area of the lot.

Q) Replace the following under Part 13.1 – General Definitions

[1]**HIGH DENSITY RESIDENTIAL** means residential development at a density of over 70 dwelling units per net developable hectare except when located in the Downtown or C5 Districts.

[12]**LOW DENSITY RESIDENTIAL** means residential development at a density up to 35 dwelling units per net developable hectare except when located in the Downtown or C5 Districts.

[1]**MEDIUM DENSITY RESIDENTIAL** means residential development at a density of 36-70 dwelling units per net developable hectare except when located in the Downtown or C5 Districts.

R) That all numbering under the C5 District be updated accordingly.

3) If any portion of this Bylaw is declared invalid by a court of competent jurisdiction, then the invalid portion must be severed and the remainder of the Bylaw is deemed valid.

4) This Bylaw becomes effective upon third and final reading.

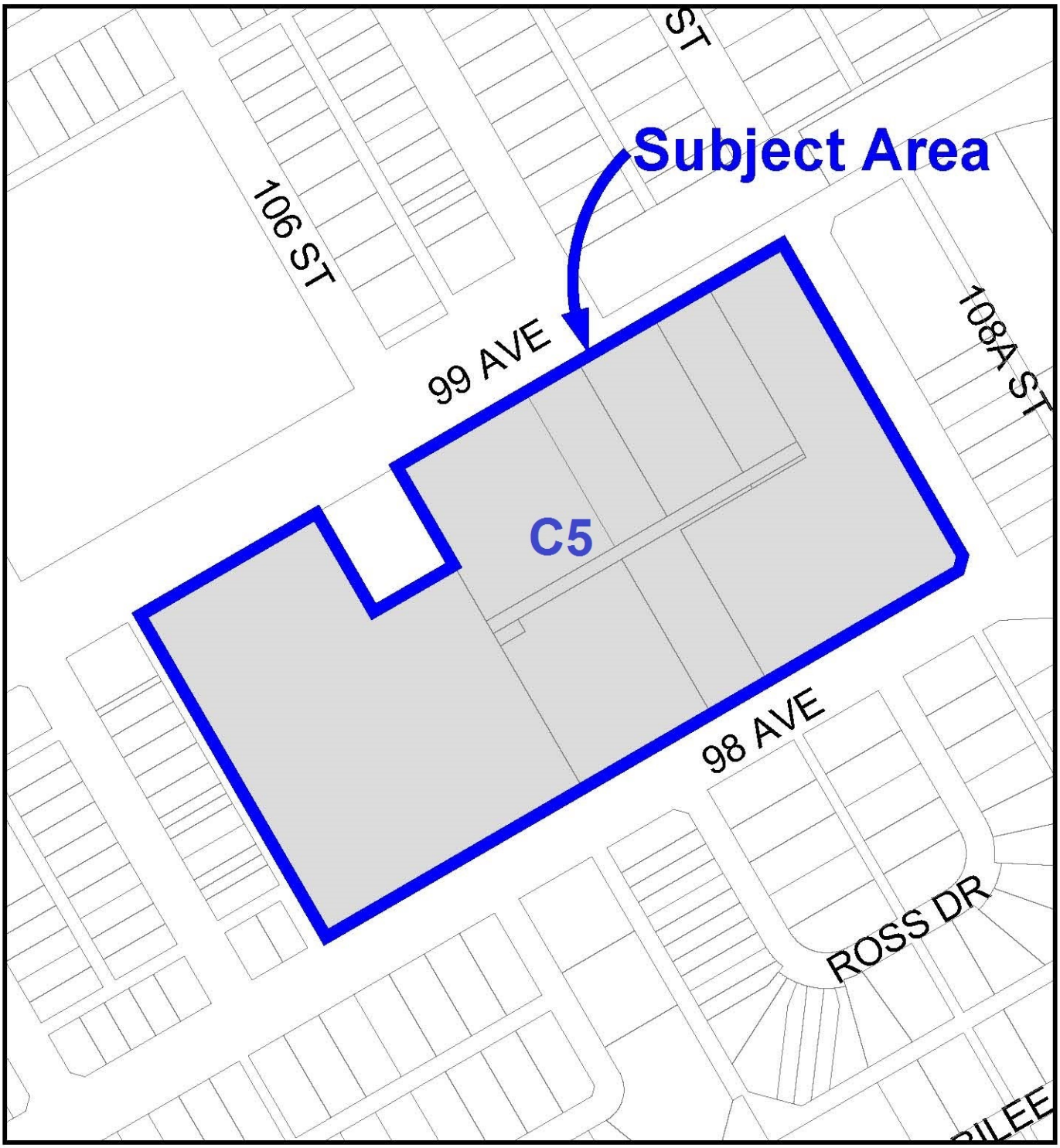
READ a first time this	14th	day of	June	A.D., 2016
READ a second time this		day of		A.D., 2016
READ a third time and passed this		day of		A.D., 2016

_____
MAYOR

_____
DIRECTOR, LEGISLATIVE SERVICES

DATE SIGNED: _____

BYLAW C10-16
Appendix A- Location Map



[1]6.13 C5 – Fort Mall Redevelopment District

6.13.1 Purpose

This district is generally intended to provide regulations for the redevelopment of the Fort Mall site as envisioned in the Downtown Area Redevelopment Plan & Design Guidelines (Bylaw C14-08). A variety of land uses are supported in this district including residential, commercial, and mixed-use. Higher densities and scale greater than seen elsewhere in Fort Saskatchewan are supported, with high rise buildings accommodated in specific locations provided that the design ensures development relates to the adjacent areas and provides harmonious transitions. Open space and pedestrian connections will be provided to ensure ease of movement to and from the area, and opportunities for recreation. Special emphasis shall be given for the creation of a high quality public realm including urban plazas, outdoor amenity areas and interactive streetscapes.

[1] C22-14

6.13.2 C5 Permitted & Discretionary Uses:

(a) C5 Permitted Uses	
- [1](Deleted) - Apartment Dwelling - Assisted Living Facility - Business Support Service - Commercial School - Community Service Facility - Custom Manufacturing Establishment - Day Care Facility* - Eating and Drinking Establishment - Eating and Drinking Establishment (limited) - Eating and Drinking Establishment (outdoor) - Emergency Response Service - Health Service - Home Office - Hotel - Indoor Entertainment Facility - Indoor Recreation Facility - Multi-attached Dwelling**	- [2](Deleted) - Parking Facility - Personal Service - Pet Care Service - Place of Worship - Private Club - Professional, Financial, and Office Service - Public Facility - Retail Store (convenience) - Retail Store (general) - Retail Store (liquor) - Seasonal Garden Centre (temporary) - Show Home - Sign (Freestanding) - Sign (Identification) - Sign (portable) - Sign (Projecting) - Temporary Sales Centre - [3]Accessory development to any use listed in subsection 6.13.2(a)

*Day Care Facility may not occur within an apartment dwelling
** Multi-attached Dwellings shall be limited to the Periphery Zone, as per **Figure 6.13a**

[1] C19-15
[2] C19-15
[3] C19-15

(b) C5 Discretionary Uses	
- Casino - Government Service - Greenhouse - Late Night Club - Live Work Unit - ~~Multi-attached Dwelling~~ - Outdoor Recreation Facility - Pawn Shop	- Temporary Outdoor Event - Vehicle Sales, Leasing or Rental Facility (limited) - Veterinarian Clinic - [1](Deleted) - [2]Accessory development to any use listed in subsection 6.13.2(b)

6.13.3 Site Development Regulations

	Interior or Corner Site	
a) Site Area	Minimum Maximum	300.0m^2 (3229.2ft^2) N/A
b) Site Width	Minimum Maximum	At the discretion of Development Authority At the discretion of Development Authority
c) Front Setback	Minimum	~~For buildings with commercial uses at ground floor: 1.4m to 3.4m (4.6ft to 11.2ft) in order to achieve a continuous pedestrian zone of 3.4m (11.2ft)~~ ~~For building with residential units at ground floor: minimum 3.0m (9.8ft) with display gardens.~~ **Non-residential uses at ground floor** 0.0m (0.0ft) to 1.4m (4.6m) to achieve a continuous pedestrian zone of 3.4m (11.2ft) **Residential uses at ground floor** 3.0m (9.8ft) with display gardens **Residential uses at ground floor abutting MR** 1.0m (3.3ft) with display gardens in the MR

[1] C19-15
[2] C19-15

d) Side Setback	Minimum	~~At the discretion of the Development Authority unless located on a corner site.~~ ~~For corner sites: minimum 1.4m to 3.4m (4.6ft to 11.2ft) in order to achieve a continuous pedestrian zone of 3.4m (11.2ft)~~ 0.0m (0.0ft)
e) Rear Setback	Minimum	~~At the discretion of the Development Authority for sites not abutting a Residential Land Use District~~ 0.0m (0.0ft) when abutting a Non-Residential Land Use District 4.5m (14.8ft) or one-half (1/2) the height of the building, whichever is greater, for sites abutting a Residential Land Use District
f) Site Coverage	Maximum	70%
g) FAR	Maximum	~~3.5~~ 4.0
h) Unit Density	Maximum	~~Low density – 50 dwelling units per net developable hectare~~ ~~Medium density – 90 dwelling units per net developable hectare~~ ~~High density – 250 dwelling units per net developable hectare~~ 200 units per net developable hectare for sites less than 1500.0m² 350 units per net developable hectare for sites greater than 1500.0m²
i) Height		As per Section 6.13.4 of this Bylaw
j) Common Amenity Area	Minimum	**Apartment Dwellings** 4.5m² (48.4ft²) per dwelling unit **All other Residential Dwellings** At the discretion of the Development Authority. This can include indoor and outdoor amenities such as seating areas and roof top patios

k) Private Amenity Area	Minimum	~~7.5m² (81ft²) per dwelling unit. Minimum 25% of the required amenity area shall be provided as outdoor space~~ **Residential Dwellings at Grade and Above Grade** 3.0m² (32.3ft²) per dwelling unit to be provided by balconies, decks, patios or rooftop amenity area*** **Residential Dwellings Below Grade** To be provided through the common amenity area

*** Private Amenity Area shall only be provided by balconies in Apartment Dwellings

Urban Design Regulations

6.13.4 Urban Form

a) Maximum building height shall be determined based upon:

i. [1]The location of the building in proximity to the public roadways, as per **Figure 6.13a**.

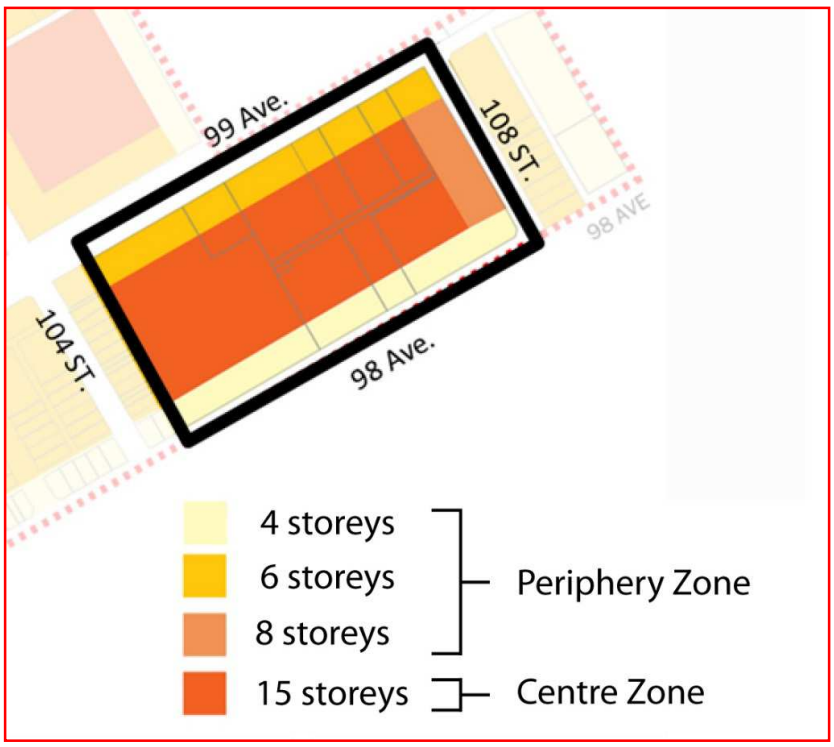
ii. ~~For mid-rise and high-rise buildings, the maximum building height shall also be limited by the application of 45 degree angular plane (**Figure 6.13b**).~~ Along 98 Avenue, new development shall have a minimum height of 2 storeys when located in the Periphery Zone, and a minimum height of 4 storeys in the Centre Zone, as per **Figure 6.13a**.

iii. Building heights shall be transitioned through appropriate stepbacks as per **Figure 6.13a**.

[1] C23-14

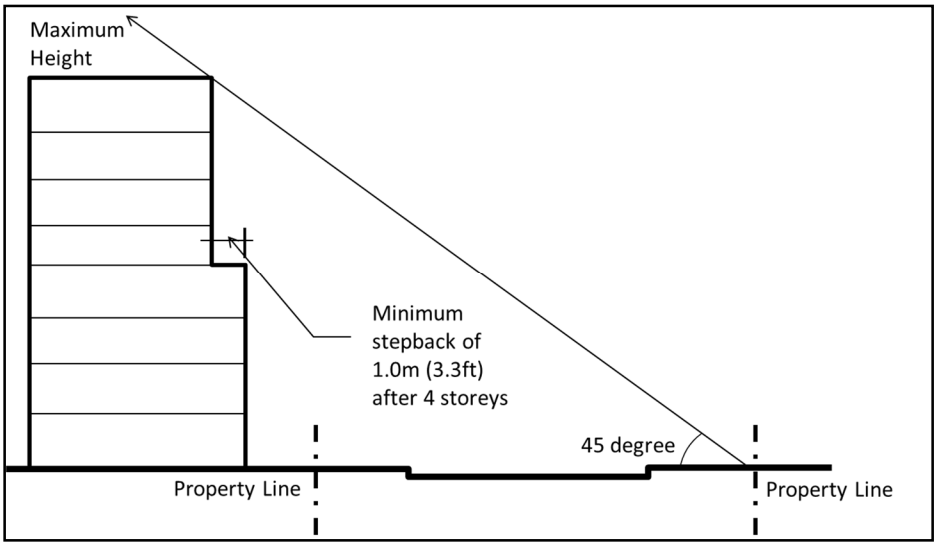
[1]Figure 6.13a: Fort Mall Site Maximum Heights Diagram

[1] C23-14



b) The maximum building height for buildings greater than 5 storeys shall be limited by the application of a 45 degree angular plane, as per **Figure 6.13b**.

Figure 6.13b: 45 Degree Angular Plane Method for Determining Height Maximums



c) ~~Vents, mechanical rooms and equipment, elevator penthouses etc. shall be integrated into the architectural treatment of building roof or screened with materials and finishes compatible with the building.~~

The maximum parapet height for all new buildings shall not exceed 1.5m (4.9ft).

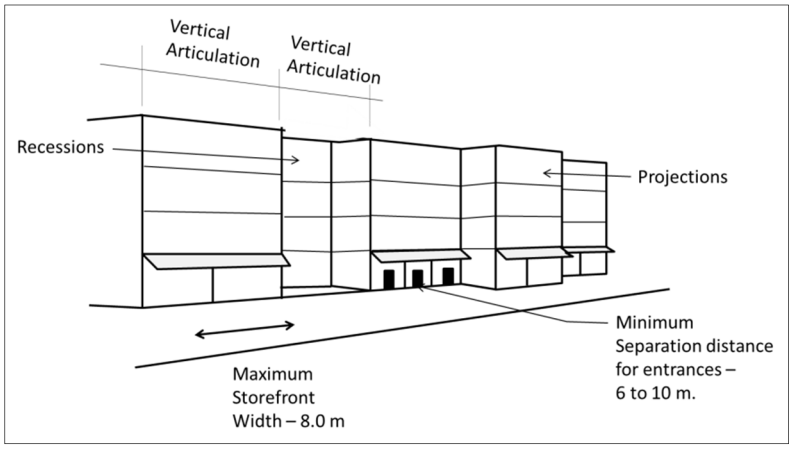
d) Vents, mechanical rooms and equipment, elevator penthouses, etc. shall be integrated into the architectural treatment of building roof or screened with materials and finishes compatible with the building.

6.13.5 Street Character and Pedestrian Realm

a) For buildings where the ground floor is occupied by non-residential tenancy, the front setback shall be hard surfaced with a consistent treatment and theme from the City sidewalk to the satisfaction of the Development Authority.

b) To avoid monotony in architecture, all buildings shall be required to provide a vertical articulation in the streetwall fronting public roads using a variety of colours, materials, projections as well as recessions in the building façade, as per **Figure 6.13c**.

Figure 6.13c: Vertical Articulation Specifications

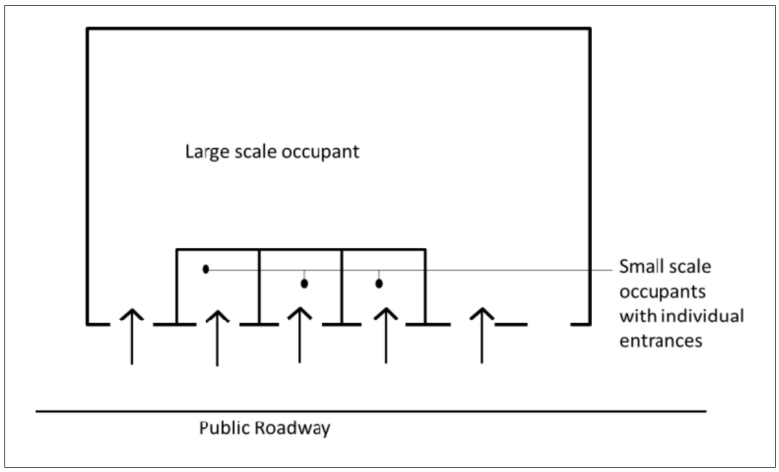


c) Individual retail store frontages along 99 Avenue at ground floor shall not exceed 8.0m (26.3ft) in width, as per **Figure 6.13c**.

d) Where feasible, entrances for commercial and office uses shall be located at intervals of 6.0m to 10.0m (19.7ft to 32.8ft) along building façades fronting public roadway.

e) For new construction, large scale commercial uses at ground floor shall be required to provide small scale individualized tenancy fronting the public roadway, as per **Figure 6.13d**.

Figure 6.13d: Small Scale Occupancy in Large Scale Commercial Uses



6.13.6 Open Space and Linkages

a) A minimum 15% of the Fort Mall site area shall be dedicated as publically-accessible open space that is connected to the wider city level open space network.

b) Open space shall be developed and landscaped in accordance with Section 4.8 to 4.11 of this Bylaw. In addition, street furniture such as benches, waste receptacles, garden lighting, etc. may be required to enhance the open space to the satisfaction of Development Authority.

c) New private or public roads in this district shall be designed in a manner to re-establish the typical block pattern and the street grid found in Fort Saskatchewan's downtown.

6.13.7 Building Massing and Architectural Character

a) Buildings at the intersection of the following streets shall be required to incorporate special architectural treatment to mark entrances to the downtown and key focal points:

i. 99 Avenue and 106 Street; and

ii. 99 Avenue and 108 Street.

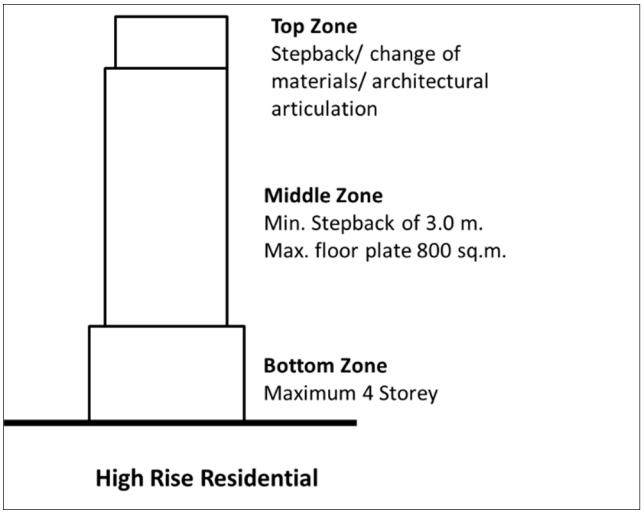
~~b) Mid-rise and high-rise buildings shall provide three distinct vertical zones as per the diagram below, and meet the following step back requirements:~~
Buildings more than 5 storeys shall provide three distinct vertical zones, as per **Figure 6.13e**, and meet the following step back requirements:

i. The base zone shall be a minimum of two storeys and a maximum four storeys, and shall be integrated with townhouses, apartments or commercial retail units;

ii. The middle zone shall provide a minimum setback of 3.0m (9.8ft) and a maximum floor plate of 800m² (8611ft²); and

iii. The top zone shall be required for high rise buildings and shall include the top three stories. The top zone shall provide either an additional setback or a change in material/colour or special architectural treatment to the satisfaction of the Development Authority.

Figure 6.13e: Vertical Zones in Mid-rise and High-rise Buildings



c) A minimum separation distance of 25.0m (82.0ft) measured perpendicularly to building face shall be provided between the shafts (middle zones) of two high rise towers.

d) Building façade on corner sites shall address both public roadways.

e) New developments shall be encouraged to incorporate public art into building façades.

f) Large blank façades with opaque surfaces shall be minimised to the satisfaction of the Development Authority.

6.13.8 Pedestrian Entrances

a) Ground floor entrances for commercial/office uses shall be level with grade of the adjacent sidewalk.

b) Ground floor entrances for residential units fronting public road shall provide a 1.0m (3.3ft) grade separation from adjacent sidewalk to provide visual privacy for residential units.

c) Entrances to commercial uses at ground floor and residential uses above ground level shall be architecturally differentiated from each other.

6.13.9 Ground Floor Treatment

a) The land uses along ground floors of all buildings shall be as per **Figure 6.13f**, whereas:

i. Ground floor uses along 99 Avenue shall be limited to commercial or residential development; and

ii. Ground floor uses along 98 Avenue shall be limited to residential development.

~~iii. Surface and structure parking areas shall be located at the rear of the building and screened from public view.~~

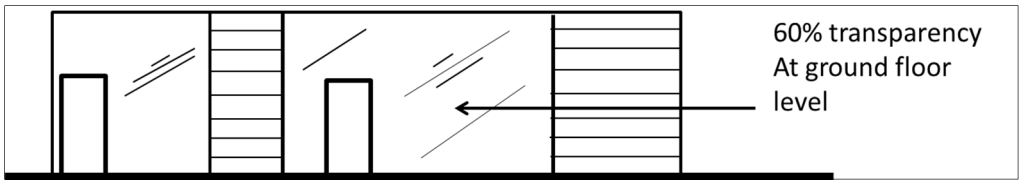
Figure 6.13f: Ground Floor Frontage Use Designations

b) ~~The ground floor of each commercial development shall be required to provide a minimum of 60% transparency measured along the width of the associated parcel.~~

~~Tempered or tinted glass that prohibits visibility shall be considered as opaque surface; and~~

Facade improvement or facades for newly constructed buildings with non-residential uses located on the ground floor facing a public street or public area shall provide a minimum 60% transparency on the ground floor level to encourage pedestrian interactions and safety, as per **Figure 6.13g**.

Figure 6.13g: Transparency in Ground Level Commercial Developments

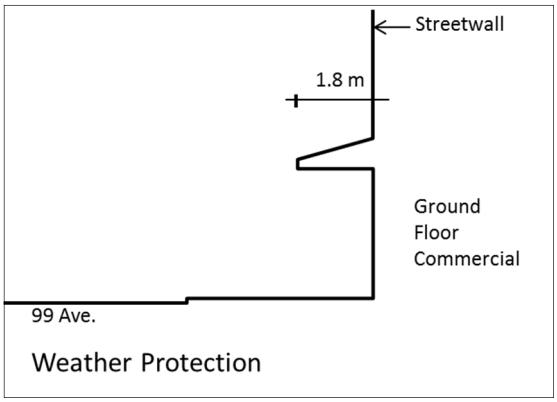


c) Principal entrances of dwelling units or commercial retail units provided at the ground floor level shall provide direct access to the adjacent public sidewalk.

6.13.10 Canopies and Weather Protection

a) A continuous weather protection of minimum 1.8m (5.9ft) width at the ground floor of all building façades fronting 99 Avenue shall be encouraged, as per **Figure 6.13h**.

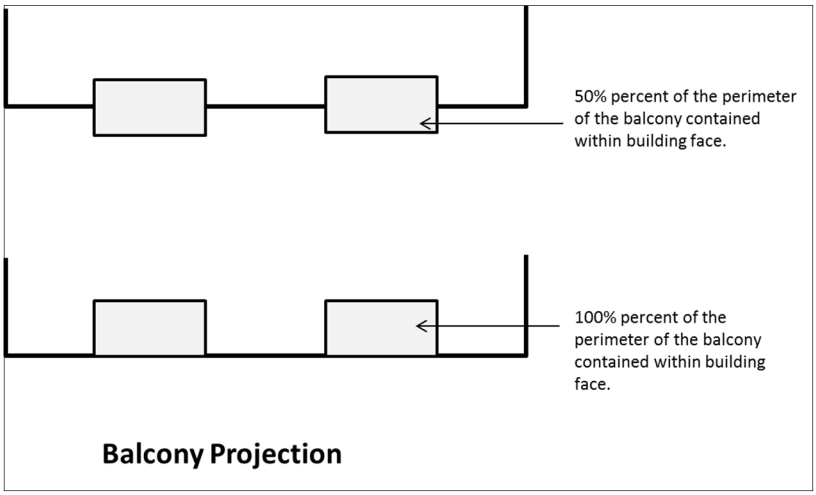
Figure 6.13h: Canopies and Weather Protection



6.13.11 Building Projections

a) Balconies on the streetwall shall be partly or fully recessed from the building face with ~~a minimum~~ approximately 50% of their perimeter contained by exterior walls of the building, as per **Figure 6.13i**.

Figure 6.13i: Balcony Projection



b) Balcony projections may project beyond the floor plate restrictions or the front streetwall up to a maximum of 1.0m (3.3ft) but shall in no case project beyond the property line.

6.13.12 General Parking Requirements

a) On-site parking should be provided at the rear or sides of buildings, within underground parkade or above-ground parking structures. Surface parking areas should not be developed adjacent to any public roadway other than a lane, unless a suitable interface with the abutting street is provided to the satisfaction of the Development Authority.

b) Corner sites may have surface parking areas located on the side of the building, facing the flanking roadway when screened from public view.

c) The Development Authority may consider granting additional Floor Area Ratio, if the applicant agrees to provide underground parking stalls to meet all parking requirements of the project.

d) Uses and developments not specified in an approved Parking Impact Assessment shall meet the Minimum Parking Requirements for Downtown, as per Table 11.e.

e) Structured parking facilities shall generally be provided at locations internal to the site. If such parking facilities are located fronting a public roadway, then the following design considerations shall be utilized:

i. Ground floor shall include retail uses with multiple entrances;

ii. Entrance to the parking facility shall be designed with special architectural treatment to maintain the integrity of retail frontage; and

iii. The facade of the upper storeys of the parking facility shall be designed to reflect residential or commercial building character.

6.13.12 ~~Parking,~~ Circulation, Accesses, Loading and Waste Collection

~~a) On-site parking should be provided at the rear or sides of buildings, within underground parkade or above-ground parking structures. Surface parking areas should not be developed adjacent to any public roadway other than a lane, unless a suitable interface with the abutting street is provided to the satisfaction of the Development Authority.~~

b) All vehicular access to parking and on-site service areas, parking facilities, waste storage/collection areas as well as loading facilities shall be screened from public roadways using enhanced landscape treatment or special architectural features.

c) Where possible, vehicular entrances to underground parking facilities and passenger drop-off areas shall be provided from the rear of buildings.

d) Internal roadway network shall be designed to improve walkability and reduce shortcutting by vehicular traffic.

e) ~~Drive-through service should be limited.~~

~~f) Structured parking facilities shall generally be provided at locations internal to the site. If such parking facilities are located fronting a public roadway, then the following design considerations shall be utilised:~~

~~i. Ground floor shall include retail uses with multiple entrances;~~
~~ii. Entrance to the parking facility shall be designed with special architectural treatment to maintain the integrity of retail frontage; and~~
~~iii. The façade of the upper storeys of the parking facility shall be designed to reflect residential or commercial building character.~~

~~g) The Development Authority may consider granting additional Floor Area Ratio, if the applicant agrees to provide underground parking stalls to meet all parking requirements of the project.~~

h) Garbage and recycling containers shall provide a minimum setback of 1.0m (3.3ft) from a property line and be screened using appropriate architectural or landscaping treatment to the satisfaction of Development Authority.

~~i) Designated areas for storage, temporary truck parking, waste collection, compaction, and loading shall have a minimum setback of 7.5m (24.6ft) from public roadway and a minimum separation of 25.0m (82.0ft) from residential buildings.~~

6.13.13 Signage

a) Buildings on corner sites shall provide signage on both building façades.

b) Projecting signs may project beyond the streetwall by a maximum of 1.0m (3.3ft) and should be restricted to ground floor only.

6.13.14 Additional Development Regulations for C5

a) All development and uses within this Land Use District are subject to the applicable provisions of Part 4 - General Regulations for all Land Use Districts, Sections 6.1 to 6.7 of Part 6 - Commercial Land Use Districts, Part 11 - Parking and Loading, and Part 12 – Signs. ~~and are subject to all provisions from the Downtown Area Redevelopment Plan (DARP) or other Statutory Plans adopted by Council;~~

b) Except for off-street parking, loading areas and approved patios, all business activities shall be carried out entirely within completely enclosed buildings or structures. Sidewalk sales, tent sales, or farmers markets shall be considered in the approved open space areas such as parking lots or plazas in accordance with the regulations for Temporary Outdoor Events; and

c) The siting and appearance of all buildings or improvements, and the landscaping of the site shall be to the satisfaction of the Development Authority in order that there shall be general conformity with adjacent buildings, and that there may be adequate protection afforded to the amenities of adjacent buildings and sites. The form and character of buildings shall complement adjacent residential character of the neighbourhood.

PART 13 – DEFINITIONS

General Definitions

DISPLAY GARDENS means an area dedicated to planting that provides privacy for residential uses, and improves streetscape aesthetics.

FLOOR AREA RATIO (FAR) means the numerical value of the gross floor area on all levels of all buildings on a lot, divided by the area of the lot.

[1]**HIGH DENSITY RESIDENTIAL** means residential development at a density of over 70 dwelling units per net developable hectare ~~for developments outside of the C5 – Fort Mall Redevelopment District. High Density Residential within the C5 – Fort Mall Redevelopment District means residential development at a density of 91-250 dwelling units per net developable hectare and is 9 to 15 storeys.~~ except when located in the Downtown or C5 Districts.

[12]**LOW DENSITY RESIDENTIAL** means residential development at a density up to 35 dwelling units per net developable hectare ~~for developments outside of the C5 – Fort Mall Redevelopment District. Low Density Residential within the C5 – Fort Mall Redevelopment District means residential development at a density not to exceed 50 dwelling units per net developable hectare and is 0 to 4 storeys.~~ except when located in the Downtown or C5 Districts.

[1]**MEDIUM DENSITY RESIDENTIAL** means residential development at a density of 36-70 dwelling units per net developable hectare ~~for developments outside of the C5 – Fort Mall Redevelopment District. Medium Density Residential within the C5 – Fort Mall Redevelopment District means residential development at a density of 51-90 dwelling units per net developable hectare and is 5 to 8 storeys.~~ except when located in the Downtown or C5 Districts.

[1] C22-14
[2] C19-14

Existing and Proposed Regulations

	Existing Regulation	***Proposed Regulation***	**MP-D Mall Precinct**
Multi-attached Dwelling	Discretionary Use	*Permitted Use*	Discretionary Use
Min. Front Setback	For buildings with commercial uses at ground floor: 1.4m to 3.4m (4.6ft to 11.2ft) in order to achieve a continuous pedestrian zone of 3.4m (11.2ft) For building with residential units at ground floor: minimum 3.0m (9.8ft) with display gardens.	*Non-residential uses at ground floor - 0.0m (0.0ft) to 1.4m (4.6m) to achieve a continuous pedestrian zone of 3.4m (11.2ft)* *Residential uses at ground floor* *3.0m (9.8ft) with display gardens* *Residential uses at ground floor abutting MR* *1.0m (3.3ft) with display gardens in the MR*	Non-residential uses at ground floor - 0.0m (0.0ft) to 1.4m (4.6m) to achieve a continuous pedestrian zone of 3.4m (11.2ft) Residential uses at ground floor 3.0m (9.8ft) with display gardens
Min. Side Setback	At the discretion of the Development Authority unless located on a corner site. For corner sites: minimum 1.4m to 3.4m (4.6ft to 11.2ft) in order to achieve a continuous pedestrian zone of 3.4m (11.2ft)	*0.0m (0.0ft)*	0.0m (0.0ft)
Min. Rear Setback	At the discretion of the Development Authority for sites not abutting a Residential Land Use District	*0.0m (0.0ft) when abutting a Non-Residential Land Use District* *4.5m (14.8ft) or one-half (1/2) the height of the building, whichever is greater, for sites abutting a Residential Land Use District*	0.0m (0.0ft) when abutting a Non-Residential Land Use District 4.5m (14.8ft) or one-half (1/2) the height of the building, whichever is greater, for sites abutting a Residential Land Use District
Max. Building Height	3 storeys along 98 Avenue	*4 storeys along 98 Avenue*	4 – 15 storeys
Floor Area Ratio	3.5	*4.0*	4.0

Unit Density	Low density – 50 dwelling units per net developable hectare Medium density – 90 dwelling units per net developable hectare High density – 250 dwelling units per net developable hectare	*200 units/net hectare for sites less than 1500.0m²* *350 units/net hectare for sites greater than 1500.0m²*	200 units/net hectare for sites less than 1500.0m² 350 units/net hectare for sites greater than 1500.0m²
Amenity Area	7.5m² (81ft²) per dwelling unit. Minimum 25% of the required amenity area shall be provided as outdoor space	*Private Amenity - 3.0m² (32.3ft²) per dwelling unit to be provided by balconies, decks, patios or rooftop amenity areas* *Common Amenity Apartment Dwellings 4.5m² (48.4ft²) per dwelling unit* *All other Residential Dwellings* *At the discretion of the Development Authority. This can include indoor and outdoor amenities such as seating areas and roof top patios*	Private Amenity - 3.0m² (32.3ft²) per dwelling unit to be provided by balconies Common Amenity - 4.5m² (48.4ft²) per dwelling unit
Min. Parking Requirements	Standard LUB minimum requirements for land uses	*Uses and developments not specified in an approved Parking Impact Assessment shall meet the Minimum Parking Requirements for Downtown, as per Table 11.5*	Minimum Parking Requirements for Downtown, as per Table 11.5

APPLICANT'S AMENITY AREA REQUEST

EXISTING C5 REGULATION - 6.13.3 (j):

Amenity Area

7.5 m^2 (81ft^2) per dwelling unit. Minimum 25% of the required amenity area shall be provided as outdoor space

APPLICANT'S REQUEST:

Common Amenity Area

Apartment Dwellings - 4.5m^2 (48.4ft^2) per dwelling unit

ADMINISTRATION'S RECOMMENDATION:

Common Amenity Area

Apartment Dwellings - 4.5m^2 (48.4ft^2) per dwelling unit

All other Residential Dwellings - At the discretion of the Development Authority. This can include indoor and outdoor amenities such as seating areas and roof top patios

Reasoning:

- To provide flexibility for the developer while maintaining a requirement for an amenity area for multi-unit developments
- This area could include benches at the ground floor or a rooftop patio
- The wording of the regulation allows for the requirement to be reviewed on a case by case basis

RESOLUTION (Should Council support the applicant's request):

1. That the amenity area requirement be amended to remove the requirement for all other residential dwellings in regards to the common area requirement.

Invistec Consulting Ltd.
4th Floor, 10235 – 101 Street
Edmonton, Alberta
T5J 3G1

June 14, 2016

RE: C5 - Fort Mall Redevelopment District Bylaw Amendment Application

Attention City Council, Planning and Development, and Residents of Fort Saskatchewan:

As the economy has shifted in the last few years, Haro Developments' initial concept has been required to change with it to ensure the successful revitalization of Fort Saskatchewan's Fort Mall District. After multiple attempts in 2015 to get development permits approved, it was determined that amendments to the C5 District would be required to help align these changes. Together with the City's Planning and Development Department, the proposed C5 District aligns with the recently adopted Downtown Land Use Districts and Haro Developments' vision for the past 4 months (see attached timeline). During these collaborations, Haro Developments has compromised with the City on things such as parking, permitted uses, exterior elevations, and setback regulations. However, the Amenity Area was an area where a decision could not be reached.

Common Amenity Area

Currently, Haro Developments has dedicated 15% of the total site towards landscaping, which has been developed and promised to be developed as amenity spaces. Through the new proposed regulations, this would require additional amenity areas to be dedicated. The amenity area is one of the highlights of the Fort Mall site, something that the condominium association takes pride and ownership of. The condominium association currently includes all the parcels and maintains the space. With competing amenity areas throughout the Fort Mall site, the possibility of competing interests may arise, causing the attention to be shifted elsewhere. With the large landscaped area prominently located along 99 Avenue, it is critical that this amenity area be focused on, ensuring the goal of creating an integrated site.

The Fort Mall site was designed to be an interactive, integrated, pedestrian-oriented mixed-use site with a large landscaped amenity area for all residents in the area to utilize. Enhanced pedestrian connections were planned to provide residents on and off site connections to this amenity area from all directions. The proposal is to utilize this large amenity space as intended and have it be shared by all those living and working in the Downtown. By creating a large amenity area, the vibrancy and energy is focused on the Fort Mall site, which is centrally location on both the site and downtown. This creates a natural gathering place that highlights 99 Avenue. Sharing the common space will accomplish three goals: improve greenspace connectivity between the Old Fort/Legacy Park and Langworthy Park, create a destination in the Downtown that is walkable from all directions for all residents of Fort Saskatchewan, and support a future transit line by creating a gathering place along 99 Avenue as indicated in the DARP.

Private Amenity Area

The Downtown Land Use Bylaw that was recently passed by Council was used to revise the policies found in the C5 District to ensure consistency among the regulations. Under the Downtown Land Uses, Private Amenity Areas are to be accommodated through balconies. Balconies are defined under the Land Use Bylaw as being a platform with or without supporting structure above the first storey. By specifying balconies, this limits the diversity in housing choices that would utilize alternative forms of private amenity areas, such as stacked

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townhouses, and ground level residential uses. As the east and south side of the Fort Mall site are intended to have residential frontages, ground floor dwellings or multi-family dwellings with porches would not be able to accommodate this regulation. Furthermore, rooftop terraces would also be restricted as they are not a platform that is attached to and projecting.

Thank you for your time and consideration.

Regards,

Stephen Yu
Planner
Invistec Consulting Ltd.
780-217-7751
stephen.yu@invistec.ca

Relevant Policies to Bylaw C10-16
Amendments to C5- Fort Mall Redevelopment District

Community Sustainability Plan – R173-14

CC – Compassionate Community & Sense of Community	
CC5	Adapt land use policies to allow for a greater range of housing options including mixed use and high density developments
SB2 – Supporting Businesses	
SB2	Proactive downtown revitalization including incentives, high density development, multiple uses and connectivity.
SB3	Develop a strategy for redevelopment of the mall site to ensure best possible future use.
UR – Urban Resources	
UR1	Rezone city to allow mixed use development, higher densities and a higher percentage of land (approximately 10-15% more) being dedicated to green spaces.
UR4	Develop the City around neighbourhood nodes so people can walk to their nearest node for daily needs and amenities.
UR17	Promote infill sites for development prior to greenfield sites.

Municipal Development Plan – Bylaw C16-10

Designation: Downtown (D)

6.1 Downtown	
6.1.2	Promote the Downtown as the centre for commerce and civic life in Fort Saskatchewan
6.1.4	Establish the Downtown as the City's most prominent walkable, urban neighbourhood, providing a unique range of residential, commercial, entertainment, cultural, and recreational opportunities.
6.1 General Urban Area	
6.2.5	Consider proposals for sensitive residential infill redevelopment projects that contribute to the livability of existing neighbourhoods.
7.1 Urban Structure and Placemaking Policies	
7.1.1	Encourage the development of the Downtown and Mixed Use Centres as primarily walkable precincts, with special attention given to the public realm and facilities for pedestrians.

7.1.5	Encourage a variety of land uses in the Downtown, Mixed Use Centres, and the General Urban Area, to promote integrated, complete neighbourhoods where residents can carry out most of their day-to-day activities.
8.5 Parking	
8.5.1	Review the Land Use Bylaw to implement reduced parking requirements in all areas, such as the Downtown and Mixed Use Centres, that have access to frequent transit and neighbourhood amenities, or where other strategies can be employed to effectively manage parking demand.
9.0 Housing	
9.1.4	Support sensitive infill and redevelopment in the Downtown, Residential Mixed Use Centres, General Urban Area, and Core Residential land use districts.
13.0 Responsive Local Economy	
13.2.1	Continue to encourage redevelopment of the mall and old hospital sites.

Downtown Area Redevelopment Plan & Design Guidelines – Bylaw C14-08

Designation: Mall Redevelopment Precinct

9.5.1 Mall Redevelopment Precinct Land Use Policies	
1)	The primary focus for the area is to provide medium to high density and scale residential and commercial development on the two mall sites.
3)	Retain the east side of 108 Street for commercial/residential mixed-uses, with a maximum building height of 4 storeys (14.0 m).
7)	Commercial development on the ground floor of buildings will have entrances that address the street and the pedestrian through the use of glazing, weather protection, signage, and lighting.
8)	The principal entrance to dwelling unit(s) provided on the ground floor of buildings will provide direct external access to the adjacent public sidewalk.
9.5.1 Mall Redevelopment Precinct Parking Policies	
2)	Consider proposals for the reduction of required on-site parking for new developments, redevelopments, or additions or enlargements to existing buildings in this Precinct, in accordance with the parameters outlined in Section 2.33 of the Land Use Bylaw.

CITY OF FORT SASKATCHEWAN

Southfort Transportation Study Update

Motions:

1. That Council lift the Southfort Transportation Study Update from the table.

2. That Council adopt the Southfort Transportation Study Update (September 2015) with the Addendum to the Transportation Study dated April 21, 2016.

Purpose:

To provide Council with the findings of the Southfort Transportation Study Update and the Addendum to the Study, which addresses concerns raised by Council at the January 12, 2016 regular Council Meeting.

Background:

In 2013, an update of the Southfort Area Structure Plan (SF-ASP) was approved. This Plan adjusted some of the proposed land uses and major road networks within the Southfort Development Area.

As a result of this SF-ASP update in 2014, a review of the Southfort Transportation Plan was undertaken in 2014 to determine expected traffic volumes, road classifications, and intersection treatments.

The resulting Study was conducted using traffic simulations of the Southfort area at 50% development and at full development. The findings of these simulations resulted in the following recommendations:

1. Southfort Drive can be reclassified as a Collector Road south of Southfort Boulevard and should terminate at Southridge Boulevard, rather than extending to the south boundary.
2. The 94 Street / Southridge Boulevard corridor can be reclassified as a Collector Road between Southfort Drive and Sienna Boulevard.
3. Six additional signalized intersections will be required in the SF-ASP.
4. Six single lane round-a-bouts should be installed at the intersections of major collectors, rather than signals as the moderate off-peak traffic volumes do not require signals.
5. An additional access to Highway 21 south of the SF-ASP area will be required at full development to relieve congestion at the Highway intersections.
6. The Highway 15 / 21 Corridor adjacent to the Study area will require six lanes within the 50% development horizon. This confirms the 2008 Road Right-of-Way Master Plan findings.

At the January 12, 2016 Council Meeting, Council referred the Study back to Administration with concerns regarding the 94 Street Classification as a two-lane collector and the recommendation for round-a-bouts on 94 Street.

Because the report is a technical document based on a scientific process, the original report remains unchanged. An addendum to the report was prepared by the Consultant to address Council's concerns.

The April 21, 2016 Addendum addresses three aspects of the original report.

1. Southfort Drive Classification: The south end of Southfort Drive between Southfort Boulevard and Southridge Boulevard is changed in classification from collector to arterial. While the

projected traffic volumes do not meet the arterial classification, this road has already been constructed to the arterial standard, therefore the addendum reflects the current configuration.

2. Round-a-bout intersections on 94 Street: The projected traffic volumes on 94 Street and the intersecting roads demonstrate that they do not need to be signalized and that stop control on the intersecting roadways will perform adequately. However, with 94 Street configured as a long straight roadway with no stop control, it is likely that traffic speeds will tend to be higher than what is acceptable through a neighbourhood. The round-a-bouts will create a traffic calmed streetscape reducing future speed and noise complaints, they will reduce shortcutting through the neighbourhood and will allow easier access to 94 Street from the intersecting roadways.

3. 94 Street Classification: Council had concerns regarding 94 Street being constructed to two lanes only. The projected traffic volumes do not meet the criteria for a four-lane roadway. However, to mitigate these concerns, a modified cross-section has been developed that will allow for the widening to four-lanes sometime in the future. Projected traffic volumes on 94 Street are between 3,800 and 7,850 vehicles per day.

The Southfort Transportation Study is a technical document that forms the basis of what transportation projects can and will be included in the Southfort Levy. If the technical merit of a project cannot be demonstrated within a supporting technical study, the project cannot be included in the Levy and becomes a future cost to the City. If the recommendations of the Study are followed then the projects identified within the Study will be constructed either at the developer's expense at the time of construction or by the Levy (also developer money). This will help mitigate future City costs like retro-fitting traffic calming features, intersection control, and roadway widening.

The round-a-bouts and intersection treatments will be investigated during the planning of construction. This is done at all intersection construction / improvement projects to ensure that the best option is used to accommodate the users. The recommendation of round-a-bouts ensures that a sufficient right-of-way is set aside and that this option is given a thorough review (it is new to Fort Saskatchewan). Without the round-a-bouts it is likely that speed and noise complaints similar to those the City receives about Westpark Drive and 95A Avenue will be duplicated in this area and that a future traffic calming plan may have to be implemented at the City's expense.

The 99 Avenue ring road in Pineview has traffic volumes of 9,000 vehicles per day and 95A Avenue has traffic volumes of 6,000 vehicles per day. Both of these roadways function very well as 2-lane collectors, however, the City does receive complaints about excessive speed and noise on these roadways. Over-building 94 Street will result in speed issues and short-cutting through predominantly residential areas rather than pushing the through traffic to the Highway, Southfort Drive (arterial), or the future arterial at 101 Street (with annexation).

Constructing 94 Street to a collector standard now will provide the City with a much more functional roadway regardless of what happens in the future. A two-lane collector standard is actually built three-lanes wide to allow for an auxiliary lane to accommodate transit stops, emergency relief (flat tire) and cyclists. If an arterial roadway classification were used, the first two lanes would be constructed (Southfort Drive) with no auxiliary lane, with the final two lanes not being constructed until warranted (if ever).

At the June 14, 2016 regular Council Meeting this item was tabled to the June 28, 2016 Council Meeting to afford Council further time to review the Study.

Plans/Standards/Legislation:

- Southfort Area Structure Plan.
- Transportation Association of Canada – Geometric Design Guide for Canadian Roads (2007).
- Institute of Traffic Engineers trip generation rates.
- Transportation Research Board of the National Academies of Science – Highway Capacity Manual (HCM).

Financial Implications:

The results of this Study will require an update to the Southfort Levy. The Levy will be updated in 2016 using internal staff capacity. Once complete, the Levy Bylaw will be brought to Council for approval and the projects will be staged within the long-term Capital Plan. As the projects will be levy-funded, there will be no tax impact on the City, other than operating.

If Council approves a Plan beyond the recommendations of the Study, the over-built projects cannot be included in the Levy and these costs will be the responsibility of the City.

Internal Impacts:

With the adoption of the Southfort Transportation Study Update, the SF-ASP will require an update to reflect the changes in classifications. As well, the Levy Bylaw will require an update. Both of these projects will be completed using existing internal resources.

Recommendations:

1. That Council lift the Southfort Transportation Study Update from the table.
2. That Council adopt the Southfort Transportation Study Update (September 2015) with the Addendum to the Transportation Study dated April 21, 2016.

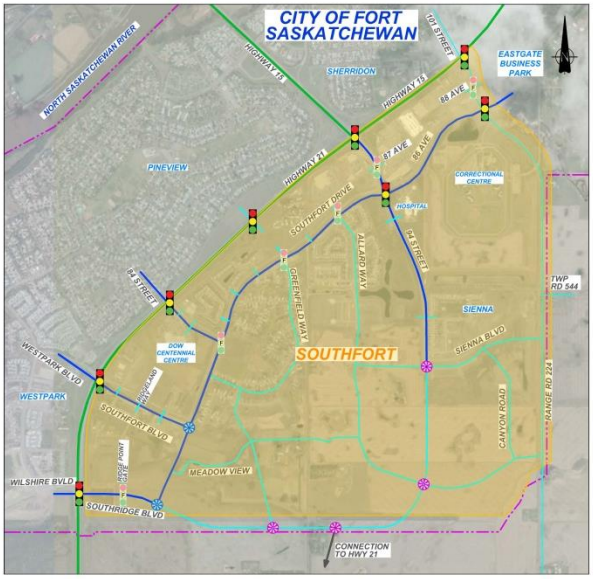
Attachments:

1. Appendix A - Southfort Transportation Study Update (September 2015)
2. Appendix B - Addendum to Transportation Study for the Southfort Area Structure Plan (April 21, 2016)

Prepared by:	Grant Schaffer Director Project Management	Date: May 30, 2016
Approved by:	Troy Fleming General Manager, Infrastructure and Community Services	Date: June 21, 2016
Reviewed by:	Kelly Kloss City Manager	Date: June 21, 2016
Submitted to:	City Council	Date: June 28, 2016

Appendix A

Transportation Study



Southfort Area Structure Plan

In the City of Fort Saskatchewan

August 2015

Prepared for:

CITY OF FORT SASKATCHEWAN ALBERTA

Al-Terra

5307 – 47 Street, Edmonton, Alberta T6B 3T4 Phone: (780) 440-4411 Fax: (780) 440-2585

CORPORATE AUTHORIZATION

This report entitled **Southfort Transportation Study** was prepared by Al-Terra Engineering Ltd., under authorization and exclusive use of the City of Fort Saskatchewan.

The designs and recommendations put forward reflect Al-Terra's best judgment with the information available. Any use of this information in a manner not intended or with the knowledge that situations have changed shall not be the responsibility of Al-Terra Engineering Ltd.

Corporate Permit	Bogusia Stapor, P.Eng.

EXECUTIVE SUMMARY

The City of Fort Saskatchewan retained Al-Terra Engineering to complete the Southfort Transportation Study, a supplementary document to the 2013 Southfort Area Structure Plan (ASP). This study includes an implementation plan for expansion and improvement of the roadway network in the Southfort development area within a mulit-modal context to support new and existing development.

The Southfort ASP is located in the southeast corner of the City of Fort Saskatchewan, bounded on the west and north by Highway 21 and Highway 15, and on the south and east by the city boundary. The ASP plans for a population of between 18,300 and 21,000 people in a variety of housing types units, multiple commercial sites, school sites, a community centre, a hospital, a correctional institution, and a variety of parks and open spaces.

The Southfort Transportation Study's objectives were to identify projected traffic impacts along the road network adjacent to and within the Southfort area and to identify roadway standards, intersection geometry, and traffic control to accommodate the projected traffic volumes at acceptable levels of service. The methodology included:

- Reviewing the Southfort ASP land use assumptions
- Reviewing the proposed road network including road alignments, classification, and cross-sections
- Reviewing and confirming background traffic volumes
- Projecting traffic on the proposed roadway network generated by the Southfort area based on trip generation, trip distribution, mode spilt, and trip assignment assumptions
- Evaluating intersection treatments (traffic control and intersection geometry) throughout the development and the external intersection connections to Highway 21, Strathcona County, and other areas of Fort Saskatchewan
- Reviewing pedestrian and bicycle routes to and through the Southfort area
- Reviewing transit opportunities in the community

Existing external arterial roadways include Highway 21 and Highway 15. Internal arterial roadways include Southfort Drive/86 Avenue, 94 Street, and connections between Highway 21 and Southfort Drive on Southridge Blvd, Southfort Blvd, and 84 Street. There are a number of collector roads identified within the Southfort ASP. Some areas within the Southfort ASP have been developed for over ten years, so some of the roadways are already constructed to a first stage or ultimate cross-section.

Existing traffic volumes were available from counts completed in 2013. Additional traffic volumes from growth in the Southfort ASP were developed based on the ASP land use concept and trip generation rates developed by the Institute of Transportation Engineers (ITE) and studies completed locally in the City of Edmonton. Low, medium, and high density residential; school; and three commercial land use types were used to generate expected trips. The trips were distributed and assigned to the network using a combination of existing splits and data obtained from Alberta Transportation's Edmonton Regional Traffic Model (which includes Fort Saskatchewan). Two scenarios were reviewed – one at 50% development of the Southfort area, and one with full development of the Southfort Area.

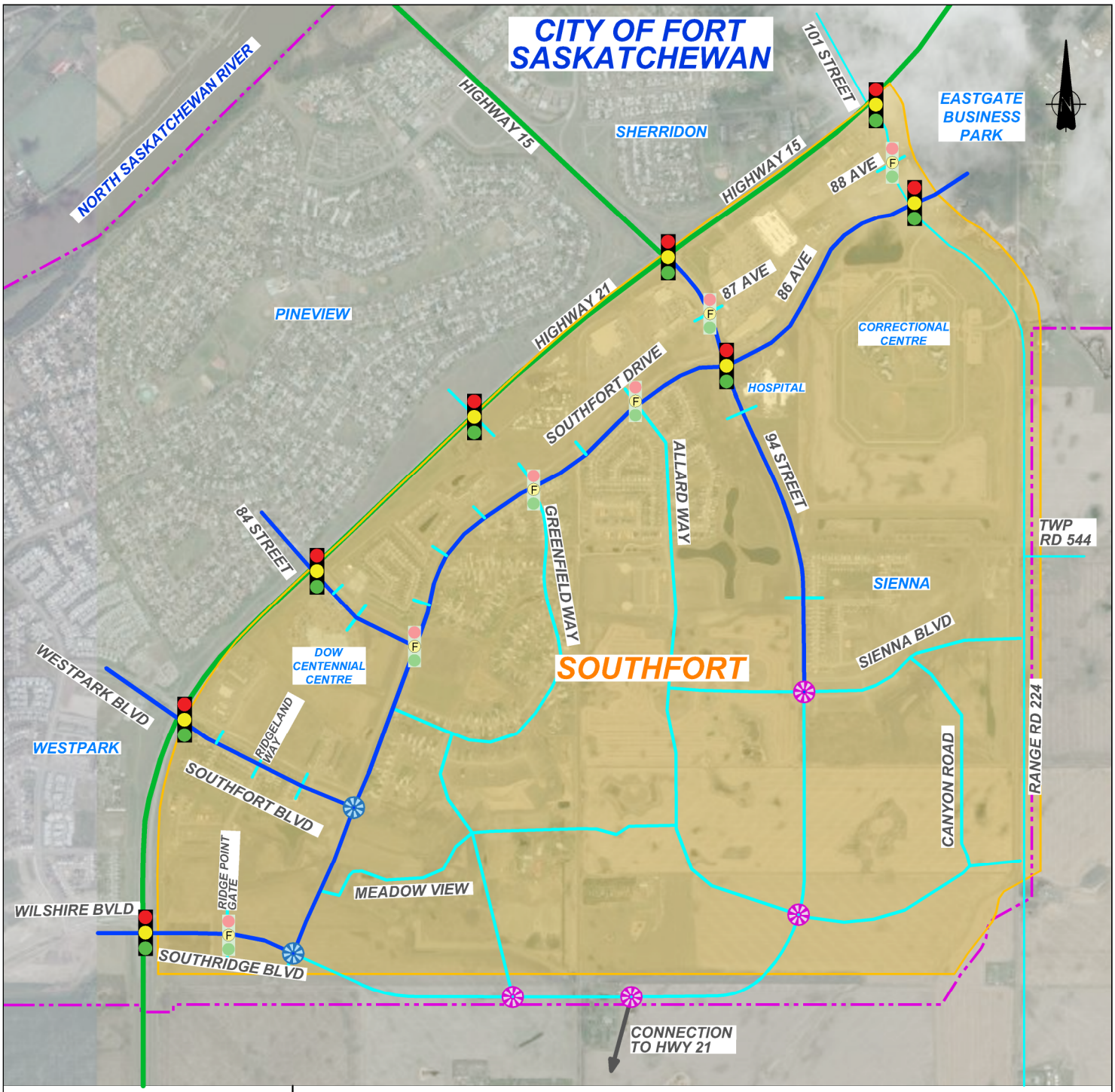
Major intersections were analyzed using Synchro Studio 9 utilizing the Highway Capacity Manual (HCM) methodology. Recommendations were made for additional through lanes, turn lanes, signalization, and/or roundabouts where required.

Arterial and collector roadway corridors were reviewed with respect to projected daily traffic volumes; some roads identified in the ASP as arterial roads are recommended to be reduced to collector status upon this analysis. Some of these collector roads do not require on-street parking, therefore a revised multi-modal roadway cross-section is recommended to provide separate space for pedestrians, cyclists, and drivers. A number of roundabouts are recommended along the collector road corridor to provide traffic calming and consistent intersection operations.

Final recommendations from the Southfort Transportation Study include:

- Highway 21 and Highway 15 adjacent to the study area will require 6 basic lanes within the 50% development horizon.
- An additional access to Highway 21, south of the Southfort ASP area, will be required at full development.
- Southfort Drive will require four lanes from Southfort Blvd. to 94 Street within the 50% development horizon.
- Southfort Drive could be reclassified as a collector road south of Southfort Blvd.
- Southridge Drive east of Southfort Drive and 94 Street south of Sienna Blvd could be reclassified as collector roads, and provide multi-modal road corridors with bicycle lanes.
- Five additional signalized intersections are identified along Southfort Drive, Southridge Blvd, and 94 Street.
- Two intersections at the south end of Southfort Drive are identified as potential roundabout locations due to the moderate traffic volumes that do not require signals.
- Four roundabouts are proposed along the Southridge Blvd/94 Street extensions.

Exhibit ES.1 illustrates the road network recommendations at full buildout of the Southfort ASP.



CITY OF FORT SASKATCHEWAN

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CITY BOUNDARY
STUDY AREA
ALBERTA HIGHWAY
ARTERIAL ROAD
COLLECTOR ROAD
PROPOSED ROUNDABOUT
POTENTIAL ROUNDABOUT
EXISTING SIGNAL
PROPOSED SIGNAL

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
INTERSECTION CONTROLS - FULL DEVELOPMENT OF SOUTHFORT

N.T.S.

DATE: AUGUST, 2015

EXHIBIT ES 1

TABLE OF CONTENTS

TABLES

EXHIBITS

APPENDICES

1.0 Introduction

In the spring of 2014, Al-Terra Engineering was commissioned by the City of Fort Saskatchewan to undertake the Southfort Transportation Study, a supplementary document to the 2013 Southfort Area Structure Plan. The study was to include an implementation plan for expansion and improvement of the roadway network in the Southfort development area within a multi-modal context.

1.1 Background

The Southfort Area Structure Plan (ASP) was approved by the City in June 2013 – Bylaw C7-13. The document provides land uses, access and servicing, and policy direction for an area on the southeast side of Fort Saskatchewan that will ultimately accommodate a population of 18,300 – 21,000.

The ASP is a guide for the location, intensity and character of land uses. The Southfort ASP land uses include:

- A variety of residential housing types and densities with 7,300 - 8,400 dwelling units
- Commercial sites located between Highway 21 and Southfort Drive
- School sites to potentially accommodate 5 schools
- Community Hospital – completed in 2012
- DOW Centennial Centre, a major recreational/cultural facility - completed in 2003
- The Fort Saskatchewan Correctional facility
- The future site of the Royal Canadian Mounted Police detachment
- Open spaces with interconnecting walkways and City's trail systems
- General water, sanitary and storm servicing facilities for the area

1.2 Study Objectives

The objective of this study was to identify the projected traffic impacts along the roadway network adjacent to and within the Southfort area and to identify required roadway standards, intersection geometry, and traffic control to accommodate the projected traffic volumes at acceptable levels of service.

1.3 Study Methodology

The Southfort Transportation Study methodology included the following components:

- A review of the Southfort ASP land use assumptions
- Examination of the proposed road network including road alignments, classification, and cross-sections
- Review and confirmation of background traffic volumes associated with the study area
- Projecting traffic on the proposed roadway network that is anticipated to be generated by the Southfort area based on trip generation, trip distribution, mode spilt, and trip assignment assumptions
- Evaluating intersection treatments (traffic control and intersection geometry) throughout the development and the external intersection connections to Highway 21, Strathcona County, and other areas of Fort Saskatchewan
- Review of pedestrian and bicycle routes to and through the Southfort area
- Review of transit opportunities in the community

2.0 Site Context

2.1 Site Location

The Southfort ASP includes approximately 700 hectares (1700 accres) of land located in the southeast part of the City of Fort Saskatchewan. The area is bounded by Highway 21/Highway 15 to the northwest, 101st Street to the northeast and by the east and south city boundary to the east and south, respectively. **Exhibit 2.1 – Key Map** illustrates the location of Southfort within the City of Fort Saskatchewan and surrounding municipalities.

2.2 Existing Area Characteristics

2.2.1 Existing Land Uses

The existing Southfort area is partially developed and the existing developments are mainly located in the west and north. The area is continuously developing and progressing to the south and east.

Initial development of the Southfort ASP was concentrated east of Highway 21/Highway 15 and on the north side of Southfort Drive, which included commercial land uses. Residential developments followed along Southfort Drive and 94th Street. The majority of the residential areas east of Southfort Drive are low density developments.

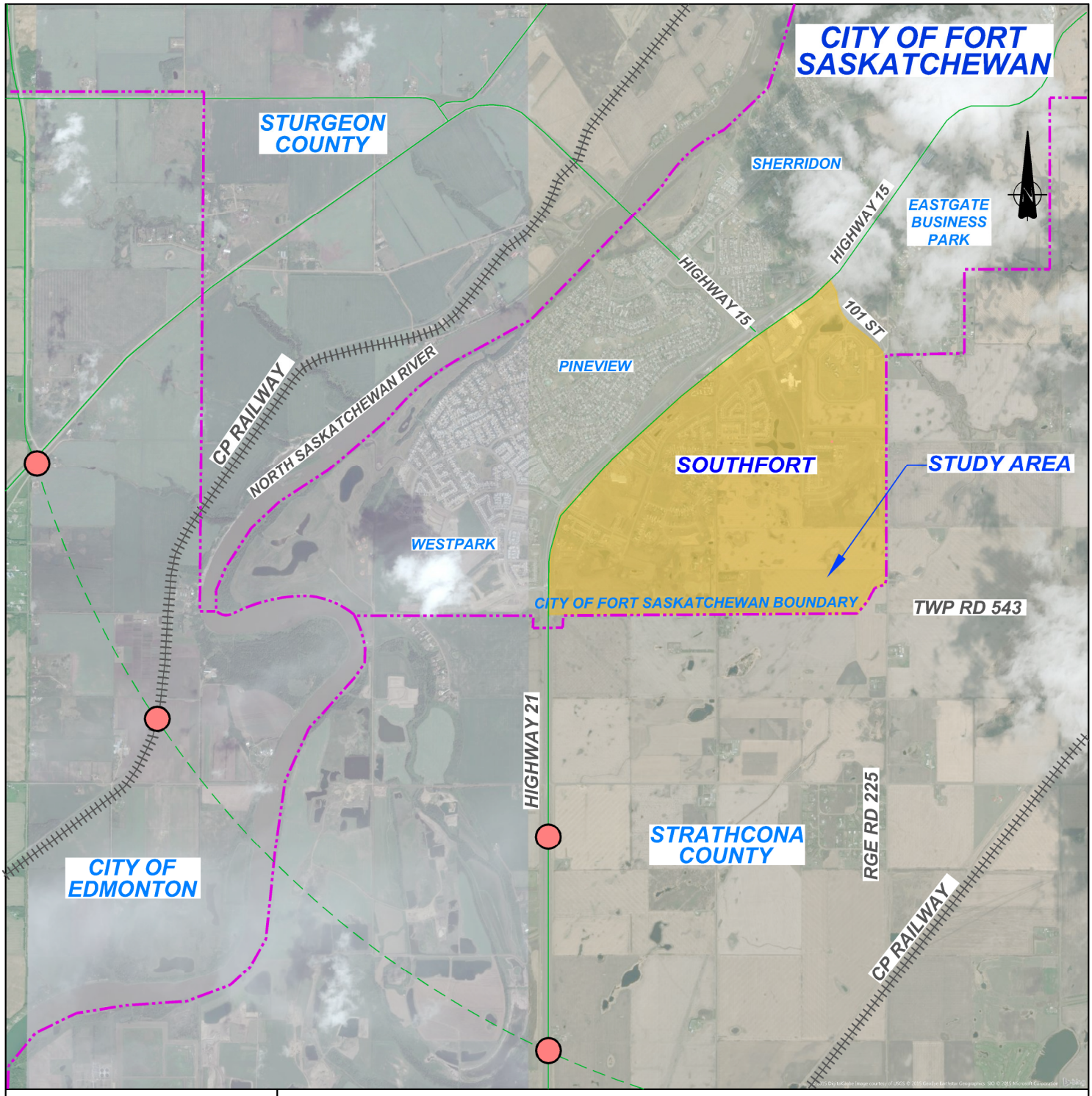
The completed institutional developments include a community hospital, correctional institution and the Dow Centennial Recreation Centre. They are located in the northeast part of the Southfort area, west of Highway 21.

2.2.2 Existing Road Network

Existing major roadways in the area include Highway 21 and Highway 15, which are classified as expressways. The basic cross-section of these roadways is a divided four lane rural roadway with widening through major intersections to accommodate turning movements. Five major signalized intersections provide primary access to Southfort and to developed areas to the west. In addition, there are right-in/right-out intersections with auxiliary lanes, which provide additional access to Southfort commercial developments.

Internal roadways in Southfort include:

- Southfort Drive/86 Avenue, which is designated as an arterial roadway between Southridge Boulevard and 101 Street, runs parallel to Highway 21 and Highway 15. In the longer term Southfort Drive is planned as a conventional four lane divided roadway south of 94 Street. Currently Southfort Drive is completed to the ultimate four lane section for only a short distance south of 94 Street. Other sections are constructed with two initial lanes and some widening at intersections. The southern portion of Southfort Drive is yet to be completed to provide continuation to Southridge Boulevard. 86 Avenue, north of 94 Street, is adjacent to the hospital and correctional institute to the east and commercial development to west. It is constructed as 4 lane undivided roadway.
- 94 Street is a southeast extension of Highway 15, southeast of the Highway 21/Highway 15 intersection. The roadway is constructed as a four lane cross-section which transitions to two lanes east of Southfort Drive. Currently 94 Street extends south and terminates at Sienna Boulevard. Eventually, 94 Street will extend south and west to connect to Southridge Boulevard when



MUNICIPAL BOUNDARY

ALBERTA HIGHWAY

CONCEPTUAL CORRIDOR

TENTATIVE GRADE SEPARATION

CITY OF FORT SASKATCHEWAN

Al-Terra

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORATION STUDY
KEY MAP

N.T.S.

DATE: AUGUST, 2015

EXHIBIT 2.1

development progresses futher south. 94 Street provides access to the Sienna neighborhood currently under construction.

- Southridge Boulevard, Southfort Boulevard, and 84 Street provide arterial standard road connections between Highway 21 and Southfort Drive, and are constructed as either 4 or 2 lane cross-sections.
- 101 Street, at the north boundary of Southfort ASP, is constructed to an urban arterial standard with a 4 lane divided cross-section. East of 86 Avenue, the roadway transitions to 2 lane rural cross-section.
- Collector roadways which include Allard Way and Greenfield Way provide access to developed Southfort Neighborhoods east of Southfort Drive.

2.2.3 Existing Traffic

Existing (2013) intersection traffic counts at the Highway 21/Highway 15 intersection, and link volumes at some internal Southfort locations were provided by the City. In addition, permanent counter information was used to determine the peak hour relationship to daily traffic volumes on the road network.

No intersection traffic information was provided within the existing internal roadways, but it was estimated based on methodology used for new developments and then iteratively balanced between available link volumes

Estimated traffic volumes representing year 2013 conditions, which include the road network and development that existed at that time, are illustrated in **Appendix A**. 2013 is considered the base year for future traffic estimates throughout the study.

3.0 Development and Traffic Characteristics

3.1 Proposed Development

The Southfort ASP is bounded by Highway 21 and Highway 15 to the west, 101 Street to the north, Range Road 225 (east city boundary) and section line 525 (south city boundary).

The area includes commercial developments between Highway 21/15 and Southfort Drive, which are mostly developed; the remaining lots (approximately 7.0ha [17 acres]) are being developed and will be completed in the near future.

The existing to date developed dwelling unit numbers in Southfort were based on 2013 census data and are presented in **Table 3.1**.

Table 3.1: Existing Residential Units

	Existing Number of Units (2013)
Low Density Residential	1045
Medium Density Residential	210
High Density Residential	195
Total	**1450 DU**

The number of dwelling units (DU) for full buildout of Southfort was estimated based on existing and future preliminary development plans using the lot counts. The areas where plans were not yet available and for the high density development, the following assumptions were used to estimate number of dwelling units:

- Low Density Residential (LD) – 28 DU/hectare
- Medium Density Residential (MD) – 35 DU/hectare
- High Density (HD) – 55 DU/hectare

Estimated total number of dwelling units based on full development of Southfort area is summarized in **Table 3.2**.

Table 3.2: Full Development Residential Units

	Number of Units @ Full Development
Low Density Residential	5210
Medium Density Residential	730
High Density Residential	630
Total	**6570 DU**

Additional developments indicated on the Southfort ASP include five potential school sites. For the purpose of this traffic assessment, one school was included with an assumed 600 students.

3.2 Growth Trends and Analysis Horizon

There are two residential areas developing concurrently in the City of Fort Saskatchewan. These areas include the Southfort and Westpark areas. Based on historical development intensity and local contractors' workforce potential, it is assumed that approximately 500 residential lots could be developed in one year. Futher, it is assumed that half of these lots would be developed in Westpark and the other half in Southfort. It is estimated that Westpark would be fully developed within 6 years and then the full development effort will be directed into Southfort.

Based on the above assumptions it is estimated that 50% development level of Southfort could occur within 10 years and the area could be fully developed in 15 years. **Exhibit 3.1** illustrates the land use at full development of Southfort. Existing Southfort development trends indicate that areas along Southfort Drive and 94 Street (north) would be developed first. The 50% development level is illustrated in **Exhibit 3.2**, indicating that southeast area of Southfort will be developed last.

The two future horizons were established for this study are:

1. Full development of the Southfort Area with possible timeline - 15 years
2. 50% development level with estimated possible timeline - 10 years

3.3 Background Traffic

Alberta Transportation's Regional Transportation Traffic Model for 2044 includes the City of Fort Saskatchewan with the main road network. The model inputs include future industrial developments in the north part of the City and developments north of the City in addition to the residential areas such as Southfort and Westpark.

The future model traffic estimates indicate Highway 21 and Highway 15 volumes lower than existing (2012) volumes, which suggests that external to the City through traffic will not grow, especially if another higher speed road corridor is provided, such as new river crossing south of the City.

It is assumed that future Highway 21 and Highway 15 growth will be the result of pending development in the City.

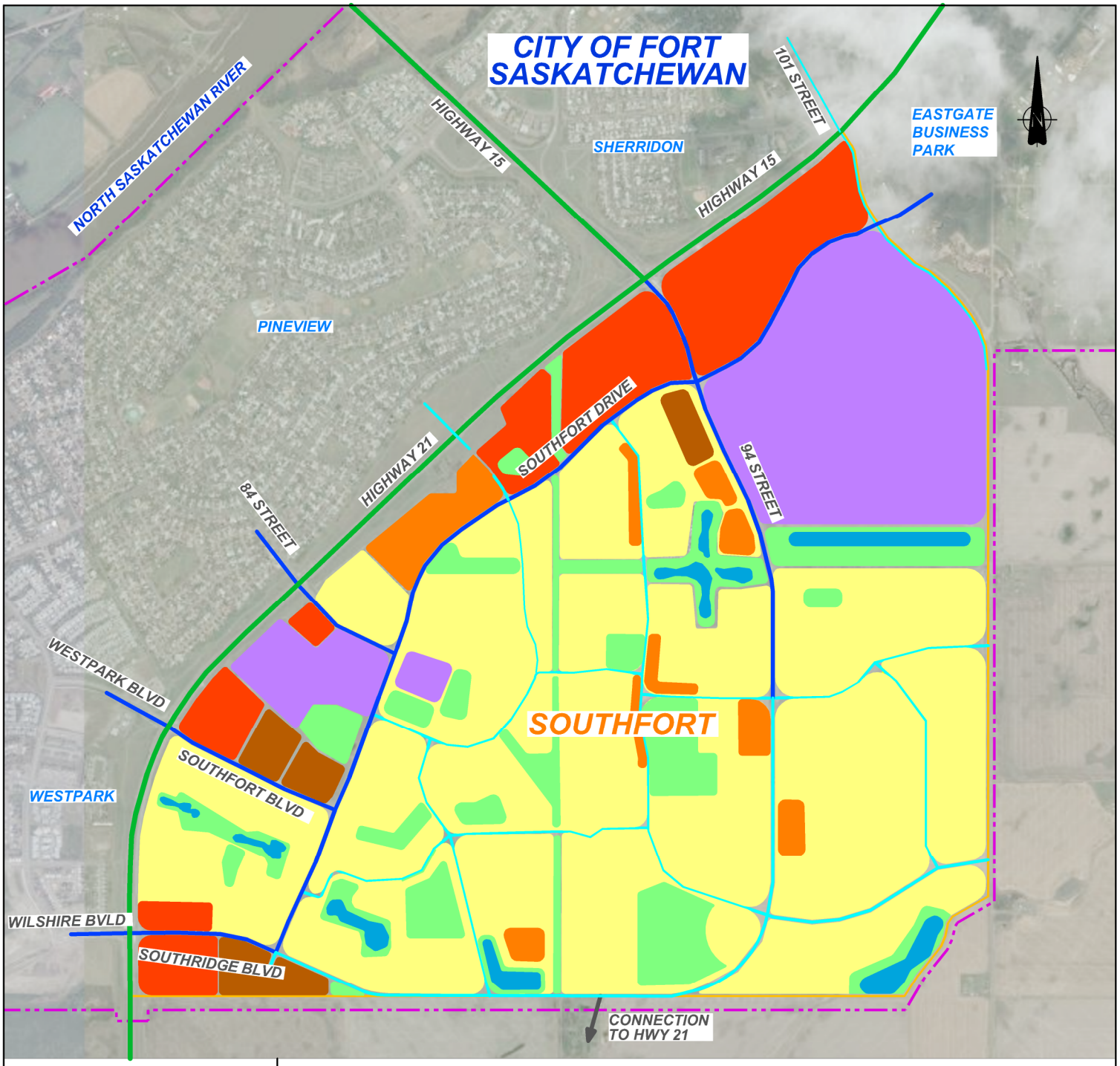
3.4 Transportation Study Methodology and Assumptions

A traditional four step traffic model was used to estimate future traffic volumes on the road network. Requirements for transportation infrastructure, which includes road laning and intersection control requirements, were developed based on the model.

The model includes following steps:

1. Trip Generation – estimates of number of trips generated within each land use
2. Trip Distribution – determination of origin and destination of the trips
3. Modal Split – vehicles, transit and other transportation modes' share of the trip generation
4. Trip Assignment – assumption of which roads would be used to execute the trips

PTV Vistro modelling software was used to estimate traffic on the road links and the turning movements at intersections. The estimated future traffic was analyzed using Synchro 9 software, in which the Highway Capacity Manual (HCM) methodology was utilized. The analysis determined Level of Service (LOS) which



CITY BOUNDARY
ALBERTA HIGHWAY
ARTERIAL ROAD
COLLECTOR ROAD
RESIDENTIAL- LOW DENSITY
RESIDENTIAL-MEDIUM DENSITY
RESIDENTIAL-HIGH DENSITY
PARK
STORM WATER MANAGEMENT POND
COMMERCIAL
INSTITUTIONAL

CITY OF FORT SASKATCHEWAN

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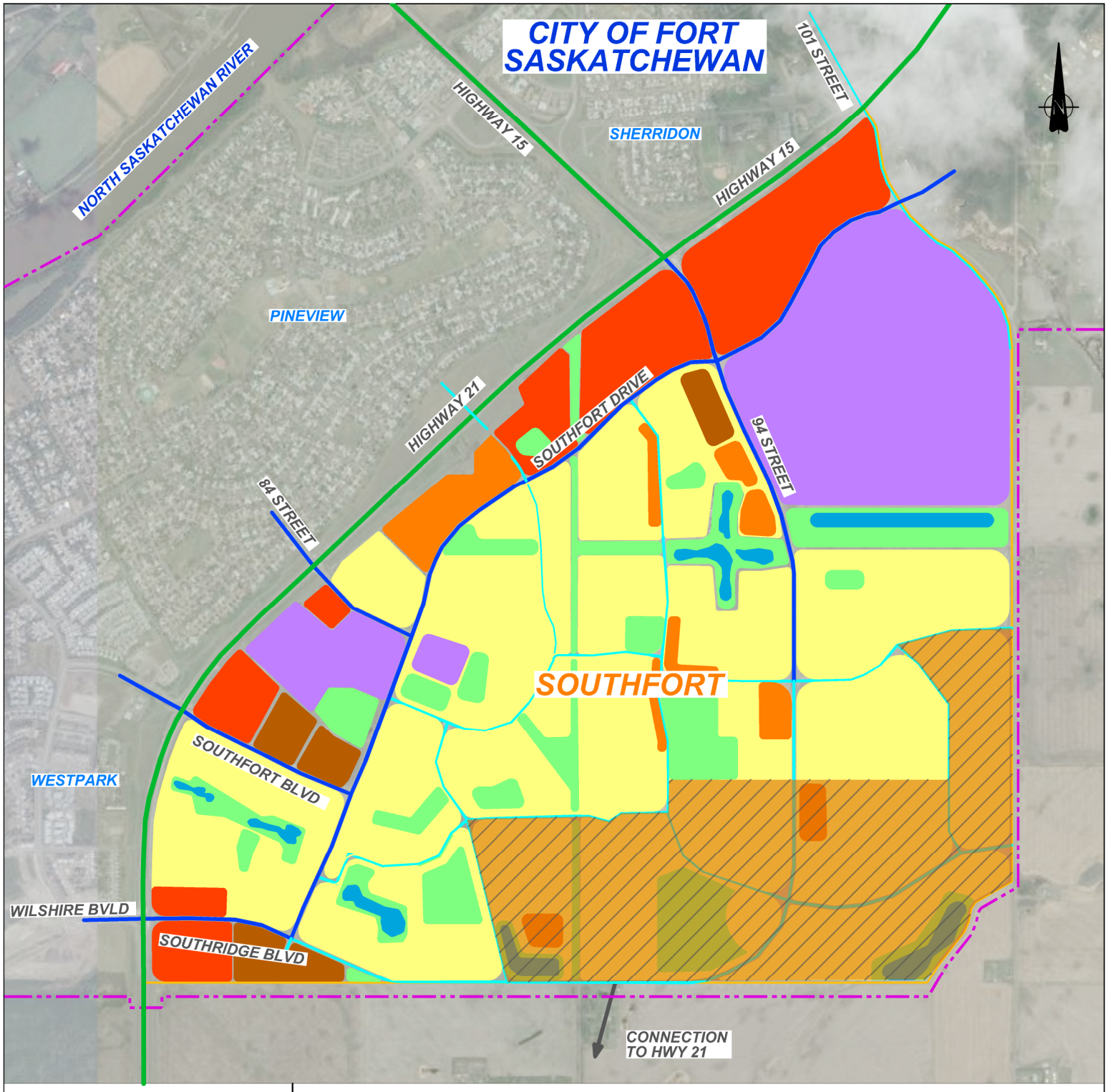
CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
LAND USE MAP
AT FULL DEVELOPMENT OF SOUTHFORT

N.T.S.

DATE: AUGUST, 2015

EXHIBIT 3.1



CITY OF FORT SASKATCHEWAN

CITY BOUNDARY	RESIDENTIAL-MEDIUM DENSITY
UNDEVELOPED LANDS	RESIDENTIAL-HIGH DENSITY
ALBERTA HIGHWAY	PARK
ARTERIAL ROAD	STORM WATER MANAGEMENT POND
COLLECTOR ROAD	COMMERCIAL
RESIDENTIAL- LOW DENSITY	INSTITUTIONAL

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CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
LAND USE MAP
AT 50% DEVELOPMENT OF SOUTHFORT

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EXHIBIT 3.2

is based on average vehicle delay. In addition, Volume to Capacity (v/c) ratios and queues at intersections were determined to indicate effectiveness of the transportation system.

Future traffic within the area and at external intersections was estimated by adding new trips generated by new developments to the existing traffic.

3.4.1 Zone Structure

The Southfort area was divided into homogeneous zones, representing specific land uses (residential, commercial, etc.) for which trips were estimated. **Exhibit 3.3** shows the zone map developed for the model. The zones included existing developments as well as future ones. All Southfort zones are considered internal.

The external zones are accessible via entry/exit points identified in **Exhibit 3.3**, and are often referred to as gates.

The gates are located outside the Southfort area and treat other city locations such as Westpark, Pine View, Sherridon, and East Gate Business Park as external zones. Other external zones include the City of Edmonton, Strathcona County, and Sturgeon County – all which are accessible via Highway 21, Highway 15, and various Township and Range Roads.

Two additional zones were added to the structure to account for the Westpark development and a possible commercial development west of Highway 21 between 84 Street and Highway 15, which would impact Highway 21 traffic.

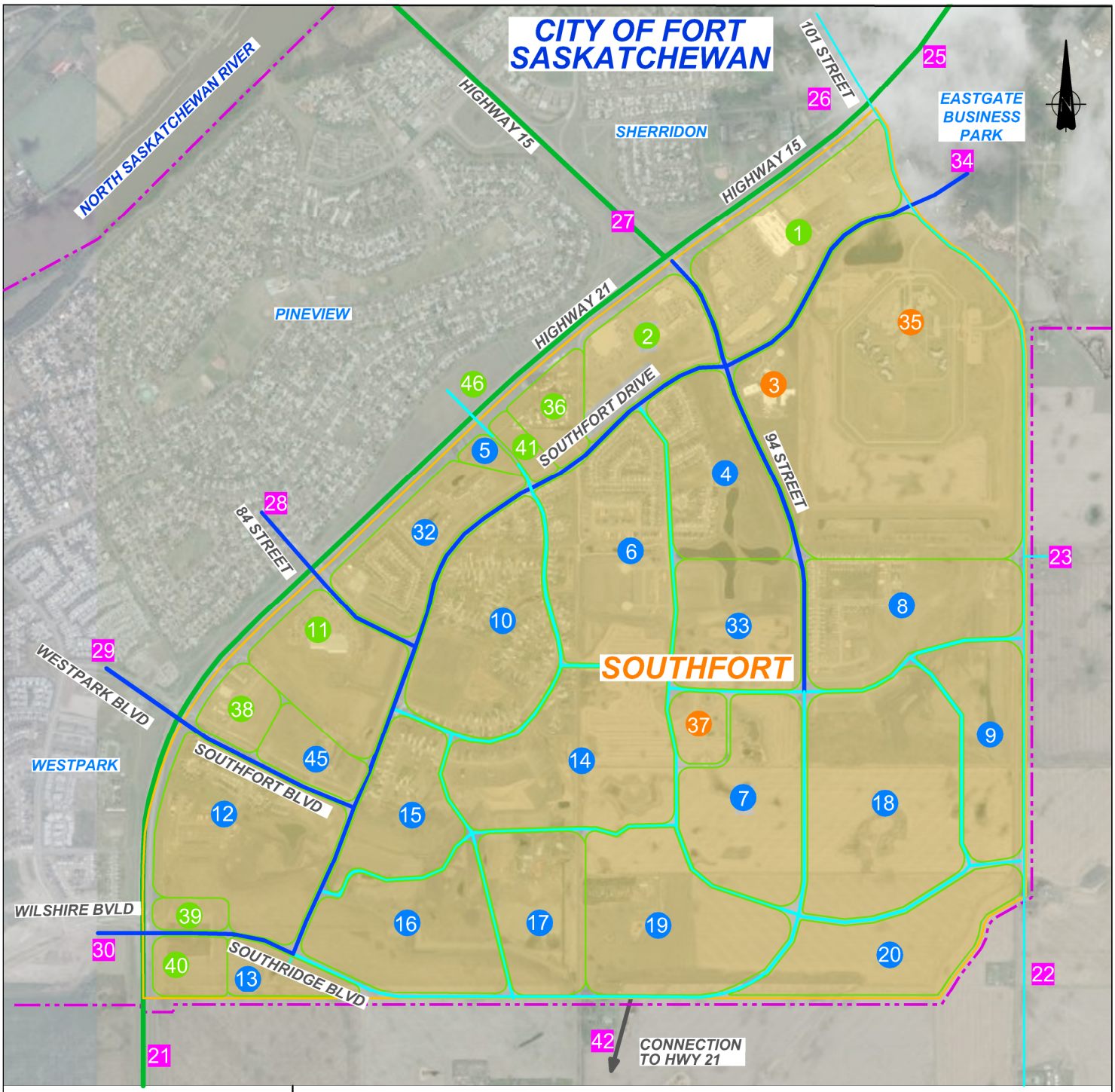
3.4.2 Trip Generation

Trip generation was assigned to the different housing types, school, and commercial development. Residential, school and commercial trip generation rates used in the traffic estimation are based on studies conducted locally by the City of Edmonton and the Institute of Transportation Engineers (ITE). **Appendix B** includes a summary of trip generation rates and fitted curve formulas for the lane uses in the model.

The Trip Generation Rates and Directional Splits are presented in **Table 3.3**:

Table 3.3: Trip Generation Rates and Directional Splits

Land Use	Land Use Code	Variable	Trip Generation Rates						
			Weekday	AM Peak	% In	% Out	PM Peak	% In	% Out
Low Density Residential	210	DU	7.92	0.69	19%	81%	0.79	67%	33%
Medium Density Residential	RA5	DU	6.59	0.46	21%	79%	0.58	65%	35%
High Density Residential	RA7&RA8	DU	5.81	0.34	17%	83%	0.4	63%	37%
School	520	Students		0.2	55%	45%	0.05	49%	51%
Commercial (Floor Area 22,000-50,000sq.ft)	820	1,000 sq.ft.		5.62	55%	45%	*Based on fitted Curve	48%	52%
Commercial (Floor Area 50,000-108,000sq.ft)	820	1,000 sq.ft.		4.02	53%	47%	*Based on fitted Curve	48%	52%
Commercial (Floor Area <22,000 and >108,000sq.ft)	820	1,000 sq.ft.		*Based on fitted Curve	67%	33%	*Based on fitted Curve	50%	50%



CITY OF FORT SASKATCHEWAN

- CITY BOUNDARY
- ZONE AREAS
- ALBERTA HIGHWAY
- ARTERIAL ROAD
- COLLECTOR ROAD
- INTERNAL ZONE - COMMERCIAL
- INTERNAL ZONE - RESIDENTIAL
- INSTITUTIONAL
- EXTERNAL ZONE

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CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ZONE MAP OF SOUTHFORT

N.T.S.

DATE: AUGUST, 2015

EXHIBIT 3.3

A summary of trips generated within the Southfort Area, excluding existing developments, is presented in **Table 3.4**.

Table 3.4: Summary of New Trips Generated in Southfort

Land Use	Size	Units	Trips Generated					
			AM Peak	In	Out	PM Peak	In	Out
Low Density Residential	4,042	DU	2,789	530	2,259	3,193	2,139	1,054
Medium Density Residential	518	DU	238	50	188	300	195	105
High Density Residential	405	DU	138	23	114	162	102	60
School	900	students	72	40	32	45	22	23
Commercial Areas Combined	727	1,000 sq.ft.	1,416	836	580	4,271	2,100	2,172

For the purpose of this study the residential trip generation has been reduced by 7% to reflect anticipated use of transit, ride sharing, walking, cycling, and work at home as an alternative to using a vehicle.

3.4.3 Trip Distribution and Assignment

Residential vehicle trips to and from the Southfort area were distributed assuming 93% and 90% of trips would be between an external and internal zone during the am and pm peak, respectively. The remaining residential trips would be internal trips.

The trip distribution origin and destination for the study area uses the regional traffic model developed by Alberta Transportation. The model includes inputs pertaining to trip production and trip attraction for traffic analysis zones in the Edmonton region including the City of Fort Saskatchewan.

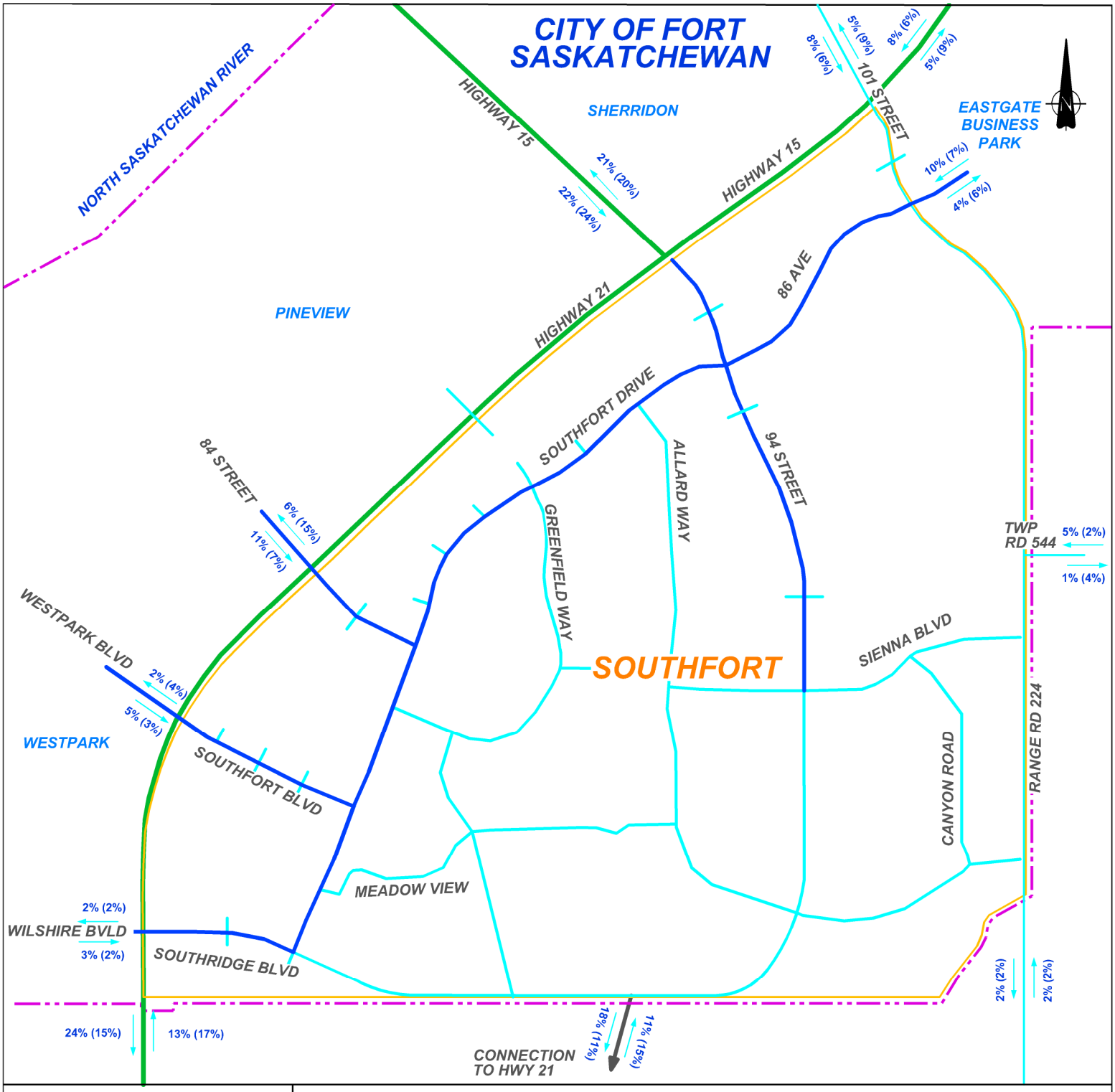
A detailed review of the regional model provided the basis for determining peak hour trip distribution percentages between Southfort and the external zones in the longer term, when Southfort reaches full development.

Exhibit 3.4 presents the traffic distribution during the AM and PM Peak hours for the road network in the study area road network.

Internal trips are assumed to occur between residential and other land uses, such as residential and commercial, residential and the DOW Centennial Centre, and residential and the hospital. These trips were distributed proportionately to the size of the zone. School trips, because of the minor impact on the road network during peak hours were distributed in similar manner as residential trips.

Trip assignment has been carried out based on the shortest and fastest way between the origin and destination using available road network.

New commercial trips generated by the Southfort ASP and the commercial west of Highway 21 have been broken into two types of trips: primary and pass-by.



CITY OF FORT SASKATCHEWAN

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CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ROAD NETWORK - TRAFFIC DISTRIBUTION
PEAK PERCENTAGE

N.T.S.

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EXHIBIT 3.4

- **Primary trips** are trips solely between an origin and destination: for example between home and the commercial development. Primary trips are assumed to represent 70% of all commercial trips.
- **Pass-by trips** are the secondary stops that are made at the commercial development when driving from another origin to destination (for example, from work to home via the commercial site). It is assumed that 30% of trips to the commercial site(s) would be by-pass trips.

Diverted trips are a result of vehicles travelling outside of the study area (origin and destination outside the study boundary) that makes a pass-by stop within the study area. No diverted trips were assumed for the study because these trips are accounted in the primary trip totals.

3.4.4 Design Traffic Volumes

Traffic volumes for full development of the Southfort areas, which represent combined existing and development traffic, are presented in **Exhibit 3.5** (AM peak) and **Exhibit 3.6** (PM peak).

The road network and the design traffic volumes at 50% development of the Southfort ASP are presented in **Exhibit 3.7** (AM peak) and **Exhibit 3.8** (PM Peak).

3.4.5 Daily Volumes

Review of the existing AM and PM peak volumes and their proportion at various locations in the city indicates that AM peak represents about 8% and the PM peak represents about 10% of the daily volumes.

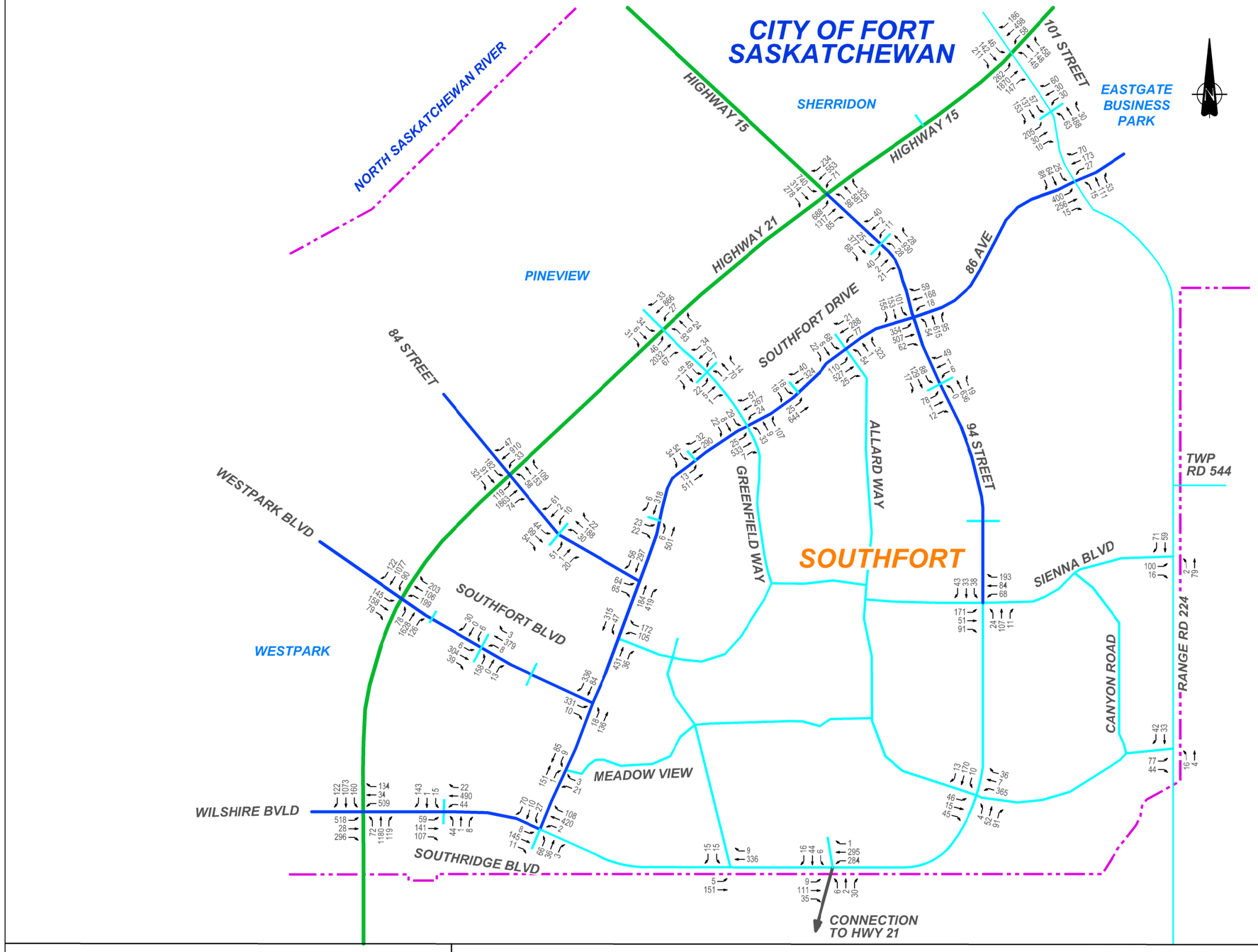
It was assumed that future traffic patterns will remain similar and the above percentages were used to estimate daily traffic volumes for the both the full development and the 50% development scenarios.

Estimated future traffic volumes in the Southfort area are presented in **Exhibit 3.9** (full development) and **Exhibit 3.10** (50% development).

Based on the daily traffic volume estimates, not all the roads identified as arterials in the ASP reach traffic volumes expected for arterial roadways (5,000-20,000vpd) where the major function is traffic mobility. Roads with lower volumes may be accommodated with a collector road standard (less than 8,000vpd) where mobility and access to adjacent residential areas is of equal importance.

Collector roadways could be accommodated with a two lane undivided road within the standard collector right-of-way. Traffic control at intersections was determined based on the projected traffic during peak hours.

CITY OF FORT SASKATCHEWAN



CITY OF FORT SASKATCHEWAN

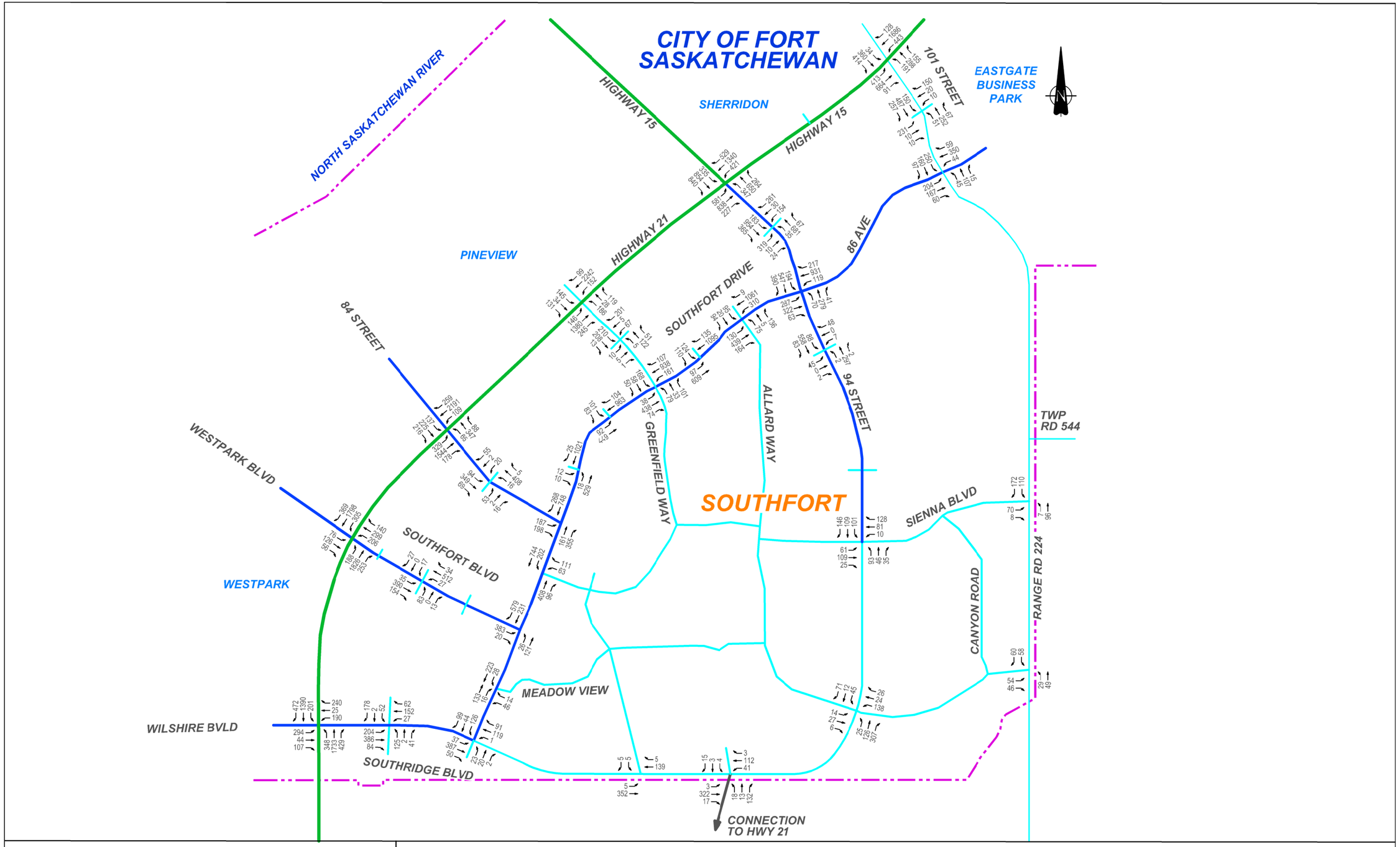
Al-Terra

- CITY BOUNDARY
- HIGHWAY (EXPRESSWAY)
- ARTERIAL ROAD
- COLLECTOR ROAD

N.T.S.

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ESTIMATED AM PEAK DESIGN VOLUMES
AT FULL DEVELOPMENT OF SOUTHFORT
DATE: AUGUST, 2015

EXHIBIT 3.5



CITY OF FORT SASKATCHEWAN

Al-Terra

CITY BOUNDARY
HIGHWAY (EXPRESSWAY)
ARTERIAL ROAD
COLLECTOR ROAD

N.T.S.

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ESTIMATED PM PEAK DESIGN VOLUMES
AT FULL DEVELOPMENT OF SOUTHFORT
DATE: AUGUST, 2015

EXHIBIT 3.6

CITY OF FORT SASKATCHEWAN

NORTH SASKATCHEWAN RIVER

HIGHWAY 15

HIGHWAY 15

HIGHWAY 21

SHERRIDON

PINEVIEW

WESTPARK

SOUTHFORT

EASTGATE BUSINESS PARK

101 STREET

86 AVE

SOUTHFORT DRIVE

84 STREET

94 STREET

ALLARD WAY

GREENFIELD WAY

WESTPARK BLVD

SOUTHFORT BLVD

SIENNA BLVD

MEADOW VIEW

WILSHIRE BVLD

SOUTHRIDGE BLVD

TWP RD 544

RANGE RD 224

N

CITY OF FORT SASKATCHEWAN

Al-Terra

CITY BOUNDARY

HIGHWAY (EXPRESSWAY)

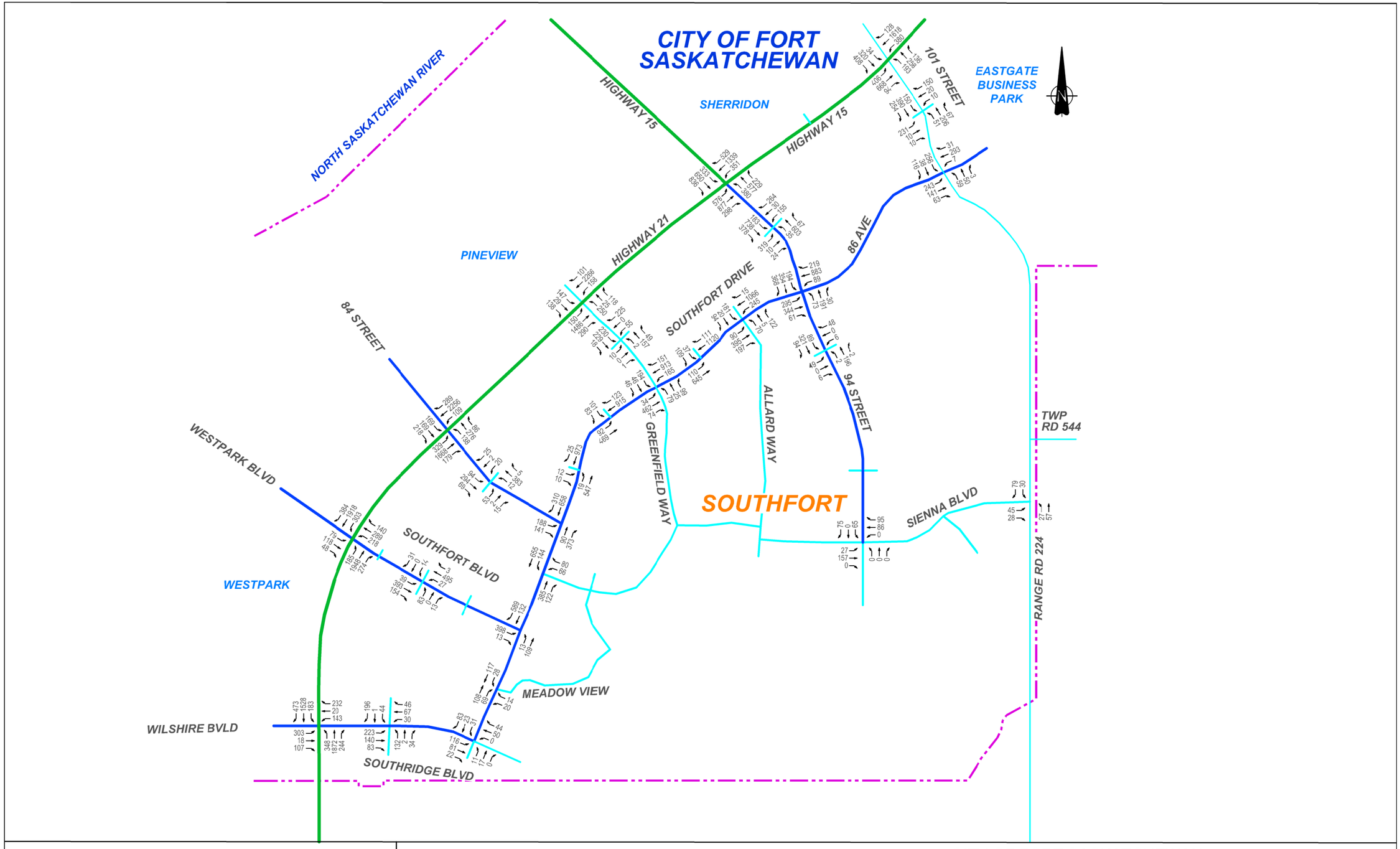
ARTERIAL ROAD

COLLECTOR ROAD

N.T.S.

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ESTIMATED AM PEAK DESIGN VOLUMES
AT 50% DEVELOPMENT OF SOUTHFORT
DATE: AUGUST, 2015

EXHIBIT 3.7



CITY OF FORT SASKATCHEWAN

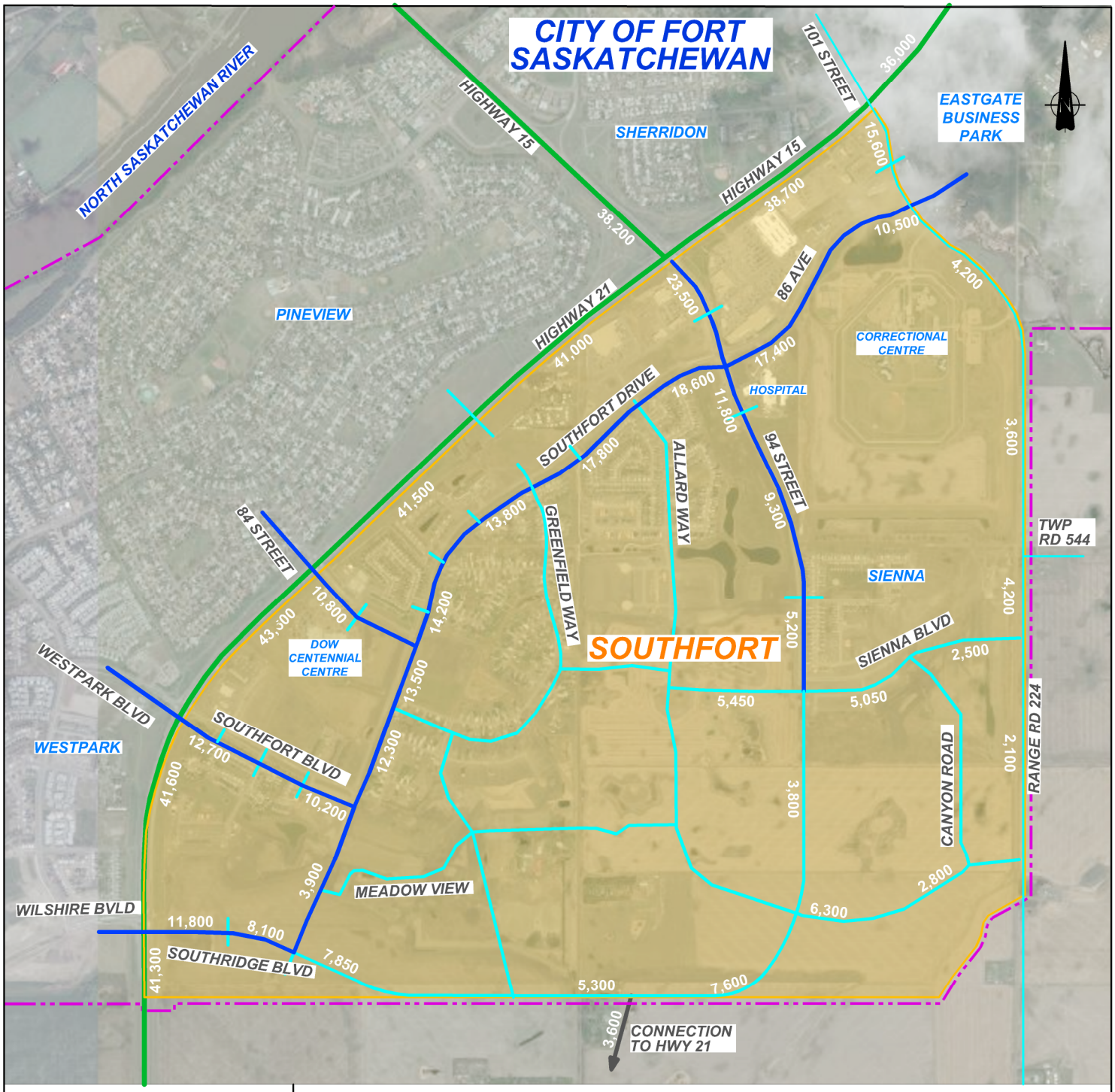
Al-Terra

CITY BOUNDARY
HIGHWAY (EXPRESSWAY)
ARTERIAL ROAD
COLLECTOR ROAD

N.T.S.

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ESTIMATED PM PEAK DESIGN VOLUMES
AT 50% DEVELOPMENT OF SOUTHFORT
DATE: MARCH, 2015

EXHIBIT 3.8



CITY BOUNDARY
ZONE AREAS
ALBERTA HIGHWAY
ARTERIAL ROAD
COLLECTOR ROAD

CITY OF FORT SASKATCHEWAN

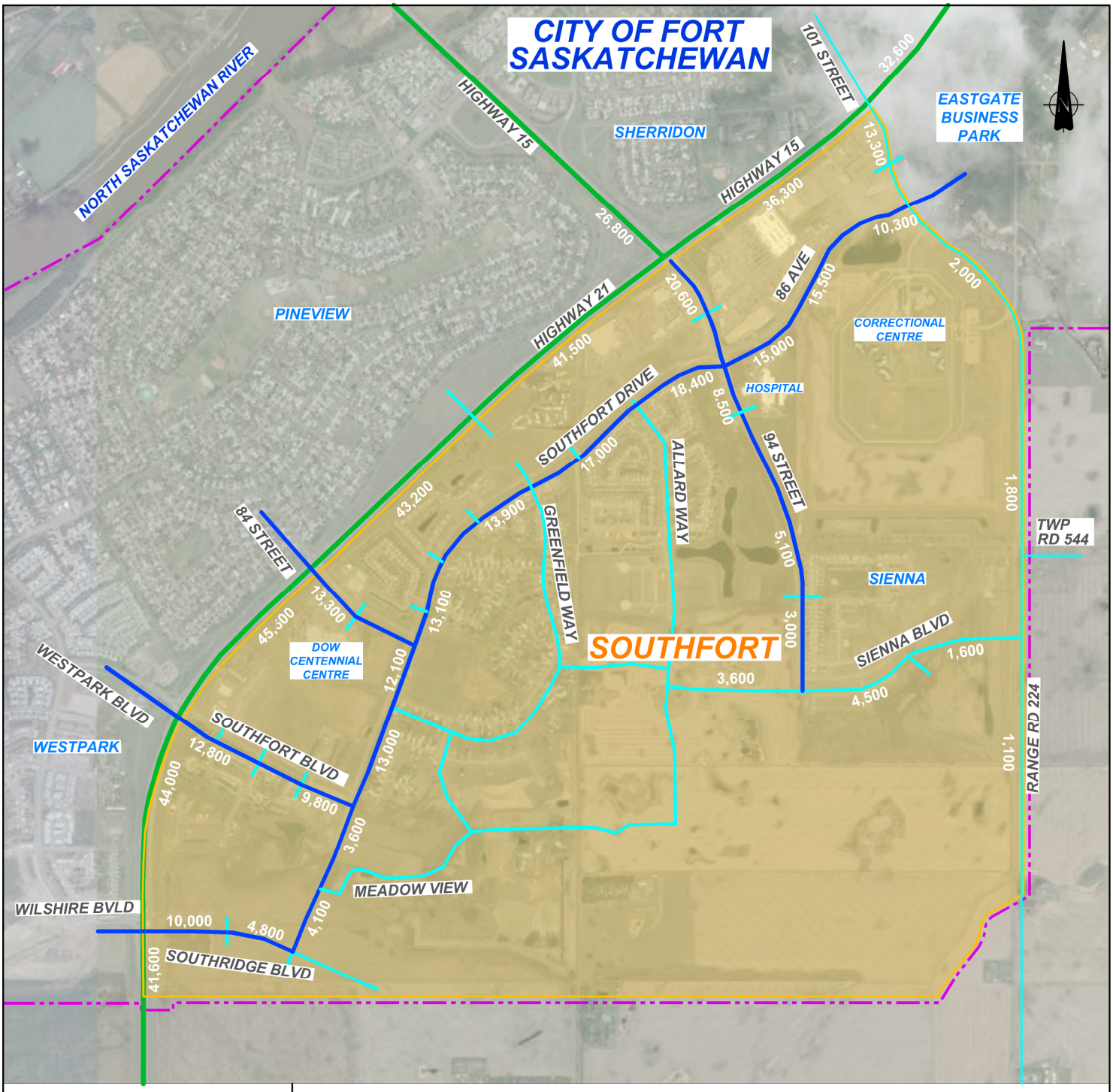
Al-Terra

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ROAD NETWORK - ESTIMATED DAILY VOLUMES AT FULL DEVELOPMENT OF SOUTHFORT

N.T.S.

DATE: AUGUST, 2015

EXHIBIT 3.9



CITY BOUNDARY
ZONE AREAS
ALBERTA HIGHWAY
ARTERIAL ROAD
COLLECTOR ROAD

CITY OF FORT SASKATCHEWAN

Al-Terra

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ROAD NETWORK - ESTIMATED DAILY VOLUMES
AT 50% DEVELOPMENT OF SOUTHFORT

N.T.S.

DATE: AUGUST, 2015

EXHIBIT 3.10

4.0 Transportation Assessment

4.1 Capacity Analysis

Using projected traffic, operations within the road network during AM and PM peak were determined using Synchro Studio 9 and Sidra 6.1 software suites. Level of Service (LOS) at intersections in the Southfort road network were determined using 2000 and 2010 Highway Capacity Manual (HCM) methods. The software determines the LOS, which is defined by the HCM as average vehicle delay at an intersection. In addition, volume to capacity ratio (v/c) and the length of the queues were determined, which provided information used during intersection and turning lanes design.

The objective of the traffic operations at intersections is to provide an acceptable LOS which in the long term is considered:

- LOS D - delays less than 55 sec./veh. at signalized intersections and less than 35 sec./veh. at unsignalized intersections
- v/c less than 0.9

The intersection operations were analyzed utilizing the following inputs for the signalized intersections:

- Ideal saturation flow: 1850 veh./hr./ln.
- Peak Hour Factor (PHF):
  - 1.0, at all Highway 21 and Highway 15 intersections where conditions approach saturation,
  - 0.92 (default), for the internal intersections
- 5% heavy vehicles
- 5 pedestrian calls/hr.
- Actuated pedestrian phase provided for all approaches

All Southfort internal and external intersections were modelled during peak hours and at the two future horizons. Major intersections at Highway 21/Highway 15 and the Southfort Drive corridors were modeled in detail and the results are included in this report. The internal intersections with low and moderate traffic volumes can operate satisfactorily with unsignalized controls.

In addition, existing non-signalized major intersections on Southfort Drive and other internal intersections were analyzed using the Transportation Association of Canada (TAC) signals warrant procedure. The analyses take into consideration intersection lanes, geometry, spacing to upstream signalized intersections, traffic volumes, traffic composition, main roadway speed, pedestrian presence, bus routes, demographics in the area, and size of the community. The analyses produce a score, which if higher than 100, indicates that significant controls such as signals or a roundabout are likely required to provide satisfactory operations. Signal Warrants worksheets are included in **Appendix D**.

The following signalized intersections require some improvements to satisfactorily accommodate the future traffic:

- Highway 21 – Wilshire Blvd./Southridge Blvd.
- Highway 21 – Westpark Blvd./Southfort Blvd.
- Highway 21 – 84 Street

- Highway 21 – Commercial Access west, south of Highway 15
- Highway 21/ Highway 15 – Highway 15/94 Street
- Highway 15 – 101 Street
- 88 Avenue – 101 Street
- 86 Avenue – 101 Street
- 86 Avenue/Southfort Blvd. – 94 Street
- 94 Street – 87 Avenue
- Southfort Drive – Allard Way
- Southfort Drive – Greenview Way North
- Southfort Drive – 84 Street
- Southridge Blvd. – Ridge Point Gate

In addition, warrant analyses were completed for intersections at:

- 94 Street – South Pointe/Hospital Access
- 84 Street – DOW Centre Access
- Southfort Drive – Greenview Way South
- Southfort Drive – Southfort Boulevard
- Southridge Blvd. – Southfort Drive

4.1.1 Southfort Full Development

Initially, the traffic was assigned to Highway 21 south, utilizing existing Highway 21 intersections. This resulted in the Highway 21 and Southridge Boulevard intersection failing during the AM peak due to excessive left turning volumes (>850 vph) in addition to other traffic at the intersection. Based on this preliminary analysis, an additional Highway 21 connection was proposed, which would be used by traffic originating in southeast area of Southfort. The connection to Highway 21 would be provided at an intersection located south of Southridge Boulevard, possibly in conjunction with possible developments along Highway 21 and south of the existing city boundary. **Exhibits 3.5** and **3.6** illustrate traffic for which the additional connection to Highway 21 would be provided to assure that the proposed roadway system provides acceptable traffic operations at full development of the Southfort ASP.

The following tables summarize the AM and PM peak hour capacity analysis results for the above noted signalized intersections.

Note the makings in the following tables:

- m – Volume for 95th percentile queues is metered by upstream signal
- # – 95th percentile volume exceeds capacity, queue may be longer
- Phases:
  - Prot – Protected
  - Pm+pt – Permissive and protected
  - Perm – Permissive
  - Pm+ov – Permissive and Right Turn Overlap

Detailed Synchro Reports are included in **Appendix C**.

Table 4.1 – Highway 21 & Wilshire Blvd/Southridge Blvd Intersection Analysis

Highway 21 – Wilshire Blvd./Southridge Blvd.												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Volume (vph)	518	28	296	509	34	134	72	1180	119	160	1073	122
v/c	0.84	0.08	0.21	0.75	0.1	0.09	0.39	0.52	0.15	0.61	0.45	0.15
Delay(s)	65.7	53.3	0.3	58.4	54.4	0.1	69.0	28	6.6	66.4	29.4	11.7
LOS	E	D	A	E	D	A	E	C	A	E	C	B
95th Queue (m)	96.3	8	0	95.5	9.3	0	19.7	139.1	16.8	38.5	103.1	21.3
Intersection Average Delay(s)				***35.2***					***Intersection LOS***		***D***	
PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Volume (vph)	294	44	107	190	25	240	348	1733	429	201	1390	472
v/c	0.69	0.12	0.07	0.59	0.07	0.16	0.78	0.61	0.6	0.67	0.53	0.47
Delay(s)	67.5	53.5	0.1	64.1	59.3	0.2	71.4	22.8	9.5	88.3	13.2	8.4
LOS	E	D	A	E	E	A	E	C	A	F	B	A
95th Queue (m)	#61.4	10.7	0	39.5	8.3	0	68.2	181	64.3	m36.0	156.3	121.4
Intersection Average Delay(s)				***26.4***					***Intersection LOS***		***C***	

Table 4.1 presents the intersection analysis for Highway 21 at Wilshire Blvd/Southridge Blvd. It is assumed that Highway 21 would be improved to six lanes with double left turn lanes for north and southbound approaches. The Wilshire Boulevard and Southridge Boulevard approaches configuration would provide adequate operations in the long term.

The improved intersection would operate at marginally acceptable LOS, which for the whole intersection would provide LOS D and C during AM and PM peak hours with some movements operating at LOS E. The results indicate v/c values within the set objective of less than 0.9.

Table 4.2 – Highway 21 & Westpark Blvd/Southfort Blvd Intersection Analysis

Highway 21 – Westpark Blvd./Southfort Blvd.												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	1	2	1	2	1	1	1	3	1	2	3	1
Volume (vph)	145	158	79	199	106	203	78	1628	126	90	1077	122
v/c	0.53	0.44	0.33	0.4	0.61	0.6	0.56	0.61	0.13	0.43	0.42	0.12
Delay(s)	48.6	61	9.4	44	74	31	61.2	22.9	3.9	67.3	23.1	2.3
LOS	D	E	A	D	E	C	E	C	A	E	C	A
95th Queue (m)	53.5	34.9	10.8	34.1	50.3	51	m38.6	156	m13.2	24.4	77.3	8.2
Intersection Average Delay(s)				***28.4***					***Intersection LOS***		***C***	
PM Peak												
Coordinated/Actuated 140 sec. Cycle	Eastbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	1	1	1	2	1	1	1	3	1	2	3	1
Volume (vph)	76	126	56	206	299	140	188	1826	253	305	1798	369
v/c	0.57	0.21	0.14	0.36	0.84	0.34	0.8	0.76	0.29	0.77	0.78	0.44
Delay(s)	57.4	48.3	0.8	40.7	73.5	7.7	72.4	26.3	4	73.0	33.6	11.4
LOS	E	D	A	D	E	A	E	C	A	E	C	A
95th Queue (m)	28.6	24.8	0	32.5	112.3	15.3	#114.4	181	2.4	#63.6	174.7	53.5
Intersection Average Delay(s)				***33.6***					***Intersection LOS***		***C***	

Table 4.2 presents the intersection analysis for Highway 21 at Westpark Blvd/Southfort Blvd. The Westpark Boulevard/Southfort Boulevard and Highway 21 intersection would perform adequately in long term providing that Highway 21 is upgraded to six lanes.

Table 4.3 – Highway 21 & 84 Street Intersection Analysis

Highway 21 – 84 Street												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Free	Perm		Free	Prot		Perm	Prot		Perm
Lanes	1	2	1	1	2	1	2	3	1	2	3	1
Volume (vph)	182	91	321	58	153	109	119	1863	74	33	910	47
v/c	0.63	0.11	0.23	0.47	0.45	0.08	0.52	0.68	0.08	0.35	0.35	0.06
Delay(s)	52.6	39.4	0.4	75.4	67.4	0.1	59.7	16.8	3.1	71.8	15.2	0.1
LOS	D	D	A	E	E	A	E	B	A	E	B	A
95th Queue (m)	62.5	16.8	0	31.5	34.8	0	28.1	91.7	m3.1	21.9	61.1	0.2
Intersection Average Delay(s)				***20.9***					***Intersection LOS***		***C***	

PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Free	Perm		Free	Prot		Perm	Prot		Perm
Lanes	1	2	1	1	2	1	2	3	1	2	3	1
Volume (vph)	137	225	216	65	347	88	329	1544	178	109	2191	259
v/c	0.74	0.28	0.14	0.41	0.71	0.06	0.85	0.55	0.19	0.52	0.86	0.29
Delay(s)	66.7	41.9	0.2	59.2	61.8	0.1	77.2	18.7	3.8	69.8	32.3	6.1
LOS	A	D	A	E	E	A	E	B	A	E	C	A
95th Queue (m)	#53.4	38.1	0	31.4	64.5	0	#75.2	120.2	14.8	26.3	232.5	24.6
Intersection Average Delay(s)				***31.4***					***Intersection LOS***		***C***	

Table 4.3 presents the intersection analysis for Highway 21 at 84 Street. The highest Highway 21 and Highway 15 traffic volumes occur in the area adjacent to the commercial centers between 84 Street and 101 Street. The heaviest traffic occurs during the PM peak where the commercial traffic mixes with commuter traffic to create high volume demands. The intersections suffer significant congestion even with Highway 21 and Highway 15 upgraded to 6 lanes.

To provide additional capacity it is proposed to provide 2 through lanes eastbound and westbound at 84 Street approaches (there is currently one lane on each approach).

Assuming that the intersection would be improved, the overall operations in the long term would be acceptable even though some of the movements would operate at LOS E.

Table 4.4 – Highway 21 & Future Commercial Access Intersection Analysis

Highway 21 – Future Commercial Access												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through/Right		Left	Through/Right		Left	Through	Right	Left	Through	Right
Phase	Per			Per			Prot		Perm	Prot		Perm
Lanes	1	1		1	1		2	3	1	1	3	1
Volume (vph)	34	6	31	93	9	24	46	2032	67	27	866	33
v/c	0.12	0.11		0.15	0.07		0.26	0.68	0.64	0.57	0.57	0.57
Delay(s)	45.2	17.4		32.9	22.9		54.4	21.8	8.2	52.7	17	0.1
LOS	D	B		C	C		D	C	A	D	B	A
95th Queue (m)	18.5	11.4		15.1	11.2		m11.2	172.1	m13.0	#22.2	62.6	0
Intersection Average Delay(s)		***21.2***							***Intersection LOS***		***C***	

PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through/Right		Left	Through/Right		Left	Through	Right	Left	Through	Right
Phase	Per			Per			Prot		Perm	Prot		Perm
Lanes	1	1		1	1		2	3	1	1	3	1
Volume (vph)	145	34	131	186	28	119	146	1380	245	152	2242	99
v/c	0.76	0.46		0.47	0.32		0.52	0.5	0.26	0.59	0.83	0.11
Delay(s)	76.1	17.5		44.2	12.3		64.2	18.7	3.4	68.8	28.2	4.1
LOS	E	B		D	B		E	B	A	E	C	A
95th Queue (m)	61.4	29.7		30.9	23.2		32.1	108.4	16.5	34.4	241.7	10.5
Intersection Average Delay(s)		***27.3***							***Intersection LOS***		***C***	

Table 4.4 presents the intersection analysis for Highway 21 at the Future Commercial Access. This all-direction intersection to the future commercial area located both west and east of Highway 21, south of Highway 15, should operate satisfactory in the long term. Highway 21 requires widening to a 6 basic lane cross-section and additional auxiliary lanes are required to accommodate turning commercial traffic.

Table 4.5 – Highway 21/Highway 15 & Highway 15/94 Street Intersection Analysis

Highway 21/Highway 15 – Highway 15/94 Street												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	Prot		Free	Prot		Free	Prot		Free	Prot		Free
Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Volume (vph)	740	314	278	98	587	325	688	1317	85	71	553	234
v/c	0.9	0.23	0.19	0.44	0.79	0.22	0.87	0.71	0.06	0.33	0.65	0.16
Delay(s)	62.6	27.8	0.3	64.7	57.04	0.3	60.8	39.7	0.1	62.9	55.1	0.2
LOS	E	C	A	E	E	A	E	D	A	E	E	A
95th Queue (m)	#136.3	41.4	0	22.6	#100.6	0	114	121.6	0	17.6	60.3	0
Intersection Average Delay(s)				***42.4***					***Intersection LOS***		***D***	
PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	Prot		Free	Prot		Free	Prot		Free	Prot		Free
Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Volume (vph)	335	854	840	347	650	264	581	838	227	421	1340	529
v/c	0.84	0.96	0.56	0.81	0.7	0.15	0.91	0.5	0.15	0.79	0.89	0.35
Delay(s)	79	72.7	1.5	78.4	39.7	0.2	75.3	40.7	0.2	51.5	48.9	0.4
LOS	E	E	A	E	D	A	E	D	A	D	D	A
95th Queue (m)	#69.7	#165.8	0	69.1	91.5	0	#112.7	80.7	0	67	151	0
Intersection Average Delay(s)				***42.7***					***Intersection LOS***		***D***	

Table 4.5 presents the intersection analysis for Highway 21/Highway 15 at Highway 15/94 Street. Based on the estimated long term traffic, this intersection will experience congestion. The overall intersection delay is acceptable, operating at a LOS D during AM and PM peaks, and v/c values for all movements are less than 1. Some of the movements show LOS E (delay 55-80 sec./veh), and the westbound left turn operates at a LOS F (delay > 80 sec./veh.). Similar to intersections to the south, Highway 21 requires improvements to a 6 lane cross-section with double left turn lanes for all four approaches.

There is no further widening considered due to physical constraints of Highway 15 to the west.

Table 4.6 – Highway 15 & 101 Street Intersection Analysis

Highway 15 – 101 Street												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	Perm		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	1	2	1	2	2	1	2	3	1	2	3	1
Volume (vph)	46	142	211	149	148	458	262	1870	147	58	498	186
v/c	0.48	0.5	0.15	0.34	0.25	0.32	0.65	0.63	0.15	0.32	0.19	0.21
Delay(s)	75.4	66.4	0.2	50.3	47.9	0.6	66.1	16.3	4.4	67.2	14.7	2.5
LOS	E	E	B	D	D	A	E	B	A	E	B	A
95th Queue (m)	26.7	32.5	25.3	29.5	29.9	144.8	55.3	195.7	9.1	14.4	35.2	11.9
Intersection Average Delay(s)				***21.0***					***Intersection LOS***		***C***	

PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	Perm		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	1	2	1	2	1	1	2	3	1	2	3	1
Volume (vph)	34	360	414	191	288	155	413	664	91	443	1686	128
v/c	0.26	0.75	0.23	0.24	0.45	0.1	0.74	0.43	0.13	0.7	0.73	0.17
Delay(s)	56.3	66.7	0.3	45.4	49.5	0.1	62.2	13.4	0.5	59.3	32.1	6.7
LOS	E	E	A	D	D	A	E	B	A	E	C	A
95th Queue (m)	18.3	64.3	61.8	34.5	54.8	0	m81.8	52.2	m0.0	81.1	165.3	16.5
Intersection Average Delay(s)				***33.9***					***Intersection LOS***		***C***	

Table 4.6 presents the intersection analysis for Highway 15 at 101 Street. This intersection will operate satisfactory in the long term providing that the Highway 15 is upgraded to 6 lanes and double left turn lanes are provided as indicated in the table above.

Table 4.7 – 88 Avenue & 101 Street Intersection Analysis

86 Avenue - 101 Street												
AM Peak												
Coordinated/Actuated 70 sec. Cycle	South/Easbound			North/Westbound			North/Eastbound			South/Westbound		
Movement	Left	Through	Right	Left	Through	Through /Right	Left/ Through	Through	Through /Right	Left/ Through	Through	Through /Right
Phase	Perm		Perm	Perm								
Lanes	1	1	1	1	1	1	1		1	1		1
Volume (vph)	25	64	88	15	111	53	400	256	15	27	173	70
v/c	0.06	0.11	0.15	0.04	0.15		0.82	0.32		0.19	0.19	
Delay(s)	17.7	16.8	5.2	19.3	13.1		27.8	10		6.2	6.2	
LOS	B	B	A	B	B		C	A		A	A	
95th Queue (m)	7.6	14.7	0	6	13.6		68.7	27.3		10.4	10.4	
Intersection Average Delay(s)			***15.3***				***Intersection LOS***			***B***		
PM Peak												
Coordinated/Actuated 70 sec. Cycle	South/Easbound			North/Westbound			North/Eastbound			South/Westbound		
Movement	Left	Through	Right	Left	Through	Through /Right	Left/ Through	Through	Through /Right	Left/ Through	Through	Through /Right
Phase	Perm		Perm	Perm								
Lanes	1	1	1	1	1	1	1		1	1		1
Volume (vph)	250	160	97	45	107	15	204	167	60	44	350	59
v/c	0.39	0.17	0.11	0.07	0.07		0.82	0.4		0.46	0.46	
Delay(s)	8.2	6.9	2.2	11.6	9.4		45.2	15.6		17.8	17.8	
LOS	A	A	A	B	A		D	B		B	B	
95th Queue (m)	60.8	30.2	m6.9	10	9.6		40	27.9		27.1	27.1	
Intersection Average Delay(s)			***16.6***				***Intersection LOS***			***B***		

Table 4.7 presents the intersection analysis for 88 Avenue at 101 Street. This existing unsignalized intersection will require signals in the future. The TAC warrant indicates a score of 138, further confirming the capacity analysis. The intersection configuration currently constructed, with signals added, would provide good LOS in the long term.

Table 4.8 – 86 Avenue & 101 Street Intersection Analysis

86 Avenue - 101 Street												
AM Peak												
Coordinated/Actuated 70 sec. Cycle	South/Easbound			North/Westbound			North/Eastbound			South/Westbound		
Movement	Left	Through	Right	Left	Through	Through /Right	Left/ Through	Through	Through /Right	Left/ Through	Through	Through /Right
Phase	Perm		Perm	Perm								
Lanes	1	1	1	1	1	1	1		1	1		1
Volume (vph)	25	64	88	15	111	53	400	256	15	27	173	70
v/c	0.06	0.09	0.14	0.03	0.13		0.82	0.32		0.19	0.19	
Delay(s)	15.2	14.8	3.4	19.3	13.1		27.8	10		6.2	6.2	
LOS	B	B	A	B	B		C	A		A	A	
95th Queue (m)	5.8	11.9	0	6	13.6		68.7	27.3		10.4	48.8	
Intersection Average Delay(s)				***15.1***				***Intersection LOS***			***B***	
PM Peak												
Coordinated/Actuated 70 sec. Cycle	South/Easbound			North/Westbound			North/Eastbound			South/Westbound		
Movement	Left	Through	Right	Left	Through	Through /Right	Left/ Through	Through	Through /Right	Left/ Through	Through	Through /Right
Phase	Perm		Perm	Perm								
Lanes	1	1	1	1	1	1	1		1	1		1
Volume (vph)	250	160	97	45	107	15	204	167	60	44	350	59
v/c	0.39	0.17	0.11	0.07	0.07		0.82	0.4		0.46	0.46	
Delay(s)	8.5	6	1.9	11.6	9.4		45.2	15.6		17.8	17.8	
LOS	A	A	A	B	A		D	B		B	B	
95th Queue (m)	60.8	30.2	m6.9	10	9.6		40	27.9		27.1	27.1	
Intersection Average Delay(s)				***16.6***				***Intersection LOS***			***B***	

Table 4.8 presents the intersection analysis for 86 Avenue at 101 Street. The existing 86 Avenue and 101 Street signalized intersection will perform well in the long term with acceptable LOS and v/c ratios.

Table 4.9 – 86 Avenue/Southfort Drive & 94 Street Intersection Analysis

86 Avenue/Southfort Drive - 94 Street												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	North/Easbound			South/Westbound			Northbound			Southbound		
Movement	Left	Through	Through /Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt			Perm		Perm	Perm		Perm	Perm		Perm
Lanes	1	2	1	1	2	1	1	2	1	1	2	1
Volume (vph)	354	507	62	18	168	59	54	615	62	101	153	155
v/c	0.55	0.35		0.13	0.26	0.17	0.12	0.47	0.15	0.47	0.12	0.23
Delay(s)	24.6	20.1		48.6	48.5	9.4	26.9	31.8	5.2	37.1	24.6.4.8	5.4
LOS	C	C		D	D	A	C	C	A	D	C	A
95th Queue (m)	87.3	63.7		12.5	34.3	10.8	20.1	89	11.5	38.4	22.7	16.3
Intersection Average Delay(s)			***25.4***			***Intersection LOS***			***C***			
PM Peak												
Coordinated/Actuated 140 sec. Cycle	North/Easbound			South/Westbound			Northbound			Southbound		
Movement	Left	Through	Through /Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt			Perm		Perm	Perm		Perm	Perm		Perm
Lanes	1	2	1	1	2	1	1	2	1	1	2	1
Volume (vph)	287	322	63	119	931	217	70	279	41	194	547	390
v/c	0.78	0.2		0.32	0.68	6.9	0.37	0.26	0.08	0.62	0.5	0.52
Delay(s)	37	10.1		33.4	38.5	6.9	43.9	35.9	2.3	42.3	36.3	7.1
LOS	D	B		C	D	A	D	D	A	D	D	A
95th Queue (m)	81	24.6		44.2	153	23.3	31.4	43.4	3	m46.4	52.8	m26.3
Intersection Average Delay(s)			***28.9***			***Intersection LOS***			***C***			

Table 4.9 presents the intersection analysis for 86 Avenue/Southfort Drive at 94 Street. The existing signalized intersection will operate satisfactorily in the long term horizon.

It is assumed that Southfort Drive, currently 2 lane roadway south of 94 Street, will be widened to 4 lanes progressively with the increasing traffic due to development within the Southfort area.

Table 4.10 – 87 Avenue & 94 Street Intersection Analysis

87 Avenue - 94 Street												
AM Peak												
Coordinated/Actuated 70 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Through /Right	Left	Through	Through /Right	Left	Through	Through /Right	Left	Through	Through /Right
Phase	Perm			Perm			Perm			Perm		
Lanes	1	1		1	1		1	1	1	1	1	1
Volume (vph)	40	2	21	11	2	40	70	930	28	25	377	68
v/c	0.2	0.09		0.06	0.15		0.11	0.37		0.07	0.18	
Delay(s)	26.2	11.3		23.3	9.7		8.3	9.8		5	3.3	
LOS	C	B		C	A		A	A		A	A	
95th Queue (m)	11.7	5.5		5	7.2		20	105.6		4.4	18.7	
Intersection Average Delay(s)			***8.0***			***Intersection LOS***			***A***			

PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Through /Right	Left	Through	Through /Right	Left	Through	Through /Right
Phase	pm+pt		Perm	Perm			Perm			Perm		
Lanes	1	1		1	1		1	1	1	1	1	1
Volume (vph)	319	10	24	154	30	261	35	681	67	183	954	365
v/c	0.8	0.05		0.76	0.78		0.39	0.44		0.68	0.79	
Delay(s)	50.9	10.2		78.6	38.7		47.3	28.1		35.9	29.2	
LOS	D	B		E	D		D	C		D	C	
95th Queue (m)	99.5	7.7		64.2	67		m19.9	123.8		m31.6	#m105.8	
Intersection Average Delay(s)			***35.0***			***Intersection LOS***			***D***			

Table 4.10 presents the intersection analysis for 87 Avenue at 94 Street. This intersection provides access to commercial areas north and south of 94 Street. This intersection will fail with its current unsignalized configuration. Signals will be required at this intersection, which result in acceptable levels of service and v/c ratios.

Table 4.11 – Southfort Drive & Allard Way Intersection Analysis

Southfort Drive - Allard Way												
AM Peak												
Coordinated/Actuated 70 sec. Cycle	Eastbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Through /Right	Left	Through	Through /Right	Left	Through	Right	Left	Through	Right
Phase	Perm			Perm			Perm		Perm	Perm		Perm
Lanes	1		1	1		1	1	2	1	1	2	1
Volume (vph)	68	5	22	54	1	323	110	527	25	77	288	21
v/c	0.71	0.09		0.23	0.76		0.17	0.25	0.03	0.15	0.13	0.02
Delay(s)	59.7	10.1		23.3	21.7		7.9	7	3.7	5.3	4.1	0.9
LOS	E	B		C	C		A	A	A	A	A	A
95th Queue (m)	20	5.5		13.4	37.7		13.7	26.3	2.5	13.1	18.6	1.4
Intersection Average Delay(s)			***12.4***			***Intersection LOS***				***B***		
PM Peak												
Coordinated/Actuated 70 sec. Cycle	Eastbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Through /Right	Left	Through	Through /Right	Left	Through	Right	Left	Through	Right
Phase	Perm			Perm			Perm		Perm	Perm		Perm
Lanes	1		1	1		1	1	2	1	1	2	1
Volume (vph)	95	20	94	75	5	136	130	439	164	310	1061	9
v/c	0.52	0.35		0.4	0.4		0.39	0.17	0.14	0.47	0.42	0.01
Delay(s)	36.4	11.2		31.5	9		12.4	6	3.4	6.9	3.1	0
LOS	D	B		C	A		B	A	A	A	A	A
95th Queue (m)	23.7	13.9		19.3	13.4		22.9	20.3	9.8	26.4	17.5	0
Intersection Average Delay(s)			***7.3***			***Intersection LOS***				***A***		

Table 4.11 presents the intersection analysis for Southfort Drive at Allard Way. The existing Southfort Drive and Allard Way intersection will require signal control to accommodate future traffic. The TAC signal warrant indicates score of 195 in the long term. The intersection is currently constructed to first stage configuration with single through/right and left turn lanes on Southfort Drive would experience significant congestion under long term traffic demand, even if signalized. To provide adequate operation it is assumed that by full development of the Southfort area, Southfort Drive will be already upgraded to 4 lanes; analysis of operations under these conditions are summarized in the above table.

Table 4.12 – Southfort Drive & Greenview Way North Intersection Analysis

Southfort Drive - Greenview Way North												
AM Peak												
Coordinated/Actuated 70 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Through /Right	Left	Through	Through /Right	Left	Through	Right	Left	Through	Right
Phase	Perm			Perm			Perm		Perm	Perm		Perm
Lanes	1		1	1		1	1	2	1	1	2	1
Volume (vph)	29	8	22	33	9	107	25	533	7	24	267	51
v/c	0.24	0.16		0.25	0.46		0.03	0.21	0.01	0.04	0.1	0.04
Delay(s)	38	20.1		31.9	13.3		1.8	1.7	0	2.9	2.6	1.5
LOS	D	C		C	B		A	A	A	A	A	A
95th Queue (m)	m10.1	m7.1		12	14.4		m1.4	9.7	m0	4.3	17.6	4.7
Intersection Average Delay(s)		***5.5***				***Intersection LOS***				***A***		
PM Peak												
Coordinated/Actuated 70 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Through /Right	Left	Through	Through /Right	Left	Through	Right	Left	Through	Right
Phase	Perm			Perm			Perm		Perm	Perm		Perm
Lanes	1		1	1		1	1	2	1	1	2	1
Volume (vph)	168	58	50	79	33	101	38	438	74	161	938	107
v/c	0.45	0.35		0.4	0.39		0.11	0.19	0.07	0.26	0.4	0.1
Delay(s)	30.2	18.4		32.2	12.6		6.3	5.6	3	3	2.9	0.3
LOS	C	B		C	B		A	A	A	A	A	A
95th Queue (m)	18.5	19		20.9	17.1		m6.3	20.9	6.4	2.1	12	0.1
Intersection Average Delay(s)		***7.8***				***Intersection LOS***				***A***		

Table 4.12 presents the intersection analysis for Southfort Drive at Greenview Way North. This intersection will require signals, and Southfort Drive will require widening to 4 lanes to accommodate the long term traffic. The TAC signal warrant score indicates value 141. As shown in the table above, the upgraded intersection will provide very good level of service at full development of the Southfort area.

Table 4.13 – Southfort Drive & 84 Street Intersection Analysis

Southfort Drive - 84 Street						
AM Peak						
Coordinated/Actuated 70 sec. Cycle	Easbound		Northbound		Southbound	
Movement	Left	Right	Left	Through	Through	Right
Phase	Prot	Free	Perm			Perm
Lanes	1	1	1	1	1	1
Volume (vph)	64	65	184	419	297	56
v/c	0.13	0.13	0.38	0.48	0.34	0.04
Delay(s)	23.1	11.2	13.1	13.2	9.9	0.1
LOS	C	B	B	B	A	A
95th Queue (m)	17.8	11.1	29.5	58.4	49	0
Intersection Average Delay(s)			***12.1***	***Intersection LOS B***		

Southfort Drive - 84 Street						
PM Peak						
Coordinated/Actuated 70 sec. Cycle	Easbound		Northbound		Southbound	
Movement	Left	Right	Left	Through	Through	Right
Phase	Prot	Free	Perm			Perm
Lanes	1	1	1	1	1	1
Volume (vph)	187	198	161	355	748	268
v/c	0.43	0.37	0.61	0.33	0.7	0.18
Delay(s)	25.4	5.8	22.0	8.1	14.9	0.2
LOS	C	A	C	A	B	A
95th Queue (m)	38.8	14.4	#43.1	35.5	124	0
Intersection Average Delay(s)			***12.3***	***Intersection LOS B***		

Table 4.13 presents the intersection analysis for Southfort Drive at 84 Street. Signals will be required at this intersection in the long term. With the existing two lanes on Southfort Drive, the TAC signal warrant score is expected to be 140 with long term traffic volumes; with a future four lane cross-section on Southfort Drive, the TAC signal warrant score is 126 with long term traffic.

The results presented in the above table show the intersection analyzed with signal control utilizing a possible first stage intersection configuration, which includes a single lane northbound and southbound through movements and turning lanes for the three approaches.

South of 84 Street, Southfort Drive traffic volumes drop significantly and could be accommodated with a two lane roadway in the long term rather than four lanes which will be required north of 84 Street.

When the existing unsignalized intersection operates at poor service levels, two options should be considered: signal control or a roundabout. Roundabouts, especially singe lane, are considered superior to signals. They are safer for vehicles, cyclist, and pedestrians; they are easy to navigate and provide better operation for all movements during off peak hours when the vehicles do not need to stop at the intersection.

Roundabouts are safer than comparable signalized intersections in part because the roundabout geometry acts as calming feature and significantly reduces severity of collisions.

Table 4.14 – Southfort Drive & Greenfield Way South Intersection Analysis

Southfort Drive - Greenfiled Way South						
AM Peak						
Stop Controlled	Westbound		Northbound		Southbound	
Movement	Left	Right	Through	Right	Left	Through
Lanes	1	1	1	1	1	1
Volume (vph)	105	172	431	36	47	315
v/c	0.38	0.3	0.27	0.02	0.05	0.2
Delay(s)	24.4	13.6	0.0	0	8.6	0
LOS	C	B	A	A	A	A
95th Queue (m)	13.3	10	0	0	1.2	0
Intersection Average Delay(s)			***4.8***		***Intersection LOS A***	

Southfort Drive - Greenfiled Way South						
PM Peak						
Stop Controlled	Westbound		Northbound		Southbound	
Movement	Left	Right	Through	Right	Left	Through
Lanes	1	1	1	1	1	1
Volume (vph)	63	111	408	96	202	744
v/c	0.32	0.17	0.24	0.06	0.19	0.44
Delay(s)	32.1	11.8	0.0	0	9.3	0
LOS	D	B	A	A	A	A
95th Queue (m)	10.5	5	0	0	5.6	0
Intersection Average Delay(s)			***3.2***		***Intersection LOS A***	

Table 4.14 presents the intersection analysis for Southfort Drive at Greenfield Way South. The existing Southfort Drive is currently a two lane road with turning lanes at the Greenfield Way intersection. Greenfield Way is also a two lane roadway and at the approach to Southfort Drive has one shared lane to accommodate left and right turning movement.

The existing intersection in the long term does not warrant signals with a TAC warrant score of 95 but the Greenfield approach would experience long delays especially during pm peak. The delays may be reduced with an additional lane provided to separately accommodate the right and left turn movements.

The analysis in the above table show results assuming that right and left turn lanes are provided, and indicate that intersection would operate satisfactorily in the long term. The delays experienced by left turning vehicles would likely result in drivers choosing either a right turn at the intersection to travel to the south via 84 Street or use the nearby signalized intersection at Greenfield Way North.

Table 4.15 – Southfort Drive & Southridge Boulevard Intersection Analysis (Stop Control)

Southfort Drive and Southridge Boulevard													
AM Peak													
Stop Controlled	Easbound			Westbound			Northbound			Southbound			
Movement	Left	Through/Right		Left	Through/Right		Left/Through/Right			Left	Through/Right		
Control	Perm	Free		Perm	Free		Stop			Stop	Stop		
Lanes	1	1		1	1		1			1	1		
Volume (vph)	8	145	11	20	420	108	66	36	3	27	10	70	
v/c	0.01	0.1		0.02	0.33		0.37			0.09	0.16		
Delay(s)	8.6	0		7.6	0		24.4			18.4	13.2		
LOS	A	A		A	A		C			C	B		
95th Queue (m)	0.2	0		0.4	0		13.2			2.4	4.6		
Intersection Average Delay(s)			***4.7***					***Intersection LOS***				***A***	
PM Peak													
Stop Controlled	Easbound			Westbound			Northbound			Southbound			
Movement	Left	Through/Right		Left	Through/Right		Left/Through/Right			Left	Through/Right		
Control	Perm	Free		Perm	Free		Stop			Stop	Stop		
Lanes	1	1		1	1		1			1	1		
Volume (vph)	37	387	50	1	119	91	23	20	2	126	44	99	
v/c	0.028	0		0.001	0		0.147			0.365	0.236		
Delay(s)	7.75	0		8.26	0		18.8			21.3	12.8		
LOS	A	A		A	A		C			C	B		
95th Queue (m)	0.9	0		0	0		4.5			13.9	7.8		
Intersection Average Delay(s)			***5.7***					***Intersection LOS***				***A***	

Table 4.15 presents the intersection analysis for Southfort Drive at Southridge Boulevard. The TAC signal warrant analysis indicates that intersection does not require signals in the long term (score of 57), assuming an undivided 2 lane standard of approaching roads. The analysis shows that turn lanes are required and some movements operate at LOS C and D.

An alternative intersection control, a roundabout, was also considered at this location. **Table 4.16** presents the intersection analysis for Southfort Drive at Southridge Boulevard with a roundabout control.

Table 4.16 – Southfort Drive & Southridge Boulevard Intersection Analysis (Roundabout)

Southfort Drive and Southridge Boulevard													
AM Peak													
Single Lane Roundabout	Easbound			Westbound			Northbound			Southbound			
Movement	Left/Through/Right			Left/Through/Right			Left/Through/Right			Left/Through/Right			
Control	Yield			Yield			Yield			Yield			
Lanes	1			1			1			1			
Volume (vph)	8	145	11	20	420	108	66	36	3	27	10	70	
v/c	0.172			0.614			0.126			0.175			
Delay(s)	5.1			12.5			5.2			7.9			
LOS	A			B			A			A			
95th Queue (m)	5.2			32.8			3.5			4.7			
Intersection Average Delay(s)			***9.8***					***Intersection LOS***			***A***		
PM Peak													
Single Lane Roundabout	Easbound			Westbound			Northbound			Southbound			
Movement	Left/Through/Right			Left/Through/Right			Left/Through/Right			Left/Through/Right			
Control	Yield			Yield			Yield			Yield			
Lanes	1			1			1			1			
Volume (vph)	37	387	50	1	119	91	23	20	2	126	44	99	
v/c	0.569			0.229			0.084			0.313			
Delay(s)	11.9			5.8			7.1			7.2			
LOS	B			A			A			A			
95th Queue (m)	27			7.3			2.1			10.6			
Intersection Average Delay(s)			***9.1***					***Intersection LOS***			***A***		

Both intersection controls provide very good traffic operations. The roundabout control would require fewer approach lanes to the intersection, and provides a more consistent level of service for all approaches.

The internal roadways south and east of Southfort Drive were analyzed assuming two lane roadways (collector standard) with widening at the intersections to provide left turning lanes. The analysis indicate that the LOS at the intersections during AM and PM peaks are LOS A or B (average delays less than 15 sec./veh.). Some selected left turn movements from minor roads would operate at LOS D (average delays no more than 35 sec./veh.), which is considered acceptable in the long term. None of the internal intersections reach the warrant for signals.

4.1.2 Southfort 50% Development Level

For the scenario with 50% development of the Southfort ASP, Highway 21 and Highway 15 intersections initially were analyzed assuming the existing four lane roadway. The analysis indicated that the intersections providing access to the Southfort area would fail during peak hours with only four lanes on the highway. Therefore, all analysis relating to the 50% Southfort development scenario assumes six through lanes on the Highway 15 and Highway 21 corridor adjacent to the Southfort area.

Table 4.17 – Highway 21 & Wilshire Blvd/Southridge Blvd Intersection Analysis, 50% Development

Highway 21 – Wilshire Blvd./Southridge Blvd.												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Free	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Volume (vph)	526	13	526	346	13	75	72	1202	57	84	1192	125
v/c	0.88	0.03	0.2	0.62	0.04	0.05	0.37	0.42	0.06	0.42	0.4	0.13
Delay(s)	65.8	45.9	0.3	53.3	52.3	0.1	68.7	18.6	0.1	58.8	19.9	7.8
LOS	E	D	A	D	D	A	E	B	A	E	B	A
95th Queue (m)	69.9	4.2	0	42.9	4.6	0	18.9	116.2	0	M21.4	97	15.1
Intersection Average Delay(s)				***27.7***					***Intersection LOS***		***C***	
PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Free	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Volume (vph)	308	23	192	197	21	309	212	1701	265	295	1412	473
v/c	0.77	0.06	0.13	0.53	0.06	0.2	0.67	0.6	0.4	0.74	0.47	0.43
Delay(s)	66.4	51.8	0.2	56	53.2	0.3	72.1	22.3	7.5	51.8	27.9	12.7
LOS	E	D	A	E	D	A	E	C	A	D	C	B
95th Queue (m)	46.4	6.7	0	30.8	6.4	57.2	44.7	181	36.1	m58.4	130.9	81.1
Intersection Average Delay(s)				***27.7***					***Intersection LOS***		***C***	

Table 4.17 presents the intersection analysis for Highway 21 at Wilshire Blvd/Southridge Blvd at 50% Southfort development. This intersection will operate at an overall acceptable LOS with the lane configuration identified in the table.

Table 4.18 – Highway 21 & Westpark Blvd/Southfort Blvd Intersection Analysis, 50% Development

Highway 21 – Westpark Blvd./Southfort Blvd.												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	1	2	1	2	1	1	1	3	1	2	3	1
Volume (vph)	144	151	71	271	107	203	58	1614	131	90	1077	130
v/c	0.65	0.41	0.23	0.69	0.6	0.68	0.45	0.54	0.13	0.52	0.36	0.14
Delay(s)	62.9	61	1.8	60.4	73.4	26.3	64.9	16.8	4.9	66.0	14.9	4.4
LOS	E	E	A	E	E	C	E	B	A	E	B	A
95th Queue (m)	55.3	32.2	0	46.9	48.6	36.8	m26.8	142.5	m14.5	25.4	56.7	4.4
Intersection Average Delay(s)				***25.4***					***Intersection LOS***		***C***	
PM Peak												
Coordinated/Actuated 140 sec. Cycle	Eastbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	1	2	1	2	1	1	1	3	1	2	3	1
Volume (vph)	79	118	48	218	289	140	188	1858	272	303	1918	384
v/c	0.49	0.19	0.12	0.37	0.84	0.34	0.81	0.79	0.34	0.81	0.85	0.48
Delay(s)	48.2	48.1	0.6	41.2	74.6	6.8	79.8	42	20.5	65.8	34	14.5
LOS	D	D	A	D	E	A	E	D	C	E	C	B
95th Queue (m)	29.4	23.6	0	34.4	110	13.6	#90.0	222.3	m78.3	m50.4	#177.8	m40.8
Intersection Average Delay(s)				***39.6***					***Intersection LOS***		***D***	

Table 4.18 presents the intersection analysis for Highway 21 at Westpark Blvd/Southfort Blvd at 50% Southfort development. The intersection will operate at an overall acceptable LOS.

Table 4.19 – Highway 21 & 84 Street Intersection Analysis, 50% Development

Highway 21 – 84 Street												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Free	Perm		Free	Prot		Perm	Prot		Perm
Lanes	1	2	1	1	2	1	2	3	1	2	3	1
Volume (vph)	184	72	300	83	98	109	119	1847	74	33	927	32
v/c	0.68	0.27	0.7	0.13	0.51	0.41	0.5	0.61	0.07	0.19	0.34	0.04
Delay(s)	58.8	55.3	22.1	41.1	66.5	11.8	78.1	12.4	1.2	50.3	23.5	3.7
LOS	E	E	C	D	E	B	E	B	A	E	C	A
95th Queue (m)	62	32	42.1	11.9	42.1	14.4	m28.4	83.7	m2.6	20.9	81.7	3.8
Intersection Average Delay(s)			***22.8***						***Intersection LOS***		***C***	
PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Free	Perm		Free	Prot		Perm	Prot		Perm
Lanes	1	2	1	1	2	1	2	3	1	2	3	1
Volume (vph)	136	169	218	138	276	86	345	1704	178	109	2256	289
v/c	0.76	0.56	0.5	0.28	0.85	0.21	0.98	0.66	0.21	0.53	0.95	0.36
Delay(s)	66.7	60.2	10.2	39.1	78.7	1.2	79.2	7.8	0.6	88.6	23.9	7.6
LOS	E	E	B	D	E	A	E	A	A	F	C	A
95th Queue (m)	#54.0	67.9	22.8	23.6	#111.0	0	m#79.8	37.5	m0.2	m20.0	#268.2	m30.6
Intersection Average Delay(s)			***26.3***						***Intersection LOS***		***C***	

Table 4.19 presents the intersection analysis for Highway 21 at 84 Street at 50% Southfort development. Overall the intersection would provide acceptable operations with some movements experiencing longer delays during pm peak.

Considering that this analysis is at a planning stage, actual volumes may be slightly different and signals timing and coordination could be adjusted and improved during implementation and service to reflect actual traffic conditions.

Table 4.20 – Highway 21 & Future Commercial Access Intersection Analysis, 50% Development

Highway 21 – Future Commercial Access												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through/Right		Left	Through/Right		Left	Through	Right	Left	Through	Right
Phase	Per			Per			Prot		Perm	Prot		Perm
Lanes	2	1		2	1		2	3	1	1	3	1
Volume (vph)	34	6	31	102	9	16	46	2039	69	30	830	34
v/c	0.06	0.1		0.18	0.07		0.25	0.59	0.06	0.34	0.27	0.03
Delay(s)	43.5	17.6		45.3	24.1		58.2	10.8	3.4	31	9.2	0.5
LOS	D	B		D	C		E	B	A	C	A	A
95th Queue (m)	9	11.2		20.8	10.2		m11.2	113.1	m7.6	11.2	30.3	0.2
Intersection Average Delay(s)			***12.6***						***Intersection LOS***		***B***	

PM Peak												
Coordinated/Actuated 140 sec. Cycle	Easbound			Westbound			Northbound			Southbound		
Movement	Left	Through/Right		Left	Through/Right		Left	Through	Right	Left	Through	Right
Phase	Per			Per			Prot		Perm	Prot		Perm
Lanes	1	1		1	1		2	3	1	1	3	1
Volume (vph)	147	29	138	250	25	118	150	1486	290	158	2266	101
v/c	0.45	0.59		0.85	0.53		0.3	0.54	0.31	0.74	0.85	0.12
Delay(s)	50.3	21.6		74.6	21.1		66.4	33.3	17.5	52.9	47.4	14.1
LOS	D	C		E	C		E	C	B	D	D	B
95th Queue (m)	24.3	27.4		39.1	24.8		m27.6	141.7	m61.1	m56.8	m#298.0	m18.5
Intersection Average Delay(s)			***41.6***						***Intersection LOS***		***D***	

Table 4.20 presents the intersection analysis for Highway 21 at the future commercial access at 50% Southfort development. The intersection operates at an overall acceptable LOS, with some longer delays occurring for some movements.

Table 4.21 – Highway 21/Highway 15 & Highway 15/94 Street Intersection Analysis, 50% Development

Highway 21/Highway 15 – Highway 15/94 Street												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	Eastbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Free	pm+pt		Free	Prot		Free	Prot		Free
Lanes	2	2	1	2	2	1	2	33	1	2	3	1
Volume (vph)	740	276	262	101	401	195	660	1317	85	53	554	238
v/c	0.91	0.25	0.18	0.18	0.61	0.13	0.91	0.65	0.13	0.32	0.48	0.16
Delay(s)	48	35.9	0.3	27.8	56.2	0.2	59.3	41.4	3.9	69.7	47.9	0.2
LOS	D	D	A	C	E	A	E	D	A	E	D	A
95th Queue (m)	#105.8	43.2	0	15.1	74.3	0	#130.3	143.1	M7.6	15.2	64.2	0
Intersection Average Delay(s)				***39.9***					***Intersection LOS***		***D***	
PM Peak												
Coordinated/Actuated 140 sec. Cycle	Eastbound			Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Phase	pm+pt		Free	pm+pt		Free	Prot		Free	Prot		Free
Lanes	2	2	1	2	2	1	2	33	1	2	3	1
Volume (vph)	333	650	836	380	577	229	576	877	298	351	1339	529
v/c	0.7	0.87	0.56	0.86	0.74	0.2	0.91	0.5	0.43	0.75	0.88	0.35
Delay(s)	40.8	65.5	1.5	51	45.3	0.2	70.4	40.9	21.2	82.9	32.8	0.5
LOS	D	E	A	D	D	A	E	D	C	E	C	A
95th Queue (m)	47.3	#126.4	0	m#62.8	m93.4	m0	#115.6	113.2	84.9	66.3	147	0
Intersection Average Delay(s)				***37.1***					***Intersection LOS***		***D***	

Table 4.21 presents the intersection analysis for Highway 21/Highway 15 at Highway 15/94 Street at 50% Southfort Development. Overall the intersection operates within acceptable LOS but there will be congestion during peak hours.

Table 4.22 – Highway 15 & 101 Street Intersection Analysis, 50% Development

Highway 15 – 101 Street												
AM Peak												
Coordinated/Actuated 140 sec. Cycle	South/Easbound			North/Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Rt/Th	Left	Through	Right	Left	Through	Right
Phase	Perm		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	1	2	1	2	1		2	3	1	2	3	1
Volume (vph)	46	131	209	159	130	407	221	1770	150	49	478	166
v/c	0.49	0.33	0.59	0.33	0.55		0.58	0.65	0.17	0.22	0.2	0.23
Delay(s)	64.3	47.1	13.2	35.9	13.9		52.9	19.6	4.7	52.4	17.2	3.5
LOS	E	D	B	D	B		D	B	A	D	B	A
95th Queue (m)	22.7	24.6	22	24.6	34.8		38.8	136	14.8	12.3	33.6	13.1
Intersection Average Delay(s)				***21.2***					***Intersection LOS***		***C***	

PM Peak												
Coordinated/Actuated 140 sec. Cycle	South/Easbound			North/Westbound			Northbound			Southbound		
Movement	Left	Through	Right	Left	Through	Rt/Th	Left	Through	Right	Left	Through	Right
Phase	Perm		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Lanes	1	2	1	2	1		2	3	1	2	3	1
Volume (vph)	34	320	408	193	258	136	406	668	94	380	1618	128
v/c	0.23	0.74	0.81	0.48	0.45		0.82	0.57	0.21	0.31	0.73	0.17
Delay(s)	52.2	65.7	24.6	42.5	33.9		79.2	39.9	m17.4	33	34.4	6
LOS	D	E	C	D	C		E	D	A	C	C	A
95th Queue (m)	18.4	64.4	61.5	m28.7	47		80.4	76.2	m17.4	56.9	174.9	15.2
Intersection Average Delay(s)				***39.3***					***Intersection LOS***		***D***	

Table 4.22 presents the intersection analysis for Highway 15 at 101 Street at 50% Southfort development. This intersection will operate satisfactorily within the 50% development level horizon.

Traffic estimates at the 50% development level indicate volumes that are lower than at the full development level, so intersections along Southfort Drive should operate satisfactory. The improvement implementation would be dependent on actual development progress within the Southfort area.

4.2 Road Standards

The projected daily traffic volumes are illustrated in **Exhibits 3.9** (full development) and **Exhibit 3.10** (50% development).

The land use concept for the Southfort ASP indicates Southridge Boulevard, Southfort Boulevard, 84 Street, 94 Street, and Southfort Drive with arterial standard road designation and typical four lane cross-sections.

Typically, roads with volumes less than 8,000 vehicle per day in residential areas may be accommodated with a collector roadway standard. Based on the traffic estimates, not all the roads designated as arterials in the ASP reach arterial roadway volumes. This applies to 94 Street, south of the Sienna neighborhood and the Southridge Boulevard extension east of Southfort Drive.

It is proposed to designate these roadways as collectors, with road width of 11.5 m (lip to lip of gutter) with widening at intersections to accommodate turning movements as appropriate.

It is estimated that the south section of the Southfort Drive, south of Southfort Boulevard, will experience daily volumes around 4,000 vehicles at full Southfort development. This section could be accommodated with a two lane roadway (the arterial four lane road is not required). However, the first stage of Southfort Drive (two lanes of the ultimate four lanes) were constructed in 2015. Considering that the first two lanes are considered a temporary measure, the City may wish to have Southfort Drive a four-lane arterial for its entire length for consistency along the corridor.

Southfort Drive terminates at Southridge Boulevard and the south leg of the intersection will provide access to high density development.

As was indicated, there would be a capacity constraint at the Highway 21 and Southridge Boulevard intersection at full development of Southfort. This necessitates an additional connection to Highway 21 to the south. The connection is shown on the exhibits, for which a location is approximate and should be determined in conjunction with development plans for the area south of Southfort. Based on the current traffic assessment the connection to the south could be accommodated with a collector road standard.

4.2.1 Collector Road Cross-Section

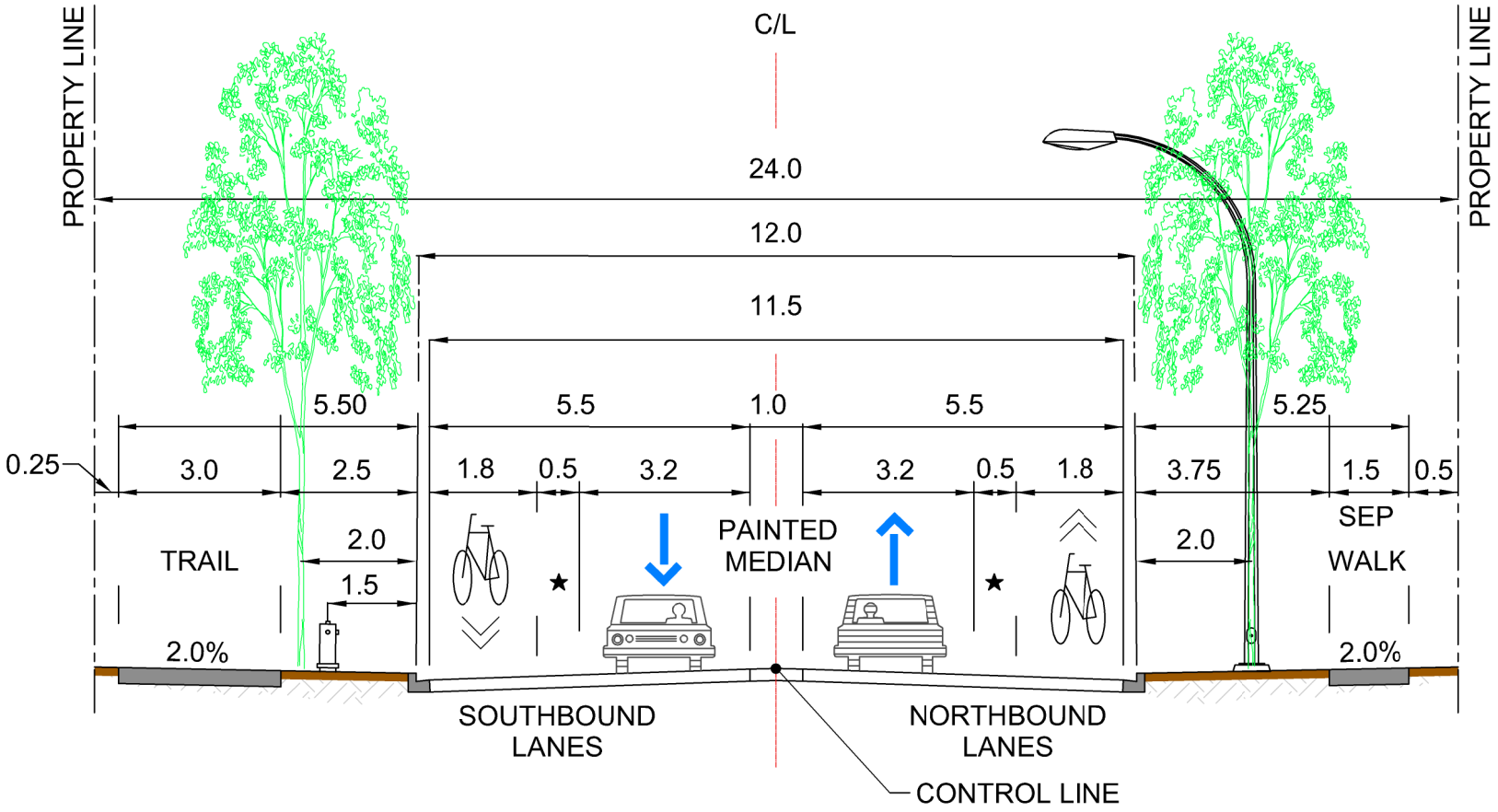
Sections of 94 Street and Southridge Boulevard which are to be constructed using collector standard are 11.5m wide and due to a lack of active or passive traffic calming, these roads may inadvertently encourage speeding – especially that there are no front facing lots and no demand for parking along these corridors. A cross-section illustrated in **Exhibit 3.11** that shows elements that can be implemented within the paved width which would include two opposing 3.2 m wide travel lanes separated with a 1.0m wide median. The remaining width on both sides would be designated to cyclists. The 1.8m wide cycling lane would have a 0.5m wide buffer (two parallel lines on pavement) to provide extra protection to cyclists. This cross-section would visually narrow the roadway and influence the drivers to travel at slower speeds, while providing buffered cycling lanes. The proposed cross-section typical complete-street (multi-modal) oriented context sensitive street design, which is very appropriate in residential and parks area.

4.3 Intersection Treatment Options

Traffic and signal warrant analysis indicate which intersections in the Southfort area would require upgraded intersection control. The Southfort Drive intersections at 84 Street, Southfort Boulevard, and Southridge Boulevard will operate satisfactory during peak hours with a stop control at full development of the Southfort area. The stop controlled movements will experience acceptable (less than 35 sec./veh.) – LOS D delays. However, if there are public complaints regarding delays at these intersections, a roundabout option should be considered to improve these intersections (rather than unwarranted signals).

Estimated traffic at the above noted intersections can be well accommodated with single lane roundabouts. The roundabouts would provide superior operation for all movements. Roundabouts operate at slower speeds, provide traffic calming for the road network, and are safer than stop controlled or signalized intersections.

If a number of roundabouts were introduced in the Southfort area, the overall network would be safer for all users – drivers, cyclists, and pedestrians – because drivers would have to slow down to negotiate the geometry at the intersections.



CITY OF FORT SASKATCHEWAN

Al-Terra

CITY OF FORT SASKATCHEWAN

SOUTHFORT TRANSPORATION STUDY

PROPOSED COLLECTOR TYPICAL CROSS-SECTON

N.T.S. **DATE: AUGUST, 2015** **EXHIBIT 3.11**

Benefits of roundabouts as compared to traffic signals or stop control:

- Improves traffic flow and safety
- Traffic moves through intersection at reduced speeds
- There are fewer conflicts points between vehicles and pedestrians
- Reduces or eliminates head-on high speed and right angle collisions
- Vehicles are not forced to stop, so traffic flows continuously
- Improves the character of the roadway

Benefits of Roundabouts versus Traffic Signals:

- Potentially roadway right-of-way width may be reduced due to narrower median and fewer approach lanes
- Lower operational and maintenance costs
- Continues to function normally if damaged or during a power failure
- Signalization will not be required in long term
- Cost of construction is similar

Research indicates that due to a reduction in operating speed and conflicts, roundabouts are safer as compared to signals and stop control and experience a:

- 90% reduction in fatalities
- 75% reduction in injuries
- 37% reduction in total number of collisions
- 40% reduction in pedestrian collisions

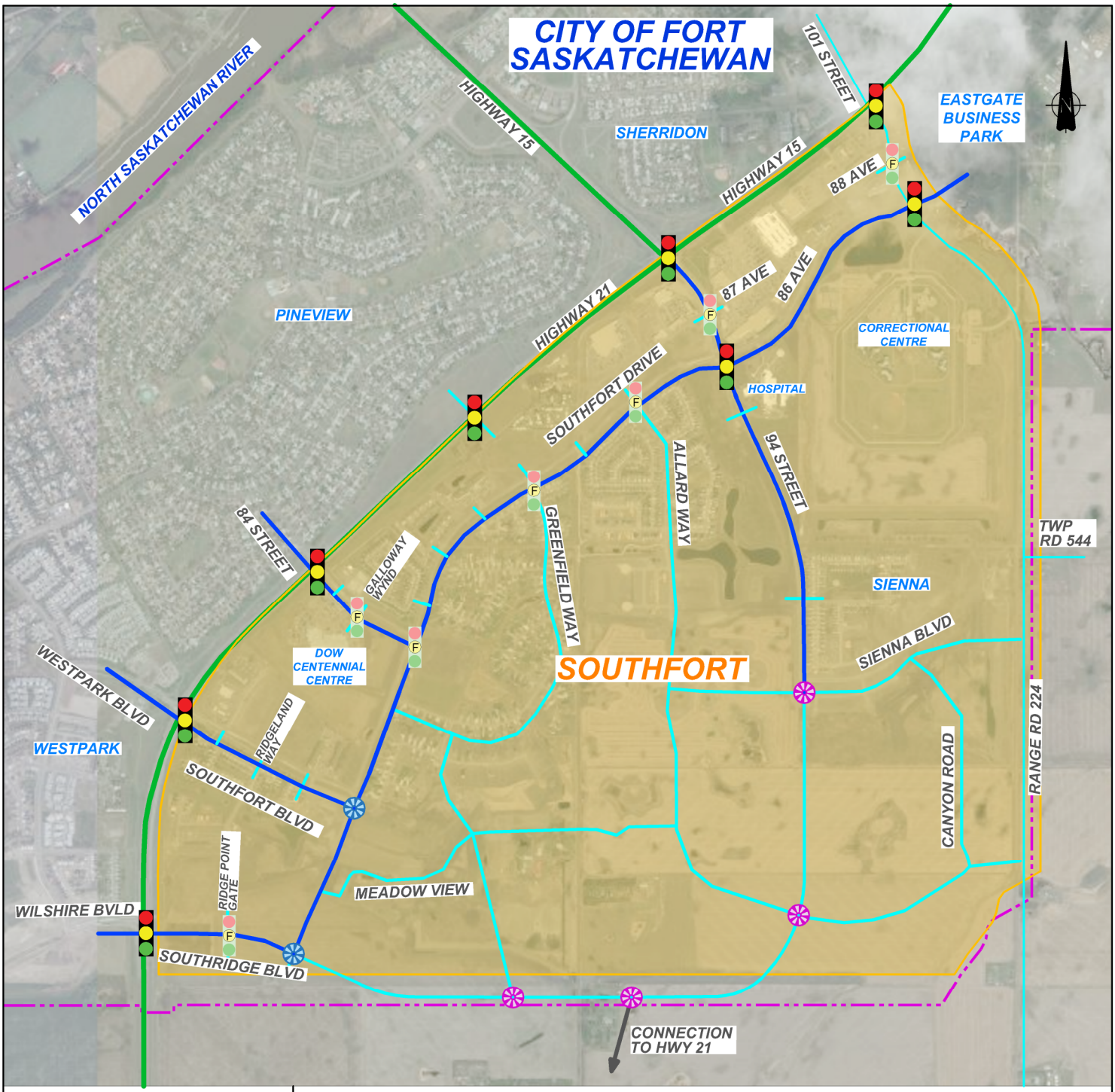
The above safety statistics are based on "Safety Effect of Roundabout Conversions in the United States: Empirical Bayes Observational Before-After Study." Transportation Research Record No. 1751, Transportation Research Board, National Academy of Sciences (NAS), Washington, D.C. 2001.

Exhibit 3.12 indicates the proposed road network and intersection traffic controls at full development of the Southfort area. Existing and future signals shown on the exhibit are required based on traffic demand. Locations of potential and recommended roundabout locations are also shown on map.

Roundabout intersections are good solutions for the Southfort area because the main roads, which include 94 Street and Southridge Boulevard, are adjacent to residential developments and parks. The roundabouts would promote slower speeds and would create friendlier environment for pedestrians and cyclists. The roundabouts will accommodate long term traffic for all movements without the need for signals and vehicles would experience less delays than at signals.

The proposed roundabouts would be designed to slow down traffic so the approaching and circulating traffic speeds are similar. The central island would have an apron to accommodate large trucks. The geometry of roundabout would accommodate cars, transit, school busses, and fire trucks within the paved roadway without using the apron.

The proposed roundabouts would be single lane roundabouts with outside diameter 40-45m. The circulating speed of the roundabout would be approximately 30km/h and have similar entrance and exit speeds. The low speeds and the geometry make the roundabouts safer and easy to navigate. The



CITY OF FORT SASKATCHEWAN

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CITY BOUNDARY
STUDY AREA
ALBERTA HIGHWAY
ARTERIAL ROAD
COLLECTOR ROAD
PROPOSED ROUNDABOUT
POTENTIAL ROUNDABOUT
EXISTING SIGNAL
PROPOSED SIGNAL

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
INTERSECTION CONTROLS - FULL DEVELOPMENT OF SOUTHFORT

N.T.S.

DATE: AUGUST, 2015

EXHIBIT 3.12

roundabouts would have splitter islands on the approaches which would provide safe and easy pedestrian crossing.

Based on the foregoing traffic projections and analysis, during further development of the Southfort area and road construction, the roundabout intersection control is proposed to provide a friendly and lower speed environment for all users in this residential neighborhood.

Some roundabouts identified on Southfort Drive in **Exhibit 3.12** are shown as potential. The signal warrants are not met for those intersections but minor movements may experience somewhat longer delays, which may be perceived as unacceptable by local residences. In this case roundabout control should be an option considered rather than signals.

4.4 Public Transportation and Pedestrian/Cyclist Network

4.4.1 Public Transportation

Currently public transportation doesn't have any significant share of the travel market in the City of Fort Saskatchewan. If in the future there is a demand for public transportation in the Southfort ASP, the City should review the arterial, collector, and a walkway/multi-use trail system to provide a desired maximum 400m walking distance between any residence and a potential bus stop located on collector or arterial roadways.

4.4.2 Pedestrian/Cyclist Network

Active transportation is considered a high priority and effective pedestrian linkages between residential, commercial and institutional area are considered essential. Based on the Southfort ASP, a series of multi-use trail linkages along the highway corridor and through greenbelts connects the Southfort area with surrounding communities. The Recreational, Culture, and Parks Facilities Master Plan defines regional, primary, and secondary trails and should be used as a guide in further development of the Southfort area to provide an active transportation network.

If the proposed collector cross-section is adopted, the trail system should incorporate the proposed bike lanes into the system.

5.0 Conclusions and Recommendations

Based on the analysis described, we have concluded the following:

1. Highway 21 and Highway 15 will require widening to 6 basic lanes within the 50% development level horizon to provide satisfactory operations at intersections which provide access to Southfort area. Traffic volumes and operations at the intersections should be monitored to ensure optimal timing of improvements.
2. The Southfort Drive arterial roadway should terminate at Southridge Boulevard.
3. With full development of the Southfort ASP, an additional connection to Highway 21, south of Southridge Boulevard will be required to accommodate traffic travelling to/from Edmonton and Strathcona via Highway 21. The location and the alignment of the Highway 21 connection should be incorporated into development plans for the area south of Southfort.
4. Southfort Drive will require four lanes from Southfort Boulevard to 94 Street to accommodate 50% development and full development levels.
5. Not all the roads designated as arterials in the ASP reach arterial roadway volumes, therefore it is proposed to construct collector standard roadway on 94 Street south of the Sienna neighbourhood, and Southridge Boulevard east of Southfort Drive, rather than a conventional divided arterial.
   A context sensitive cross-section is suggested to influence speeds on those roads, while providing buffered bike lanes and encouraging active transportation in the area.
6. To build on the multi-modal alternative approach, a number of single lane roundabouts are proposed which will provide superior traffic control at the intersections as well as act as traffic calming feature desired in residential and parks environments.
7. The Southfort Drive intersections at Southfort Boulevard and Southridge Boulevard do not reach the warrant for signals but may experience somewhat longer delays for minor turning movements. The intersections could be converted to single lane roundabouts to provide continuous flow, as well as safer operations for all movements and users.

Appendix A

Existing Traffic (2013)
Estimated and Balanced – Synchro View

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CITY OF FORT SASKATCHEWAN

NORTH SASKATCHEWAN RIVER

HIGHWAY 15

HIGHWAY 15

HIGHWAY 21

SHERRIDON

PINEVIEW

WESTPARK

SOUTHFORT

EASTGATE BUSINESS PARK

101 STREET

86 AVE

94 STREET

84 STREET

SOUTHFORT DRIVE

ALLARD WAY

GREENFIELD WAY

SOUTHFORT BLVD

WESTPARK BLVD

WILSHIRE BVLD

MEADOW VIEW

SOUTHRIDGE BLVD

TWP RD 544

RANGE RD 224

CITY OF FORT SASKATCHEWAN

Al-Terra

CITY BOUNDARY

HIGHWAY (EXPRESSWAY)

ARTERIAL ROAD

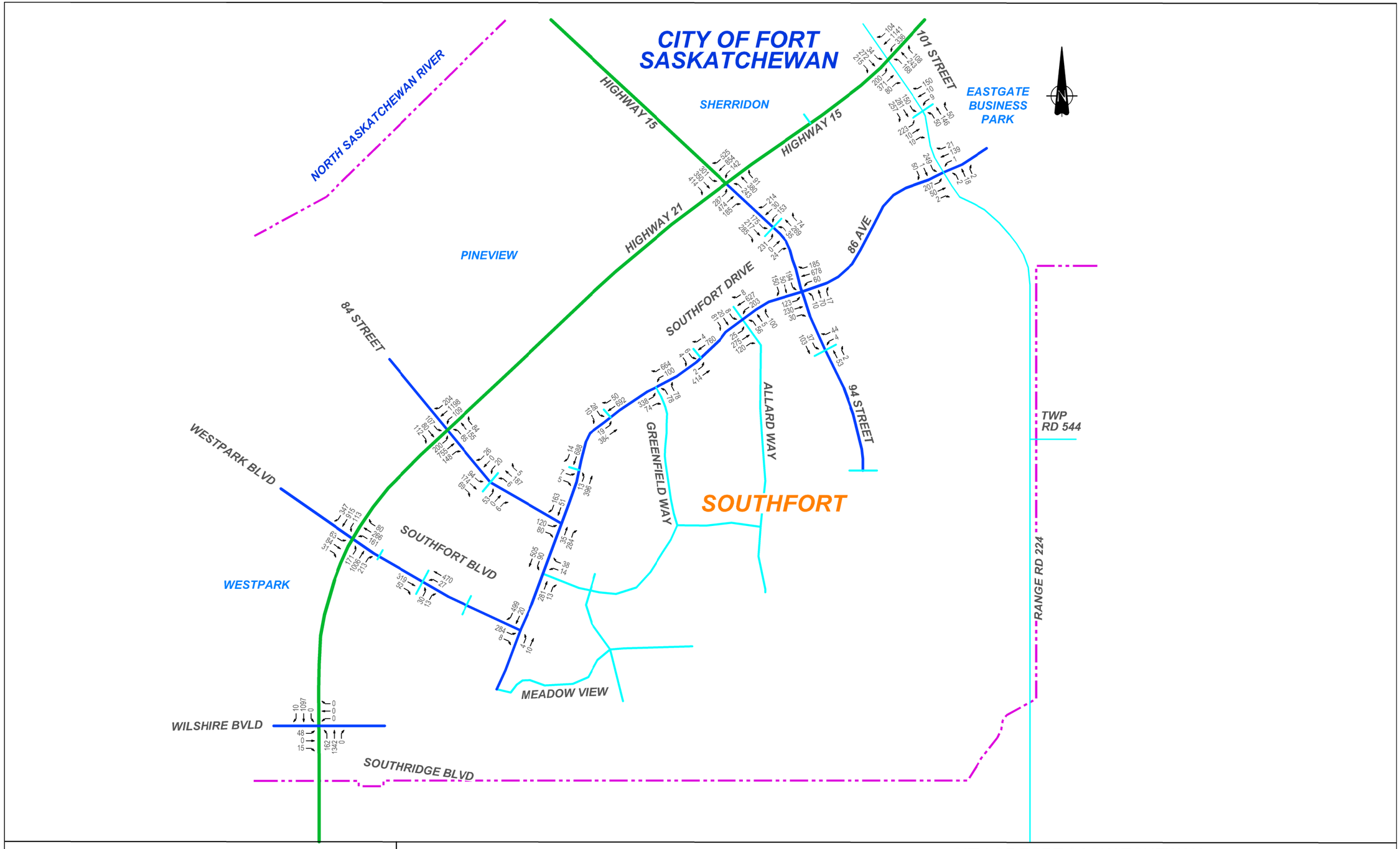
COLLECTOR ROAD

N.T.S.

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ESTIMATED AM PEAK DESIGN VOLUMES
AT SOUTHFORT EXISTING 2013

DATE: AUGUST, 2015

APPENDIX C-1



CITY OF FORT SASKATCHEWAN

Al-Terra

CITY BOUNDARY
HIGHWAY (EXPRESSWAY)
ARTERIAL ROAD
COLLECTOR ROAD

N.T.S.

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY
ESTIMATED PM PEAK DESIGN VOLUMES
AT SOUTHFORT EXISTING 2013
DATE: AUGUST, 2015

APPENDIX C-2

Appendix B

Trip Generations Rates Used in Edmonton Capital Regions

Al-Terra

2013 RECOMMENDED TRIP GENERATION RATES

RESIDENTIAL LAND USES

Land Use	Time Period	Rate	In/Out Split	Notes
Low Density Residential	AM Peak Hour	0.69 trips/du	19%/81%	Measured
	PM Peak Hour	0.79 trips/du	67%/33%	Measured
	Daily	7.92 trips/du	50%/50%	Measured
RF5 – Row Housing	AM Peak Hour	0.46 trips/du	21%/79%	ITE LUC 221
	PM Peak Hour	0.58 trips/du	65%/35%	ITE LUC 221
	Daily	6.59 trips/du	50%/50%	ITE LUC 221
RA7 & RA8 – Apartment Housing	AM Peak Hour	0.34 trips/du	17%/83%	Measured
	PM Peak Hour	0.40 trips/du	63%/37%	Measured
	Daily	5.81 trips/du	50%/50%	ITE LUC 230
Non-specific Medium Density Residential	AM Peak Hour	0.44 trips/du	17%/83%	ITE LUC 230
	PM Peak Hour	0.62 trips/du	65%/35%	ITE LUC 220
	Daily	5.81 trips/du	50%/50%	ITE LUC 230

The low density residential rates summarized above should be used as base rates, which may be adjusted to better reflect the specific scenario being analyzed including the potential changes in traffic generation during the life cycle of neighbourhoods and potential changes in private vehicle usage with global improvements to transit and active modes infrastructure.

COMMERICAL LAND USES

Land Use	Time Period	Rate	In/Out Split	Notes
CNC Sites 22,000 SF to 50,000 SF	AM Peak Hour	5.62 trips/1,000 SF	55%/45%	CNC Weighted Avg.
	PM Peak Hour	Y=[425.54Ln(x)-1140.3]/(x) trips/1,000 SF	48%/52%	CNC & CSC Fitted Curve
CSC Sites 50,000 SF to 108,000 SF	AM Peak Hour	4.02 trips/1,000 SF	53%/47%	CSC Weighted Avg. > 50,000 SF
	PM Peak Hour	Y=[425.54Ln(x)-1140.3]/(x) trips/1,000 SF	48%/52%	CNC & CSC Fitted Curve
	Saturday Peak Hour	Y=exp[0.65*Ln(x)+3.76]/(x) trips/1,000 SF	50%/50%	ITE Fitted Curve
Commercial Sites < 22,000 SF and > 108,000 SF	AM Peak Hour	Y=exp[0.59*Ln(x)+2.32]/(x) trips/1,000 SF	67%/33%	ITE Fitted Curve
	PM Peak Hour	Y=exp[0.67*Ln(x)+3.37]/(x) trips/1,000 SF	50%/50%	
	Saturday Peak Hour	Y=exp[0.65*Ln(x)+3.76]/(x) trips/1,000 SF	51%/49%	

2013 RECOMMENDED TRIP GENERATION RATES

COMMERICAL LAND USES (con't)

Land Use	Time Period	Rate	In/Out Split	Notes
Gas Bar with Convenience Store	AM Peak Hour	12.36 trips/FP	51%/49%	Weighted Avg.
	PM Peak Hour	17.23 trips/FP	49%/51%	
Gas Bar with Convenience Store & Tim Hortons	AM Peak Hour	51.43 trips/1,000 SF	51%/49%	Weighted Avg.
	PM Peak Hour	27.10 trips/1,000 SF	48%/52%	
Bank with Drive-Through	AM Peak Hour	5.25 trips/1,000 SF	62%/38%	Weighted Avg.
	PM Peak Hour	10.68 trips/1,000 SF	46%/54%	
Fast Food with Drive-Through	AM Peak Hour	20.27 trips/1,000 SF	51%/49%	Weighted Avg.
	PM Peak Hour	13.89 trips/1,000 SF	45%/55%	
Tim Hortons	AM Peak Hour	137.64 trips/1,000 SF	49%/51%	Weighted Avg.
	PM Peak Hour	51.86 trips/1,000 SF	50%/50%	

The Commercial trip generation rates summarized in these tables meet the standards for the establishment of trip generation rates as outlined in ITE Trip Generation, and are recommended for use in the Edmonton context.

Questions or comments on the rates or their application should be directed to the City of Edmonton's Transportation Planning Branch.

Appendix C

Traffic Operation Reports

Synchro Reports at Southfort – *Full Development*

Synchro Reports at Southfort – *50% Development*

Synchro Reports at Southfort

Full Development

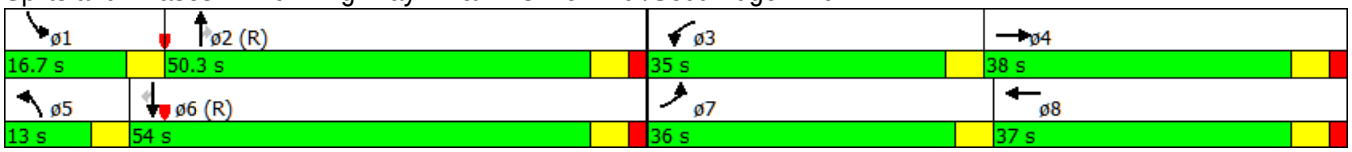
Al-Terra

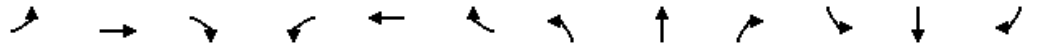
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	518	28	296	509	34	134	72	1180	119	160	1073	122
Future Volume (vph)	518	28	296	509	34	134	72	1180	119	160	1073	122
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	80.0		60.0	79.9		79.9	79.9		79.9
Storage Lanes	1		1	1		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	3283	3385	1514	3283	3385	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3283	3385	1514	3283	3385	1514	3283	4863	1514	3283	4863	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			312			141			115			128
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		258.4			273.8			345.0			780.4	
Travel Time (s)		13.5			14.3			18.0			40.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	545	29	312	536	36	141	76	1242	125	168	1129	128
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	15.0	37.0		13.0	37.0		13.0	33.0	33.0	13.5	33.0	33.0
Total Split (s)	36.0	38.0		35.0	37.0		13.0	50.3	50.3	16.7	54.0	54.0
Total Split (%)	25.7%	27.1%		25.0%	26.4%		9.3%	35.9%	35.9%	11.9%	38.6%	38.6%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	27.8	14.6	140.0	30.6	14.2	140.0	8.4	69.4	69.4	11.8	72.8	72.8
Actuated g/C Ratio	0.20	0.10	1.00	0.22	0.10	1.00	0.06	0.50	0.50	0.08	0.52	0.52
v/c Ratio	0.84	0.08	0.21	0.75	0.10	0.09	0.39	0.52	0.15	0.61	0.45	0.15
Control Delay	65.7	53.3	0.3	58.4	54.4	0.1	69.0	28.0	6.6	66.4	29.4	11.7
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	65.7	53.3	0.3	58.4	54.4	0.1	69.0	28.0	6.6	66.4	29.4	11.7
LOS	E	D	A	E	D	A	E	C	A	E	C	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		42.3			46.6			28.3			32.2	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	78.0	4.1	0.0	76.8	5.2	0.0	11.0	87.1	1.5	23.3	66.0	4.3
Queue Length 95th (m)	96.3	8.0	0.0	95.5	9.3	0.0	19.7	139.1	16.8	38.5	103.1	21.3
Internal Link Dist (m)		234.4			249.8			321.0			756.4	
Turn Bay Length (m)	60.0		60.0	80.0		60.0	79.9		79.9	79.9		79.9
Base Capacity (vph)	750	773	1514	777	749	1514	214	2409	808	303	2528	848
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	0.73	0.04	0.21	0.69	0.05	0.09	0.36	0.52	0.15	0.55	0.45	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 35.2		Intersection LOS: D	
Intersection Capacity Utilization 64.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 107: Highway 21 & Wilshire Blvd./Southridge Blvd.





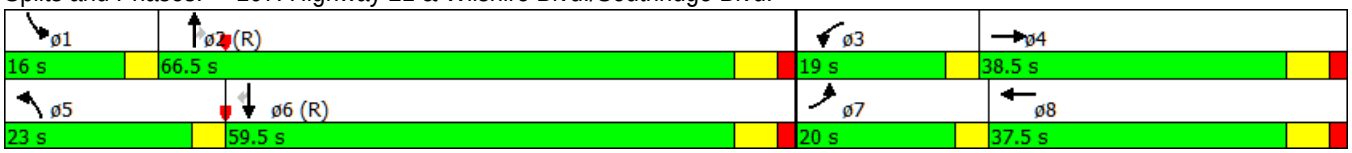
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	294	44	107	190	25	240	348	1733	429	201	1390	472
Future Volume (vph)	294	44	107	190	25	240	348	1733	429	201	1390	472
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		60.0	79.9		79.9	79.9		79.9
Storage Lanes	1		1	1		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	3283	3385	1514	3283	3385	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3283	3385	1514	3283	3385	1514	2855	4863	979	3283	4863	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			240			338			426
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		258.4			273.8			345.0			780.4	
Travel Time (s)		13.5			14.3			18.0			40.7	
Confl. Peds. (#/hr)							1733		348			
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)	294	44	107	190	25	240	348	1733	429	201	1390	472
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	15.0	37.5		13.0	37.5		13.0	33.5	33.5	13.0	33.5	33.5
Total Split (s)	20.0	38.5		19.0	37.5		23.0	66.5	66.5	16.0	59.5	59.5
Total Split (%)	14.3%	27.5%		13.6%	26.8%		16.4%	47.5%	47.5%	11.4%	42.5%	42.5%
Yellow Time (s)	3.5	4.5		3.5	4.5		3.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.5		3.5	6.5		3.5	6.5	6.5	3.5	6.5	6.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	18.2	15.3	140.0	13.8	14.2	140.0	19.0	81.4	81.4	12.8	75.2	75.2
Actuated g/C Ratio	0.13	0.11	1.00	0.10	0.10	1.00	0.14	0.58	0.58	0.09	0.54	0.54
v/c Ratio	0.69	0.12	0.07	0.59	0.07	0.16	0.78	0.61	0.60	0.67	0.53	0.47
Control Delay	67.5	53.5	0.1	64.1	59.3	0.2	71.4	22.8	9.5	88.3	13.2	8.4
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	67.5	53.5	0.1	64.1	59.3	0.2	71.4	22.8	9.5	88.3	13.2	8.4
LOS	E	D	A	E	E	A	E	C	A	F	B	A
Approach Delay		49.9			30.1			27.3			19.4	
Approach LOS		D			C			C			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (m)	42.9	6.2	0.0	27.8	3.6	0.0	50.1	117.5	12.0	26.8	115.0	53.8
Queue Length 95th (m)	#61.4	10.7	0.0	39.5	8.3	0.0	68.2	181.0	64.3	m36.0	156.3	121.4
Internal Link Dist (m)		234.4			249.8			321.0			756.4	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	79.9		79.9	79.9		79.9
Base Capacity (vph)	441	773	1514	363	749	1514	472	2826	710	313	2612	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	0.67	0.06	0.07	0.52	0.03	0.16	0.74	0.61	0.60	0.64	0.53	0.47

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 80 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 26.4 Intersection LOS: C
Intersection Capacity Utilization 69.7% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: Highway 21 & Wilshire Blvd./Southridge Blvd.



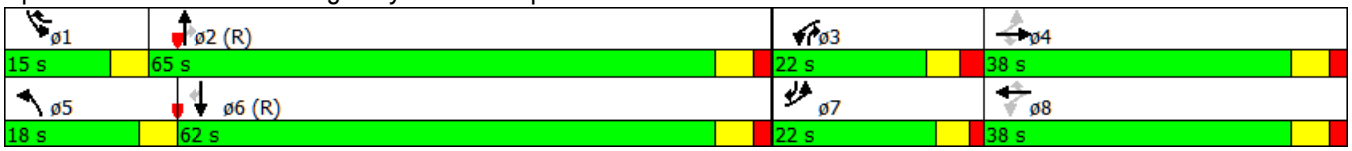
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	158	79	199	106	203	78	1628	126	90	1077	122
Future Volume (vph)	145	158	79	199	106	203	78	1628	126	90	1077	122
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		0.0	60.0		60.0	100.0		60.0	100.0		60.0
Storage Lanes	1		1	1		1	1		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3385	1514	3283	1781	1514	1692	4863	1514	3283	4863	1514
Flt Permitted	0.530			0.647			0.950			0.950		
Satd. Flow (perm)	939	3385	1486	2224	1781	1486	1690	4863	1485	3279	4863	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			101			103			101			128
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		489.0			168.0			780.4			144.9	
Travel Time (s)		25.5			8.8			40.7			7.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	153	166	83	209	112	214	82	1714	133	95	1134	128
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	7.0	7.0	7.0	10.0	7.0	7.0	20.0	7.0	7.0	7.0	4.0
Minimum Split (s)	9.0	37.5	37.5	13.5	37.0	13.5	13.5	33.0	13.5	13.5	33.0	9.0
Total Split (s)	22.0	38.0	38.0	22.0	38.0	15.0	18.0	65.0	22.0	15.0	62.0	22.0
Total Split (%)	15.7%	27.1%	27.1%	15.7%	27.1%	10.7%	12.9%	46.4%	15.7%	10.7%	44.3%	15.7%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5
All-Red Time (s)	1.5	2.0	2.0	2.5	2.0	0.0	0.0	2.0	2.5	0.0	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	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	6.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes				Yes	Yes		Yes		Yes		Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	31.6	15.6	15.6	27.1	14.4	25.8	12.1	80.2	92.9	9.4	77.6	93.5
Actuated g/C Ratio	0.23	0.11	0.11	0.19	0.10	0.18	0.09	0.57	0.66	0.07	0.55	0.67
v/c Ratio	0.53	0.44	0.33	0.40	0.61	0.60	0.56	0.61	0.13	0.43	0.42	0.12
Control Delay	48.6	61.0	9.4	44.0	74.0	31.0	61.2	22.9	3.9	67.3	23.1	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	61.0	9.4	44.0	74.0	31.0	61.2	22.9	3.9	67.3	23.1	2.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	E	A	D	E	C	E	C	A	E	C	A
Approach Delay		45.6			45.1			23.2			24.2	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	36.1	23.6	0.0	24.9	31.4	28.1	21.9	88.1	5.3	14.8	60.3	0.0
Queue Length 95th (m)	53.5	34.9	10.8	34.1	50.3	51.0	m37.9	156.0	m13.2	24.4	77.3	8.2
Internal Link Dist (m)		465.0			144.0			756.4			120.9	
Turn Bay Length (m)	60.0			60.0		60.0	100.0		60.0	100.0		60.0
Base Capacity (vph)	314	773	417	602	407	377	176	2787	1055	262	2694	1057
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	0.49	0.21	0.20	0.35	0.28	0.57	0.47	0.61	0.13	0.36	0.42	0.12

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 28.4 Intersection LOS: C
Intersection Capacity Utilization 74.9% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Highway 21 & Westpark Boulevard/Southfort Blvd.



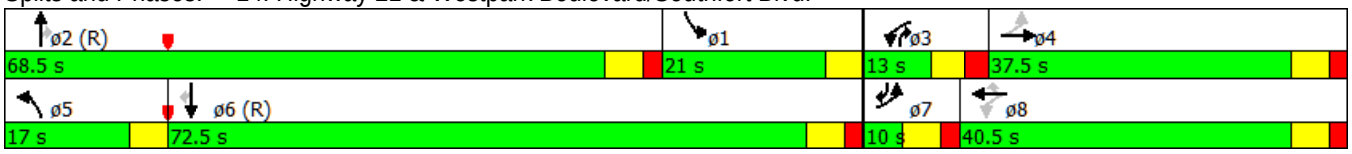
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	126	56	206	299	140	188	1826	253	305	1798	369
Future Volume (vph)	76	126	56	206	299	140	188	1826	253	305	1798	369
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		0.0	60.0		60.0	100.0		60.0	100.0		60.0
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3211	0	3283	1781	1514	1692	4863	1514	3283	4863	1514
Flt Permitted	0.272			0.559			0.950			0.950		
Satd. Flow (perm)	483	3211	0	1922	1781	1486	1691	4863	1485	3280	4863	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		46				148			166			168
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		489.0			168.0			780.4			144.9	
Travel Time (s)		25.5			8.8			40.7			7.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		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)	76	182	0	206	299	140	188	1826	253	305	1798	369
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases	4			8		8			2			6
Detector Phase	7	4		3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	7.0		7.0	10.0	10.0	7.0	20.0	7.0	7.0	7.0	4.0
Minimum Split (s)	10.0	37.5		13.0	37.0	37.0	13.0	33.0	13.0	13.0	33.0	10.0
Total Split (s)	10.0	37.5		13.0	40.5	40.5	17.0	68.5	13.0	21.0	72.5	10.0
Total Split (%)	7.1%	26.8%		9.3%	28.9%	28.9%	12.1%	48.9%	9.3%	15.0%	51.8%	7.1%
Yellow Time (s)	4.0	4.0		3.5	4.0	4.0	4.0	4.0	3.5	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.5	2.0	2.0	0.0	2.0	2.5	0.0	2.0	2.0
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
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	29.1	25.1		35.1	28.1	28.1	19.4	68.9	75.9	17.0	66.5	70.5
Actuated g/C Ratio	0.21	0.18		0.25	0.20	0.20	0.14	0.49	0.54	0.12	0.48	0.50
v/c Ratio	0.57	0.30		0.38	0.84	0.34	0.80	0.76	0.29	0.77	0.78	0.44
Control Delay	57.4	36.9		40.9	73.5	7.7	74.0	24.6	4.7	73.0	33.6	11.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	36.9		40.9	73.5	7.7	74.0	24.6	4.7	73.0	33.6	11.4
LOS	E	D		D	E	A	E	C	A	E	C	B
Approach Delay		43.0			48.8			26.5			35.1	
Approach LOS		D			D			C			D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (m)	16.6	17.7		23.7	83.0	0.0	53.3	164.8	22.1	44.4	154.8	30.7
Queue Length 95th (m)	28.6	28.1		32.5	112.3	15.3	#114.3	193.6	5.4	#63.6	174.7	53.5
Internal Link Dist (m)		465.0			144.0			756.4			120.9	
Turn Bay Length (m)	60.0			60.0		60.0	100.0		60.0	100.0		60.0
Base Capacity (vph)	134	758		549	438	477	234	2393	882	398	2309	832
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	0.57	0.24		0.38	0.68	0.29	0.80	0.76	0.29	0.77	0.78	0.44

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 33.6 Intersection LOS: C
Intersection Capacity Utilization 86.7% 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.

Splits and Phases: 14: Highway 21 & Westpark Boulevard/Southfort Blvd.



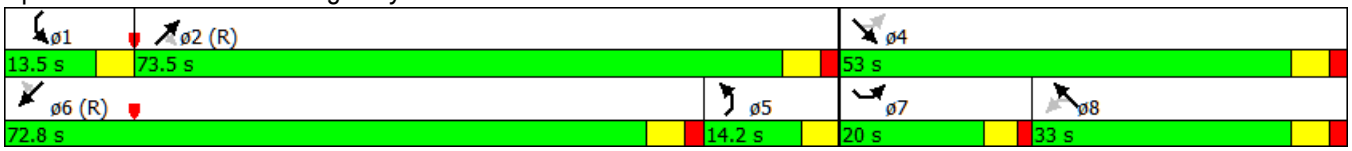
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	182	91	321	58	153	109	119	1863	74	33	910	47
Future Volume (vph)	182	91	321	58	153	109	119	1863	74	33	910	47
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		60.0	60.0		0.0	60.0		60.0	100.0		60.0
Storage Lanes	1		1	1		1	2		1	1		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3385	1514	1692	3385	1514	3283	4863	1514	1692	4863	1514
Flt Permitted	0.481			0.692			0.950			0.950		
Satd. Flow (perm)	849	3385	1494	1233	3385	1514	3273	4863	1514	1692	4863	1486
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			338			187			94			109
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		277.7			132.0			480.8			814.6	
Travel Time (s)		14.5			6.9			25.1			42.5	
Confl. Peds. (#/hr)	5		5				5					5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	192	96	338	61	161	115	125	1961	78	35	958	49
Turn Type	pm+pt	NA	Free	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			6
Detector Phase	7	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0		10.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	9.0	33.0		33.0	33.0		13.5	37.0	37.0	13.5	37.0	37.0
Total Split (s)	20.0	53.0		33.0	33.0		14.2	73.5	73.5	13.5	72.8	72.8
Total Split (%)	14.3%	37.9%		23.6%	23.6%		10.1%	52.5%	52.5%	9.6%	52.0%	52.0%
Yellow Time (s)	3.5	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	2.0		2.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	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		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes			Yes	Yes		Yes				Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	35.6	34.6	140.0	14.9	14.9	140.0	10.2	83.3	83.3	8.3	79.2	79.2
Actuated g/C Ratio	0.25	0.25	1.00	0.11	0.11	1.00	0.07	0.60	0.60	0.06	0.57	0.57
v/c Ratio	0.63	0.11	0.23	0.47	0.45	0.08	0.52	0.68	0.08	0.35	0.35	0.06
Control Delay	52.6	39.4	0.4	75.4	67.4	0.1	59.7	16.8	3.1	71.8	15.2	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	0.0
Total Delay	52.6	39.4	0.4	75.4	67.4	0.1	59.7	16.8	3.1	71.8	15.2	0.1

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
LOS	D	D	A	E	E	A	E	B	A	E	B	A
Approach Delay		22.4			45.9			18.8			16.4	
Approach LOS		C			D			B			B	
Queue Length 50th (m)	47.9	11.5	0.0	17.8	24.7	0.0	16.3	88.2	0.9	10.3	43.9	0.0
Queue Length 95th (m)	62.5	16.8	0.0	31.5	34.8	0.0	28.1	91.7	m3.1	21.9	61.1	0.2
Internal Link Dist (m)		253.7			108.0			456.8			790.6	
Turn Bay Length (m)			60.0	60.0			60.0		60.0	100.0		60.0
Base Capacity (vph)	306	1136	1494	237	652	1514	239	2892	938	114	2749	887
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	0.63	0.08	0.23	0.26	0.25	0.08	0.52	0.68	0.08	0.31	0.35	0.06

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NET and 6:SWT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 20.9 Intersection LOS: C
Intersection Capacity Utilization 80.0% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 32: Highway 21 & 84 Street



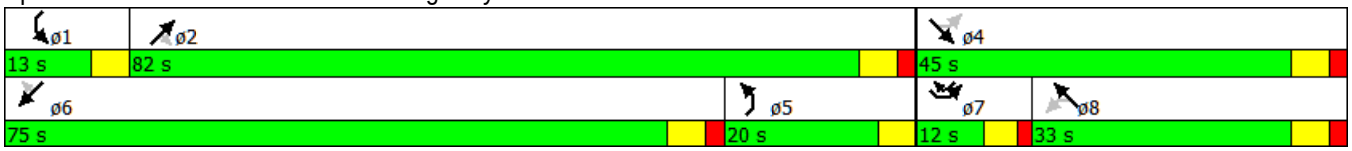
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	137	225	216	65	347	88	329	1544	178	109	2191	259
Future Volume (vph)	137	225	216	65	347	88	329	1544	178	109	2191	259
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		30.0	60.0		0.0	60.0		60.0	100.0		60.0
Storage Lanes	1		1	1		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3385	1514	1692	3385	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.280			0.611			0.950			0.950		
Satd. Flow (perm)	497	3385	1494	1088	3385	1514	3282	4863	1514	3283	4863	1486
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			216			187			152			72
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		251.0			132.0			479.5			214.2	
Travel Time (s)		13.1			6.9			25.0			11.2	
Confl. Peds. (#/hr)	5		5				5					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)	137	225	216	65	347	88	329	1544	178	109	2191	259
Turn Type	pm+pt	NA	Free	Perm	NA	Free	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4		Free	8		Free			2			6
Detector Phase	7	4		8	8		5	2	2	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	10.0		10.0	10.0		7.0	20.0	20.0	7.0	20.0	4.0
Minimum Split (s)	9.0	33.0		33.0	33.0		13.0	37.0	37.0	13.0	37.0	9.0
Total Split (s)	12.0	45.0		33.0	33.0		20.0	82.0	82.0	13.0	75.0	12.0
Total Split (%)	8.6%	32.1%		23.6%	23.6%		14.3%	58.6%	58.6%	9.3%	53.6%	8.6%
Yellow Time (s)	3.5	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.5
All-Red Time (s)	1.5	2.0		2.0	2.0		0.0	2.0	2.0	0.0	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	0.0
Total Lost Time (s)	5.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	5.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes			Yes	Yes		Yes				Yes	Yes
Recall Mode	None	None		None	None		None	Max	Max	None	Max	None
Act Effct Green (s)	32.2	31.2	132.0	19.2	19.2	132.0	15.7	76.3	76.3	8.5	69.1	77.1
Actuated g/C Ratio	0.24	0.24	1.00	0.15	0.15	1.00	0.12	0.58	0.58	0.06	0.52	0.58
v/c Ratio	0.74	0.28	0.14	0.41	0.71	0.06	0.85	0.55	0.19	0.52	0.86	0.29
Control Delay	66.7	41.9	0.2	59.2	61.8	0.1	77.2	18.7	3.8	69.8	32.3	6.1
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	66.7	41.9	0.2	59.2	61.8	0.1	77.2	18.7	3.8	69.8	32.3	6.1
LOS	E	D	A	E	E	A	E	B	A	E	C	A
Approach Delay		32.2			50.6			26.8			31.3	
Approach LOS		C			D			C			C	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Length 50th (m)	30.8	26.4	0.0	16.2	47.7	0.0	45.3	90.1	2.9	14.8	181.5	11.1
Queue Length 95th (m)	#53.4	38.1	0.0	31.4	64.5	0.0	#75.2	120.2	14.8	26.3	232.5	24.6
Internal Link Dist (m)		227.0			108.0			455.5			190.2	
Turn Bay Length (m)	60.0		30.0	60.0			60.0		60.0	100.0		60.0
Base Capacity (vph)	184	1001	1494	222	693	1514	398	2809	938	224	2545	899
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	0.74	0.22	0.14	0.29	0.50	0.06	0.83	0.55	0.19	0.49	0.86	0.29

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 132
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 31.4 Intersection LOS: C
Intersection Capacity Utilization 90.3% 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.

Splits and Phases: 32: 84 Street & Highway 21



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	6	31	93	9	24	46	2032	67	27	866	33
Future Volume (vph)	34	6	31	93	9	24	46	2032	67	27	866	33
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	50.0		0.0	60.0		0.0	60.0		60.0	60.0		0.0
Storage Lanes	1		0	2		0	2		3	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Satd. Flow (prot)	1692	1555	0	3283	1586	0	3283	4863	1514	1692	4863	1514
Flt Permitted	0.735			0.630			0.950			0.058		
Satd. Flow (perm)	1309	1555	0	2177	1586	0	3283	4863	1514	103	4863	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			11				56			94
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		122.7			156.7			814.6			419.8	
Travel Time (s)		6.4			8.2			42.5			21.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	39	0	98	34	0	48	2139	71	28	912	35
Turn Type	Perm	NA		pm+pt	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		1	6			2	
Permitted Phases	4			8					6	2		2
Detector Phase	4	4		3	8		1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		4.0	10.0		7.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	36.0	36.0		9.0	36.0		25.0	32.0	32.0	32.0	32.0	32.0
Total Split (s)	36.0	36.0		9.0	45.0		25.0	95.0	95.0	70.0	70.0	70.0
Total Split (%)	25.7%	25.7%		6.4%	32.1%		17.9%	67.9%	67.9%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.5	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
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	Max		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	31.0	31.0		40.0	40.0		7.8	90.0	90.0	79.6	79.6	79.6
Actuated g/C Ratio	0.22	0.22		0.29	0.29		0.06	0.64	0.64	0.57	0.57	0.57
v/c Ratio	0.12	0.11		0.15	0.07		0.26	0.68	0.07	0.48	0.33	0.04
Control Delay	45.2	17.4		32.9	22.9		54.4	21.8	8.2	52.7	17.0	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	17.4		32.9	22.9		54.4	21.8	8.2	52.7	17.0	0.1
LOS	D	B		C	C		D	C	A	D	B	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		30.7			30.3			22.1			17.4	
Approach LOS		C			C			C			B	
Queue Length 50th (m)	8.4	1.4		9.1	3.8		7.3	123.1	2.9	4.8	50.9	0.0
Queue Length 95th (m)	18.5	11.4		15.1	11.2		m11.0	172.1	m13.0	#22.2	62.6	0.0
Internal Link Dist (m)		98.7			132.7			790.6			395.8	
Turn Bay Length (m)	50.0			60.0			60.0		60.0	60.0		
Base Capacity (vph)	289	370		653	461		469	3126	993	58	2765	901
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	0.12	0.11		0.15	0.07		0.10	0.68	0.07	0.48	0.33	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 58.0%		ICU Level of Service B	
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: 91: Highway 21 & Future Commercial Access

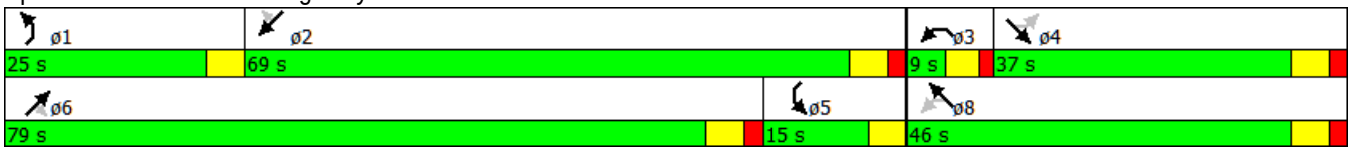
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	145	34	131	186	28	119	146	1380	245	152	2242	99
Future Volume (vph)	145	34	131	186	28	119	146	1380	245	152	2242	99
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	50.0		0.0	60.0		0.0	60.0		60.0	60.0		0.0
Storage Lanes	1		0	2		0	2		1	2		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Satd. Flow (prot)	1692	1569	0	3283	1566	0	3283	4863	1514	3283	4863	1514
Flt Permitted	0.663			0.403			0.950			0.950		
Satd. Flow (perm)	1181	1569	0	1393	1566	0	3152	4863	1514	3283	4863	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		127			119				224			94
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		122.7			156.7			600.4			419.8	
Travel Time (s)		6.4			8.2			31.3			21.9	
Confl. Peds. (#/hr)							1413					
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)	145	165	0	186	147	0	146	1380	245	152	2242	99
Turn Type	Perm	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		1	6		5	2	
Permitted Phases	4			8					6			2
Detector Phase	4	4		3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		4.0	10.0		7.0	20.0	20.0	4.0	20.0	20.0
Minimum Split (s)	37.0	37.0		9.0	37.0		25.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	37.0	37.0		9.0	46.0		25.0	79.0	79.0	15.0	69.0	69.0
Total Split (%)	26.4%	26.4%		6.4%	32.9%		17.9%	56.4%	56.4%	10.7%	49.3%	49.3%
Yellow Time (s)	4.0	4.0		3.5	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		1.5	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	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		5.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lag	Lag		Lead			Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Act Effct Green (s)	21.0	21.0		31.0	30.0		11.1	73.3	73.3	10.2	72.3	72.3
Actuated g/C Ratio	0.16	0.16		0.24	0.23		0.09	0.57	0.57	0.08	0.56	0.56
v/c Ratio	0.76	0.46		0.47	0.32		0.52	0.50	0.26	0.59	0.83	0.11
Control Delay	76.1	17.5		44.2	12.3		64.2	18.7	3.4	68.8	28.2	4.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.1	17.5		44.2	12.3		64.2	18.7	3.4	68.8	28.2	4.1
LOS	E	B		D	B		E	B	A	E	C	A
Approach Delay		44.9			30.1			20.3			29.7	
Approach LOS		D			C			C			C	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Length 50th (m)	37.4	8.8		20.7	5.9		19.5	79.2	2.4	20.4	171.2	0.6
Queue Length 95th (m)	61.4	29.7		30.9	23.2		32.1	108.4	16.5	34.4	241.7	10.5
Internal Link Dist (m)		98.7			132.7			576.4			395.8	
Turn Bay Length (m)	50.0			60.0			60.0		60.0	60.0		
Base Capacity (vph)	283	473		392	567		534	2751	953	279	2715	886
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	0.51	0.35		0.47	0.26		0.27	0.50	0.26	0.54	0.83	0.11

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 129.5
Natural Cycle: 135
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 27.3 Intersection LOS: C
Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 91: Highway 21 & Future Commercial Access



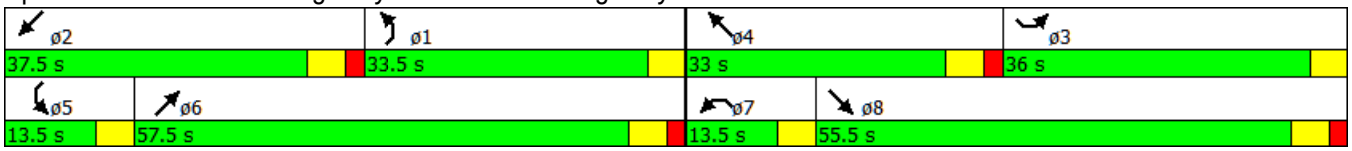
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	740	314	278	98	587	325	688	1317	85	71	553	234
Future Volume (vph)	740	314	278	98	587	325	688	1317	85	71	553	234
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	100.0		60.0	60.0		0.0	100.0		60.0	100.0		60.0
Storage Lanes	1		1	2		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	3385	3563	1514	3385	3563	1514	3385	5344	1514	3385	5344	1514
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3373	3563	1494	3370	3563	1494	3374	5344	1494	3381	5344	1494
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			278			313			226			234
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		154.9			224.0			233.3			229.7	
Travel Time (s)		8.1			11.7			12.2			12.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		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)	740	314	278	98	587	325	688	1317	85	71	553	234
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			Free			Free			Free			Free
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	
Minimum Split (s)	13.5	37.0		13.5	33.0		13.5	37.0		13.5	37.0	
Total Split (s)	36.0	55.5		13.5	33.0		33.5	57.5		13.5	37.5	
Total Split (%)	25.7%	39.6%		9.6%	23.6%		23.9%	41.1%		9.6%	26.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
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	Max		None	None		None	None	
Act Effct Green (s)	31.4	49.8	129.2	8.6	27.0	129.2	30.1	44.9	129.2	8.1	20.6	129.2
Actuated g/C Ratio	0.24	0.39	1.00	0.07	0.21	1.00	0.23	0.35	1.00	0.06	0.16	1.00
v/c Ratio	0.90	0.23	0.19	0.44	0.79	0.22	0.87	0.71	0.06	0.33	0.65	0.16
Control Delay	62.6	27.8	0.3	64.7	57.4	0.3	60.8	39.7	0.1	62.9	55.1	0.2
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	62.6	27.8	0.3	64.7	57.4	0.3	60.8	39.7	0.1	62.9	55.1	0.2

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
LOS	E	C	A	E	E	A	E	D	A	E	E	A
Approach Delay		41.4			39.7			45.1			40.8	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	94.0	27.4	0.0	12.5	73.6	0.0	88.1	103.7	0.0	9.1	46.2	0.0
Queue Length 95th (m)	#136.3	41.4	0.0	22.6	#100.6	0.0	114.0	121.6	0.0	17.6	60.3	0.0
Internal Link Dist (m)		130.9			200.0			209.3			205.7	
Turn Bay Length (m)	100.0		60.0	60.0			100.0		60.0	100.0		60.0
Base Capacity (vph)	839	1376	1494	249	745	1494	799	2134	1494	249	1304	1494
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	0.88	0.23	0.19	0.39	0.79	0.22	0.86	0.62	0.06	0.29	0.42	0.16

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 129.2
Natural Cycle: 135
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 42.4 Intersection LOS: D
Intersection Capacity Utilization 99.1% 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: 8: Highway 21 & 94 Street/Highway 15



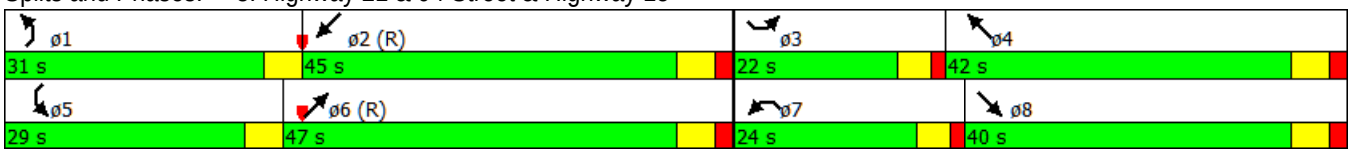
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	335	854	840	347	650	264	581	838	227	421	1340	529
Future Volume (vph)	335	854	840	347	650	264	581	838	227	421	1340	529
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	100.0		60.0	60.0		0.0	100.0		60.0	100.0		60.0
Storage Lanes	1		1	2		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	3385	3563	1514	3385	3563	1514	3385	5344	1514	3385	5344	1514
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3374	3563	1494	3378	3563	1494	3381	5344	1494	3373	5344	1494
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			435			230			180			262
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		154.9			245.8			233.3			229.7	
Travel Time (s)		8.1			12.8			12.2			12.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		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)	335	854	840	347	650	264	581	838	227	421	1340	529
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			Free			Free			Free			Free
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	
Minimum Split (s)	13.0	37.0		13.0	33.0		13.0	37.0		13.0	37.0	
Total Split (s)	22.0	40.0		24.0	42.0		31.0	47.0		29.0	45.0	
Total Split (%)	15.7%	28.6%		17.1%	30.0%		22.1%	33.6%		20.7%	32.1%	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	2.0		1.5	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	Max		None	C-Max		None	C-Max	
Act Effct Green (s)	16.5	35.1	140.0	17.9	36.5	140.0	26.4	44.0	140.0	22.0	39.6	140.0
Actuated g/C Ratio	0.12	0.25	1.00	0.13	0.26	1.00	0.19	0.31	1.00	0.16	0.28	1.00
v/c Ratio	0.84	0.96	0.56	0.81	0.70	0.18	0.91	0.50	0.15	0.79	0.89	0.35
Control Delay	79.0	72.7	1.5	78.4	39.7	0.2	75.3	40.7	0.2	51.5	48.9	0.4
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	79.0	72.7	1.5	78.4	39.7	0.2	75.3	40.7	0.2	51.5	48.9	0.4
LOS	E	E	A	E	D	A	E	D	A	D	D	A
Approach Delay		44.3			42.1			47.3			38.2	
Approach LOS		D			D			D			D	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Length 50th (m)	47.7	123.2	0.0	46.0	94.4	0.0	82.4	65.8	0.0	48.5	135.8	0.0
Queue Length 95th (m)	#69.7	#165.8	0.0	69.1	91.5	m0.0	#112.7	80.7	0.0	67.0	151.0	0.0
Internal Link Dist (m)		130.9			221.8			209.3			205.7	
Turn Bay Length (m)	100.0		60.0	60.0			100.0		60.0	100.0		60.0
Base Capacity (vph)	411	894	1494	459	928	1494	652	1681	1494	604	1512	1494
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	0.82	0.96	0.56	0.76	0.70	0.18	0.89	0.50	0.15	0.70	0.89	0.35

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 86 (61%), Referenced to phase 2:SWT and 6:NET, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 42.7 Intersection LOS: D
Intersection Capacity Utilization 95.8% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Highway 21 & 94 Street & Highway 15



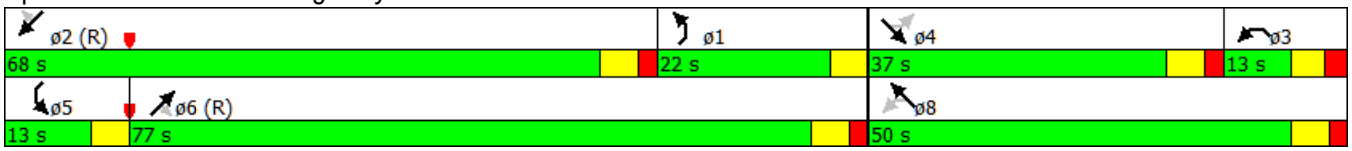
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	46	142	211	149	148	458	262	1870	147	58	498	186
Future Volume (vph)	46	142	211	149	148	458	262	1870	147	58	498	186
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		30.0	100.0		60.0	100.0		60.0
Storage Lanes	1		1	2		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3385	1514	3283	3385	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.653			0.658			0.950			0.950		
Satd. Flow (perm)	1157	3385	1494	2262	3385	1494	3263	4863	1485	3281	4863	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			222			375			101			196
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		158.4			159.5			120.6			241.3	
Travel Time (s)		8.3			8.3			6.3			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	149	222	157	156	482	276	1968	155	61	524	196
Turn Type	Perm	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		1	6		5	2	
Permitted Phases	4	4	Free	8		Free			6			2
Detector Phase	4	4		3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	37.0	37.0		13.0	37.0		13.0	33.0	33.0	13.0	33.0	33.0
Total Split (s)	37.0	37.0		13.0	50.0		22.0	77.0	77.0	13.0	68.0	68.0
Total Split (%)	26.4%	26.4%		9.3%	35.7%		15.7%	55.0%	55.0%	9.3%	48.6%	48.6%
Yellow Time (s)	4.0	4.0		3.5	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.5	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	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	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lead		Lag			Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		Max	C-Max	C-Max	Min	C-Max	C-Max
Act Effct Green (s)	12.3	12.3	140.0	25.3	25.3	140.0	18.0	90.5	90.5	8.2	80.7	80.7
Actuated g/C Ratio	0.09	0.09	1.00	0.18	0.18	1.00	0.13	0.65	0.65	0.06	0.58	0.58
v/c Ratio	0.48	0.50	0.15	0.34	0.25	0.32	0.65	0.63	0.16	0.32	0.19	0.21
Control Delay	75.4	66.4	0.2	50.6	48.1	0.6	66.1	16.3	4.4	67.2	14.6	2.5
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	75.4	66.4	0.2	50.6	48.1	0.6	66.1	16.3	4.4	67.2	14.6	2.5

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
LOS	E	E	A	D	D	A	E	B	A	E	B	A
Approach Delay		32.4			19.8			21.2			15.6	
Approach LOS		C			B			C			B	
Queue Length 50th (m)	13.5	22.0	0.0	20.6	20.8	0.0	39.5	113.0	5.3	8.8	24.7	0.0
Queue Length 95th (m)	26.7	32.8	0.0	28.8	28.9	0.0	55.3	148.2	15.8	16.3	34.3	11.6
Internal Link Dist (m)		134.4			135.5			96.6			217.3	
Turn Bay Length (m)	60.0		60.0	60.0		30.0	100.0		60.0	100.0		60.0
Base Capacity (vph)	256	749	1494	459	1063	1494	422	3142	995	216	2802	938
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	0.19	0.20	0.15	0.34	0.15	0.32	0.65	0.63	0.16	0.28	0.19	0.21

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:SWT and 6:NET, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 21.0 Intersection LOS: C
Intersection Capacity Utilization 80.6% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Highway 15 & 101 Street



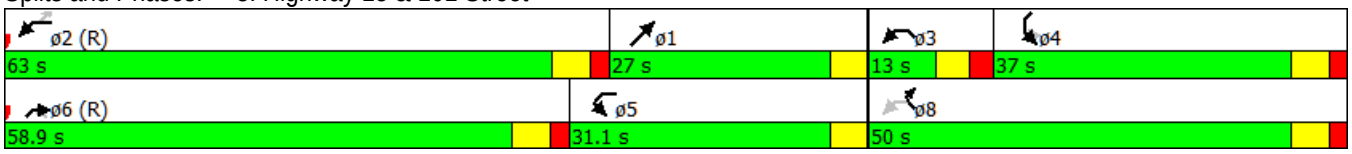
Lane Group	WBL2	WBL	WBR	NWL	NWR	NWR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	443	1686	128	191	288	155	413	664	91	34	360	414
Future Volume (vph)	443	1686	128	191	288	155	413	664	91	34	360	414
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)		100.0	60.0	60.0	30.0			60.0			60.0	
Storage Lanes		5	0	2	2			4			2	
Taper Length (m)		29.9		29.9							29.9	
Satd. Flow (prot)	3283	4773	1514	3283	2665	1514	3385	3453	1514	1692	3283	1781
Flt Permitted	0.950	0.950		0.950						0.510	0.950	
Satd. Flow (perm)	3266	4748	1485	3261	2665	1494	3385	3453	1485	905	3262	1781
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)			102			148			101			
Link Speed (k/h)		69		69			69					69
Link Distance (m)		241.3		159.3			120.6					172.8
Travel Time (s)		12.6		8.3			6.3					9.0
Confl. Peds. (#/hr)	5	5	5	5	5	5		5	5	5	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)	443	1686	128	191	288	155	413	664	91	34	360	414
Turn Type	Prot	Prot	Perm	pm+pt	Prot	Free	NA	custom	custom	custom	custom	NA
Protected Phases	5	2		3	8!		1	6			4!	
Permitted Phases			2	8!		Free			6	4!	4!	Free
Detector Phase	5	2	2	3	8		1	6	6	4	4	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	10.0		7.0	20.0	20.0	10.0	10.0	
Minimum Split (s)	13.5	33.0	33.0	13.0	37.0		13.5	33.0	33.0	37.0	37.0	
Total Split (s)	31.1	63.0	63.0	13.0	50.0		27.0	58.9	58.9	37.0	37.0	
Total Split (%)	22.2%	45.0%	45.0%	9.3%	35.7%		19.3%	42.1%	42.1%	26.4%	26.4%	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	2.0	2.0	2.5	2.0		0.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0		4.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lead	Lead	Lead			Lag	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes				Yes	Yes	Yes			
Recall Mode	Max	C-Max	C-Max	None	None		Max	C-Max	C-Max	None	None	
Act Effct Green (s)	27.1	67.4	67.4	33.6	33.6	140.0	23.0	63.3	63.3	20.6	20.6	140.0
Actuated g/C Ratio	0.19	0.48	0.48	0.24	0.24	1.00	0.16	0.45	0.45	0.15	0.15	1.00
v/c Ratio	0.70	0.73	0.17	0.24	0.45	0.10	0.74	0.43	0.13	0.26	0.75	0.23
Control Delay	59.3	32.1	6.7	45.4	49.5	0.1	62.2	13.4	0.5	56.3	66.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	32.1	6.7	45.4	49.5	0.1	62.2	13.4	0.5	56.3	66.7	0.3
LOS	E	C	A	D	D	A	E	B	A	E	E	A
Approach Delay		36.0		36.2			29.7					32.3
Approach LOS		D		D			C					C

Lane Group	WBL2	WBL	WBR	NWL	NWR	NWR2	NET	NER	NER2	SWL2	SWL	SWT
Queue Length 50th (m)	61.9	135.2	3.9	24.4	41.3	0.0	64.5	19.5	0.1	8.8	51.9	0.0
Queue Length 95th (m)	81.1	165.3	16.5	34.5	54.8	0.0	m81.8	52.2	m0.0	19.4	66.4	0.0
Internal Link Dist (m)		217.3		135.3			96.6					148.8
Turn Bay Length (m)	100.0	100.0	60.0	60.0	30.0	30.0		60.0	60.0	60.0	60.0	
Base Capacity (vph)	635	2297	767	783	837	1494	556	1560	726	200	726	1781
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	0.70	0.73	0.17	0.24	0.34	0.10	0.74	0.43	0.13	0.17	0.50	0.23

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:WBL and 6:NER, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 33.9 Intersection LOS: C
Intersection Capacity Utilization 79.4% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 3: Highway 15 & 101 Street

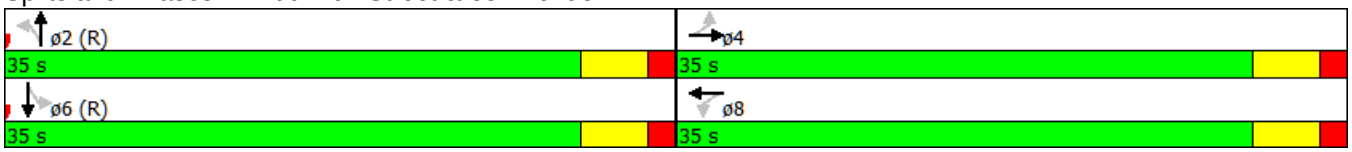


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	30	10	30	30	60	63	488	30	57	137	153
Future Volume (vph)	205	30	10	30	30	60	63	488	30	57	137	153
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	29.9		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1714	0	1692	1605	0	0	3341	0	1692	3117	0
Flt Permitted	0.695			0.729				0.882		0.410		
Satd. Flow (perm)	1238	1714	0	1299	1605	0	0	2962	0	730	3117	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			63			10			161	
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		105.5			92.3			240.1			159.5	
Travel Time (s)		5.5			4.8			12.5			8.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	216	43	0	32	95	0	0	612	0	60	305	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Total Split (%)	50.0%	50.0%		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		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	17.7	17.7		17.7	17.7			42.3		42.3	42.3	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.60		0.60	0.60	
v/c Ratio	0.69	0.10		0.10	0.21			0.34		0.14	0.16	
Control Delay	34.5	14.2		17.9	9.0			4.4		5.5	2.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	34.5	14.2		17.9	9.0			4.4		5.5	2.1	
LOS	C	B		B	A			A		A	A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		31.1			11.2			4.4			2.6	
Approach LOS		C			B			A			A	
Queue Length 50th (m)	26.6	3.3		3.3	3.3			7.7		4.0	0.0	
Queue Length 95th (m)	41.5	8.7		8.1	11.6			24.0		7.6	0.4	
Internal Link Dist (m)		81.5			68.3			216.1			135.5	
Turn Bay Length (m)										29.9		
Base Capacity (vph)	530	740		556	723			1795		441	1949	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.41	0.06		0.06	0.13			0.34		0.14	0.16	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 9.7		Intersection LOS: A	
Intersection Capacity Utilization 56.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 100: 101 Street & 88 Avenue

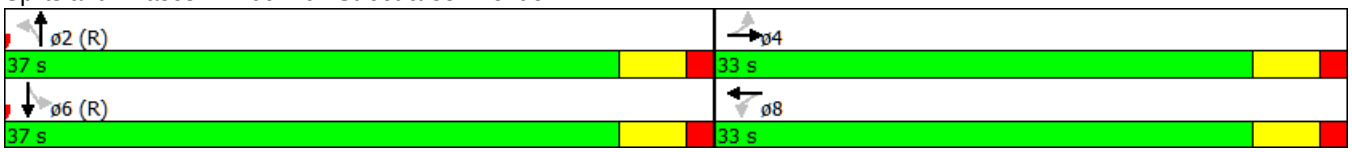


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	10	10	10	20	150	51	252	67	150	487	257
Future Volume (vph)	231	10	10	10	20	150	51	252	67	150	487	257
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	29.9		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1648	0	1692	1546	0	0	3270	0	1692	3209	0
Flt Permitted	0.640			0.744				0.807		0.532		
Satd. Flow (perm)	1140	1648	0	1325	1546	0	0	2658	0	948	3209	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			150			50			180	
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		105.5			92.3			238.2			159.3	
Travel Time (s)		5.5			4.8			12.4			8.3	
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)	231	20	0	10	170	0	0	370	0	150	744	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	33.0	33.0		33.0	33.0		37.0	37.0		37.0	37.0	
Total Split (%)	47.1%	47.1%		47.1%	47.1%		52.9%	52.9%		52.9%	52.9%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	19.2	19.2		19.2	19.2			40.8		40.8	40.8	
Actuated g/C Ratio	0.27	0.27		0.27	0.27			0.58		0.58	0.58	
v/c Ratio	0.74	0.04		0.03	0.32			0.24		0.27	0.38	
Control Delay	36.6	11.0		15.1	5.8			10.5		9.3	7.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	36.6	11.0		15.1	5.8			10.5		9.3	7.8	
LOS	D	B		B	A			B		A	A	
Approach Delay		34.5			6.3			10.5			8.0	
Approach LOS		C			A			B			A	
Queue Length 50th (m)	28.4	1.0		1.0	2.0			19.5		19.0	45.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	44.1	4.7		3.5	12.6			28.9		m28.8	54.0	
Internal Link Dist (m)		81.5			68.3			214.2			135.3	
Turn Bay Length (m)										29.9		
Base Capacity (vph)	456	665		530	708			1569		552	1944	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.51	0.03		0.02	0.24			0.24		0.27	0.38	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 73.5%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 100: 101 Street & 88 Avenue



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	64	88	15	111	53	400	256	15	27	173	70
Future Volume (vph)	25	64	88	15	111	53	400	256	15	27	173	70
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		0.0	60.0		60.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	2		0	1		0	0		0
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1781	1514	1692	3219	0	1692	1767	0	0	3237	0
Flt Permitted	0.643			0.713			0.578				0.910	
Satd. Flow (perm)	1145	1781	1514	1270	3219	0	1030	1767	0	0	2960	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			93		56			8			74	
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		240.1			574.3			216.2			250.8	
Travel Time (s)		12.5			30.0			11.3			13.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	67	93	16	173	0	421	285	0	0	284	0
Turn Type	custom	NA	custom	Perm	NA		Perm	NA		Perm	NA	
Protected Phases					2			4			8	
Permitted Phases	6	6	6	2			4			8		
Detector Phase	6	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0	23.0	23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	23.0	23.0	23.0	23.0	23.0		47.0	47.0		23.0	23.0	
Total Split (%)	32.9%	32.9%	32.9%	32.9%	32.9%		67.1%	67.1%		32.9%	32.9%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	25.1	25.1	25.1	25.1	25.1		34.9	34.9			34.9	
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36		0.50	0.50			0.50	
v/c Ratio	0.06	0.11	0.15	0.04	0.15		0.82	0.32			0.19	
Control Delay	17.7	16.8	5.2	19.3	13.1		27.8	10.0			6.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	17.7	16.8	5.2	19.3	13.1		27.8	10.0			6.2	
LOS	B	B	A	B	B		C	A			A	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach Delay		11.1			13.6			20.6			6.2	
Approach LOS		B			B			C			A	
Queue Length 50th (m)	2.9	7.4	0.0	1.5	5.7		41.9	19.4			7.0	
Queue Length 95th (m)	7.6	14.7	0.0	6.0	13.6		68.7	27.3			10.4	
Internal Link Dist (m)		216.1			550.3			192.2			226.8	
Turn Bay Length (m)	60.0			60.0								
Base Capacity (vph)	410	638	602	454	1189		618	1063			1805	
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	0.06	0.11	0.15	0.04	0.15		0.68	0.27			0.16	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 23.1 (33%), Referenced to phase 2:NWTL and 6:SETL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: 86 Avenue & 101 Street

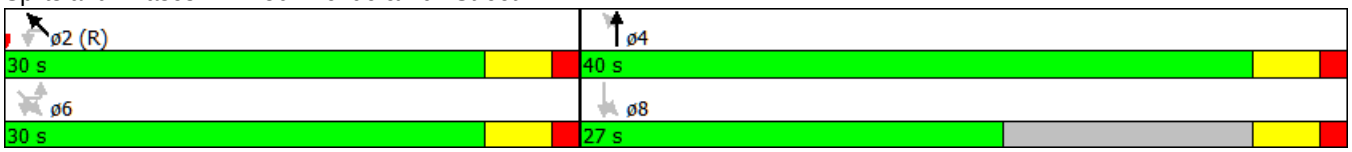
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	204	167	60	44	350	59	250	160	97	45	107	15
Future Volume (vph)	204	167	60	44	350	59	250	160	97	45	107	15
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		0.0	0.0		0.0	60.0		0.0	60.0		60.0
Storage Lanes	1		0	0		0	1		1	2		0
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1710	0	0	3301	0	1692	1781	1514	1692	3312	0
Flt Permitted	0.440				0.903		0.675			0.656		
Satd. Flow (perm)	784	1710	0	0	2995	0	1202	1781	1514	1163	3312	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			34				97		15	
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		144.8			213.3			238.2			228.7	
Travel Time (s)		7.6			11.1			12.4			11.9	
Confl. Peds. (#/hr)										5		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)	204	227	0	0	453	0	250	160	97	45	122	0
Turn Type	Perm	NA		custom	NA		custom	NA	custom	Perm	NA	
Protected Phases		4									2	
Permitted Phases	4			8	8		6	6	6	2		
Detector Phase	4	4		8	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	
Total Split (s)	40.0	40.0		27.0	27.0		30.0	30.0	30.0	30.0	30.0	
Total Split (%)	57.1%	57.1%		38.6%	38.6%		42.9%	42.9%	42.9%	42.9%	42.9%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None	None	C-Max	C-Max	
Act Effct Green (s)	22.3	22.3			22.3		37.7	37.7	37.7	37.7	37.7	
Actuated g/C Ratio	0.32	0.32			0.32		0.54	0.54	0.54	0.54	0.54	
v/c Ratio	0.82	0.40			0.46		0.39	0.17	0.11	0.07	0.07	
Control Delay	45.2	15.6			17.8		8.2	6.9	2.2	11.6	9.4	
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	45.2	15.6			17.8		8.2	6.9	2.2	11.6	9.4	
LOS	D	B			B		A	A	A	B	A	
Approach Delay		29.6			17.8			6.6			10.0	
Approach LOS		C			B			A			A	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Queue Length 50th (m)	25.0	19.4			23.3		8.6	5.4	0.3	2.8	3.4	
Queue Length 95th (m)	40.0	27.9			27.1		24.4	16.5	3.0	10.0	9.6	
Internal Link Dist (m)		120.8			189.3			214.2			204.7	
Turn Bay Length (m)							60.0			60.0		
Base Capacity (vph)	392	873			1514		646	958	859	625	1789	
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	0.52	0.26			0.30		0.39	0.17	0.11	0.07	0.07	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NWTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 16.6 Intersection LOS: B
Intersection Capacity Utilization 71.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: 86 Avenue & 101 Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	2	21	11	2	40	70	930	28	25	377	68
Future Volume (vph)	40	2	21	11	2	40	70	930	28	25	377	68
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		0.0	0.0		0.0	60.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1536	0	1692	1527	0	1692	3371	0	1692	3307	0
Flt Permitted	0.728			0.742			0.483			0.272		
Satd. Flow (perm)	1297	1536	0	1322	1527	0	860	3371	0	485	3307	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			42			7			49	
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		116.5			104.9			173.6			224.0	
Travel Time (s)		6.1			5.5			9.1			11.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	24	0	12	44	0	74	1008	0	26	469	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6	6	
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		30.0	30.0		30.0	30.0	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	11.6	11.6		11.6	11.6		56.4	56.4		56.4	56.4	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.81	0.81		0.81	0.81	
v/c Ratio	0.20	0.09		0.06	0.15		0.11	0.37		0.07	0.18	
Control Delay	26.2	11.3		23.3	9.7		7.6	9.2		5.0	3.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.2	11.3		23.3	9.7		7.6	9.2		5.0	3.3	
LOS	C	B		C	A		A	A		A	A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		20.8			12.6			9.0			3.4	
Approach LOS		C			B			A			A	
Queue Length 50th (m)	5.2	0.3		1.4	0.3		7.8	82.3		0.9	7.7	
Queue Length 95th (m)	11.7	5.5		5.0	7.2		19.6	103.9		4.4	18.7	
Internal Link Dist (m)		92.5			80.9			149.6			200.0	
Turn Bay Length (m)							60.0					
Base Capacity (vph)	370	454		377	466		693	2717		391	2674	
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	0.11	0.05		0.03	0.09		0.11	0.37		0.07	0.18	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 8.0		Intersection LOS: A	
Intersection Capacity Utilization 61.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 45: 94 Street & 87 Avenue

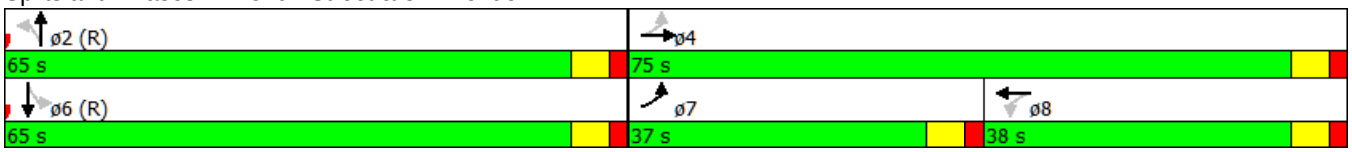
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	10	24	154	30	261	35	681	67	183	954	365
Future Volume (vph)	319	10	24	154	30	261	35	681	67	183	954	365
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		0.0	0.0		0.0	60.0		0.0	60.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1593	0	1692	1541	0	1692	3341	0	1692	3243	0
Flt Permitted	0.144			0.735			0.100			0.299		
Satd. Flow (perm)	257	1593	0	1309	1541	0	178	3341	0	533	3243	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			161			9			49	
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		104.5			113.7			140.0			245.8	
Travel Time (s)		5.5			5.9			7.3			12.8	
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)	319	34	0	154	291	0	35	748	0	183	1319	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	13.0	24.0		24.0	24.0		31.0	31.0		31.0	31.0	
Total Split (s)	37.0	75.0		38.0	38.0		65.0	65.0		65.0	65.0	
Total Split (%)	26.4%	53.6%		27.1%	27.1%		46.4%	46.4%		46.4%	46.4%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	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	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	56.7	56.7		21.7	21.7		71.3	71.3		71.3	71.3	
Actuated g/C Ratio	0.40	0.40		0.16	0.16		0.51	0.51		0.51	0.51	
v/c Ratio	0.80	0.05		0.76	0.78		0.39	0.44		0.68	0.79	
Control Delay	50.9	10.2		78.6	38.7		47.3	28.1		35.9	29.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.5		0.0	0.0	
Total Delay	50.9	10.2		78.6	38.7		47.3	28.5		35.9	29.2	
LOS	D	B		E	D		D	C		D	C	
Approach Delay		47.0			52.5			29.4			30.0	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	69.6	1.7		43.0	36.8		5.6	62.8		23.2	87.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	99.5	7.7		64.2	67.0		m19.9	123.8		m31.6	m105.8	
Internal Link Dist (m)		80.5			89.7			116.0			221.8	
Turn Bay Length (m)							60.0			60.0		
Base Capacity (vph)	421	797		299	476		90	1705		271	1675	
Starvation Cap Reductn	0	0		0	0		0	488		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	0.76	0.04		0.52	0.61		0.39	0.61		0.68	0.79	

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
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 35.0 Intersection LOS: D
Intersection Capacity Utilization 107.9% ICU Level of Service G
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 45: 94 Street & 87 Avenue

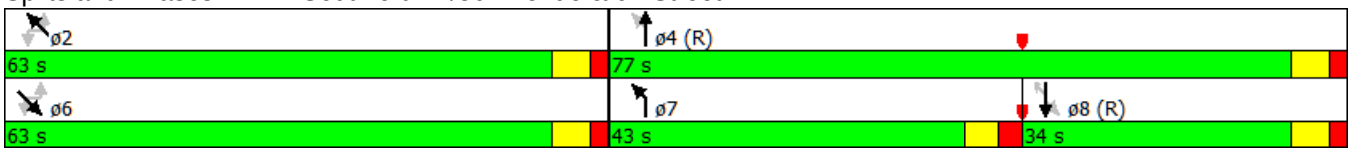


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	354	507	62	18	168	59	101	153	155	54	615	95
Future Volume (vph)	354	507	62	18	168	59	101	153	155	54	615	95
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		0	1		1	1		2
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3331	0	1692	3385	1514	1692	3385	1514	1692	3385	1514
Flt Permitted	0.525			0.426			0.311			0.650		
Satd. Flow (perm)	935	3331	0	759	3385	1514	554	3385	1514	1158	3385	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14				70			163			100
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		148.9			124.9			173.6			108.0	
Travel Time (s)		7.8			6.5			9.1			5.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	373	599	0	19	177	62	106	161	163	57	647	100
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		8	8	8	6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	30.0		30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (s)	43.0	77.0		34.0	34.0	34.0	63.0	63.0	63.0	63.0	63.0	63.0
Total Split (%)	30.7%	55.0%		24.3%	24.3%	24.3%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
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
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	Max	C-Max		C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	71.0	71.0		28.0	28.0	28.0	57.0	57.0	57.0	57.0	57.0	57.0
Actuated g/C Ratio	0.51	0.51		0.20	0.20	0.20	0.41	0.41	0.41	0.41	0.41	0.41
v/c Ratio	0.55	0.35		0.13	0.26	0.17	0.47	0.12	0.23	0.12	0.47	0.15
Control Delay	24.6	20.1		48.6	48.5	9.4	37.1	24.6	4.8	26.9	31.8	5.2
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	24.6	20.1		48.6	48.5	9.4	37.1	24.6	4.8	26.9	31.8	5.2
LOS	C	C		D	D	A	D	C	A	C	C	A

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Approach Delay		21.8			39.1			20.2			28.2	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	62.4	50.0		4.5	22.8	0.0	21.9	15.0	0.0	10.1	71.1	0.0
Queue Length 95th (m)	87.3	63.7		12.5	34.3	10.8	38.4	22.7	16.3	20.1	89.0	11.5
Internal Link Dist (m)		124.9			100.9			149.6			84.0	
Turn Bay Length (m)	60.0			60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	674	1696		151	677	358	225	1378	713	471	1378	675
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	0.55	0.35		0.13	0.26	0.17	0.47	0.12	0.23	0.12	0.47	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 25.4		Intersection LOS: C	
Intersection Capacity Utilization 82.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 71: Southfort Dr./86 Avenue & 94 Street



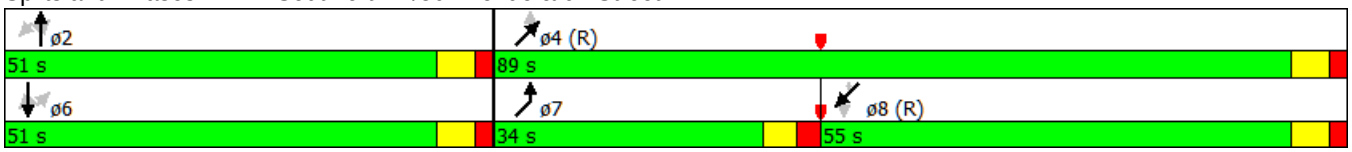
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	279	41	194	547	390	287	322	63	119	931	217
Future Volume (vph)	70	279	41	194	547	390	287	322	63	119	931	217
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3385	1514	1692	3385	1514	1692	3300	0	1692	3385	1514
Flt Permitted	0.327			0.549			0.154			0.524		
Satd. Flow (perm)	583	3385	1514	978	3385	1514	274	3300	0	933	3385	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			70			390		28				193
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		118.0			140.0			148.9			124.9	
Travel Time (s)		6.2			7.3			7.8			6.5	
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)	70	279	41	194	547	390	287	385	0	119	931	217
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		8
Detector Phase	2	2	2	6	6	6	7	4		8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	7.0	20.0		20.0	20.0	20.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	13.0	30.0		30.0	30.0	30.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	34.0	89.0		55.0	55.0	55.0
Total Split (%)	36.4%	36.4%	36.4%	36.4%	36.4%	36.4%	24.3%	63.6%		39.3%	39.3%	39.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.0		2.0	2.0	2.0
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
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max	Max	None	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)	45.0	45.0	45.0	45.0	45.0	45.0	83.0	83.0		56.5	56.5	56.5
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.59	0.59		0.40	0.40	0.40
v/c Ratio	0.37	0.26	0.08	0.62	0.50	0.52	0.78	0.20		0.32	0.68	0.30
Control Delay	43.9	35.9	2.3	42.3	35.7	5.9	37.0	10.1		33.4	38.5	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.6	1.2	0.0	0.0		0.0	0.0	0.0
Total Delay	43.9	36.0	2.3	42.3	36.3	7.1	37.0	10.1		33.4	38.5	6.9
LOS	D	D	A	D	D	A	D	B		C	D	A
Approach Delay		33.8			27.3			21.6			32.6	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	15.5	31.2	0.0	44.5	58.3	19.8	49.7	17.5		23.3	115.4	4.2

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Queue Length 95th (m)	31.4	43.4	3.0	m46.4	52.8	m26.3	81.0	24.6		44.2	153.0	23.3
Internal Link Dist (m)		94.0			116.0			124.9			100.9	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0			60.0		60.0
Base Capacity (vph)	187	1088	534	314	1088	751	446	1967		376	1366	726
Starvation Cap Reductn	0	0	0	0	240	174	0	0		0	0	0
Spillback Cap Reductn	0	97	0	0	0	0	0	0		0	0	5
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.37	0.28	0.08	0.62	0.65	0.68	0.64	0.20		0.32	0.68	0.30

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 85 (61%), Referenced to phase 4:NETL and 8:SWTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 28.9 Intersection LOS: C
Intersection Capacity Utilization 86.6% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 71: Southfort Dr./86 Avenue & 94 Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1	12	6	1	49	1	636	19	88	129	17
Future Volume (Veh/h)	78	1	12	6	1	49	1	636	19	88	129	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	82	1	13	6	1	52	1	669	20	93	136	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											235	
pX, platoon unblocked	0.99	0.99	0.99	0.99	0.99		0.99					
vC, conflicting volume	1046	1013	136	1006	1011	669	154			689		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1039	1006	117	1000	1004	669	135			689		
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 %	50	100	99	97	100	89	100			90		
cM capacity (veh/h)	165	210	914	195	211	452	1411			891		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	96	59	1	669	20	93	136	18
Volume Left	82	6	1	0	0	93	0	0
Volume Right	13	52	0	0	20	0	0	18
cSH	186	392	1411	1700	1700	891	1700	1700
Volume to Capacity	0.52	0.15	0.00	0.39	0.01	0.10	0.08	0.01
Queue Length 95th (m)	20.6	4.1	0.0	0.0	0.0	2.8	0.0	0.0
Control Delay (s)	43.4	15.8	7.6	0.0	0.0	9.5	0.0	0.0
Lane LOS	E	C	A			A		
Approach Delay (s)	43.4	15.8	0.0			3.6		
Approach LOS	E	C						

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	0	2	7	0	48	2	297	2	88	558	83
Future Volume (Veh/h)	45	0	2	7	0	48	2	297	2	88	558	83
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)	45	0	2	7	0	48	2	297	2	88	558	83
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											237	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1083	1037	558	1037	1118	297	641			299		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1005	950	382	950	1046	297	480			299		
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 %	72	100	100	96	100	93	100			93		
cM capacity (veh/h)	162	201	555	188	176	735	899			1245		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	55	2	297	2	88	558	83
Volume Left	45	7	2	0	0	88	0	0
Volume Right	2	48	0	0	2	0	0	83
cSH	167	536	899	1700	1700	1245	1700	1700
Volume to Capacity	0.28	0.10	0.00	0.17	0.00	0.07	0.33	0.05
Queue Length 95th (m)	8.7	2.7	0.1	0.0	0.0	1.8	0.0	0.0
Control Delay (s)	34.9	12.5	9.0	0.0	0.0	8.1	0.0	0.0
Lane LOS	D	B	A			A		
Approach Delay (s)	34.9	12.5	0.1			1.0		
Approach LOS	D	B						

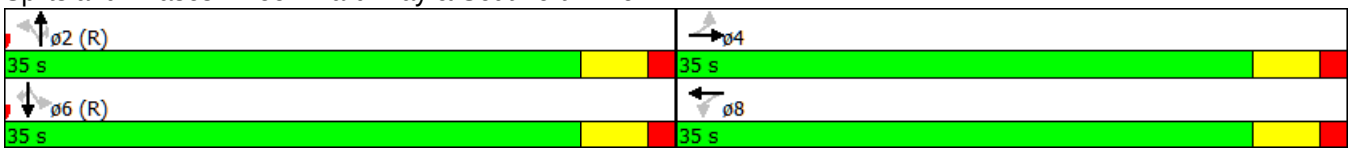
Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	52.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	5	22	54	1	323	110	527	25	77	288	21
Future Volume (vph)	68	5	22	54	1	323	110	527	25	77	288	21
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	20.0		0.0	20.0		0.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1562	0	1692	1514	0	1692	3385	1514	1692	3385	1514
Flt Permitted	0.301			0.739			0.567			0.444		
Satd. Flow (perm)	536	1562	0	1317	1514	0	1010	3385	1514	791	3385	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			200				31			31
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		110.5			188.6			221.4			222.3	
Travel Time (s)		5.8			9.8			11.6			11.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	28	0	57	341	0	116	555	26	81	303	22
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Total Split (s)	35.0	35.0		35.0	35.0		35.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	50.0%	50.0%		50.0%	50.0%		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	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.5	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
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.3	13.3		13.3	13.3		46.7	46.7	46.7	46.7	46.7	46.7
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.67	0.67	0.67	0.67	0.67	0.67
v/c Ratio	0.71	0.09		0.23	0.76		0.17	0.25	0.03	0.15	0.13	0.02
Control Delay	59.7	10.1		23.3	21.7		7.9	7.0	3.7	5.3	4.1	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	10.1		23.3	21.7		7.9	7.0	3.7	5.3	4.1	0.9
LOS	E	B		C	C		A	A	A	A	A	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		45.8			21.9			7.0			4.2	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	9.3	0.6		6.7	17.4		5.6	14.7	0.2	2.9	5.5	0.0
Queue Length 95th (m)	20.0	5.5		13.4	37.7		13.7	26.3	2.5	13.1	18.6	1.4
Internal Link Dist (m)		86.5			164.6			197.4			198.3	
Turn Bay Length (m)	20.0			20.0			60.0		60.0	60.0		60.0
Base Capacity (vph)	229	682		564	763		674	2259	1020	528	2259	1020
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	0.31	0.04		0.10	0.45		0.17	0.25	0.03	0.15	0.13	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 60.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 55: Allard Way & Southfort Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	20	94	75	5	136	130	439	164	310	1061	9
Future Volume (vph)	95	20	94	75	5	136	130	439	164	310	1061	9
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	20.0		0.0	20.0		0.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1561	0	1692	1523	0	1692	3385	1514	1692	3385	1514
Flt Permitted	0.658			0.684			0.249			0.497		
Satd. Flow (perm)	1172	1561	0	1219	1523	0	444	3385	1514	885	3385	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		94			136				164			31
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		110.5			188.6			221.4			222.3	
Travel Time (s)		5.8			9.8			11.6			11.6	
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)	95	114	0	75	141	0	130	439	164	310	1061	9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Total Split (s)	23.0	23.0		23.0	23.0		47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	32.9%	32.9%		32.9%	32.9%		67.1%	67.1%	67.1%	67.1%	67.1%	67.1%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.5	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
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	10.9	10.9		10.8	10.8		52.3	52.3	52.3	52.3	52.3	52.3
Actuated g/C Ratio	0.16	0.16		0.15	0.15		0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	0.52	0.35		0.40	0.40		0.39	0.17	0.14	0.47	0.42	0.01
Control Delay	36.4	11.2		31.5	9.0		12.4	6.0	3.4	6.9	3.1	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	11.2		31.5	9.0		12.4	6.0	3.4	6.9	3.1	0.0
LOS	D	B		C	A		B	A	A	A	A	A
Approach Delay		22.7			16.8			6.6			3.9	
Approach LOS		C			B			A			A	
Queue Length 50th (m)	12.1	2.4		9.3	0.6		8.1	12.7	0.0	10.3	17.5	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	23.7	13.9		19.3	13.4		22.9	20.3	9.8	26.4	17.5	m0.0
Internal Link Dist (m)		86.5			164.6			197.4			198.3	
Turn Bay Length (m)	20.0			20.0			60.0		60.0	60.0		60.0
Base Capacity (vph)	301	471		313	492		331	2527	1171	660	2527	1138
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	0.32	0.24		0.24	0.29		0.39	0.17	0.14	0.47	0.42	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 38 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 7.3		Intersection LOS: A	
Intersection Capacity Utilization 68.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

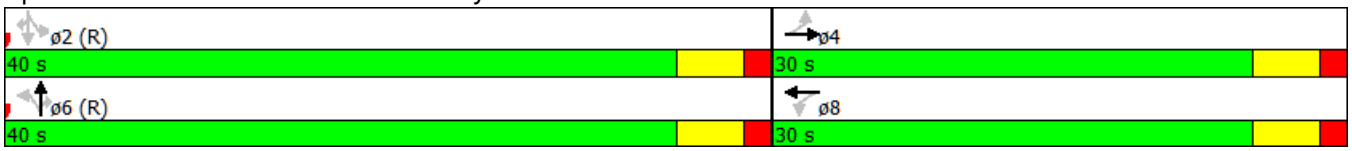
Splits and Phases: 55: Allard Way & Southfort Drive

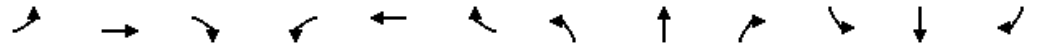
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	8	22	33	9	107	25	533	7	24	267	51
Future Volume (vph)	29	8	22	33	9	107	25	533	7	24	267	51
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	60.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1584	0	1692	1534	0	1692	3385	1514	1692	3385	1514
Flt Permitted	0.679			0.737			0.579			0.442		
Satd. Flow (perm)	1210	1584	0	1313	1534	0	1031	3385	1514	787	3385	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			113				31			54
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		138.6			93.4			198.8			262.5	
Travel Time (s)		7.2			4.9			10.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	31	0	35	122	0	26	561	7	25	281	54
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	custom	NA	custom
Protected Phases		4			8			6				
Permitted Phases	4	4		8			6		6	2	2	2
Detector Phase	4	4		8	8		6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Total Split (s)	30.0	30.0		30.0	30.0		40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%	57.1%	57.1%	57.1%	57.1%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.5	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
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.6	7.6		7.6	7.6		55.5	55.5	55.5	55.5	55.5	55.5
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.79	0.79	0.79	0.79	0.79	0.79
v/c Ratio	0.24	0.16		0.25	0.46		0.03	0.21	0.01	0.04	0.10	0.04
Control Delay	38.0	20.1		31.9	13.3		1.8	1.7	0.0	2.9	2.6	1.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	20.1		31.9	13.3		1.8	1.7	0.0	2.9	2.6	1.5
LOS	D	C		C	B		A	A	A	A	A	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		29.1			17.4			1.7			2.5	
Approach LOS		C			B			A			A	
Queue Length 50th (m)	4.2	0.9		4.5	1.1		0.7	8.2	0.0	0.9	8.3	0.4
Queue Length 95th (m)	m10.1	m7.1		12.0	14.4		m1.4	9.7	m0.0	4.3	17.6	4.7
Internal Link Dist (m)		114.6			69.4			174.8			238.5	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	60.0		60.0
Base Capacity (vph)	432	580		468	620		817	2684	1206	624	2684	1211
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	0.07	0.05		0.07	0.20		0.03	0.21	0.01	0.04	0.10	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay: 5.5		Intersection LOS: A	
Intersection Capacity Utilization 38.2%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 51: Greenview Way N & Southfort Drive



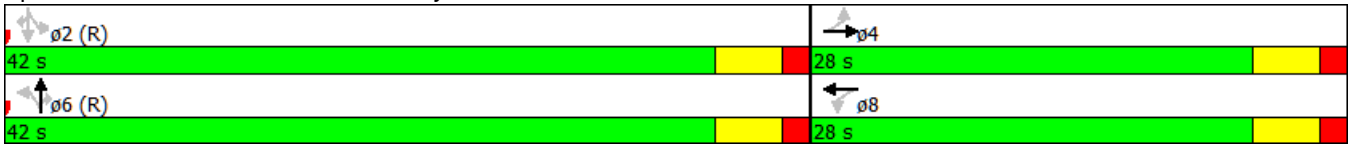


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	58	50	79	33	101	38	438	74	161	938	107
Future Volume (vph)	168	58	50	79	33	101	38	438	74	161	938	107
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	60.0		60.0
Storage Lanes	2		0	1		0	1		1	1		0
Taper Length (m)	30.0			29.9			29.9			29.9		
Satd. Flow (prot)	3283	1659	0	1692	1580	0	1692	3385	1514	1692	3385	1514
Flt Permitted	0.671			0.687			0.286			0.498		
Satd. Flow (perm)	2319	1659	0	1224	1580	0	510	3385	1514	887	3385	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			101				74			107
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		138.6			112.3			200.5			262.5	
Travel Time (s)		7.2			5.9			10.5			13.7	
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)	168	108	0	79	134	0	38	438	74	161	938	107
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	custom	NA	custom
Protected Phases		4			8			6				
Permitted Phases	4	4		8			6		6	2	2	2
Detector Phase	4	4		8	8		6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0	23.0	23.0	23.0	23.0
Total Split (s)	28.0	28.0		28.0	28.0		42.0	42.0	42.0	42.0	42.0	42.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%	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	3.5	3.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.5	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
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.3	11.3		11.3	11.3		48.7	48.7	48.7	48.7	48.7	48.7
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.70	0.70	0.70	0.70	0.70
v/c Ratio	0.45	0.35		0.40	0.39		0.11	0.19	0.07	0.26	0.40	0.10
Control Delay	30.2	18.4		32.2	12.6		6.3	5.6	3.0	3.0	2.9	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	18.4		32.2	12.6		6.3	5.6	3.0	3.0	2.9	0.3
LOS	C	B		C	B		A	A	A	A	A	A
Approach Delay		25.6			19.9			5.3			2.7	
Approach LOS		C			B			A			A	
Queue Length 50th (m)	10.9	7.1		10.0	4.0		2.0	12.5	0.3	2.6	8.0	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	18.5	19.0		20.9	17.1		m6.3	20.9	6.4	5.1	12.0	0.1
Internal Link Dist (m)		114.6			88.3			176.5			238.5	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	60.0		60.0
Base Capacity (vph)	761	578		402	586		354	2353	1075	616	2353	1085
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	0.22	0.19		0.20	0.23		0.11	0.19	0.07	0.26	0.40	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 68 (97%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 7.8		Intersection LOS: A	
Intersection Capacity Utilization 72.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 51: Greenview Way N & Southfort Drive



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	64	65	184	419	297	56
Future Volume (vph)	64	65	184	419	297	56
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0	0.0	60.0			0.0
Storage Lanes	0	1	1			1
Taper Length (m)	29.9		29.9			
Satd. Flow (prot)	1692	1514	1692	1781	1781	1514
Flt Permitted	0.950		0.552			
Satd. Flow (perm)	1692	1514	983	1781	1781	1514
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		68				59
Link Speed (k/h)	69			69	69	
Link Distance (m)	237.4			98.9	110.1	
Travel Time (s)	12.4			5.2	5.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	68	194	441	313	59
Turn Type	Prot	Perm	Perm	NA	NA	Free
Protected Phases	4			2	6	
Permitted Phases		4	2			Free
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	15.0	15.0	15.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	
Total Split (s)	28.0	28.0	42.0	42.0	42.0	
Total Split (%)	40.0%	40.0%	60.0%	60.0%	60.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	Max	Max	Max	
Act Effct Green (s)	22.0	22.0	36.0	36.0	36.0	70.0
Actuated g/C Ratio	0.31	0.31	0.51	0.51	0.51	1.00
v/c Ratio	0.13	0.13	0.38	0.48	0.34	0.04
Control Delay	23.1	11.2	13.1	13.2	9.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	11.2	13.1	13.2	9.9	0.1
LOS	C	B	B	B	A	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	17.1			13.2	8.4	
Approach LOS	B			B	A	
Queue Length 50th (m)	12.1	0.0	14.9	36.0	37.0	0.0
Queue Length 95th (m)	17.8	11.1	29.5	58.4	49.0	0.0
Internal Link Dist (m)	213.4			74.9	86.1	
Turn Bay Length (m)	60.0		60.0			
Base Capacity (vph)	531	522	505	915	915	1514
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	0.13	0.13	0.38	0.48	0.34	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 51.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 12: Southfort Drive & 84 Street

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	187	198	161	355	748	268
Future Volume (vph)	187	198	161	355	748	268
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0	0.0	60.0			0.0
Storage Lanes	0	1	1			1
Taper Length (m)	29.9		29.9			
Satd. Flow (prot)	1692	1514	1692	1781	1781	1514
Flt Permitted	0.950		0.246			
Satd. Flow (perm)	1692	1514	438	1781	1781	1514
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		198				203
Link Speed (k/h)	69			69	69	
Link Distance (m)	235.2			240.5	132.3	
Travel Time (s)	12.3			12.5	6.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	187	198	161	355	748	268
Turn Type	Prot	Perm	Perm	NA	NA	Free
Protected Phases	4			2	6	
Permitted Phases		4	2			Free
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	23.0	23.0	23.0	23.0	23.0	
Total Split (s)	23.0	23.0	47.0	47.0	47.0	
Total Split (%)	32.9%	32.9%	67.1%	67.1%	67.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	Max	Max	Max	
Act Effct Green (s)	18.0	18.0	42.0	42.0	42.0	70.0
Actuated g/C Ratio	0.26	0.26	0.60	0.60	0.60	1.00
v/c Ratio	0.43	0.37	0.61	0.33	0.70	0.18
Control Delay	25.4	5.8	22.0	8.1	14.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	5.8	22.0	8.1	14.9	0.2
LOS	C	A	C	A	B	A
Approach Delay	15.3			12.4	11.1	
Approach LOS	B			B	B	
Queue Length 50th (m)	21.2	0.0	12.3	21.4	71.9	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Queue Length 95th (m)	38.8	14.4	#43.1	35.5	124.0	0.0
Internal Link Dist (m)	211.2			216.5	108.3	
Turn Bay Length (m)	60.0		60.0			
Base Capacity (vph)	435	536	262	1068	1068	1514
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	0.43	0.37	0.61	0.33	0.70	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 47 (67%), Referenced to phase 4:EBL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 72.7%		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: 12: Southfort Drive & 84 Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	105	172	431	36	47	315
Future Volume (Veh/h)	105	172	431	36	47	315
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	111	181	454	38	49	332
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						262
pX, platoon unblocked	0.94					
vC, conflicting volume	884	454			492	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	846	454			492	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	70			95	
cM capacity (veh/h)	295	600			1056	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	111	181	454	38	49	332
Volume Left	111	0	0	0	49	0
Volume Right	0	181	0	38	0	0
cSH	295	600	1700	1700	1056	1700
Volume to Capacity	0.38	0.30	0.27	0.02	0.05	0.20
Queue Length 95th (m)	13.3	10.0	0.0	0.0	1.2	0.0
Control Delay (s)	24.4	13.6	0.0	0.0	8.6	0.0
Lane LOS	C	B			A	
Approach Delay (s)	17.7		0.0		1.1	
Approach LOS	C					

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	63	111	408	96	202	744
Future Volume (Veh/h)	63	111	408	96	202	744
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)	63	111	408	96	202	744
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (m)						240
pX, platoon unblocked	0.74					
vC, conflicting volume	1556	408			504	
vC1, stage 1 conf vol	408					
vC2, stage 2 conf vol	1148					
vCu, unblocked vol	1575	408			504	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	83			81	
cM capacity (veh/h)	195	637			1045	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	63	111	408	96	202	744
Volume Left	63	0	0	0	202	0
Volume Right	0	111	0	96	0	0
cSH	195	637	1700	1700	1045	1700
Volume to Capacity	0.32	0.17	0.24	0.06	0.19	0.44
Queue Length 95th (m)	10.5	5.0	0.0	0.0	5.6	0.0
Control Delay (s)	32.1	11.8	0.0	0.0	9.3	0.0
Lane LOS	D	B			A	
Approach Delay (s)	19.2		0.0		2.0	
Approach LOS	C					

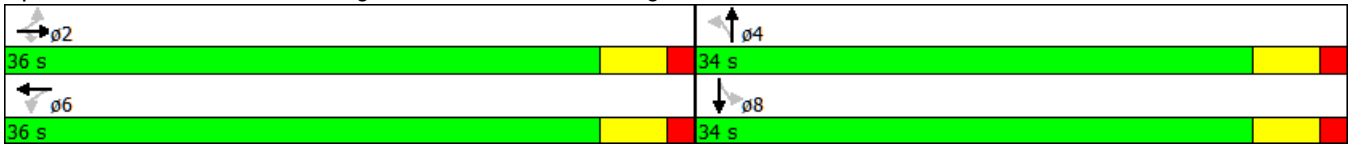
Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	141	107	44	490	22	44	1	8	15	1	143
Future Volume (vph)	59	141	107	44	490	22	44	1	8	15	1	143
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	50.0		0.0	60.0		60.0	30.0		0.0	30.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Satd. Flow (prot)	1692	3385	1514	1692	3365	0	1692	1545	0	1692	1516	0
Flt Permitted	0.451			0.658			0.660			0.752		
Satd. Flow (perm)	803	3385	1514	1172	3365	0	1176	1545	0	1340	1516	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			113		8			8			151	
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		273.8			120.9			69.4			106.1	
Travel Time (s)		14.3			6.3			3.6			5.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	148	113	46	539	0	46	9	0	16	152	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6			4			8		
Detector Phase	2	2	2	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0	23.0	23.0	23.0		27.0	27.0		27.0	27.0	
Total Split (s)	36.0	36.0	36.0	36.0	36.0		34.0	34.0		34.0	34.0	
Total Split (%)	51.4%	51.4%	51.4%	51.4%	51.4%		48.6%	48.6%		48.6%	48.6%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		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	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		None	None		None	None	
Act Effct Green (s)	36.5	36.5	36.5	36.5	36.5		10.0	10.0		10.0	10.0	
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70		0.19	0.19		0.19	0.19	
v/c Ratio	0.11	0.06	0.10	0.06	0.23		0.21	0.03		0.06	0.37	
Control Delay	4.9	4.1	1.4	4.3	4.4		20.1	11.3		17.5	7.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.9	4.1	1.4	4.3	4.4		20.1	11.3		17.5	7.0	
LOS	A	A	A	A	A		C	B		B	A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		3.3			4.4			18.7			8.0	
Approach LOS		A			A			B			A	
Queue Length 50th (m)	2.1	2.5	0.0	1.5	10.2		3.7	0.1		1.3	0.1	
Queue Length 95th (m)	5.9	5.0	4.1	4.4	16.0		10.9	2.9		5.2	11.8	
Internal Link Dist (m)		249.8			96.9			45.4			82.1	
Turn Bay Length (m)	50.0			60.0			30.0			30.0		
Base Capacity (vph)	559	2355	1087	815	2344		652	860		742	908	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.11	0.06	0.10	0.06	0.23		0.07	0.01		0.02	0.17	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 52.4			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 5.3		Intersection LOS: A	
Intersection Capacity Utilization 61.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 206: Ridge Point Gate & Southridge Blvd.

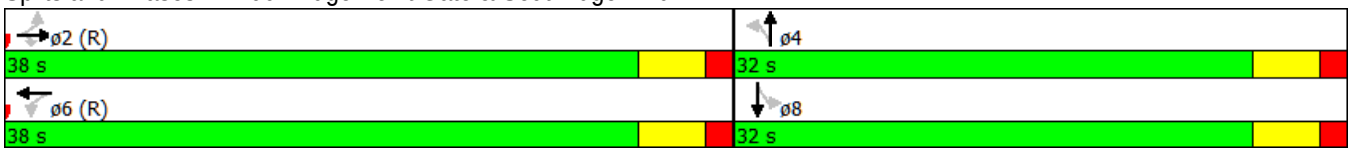


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	386	84	27	152	62	125	2	41	52	2	178
Future Volume (vph)	204	386	84	27	152	62	125	2	41	52	2	178
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	50.0		0.0	60.0		60.0	30.0		0.0	30.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Satd. Flow (prot)	1692	3385	1514	1692	3239	0	1692	1527	0	1692	1518	0
Flt Permitted	0.618			0.523			0.589			0.729		
Satd. Flow (perm)	1101	3385	1514	932	3239	0	1049	1527	0	1299	1518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84		62			41			178	
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		273.8			140.5			69.4			106.1	
Travel Time (s)		14.3			7.3			3.6			5.5	
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)	204	386	84	27	214	0	125	43	0	52	180	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6			4			8		
Detector Phase	2	2	2	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0	23.0	23.0	23.0		27.0	27.0		27.0	27.0	
Total Split (s)	38.0	38.0	38.0	38.0	38.0		32.0	32.0		32.0	32.0	
Total Split (%)	54.3%	54.3%	54.3%	54.3%	54.3%		45.7%	45.7%		45.7%	45.7%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		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	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	45.8	45.8	45.8	45.8	45.8		14.2	14.2		14.2	14.2	
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.65		0.20	0.20		0.20	0.20	
v/c Ratio	0.28	0.17	0.08	0.04	0.10		0.59	0.13		0.20	0.40	
Control Delay	7.6	5.9	1.9	6.3	4.1		35.8	8.0		22.9	6.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.6	5.9	1.9	6.3	4.1		35.8	8.0		22.9	6.5	
LOS	A	A	A	A	A		D	A		C	A	
Approach Delay		5.9			4.3			28.7			10.2	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	23.8	9.1	0.0	1.0	3.1		15.9	0.3		6.1	0.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	22.8	18.6	m4.1	5.0	9.4		27.3	6.5		12.6	12.7	
Internal Link Dist (m)		249.8			116.5			45.4			82.1	
Turn Bay Length (m)	50.0			60.0			30.0			30.0		
Base Capacity (vph)	720	2215	1020	609	2141		404	614		501	694	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.28	0.17	0.08	0.04	0.10		0.31	0.07		0.10	0.26	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 9.3		Intersection LOS: A	
Intersection Capacity Utilization 61.4%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 206: Ridge Point Gate & Southridge Blvd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	145	11	20	420	108	66	36	3	27	10	70
Future Volume (Veh/h)	8	145	11	20	420	108	66	36	3	27	10	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	153	12	21	442	114	69	38	3	28	11	74
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	556			165			738	773	159	732	722	499
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	556			165			738	773	159	732	722	499
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 %	99			98			75	88	100	91	97	87
cM capacity (veh/h)	1000			1395			275	319	878	296	341	566

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	8	165	21	556	110	28	85
Volume Left	8	0	21	0	69	28	0
Volume Right	0	12	0	114	3	0	74
cSH	1000	1700	1395	1700	294	296	521
Volume to Capacity	0.01	0.10	0.02	0.33	0.37	0.09	0.16
Queue Length 95th (m)	0.2	0.0	0.4	0.0	13.2	2.4	4.6
Control Delay (s)	8.6	0.0	7.6	0.0	24.4	18.4	13.2
Lane LOS	A		A		C	C	B
Approach Delay (s)	0.4		0.3		24.4	14.5	
Approach LOS					C	B	

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	387	50	27	152	62	23	20	2	126	44	99
Future Volume (Veh/h)	37	387	50	27	152	62	23	20	2	126	44	99
Sign Control		Free			Free			Stop			Stop	
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)	37	387	50	27	152	62	23	20	2	126	44	99
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	214			437			813	754	412	710	748	183
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	214			437			813	754	412	710	748	183
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			98			90	94	100	60	86	88
cM capacity (veh/h)	1338			1107			223	318	633	314	320	852

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	37	437	27	214	45	126	143
Volume Left	37	0	27	0	23	126	0
Volume Right	0	50	0	62	2	0	99
cSH	1338	1700	1107	1700	266	314	564
Volume to Capacity	0.03	0.26	0.02	0.13	0.17	0.40	0.25
Queue Length 95th (m)	0.7	0.0	0.6	0.0	4.7	14.7	7.9
Control Delay (s)	7.8	0.0	8.3	0.0	21.3	23.9	13.5
Lane LOS	A		A		C	C	B
Approach Delay (s)	0.6		0.9		21.3	18.4	
Approach LOS					C	C	

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	52.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	173	558	110	113
Demand Flow Rate, veh/h	182	586	115	119
Vehicles Circulating, veh/h	43	120	198	538
Vehicles Exiting, veh/h	614	193	27	168
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	108	0
Ped Cap Adj	1.000	1.000	0.984	1.000
Approach Delay, s/veh	5.0	11.9	5.3	7.9
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	182	586	115	119
Cap Entry Lane, veh/h	1082	1002	927	660
Entry HV Adj Factor	0.952	0.952	0.957	0.953
Flow Entry, veh/h	173	558	110	113
Cap Entry, veh/h	1031	954	873	629
V/C Ratio	0.168	0.585	0.126	0.180
Control Delay, s/veh	5.0	11.9	5.3	7.9
LOS	A	B	A	A
95th %tile Queue, veh	1	4	0	1

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	474	211	45	269
Demand Flow Rate, veh/h	497	222	47	282
Vehicles Circulating, veh/h	179	84	577	150
Vehicles Exiting, veh/h	253	540	99	156
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	137	0
Ped Cap Adj	1.000	1.000	0.979	1.000
Approach Delay, s/veh	11.0	5.7	6.9	6.9
Approach LOS	B	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	497	222	47	282
Cap Entry Lane, veh/h	945	1039	635	973
Entry HV Adj Factor	0.953	0.951	0.957	0.953
Flow Entry, veh/h	474	211	45	269
Cap Entry, veh/h	900	988	595	927
V/C Ratio	0.526	0.214	0.076	0.290
Control Delay, s/veh	11.0	5.7	6.9	6.9
LOS	B	A	A	A
95th %tile Queue, veh	3	1	0	1

Synchro Reports at Southfort

50% Development

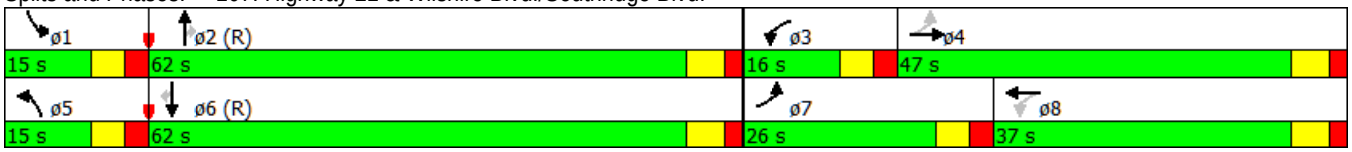
Al-Terra

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	526	13	297	326	13	75	72	1202	57	84	1192	125
Future Volume (vph)	526	13	297	326	13	75	72	1202	57	84	1192	125
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		60.0	79.9		79.9	79.9		79.9
Storage Lanes	1		1	1		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	3283	3385	1514	3283	3385	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.503			0.749			0.950			0.950		
Satd. Flow (perm)	1738	3385	1514	2589	3385	1514	3283	4863	1514	3283	4863	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			235			210			164			164
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		258.4			273.8			345.0			780.4	
Travel Time (s)		13.5			14.3			18.0			40.7	
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)	526	13	297	326	13	75	72	1202	57	84	1192	125
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	15.0	37.0		13.0	37.0		13.0	33.0	33.0	13.0	33.0	33.0
Total Split (s)	26.0	47.0		16.0	37.0		15.0	62.0	62.0	15.0	62.0	62.0
Total Split (%)	18.6%	33.6%		11.4%	26.4%		10.7%	44.3%	44.3%	10.7%	44.3%	44.3%
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.5	2.0		2.5	2.0		2.5	2.0	2.0	2.5	2.0	2.0
Lost Time Adjust (s)	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	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	30.6	18.2	140.0	24.2	14.2	140.0	8.3	82.8	82.8	8.6	85.7	85.7
Actuated g/C Ratio	0.22	0.13	1.00	0.17	0.10	1.00	0.06	0.59	0.59	0.06	0.61	0.61
v/c Ratio	0.88	0.03	0.20	0.62	0.04	0.05	0.37	0.42	0.06	0.42	0.40	0.13
Control Delay	65.8	45.9	0.3	53.3	52.3	0.1	68.7	18.6	0.1	63.8	21.7	7.4
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	65.8	45.9	0.3	53.3	52.3	0.1	68.7	18.6	0.1	63.8	21.7	7.4
LOS	E	D	A	D	D	A	E	B	A	E	C	A
Approach Delay		42.2			43.6			20.5			22.9	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	~89.7	1.8	0.0	46.6	1.8	0.0	10.4	52.7	0.0	13.0	61.0	6.5
Queue Length 95th (m)	69.9	4.2	0.0	42.9	4.6	0.0	18.9	116.2	0.0	m21.1	96.8	m14.6
Internal Link Dist (m)		234.4			249.8			321.0			756.4	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	79.9		79.9	79.9		79.9
Base Capacity (vph)	600	991	1514	527	749	1514	213	2876	962	216	2977	990
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	0.88	0.01	0.20	0.62	0.02	0.05	0.34	0.42	0.06	0.39	0.40	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 28.3		Intersection LOS: C	
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 107: Highway 21 & Wilshire Blvd./Southridge Blvd.



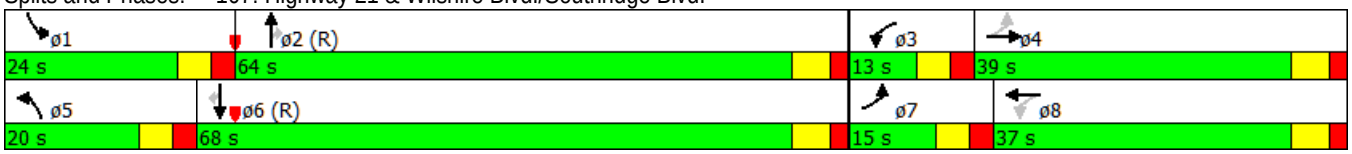
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	308	23	192	197	21	309	212	1701	265	295	1412	473
Future Volume (vph)	308	23	192	197	21	309	212	1701	265	295	1412	473
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		60.0	79.9		79.9	79.9		79.9
Storage Lanes	1		1	2		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	3283	3385	1514	3283	3385	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.665			0.742			0.950			0.950		
Satd. Flow (perm)	2298	3385	1514	2564	3385	1514	2868	4863	979	3283	4863	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			192			242			208			469
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		258.4			273.8			345.0			780.4	
Travel Time (s)		13.5			14.3			18.0			40.7	
Confl. Peds. (#/hr)							1733		348			
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)	308	23	192	197	21	309	212	1701	265	295	1412	473
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	15.0	37.0		13.0	37.0		13.0	33.0	33.0	13.0	33.0	33.0
Total Split (s)	15.0	39.0		13.0	37.0		20.0	64.0	64.0	24.0	68.0	68.0
Total Split (%)	10.7%	27.9%		9.3%	26.4%		14.3%	45.7%	45.7%	17.1%	48.6%	48.6%
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.5	2.0		2.5	2.0		2.5	2.0	2.0	2.5	2.0	2.0
Lost Time Adjust (s)	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	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	20.4	15.4	140.0	18.0	14.2	140.0	13.4	82.3	82.3	16.9	85.8	85.8
Actuated g/C Ratio	0.15	0.11	1.00	0.13	0.10	1.00	0.10	0.59	0.59	0.12	0.61	0.61
v/c Ratio	0.77	0.06	0.13	0.53	0.06	0.20	0.67	0.60	0.40	0.74	0.47	0.43
Control Delay	66.4	51.8	0.2	56.0	53.2	0.3	72.1	22.3	7.5	51.8	27.9	12.7
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	66.4	51.8	0.2	56.0	53.2	0.3	72.1	22.3	7.5	51.8	27.9	12.7
LOS	E	D	A	E	D	A	E	C	A	D	C	B
Approach Delay		41.4			23.2			25.3			27.8	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	41.9	3.2	0.0	25.8	3.0	0.0	30.6	115.3	7.3	43.5	100.5	32.0
Queue Length 95th (m)	46.4	6.7	0.0	30.8	6.4	0.0	44.7	181.0	36.1	m58.4	130.9	81.1
Internal Link Dist (m)		234.4			249.8			321.0			756.4	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	79.9		79.9	79.9		79.9
Base Capacity (vph)	398	797	1514	369	749	1514	338	2858	661	430	2978	1109

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	0.77	0.03	0.13	0.53	0.03	0.20	0.63	0.60	0.40	0.69	0.47	0.43

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 27.7		Intersection LOS: C	
Intersection Capacity Utilization 73.1%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 107: Highway 21 & Wilshire Blvd./Southridge Blvd.



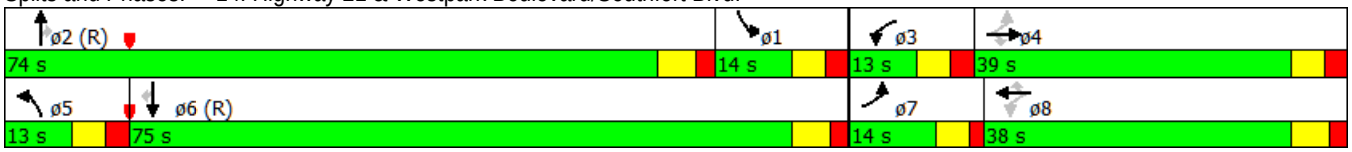
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	151	71	270	107	203	58	1614	126	97	1060	130
Future Volume (vph)	144	151	71	270	107	203	58	1614	126	97	1060	130
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		60.0	100.0		60.0	100.0		60.0
Storage Lanes	1		1	1		1	1		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3385	1514	3283	1781	1514	1692	4863	1514	3283	4863	1514
Flt Permitted	0.553			0.656			0.950			0.950		
Satd. Flow (perm)	980	3385	1486	2255	1781	1486	1689	4863	1485	3279	4863	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			164			117			130
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		489.0			168.0			780.4			144.9	
Travel Time (s)		25.5			8.8			40.7			7.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		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)	144	151	71	270	107	203	58	1614	126	97	1060	130
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	7.0	7.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	7.0	7.0
Minimum Split (s)	9.0	37.0	37.0	13.0	37.0	37.0	13.0	33.0	33.0	13.0	33.0	33.0
Total Split (s)	14.0	39.0	39.0	13.0	38.0	38.0	13.0	74.0	74.0	14.0	75.0	75.0
Total Split (%)	10.0%	27.9%	27.9%	9.3%	27.1%	27.1%	9.3%	52.9%	52.9%	10.0%	53.6%	53.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.5	2.5	2.5	2.5	2.0	2.0	2.5	2.0	2.0	2.5	2.0	2.0
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)	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes		Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	25.1	15.1	15.1	21.1	14.1	14.1	10.6	85.9	85.9	8.0	85.9	85.9
Actuated g/C Ratio	0.18	0.11	0.11	0.15	0.10	0.10	0.08	0.61	0.61	0.06	0.61	0.61
v/c Ratio	0.65	0.41	0.23	0.69	0.60	0.68	0.45	0.54	0.13	0.52	0.36	0.14
Control Delay	62.9	61.0	1.8	60.4	73.4	26.3	64.9	16.8	4.9	68.1	14.7	4.1
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	62.9	61.0	1.8	60.4	73.4	26.3	64.9	16.8	4.9	68.1	14.7	4.1
LOS	E	E	A	E	E	C	E	B	A	E	B	A
Approach Delay		50.3			50.9			17.6			17.6	
Approach LOS		D			D			B			B	
Queue Length 50th (m)	36.4	21.7	0.0	35.3	30.0	10.6	14.4	92.9	0.1	14.9	46.3	0.6
Queue Length 95th (m)	55.3	32.2	0.0	46.9	48.6	36.8	m26.8	142.5	m14.5	25.4	57.9	4.3
Internal Link Dist (m)		465.0			144.0			756.4			120.9	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	100.0		60.0	100.0		60.0
Base Capacity (vph)	221	797	475	391	407	466	128	2983	956	187	2982	961

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	0.65	0.19	0.15	0.69	0.26	0.44	0.45	0.54	0.13	0.52	0.36	0.14

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 25.4		Intersection LOS: C	
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: 14: Highway 21 & Westpark Boulevard/Southfort Blvd.



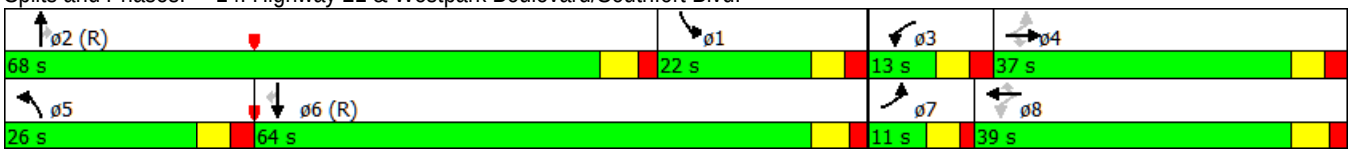
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	118	48	218	289	140	188	1858	272	303	1918	384
Future Volume (vph)	79	118	48	218	289	140	188	1858	272	303	1918	384
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		60.0	100.0		60.0	100.0		60.0
Storage Lanes	1		1	1		1	1		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3385	1514	3283	1781	1514	1692	4863	1514	3283	4863	1514
Flt Permitted	0.269			0.627			0.950			0.950		
Satd. Flow (perm)	477	3385	1486	2155	1781	1486	1691	4863	1485	3280	4863	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156			156			158			206
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		489.0			168.0			780.4			144.9	
Travel Time (s)		25.5			8.8			40.7			7.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		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)	79	118	48	218	289	140	188	1858	272	303	1918	384
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	7.0	7.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	7.0	7.0
Minimum Split (s)	9.0	37.0	37.0	13.0	37.0	37.0	13.0	33.0	33.0	13.0	33.0	33.0
Total Split (s)	11.0	37.0	37.0	13.0	39.0	39.0	26.0	68.0	68.0	22.0	64.0	64.0
Total Split (%)	7.9%	26.4%	26.4%	9.3%	27.9%	27.9%	18.6%	48.6%	48.6%	15.7%	45.7%	45.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.5	2.5	2.5	2.5	2.0	2.0	2.5	2.0	2.0	2.5	2.0	2.0
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)	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes		Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.2	25.2	25.2	34.2	27.2	27.2	19.1	67.8	67.8	16.0	64.7	64.7
Actuated g/C Ratio	0.23	0.18	0.18	0.24	0.19	0.19	0.14	0.48	0.48	0.11	0.46	0.46
v/c Ratio	0.49	0.19	0.12	0.37	0.84	0.34	0.81	0.79	0.34	0.81	0.85	0.48
Control Delay	48.2	48.1	0.6	41.2	74.6	6.8	79.8	42.0	20.5	65.8	34.0	14.5
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	48.2	48.1	0.6	41.2	74.6	6.8	79.8	42.0	20.5	65.8	34.0	14.5
LOS	D	D	A	D	E	A	E	D	C	E	C	B
Approach Delay		38.8			48.7			42.5			34.8	
Approach LOS		D			D			D			C	
Queue Length 50th (m)	17.1	15.2	0.0	25.1	80.3	0.0	54.7	150.5	26.9	41.6	149.8	27.4
Queue Length 95th (m)	29.4	23.6	0.0	34.4	110.0	13.6	m#90.0	222.3	m78.3	m50.4	#177.8	m40.8
Internal Link Dist (m)		465.0			144.0			756.4			120.9	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	100.0		60.0	100.0		60.0
Base Capacity (vph)	161	749	450	582	419	469	249	2354	800	375	2246	796

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	0.49	0.16	0.11	0.37	0.69	0.30	0.76	0.79	0.34	0.81	0.85	0.48

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 39.6 Intersection LOS: D
Intersection Capacity Utilization 89.6% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Highway 21 & Westpark Boulevard/Southfort Blvd.



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	184	72	300	60	98	109	119	1849	74	33	927	32
Future Volume (vph)	184	72	300	60	98	109	119	1849	74	33	927	32
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		60.0	60.0		0.0	60.0		60.0	100.0		60.0
Storage Lanes	1		1	2		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1781	1514	3283	1781	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.502			0.710			0.950			0.950		
Satd. Flow (perm)	889	1781	1485	2454	1781	1514	3273	4863	1514	3283	4863	1486
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			240			117			117			117
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		277.7			132.0			480.8			814.6	
Travel Time (s)		14.5			6.9			25.1			42.5	
Confl. Peds. (#/hr)	5		5				5					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)	184	72	300	60	98	109	119	1849	74	33	927	32
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	9.0	33.0	33.0	15.0	33.0	33.0	13.0	37.0	37.0	13.0	37.0	37.0
Total Split (s)	17.0	37.0	37.0	15.0	35.0	35.0	16.0	75.0	75.0	13.0	72.0	72.0
Total Split (%)	12.1%	26.4%	26.4%	10.7%	25.0%	25.0%	11.4%	53.6%	53.6%	9.3%	51.4%	51.4%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.5	2.0	2.0	2.5	2.0	2.0	2.5	2.0	2.0	2.5	2.0	2.0
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)	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes	Yes				Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	31.7	21.1	21.1	22.9	15.2	15.2	10.1	87.6	87.6	7.4	79.6	79.6
Actuated g/C Ratio	0.23	0.15	0.15	0.16	0.11	0.11	0.07	0.63	0.63	0.05	0.57	0.57
v/c Ratio	0.68	0.27	0.70	0.13	0.51	0.41	0.50	0.61	0.07	0.19	0.34	0.04
Control Delay	58.8	55.3	22.1	41.1	66.5	11.8	78.1	12.5	1.2	50.3	23.5	3.7
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	58.8	55.3	22.1	41.1	66.5	11.8	78.1	12.5	1.2	50.3	23.5	3.7
LOS	E	E	C	D	E	B	E	B	A	D	C	A
Approach Delay		38.5			38.5			15.9			23.8	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	46.7	19.4	16.1	7.2	27.5	0.0	17.9	47.4	0.0	4.8	68.6	0.5
Queue Length 95th (m)	62.0	32.0	46.1	11.9	42.1	14.4	m28.4	83.6	m2.6	10.7	81.7	3.8
Internal Link Dist (m)		253.7			108.0			456.8			790.6	
Turn Bay Length (m)			60.0	60.0			60.0		60.0	100.0		60.0
Base Capacity (vph)	270	394	515	477	368	406	253	3042	991	173	2766	895

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	0.68	0.18	0.58	0.13	0.27	0.27	0.47	0.61	0.07	0.19	0.34	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NET and 6:SWT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 22.8		Intersection LOS: C	
Intersection Capacity Utilization 75.5%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 32: Highway 21 & 84 Street

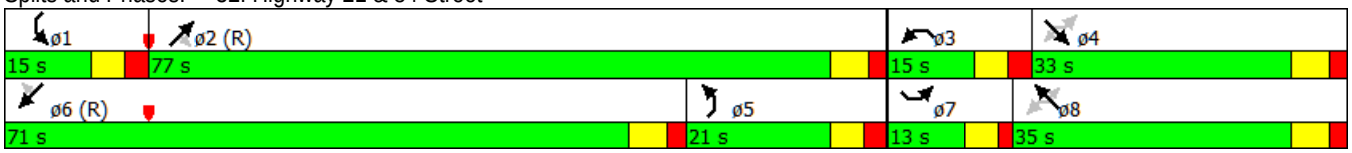
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	136	169	218	138	276	86	345	1704	178	109	2256	289
Future Volume (vph)	136	169	218	138	276	86	345	1704	178	109	2256	289
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		60.0	60.0		0.0	60.0		60.0	100.0		60.0
Storage Lanes	1		1	2		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	1781	1514	3283	1781	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.267			0.453			0.950			0.950		
Satd. Flow (perm)	474	1781	1485	1566	1781	1514	3282	4863	1514	3283	4863	1486
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			218			156			128			144
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		277.7			132.0			480.8			814.6	
Travel Time (s)		14.5			6.9			25.1			42.5	
Confl. Peds. (#/hr)	5		5				5					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)	136	169	218	138	276	86	345	1704	178	109	2256	289
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	9.0	33.0	33.0	15.0	33.0	33.0	13.0	37.0	37.0	13.0	37.0	37.0
Total Split (s)	13.0	33.0	33.0	15.0	35.0	35.0	21.0	77.0	77.0	15.0	71.0	71.0
Total Split (%)	9.3%	23.6%	23.6%	10.7%	25.0%	25.0%	15.0%	55.0%	55.0%	10.7%	50.7%	50.7%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.5	2.0	2.0	2.5	2.0	2.0	2.5	2.0	2.0	2.5	2.0	2.0
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)	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.8	23.8	23.8	34.2	25.5	25.5	15.0	74.7	74.7	8.8	68.5	68.5
Actuated g/C Ratio	0.23	0.17	0.17	0.24	0.18	0.18	0.11	0.53	0.53	0.06	0.49	0.49
v/c Ratio	0.76	0.56	0.50	0.28	0.85	0.21	0.98	0.66	0.21	0.53	0.95	0.36
Control Delay	66.7	60.2	10.2	39.1	78.7	1.2	79.2	7.8	0.6	88.6	23.9	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	66.7	60.2	10.2	39.1	78.7	1.2	79.2	7.8	0.6	88.6	23.9	7.6
LOS	E	E	B	D	E	A	E	A	A	F	C	A
Approach Delay		41.0			54.4			18.3			24.8	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	30.2	44.6	0.0	15.3	76.7	0.0	48.7	33.9	0.0	16.9	65.2	1.2
Queue Length 95th (m)	#54.0	67.9	22.8	23.6	#111.0	0.0	m#79.8	37.5	m0.2	m20.0	#268.2	m30.6
Internal Link Dist (m)		253.7			108.0			456.8			790.6	
Turn Bay Length (m)			60.0	60.0			60.0		60.0	100.0		60.0
Base Capacity (vph)	180	343	462	496	368	437	351	2594	867	216	2378	800

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	0.76	0.49	0.47	0.28	0.75	0.20	0.98	0.66	0.21	0.50	0.95	0.36

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NET and 6:SWT, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 26.3		Intersection LOS: C	
Intersection Capacity Utilization 96.7%		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: 32: Highway 21 & 84 Street



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	34	6	31	102	9	16	46	2039	69	30	830	34
Future Volume (vph)	34	6	31	102	9	16	46	2039	69	30	830	34
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	50.0		0.0	60.0		0.0	60.0		60.0	60.0		0.0
Storage Lanes	2		0	2		0	2		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Satd. Flow (prot)	3283	1557	0	3283	1610	0	3283	4863	1514	1692	4863	1514
Flt Permitted	0.741			0.733			0.950			0.078		
Satd. Flow (perm)	2561	1557	0	2533	1610	0	3283	4863	1514	139	4863	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			16				69			55
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		122.7			156.7			814.6			419.8	
Travel Time (s)		6.4			8.2			42.5			21.9	
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)	34	37	0	102	25	0	46	2039	69	30	830	34
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8					6	2		2
Detector Phase	4	4		8	8		1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	36.0	36.0		36.0	36.0		25.0	32.0	32.0	32.0	32.0	32.0
Total Split (s)	36.0	36.0		36.0	36.0		25.0	104.0	104.0	79.0	79.0	79.0
Total Split (%)	25.7%	25.7%		25.7%	25.7%		17.9%	74.3%	74.3%	56.4%	56.4%	56.4%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.5	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
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Recall Mode	Max	Max		Max	Max		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	31.0	31.0		31.0	31.0		7.7	99.0	99.0	88.7	88.7	88.7
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.06	0.71	0.71	0.63	0.63	0.63
v/c Ratio	0.06	0.10		0.18	0.07		0.25	0.59	0.06	0.34	0.27	0.03
Control Delay	43.5	17.6		45.3	24.1		58.2	10.8	3.4	31.0	9.2	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.5	17.6		45.3	24.1		58.2	10.8	3.4	31.0	9.2	0.5
LOS	D	B		D	C		E	B	A	C	A	A
Approach Delay		30.0			41.1			11.6			9.6	
Approach LOS		C			D			B			A	
Queue Length 50th (m)	4.0	1.4		12.3	2.1		6.8	81.1	1.4	2.6	25.4	0.0
Queue Length 95th (m)	9.0	11.2		20.8	10.2		m11.7	113.1	m7.6	11.2	30.3	0.2
Internal Link Dist (m)		98.7			132.7			790.6			395.8	
Turn Bay Length (m)	50.0			60.0			60.0		60.0	60.0		
Base Capacity (vph)	567	368		560	368		469	3438	1090	88	3079	978
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	0.06	0.10		0.18	0.07		0.10	0.59	0.06	0.34	0.27	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:SWTL and 6:NET, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 58.4%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

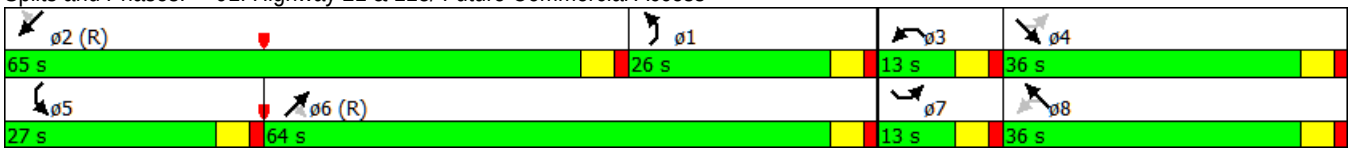
Splits and Phases: 91: Commercial Access & Highway 21

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	147	29	138	250	25	118	150	1486	290	158	2266	101
Future Volume (vph)	147	29	138	250	25	118	150	1486	290	158	2266	101
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	50.0		0.0	60.0		0.0	60.0		60.0	60.0		0.0
Storage Lanes	2		0	2		0	2		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Satd. Flow (prot)	3283	1561	0	3283	1561	0	3283	4863	1514	1692	4863	1514
Flt Permitted	0.398			0.299			0.950			0.950		
Satd. Flow (perm)	1376	1561	0	1033	1561	0	3283	4863	1514	1692	4863	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		138			118				204			94
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		122.7			156.7			814.6			419.8	
Travel Time (s)		6.4			8.2			42.5			21.9	
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)	147	167	0	250	143	0	150	1486	290	158	2266	101
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8					6			2
Detector Phase	7	4		3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	12.0	36.0		12.0	36.0		25.0	32.0	32.0	12.0	32.0	32.0
Total Split (s)	13.0	36.0		13.0	36.0		26.0	64.0	64.0	27.0	65.0	65.0
Total Split (%)	9.3%	25.7%		9.3%	25.7%		18.6%	45.7%	45.7%	19.3%	46.4%	46.4%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.5	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
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	22.5	14.5		22.5	14.5		21.0	79.8	79.8	17.7	76.5	76.5
Actuated g/C Ratio	0.16	0.10		0.16	0.10		0.15	0.57	0.57	0.13	0.55	0.55
v/c Ratio	0.45	0.59		0.85	0.53		0.30	0.54	0.31	0.74	0.85	0.12
Control Delay	50.3	21.6		74.6	21.1		66.4	33.3	17.5	52.9	47.4	14.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	21.6		74.6	21.1		66.4	33.3	17.5	52.9	47.4	14.1
LOS	D	C		E	C		E	C	B	D	D	B
Approach Delay		35.0			55.1			33.5			46.4	
Approach LOS		D			E			C			D	
Queue Length 50th (m)	19.3	8.1		33.9	6.9		16.8	113.5	30.4	41.6	239.7	10.1
Queue Length 95th (m)	24.3	27.4		39.1	24.8		m27.6	141.7	m61.1	m56.8	m#298.0	m18.5
Internal Link Dist (m)		98.7			132.7			790.6			395.8	
Turn Bay Length (m)	50.0			60.0			60.0		60.0	60.0		
Base Capacity (vph)	330	453		295	437		492	2772	950	265	2656	869
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	0.45	0.37		0.85	0.33		0.30	0.54	0.31	0.60	0.85	0.12

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:SWT and 6:NET, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 41.6		Intersection LOS: D	
Intersection Capacity Utilization 85.1%		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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 91: Highway 21 & 118/ Future Commercial Access



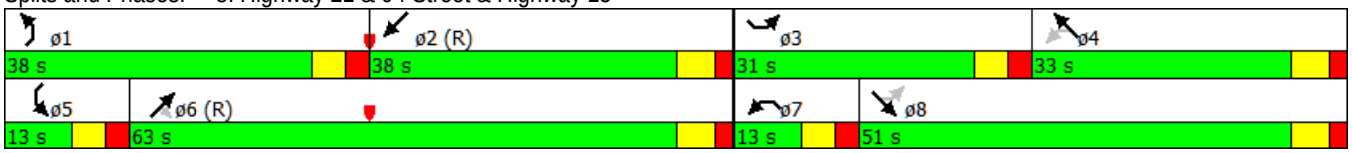
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	740	276	262	101	401	195	660	1339	91	53	554	237
Future Volume (vph)	740	276	262	101	401	195	660	1339	91	53	554	237
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	100.0		60.0	60.0		0.0	100.0		60.0	100.0		60.0
Storage Lanes	1		1	2		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	3283	3385	1514	3283	3385	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.283			0.582			0.950			0.950		
Satd. Flow (perm)	975	3385	1494	2002	3385	1494	3273	4863	1486	3280	4863	1494
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			262			257			164			257
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		154.9			245.8			233.3			229.7	
Travel Time (s)		8.1			12.8			12.2			12.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		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)	740	276	262	101	401	195	660	1339	91	53	554	237
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		Free	4		Free			6			Free
Detector Phase	3	8		7	4		1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0	20.0	7.0	20.0	
Minimum Split (s)	13.0	37.0		13.0	33.0		13.0	37.0	37.0	13.0	37.0	
Total Split (s)	31.0	51.0		13.0	33.0		38.0	63.0	63.0	13.0	38.0	
Total Split (%)	22.1%	36.4%		9.3%	23.6%		27.1%	45.0%	45.0%	9.3%	27.1%	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.5	2.0		2.5	2.0		2.5	2.0	2.0	2.5	2.0	
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)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?					Yes							
Recall Mode	None	None		None	Max		None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	58.0	45.0	140.0	34.2	27.2	140.0	30.8	59.6	59.6	7.0	33.2	140.0
Actuated g/C Ratio	0.41	0.32	1.00	0.24	0.19	1.00	0.22	0.43	0.43	0.05	0.24	1.00
v/c Ratio	0.91	0.25	0.18	0.18	0.61	0.13	0.91	0.65	0.13	0.32	0.48	0.16
Control Delay	48.0	35.9	0.3	27.8	56.2	0.2	59.3	41.4	3.9	69.7	47.9	0.2
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	48.0	35.9	0.3	27.8	56.2	0.2	59.3	41.4	3.9	69.7	47.9	0.2
LOS	D	D	A	C	E	A	E	D	A	E	D	A
Approach Delay		35.6			36.4			45.4			35.9	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	82.1	30.8	0.0	8.9	56.2	0.0	102.9	126.4	0.8	7.7	51.2	0.0
Queue Length 95th (m)	#105.8	43.2	0.0	15.1	74.3	0.0	#130.3	143.1	m7.6	15.2	64.2	0.0
Internal Link Dist (m)		130.9			221.8			209.3			205.7	
Turn Bay Length (m)	100.0		60.0	60.0			100.0		60.0	100.0		60.0
Base Capacity (vph)	816	1088	1494	552	656	1494	750	2069	727	164	1153	1494

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	0.91	0.25	0.18	0.18	0.61	0.13	0.88	0.65	0.13	0.32	0.48	0.16

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:SWT and 6:NET, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 39.9	Intersection LOS: D
Intersection Capacity Utilization 109.4%	ICU Level of Service H
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: Highway 21 & 94 Street & Highway 15



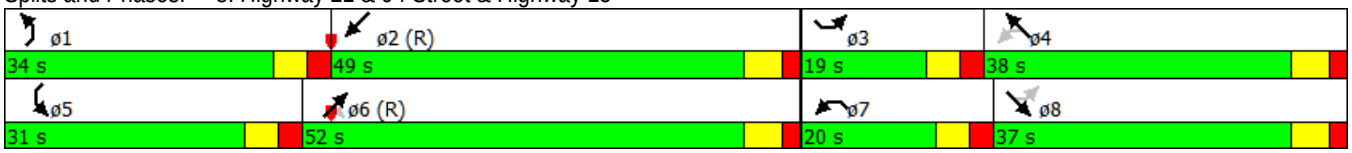
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	333	650	836	380	577	229	576	877	298	351	1339	529
Future Volume (vph)	333	650	836	380	577	229	576	877	298	351	1339	529
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	100.0		60.0	60.0		50.0	100.0		60.0	100.0		60.0
Storage Lanes	1		1	2		1	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	3283	3385	1514	3283	3385	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.230			0.145			0.950			0.950		
Satd. Flow (perm)	793	3385	1494	500	3385	1494	3280	4863	1486	3272	4863	1494
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			421			164			241			239
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		154.9			245.8			233.3			229.7	
Travel Time (s)		8.1			12.8			12.2			12.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		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)	333	650	836	380	577	229	576	877	298	351	1339	529
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		Free	4		Free			6			Free
Detector Phase	3	8		7	4		1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0	20.0	7.0	20.0	
Minimum Split (s)	13.0	37.0		13.0	33.0		13.0	37.0	37.0	13.0	37.0	
Total Split (s)	19.0	37.0		20.0	38.0		34.0	52.0	52.0	31.0	49.0	
Total Split (%)	13.6%	26.4%		14.3%	27.1%		24.3%	37.1%	37.1%	22.1%	35.0%	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.5	2.0		2.5	2.0		2.5	2.0	2.0	2.5	2.0	
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)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?					Yes							
Recall Mode	None	None		None	Max		None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	43.8	31.1	140.0	46.2	32.3	140.0	27.1	50.9	50.9	20.1	43.9	140.0
Actuated g/C Ratio	0.31	0.22	1.00	0.33	0.23	1.00	0.19	0.36	0.36	0.14	0.31	1.00
v/c Ratio	0.70	0.87	0.56	0.86	0.74	0.15	0.91	0.50	0.43	0.75	0.88	0.35
Control Delay	40.8	65.5	1.5	51.0	45.3	0.2	70.4	41.7	21.6	79.9	32.8	0.5
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	40.8	65.5	1.5	51.0	45.3	0.2	70.4	41.7	21.6	79.9	32.8	0.5
LOS	D	E	A	D	D	A	E	D	C	E	C	A
Approach Delay		31.6			38.4			47.7			32.5	
Approach LOS		C			D			D			C	
Queue Length 50th (m)	34.7	95.7	0.0	41.9	68.7	0.0	89.0	57.4	13.1	46.7	139.3	0.0
Queue Length 95th (m)	47.3	#126.4	0.0	m#62.8	m93.4	m0.0	#115.6	113.2	84.9	66.3	147.0	0.0
Internal Link Dist (m)		130.9			221.8			209.3			205.7	
Turn Bay Length (m)	100.0		60.0	60.0		50.0	100.0		60.0	100.0		60.0
Base Capacity (vph)	480	750	1494	443	779	1494	656	1767	693	586	1524	1494

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	0.69	0.87	0.56	0.86	0.74	0.15	0.88	0.50	0.43	0.60	0.88	0.35

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:SWT and 6:NET, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 37.1		Intersection LOS: D	
Intersection Capacity Utilization 95.7%		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: Highway 21 & 94 Street & Highway 15



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	46	131	209	159	130	407	221	1770	150	49	476	186
Future Volume (vph)	46	131	209	159	130	407	221	1770	150	49	476	186
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		60.0	60.0		60.0	100.0		60.0	100.0		60.0
Storage Lanes	1		0	2		0	2		1	2		1
Taper Length (m)	29.9			29.9			29.9			29.9		
Satd. Flow (prot)	1692	3385	1514	3283	2957	0	3283	4863	1514	3283	4863	1514
Flt Permitted	0.452			0.455			0.950			0.950		
Satd. Flow (perm)	803	3385	1486	1564	2957	0	3261	4863	1485	3280	4863	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			209		360				117			186
Link Speed (k/h)		69			69			69			69	
Link Distance (m)		161.2			159.5			120.6			241.3	
Travel Time (s)		8.4			8.3			6.3			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		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)	46	131	209	159	537	0	221	1770	150	49	476	186
Turn Type	Perm	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		1	6		5	2	
Permitted Phases	4	4	4	8					6			2
Detector Phase	4	4	4	3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	37.0	37.0	37.0	13.0	37.0		13.0	33.0	33.0	13.0	33.0	33.0
Total Split (s)	37.0	37.0	37.0	13.0	50.0		31.0	57.0	57.0	33.0	59.0	59.0
Total Split (%)	26.4%	26.4%	26.4%	9.3%	35.7%		22.1%	40.7%	40.7%	23.6%	42.1%	42.1%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0		3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0		2.5	2.0	2.0	2.5	2.0	2.0
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
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	None	None	None	Max	Max
Act Effct Green (s)	12.8	12.8	12.8	25.8	25.8		12.7	61.1	61.1	7.5	53.1	53.1
Actuated g/C Ratio	0.12	0.12	0.12	0.24	0.24		0.12	0.56	0.56	0.07	0.48	0.48
v/c Ratio	0.49	0.33	0.59	0.33	0.55		0.58	0.65	0.17	0.22	0.20	0.23
Control Delay	64.3	47.1	13.2	35.9	13.9		52.9	19.5	4.7	52.4	17.2	3.5
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	64.3	47.1	13.2	35.9	13.9		52.9	19.5	4.7	52.4	17.2	3.5
LOS	E	D	B	D	B		D	B	A	D	B	A
Approach Delay		30.8			18.9			21.9			16.0	
Approach LOS		C			B			C			B	
Queue Length 50th (m)	9.7	14.2	0.0	14.6	16.8		24.0	97.5	3.2	5.3	20.8	0.0
Queue Length 95th (m)	22.7	24.6	22.0	24.6	34.8		38.8	136.0	14.8	12.3	33.6	13.1
Internal Link Dist (m)		137.2			135.5			96.6			217.3	
Turn Bay Length (m)	60.0		60.0	60.0			100.0		60.0	100.0		60.0
Base Capacity (vph)	227	959	570	478	1404		750	2707	878	810	2356	815

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	0.20	0.14	0.37	0.33	0.38		0.29	0.65	0.17	0.06	0.20	0.23

Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 109.7			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 88.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 15 & 101 Street

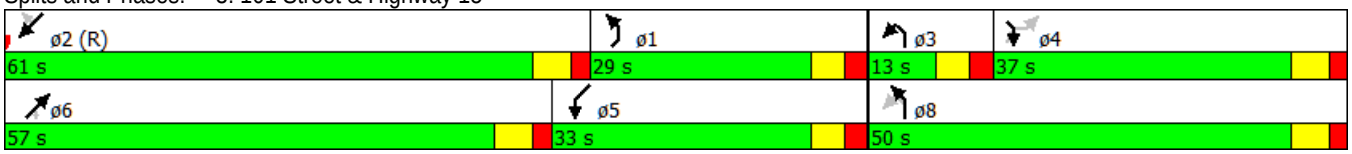
Lane Group	NBL2	NBL	NBR	SEL	SER	SER2	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	193	258	136	34	320	408	406	668	94	380	1618	128
Future Volume (vph)	193	258	136	34	320	408	406	668	94	380	1618	128
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)		60.0	60.0	60.0	60.0		100.0		60.0	100.0		60.0
Storage Lanes		2	0	1	0		2		1	2		1
Taper Length (m)		29.9		29.9			29.9			29.9		
Satd. Flow (prot)	3283	3151	0	1692	2665	1514	3283	4863	1514	3283	4863	1514
Flt Permitted	0.297	0.968		0.523			0.950			0.950		
Satd. Flow (perm)	1023	3136	0	928	2582	1486	3158	4863	1485	3266	4863	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		76				322			117			117
Link Speed (k/h)		69		69				69			69	
Link Distance (m)		158.8		161.2				120.6			241.3	
Travel Time (s)		8.3		8.4				6.3			12.6	
Confl. Peds. (#/hr)	5	5	5	5	5	5	139		5	5		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)	193	394	0	34	320	408	406	668	94	380	1618	128
Turn Type	pm+pt	Prot		Perm	Prot	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases	8			4	4	4			6			2
Detector Phase	3	8		4	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	13.0	37.0		37.0	37.0	37.0	13.0	33.0	33.0	13.0	33.0	33.0
Total Split (s)	13.0	50.0		37.0	37.0	37.0	29.0	57.0	57.0	33.0	61.0	61.0
Total Split (%)	9.3%	35.7%		26.4%	26.4%	26.4%	20.7%	40.7%	40.7%	23.6%	43.6%	43.6%
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.5	2.0	2.0	2.5	2.0	2.0
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
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	None	None	C-Max	C-Max
Act Effct Green (s)	36.9	36.9		22.8	22.8	22.8	21.1	33.7	33.7	51.5	64.0	64.0
Actuated g/C Ratio	0.26	0.26		0.16	0.16	0.16	0.15	0.24	0.24	0.37	0.46	0.46
v/c Ratio	0.48	0.45		0.23	0.74	0.80	0.82	0.57	0.21	0.31	0.73	0.17
Control Delay	42.5	33.9		52.2	65.7	24.6	79.2	39.9	5.5	33.0	34.4	6.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	33.9		52.2	65.7	24.6	79.2	39.9	5.5	33.0	34.4	6.0
LOS	D	C		D	E	C	E	D	A	C	C	A
Approach Delay		36.8		43.1				50.8			32.4	
Approach LOS		D		D				D			C	
Queue Length 50th (m)	22.0	37.5		8.7	50.7	23.3	62.6	55.3	3.3	39.2	136.6	1.7
Queue Length 95th (m)	m28.7	47.0		18.4	64.4	61.5	80.4	76.2	m17.4	56.9	174.9	15.2
Internal Link Dist (m)		134.8		137.2				96.6			217.3	
Turn Bay Length (m)	60.0	60.0		60.0	60.0	60.0	100.0		60.0	100.0		60.0
Base Capacity (vph)	399	1042		205	590	579	539	1771	615	1207	2223	742

Lane Group	NBL2	NBL	NBR	SEL	SER	SER2	NEL	NET	NER	SWL	SWT	SWR
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	0.48	0.38		0.17	0.54	0.70	0.75	0.38	0.15	0.31	0.73	0.17

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 77 (55%), Referenced to phase 2:SWT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 39.3		Intersection LOS: D	
Intersection Capacity Utilization 89.3%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 3: 101 Street & Highway 15



Appendix D

Signal Warrants Worksheets

Al-Terra

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	Southridge Blvd.	Direction (EW or NS)	EW	Road Authority:	City of Fort Saskatchewan
Side Street (name)	Ridge Point Gate	Direction (EW or NS)	NS	City:	City of Fort Saskatchewan
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.	Analysis Date:	2015 Jul 27, Mon
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	2025 Jul 27, Sun
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Southridge Blvd.	WB	1		1		1			2
Southridge Blvd.	EB	1		2			1		2
Ridge Point Gate	NB	1				1			
Ridge Point Gate	SB	1				1			
Are the Ridge Point Gate NB right turns significantly impeded by through movements? (y/n)							n		
Are the Ridge Point Gate SB right turns significantly impeded by through movements? (y/n)							n		

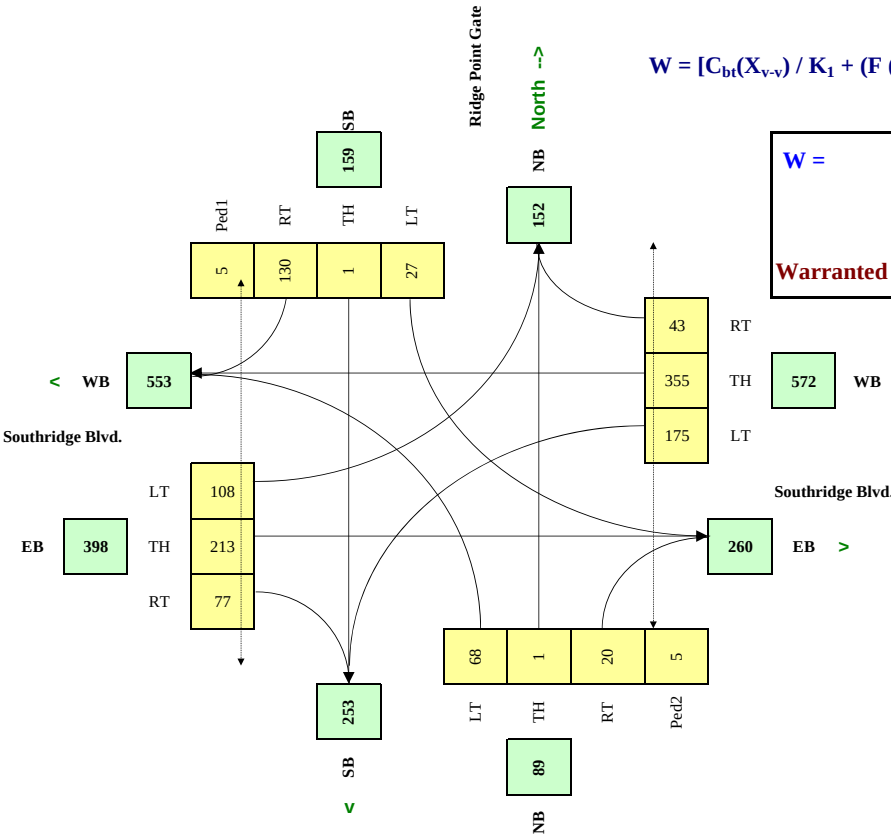
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Southridge Blvd.	EW	60	5.0%	n	0.0
Ridge Point Gate	NS		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	44	1	8	15	1	143	44	490	22	59	141	107	30	30	30	30
8:30 - 9:30	60	1	17	24	1	115	200	313	38	95	188	68				
12:00 - 13:00	60	1	17	24	1	115	200	313	38	95	188	68				
13:00 - 14:00	60	1	17	24	1	115	200	313	38	95	188	68				
16:00 - 17:00	125	2	41	52	2	178	204	386	84	207	386	84				
17:00 - 18:00	60	1	17	24	1	115	200	313	38	95	188	68				
Total (6-hour peak)	**409**	**7**	**117**	**163**	**7**	**781**	**1,048**	**2,128**	**258**	**646**	**1,279**	**463**	**30**	**30**	**30**	**30**
Average (6-hour peak)	**68**	**1**	**20**	**27**	**1**	**130**	**175**	**355**	**43**	**108**	**213**	**77**	**5**	**5**	**5**	**5**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	118	107	11
		Veh	*Ped*

Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	Southridge Blvd.	Direction (EW or NS)	EW	Road Authority:	City of Fort Saskatchewan
Side Street (name)	Southfort Drive	Direction (EW or NS)	NS	City:	City of Fort Saskatchewan
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.	Analysis Date:	2015 Jul 27, Mon
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	2025 Jul 27, Sun
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Southridge Blvd.	WB		1				1		1
Southridge Blvd.	EB	1				1			1
Southfort Drive	NB				1				
Southfort Drive	SB	1				1			
Are the Southfort Drive NB right turns significantly impeded by through movements? (y/n)							n		
Are the Southfort Drive SB right turns significantly impeded by through movements? (y/n)							n		

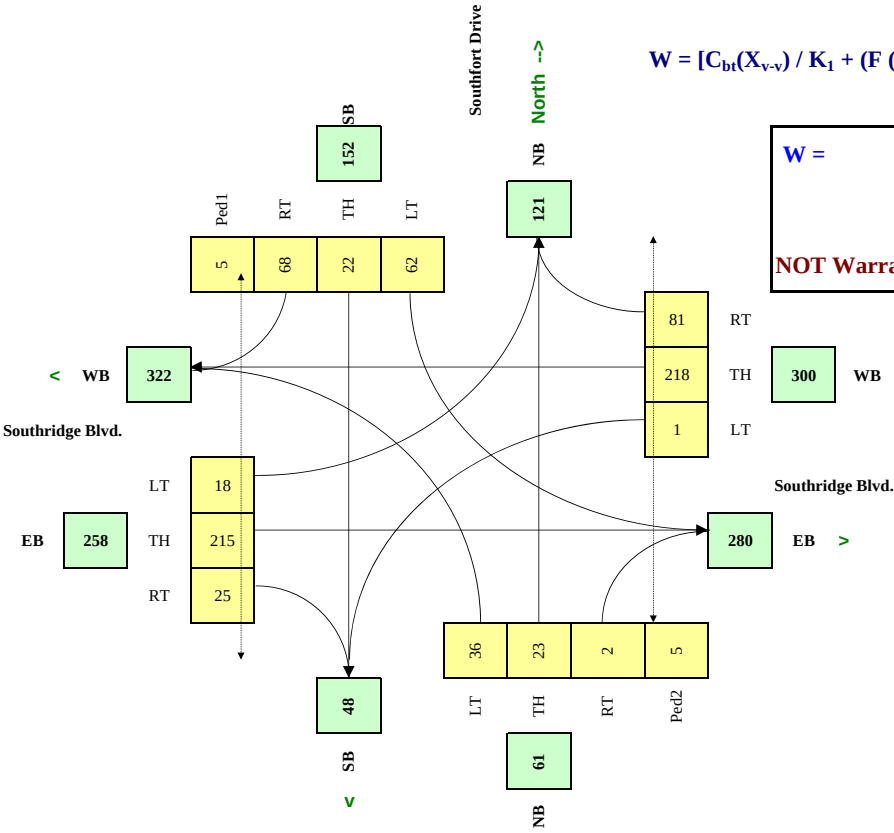
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Southridge Blvd.	EW	60	5.0%	n	0.0
Southfort Drive	NS		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	66	36	3	27	10	70	2	420	108	8	145	11	30	30	30	30
8:30 - 9:30	32	20	2	55	19	60	1	192	71	16	190	22				
12:00 - 13:00	32	20	2	55	19	60	1	192	71	16	190	22				
13:00 - 14:00	32	20	2	55	19	60	1	192	71	16	190	22				
16:00 - 17:00	23	20	2	126	44	99	1	119	91	37	387	50				
17:00 - 18:00	32	20	2	55	19	60	1	192	71	16	190	22				
Total (6-hour peak)	217	136	13	373	130	409	7	1,307	483	109	1,292	149	30	30	30	30
Average (6-hour peak)	36	23	2	62	22	68	1	218	81	18	215	25	5	5	5	5

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W =	57	49	8
		Veh	*Ped*

NOT Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	Southfort Blvd.	Direction (EW or NS)	EW	Road Authority:	City of Fort Saskatchewan
Side Street (name)	Ridgeland Way	Direction (EW or NS)	NS	City:	City of Fort Saskatchewan
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.	Analysis Date:	2015 Jul 27, Mon
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	2025 Jul 27, Sun
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Southfort Blvd.	WB	1				1			1
Southfort Blvd.	EB	1				1			1
Ridgeland Way	NB				1				
Ridgeland Way	SB				1				
Are the Ridgeland Way NB right turns significantly impeded by through movements? (y/n)							n		
Are the Ridgeland Way SB right turns significantly impeded by through movements? (y/n)							n		

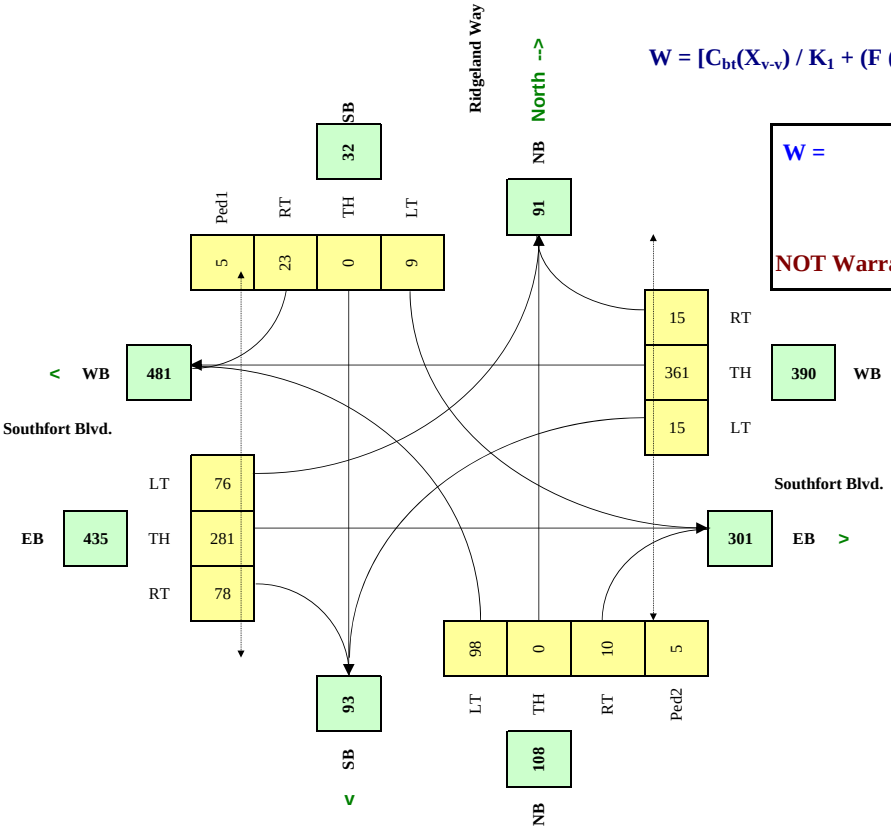
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Southfort Blvd.	EW	60	5.0%	n	0.0
Ridgeland Way	NS		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	158	1	13	6	1	30	8	379	3	6	304	39	30	30	30	30
8:30 - 9:30	86	0	9	8	0	20	13	318	13	103	248	69				
12:00 - 13:00	86	0	9	8	0	20	13	318	13	103	248	69				
13:00 - 14:00	86	0	9	8	0	20	13	318	13	103	248	69				
16:00 - 17:00	83	1	13	17	1	27	27	512	34	35	390	154				
17:00 - 18:00	86	0	9	8	0	20	13	318	13	103	248	69				
Total (6-hour peak)	**585**	**2**	**62**	**55**	**2**	**137**	**87**	**2,163**	**89**	**453**	**1,686**	**469**	**30**	**30**	**30**	**30**
Average (6-hour peak)	**98**	**0**	**10**	**9**	**0**	**23**	**15**	**361**	**15**	**76**	**281**	**78**	**5**	**5**	**5**	**5**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W =	82	71	11
		Veh	*Ped*

NOT Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	Southfort Drive	Direction (EW or NS)	NS
Side Street (name)	Southfort Blvd.	Direction (EW or NS)	EW
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

Road Authority:	City of Fort Saskatchewan
City:	City of Fort Saskatchewan
Analysis Date:	2015 Jul 27, Mon
Count Date:	2025 Jul 27, Sun
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Southfort Drive	NB	1				1			1
Southfort Drive	SB	1				1			1
Southfort Blvd.	WB								
Southfort Blvd.	EB	1					1		
							n		
							n		

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

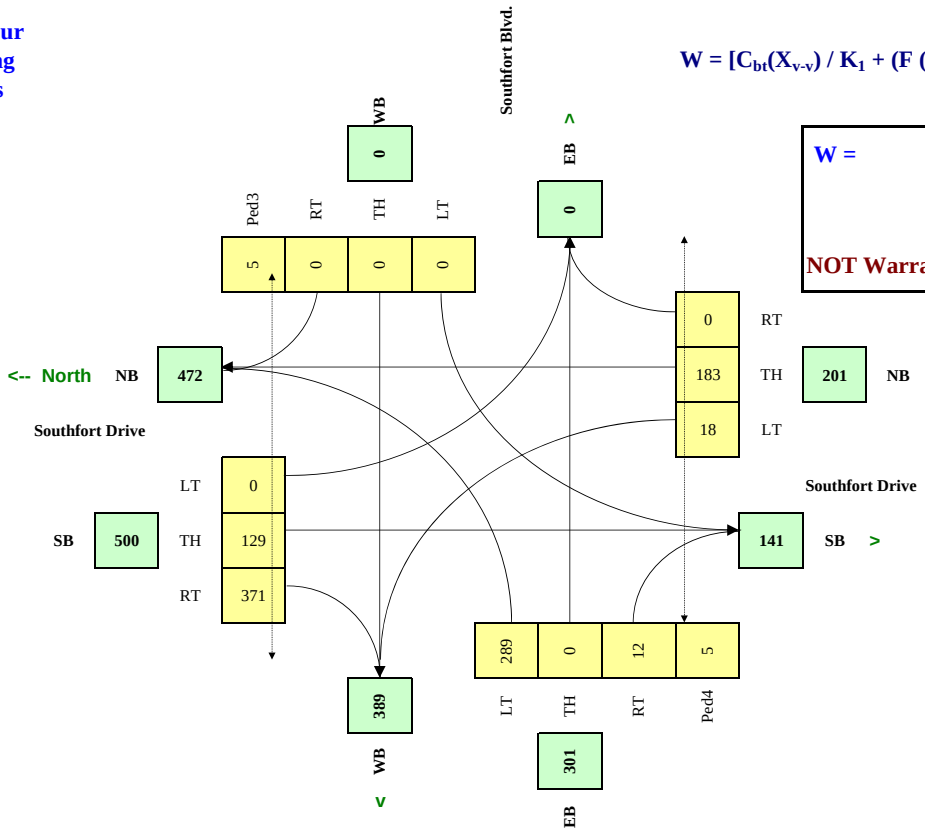
Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Southfort Drive	NS	60	5.0%	n	0.0
Southfort Blvd.	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	18	331			84	336				331		10	30	30	30	30
8:30 - 9:30	16	161			114	327				255		11				
12:00 - 13:00	16	161			114	327				255		11				
13:00 - 14:00	16	161			114	327				255		11				
16:00 - 17:00	26	121			234	579				383		20				
17:00 - 18:00	16	161			114	327				255		11				
Total (6-hour peak)	**108**	**1,096**	**0**	**0**	**774**	**2,223**	**0**	**0**	**0**	**1,734**	**0**	**74**	**30**	**30**	**30**	**30**
Average (6-hour peak)	**18**	**183**	**0**	**0**	**129**	**371**	**0**	**0**	**0**	**289**	**0**	**12**	**5**	**5**	**5**	**5**

Average 6-hour Peak Turning Movements

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$



W =	72	64	8
		Veh	*Ped*

NOT Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	Southfort Drive	Direction (EW or NS)	NS
Side Street (name)	Greenfield Way (S)	Direction (EW or NS)	EW
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimates are based on existing 6 highest hours.
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET		

Road Authority:	City of Fort Saskatchewan
City:	City of Fort Saskatchewan
Analysis Date:	2015 Jul 27, Mon
Count Date:	2025 Jul 27, Sun
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Southfort Drive	NB			1			1		1
Southfort Drive	SB	1		1					1
Greenfield Way (S)	WB				1				
Greenfield Way (S)	EB								

Are the Greenfield Way (S) WB right turns significantly impeded by through movements? (y/n)

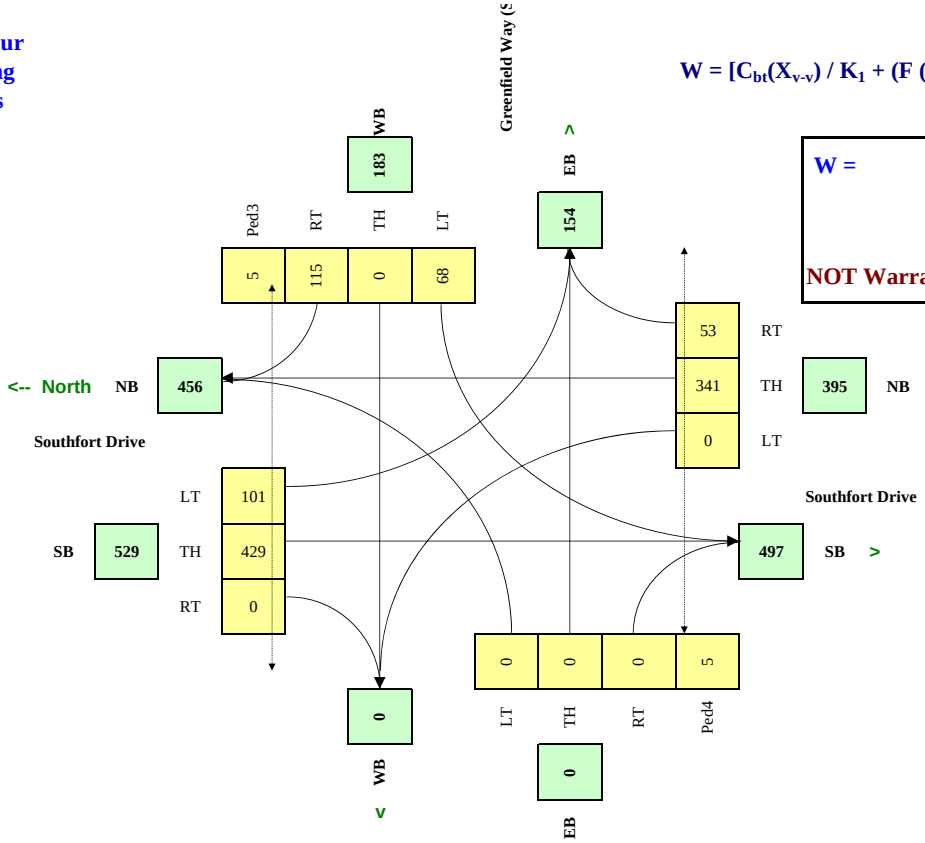
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Southfort Drive	NS	60	2.0%	n	0.0
Greenfield Way (S)	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30		431	36	47	315		105		172				30	30	30	30
8:30 - 9:30		302	47	89	378		60		101							
12:00 - 13:00		302	47	89	378		60		101							
13:00 - 14:00		302	47	89	378		60		101							
16:00 - 17:00		408	96	202	744		63		111							
17:00 - 18:00		302	47	89	378		60		101							
Total (6-hour peak)	**0**	**2,047**	**320**	**605**	**2,571**	**0**	**408**	**0**	**687**	**0**	**0**	**0**	**30**	**30**	**30**	**30**
Average (6-hour peak)	**0**	**341**	**53**	**101**	**429**	**0**	**68**	**0**	**115**	**0**	**0**	**0**	**5**	**5**	**5**	**5**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W =	95	83	12
		Veh	*Ped*

NOT Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	84 Street	Direction (EW or NS)	EW
Side Street (name)	Galloway Wynd	Direction (EW or NS)	NS
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimates are based on existing 6 highest hours.

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

Road Authority:	City of Fort Saskatchewan
City:	City of Fort Saskatchewan
Analysis Date:	2015 Jul 27, Mon
Count Date:	2025 Jul 27, Sun
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
84 Street	WB	1		2					2
84 Street	EB	1		2					2
Galloway Wynd	NB				1				
Galloway Wynd	SB	1					1		
Are the Galloway Wynd NB right turns significantly impeded by through movements? (y/n)							n		

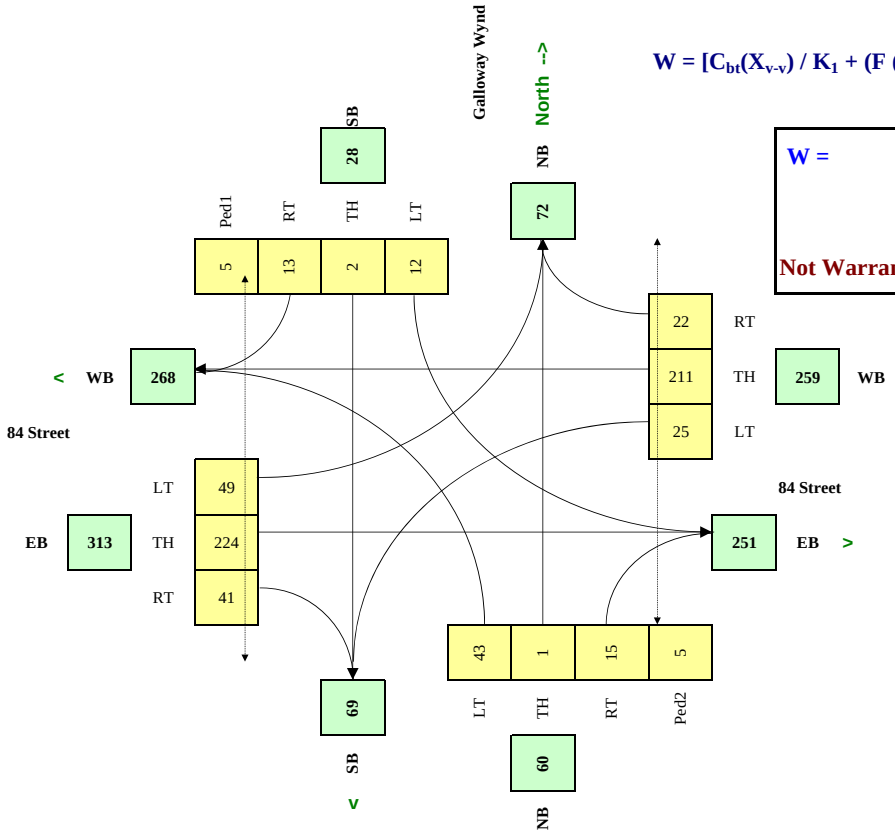
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
84 Street	EW	60	2.0%	n	0.0
Galloway Wynd	NS		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	51	1	20	10	2	6	44	99	51	22	188	30	30	30	30	30
8:30 - 9:30	39	1	14	11	2	12	23	190	19	44	201	37				
12:00 - 13:00	39	1	14	11	2	12	23	190	19	44	201	37				
13:00 - 14:00	39	1	14	11	2	12	23	190	19	44	201	37				
16:00 - 17:00	53	2	16	20	2	26	16	408	5	94	349	69				
17:00 - 18:00	39	1	14	11	2	12	23	190	19	44	201	37				
Total (6-hour peak)	**260**	**7**	**92**	**74**	**12**	**80**	**152**	**1,267**	**132**	**292**	**1,341**	**247**	**30**	**30**	**30**	**30**
Average (6-hour peak)	**43**	**1**	**15**	**12**	**2**	**13**	**25**	**211**	**22**	**49**	**224**	**41**	**5**	**5**	**5**	**5**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	34	27	7
		Veh	*Ped*

Not Warranted - Vs<75

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	Southfort Drive	Direction (EW or NS)	NS
Side Street (name)	84 Street	Direction (EW or NS)	EW
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET		

Road Authority:	City of Fort Saskatchewan
City:	City of Fort Saskatchewan
Analysis Date:	2015 Jul 27, Mon
Count Date:	2025 Jul 27, Sun
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Southfort Drive	NB	1		2					2
Southfort Drive	SB			2			1		2
84 Street	WB								
84 Street	EB	1					1		

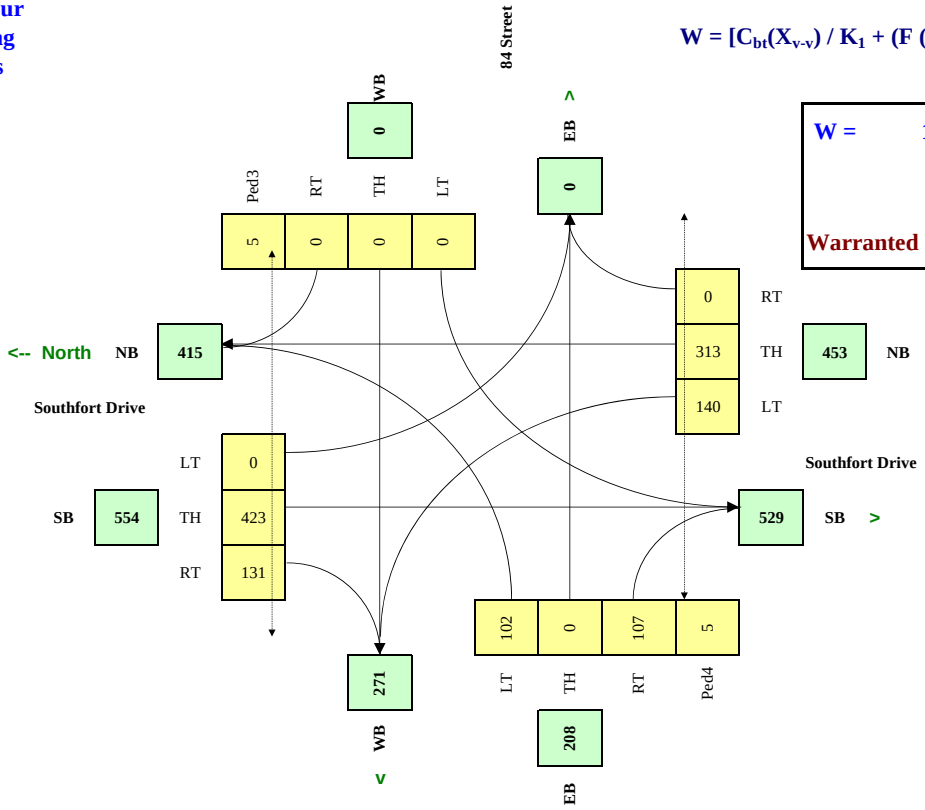
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Southfort Drive	NS	60	2.0%	n	0.0
84 Street	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	184	419			297	56				64		65	30	30	30	30
8:30 - 9:30	123	276			373	116				90		94				
12:00 - 13:00	123	276			373	116				90		94				
13:00 - 14:00	123	276			373	116				90		94				
16:00 - 17:00	161	355			748	268				187		198				
17:00 - 18:00	123	276			373	116				90		94				
Total (6-hour peak)	**837**	**1,878**	**0**	**0**	**2,537**	**788**	**0**	**0**	**0**	**611**	**0**	**639**	**30**	**30**	**30**	**30**
Average (6-hour peak)	**140**	**313**	**0**	**0**	**423**	**131**	**0**	**0**	**0**	**102**	**0**	**107**	**5**	**5**	**5**	**5**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W =	126	114	12
		Veh	*Ped*

Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	Southfort Drive	Direction (EW or NS)	NS
Side Street (name)	Greenfield Way (N)	Direction (EW or NS)	EW
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimates are based on existing 6 highest hours.

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

Road Authority:	City of Fort Saskatchewan
City:	City of Fort Saskatchewan
Analysis Date:	2015 Jul 27, Mon
Count Date:	2025 Jul 27, Sun
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Southfort Drive	NB	1		2			1		2
Southfort Drive	SB	1		2			1		2
Greenfield Way (N)	WB	1					1		
Greenfield Way (N)	EB	1					1		

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

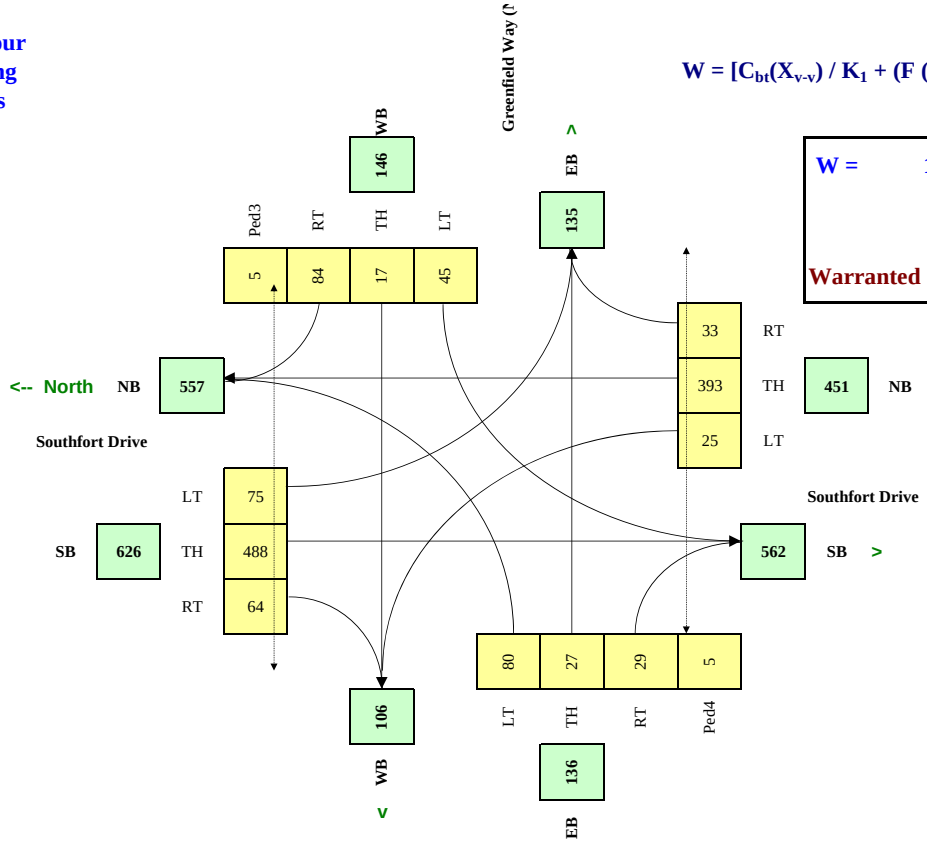
Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Southfort Drive	NS	60	5.0%	n	0.0
Greenfield Way (N)	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1	Ped2	Ped3	Ped4
													NS	NS	EW	EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	25	533	7	24	267	51	33	9	107	29	8	22	30	30	30	30
8:30 - 9:30	22	347	29	66	430	56	40	15	74	70	24	26				
12:00 - 13:00	22	347	29	66	430	56	40	15	74	70	24	26				
13:00 - 14:00	22	347	29	66	430	56	40	15	74	70	24	26				
16:00 - 17:00	38	438	74	161	938	107	79	33	101	168	58	50				
17:00 - 18:00	22	347	29	66	430	56	40	15	74	70	24	26				
Total (6-hour peak)	151	2,359	197	449	2,925	382	272	102	504	477	162	176	30	30	30	30
Average (6-hour peak)	25	393	33	75	488	64	45	17	84	80	27	29	5	5	5	5

Average 6-hour Peak Turning Movements

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$



W =	141	127	14
		Veh	Ped

Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	Southfort Drive	Direction (EW or NS)	NS
Side Street (name)	Allard Way	Direction (EW or NS)	EW
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET		

Road Authority:	City of Fort Saskatchewan
City:	City of Fort Saskatchewan
Analysis Date:	2015 Jul 27, Mon
Count Date:	2025 Jul 27, Sun
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Southfort Drive	NB	1		2			1		2
Southfort Drive	SB	1		2			1		2
Allard Way	WB					1			
Allard Way	EB	1				1	1		
Are the Allard Way WB right turns significantly impeded by through movements? (y/n)							n		
Are the Allard Way EB right turns significantly impeded by through movements? (y/n)							n		

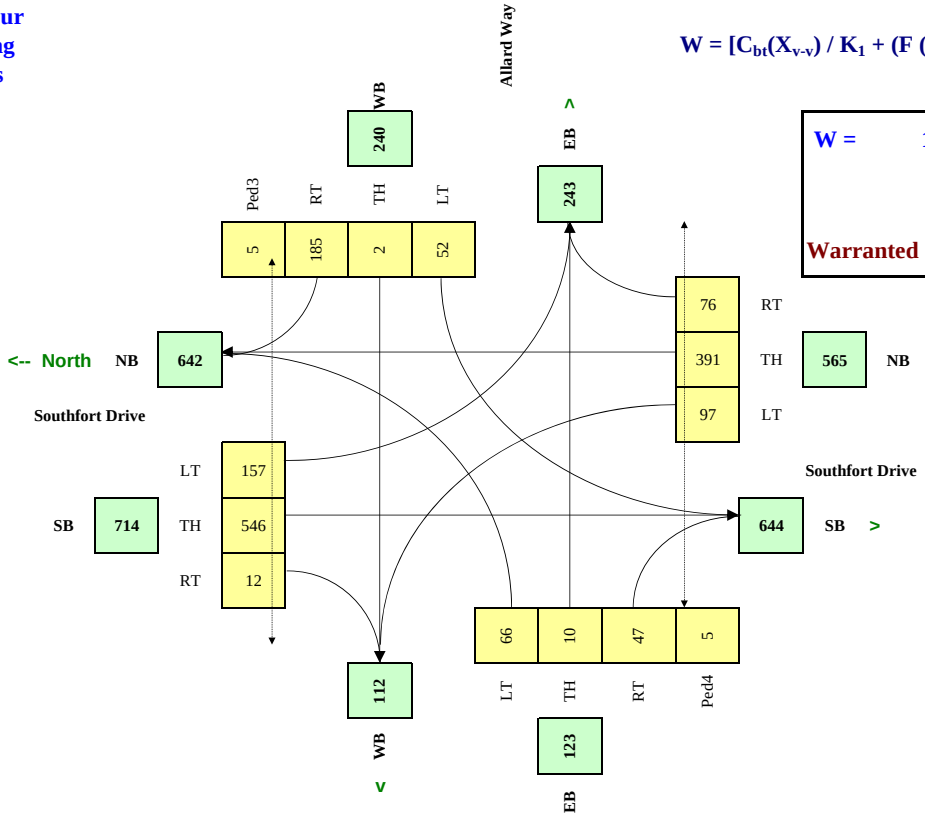
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Southfort Drive	NS	60	2.0%	n	0.0
Allard Way	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1	Ped2	Ped3	Ped4
													NS	NS	EW	EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	110	527	25	77	288	21	54	1	323	68	5	22	30	30	30	30
8:30 - 9:30	86	345	67	138	481	11	46	2	163	58	9	41				
12:00 - 13:00	86	345	67	138	481	11	46	2	163	58	9	41				
13:00 - 14:00	86	345	67	138	481	11	46	2	163	58	9	41				
16:00 - 17:00	130	439	164	310	1061	9	75	5	136	95	20	94				
17:00 - 18:00	86	345	67	138	481	11	46	2	163	58	9	41				
Total (6-hour peak)	584	2,346	457	939	3,273	74	313	14	1,111	395	61	280	30	30	30	30
Average (6-hour peak)	97	391	76	157	546	12	52	2	185	66	10	47	5	5	5	5

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W =	195	178	17
		Veh	*Ped*

Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	94 Street	Direction (EW or NS)	NS
Side Street (name)	87 Avenue	Direction (EW or NS)	EW
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET		

Road Authority:	City of Fort Saskatchewan
City:	City of Fort Saskatchewan
Analysis Date:	2015 Jul 27, Mon
Count Date:	2025 Jul 27, Sun
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
94 Street	NB	1		1		1			2
94 Street	SB	1		1		1			2
87 Avenue	WB				1				
87 Avenue	EB	1				1			

Are the 87 Avenue WB right turns significantly impeded by through movements?	(y/n)	n
Are the 87 Avenue EB right turns significantly impeded by through movements?	(y/n)	n

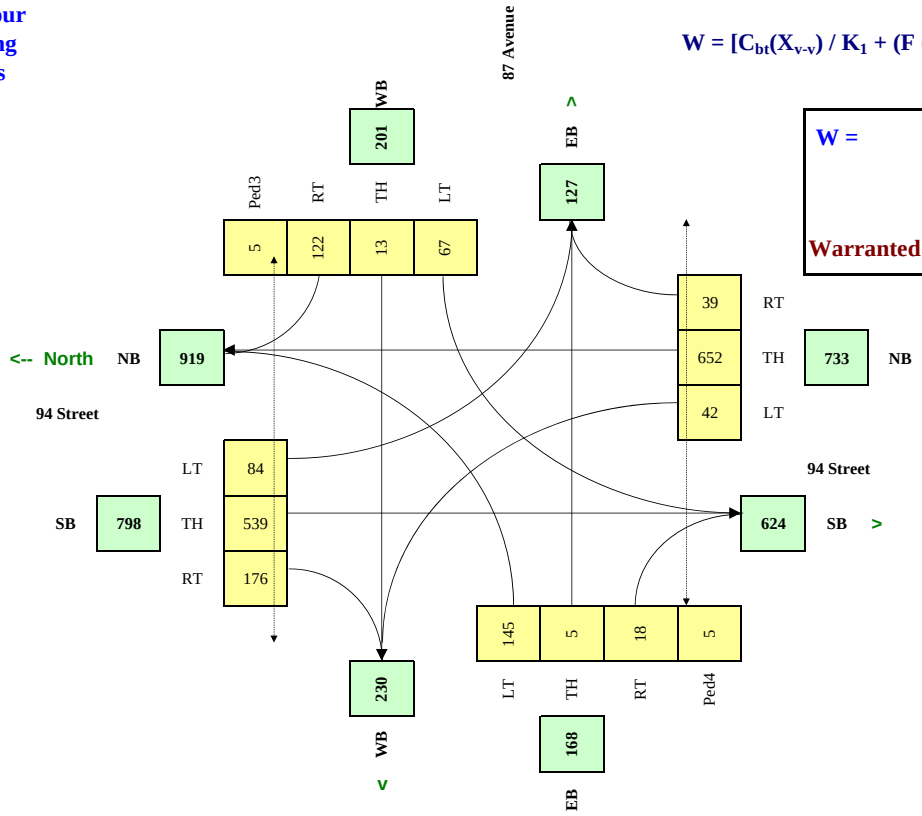
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
94 Street	NS	60	2.0%	n	0.0
87 Avenue	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1	Ped2	Ped3	Ped4
	NS			NS			EW			EW			NS	NS	EW	EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	70	930	28	25	377	68	11	2	40	40	2	21	30	30	30	30
8:30 - 9:30	37	575	34	74	475	155	59	11	107	128	4	16				
12:00 - 13:00	37	575	34	74	475	155	59	11	107	128	4	16				
13:00 - 14:00	37	575	34	74	475	155	59	11	107	128	4	16				
16:00 - 17:00	35	681	67	183	954	365	154	30	261	319	10	24				
17:00 - 18:00	37	575	34	74	475	155	59	11	107	128	4	16				
Total (6-hour peak)	253	3,911	231	504	3,231	1,053	401	76	729	871	28	109	30	30	30	30
Average (6-hour peak)	42	652	39	84	539	176	67	13	122	145	5	18	5	5	5	5

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W =	259	239	20
		Veh	*Ped*

Warranted

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	94 Street	Direction (EW or NS)	NS
Side Street (name)	Hospital Access	Direction (EW or NS)	EW
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

Road Authority:	City of Fort Saskatchewan
City:	City of Fort Saskatchewan
Analysis Date:	2015 Jul 27, Mon
Count Date:	2025 Jul 27, Sun
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
94 Street	NB	1		1			1		1
94 Street	SB	1		1			1		1
Hospital Access	WB				1				
Hospital Access	EB				1				

Are the Hospital Access WB right turns significantly impeded by through movements? (y/n) n
Are the Hospital Access EB right turns significantly impeded by through movements? (y/n) n

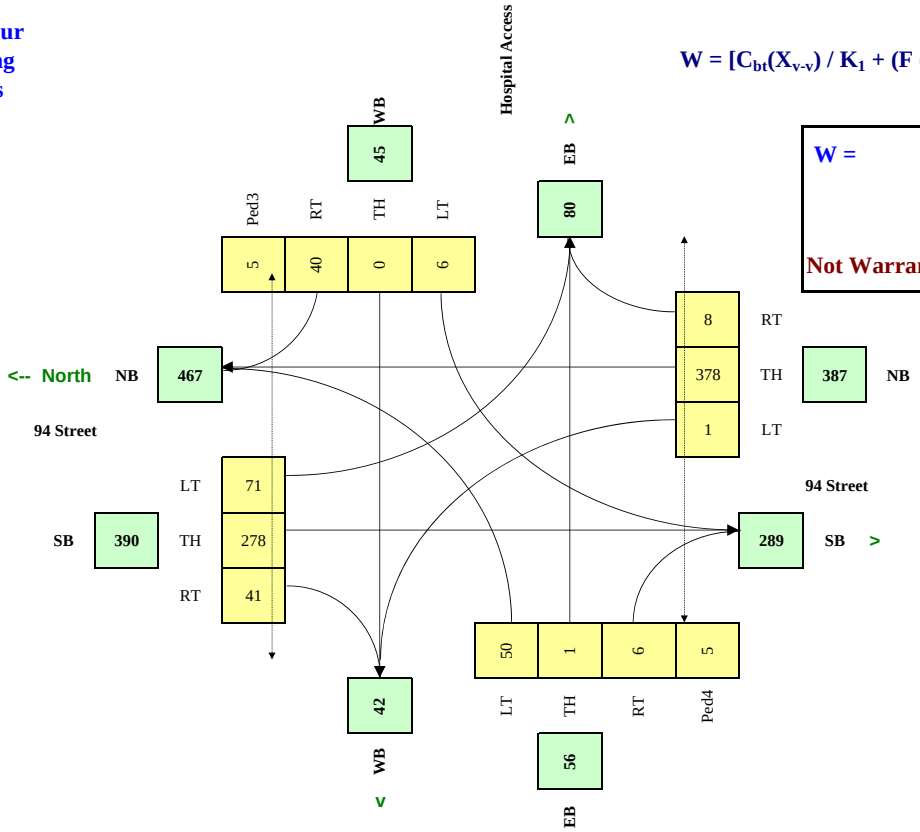
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
94 Street	NS	60	5.0%	n	5.5
Hospital Access	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1	Ped2	Ped3	Ped4
	NS			NS			EW			EW			NS	NS	EW	EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	1	636	19	88	129	17	6	1	49	78	1	12	30	30	30	30
8:30 - 9:30	1	333	7	63	245	36	5	0	35	44	1	5				
12:00 - 13:00	1	333	7	63	245	36	5	0	35	44	1	5				
13:00 - 14:00	1	333	7	63	245	36	5	0	35	44	1	5				
16:00 - 17:00	2	297	2	88	558	83	7	0	48	45	0	2				
17:00 - 18:00	1	333	7	63	245	36	5	0	35	44	1	5				
Total (6-hour peak)	**7**	**2,265**	**49**	**428**	**1,667**	**244**	**33**	**1**	**237**	**299**	**5**	**34**	**30**	**30**	**30**	**30**
Average (6-hour peak)	**1**	**378**	**8**	**71**	**278**	**41**	**6**	**0**	**40**	**50**	**1**	**6**	**5**	**5**	**5**	**5**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W =	52	47	5
		Veh	*Ped*

Not Warranted - Vs<75

RESET SHEET

City of Fort Saskatchewan - Traffic Signal Warrant Analysis

Main Street (name)	101 Street	Direction (EW or NS)	NS	Road Authority:	City of Fort Saskatchewan
Side Street (name)	88 Avenue	Direction (EW or NS)	EW	City:	City of Fort Saskatchewan
Quadrant / Int #		Comments	AM and PM Peak represent long term traffic. Remaining hours estimats are based on existing 6 highest hours.	Analysis Date:	2015 Jul 27, Mon
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	2025 Jul 27, Sun
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
101 Street	NB		1			1			2
101 Street	SB	1		1		1			2
88 Avenue	WB				1				
88 Avenue	EB				1				
Are the 88 Avenue WB right turns significantly impeded by through movements? (y/n)							n		
Are the 88 Avenue EB right turns significantly impeded by through movements? (y/n)							n		

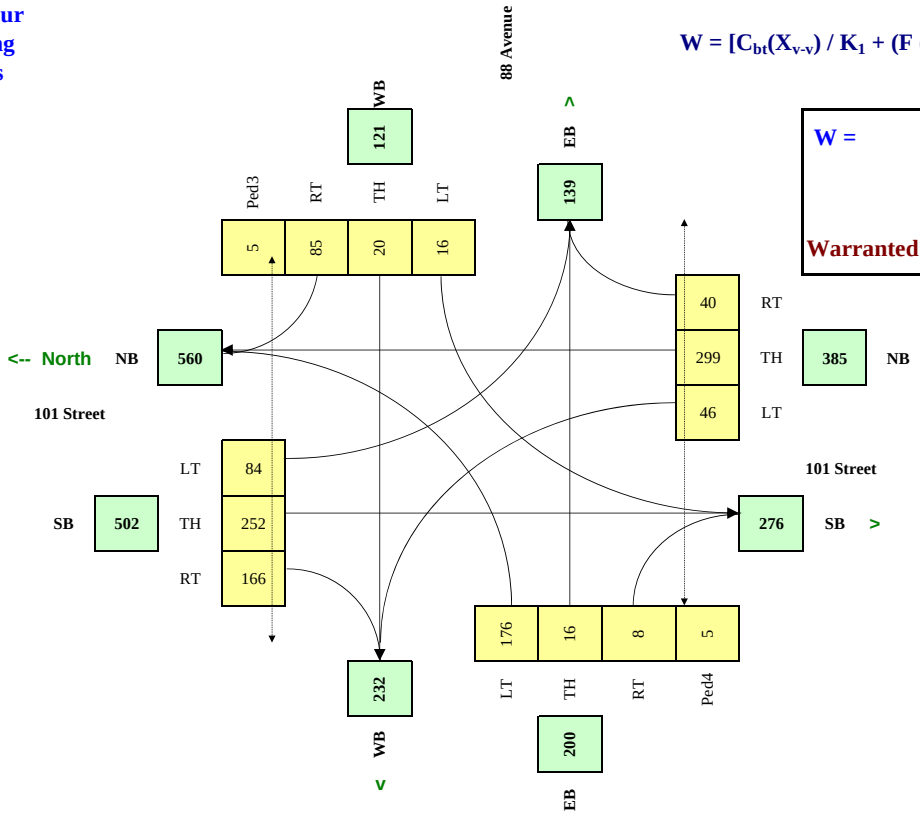
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	25,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
101 Street	NS	60	5.0%	n	0.0
88 Avenue	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:30 - 8:30	63	488	30	57	137	153	30	30	60	205	30	10	30	30	30	30
8:30 - 9:30	41	264	35	74	222	146	14	18	75	155	14	7				
12:00 - 13:00	41	264	35	74	222	146	14	18	75	155	14	7				
13:00 - 14:00	41	264	35	74	222	146	14	18	75	155	14	7				
16:00 - 17:00	51	252	67	150	487	257	10	20	150	231	10	10				
17:00 - 18:00	41	264	35	74	222	146	14	18	75	155	14	7				
Total (6-hour peak)	278	1,796	237	503	1,512	994	96	122	510	1,056	96	48	30	30	30	30
Average (6-hour peak)	46	299	40	84	252	166	16	20	85	176	16	8	5	5	5	5

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W =	136	125	11
		Veh	Ped

Warranted

RESET SHEET

Appendix B

Technical Memorandum

5307 – 47 Street NW, Edmonton, Alberta T6B 3T4 Phone: (780) 440-4411

Date: April 21, 2016 File: 1412-03

Attention: Mr. Grant Schaffer, C.E.T.
Director, Project Management
City of Fort Saskatchewan

From: Corry Broks, P.Eng.

Re: Addendum to Transportation Study for the Southfort Area Structure Plan in the City of Fort Saskatchewan

This Addendum to the Transportation Study for the Southfort Area Structure Plan in the City of Fort Saskatchewan has been prepared to address concerns expressed during presentation of the final report to City Council on January 12, 2016. The Addendum should be read in conjunction with the original report, and is intended to specifically address the issues and policies of the community, as expressed by City Council, and which are not reflected in the technical findings of the study and report. Specifically, the requested changes include the following.

1. *Change the designation of the south end of Southfort Drive between Southfort Boulevard and Southridge Boulevard from a collector roadway to an arterial roadway, with traffic signals at both intersections.*

   This change was requested because the Southridge Boulevard intersection at Southfort Drive had previously been constructed to a 4-lane divided arterial configuration. In addition, 2 lanes of the ultimate 4 lane roadway exist for the south leg of Southfort Drive to Southfort Boulevard, and the required right-of-way to accommodate the arterial had been protected.

   The collector designation was assigned to the south leg of Southfort Drive in the report based on modeling results for the long term, or build out of the Southfort Area. Our projected volumes of approximately 4000 vehicles per day would typically be accommodated by a collector roadway, with one lane of traffic in each direction. Roundabout intersection control at the Southfort Boulevard and Southridge Boulevard intersections would provide superior operations to a signalized intersection.

   The City has indicated a desire to maintain consistency along the Southfort Drive corridor to Southridge Boulevard, and accordingly, we have prepared an exhibit (**Exhibit ES-A1**), identifying Southfort Drive as an arterial roadway throughout the Southfort Area.

2. *Designate the roundabout intersections along 94 Street as intersection control to be reviewed at the time of construction.*

   We understand this change was requested due to concerns that roundabout intersection control may not be well accepted by the public and that projected traffic volumes on 94 Street could be much higher if lands to the south are annexed and developed in the future.

   The build out model developed for Southfort estimates that traffic volumes on 94 Street and Southridge Boulevard, south of the proposed Sienna Boulevard, are well below the threshold for a 4-lane arterial road, and could readily be accommodated by a collector road with one lane in each direction. 94 Street /

Southridge Boulevard will not likely warrant traffic signals at intersecting collectors, and would function well as stop-controlled for the minor collector roads entering 94 Street / Southridge Boulevard. It was concluded during the study that 94 Street / Southridge Boulevard operating as a free flow, wide collector would promote speeding and safety concerns due to the alignment proposed in the Area Structure Plan (long, straight sections and generous curves). Roundabout intersection control on this roadway would provide traffic calming, while allowing free-flow, which is considered highly desirable and context sensitive for this roadway through a primarily low density residential area.

We have also re-examined the potential for significant increased traffic on 94 Street / Southridge Boulevard if annexation and significant development occurs in the future, south of the Southfort Area. This is unlikely to occur due to the primarily residential nature of the land use along 94 Street, not being conducive to attracting traffic to this area. It could be argued that by providing roundabout intersection control and a 2-lane roadway for 94 Street, shortcutting through the neighbourhood would be discouraged, which would be highly desirable.

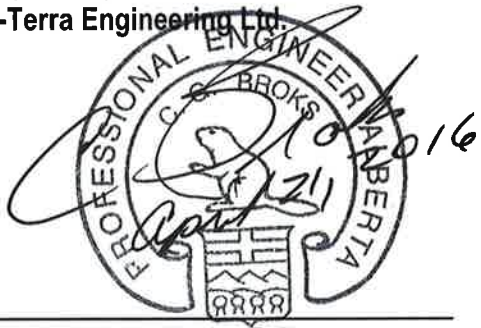
Exhibit ES-A1 has been revised to show that roundabout intersections along 94 Street / Southridge Boulevard should be reviewed at the time of implementation to confirm their suitability. We also suggest that this corridor be reviewed during the Transportation Master Plan update.

3. *Develop a revised cross-section for 94 Street / Southridge Boulevard based on a 28m wide right-of-way that would allow widening the carriage way to a 4-lane undivided standard.*

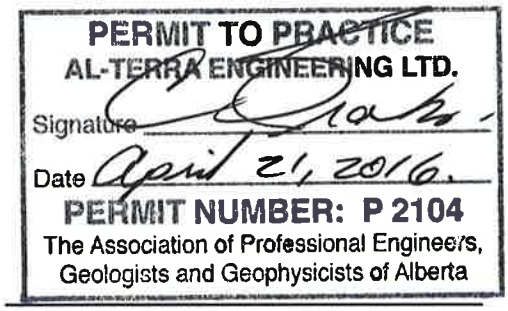
   The proposed cross-section is shown on **Exhibit A1**, and is based on initially constructing to the City's 12.0m wide collector roadway, in accordance with the recommendations in the original report, and then, if required in the future, widening to 14.5m to provide a 4-lane undivided roadway. Careful consideration for locating infrastructure outside of the widened area as shown would provide the most cost effective approach.

This Addendum to the Transportation Study for the Southfort Area Structure Plan in the City of Fort Saskatchewan as prepared at the direction of Fort Saskatchewan City Council, and provides specific changes to the final report where the wishes and policies of the community do not align with the technical findings of the engineering study and report. As this Addendum covers only a small part of the original study, it should be read and considered in conjunction with the original study.

Prepared by:
Al-Terra Engineering Ltd.



Corry Broks, P.Eng.

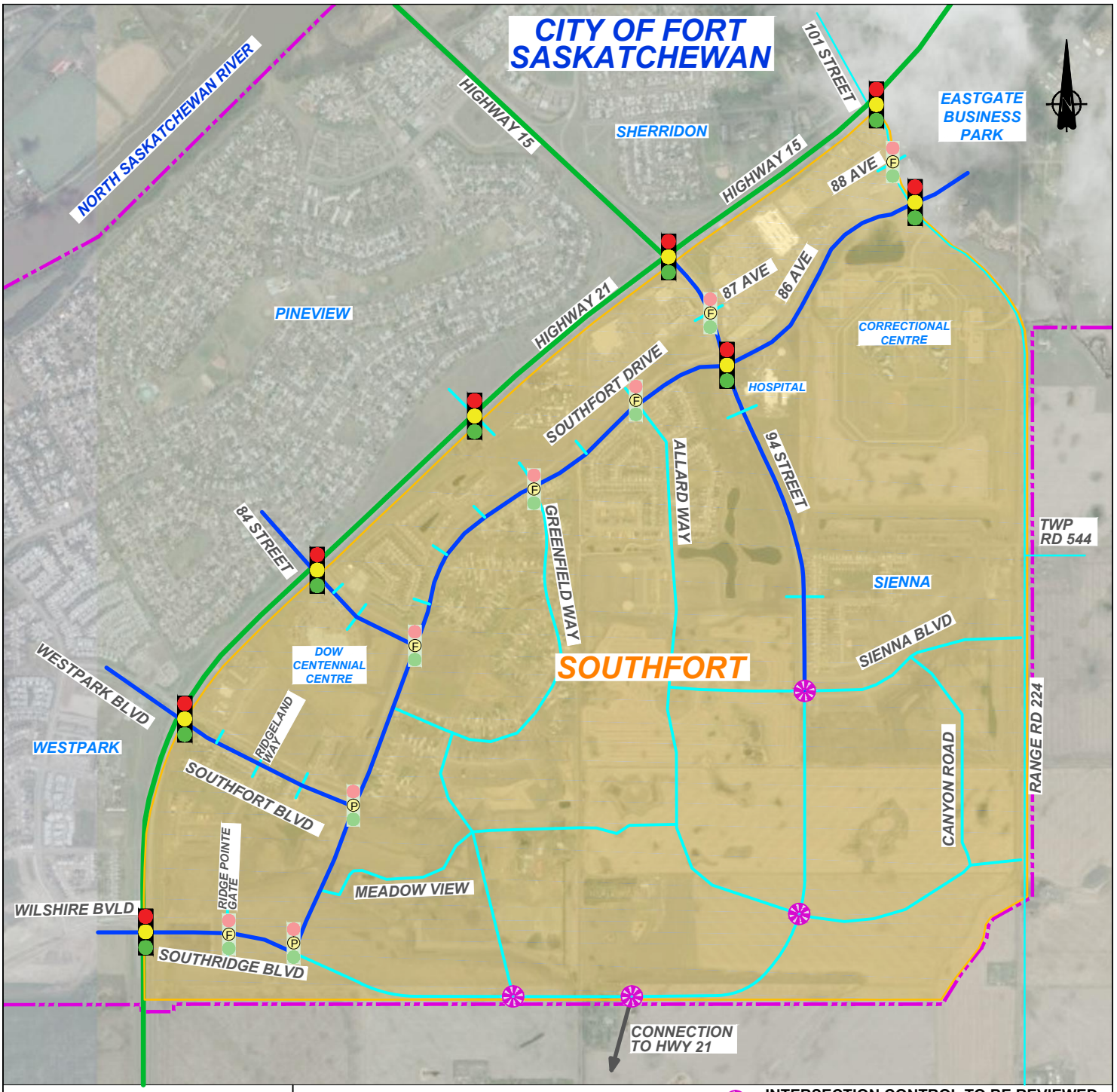


Permit to Practice

/jl

Enclosures:

- Exhibit ES-A1 – Intersection Controls, Full Development of Southfort
- Exhibit A1 – Proposed Collector Typical Cross-Section



CITY OF FORT SASKATCHEWAN

Al-Terra

CITY BOUNDARY

STUDY AREA

ALBERTA HIGHWAY

ARTERIAL ROAD

COLLECTOR ROAD

INTERSECTION CONTROL TO BE REVIEWED PRIOR TO CONSTRUCTION

EXISTING SIGNAL

PROPOSED SIGNAL

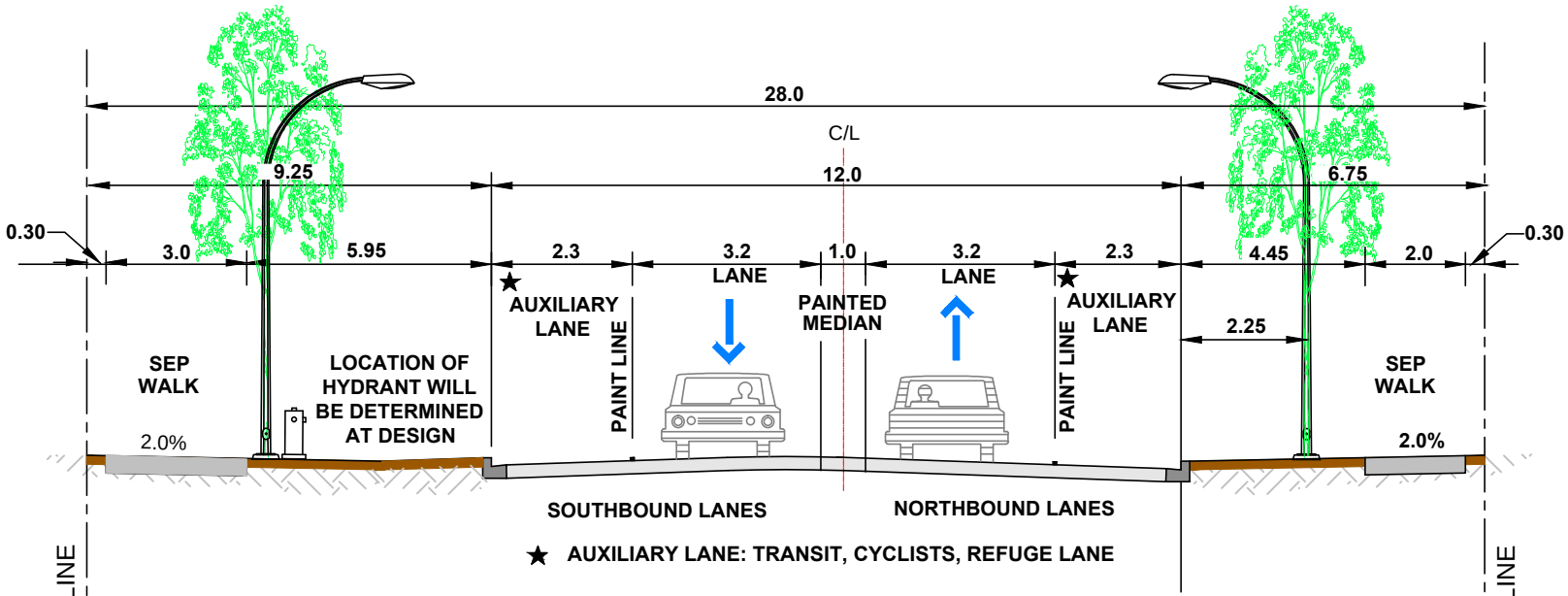
POTENTIAL SIGNAL

CITY OF FORT SASKATCHEWAN
SOUTHFORT TRANSPORTATION STUDY - ADDENDUM
INTERSECTION CONTROLS -
FULL DEVELOPMENT OF SOUTHFORT

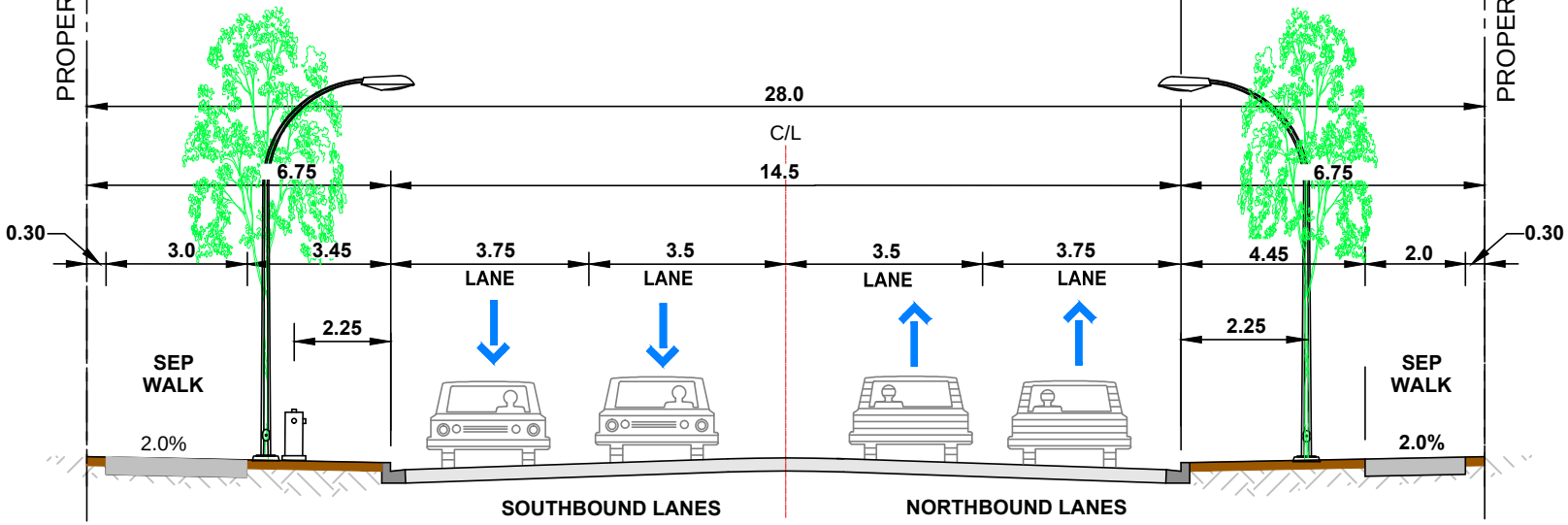
N.T.S.

DATE: APRIL, 2016

EXHIBIT ES-A1



COLLECTOR TYPICAL CROSS-SECTON - ROUNDABOUT OPTION



FOUR LANE COLLECTOR - TYPICAL CROSS-SECTON

CITY OF FORT SASKATCHEWAN

Al-Terra

CITY OF FORT SASKATCHEWAN

SOUTHFORT TRANSPORTATION STUDY - ADDENDUM

PROPOSED COLLECTOR TYPICAL CROSS-SECTON

N.T.S.

DATE: APRIL, 2016

EXHIBIT A1

CITY OF FORT SASKATCHEWAN

Sale of Old Hospital Land

Motion:

That Council authorize Administration to list land for sale, legally described as Lot 17, Block 22, Plan 1523644 and Lot 18, Block 22, Plan 1523644, at market value as determined through a professional appraisal.

Purpose:

To move forward with the redistricting and listing for sale of the Old Hospital Land, described as Lot 17, Block 22, Plan 1523644 and Lot 18, Block 22, Plan 152364.

Background:

In October of 2014, the full 7.27 acre Old Hospital land was appraised as follows:

Short Legal Description	Size	Value	Unit Value
Lot A, Plan 911NY; Lot 8, Block 22, Plan 6180NY; Lot R1, Block 22, Plan 3610RS	7.27 acres	$5,450,000 (less demolition)	$750,000/acre (less demolition)

In February of 2015, Council agreed to subdivide and market the Old Hospital Land. The intention of subdividing the parcel into three lots was to put the 4.47 acre, northern-most lot up for sale, designate the 1.21 acre, southern-most lot for social benefit, and the use of the 1.24 acre, middle lot would be determined at a later date, based on the developments at either the north or south lots.

In September of 2015, the newly subdivided Old Hospital Land was re-appraised in order to reflect any changes in market conditions and the effect of subdivision. The lots were appraised as follows:

Short Legal Description	Size	Value	Unit Value
Part of Lot 8/22/6180NY; Lot R1/22/3610RS	1.55 acres	**$1,125,000**	$725,000/acre
Lot 18, Block 11, Plan 1523644	1.24 acres	**$900,000**	$725,000/acre
Lot 17, Block 11, Plan 1523644	4.47 acres	**$2,905,000**	$650,000/acre

Following the appraisal, the intention was to redistrict the 4.47 acre northern-most lot from Direct Control Council (DC(C)) to High Density Multiple Resident District (RMH) in order to provide a clear direction for the use of the land, as well as guidelines and regulations for prospective buyers.

In November of 2015, the City was approached by parties interested in the 4.47 acre lot. As a result, in December 2015 the 4.47 acre northern-most lot was put on the market at the appraised price of $2,905,000, based on DC(C) zoning. Information on the site was sent out to developers and real estate professionals within the region, advertisements were placed in regional and western Canadian real estate publications, and a sign was placed on the site.

In March of 2016, Council granted the 1.21 acre southern-most lot to the Heartland Housing Foundation on the condition it be used for the development of a seniors/affordable housing apartment complex.

To date, the City has received 13 inquiries related to the 4.47 northern-most lot, but has not received any formal offers.

The Old Hospital Land is currently being re-appraised in order to reflect changes in market conditions and the granting of the 1.21 acre parcel to the Heartland Housing Foundation. The reappraisal will include the potential impact of amalgamation of the 4.47 acre northern-most lot and the 1.24 acre middle lot.

Plans/Standards/Legislation:

If approved, this motion will initiate the next steps for the sale of the Old Hospital Land, which will include an amendment to the Land Use Bylaw and development of conditions of sale. Administration intends to bring this forward to Council following the summer break.

The sale of the Old Hospital Land aligns with the following City of Fort Saskatchewan Strategic Plan Goals:

- Promote Sustainability through infill development.
- Explore opportunities to increase accessible and affordable housing within the community.
- Analyze our current financial policies and develop a strategy to ensure that future financial requirements are planned and provided for.

Financial Implications:

Proceeds from the sale of the land would be placed in Municipal Land Reserve.

Employing the services of a real estate professional to list the property will require a commission fee. Commission fees on this type property could range between 3% to 5%.

Council will have the opportunity to consider all submitted offers, but would not be required to accept any.

Internal Impacts:

Economic Development will no longer serve as the real estate sales representative for this property.

Recommendation:

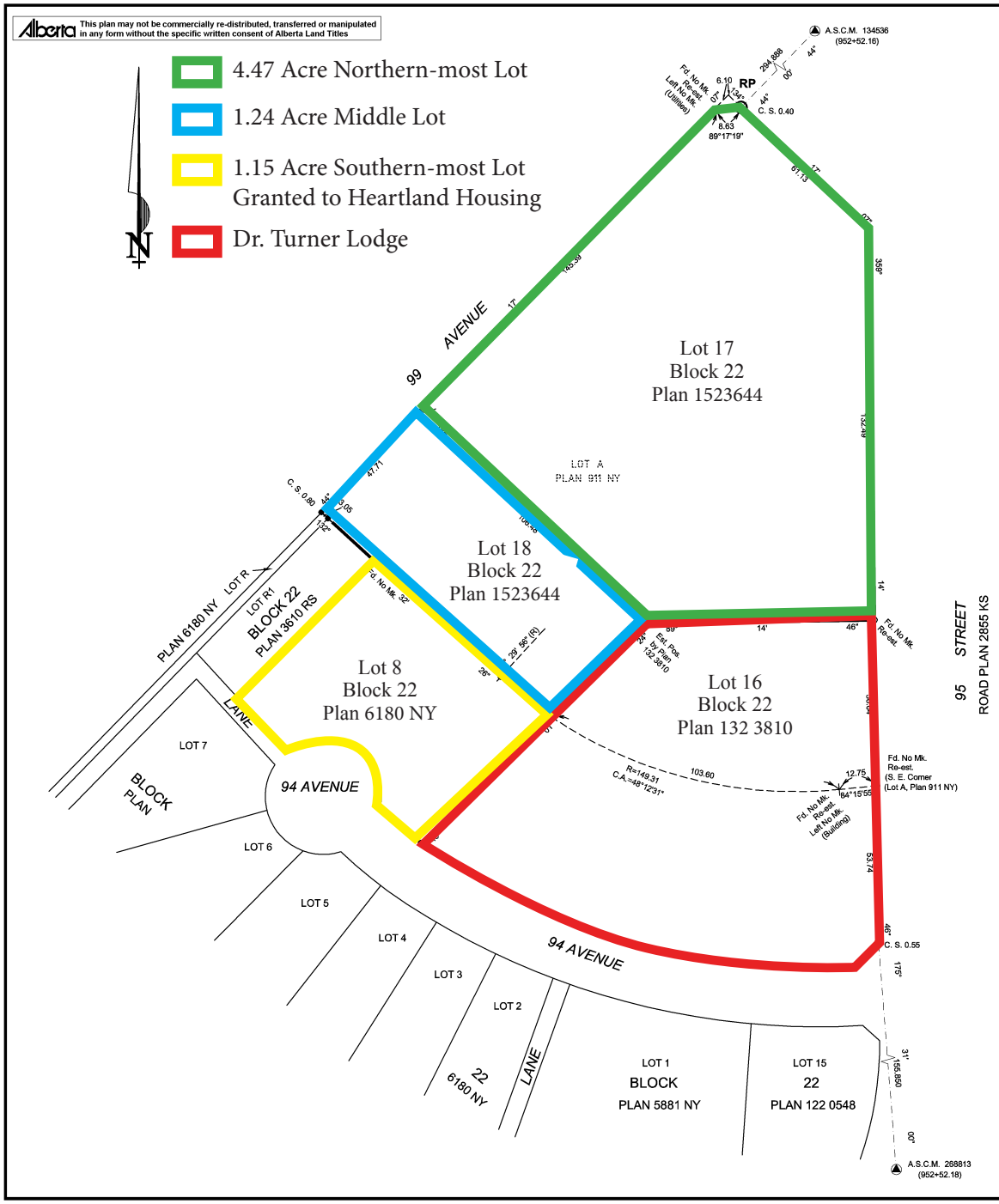
That Council authorize Administration to list land for sale, legally described as Lot 17, Block 22, Plan 1523644 and Lot 18, Block 22, Plan 1523644, at market value as determined through a professional appraisal.

Attachment:

Registered Subdivision Plan

File No.:

Prepared by:	Mike Erickson Economic Development Officer	Date: June 22, 2016
Approved by:	Troy Fleming General Manager, Infrastructure and Community Services	Date: June 22, 2016
Reviewed by:	Kelly Kloss City Manager	Date: June 22, 2016
Submitted to:	City Council	Date: June 28, 2016



LAND TITLES OFFICE

PLAN No. 1523644

ENTERED AND REGISTERED

ON August 12, 2015

INSTRUMENT No. 152 241 928

A. Bennett

A.D. REGISTRAR

N.A.L.R.D.

SURVEYOR:

NAME: DAVID J. McARTHUR, A.L.S.

DATE OF SURVEY: JUNE 5, 2015

IN ACCORDANCE WITH THE PROVISIONS OF THE SURVEYS ACT

ALBERTA LAND SURVEYORS' ASSOCIATION PERMIT NUMBER P 073 PALS GEOMATICS CORP.

SUBDIVISION AUTHORITY

NAME: CITY OF FORT SASKATCHEWAN

FILE NO.

REGISTERED OWNERS

THE CITY OF FORT SASKATCHEWAN

NOTES:

- STATUTORY IRON SURVEY POSTS FOUND SHOWN THUS •
- STATUTORY IRON SURVEY POSTS PLANTED AND MARKED WITH CORPORATION PERMIT NUMBER P073 SHOWN THUS ○
- ALBERTA SURVEY CONTROL MARKERS (A.S.C.M.) SHOWN THUS ▲
- GEO-REFERENCE POINT (RP) SHOWN THUS ○ RP
- BEARINGS ARE NAD83, 3TM GRID AND ARE DERIVED FROM G.N.S.S. OBSERVATIONS.
- COMBINED SCALE FACTOR IS 0.999837.
- REFERENCE MERIDIAN IS 114°.
- GEO-REFERENCE POINT (RP) IS A Fd. I, WITH 3TM NAD83(ORIG) COORDINATES: NORTHING 5952720.894, EASTING 51346.751.
- ALL DISTANCES ARE SHOWN IN METRES AND DECIMALS THEREOF.
- ALL DISTANCES ON CURVED BOUNDARIES ARE ARC LENGTHS.
- AREA AFFECTED BY THE REGISTRATION OF THIS PLAN BOUNDED THUS ——— AND CONTAINS: *2.31 ha.*

ABBREVIATIONS DENOTED THUS:

C.A. - CENTRAL ANGLE	G.N.S.S. - GLOBAL NAVIGATION SATELLITE SYSTEM	Mk'd - MARKED	Re-est. - RE-ESTABLISHED
C.S. - COUNTERSUNK	ha. - HECTARE	MR - MUNICIPAL RESERVE	Res. - RESTORED
C. OF T. - CERTIFICATE OF TITLE	I. - STATUTORY IRON POST	N. - NORTH	RGE. - RANGE
E. - EAST	M. - MOUND	Pl. - PLANTED	R/W - RIGHT OF WAY
ER - ENVIRONMENTAL RESERVE	Mp. - MARKER POST	Pos. - POSITION	S. - SOUTH
Est. - ESTABLISHED	MER. - MERIDIAN	PUL - PUBLIC UTILITY LOT	SEC. - SECTION
Fd. - FOUND	Mk. - MARK	(R) - RADIAL	TWP. - TOWNSHIP
		R - RADIUS	W. - WEST

SHERRIDON

PLAN SHOWING SURVEY OF

SUBDIVISION

OF

LOT A, PLAN 911 NY

WITHIN

RIVER LOT 13, FORT SASKATCHEWAN SETTLEMENT

(THEORETICAL - S.E.1/4 - SEC. 31 - TWP. 54 - RGE. 22 - W. 4TH MER.)

FORT SASKATCHEWAN - ALBERTA

DAVID J. McARTHUR, A.L.S. **2015**

SCALE: 1: 1000 0 10 20 30 40 50 100 150 METRES

Pals Geomatics Corp.
Phone: (780) 455 - 3177 Fax: (780) 451 - 2047
Email: edmonton@palsgeomatics.com
10704 - 176 Street NW, Edmonton, Alberta T5S 1G7

FILE NO.	11500025S
FIELD BY:	JT
DRAFTED BY:	LH
CHECKED BY:	JM

CITY OF FORT SASKATCHEWAN

City Land Purchase

Motion:

That Council authorize the use of $4,408,000 from reserves ($2,672,742 from the Land Purchase Reserve and $1,735,258 from the Self-Financing Infrastructure Reserve) to complete the sale agreement of 7.7 acres of property from Southfort Development Corporation designated as Lot 5, Block 1, Plan 1424386 as presented in Figure 1 “Fire Station Land June 28, 2016”.

Purpose:

For Council to authorize the purchase of property to be used for future City operational needs.

Background:

Fire Station Land

As the City of Fort Saskatchewan is a fast growing municipality, managing growth as it relates to municipal infrastructure is a priority for the community. Managing growth in a proactive manner requires the City to plan ahead for future needs and to ensure it is not left having to build or purchase assets under duress.

Current fire response service levels within the community are acceptable, however the continued growth in the community will require the construction of a second fire station in order to meet the service demands of currently undeveloped lands.

The City engaged Darkhorse Emergency Services to undertake an analysis of current response service levels and to create a model that will allow for the evaluation of a second fire station location. Our analysis has shown that while a second Fire Station is not required at this time, planning for the construction of that facility should begin within the next few years.

The City undertook an evaluation of available land for the consideration of a future Fire Station by analyzing all available land options that currently exist within the appropriate area identified as suitable for a second Fire Station. At this time, there are limited options available for the purchase of suitable land for this purpose and as such, Administration is recommending that Council immediately authorize the purchase of land for future construction of a second Fire Station. Land purchase options diminish as time passes, and available land maybe sold to other purchasers.

The main criteria used for the evaluation of potential sites was the location, and secondary considerations were the price, site access, and site size. Based on all available options presented, Administration recommends purchasing Lot 5, Block 1, Plan 1424386 as shown on Figure 1. It is recommended that the entire 7.7 acre piece of land shown within the red box be purchased. Administration has signed a sale agreement that is conditional on receiving Council’s formal approval.

Currently Fire Service response times are shown that calls are responded to within a 10 minute response time 75.7% of the time. This is considered an acceptable standard for municipalities, and is comparable to other municipalities with full-time fire departments. Utilizing our Fire Station Location Model, the additional location would see an immediate increase in performance to 81.9%, making this location acceptable from a service delivery perspective for future growth. Our goal is to sustain service levels above 80% when possible.

The construction of a new Fire Station has been on the 10-Year Capital Plan for several years and although it is not needed at this time, accommodations should be made to ensure the City is prepared when it is deemed necessary. The proposed 10-Year Capital Budget to be presented

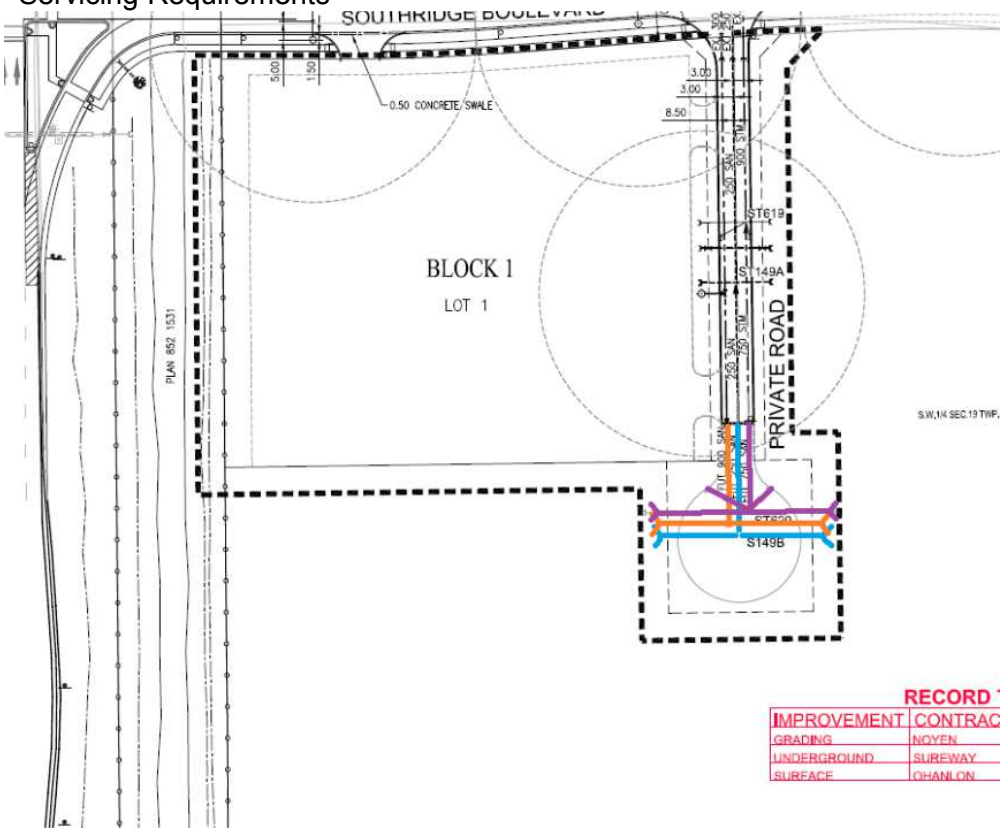
this fall will recommend facility design work begin in 2018, with anticipated construction proceeding in 2020. The land not needed for a Fire Hall at this location provides a future Council with options to accommodate City operations, or to sell the unused portion for future development opportunities.

Figure 1 - Fire Station Land – June 28, 2016

Purchase Conditions
Known conditions of sale at this time include:

- Total cost of land purchase and servicing to meet our obligations under the sale agreement is $4,408,000 for the 7.7 Acres as shown in Figure 1.
- The City is required to complete the servicing work for the parcel (as well as the remnant 4.4 Acre parcel to the west created by the subdivision) prior to the end of the 2017 construction season as per Figure 2.The City will complete the final grade of the site.
- Sale conditional to receiving Council approval.

Figure 2 – Servicing Requirements



Financial Implications:

Currently, the Land Purchase Reserve balance is $2,672,742 and the uncommitted Self-Financing Infrastructure Reserve balance is $10,016,377. Operating costs with the purchase of this land are considered to be minimal.

Recommendation:

That Council authorize the use of $4,408,000 from reserves ($2,672,742 from the Land Purchase Reserve and $1,735,258 from the Self-Financing Infrastructure Reserve) to complete the sale agreement of 7.7 acres of property from Southfort Development Corporation designated as Lot 5, Block 1, Plan 1424386 as presented in Figure 1 “Fire Station Land June 28, 2016.”

Prepared/Approved by:	Troy Fleming General Manager Infrastructure and Community Services	Date: June 21, 2016
Reviewed by:	Kelly Kloss City Manager	Date: June 22, 2016
Submitted to:	Council	Date: June 28, 2016