CITY OF Camrose

FINAL REPORT

East Gateway Area Structure Plan

July 2016

Acknowledgements

The following people are recognized for their efforts and insights in contributing to the preparation of this Area Structure Plan (ASP):

Aaron Leckie, BA, MCP (Cand.), Director of Planning & Development Services
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Wayne Steel, A.A.E., Airport Manager, City of Camrose
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Pete Bayerle, CP Rail, Public Works Manager

Plan area landowners and members of the public who attended meetings and provided comments about the ASP.

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1.0 Introduction

1.1 Plan Area Location

The East Gateway Area Structure Plan (ASP) area applies to the area shown on Figure 1. The area is located in the northeast quadrant of Camrose and is bounded by:

1. Township Road 471 and the CN Railway right-of-way to the north;
2. Highway 13 and the CP Railway right-of-way to the south;
3. 39 Street to the west; and
4. Range Road 200 to the east.

Highway 26 runs east-west through roughly the bottom third of the plan area.

These lands consist of 396.8 (ha) and a majority of the lands within the plan area were annexed to the City in 2009.

1.2 Name of Development Area

The plan area is identified as the East Gateway ASP. The City of Camrose Municipal Development Plan (2011) identifies the East Gateway area as one of the future planning areas in the City.

1.3 History

Lands within the plan area have historically been used for agricultural purposes. Approximately half of the lands within the plan area are currently under agricultural production. A former dairy farm and some of its buildings, dating from the 1930s, sits on a triangular parcel south of Highway 26 and west of Range Road 201.

In 2009, the City of Camrose annexed approximately 1,147 ha of land from Camrose County, including the eastern half of the East Gateway plan area. The 2009 Annexation Report, prepared by the Municipal Government Board, identifies that the annexed lands will accommodate a mix of residential, commercial and industrial development and meet the City's land needs until 2039. The Report also identified necessary infrastructure improvements to accommodate the anticipated development, including the following improvements for the East Gateway ASP area:

- Upgrades to Highway 26, Range Road 200 and Exhibition Drive to an urban standard;
- Servicing properties with a water network of transmission and distribution lines from the north, south and west, and with lines extended to the east and southeast to encourage future growth;
- Extending sanitary servicing from the south and the west. Services in the southeast section of the plan area will be extended through properties to the east and north to permit drainage;
- Ensuring the all developments will retain storm run-off, release flows at pre-development rates, and will convey the water to the northwest and southwest; and
- Designing storm water management facilities, located in the northern portion of the plan area, to discourage the presence of birds and waterfowl that may be a threat to the nearby Camrose Airport.

1.4 Purpose

The purpose of the East Gateway ASP is to provide a detailed framework for the future development of the East Gateway area, and increase the commercial and industrial land supply in the City.

The ASP has been prepared in conformance with the requirements of the City of Camrose Municipal Development Plan (MDP), and the *Municipal Government Act*.

As required, the ASP has been designed to:

1. Conform to the Future Land Use Concept (2014) Map 1 of the Intermunicipal Development Plan Bylaw 1345, as amended by Bylaw 2780/14;
2. Conform to the Land Use Concept (2011), Map 2 of the Municipal Development Plan Bylaw 2188/99, as amended by Bylaw 2684/11;
3. Establish the conceptual land use, municipal reserve, transportation and servicing patterns, and development phasing for East Gateway to implement the MDP, which designates this portion of the City for commercial and industrial expansion; and
4. Summarize existing physical features and development conditions, and provide public engagement opportunities.

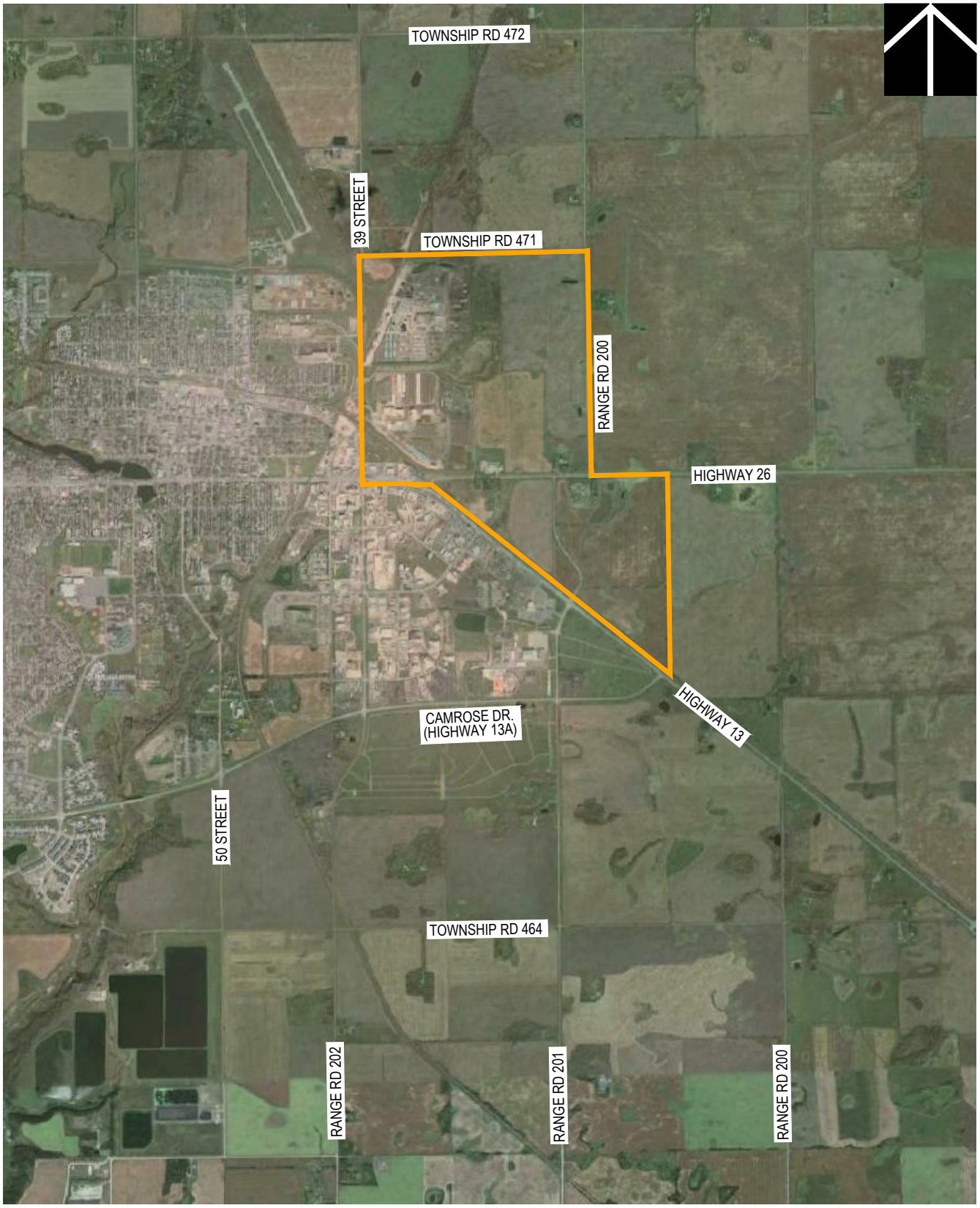
1.5 Area Structure Plan Vision

The East Gateway plan area will support regional and local economic opportunities by developing a commercial and industrial business park that has high aesthetic standards given its proximity to two major entrance corridors to the City; these being Highway 13 and Highway 26. The development of the commercial and industrial business park will be founded on sustainable development practices, and it is anticipated the commercial and industrial business park will positively contribute to the City's economy, protect on-site wetlands, and create a unique sense of place. It is expected that the East Gateway plan area will develop into an employment and services centre where people can work, shop, and play, while enjoying easy access to and connectivity throughout Camrose.

1.6 Area Structure Plan Goals

The primary goals of the East Gateway ASP are to:

1. Accommodate industrial and highway commercial development within the plan area;
2. Ensure development along Highway 13 and Highway 26 is designed to high aesthetic standards appropriate to its location as key entrance corridors to the City;
3. Protect on-site wetlands and historical resources in accordance with the requirements of the Province of Alberta;
4. Provide an efficient transportation network, including railways and a trail network, to address regional and local needs, provide sufficient access to travellers and exposure for commercial businesses;
5. Provide appropriate servicing for each lot. Private on-site servicing shall be provided for lands located in the northwest portion of the plan area. The balance of the plan area will be provided with municipal services.
6. Ensure cost sharing for on-site major infrastructure.



LEGEND

ASP BOUNDARY - GROSS AREA = 396.8 ha (980.5 ac)

Spencer McCann / Mar. 9, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\03_Reports\32_Working\ASP\Figure 1 Location Plan.dwg

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AREA STRUCTURE PLAN
LOCATION PLAN

FIGURE 1

0 150 300 450 600m

1.7 Timeframe of the Plan

Based on the 2009 Annexation Report it is anticipated that the plan area will be developed over a period of 30 years, subject to market demand. Development phasing and development timeframes will be reviewed as part of an Economic Development Strategy and/or Retail and Industrial Demand Study and Strategy; should the City undertake such studies.

2.0 Statutory Compliance

2.1 Intermunicipal Development Plan

The Intermunicipal Development Plan (IDP), Bylaw 1345 & 2780/14 as amended, for Camrose County and the City of Camrose applies to the plan area. The IDP Future Land Use Concept Map designates the area bordering the north section of the plan area as future commercial and industrial, and the area bordering the east boundary of the plan area as part of the Cooperation Zone, which is identified as lands into which the City of Camrose is predicted to grow. This type of development is expected to provide a natural transition to the City of Camrose and excludes agricultural development.

2.2 Municipal Development Plan

The City of Camrose Municipal Development Plan (MDP), Bylaw 2684/11 Future Land Use Policy, Map 2, designates the plan area for industrial with highway commercial and mixed use land uses. The East Gateway ASP complies with these land use designations stipulated for the plan area.

The MDP also includes policy direction for the development of specific land uses within the City of Camrose. The policies relevant to the plan area, including those which pertain to highway commercial and industrial uses, open space, transportation and servicing, as outlined in the MDP, are described in following table.

Table 1: MDP Policies

Policy Area	Policy
Highway Commercial	The City of Camrose shall support the establishment of future fringe, or highway commercial uses in locations as shown on the Future Land Use Map.
	The City of Camrose shall support properly planned and developed highway commercial developments along Highway 13 on the west and east ends of the City.
	The City of Camrose shall require auxiliary lanes, service roads or suitable access to all new highway commercial development in accordance with the Highway 13 Transportation Functional Plan.
Industrial Development	The City of Camrose shall support logical extensions of existing industrial areas in close relation to urban land uses with due consideration to municipal servicing and environmental impact.
	The City of Camrose shall continue to provide ample lands for industrial use, and support the provision of a variety of parcel sizes, with the desired combination of services, municipal utilities and transport facilities.
	The City of Camrose shall protect the designated industrial areas from conflicting land uses in the short and long term.
Recreation and Open Space Development	The City of Camrose shall preserve and make accessible the community's physical resources, both natural and historic.
	The City of Camrose shall support the designation of lands for park and open space in conjunction with the subdivision process.
	The City of Camrose shall support the ongoing development of trails and trail 'connectors' in both established and new subdivisions with the purpose of linking parks, green spaces and facilities to the linear park system.

Chapter 7 – Land Use Policies of this ASP includes policies that support the MDP policies outlined above.

2.3 Existing Area Structure Plan

There have been no previous ASPs approved for the plan area.

In 2009 the City began a process to develop an ASP for the plan area. However, due to an annexation involving the subject lands and changing market conditions progress on the preparation of the ASP was suspended.

2.4 Adjacent Area Structure Plan

The Bayou PermaPipe Area Structure Plan (ASP) currently applies to the lands to the north of the plan area and within Camrose County (SW12-47-20-4). The ASP includes a land use concept plan that identifies future uses to include general agriculture, rural industrial, environmental reserve, municipal reserve, and a public utility lot.

3.0 Municipal Documents

3.1 City of Camrose Growth Study

The 2006 City of Camrose Growth Study Update prepared by Brown & Associates identified future land requirements for 30, 40 and 50 year timeframes. Based on the developable land available (at the time of the study) and the estimated population growth, lands have been identified as necessary to accommodate growth over those timeframes. Future growth has been limited in the northwest and northeast due to the costs of upgrading sanitary and stormwater systems for those areas. The lands bordering the plan area to the east have been identified as part of the land required to accommodate 30 year growth.

3.2 Transportation Master Plan

The Transportation Master Plan (TMP), prepared by ISL Engineering and Land Services in 2007, proposed to realign Highway 26 to address perceived safety issues at the existing intersection with Highway 13 and the CP rail right-of-way crossing. The TMP further identified that Highway 26 would be realigned to 44 Avenue (44 Avenue was a misprint in the TMP. The realignment of Highway 26 was intended to connect with 36 Street). The TMP also shows the extension of the realignment of Exhibition Drive, from Highway 13 to Highway 26, aligning with Range Road 200.

These roadway modifications have been re-evaluated for the purposes of this ASP. The realignment of Highway 26 is no longer a recommended alignment for the following reasons:

- Realignment will be through an existing wetland that was not identified in the TMP. Abandoning the realignment avoids disturbance of this wetland, potential environmental acquisition and compensation costs and permitting.
- The existing Highway 26 alignment can accommodate development traffic volumes with minimal improvements.
- The cost to abandon the existing Highway 26 alignment and railway crossing, construct a new highway, and new railway crossing is considered to be cost prohibitive and as a result would carry financial impacts on future land development.
- Maintaining the existing alignment creates a larger, contiguous land development parcel.

3.3 Highway 13/26 Functional Planning Study

The Highway 13/26 Functional Planning Study, prepared by ISL Engineering and Land Services in 2000, identified the need to realign Highway 26 and Exhibition Drive. The ASP land use concept is consistent with the Study, however the realignment of Highway 26 is no longer a recommended alignment for the following reasons:

- Realignment will be through an existing wetland that was not identified in the Functional Planning Study. Abandoning the realignment avoids disturbance of this wetland, potential environmental acquisition and compensation costs and permitting.
- The existing Highway 26 alignment can accommodate development traffic volumes with minimal improvements.
- The cost to abandon the existing Highway 26 alignment and railway crossing, construct a new highway, and new railway crossing is considered to be cost prohibitive and as a result would carry financial impacts on future land development.
- Maintaining the existing alignment creates a larger, contiguous land development parcel.

3.4 Traffic Impact Assessment

ISL Engineering and Land Services has prepared a Traffic Impact Assessment (TIA) for this ASP, and is attached as Appendix A.

3.5 Water Distribution System Master Plan Update

The Water Distribution System Master Plan Update, prepared by Associated Engineering in 2006, contains future water servicing plans for the City including the ASP area. Planned future servicing of the ASP area includes a 600.0 mm main from the Water Treatment Plant in the south as well as upgraded 250.0 mm/300.0 mm pipes in the existing system west of the ASP area, some of which have already been constructed since 2006. An existing water main along 39 Street was upgraded to a 250.0 mm pipe, and a new 250mm pipe connection between 39 Street and the intersection of 41 Street and 52 Avenue was installed. These upgrades have supplemented the fire flows to the area. In addition, two 300.0 mm water mains have been installed across SW1-47-20-4. Interim water servicing of the ASP area may be possible from an existing 300.0 mm main located south of the ASP area, however until these pipe upgrades (and potential fire pump upgrades) are completed, fire flows in the ASP area may remain below standards.

These infrastructure requirements have been integrated into the land use concept.

3.6 Sanitary Sewer Master Plan

The Sanitary Sewer Master Plan, prepared by Associated Engineering in 2007, contains future sanitary servicing plans for the City including the ASP area. The Master Plan proposed a lift station to service low-lying lands in the northeast portion of the ASP area. This lift station would discharge to the south, through the remainder of the ASP area. Due to downstream existing system capacity constraints, in-line storage is required for the east and south portions of the ASP area (including the lift station catchment area) which will drain south by gravity to the existing system.

The west half of the ASP area would drain by gravity to the existing system in the west without storage. These infrastructure requirements have been integrated into the land use concept.

3.7 Stormwater Master Plan Update

The Stormwater Master Plan Update, prepared by Associated Engineering in 2008, contains future stormwater management plans for the City including the ASP area. Stormwater management facilities (e.g. storm ponds) are required to control the quantity and quality of stormwater runoff and to protect the downstream systems, including Camrose Creek which has known erosion issues.

The Master Plan indicates several upgrades that have been carried out in the downstream systems which will be beneficial for servicing of the south basin of the ASP area. Ponds in the south basin of the ASP area would discharge to existing storm sewers or channels to the south and west. An upgrade to the north ring-road drainage channel (as either a channel upgrade or new pipe) is required to service the north basin of the ASP area. The storm system along the future north ring road has not yet been constructed, but would be required for components of development within the ASP area. These infrastructure requirements have been integrated into the land use concept.

3.8 Land Use Bylaw

The City's Land Use Bylaw, Bylaw 2880-16, as amended, controls development of the lands within the plan area, which are currently zoned Urban Reserve (UR), General Industrial (M1), Heavy Industrial (M2), and Highway Commercial (C2).

Operations at the Camrose Airport, located north and west of the plan area, have necessitated the implementation of development restrictions in order to protect flight paths and allow for safe aviation operations. These restrictions apply to any development located within the Airport Vicinity Protection Plan Overlay of Land Use Bylaw 2880-16. The Overlay addresses noise exposure forecasts, provides regulations to ensure the maximum height of any development does not protrude into the airport's outer surface, which is located 45.0 m above the airport's elevation of 737.6 m, and requires that any nuisances created by development, not limited to, electronic facilities, light, or visibility (e.g. dust or smoke), and wildlife are mitigated.

The Overlay affects the western portion of the plan area, which is currently under agricultural production and developed with Bayou PermaPipe and Shaw Pipe operations. These areas are currently zoned or will be zoned UR, M1, M2, and C2. The maximum building height allowable within any of these zoning districts is 24.0 m. Based on the highest elevations of the plan area (751.0 m) and the maximum allowable building height of the existing and proposed zoning districts no development is anticipated to protrude into the airport's outer surface.

3.9 Green Space Master Plan

The Green Space Master Plan (GSMP), prepared by Dillon Consulting in 2014, has identified opportunities within the plan area in which to further develop green spaces and a trail system. The future green space concept includes trails that connect to existing and future trails within the City, as well as future inter-municipal connections. For the East Gateway ASP area the GSMP, Map 6, identifies five greenspaces that are connected to a comprehensive trail network. The network also connects the plan area to adjacent neighbourhoods and Camrose County.

The East Gateway ASP recognizes the five greenspaces by designating them as storm water management facilities, Environmental Reserve or Municipal Reserve. Trails provide connections to these areas, and provide connections to adjacent neighbourhoods via 39 Street, Township Road 471, and Exhibition Drive and to the County via Highway 26. The East Gateway ASP has been designed to implement GSMP policies for Natural Areas, Parkland, Trails, and Green Space Acquisition.

3.10 Environmental Overview

In November 2015 ISL Engineering and Land Services completed an Environmental Overview of the plan area, which is attached as Appendix B. The overview, complements a Wetlands Inventory prepared by the City of Camrose in 2009, includes information about habitat features, waterbodies, wetlands and watercourses, and vegetation characteristics of the plan area. Based on historical information provided by Alberta Environment and Parks (AEP) two of the wetlands within the plan area appear to be considered Crown-owned waterbodies under the Public Lands Act. There are a number of other wetlands that will be considered by AEPs Water Boundary Group to determine if they are claimable wetlands.

The short-eared owl has been previously located within the plan area, and is listed by the Committee on the Status of Endangered Wildlife in Canada as a species of Special Concern, and is listed on Schedule 1 as Special Concern of the *Species at Risk Act*.

Policies to ensure developments address federal, provincial and municipal legislation pertaining to environmental concerns have been included in the ASP.

3.11 Wetland Desktop Review

In May 2016 ISL Engineering and Land Services completed a Wetland Desktop Review (Review), which is included as Appendix B. The Review identified four semi-permanent (IV) and permanent (V) wetlands within the East Gateway area. Generally, semi-permanent (IV) and permanent (V) wetlands are recommended for

conservation within an area due to the potential landscape hydrologic impact. Based on the results of the Review, three of the four wetlands will be retained as one or a combination of Municipal Reserve, Environmental Reserve, and as storm water management facilities, while one wetland is anticipated to be disturbed by general industrial development.

The Review recommends that storm water facilities associated with naturally occurring wetlands, mimic natural wetlands to allow for the creation of wetland-like habitat. All wetland disturbance (including storm water management facilities) will require *Water Act* approval and compensation, while development associated with storm water management facilities will also require Environmental Protection and Enhancement Act (EPEA) approval.

All wetland associated regulations will require field assessments and reporting conducted by a Wetland Science Practitioner (WSP) pursuant to the Wetland Policy prior to development.

3.12 Contributions Plan

ISL Engineering and Land Services has prepared a Contributions Plan to address how developer costs are to be allocated for major infrastructure within the ASP. The Plan identifies the types of infrastructure that are required, such as roads, water, sanitary and storm servicing and how the cost of the infrastructure are to be cost shared amongst the developers within the ASP area. The full Contributions Plan can be found in Appendix C.

4.0 Site Analysis

4.1 Historical and Archaeological Review

The Historic Resources Management Branch of Alberta Culture and Tourism conducted a review of the plan area and on February 16, 2016 concluded that an historic resources impact assessment at this time is not required. The Branch advised SE1-47-20-4, NW36-46-20-4 and NE35-46-20-4 contain unrecorded historic structures that may have potential heritage significance. To further identify these structures a Historic Resources Impact Assessment may be required at the time of subdivision or development, and a *Historical Resources Act* clearance is required. A letter from the Historic Resources Management Branch is provided within Appendix D.

4.2 Soils

The Canada Land Inventory of soil capability for agriculture has identified the soils in this area to be of a Class 2, which have moderate limitations that restrict the range of crops or require moderate conservation practices. Soils are not expected to have any negative impacts on development.

As the site has historically consisted of agricultural uses a geotechnical report at this stage of the process was not seen as essential. The necessity for any geotechnical evaluations will be determined at the subdivision or development stage.

4.3 Topography

The plan area is relatively flat with very mild topographical relief, as shown in Figure 2. The elevations range from 751.0 m in the southeast to 738.0 m in the northwest. In general, overland flows trend north and south from Highway 26. Landowners in the plan area have advised that ponding is occurring in the northwest and southeast.

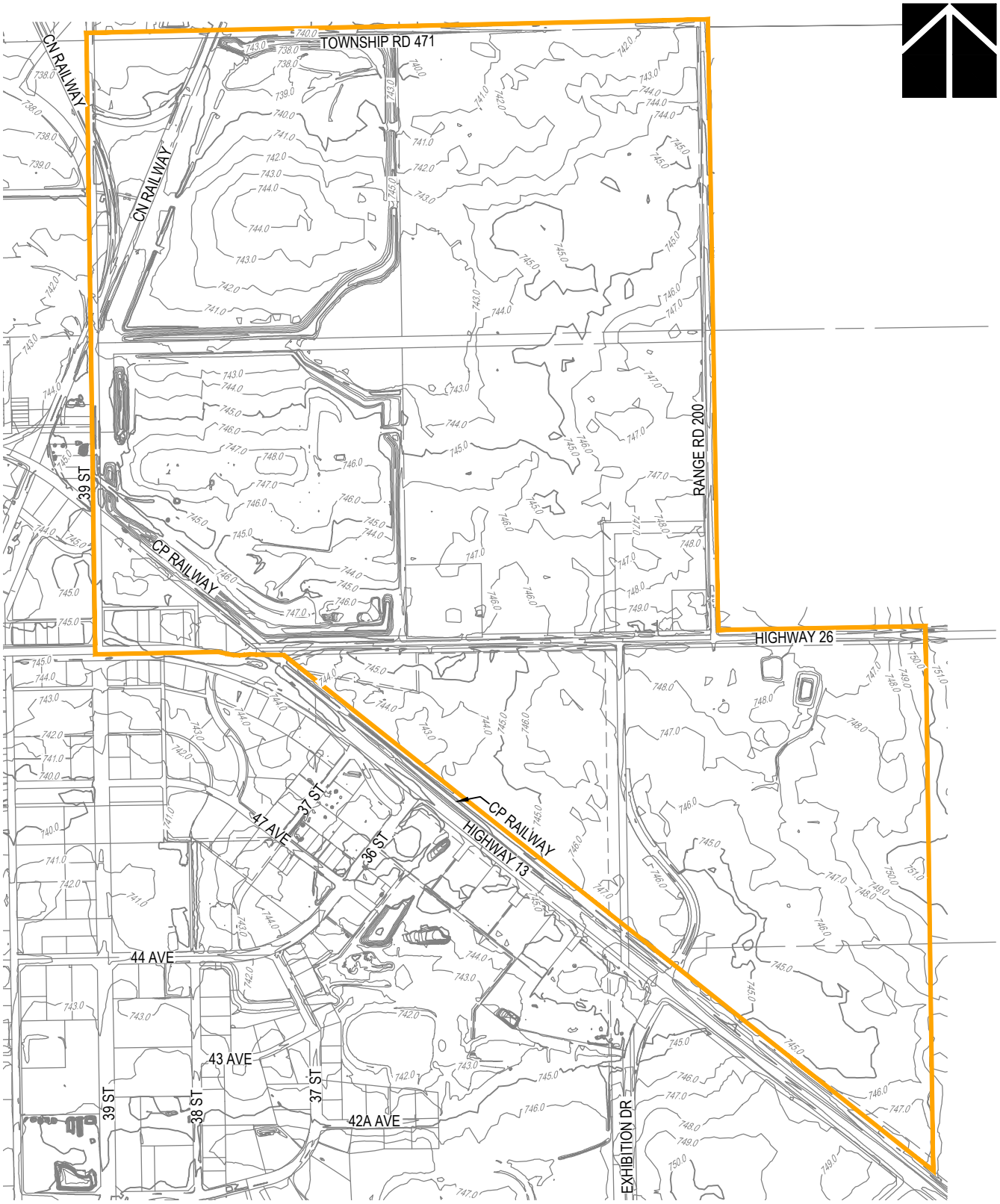
4.4 Biophysical Impact Assessment

A Biophysical Impact Assessment (BIA) has not been prepared for the plan area. BIAs are prepared to identify the Valued Ecosystem Components (VEC) that may be impacted by a project construction, operation, maintenance, and/or decommissioning.

The VEC evaluated in a BIA is dependent on the proposed project and the existing site conditions. Common VECs that may be effected by a project include: geology (e.g., bedrock and soils), hydrology, (e.g. surface and ground water), fish and fish habitat, vegetation (e.g. communities, rare plants and rare plant communities, weeds), wildlife and wildlife habitat (including connectivity and possible species specific surveys), wetlands, historic and archaeological resources, as well as visual resources. Potential environmental effects on VECs of a project are evaluated to determine mitigation and best management practices that will reduce the environmental effects of the project and any residual effects after mitigation has been applied. The value of a VEC not only relates to its role in the ecosystem, but also to the value placed by society.

4.4.1 Project Effects

The impact analysis of a project should include consideration of relevant mitigation measures. Mitigation is considered to be the avoidance, reduction or control of a project's adverse environmental effects. The following mitigation measures are applied in a tiered approach.



LEGEND

ASP BOUNDARY - GROSS AREA = 396.8 ha (980.5 ac)

Spencer McCann / Mar. 9, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\03_Reports\32_Working\ASP\Figure 2 Topography Plan.dwg

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AREA STRUCTURE PLAN

TOPO□RAP□□ PLAN

FIGURE 2

0 150 300 450 600m

- **Avoidance:** measures taken to avoid creating potential effects from the outset, such as considering spatial or temporary factors in project planning. These measures are taken to avoid potential effects on VECs.
- **Minimization:** measures taken to reduce the duration, intensity and/or extent of potential effects that cannot be completely avoided, as far as feasible.
- **Restoration:** measures taken in response to potential residual effects where these effects cannot be completely avoided and/or minimized.
- **Offset/Engineered:** measures taken to offset for any residual significant, adverse impacts that cannot be avoided, minimized, and/or restored.

Additional environmental conditions such as severe weather events including high wind speeds (e.g., tornadoes), heavy/persistent precipitation (e.g., storms, tornadoes), extreme temperatures, lightning and temperature inversions, are not typically considered during an effects assessment.

Significance of Effects

The effects of a project should be evaluated after mitigation is applied for magnitude, duration and extent, to determine the potential environmental consequences associated with a project. The following describes each parameter that should be considered with respect to each VEC:

- Magnitude is the degree of change in, or risk to, a landscape, community, or species diversity.
- Duration is the length of time over which a project or effect is measured.
- Extent refers to the area over which a project effect is measurable.

4.4.2 Plan Area VEC Recommendations

Based on the Environmental Overview and the Wetland Desktop Review (Appendix B), ISL Engineering and Land Services recommends that a BIA be conducted prior to subdivision or development. Depending on the proposed development the following VECs are recommended (but at not limited to): soils, hydrology, (e.g. surface and ground water), vegetation (e.g. communities, rare plants and rare plant communities, weeds), wildlife and wildlife habitat (including connectivity and possible species specific surveys such as breeding birds and amphibian surveys), and wetlands. Additional VECs, such as air quality, may also be considered depending on the type of industrial development; at the discretion of the City.

4.5 Environmental Site Assessment

An Environmental Site Assessment (ESA) Phase I, II and III, which identifies environmental contamination for a given site, has not been prepared for the plan area. As the majority of the plan area has historically consisted of agricultural uses, an ESA at this stage of the development process was not seen as essential. However given the industrial development in the area, the presence of railway rights-of-way, and the existence of well sites, aboveground storage tanks and storage barrels a Phase I ESA is recommended for future development. Accordingly, the necessity for any ESA will be determined at the subdivision or development stage.

4.6 Current Land Uses

The plan area currently has a mix of industrial (pipe storage), commercial and agricultural land uses, railway and utility rights-of-way and wetlands, as shown on Figure 3.

Three quarter sections within Section 1-47-20-4, located north of Highway 26, are either developed or proposed to be developed by businesses associated with pipe fabrication, storage and/or distribution. Lands adjacent to Highway 13 in the southwest portion of the plan area are developed for commercial uses, including automobile dealerships and home improvement outlets. The remainder of the plan area, with the

exception of one industrial business located north of Highway 26, is used for agricultural purposes. Two existing farmsteads are located adjacent to the intersection of Range Road 200 and Highway 26. Vegetation in the plan area is limited to a few isolated tree stands and hedgerows near the farmsteads.

The plan area is located east and north of existing industrial and commercial development, within the east portion of the City. The MDP has designated the majority of this area of the City for industrial development.

The City's airport is located immediately north and west of the plan area. At this time the airport does not have any expansion plans, or plans to provide spurs from the adjacent CN rail right-of-way. The airport's flight path lies in a linear placement, in a northwest to southeast alignment, across the northwest portion of the plan area. As identified in Section 3.8 all development contained within this flight path is subject to building height and nuisance regulations of the City of Camrose Land Use Bylaw and as outlined in the Airport Vicinity Protection Plan Overlay.

In addition to the airport, the plan area is well connected to the region's transportation network. The CN and CP railway right-of-way traverse the northwest and south portions of the East Gateway area, respectively. Highway 13 and Highway 26, both major gateways into the City, provide access to Camrose County and beyond. The proximity of the plan area to other industrial development, the airport and these major transportation corridors make it an ideal location for highway commercial and a range of industrial development opportunities.

4.6.1 Wells and Utility Rights-of-Way

The plan area, according to the Alberta Energy Regulator (AER) well map viewer and AbaData information, indicates there are five abandoned wells (Wellsite 12-01, 05-01, 02-01, 14-36, 13-36) and three active wells, as shown on Figure 3. None of the wells are sour gas facilities. The abandoned wells will require a minimum 5.0 m setback radius around each well, as per AER Directive 079.

There are four utility rights-of-way within the plan area, which include:

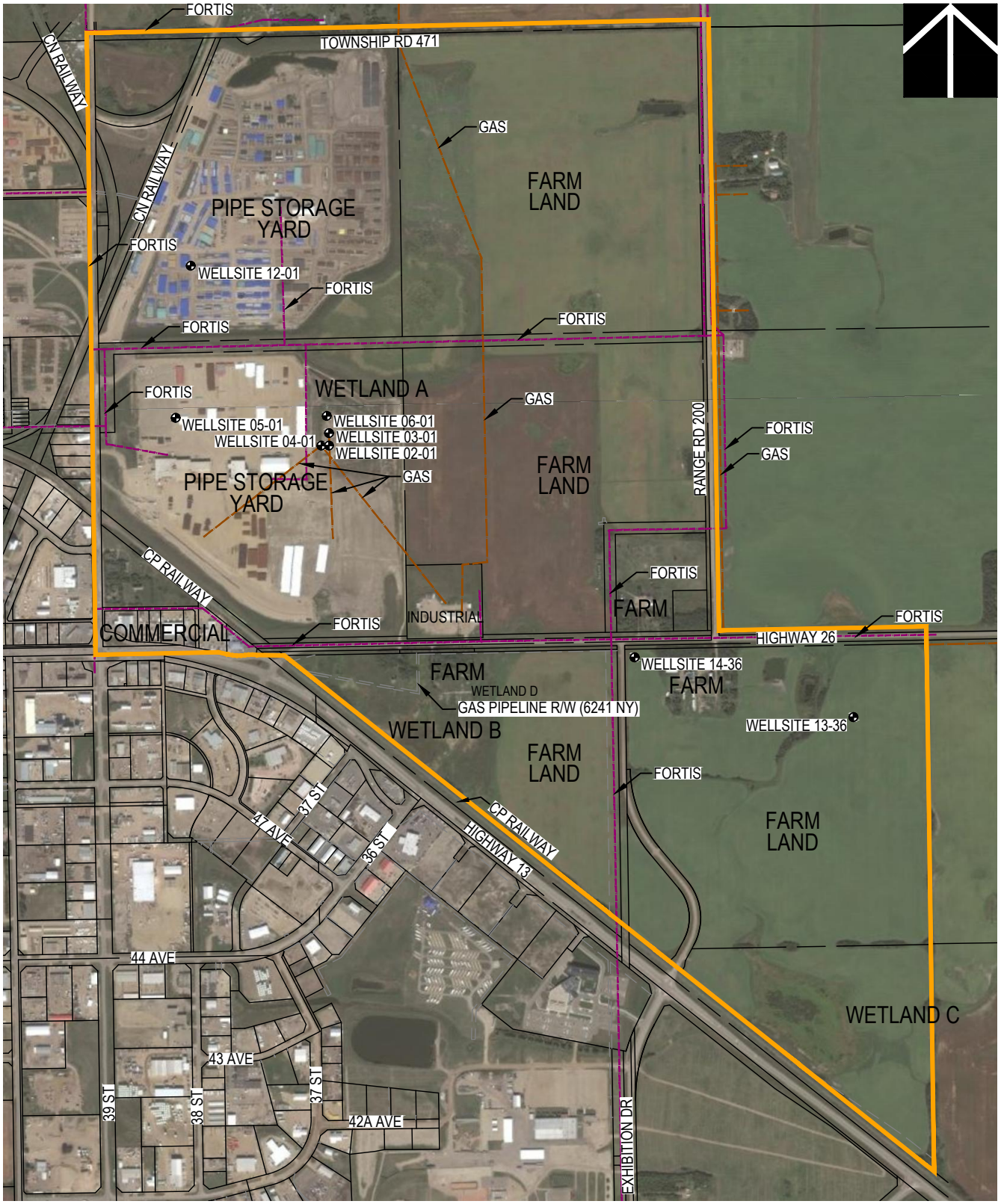
1. An Altalink right-of-way that trends east/west across the northern portion of the plan area;
2. An Altalink right-of-way located adjacent to the eastern boundary of the plan area which trends north/south to the south boundary of the plan area;
3. A gas pipeline that trends north from Highway 26 to Township Road 471; and
4. A gas pipeline located within NE¼35-46-20, at the intersection of Highway 13 and 26.

The setback for these facilities are located at the edge of each right-of-way for the pipelines and 100.0 m radius for the wells center.

4.6.2 Railway Rights-of-Way

The plan area includes two main lines: a CP Railway right-of-way that runs along the southwest boundary of the plan area, parallel to and east of Highway 13, and a CN rail right-of-way, which traverses the northwest portion of the plan area.

The CP Railway (CP) right-of-way is a mainline and accommodates 4 to 5 trains per day. At this time CP has no plans for facility expansion; however they anticipate an increase in train traffic as a result of the opening of the nearby Cargill crush plant. CP advises that the proposed land use designations are appropriate and compatible with railway operations, there are no plans for new road crossings or upgrades to road crossings, and there may be interest for rail-served commercial or light industrial development.



LEGEND

ASP BOUNDARY - GROSS AREA = 396.8 ha (980.5 ac)

Chuck Hunt / May. 4, 16 / J:\145001\14579_Camrose_East_Gateway_ASP\03_Reports\32_Working\ASP\Figure 3 Existing And Surrounding Land Uses.dwg

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AREA STRUCTURE PLAN

EXISTING AND SURROUNDING LAND USES

FIGURE 3

0 150 300 450 600m

The CN Railway (CN) right-of-way in Camrose is a principal main line and typically sees about 8 to 10 trains per day. CN advises that the proposed heavy and medium industrial and highway commercial land use designations are appropriate and compatible with railway operations, that there are no plans for changes to the rail or train traffic, new road crossings, upgrades to road crossings, and that there could be interest for rail-served industrial development in this part of Camrose, and for lands north and east of the ASP boundaries.

A recommended setback for buildings located adjacent to main lines has been provided in a report named "Final Report Proximity Guidelines and Best Practices", prepared by the Railway Association of Canada (RAC) and the Federation of Canadian Municipalities (FCM). The report identifies a 30m setback from the property line of a railway company's main line to a building. This setback is recommended to reduce vibration potential on nearby buildings. The Development Authority shall have regard to the recommendations outlined in the above-mentioned report, for all development located adjacent to these main rail lines.

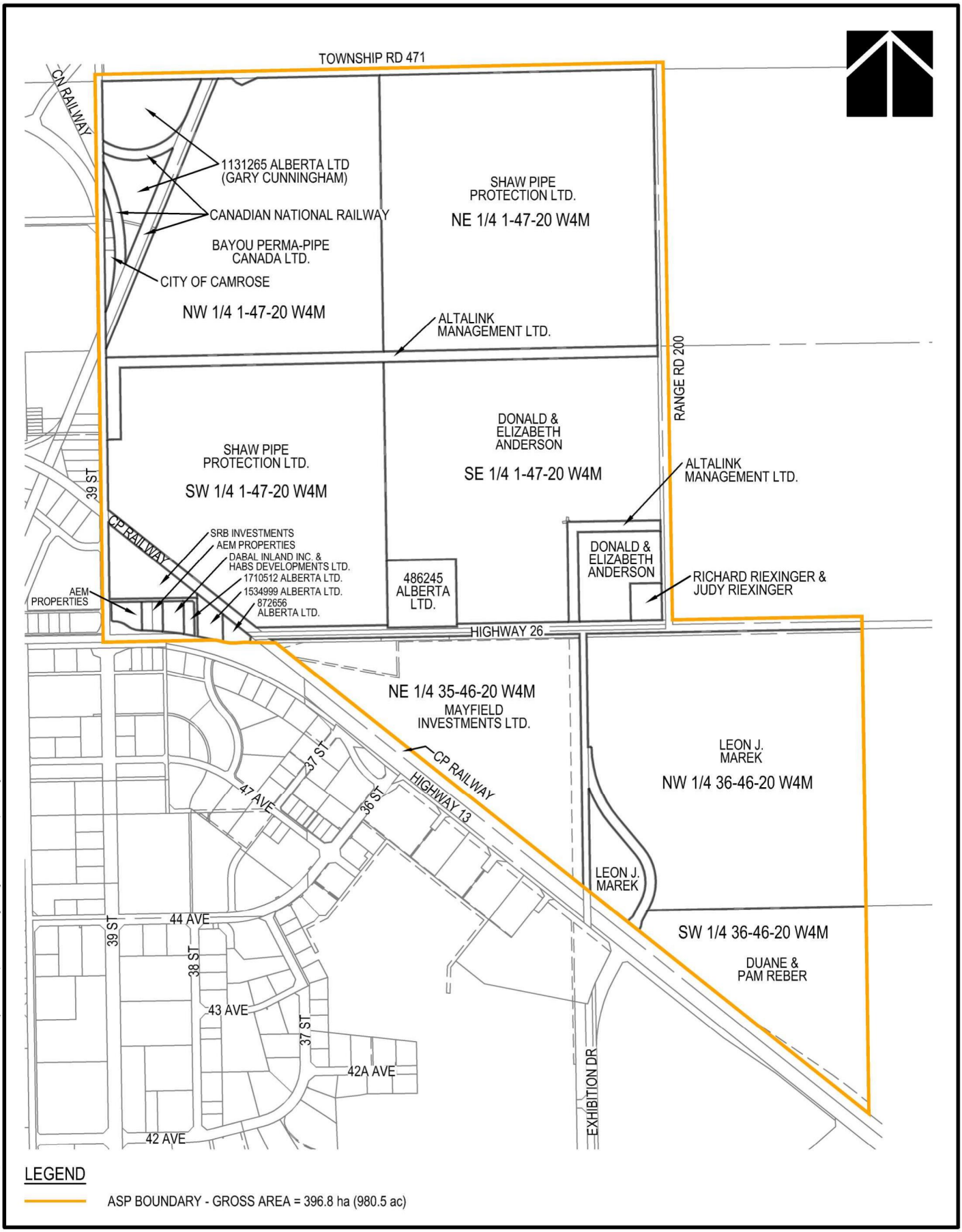
4.7 Property Ownership Patterns

The land located within the plan area is owned by 16 different landowners, as described in the following table and shown in Figure 4.

Table 2: Property Ownership

Legal Description (2008)	Owner (2016)	Area (ha)	% of Total
Lot A1, Plan 852 0671	1534999 Alberta Ltd.	0.751	0.19%
Lot 7, Block 1, Plan 802 2059	1710512 Alberta Ltd.	0.3	0.08%
SE¼ 1;47;20;4	486245 Alberta Ltd.	3.941	0.99%
Lot A2, Plan 852 0671	872656 Alberta Ltd.	0.403	0.10%
RW 47, Plan 4856MC	AltaLink Management Ltd.	7.1	1.79%
Lot 1, Block 1, Plan 012 3192	Bayou Perma-Pipe Canada Ltd.	51.74	13.04%
NW¼ 1;47;20;4	Canadian National Railway	1.03	0.26%
NW¼ 1;47;20;4	City of Camrose	0.971	0.16%
Lot 5, Block 1, Plan 802 2059; Lot 6, Block 1, Plan 802 2059	Dabal Inland Inc. & Habs Developments Ltd.	0.55	0.14%
SE¼ 1;47;20;4	Donald C. & Elizabeth M. Anderson	54.638	13.77%
Lot 1, Plan 012 3964	Duane Reber & Pam Reber	21.804	5.50%
SW¼ 1;47;20;4	SRB Investments	2.96	0.75%
Lot 1, Block 1, Plan 062 1893	Leon J. Marek	62.188	15.67%
Lot A, Block 1, Plan 052 0680	Mayfield Investments Ltd.	32.268	8.13%
SE¼ 1;47;20;4	Richard Riexinger & Judy Riexinger	0.974	0.25%

Legal Description (2008)	Owner (2016)	Area (ha)	% of Total
NE¼ 1;47;20;4 and SW¼ 1;47;20;4	Shaw Pipe Protection Ltd.	116.565	29.37%
NW¼ 1;47;20;4	1131265 Alberta Ltd.	7.43	1.87%
Lot 1, Block 1, Plan 802 2059,	AEM Properties	0.61	0.15%
Lot 3, Block 1, Plan 802 2059; Lot 4, Block 1, Plan 802 2059	AEM Properties	0.52	0.13%
	Total – all parcels	**366.38**	
	Total Plan Area – including roads	**396.8**	



LEGEND

ASP BOUNDARY - GROSS AREA = 396.8 ha (980.5 ac)

Eric Tan / Mar. 17, 16 / J:\145001\145179_Camrose_East_Gateway_ASP\03_Reports\32_WorkingASP\Figure 4 Land Ownership Plan_.dwg

ISL Engineering and Land Services

CITY OF Camrose

CITY OF CAMROSE

AREA STRUCTURE PLAN
LAND OWNERSHIP PLAN

FIGURE 4

0 150 300 450 600m

5.0 Engagement Plan

ISL prepared an Engagement Plan to guide opportunities for information exchange with Council, Administration, key referral agencies, landowners and the general public throughout the project. The engagement activities included landowner and stakeholder meetings, notification and distribution of relevant project information, advertisements, and a public open house. The Engagement Plan is located within Appendix E.

5.1 Previous Engagement Activities

In 2008 the City of Camrose initiated the preparation of the East Gateway ASP. On November 12, 2008 the City conducted a public open house as part of the initial planning process. Participants at the open house met project representatives, viewed display boards and provided feedback through a comment form. Twenty people attended the open house and five comment forms were received. Feedback received indicated that participants agreed with a mix of commercial and industrial land uses in the plan area, and supported policies that encouraged pedestrian/cycling trails and identified Highway 26 as a gateway into the City. Although the completion of the ASP was delayed until 2016, the input from the initial engagement in 2008 has been considered in the preparation of this ASP.

5.2 Current Engagement Activities

To inform plan area landowners, stakeholders and the public of the project the following three tasks were undertaken:

1. First, in November 2015 the project team met with plan area landowners and stakeholders to discuss the project and provide feedback about the project vision, objectives, and opportunities and concerns.

2. Second, in February 2016 project updates, namely a draft land use concept, was emailed/mailed to landowners and stakeholders.

3. Finally, on March 17, 2016 the project team hosted an open house to present highlights of the draft ASP. Invitations were mailed/emailed to stakeholders/landowners two weeks prior to the open house. Advertisements were also published on the City's website, in The Camrose Booster, and on the City's Facebook and Twitter accounts.

A summary of these three activities is presented below.

5.3 Landowner Meeting

On November 26, 2015 the project team met with plan area landowners at the Camrose Best Western from 10:00 a.m. to 12:00 p.m. Meeting invitations were mailed/emailed to landowners one week prior to the meeting.

The purpose of the meeting was to inform landowners of the project; present technical findings; discuss the 2008 draft land use concept, as shown in Appendix F, confirm the project vision and objectives, and identify any opportunities and concerns about the project. The meeting included a PowerPoint presentation providing project information, a facilitated question and answer session, and the provision of a feedback questionnaire. The feedback from attendees helped inform the development of the East Gateway ASP.

Nine participants signed in at the meeting. As of March 23, 2016, nine questionnaires were returned to ISL Engineering and Land Services.

In summary, landowners supported the 2008 vision. However landowners raised concerns about the 2008 land use concept, which realigned Highway 26. Landowners also identified the following opportunities and concerns about the plan area, as shown in Table 3.

Table 3: Landowner Identified Opportunities and Concerns for the ASP Area

Opportunities	Concerns
What opportunities exist for the East Gateway ASP Area?	**What concerns do you have for the East Gateway ASP Area?**
• Central location of industrial/commercial business. • Employment for Camrosians. • Increase tax base, thus improved infrastructure. • Increased business for small businesses in Camrose is a good thing as more people move here to live, work and play. • CP/CN interchange for rail – larger than existing to reduce congestion. • Create a comparable development to the west end with retail development. • Have commercial development behind the retail development, as in draft plan. • Creating employment in retail and commercial. • Getting access to parcels will allow for future subdivisions and development. • Opportunity to realign Highway 26 to address safety concerns. • The realignment of Exhibition Drive to connect with the Range Road 200 will occur with the future development of this property. • Proper drainage for stormwater management. • Increased green space and park spaces.	• Cut off of frontage exposure and utility service connection for existing business along Highway 26. • Ease of heavy industrial traffic (semi-truck, rigs, and heavy cranes) between northern businesses. • Traffic flow from Highway 13 east onto Highway 26 east (and west). • The alignment of Exhibition Drive/Range Road 200 bisects an existing farmstead. • Access will of course be a challenge due to highway rules, etc. The Ring Road 13A should continue north to Highway 26 as access so trucks don't have to enter city limits and slow down traffic. • Hopefully, if this land is sold for development, the City will provide sewer, water, power, etc. • Not only industrial wanted, but mixed with commercial and green areas. • Too much red tape, which would drastically slow down and possibly stop development. • Existing traffic flow is congested along 39 St. Improve traffic flow around northeast edge. Alternate access around tracks. • Stormwater/environmental area drainage.

The views, as expressed by the landowners, were instrumental in developing the future vision, goals, objectives and policies of the ASP.

5.4 Stakeholder Feedback

The project team had meetings or correspondence with the following stakeholders: Alberta Culture and Tourism; Alberta Environment and Parks; Alberta Transportation; CP Rail, CN Rail, Camrose Airport, Camrose Chamber of Commerce, Camrose Regional Exhibition, Battle River Regional Division #31, Elk Island Catholic Separate Regional Division #41, and Camrose County. In summary, stakeholders supported the 2008 land use concept. Table 4 summarizes the comments provided by stakeholders.

Table 4: Summarized Stakeholder Comments

Stakeholder	Comments
Alberta Culture and Tourism (ACT)	ACT advised that any development within SE1-47-20-4, NW36-46-20-4 and NE35-46-20-4 may require a Historic Resources Impact Assessment.
Alberta Environment and Parks (AEP)	AEP has identified two Crown-owned wetlands (identified as wetland A and B on Figure 3) within the East Gateway plan area.
CP Rail	CP has advised that the proposed land use designations are appropriate and compatible with railway operations, there are no plans for new road crossings or upgrades to road crossings, and there may be interest for rail-served commercial or light industrial development.
CN Rail	CN has advised that the proposed heavy and medium industrial and highway commercial land use designations are appropriate and compatible with railway operations, that there are no plans for changes to the rail or train traffic, new road crossings, upgrades to road crossings, and that there could be interest for rail-served industrial development in this part of Camrose, and for lands north and east of the ASP boundaries.
Camrose Airport	The Airport Manager has advised that the wetlands in the plan area currently do not present a hazard to the users of the Camrose Airport, and he does not have concerns with the proposed land use concept provided the building heights of the Airport Vicinity Protection Plan Overlay (AVPPO) are respected and any nuisances (e.g. bright yard lights or development creating dust, haze, and smoke) are mitigated by the Land Use Bylaw. He also advised that any development that creates such nuisances should not be encouraged in the plan area.
Camrose Regional Exhibition (CRE)	The Chief Executive Officer of the CRE did not have any concerns with the proposed land use concept, and advised that he supports a land use concept where Highway 26 remains in its current alignment.
Camrose County	The County's Manager of Planning and Development does not have any concerns with the proposed land use concept and advises that it aligns with the existing Inter-municipal Development Plan, the County's future growth pattern and industrial development, the AVPPO should apply to the plan area, and stormwater management should be addressed.

Input from stakeholders has definitively shaped the land use concept and policies of the ASP, particularly the identification of two Crown-owned wetlands. Accordingly the wetlands will remain in a natural state, Highway 26 will remain in its current alignment to avoid the wetlands, and any development within SE1-47-20-4, NW36-46-20-4 and NE35-46-20-4 may require a Historic Resources Impact Assessment.

5.5 Circulation Responses

On February 22, 2016 landowners and stakeholders were provided with a copy of the proposed land use concept. As of March 11, 2016, no comments affecting the ASP have been provided to ISL Engineering and Land Services.

5.6 Public Open House

On March 17, 2016 a public open house was held at the Camrose Best Western from 4:00 p.m. to 7:00 p.m. to present and gather feedback on the draft East Gateway ASP. The open house included static information displays, and comment forms. Project representatives were in attendance to respond to questions from attendees. Twenty six people attended the Open House and eight comment forms and email comments were received as of April 1, 2016. Overall, participants support the proposed land use concept, appreciated that the ASP includes trails and park spaces, and were supportive of the proposed transportation network. Feedback from the Open House is provided within Appendix G.

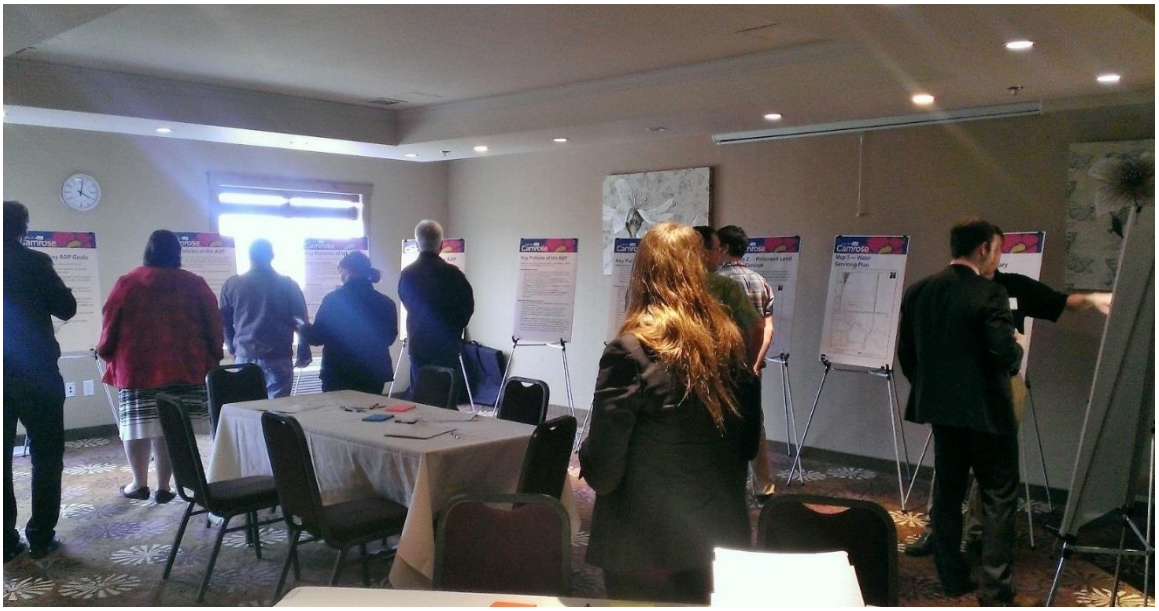


Photo Exhibit 1: March 17, 2016 Public Open House

6.0 Land Use Concept

The East Gateway ASP land use concept creates a highway commercial area, a heavy industrial area and a general industrial area, as shown on Figure 5. The land use concept locates highway commercial in existing areas and an area of high visibility, heavy industrial adjacent to arterial roads, and the balance of the plan area contains general industrial uses. This land use approach facilitates a diversity of industrial development, requires visual screening to reduce conflict and enhance compatibility, and promotes an improved aesthetic relationship with nearby land uses. The comprehensive design of the land use concept:

a. Is compatible with adjacent land use designations and development;

b. Includes a compatible combination of land use designations;

c. Integrates public amenities, pedestrian connections and natural features;

d. Provides excellent access to air, rail, highway and trail corridors; and

e. Identifies gateway corridors that will be developed in a manner that creates a sense of arrival and place and that maintains a high standard of aesthetic appeal.

Objectives

The following outlines the objectives of the East Gateway ASP:

a. To develop a commercial and industrial business park at the eastern gateway into the City, which has its own identity, and is also a logical and functional extension of and connected to the City of Camrose;

b. To provide a range of employment and business opportunities and services for the residents of Camrose and the regional market;

c. To provide adequate transitioning or buffering between any conflicting land uses;

d. To maintain high development standards adjacent to the highway corridors which run through the plan area, recognizing the ‘gateway’ function of these corridors into the City;

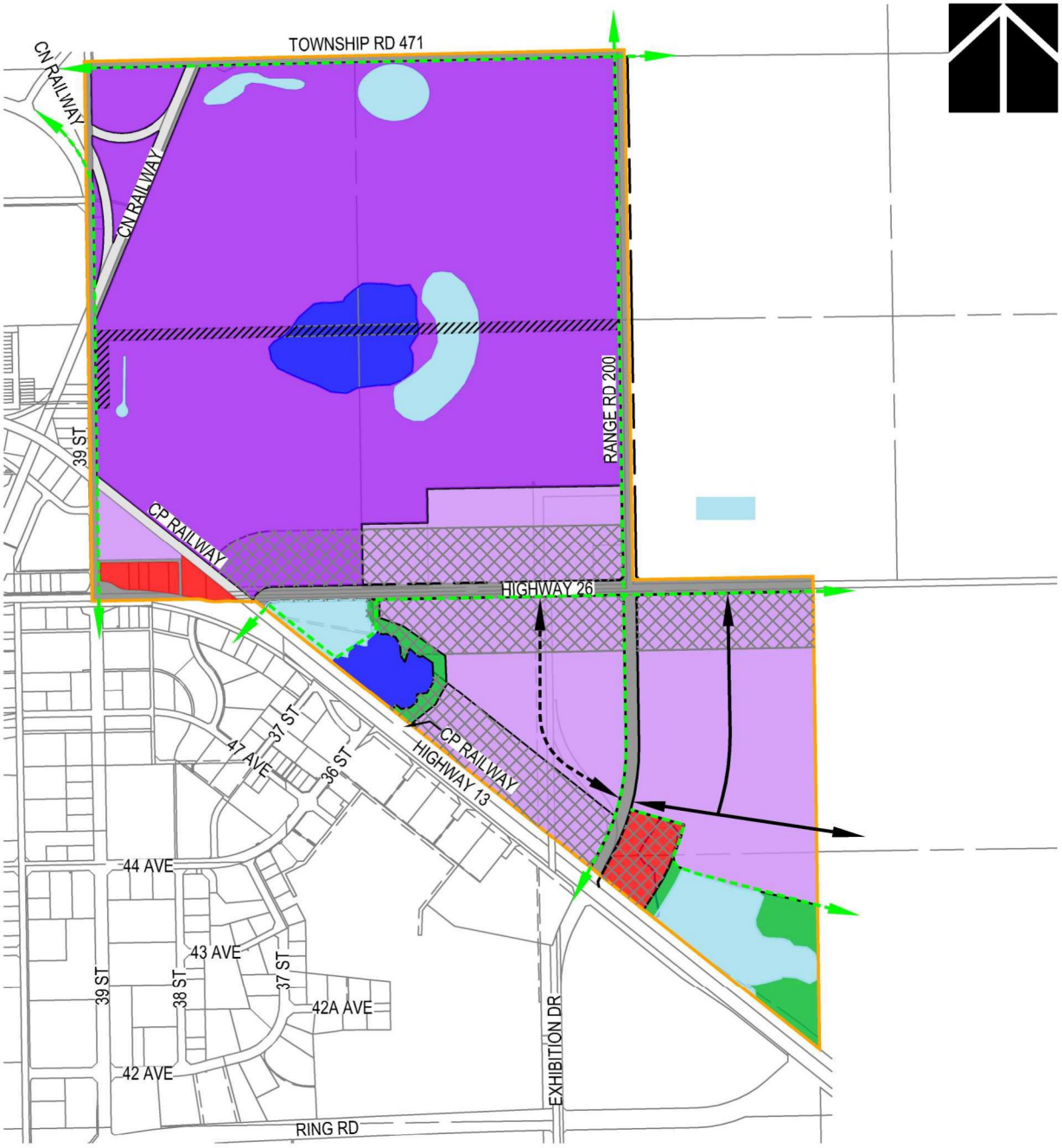
e. To create a sense of place by designing pedestrian links, parks and open spaces in order to encourage non-vehicular, passive recreation and socializing opportunities;

f. To allow for the logical and economical extension of the transportation network and the servicing system consistent with municipal policies and market demands;

g. To ensure that land uses are provided with safe and convenient access, and that the transportation corridors respect the safety and function of adjacent rail rights-of-way;

h. To encourage energy efficient and environmentally responsible designs wherever possible through the use of landscape design, stormwater management strategies, and building and site orientation techniques; and

i. Ensure public access to wetlands and stormwater management facilities, and provide vistas to these features.



LEGEND

- ASP BOUNDARY - GROSS AREA = 396.8 ha (980.5 ac)
- HIGHWAY COMMERCIAL (7.5 ha) / (18.5 ac)
- GENERAL INDUSTRIAL (110.0 ha) / (271.8 ac)
- HEAVY INDUSTRIAL (201.1 ha) / (496.7 ac)
- STORM WATER FACILITY (24.0 ha) / (59.3 ac)
- ENVIRONMENTAL RESERVE (15.2 ha) / (37.6 ac)
- MUNICIPAL RESERVE (8.2 ha) / (20.3 ac)
- RAILWAY R.O.W. (5.8 ha) / (14.3 ac)
- INTERNAL CIRCULATION (25.0 ha) / (62.0 ac)
- POWERLINE R.O.W.
- GATEWAY OVERLAY
- TRAIL
- CONCEPTUAL ROAD LOCATION
- LOCAL INDUSTRIAL ROADWAY

Eric Tan / Mar. 17, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\03_Reports\32_WorkingASP\Figure 5 Land Use Plan.dwg

ISL Engineering and Land Services

CITY OF Camrose

CITY OF CAMROSE

AREA STRUCTURE PLAN
LAND USE PLAN

FIGURE 5

0 200 400 600 800m

6.1 Land Use Statistics

The following table outlines the proposed development statistics for the plan area based on the land use concept shown in Figure 5.

Table 5: Land Use Statistics

	Area (ha)	% of NDA
Gross Area	396.8	
Environmental Reserve	15.2	
Net Developable Area (NDA)	381.6	
Municipal Reserve	8.2	2.1
Stormwater Management Facility	24.0	6.2
Roads	25.0	6.5
Railway	5.8	1.5
Highway Commercial	7.5	1.9
General Industrial	110.0	28.6
Heavy Industrial	201.1	52.4

7.0 Land Use Policies

The following policy headings and their corresponding policies relate to the land use designations identified on Figure 5. General land use policies that apply to the entirety of the East Gateway ASP area introduce this Chapter.

7.1 General Land Use Policies

1. The City of Camrose shall:

    a. Establish an identifiable image, or theme, for the East Gateway area using entrance features, landscaping, streetscape design elements, lighting, public and private signage, wayfinding, and parks and trails that enhances the City's image.

    b. Develop an inviting public realm of streets, parks, trails and open space that encourage pedestrian traffic and social gathering spaces.

2. Prior to subdivision or development, the applicant shall prepare a wildlife survey following the Environment and Sustainable Resource Development for Sensitive Species Inventory Guidelines. If an active nest and surrounding habitat are located within the proposed development, appropriate setbacks will be implemented as per the Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta.

3. Prior to subdivision or development, the applicant may be required to prepare a Biophysical Impact Assessment, Environmental Site Assessment, Geotechnical Assessment, Servicing Design Report and/or Transportation Impact Assessment to support an application.

4. Any development within the Airport Vicinity Protection Plan Overlay, as shown on Figure 5a, shall be referred to the City of Camrose Airport and conform to the regulations of the Overlay as described in the City of Camrose Land Use Bylaw.

    a. Development shall not protrude into the airport's outer surface, or create any electromagnetic, light, or visibility (e.g. dust, haze or smoke) nuisance.

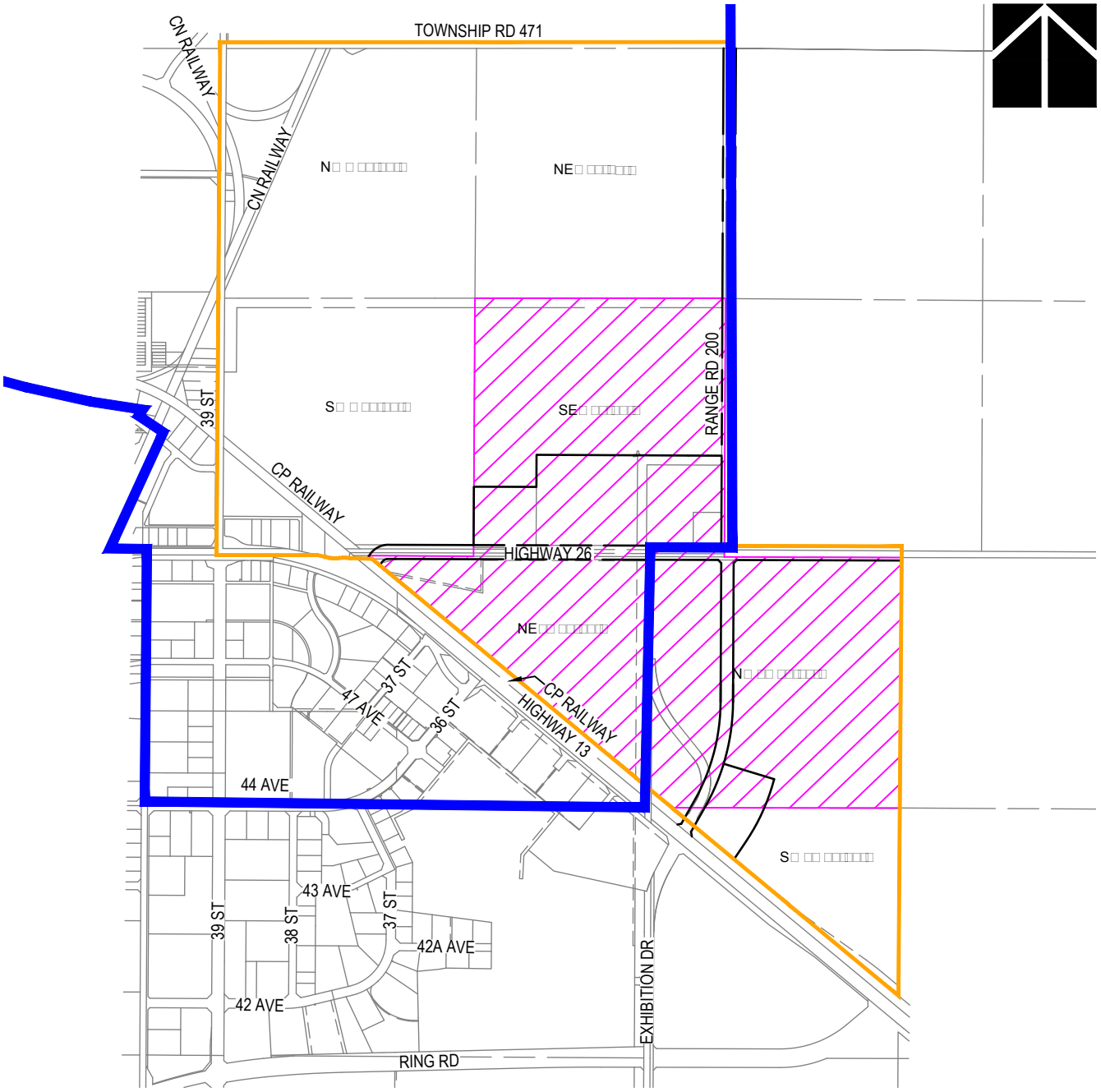
5. At the time of subdivision or development for lands within SE1-47-20-4, NW36-46-20-4 and NE35-46-20-4, as shown on Figure 5a, a Historic Resources Impact Assessment may be required and submitted to the Province of Alberta.

6. The City of Camrose encourages rail side development adjacent to the CP Rail and CN Rail rights-of-way subject to the Transportation Master Plan, the East Gateway Transportation Impact Assessment, and review by the City's Infrastructure and Planning Department.

7. Development adjacent to the CP Rail and CN Rail rights-of-way should be setback a minimum of 30.0 m from the property line of a railway company's main line to a building. This setback shall reduce vibration potential on nearby buildings.

8. At the time of Development Permit application for any industrial development the Development Authority may require the submission of a Risk Assessment to identify possible risk and any strategies to mitigate and/or minimize the risk, such but not limited to the provision of on-site emergency response, additional development setbacks from property lines and/or adjacent development, and/or the provision of berms, landscaping and/or fencing.

9. Crime Prevention through Environmental Design (CPTED) techniques of natural surveillance, natural access control and territorial reinforcement shall be considered in all development applications.



LEGEND

- ASP BOUNDARY
- AVPPO BOUNDARY
- LANDS REQUIRING A HISTORIC RESOURCES IMPACT ASSESSMENT

Chuck Hunt / Mar. 29, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\03_Reports\32_Working\ASP\Figure 5a AVPPO And HRPAs.dwg

ISL Engineering and Land Services

CITY OF Camrose

CITY OF CAMROSE

AREA STRUCTURE PLAN
A□PPO □□d □ISTORICAL RESOURCES
POLIC□ AREAS

FIGURE 5A

0 200 400 600 800m

10. Any non-residential development located adjacent to an existing residential development shall address land use incompatibilities and nuisance such as, but not limited to, noise, dust, odor, outdoor storage, loading, or traffic to the satisfaction of the Development Authority by providing additional screening (e.g. landscaping and/or fencing) and setbacks.

11. Temporary or interim uses, other than agriculture, will be discouraged unless it can be demonstrated that the use will not affect the ultimate integrity of the ASP.

12. Active oil and gas wells require setbacks in accordance with Alberta Energy Regulator (AER) requirements.

13. Abandoned oil and gas wells require a minimum 5.0 m radius around each well, as per AER Directive 079.

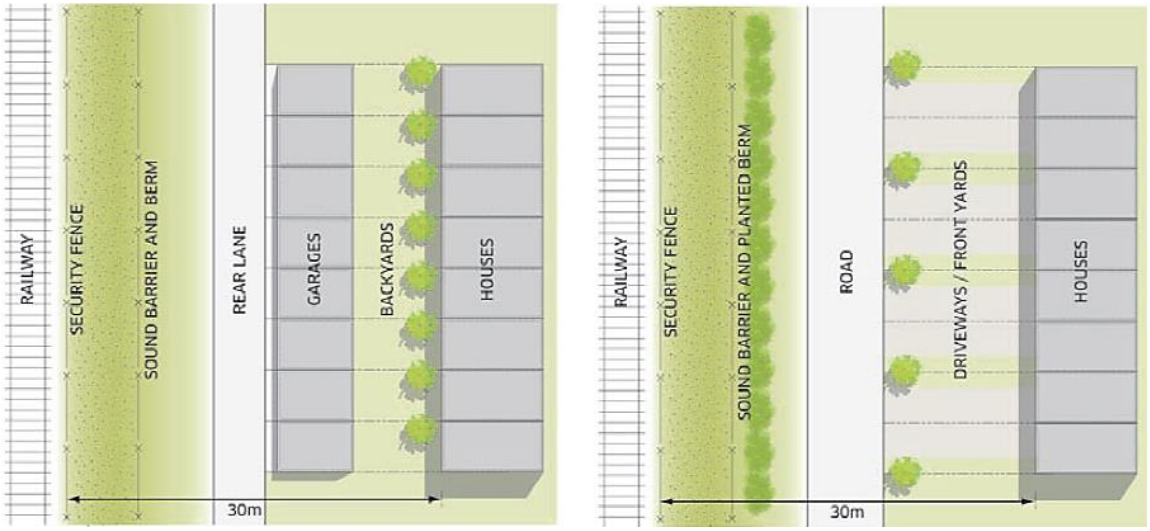


Photo Exhibit 2: 30m Setback from Railway Right-of-Way to Development (Source: Guidelines for New Development in Proximity to Railway Operations, Federation of Canadian Municipalities and the Railway Association of Canada, 2013).

7.2 Environmental Reserve Policies

Some wetlands within the plan area will be designated as Environmental Reserve. Alberta Environment and Parks (AEP) has identified two Crown-owned wetlands (identified as Wetland A and Wetland B on Figure 3) within the East Gateway plan area. These wetlands are approximately 15.2 hectares (ha) and designated as Environmental Reserve, as shown on Figure 5. Wetland C and Wetland D, as identified on Figure 3, is not being claimed as bed and shore by AEP and will be integrated into the East Gateway stormwater management system and Municipal Reserve lands as a means to conserve and manage the wetland area.

1. Prior to subdivision or development Wetland A, B C and D, and all other potential wetlands in the plan area must be delineated, classified, and assessed by a Wetland Science Practitioner (WSP) pursuant to the Wetland Policy.

2. Wetland A will be retained as Environmental Reserve surrounded by Heavy Industrial development. If development is anticipated to occur within the natural wetland boundary, a *Water Act* and compensation will be required for any disturbance within the wetland boundary.

3. The southern and eastern portion of Wetland B is designated as Environmental and Municipal Reserve, while the northern and western portion has been designed as a storm water facility. Wetland D is located within future general industrial land use and is likely hydrologically connected to Wetland B. If Wetland B and Wetland D are hydrologically connected, and a portion of the wetland complex must be removed for development, Wetland D is preferred as it is the less permanent portion of the wetland complex.

    a. Wetland B will require *Water Act* approval for disturbance.

    b. Wetland D requires both a *Water Act* and *EPEA* approval for the storm water facility. Wetland replacement (e.g. compensation) will be a requirement for all *Water Act* approvals.

4. Wetland C is primarily located within a future storm water management facility and Municipal Reserve. To convert Wetland C into a storm water facility, a *Water Act* and *EPEA* approval will be required as the wetland will be Impacted both by the storm water facility (requiring *Water Act* and *EPEA*), as well as the general industrial development which will disturb the north portion of the wetland and require *Water Act* approval. Wetland replacement (e.g. compensation) will be a requirement for *Water Act* approval.

5. All developments shall ensure access to waterbodies via connections to the trail network to ensure the amenity values of natural areas are enhanced.

6. Development in the plan area shall avoid having an impact on waterbodies whenever possible.

    a. Measures to compensate for any loss should be explored as a last option. Where any alteration to, or removal of, waterbodies is deemed necessary then approvals will be required under the *Water Act*. In such cases, AEP compensation ratios shall apply. The cost to acquire the land is also required.

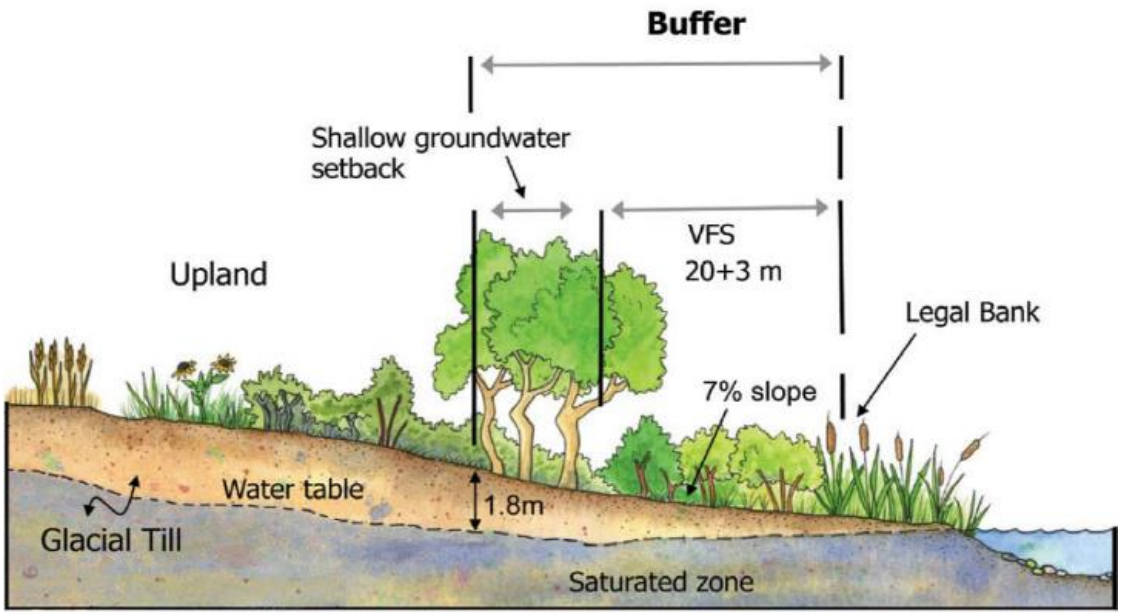


Photo Exhibit 3: A Lake or Wetland Buffer and Setback (Source: Stepping Back from the Water, Alberta Environment and Sustainable Resource Development, 2012)

7.3 Municipal Reserve Policies

Municipal Reserve will be dedicated as a combination of land for green infrastructure (parks and trails), and as cash-in-lieu in accordance with the MGA. Where allocated as land, Municipal Reserve may be provided as local parks, a trail network, or open space adjacent to storm water management facilities, or the trail network, as shown on Figure 5.

The parks will be well connected to the trail network, provided with road frontage, and situated near waterbodies or commercial services so that the parks provide an amenity space for the area and views to waterbodies for visitors who will visit the park. These opportunities not only provide for a better environment but also add to the overall aesthetics of the area.

Pedestrian and cycling trails have been identified as amenities that are important to the citizens of Camrose. Accordingly, an important objective of the East Gateway ASP is to ensure the development of a safe and connected trail network designed to tie into existing and future transportation routes, and adjacent neighbourhoods. Such a network will enhance the walkability, long term livability and sustainability of the area, and provide an attractive and viable alternative to driving.

The East Gateway plan area has been designed to provide a linear park system of trails that connects the area to adjacent neighbourhoods, and Municipal Reserve and Environmental Reserve areas.

1. Parks, trails and open space shall be provided in accordance with the locations shown on Figure 5.
2. A minimum of two local park sites, a minimum of 0.3 ha in size, shall be located in the western and eastern portion of the plan area.
    a. The parks shall serve as an amenity to adjacent properties and provide a vista into the commercial and industrial business park and to an adjacent water body or stormwater management facility.

b. The parks will be programmed in accordance with the Green Space Master Plan, shall serve as trailheads, and may function as an interpretive centre, multi-purpose pad, and/or playground.

c. Not less than 15% of the perimeter of the centralized a local park shall front a road to ensure it is visible and accessible to the public.

3. The land surrounding Environmental Reserve in the western portion of the plan area shall be dedicated as Municipal Reserve for open space purposes in order to provide a buffer between the Environmental Reserve parcel and adjacent development.

4. The land surrounding the storm water management facility in the eastern portion of the plan area, and located above the 1:100 year water level, may be dedicated as Municipal Reserve where it includes a recreational component, such as a trail and/or seating areas and enhanced landscaping.

5. The plan area shall include a trail network which is provided as an amenity for visitors to encourage an active lifestyle.

   a. The trail will be located within 39 Street, Township Road 471, Range Road 200, and Highway 26 and or adjacent to the roadway network. These lands will be acquired through the subdivision process and dedicated as road rights-of way and/or Municipal Reserve.

      i. Major arterials and major collectors within the plan area will be provided with a trail on one side of the road.

      ii. The City will work with CN Rail to develop a trail crossing at Township Road 471 and the CN Rail right-of-way.

   b. The trail network will:

      i. Meander gently and avoid existing vegetation.

      ii. Be as continuous as possible, linked with sidewalk connections, and minimize road crossings.

      iii. Provide connections into businesses, parks, storm water management facilities, open space and bus stops.

      iv. Make it easy for pedestrians or cyclists to move about easily and safely in order to reduce vehicle usage for short trips.

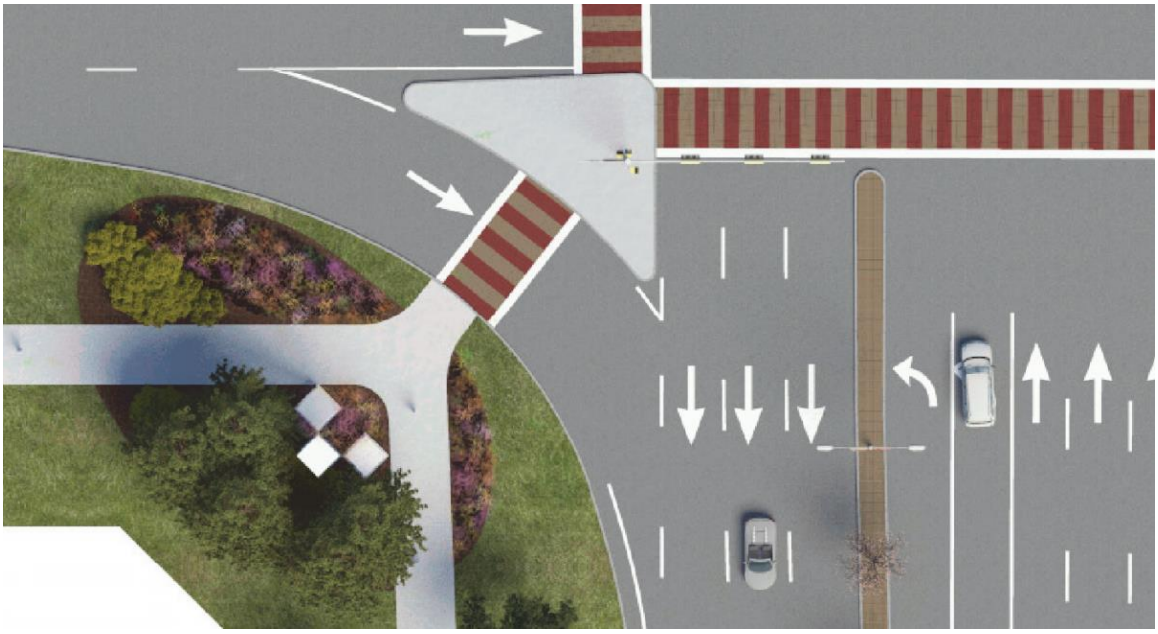


Photo Exhibit 4: Intersection and Crosswalk Patterning for Pedestrians and Cyclists

i. Tie into existing and planned trail connections to adjacent lands in accordance with the locations shown on Figure 5. The trails in the west and south will link the plan area to the centre of Camrose via Camrose Drive or the Camrose Regional Exhibition lands, while the trails in the east will link the plan area to Camrose County.

ii. Provide for seating and amenity nodes located along the trail. Seating nodes and locations should be determined during the preliminary design phase. Ideally these would be located next to connections into the businesses. Amenities should include benches, trash/recycling receptacles, and bike racks. Landscaping efforts should be focused at these nodes and provide some element of shade and shelter.

iii. Provide pedestrian-scale wayfinding along the trail.

iv. Create an interesting easily identifiable palette of street furnishings.

6. Prior to subdivision endorsement Municipal Reserve will be provided as land, as cash-in-lieu of land, or as combination of land and cash-in-lieu, in the amount of 10% of the developable area.

7.4 Highway Commercial Policies

Highway commercial development will occupy two sites in the plan area, one in the west and one in east. These sites total 7.5 ha, or 1.9% of net developable area, and are characterized by their proximity to Highway 13 and Highway 26, which will allow for the effective capture of the regional and local retail markets.

The development intent for these two sites is to create two nodes for employment and commercial services, and to provide a standard of development appropriate to their prominent location. It is anticipated that the eastern site, in addition to the general industrial area to the north, will be developed with a campus-like setting, complete with a park and a pedestrian network developed to link employees to destinations, such as restaurants and/or convenience stores. The objective is to create opportunities for social interaction, offer outdoor amenities, and a high degree of walkability and connectivity. These sites will be developed under the Highway Commercial (C2) Land Use District.

1. Given the prominent location of Highway Commercial sites along Highway 13 and Highway 26 development within this area will be governed by the policies of Gateway Overlay in Section 7.7.

2. Prior to issuance of a Development Permit for lands designated Highway Commercial, a site plan identifying enhanced parking lot landscaping, paved and screened parking and loading areas, and appropriate signage, must be submitted to the satisfaction of the approving authority.

7.5 General Industrial

The plan area contains 110.0 ha of land designated for a range of general industrial uses, which can be accommodated on a range of potential lot sizes. These lands are generally located within the center of the plan area and adjacent to arterial road ways.

The general industrial area includes three distinct sub-areas. The first sub-area is located in the central portion of the plan area, fronting onto Highway 26 west of Range Road 200. This area is intended for larger industrial lots. The second sub-area is located south of Highway 26 and west of Range Road 201 and adjacent to the CP Rail right-of-way. This area is intended for a single industrial user; however it may accommodate industrial lot sizes of a minimum of 700.0 m² and accommodate numerous users. These lands may also accommodate rail spurs from the CP Rail right-of-way. The sub-area also includes a stormwater management facility, wetland, open space and trail. The third sub-area is located in the eastern portion of plan area, and south of Highway 26 and east of Range Road 201. Lots in the sub-area are suitable for 0.8 ha – 2.0 ha development parcels. This sub-area, in conjunction with a Highway Commercial site, will be developed as a campus-like setting consisting of a stormwater management facility, park and trail.

The objective for this area is to allow for the development of businesses that do not require significant outdoor storage, do not have nuisance factors outside of enclosed buildings, and which are compatible with commercial development. This area may allow for the development of multi-bay office/warehouse uses. The sub-areas will be developed under the General Industrial (M1) Land Use District.

1. No development within this area shall permit uses with off-site nuisance factors, including noise, pollution or dust, and shall present an orderly and welcoming appearance to the street.
2. Given that the General Industrial designation sites are highly visible and are located adjacent to primary gateways into the City, it is important to create a physically attractive and comprehensively planned environment. As such, most of the areas designated General Industrial fall within the Gateway Overlay, as described in Section 7.7.
3. Outdoor storage yards associated with General Industrial uses shall be screened from view from major arterial roadways.
4. The City of Camrose encourages rail side development adjacent to the CP Rail and CN Rail rights-of-way within sub-area two subject to the Transportation Master Plan, the East Gateway Transportation Impact Assessment, and review by the City's Infrastructure and Planning Department.
5. Development adjacent to the CP Rail and CN Rail rights-of-way shall be setback 30.0 m from the property line of a railway company's main line to a building. This setback shall reduce vibration potential on nearby buildings.

7.6 Heavy Industrial Policies

The plan area contains 201.1 ha of land designated for heavy industrial uses. These lands are either developed or proposed to be developed by businesses associated with pipe fabrication, storage and/or distribution. Typically, heavy industrial land uses have higher impacts with regard to noise, dust, odour, appearance, and fire and explosion hazard. The plan aims to buffer main arterials, the adjacent General Industrial policy area and an existing industrial/commercial business and a farmstead development from these uses by providing visual screening (e.g. fencing, landscaping, berming, or a combination thereof) at the time of subdivision or development. This area is intended for large industrial lots, and likely one or two industrial users.

These lands also include a stormwater management facility, wetland, and a trail around the north, west and south borders of the policy area.

These sites will be developed under the Heavy Industrial (M2) Land Use District.

1. Heavy Industrial uses shall be screened from view from major arterial roadways through provision of building locations and/or visual screening consisting of landscaping or fencing, or a combination thereof.
2. At the time of Development Permit application for any industrial development the Development Authority may require the submission of a Risk Assessment to identify possible risk and any strategies to mitigate and/or minimize the risk, such but not limited to the provision of on-site emergency response, additional development setbacks from property lines and/or adjacent development, and/or the provision of berms, landscaping and/or fencing.
3. Any non-residential development located adjacent to an existing residential development shall address land use incompatibilities and nuisance such as, but not limited to, noise, dust, odor, outdoor storage, loading, or traffic to the satisfaction of the Development Authority by providing additional screening (e.g. landscaping and/or fencing) and setbacks.
4. Temporary or interim uses, other than agriculture, will be discouraged unless it can be demonstrated that the use will not affect the ultimate integrity of the ASP.

7.7 Gateway Overlay Policies

Gateways into Camrose, such as Highway 13 and Highway 26, are special areas that convey the City's character. They form first impressions, and as such it is important for their value to be protected and enhanced. Through proper design, gateway and streetscape treatments can provide a strong sense of identity and arrival, and enhance not only the visual appeal but the economic assets of the corridors.

Highway 13 and Highway 26 provide a unique opportunity to showcase life in Camrose because these corridors are frequently used by residents and visitors. As an important route of travel it is clear that the impression created by Highway 13 and Highway 26 will have an impact on the overall image of the City. Accordingly, the Gateway Overlay will be applied to those lands adjacent to Highway 13 and Highway 26, and outline the policies that should inform the design, function and character of these corridors.

The purpose of the Gateway Overlay is to ensure that development visible from these corridors, and the corridors themselves, are developed in a manner that creates a sense of arrival and place and that maintains a high standard of aesthetic appeal. Gateway corridors, in addition to being a linear entrance, consist of specific entrance features; that are an assemblage of buildings, natural features, landscaping, lighting and signage. The following policies will provide guidance for the development of each of these elements. Development within the Gateway Overlay area shall be based on the following policies:

1. All developments which fall within the Gateway Overlay, as shown on Figure 5, shall comply with the policies of this Section, to the satisfaction of the approving authority. The Overlay includes all lands within 100.0 m of the Highway 13 and Highway 26 right-of-way.

2. The City of Camrose shall develop a Gateway Entrance Feature Program to introduce unique and dramatic elements to the streetscape design at three key intersections. The Program will:

    a. Apply to the intersections of Highway 13 and Highway 26; Highway 13 at Range Road 200; and Highway 26 at Range Road 200. The consistent design of these feature intersections creates rhythm and repetition and strengthens the overall visual identity;

Photo Exhibit 5: Key Intersection Concept

    b. Identify the theme and type of entrance feature identified in Policy 7.7.2.a. The three feature nodes provide the opportunity to tell three unique stories integral to the life and history of the plan area or Camrose. Some examples of these themes include agriculture, sports, community history, and

citizens of Camrose. Elements such as sign blades, wayfinding, and traffic signal structures should be complementary to the East Gateway aesthetic.

c. Entrance features shall be designed in a manner that will not disrupt traffic flow or block sight lines, provide a unique way to celebrate East Gateway, and create a dramatic effect that will become a unique Camrose signature; and

Photo Exhibit 6: Entrance Feature Artwork

d. Collect levies at $500.00/hectare to assist in the completion of this program.

3. Plan area development shall be designed in a manner that will compliment and visually improve the Highway 13 and Highway 26. Development shall consider the following:

   a. Development shall provide sight lines to wetlands, parks, open space or trails in order to reveal and celebrate the areas natural character and amenities.

   b. Buildings shall be street facing. This requires all 4 facades of the building to be architecturally finished, particularly those facades facing Highway 13 and Highway 26. Placing the building at the rear of the property should be avoided.

   c. Development shall provide screening that ensure storage yards, loading areas, waste and recycling receptacles, and other uses that have adverse visual impacts are hidden from public view from the entry corridors.

   d. Landscaping provides an aesthetically pleasing environment, and a means to frame buildings, soften parking areas, and to screen loading and service areas.

      i. Landscaping on the yards visible from Highway 13 and Highway 26 shall be visually attractive and provide a high level of design quality.

Photo Exhibit 7: Parking Lot Landscaping and Walkways

ii. Landscaping shall be low maintenance with hardy, drought resistant plant species.

iii. Trees should be clustered to provide a canopy for trails and walkways and provide a more pedestrian focused sense of scale.

iv. Plant material species in the Commercial area should be limited to deciduous trees with high canopies. Coniferous trees should be used strategically for screening purposes, particularly in the Industrial area.

v. Shrub and perennial plantings provide color and interest, and should be provided in key locations, predominately at seating areas.

vi. Plantings should provide four-season features and highlight amenities.

Photo Exhibit 8: Plantings Providing Color and Interest

vii. Rolling berms screen industrial development and create a visually strong backdrop for plantings and may be required at the time of development.

e. Building signage facing Highway 13 and Highway 26 shall be limited to:

   i. One illuminated business name sign per building;

   ii. Illuminated cut out letters; and

   iii. 15% of the area of the façade to a maximum of 40.0 m².

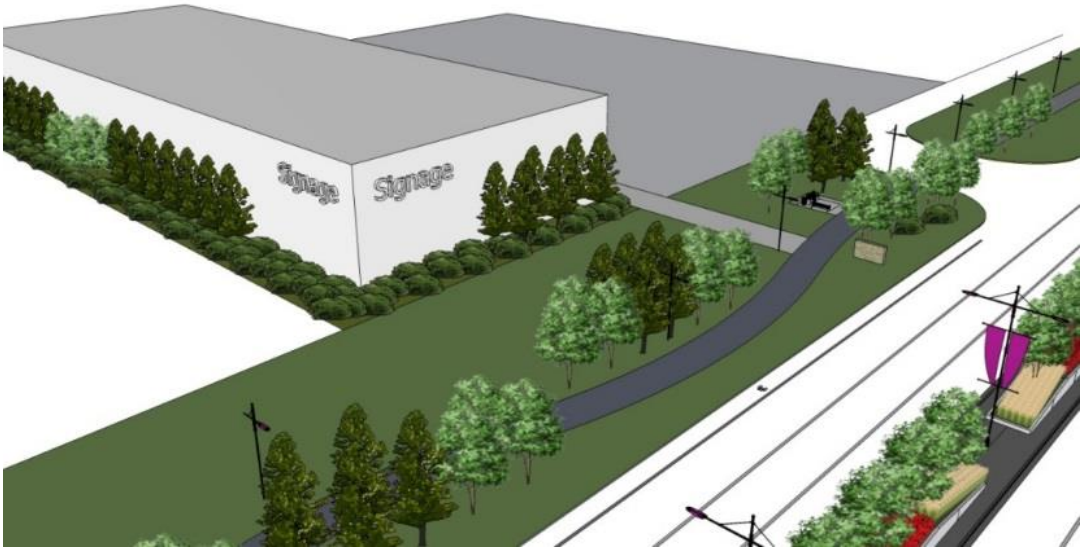


Photo Exhibit 9: Building Signage and Landscaping

f. Billboards shall not be permitted in the Highway 13 and Highway 26 right-of-way or on private property.

g. Parking is recommended to be located at the rear or side of buildings.

   i. Parking lot landscaping shall include trees and permeable road surfaces to reduce the heat island effect created by asphalt parking lot surfaces.

   ii. Pedestrian connections should be provided from interior walkways on site to exterior trails and sidewalks located on streets. All primary buildings should have strong connections to the trail network.

   iii. Loading areas should remain separate from parking areas.

   iv. Loading docks should not face Highway 13 and Highway 26 and should be screened and architecturally articulated in a manner to reduce visual impact (e.g. screening walls composed of same materials as building).

   v. Garbage enclosures and work yards should be well screened with architectural elements and/or landscaping.

8.0 Transportation

The East Gateway transportation network will consist of a roadway system that moves goods and people efficiently through the plan area, and that provides access to the regional highway system and the major arterials serving Camrose. The transportation network has also been designed to ensure multi-modal transportation options, taking into account accessibility and safe movements for truck, rail, and pedestrian and cycling traffic.

The plan area is provided with access from three important transportation corridors in the City, which include:

- 39 Street, which forms part of the north-south connection of the City's ring road in the northeast portion of the City;
- Highway 26, the main highway entrance from east of the City; and
- Highway 13, the main highway entrance from east central Alberta into the City. Access from Highway 13 to the plan area is limited by two at-grade rail crossings located at Exhibition Drive and Highway 26.

The transportation network will be developed in a compatible manner with surrounding road networks and with the existing railway network. The roadway hierarchy will include an arterial and collector system, supplemented with local roadways, as shown on Figure 6.

In accordance with the Traffic Impact Assessment (TIA) prepared for this ASP the following key roadway improvements will be made:

- 39 Street/Highway 13: Minor signal phasing improvements and westbound right turn lane;
- Highway 26/Highway 13: Traffic Signals;
- Highway 26/RR 200: Single lane roundabout;
- RR 200: Realignment, Minor Collector; and
- Highway 26: Arterial Classification.

Please refer to the TIA for detailed analysis and a full description of the key roadway improvements.

8.1 Arterial Road Networks

The major arterial road network for the plan area is based on the existing arterial roadway alignments (Highway 13 and Highway 26). The intersection of these arterial roadways accommodate the majority of the traffic in the plan area. Any adjustments to the existing geometry and/or traffic control at the Highway 13 and Highway 26 intersection will be designed in accordance with the requirements of the City of Camrose. Consideration will be given to safe and convenient vehicular and pedestrian crossings. Truck and dangerous goods routes or movements along the arterials will be consistent with the City of Camrose 2007 Transportation Master Plan (TMP).

The TMP and Highway 13/26 Functional Planning Study (2000) proposed the realignment of Highway 26 with 36 Street. This realignment is not being considered for this study on the basis of the following:

- Realignment will be through an existing wetland that was not identified in the TMP and Highway 13/26 Functional Planning Study. Abandoning the realignment avoids disturbance of this wetland, potential environment compensation costs and permitting.
- The existing Highway 26 alignment can accommodate development traffic volumes with minimal improvements.

- The cost to abandon the existing Highway 26 alignment and railway crossing, construct a new highway, and new railway crossing is considered to be cost prohibitive and as a result would carry financial impacts on future land development.
- Maintaining the existing alignment creates a larger, contiguous land development parcel.

8.2 Collector Roads

The existing alignment of Range Road 200 will provide collector road access for earlier stages of development and will be realigned with further stages. The realignment will create a new four legged intersection with the existing Range Road 200 alignment, north of Highway 26.

8.3 Local Roads

A series of local industrial roadways within the land area connect to Highway 26 and Range Road 200 at full build out of the plan area.

8.4 Transit

The 2007 Transportation Master Plan indicates that Camrose is approaching a population size which can support a public transit service. While it may be some years before transit service is provided to the plan area and along its major arterials and collectors, it is recognized that the creation of a walkable and transit supported environment will contribute to the sustainability of the area.

8.5 Transportation Policies

1. The Traffic Impact Assessment (TIA) accompanying this ASP, which is attached as Appendix C, should be reviewed in conjunction with any subdivision and development application. The TIA has identified and assessed the potential impacts from the proposed development activities on the surrounding road network and provided strategies to mitigate the adverse impacts. The report identifies trip generation rates, recommended staging of road construction and delineates preferred intersection spacing. All future access and intersection locations shall have regard to the recommendations made in the TIA.

2. The City of Camrose shall develop a road right-of-way standard for main arterial corridors that is appropriate given their gateway function. This standard shall have regard to specific guidelines for the development landscaping, pedestrian and bicycle routes, lighting and street furniture, and transit stops.

    a. The City of Camrose shall consider alternative road standards for roadways internal to the plan area. These standards shall have regard for non-vehicular traffic.

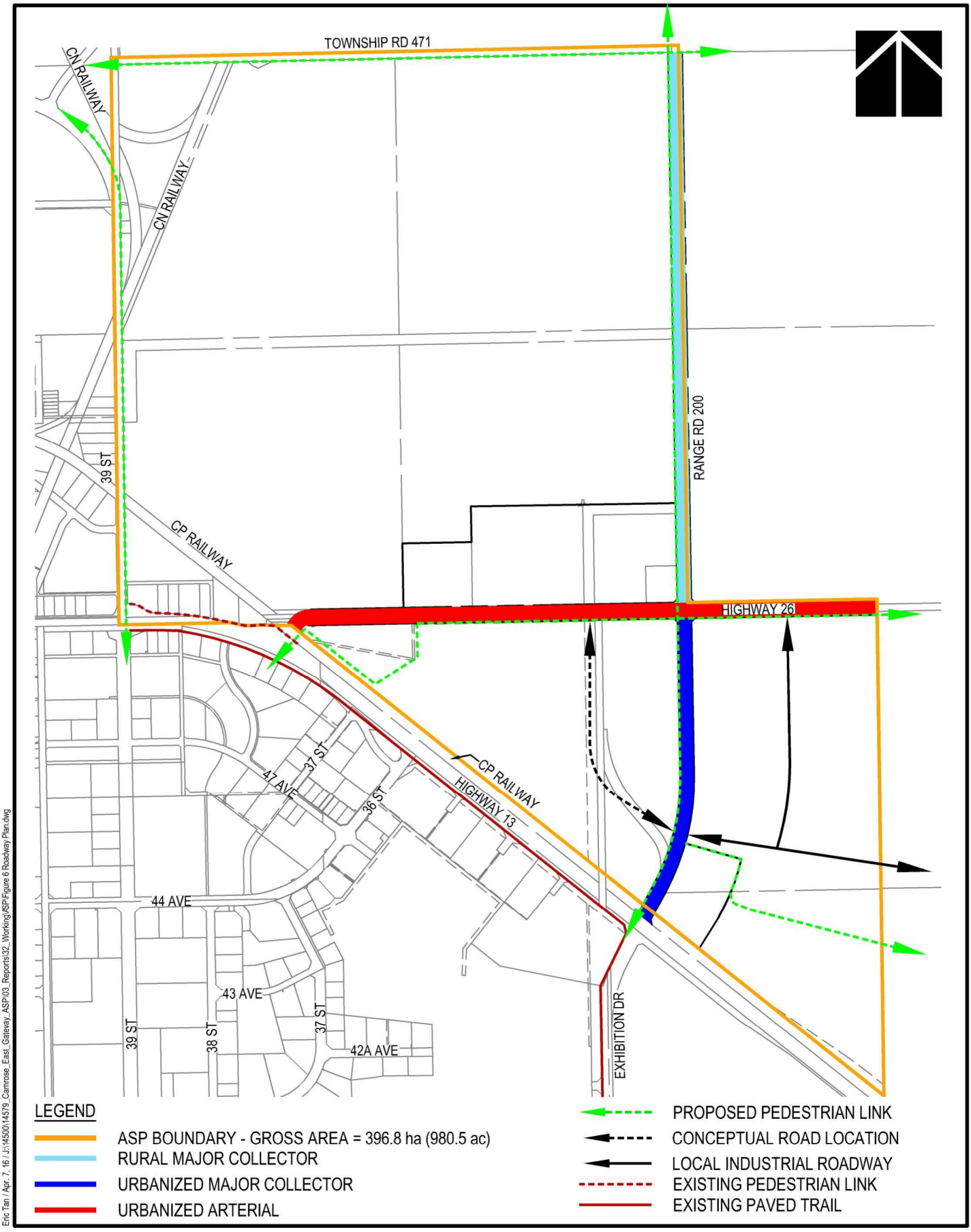
3. The realignment of Range Road 201/Exhibition Drive to line up with the existing Range Road 200 will occur at the time of future the future development of NW36-46-20-4.

4. Any proposed modifications to or realignments of at-grade crossings will require applications to CP Rail, CN Rail and the Canada Transportation Association (CTA).

    a. CP Rail Crossing:

        i. Range Road 200 at Highway 13 will require a rail crossing (warning system with gates) at Stage 1 build out.

        ii. Highway 26 at Highway 13 requires a rail crossing (warning system with gates) at Stage 2 build out. Highway 13 (48 Avenue) will require signalization.



Eric Tan / Apr. 7, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\03_Reports\32_Working\ASP\Figure 6 Roadway Plan.dwg

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AREA STRUCTURE PLAN
ROADWAY PLAN

FIGURE 6

0 150 300 450 600m

iii. The two railway crossings will require pre-emption at the adjacent signalized intersections and should be confirmed at the detailed design stage.

5. The City of Camrose may require the submission of a Transportation Impact Assessment, prepared to the satisfaction of the Development Authority, at the time of subdivision or development.

6. Continuous and well delineated pedestrian routes within developments shall be prioritized and provided wherever feasible.

    a. In order to ensure the quality, convenience and safety of access by foot and bicycle, a non-vehicular access strategy plan (including provision of sidewalks, trails, future transit stops, tie-ins to adjacent areas and road crossing locations) shall be prepared at the time of Development Permit application, to the satisfaction of the Development Authority.

7. At the time of subdivision cross lot access agreements between lots adjacent to Highway 13, or fronting onto Highway 26 and Range Road 201 and Range Road 200 may be considered in order to facilitate movement between lots and reduce accesses to these roadways.

9.0 Utilities

9.1 Water Servicing

The water servicing concept within the plan area, presented on Figure 7, is in general accordance with the City of Camrose Water Distribution System 2006 Master Plan Update Report. Water service will be extended into the plan area from an existing 300.0 mm water service located at the east boundary of SW1-47-20-4 and an existing 300.0 mm waterline along Exhibition Drive south of Highway 13. A proposed 600.0 mm water main will ultimately be constructed from Highway 26/Range Road 200 intersection within the plan area to 68 Street / Enevold Drive to service the plan area and other future developments within the City of Camrose.

9.2 Sanitary System

The sanitary servicing concept for the ASP area, presented on Figure 8, is in general accordance with the City of Camrose 2007 Sanitary Sewer Master Plan. Sanitary service will be extended into the plan area from 36 Street south of Highway 13. The plan area is anticipated to be gravity serviced with two private lift stations servicing the two north quarter sections. A central municipally owned and operated pump station could also be implemented within the two north quarter sections should smaller industrial subdivisions parcels develop.

The northwest portion of the plan area will be serviced by the extension of the existing trunk sewer on 54 Avenue. The SW1-47-20-4 (Shaw Pipe Plant), is serviced by a 100.0 mm force main which discharges into the existing sanitary trunk north of 48 Avenue.

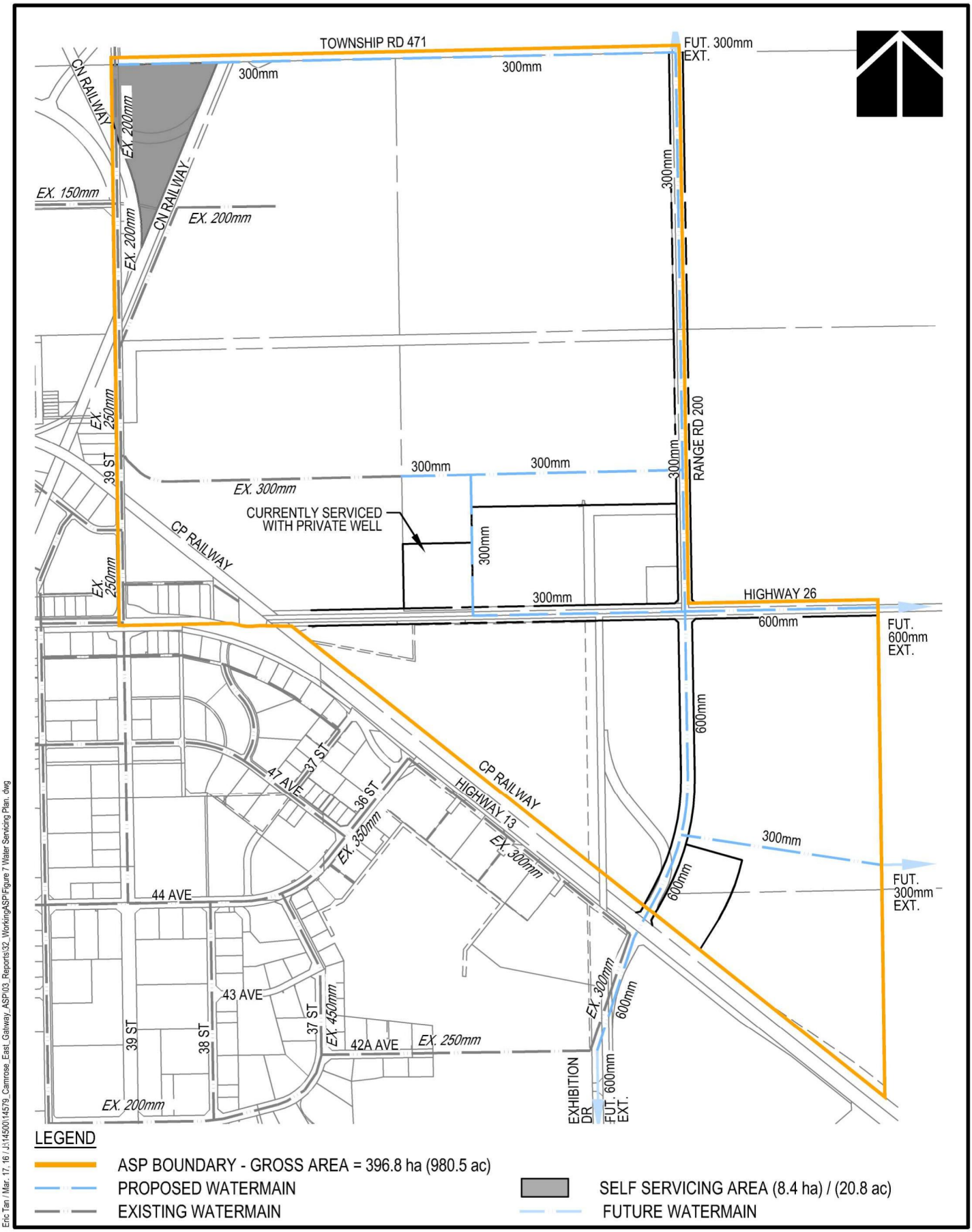
The Sanitary Sewer Master Plan identified that the Mohler Industrial area sanitary system had capacity available to service 100.0 ha of industrial land. As a result, inline sanitary pipe storage, located along CP Rail and along the east side of the municipal reserve, have been proposed to temporarily retain flows by controlling discharge to the existing sanitary system along 36 Street south. Industrial development users have high variability in sewage generation rates between users that will need to be monitored throughout the buildout of the plan area to potentially defer or mitigate infrastructure costs.

9.3 Storm Water Management

The storm water management concept generally conforms to the 2008 Stormwater Master Plan Update. The drainage basin boundary ridge runs east to west across the plan area along Highway 26, with the lands to the north draining to the ring road drainage channel and the lands to the south draining across Highway 13 and the CP Rail right-of-way into the Mohler drainage system. The storm water management concept illustrates one proposed Storm Water Management Facility (SWMF) east of Range Road 200, one proposed SWMF south of Highway 26, and two proposed and two existing SWMF north of Highway 26 as illustrated on Figure 9.

9.3.1 North Drainage Basin

According to the 2008 Stormwater Master Plan Update, the ring-road drainage channel will be extended upstream past the Camrose Airport (eastward) as an open channel or pipe system in order to service the area to the east. Due to right-of-way restrictions between the Airport and the Shaw Pipe Plant located west of 39th Street, the extension may consist of pipe instead of channel. At present the SWMF located on NW1-47-20-4 drains to the 46th Street channel. As per the Stormwater Master Plan, two new storm water management facilities will be provided to control runoff from the remainder of the land to predevelopment rates.



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AREA STRUCTURE PLAN
WATER SERVICING PLAN

FIGURE 7

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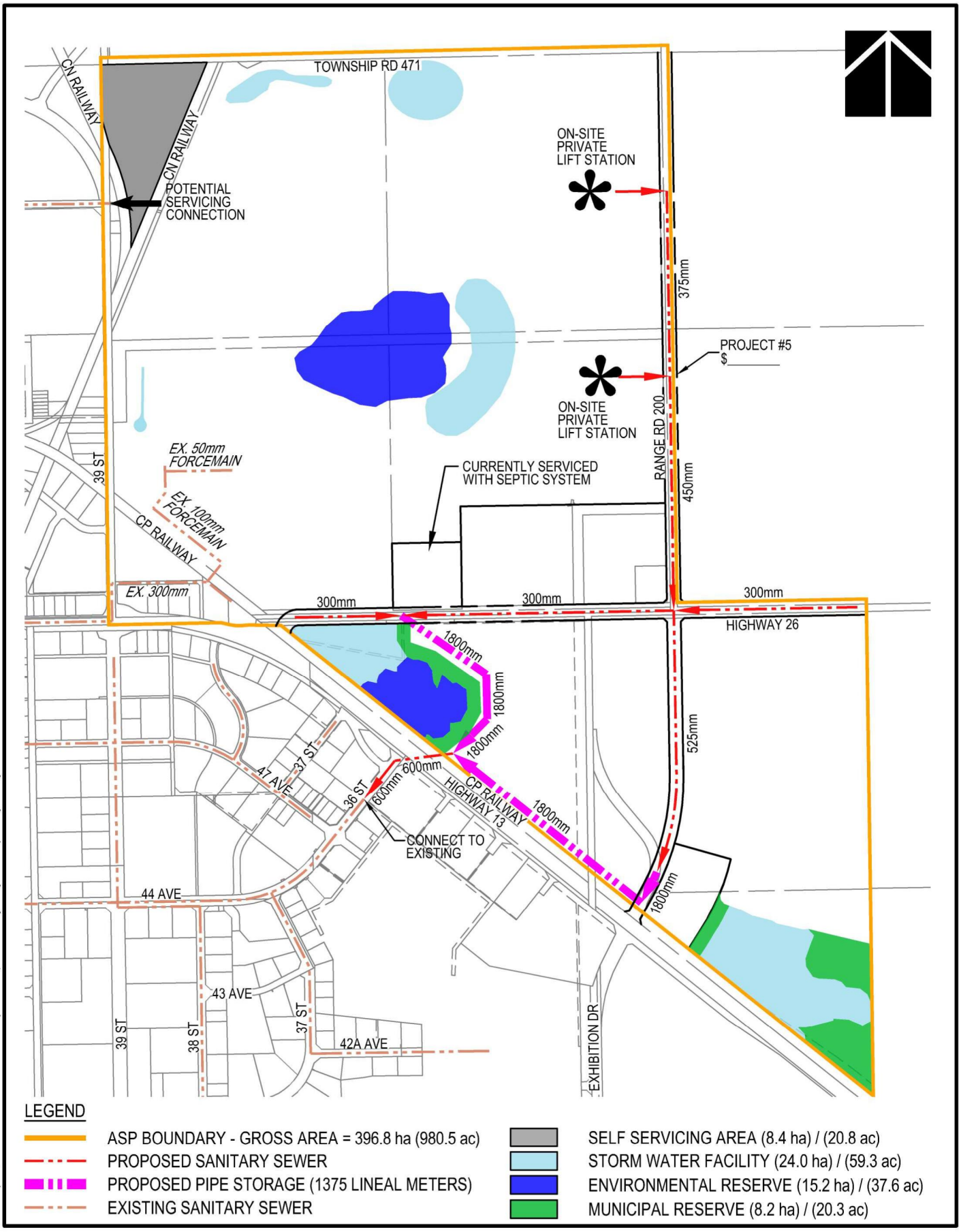

Eric Tan / Apr. 11, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\03_Reports\32_Working\ASP\Figure 8 Sanitary Servicing Pla n.dwg

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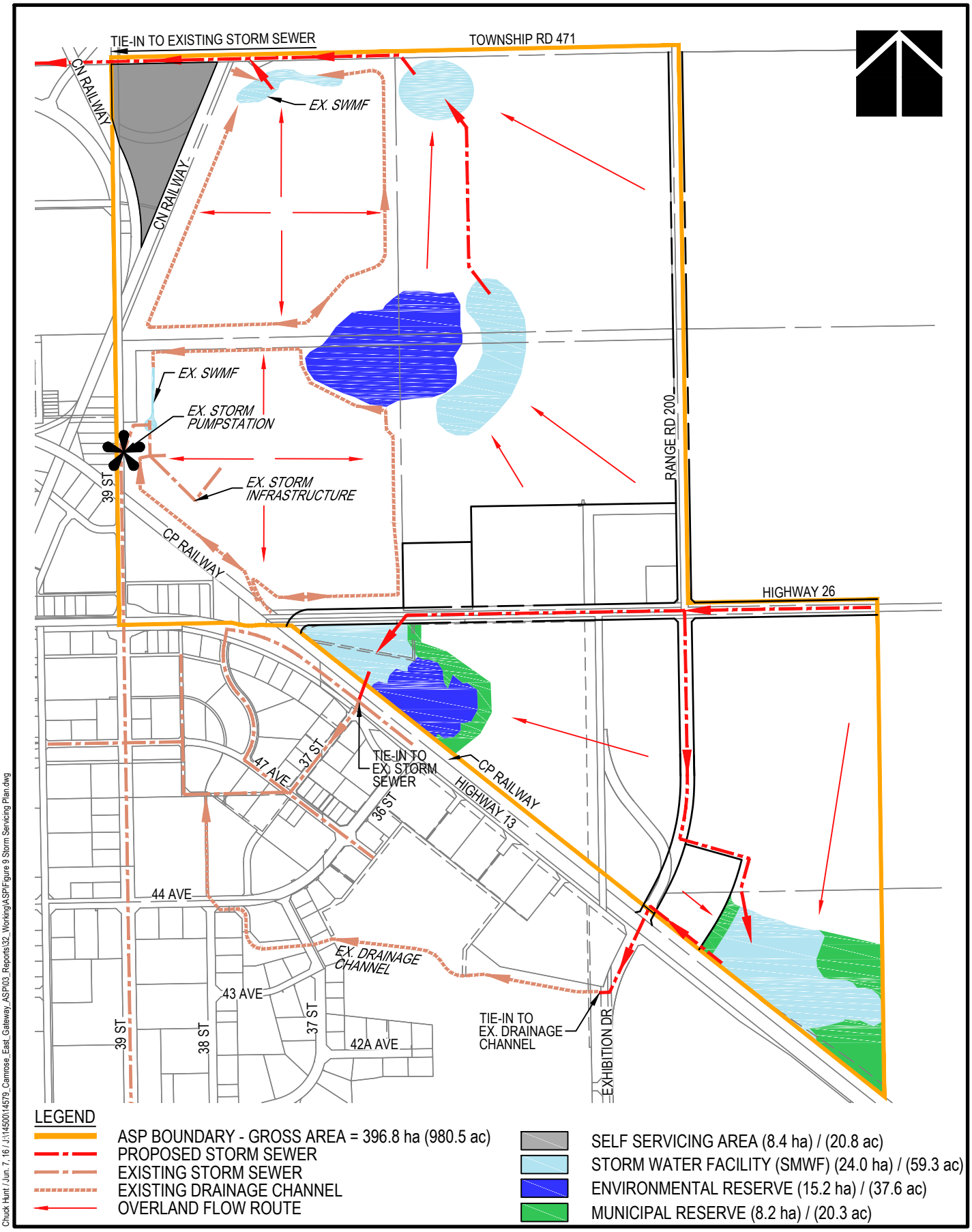
AREA STRUCTURE PLAN
SANITARY SERVICING PLAN

FIGURE 8

0 150 300 450 600m



Chuck Hunt / Jun. 7, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\03_Reports\32_Working\ASP\Figure 9 Storm Servicing Plan.dwg

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AREA STRUCTURE PLAN
STORM SER□ICIN□ PLAN

FIGURE 9

0 150 300 450 600m

9.3.2 South Drainage Basin

Currently, the SW1 47-20-4 (Shaw Pipe Plant) discharges into an onsite SWMF, consisting of a perimeter ditch, which is pumped to the 750.0 mm 39th Street storm trunk. The remainder of the ASP lands, generally south of the current Highway 26 alignment, will be serviced through an east or west SWMF designed to control runoff to predevelopment rates and address water quality. The west SWMF will service lands between Highway 26, Highway 13 and Exhibition Drive, and discharge to the existing storm sewer on along 37 Street to Highway 13. The east SWMF servicing lands south of Highway 26 and east of future Exhibition Drive will be designed to control runoff to predevelopment rates and address water quality and discharge across the CP Rail right-of-way to the Mohler Industrial storm system existing ditch.

9.3.3 Storm Water Policies

1. The 2008 Storm Water Master Plan Update recommends "…that all future storm management facilities within the vicinity of the airport be constructed as dry ponds or have minimal water areas with naturalized shorelines". The ASP recommends several design strategies that are meant to discourage the presence of birds and waterfowl, which have the potential to negatively impact the safe operation of airport traffic, including: draining wet areas, minimizing open-water areas and/or creating steep shorelines to minimize vegetation and therefore nesting and feeding habitat. The Airport Authority was contacted and expressed no concerns regarding open water, wet ponds or wetlands within the plan area.

2. Storm water management facilities will control storm water discharge (water quantity), address storm water quality and provide an important amenity function within the plan area.

3. Two existing wetlands (Wetland A and B on Figure 3) have been identified by AEP as potentially Crown claimed in the future. They are designated as Environmental Reserve and Environmental Reserve and Storm Water Management Facilities on Figure 5, respectively. Any Crown-owned wetlands will require AEP approvals for alterations of the bed and shore under the *Public Lands Act*.

4. Storm water facilities associated with naturally occurring wetlands (e.g. Wetland B and Wetland C) should be naturalized. They should be designed in accordance with Alberta Environment and Parks (AEP) requirements, and planted with native vegetation similar to the vegetation communities found in the existing and adjacent wetlands thereby creating continuous wetland-like habitat for wildlife. Naturalization may also include mimicking wetland geometry (e.g. avoid square facility geometry with unnatural angles) and employing natural substrate instead of rip-rap to encourage wildlife use, such as nesting, foraging, and staging.

5. *Water Act* approval is required for any activity that may impact wetlands, including development of storm water facilities.

6. An On-site Storm Water Management Plan, outlining the integration of low impact development design strategies, must be submitted at the Development Permit stage to the satisfaction of the approving authority.

    a. The Plan will aim to include low-impact development design strategies with the goal of reducing overall discharge, recharging ground water and enhancing water quality. Design strategies may include the use of bioswales and rain gardens, landscaping with native species, and incorporating on-site detention facilities wherever it is feasible to do so.

7. Storm water management facilities shall be tied into the park, trail and open space network in order to serve as amenities and provide view corridors for visitors and employees. Wherever possible views toward storm water facilities should be enhanced and encouraged, and adjacent development shall provide enhanced landscaping as screening where outdoor storage areas are adjacent to them.

8. Viewpoint parks shall be developed in association with storm water management facilities where they can enhance their amenity value, and in particular where they can provide a resting spot and view opportunity in association with the trail network.

9.4 Shallow Utilities Policies

Shallow utilities such as gas, power, telephone and cable will be provided to the site as required through franchised agencies and by the extension of existing adjacent infrastructure.

1. No servicing constraints are anticipated. As per typical servicing practices, these utilities will be placed within road rights-of-way or within registered easements.

9.5 General Servicing Policies

1. All fees to produce this ASP, and associated Transportation Impact Assessment, Contributions Plan and Phase I Biophysical Assessment, will be recovered by the City through the East Gateway levy.

2. Upon approval of this ASP, the Water Master Plan Update (2006), the Sanitary Sewer Master Plan Update (2007) and the Stormwater Master Plan Update (2008) shall be reviewed and/or updated to ensure consistency with the servicing design strategy outlined in this ASP document.

3. Upon the update of the Water Master Plan, the Sanitary Sewer Master Plan and the Stormwater Master Plan the East Gateway ASP shall be reviewed and/or updated to ensure consistency with the Master Plans.

4. Prior to subdivision or development, the applicant may be required to prepare a Biophysical Impact Assessment, Environmental Site Assessment, Geotechnical Assessment, Servicing Design Report and/or Transportation Impact Assessment to support an application.

5. On October 26, 2015, pursuant to the *Municipal Government Act*, City Council the lands adjacent to 39 Street and Township Road 471 as an area with limited municipal services. This area is known as 'Area 15' and is identified in Photo Exhibit 10. Area 15 has two geographies: one area generally located west of 39 Street/RR 201; and, the second area generally located east of 39 Street. As per City Bylaw 2866-15, Area 15 is exempt from the requirement to install, connect to, or oversize municipal sanitary, water, or storm services on, through, adjacent, or in proximity to any property. The Bylaw further describes that private services in the form of holding tanks or any other service option may be permitted subject to approval from the General Manager of Infrastructure and Planning Services, in accordance with applicable Municipal and Provincial Standards and Regulations.

Photo Exhibit 10: Area 15, as identified in Bylaw 2866-15

10.0 Sustainability Policies

The following policies shall be integrated into development wherever possible:

1. Utilize native plantings in order to reduce the requirement for irrigation and maintenance.
2. Strategically locate landscaping to maximize solar benefits and increase the energy efficiency of buildings. For example, plant coniferous vegetation at higher densities along the west face of buildings in order to shelter from prevailing winds; plant deciduous trees along the south side of buildings to provide shading in the summer and allow unobstructed sunlight in the winter.
3. Encourage energy efficient building design in order to reduce costs and lessen the impact on the environment. For example, integrate high efficiency HVAC systems, enhance insulation, utilize alternative roofing materials (e.g. reflective or white roofs), strategically locate windows to enhance natural lighting and reduce energy use for lighting.
4. Orient buildings to the front of the lot wherever feasible to not only contribute to a more pleasing streetscape but also to reduce the distance required for infrastructure extensions.
5. Encourage shared facilities between neighbouring businesses to avoid unnecessary redundancy. For example, allow for communal waste collection areas, shipping and receiving areas, parking, or outdoor lunch areas.
6. Ensure pedestrian connections are provided between sites, between buildings on a site, and between buildings and the sidewalk/trail network in order to encourage pedestrian activity.
7. Utilize bioswales to reduce pipe infrastructure and enhance natural systems. Bioswales may be integrated with the landscaped setback of the site or within parking areas to provide an amenity as well as a stormwater servicing function.
8. The implementation of sustainable development strategies shall be encouraged and integrated where feasible, at the subdivision and Development Permit stages, to the satisfaction of the Development Authority.
9. The Development Authority shall devise incentives and facilitate negotiations between adjacent businesses for the purpose of promoting sustainable design implementation.
10. The Land Use Bylaw shall be reviewed and amended for the purpose of facilitating the implementation of sustainable design strategies.

11.0 Implementation

This ASP will be implemented through a variety of mechanisms available to municipalities, including: the MDP, ASP amendments, the Land Use Bylaw, subdivision review, the development permitting process and development agreements.

11.1 Plans and Policy Documents

Section 638 of the *Municipal Government Act* states that all statutory plans are to be consistent with one another. Accordingly, the MDP requires a map amendment to make it consistent with the land uses, transportation network, and policies identified in this ASP. Neighbourhood Structure Plans will not be required in advance of subdivision or Development Permit submission.

Supporting technical appendices prepared in the development of this ASP will be published separately and made available on the City website to inform subsequent plans and more detailed engineering for developments in the plan area. Technical appendices for review include.

Appendix A - Traffic Impact Assessment
Appendix B - Environmental Overview and Wetland Desktop Review
Appendix C - Contributions Plan
Appendix D - Historical Resources Act Clearance Letter
Appendix E - Engagement Plan
Appendix F - 2008 East Gateway Area Structure Plan Draft Land Use Concept
Appendix G - March 17, 2016 Open House Feedback

As such, these technical appendices are not part of the ASP Bylaw, and may require updates on an individual development application basis, or as conditions change in the plan area.

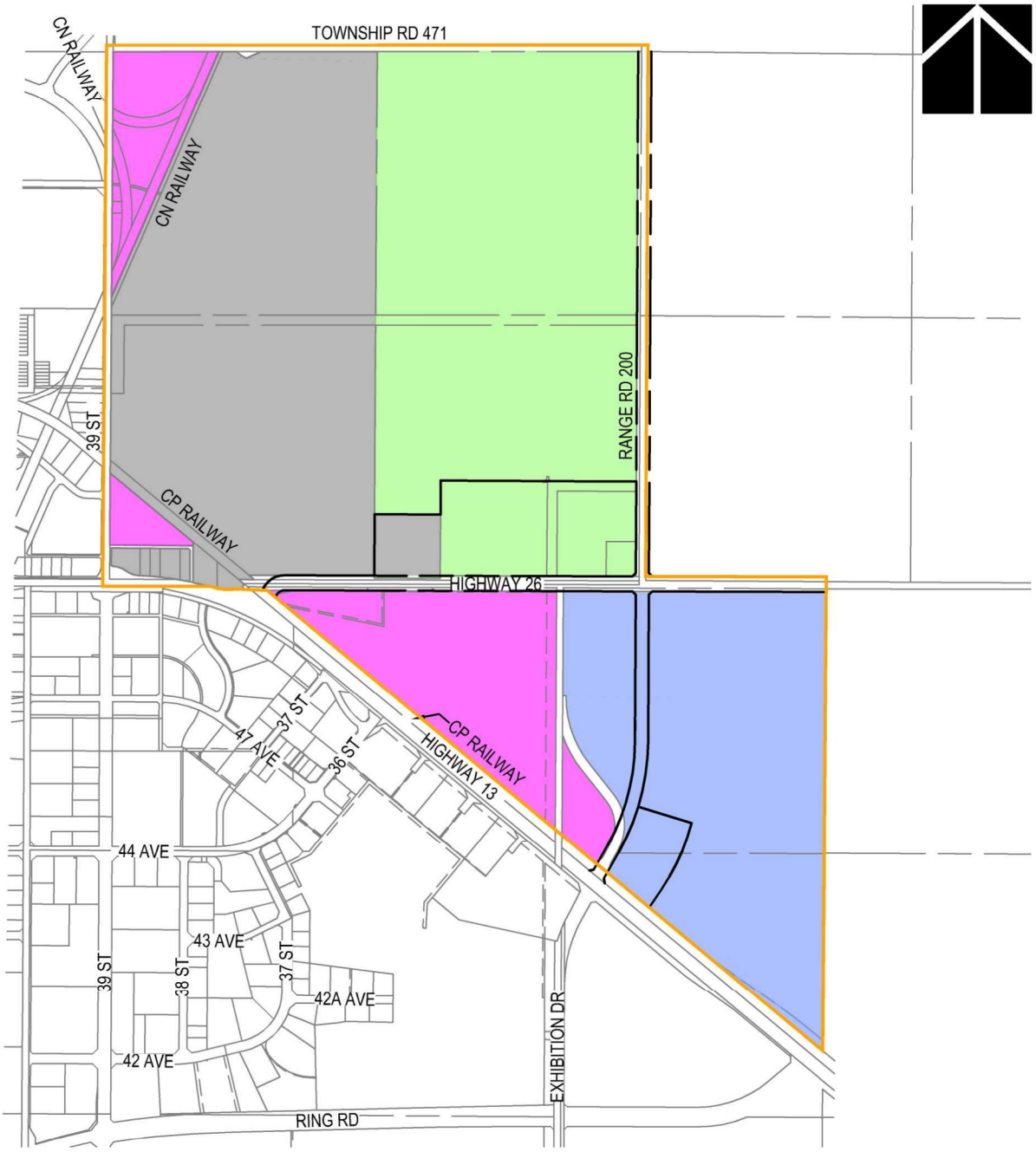
11.2 Rezoning

In order to comply with the Land Use Bylaw, a series of redistricting applications may be required concurrent with individual applications to subdivide or develop. Land use districts intended to implement development in the plan area include, but are not limited to, Highway Commercial (C2), General Industrial (M1), and Heavy Industrial (M2). Land designated for highway commercial development should be redistricted to C2 District, and land designated for General Industrial or Heavy Industrial development should be redistricted to M1 or M2 District.

11.3 Development Staging

The anticipated development staging for the plan area is shown on Figure 10, and is based upon contiguous access to utility services and road systems. Existing development that meets the intent of the Future Land Use Concept shown on Figure 5 is also identified. As prevailing market conditions warrant, development will commence in the southwest portion of plan area. It is then anticipated that subdivision and development will proceed to the northeast, and then eastward from the previous stages. Where a later stage precedes an earlier one, an ASP amendment shall not be required as long as the condition for contiguous extension of servicing and roadways can be met.

Development phasing and development timeframes will be reviewed as part of an Economic Development Strategy and/or Retail and Industrial Demand Study and Strategy; should the City undertake such studies.



LEGEND

- ASP BOUNDARY
- EXISTING DEVELOPMENT
- STAGE 1
- STAGE 2
- STAGE 3

Eric Tan / Apr. 11, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\03_Reports\32_Working\ASP\Figure 10 Development Staging Map (160411).dwg

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AREA STRUCTURE PLAN
DEVELOPMENT STAGING MAP

FIGURE 10

0 200 400 600 800m

Appendix A

Traffic Impact Assessment

ISL Engineering and Land Services

Inspiring sustainable thinking

Suite 100, 7909 – 51 Avenue Edmonton, AB T6E 5L9 T: 780.438.9000 F: 780.438.3700

March 28, 2016

Our Reference: 14579

City of Camrose

Attention: Click here to enter text.

Dear Sir:

Reference: East Gateway Area Structure Plan – Traffic Impact Assessment

---

The City of Camrose (City) Area Structure Plan (ASP) proposes various land uses for future developments. The impact of these future developments on the road network requires assessment to ensure that existing and or proposed transport infrastructure has the capacity to allow the efficient travel of expected traffic volumes. ISL completed the traffic impact assessment and it is contained herein. Our background, methodology, analysis, findings summary, client perspective, and recommendations are below.

1.0 Background

The East Gateway Area Structure Plan (ASP) area applies to the area shown on Figure 1. The area is located in the northeast quadrant of Camrose and is bounded by:

1. CN Rail line and Township Road 471 to the north;
2. Highways 13 and 26 to the south;
3. 39 Street to the west; and
4. Range Road 200 to the east.

These lands consist of 396.8 (ha) and were annexed to the City in 2009.

The purpose of this study is to determine what type of improvements, if any, are required at the 'ultimate conditions' The ultimate conditions are 2021 background traffic plus 'stage 1' development traffic horizon and the 2036 background traffic plus 'full build-out' development traffic. The following sections will detail ISL's methodology, analysis and recommendations.

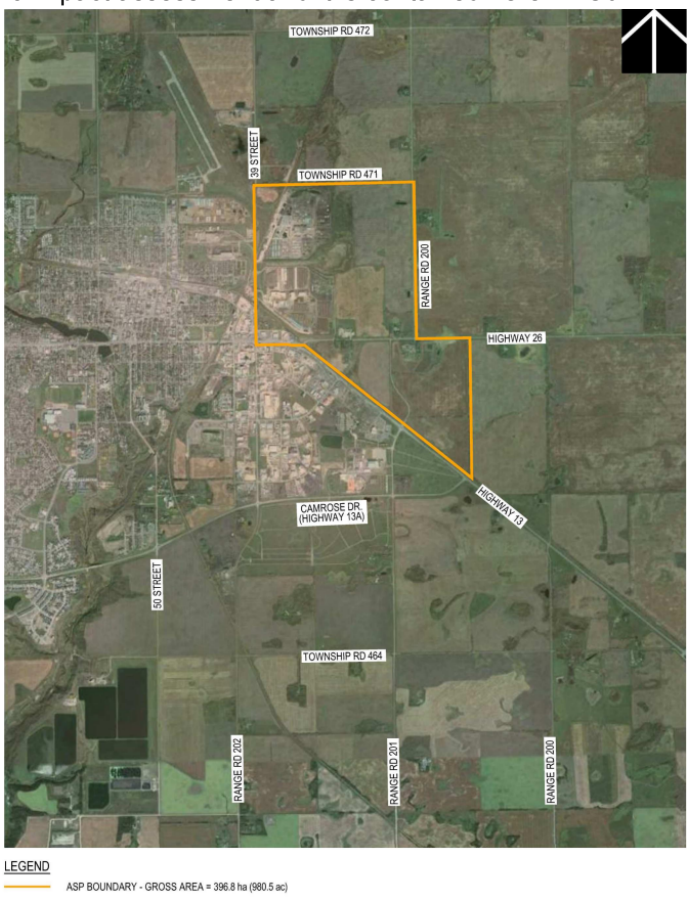


Figure 1 – Location Plan

2.0 Traffic Analysis

2.1 Land Use

For the purpose of this traffic assessment, the lands have been grouped into zones according to the proposed access locations (see Section 2.5). The collation of proposed land use designations into zones is illustrated by Figure 2.

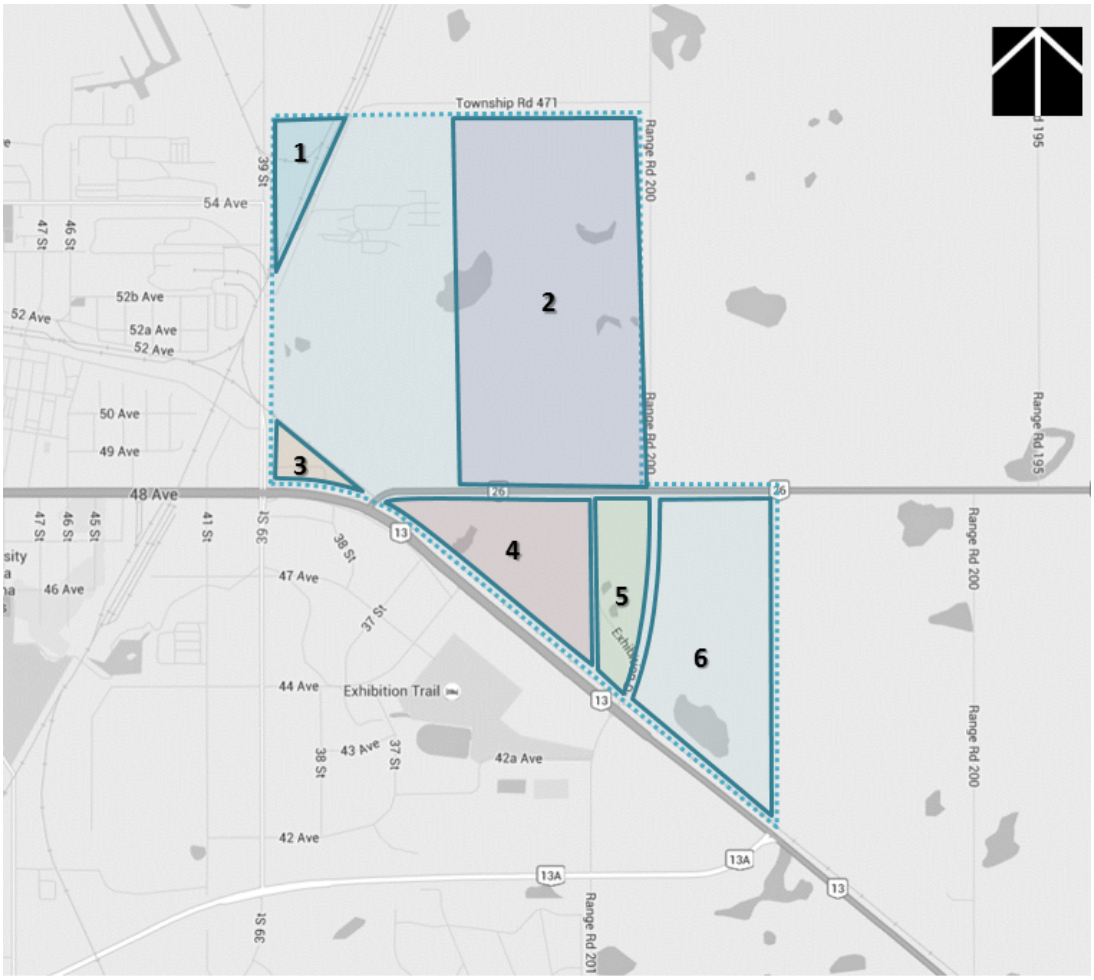


Figure 2 – Traffic Analysis Zones

Traffic analysis zones do not include land that is already developed.

Applying the zones illustrated above results in a breakdown of land use areas as follows:

Table 1: Land Use Breakdown

ZONE	1	2	3	4	5	6	TOTAL
HIGHWAY COMMERICAL (ha)			3.1			4.4	7.5
GENERAL INDUSTRIAL (ha)		21.1	2.9	21.6	17.9	46.5	110
HEAVY INDUSTRIAL (ha)	8.3	192.8					201.1

2.2 Ultimate Conditions

The development of the lands outlined in the above sections are to be constructed in two distinct stages. Stage 1: Development of Zone 1, 3 & 4 (2021), Stage 2: Full Build Out (2036).

2.3 Background Traffic

Background traffic was compiled using 2013 and 2014 raw count data supplied by the City of Camrose for the following intersections.

- Location 1: 39 Street / 54 Avenue
- Location 2: 39 Street / 51 Avenue
- Location 3: 39 Street / 48 Avenue (Highway 13)
- Location 4: Highway 26 / 48 Avenue (Highway 13)
- Location 5: 36 Street / 48 Avenue (Highway 13)
- Location 6: Exhibition Drive / 48 Avenue (Highway 13)
- Location 7: Exhibition Drive / Highway 26

The count volumes of existing intersections were adjusted to ensure a balanced in/out relationship between intersections.

2.3.1 Background Growth

The balanced volumes as described above formed the grounds for background traffic to which a compound growth rate of 2 percent was applied. These volumes were factored to the year 2021 and 2036, representing background traffic at stages 1 and 2. The 2014 AM and PM balanced traffic volumes are provided in the Appendix.

2.4 Development Traffic

2.4.1 Trip Generation

The site generated traffic volumes for Highway Commercial and Heavy Industrial were based on the Institute of Transportation Engineers Trip Generation Manual 9th Edition. The rate of trip generation for General Industrial was based on factors more appropriate for this locality, based on measured trip generation rates that have been agreed previously by ISL in coherence with other municipalities in Alberta.

Table 2: Trip Rates

LAND USE	Floor Area Ratio (FAR)	Trip Rate			Pass by	Internal
		AM	PM	Unit		
HIGHWAY COMMERCIAL	0.25	0.96	3.71	sq. ft./1000	20%	20%
GENERAL INDUSTRIAL	1	2.58	2.79	Acres	0%	0%
HEAVY INDUSTRIAL	1	1.98	2.16	Acres	0%	0%

Detailed zone by zone trip generation stats are provided in the Appendix for each stage of development.

2.5 Trip Distribution

Site generated traffic volumes are expected to access / egress from externalities as per the percentages illustrated in Figure 3. Site traffic routing within the development area has been determined based on existing traffic volume routing and shortest travel paths to and from each zone.

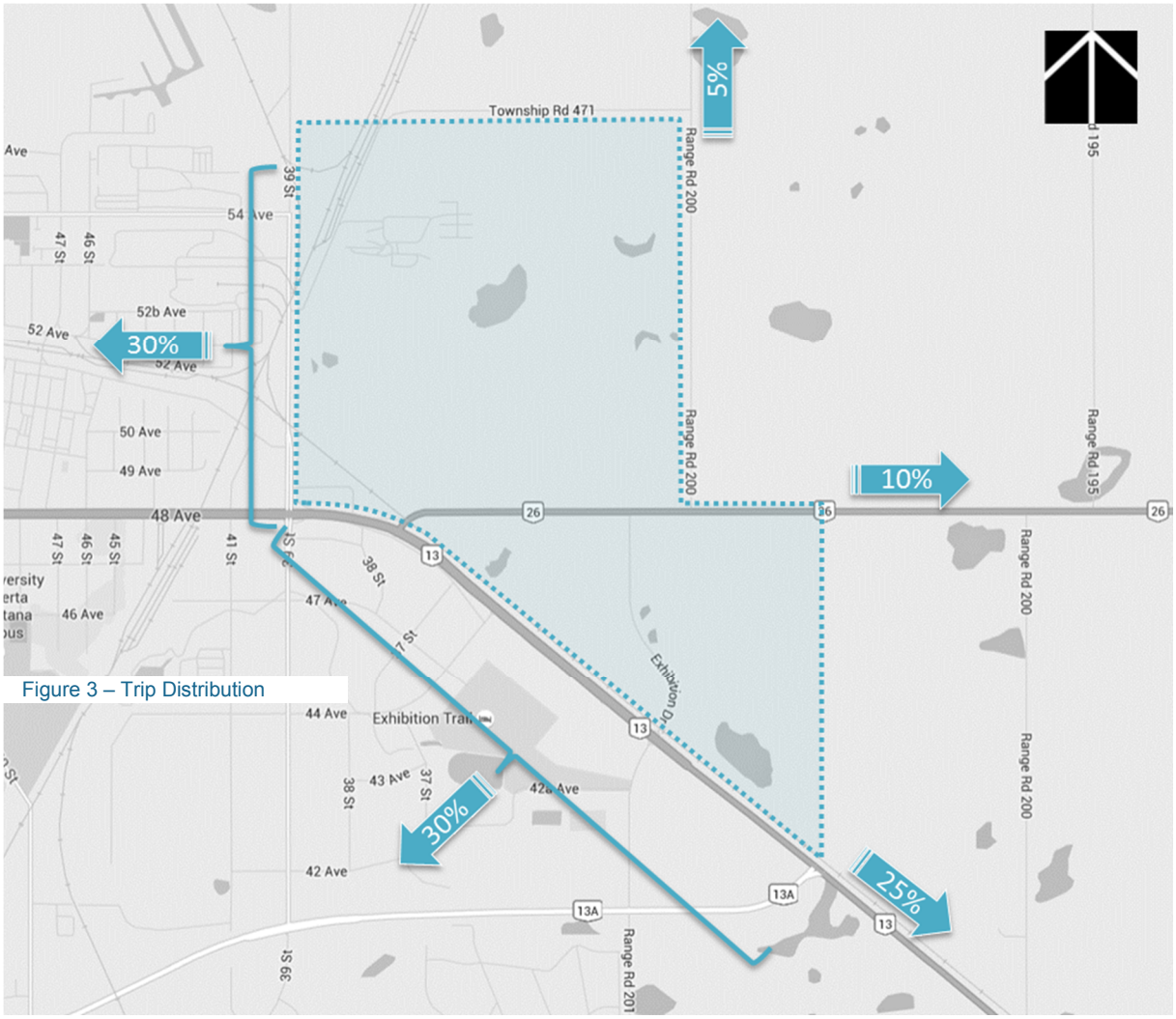


Figure 3 – Trip Distribution

2.6 Future Roadway Network

2.6.1 Stage 1

Stage 1 ultimate condition is expected to utilize the existing network in its current form. Zone 3 has been assessed with access via the introduction of a fourth leg (west-bound) to the existing 3-way intersection of 39 Street and 51 Avenue. Zone 4 has been assessed with access via existing Highway 26 and Exhibition Drive. This is shown in Figure 4.

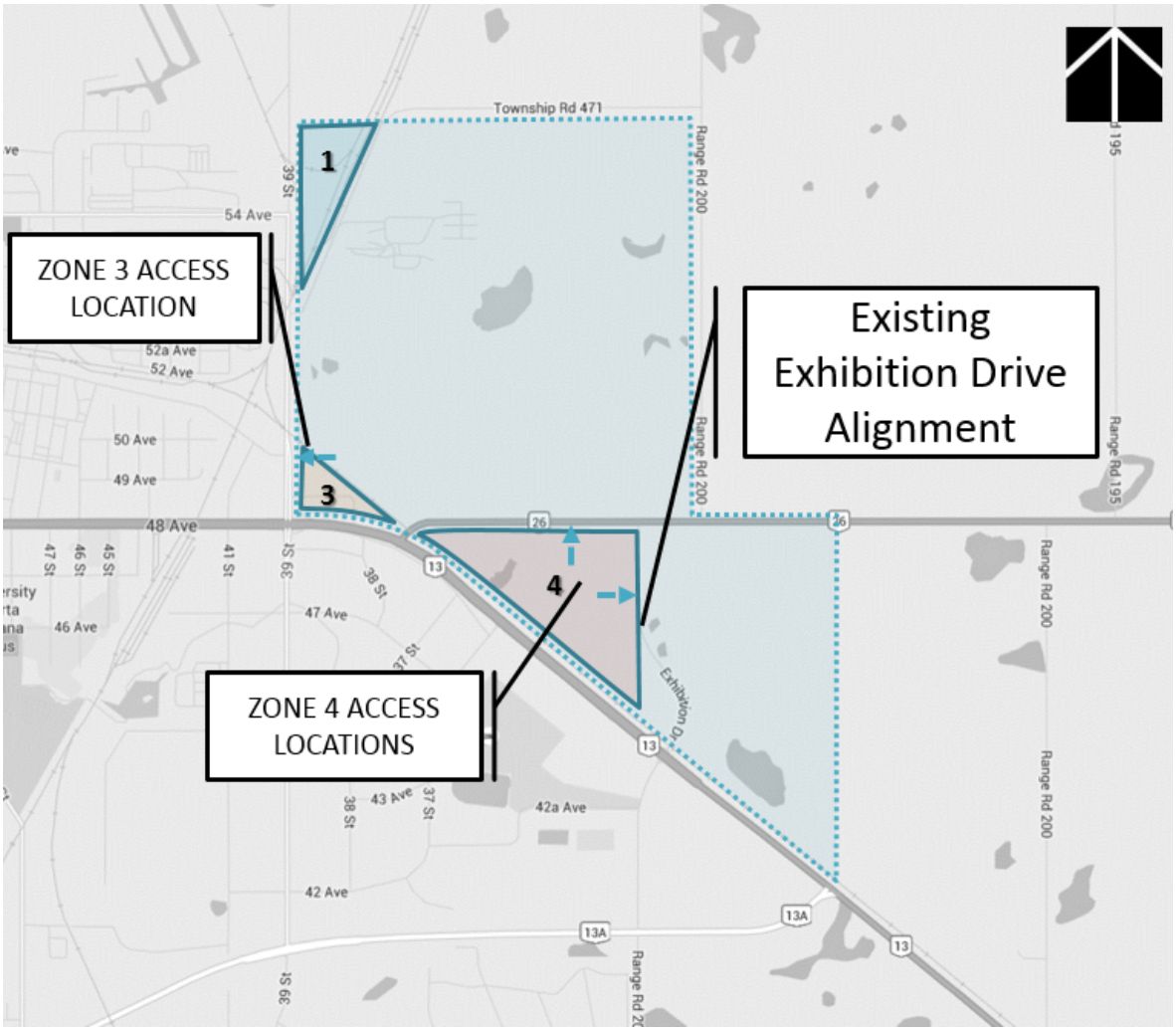


Figure 4 – Road Network (Stage 1)

Zone 1 access is assumed in the area of the rail crossings.

2.6.2 Stage 2

Stage 2 design scenario is expect to see a change in alignment of Exhibition Drive. The northern section on Exhibition Drive is expected to be offset east to align with the existing 3-way arrangement of Highway 26 and Range Road 200 (North). This arrangement is depicted in Figure 4 below.

Figure 5 – Road Network (Ultimate Conditions)

Future access to zone 4 and zone 5 is to be to/from the local access road, between Highway 26 and the realignment of RR 200. Zone 2 access is assumed to be to/from RR 200. Zone 6 access is assumed to/from Exhibition Drive. Future details regarding access management strategies are provided in Section 5.

3.0 Analysis

3.1 Methodology

Operational analyses for signalized and unsignalized intersections were performed using Synchro 9. This software is used to evaluate the performance of intersections on the roadway network using the Highway Capacity Manual (HCM) techniques. Using the HCM methodology, intersection performance is categorized by its "Level of Service", or LOS. There are six levels of service as follows:

- LOS A represents the highest level of service, or generally "free flowing conditions"
- LOS F generally represents a "breakdown" or "gridlock" condition in vehicular flow. At signalized intersections drivers will experience waits of two or more cycles.
- Levels of service B, C, D and E are intermediate levels of performance between each extreme
- LOS D reflects "normal" peak hour congestion, generally accepted criterion for design analysis.
- LOS E reflects an intersection or movement experiencing congestion and high delays. It may be accepted for certain movements only (such as low volume or low v/c ratio movements).

Typically, LOS D or better is the accepted standard for peak hour operations of all movements at an intersection.

Table 2 shows average delay per vehicle values that correspond with the six service levels.

Table 3: LOS Criteria for Signalized and Unsignalized intersections

	Average Delay Per Vehicle (s)	
LOS	**Signalized**	**Unsignalized**
A	< 10	< 10
B	10 – 20	10 – 15
C	20 – 35	15 – 25
D	35 – 55	25 – 35
E	55 – 80	35 – 50
F	> 80	> 50

In this study LOS is reported for each intersection movement. This allows for an accurate assessment of each movement's delay, as opposed to averaging delays for approaches or the entire intersection, which can mask specific problem movements.

Synchro also calculates each movement's volume to capacity ratio (v/c). A v/c ratio of 1.0 represents an intersection or movement at full capacity with no ability to accommodate additional traffic. Typically, a v/c ratio of 0.9 or lower for all intersection movements is the accepted standard for peak hour operations. Finally, Synchro also calculates the 95th percentile vehicle queue length for each intersection movement. This allows the determination of left and right turn storage requirements. Use of the 95th percentile vehicle queue length criterion is accepted practice for normal peak hour operation; it means that the queue length is exceeded 5% of the time.

Traffic signal warrants were completed using TAC's Traffic Signal Warrant Matrix, which reports a warrant score. Values above 100 are considered warranted and values below 100 are not considered warranted.

3.2 Results

3.2.1 Stage 1 Traffic Analysis Results

Stage 1 Synchro analysis indicates that the existing road network has the capacity to accommodate 2021 background traffic and the additional site traffic generated by the proposed developments. No improvement are required to the network based on Stage 1 traffic. There are no issues to report. Detailed stage 1 Synchro reports are provided in the Appendix.

3.2.2 Stage 2 Traffic Analysis Results

Stage 2 Synchro analysis indicates the following operations issues with the roadway network, including:

39 Street/48 Avenue

- (PM Peak) Southbound Left operating at a v/c ratio of 0.95
- Southbound left turning signal is required
- (AM Peak) Eastbound left turn operating at a v/c ratio of 1.08, Westbound curb lane operating at a v/c ratio of 1.04
- Eastbound left turning signal is required, exclusive westbound right turning lane is required
- With the addition of the above improvements all movements will operate satisfactorily

48 Avenue/Highway 26

- (AM and PM Peak)Insufficient capacity for vehicles turning on to 48 Avenue based on the existing traffic control conditions
- Traffic Signals required
- With the installation of traffic signals all movements will operate at a LOS C (or better) with a v/c < 0.81 (or better).
- (PM Peak) Southeast left turning movement 95th percentile queue is estimated at approximately 90 m and the current storage is approximately 80 m.
    - Approximately 1 – 2 vehicles will queue into the through lanes, however this will only occur at the 95th percentile queuing (95% of the time this will not be an issue), therefore is not considered a critical issue
- An exclusive southbound right turning lane with a minimum 25 m storage will be required

Exhibition Drive/Highway 26

- (AM and PM Peak) Insufficient capacity for vehicles turning on to Highway 26 based on the existing traffic control conditions (North/South, Stop Sign)
- Single lane roundabout or traffic signals required
- With the addition of the above improvements all movements will operate satisfactorily

3.2.3 Exhibit Drive and Highway 26 (Traffic Signal vs. Roundabout)

The following details the comparative benefits of the traffic signal compared to a roundabout, based on a high level cursory review of a number of related items.

Table 4: Roundabout/Traffic Signal Comparison Criteria

	Criteria		
	Costs	**Safety**	**Operations**
Sub-criteria	Construction	Impact on Collision Rate	Impact on Operational Speed
	Right of Way	Pedestrians	Impact of Emissions
	Operational	Cyclists	Overall Capacity
	Maintenance		Accommodation of Large Vehicles

Costs

Construction: The construction cost of a roundabout is likely to be higher because it requires significant modifications to the pavement area while a traffic signal can be installed under the current geometric conditions. Modifications will also include introducing some small deflection curves to the entry to encourage lower entry speeds.

Right of Way: Additional right of way is also often required for a roundabout. The traffic signals could likely be installed without purchasing additional right of way and without alterations to the existing geometry.

Operational: Operational costs are expected to be higher for a traffic signal given the need for technicians to be available on-call in case of a power outage or other unforeseen problem. A traffic signal is also more susceptible to be inoperable given that its infrastructure can be run into and destroyed as a result of a vehicular collision.

Maintenance: Maintenance costs are assumed to be slightly higher for a traffic signal as it requires additional maintenance costs due certain electronic and lighting components that need to be inspected and replaced regularly.

Safety

Collision Rates: According the National Cooperative Highway Research Program Report 672 (Published by the Transportation Research Board, 2010) there is an observed reduction of 35% to 75% in total and injury vehicular crashes, respectively, following conversion to a roundabout from a traffic signal.

Cyclists: Proportionally, cyclists were more often involved in crashes (16%) at roundabouts than at signalized intersections and the consequences of such crashes were more serious. There was however no distinction given between cyclists riding on the roadway within the travel lanes or on a pathway crossing the travel lanes.

Pedestrians: A Dutch study of 181 intersections converted to roundabouts found reductions of 73% in all pedestrian crashes and 89% in pedestrian injury crashes. Generally speaking, roundabouts have a superior safety record compared to a traffic signal as indicated.

Operations

Speed: A traffic signal can accommodate higher through speeds than a roundabout. Traffic will be able to proceed through a green light without stopping or slowing down while a vehicle must slow to the design speed of the roundabout. In the case of Highway 26, the first intersection for traffic from the west, a roundabout is considered more desirable as to control speeds.

Emissions: Both types of intersection control will require that traffic must stop to allow cross street traffic to go. A signal will however require more total stops per day during the off-peak hours compared to a

roundabout. A traffic signal will likely result in higher greenhouse gas emissions due to on average a higher number of stops and starts per hour.

Accommodation of Larger Vehicle: Both intersections types can accommodate larger vehicles, expect that a roundabout may require additional right of way and incur higher costs due to oversizing for larger vehicles. Both intersection types will require special attention in accommodating excessively longer vehicles. A roundabout will not require special attention for accommodating excessively higher vehicles, while a traffic signal will require rotatable bases.

Overall Capacity: In general a roundabout can accommodate a higher total number of vehicles compared to a traffic signal.

Based on the above criteria, sub-criteria and discussion of each the following, ratings and weights were given to each type of improvement. The ratings are given as relative ratings as followings:

- 10/10 = Relatively Superior in Comparison
- 7/10 = Great in Comparison, But Other is Superior
- 5/10 = Fair in Comparison, But Other is Easily Superior
- 3/10 = Poor in Comparison, Other is Far Superior
- 0/10 = Incomparable, Does not provide a benefit similar to other
- 10 for Both = Relatively the Same Benefit

Table 5: Traffic Signal and Roundabout Comparison

Criteria	Sub-criteria	Rating		Criteria Weight	Score	
		Traffic Signal	Roundabout		Traffic Signal	Roundabout
Cost	Construction	10	5	30%	0.225	0.188
	Right of Way Costs	10	0			
	Operational	5	10			
	Maintenance	5	10			
	Total	30	25			
Safety	Collision Rate	3	10	40%	0.213	0.36
	Pedestrians	3	10			
	Cyclists	10	7			
	Total	16	27			
Operations	Speed	7	10	30%	0.278	0.278
	Emissions	7	10			
	Capacity	7	10			
	Large Vehicles	10	7			
	Total	37	37	100%	71.6%	82.6%

Based on the comparison of the traffic signal and roundabout a roundabout is recommended as the preferred traffic control option based on the comparison. A few highlights include:

- Need for a speed control measure
- Safety benefits, reduction in overall collision rates

Additional right of way will likely be required for the roundabout. A functional plan for the roundabout is recommended to determine right of way requirements to be acquired as development proceeds.

4.0 Rail Crossing Review

CN Rail Operates up to 10 trains per day, based on discussions with CN in the fall of 2015. The current Highway 26 crossing is fit with overhead warning flashers and ground mounted signs. The existing RR 200 crossing has only ground mounted signs.

ISL completed a cursory review of these existing crossings at Highway 26 and RR 200, based on Section 9.0 of the Transport Canada Grade Crossing standards. For this analysis the CN rail line is assumed to have an operating speed of less than 25 km/h. Based on this the following applies:

The requirements for a warning system without gates are shown in the following:

- Cross product (daily train volumes x daily traffic volumes) > 2000

The requirements for a warning system with gates are:

- Cross product (daily train volumes x daily traffic volumes) > 2000, AND
- Spacing, from the stop bar of the adjacent street, to the edge of the crossing is as follows:
    - Unsignalized Cross Street (48 Avenue) = 30 m
    - Signalized Cross Street (48 Avenue) = 60 m

OR

- Cross product (daily train volumes x daily traffic volumes) > 50000

Applying the above to the stage 1 and stage 2 traffic volumes is shown in the table.

Table 6: Railway Crossing Review

Roadway	Stage 1		Stage 2		Spacing
	Volume	Cross Product	Volume	Cross Product	
Highway 26	4200	42000	~12000	120,000	~45 m
RR 200	770	7700	~ 6000	60,000	~30 m

(Daily volume based on PM Peak hour volume multiplied by 10)

As shown in Table 6, RR 200 meets the criteria for a warning system with gates, based on the stage 1 traffic volumes, due to the limited spacing between the rail crossing and the signalized intersection.

The Highway 26 crossing can maintain the existing warning system but will require gates with daily volumes at or above 5000 or with the installation of traffic signals at 48 Avenue, due to the limited spacing between the rail crossing and 48 Avenue. Detailed Section 9 from the Transport Canada Grade Crossing Standards are provided in the appendix.

5.0 Access Management and Roadway Classification

Highway 26 will be maintained as 2 lane roadway, based on the future traffic volume required. Given the current connectivity of this roadway as a provincial Highway it is logical to classify this as an arterial. Accesses along Highway 26 should be given a minimum spacing of 120 m (between accesses) and 200 m spacing from the future local roadway between Highway 26 and Exhibition Drive.

Exhibition Drive will be realigned as a 2 lane roadway and given the future traffic volume will be classified as a collector roadway. Access along Exhibit Drive should be given a minimum spacing of 60 m (between accesses) and 120 m from the future local roadway between Highway 26 and Exhibit Drive.

No access should be allowed between the rail crossings and 48 Avenue, with a minimum of 60 m spacing on the north side of the rail crossing to any access.

6.0 Conclusions and Recommendations

6.1 Stage 1 Conclusions

Based on the analysis ISL has concluded the following:

- Stage 1 Synchro analysis indicates that the existing road network has the capacity to accommodate 2021 background traffic and the additional site traffic generated by the proposed developments. No improvement are required to the network based on Stage 1 traffic.
- RR 200 meets the criteria for a warning system with gates, based on the stage 1 traffic volumes, due to the limited spacing between the rail crossing and the signalized intersection.
- No improvements are required to the existing Highway 26 rail crossing at stage 1.

6.2 Stage 2 Conclusions

39 Street/48 Avenue

- (PM Peak) Southbound Left operating at a v/c ratio of 0.95
- Southbound left turning signal is required
- (AM Peak) Eastbound left turn operating at a v/c ratio of 1.08, Westbound curb lane operating at a v/c ratio of 1.04
- Eastbound left turning signal is required, exclusive westbound right turning lane is required
- With the addition of the above improvements all movements will operate satisfactorily

48 Avenue/Highway 26

- (AM and PM Peak)Insufficient capacity for vehicles turning on to 48 Avenue based on the existing traffic control conditions
- Traffic Signals required
- With the installation of traffic signals all movements will operate at a LOS C (or better) with a v/c < 0.81 (or better).
- (PM Peak) Southeast left turning movement 95th percentile queue is estimated at approximately 90 m and the current storage is approximately 80 m.
    - Approximately 1 – 2 vehicles will queue into the through lanes, however this will only occur at the 95th percentile queuing (95% of the time this will not be an issue), therefore is not considered a critical issue
- An exclusive southbound right turning lane with a minimum 25 m storage will be required

Exhibition Drive/Highway 26

- (AM and PM Peak) Insufficient capacity for vehicles turning on to Highway 26 based on the existing traffic control conditions (North/South, Stop Sign)
- Single lane roundabout and traffic signals were compared as possible intersection improvement and it was found that a roundabout is the preferred option, highlights of the comparison include:
    - Need for a speed control measure
    - Safety benefits, reduction in overall collision rates

6.3 Access Management and Roadway Classification Conclusion

Highway 26 will be maintained as 2 lane roadway, based on the future traffic volume required. Given the current connectivity of this roadway as a provincial Highway it is logical to classify this as an arterial. Accesses along Highway 26 should be given a minimum spacing of 120 m (between accesses) and 200 m spacing from the future local roadway between Highway 26 and Exhibition Drive.

Exhibition Drive will be realigned as a 2 lane roadway and given the future traffic volume will be classified as a collector roadway. Access along Exhibit Drive should be given a minimum spacing of 60 m (between accesses) and 120 m from the future local roadway between Highway 26 and Exhibit Drive.

No access should be allowed between the rail crossings and 48 Avenue.

6.4 Recommendations

Upon the finding from the analysis, ISL recommends the following improvements:

Stage 1 – No intersection improvements are required

- RR 200 railway crossing will need to be improved to a warning system with gates, due to the limited spacing to 48 Avenue. No further railway crossing improvements needed.

Stage 2 – Improvement Plan

39 Street and Highway 13

- Eastbound Left Turn Signal Phase
- Southbound Left Turn Signal Phase
- Westbound Dedicated Right Turn Lane

Highway 13 and Highway 26

- Traffic Signals
- Dedicated SBR Lane with 25 m storage

Highway 26 and RR 200

- Single land roundabout
    - Additional right of way will likely be required for the roundabout. A functional plan for the roundabout is recommended to determine right of way requirements to be acquired as development proceeds.

Highway 26

- Arterial Roadway Classification
- Access spacing
    - 120 m between accesses
    - 200 m between intersections

- The Highway 26 crossing can maintain the existing warning system but will require gates with daily volumes at or above 5000 or with the installation of traffic signals at 48 Avenue, due to the limited spacing between the rail crossing and 48 Avenue.

RR 200

- Collector roadway classification
  - Access spacing
    - 60 m between accesses
    - 120 m between intersections

We trust the foregoing is satisfactory. Please contact Daniel Zeggelaar, P. Eng. at 780.438.9000 should you require clarification.

Sincerely,

Daniel Zeggelaar, P. Eng.
Senior Transportation Engineer

APPENDICES

TRAFFIC VOLUMES

TRAFFIC COUNTS, 2014 BALANCED, STAGE 1 (TOTAL) AND STAGE 2 (TOTAL)

City of Camrose
36 st. & Hwy 13
TURNING MOVEMENT SUMMARY
ENDING: Fri 16/08/2013

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: 36sHwy13.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	0	0	0	0	0	57	17	0	10	0	19	0	16	46	0	165
11:30	0	0	0	0	0	0	43	16	0	16	0	17	0	17	40	0	149
11:45	0	0	0	0	0	0	50	15	0	22	0	21	0	19	44	0	171
12:00	0	0	0	0	0	0	61	11	0	20	0	15	0	19	41	0	167
Hour Total	0	0	0	0	0	0	211	59	0	68	0	72	0	71	171	0	652
12:15	0	0	0	0	0	0	36	5	0	15	0	19	0	18	46	0	139
12:30	0	0	0	0	0	0	42	15	0	7	0	19	0	22	46	0	151
12:45	0	0	0	0	0	0	50	15	0	15	0	16	0	18	54	1	169
13:00	0	0	0	0	0	0	38	10	0	10	0	17	0	13	48	0	136
Hour Total	0	0	0	0	0	0	166	45	0	47	0	71	0	71	194	1	595
13:15	0	0	0	0	0	0	55	10	0	13	0	13	0	26	52	2	171
13:30	0	0	0	0	0	0	37	8	0	11	0	15	0	21	55	0	147
13:45	0	0	0	0	0	0	38	9	0	19	0	16	0	21	38	0	141
14:00	0	1	0	0	0	0	50	13	0	9	0	22	0	22	46	0	163
Hour Total	0	1	0	0	0	0	180	40	0	52	0	66	0	90	191	2	622
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	42	12	0	17	0	21	0	24	40	0	156
15:30	0	0	0	0	0	0	55	12	0	20	0	20	0	17	57	0	181
15:45	0	0	0	0	0	0	51	13	0	23	0	19	0	24	62	0	192
16:00	0	0	0	0	0	0	42	10	0	13	0	26	0	24	62	0	177
Hour Total	0	0	0	0	0	0	190	47	0	73	0	86	0	89	221	0	706
16:15	0	0	0	0	0	0	64	10	0	17	0	21	0	19	64	0	195
16:30	0	0	0	0	0	0	50	13	0	18	0	21	0	26	70	0	198
16:45	0	0	0	0	0	0	55	10	0	22	0	21	0	24	72	0	204
17:00	0	0	0	0	0	0	58	7	0	14	0	22	0	17	64	0	182
Hour Total	0	0	0	0	0	0	227	40	0	71	0	85	0	86	270	0	779
17:15	0	0	0	0	0	0	54	7	0	28	0	38	0	23	74	0	224
17:30	0	0	0	0	0	0	48	3	0	11	0	24	0	17	68	0	171
17:45	0	0	0	0	0	0	58	8	0	19	0	25	0	17	88	0	215
18:00	0	0	0	0	0	0	50	4	0	10	0	13	0	6	67	0	150
Hour Total	0	0	0	0	0	0	210	22	0	68	0	100	0	63	297	0	760
DAY TOTAL	0	1	0	0	0	0	1184	253	0	379	0	480	0	470	1344	3	4114
PERCENTS	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	28.8%	6.2%	0.0%	9.3%	0.0%	11.6%	0.0%	11.4%	32.6%	0.0%	100%
AM Times							11:15	11:15		11:15		11:15		11:15	11:15		
AM Peaks							211	59		68		72		71	171		
Factors							.86	.86		.77		.85		.93	.92		
PM Times		13:15					16:15	12:30		16:30		17:00		15:45	17:15	12:30	
PM Peaks		1					227	50		82		109		93	297	3	
Factors		.25					.88	.83		.73		.71		.89	.84	.37	

Peak Hour

City of Camrose
39StS54 39s_CPR54a
39St.(South 54 Ave)
VOLUME SUMMARY
Fri 16/08/2013

Site Reference: 000000018756
Site ID: 000000018756
Location: 39STS54AVE

File: D0816003.prn
City: Camrose:
County: Canada:

TIME	1 SOUTH	2	Total
08:00	67	65	132
09:00	123	121	244
10:00	123	112	235
11:00	81	79	160
12:00	121	117	238
13:00	141	131	272
14:00	108	110	218
15:00	132	132	264
16:00	166	155	321
17:00	85	87	172
18:00	65	66	131
19:00	40	42	82
20:00	28	24	52
21:00	24	25	49
22:00	14	16	30
00	6	6	12
:00	13	11	24
DAY TOTAL	1337	1299	2636
PERCENTS	50.8%	49.2%	100%
AM Times	08:30	08:30	
AM Peaks	129	125	
PM Times	15:15	15:00	
PM Peaks	166	157	

City of Camrose
39StS54
39St.(South 54 Ave)
VOLUME SUMMARY
Sat 17/08/2013

Site Reference: 000000018756
Site ID: 000000018756
Location: 39STS54AVE

File: D0816003.prn
City: Camrose:
County: Canada:

TIME	1 SOUTH	2	Total
01:00	16	16	32
02:00	3	2	5
03:00	16	11	27
04:00	0	0	0
05:00	0	0	0
06:00	12	10	22
07:00	59	67	126
08:00	24	21	45
09:00	48	47	95
10:00	32	37	69
11:00	45	44	89
12:00	50	51	101
13:00	34	41	75
14:00	47	52	99
15:00	47	47	94
00	90	87	177
:00	40	41	81
18:00	32	28	60
19:00	26	28	54
20:00	23	24	47
21:00	16	11	27
22:00	18	17	35
23:00	7	6	13
24:00	9	6	15
DAY TOTAL	694	694	1388
PERCENTS	50.0%	50.0%	100%
AM Times	06:15	06:15	
AM Peaks	59	67	
PM Times	15:15	15:00	
PM Peaks	90	90	

City of Camrose
39StS54
39St.(South 54 Ave)
VOLUME SUMMARY
Sun 18/08/2013

Site Reference: 000000018756
Site ID: 000000018756
Location: 39STS54AVE

File: D0816003.prn
City: Camrose:
County: Canada:

TIME	1 SOUTH	2	Total
01:00	34	26	60
02:00	6	9	15
03:00	1	1	2
04:00	0	0	0
05:00	1	1	2
06:00	3	4	7
07:00	24	29	53
08:00	12	12	24
09:00	18	17	35
10:00	14	15	29
11:00	15	21	36
12:00	28	29	57
13:00	24	22	46
14:00	29	23	52
15:00	22	21	43
00	46	41	87
:00	24	25	49
18:00	27	24	51
19:00	22	18	40
20:00	19	21	40
21:00	22	21	43
22:00	14	13	27
23:00	12	12	24
24:00	8	10	18
DAY TOTAL	425	415	840
PERCENTS	50.6%	49.4%	100%
AM Times	00:15	10:45	
AM Peaks	34	31	
PM Times	15:15	15:30	
PM Peaks	46	43	

City of Camrose
39StS54
39St.(South 54 Ave)
VOLUME SUMMARY
Mon 19/08/2013

Site Reference: 000000018756
Site ID: 000000018756
Location: 39STS54AVE

File: D0816003.prn
City: Camrose:
County: Canada:

TIME	1 SOUTH	2	Total
01:00	14	10	24
02:00	1	2	3
03:00	0	0	0
04:00	3	2	5
05:00	0	0	0
06:00	20	21	41
07:00	106	118	224
08:00	107	103	210
09:00	131	131	262
10:00	109	97	206
11:00	127	129	256
12:00	147	142	289
13:00	150	146	296
14:00	134	129	263
15:00	157	153	310
00	189	183	372
:00	150	147	297
18:00	84	85	169
19:00	38	39	77
20:00	23	24	47
21:00	15	15	30
22:00	24	22	46
23:00	21	18	39
24:00	7	6	13
DAY TOTAL	1757	1722	3479
PERCENTS	50.6%	49.4%	100%
AM Times	11:15	08:00	
AM Peaks	147	146	
PM Times	15:00	15:00	
PM Peaks	212	212	

City of Camrose
39StS54
39St.(South 54 Ave)
VOLUME SUMMARY
Tue 20/08/2013

Site Reference: 000000018756
Site ID: 000000018756
Location: 39STS54AVE

File: D0816003.prn
City: Camrose:
County: Canada:

TIME	1 SOUTH	2	Total
01:00	14	13	27
02:00	8	6	14
03:00	19	16	35
04:00	1	1	2
05:00	2	1	3
06:00	40	39	79
07:00	118	122	240
08:00	121	113	234
09:00	158	149	307
10:00	144	135	279
11:00	175	163	338
12:00	137	127	264
13:00	175	163	338
14:00	140	132	272
15:00	152	146	298
00	160	154	314
:00	97	89	186
18:00	90	86	176
19:00	51	52	103
20:00	22	18	40
21:00	36	36	72
22:00	16	16	32
23:00	20	20	40
24:00	8	5	13
DAY TOTAL	1904	1802	3706
PERCENTS	51.4%	48.6%	100%
AM Times	10:30	10:45	
AM Peaks	177	166	
PM Times	15:00	15:00	
PM Peaks	185	173	

City of Camrose
Exh Dr. & Hwy13
TURNING MOVEMENT SUMMARY
ENDING: Fri 16/08/2013

S[illegible] Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: ExhDrHwy13.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	0	1	0	0	0	63	2	0	2	2	10	0	5	45	0	130
11:30	0	0	1	0	0	0	45	3	0	1	0	6	0	4	46	0	106
11:45	0	2	1	0	0	1	46	1	1	0	2	8	0	10	52	1	125
12:00	0	0	2	0	0	0	66	3	0	1	1	8	0	8	47	0	136
Hour Total	0	2	5	0	0	1	220	9	1	4	5	32	0	27	190	1	497
12:15	0	0	0	0	0	0	37	3	0	0	1	3	0	10	46	0	100
12:30	0	0	2	0	0	0	42	0	0	0	1	16	0	11	42	0	114
12:45	0	0	0	0	0	1	55	1	0	0	0	11	0	6	59	3	136
13:00	0	1	1	0	0	0	45	1	0	3	3	14	0	5	50	2	125
Hour Total	0	1	3	0	0	1	179	5	0	3	5	44	0	32	197	5	475
13:15	0	0	2	0	0	2	55	0	0	0	3	14	0	12	58	1	147
13:30	0	0	0	0	0	0	46	1	0	2	1	8	0	8	41	1	108
13:45	0	0	0	0	0	0	48	1	0	7	3	14	0	5	56	1	135
14:00	0	1	0	0	0	1	62	0	1	3	0	17	0	3	56	0	144
Hour Total	0	1	2	0	0	3	211	2	1	12	7	53	0	28	211	3	534
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	1	0	0	0	58	2	0	0	0	11	0	9	51	0	132
15:30	0	1	2	0	0	1	55	1	0	2	0	9	0	4	59	0	134
15:45	0	0	1	0	0	0	58	1	0	2	4	7	0	3	62	0	138
16:00	0	1	1	0	0	0	36	0	0	1	0	11	0	11	65	0	126
Hour Total	0	2	5	0	0	1	207	4	0	5	4	38	0	27	237	0	530
16:15	0	0	0	0	0	1	52	2	0	3	1	14	0	8	65	0	146
16:30	0	0	0	0	0	0	56	1	0	4	3	23	1	11	80	0	179
16:45	0	0	0	0	0	0	43	1	0	0	1	9	0	8	58	0	120
17:00	0	0	0	0	0	0	46	4	0	0	0	10	0	6	68	1	135
Hour Total	0	0	0	0	0	1	197	8	0	7	5	56	1	33	271	1	580
17:15	0	0	0	0	0	1	53	3	0	1	2	12	0	14	83	0	169
17:30	0	0	0	0	0	0	37	2	0	0	1	13	0	6	60	1	120
17:45	0	1	2	0	0	0	54	2	0	0	3	14	0	14	84	1	175
18:00	0	0	0	0	0	0	35	3	0	2	1	13	0	8	64	0	126
Hour Total	0	1	2	0	0	1	179	10	0	3	7	52	0	42	291	2	590
DAY TOTAL	0	7	17	0	0	8	1193	38	2	34	33	275	1	189	1397	12	3206
PERCENTS	0.0%	0.3%	0.6%	0.0%	0.0%	0.3%	37.3%	1.2%	0.1%	1.1%	1.0%	8.5%	0.0%	5.8%	43.5%	0.3%	100%
AM Times	11:00	11:15			11:00	11:15	11:15	11:00	11:15	11:15	11:15		11:15	11:15	11:00		
AM Peaks	2	5			1	220	9	1	4	5	32		27	190	1		
Factors	.25	.62			.25	.83	.75	.25	.50	.62	.80		.67	.91	.25		
PM [illegible]mes	11:30	11:45			12:30	13:15	17:00	11:30	13:00	13:00	16:00	15:45	17:15	17:00	12:45		
PM [illegible]eaks	2	5			3	211	11	1	12	10	57	1	42	295	7		
Factors	.25	.62			.37	.85	.68	.25	.42	.83	.61	.25	.75	.87	.58		

Peak Hour

City of Camrose
Hwy 26 & 48 Ave
TURNING MOVEMENT SUMMARY
ENDING: Thu 15/08/2013

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: CorrectLn48a_1.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	0	0	0	0	0	0	0	0	3	3	10	0	5	31	27	79
11:30	0	1	0	0	0	0	0	0	0	4	2	10	0	9	56	15	97
11:45	0	0	0	0	0	0	0	0	0	1	3	10	0	9	47	16	86
12:00	0	0	0	0	0	0	0	0	0	0	1	9	0	8	54	24	96
Hour Total	0	1	0	0	0	0	0	0	0	8	9	39	0	31	188	82	358
12:15	0	0	0	0	0	0	0	0	0	2	4	13	0	12	53	25	109
12:30	0	0	0	0	0	0	0	0	0	3	4	8	0	7	52	29	103
12:45	0	0	0	0	0	0	0	0	0	1	6	9	0	11	44	16	87
13:00	0	0	0	0	0	0	0	0	0	3	1	6	0	6	51	24	91
Hour Total	0	0	0	0	0	0	0	0	0	9	15	36	0	36	200	94	390
13:15	0	1	0	0	0	0	0	0	0	2	3	12	0	8	61	23	110
13:30	0	0	0	0	0	0	0	0	0	1	3	13	0	11	62	23	113
13:45	0	1	0	1	0	0	1	0	0	1	4	4	0	4	53	17	86
14:00	0	1	0	0	0	0	0	0	0	2	1	10	0	9	45	24	92
Hour Total	0	3	0	1	0	0	1	0	0	6	11	39	0	32	221	87	401
14:15	0	0	0	0	0	0	1	0	0	3	4	15	0	7	51	31	112
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	1	0	0	3	4	15	0	7	51	31	112
15:15	0	0	0	0	0	0	0	0	0	1	5	7	0	14	53	33	113
15:30	0	0	0	0	0	0	0	0	0	0	1	8	0	17	68	28	122
15:45	0	0	0	0	0	0	0	0	0	5	2	7	0	15	70	31	130
16:00	0	0	0	0	0	0	1	0	0	3	3	6	0	12	72	30	127
Hour Total	0	0	0	0	0	0	1	0	0	9	11	28	0	58	263	122	492
16:15	0	0	0	0	0	0	0	0	0	4	6	7	0	14	63	25	119
16:30	0	0	0	0	0	0	0	0	0	0	7	8	0	11	66	35	127
16:45	0	0	0	0	0	0	0	0	0	2	0	5	0	9	69	37	122
17:00	0	1	0	0	0	0	0	0	0	1	4	11	0	25	58	38	138
Hour Total	0	1	0	0	0	0	0	0	0	7	17	31	0	59	256	135	506
17:15	0	0	0	0	0	0	0	0	0	2	3	8	0	16	74	43	146
17:30	0	0	0	0	0	0	0	0	0	1	3	7	0	10	65	40	126
17:45	0	5	0	0	0	0	5	0	0	1	4	6	0	5	58	29	113
18:00	0	0	0	0	0	0	0	0	0	0	2	6	0	13	62	30	113
Hour Total	0	5	0	0	0	0	5	0	0	4	12	27	0	44	259	142	498
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY TOTAL	0	10	0	1	0	0	8	0	0	46	79	215	0	267	1438	693	2757
PERCENTS	0.0%	0.4%	0.0%	0.1%	0.0%	0.0%	0.3%	0.0%	0.0%	1.7%	2.9%	7.8%	0.0%	9.6%	52.1%	25.1%	100%

Peak Hour

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: CorrectLn48a_1.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
AM Times	10:45								11:00	11:15	11:15		11:15	11:15	11:15		
AM Peaks	1								8	9	39		31	188	82		
Factors	.25								.50	.75	.97		.86	.83	.75		
PM Times	17:00		13:00				17:00		15:30	15:45	11:30		16:30	15:30	16:45		
PM Peaks	6		1				5		12	18	42		61	273	158		
Factors	.30		.25				.25		.60	.64	.80		.61	.94	.91		

City of Camrose
Hwy 26 &48 ave
TURNING MOVEMENT SUMMARY
ENDING: Thu 15/08/2013

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: CorrectLn48a_2.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	12	1	1	0	7	47	1	0	0	0	0	0	0	0	0	69
11:30	0	24	2	2	0	4	60	7	0	0	0	0	0	0	0	0	99
11:45	0	21	2	3	0	4	59	1	0	0	0	0	0	0	0	0	90
12:00	1	23	2	2	0	6	53	1	0	0	0	0	0	0	1	0	89
Hour Total	1	80	7	8	0	21	219	10	0	0	0	0	0	0	1	0	347
12:15	0	24	3	4	0	9	57	4	0	0	0	0	0	0	0	0	101
12:30	0	18	1	1	0	6	62	0	0	0	0	0	0	0	0	0	88
12:45	0	23	2	2	0	2	52	0	0	0	0	0	0	0	1	0	82
13:00	0	18	4	3	0	3	73	4	0	0	0	0	0	0	0	0	105
Hour Total	0	83	10	10	0	20	244	8	0	0	0	0	0	0	1	0	376
13:15	0	29	0	0	0	4	60	2	0	0	0	0	0	0	0	0	95
13:30	0	36	0	1	0	3	55	0	0	0	0	0	0	0	0	0	95
13:45	0	21	1	4	0	4	48	0	0	0	0	0	0	0	0	1	79
14:00	0	28	2	2	0	6	49	1	0	0	0	0	0	1	0	1	90
Hour Total	0	114	3	7	0	17	212	3	0	0	0	0	0	1	0	2	359
14:15	0	16	2	4	0	1	37	0	0	0	0	0	0	0	0	1	61
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	16	2	4	0	1	37	0	0	0	0	0	0	0	0	1	61
15:15	0	23	3	2	0	6	42	3	0	0	0	0	0	0	0	0	79
15:30	0	29	1	2	0	2	65	1	0	0	0	0	0	0	0	0	100
15:45	0	31	6	5	0	3	54	2	0	0	0	0	0	0	0	0	101
16:00	0	35	3	0	0	2	64	4	0	0	0	0	0	0	0	0	108
Hour Total	0	118	13	9	0	13	225	10	0	0	0	0	0	0	0	0	388
16:15	0	18	1	1	0	2	65	2	0	0	0	0	0	0	0	3	92
16:30	0	18	2	2	1	2	43	1	0	0	0	0	0	0	0	0	69
16:45	0	26	2	2	0	4	62	1	0	0	0	0	0	0	0	0	97
17:00	0	24	1	2	0	2	57	1	0	0	0	0	0	0	0	1	88
Hour Total	0	86	6	7	1	10	227	5	0	0	0	0	0	0	0	4	346
17:15	0	27	1	4	0	3	80	0	0	0	1	0	0	0	0	0	116
17:30	0	16	2	1	0	2	56	1	0	0	0	1	0	0	0	0	79
17:45	0	19	3	1	0	3	62	1	0	0	0	0	0	0	0	1	90
18:00	0	22	4	3	0	5	47	0	0	0	1	1	0	0	2	1	86
Hour Total	0	84	10	9	0	13	245	2	0	0	2	2	0	0	2	2	371
DAY TOTAL	1	581	51	54	1	95	1409	38	0	0	2	2	0	1	4	9	2248
PERCENTS	0.1%	25.9%	2.3%	2.5%	0.1%	4.3%	62.7%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	100%

Peak Hour

AM Times	11:15	11:15	11:15	11:15		11:15	11:15	11:15							11:15		
AM Peaks	1	80	7	8		21	219	10							1		
Factors	.25	.83	.87	.66		.75	.91	.35							.25		
PM Times	11:30	15:15	15:15	11:30	15:45	11:45	16:45	11:30			17:15	17:15		13:15	12:00	16:15	
PM Peaks	1	118	13	11	1	25	255	13			2	2		1	2	4	
Factors	.25	.84	.54	.68	.25	.69	.79	.46			.50	.50		.25	.50	.33	

City of Camrose
RgeRd200&Hwy26
TURNING MOVEMENT SUMMARY
ENDING: Tue 23/07/2013

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: RgeRd200Hwy26.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	0	0	1	0	0	20	0	0	0	0	0	0	0	24	0	45
11:30	0	0	0	0	0	0	24	0	0	0	0	0	0	0	19	1	44
11:45	0	0	1	0	0	1	28	0	0	0	0	0	0	0	23	0	53
12:00	0	0	0	0	0	0	28	0	0	0	0	0	0	0	17	1	46
Hour Total	0	0	1	1	0	1	100	0	0	0	0	0	0	0	83	2	188
12:15	0	0	0	0	0	1	21	0	0	0	0	0	0	0	29	1	52
12:30	0	1	0	0	0	0	22	0	0	0	0	0	0	0	20	0	43
12:45	0	3	0	0	0	0	25	0	0	0	0	0	0	0	24	0	52
13:00	0	0	0	0	0	0	34	0	0	0	0	0	0	0	22	1	57
Hour Total	0	4	0	0	0	1	102	0	0	0	0	0	0	0	95	2	204
13:15	0	1	0	0	0	1	25	0	0	0	0	0	0	0	21	1	49
13:30	0	1	0	0	0	0	32	0	0	0	0	0	0	0	36	0	69
13:45	0	1	0	1	0	0	32	0	0	0	0	0	0	0	21	0	55
14:00	0	0	0	0	0	0	30	0	0	0	0	0	0	0	37	1	68
Hour Total	0	3	0	1	0	1	119	0	0	0	0	0	0	0	115	2	241
14:15	0	1	0	0	0	0	33	0	0	0	0	0	0	0	19	0	53
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	1	0	0	0	0	33	0	0	0	0	0	0	0	19	0	53
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	28	0	0	0	0	0	0	0	31	0	59
15:45	0	0	0	0	0	1	31	0	0	0	0	0	0	0	42	0	74
16:00	0	0	0	0	0	0	28	0	0	0	0	0	0	0	30	1	59
Hour Total	0	0	0	0	0	1	87	0	0	0	0	0	0	0	103	1	192
16:15	0	0	0	0	0	0	24	0	0	0	0	0	0	0	38	1	63
16:30	0	1	0	1	0	1	29	0	0	0	0	0	0	0	48	1	81
16:45	0	0	0	0	0	1	23	0	0	0	1	0	0	0	45	2	72
17:00	0	0	0	1	0	0	30	0	0	0	0	0	0	0	52	4	87
Hour Total	0	1	0	2	0	2	106	0	0	0	1	0	0	0	183	8	303
17:15	0	1	0	1	0	0	29	0	0	0	0	0	0	0	65	1	97
17:30	0	0	0	0	0	0	37	0	0	0	0	0	0	0	48	1	86
17:45	0	0	0	0	0	0	28	0	0	0	0	0	0	0	52	5	85
18:00	0	2	0	0	0	0	39	0	0	0	0	0	0	0	34	1	76
Hour Total	0	3	0	1	0	0	133	0	0	0	0	0	0	0	199	8	344
DAY TOTAL	0	12	1	5	0	6	680	0	0	0	1	0	0	0	797	23	1525
PERCENTS	0.0%	0.8%	0.1%	0.4%	0.0%	0.4%	44.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.2%	1.5%	100%
AM Times			11:00	10:30		11:00	11:15								11:15	11:15	
AM Peaks			1	1		1	100								83	2	
Factors			.25	.25		.25	.89								.86	.50	
PM Times		12:30	11:30	16:30		11:30	17:15			16:00					17:00	17:00	
PM Peaks		5	1	3		2	133			1					217	11	
Factors		.41	.25	.75		.50	.85			.25					.83	.55	

Peak Hour

City of Camrose
39 St. & 48 Ave.
TURNING MOVEMENT SUMMARY
ENDING: Mon 18/08/2014

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: 39s48a_1a.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	0	0	0	0	0	0	0	1	1	24	26	0	12	68	17	149
11:30	0	0	0	0	0	0	0	0	0	5	24	19	0	7	62	14	131
11:45	0	0	0	0	0	1	0	0	0	2	26	24	0	8	77	9	147
12:00	0	0	0	0	0	0	0	0	1	2	23	28	1	5	79	13	152
Hour Total	0	0	0	0	0	1	0	0	2	10	97	97	1	32	286	53	579
12:15	0	0	0	0	0	0	0	0	3	10	38	61	3	6	83	18	222
12:30	0	0	0	0	0	0	0	0	2	3	15	21	0	18	60	16	135
12:45	0	0	0	0	0	0	0	0	0	4	12	18	0	25	92	16	167
13:00	0	0	0	0	0	0	0	0	0	6	12	12	0	7	57	14	108
Hour Total	0	0	0	0	0	0	0	0	5	23	77	112	3	56	292	64	632
13:15	0	0	0	0	0	0	0	0	0	3	10	25	0	15	70	17	140
13:30	0	0	0	0	0	0	0	0	2	6	22	20	2	24	70	16	162
13:45	0	0	0	0	0	0	0	0	0	6	15	39	0	17	69	9	155
14:00	0	0	0	0	0	0	0	0	2	2	17	18	2	29	83	13	166
Hour Total	0	0	0	0	0	0	0	0	4	17	64	102	4	85	292	55	623
14:15	0	0	0	0	0	0	0	0	2	2	19	19	3	15	80	5	145
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	2	2	19	19	3	15	80	5	145
DAY TOTAL	0	0	0	0	0	1	0	0	13	52	257	330	11	188	950	177	1979
PERCENTS	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.7%	2.7%	13.0%	16.7%	0.5%	9.4%	48.0%	8.9%	100%
AM Times						11:00			11:15	11:15	11:15	11:15	11:15	11:15	11:15	11:15	
AM Peaks						1			2	10	97	97	1	32	286	53	
Factors						.25			.50	.50	.93	.86	.25	.66	.90	.77	
PM Times						11:30			11:45	12:15	11:30	11:45	13:30	13:15	12:00	12:15	
PM Peaks						1			6	23	111	134	7	85	314	64	
Factors						.25			.50	.57	.73	.54	.58	.73	.85	.88	

City of Camrose
39 St. & 48 Ave.
TURNING MOVEMENT SUMMARY
ENDING: Mon 18/08/2014

Site Reference: 000000000002
Site ID: (UNDEFINED
Location:

File: 39s48a_1b.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
15:15	0	0	0	0	0	0	0	0	1	4	22	28	0	22	72	22	171
15:30	0	0	0	0	1	0	0	0	0	0	24	21	2	12	62	9	131
15:45	0	0	3	0	0	0	2	0	0	1	11	25	0	11	84	9	146
16:00	0	0	0	0	0	0	0	0	1	5	25	34	0	11	83	18	177
Hour Total	0	0	3	0	1	0	2	0	2	10	82	108	2	56	301	58	625
16:15	0	0	0	0	0	0	1	0	0	1	22	24	0	16	81	17	162
16:30	0	0	0	0	0	0	0	0	0	2	10	24	0	8	67	9	120
16:45	0	0	0	0	0	0	0	0	1	2	24	23	0	10	89	17	166
17:00	0	0	0	0	0	0	0	0	0	8	27	37	1	17	120	21	231
Hour Total	0	0	0	0	0	0	1	0	1	13	83	108	1	51	357	64	679
17:15	0	0	0	1	0	0	0	0	0	9	26	43	0	11	108	22	220
17:30	0	0	0	0	0	0	1	0	0	1	26	36	0	13	104	13	194
17:45	0	0	0	0	0	0	0	0	0	10	21	42	0	6	85	15	179
18:00	0	0	0	0	0	1	0	0	0	4	18	50	0	8	105	11	197
Hour Total	0	0	0	1	0	1	1	0	0	24	91	171	0	38	402	61	790
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY TOTAL	0	0	3	1	1	1	4	0	3	47	256	387	3	145	1060	183	2094
PERCENTS	0.0%	0.0%	0.2%	0.1%	0.1%	0.1%	0.2%	0.0%	0.2%	2.2%	12.2%	18.4%	0.1%	6.9%	50.6%	8.7%	100%

Peak Hour

AM Times																	
AM Peaks																	
Factors																	
PM Times	15:00	16:30	14:45	17:15	15:30			15:15	17:00	16:45	17:15	14:45	15:15	16:45	16:45		
PM Peaks	3	1	1	1	3			2	28	103	171	2	56	421	73		
Factors	.25	.25	.25	.25	.37			.50	.70	.95	.85	.25	.63	.87	.82		

City of Camrose
39 St. & 48 Ave.
TURNING MOVEMENT SUMMARY
ENDING: Mon 18/08/2014

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: 39s48a_2.prn
City: Camrose:
County:

	FROM NORTH				FROM EAST				FROM SOUTH				FROM WEST				
TIME	Ped	Right	Thru	Left	Ped	Right	Thru	Left	Ped	Right	Thru	Left	Ped	Right	Thru	Left	TOTAL
11:15	0	9	16	28	0	14	54	3	0	0	0	1	0	0	0	0	125
11:30	0	15	21	34	1	22	91	5	0	0	0	0	0	0	0	0	189
11:45	1	12	18	31	0	13	85	0	0	0	0	0	0	0	0	0	160
12:00	1	7	15	42	0	20	74	2	0	0	0	0	0	0	0	0	161
Hour Total	2	43	70	135	1	69	304	10	0	0	0	1	0	0	0	0	635
12:15	0	15	20	35	0	18	90	7	0	0	0	0	0	0	0	0	185
12:30	1	9	15	15	0	16	76	10	0	0	1	1	0	0	10	0	154
12:45	1	11	7	13	0	12	78	5	0	0	0	1	0	0	2	0	130
13:00	0	1	29	47	0	9	92	0	0	0	0	0	0	2	0	0	180
Hour Total	2	36	71	110	0	55	336	22	0	0	1	2	0	2	12	0	649
13:15	0	8	21	23	0	15	103	8	0	0	0	0	1	0	0	0	179
13:30	0	6	21	28	0	10	83	6	0	0	0	0	0	0	11	1	166
13:45	0	3	10	30	0	6	76	8	0	1	0	0	0	0	0	0	134
14:00	0	5	13	25	0	14	94	5	0	0	0	0	0	0	0	0	156
Hour Total	0	22	65	106	0	45	356	27	0	1	0	0	1	0	11	1	635
14:15	0	6	21	20	0	8	85	6	0	0	0	0	4	0	0	0	150
14:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Hour Total	0	6	21	20	0	8	89	6	0	0	1	0	4	0	0	0	155
15:15	0	9	13	24	0	8	86	9	0	0	0	0	0	0	0	0	149
15:30	1	9	21	31	0	4	98	6	0	0	0	0	0	0	0	0	170
15:45	0	10	26	26	0	8	80	5	0	0	0	0	0	0	0	0	155
16:00	1	8	32	30	0	4	100	2	0	0	0	0	0	0	0	0	177
Hour Total	2	36	92	111	0	24	364	22	0	0	0	0	0	0	0	0	651
16:15	3	1	15	22	0	5	77	12	0	0	0	0	0	0	1	0	136
16:30	0	2	13	26	0	14	55	4	0	0	0	0	0	0	2	0	116
16:45	0	7	13	21	0	10	58	6	0	0	1	1	0	0	0	0	117
17:00	0	6	3	16	0	15	88	12	0	0	0	0	0	0	0	0	140
Hour Total	3	16	44	85	0	44	278	34	0	0	1	1	0	0	3	0	509
17:15	0	10	8	20	0	11	94	3	0	0	0	0	0	0	0	0	146
17:30	0	14	16	19	0	11	79	7	0	0	0	0	0	0	0	0	146
17:45	0	13	15	26	0	11	99	6	0	0	0	0	0	0	0	0	170
18:00	0	10	12	24	0	16	116	10	0	0	0	0	0	0	0	0	188
Hour Total	0	47	51	89	0	49	388	26	0	0	0	0	0	0	0	0	650
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY TOTAL	9	206	414	656	1	294	2115	147	0	1	3	4	5	2	26	1	3884
PERCENTS	0.3%	5.4%	10.7%	16.9%	0.1%	7.6%	54.5%	3.7%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.6%	0.0%	100%

Peak Hour

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: 39s48a_2.prn
City: Camrose:
County:

	FROM NORTH				FROM EAST				FROM SOUTH				FROM WEST				
TIME	Ped	Right	Thru	Left	Ped	Right	Thru	Left	Ped	Right	Thru	Left	Ped	Right	Thru	Left	TOTAL
AM Times	11:15	11:15	11:15	11:15	10:45	11:15	11:15	11:15				10:30					
AM Peaks	2	43	70	135	1	69	304	10				1					
Factors	.50	.71	.83	.80	.25	.78	.83	.50				.25					
PM Times	15:30	11:30	15:30	11:30	11:30	11:30	17:15	16:15	13:00	11:45	12:00	13:30	12:15	12:45	12:45		
PM Peaks	5	49	94	142	1	73	388	34	1	1	2	4	2	13	1		
Factors	.41	.81	.73	.84	.25	.82	.83	.70	.25	.25	.50	.25	.25	.29	.25		

City of Camrose
39 St. & 51 Ave.
TURNING MOVEMENT SUMMARY
ENDING: Thu 17/07/2014

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: 39s51a.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	5	19	0	0	0	0	0	0	0	9	22	0	22	0	5	82
11:30	0	7	12	0	0	0	0	0	0	0	8	36	0	30	0	7	100
11:45	0	4	12	0	0	0	0	0	0	0	6	32	0	19	0	4	77
12:00	1	10	14	0	0	0	0	0	0	0	8	34	0	27	0	4	98
Hour Total	1	26	57	0	0	0	0	0	0	0	31	124	0	98	0	20	357
12:15	0	11	28	0	0	0	0	0	0	0	9	58	0	30	0	5	141
12:30	0	4	18	0	0	0	0	0	0	0	12	39	0	28	0	5	106
12:45	0	3	3	0	0	0	0	0	0	0	7	26	1	36	1	5	82
13:00	0	2	5	0	0	0	0	0	0	0	28	36	0	39	0	13	123
Hour Total	0	20	54	0	0	0	0	0	0	0	56	159	1	133	1	28	452
13:15	0	3	10	0	0	0	0	0	1	0	9	31	0	41	0	2	97
13:30	0	1	4	0	0	0	0	0	0	0	9	16	0	33	0	6	69
13:45	0	5	6	0	0	0	0	0	0	0	12	20	0	28	0	1	72
14:00	0	1	9	0	0	0	0	0	0	0	6	32	0	29	0	0	77
Hour Total	0	10	29	0	0	0	0	0	1	0	36	99	0	131	0	9	315
14:15	0	2	9	0	0	0	0	0	0	0	9	26	0	30	0	2	78
14:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
14:45	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
15:00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Hour Total	0	2	12	0	0	0	0	0	0	0	11	26	0	30	1	2	84
15:15	0	0	9	0	0	0	0	0	0	0	28	24	0	30	0	6	97
15:30	1	1	19	0	0	0	0	0	0	0	12	20	0	21	0	5	79
15:45	0	5	22	0	0	0	0	0	0	0	10	28	0	27	0	1	93
16:00	0	12	67	0	0	0	0	0	0	0	19	28	0	33	0	2	161
Hour Total	1	18	117	0	0	0	0	0	0	0	69	100	0	111	0	14	430
16:15	0	3	15	0	0	0	0	0	0	0	13	26	0	26	0	3	86
16:30	0	5	14	0	0	0	0	0	0	0	9	37	0	25	0	4	94
16:45	0	19	36	0	0	0	0	0	0	0	11	49	0	26	0	1	142
17:00	0	7	12	0	0	0	0	0	0	0	4	32	0	27	0	3	85
Hour Total	0	34	77	0	0	0	0	0	0	0	37	144	0	104	0	11	407
17:15	0	3	6	0	0	0	0	1	0	0	3	50	0	31	0	1	95
17:30	0	2	6	0	0	0	0	0	0	0	6	31	0	22	0	1	68
17:45	0	2	19	0	0	0	0	0	0	0	4	32	1	14	0	1	73
18:00	0	4	4	0	0	0	0	0	0	0	5	20	0	32	0	1	66
Hour Total	0	11	35	0	0	0	0	1	0	0	18	133	1	99	0	4	302
18:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Hour Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
DAY TOTAL	2	122	381	0	0	0	0	1	1	0	258	785	2	706	2	88	2348
PERCENTS	0.1%	5.2%	16.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	11.0%	33.5%	0.0%	30.0%	0.0%	3.7%	100%

Peak Hour

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: 39s51a.prn
City: Camrose:
County:

	FROM NORTH				FROM EAST				FROM SOUTH				FROM WEST				
TIME	Ped	Right	Thru	Left	Ped	Right	Thru	Left	Ped	Right	Thru	Left	Ped	Right	Thru	Left	TOTAL
AM Times	11:15	11:15	11:15							11:15	11:15			11:15		11:15	
AM Peaks	1	26	57							31	124			98		20	
Factors	.25	.65	.75							.86	.86			.81		.71	
PM Times	11:30	16:00	16:00				16:30	12:30		15:15	16:30	12:00	12:45	12:00		12:15	
PM Peaks	1	39	132				1	1		69	168	1	149	1		28	
Factors	.25	.51	.49				.25	.25		.61	.84	.25	.90	.25		.53	

City of Camrose
39 St. & 54 Ave.
TURNING MOVEMENT SUMMARY
ENDING: Thu 17/07/2014

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: 39s54a.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	1	3	0	0	0	0	0	0	0	6	7	0	8	0	2	27
11:30	0	0	7	0	0	0	0	0	0	0	3	3	0	4	0	2	19
11:45	0	1	2	0	0	0	0	0	0	0	1	5	0	0	0	2	11
12:00	0	1	4	0	0	0	0	0	0	0	4	12	0	4	0	0	25
Hour Total	0	3	16	0	0	0	0	0	0	0	14	27	0	16	0	6	82
12:15	0	3	2	0	0	0	0	0	0	0	5	13	0	3	0	1	27
12:30	0	0	1	0	0	0	0	0	0	0	3	4	0	9	0	0	17
12:45	0	0	4	0	0	0	0	0	0	0	3	5	0	6	0	0	18
13:00	0	0	4	0	0	0	0	0	0	0	2	9	0	11	0	2	28
Hour Total	0	3	11	0	0	0	0	0	0	0	13	31	0	29	0	3	90
13:15	0	3	4	0	0	0	0	0	0	0	2	4	0	7	0	0	20
13:30	0	2	4	0	0	0	0	0	0	0	1	9	0	4	0	1	21
13:45	0	1	2	0	0	0	0	0	0	0	3	3	0	4	0	1	14
14:00	0	0	4	0	0	0	0	0	0	0	1	5	0	3	0	1	14
Hour Total	0	6	14	0	0	0	0	0	0	0	7	21	0	18	0	3	69
14:15	0	1	4	0	0	0	0	0	0	0	4	8	0	5	0	1	23
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
15:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Hour Total	0	1	4	0	0	0	Peak Hour	0	0	0	4	8	0	5	0	1	25
15:15	0	0	6	0	0	0	0	0	0	0	8	9	0	18	0	2	43
15:30	0	0	5	0	0	0	0	0	0	0	5	8	0	1	0	0	19
15:45	0	1	5	0	0	0	0	0	0	0	7	36	0	6	0	0	55
16:00	0	2	2	0	0	0	0	0	0	0	6	16	0	9	0	1	36
Hour Total	0	3	18	0	0	0	0	0	0	0	26	69	0	34	0	3	153
16:15	0	0	3	0	0	0	0	0	0	0	1	3	0	8	0	2	17
16:30	0	0	2	0	0	0	0	0	0	0	3	4	0	3	0	1	13
16:45	0	0	3	0	0	0	0	0	0	0	3	6	0	4	0	0	16
17:00	0	2	0	0	0	0	0	0	0	0	3	11	0	3	0	0	19
Hour Total	0	2	8	0	0	0	0	0	0	0	10	24	0	18	0	3	65
17:15	0	0	0	0	0	0	0	0	0	0	1	4	0	5	0	0	10
17:30	0	0	1	0	0	0	0	0	0	0	6	1	0	1	0	1	10
17:45	0	0	2	0	0	0	0	0	0	0	2	7	0	5	0	0	16
18:00	0	1	1	0	0	0	0	0	0	0	6	3	0	2	0	0	13
Hour Total	0	1	4	0	0	0	0	0	0	0	15	15	0	13	0	1	49
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY TOTAL	0	19	75	0	0	0	2	0	0	0	89	195	0	133	0	20	533
PERCENTS	0.0%	3.6%	14.1%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	16.7%	36.6%	0.0%	24.9%	0.0%	3.7%	100%

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: 39s54a.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
AM Times		11:15	11:15							11:15	11:15			11:15		11:00	
AM Peaks		3	16							14	27			16		6	
Factors		.75	.57							.58	.56			.50		.75	
PM Times		13:00	15:15				14:15			15:15	15:15			15:15		11:30	
PM Peaks		6	18				2			26	69			34		5	
Factors		.50	.75				.50			.81	.47			.47		.62	

City of Camrose
Camrose Dr. & Hwy 13
TURNING MOVEMENT SUMMARY
ENDING: Fri 08/08/2014

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: CdH13_1.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	0	0	0	0	0	45	17	0	19	0	0	0	2	36	0	119
11:30	0	0	0	0	0	0	41	20	0	20	0	0	0	3	49	1	134
11:45	0	0	0	0	0	0	66	26	0	15	0	0	0	1	45	0	153
12:00	0	0	0	0	0	0	59	13	0	19	0	2	0	4	33	0	130
Hour Total	0	0	0	0	0	0	211	76	0	73	0	2	0	10	163	1	536
12:15	0	0	0	0	0	0	42	28	0	13	0	0	0	1	48	0	132
12:30	0	0	0	0	0	0	55	21	0	13	0	0	0	2	41	0	132
12:45	0	0	0	0	0	0	75	17	0	14	0	2	0	1	75	1	185
13:00	0	0	0	0	0	0	62	13	0	21	0	4	0	0	71	0	171
Hour Total	0	0	0	0	0	0	234	79	0	61	0	6	0	4	235	1	620
13:15	0	0	0	0	0	3	62	23	0	20	1	3	0	1	67	0	180
13:30	0	0	0	0	0	0	94	33	2	22	0	1	0	3	72	0	227
13:45	0	0	0	0	0	0	54	10	0	17	0	0	0	2	65	0	148
14:00	0	0	0	0	0	0	51	26	1	14	0	0	0	0	47	0	139
Hour Total	0	0	0	0	0	3	261	92	3	73	1	4	0	6	251	0	694
14:15	0	0	0	0	0	0	57	15	0	28	1	3	0	0	61	0	165
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	57	15	0	28	1	3	0	0	61	0	165
DAY TOTAL	0	0	0	0	0	3	763	262	3	235	2	15	0	20	710	2	2015
PERCENTS	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	37.9%	13.1%	0.2%	11.7%	0.1%	0.7%	0.0%	0.9%	35.2%	0.0%	100%

AM Times						11:15	11:15		11:15		11:15		11:15	11:15	10:45		
AM Peaks						211	76		73		2		10	163	1		
Factors						.79	.73		.91		.25		.62	.83	.25		
PM Times					12:30	12:45	13:15	13:15	13:30	12:30	12:45		11:30	12:45	11:30		
PM Peaks					3	293	92	3	81	1	10		9	285	1		
Factors					.25	.77	.69	.37	.72	.25	.62		.56	.95	.25		

City of Camrose
Camrose Dr. & Hwy 13
TURNING MOVEMENT SUMMARY
ENDING: Fri 08/08/2014

Site Reference: 000000000002
Site ID: (UNDEFINED
Location:

File: CdH13_2.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
15:15	0	0	1	0	0	0	65	17	0	24	0	2	0	0	65	0	174
15:30	0	0	0	0	0	0	57	26	0	18	0	3	0	1	41	1	147
15:45	0	0	0	0	0	0	73	26	0	26	0	1	0	3	67	0	196
16:00	0	0	0	0	0	0	42	19	0	10	0	0	0	5	81	0	157
Hour Total	0	0	1	0	0	0	237	88	0	78	0	6	0	9	254	1	674
16:15	0	0	0	0	0	0	57	28	0	16	0	1	0	4	58	0	164
16:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
16:45	0	0	0	0	0	0	52	13	0	27	0	1	0	2	56	0	151
17:00	0	0	0	0	0	0	60	17	0	25	0	3	0	0	91	0	196
Hour Total	0	0	0	0	0	0	170	58	0	68	0	5	0	6	205	0	512
17:15	0	0	0	0	0	0	47	21	0	25	0	0	0	4	94	0	191
17:30	0	0	0	0	0	0	80	23	0	23	0	0	0	3	103	0	232
17:45	0	0	0	0	0	0	54	18	0	22	0	3	0	5	65	0	167
18:00	0	0	0	0	0	1	86	23	0	24	0	1	0	1	63	0	199
Hour Total	0	0	0	0	0	1	267	85	0	94	0	4	0	13	325	0	789
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY TOTAL	0	0	1	0	0	1	674	231	0	240	0	15	0	28	784	1	1975
PERCENTS	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	34.2%	11.7%	0.0%	12.2%	0.0%	0.7%	0.0%	1.4%	39.6%	0.0%	100%

Peak Hour

AM Times
AM Peaks
Factors

PM Times	14:30		17:15	17:15	15:30	16:45		15:00		15:30	17:00	14:45		
PM Peaks	1		1	267	99	100		6		13	353	1		
Factors	.25		.25	.77	.88	.92		.50		.65	.85	.25		

City of Camrose
Correction Line & 48 Ave.
TURNING MOVEMENT SUMMARY
ENDING: Wed 30/07/2014

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: CL48a_2.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
11:15	0	0	0	0	0	0	9	0	0	1	5	8	0	6	41	21	91
11:30	0	0	0	0	0	0	0	0	0	1	0	9	0	4	52	14	80
11:45	0	0	0	0	0	0	0	0	0	2	2	11	0	9	48	23	95
12:00	0	0	0	0	0	0	0	0	0	0	0	13	0	5	70	27	115
Hour Total	0	0	0	0	0	0	9	0	0	4	7	41	0	24	211	85	381
12:15	0	0	0	0	0	0	0	0	0	0	6	5	0	6	71	27	115
12:30	0	0	0	0	0	0	0	0	0	2	1	12	0	11	81	37	144
12:45	0	3	0	0	0	0	0	0	0	2	3	5	0	14	82	25	134
13:00	0	0	0	0	0	1	2	0	0	1	9	7	0	16	94	26	156
Hour Total	0	3	0	0	0	1	2	0	0	5	19	29	0	47	328	115	549
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
13:30	0	0	0	0	0	3	78	2	0	2	9	9	0	0	4	3	110
13:45	0	0	0	0	0	5	90	0	0	1	2	5	0	0	1	1	105
14:00	0	0	0	0	0	2	129	1	0	3	0	6	0	0	0	0	141
Hour Total	0	0	0	0	0	10	297	3	0	6	11	20	0	0	7	4	358
14:15	0	0	0	0	1	5	113	0	0	2	8	12	0	0	0	0	141
14:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Hour Total	0	0	0	0	1	5	115	0	0	2	8	12	0	0	4	0	147
15:15	0	0	1	0	0	3	100	2	0	2	8	17	0	0	0	0	133
15:30	0	0	0	0	0	2	104	4	0	0	3	5	0	0	0	0	118
15:45	0	0	0	0	0	3	156	5	0	0	4	12	0	0	0	0	180
16:00	0	0	0	0	0	7	143	1	0	2	4	16	0	0	0	0	173
Hour Total	0	0	1	0	0	15	503	12	0	4	19	50	0	0	0	0	604
16:15	0	2	0	0	0	6	113	3	0	2	4	15	0	0	0	0	145
16:30	0	0	0	0	0	7	124	7	0	5	4	15	0	0	0	0	162
16:45	0	1	0	0	0	5	108	8	0	3	9	16	0	0	0	0	150
17:00	0	0	0	0	0	4	115	2	0	4	6	10	0	0	0	0	141
Hour Total	0	3	0	0	0	22	460	20	0	14	23	56	0	0	0	0	598
17:15	0	0	0	1	0	3	117	0	0	2	6	6	0	0	0	0	135
17:30	0	0	0	0	0	2	109	4	0	0	5	5	0	0	0	0	125
17:45	0	0	0	0	0	8	114	1	0	3	4	11	0	0	0	0	141
18:00	0	0	0	0	0	7	111	2	0	1	3	10	0	0	0	0	134
Hour Total	0	0	0	1	0	20	451	7	0	6	18	32	0	0	0	0	535
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY TOTAL	0	6	1	1	1	73	1837	42	0	41	105	240	0	71	550	204	3172
PERCENTS	0.0%	0.2%	0.1%	0.1%	0.1%	2.4%	57.9%	1.3%	0.0%	1.2%	3.3%	7.5%	0.0%	2.2%	17.3%	6.4%	100%

Peak Hour

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: CL48a_2.prn
City: Camrose:
County:

TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
AM Times							10:30				11:00	11:00	11:15		11:15	11:15	11:15	
AM Peaks							9				4	7	41		24	211	85	
Factors							.25				.50	.35	.78		.66	.75	.78	
PM Times	12:00	14:30	16:30	13:30	16:00	15:45	16:15		16:15	16:45	16:00		12:15	12:15	12:00		
PM Peaks	3	1	1	1	25	536	20		14	26	62		47	328	116		
Factors	.25	.25	.25	.25	.89	.85	.62		.70	.72	.96		.73	.87	.78		

City of Camrose
Correction Line & 48 Ave.
TURNING MOVEMENT SUMMARY
ENDING: Wed 30/07/2014

Site Reference: 000000000001
Site ID: (UNDEFINED
Location:

File: CL48a_1.prn
City: Camrose:
County:

	FROM NORTH				FROM EAST				FROM SOUTH				FROM WEST				
TIME	Ped	Right	Thru	Left	Ped	Right	Thru	Left	Ped	Right	Thru	Left	Ped	Right	Thru	Left	TOTAL
11:15	0	23	3	2	0	0	0	0	0	0	0	0	1	7	45	21	102
11:30	0	18	2	4	0	0	0	0	0	0	0	0	0	8	54	16	102
11:45	0	20	1	4	0	0	0	0	0	0	0	0	0	10	47	24	106
12:00	0	25	3	3	0	0	0	0	0	0	0	1	0	6	66	22	126
Hour Total	0	86	9	13	0	0	0	0	0	0	0	1	1	31	212	83	436
12:15	0	31	4	2	0	0	0	0	0	0	0	0	0	8	79	29	153
12:30	0	22	3	6	0	0	0	0	0	0	0	0	0	14	84	29	158
12:45	0	20	2	3	0	0	0	0	0	0	0	0	0	15	76	24	140
13:00	0	28	2	3	0	0	0	0	0	0	0	0	0	10	90	24	157
Hour Total	0	101	11	14	0	0	0	0	0	0	0	0	0	47	329	106	608
13:15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13:30	0	16	11	4	0	0	1	0	0	0	0	0	0	11	51	23	117
13:45	0	32	2	3	0	0	0	0	0	0	0	1	0	8	56	24	126
14:00	0	23	4	1	0	0	0	0	0	0	0	0	0	21	83	18	150
Hour Total	1	71	17	8	0	0	1	0	0	0	0	1	0	40	190	65	394
14:15	0	19	4	7	0	1	0	0	0	0	0	1	0	15	79	25	151
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ho Total	0	19	4	7	0	1	0	0	0	0	0	1	0	15	79	25	151
DAY TOTAL	1	277	41	42	0	1	1	0	0	0	0	3	1	133	810	279	1589
PERCENTS	0.1%	17.5%	2.6%	2.7%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	8.3%	50.9%	17.5%	100%
AM Times		11:15	11:15	11:15								11:15	10:30	11:15	11:15	11:15	
AM Peaks		86	9	13								1	1	31	212	83	
Factors		.86	.75	.81								.25	.25	.77	.80	.86	
PM Times	12:30	12:15	13:30	11:45		13:30	12:45					13:30		13:30	12:15	12:15	
PM Peaks	1	101	21	15		1	1					2		55	329	106	
Factors	.25	.81	.47	.62		.25	.25					.50		.65	.91	.91	

City of Camrose
Correction Line & 48 Ave.
TURNING MOVEMENT SUMMARY
ENDING: Wed 30/07/2014

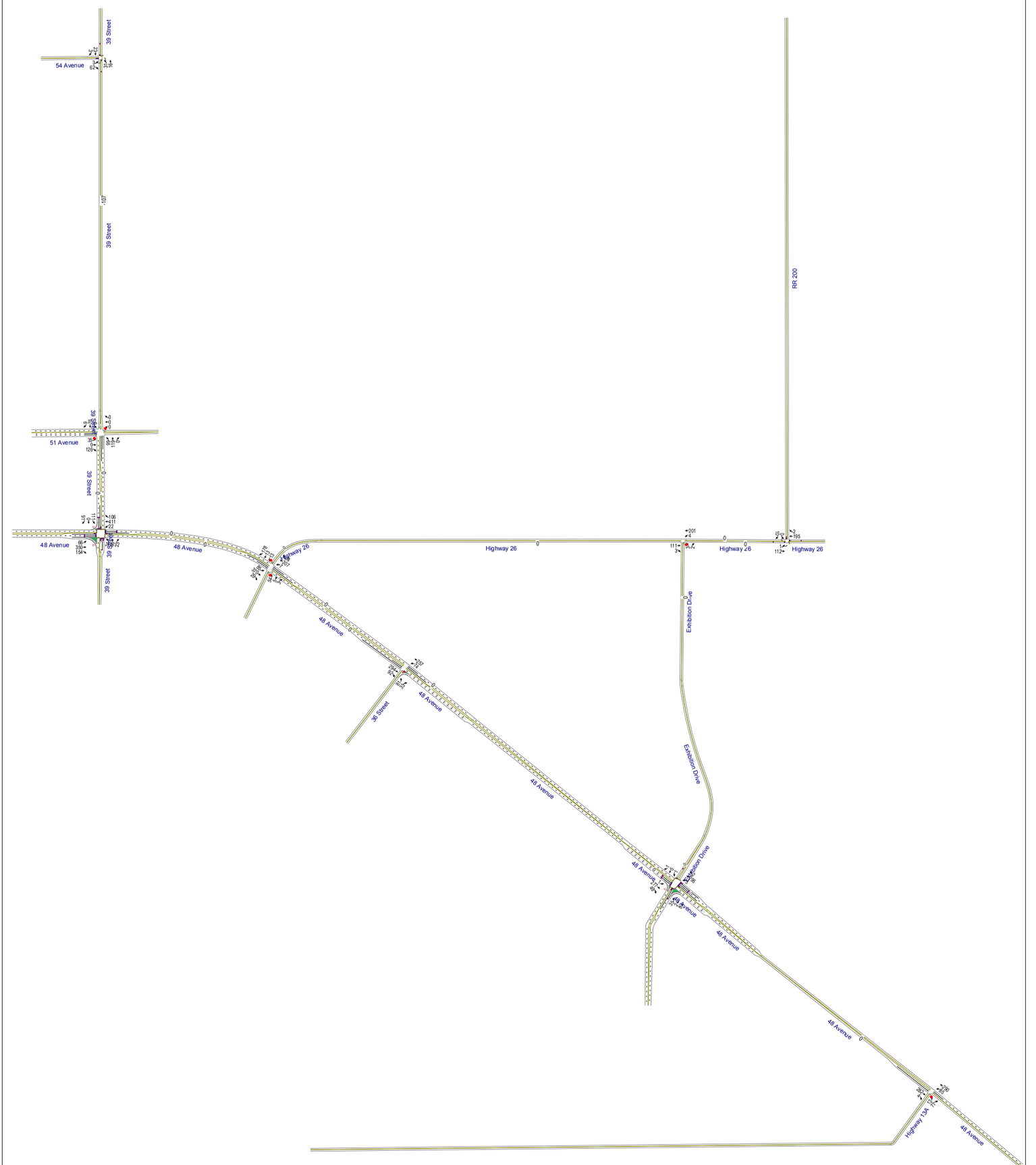
Site Reference: 000000000002
Site ID: (UNDEFINED
Location:

File: CL48a_1b.prn
City: Camrose:
County:

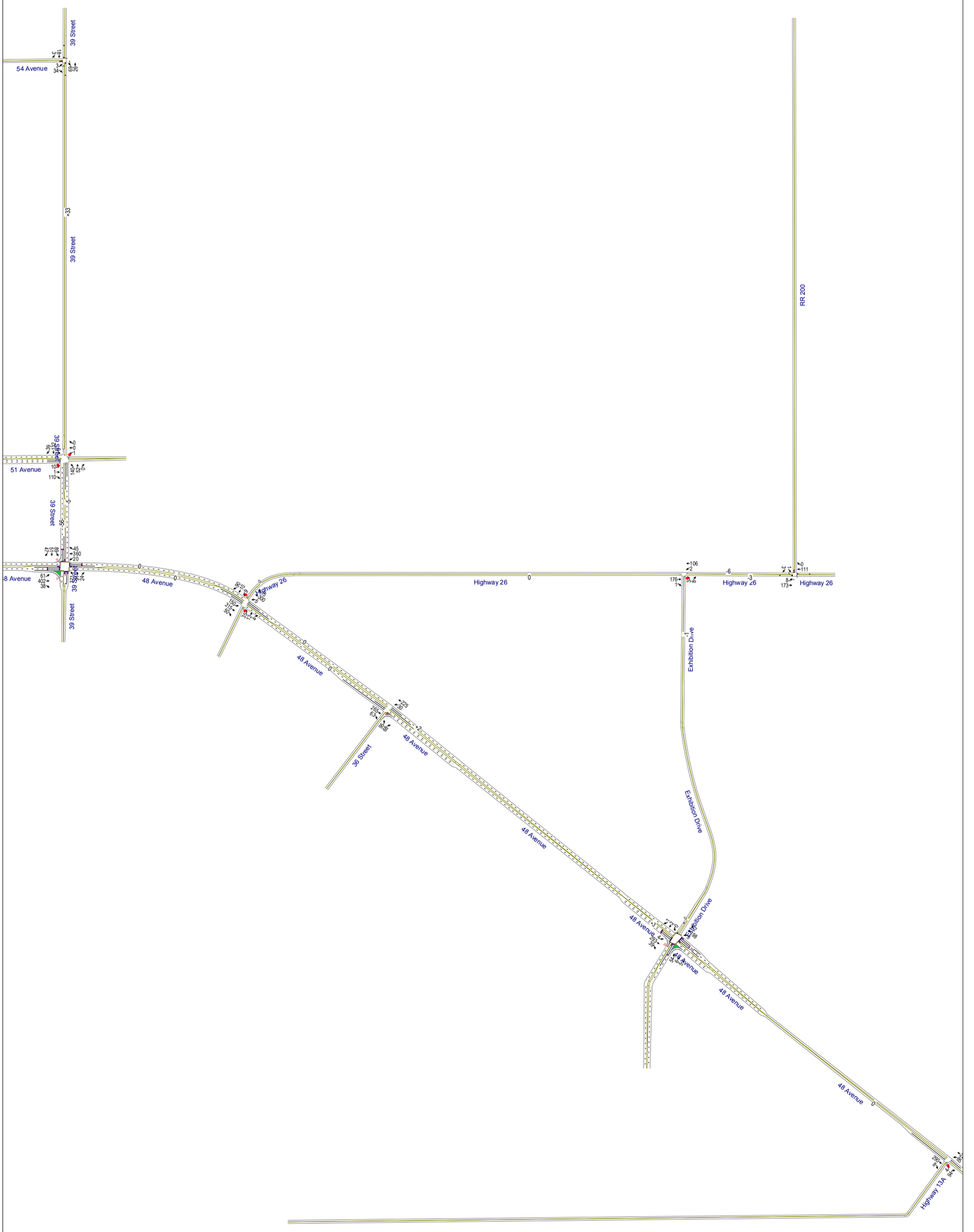
TIME	FROM NORTH Ped	Right	Thru	Left	FROM EAST Ped	Right	Thru	Left	FROM SOUTH Ped	Right	Thru	Left	FROM WEST Ped	Right	Thru	Left	TOTAL
15:15	0	20	2	0	0	0	0	0	0	0	0	0	0	12	47	24	105
15:30	0	31	5	0	0	0	0	0	0	0	0	0	0	19	83	26	164
15:45	0	20	1	4	0	0	0	0	0	0	0	0	0	20	93	35	173
16:00	0	18	3	8	0	0	0	0	0	0	0	0	0	11	74	21	135
Hour Total	0	89	11	12	0	0	0	0	0	0	0	0	0	62	297	106	577
16:15	0	24	5	2	0	0	0	0	0	0	0	0	0	11	97	35	174
16:30	0	23	4	5	0	0	1	0	0	0	0	0	0	11	75	29	148
16:45	0	28	3	4	0	0	6	0	0	0	0	0	0	19	89	38	187
17:00	0	25	3	2	0	0	0	0	0	0	0	0	0	10	69	25	134
Hour Total	0	100	15	13	0	0	7	0	0	0	0	0	0	51	330	127	643
17:15	0	35	3	7	0	0	0	0	0	0	0	0	0	17	99	33	194
17:30	0	28	1	0	0	0	0	0	0	0	0	0	0	13	94	29	165
17:45	1	30	0	10	0	0	0	0	0	0	0	1	0	15	88	33	178
18:00	0	24	2	4	0	0	0	0	0	0	0	0	0	5	100	22	157
Hour Total	1	117	6	21	0	0	0	0	0	0	0	1	0	50	381	117	694
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY TOTAL	1	306	32	46	0	0	7	0	0	0	0	1	0	163	1008	350	1914
PERCENTS	0.1%	16.0%	1.7%	2.5%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.5%	52.6%	18.2%	100%

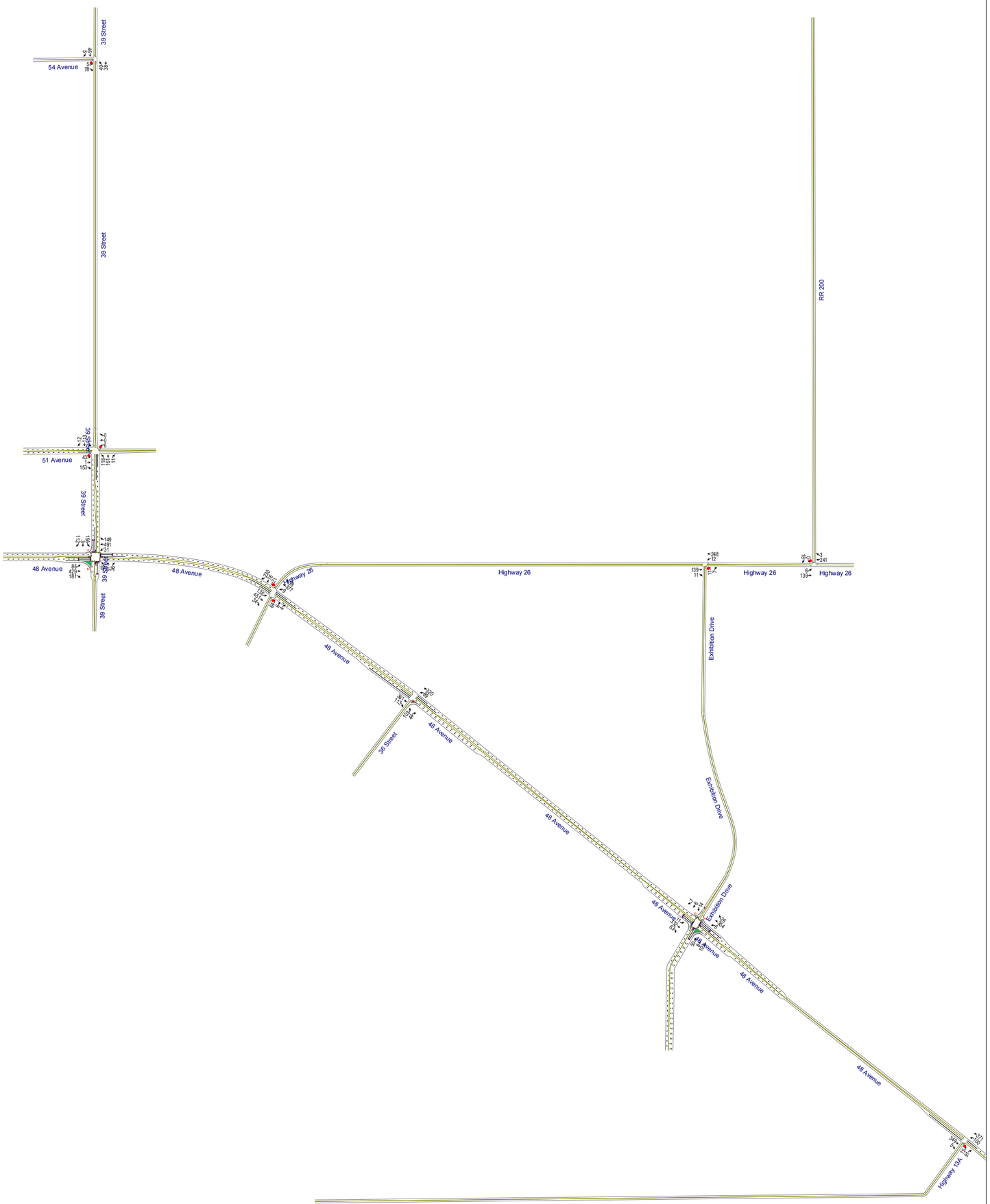
Peak Hour

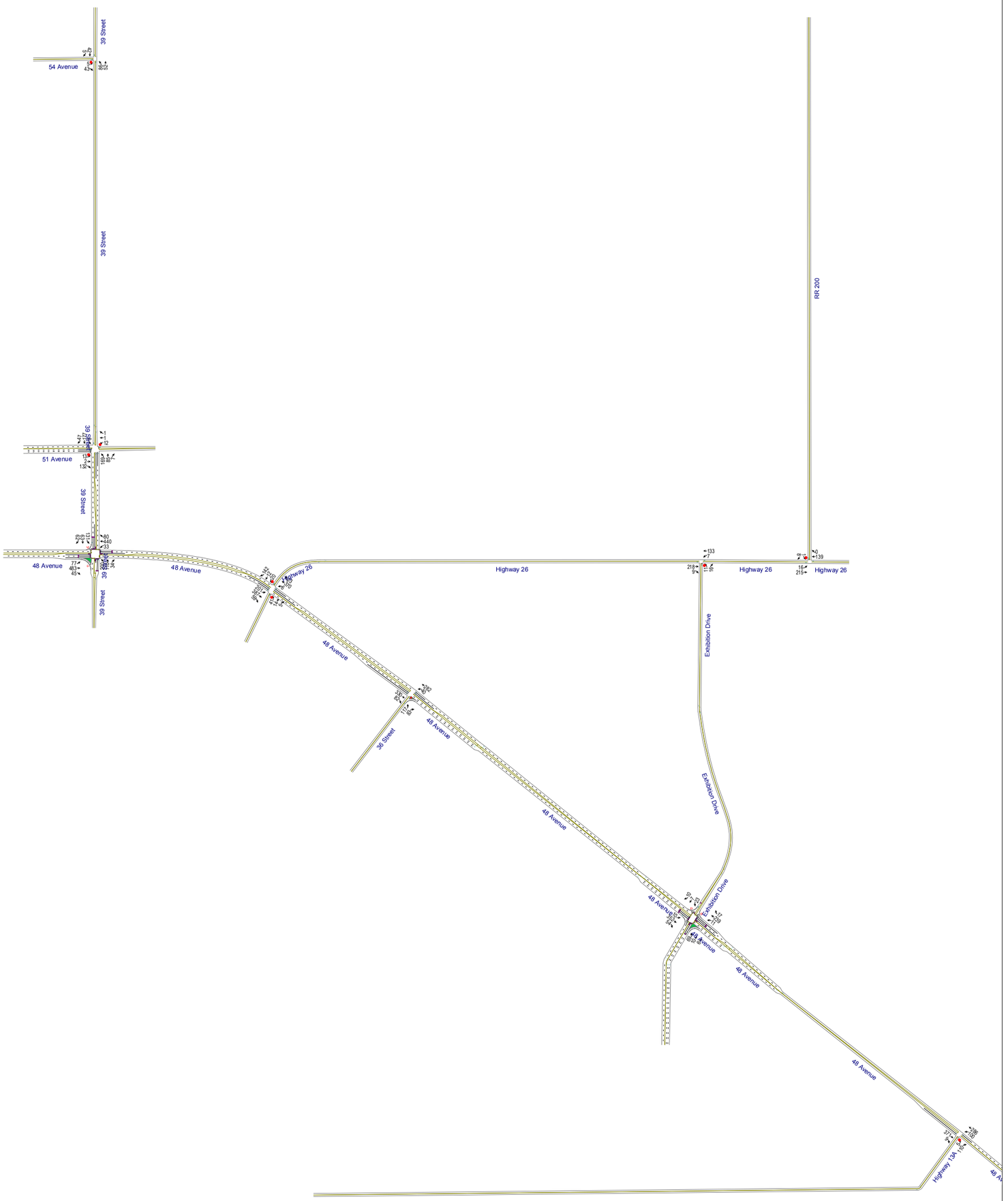
AM Times																	
AM Peaks																	
Factors																	
PM Times	17:00	17:00	16:00	17:15			16:00				17:00			15:15	17:15	16:15	
PM Peaks	1	118	15	21			7				1			62	381	127	
Factors	.25	.84	.75	.52			.29				.25			.77	.95	.83	


39 Street
54 Avenue
107'
39 Street
RR 200
51 Avenue
39 Street
48 Avenue
48 Avenue
Highway 26
Highway 26
Highway 26
Highway 26
39 Street
39 Street
49 Avenue
Exhibition Drive
48 Avenue
39 Street
48 Avenue
Exhibition Drive
48 Avenue
48 Avenue
48 Avenue
48 Avenue
Highway 13A
48 Avenue

2014 PM Balanced Background Traffic Volumes
Volume Balance Between Intersections **31/03/2016**




39 Street
54 Avenue
39 Street
RR 200
39 Street
51 Avenue
39 Street
48 Avenue
48 Avenue
Highway 26
Highway 26
Highway 26
48 Avenue
36 Street
48 Avenue
Exhibition Drive
Exhibition Drive
48 Avenue
48 Avenue
48 Avenue
Highway 13A


39 Street
54 Avenue
39 Street
RR 200
51 Avenue
39 Street
48 Avenue
39 Street
39 Street
48 Avenue
Highway 26
Highway 26
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48 Avenue
Exhibition Drive
36 Street
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Exhibition Drive
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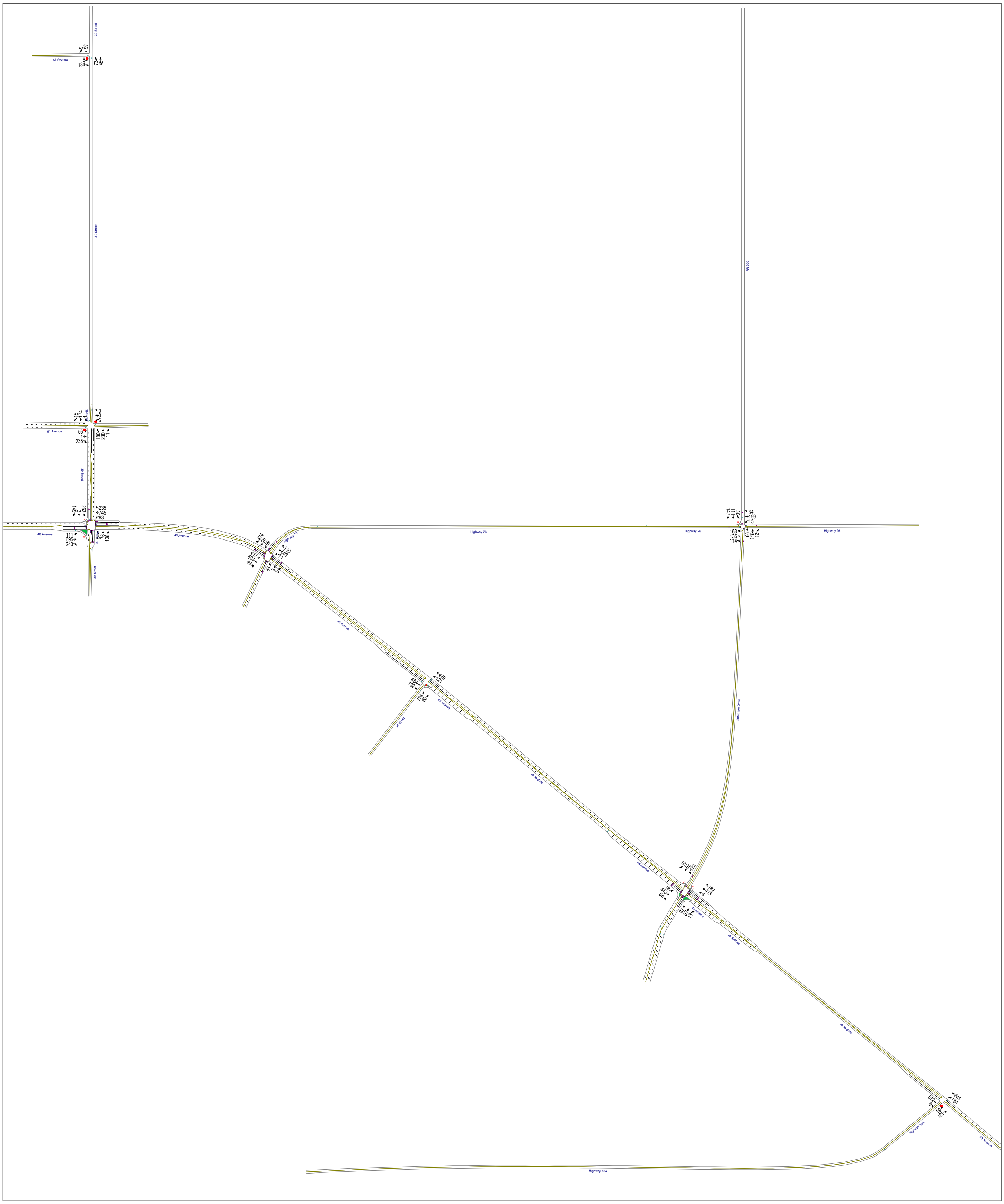
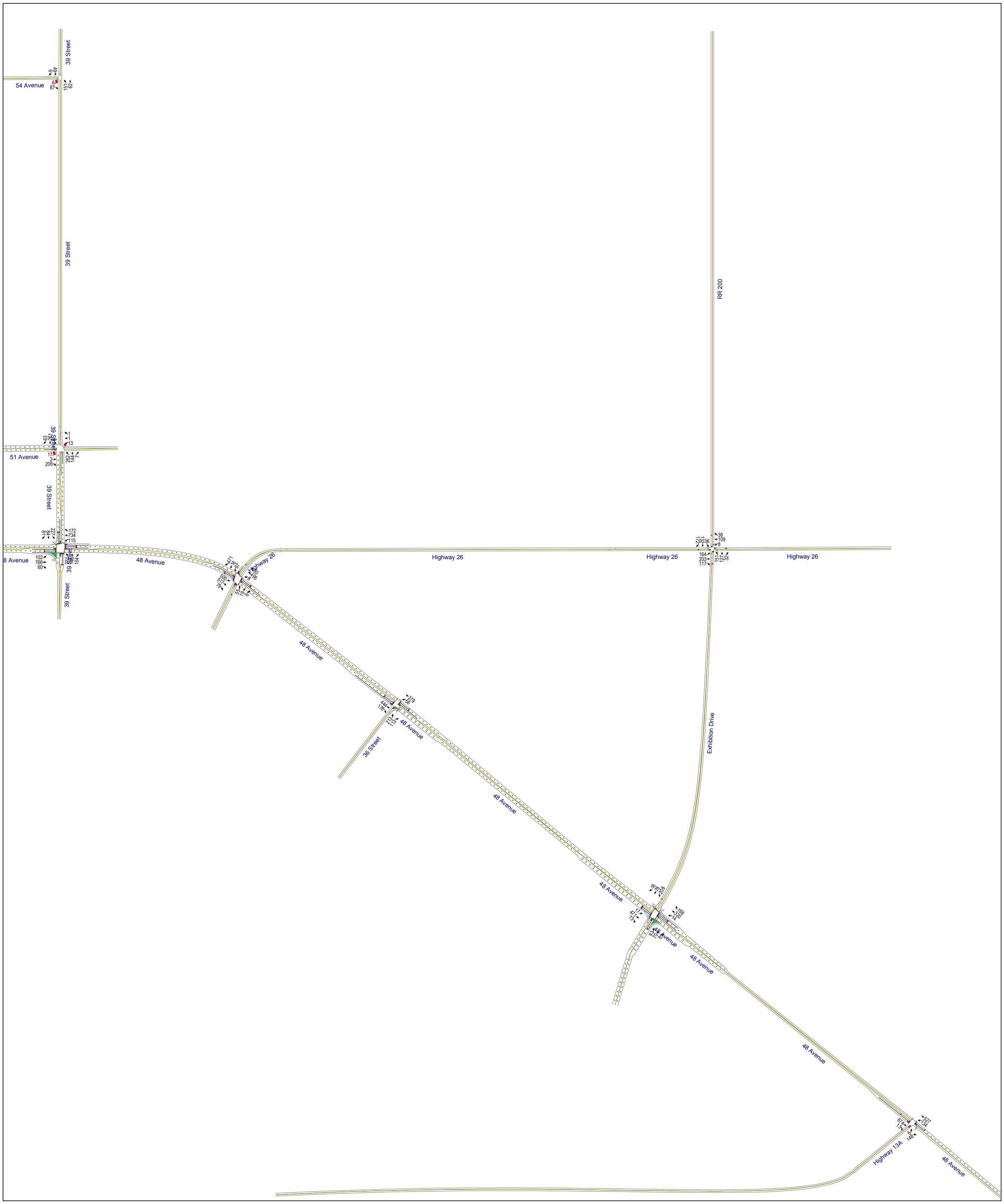
48 Avenue
Highway 13
48 A

2036 AM Background + Stage 2 Traffic Volumes
Volumes 31/03/2016



_Design\10_By_Discipline\Traffic Impact Assessment\JN_WorkingFolder\Models\2036 Improved Conditions\2036 BG+S2 AM.syn
2036 BG + Stage 2 Traffic Volumes Build
JN

2036 PM Background + Stage 2 Traffic Volumes
Volumes **31/03/2016**



STAGE 1 – AM TRAFFIC ANALYSIS

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	50	8	10	14	8	7	11	332	63	6	354	26
Future Volume (veh/h)	50	8	10	14	8	7	11	332	63	6	354	26
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	54	9	0	15	9	0	12	361	0	7	385	0
Adj No. of Lanes	1	1	1	0	1	0	0	3	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	810	931	792	368	199	0	81	1455	0	367	1062	475
Arrive On Green	0.12	0.50	0.00	0.30	0.30	0.00	0.30	0.30	0.00	0.30	0.30	0.00
Sat Flow, veh/h	1774	1863	1583	901	665	0	52	5002	0	1016	3539	1583
Grp Volume(v), veh/h	54	9	0	24	0	0	140	233	0	7	385	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1565	0	0	1817	1543	0	1016	1770	1583
Q Serve(g_s), s	1.0	0.1	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.3	5.1	0.0
Cycle Q Clear(g_c), s	1.0	0.1	0.0	0.5	0.0	0.0	3.4	3.4	0.0	3.7	5.1	0.0
Prop In Lane	1.00		1.00	0.62		0.00	0.09		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	810	931	792	567	0	0	610	926	0	367	1062	475
V/C Ratio(X)	0.07	0.01	0.00	0.04	0.00	0.00	0.23	0.25	0.00	0.02	0.36	0.00
Avail Cap(c_a), veh/h	810	931	792	567	0	0	610	926	0	367	1062	475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.4	7.5	0.0	14.9	0.0	0.0	15.9	15.9	0.0	17.3	16.5	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.0	0.9	0.7	0.0	0.1	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	0.0	0.3	0.0	0.0	1.9	1.5	0.0	0.1	2.7	0.0
LnGrp Delay(d),s/veh	9.5	7.6	0.0	15.0	0.0	0.0	16.8	16.6	0.0	17.4	17.5	0.0
LnGrp LOS	A	A		B			B	B		B	B	
Approach Vol, veh/h		63			24			373			392	
Approach Delay, s/veh		9.2			15.0			16.6			17.5	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		36.0		24.0	12.0	24.0		24.0
Change Period (Y+Rc), s		6.0		6.0	5.0	* 6		6.0
Max Green Setting (Gmax), s		30.0		18.0	7.0	* 18		18.0
Max Q Clear Time (g_c+I1), s		2.1		5.4	3.0	2.5		7.1
Green Ext Time (p_c), s		0.3		7.9	0.0	0.2		7.0

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	429	181	31	491	149	40	57	36	156	3	112
Future Volume (veh/h)	85	429	181	31	491	149	40	57	36	156	3	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	92	466	0	34	534	162	43	62	39	170	3	0
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	1198	536	331	907	274	715	1030	597	477	1007	0
Arrive On Green	0.34	0.34	0.00	0.34	0.34	0.34	0.12	0.48	0.48	0.28	0.28	0.00
Sat Flow, veh/h	746	3539	1583	923	2680	810	1774	2159	1252	1288	3632	0
Grp Volume(v), veh/h	92	466	0	34	352	344	43	50	51	170	3	0
Grp Sat Flow(s),veh/h/ln	746	1770	1583	923	1770	1720	1774	1770	1642	1288	1770	0
Q Serve(g_s), s	7.6	6.5	0.0	1.9	10.7	10.8	0.9	1.0	1.1	7.1	0.0	0.0
Cycle Q Clear(g_c), s	18.3	6.5	0.0	8.4	10.7	10.8	0.9	1.0	1.1	7.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.47	1.00		0.76	1.00		0.00
Lane Grp Cap(c), veh/h	240	1198	536	331	599	582	715	844	783	477	1007	0
V/C Ratio(X)	0.38	0.39	0.00	0.10	0.59	0.59	0.06	0.06	0.07	0.36	0.00	0.00
Avail Cap(c_a), veh/h	240	1198	536	331	599	582	715	844	783	477	1007	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.4	16.4	0.0	19.6	17.8	17.8	10.8	9.2	9.2	19.2	16.6	0.0
Incr Delay (d2), s/veh	4.6	1.0	0.0	0.6	4.2	4.4	0.2	0.1	0.2	2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.3	0.0	0.5	5.9	5.8	0.5	0.5	0.5	2.8	0.0	0.0
LnGrp Delay(d),s/veh	30.0	17.3	0.0	20.2	21.9	22.1	11.0	9.3	9.3	21.2	16.7	0.0
LnGrp LOS	C	B		C	C	C	B	A	A	C	B	
Approach Vol, veh/h		558			730			144			173	
Approach Delay, s/veh		19.4			22.0			9.8			21.2	
Approach LOS		B			C			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		37.0		28.0	12.5	24.5		28.0
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0		6.0
Max Green Setting (Gmax), s		31.0		22.0	7.5	18.5		22.0
Max Q Clear Time (g_c+I1), s		3.1		20.3	2.9	9.1		12.8
Green Ext Time (p_c), s		2.7		1.6	0.0	1.5		8.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.9
HCM 2010 LOS	B

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	361	113	89	320	103	44
Future Volume (Veh/h)	361	113	89	320	103	44
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	392	123	97	348	112	48
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			515		760	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			515		760	196
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		64	94
cM capacity (veh/h)			1047		310	812

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3	NE 1
Volume Total	196	196	123	97	174	174	160
Volume Left	0	0	0	97	0	0	112
Volume Right	0	0	123	0	0	0	48
cSH	1700	1700	1700	1047	1700	1700	381
Volume to Capacity	0.12	0.12	0.07	0.09	0.10	0.10	0.42
Queue Length 95th (m)	0.0	0.0	0.0	2.3	0.0	0.0	15.4
Control Delay (s)	0.0	0.0	0.0	8.8	0.0	0.0	21.1
Lane LOS				A			C
Approach Delay (s)	0.0			1.9			21.1
Approach LOS							C

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	139	11	12	248	11	7
Future Volume (Veh/h)	139	11	12	248	11	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	151	12	13	270	12	8
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			163		453	157
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			163		453	157
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1416		559	889

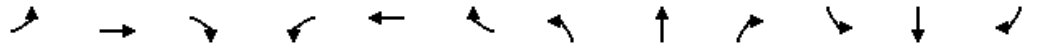
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	163	283	20
Volume Left	0	13	12
Volume Right	12	0	8
cSH	1700	1416	657
Volume to Capacity	0.10	0.01	0.03
Queue Length 95th (m)	0.0	0.2	0.7
Control Delay (s)	0.0	0.4	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	78	40	38	46	5
Future Volume (Veh/h)	5	78	40	38	46	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	85	43	41	50	5
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	180	52	55			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	180	52	55			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	92	97			
cM capacity (veh/h)	788	1015	1550			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	90	84	55
Volume Left	5	43	0
Volume Right	85	0	5
cSH	999	1550	1700
Volume to Capacity	0.09	0.03	0.03
Queue Length 95th (m)	2.3	0.7	0.0
Control Delay (s)	9.0	3.9	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	3.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	22.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	1	153	6	0	0	118	161	11	1	113	12
Future Volume (Veh/h)	43	1	153	6	0	0	118	161	11	1	113	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	1	166	7	0	0	128	175	12	1	123	13
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								252				
pX, platoon unblocked												
vC, conflicting volume	562	574	130	729	569	175	136			187		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	562	574	130	729	569	175	136			187		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	100	82	97	100	100	91			100		
cM capacity (veh/h)	407	391	920	258	393	868	1448			1387		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1
Volume Total	47	167	7	128	175	12	137
Volume Left	47	0	7	128	0	0	1
Volume Right	0	166	0	0	0	12	13
cSH	407	913	258	1448	1700	1700	1387
Volume to Capacity	0.12	0.18	0.03	0.09	0.10	0.01	0.00
Queue Length 95th (m)	2.9	5.1	0.6	2.2	0.0	0.0	0.0
Control Delay (s)	15.0	9.8	19.3	7.7	0.0	0.0	0.1
Lane LOS	B	A	C	A			A
Approach Delay (s)	11.0		19.3	3.1			0.1
Approach LOS	B		C				

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	34.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	64	6	4	21	16	230	136	451	34	9	377	38
Future Volume (Veh/h)	64	6	4	21	16	230	136	451	34	9	377	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	7	4	23	17	250	148	490	37	10	410	41
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	1288	1276	264	999	1274	226	451			527		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1288	1276	264	999	1274	226	451			527		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	0	95	99	86	88	68	87			99		
cM capacity (veh/h)	67	142	735	169	142	778	1106			1036		

Direction, Lane #	NB 1	SB 1	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3
Volume Total	81	290	148	327	200	10	273	178
Volume Left	70	23	148	0	0	10	0	0
Volume Right	4	250	0	0	37	0	0	41
cSH	73	502	1106	1700	1700	1036	1700	1700
Volume to Capacity	1.10	0.58	0.13	0.19	0.12	0.01	0.16	0.10
Queue Length 95th (m)	45.7	27.4	3.5	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	235.5	21.5	8.8	0.0	0.0	8.5	0.0	0.0
Lane LOS	F	C	A			A		
Approach Delay (s)	235.5	21.5	1.9			0.2		
Approach LOS	F	C						

Intersection Summary				
Average Delay	17.7			
Intersection Capacity Utilization	52.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	139	241	3	0	18
Future Volume (Veh/h)	6	139	241	3	0	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	151	262	3	0	20
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	265				428	264
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	265				428	264
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	97
cM capacity (veh/h)	1299				580	775

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	158	265	20
Volume Left	7	0	0
Volume Right	0	3	20
cSH	1299	1700	775
Volume to Capacity	0.01	0.16	0.03
Queue Length 95th (m)	0.1	0.0	0.6
Control Delay (s)	0.4	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	349	5	100	371	15	91
Future Volume (Veh/h)	349	5	100	371	15	91
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	379	5	109	403	16	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			384		1000	379
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			384		1000	379
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		93	85
cM capacity (veh/h)			1174		244	668

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1
Volume Total	379	5	109	403	115
Volume Left	0	0	109	0	16
Volume Right	0	5	0	0	99
cSH	1700	1700	1174	1700	538
Volume to Capacity	0.22	0.00	0.09	0.24	0.21
Queue Length 95th (m)	0.0	0.0	2.3	0.0	6.1
Control Delay (s)	0.0	0.0	8.4	0.0	13.5
Lane LOS			A		B
Approach Delay (s)	0.0		1.8		13.5
Approach LOS					B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

STAGE 1 – PM TRAFFIC ANALYSIS

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	69	10	6	23	7	10	10	352	54	11	239	17
Future Volume (veh/h)	69	10	6	23	7	10	10	352	54	11	239	17
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	75	11	0	25	8	0	11	383	0	12	260	0
Adj No. of Lanes	1	1	1	0	1	0	0	3	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	811	931	792	432	124	0	78	1462	0	359	1062	475
Arrive On Green	0.12	0.50	0.00	0.30	0.30	0.00	0.30	0.30	0.00	0.30	0.30	0.00
Sat Flow, veh/h	1774	1863	1583	1087	414	0	45	5025	0	996	3539	1583
Grp Volume(v), veh/h	75	11	0	33	0	0	148	246	0	12	260	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1501	0	0	1833	1543	0	996	1770	1583
Q Serve(g_s), s	1.5	0.2	0.0	0.1	0.0	0.0	0.0	3.6	0.0	0.6	3.3	0.0
Cycle Q Clear(g_c), s	1.5	0.2	0.0	0.8	0.0	0.0	3.6	3.6	0.0	4.2	3.3	0.0
Prop In Lane	1.00		1.00	0.76		0.00	0.07		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	811	931	792	556	0	0	614	926	0	359	1062	475
V/C Ratio(X)	0.09	0.01	0.00	0.06	0.00	0.00	0.24	0.27	0.00	0.03	0.24	0.00
Avail Cap(c_a), veh/h	811	931	792	556	0	0	614	926	0	359	1062	475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.5	7.5	0.0	15.0	0.0	0.0	16.0	16.0	0.0	17.6	15.9	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.2	0.0	0.0	0.9	0.7	0.0	0.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.1	0.0	0.4	0.0	0.0	2.0	1.6	0.0	0.2	1.7	0.0
LnGrp Delay(d),s/veh	9.7	7.6	0.0	15.2	0.0	0.0	16.9	16.7	0.0	17.7	16.4	0.0
LnGrp LOS	A	A		B			B	B		B	B	
Approach Vol, veh/h		86			33			394			272	
Approach Delay, s/veh		9.4			15.2			16.8			16.5	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		36.0		24.0	12.0	24.0		24.0
Change Period (Y+Rc), s		6.0		6.0	5.0	* 6		6.0
Max Green Setting (Gmax), s		30.0		18.0	7.0	* 18		18.0
Max Q Clear Time (g_c+I1), s		2.2		5.6	3.5	2.8		6.2
Green Ext Time (p_c), s		0.5		7.0	0.1	0.3		6.7

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	483	45	33	440	80	200	110	34	131	63	62
Future Volume (veh/h)	77	483	45	33	440	80	200	110	34	131	63	62
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	84	525	0	36	478	87	217	120	37	142	68	0
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	1035	463	259	875	158	740	1407	419	506	1143	0
Arrive On Green	0.29	0.29	0.00	0.29	0.29	0.29	0.12	0.52	0.52	0.32	0.32	0.00
Sat Flow, veh/h	842	3539	1583	874	2995	542	1774	2691	800	1225	3632	0
Grp Volume(v), veh/h	84	525	0	36	281	284	217	77	80	142	68	0
Grp Sat Flow(s),veh/h/ln	842	1770	1583	874	1770	1767	1774	1770	1721	1225	1770	0
Q Serve(g_s), s	6.1	8.0	0.0	2.3	8.7	8.8	4.7	1.4	1.5	5.8	0.9	0.0
Cycle Q Clear(g_c), s	14.9	8.0	0.0	10.3	8.7	8.8	4.7	1.4	1.5	5.8	0.9	0.0
Prop In Lane	1.00		1.00	1.00		0.31	1.00		0.47	1.00		0.00
Lane Grp Cap(c), veh/h	243	1035	463	259	517	517	740	926	900	506	1143	0
V/C Ratio(X)	0.35	0.51	0.00	0.14	0.54	0.55	0.29	0.08	0.09	0.28	0.06	0.00
Avail Cap(c_a), veh/h	243	1035	463	259	517	517	740	926	900	506	1143	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.7	19.1	0.0	23.4	19.4	19.4	10.2	7.7	7.8	16.8	15.2	0.0
Incr Delay (d2), s/veh	3.9	1.8	0.0	1.1	4.1	4.2	1.0	0.2	0.2	1.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	4.1	0.0	0.6	4.8	4.9	2.4	0.7	0.8	2.1	0.4	0.0
LnGrp Delay(d),s/veh	29.5	20.9	0.0	24.5	23.4	23.5	11.2	7.9	7.9	18.2	15.3	0.0
LnGrp LOS	C	C		C	C	C	B	A	A	B	B	
Approach Vol, veh/h		609			601			374			210	
Approach Delay, s/veh		22.1			23.5			9.8			17.3	
Approach LOS		C			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		40.0		25.0	13.0	27.0		25.0
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0		6.0
Max Green Setting (Gmax), s		34.0		19.0	8.0	21.0		19.0
Max Q Clear Time (g_c+I1), s		3.5		16.9	6.7	7.8		12.3
Green Ext Time (p_c), s		4.9		1.9	0.1	3.3		5.8

Intersection Summary	
HCM 2010 Ctrl Delay	19.5
HCM 2010 LOS	B

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	330	82	40	282	117	83
Future Volume (Veh/h)	330	82	40	282	117	83
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	359	89	43	307	127	90
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			448		598	180
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			448		598	180
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		70	89
cM capacity (veh/h)			1109		417	832

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3	NE 1
Volume Total	180	180	89	43	154	154	217
Volume Left	0	0	0	43	0	0	127
Volume Right	0	0	89	0	0	0	90
cSH	1700	1700	1700	1109	1700	1700	525
Volume to Capacity	0.11	0.11	0.05	0.04	0.09	0.09	0.41
Queue Length 95th (m)	0.0	0.0	0.0	0.9	0.0	0.0	15.3
Control Delay (s)	0.0	0.0	0.0	8.4	0.0	0.0	16.6
Lane LOS				A			C
Approach Delay (s)	0.0			1.0			16.6
Approach LOS							C

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	218	9	7	133	11	16
Future Volume (Veh/h)	218	9	7	133	11	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	237	10	8	145	12	17
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			247		403	242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			247		403	242
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1319		600	797

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	247	153	29
Volume Left	0	8	12
Volume Right	10	0	17
cSH	1700	1319	701
Volume to Capacity	0.15	0.01	0.04
Queue Length 95th (m)	0.0	0.1	1.0
Control Delay (s)	0.0	0.5	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.4
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	43	86	52	42	5
Future Volume (Veh/h)	5	43	86	52	42	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	47	93	57	46	5
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	292	48	51			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	292	48	51			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	95	94			
cM capacity (veh/h)	657	1020	1555			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	52	150	51
Volume Left	5	93	0
Volume Right	47	0	5
cSH	969	1555	1700
Volume to Capacity	0.05	0.06	0.03
Queue Length 95th (m)	1.3	1.4	0.0
Control Delay (s)	8.9	4.8	0.0
Lane LOS	A	A	
Approach Delay (s)	8.9	4.8	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	2	132	12	1	1	169	85	7	0	177	47
Future Volume (Veh/h)	13	2	132	12	1	1	169	85	7	0	177	47
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	2	143	13	1	1	184	92	8	0	192	51
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								252				
pX, platoon unblocked												
vC, conflicting volume	679	686	218	822	703	92	243			100		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	679	686	218	822	703	92	243			100		
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 %	96	99	83	94	100	100	86			100		
cM capacity (veh/h)	325	319	822	215	312	965	1323			1493		

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1	NB 2	NB 3	SB 1
Volume Total	9	7	143	15	184	92	8	243
Volume Left	9	5	0	13	184	0	0	0
Volume Right	0	0	143	1	0	0	8	51
cSH	325	323	822	232	1323	1700	1700	1493
Volume to Capacity	0.03	0.02	0.17	0.06	0.14	0.05	0.00	0.00
Queue Length 95th (m)	0.7	0.5	4.8	1.6	3.7	0.0	0.0	0.0
Control Delay (s)	16.4	16.4	10.3	21.6	8.2	0.0	0.0	0.0
Lane LOS	C	C	B	C	A			
Approach Delay (s)	10.9			21.6	5.3			0.0
Approach LOS	B			C				

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	39.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	41	14	5	20	12	142	201	387	59	6	370	23
Future Volume (Veh/h)	41	14	5	20	12	142	201	387	59	6	370	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	15	5	22	13	154	218	421	64	7	402	25
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	1264	1330	242	1088	1350	214	427			485		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1264	1330	242	1088	1350	214	427			485		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	43	88	99	83	89	81	81			99		
cM capacity (veh/h)	79	123	758	130	120	792	1129			1074		

Direction, Lane #	NB 1	SB 1	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3
Volume Total	65	189	218	281	204	7	268	159
Volume Left	45	22	218	0	0	7	0	0
Volume Right	5	154	0	0	64	0	0	25
cSH	93	401	1129	1700	1700	1074	1700	1700
Volume to Capacity	0.70	0.47	0.19	0.17	0.12	0.01	0.16	0.09
Queue Length 95th (m)	26.4	18.6	5.4	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	104.9	21.8	9.0	0.0	0.0	8.4	0.0	0.0
Lane LOS	F	C	A			A		
Approach Delay (s)	104.9	21.8	2.8			0.1		
Approach LOS	F	C						

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	45.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	215	139	0	1	8
Future Volume (Veh/h)	16	215	139	0	1	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	234	151	0	1	9
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	151				419	151
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	151				419	151
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	1430				584	895

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	251	151	10
Volume Left	17	0	1
Volume Right	0	0	9
cSH	1430	1700	850
Volume to Capacity	0.01	0.09	0.01
Queue Length 95th (m)	0.3	0.0	0.3
Control Delay (s)	0.6	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	371	9	100	286	5	110
Future Volume (Veh/h)	371	9	100	286	5	110
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	403	10	109	311	5	120
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			413		932	403
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			413		932	403
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		98	81
cM capacity (veh/h)			1146		268	647

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1
Volume Total	403	10	109	311	125
Volume Left	0	0	109	0	5
Volume Right	0	10	0	0	120
cSH	1700	1700	1146	1700	613
Volume to Capacity	0.24	0.01	0.10	0.18	0.20
Queue Length 95th (m)	0.0	0.0	2.4	0.0	5.8
Control Delay (s)	0.0	0.0	8.5	0.0	12.4
Lane LOS			A		B
Approach Delay (s)	0.0		2.2		12.4
Approach LOS					B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

STAGE 2 – AM TRAFFIC ANALYSIS

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	67	67	13	122	52	10	18	443	84	8	473	182
Future Volume (veh/h)	67	67	13	122	52	10	18	443	84	8	473	182
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1810	1810	1900	1810	1900	1900	1810	1900	1810	1810	1810
Adj Flow Rate, veh/h	73	73	0	133	57	0	20	482	0	9	514	0
Adj No. of Lanes	1	1	1	0	1	0	0	3	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	788	959	815	447	174	0	88	1254	0	283	929	416
Arrive On Green	0.08	0.53	0.00	0.36	0.36	0.00	0.27	0.27	0.00	0.27	0.27	0.00
Sat Flow, veh/h	1723	1810	1538	946	476	0	78	4789	0	883	3438	1538
Grp Volume(v), veh/h	73	73	0	190	0	0	187	315	0	9	514	0
Grp Sat Flow(s),veh/h/ln	1723	1810	1538	1422	0	0	1723	1498	0	883	1719	1538
Q Serve(g_s), s	1.4	1.2	0.0	4.8	0.0	0.0	0.0	5.1	0.0	0.5	7.7	0.0
Cycle Q Clear(g_c), s	1.4	1.2	0.0	5.7	0.0	0.0	5.1	5.1	0.0	5.6	7.7	0.0
Prop In Lane	1.00		1.00	0.70		0.00	0.11		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	788	959	815	620	0	0	532	810	0	283	929	416
V/C Ratio(X)	0.09	0.08	0.00	0.31	0.00	0.00	0.35	0.39	0.00	0.03	0.55	0.00
Avail Cap(c_a), veh/h	848	959	815	620	0	0	580	899	0	309	1031	461
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.5	6.9	0.0	13.9	0.0	0.0	17.8	17.9	0.0	20.2	18.8	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.0	1.3	0.0	0.0	0.4	0.3	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.6	0.0	2.5	0.0	0.0	2.6	2.1	0.0	0.1	3.7	0.0
LnGrp Delay(d),s/veh	8.5	7.1	0.0	15.1	0.0	0.0	18.2	18.2	0.0	20.2	19.3	0.0
LnGrp LOS	A	A		B			B	B		C	B	
Approach Vol, veh/h		146			190			502			523	
Approach Delay, s/veh		7.8			15.1			18.2			19.3	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		37.8		22.2	9.9	27.9		22.2
Change Period (Y+Rc), s		6.0		6.0	5.0	* 6		6.0
Max Green Setting (Gmax), s		30.0		18.0	7.0	* 20		18.0
Max Q Clear Time (g_c+I1), s		3.2		7.1	3.4	7.7		9.7
Green Ext Time (p_c), s		4.1		8.3	0.1	2.6		6.5

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	695	243	83	745	235	54	76	108	263	3	149
Future Volume (veh/h)	111	695	243	83	745	235	54	76	108	263	3	149
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1810	1810	1810	1810	1810	1810	1810	1900	1810	1810	1900
Adj Flow Rate, veh/h	121	755	0	90	810	255	59	83	117	286	3	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	267	1529	684	283	1092	489	546	388	347	503	918	0
Arrive On Green	0.07	0.44	0.00	0.32	0.32	0.32	0.09	0.23	0.23	0.14	0.27	0.00
Sat Flow, veh/h	1723	3438	1538	686	3438	1538	1723	1719	1538	1723	3529	0
Grp Volume(v), veh/h	121	755	0	90	810	255	59	83	117	286	3	0
Grp Sat Flow(s),veh/h/ln	1723	1719	1538	686	1719	1538	1723	1719	1538	1723	1719	0
Q Serve(g_s), s	3.8	13.3	0.0	9.1	17.9	11.5	2.1	3.3	5.4	10.6	0.1	0.0
Cycle Q Clear(g_c), s	3.8	13.3	0.0	11.6	17.9	11.5	2.1	3.3	5.4	10.6	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	267	1529	684	283	1092	489	546	388	347	503	918	0
V/C Ratio(X)	0.45	0.49	0.00	0.32	0.74	0.52	0.11	0.21	0.34	0.57	0.00	0.00
Avail Cap(c_a), veh/h	267	1529	684	283	1092	489	546	388	347	503	918	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.7	16.8	0.0	24.8	25.9	23.7	20.7	26.8	27.6	20.4	22.9	0.0
Incr Delay (d2), s/veh	5.4	1.1	0.0	2.9	4.6	3.9	0.4	1.3	2.6	4.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.5	0.0	2.0	9.1	5.4	1.0	1.7	2.6	5.6	0.0	0.0
LnGrp Delay(d),s/veh	24.1	17.9	0.0	27.7	30.4	27.7	21.1	28.0	30.2	25.0	22.9	0.0
LnGrp LOS	C	B		C	C	C	C	C	C	C	C	
Approach Vol, veh/h		876			1155			259			289	
Approach Delay, s/veh		18.8			29.6			27.4			24.9	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	25.2		43.8	12.5	28.7	10.8	33.0
Change Period (Y+Rc), s	4.5	6.0		6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	11.5	19.2		37.8	7.5	22.7	6.3	27.0
Max Q Clear Time (g_c+I1), s	12.6	7.4		15.3	4.1	2.1	5.8	19.9
Green Ext Time (p_c), s	0.0	1.9		20.5	0.0	2.7	0.0	6.8

Intersection Summary	
HCM 2010 Ctrl Delay	25.2
HCM 2010 LOS	C

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	85	8	5	69	20	474	417	604	46	11	503	110
Future Volume (veh/h)	85	8	5	69	20	474	417	604	46	11	503	110
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1810	1900	1900	1810	1810	1810	1810	1900	1810	1810	1900
Adj Flow Rate, veh/h	92	9	5	75	22	515	453	657	50	12	547	120
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	262	280	156	356	94	394	594	2045	155	365	1075	235
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.19	0.63	0.63	0.38	0.38	0.38
Sat Flow, veh/h	840	1094	608	1079	368	1538	1723	3239	246	717	2807	614
Grp Volume(v), veh/h	92	0	14	97	0	515	453	348	359	12	334	333
Grp Sat Flow(s),veh/h/ln	840	0	1702	1447	0	1538	1723	1719	1766	717	1719	1701
Q Serve(g_s), s	7.8	0.0	0.5	3.6	0.0	20.5	11.4	7.5	7.5	0.8	11.9	12.0
Cycle Q Clear(g_c), s	12.0	0.0	0.5	4.1	0.0	20.5	11.4	7.5	7.5	0.8	11.9	12.0
Prop In Lane	1.00		0.36	0.77		1.00	1.00		0.14	1.00		0.36
Lane Grp Cap(c), veh/h	262	0	436	451	0	394	594	1085	1115	365	658	652
V/C Ratio(X)	0.35	0.00	0.03	0.22	0.00	1.31	0.76	0.32	0.32	0.03	0.51	0.51
Avail Cap(c_a), veh/h	262	0	436	451	0	394	770	1085	1115	365	658	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	22.3	23.6	0.0	29.8	11.8	6.8	6.8	15.5	18.9	18.9
Incr Delay (d2), s/veh	0.8	0.0	0.0	1.1	0.0	155.3	3.3	0.8	0.8	0.2	2.8	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.2	1.8	0.0	25.7	5.8	3.7	3.8	0.2	6.2	6.2
LnGrp Delay(d),s/veh	29.2	0.0	22.3	24.7	0.0	185.0	15.1	7.6	7.6	15.7	21.7	21.8
LnGrp LOS	C		C	C		F	B	A	A	B	C	C
Approach Vol, veh/h		106			612			1160			679	
Approach Delay, s/veh		28.3			159.6			10.5			21.6	
Approach LOS		C			F			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	19.9	35.1		25.0		55.0		25.0
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s	23.5	22.5		20.5		50.5		20.5
Max Q Clear Time (g_c+I1), s	13.4	14.0		14.0		9.5		22.5
Green Ext Time (p_c), s	1.9	7.6		2.9		29.2		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		49.9
HCM 2010 LOS		D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	163	135	114	15	199	34	66	118	12	30	111	147
Future Volume (veh/h)	163	135	114	15	199	34	66	118	12	30	111	147
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1810	1900	1900	1810	1900	1900	1810	1900	1900	1810	1900
Adj Flow Rate, veh/h	177	147	124	16	216	37	72	128	13	33	121	0
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	310	230	164	100	585	96	272	435	39	187	590	0
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	496	575	410	38	1463	239	412	1089	98	224	1474	0
Grp Volume(v), veh/h	448	0	0	269	0	0	213	0	0	154	0	0
Grp Sat Flow(s),veh/h/ln	1481	0	0	1741	0	0	1598	0	0	1698	0	0
Q Serve(g_s), s	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.0	0.0	0.0	4.8	0.0	0.0	3.6	0.0	0.0	2.5	0.0	0.0
Prop In Lane	0.40		0.28	0.06		0.14	0.34		0.06	0.21		0.00
Lane Grp Cap(c), veh/h	704	0	0	781	0	0	746	0	0	776	0	0
V/C Ratio(X)	0.64	0.00	0.00	0.34	0.00	0.00	0.29	0.00	0.00	0.20	0.00	0.00
Avail Cap(c_a), veh/h	704	0	0	781	0	0	746	0	0	776	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.1	0.0	0.0	9.6	0.0	0.0	9.2	0.0	0.0	8.9	0.0	0.0
Incr Delay (d2), s/veh	4.4	0.0	0.0	1.2	0.0	0.0	1.0	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	0.0	2.6	0.0	0.0	2.0	0.0	0.0	1.4	0.0	0.0
LnGrp Delay(d),s/veh	15.5	0.0	0.0	10.8	0.0	0.0	10.2	0.0	0.0	9.4	0.0	0.0
LnGrp LOS	B			B			B			A		
Approach Vol, veh/h		448			269			213			154	
Approach Delay, s/veh		15.5			10.8			10.2			9.4	
Approach LOS		B			B			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0
Max Q Clear Time (g_c+I1), s		13.0		4.5		6.8		5.6
Green Ext Time (p_c), s		3.4		4.1		6.9		3.8

Intersection Summary	
HCM 2010 Ctrl Delay	12.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	19.1

Movement	SET	SER	NWL	NWT	NEL	NER
Traffic Vol, veh/h	486	192	121	429	194	60
Future Vol, veh/h	486	192	121	429	194	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	1200	600	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	528	209	132	466	211	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	528	0	1024	-
Stage 1	-	-	-	-	528	-
Stage 2	-	-	-	-	496	-
Critical Hdwy	-	-	4.2	-	6.9	-
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.25	-	3.55	-
Pot Cap-1 Maneuver	-	-	1015	-	226	0
Stage 1	-	-	-	-	548	0
Stage 2	-	-	-	-	569	0
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1015	-	~ 197	-
Mov Cap-2 Maneuver	-	-	-	-	~ 197	-
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	495	-

Approach	SE	NW	NE
HCM Control Delay, s	0	2	134.3
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	197	1015	-	-	-
HCM Lane V/C Ratio	1.07	0.13	-	-	-
HCM Control Delay (s)	134.3	9.1	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	9.8	0.4	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	6	134	73	45	56	6
Future Vol, veh/h	6	134	73	45	56	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	7	146	79	49	61	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	272	64	67	0	-	0
Stage 1	64	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	711	992	1516	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	820	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	673	992	1516	-	-	-
Mov Cap-2 Maneuver	673	-	-	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	776	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	4.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1516	-	972	-	-
HCM Lane V/C Ratio	0.052	-	0.157	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	56	1	235	6	0	0	180	230	11	1	174	15
Future Vol, veh/h	56	1	235	6	0	0	180	230	11	1	174	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	600	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	61	1	255	7	0	0	196	250	12	1	189	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	840	840	197	969	849	250	205	0	0	250	0	0
Stage 1	199	199	-	641	641	-	-	-	-	-	-	-
Stage 2	641	641	-	328	208	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	281	298	837	230	295	781	1349	-	-	1298	-	-
Stage 1	796	731	-	458	465	-	-	-	-	-	-	-
Stage 2	458	465	-	679	724	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	249	254	837	141	252	781	1349	-	-	1298	-	-
Mov Cap-2 Maneuver	249	254	-	141	252	-	-	-	-	-	-	-
Stage 1	680	730	-	391	397	-	-	-	-	-	-	-
Stage 2	391	397	-	471	723	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	31.8	3.5	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1349	-	-	249	829	141	1298	-	-
HCM Lane V/C Ratio	0.145	-	-	0.244	0.309	0.046	0.001	-	-
HCM Control Delay (s)	8.1	-	-	24.1	11.3	31.8	7.8	0	-
HCM Lane LOS	A	-	-	C	B	D	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.9	1.3	0.1	0	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	SET	SER	NWL	NWT	NEL	NER
Traffic Vol, veh/h	572	6	134	645	19	121
Future Vol, veh/h	572	6	134	645	19	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	1000	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	622	7	146	701	21	132

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	622	0	1614	622
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	992	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	944	-	112	481
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	354	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	944	-	95	481
Mov Cap-2 Maneuver	-	-	-	-	95	-
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	299	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.6	27.3
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	310	944	-	-	-
HCM Lane V/C Ratio	0.491	0.154	-	-	-
HCM Control Delay (s)	27.3	9.5	-	-	-
HCM Lane LOS	D	A	-	-	-
HCM 95th %tile Q(veh)	2.6	0.5	-	-	-

STAGE 2 – PM TRAFFIC ANALYSIS

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	93	70	8	208	78	18	17	471	73	14	320	168
Future Volume (veh/h)	93	70	8	208	78	18	17	471	73	14	320	168
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1810	1810	1900	1810	1900	1900	1810	1900	1810	1810	1810
Adj Flow Rate, veh/h	101	76	0	226	85	0	18	512	0	15	348	0
Adj No. of Lanes	1	1	1	0	1	0	0	3	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	769	927	788	412	135	0	83	1372	0	293	1006	450
Arrive On Green	0.11	0.51	0.00	0.32	0.32	0.00	0.29	0.29	0.00	0.29	0.29	0.00
Sat Flow, veh/h	1723	1810	1538	980	425	0	65	4837	0	859	3438	1538
Grp Volume(v), veh/h	101	76	0	311	0	0	199	331	0	15	348	0
Grp Sat Flow(s),veh/h/ln	1723	1810	1538	1405	0	0	1757	1498	0	859	1719	1538
Q Serve(g_s), s	2.1	1.3	0.0	11.2	0.0	0.0	0.0	5.4	0.0	0.9	4.9	0.0
Cycle Q Clear(g_c), s	2.1	1.3	0.0	11.9	0.0	0.0	5.4	5.4	0.0	6.3	4.9	0.0
Prop In Lane	1.00		1.00	0.73		0.00	0.09		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	769	927	788	546	0	0	578	877	0	293	1006	450
V/C Ratio(X)	0.13	0.08	0.00	0.57	0.00	0.00	0.34	0.38	0.00	0.05	0.35	0.00
Avail Cap(c_a), veh/h	769	927	788	546	0	0	578	877	0	293	1006	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.4	7.6	0.0	18.3	0.0	0.0	17.3	17.3	0.0	19.8	17.1	0.0
Incr Delay (d2), s/veh	0.4	0.2	0.0	4.3	0.0	0.0	1.6	1.2	0.0	0.3	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.7	0.0	5.2	0.0	0.0	2.9	2.4	0.0	0.2	2.5	0.0
LnGrp Delay(d),s/veh	9.8	7.8	0.0	22.6	0.0	0.0	18.9	18.5	0.0	20.1	18.1	0.0
LnGrp LOS	A	A		C			B	B		C	B	
Approach Vol, veh/h		177			311			530			363	
Approach Delay, s/veh		8.9			22.6			18.7			18.1	
Approach LOS		A			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		37.5		24.0	12.0	25.5		24.0
Change Period (Y+Rc), s		6.0		6.0	5.0	* 6		6.0
Max Green Setting (Gmax), s		30.0		18.0	7.0	* 20		18.0
Max Q Clear Time (g_c+I1), s		3.3		7.4	4.1	13.9		8.3
Green Ext Time (p_c), s		6.4		7.4	0.1	2.2		6.9

Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	766	60	115	734	172	270	146	104	227	84	81
Future Volume (veh/h)	102	766	60	115	734	172	270	146	104	227	84	81
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1810	1810	1810	1810	1810	1810	1810	1900	1810	1810	1900
Adj Flow Rate, veh/h	111	833	0	125	798	187	293	159	113	247	91	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	237	1351	604	230	908	406	587	527	353	495	884	0
Arrive On Green	0.06	0.39	0.00	0.26	0.26	0.26	0.11	0.27	0.27	0.10	0.26	0.00
Sat Flow, veh/h	1723	3438	1538	638	3438	1538	1723	1974	1321	1723	3529	0
Grp Volume(v), veh/h	111	833	0	125	798	187	293	137	135	247	91	0
Grp Sat Flow(s),veh/h/ln	1723	1719	1538	638	1719	1538	1723	1719	1576	1723	1719	0
Q Serve(g_s), s	3.1	13.6	0.0	13.7	15.6	7.1	7.5	4.4	4.8	7.3	1.4	0.0
Cycle Q Clear(g_c), s	3.1	13.6	0.0	18.3	15.6	7.1	7.5	4.4	4.8	7.3	1.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.84	1.00		0.00
Lane Grp Cap(c), veh/h	237	1351	604	230	908	406	587	459	421	495	884	0
V/C Ratio(X)	0.47	0.62	0.00	0.54	0.88	0.46	0.50	0.30	0.32	0.50	0.10	0.00
Avail Cap(c_a), veh/h	249	1351	604	230	908	406	587	459	421	495	884	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.2	17.0	0.0	28.0	24.7	21.6	17.3	20.4	20.6	16.9	19.8	0.0
Incr Delay (d2), s/veh	1.4	2.1	0.0	9.0	11.8	3.7	0.7	1.7	2.0	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	6.8	0.0	3.0	8.8	3.4	1.1	2.3	2.3	0.5	0.7	0.0
LnGrp Delay(d),s/veh	19.6	19.1	0.0	36.9	36.5	25.3	18.0	22.1	22.6	17.7	20.1	0.0
LnGrp LOS	B	B		D	D	C	B	C	C	B	C	
Approach Vol, veh/h		944			1110			565			338	
Approach Delay, s/veh		19.2			34.6			20.1			18.3	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		33.5	12.5	24.0	9.0	24.5	11.8	24.7
Change Period (Y+Rc), s		6.0	5.0	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s		27.5	7.5	18.0	5.0	18.0	7.3	18.7
Max Q Clear Time (g_c+I1), s		15.6	9.5	3.4	5.1	20.3	9.3	6.8
Green Ext Time (p_c), s		11.3	0.0	4.2	0.0	0.0	0.0	3.7

Intersection Summary	
HCM 2010 Ctrl Delay	25.1
HCM 2010 LOS	C

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	55	19	6	97	16	471	500	517	79	8	495	90
Future Volume (veh/h)	55	19	6	97	16	471	500	517	79	8	495	90
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1810	1900	1900	1810	1810	1810	1810	1900	1810	1810	1900
Adj Flow Rate, veh/h	60	21	7	105	17	512	543	562	86	9	538	98
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	260	358	119	400	58	424	637	1823	278	316	859	156
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.26	0.61	0.61	0.30	0.30	0.30
Sat Flow, veh/h	846	1300	433	1143	212	1538	1723	2992	456	758	2908	528
Grp Volume(v), veh/h	60	0	28	122	0	512	543	322	326	9	317	319
Grp Sat Flow(s),veh/h/ln	846	0	1733	1355	0	1538	1723	1719	1729	758	1719	1716
Q Serve(g_s), s	4.8	0.0	0.9	5.1	0.0	21.5	15.2	7.0	7.1	0.7	12.5	12.5
Cycle Q Clear(g_c), s	10.8	0.0	0.9	6.0	0.0	21.5	15.2	7.0	7.1	0.7	12.5	12.5
Prop In Lane	1.00		0.25	0.86		1.00	1.00		0.26	1.00		0.31
Lane Grp Cap(c), veh/h	260	0	477	459	0	424	637	1048	1054	316	508	507
V/C Ratio(X)	0.23	0.00	0.06	0.27	0.00	1.21	0.85	0.31	0.31	0.03	0.62	0.63
Avail Cap(c_a), veh/h	260	0	477	459	0	424	869	1310	1318	330	539	539
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	0.0	20.8	22.8	0.0	28.3	13.2	7.3	7.3	19.6	23.8	23.8
Incr Delay (d2), s/veh	0.4	0.0	0.1	0.3	0.0	114.2	6.1	0.2	0.2	0.0	2.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.5	2.1	0.0	22.6	8.0	3.4	3.4	0.1	6.2	6.2
LnGrp Delay(d),s/veh	27.4	0.0	20.9	23.2	0.0	142.5	19.3	7.5	7.5	19.7	25.8	25.9
LnGrp LOS	C		C	C		F	B	A	A	B	C	C
Approach Vol, veh/h		88			634			1191			645	
Approach Delay, s/veh		25.4			119.5			12.9			25.8	
Approach LOS		C			F			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	24.5	27.6		26.0		52.1		26.0
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s	30.5	24.5		21.5		59.5		21.5
Max Q Clear Time (g_c+I1), s	17.2	14.5		12.8		9.1		23.5
Green Ext Time (p_c), s	2.8	8.5		3.7		31.4		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		43.0
HCM 2010 LOS		D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	203	117	8	109	38	151	127	32	36	132	172
Future Volume (veh/h)	164	203	117	8	109	38	151	127	32	36	132	172
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1810	1900	1900	1810	1900	1900	1810	1900	1900	1810	1900
Adj Flow Rate, veh/h	178	221	127	9	118	41	164	138	35	39	143	187
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	283	287	147	95	511	168	351	270	58	124	283	328
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	440	717	368	28	1277	421	580	674	145	89	709	819
Grp Volume(v), veh/h	526	0	0	168	0	0	337	0	0	369	0	0
Grp Sat Flow(s),veh/h/ln	1525	0	0	1726	0	0	1399	0	0	1617	0	0
Q Serve(g_s), s	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	14.0	0.0	0.0	2.9	0.0	0.0	7.6	0.0	0.0	7.7	0.0	0.0
Prop In Lane	0.34		0.24	0.05		0.24	0.49		0.10	0.11		0.51
Lane Grp Cap(c), veh/h	717	0	0	775	0	0	678	0	0	735	0	0
V/C Ratio(X)	0.73	0.00	0.00	0.22	0.00	0.00	0.50	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	717	0	0	775	0	0	678	0	0	735	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.1	0.0	0.0	9.0	0.0	0.0	10.2	0.0	0.0	10.4	0.0	0.0
Incr Delay (d2), s/veh	6.5	0.0	0.0	0.6	0.0	0.0	2.6	0.0	0.0	2.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	0.0	1.5	0.0	0.0	3.7	0.0	0.0	4.0	0.0	0.0
LnGrp Delay(d),s/veh	18.7	0.0	0.0	9.6	0.0	0.0	12.8	0.0	0.0	12.9	0.0	0.0
LnGrp LOS	B			A			B			B		
Approach Vol, veh/h		526			168			337			369	
Approach Delay, s/veh		18.7			9.6			12.8			12.9	
Approach LOS		B			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0
Max Q Clear Time (g_c+I1), s		16.0		9.7		4.9		9.6
Green Ext Time (p_c), s		1.4		5.3		7.7		5.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	6	87	151	62	49	6
Future Vol, veh/h	6	87	151	62	49	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	7	95	164	67	53	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	453	57	60	0	-	0
Stage 1	57	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	559	1001	1525	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	496	1001	1525	-	-	-
Mov Cap-2 Maneuver	496	-	-	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	598	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	5.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1525	-	939	-	-
HCM Lane V/C Ratio	0.108	-	0.108	-	-
HCM Control Delay (s)	7.6	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.4	-	0.4	-	-

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	17	2	206	13	1	1	262	144	7	0	261	63
Future Vol, veh/h	17	2	206	13	1	1	262	144	7	0	261	63
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	600	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	18	2	224	14	1	1	285	157	8	0	284	68

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1045	1044	318	1157	1078	157	352	0	0	157	0	0
Stage 1	318	318	-	726	726	-	-	-	-	-	-	-
Stage 2	727	726	-	431	352	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	204	226	716	171	216	881	1190	-	-	1405	-	-
Stage 1	687	648	-	411	425	-	-	-	-	-	-	-
Stage 2	411	425	-	597	626	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	165	172	716	95	164	881	1190	-	-	1405	-	-
Mov Cap-2 Maneuver	165	172	-	95	164	-	-	-	-	-	-	-
Stage 1	522	648	-	313	323	-	-	-	-	-	-	-
Stage 2	311	323	-	409	626	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	45.9	5.7	0
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1190	-	-	165	695	104	1405	-	-
HCM Lane V/C Ratio	0.239	-	-	0.112	0.325	0.157	-	-	-
HCM Control Delay (s)	9	-	-	29.6	12.7	45.9	0	-	-
HCM Lane LOS	A	-	-	D	B	E	A	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.4	1.4	0.5	0	-	-

SECTION 9.0 GRADE CROSSING STANDARDS – TRANSPORT CANADA

9 WARNING SYSTEMS SPECIFICATION

9.1 The specifications for a public grade crossing at which a warning system without gates is required are as follows:

a) where the forecast cross-product is 2,000 or more;
b) Where there is no sidewalk, path or trail and the railway design speed is more than 129 km/hr (80 mph);
c) Where there is a sidewalk, path or trail and the railway design speed is more than 81 km/hr (50 mph); or
d) where the railway design speed is more than 25 km/hr (15 mph) but less than the railway design speed referred to in b) or c), as the case may be, and
    i. where there are two or more lines of railway where railway equipment may pass each other; or
    ii. the distance as shown in Figure 9-1(a) between a Stop sign at an intersection and the nearest rail in the crossing surface is less than 30 m; or
    iii. in the case of an intersection with a traffic signal, the distance between the stop line of the intersection and the nearest rail in the crossing surface, as shown in Figure 9-1(b), is less than 60 m, or where there is no stop line, the distance between the travelled way and the nearest rail in the crossing surface is less than 60 m.

9.2 The specifications for a public grade crossing at which a warning system with gates is required are as follows:

9.2.1 a warning system is required under article 9.1 and;

(a) the forecast cross-product is 50,000 or more;
(b) there are two or more lines of railway where railway equipment may pass each other;
(c) the railway design speed is more than 81 km/hr (50 mph);
(d) the distance as shown in Figure 9-1(a) between a Stop sign at an intersection and the nearest rail in the crossing surface is less than 30 m; or
(e) in the case of an intersection with a traffic signal, the distance between the stop line of the intersection and the nearest rail in the crossing surface, as shown in Figure 9-1(b), is less than 60 m, or where there is no stop line, the distance between the travelled way and the nearest rail in the crossing surface is less than 60 m.

9.3 The specifications for a private grade crossing at which a warning system without gates is required are as follows:

9.3.1 where the forecast cross-product is 2,000 or more, or

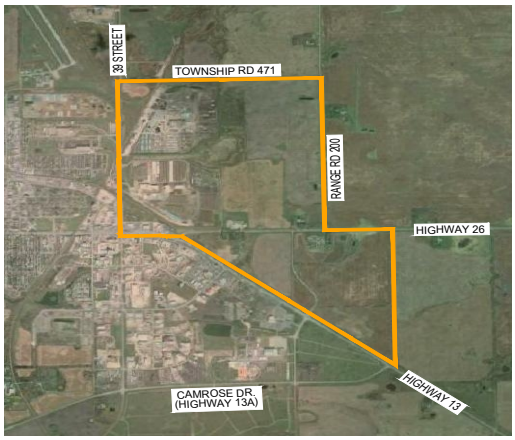
9.3.2 where the railway design speed is more than 25 km/hr (15 mph), and;
(a) the forecast cross-product is 100 or more and there are two or more lines of railway where railway equipment may pass each other;
(b) the forecast cross-product is 100 or more and grade crossing does not includes a sidewalk, path or trail and the railway design speed is more than 129 km/hr (80 mph); or
(c) the grade crossing includes a sidewalk, path or trail and the railway design speed is more than 81 km/hr (50 mph).

Appendix B

Environmental Overview and Wetland Desktop Review

ISL Engineering and Land Services

Inspiring sustainable thinking



City of Camrose

Report

Environmental Overview
East Gateway ASP
NE-35-46-20-W4M; 36-46-20-W4M; 01-47-20-W4M

April 2016

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FIGURES

1.0 Introduction

The City of Camrose is currently in the process of preparing the East Gateway Area Structure Plan (ASP). The ASP area is located in the northeast quadrant of the City and is approximately 397 ha in size. As part of the East Gateway ASP an Environmental Overview was completed.

The ASP area is located within the Central Parkland region of the province. This area is located in the North Saskatchewan watershed, which typically contains wetlands and is home to numerous environmental features, such as: Parkland; farmland and cultivated lands; and, numerous rivers and streams. Based on our review and on information received from the City, a number of potential wetland areas have been identified. In addition one species (short-eared owl) has been identified in the ASP area as having a historical presence within the East Gateway plan area.

The primary purpose of the Overview was to provide the City with guidance on the claimability of the wetland(s) as Crown claimed waterbodies under the *Public Lands Act*.

1.1 Objectives

The objectives of the Environmental Overview are to:

- complete a desktop review to identify any potential environmentally sensitive elements including rare plants, weeds, wildlife and aquatic features (i.e., wetlands and watercourses);
- provide regulatory guidance for any potential activities related to the ASP; and
- review of historical wetland information within the ASP area.

The desktop review was limited to an area of the ASP footprint, and up to one (1) kilometer from the ASP footprint, due to the surrounding area being moderately impacted by human disturbance.

2.0 Desktop Review

2.1 Introduction and Organization

ISL's Environmental Services performed an Environmental Overview of the proposed ASP area. The Overview includes a literature review of previous studies as well as provincially, federally, and internationally identified areas and features. A review of relevant regulatory framework is provided within Section 3.0.

The Overview provides information relevant to the ecology and conservation of the landscape with in the proposed ASP area and vicinity. This review includes information about Alberta Natural Regions, Canada Wetland Region, Soil Characteristics, as well as important waterbodies, wetlands and wildlife areas (*i.e.*, Ramsar Wetlands of International Importance, World Biosphere Reserves, Western Hemisphere Shorebird Reserves, Important Bird Areas, National Wildlife Areas, Migratory Bird Sanctuaries, Ducks Unlimited Canada [DUC] Projects, Provincial Parks and Ecological Reserves). Additionally, potential elements of concern (*i.e.*, vegetation and wildlife species) were identified using Alberta Conservation Information Management System (ACIMS) and the Fish and Wildlife Management Internet Mapping Tool (FWMIS).

2.2 Environmental Background

2.2.1 Natural Region

The ASP area is located in the Central Parkland Subregion of the Parkland Natural Region (Natural Regions Committee [NRC] 2006). The Parkland Natural region is approximately 9% of the province (60,747 km2) and the Central parkland Subregion is the largest of the subregions (53,706 km2) (NRC 2006).

Approximately 5 % of the land base remains under native vegetation cover; these remnant patches of native vegetation consist of aspen parkland and grasslands. The ASP area lies within the northern portion of the Subregion; native vegetation in this area is characterized by aspen stands with variable understory vegetation that may include prickly rose (Rosa acicularis), beaked hazelnut (Corylus cornuta), saskatoon (Amelanchier alnifolia), hay sedge (Carex siccata) and creeping juniper (Juniperus horizontalis) (NRC 2006).

Wetlands occur at roughly 10% of the Subregion area, while waterbodies account for approximately 2% of the Subregion area (NRC 2006). Waterbodies include the Red Deer, Battle, and North Saskatchewan Rivers (NRC 2006). Typical wetland types include marshes, willow swamps, or treed fens (NRC 2006). Wetland communities are dominated by emergent marsh vegetation, such as common cattail (Typha latifolia), sedges (e.g., Carex spp.), or rushes (e.g., Scirpus spp.) (NRC 2006).

The majority of the Central Parkland Subregion is cultivated, due to the adequate precipitation, sufficiently warm and long growing seasons, and productive soils (NRC 2006). In addition to vast expanses of agricultural land, this Subregion is the most densely populated Subregion, containing Edmonton, Red Deer, and part of Calgary (NRC 2006).

2.2.2 Important Regional Habitat

The ASP area is not located within or in close proximity (i.e., 5 km) to any Ramsar Wetlands of International Importance (Bureau of the Convention on Wetlands 2014), World Biosphere Reserves (United Nations Educations, Scientific and Cultural Organization 2015), Western Hemisphere Shorebird Reserves (Western Hemisphere Shorebird Reserve Network 2012), Important Bird Areas (Bird Studies Canada and Nature Canada 2015) National Wildlife Areas (EC 2014b), Migratory Bird Sanctuaries (EC 2014b), DUC Projects (DUC 2014), Provincial Parks or Ecological Reserves (Alberta Tourism, Parks and Recreation 2015).

2.2.3 Waterbodies

Wetland Region

Wetlands are defined as follows:

- "areas where soils are water-saturated for a sufficient length of time such that excess water and resulting low soil oxygen levels are principal determinants of vegetation and soil development. Wetlands will have a relative abundance of hydrophytes in the vegetation community and/or soils features 'hydric' characters…" (Mackenzie and Moran 2004).
- "land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation and various kinds of biological activity which are adapted to a wet environment." (National Wetland Working Group 1997).

The ASP area is located in the Transitional Subregion within the Mid-Boreal Wetland Region (Natural Resources Canada 1986). This Subregion represents the transition between prairie and boreal regions, consequently, fens, bogs, swamps and marshes occur in topographical depressions at roughly equal frequency.

Watershed

The ASP area is located within the North Saskatchewan Watershed and the Battle River sub-watershed. The largest tributaries to the North Saskatchewan River include the Battle, Clearwater, Brazeau and Vermillion Rivers. The river basin begins in the Rocky Mountains (*i.e.*, the Columbia Icefield of Banff and Jasper National Parks) and flows east through the prairies to Saskatchewan. The North Saskatchewan River Basin is approximately 80,000 km^2 within Alberta (AEP 2014), but drains areas throughout Alberta, Saskatchewan, and Manitoba.

2.3 Biophysical Desktop Results

2.3.1 Wetlands

16 potential wetlands were potentially occurring within the ASP footprint based on a desktop review of aerial photography, and are outlined on Figure 1. Table 1 describes the wetlands based on wetland number.

Table 1: Environmental Sensitivities

Wetland Number	Claimable (Y/N/P)[1]	Comments
A	Y	Appears to be permanent based on aerial photography, as well as previously mentioned as claimable (Lorne Cole Pers. Communication)
B	Y	Appears to be permanent based on aerial photography, as well as previously mentioned as claimable (Lorne Cole Pers. Communication)
C	N	Appears to be non-permanent based on aerial photography as well as previously mentioned as non-claimable (Lorne Cole Pers. Communication)
D1-D5	N	All open water wetlands that appear to be man-made (e.g., dugouts), and therefore non-claimable
F1-F4	N	Appears to be non-permanent based on aerial photography.

1:Y- Yes ; N – No; P - Potential

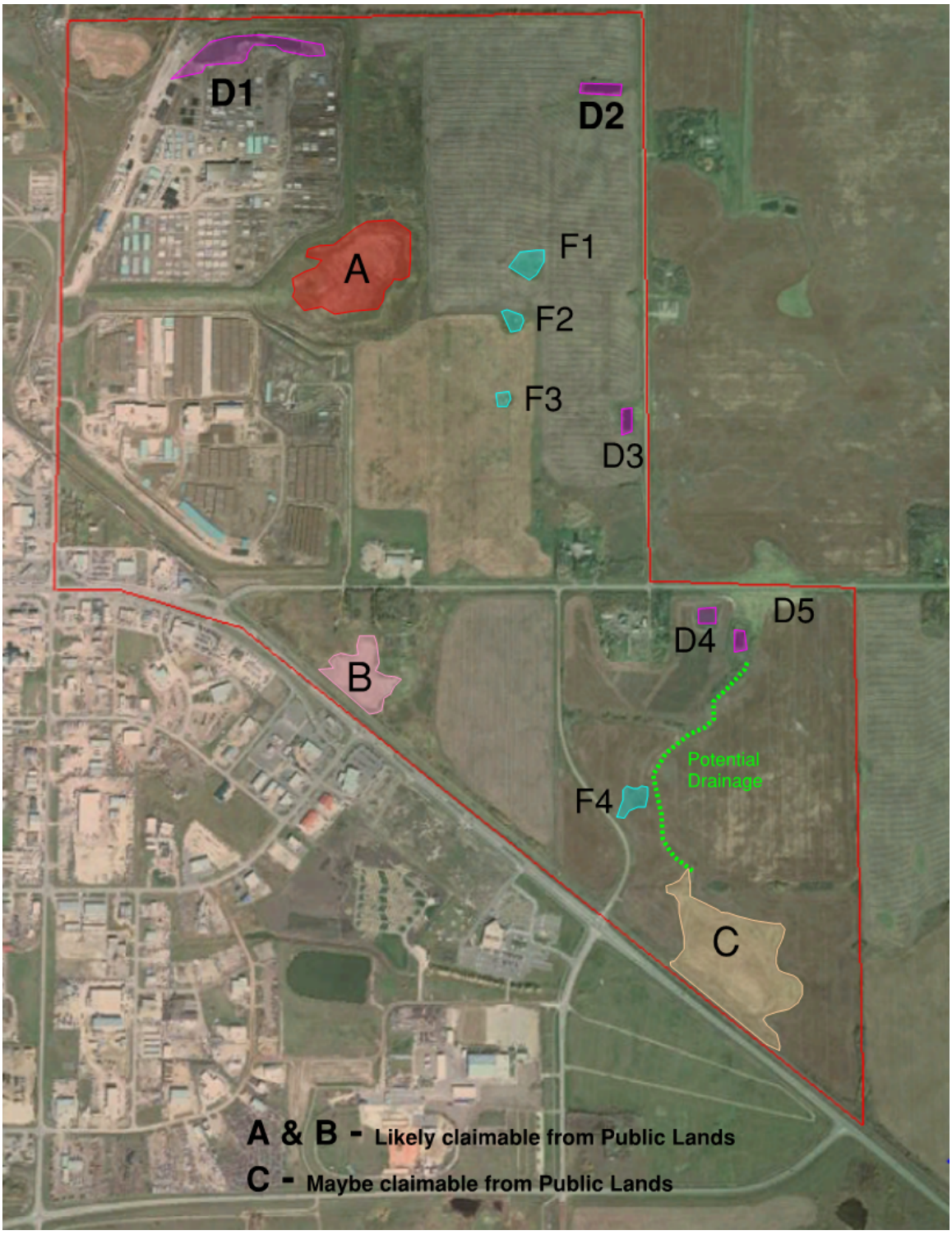

Figure 1: Potential environmental sensitivities within ASP area.

2.3.2 Watercourses

No permanent watercourses were determined to occur within the ASP footprint based on a desktop review of aerial photography. Three potential ephemeral drainages appear to occur within 36-46-20-W4M, and are outlined on Figure 1.

2.3.3 Wildlife and Botanical Occurrences

Vegetation

ACIMS element occurrence data was reviewed to identify known rare plant and rare ecological community occurrences in the vicinity of the ASP area.

The ACIMS database search returned 0 element occurrences of rare plant, rare lichens or rare ecological community occurrences, known from within 1 km of the ASP area. Table 1, of Appendix 1, indicates rare species that are known to occur within the Central Parkland Natural Subregion, while Table 3 indicates rare ecological communities.

Wildlife

A search of the Alberta Environment and Park (AEP)'s Fisheries and Wildlife Management Information System (FWMIS) database reported 1 bird species (short-eared owl) historically found locally within the ASP area (i.e., 1 km) (AEP 2015). See Table 2 for species list, as well as provincial ranking. Rare species known to occur within the Central Parkland Natural Subregion are currently under review, however, the previous list is provided in Table 1 of Appendix 1. The FWMIS reports have been provided within Appendix 2. All waterbodies (e.g., wetlands) or any unique habitat features (e.g., tree stands within agricultural areas) encourage extensive wildlife use, therefore a preconstruction wildlife survey should occur prior to any activity occurring.

The short-eared owl is listed by COSEWIC as a species of Special Concern, and is listed on Schedule 1 as Special Concern of the *Species at Risk Act*. The short-eared owl is also classified as May Be At under the General Status of Alberta Wild Species.

Table 2: Historical Occurrence of Wildlife Elements

Common Name	Scientific Name	Provincial Rank	Global Rank
Birds			
Short-eared owl	*Asio flammeus*	S3	G5

Sources: ACIMS (2015b), Committee on the Status of Endangered Wildlife (COSEWIC) (2014), *Species at Risk Act* (*SARA*) (Government of Canada 2014a), FWMIS (AESRD 2014b), Alberta *Wildlife Act* (AESRD 2014d), NatureServe (2014a).

Notes:

1. Provincial (S) ranks are assigned by the provincial and federal Conservation Data Centre(s). Ranks range from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions. Definitions adapted from NatureServe (2014b) and ACIMS (2014c).

   S1 Critically Imperiled: very high risk of extinction due to rarity (often five or fewer), very steep population declines or other factor(s).

   S2 Imperiled: at high risk of extinction due to restricted range, few populations, steep population declines, or other factor(s). Twenty or fewer occurrences known.

   S3 Vulnerable – rare or uncommon, or found in a restricted range (though may be abundant in some locations), small population sizes, steep population declines, or other factor(s). One hundred or fewer occurrences known

   S4 Apparently Secure – Uncommon but not rare; possible cause for long-term concern due to population declines or other factor(s).

   S5 Secure – common, widespread and abundant.

   S#S# Range Rank: a numeric range rank (e.g., S4S5) indicates the range of uncertainty about the state of the element.

   S#? Inexact: applied when rank is most likely appropriate but conflicting information or more data is required (e.g.¸S3?).

   SU Unrankable: Element is unrankable due to lack of information or conflicting information.

   SNR Not Ranked: Conservation status has not been assessed.

   SNA Not Applicable: Status rank is not applicable as the element is not suitable for conservation activities (e.g., introduced species).
2. Global (G) ranks are based on species status world-wide and follow a system parallel to Provincial Ranks (Note 1).
3. Data from Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Government of Canada 2014). See Note 2 for definitions.
4. Data from the Species at Risk Act (SARA) (Government of Canada 2014a). The Act establishes Schedule 1 as the list of species to be protected on all federal lands in Canada. See Note 2 for definitions.

3.0 Regulatory Framework

The below section provides a summary of relevant environmental regulations that may pertain to development in the ASP.

3.1 Federal Regulations

3.1.1 Migratory Birds Convention Act

The Migratory Birds Convention Act (MBCA) is administered by Environment Canada (EC) to ensure protection of migratory birds, their nest, and their eggs. Birds protected by the MBCA include waterfowl (such as ducks, geese and swans), insectivorous birds (such as wrens, robins, shrikes and woodpeckers), and some nongame birds (such as herons and gulls) (EC 2013).

To protect migratory birds, EC provides general nesting dates based on geographic location (EC 2014a). The general nesting period covers the majority of species covered under the MBCA, however, it may not be accurate for species that can breed at any time during optimal conditions (e.g., Crossbill species), or species that may nest earlier or later (EC 2014a).

The migratory bird nesting period for the proposed ASP area is **April 10 to August 31**. During this period (i.e., the Restricted Activity Dates [RAD]), construction activities require a pre-construction nest-sweep to avoid disturbance and continuous monitoring to identify potential new nests. Depending on the species, a setback distance may be applied to the nest where no work may occur until the young have fledged. Clearing activities in the ASP area for any high potential habitat are recommended to occur prior to the nesting period (i.e., winter) thereby removing habitat and potential spring nesting. It is important to note that this period may not include those nesting periods for species not covered under the MBCA but are covered under Alberta's Wildlife Act.

3.2 Alberta Provincial Regulations

3.2.1 Water Act

A new Wetland Policy for Alberta was released on June 1, 2015. The Policy should not affect the regulatory process (*i.e.,* wetlands are still regulated under the *Water Act* and *Public Lands Act*), however, it will affect the survey methodology and time required for survey for wetlands anticipated to experience permanent disturbance.

The goal of the Policy is to conserve, restore protect and manage Alberta's wetlands through several objectives (Government of Alberta 2013), such as:

- wetlands of the highest value to be protected long-term;
- wetlands, including their benefits and services, are to be conserved in restored in areas where loss has been high;
- wetlands are to be managed by avoiding, minimizing and replacing lost wetland value; and
- wetland management will be considered at a regional context.

Under the authority of the *Water Act*, wetlands must be classified using the Alberta Wetland Classification System and assigned an ecological wetland value using the Alberta Wetland Rapid Evaluation Tool (AB-WRET). This standardized method must be performed by a Qualified Wetland Science Practitioner (QWSP) to ensure that wetland replacement, when required, considers both specific wetland function and loss of area. Any compensation for wetland disturbance (or loss) will be directed toward county and municipal-level agencies to assist with its sustainability planning and restoration efforts.

Water Act regulated activities (*i.e.*, do not have a COP Notification or exemption) require compensation for wetland loss under the Wetland Policy. However, the new Policy shifts compensation payments away from non-profit conservation agencies such as Ducks Unlimited Canada (DUC) and redirects funds back to local areas where actual wetland losses may occur or have historically occurred. This recent redirection of local compensation funds will be administered by AEP or a municipality and all wetland values will be assessed using the AB-WRET. This will allow counties and municipalities to account for their own respective past, current and future wetland losses and better inform their sustainable development plans. Funds from wetland losses derived from development activities or historic loss in the county can be integrated into local stewardship and restoration efforts.

3.2.2 Wildlife Act

In addition to the federal *MBCA*, birds may be protected provincially under the *Wildlife Act*. AEP administers the *Wildlife Act*, which influences and controls human activities that may have adverse effects on wildlife or wildlife habitat on both Crown and privately owned land. Section 36(1) of the *Wildlife Act* states that a person shall not willfully molest, disturb or destroy a house, nest or den of prescribed wildlife or beaver dam in prescribed areas and prescribed times. This applies to nests and dens of endangered wildlife, migratory birds, snakes (except prairie rattlesnakes), bats and prairie rattle snake hibernacula. Additionally, Section 36(1) also applies to beaver dens and houses on land that is not privately owned as well as houses, nests, and dens of all wildlife in a wildlife sanctuary and nests of game birds in game bird sanctuaries. As a result of the *Wildlife Act*, setbacks and RADs have been defined for important species.

RADs are based on existing knowledge of species-specific seasonal life history traits, such as breeding, nesting, and rearing activities. Generally, interannual climate variation is captured within the dates, however, there may be occurrences where the RAD does not cover the entire trait (*i.e.*, young still in the nest) (Government of Alberta 2011). As a result the RAD should be extended to avoid disturbance. Setback distances are based on thresholds where human disturbance will adversely affect key wildlife areas or sites. Table 2 describes the level of anticipated disturbance (*i.e.*, low, medium and high) that affect setback distances (Government of Alberta 2011).

Table 3: Level of Disturbance for Setback Distances

Level of Disturbance	Explanation
Low	Infrequent, low-impact, no habitat modification, and short duration (*i.e.*, hours). An example of this level activity is land surveying.
Medium	High frequency, with some vehicles and equipment, minor habitat alteration, moderate duration (*i.e.*, days). An example of this level of activity is seismic drilling or pipeline construction.
High	High frequency, vehicle and equipment, permanent modification of vegetation, soils and/or hydrology, long duration (*i.e.*, more than 10 years). An example of this level of activity is permanent road construction.

The short-eared owl is listed by COSEWIC as a species of Special Concern, and is listed on Schedule 1 as Special Concern of the *Species at Risk Act*. The short-eared owl is also classified as May Be At under the

General Status of Alberta Wild Species. There are specific setback distances and recommended restricted dates for working around short-eared owls, provided in Table 3 (Government of Alberta 2011).

Table 4 Recommended Restricted Activity Dates and Setback Distances by Level of Disturbance for Short-eared Owl.

Species	Location	Time of Year	Level of Disturbance		
			Low	Medium	High
Short-eared Owl	Active nest and surrounding habitat	March 15 – July 15	100 m	100 m	100 m

3.2.3 Weed Control Act

The *Weed Control Act* protects stakeholders from economic and invasive losses caused by weeds. Some weed species exhibit extreme growth habits, which can have consequences for line of sight at intersections, wildlife control along roadways, culvert and outfall maintenance, agricultural production, livestock forage quality, and many others. The *Act* prescribes activities that must be undertaken should a noxious or restricted weed be encountered. Each Municipality is responsible for enforcing the *Act*. Under the *Act* all Noxious weeds must be controlled (*i.e.*, inhibit growth and/or spread, or destroy), while Prohibited Noxious weeds must be destroyed (*i.e.*, kill all growing parts, or render reproductively non-viable).

For the purposes of this report a weed is considered any non-native species which includes regulated weeds (*i.e.*, Prohibited Noxious weeds and Noxious weeds) under the *Weed Control Act*.

4.0 Summary

The following provides a summary of the Environmental Overview for the East Gateway ASP

- No historical botanical occurrences were identified within the area, while one previously identified *SARA* listed wildlife occurrence was identified.
- Federal Environmental Regulations identified as potentially required for the ASP area include the MBCA (including nesting periods).
- Provincial Regulations identified as potentially required for the ASP include the *Water Act*, the Wildlife Act (including setback distances for historically occurring elements of concern and RADs) and Weed Control Act.
- A number of wetlands within the ASP area have been confirmed to be non-claimable, as others wetlands still require to be assessed under both the *Water Act* and the *Public Lands Act*.

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Appendix 1

Rare Elements and Communities in the Central Parkland Natural Subregion

Appendix A: Rare Elements and Communities in the Central Parkland Natural Subregion

Table 1: Rare Species Known to Occur in the Central Parkland Natural Subregion

Common Name	Scientific Name	Provincial Rank[1,2,3]
Vascular Plants		
annual skeletonweed	*Shinnersoseris rostrata*	S3
blunt-leaved watercress	*Rorippa curvipes*	S3
bog adder's-mouth	*Malaxis paludosa*	S2S3
Canada brome	*Bromus latiglumis*	S1
Canadian rice grass	*Piptatherum canadense*	S2
clammy hedge-hyssop	*Gratiola neglecta*	S3
Columbia watermeal	*Wolffia columbiana*	S2
Crawe's sedge	*Carex crawei*	S3
crowfoot violet	*Viola pedatifida*	S3
dark-green goosefoot	*Chenopodium atrovirens*	S1
dwarf grape fern	*Botrychium simplex*	S2
false buffalo grass	*Munroa squarrosa*	S3
few-flowered aster	*Almutaster pauciflorus*	S3
field grape fern	*Botrychium campestre*	S3
flat-topped white aster	*Doellingeria umbellata var. pubens*	S3
fox sedge	*Carex vulpinoidea*	S3
Fremont's goosefoot	*Chenopodium fremontii*	S2
hairy pepperwort	*Marsilea vestita*	S3
Kelsey's cat's eye	*Cryptantha kelseyana*	S3
lance-leaved loosestrife	*Lysimachia hybrida*	S3
Leiberg's millet	*Dichanthelium leibergii*	S1
long-leaved bluets	*Houstonia longifolia*	S3
low cinquefoil	*Potentilla plattensis*	S2
marsh gentian	*Gentiana fremontii*	S3
Nevada rush	*Juncus nevadensis*	S1
open sedge	*Carex aperta*	S2
ovate spikerush	*Eleocharis ovata*	S1
Pallas' bugseed	*Corispermum pallasii*	S2
porcupine sedge	*Carex hystericina*	S2
river bulrush	*Bolboschoenus fluviatilis*	S1
rough barnyard grass	*Echinochloa muricata var. microstachya*	S1
sandhills cinquefoil	*Potentilla lasiodonta*	S3
shrubby evening-primrose	*Oenothera serrulata*	S3
slender beak-rush	*Rhynchospora capillacea*	S2
slender naiad	*Najas flexilis*	S3
smooth monkeyflower	*Mimulus glabratus*	S1
smooth sweet cicely	*Osmorhiza longistylis*	S3
spatulate grape fern	*Botrychium spathulatum*	S3
tall blue lettuce	*Lactuca biennis*	S3
widgeon-grass	*Ruppia cirrhosa*	S3
Wilcox's panicgrass	*Dichanthelium wilcoxianum*	S2
wild comfrey	*Cynoglossum virginianum var. boreale*	S1
yellow water-crowfoot	*Ranunculus flabellaris*	S1
Non-Vascular Plant		
bean-spored rim-lichen	*Lecania dubitans*	S2S4
beautiful branch moss	*Callicladium haldanianum*	S2
black woodscript lichen	*Xylographa parallela*	S2S4
bladder-cap moss	*Physcomitrium hookeri*	S2
blunt-leaved hair moss	*Didymodon tophaceus*	S2S3
broken-leaf moss	*Dicranum tauricum*	S1S3
bumpy rim-lichen	*Lecanora hybocarpa*	S2
campylium moss	*Campylium radicale*	S3
cat-tongue liverwort	*Conocephalum salebrosum*	S2S4
cushion moss	*Dicranum ontariense*	S1S2
dot lichen	*Micarea melaena*	S1
dot lichen	*Myxobilimbia sabuletorum*	S2

Common Name	Scientific Name	Provincial Rank[1,2,3]
dotted ramalina	*Ramalina farinacea*	S3
fallacious screw moss	*Didymodon fallax*	S2S3
flat fruited pelt lichen	*Peltigera horizontalis*	S2S4
frost lichen	*Physconia isidiigera*	S2
frosted rim-lichen	*Lecanora caesiorubella ssp. saximontana*	S1
lichen	*Pseudevernia consocians*	S2
liverwort	*Calypogeia muelleriana*	S2S4
liverwort	*Mannia fragrans*	SU
liverwort	*Mannia pilosa*	SU
liverwort	*Pellia neesiana*	SU
liverwort	*Riccardia multifida*	SU
liverwort	*Riccia fluitans*	SU
liverwort	*Ricciocarpos natans*	SU
long-stalked beardless moss	*Hennediella heimii*	S2S3
moss	*Brachythecium hylotapetum*	S1S3
moss	*Bryum turbinatum*	S2S3
moss	*Bryum uliginosum*	S1S2
moss	*Desmatodon randii*	SU
moss	*Entodon concinnus*	S1S2
moss	*Leskea gracilescens*	S2
moss	*Leskea obscura*	S1
moss	*Leskea polycarpa*	S1
moss	*Pohlia atropurpurea*	S2
moss	*Thuidium philibertii*	S1S2
moss	*Limprichtia cossonii*	SU
moss	*Bryohaplocladium virginianum*	S1S2
mottled-disk lichen	*Trapeliopsis flexuosa*	S1S3
narrow-leafed chain-teeth moss	*Tortula cernua*	S1
Ontario Rhodobryum moss	*Rhodobryum ontariense*	S1S2
rosette lichen	*Physcia dimidiata*	S2
sand-loving Iceland lichen	*Cetraria arenaria*	S1S2
Schleicher's silk moss	*Entodon schleicheri*	S2S3
shadow lichen	*Phaeophyscia cernohorskyi*	S2
short-tooth hump moss	*Amblyodon dealbatus*	S3
soot lichen	*Cyphelium notarisii*	S2
sunburst lichen	*Xanthomendoza montana*	S3
Vertebrates		
Amphibians		
Canadian Toad	*Anaxyrus hemiophrys*	S3
Northern Leopard Frog	*Lithobates pipiens*	S2S3
Birds		
American White Pelican	*Pelecanus erythrorhynchos*	S2S3B
Ferruginous Hawk	*Buteo regalis*	S2S3B
Peregrine Falcon	*Falco peregrinus*	S2S3
Piping Plover	*Charadrius melodus circumcinctus*	S2
Trumpeter Swan	*Cygnus buccinator*	S2S3
Western Burrowing Owl	*Athene cunicularia hypugaea*	S2
White-faced Ibis	*Plegadis chihi*	S1
Whooping Crane	*Grus americana*	S1
Fish		
Lake Sturgeon	*Acipenser fulvescens*	S1S2

Source: ACIMS 2015e

Notes:

1. Definitions of provincial species status ranks and Tracking and Watch Lists are provided in the footnotes of Table 1.
2. The current general status ranks of these species were reviewed, but have not been included in this report.
3. Vascular and Non-Vascular status consistent with ACIMS (ACIMS 2015). ACIMS for vertebrates have not been updated for 2015.

Table 2: Rare Ecological Communities Known to Occur in the Central Parkland Natural Subregion

Common Name	Scientific Name	Provincial Rank[1]
plains rough fescue - western porcupine grass grassland	*Festuca hallii - Hesperostipa curtiseta grassland*	S2S3
plains rough fescue - sand grass	*Festuca hallii - Calamovilfa longifolia*	S1
plains rough fescue - June grass / juniper / forbs	*Festuca hallii - Koeleria macrantha / Juniperus horizontalis / forbs*	S2
balsam poplar / high-bush cranberry / ostrich fern	*Populus balsamifera / Viburnum opulus / Matteuccia struthiopteris*	S1S2
creeping juniper / (June grass) / green reindeer lichen	*Juniperus horizontalis / (Koeleria macrantha) / Cladina mitis*	S1S2
Nevada bulrush - (seaside arrow-grass)	*Scirpus nevadensis - (Triglochin maritima)*	S2S3
alkali cord grass - (western wheat grass)	*Spartina gracilis - (Pascopyrum smithii)*	S2S3
seaside arrow-grass emergent marsh	*Triglochin maritima emergent marsh*	S2?
plains rough fescue grassland	*Festuca hallii grassland*	S1
little bluestem - sand grass	*Schizachyrium scoparium - Calamovilfa longifolia*	S2
sand dropseed semi-active dune	*Sporobolus cryptandrus semi-active dune*	S2
salt grass - western wheat grass	*Distichlis stricta - Pascopyrum smithii*	S2
sand grass - sand dropseed	*Calamovilfa longifolia - Sporobolus cryptandrus*	S2S3
aspen / creeping juniper / hay sedge woodland	*Populus tremuloides / Juniperus horizontalis / Carex siccata woodland*	S2S3
tamarack - black spruce / red-osier dogwood - wild red raspberry	*Larix laricina - Picea mariana / Cornus stolonifera - Rubus idaeus*	S1S2
black spruce / red-osier dogwood / feathermoss	*Picea mariana / Cornus stolonifera / feathermoss*	S1S2
Alaska birch - white spruce / pussy willow / common horsetail swamp forest community	*Betula neoalaskana - Picea glauca / Salix discolor / Equisetum arvense swamp forest community*	S1S2
Manitoba maple / choke cherry	*Acer negundo / Prunus virginiana*	S1S2
sand grass - needle-and-thread grassland	*Calamovilfa longifolia - Stipa comata grassland*	S3
Nuttall's salt-meadow grass community	*Puccinellia nuttalliana community*	S3?
samphire emergent marsh	*Salicornia rubra emergent marsh*	S2

Sources: ACIMS 2015c, Allen 2014, NatureServe 2015

Notes:

1. Definitions of provincial species status ranks and Tracking and Watch Lists are provided in the footnotes of Table 1.

Appendix 2

FWMIS Species Summary Reports

Alberta Environment and Parks

Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Nov-2015 12:52

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
No Species Found in Search Extent	SHORT-EARED OWL	No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
648533, 5873684	10-TM AEP Forest	NW 36 46 20 4	3 kilometers

Wildlife Contact Information

Primary Contact

Name:	Phone:	Email:	Town:
Dave Moore	780-853-8137	Dave.Moore@gov.ab.ca	

Alternative

Name:	Phone:	Email:	Town:

Fisheries Contact Information

Primary Contact

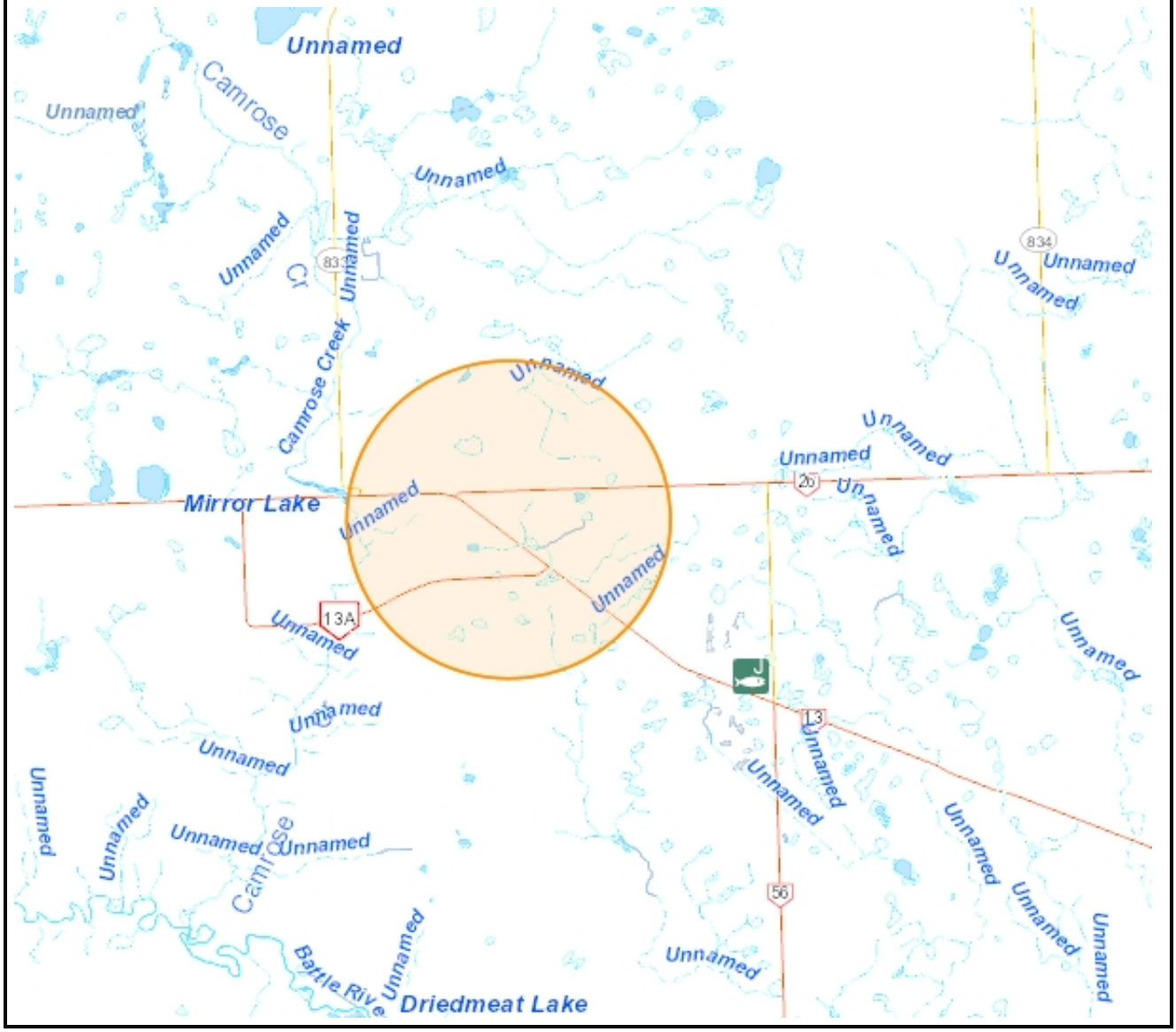
Name:	Phone:	Email:	Town:
Jason Cooper	403-340-7685	Jason.Cooper@gov.ab.ca	Red Deer

Alternative

Name:	Phone:	Email:	Town:
			Red Deer

27-Nov-2015 12:52

Map Results



ISL Engineering and Land Services

Inspiring sustainable thinking

Memorandum

#1, 6325 – 12 Street SE, Calgary, AB T2H 2K1 T: 403.254.0544 F: 403.254.9186

To:	**City of Camrose**	Date:	**May 4, 2016**
Attention:	**Francisca Karl, Aaron Leckie**	Project No.:	**14579**
Cc:	**David Schoor**		
Reference:	**East Gateway Wetland Desktop Review**		
From:	**Courtney Miller**		

1.0 Introduction

The East Gateway area of Camrose currently has a mix of industrial (pipe storage), commercial and agricultural land uses, railway and utility rights-of-way, as well as wetlands. As an addition to the East Gateway Area Structure Plan (the Project), ISL completed a Wetland Desktop Review of wetlands located within the proposed future East Gateway Area to supplement to the Environmental Overview completed by ISL Engineering and Land Services. The objectives of the Wetland Desktop Review are to:

1) classify and delineate wetlands from historical aerial photographs pursuant to the Wetland Identification and Delineation Directive (Government of Alberta 2015a);
2) identify applicable wetland-specific regulatory requirements;
3) inform the City of Camrose of wetland assets potentially impacted by this future development, and
4) provide environmental planning recommendations for the Project related to conservation, Municipal and Environmental Reserve, as well as future land use concepts,

1.1 Overview

The Wetland Desktop Review has identified four semi-permanent (IV) and permanent (V) wetlands within the Project area. Generally, semi-permanent (IV) and permanent (V) wetlands are recommended for conservation within a plan area due to the potential landscape hydrologic impact. Three of the four wetlands will be retained within the plan area as one or a combination of Municipal Reserve, Environmental Reserve, and as storm water management facilities, while one wetland is anticipated to be disturbed by general industrial development. ISL recommends that storm water facilities associated with naturally occurring wetlands, mimic natural wetlands to allow for creation of wetland-like habitat. All wetland disturbance (including storm water management facilities) will require Water *Act* approval and compensation, while work associated with storm water management facilities will also require *Environmental Protection and Enhancement Act* (*EPEA*) approval. All wetland associated regulations will require field assessments and reporting conducted by a Wetland Science Practitioner (WSP) pursuant to the Wetland Policy prior to development.

2.0 Desktop Review

2.1 Wetland Classification in Alberta

Wetlands are areas where the soil is inundated with water at an ephemeral to permanent time scale, such that the soils become reduced (i.e., hydric) and hydrophytic vegetation is dominant. Based on hydrologic, ecological, and soil (i.e., biogeochemical) properties, wetlands can be further grouped and classified. The methodology used to classify wetlands for the Project was based on the Alberta Wetland Classification System (AWCS) (Alberta Environment and Sustainable Resource Development [ESRD] 2015).

Within the AWCS there are five wetland classes divided into forms based on vegetation. Wetland forms are further subdivided into types based on biological, hydrologic, or biogeochemial attributes. Stewart and Kantrud (1971) Classes are comparable to the Water Permanency Type.. It should be noted that to determine the full wetland Class, Form, and Type according to the

AWCS, field assessment is required. Consequently, this report only reports on the Water Permanence type (i.e., not Salinity, or Acidity-Alkalinity types).

The following provides definitions of each wetland Class (from ESRD 2015). For more information on wetland Classification see the Alberta Wetland Classification System (ESRD 2015).

Marshes are mineral wetlands with water levels near at or above the ground surface for variable periods during the year, and which supports graminoid vegetation in the deepest portion of the wetland in the majority of years.
Shallow open water wetlands are mineral wetlands with water levels near, at or above the ground surface of variable periods of the year, which is less than two metres deep at mid-summer and that contains an open water zone in the deepest wetland zone covering greater than 25% of the total area in the majority of years. The open water zone is an expanse of open, mostly unshaded water in marshes and shallow open waters that typically supports submersed, or floating vegetation and is less than 2 m deep at mid-summer.
Swamps are mineral wetlands with water levels near, at or above the ground surface for variable periods during the year which contains either more than 25% tree cover, or a variety of species or more than 24% shrub cover of a variety of species.

Bogs are peatlands fed by ombrogenous waters originating from precipitation with low concentrations of dissolved minerals.
Fens are minerogenous peatlands with surface or subsurface water flow that range from moderately-acidic or basic.

Table 2.1 provides details on the AWCS. The Project area is expected to contain marshes, shallow open water, and swamps (i.e., not peatlands).

Table 2.1: Alberta Wetland Classification System

Class	Form	Type		
		Salinity	Water Permanence[1]	Acidity - Alkalinity
Bog [B]	Wooded coniferous [WC], Shrubby [S], Graminoid [G]	Freshwater [f]	--	Acidic [a]
Fen [F]	Wooded coniferous [WC], Shrubby [S], Graminoid [G]	Freshwater [f]	--	Poor [p]
		Freshwater [f]	--	Moderate-rich [mr]
		Freshwater [f] to slightly brackish [sb]	--	Extreme-rich [er]
Marsh [M]	Graminoid [G]	Freshwater [f] to slightly brackish [sb]	Temporary [II]	--
		Freshwater [f] to moderately brackish [mb]	Seasonal [III]	--
		Freshwater [f] to brackish [b]	Semi-permanent [IV]	--
Shallow Open Water [W]	Submersed and/or floating aquatic vegetation [A], bare [B]	Freshwater [f] to moderately brackish [mb]	Seasonal [III]	--
		Freshwater [f] to sub-saline [ss]	Semi-permanent [IV]	--
		Slightly brackish [sb] to sub-saline [ss]	Permanent [V]	--
		Saline [s]	Intermittent [VI]	--
Swamps [S]	Wooded coniferous [Wc] [2], Wooded mixedwood [Wm] [2], Wooded deciduous [Wd][2], Shrubby [S]	Freshwater [f] to slightly brackish [sb]	Temporary [II]	--
		Freshwater [f] to slightly brackish [sb]	Seasonal [III]	--
		Moderately brackish [mb] to sub-saline [ss]	Seasonal [III]	--

Source: ESRD 2015.
Notes:
1. Roman numerals equivalent to wetland classes by Stewart and Kantrud (1971).
2. Swamp types are not applicable to wooded swamps due to lack of available information.

2.2 Regulatory Framework

Provincial regulations which are applicable to wetlands are described below. Information on other regulations applicable to other environmental aspects of the Project are available in the East Gateway Environmental Overview Report (ISL 2015).

2.2.1 Provincial

Environmental Protection and Enhancement Act (EPEA)

The EPEA is administered through Alberta Environment and Parks (AEP) for the proposed Project, and through the Alberta Energy Regulator for oil and gas related activities. The *Act* supports the protection, enhancement and wise use of the environment within a development framework. The EPEA manages air, land, and water. EPEA and its accompanying regulations set out in detail which activities require approvals and the requirements for obtaining them. An approval may be required for activities related to storm water management, waste management, substance release, potable water, pesticides, designated materials, water wells, as well as for conservation and reclamation.

Public Lands Act

The *Public Lands Act* requires surface disposition be issued for the use of all public lands in Alberta. The *Act* is responsible for administering lands owned by the Crown. Under Section 3 of the *Act*, public lands include the bed and shore of all permanent and naturally occurring waterbodies, including wetlands, unless the title has been granted to a private landowner. The Water Boundary Group for AEP makes a determination of Crown claimed waterbodies under the *Public Lands Act*. All watercourses are assumed to be claimed by the Crown, however, all Class III and above wetlands must be submitted to the Water Boundary group for determination of Crown ownership. Currently, the review process for determination of Crown ownership can take up to 9 months.

Water Act

The *Water Act* manages Alberta's water resources. Through AEP the *Act* governs *act*ivities affecting waterbodies in Alberta, including construction, water diversions and infilling of wetlands. *Water Act* approval is required to alter flow of level of water; change the location of water; change the direction of water flow, cause the siltation of water; cause erosion of bed or shore of any waterbody; or any effect on the aquatic environment. With respect to the Project, details pertaining to Restricted Activity Periods and fisheries has been omitted from this Wetland Desktop Review.

Within the *Water Act* a number of activities fall under the guidance of Code of Practice (COP) Notifications. A Code of Practice for Watercourse Crossings is required for all vehicle and equipment crossings (AEP 2000). Notification must be submitted to AEP at least 14 days prior to construction. For activities within wetlands that do not fall under the guidance of a COP, a *Water Act* approval is required, which may take up to one year to obtain if the Water Boundary Group reviews the Project for Crown Ownership (see above). Any *Water Act* approval related to activities within a wetland is also regulated by the Alberta Wetland Policy.

Alberta Wetland Policy

A Wetland Policy for Alberta was released on June 1, 2015. The Policy does not affect the regulatory process (i.e., wetlands are still regulated under the *Water Act* and *Public Lands Act*), however, it does affect the survey methodology and time required for survey.

The goal of the Policy is to conserve, restore protect and manage Alberta's wetlands through several objectives (Government of Alberta 2013), such as:

- wetlands of the highest value to be protected long-term;
- wetlands, including their benefits and services, are to be conserved in restored in areas where loss has been high;
- wetlands are to be managed by avoiding, minimizing and replacing lost wetland value; and
- wetland management will be considered at a regional context.

Under the authority of the Water Act, wetlands must be classified using the Alberta Wetland Classification System and assigned an ecological wetland value using the Alberta Wetland Rapid Evaluation Tool (AB-WRET). The AB-WRET-Estimate (AB-WRET-E) is provided as a planning tool to estimate the potential value of wetlands, while the AB-WRET-Actual (AB-WRET-A) is the field assessment. The AB-WRET-A must be performed by a WSP to ensure that wetland replacement, when required, considers both specific wetland function and loss of area. Any compensation for wetland disturbance (or loss) will be directed toward county and municipal-level agencies to assist with its sustainability planning and restoration efforts.

Water Act regulated activities (i.e., do not have a COP Notification or exemption) require compensation for wetland loss under the Wetland Policy for all wetlands, except for Class I (Stewart and Kantrud 1971). Class I wetlands do not require compensation for Water Act regulated activities (i.e., no AB-WRET-A assessment), but do require a Water Act approval. However, the new Policy shifts compensation payments away from non-profit conservation agencies such as Ducks Unlimited Canada (DUC) and redirects funds back to local areas where actual wetland losses may occur or have historically occurred. This recent redirection of local compensation funds will be administered by AEP or a municipality and all wetland values will be assessed using the AB-WRET-Actual. This will allow counties and municipalities to account for their own respective past, current and future wetland losses and better inform their sustainable development plans. Funds from wetland losses derived from development activities or historic loss in the county can be integrated into local stewardship and restoration efforts.

Activities identified under a COP of the Water Act (e.g., Code of Practice for Watercourse Crossings), require a notification but do not require compensation or *Water Act* approval.

3.0 Methodology

3.1 Study area

The study area boundaries encompassed Section 1- 47-20 W4M and NW 36-46-19 W4M as well as portions of NE 35-46-20 W4M, NW 35-46-20 W4M, and SW 36-46-20 W4M (Figure 3.1).

Figure 3.1: Overview of Project Area

3.2 Wetlands

3.2.1 Wetland Replacement

The Alberta Merged Wetland Inventory (AMWI) dataset is a combination of multiple datasets, which vary both in their accuracy and creation dates. The AMWI as well as the AB-WRET-E can estimate the wetland value generalized by quarter section. See Section 4.1 of this Wetland Desktop Review for more details.

3.2.2 Aerial Interpretation

A desktop review was conducted using available information from the Alberta Merged Wetland Inventory (AMWI) (AEP 2013) and historical photographs from the Air Photo Record System (APRS) (AEP 2015).

Historical ortho-rectified aerial photographs and their related precipitation values as per the Wetland Identification and Delineation Directive (Government of Alberta 2015a) were used for wetland delineation and in the estimation of permanence (Table 3.1). Wetlands were identified and classed (as per the AWCS) through aerial photograph interpretation using key indicators such as geomorphology, surficial hydrology, as well as vegetation type and cover. Delineated wetland features attempt to identify the transition zone as accurately as feasible. Photographs with an overlay of the desktop delineated wetlands are provided in Figures 3.3-3.8 (attached). Recent satellite imagery (ESRI 2016) with an overlay of the desktop delineated wetlands is provided in Figure 3.9 (attached). See Section 4.2 of this Wetland Desktop Review for more details.

Artificial wetlands

Artificial wetlands were also delineated during satellite imagery interpretation. Artificial wetlands likely contain surface water and may contain wetland vegetation and hydric soils. However, these features have been anthropogenically created. Dugouts are common artificial landscapes on the cultivated landscape, and are intended for agricultural use. They may occur as isolated basins and cutoff from surficial water (e.g., wetlands, watercourses or drainages), however, dugout features are often created within the boundaries of wetlands as these locations are known sources of water.

Aerial Interpretation Limitations

Aerial and satellite imagery interpretation is an effective way to identify likely wetland features during project planning stages. However, the inconspicuous physical characteristics of some wetlands may have potentially hindered their identification during interpretation due to their small size or often ephemeral and temporary occurrence on agricultural land. Additionally, swamp type wetlands are particularly difficult to differentiate from wet forest during satellite interpretation. Due to the limitations of imagery interpretation, the wetland locations should be used as a guideline for planning only. Prior to any construction activity, field surveys may be required for various federal (e.g., *Migratory Birds Convention Act*, *Species At Risk Act*, *Fisheries Act*) and provincial (e.g., *Water Act*, *Historical Resource Act*, *Wildlife Act*) regulatory and permitting requirements.

Table 3.1: Documentation of Historic Imagery used for Desktop Wetland Delineation

Associated Figure Number	Air Photo Date[1] (Season)	Air Photo ID	Scale	Annual Precipitation[2]	Monthly Precipitation[2]	Daily Precipitation[2]
3.3	20-Oct-75 (Fall)	AS 1416	1:24000	Average	Above Average Monthly (7.78 mm in 2 weeks previous)	0 mm
3.4	17-Sept-76 (Fall)	AS 1539	1:31680	Below Average	Below Average Monthly (16.03 mm in 2 weeks previous)	0 mm
3.5	25-May-79 (Spring)	AS 1935	1:30000	Well Above Average	Average Monthly (26.84 mm in 2 weeks previous)	0 mm
3.6	11-May-83 (Spring)	AS 2805	1:25000	Above Average	Below Average Monthly (4.34 mm in 2 weeks previous)	0 mm
3.7	13-Aug-01 (Summer)	AS 5169B	1:20000	Well Below Average	Well below average monthly (2.02 mm in 2 weeks previous)	0 mm
3.8	25-Jun-03 (Summer)	AS 5255B	1:30000	Below Average	Below Average Monthly (29.77mm in 2 weeks previous)	0 mm

Notes:
1. All aerial imagery sourced from AEP's Aerial Photo Record System (APRS) (AEP 2015) and are all black and white.
2. All historical precipitation data from Alberta Agriculture and Forestry (2015).

4.0 Results of Desktop Review

4.1 Wetland Replacement Value

The cost for wetland replacement is dependent on the Relative Wetland Value as determined by AEP as well as the value of the wetland as determined by the AB-WRET-A, however, the results of the AB-WRET-E can be used as a planning tool (Figure 3.2). No A value wetlands are estimated to be part of the Project area, however, the AB-WRET-A may result in identification of an A value wetland.

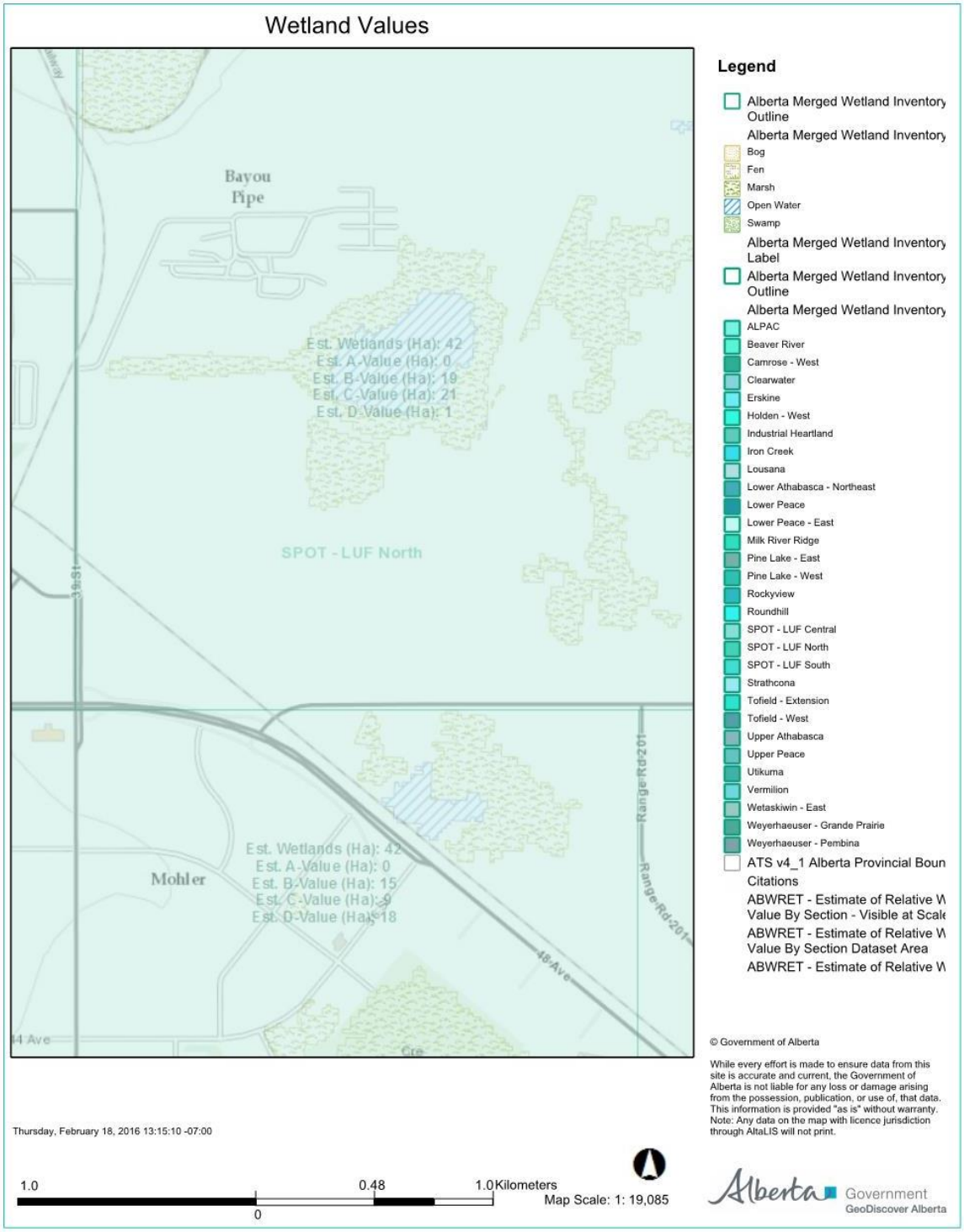
The Project is located in the Central Parkland South Saskatchewan Natural Region and Basin where wetland replacement *in-lieu* fees for this Relative Wetland Value Assessment Unit are $18,523/ha (Government of Alberta 2015b). The value for *in-lieu* fees assumes a D value of replacement wetland according to the Wetland Replacement Matrix in Table 4.2 (Government of Alberta 2015b). If there are no A value wetlands identified by the AB-WRET-A field assessments, any proponent can expect to pay replacement fees at a ratio 4:1 to 1:1 for wetland disturbance.

Table 7.1: Wetland Replacement Matrix

Value of Wetland Lost	Value of Replacement Wetland			
	D	C	B	A
A	8:1	4:1	2:1	1:1
B	4:1	2:1	1:1	0.5:1
C	2:1	1:1	0.5:1	0.25:1
D	1:1	0.5:1	0.25:1	0.125:1

Notes: As described in Government of Alberta (2015d).

Figure 3.2: AMWI and AB-WRET-Estimate Results



4.2 Aerial Interpretation

In the Camrose East Gateway Project area, 64 wetlands were classified and delineated using historical imagery (Figures 3.3 to 3.9) totally approximately 42.64 ha. Wetlands include: 60 Marshes, three Shallow Open Water wetlands, and one Swamp. Five artificial wetlands were also identified in the Project area (2.03 ha). Table 4.2 summarizes the results of the desktop aerial interpretation.

Table 4.2: Desktop Wetland Assessment Results[1]

Class	Form	Type	Number of Features	Area (ha)
		Water Permanence[2]		
Marsh [M]	Graminoid [G]	Temporary [II]	46	7.10
		Seasonal [III]	12	4.15
		Semi-permanent [IV]	2	10.92
Shallow Open Water [W]	Submersed and/or floating aquatic vegetation [A][3]	Semi-permanent [IV]	1	13.57
		Permanent [V]	1	4.18
		Artificially Enhanced[4]	1	2.60
Swamps [S]	Wooded mixedwood [Wm]	N/A	1	0.12
Artificial	N/A	N/A	5	2.03

Notes:

1. This table is an estimate of wetland numbers and Classes. Fieldwork by a WSP is required for confirmation.
2. Only Water Permanence Type can be estimated from aerial photograph interpretation. Fieldwork by a WSP is required for further Classification.
3. No Bare forms for Shallow Open Water wetland Class were identified by aerial photograph interpretation.
4. One artificially enhanced wetland was identified. This wetland's water permanence was increased (i.e., became more permanent) as a result of adjacent land use (e.g., construction).

5.0 Recommendations

5.1 Wetland Replacement

Based on the results of the Aerial Interpretation and using the proportion of wetland values identified by the AB-WRET-E, replacement is anticipated to cost approximately two million dollars for removal of all wetlands within the Project area. However, ISL does not recommend removal of all wetlands from the Project area.

5.2 Wetland Conservation

Generally, ISL recommends retention of semi-permanent (IV) and permanent (V) wetlands due to the potential landscape hydrologic impact; these basins typically hold more water than seasonal, temporary, or ephemeral wetlands and may be significant to catchment hydrology. To infill them during development would not only displace this water, but also likely impact the overland flow dynamics, which could lead to flooding and/or spring melt and storm water management issues. Additionally, semi-permanent (IV) and permanent (V) wetlands provide shallow water habitat for waterfowl, shorebirds, amphibians and other wildlife for most of the year (i.e., have reasonably permanent water). With respect to vegetation, these basins have not typically been previously cultivated due to water presence relative to less permanent wetlands and consequently may also have more native species and high potential for rare species.

It should be noted that less permanent wetlands also provide important wetland functions such as storm water retention, sediment and nutrient retention, as well as wildlife habitat, however, they occur as smaller features on the landscape within the Project area and the impact of their disturbance is anticipated to be less since the majority of them have been historically disturbed by cultivation. On other Project, conservation of seasonal, temporary, or ephemeral wetlands may be appropriate.

ISL has identified semi-permanent (IV) and permanent (V) four wetlands within the Project area. However, the wetland identification, delineation, and classification provided in this Wetland Desktop Review are provided a planning tool only. Field

assessments pursuant to the Wetland Policy will be required prior to development. Table 5.1 and Figures 3.3 to 3.8 identify the four wetlands.

Table 4.3: Permanent and Semi-permanent wetlands within the Project Area[1]

Wetland ID	ASP Wetland Reference	Class	Form	Type	Area (ha)
				Water Permanence[2]	
Wetland 1	Wetland C	Marsh [M]	Graminoid [G]	Semi-permanent [IV]	10.23
Wetland 2	Wetland D	Marsh [M]	Graminoid [G]	Semi-permanent [IV]	0.69
Wetland 3[3]	Wetland B[3]	Shallow Open Water [W]	Submersed and/or floating aquatic vegetation [A]	Permanent [V]	4.18
Wetland 4[3]	Wetland A[3]	Shallow Open Water [W]	Submersed and/or floating aquatic vegetation [A]	Semi-permanent [IV]	13.57

1. This table is an estimate of wetland areas and Classes. Fieldwork by a WSP is required for confirmation.
2. Only Water Permanence Type can be estimated from aerial photograph interpretation. Fieldwork by a WSP is required for further Classification.
3. Wetland has been identified by AEP as potentially Crown claimed in the future

5.3 Wetland-Specific Recommendations and Development

Generally, Wetland 1, 3 and 4 will be retained as Municipal Reserve, Environmental Reserve, or a storm water facility (Area Structure Plan [ASP] Figure 5), while Wetland 2 is anticipated to be disturbed by general industrial development. ISL recommends that storm water facilities associated with naturally occurring wetlands (i.e., Wetland 2 and Wetland 3) should be naturalized. For example, they should be planted with native vegetation similar to the vegetation communities found in the existing and adjacent wetlands thereby creating continuous wetland-like habitat for wildlife. Naturalization may also include mimicking wetland geometry (i.e., avoid square facility geometry with unnatural angles) and employing natural substrate instead of rip-rap to encourage wildlife use, such as nesting, foraging, and staging.

The following section describes the anticipated work associated with each of the four semi-permanent (IV) and permanent (V) wetlands within the Project area. All wetland future wetland delineation, classification, and assessment work must be done by a WSP pursuant to the Wetland Policy.

5.3.1 Wetland 1

Wetland 1 is primarily located within future a storm water management facility and Municipal Reserve (ASP Figure 5). To convert Wetland 1 into a storm water facility, a *Water A*ct and *EPEA* approval will be required as the wetland will be impacted both by the storm water facility (requiring *Water Act* and *EPEA*), as well as the general industrial development which will disturb the north portion of the wetland and require *Water Act* approval. Wetland replacement (i.e., compensation) will be a requirement for *Water Act* approval.

5.3.2 Wetland 2 and Wetland 3

Wetland 2 is located within future General Industrial land use and is likely hydrologically connected to Wetland 3 (ASP Figure 5). The southern and eastern portion of Wetland 3 is identified as Environmental and Municipal Reserve, while the northern and western portion has been identified as a storm water facility. If Wetland 2 and Wetland 3 are hydrologically connected, and a portion of the wetland complex must be removed for development, the north portion (i.e., Wetland 2) is preferred as it is the less permanent portion of the wetland complex. With respect to regulatory requirements, Wetland 2 will require *Water Act* approval for disturbance, while Wetland 3 requires both a *Water Act* and *EPEA* approval for the storm water facility. Wetland replacement (i.e., compensation) will be a requirement for all *Water Act* approvals.

5.3.3 Wetland 4

Wetland 4 will be retained as Environmental Reserve surrounded by Heavy Industrial development (ASP Figure 5). A wetland delineation by a WSP is recommended to identify wetland boundaries prior to development. If the development is anticipated to occur within the natural wetland boundary, a *Water Act* and compensation will be required for any disturbance within the wetland boundary.

6.0 References

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Appendix C

Contributions Plan

ISL Engineering and Land Services

Inspiring sustainable thinking

City of Camrose

Report - Draft

East Gateway Contribution Plan

May 2016

Table of Contents

APPENDICES

TABLES

FIGURES

Following Page

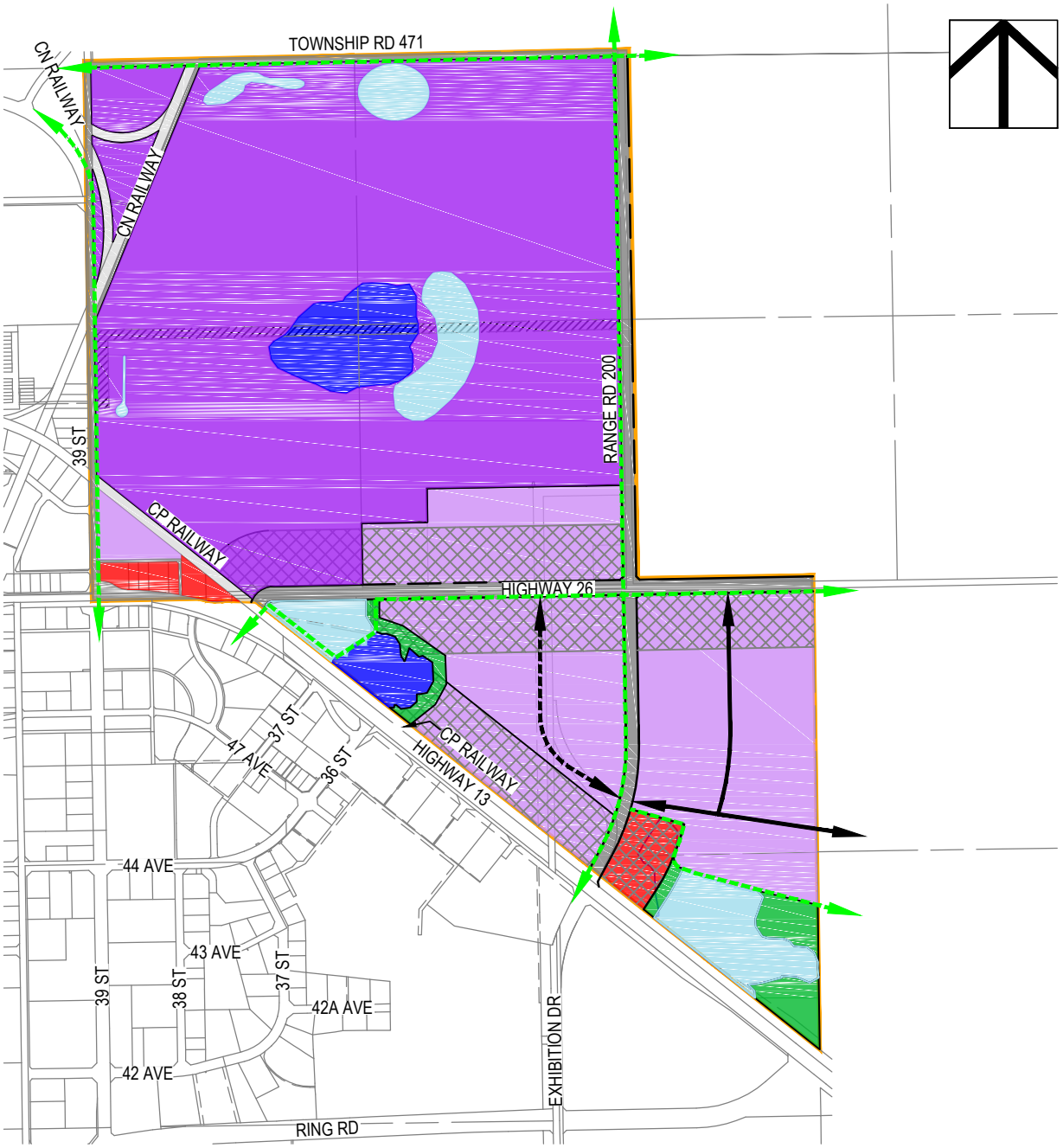
1.0 Introduction

ISL Engineering and Land Services Ltd. (ISL) was retained by the City of Camrose to update the Contribution Plan in conjunction with updating the East Gateway Area Structure Plan (ASP). The Contribution Plan will supplement and support the East Gateway ASP and will address the allocation of developer costs for major infrastructure within the Plan Area. This will ensure that costs of development are allocated both equally and equitably so that individual developers are not disproportionally burdened.

This updated Contribution Plan will focus on the cost sharing of major infrastructure including roads, water, sanitary, and storm infrastructure within the East Gateway Plan Area and do not include levy projects or costs.

2.0 Location and Land Use

The East Gateway Plan Area as shown in Figure 2.1, is located on the northeast side of the City of Camrose, bounded to the west by 39 Street, to the south by Highways 13 and 26, to the east by Range Road 200 and to the north by Township Road 471. The Plan Area is divided into two distinct portions with a section of land located north of Highway 26 and a triangular section located south of Highway 26. The land use for the area to the north of Highway 26 is intended to be heavy industrial with highway commercial bordering Highways 13 and 26. The land use for the area to the south of Highway 26 will mainly be general industrial.



LEGEND

- ASP BOUNDARY - GROSS AREA = 398.5 ha (984.7 ac)
- HIGHWAY COMMERCIAL (7.5 ha) / (18.5 ac)
- GENERAL INDUSTRIAL (110.0 ha) / (271.8 ac)
- HEAVY INDUSTRIAL (201.1 ha) / (496.7 ac)
- STORM WATER FACILITY (24.0 ha) / (59.3 ac)
- ENVIRONMENTAL RESERVE (15.2 ha) / (37.6 ac)
- MUNICIPAL RESERVE (8.2 ha) / (20.3 ac)
- RAILWAY R.O.W. (5.8 ha) / (14.3 ac)
- INTERNAL CIRCULATION (26.7 ha) / (66.0 ac)
- POWERLINE R.O.W.
- GATEWAY OVERLAY
- TRAIL
- CONCEPTUAL ROAD LOCATION
- LOCAL INDUSTRIAL ROADWAY

ISL Engineering and Land Services

CITY OF Camrose

CITY OF CAMROSE

CONTRIBUTION PLAN
LAN□ USE CONCEPT

FIGURE 2.1

0 200 400 600 800m

3.0 Assessable Area

The assessable net development area will contribute to the cost sharing of major infrastructure. The assessable net development area include lands that will directly benefit from the specific improvements within the Plan Area. Excluded from the Assessable Area are non-developable lands such as:

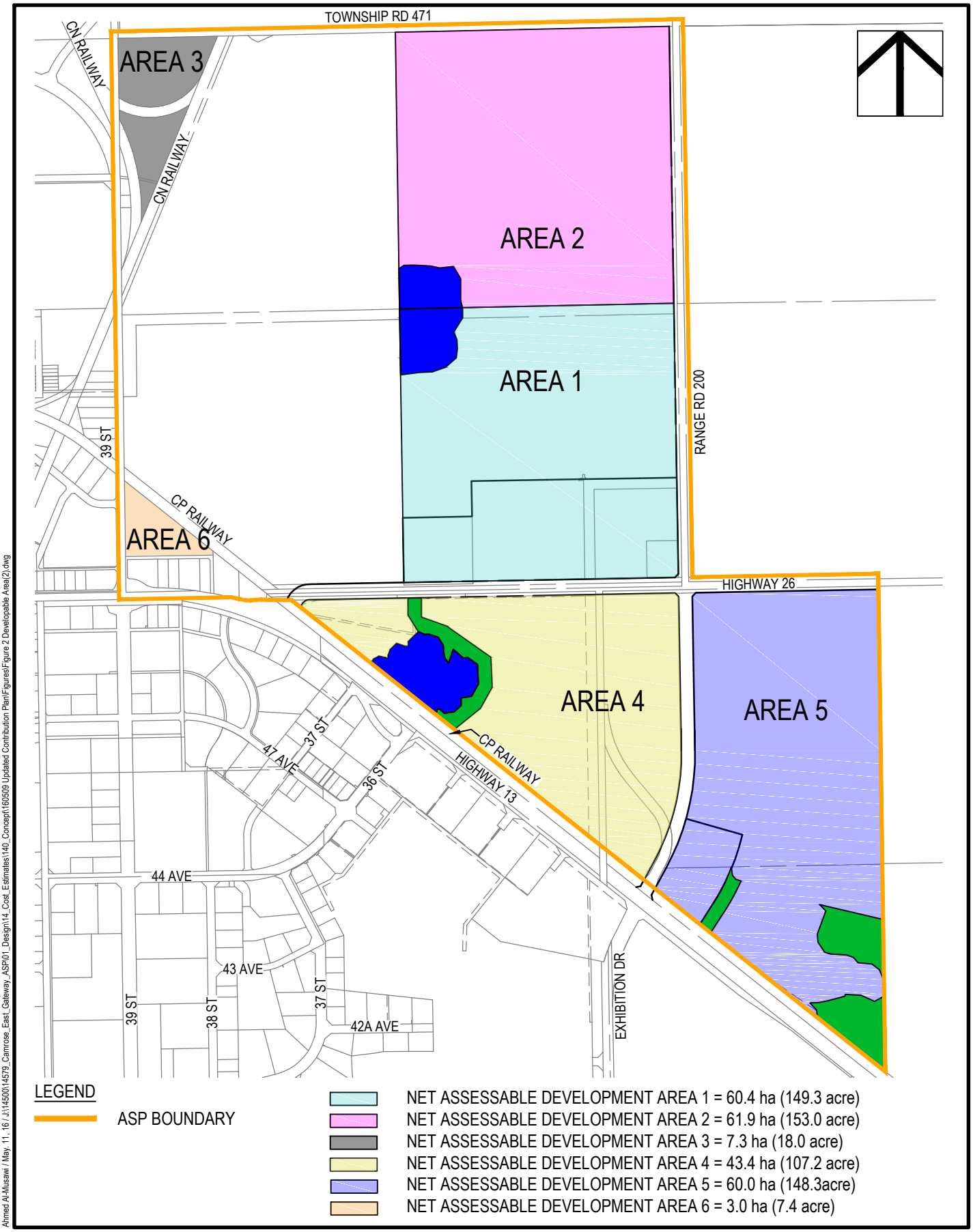
- Road Right-of-Way (ROW)
- Municipal Reserve (MR)
- Environmental Reserve (ER)

The total East Gateway Plan Area covers about 400 ha. As shown on Figure 3.1, the two quarter sections adjacent to 39 Street are already developed and are also excluded from the Assessable Area.

The assessable net development area for various parcels within East Gateway are illustrated on Table 3.1 below and Figure 3.1.

Table 3.1: Assessable Net Development Area

Land Parcel	Gross Area (ha)	Gross Area (acre)	Environmental Reserve: ER (ha)	Arterial Road (ha)	Municipal Reserve: MR (ha)	Net Assessable Development Area (ha)	Net Development Area (acre)
1	66.7	164.8	3.0	3.2		60.4	149.3
2	67.3	166.2	2.2	3.2		61.9	153.0
3	7.3	18.0				7.3	18.0
4	51.8	128.1	4.2	1.8	2.4	43.4	107.3
5	67.7	167.2		1.8	5.9	60.0	148.3
6	3.0	7.3				3.0	7.3
Total	**263.7**	**651.7**	**9.4**	**10.0**	**8.2**	**236.1**	**583.3**



Ahmed Al-Musawi / May. 11, 16 / J:\145001\14579_Camrose_East_Gateway_ASP\01_Design\14_Cost_Estimates\140_Concept\160509 Updated Contribution Plan\Figures\Figure 2 Developable Area(2).dwg

ISL Engineering and Land Services

CITY OF Camrose

CITY OF CAMROSE

CONTRIBUTION PLAN
NET ASSESSABLE □E□ELOPMENT AREAS

FIGURE 3.1

0 200 400 600 800m

4.0
2008 City of Camrose Offsite Levy Bylaw

The following summarizes infrastructure included within the City of Camrose Offsite Levy Bylaw:

- Arterial roadways construction or improvements to existing roadways.
- Watermain infrastructure such as transmission mains, reservoirs, and booster stations
- Sanitary infrastructure such as sanitary trunks, lifts stations, force mains, and existing trunk upgrades.
- Storm water infrastructure such as existing ditch upgrading certain ponds and erosion control projects.

The specific projects that fall within the above categories are detailed within the 2008 City of Camrose Offsite Levy Bylaw which is publically available. Levies are allocated based on assessable net development land which does not include municipal reserve, environmental reserve and road right of way.

The offsite levy costs are different projects than those included in the contribution plan and would be an additional cost to the development lands.

5.0 Contribution Plan

The contribution plan will focus on cost shareable infrastructure only. Preliminary cost estimates for each specific project based on infrastructure type are included with this report and are intended to be used for project budgets at this stage. The final contribution costs shall be actual incurred costs based on progress payment certificates.

The projects items have been identified in accordance with the current utility and transportation Master Plans. The costs and project items are subject to change in the future based on utility and transportation Master Plans updates.

Table 5.1 at the end of this section summarizes the total project cost and cost allocation summary per project.

5.1 Transportation Infrastructure

The roadway plan is shown on Figure 5.0 and is in accordance with the updated Traffic Impact Assessment (TIA) completed by ISL. Highway 26 is considered to be an arterial roadway and RR 200 and Exhibition Drive as major collectors. The TIA also identified that Exhibition Drive would need to be realigned to accommodate the development in this area.

From the TIA, the roadways assessment was based on the 'ultimate conditions' which includes:

- Stage 1: 2021 background traffic plus 'stage 1' development traffic horizon, and
- Stage 2: 2036 background traffic plus 'full build-out' development traffic.

Based on the TIA, no intersection improvements are required to accommodate Stage 1 traffic. For Stage 2, the following intersection improvements include:

1. Project 1 - 39 Street and Highway 13 intersection will require a minor signal phase improvement and westbound right turn lane
2. Project 2 - Highway 13 and Highway 26 intersection will require traffic signals, railway crossing arms, and dedicated southbound right lane with 25 m storage.
3. Project 4 - Highway 26 and RR 200 will require a single lane roundabout

In addition to the above intersection improvements, Highway 26, RR 200 and Exhibition Drive would also need other improvements. The City of Camrose has requested that Highway 26 be upgraded to an urbanized arterial road. A conceptual plan of the improvements required to urbanize Highway 26 has been included in Appendix A. The realigned Exhibition Drive will be constructed to an urbanized major collector, while RR 200 will remain fully reconstructed to an asphalt rural roadway. These improvements can be considered as part of the Stage 2 full build out-development.

Cost Shareable Infrastructure

The following items are considered cost shareable:

- Turn lanes, roundabout and traffic lights as required for major intersections (i.e. arterial to arterial or arterial to collector). Note, turn lanes and traffic lights required at accesses to individual lots are to be borne by the individual developers.
- Highway 26, RR 200 and Exhibition Drive improvements – includes road widening, surface improvements, and landscaping.

The cost sharing of the above improvements will be calculated as follows:

- **Project 1** – 39 Street and Highway 13 intersection improvements with westbound right turn lane and signal improvement (as shown on Figure 5.1) is to be cost shared by all landowners within Areas 1, 2, 3, 4, 5 and 6 on a per-area-basis. This project benefits the overall Plan Area. The total cost to be cost shared is $500,000 (in 2016 dollars).
- **Project 2** – Highway 13 and 26 traffic signals, railway crossing arms, and southbound right turn lane (as shown on Figure 5.1) is to be cost shared by all landowners within Areas 1, 2, 3, 4, 5 and 6 on a per-area-basis. The total cost to be cost shared is $950,000 (in 2016 dollars).
- **Project 3** –Urbanized Arterial - Highway 26 improvements (as shown on Figure 5.1) is to be cost shared by all landowners within Areas 1, 2, 3, 4, 5 and 6 on a per-area-basis. This project benefits the overall Plan Area. The total cost to be cost shared is $8,578,889 (in 2016 dollars).
- **Project 4** – Highway 26/RR200 roundabout (as shown on Figure 5.1) is to be cost shared by all landowners within Areas 1, 2, 3, 4, 5 and 6 on a per-area-basis. This project benefits the overall Plan Area. The total cost to be cost shared is $585,000 (in 2016 dollars).
- **Project 5 –** Urbanized Major Collector - Exhibition Drive improvements (as shown on Figure 5.1) is to be cost shared by all landowners within Areas 1, 2, 3, 4, 5 and 6 on a per-area-basis as this project benefits the overall Plan Area. The total cost to be cost shared is $4,427,054 (in 2016 dollars).
- **Project 6** – Reconstructed Rural Major Collector – Range Road 200 improvements (as shown on Figure 5.1) is to be cost shared by all landowners within Areas 1, 2, 3, 4, 5 and 6 on a per-area-basis as this project benefits the overall Plan Area. The total cost to be cost shared is $5,536,852 (in 2016 dollars).

Note that, the above projects as developed for this report were based on the most current transportation master plan and may be subject to change if the master plan is updated.

The total costs and proportional cost allocation are summarized in Table 5.1. Concept engineering cost estimates for the above projects are included in Appendix B and organized by project number.

5.2 Water Infrastructure

Water servicing of the Plan Area is shown on Figure 5.1 and includes an extension of an existing 300 mm water main located east of 39 Street and north of CP Railway into the Plan Area. Most of the Plan Area will be serviced by a 300 mm water main. In addition, there is a proposed 600 mm water main that will ultimately be constructed from the Highway 26/RR200 intersection and will head south, continuing past Highway 13 before heading west near Ring Road. This proposed 600 mm water main will service the Plan Area and other future developments within the City of Camrose.

In addition to the existing developed areas, there is a small development located just north of Highway 26 that is currently serviced with a private well. At the time of writing this report, it is unknown if this property will tie into the municipal water network once it is constructed. We have assumed they will tie into the water system once the system is present and would pay it portion of the contribution costs.

Based on a discussion with the City the upsizing cost of all mains from a 300 mm to larger infrastructure and its appurtenances within the Plan Area will likely be included within the City's offsite levy bylaw.

Cost Shareable Infrastructure

The upsizing costs of the mains are broken down into different projects to provide an overall magnitude of costs and are listed below:

- **Project 7** – The proposed 600 mm watermain along Exhibition Drive heading south (as shown on Figure 5.2). The total cost of the project is $1,830,984 (in 2016 dollars). A $694,539 portion of the total

cost is to be cost shared evenly between area 4 and area 5. The oversizing amount of $1,136,444 would be included and recovered through an offsite levy.

- **Project 7A** – The proposed 600 mm offsite watermain extension along Exhibition Drive heading south (as shown on Figure 5.2). The total project cost is $1,025,660 (in 2016 dollars). A $509,645 portion of the total cost is to be cost shared amongst all the landowners in Areas 1,2,3,4, 5 and 6 on a per-area-basis as this water main will improve water pressure and flows to the service the Plan Area. The other $516,015 would be included and recovered through an offsite levy.
- **Project 8** – 600 mm watermain along Highway 26 and east of RR200 (as shown on Figure 5.2). The total project cost is $881,772 (in 2016 dollars). A $311,245 portion of the total cost would be paid by Area 5. The oversizing amount of $570,528 would be included and recovered through an offsite levy.
- **Project 8A** –The proposed 300 mm watermain along Highway 26 at a cost of $355,200 will be cost shared equally between Area 1 and Area 4.

Note that, the above projects as developed for this report were based on the most current water master plan and may be subject to change if the master plan is updated.

The total costs and proportional cost allocation are summarized in Table 5.1. Concept engineering cost estimates for the above projects are included in Appendix B and organized by project number.

5.3 Sanitary Infrastructure

Sanitary servicing of the Plan Area is shown on Figure 5.3. The Plan Area is to be serviced by two onsite private lift stations in the north quarter sections located to the west of Range Road 200 and by gravity trunks for the remaining area. From the 2007 Sanitary Sewer Master Plan, the Mohler Industrial area sewers have limited industrial servicing capacity of 100ha and cannot service the entire Plan Area. As a result, the 2007 Sanitary Sewer Master Plan recommended in-line storage for the area to the northeast of Highway 13.

In addition to the existing developed areas, there is a small development located just north of Highway 26 that is currently serviced with a septic system. At the time of writing this report, it is assumed that this area will be serviced by the 1800 mm sanitary trunk and this area is included in the cost sharing calculations.

The sanitary infrastructure for the Plan Area is fairly extensive and it is recommended to be staged where possible to defer construction. This will encourage development and enable onsite improvement levies to be collected.

Lift Stations

Two onsite private lift stations have been identified to service the heavy industrial area in the north quarters of the Plan Area as this area is likely to be developed by two landowners. The lift stations are to be constructed by the individual landowners and will be operated and maintained by them as well. Should smaller industrial subdivisions develop within the north quarters, a centrally located lift station funded by development would be constructed and dedicated to the City to own and operate. Based on the above, the cost of the private lift stations will not be included in the Contribution Plan as cost shareable as these are to be privately owned and constructed.

In-line Storage

As per the 2007 Sanitary Sewer Master Plan, an in-line storage facility is required for the area northeast of Highway 13 due to downstream capacity constraints. The Master Plan also identified that the amount of storage generally required was about 800 lineal metres of 1800 mm diameter pipe per quarter section developed. For the Plan Area this is roughly 1380 lineal metres of 1800 mm diameter pipe. This oversized storage pipe would likely need to be Real Time Controlled (RTC) in order to determine when storage should

be activated during wet weather flow conditions and when flow from the storage could be released into the downstream system when capacity is available. The details of the RTC system will be determined during detailed design. Based on the above, the cost of the storage pipe and the RTC system is included in the Contribution Plan as cost shareable.

Cost Shareable Infrastructure

The following sanitary infrastructure that are considered cost shareable are:

- Trunks sized at 375 mm or greater including manholes
- In-line storage facility and the RTC system

As mentioned above, the private lift stations are not included as cost shareable infrastructure as these will be privately owned. However, if at the time of development the north quarters subdivide and a centrally located lift station is implemented, costs for the lift station can be calculated at the time of subdivision.

The cost sharing of the above infrastructure will be calculated as follows:

- **Project 9** – Sanitary trunk located along RR 200 (as shown on Figure 5.3) is to be cost shared by the landowners of Areas 1 and 2 based on oversizing. The total cost to be cost shared is $448,515 (in 2016 dollars).
- **Project 10** – The sanitary trunk located along Exhibition Drive (as shown on Figure 5.3) is to be cost shared by all landowners of Areas 1, 2, and 5 on a per-area-basis as this trunk not only accepts sanitary flows from Area 5 but also from Areas 1 and 2. The total cost to be cost shared is $735,138 (in 2016 dollars).
- **Project 11** – The inline storage and the RTC system (as shown on Figure 5.3) is to be cost shared by all landowners within Areas 1, 2, 4 and 5 on oversizing and a per-area-basis as this storage facility will benefit these users. The total cost to be cost shared is $4,347,089 (in 2016 dollars).
- **Project 11A** – the offsite sanitary trunk (as shown on Figure 5.3) is required to discharge the stored flows into the existing downstream system at Highway 13 and 36 Street. The cost will be shared by all landowners within Areas 1, 2, 4 and 5 on a per-area-basis as this offsite sanitary trunk will benefit these users. The total cost to be cost shared is $644,839 (in 2016 dollars).

Note that, the above projects as developed for this report were based on the most current sanitary master plan and may be subject to change if the master plan is updated.

The total costs and proportional cost allocation are summarized in Table 5.2. Concept engineering cost estimates for the above projects are included in Appendix B and organized by project number.

5.4 Stormwater

The stormwater management concept for the Plan Area is shown on Figure 5.4 and generally follows the 2008 Stormwater Master Plan Update. From Figure 5.4, four new SWMFs are required for the Plan Area - two SWMFs located west of Range Road 200 and north of Highway 26 to serve the heavy industrial area and one SWMF located between Highways 13 and 26 and one located east of Range Road 200 to serve the general industrial area. There are two existing SWMFs east of 39 Street that services the existing developments. Storm sewers have also been proposed to provide conveyance along the arterial roads and between the SWMFs.

Cost Shareable Infrastructure

The following storm infrastructure that are considered cost shareable are:

- Storm sewers sized at 375 mm or greater including manholes
- SWMFs

The cost sharing for the above infrastructure will be calculated as follows:

- **Project 12** – The storm sewer between the SWMFs in Areas 1 and 2 (as shown on Figure 5.4) will be the responsibility of the landowner of Area 1 as this sewer is used to convey storm flows from Area 1 into the Area 2 SWMF. The total project cost is $601,791 (in 2016 dollars).
- **Project 13** – The storm sewer immediately downstream of Area 2's SWMF along TWP RD 471 (as shown on Figure 5.4) is to be cost shared by the landowners of Areas 1 and 2 on a per-area-basis as they both utilize this downstream sewer to discharge their SWMFs into the downstream system. The total cost to be cost shared is $568,663 (in 2016 dollars).
- **Project 14** – The storm sewer immediately downstream of Area 3's SWMF along TWP RD 471 (as shown on Figure 5.4) is to be cost shared by the landowners of Areas 1 and 2 on a per-area-basis as they all utilize this downstream sewer to discharge their SWMFs into the downstream system. The total cost to be cost shared is $610,821 (in 2016 dollars).
- **Project 14A –** The offsite storm sewer along TWP RD 471, west of 39 Street (as shown on Figure 5.4) is to be cost shared by the landowners of Areas 1 and 2 on a per-area-basis as this is required to tie-in to the existing downstream storm system. The total cost to be cost shared is $485,440 (in 2016 dollars).
- **Project 15 –** The storm sewer downstream of Area 4's SWMF (as shown on Figure 5.4) that ties into the existing storm system at Highway 13 and 37 Street. The cost of this sewer will mainly be the responsibility of the landowner of Area 4 as this sewer is used to discharge storm flows from Area 4's SWMF. The landowners of Areas 1, 2, and 5 will contribute a small portion to the overall sewer cost based on the proportional catchment area that the roadway contributes to the sewer. The total cost to be cost shared is $479,540 (in 2016 dollars).
- **Project 16** – The storm sewer downstream of Area 5's SWMF (as shown on Figure 5.3) that ties into the existing drainage channel at Exhibition Drive. The cost of this sewer will mainly be the responsibility of the landowners of Area 5 as this sewer is used to discharge storm flows from Area 5's SWMF. The landowners of Areas 1, 2, and 4 will contribute a small portion to the overall sewer cost based on the proportional catchment area that the roadway contributes storm runoff to the sewer. The total cost to be cost shared is $935,813 (in 2016 dollars).
- **Project 17** – The SWMF for Area 4 (as shown on Figure 5.4) will mainly be the responsibility of the landowner of Area 4. The landowners of Areas 1, 2, 3, 5 and 6 will contribute a small portion to the overall SWMF cost based on the proportional catchment area that the roadway contributes storm runoff to the SWMF. The total cost to be cost shared is $3,610,000 (in 2016 dollars).
- **Project 18** – The SWMF for Area 5 (as shown on Figure 5.4) will mainly be the responsibility of the landowners of Area 5. The landowners of Areas 1, 2, 3, 5 and 6 will contribute a small portion to the overall SWMF cost based on the proportional catchment area that the roadway contributes storm runoff to the SWMF. The total project cost is $3,450,000 (in 2016 dollars).

As Areas 1 and 2 are likely to be developed by two landowners, the landowners of Areas 1 and 2 are responsible for their own SWMFs (i.e. they will own and operate the SWMFs), thus no cost sharing is required for SWMF construction. However, if at the time of development the north quarters subdivide and the SWMFs service multiple properties then the construction of the SWMF can be cost shared amongst its users (on a per-area-basis) and will be owned and operated by the City.

Note that, the above projects as developed for this report were based on the most current stormwater master plan and may be subject to change if the master plan is updated.

The total costs and proportional cost allocation are summarized in Table 5.1. Concept engineering cost estimates for the above projects are included in Appendix B and organized by project number.

Table 5.1: Total Project Cost and Allocation Cost Summary

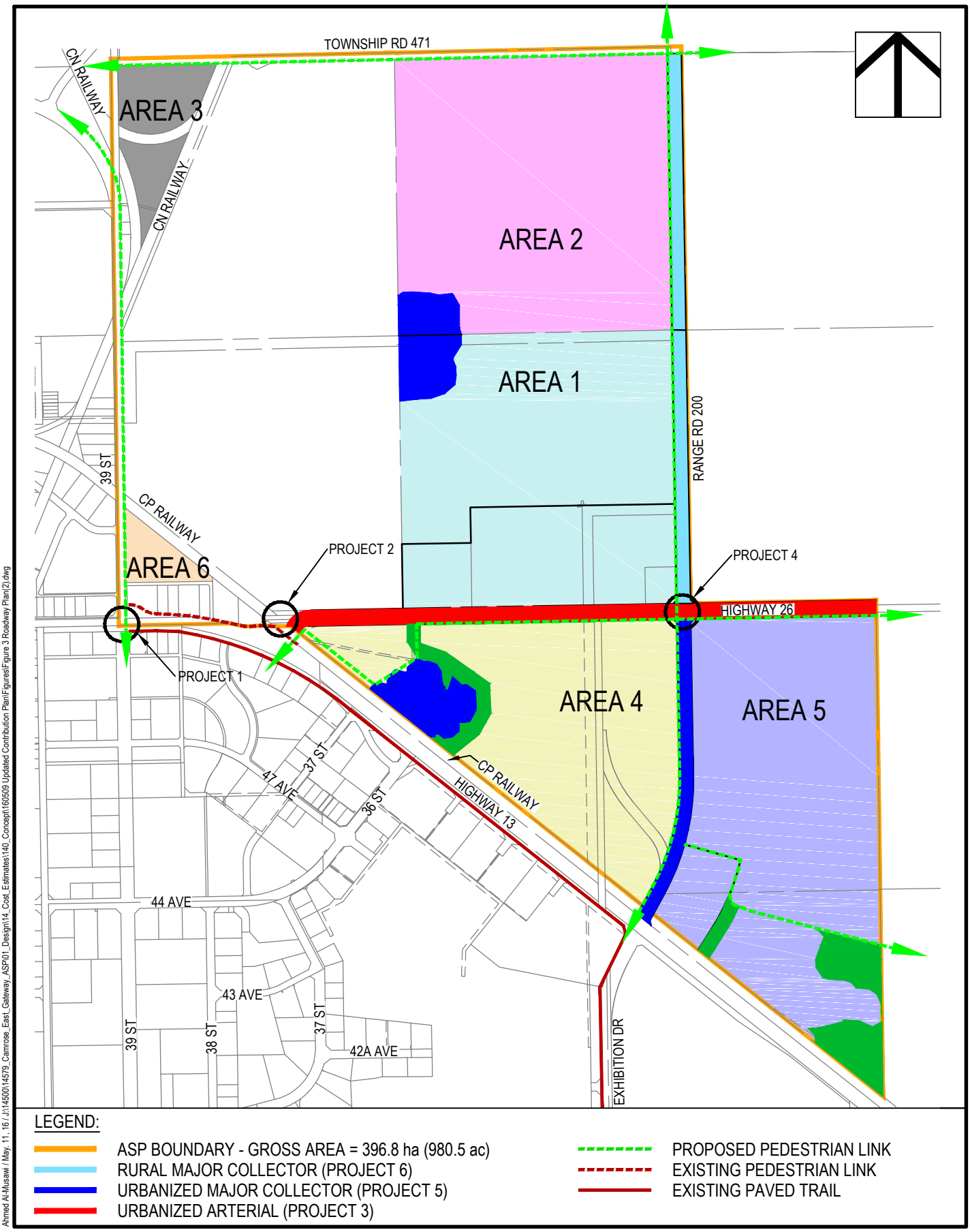
Project #	Project	Land Parcel	Net Assessable Development Area (ha)	Cost Sharing Percentage	Cost Sharing Amount	Off-site Levy Amount	Project Total Cost
1	**Transportation**		**236.1**	**100.00%**	**$500,000**		**$500,000**
	(39 Street and Highway 13 Intersection, will require a minor signal phase improvement and westbound right turn lane)	1	60.4	25.6%	$128,020		
		2	61.9	26.2%	$131,132		
		3	7.3	3.1%	$15,463		
		4	43.4	18.4%	$91,988		
		5	60.0	25.4%	$127,132		
		6	3.0	1.3%	$6,265		
2	**Transportation**		**236.1**	**100.00%**	**$950,000**		**$950,000**
	(Highway 13 and Highway 26 Intersection, will require traffic signals and Dedicated SBR Lane with 25 m storage.)	1	60.4	25.6%	$243,238		
		2	61.9	26.2%	$249,152		
		3	7.3	3.1%	$29,379		
		4	43.4	18.4%	$174,778		
		5	60.0	25.4%	$241,551		
		6	3.0	1.3%	$11,903		
3	**Transportation**		**236.1**	**100.00%**	**$8,578,889**		**$8,578,889**
	(Highway 26 urbanization with curb, gutter, underground storm, boulevards, one side asphalt trail)	1	60.4	25.6%	$2,196,539		
		2	61.9	26.2%	$2,249,942		
		3	7.3	3.1%	$265,307		
		4	43.4	18.4%	$1,578,316		
		5	60.0	25.4%	$2,181,300		
		6	3.0	1.3%	$107,486		
4	**Transportation**		**236.1**	**100.00%**	**$585,000**		**$585,000**
	(Highway 26/RR200 Roundabout)	1	60.4	25.6%	$149,783		
		2	61.9	26.2%	$153,425		
		3	7.3	3.1%	$18,091		
		4	43.4	18.4%	$107,626		
		5	60.0	25.4%	$148,744		
		6	3.0	1.3%	$7,330		
5	**Transportation**		**236.1**	**100.00%**	**$4,427,054**		**$4,427,054**
	(Exhibition Drive urbanization with curb, gutter, underground storm, boulevards, one side asphalt trail))	1	60.4	25.6%	$1,133,503		
		2	61.9	26.2%	$1,161,061		
		3	7.3	3.1%	$136,909		
		4	43.4	18.4%	$814,475		
		5	60.0	25.4%	$1,125,639		
		6	3.0	1.3%	$55,467		
6	**Transportation**		**236.1**	**100.00%**	**$5,536,852**		**$5,536,852**
	(RR 200 reconstruction to asphalt rural roadway with asphalt trail on one side)	1	60.4	25.6%	$1,417,656		
		2	61.9	26.2%	$1,452,122		
		3	7.3	3.1%	$171,230		
		4	43.4	18.4%	$1,018,652		
		5	60.0	25.4%	$1,407,820		
		6	3.0	1.3%	$69,372		
7	**Watermain**		**103.4**	**100.00%**	**$694,539**	**$1,136,444**	**$1,830,984**
	(Watermain along Exhibition Drive, from HW 13 to HW 26)	4	43.4	50.0%	$347,270		
		5	60.0	50.0%	$347,270		
7A	**Watermain**		**236.1**	**100.00%**	**$509,645**	**$516,015**	**$1,025,660**
	(Offsite watermain extension along Exhibition Drive, south of ASP boundary and up to 42A Ave adjacent to Casino)	1	60.4	25.6%	$130,489		
		2	61.9	26.2%	$133,662		
		3	7.3	3.1%	$15,761		
		4	43.4	18.4%	$93,763		
		5	60.0	25.4%	$129,584		
		6	3.0	1.3%	$6,385		
8	**Watermain**		**60.0**	**100.00%**	**$311,245**	**$570,528**	**$881,772**
	(Watermain along Highway 26 east of RR200 to ASP boundary)	5	60.0	100.0%	$311,245		
8A	**Watermain**		**103.9**	**100.00%**	**$355,200**		**$355,200**
	(Watermain along Highway 26 west of RR200)	1	60.4	50.0%	$177,600		
		4	43.4	50.0%	$177,600		
9	**Sanitary**		**122.3**	**100.00%**	**$448,515**		**$448,515**
	(Sanitary trunk along RR 200 north of HW 26)	1	60.4	49.9%	$223,782		
		2	61.9	50.1%	$224,734		

Table 5.1: Total Project Cost and Allocation Cost Summary

Project #	Project	Land Parcel	Net Assessable Development Area (ha)	Cost Sharing Percentage	Cost Sharing Amount	Off-site Levy Amount	Project Total Cost
10	**Sanitary**		**182.4**	**100.00%**	**$735,138**		**$735,138**
	(Sanitary trunk located along Exhibition Drive, between HW 13 and HW 26)	1	60.4	31.4%	$231,026		
		2	61.9	32.2%	$236,643		
		5	60.0	36.4%	$267,470		
11	**Sanitary**		**225.8**	**100.00%**	**$4,347,089**		**$4,347,089**
	(The inline 1800mm storage pipe and the RTC system located in Area 4)	1	60.4	26.8%	$1,163,592		
		2	61.9	27.4%	$1,191,882		
		4	43.4	19.2%	$836,096		
		5	60.0	26.6%	$1,155,520		
11A	**Sanitary**		**225.8**	**100.00%**	**$644,839**		**$644,839**
	(Offsite sanitary trunk south of ASP boundary crossing HW 13 up to the 36 Street tie-in)	1	60.4	26.8%	$172,605		
		2	61.9	27.4%	$176,802		
		4	43.4	19.2%	$124,025		
		5	60.0	26.6%	$171,408		
12	**Storm**		**60.4**	**100.00%**	**$601,791**		**$601,791**
	(The storm sewer between the SWMFs in Areas 1 and 2)	1	60.4	100.0%	$601,791		
13	**Storm**		**122.3**	**100.00%**	**$568,663**		**$568,663**
	(The storm sewer immediately downstream of Area 2's SWMF)	1	60.4	49.4%	$280,917		
		2	61.9	50.6%	$287,746		
14	**Storm**		**122.3**	**100.00%**	**$610,821**		**$610,821**
	(The storm sewer immediately downstream of Area 3's SWMF)	1	60.4	49.4%	$301,742		
		2	61.9	50.6%	$309,078		
14A	**Storm**		**122.3**	**100.00%**	**$485,440**		**$485,440**
	(The offsite storm sewer along TWP RD 471, west of 39 Street, ties-in after railway crossing)	1	60.4	49.4%	$239,805		
		2	61.9	50.6%	$245,635		
15	**Storm**		**48.7**	**100.00%**	**$479,540**		**$479,540**
	(The offsite storm sewer downstream of Area 4's SWMF up to 37 Street tie-in)	1 (road)	1.4	2.8%	$13,355		
		2 (road)	1.4	2.9%	$13,679		
		3 (road)	0.2	0.3%	$1,613		
		4 (road)	1.0	2.0%	$9,596		
		5 (road)	1.3	2.8%	$13,262		
		6 (road)	0.1	0.1%	$653		
		4	43.4	89.1%	$427,382		
16	**Storm**		**62.7**	**100.00%**	**$935,813**		**$935,813**
	(The storm sewer downstream of Area 5's SWMF up to the existing drainage ditch tie-in)	1 (road)	0.7	1.1%	$10,095		
		2 (road)	0.7	1.1%	$10,341		
		3 (road)	0.1	0.1%	$1,219		
		4 (road)	0.5	0.8%	$7,254		
		5 (road)	0.7	1.1%	$10,025		
		6 (road)	0.0	0.1%	$494		
		5	60.0	95.8%	$896,384		
17	**SWMF**		**48.7**	**100.00%**	**$3,610,000**		**$3,610,000**
	(The SWMF for Area 4)	1 (road)	1.4	2.8%	$100,534		
		2 (road)	1.4	2.9%	$102,978		
		3 (road)	0.2	0.3%	$12,143		
		4 (road)	1.0	2.0%	$72,238		
		5 (road)	1.3	2.8%	$99,837		
		6 (road)	0.1	0.1%	$4,920		
		4	43.4	89.1%	$3,217,350		

Table 5.1: Total Project Cost and Allocation Cost Summary

Project #	Project	Land Parcel	Net Assessable Development Area (ha)	Cost Sharing Percentage	Cost Sharing Amount	Off-site Levy Amount	Project Total Cost
18	**SWMF**		**62.7**	**100.00%**	**$3,450,000**		**$3,450,000**
	(The SWMF for Area 5)	1 (road)	0.7	1.1%	$37,217		
		2 (road)	0.7	1.1%	$38,122		
		3 (road)	0.1	0.1%	$4,495		
		4 (road)	0.5	0.8%	$26,742		
		5 (road)	0.7	1.1%	$36,959		
		6 (road)	0.0	0.1%	$1,821		
		5	60.0	95.8%	$3,304,642		
19	**Landscaping**		**236.1**	**100.00%**	**$153,433**		**$153,433**
	(HW 13 and HW 26 entrance and aesthetics improvements)	1	60.4	25.6%	$39,285		
		2	61.9	26.2%	$40,240		
		3	7.3	3.1%	$4,745		
		4	43.4	18.4%	$28,228		
		5	60.0	25.4%	$39,012		
		6	3.0	1.3%	$1,922		
20	**Reports**		**236.1**	**100.00%**	**$89,980**		**$89,980**
	(ASP, TIA, Desktop Wetland Study, and Contribution Report)	1	60.4	25.6%	$23,038		
		2	61.9	26.2%	$23,599		
		3	7.3	3.1%	$2,783		
		4	43.4	18.4%	$16,554		
		5	60.0	25.4%	$22,879		
		6	3.0	1.3%	$1,127		



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ISL Engineering and Land Services

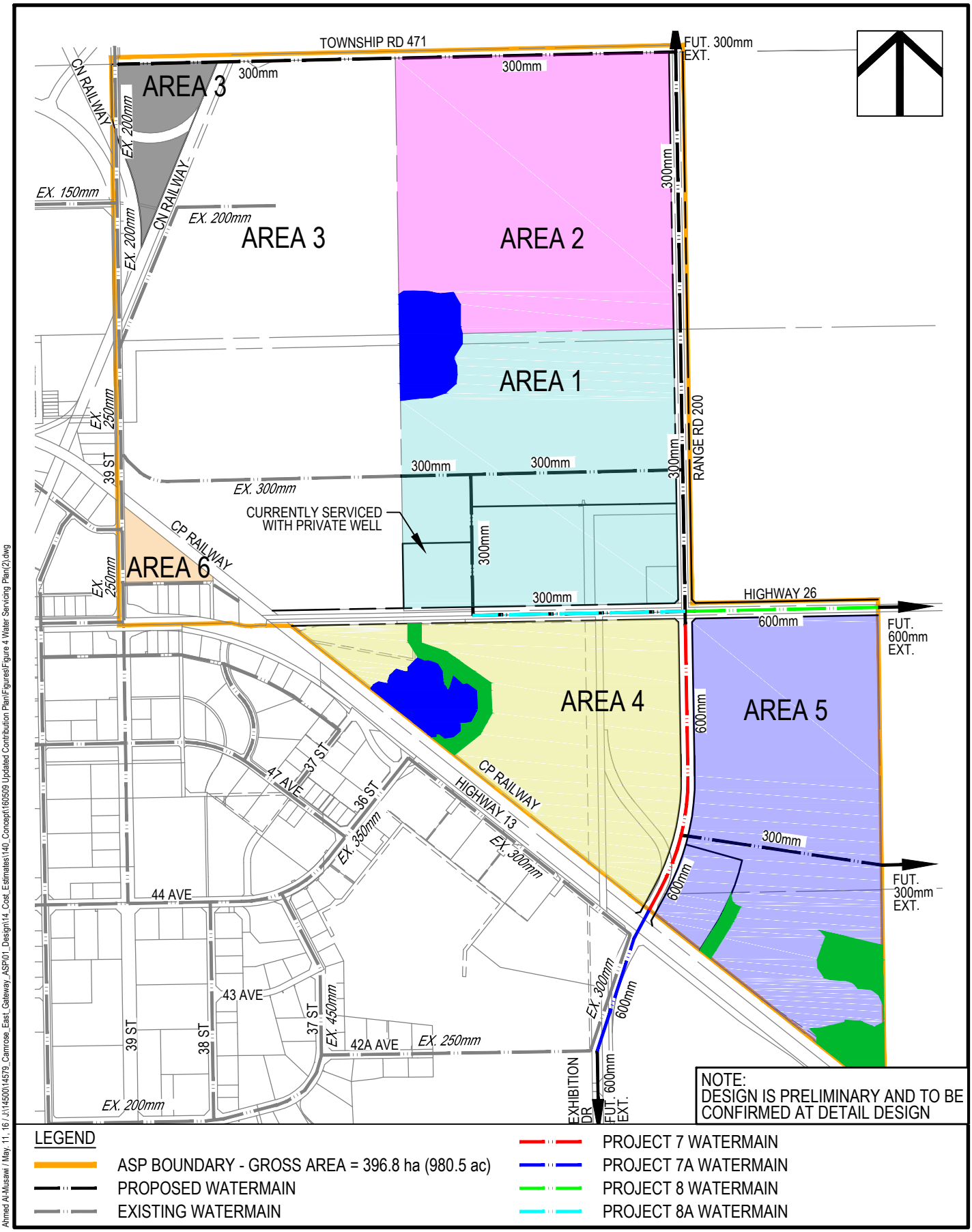
CITY OF Camrose

CITY OF CAMROSE

CONTRIBUTION PLAN
ROA□□ A□S

FIGURE 5.1

0 150 300 450 600m



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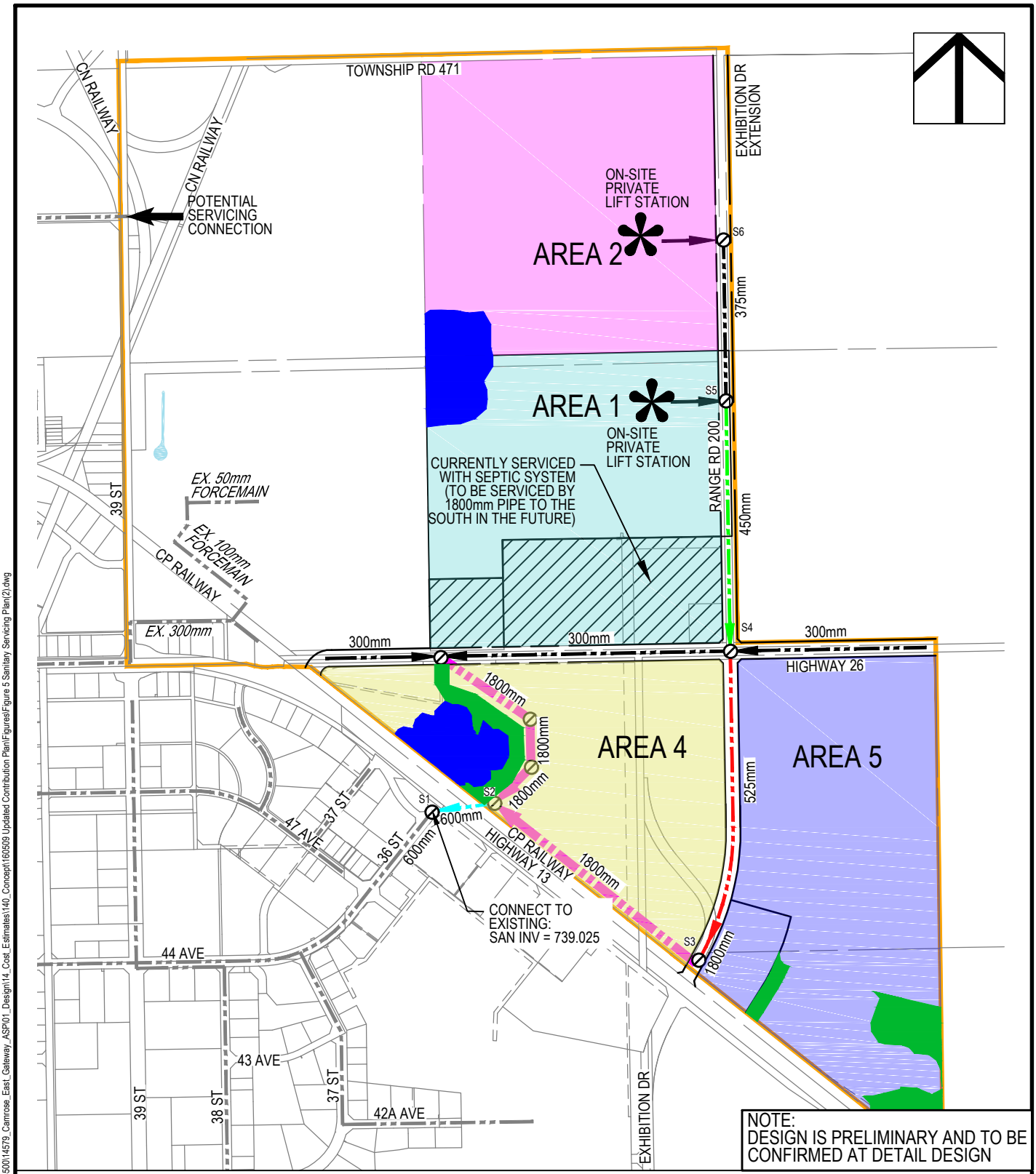
CONTRIBUTION PLAN PLAN
POTABLE □ ATER INFRASTRUCTURE

FIGURE 5.2

0 150 300 450 600m



LEGEND

- PROJECT 9 SANITARY SEWER (450mm)
- PROJECT 10 SANITARY SEWER (525mm)
- PROJECT 11 SANITARY SEWER (1800mm)
- PROJECT 11A SANITARY SEWER (600mm)
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER

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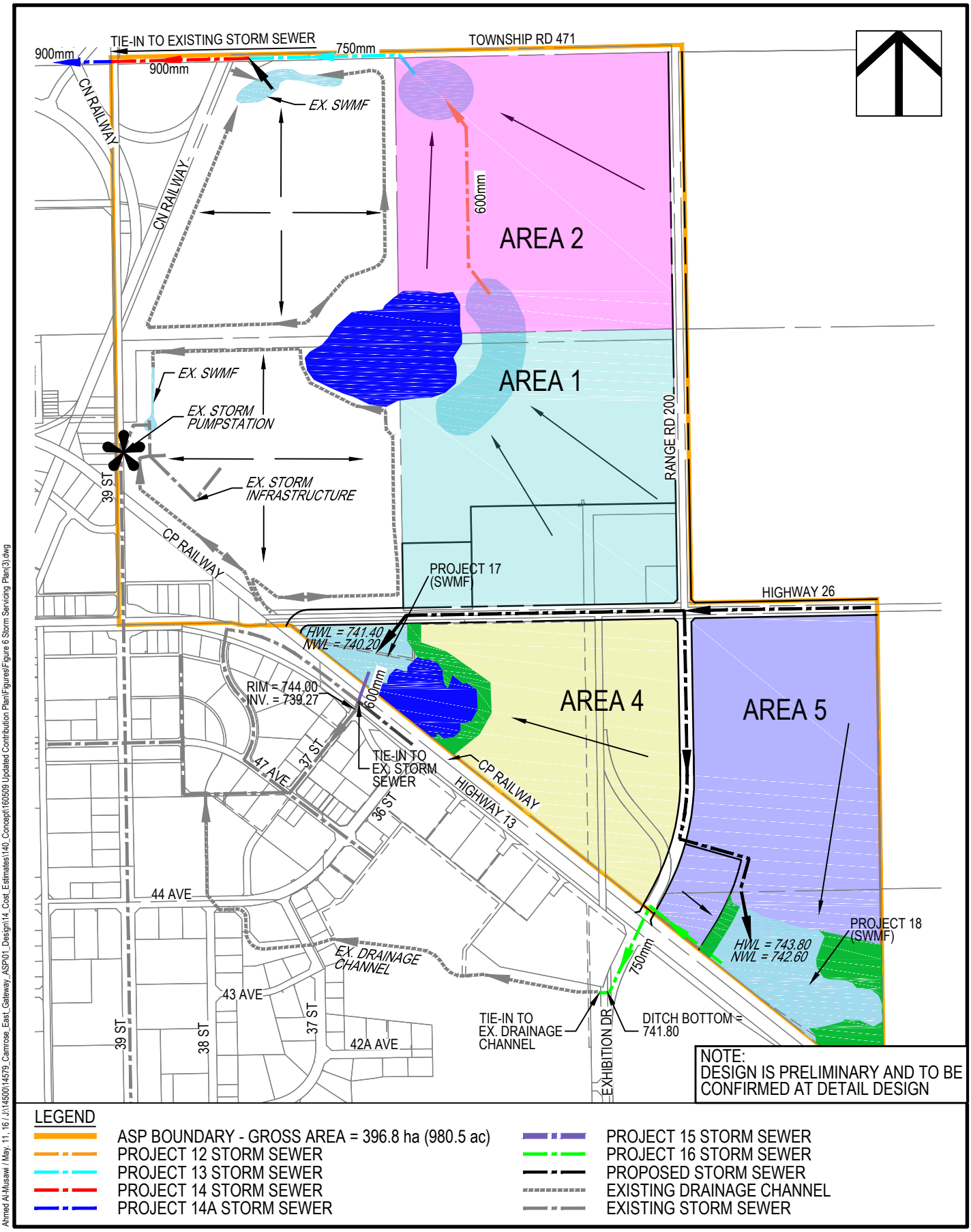
CONTRIBUTION PLAN
SANITAR□ INFRASTRUCTURE

FIGURE 5.3

0 150 300 450 600m



Ahmed Al-Musawi / May. 11, 16 / J:\145000\145579_Camrose_East_Gateway_ASP\01_Design\14_Cost_Estimates\140_Concept\160509 Updated Contribution Plan\Figures\Figure 6 Storm Servicing Plan(3).dwg

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CITY OF Camrose

CITY OF CAMROSE

CONTRIBUTION PLAN
STORM INFRASTRUCTURE

FIGURE 5.4

0 150 300 450 600m

6.0 Development Entrance Aesthetics and Reports

A $500 /ha Project 19 contribution cost will be collected from Areas 1, 2, 3, 4, 5 and 6, identified on Figure 3.0 to improve aesthetics along the development entrance at Highway 13 and Highway 26.

The $243,413 required for Project 20 to complete the East Gateway Area Structure Plan, Traffic Impact Assessment, Contribution Plan and Wetland Desktop Review will be collected from Area 1, 2, 3, 4, 5 and 6.

7.0 Cost Sharing Methods

The previous draft Contribution Plan by Focus Corporation (2009) identified different cost sharing methods that have generally been used. As these methods are commonly used in the industry, ISL has included portions of the Focus report for Section 6.

7.1 Over Expenditures

Cost recovery is a critical item to be determined within the East Gateway Area Structure Plan (ASP) in finding an equitable method of sharing the financial burdens placed on the developer for up fronting infrastructure. The first developer will connect to existing infrastructure and extend the infrastructure to service lands. The extension of infrastructure is often oversized or constructed to benefit additional lands/landowners. The additional cost related to oversizing or constructing infrastructure that benefits additional lands/landowners is called over expenditures and requires a mechanism for recovery.

7.2 Industry Methods

There are four general methods utilized for recovering over expenditures as follows:

1. The first developer completes construction and payment of specific project carrying the over expenditure. The second and subsequent developers then repay the first developer on a per hectare basis as they are required to pay their assessments leaving the first developer to carry the over expenditure for an indeterminate period of time. This is considered unfair in most municipalities that deal with large front end costs. It delays development until someone is willing to pay the large costs up front and carry them for an indefinite period. It can be difficult for the developer to receive financing for their projects under this scenario. This is not a method we would recommend. This method is often used if a municipality builds the infrastructure. This method of recovery is often referred to as first in last out.
2. The first developer performs the construction and pays the entire portion. The second developer repays all of the over expenditures owed to the first developer less the levy amount so that each developer takes their portion of the “banking" process. This method has a tendency to eliminate the smaller developer as they cannot receive funding for a large over expenditure for a small development. This method is best used in the instance where the first developer is building all the infrastructure, most of which services the second developer.

3. The third method being used by many areas is common in the City of Edmonton. This method takes into consideration the size of the development and presents a method of jointly having a number of “bankers” at any point in time for the over expenditure. Everyone carries a size appropriate amount of the over-expenditure for a limited period of time. The following is the formula used:

    a. Over expenditure less levies = recoveries.
    b. Over expenditure cost sharing by second developer is:

$$\text{Over expenditure (1" dev.)} \times \frac{\text{Area (dev. 2)}}{\text{Area (dev. 2) + Area (dev. 1)}} = \text{Payment to dev. 1}$$

Recoveries of Developer 2 Similar as recoveries to Stage 1. The third method mentioned above, the A/A+B method, seems to be the fairest and allows for orderly development by all developers. This process can be more difficult to manage.

4. The fourth method is a custom developer to developer agreements where the interested parties negotiate amongst each other to determine recovery timing and which party(s) upfront the infrastructure.

7.3 Levy Collection Timing

Levy payments for onsite infrastructure should be collected at the time of development agreement or development permit once the extent of required leviable construction has been determined and costs are estimated but before the construction has been initiated. Based on the over-expenditure recovery plan outlined above, the developer is given credit against his levy payment for the estimated cost of the leviable construction he is required to do as part of his servicing agreement. This minimizes the size of the over-expenditures. Final over expenditures are then recalculated based on actual as-built costs after construction completion. By collecting levies at approximately the same time as the construction is performed the levy amount will be more accurate and the City will not be responsible for unforeseen shortfalls at a later date. Levies should be recalculated based on inflation and as-built costs on an annual basis.

8.0 Conclusions and Recommendations

8.1 Conclusions

The following can be concluded with respect to contribution cost allocation:

- Transportation projects 1 to 6 are to be cost shared based on a per-area-basis between the landowners of Areas 1, 2, 3, 4, 5 and 6 as the infrastructure benefits all parties.
- Water infrastructure project 7A is to be cost shared based on a per-area basis between the landowners of Areas 1, 2, 4, 5 and 6. The additional oversizing cost for increasing the pipe infrastructure from a 300mm watermain to a 600mm watermain would be recovered through an offsite levy.
- Water infrastructure project 7 is to be cost shared equally between the landowners of Areas 4 and 5. The additional oversizing cost for increasing the pipe infrastructure from a 300mm watermain to a 600mm watermain would be recovered through an offsite levy.
- Water infrastructure project 8 is to be allocated to area 5 for the 300mm watermain base cost. The additional oversizing cost for increasing the pipe infrastructure from a 300mm watermain to a 600mm watermain would be recovered through an offsite levy.
- Project 8A –The proposed 300 mm watermain along Highway 26 at a cost of $355,200 will be cost shared equally between Area 1 and Area 4.
- Sanitary project 9 is to be cost shared based on a per-area basis between the landowners of Areas 1 and 2 as the infrastructure provides benefits to only these parties.
- Sanitary project 10 is to be cost shared based on a per-area basis between the landowners of Areas 1, 2, and 5 as the infrastructure benefits only these parties.
- Sanitary projects 11 and 11A are to be cost shared based on a per-area basis between the landowners of Areas 1, 2, 4, and 5 as the infrastructure benefits all parties.
- The cost of storm project 12 will be the responsibility of the landowner of Area 1 as Area 1 contributes storm flows to this sewer.
- Storm projects 14 and 14A are to be cost shared based on a per-area basis between the landowners of Areas 1 and 2 as the infrastructure benefits only these parties.
- Storm projects 15 and 16 will mainly be the responsibility of landowners for Area 4 and 5 respectively. Depending on the roadway contribution of storm runoff, other landowners within the Plan Area may contribute a small portion towards the cost of these projects.
- SWMF projects 17 and 18 will mainly be the responsibility of landowners for Area 4 and 5 respectively. Depending on the roadway contribution of storm runoff, other landowners within the Plan Area may contribute a small portion towards the cost of these projects.
- A $500 /ha Project 19 contribution cost will be collected from Areas 1, 2, 3, 4, 5 and 6, identified on Figure 3.0 to improve aesthetics along the development entrance at Highway 13 and Highway 26.
- The $89,980 required for Project 20 to complete the East Gateway Area Structure Plan, Traffic Impact Assessment, Contribution Plan and Wetland Desktop Review will be collected from Area 1, 2, 3, 4, and 5.

A summary of the total costs of the above projects broken down by infrastructure type and by land parcel is shown in Table 8.1 and Table 8.2.

Table 8.1: Summary of Total Cost by Infrastructure Type and Land Parcel

Project	Land Parcel	Net Assessable Development Area (ha)	Cost Contribution	Off-Site Levy Amount	Project Total Cost
Transportation Projects (1, 2, 3, 4, 5, 6)		**236.1**			**$20,577,794**
	1	60.4	$5,268,739		
	2	61.9	$5,396,834		
	3	7.3	$636,379		
	4	43.4	$3,785,836		
	5	60.0	$5,232,186		
	6	3.0	$257,821		
Watermain Projects (7, 7A, 8)		**236.1**		**$2,222,987**	**$1,870,629**
	1	60.4	$308,090		
	2	61.9	$133,662		
	3	7.3	$15,761		
	4	43.4	$618,633		
	5	60.0	$788,098		
	6	3.0	$6,385		
Sanitary Projects (9, 10, 11, 11A)		**225.8**			**$6,175,582**
	1	60.4	$1,791,005		
	2	61.9	$1,830,060		
	4	43.4	$960,121		
	5	60.0	$1,594,397		
Storm Projects (12, 13, 14, 14A, 15, 16)		**236.1**			**$3,682,067**
	1	60.4	$1,447,704		
	2	61.9	$866,479		
	3	7.3	$2,832		
	4	43.4	$444,232		
	5	60.0	$919,672		
	6	3.0	$1,147		
SWMF Projects (17, 18)		**236.1**			**$7,060,000**
	1	60.4	$137,751		
	2	61.9	$141,101		
	3	7.3	$16,638		
	4	43.4	$3,316,331		
	5	60.0	$3,441,438		
	6	3.0	$6,741		
Miscellaneous Projects (19, 20)		**236.1**			**$243,413**
	1	60.4	$62,324		
	2	61.9	$63,839		
	3	7.3	$7,528		
	4	43.4	$44,782		
	5	60.0	$61,891		
	6	3.0	$3,050		

Table 8.2: Summary of Contribution Cost per Land Parcel

Land Parcel	Net Assessable Development Area (ha)	Net Assessable Development Area (acre)	Contribution Cost	Contribution Cost/ha	Contribution Cost/acre	Off-site Levy Amount
1	60.4	149.3	$9,015,612	$149,170	$60,367	
2	61.9	153.0	$8,431,974	$136,202	$55,119	
3	7.3	18.0	$679,139	$93,033	$37,649	
4	43.4	107.3	$9,169,934	$211,153	$85,451	
5	60.0	148.3	$12,039,682	$200,564	$81,165	
6	3.0	7.3	$275,144	$93,033	$37,649	
Total	**236.1**	**583.3**	**$39,609,485**	**$167,801**	**$67,907**	**$2,222,987**

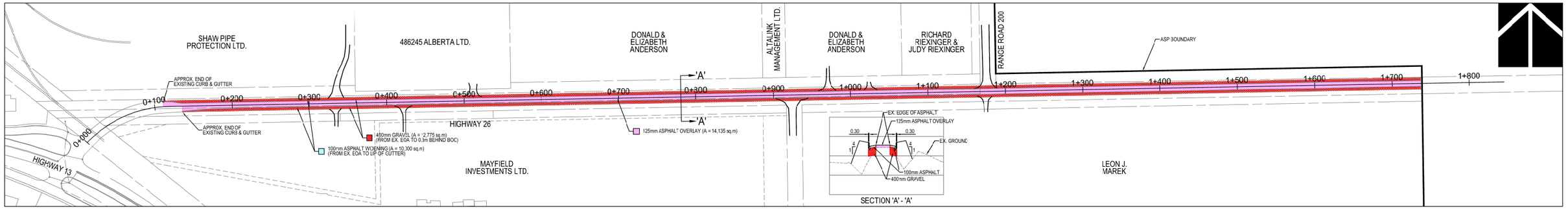
8.2 Recommendations

As the required transportation, water, sanitary and storm infrastructure is fairly extensive for the Plan Area, it is recommended that the infrastructure be staged where ever possible to defer construction costs.

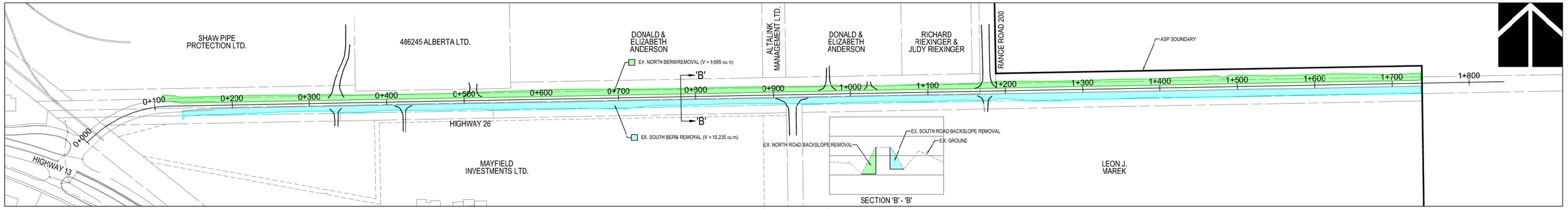
It is recommended that the contribution plan costs and items be updated as storm, water, sanitary and transportation master plans are updated.

Appendix A

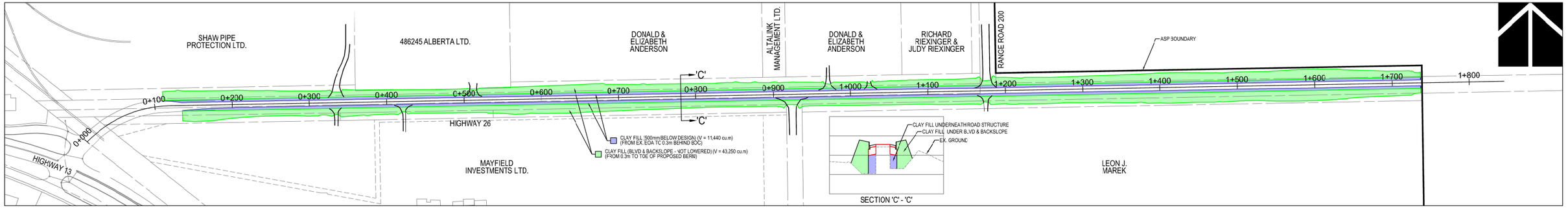
Highway 26 Summary Plan



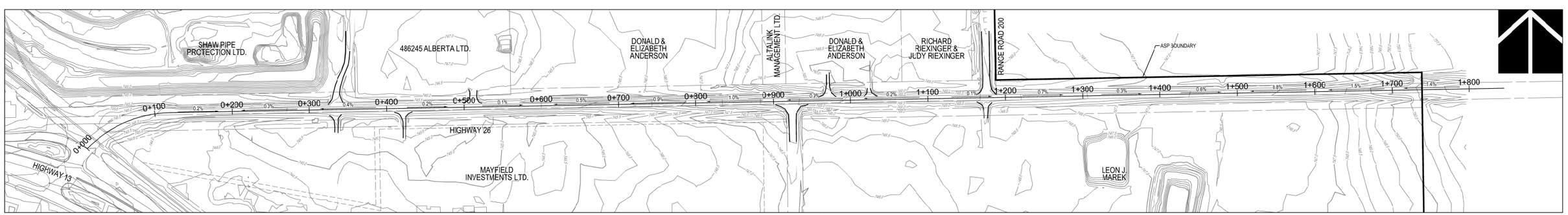
ASPHALT & GRAVEL AREAS



REMOVAL AREAS



CLAY FILL AREAS



EXISTING GROUND CONTOURS

NOTE:
15% SHRINKAGE APPLIED

No.	DESCRIPTION	BY	DATE
######	#########	#######	#########
######	#########	#######	#########
######	#########	#######	#########
######	#########	#######	#########
######	#########	#######	#########
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REVISIONS

HORZ 1:2500 0 25 50 75 100m

Scale

ISL Engineering and Land Services

CITY OF CAMROSE

CAMROSE EAST GATEWAY CONTRIBUTION PLAN

Drawn: ELT	Design Checked: SN	Date: --
Designed: ELT	Discipline Review: SN	Date: --

REHABILITATION PLAN
HIGHWAY 26

Drawing No.
14579 REHAB 01

Sheet No.
1

Eric Tan / Apr. 15, 16 / J:\14500\14579_Camrose_East_Gateway_ASP\02_CAD\21_Models\210_C3D\Surface\Design\160414\Highway 26\Highway 26 Cut Fill Summary.dwg

Appendix B

Detail Cost Estimates

ISL Engineering and Land Services

Camrose East Gateway - Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project 3: Highway 26					
Part 1: Storm Sewer Mains					
1.01	Storm including pipe, manholes, catchbasins, frame and covers, cb leads etc.	$950.00	m	1,600	$1,520,000.00
			Part 1: Storm Sewer Mains		**$1,520,000.00**
				Cost/m	$950.00
Part 2: Earthworks and Removals					
2.01	Excavate existing road backslope (marginal) and truck off-site	$20.00	m^3	19,930	$398,600.00
2.02	Common import (Supply, place and compact)	$13.16	m^3	54,690	$719,720.40
2.03	Milling for Key-in (0.5m wide by 100mm deep)	$17.06	m	3,200	$54,592.00
2.04	Milling 0-50mm deep	$30,000.00	PC Sum	1	$30,000.00
2.05	Strip topsoil and place in stockpile (assumed 300mm)	$4.29	m^3	14,630	$62,762.70
2.06	Remove existing culverts and dispose	$20,000.00	L. Sum	1	$20,000.00
			Part 2: Earthworks and Removals		**$1,285,675.10**
				Cost/m	$803.55
Part 3: Concrete and Asphalt Roadway Structure					
3.01	125mm Asphalt Overlay	$39.15	m^2	14,135	$553,385.25
3.02	100mm Asphalt Pavement (ACO)	$31.35	m^2	10,000	$313,500.00
3.03	400mm - 20mm Crushed granular base c/w prime coat (300mm behind curb)	$43.50	m^2	12,775	$555,712.50
3.04	300mm Cement stabilization subgrade prep. Including 25 kg/sq.m	$16.50	m^2	12,775	$210,787.50
3.05	3.0m Asphalt trail c/w granular base	$300.00	m	1,600	$480,000.00
3.06	Wick drain c/w CB Connections	$2.25	m	3,200	$7,200.00
3.07	200mm Straight face curb with a 250mm gutter	$85.00	m	3,200	$272,000.00
3.08	Asphalt fills on existing roadway to accommodate 0.5% lip of gutter	$120.00	tonne	945	$113,400.00
			Part 3: Concrete and Asphalt Roadway Structure		**$2,505,985.25**
				Cost/m	$1,566.24
Part 4: Pavement Markings and Signage					
4.01	100mm Solid Yellow Lane Line (Inlaid Thermoplastic) at FAC	$24.22	m	1,600	$38,752.00
4.02	Signage	$20,000.00	PC Sum	1	$20,000.00
			Part 4: Pavement Markings and Signage		**$58,752.00**
				Cost/m	$36.72

ISL Engineering and Land Services

Camrose East Gateway - Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Part 5: Landscaping					
5.01	200mm Topsoil and seed	$7.00	m^2	32,855	$229,985.00
5.02	Landscape maintenance	$34,123.88	year	2	$68,247.75
5.03	Estimated trees (both sides)	$625.00	each	360	$225,000.00
			Part 5: Landscaping		**$523,232.75**
				Cost/m	$327.02
Part 6: Miscellaneous					
6.01	Traffic Accommodation	$50,000.00	P.C. Sum	1	$50,000.00
6.02	Additional subgrade cement (provisional)	$275.00	tonne	100	$27,500.00
6.03	Hydrovac	$20,000.00	PC Sum	1	$20,000.00
6.04	Misc. utility relocates	$30,000.00	PC Sum	1	$30,000.00
6.05	Connect existing access	$3,000.00	each	6	$18,000.00
			Part 6: Miscellaneous		**$145,500.00**
				Cost/m	$90.94
Part 7: Power					
7.01	Underground power	$150.00	m	1,600	$240,000.00
7.02	Street lights (40m spacing/one side of street)	$5,500.00	each	40	$220,000.00
7.03	Remove overhead power (budget)	$100,000.00	L.Sum	1	$100,000.00
			Part 7: Power		**$560,000.00**
				Cost/m	$350.00

ISL Engineering and Land Services

Camrose East Gateway - Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount

Cost Summary - Project 3

Part 1: Storm Sewer Mains		$1,520,000.00
Part 2: Earthworks and Removals		$1,285,675.10
Part 3: Concrete and Asphalt Roadway Structure		$2,505,985.25
Part 4: Pavement Markings and Signage		$58,752.00
Part 5: Landscaping		$523,232.75
Part 6: Miscellaneous		$145,500.00
Part 7: Power		$560,000.00
	Project 3 Subtotal:	$6,599,145.10
	Cost/m	$4,124.47
	Engineering (15%)	$989,871.77
	Contingency (15%)	$989,871.77
	Project 3 Total:	$8,578,888.63
	Cost/m	$5,361.81

ISL Engineering and Land Services

Camrose East Gateway - Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project 4: Highway 26 / Range Road 200 Roundabout					
Part 1: Roundabout					
1.01	Roundabout at Range Road 200 Intersection	$450,000.00	L.Sum	1	$450,000.00
				Part 1: Roundabout	**$450,000.00**
				Cost/m	$281.25

Cost Summary - Project 4

Part 1: Roundabout	$450,000.00
Project 4 Subtotal	$450,000.00
Engineering (15%)	$67,500.00
Contingency (15%)	$67,500.00
Project 4 Total	$585,000.00

ISL Engineering and Land Services

Camrose East Gateway - Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project 5: Exhibition Drive					
Part 1: Storm Sewer Mains					
1.01	Storm including pipe, manholes, catchbasins, frame and covers, cb leads etc.	$800.00	m	930	$744,000.00
1.02	Offsite from road edge to pond	$950.00	m	100	$95,000.00
			Part 1: Storm Sewer Mains		**$839,000.00**
				Cost/m	$902.15
Part 2: Earthworks					
2.01	Common import (Supply, place and compact)	$6.50	m^3	46,265	$300,722.50
			Part 2: Earthworks		**$300,722.50**
				Cost/m	$323.36
Part 3: Concrete and Asphalt Roadway Structure					
3.01	100mm Asphalt Pavement (ACO)	$31.35	m^2	12,050	$377,767.50
3.02	400mm - 20mm Crushed granular base c/w prime coat (300mm behind curb)	$43.50	m^2	13,440	$584,640.00
3.03	300mm Cement stabilization subgrade prep. Including 25 kg/sq.m	$16.50	m^2	13,440	$221,760.00
3.04	3.0m Asphalt trail c/w granular base	$300.00	m	930	$279,000.00
3.05	Wick drain c/w CB Connections	$2.25	m	1,860	$4,185.00
3.06	200mm Straight face curb with a 250mm gutter	$85.00	m	1,860	$158,100.00
			Part 3: Concrete and Asphalt Roadway Structure		**$1,625,452.50**
				Cost/m	$1,747.80
Part 4: Pavement Markings					
4.01	100mm Solid Yellow Lane Line (Inlaid Thermoplastic) at FAC	$24.22	m	930	$22,524.60
4.02	Signage	$20,000.00	PC Sum	1	$20,000.00
			Part 4: Pavement Markings		**$42,524.60**
				Cost/m	$45.73
Part 5: Landscaping					
5.01	200mm Topsoil and seed	$7.00	m^2	21,775	$152,425.00
5.02	Boulevard landscape maintenance	$21,275.63	year	2	$42,551.25
5.03	Estimated trees (both sides)	$625.00	each	210	$131,250.00
			Part 5: Landscaping		**$326,226.25**
				Cost/m	$350.78
Part 6: Power					
6.01	Underground power	$150.00	m	930	$139,500.00
6.02	Street lights (40m spacing/one side of street)	$5,500.00	each	24	$132,000.00
			Part 6: Power		**$271,500.00**
				Cost/m	$291.94

ISL Engineering and Land Services

Camrose East Gateway - Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount

Cost Summary - Project 5

Part 1: Storm Sewer Mains		$839,000.00
Part 2: Earthworks		$300,722.50
Part 3: Concrete and Asphalt Roadway Structure		$1,625,452.50
Part 4: Pavement Markings		$42,524.60
Part 5: Landscaping		$326,226.25
Part 6: Power		$271,500.00
	Project 5 Subtotal	$3,405,425.85
	Cost/m	$3,661.75
	Engineering (15%)	$510,813.88
	Contingency (15%)	$510,813.88
	Project 5 Total	$4,427,053.61
	Cost/m	$4,760.27

ISL Engineering and Land Services

Camrose East Gateway - Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project 6: Range Road 200					
Part 1: Earthworks					
1.01	Excavate existing Range Road 200 road core and truck off-site	$20.00	m^3	32,450	$649,000.00
1.02	Common import (Supply, place and compact)	$9.25	m^3	37,320	$345,210.00
1.03	Clay berm adjacent to property line for asphalt trail	$9.25	m^3	24,840	$229,770.00
1.04	Strip topsoil and place in stockpile (assumed 300mm)	$4.29	m^3	9,385	$40,261.65
				Part 1: Earthworks	**$1,264,241.65**
				Cost/m	$790.15
Part 2: Asphalt Roadway Structure					
3.01	100mm Asphalt Pavement (ACO)	$31.35	m^2	15,795	$495,173.25
3.02	350mm - 20mm Crushed granular base c/w prime coat (300mm behind curb)	$38.00	m^2	18,820	$715,160.00
3.03	300mm Cement stabilization subgrade prep. Including 25 kg/sq.m	$16.50	m^2	18,820	$310,530.00
3.04	3.0m Asphalt trail c/w granular base	$300.00	m	1,600	$480,000.00
				Part 2: Asphalt Roadway Structure	**$2,000,863.25**
				Cost/m	$1,250.54
Part 3: Pavement Markings and Signage					
3.01	100mm Solid Yellow Lane Line (Inlaid Thermoplastic) at FAC	$24.22	m	1,600	$38,752.00
3.02	Signage	$20,000.00	PC Sum	1	$20,000.00
				Part 3: Pavement Markings and Signage	**$58,752.00**
				Cost/m	$36.72
Part 4: Landscaping					
4.01	200mm Topsoil and seed	$7.00	m^2	43,200	$302,400.00
4.02	Landscape maintenance	$22,680.00	year	2	$45,360.00
				Part 4: Landscaping	**$347,760.00**
				Cost/m	$217.35
Part 5: Miscellaneous					
5.01	Traffic Accommodation	$50,000.00	P.C. Sum	1	$50,000.00
5.02	Additional subgrade cement (provisional)	$275.00	tonne	100	$27,500.00
5.03	Hydrovac	$20,000.00	PC Sum	1	$20,000.00
5.04	Misc. utility relocates	$30,000.00	PC Sum	1	$30,000.00
				Part 5: Miscellaneous	**$127,500.00**
				Cost/m	$79.69
Part 6: Power					
6.01	Underground power	$150.00	m	1,600	$240,000.00
6.02	Street lights (40m spacing/one side of street)	$5,500.00	each	40	$220,000.00
				Part 6: Power	**$460,000.00**
				Cost/m	$287.50

ISL Engineering and Land Services

Camrose East Gateway - Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount

Cost Summary - Project 6

Part 1: Earthworks		$1,264,241.65
Part 2: Asphalt Roadway Structure		$2,000,863.25
Part 3: Pavement Markings and Signage		$58,752.00
Part 4: Landscaping		$347,760.00
Part 5: Miscellaneous		$127,500.00
Part 6: Power		$460,000.00
Project 6 Total		$4,259,116.90
Cost/m		$2,661.95
Engineering (15%)		$638,867.54
Contingency (15%)		$638,867.54
Project 6 Total		$5,536,851.97
Cost/m		$3,460.53

ISL Engineering and Land Services

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #7: Range Rd 200 From Highway 26 to CP Trail					
Part U1: Water Mains (Oversized-600mm)					
U-1.1	600mm Watermain, PVC C-900	$740.00	m	1287	$952,380.00
U-1.2	Supply and Install 600mm Valve	$38,900.00	each	10	$389,000.00
U-1.3	Fittings (5% of Cost)	$67,069.00	L. Sum	1	$67,069.00
				Part U1 - Water Sub-total	$1,408,449.00
				Cost/m	$1,094.37
				Engineering (15%)	$211,267.35
				Contingency (15%)	$211,267.35
				Project #7 Total	**$1,830,983.70**
				Cost/m	$1,422.68
Part U1: Water Mains (Without Oversizing-300mm)					
U-1.1	300mm Watermain, PVC C-900	$360.00	m	1287	$463,320.00
U-1.2	Supply and Install 300mm Valve	$4,550.00	each	10	$45,500.00
U-1.3	Fittings (5% of Cost)	$25,441.00	L. Sum	1	$25,441.00
				Part U1 - Water Sub-total	$534,261.00
				Cost/m	$415.12
				Engineering (15%)	$80,139.15
				Contingency (15%)	$80,139.15
				Project #7 Total	**$694,539.30**
				Cost/m	$539.66
				Cost of Oversizing	**$1,136,444.40**
Project #7A (Off-site Watermain): Highway 26 South of Property Line up to Tie-in Point					
Part U1: Water Mains (Oversized-600mm)					
U-1.1	600mm Watermain, PVC C-900	$740.00	m	364	$269,619.00
U-1.2	Supply and Install Watermain, Case bore with casing, spacers, end caps and anode	$2,880.00	m	100	$287,280.00
U-1.3	Supply and Install 600mm Valve	$38,900.00	each	5	$194,500.00
U-1.4	Fittings (5% of Cost)	$37,569.95	L. Sum	1	$37,569.95
				Part UA3 - Water Total	$788,968.95
				Cost/m	$2,165.41
				Engineering (15%)	$118,345.34
				Contingency (15%)	$118,345.34
				Project #7A Total	**$1,025,659.64**
				Cost/m	$2,815.04

ISL Engineering and Land Services

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Part U1: Water Mains (Without Oversizing-300mm)					
U-1.1	300mm Watermain, PVC C-900	$360.00	m	364	$131,166.00
U-1.2	300mm Watermain Directional Drill Under Hwy 13 & CP Rail	$2,200.00	m	100	$219,450.00
U-1.3	Supply and Install 300mm Valve	$4,550.00	each	5	$22,750.00
U-1.4	Fittings (5% of Cost)	$18,668.30	L. Sum	1	$18,668.30
				Part UA3 - Water Total	$392,034.30
				Cost/m	$1,075.98
				Engineering (15%)	$58,805.15
				Contingency (15%)	$58,805.15
				Project #7ATotal	**$509,644.59**
				Cost/m	$1,398.78
				Cost of Oversizing	**$516,015.05**

Project #8: Highway 26, East of Range Rd 200 and up to Property Line

Item No.	Description	Prices	Unit	Quantity	Amount
Part U1: Water Mains (Oversized-600mm)					
U-1.1	600mm Watermain, PVC C-900	$740.00	m	558	$412,587.00
U-1.2	Supply and Install 600mm Valve	$38,900.00	each	6	$233,400.00
U-1.3	Fittings and Valves (5% of Cost)	$32,299.35	L. Sum	1	$32,299.35
				Part U1 - Water Sub-total	$678,286.35
				Cost/m	$1,216.55
				Engineering (15%)	$101,742.95
				Contingency (15%)	$101,742.95
				Project #8 Total	**$881,772.26**
				Cost/m	$1,581.51
Part U1: Water Mains (Without Oversizing-300mm)					
U-1.1	300mm Watermain, PVC C-900	$360.00	m	558	$200,718.00
U-1.2	Supply and Install 300mm Valve	$4,550.00	each	6	$27,300.00
U-1.3	Fittings and Valves (5% of Cost)	$11,400.90	L. Sum	1	$11,400.90
				Part U1 - Water Sub-total	$239,418.90
				Cost/m	$429.41
				Engineering (15%)	$35,912.84
				Contingency (15%)	$35,912.84
				Project #8 Total	**$311,244.57**
				Cost/m	$558.24
				Cost of Oversizing	**$570,527.69**

ISL Engineering and Land Services

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #8A: Highway 26, West of Range Rd 200					
Part U1: WaterMains (300mm)					
U-1.1	300mm Watermain, PVC C-900	$360.00	m	647	$232,920.00
U-1.2	Supply and Install 300mm Valve	$4,550.00	each	6	$27,300.00
U-1.3	Fittings and Valves (5% of Cost)	$13,011.00	L. Sum	1	$13,011.00
				Part U1 - Water Sub-total	$273,231.00
				Cost/m	$422.30
				Engineering (15%)	$40,984.65
				Contingency (15%)	$40,984.65
				Project #8 Total	**$355,200.30**
				Cost/m	$549.00

Cost Summary

Project #7 (600mm)	$1,830,983.70
Project #7A (600mm)	$1,025,659.64
Project #8 (600mm)	$881,772.26
Water Main Projects Total	$3,738,416
Project #7 (300mm)	$694,539.30
Project #7A (300mm)	$509,644.59
Project #8 (300mm)	$311,244.57
Project #8A (300mm)	$355,200.30
Water Main Projects Total	$1,870,629
Total Cost of Oversizing	**$2,222,987.13**

ISL Engineering and Land Services

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #9: Area #1 Sanitary Along Exhibition Drive Extension (Range Rd 200)					
Part U1: Sanitary Sewer Mains (450mm)					
U-1.1	4.0 - 5.0m Deep (450mm Sanitary Pipe)	$400.00	m	315	$126,000.00
U-1.2	5.0 - 6.0m Deep (450mm Sanitary Pipe)	$480.00	m	401	$192,528.00
U-1.3	1200mm Sanitary Manhole, incl. bases	$1,705.00	vt m	6	$10,230.00
U-1.4	CCTV at CCC	$7.00	m	716	$5,012.70
U-1.5	CCTV at FAC	$10.00	m	716	$7,161.00
U-1.6	NF-80 Frame and Cover	$680.00	each	1	$680.00
U-1.7	Remove plug and connect to existing	$3,400.00	each	1	$3,400.00
				Part U1 - Sanitary Sub-total	$345,011.70
				Cost/m	$481.79
				Engineering (15%)	$51,751.76
				Contingency (15%)	$51,751.76
				Project #9 Total	**$448,515.21**
				Cost/m	$626.33
Part U2: Sanitary Sewer Mains (300mm)					
U-2.1	0.0 - 3.0m Deep (300mm Sanitary Pipe)	$195.00	m	315	$61,425.00
U-2.2	3.0 - 4.0m Deep (300mm Sanitary Pipe)	$210.00	m	401	$84,231.00
U-2.3	1200mm Sanitary Manhole, incl. bases	$1,705.00	vt m	6	$10,230.00
U-2.4	CCTV at CCC	$7.00	m	716	$5,012.70
U-2.5	CCTV at FAC	$10.00	m	716	$7,161.00
U-2.6	NF-80 Frame and Cover	$680.00	each	1	$680.00
U-2.7	Remove plug and connect to existing	$3,400.00	each	1	$3,400.00
				Part U2 - Sanitary Sub-total	$172,139.70
				Cost/m	$240.39
				Engineering (15%)	$25,820.96
				Contingency (15%)	$25,820.96
				Project #9 Total	**$223,781.61**
				Cost/m	$312.50
				Project 9 - Cost of Oversizing	**$224,733.60**

ISL Engineering and Land Services

Contribution Cost Estimate
City of Camrose

Project #10: Exhibition Drive Extension Between Highway 26 an CP Railway

Part U1: Sanitary Sewer Mains (525mm)

Item No.	Description	Prices	Unit	Quantity	Amount
U-1.1	6.0 - 7.0m Deep (525mm Sanitary Sewer Pipe)	$590.00	m	903	$532,770.00
U-1.2	1500mm Sanitary Manhole, incl. bases	$2,215.00	vt m	6	$13,290.00
U-1.3	CCTV at CCC	$7.00	m	903	$6,321.00
U-1.4	CCTV at FAC	$10.00	m	903	$9,030.00
U-1.5	NF-80 Frame and Cover	$680.00	each	1	$680.00
U-1.6	Remove plug and connect to existing	$3,400.00	each	1	$3,400.00
				Part U1 - Sanitary Sub-total	$565,491.00
				Cost/m	$626.24
				Engineering (15%)	$84,823.65
				Contingency (15%)	$84,823.65
				Project #10 Total	**$735,138.30**
				Cost/m	$814.11

Part U2: Sanitary Sewer Mains (300mm)

U-2.1	0.0 - 3.0m Deep (300mm Sanitary Pipe)	$195.00	m	903	$176,085.00
U-2.2	1200mm Sanitary Manhole, incl. bases	$1,705.00	vt m	6	$10,230.00
U-2.3	CCTV at CCC	$7.00	m	903	$6,321.00
U-2.4	CCTV at FAC	$10.00	m	903	$9,030.00
U-2.5	NF-80 Frame and Cover	$680.00	each	1	$680.00
U-2.6	Remove plug and connect to existing	$3,400.00	each	1	$3,400.00
				Part U2 - Sanitary Sub-total	$205,746.00
				Cost/m	$227.85
				Engineering (15%)	$30,861.90
				Contingency (15%)	$30,861.90
				Project #10 Total	**$267,469.80**
				Cost/m	$296.20

Project 10 - Cost of Oversizing **$467,668.50**

ISL Engineering and Land Services

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #11: Sanitary Storage Pipe					
Part U1: Sanitary Sewer Mains (1800mm)					
U-1.1	6.0 - 7.0m Deep (1800mm Concrete Pipe, Class 4)	$2,050.00	m	1,335	$2,735,827.50
U-1.2	3000mm Sanitary Manhole, incl. bases	$5,000.00	vt m	18	$90,000.00
U-1.3	2400mmx2400m Box Manhole, incl. bases	$6,000.00	vt m	32	$192,000.00
U-1.4	CCTV at CCC	$7.00	m	1,335	$9,341.85
U-1.5	CCTV at FAC	$10.00	m	1,335	$13,345.50
U-1.6	Remove plug and connect to existing	$3,400.00	each	1	$3,400.00
U-1.6	Real Time Control (RTC)	$300,000.00	each	1	$300,000.00
				Part U1 - Sanitary Sub-total	$3,343,914.85
				Cost/m	$2,505.65
				Engineering (15%)	$501,587.23
				Contingency (15%)	$501,587.23
				Project #11 Total	**$4,347,089.31**
				Cost/m	$3,257.34
Project #11A: Offsite Sanitary					
Part U1: Sanitary Sewer Mains (600mm)					
U-1.1	600mm Sanitary c/w case bore with 750mm steel casing, spacers, end caps and anode protection	$2,600.00	m	181	$469,560.00
U-1.2	CCTV at CCC	$7.00	m	181	$1,264.20
U-1.3	CCTV at FAC	$10.00	m	181	$1,806.00
U-1.4	Remove plug and connect to existing	$3,400.00	each	1	$3,400.00
U-1.5	Tie-in to existing manhole, incl. rehab	$20,000.00	L. Sum	1	$20,000.00
				Part U1 - Sanitary Sub-total	$496,030.20
				Cost/m	2746.568106
				Engineering (15%)	$74,404.53
				Contingency (15%)	$74,404.53
				Project #11A Total	**$644,839.26**
				Cost/m	$3,570.54

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ISL Engineeringg and Land Servicesses

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #12: Area 1					
Part U1: Storm Sewer Mains					
U-1.1	3.0 - 4.0m Deep (600mm Concrete Pipe, Class 2)	$415.00	m	605	$251,075.00
U-1.2	1200mm Manholes, incl. bases	$1,930.00	vt m	12	$23,160.00
U-1.3	1500mm Manholes, incl. bases	$2,062.00	vt m	8	$16,496.00
U-1.4	CCTV at CCC	$7.00	m	605	$4,235.00
U-1.5	CCTV at FAC	$10.00	m	605	$6,050.00
U-1.6	NF-80 Frame and Cover	$680.00	each	5	$3,400.00
U-1.7	Outlet Control Structure	$150,000.00	each	1	$150,000.00
U-1.8	600mm Flared End c/w grate, sediment trap/sump, riprap and geotextile	$8,500.00	each	1	$8,500.00
				Part U1 - Storm Sub-total	$462,916.00
				Cost/m	$765.15
				Engineering (15%)	$69,437.40
				Contingency (15%)	$69,437.40
				Project #12 Total	**$601,790.80**
				Cost/m	$994.70
Project #13: Areas 1&2					
Part U1: Storm Sewer Mains					
U-1.1	3.0 - 4.0m Deep (750mm Concrete Pipe, Class 2)	$460.00	m	509	$234,140.00
U-1.2	1500mm Manholes, incl. bases	$2,062.00	vt m	20	$41,240.00
U-1.3	CCTV at CCC	$7.00	m	509	$3,563.00
U-1.4	CCTV at FAC	$10.00	m	509	$5,090.00
U-1.5	NF-80 Frame and Cover	$680.00	each	5	$3,400.00
U-1.6	Outlet Control Structure	$150,000.00	each	1	$150,000.00
				Part U1 - Storm Sub-total	$437,433.00
				Cost/m	$859.40
				Engineering (15%)	$65,614.95
				Contingency (15%)	$65,614.95
				Project #13 Total	**$568,662.90**
				Cost/m	$1,117.22

ISL Engineeringg and Land Servicesses

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #14: Areas 1, 2, & 3 (On-site)					
Part U1: Storm Sewer Mains					
U-1.1	3.0 - 4.0m Deep (900mm Concrete Pipe, Class 2)	$645.00	m	401	$258,645.00
U-1.2	1800mm Manholes incl. basis	$2,550.00	vt m	20	$51,000.00
U-1.3	CCTV at CCC	$7.00	m	401	$2,807.00
U-1.4	CCTV at FAC	$10.00	m	401	$4,010.00
U-1.5	Outlet Control Structure	$150,000.00	each	1	$150,000.00
U-1.6	NF-80 Frame and Cover	$680.00	each	5	$3,400.00
				Part U1 - Storm Sub-total	$469,862.00
				Cost/m	$1,171.73
				Engineering (15%)	$70,479.30
				Contingency (15%)	$70,479.30
				Project #14 Total	**$610,820.60**
				Cost/m	$1,523.24
Project #14A: Areas 1, 2, & 3 (Off-site)					
Part U1: Storm Sewer Mains					
U-1.1	3.0 - 4.0m Deep (900mm Concrete Pipe, Class 2)	$645.00	m	142	$91,590.00
U-1.2	900mm Sanitary c/w case bore with 1050mm steel casing, spacers, end caps and anode protection	$3,900.00	m	63	$245,700.00
U-1.3	1800mm Manholes incl. basis	$2,550.00	vt m	12	$30,600.00
U-1.4	CCTV at CCC	$7.00	m	205	$1,435.00
U-1.5	CCTV at FAC	$10.00	m	205	$2,050.00
U-1.6	NF-80 Frame and Cover	$680.00	each	3	$2,040.00
				Part U1 - Storm Sub-total	$373,415.00
				Cost/m	$1,821.54
				Engineering (15%)	$56,012.25
				Contingency (15%)	$56,012.25
				Project #14A Total	**$485,439.50**
				Cost/m	$2,368.00

ISL Engineeringg and Land Servicesses

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #15: Area 4					
Part U1: Storm Sewer Mains					
U-1.1	4.0 - 5.0m Deep (600mm Concrete Pipe, Class 2)	$470.00	m	58	$27,260.00
U-1.2	750mm Storm c/w case bore with 900mm steel casing, spacers, end caps and anode protection	$2,660.00	m	63	$167,580.00
U-1.3	1500mm Manholes, incl. bases	$2,062.00	vt m	10	$20,620.00
U-1.4	CCTV at CCC	$7.00	m	121	$847.00
U-1.5	CCTV at FAC	$10.00	m	121	$1,210.00
U-1.6	Outlet Control Structure	$150,000.00	each	1	$150,000.00
U-1.7	NF-80 Frame and Cover	$680.00	each	2	$1,360.00
				Part U1 - Storm Sub-total	$368,877.00
				Cost/m	$3,048.57
				Engineering (15%)	$55,331.55
				Contingency (15%)	$55,331.55
				Project #15 Total	**$479,540.10**
				Cost/m	$3,963.14
Project #16: Area 5					
Part U1: Storm Sewer Mains					
U-1.1	4.0 - 5.0m Deep (750mm Concrete Pipe, Class 2)	$600.00	m	510	$306,000.00
U-1.2	750mm Storm c/w case bore with 900mm steel casing, spacers, end caps and anode protection	$3,325.00	m	63	$209,475.00
U-1.3	1500mm Manholes, incl. bases	$2,062.00	vt m	20	$41,240.00
U-1.4	CCTV at CCC	$7.00	m	573	$4,011.00
U-1.5	CCTV at FAC	$10.00	m	573	$5,730.00
U-1.6	Outlet Control Structure	$150,000.00	each	1	$150,000.00
U-1.7	NF-80 Frame and Cover	$680.00	each	5	$3,400.00
				Part U1 - Storm Sub-total	$719,856.00
				Cost/m	$1,256.29
				Engineering (15%)	$107,978.40
				Contingency (15%)	$107,978.40
				Project #16 Total	**$935,812.80**
				Cost/m	$1,633.18

ISL Engineeringg and Land Servicesses

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount

Cost Summary

Project #12: Area 1	$601,790.80
Project #13: Areas 1&2	$568,662.90
Project #14: Areas 1, 2, & 3 (On-site)	$610,820.60
Project #14A: Areas 1, 2, & 3 (Off-site)	$485,439.50
Project #15: Area 4	$479,540.10
Project #16: Area 5	$935,812.80
Storm Projects Total	$3,682,067
Cost/m	$1,525.30

ISL Engineeringg and Land Servicesses

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #17: Area4 SWMF					
Part S1: SWMF					
S-1.1	Pond Construction, incl. Earthworks, Ramp, and Landscaping (servicing 76.4ha of land, incl. Engineering costs and Contingency)	$3,610,000.00	sq m	1	$3,610,000.00
			Project #17 - Total		**$3,610,000.00**
Project #18: Area5 SWMF					
Part S1: SWMF					
S-1.1	Pond Construction, incl. Earthworks, Ramp, and Landscaping (servicing 72.9ha of land, incl. Engineering costs and Contingency)	$3,450,000.00	sq m	1	$3,450,000.00
			Project #18 - Total		**$3,450,000.00**

Cost Summary

Project #17: Area4 SWMF	$3,610,000.00
Project #18: Area5 SWMF	$3,450,000.00
Storm Projects Total	$7,060,000

ISL Engineeringg and Land Servicesses

Contribution Cost Estimate
City of Camrose

Item No.	Description	Prices	Unit	Quantity	Amount
Project #19: HW 13 and HW 26 improvements					
Part LA1: Landscaping					
LA-1.1	HW 13 and HW 26 entrance and aesthetics improvements	$500.00	ha	236	$118,025.50
				Part LA1 - Total	$118,025.50
				Engineering (15%)	$17,703.83
				Contingency (15%)	$17,703.83
				Project #19 Total	**$153,433.15**
Project #20: Reports					
Part R1: Reports					
R-1.1	Reports (ASP, TIA, Contribution Report, and Desktop Wetland Study)	$89,980.00	L. Sum	1	$89,980.00
				Project #20 Total	**$89,980.00**

Cost Summary

Project #19: HW 13 and HW 26 improvements	$153,433.15
Project #20: Reports	$89,980.00
Miscellaneous Projects Total	$243,413

Sanitary Sanitary System Design Flow Calculations

Project #	FROM NODE	TO NODE	LAND USE	INDUSTRIAL AREA		AVG. FLOW (IND)	PEAK FACTOR (COM.)	I & I (L/s)	DESIGN FLOW	CAP.	0.86% CAP.	Percentage Full	VEL.	NOMINAL DIA.	LENGTH	SLOPE
				ADDED	TOTAL											
				Ha	Ha	(L/s)			L/s	L/s	L/s		m/s	(mm)	(m)	(%)
	S6	S5	IND	66.50	66.50	16.63	2.00	18.62	51.9	67.9	58.4	88.8%	0.61	375	440	0.15%
9	S5	S4	IND	43.83	110.37	27.59	2.00	30.90	86.1	106.7	91.7	93.8%	0.67	450	682	0.14%
10	S3	S3	IND	67.63	177.96	45.81	2.00	51.30	142.9	177.3	152.5	93.7%	0.82	525	860	0.16%

Design Flow Criteria (City of Camrose Engineering Standards except where noted):

Industrial Avg. Gen. Rate (L/s/ha) = 0.24

Industrial Peaking Factor = 2.0

Industrial Infiltration Allowance (L/s/ha)= 0.28

ISL Engineering and Land Services

Contribution Cost Estimate
City of Camrose

Sanitary System Cover Calculations

Project #	FROM NODE	TO NODE	NOMINAL DIA. (mm)	LENGTH (m)	SLOPE (%)	Upstream Rim Elevation (m)	Downstream Rim Elevation (m)	Upstream Invert Elevation (m)	Downstream Invert Elevation (m)	Upstream Cover (m)	Downstream Cover (m)
	S6	S5	375.00	440.00	0.15%	746.5	747.8	743.27	742.61	2.9	4.8
9	S5	S4	450.00	682.00	0.14%	747.8	748.6	742.50	741.55	4.8	6.6
10	S4	S3	525.00	860.00	0.16%	748.6	746.9	741.44	740.07	6.6	6.3
11	S3	S2	1800.00	703.00	0.10%	746.9	745.2	740.01	739.30	5.1	4.0
11A	S2	S1 (Existing)	600.00	172.00	0.10%	745.2	744.2	739.24	739.07	5.3	4.5

ISL Engineeringg and Land Serviceses

Contribution Cost Estimate
City of Camrose

n = 0.013

Storm Sizing

Area #	Project #	Land Use	Area (ha)	Total Area (ha)	C	A x C (ha)	Sum A x C (ha)	Design q (L/s)	Capacity Q (L/s)	q/Q	Vel (m/s)	Dia (mm)	Length (m)	Slope (%)	Time of Flow (min)
1	13	Industrial	65.87	65.87	0.70	46.11	46.11	329.4	347.3	94.8	1.23	600	605.00	0.32%	8.21
1 &2	14	Industrial	66.49	132.36	0.70	46.54	92.65	661.8	704.1	94.0	1.59	750	509.00	0.40%	5.32
1 &2&3	15	Industrial	51.72	184.08	0.70	36.20	128.86	920.4	991.5	92.8	1.56	900	402.00	0.30%	4.30
4	16	Industrial	57.10	57.10	0.70	39.97	86.08	285.5	307.0	93.0	1.09	600	121.00	0.25%	1.86
5	17	Industrial	70.28	70.28	0.70	49.20	141.85	351.4	401.4	87.5	0.91	750	573.00	0.13%	10.51

Notes:
-System designed to discharge at Predevelopment flow rate of 5 L/s/ha

Appendix D

Historical Resources Act Clearance Letter

Alberta Culture and Tourism

Heritage Division
Old St. Stephen's College
8820 – 112 Street
Edmonton, Alberta T6G 2P8
Canada
Telephone: 780-431-2300
www.alberta.ca

Via e-mail: fkarl@camrose.ca

February 16, 2016

HRM Project File: 4835-15-0154
OPaC HR Appl: 008017275

Francisca Karl
City of Camrose
5204 - 50 Avenue
Camrose AB
T4V 0S8

Dear Ms Karl:

SUBJECT: *HISTORICAL RESOURCES ACT* REQUIREMENTS 4835-15-0154-001
CITY OF CAMROSE
CITY OF CAMROSE EAST GATEWAY ASP
AREA STRUCTURE PLAN / OUTLINE PLAN
SECTIONS 35 & 36, TOWNSHIP 46, RANGE 20, W4M
SECTION 1 , TOWNSHIP 47, RANGE 20, W4M

Thank you for providing the Historic Resources Management Branch (HRMB) of Alberta Culture and Tourism with project information for the City of Camrose's City of Camrose East Gateway ASP (Project).

Listing of Historic Resources

The HRMB has confirmed that lands included within the Project area are not listed within the *Listing of Historic Resources*.

Historic Resources Potential Evaluation

Historic Structures Potential: The proposed development area contains unrecorded historic structures that may have potential heritage significance within SE 1-47-20-W4M, NW 36-46-20-W4M and NE 35-46-20-W4M. These structures may require documentation prior to impacts from subdivision development.

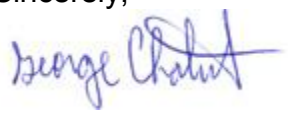
In view of the above evaluation, any ground-disturbing developments that occur in in SE 1-47-20-W4M, NW 36-46-20-W4M and/or NE 35-46-20-W4M within the Project area are to be reviewed by the HRMB. A Historic Resources Impact Assessment (HRIA) may be required. These proposed developments will require an application for *Historical Resources Act* clearance, which must be made through Alberta Culture and Tourism's On-line Permitting and Clearance (OPaC) system:

http://www.culture.alberta.ca/heritage/resourcemanagement/archaeologyhistory/researchpermitmanagementsystem/OPaC.aspx

Should you require additional information or have any questions concerning these requirements, please contact George Chalut (Land Use Planner) at 780-431-2329 (toll-free 310-0000) or george.chalut@gov.ab.ca .

I would like to thank representatives of the City of Camrose for their cooperation in our endeavour to conserve the Province's historic resources.

Sincerely,



George Chalut
Land Use Planner
Land Use Planning Section

Appendix E

Engagement Plan

East Gateway Area Structure Plan – Engagement Plan

Introduction

The intention of the East Gateway Area Structure Plan (ASP) is to provide a land use and servicing strategy, and prepare a Traffic Impact Assessment and Contributions Plan. The overall goal of the ASP is to guide the development of a coordinated and self-sufficient industrial park that is founded on progressive and sustainable planning principles that will positively contribute to the social and economic composition of Camrose.

The following Engagement Plan for the East Gateway ASP has been designed to provide an opportunity for information exchange with Council, administration, key referral agencies, landowners and the general public throughout the project. The Engagement Plan identifies the types and timing of activities planned to inform and engage Council, administration, key referral agencies, landowners and the general public.

Methodology

We propose using the following engagement activities and techniques:

Phase 1

Two **focus groups** will be held on November 26, 2015 with: 1) stakeholders and 2) landowners, to introduce the project goals and objectives, establish a vision for the plan area and discuss land use and development opportunities and constraints. Stakeholders and landowners will receive an invitation to attend the focus group session one week prior to the meeting. ISL will provide text for the invitation while the City will send out the invitations.

Phase 2

Email updates will be sent to stakeholders and landowners to share relevant project information and gather feedback on the draft Development Concept. ISL will provide text for the email and the City will send out the information.

Phase 3

A **Public Open House** (January 25, 2016) will be held to present and gather feedback on the draft ASP, Traffic Impact Assessment and Contributions Plan. The open house will be an informal drop-in session and will feature static displays. Comment forms will be used to gather feedback and project team members will be available to provide information and answer questions. ISL will provide text for the invitation and ads while the City will send out the invitations.

The public open house will be advertised for two weeks prior to the information session through the City's website, event calendar, Facebook and Twitter accounts. ISL will provide text for the information while the City will upload and send out the information.

The planning of the open house and the preparation of all presentation materials will be the responsibility of the project consulting team. We will develop all materials to publicize the session, develop session materials, and arrange/host the event. Information and materials from the public open house will be made available online for those who are unable to attend the session in-person. All session materials will be provided to the City for review and approval prior to distribution.

Following the completion of each phase, an **engagement summary** will be developed that describes the feedback received and will be shared with the City.

Action Plan

Phase	Task	Description	Schedule
1	Invitations for Stakeholder/Landowner Focus Groups	• Prepare invitation letter. City to Mail/email invitation to stakeholders/landowners.	• Distributed one week prior to meetings.
1	Focus Groups Materials	• Develop agenda, information package, focus group process, comment form.	• Approval one week prior to meetings. • Produce week prior to meetings.
1	Focus Groups	• Introduce the project goals and objectives, establish a vision for the plan area and discuss land use and development opportunities and constraints.	• November 26, 2015
1	Focus Groups Summary	• Provide a summary of the focus groups and comments received.	• Complete and submit to City two weeks after the session.
2	Email Notification	• Share relevant project information and gather feedback on the draft Development Concept.	• December, 2015
2	Feedback Summary	• Provide a summary of any feedback received.	• January 8, 2016
3	Advertisements for Open House	• Prepare invitation letter. City to Mail/email invitation to stakeholders/landowners.	• Approval from City two to three weeks prior to session. • Published/posted for two consecutive weeks prior to session.
3	Open House Materials	• Develop display boards, information package, comment form.	• Approval one week prior to session. • Produce week prior to session.
3	Open House	• Present and gather feedback on the draft ASP, Traffic Impact Assessment and Contributions Plan.	• January 25, 2016
3	Open House Summary	• Provide a summary of the session and comments received.	• Complete and submit to The City two weeks after the session.

Appendix F

2008 East Gateway Area Structure Plan Draft Land Use Concept

Figure 4 - Development Concept

Appendix G

March 17, 2016 Open House Feedback

East Gateway Area Structure Plan

Public Open House – March 17, 2016

Feedback Summary

Part 1: About the Proposed ASP

a) On a scale of 1 to 5, where 1 means *Not at all Satisfied* and 5 means *Very Satisfied*, how satisfied are you overall with the draft East Gateway Area Structure Plan?

- 1 – x0 (not at all satisfied)
- 2 – x0
- 3 – x1
- 4 – x2
- 5 – x4 (very satisfied)

b) Are there improvements you suggest for the draft ASP?

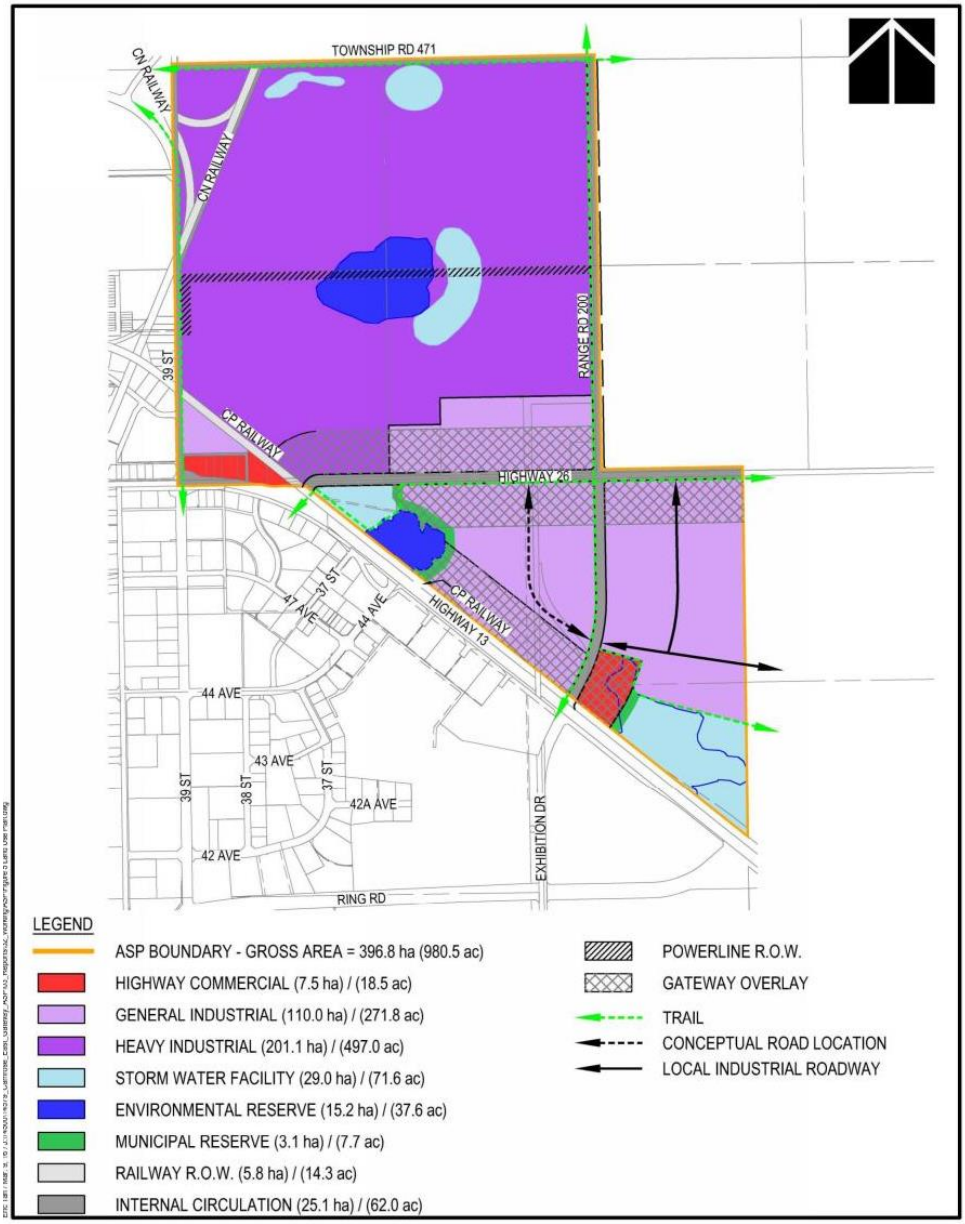
- Do not like 39 Street.
- Looks okay so far!

c) What do you like about the proposed land use concept?

- Trails and park space.
- That it incorporates trails. Also pleased to see that connectivity is being considered with these plans.
- It keeps existing roads in place.
- Appears that a lot of though was given to the plan and future land use.
- All parties' interests have been addressed in terms of road access and implications on other facets of transportation, drainage and road traffic patterns.
- Continued use of existing rail/Highway 26 crossing rather than the abandonment as proposed on original proposal.
- Very positive.

d) How would you change the proposed land use concept? Illustrate on the map provided below.

- No comments received.



ISL Engineering and Land Services

CITY OF Camrose

CITY OF CAMROSE
AREA STRUCTURE PLAN
LAND USE PLAN
DRAFT

FIGURE 5
0 200 400 600 800m

Part 2: About You

a. I am: (*Please check all that apply*)

- A resident of the City of Camrose – x5
- A resident of Camrose County – x2
- An area business owner/operator – x0
- An area land owner – x0
- Other – x0

b. How did you hear about this event? (*Please check all that apply*). Your response will help us plan for future events.

- Newspaper Ad – x4
  - Camrose Booster
- Word of mouth – x2
- Poster
- City of Camrose Website - x2
- Social Media
- Other:
  - Letter invite – x2

c. Do you have any other comments about the project?

- Suggestion to have the trail completely go around the wetland area.
- A larger room, more space between displays and directional signs to location in-house.