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FINAL REPORT

Saskatchewan Ministry of Highways and Infrastructure

South Saskatoon Freeway
General Location Study

November 2017

CANADA'S BEST MANAGED COMPANIES Platinum member

Executive Summary

The purpose of this project is to complete a General Location Study for the south Saskatoon Freeway. A General Location Study is the first action taken when a new highway is being planned. A 500m wide corridor is defined, from which a detailed location can be established in future planning work. This report presents the findings of the study including a general discussion of the constraints that were considered, the alignment options that were evaluated and the results of the evaluation. The recommended options in both the southeast and west sections of the Saskatoon Freeway are presented along with recommendations for further study.

The original scope of work for this project included the South Saskatoon Freeway alignment extending from south of Highway No. 5 east of the City of Saskatoon (City), clockwise to Highway No. 14 in the west. The connection from Highway No. 11 to Highway No. 7 was eliminated from the scope of work as the results of a cost benefit analysis indicated that it was not warranted. A connection from Highway No. 11 to Highway No. 7 could be added in the future, but it would likely be in the vicinity of Victor Road or further south due to existing and planned future development within the RM of Corman Park (RM), south of the City.

With the removal of the connection from Highway No. 11 to Highway No. 7, the study was broken up into two sections. The southeast section (south of Highway No. 5 to Highway No. 11) and the west section (Highway No. 14 to Highway No. 7). Three options were developed for the west section and 5 options were developed for the southeast section. The Triple Bottom Line (TBL) evaluation method considers a series of weighted evaluation criteria in three key areas including environmental, social and economic criteria. The TBL evaluation method was used to rank the options. The recommended options are Option W-2 (shown in red on Figure 9-2) for the west section and Option SE-1 (shown in red on Figure 9-3) for the southeast section.

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1 Introduction

The City of Saskatoon (City) has been experiencing rapid growth over the past decade. This has led to increased traffic volumes, resulting in congestion on City streets. A Travel Demand Model (TDM) project was completed jointly by the Saskatchewan Ministry of Highways and Infrastructure (MHI) and the City of Saskatoon, in coordination with other regional stakeholders. The purpose of the TDM project is to help provide evidence-based traffic forecasts to support key highway planning initiatives in Saskatoon and area. According to the TDM project, the majority of traffic that would use the Saskatoon Freeway is destined for the City. There is currently no efficient way for traffic to reach its destination within the City, resulting in increased congestion on City streets. The Saskatoon Freeway will help to relieve congestion in Saskatoon by providing an efficient way for this traffic to reach its destination within the City with minimal use of City streets. The Saskatoon Freeway will also provide a high speed free-flow bypass route for through traffic that is not destined for the City.

In previous planning work and through the early stages of this project, the Saskatoon Freeway was referred to as the Perimeter Highway. After work was underway on the General Location Study, it was determined that the Saskatoon Freeway is a more appropriate name for the roadway. Therefore, it is now referred to as the Saskatoon Freeway throughout this report.

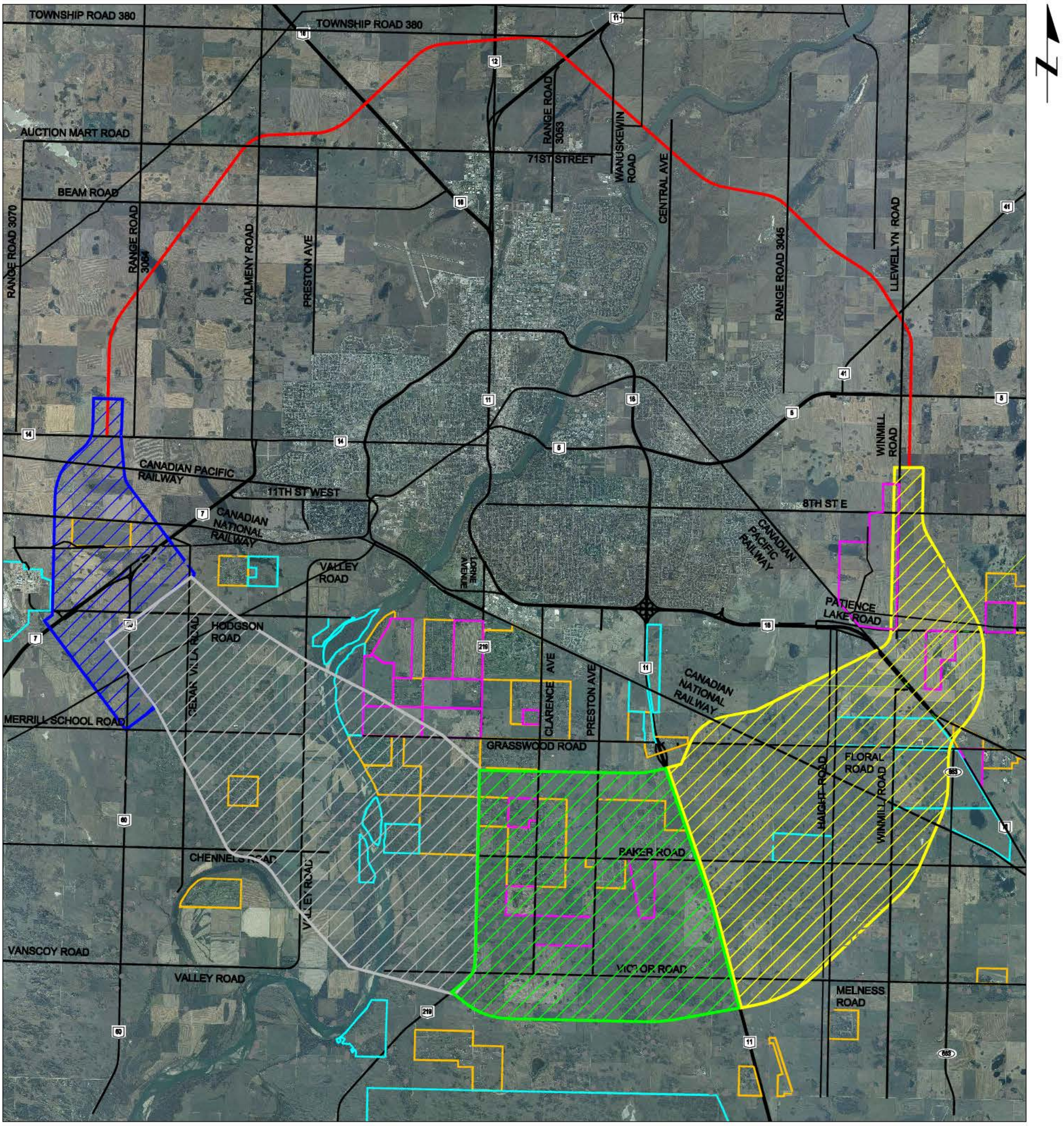
The City's growth has slowed down more recently. However, development is still proceeding in and around the City. To mitigate the effect of development on the Saskatoon Freeway, a development freeze was placed on the lands in the study area. This project seeks to define a corridor for the Saskatoon Freeway so the size of the area under development control can be reduced. This will help reduce or eliminate the impact on many landowners within the RM of Corman Park (RM), south of the City.

The north route for the Saskatoon Freeway was studied in the mid-2000's, was validated in 2014, and is approved. It is shown on Figure 1-1 in red. The route for the South Saskatoon Freeway is being established as part of this project so that it can be integrated into the overall community planning work that is occurring. It will also help guide development and provide certainty for investment by the public and industry.

The South Saskatoon Freeway General Location Study extends from south of Highway No. 5 in the east, clockwise to Highway No. 14 west of the City. The study area is broken down into several sections which are shown on Figure 1-1. The west section includes the connection from Highway No. 14 to Highway No. 7 and the southeast section is from south of Highway No. 5 to Highway No. 11. The connection from Highway No. 7 to Highway No. 219, and from Highway No. 219 to Highway No. 11 were also initially included in the scope of work, but have since been eliminated. Additional details and justification are provided in Section 2, Scope of Work.

Associated Engineering (AE) was commissioned by MHI to complete a General Location Study (GLS) for the South Saskatoon Freeway. A GLS is the first action taken when a new highway is being planned. A 500m wide corridor is defined at the GLS stage, from which a detailed location can be established in future planning work. This report presents the findings of the study including a general discussion of the constraints that were considered, the alignment options that were evaluated, and the results of the evaluation. The recommended options in both the southeast and west sections of the Saskatoon Freeway are presented along with recommendations for future study.

STUDY AREAS
SOUTH SASKATOON FREEWAY



LEGEND

- EXISTING DEVELOPEMENT
- PROPOSED DEVELOPEMENT
- OTHER JURISDICTIONS
- APPROVED ALIGNMENT
- INDIVIDUAL RESIDENCES AND BUSINESSES

LEGEND

- WEST STUDY AREA
- SOUTHWEST STUDY AREA
- SOUTH STUDY AREA
- SOUTHEAST STUDY AREA

Government of Saskatchewan
Ministry of Highways & Infrastructure

FIGURE 1-1
STUDY AREAS

Associated Engineering

2 Scope of Work

2.1 STUDY LOCATIONS

The South Saskatoon Freeway General Location Study project includes connection points to the existing approved alignment south of Highway No. 5 east of the City and at Highway No. 14 west of the City. The alignment connecting the tie-in points is broken down into several sections.

The southeast section begins south of Highway No. 5 east of the City and extends clockwise to Highway No. 11 south. Access points to the Saskatoon Freeway will be provided at Highway No. 11, Highway No. 16 and Township Road 364 (8th Street East). Another access point could be provided between Highway No. 11 and Highway No. 16. Patience Lake Road will cross the Saskatoon Freeway on an overpass. CP Railroad tracks are located near Highway No. 16 through most of the project area. This will need to be considered in the design of the Highway No. 16 interchange.

The south section connects Highway No. 11 and Highway No. 219. This section is through an area with significant existing development including single parcel and multi-parcel developments.

The southwest section extends from Highway No. 219 to Highway No. 7. A major feature of this section is the river crossing. The selection of the river crossing location would be a major determining factor in the route selection in the southwest section, and would influence the location of the adjacent sections.

The west section consists of the connection from Highway No. 7 clockwise to Highway No. 14 west of the City. This section is relatively short, but includes several constraints, which will be discussed in Section 9. It includes interchanges at Highway No. 7 and Highway No. 14, and two railroad overpasses (CP Rail and CN Rail).

2.2 TRIPLE BOTTOM LINE EVALUATION

A Triple Bottom Line (TBL) evaluation method was used to rank the options. The TBL evaluation method ranks the options in a series of weighted evaluation criteria in three key areas including environmental, social and economic criteria resulting in a score for each option in each criterion. The preferred option is the option with the highest total score. The TBL evaluation method will be discussed in greater detail in subsequent sections of the report.

2.3 LIMITATIONS OF GENERAL LOCATION WORK AND SW QUADRANT EXCLUSION

The Saskatoon Freeway was initially envisioned as a ring road that would be continuous around the entire perimeter of the City. The original scope of work for this project included the alignment of the entire south Saskatoon Freeway extending from south of Highway No. 5 east of the City clockwise to Highway No. 14 in the west. In the terms of reference for the project, the south section from Highway No. 11 to Highway No. 219 was included in the scope of work, and the southwest section from Highway No. 219 to Highway No. 7 was included as optional scope of work.

As a result of the feedback that was received at the first Public Information Session indicating limited support for the southwest connection, MHI completed a cost benefit analysis to evaluate the need for the southwest connection. The details of the analysis are summarized in the following paragraphs.

2.3.1 Southwest Connection Benefit Cost Analysis

Three options for the southwest quadrant of the Saskatoon Freeway were examined. The base scenario includes consistent land use, 500,000 population and economic growth in the 26-year time horizon. The North Saskatoon Freeway is assumed to be in place, with four lanes and a 110 km/h operating speed.

Benefit Cost Analysis Options Examined

Option 1	Closest to Saskatoon (Grasswood Road intersection)
Option 2	Intersects Hwy 11, 7 km south of Grasswood Road (Baker Road Intersection)
Option 3	Intersects Hwy 11, 10 km south of Grasswood Road (Victor Road Intersection)

In comparing the options, key factors to consider include anticipated traffic volumes, cost and impact to development. In general, the further away from the City it is, the more the option would cost. This is compounded by the fact that the floodplain gets significantly wider, further away from the City. Therefore, the bridge costs would be much higher. By contrast, options that are closer to the City tend to attract more traffic, but would impact additional developments.

The Saskatchewan Trucking Association mentioned they were supportive of the route in the southwest quadrant, as the existing South Circle Drive is difficult to manoeuvre with large trucks. Over dimensional routes around Saskatoon will need to be considered as part of future planning for the Saskatoon Freeway. The Whitecap Dakota First Nation has also voiced a desire to have the route set, as it would provide better access to the First Nation. It is anticipated that landowners in the southwest area, as well as the RM of Corman Park will be supportive of omitting this portion of the route.

The benefit cost ratio was low for all three options. The benefit cost analysis results are summarized below.

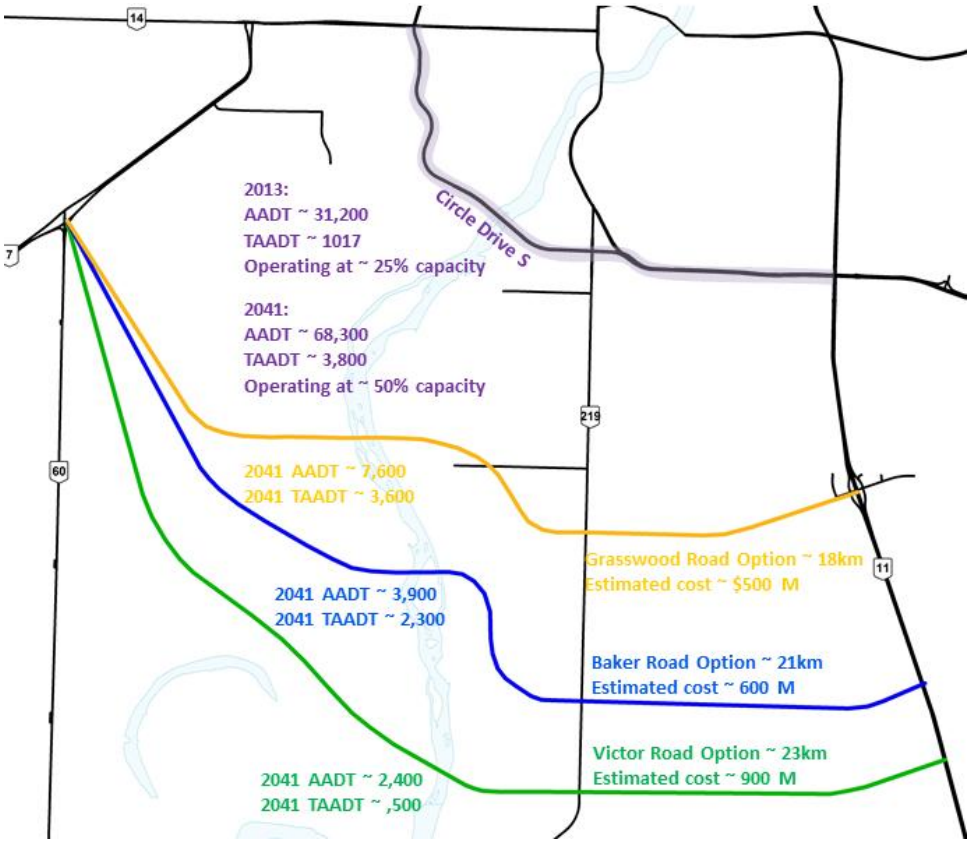
Benefit Cost Analysis for Southwest Quadrant

Parameter	**Option 1**	**Option 2**	**Option 3**
	Grasswood Road Crossing	Baker Road Crossing	Victor Road Crossing
Total Benefits ($000s)	$0.22	-$67.90	-$95.32
Total Costs ($000s)	$412.70	$527.34	$825.41
Benefit Cost Ratio	0.001	-0.129	-0.115
Rank	**1**	**3**	**2**

Note: Identified costs are in millions.

In summary, the results of the cost benefit analysis indicated that construction of the southwest section including the new south river crossing was not warranted. Based on the results of the cost benefit analysis, the decision was made to eliminate the connection from Highway No. 7 to Highway No. 219. With the decision to eliminate setting a corridor between Highway 7 and Highway 219, it may not be necessary to connect Highway 219 to Highway No. 11. Public and RM feedback showed a preference for a route in the vicinity of Victor Road. However, the RM has a high demand for residential development projects in this area. Furthermore, the infrastructure in this area is more than adequate to support the existing and planned low density residential development for years to come. Therefore, a need to protect for a corridor west of Highway No. 11 is deemed unnecessary. TDM analysis indicates that the traffic volumes on the Saskatoon Freeway between Highway No. 11 and Highway 219 would be low supporting the decision to eliminate the connection from the scope of work and confirming that the connection is not required for the Saskatoon Freeway to be an effective bypass/commuter route.

The three options can be seen in Figure 2-1 below along with information on the anticipated traffic volumes and costs.



3 Project Team

Associated Engineering was engaged by the Saskatchewan Ministry of Highways and Infrastructure as the Prime Consultant on the project. Associated Environmental completed the Environmental and Heritage Resources Desktop Reviews, Golder Associates completed the Geotechnical Desktop Analysis and Fast Consultants led the public and stakeholder consultation components of the project.

Two committees were established to provide direct input and guidance on the project. The two committees included the Steering Committee and the Technical Committee.

The Steering Committee was comprised of representatives from:

- RM of Corman Park
- City of Saskatoon
- Community Planning, Ministry of Government Relations
- Saskatoon Chamber of Commerce
- Saskatoon Regional Economic Development Authority
- Network Planning and Programs, Ministry of Highways and Infrastructure
- Major Projects, Ministry of Highways and Infrastructure
- Communications and Public Relations, Ministry of Highways and Infrastructure

The Technical Committee included representatives from the following organizations:

- Traffic Engineering and Development, Central Region Ministry of Highways and Infrastructure
- Geotechnical Road Sciences and Environmental Standards, Ministry of Highways and Infrastructure
- Major Projects, Ministry of Highways and Infrastructure
- Network Planning and Programs, Ministry of Highways and Infrastructure
- Community Planning, Ministry of Government Relations
- SaskBuilds
- City of Saskatoon
- RM of Corman Park

Meetings were held with both the Steering Committee and Technical Committee throughout the project. Refer to Appendix A for meeting minutes from the Steering and Technical Committee. The Steering Committee provided input and guidance on the project Terms of Reference and recommendations. The Technical Committee provided technical input into the project including factors to be considered in the option evaluation. The Technical Committee also participated in the option evaluation by assisting with the determination of the weighting of the Criteria and by confirming the ranking of the Options in the areas that were more subjective in nature.

4 Background Data Review

Several reports were reviewed to identify the design considerations and help guide the analysis and evaluation that forms the basis for the recommendations provided in this report. This section summarizes the key information that was gathered from reports relevant to this project through the review process.

4.1 EAST PERIMETER HIGHWAY FUNCTIONAL PLANNING STUDY – JUNE 2005

The East Perimeter Highway Functional Planning Study recommends an alignment around the east side of Saskatoon between Highway No. 11 to the south and Highway No. 16 to the north. The recommended alignment includes the section of the Saskatoon Freeway between Highway No. 11 to the south and Highway No. 5 to the east intersecting Highway No. 16 at Zimmerman Road, which would later be deemed not valid due to changed conditions outlined in the Saskatoon Perimeter Highway Validation Study. The alignment south of Highway No. 5 (8th Street) defines the east tie in point for the Saskatoon Freeway General Location Study.

4.2 PERIMETER HIGHWAY PHASE 2 ROUTE LOCATION AND FUNCTIONAL PLANNING STUDY – AUGUST 2007

The Perimeter Highway Phase 2 Route Location and Functional Planning Study includes a recommendation for the Saskatoon Freeway alignment around the west side of Saskatoon between Highway No. 16 West and Highway No. 14. The alignment at Highway No. 14 defines the west tie in point for the Saskatoon Freeway General Location Study.

4.3 SASKATOON PERIMETER HIGHWAY VALIDATION STUDY REPORT FINAL JUNE 2014

The purpose of the Perimeter Highway Validation Study is to assess whether significant changes in conditions require that the approved route be reviewed further in terms of its location around the City and the timing of its implementation.

The study examined several sections of the Saskatoon Freeway that had been defined by previous planning. The sections were between Highway 11 south and Highway 14 (counter clockwise) around the southeast, east, north and west sides of Saskatoon. The remaining quarter in the southwest will be determined if a complete ring road is desirable.

Planning for the Saskatoon Freeway is founded on the premise that the City of Saskatoon can grow inside this future roadway corridor and accommodate a population of 400,000. Existing residential and community areas within the City have considered growth up to Saskatoon Freeway. The Corman Park Saskatoon Planning District have identified future development areas that would eventually see growth extend beyond the approved route in the northeast as this area is expected to be a focal point in the future to allow the City to continue to expand and grow beyond the 400,000 horizon.

The Holmwood Sector Plan considers lands currently within the RM of Corman Park. These lands were excluded from a recent annexation, but they are located within the Saskatoon Freeway Corridor. If the Saskatoon Freeway remains where it is currently approved, City residential areas will straddle both sides of the corridor.

There is a strong desire from most to confirm what is happening at the connection between Highway 14 and Highway 11 south. Uncertainty is delaying development plans. Further delay will result in even more challenges due to the existing and high demand for future residential developments in this area.

The Perimeter Highway Validation Study included recommendations specific to each section of the Saskatoon Freeway as follows. The following sections of the Saskatoon Freeway alignment are considered valid:

- Highway No. 5 to Wanuskewin Road
- Highway No. 16 west to Highway No. 14.

The sections of the route considered to be invalid include:

- The south terminal at Highway No. 11 South (due to development constraints and the inflexibility to address future operational needs)
- Highway No. 11 South to Highway No. 5 (due to adjacent land development, and geometry and operational concerns at Highway No. 16 East).

Areas that are currently valid but will need to be reviewed further due to surrounding constraints to confirm their ultimate validity include:

- The north area between Wanuskewin Road and Highway 16 West;
  - The alignment appears to be in the optimum location. However, additional study and analysis of other options should be completed to address interchange spacing and access management requirements.

The study identified several issues with the previously approved route in the southeast (Highway No. 5 to Highway No. 11 south). They are included in the following paragraphs.

At the south terminal (Highway No. 11 South) land has been set aside to construct a service interchange. A systems interchange is required at the junction of Highway No. 11 and the Saskatoon Freeway. Adjacent development and existing land uses may preclude construction of a systems interchange unless the terminal is moved further south.

The alignment intersected Highway No. 16 at Zimmerman Road. The report noted that interchange spacing along Highway No. 16 would not meet the desirable intersection spacing along Highway No. 16 due to the proximity to the proposed interchange at Boychuk Drive. At the Highway No. 16 interchange location, ramps would intersect Highway No. 16 on a curve. The proximity of Highway No. 16 to the railway tracks at the respective crossing locations is limited to approximately 1 km resulting in increased costs and right-of-way requirements due to an extended length of elevated roadway.

Shifting the Saskatoon Freeway away from the City in the southeast would support expansion of the Rosewood neighbourhood. The previous alignment of the Saskatoon Freeway would bisect the neighbourhood if the expansion currently being considered by the City was completed. Establishing a desirable City neighbourhood size and internal road network for the Rosewood neighbourhood requires that the Saskatoon Freeway be moved further out.

Other study recommendations that are not specifically related to the validity of the route were also provided. They are included in the following paragraphs.

The appropriate staged access management strategy for highway and local road at opening day need to be determined. The following options are available:

- At-grade intersections are permitted for both highway and local roads
- At-grade intersections are permitted for local roads only with highway accesses grade separated
- Full access control for all accesses.

The general preference of the Steering and Technical Committees on the Perimeter Highway Validation Study project was for either of the latter two.

It was recommended that the planning of Saskatoon Freeway between Highway No. 14 and Highway No. 7 be continued. It would also be appropriate to determine the need for Saskatoon Freeway to extend around the southwest area of the City that would either require a new (green field) alignment or utilization of existing City and RM roads. The Perimeter Highway Validation Study Steering Committee specifically identified the South Circle Drive River crossing as an option that should be considered when developing route options to gain access to Highway No. 7.

A possible timeline should be developed to guide the implementation of Saskatoon Freeway that would provide some certainty and milestones for which key stakeholders can gauge the progress of this work. Meewasin Valley Authority should be engaged as soon as possible for the purpose of confirming specific crossing requirements for the South Saskatchewan River crossing if required, and any other environmentally sensitive areas under their jurisdiction.

Confirm the extent of revisions required to previously approved land use and infrastructure planning that will be impacted by a need to move Saskatoon Freeway away from the approved route in the southeast area. Coordinate revisions of those plans where needed.

The suggested order of need to continue the planning and design of Saskatoon Freeway is listed from higher to lower priority as follows:

- Initiate a study to determine the need for a southwest connection of Saskatoon Freeway between Highway No. 11 south and Highway No. 7.
- Complete the general location study of Saskatoon Freeway from Highway No. 11 south to north of 8 Street East. (This study can be done independently or concurrently with determining the need for a southwest connection).

  - Several options were developed for the location of the southeast route that were used to determine the study area for the South Saskatoon Freeway General Location Study.
- Undertake the planning for the Saskatoon Freeway between Highway No. 14 and Highway No. 7.
- If an alignment around the southwest area for Saskatoon Freeway is needed, complete the general location study to determine the route location.
- Complete the functional planning of the alignments and interchange requirements for those portions of the Saskatoon Freeway considered to be valid and those for which general locations studies have been completed.

4.4 SASKATOON NORTH PARTNERSHIP FOR GROWTH REGIONAL PLAN DRAFT – MAY 2017

The purpose of the Saskatoon North Partnership For Growth Regional Plan was to coordinate urban growth and development for the region including the RM of Corman Park, Martensville, Saskatoon, Warman and Osler. The Regional Plan seeks to define a framework including key requirements to promote sustainable development while taking steps to mitigate hazards such as flooding and slope instability.

The Saskatoon North Partnership for Growth Regional Plan defines Future Urban Growth areas predominantly to the north of Saskatoon including areas where urban growth extends beyond the Saskatoon Freeway. The Regional Plan considers population horizons of 700,000 and 1,000,000 within the entire region.

The Regional Plan project proceeded concurrently with the South Saskatoon Freeway General Location Study. The two project teams met and exchanged information. The Regional Plan is fairly complete with the development areas set and the land use map being endorsed by all municipal partners. The location of the South Saskatoon Freeway was considered in setting future development areas around the City.

4.5 WEST CONNECTOR ROUTE

The purpose of the West Connector Route (WCR) Feasibility Study was to provide potential options, determine constraints, and critical information pertaining to the potential future WCR. The purpose of this study was not to recommend, nor to select a preferred alternative for the route.

4.5.1 Summary and Recommendations

The WCR received positive feedback from the public and stakeholders, supporting the need for a West Connector Route. While the overall route preferences differed between the public and the stakeholders, the responses indicated that such a route would be used. Figure 4-1 shows the different options that were under consideration.

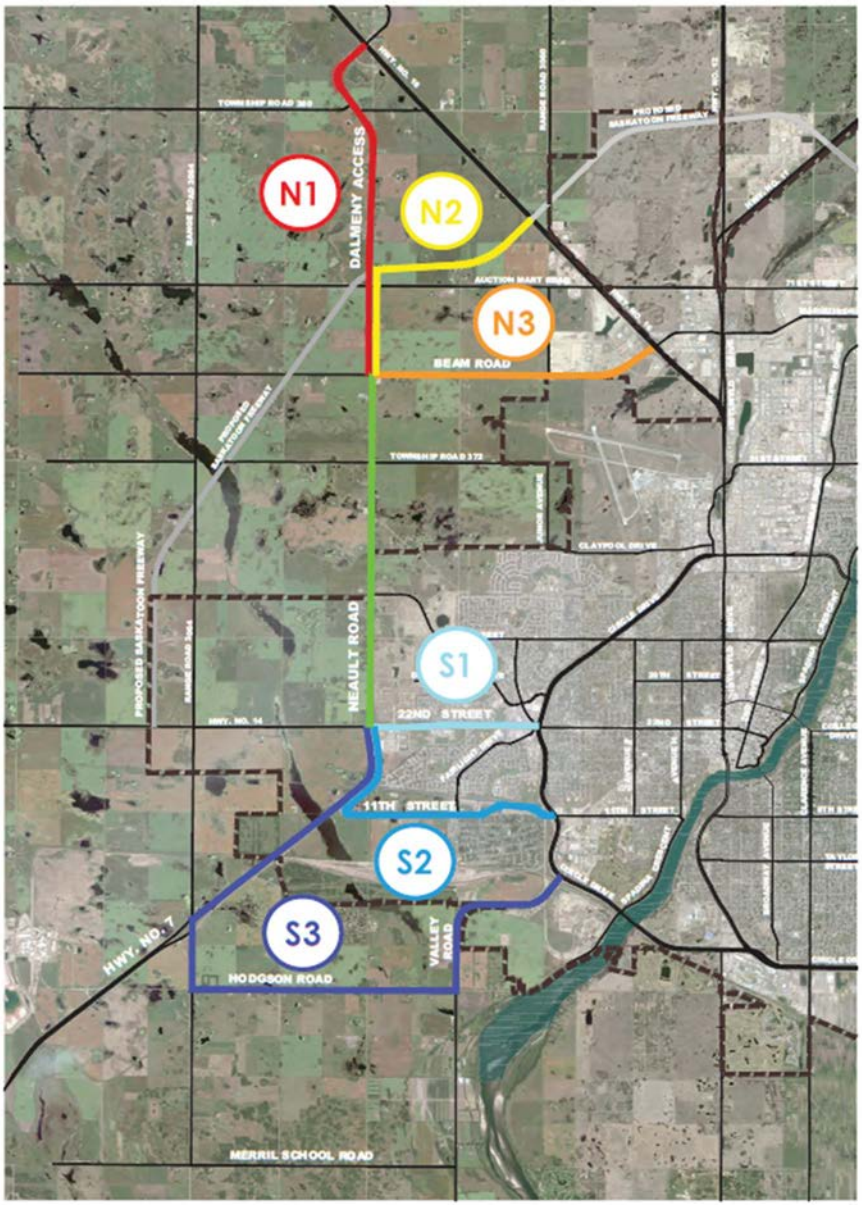


Figure 4-1
West Connector Route Options

Due to the complexity and financial commitment required for the Saskatoon Freeway, the Ministry looked at potential interim network improvement scenarios to relieve current traffic congestion within the City. The West Connector Route (WCR) was identified as an interim option to relieve traffic congestion within the City. Support was expressed by the City, the Rural Municipality of Corman Park (RM) and the trucking community to explore options for the WCR. The WCR has been characterized as a short-term mitigation

measure to provide a north-south connection that would encourage trucks and other long-distance traffic to use an alternate route rather than Circle Drive North, which is ultimately the goal of the Saskatoon Freeway. Based on the TDM model analysis undertaken, the WCR is not seen as a beneficial corridor to provincial traffic. However, it is a highly desirable corridor to the City and the RM primarily benefitting local traffic and development growth.

5 Geotechnical Assessment

Golder Associates prepared the Saskatoon Freeway Geotechnical Desktop Study. The study is included in Appendix B. It provides geotechnical input for the South Saskatoon Freeway General Location Study based on existing available data in the project area that could affect the design of the South Saskatoon Freeway or impact the selection of the optimal alignment.

5.1 GENERAL INFORMATION

5.1.1 Geology

A general description of the geology and hydrogeology was provided in the study area. No significant considerations were identified related to geology. Refer to Figure 5-1 for details of the surficial geology in the study area.

5.1.2 Groundwater

In general, groundwater ranges from 3 to 6m below ground surface, but is as shallow as 1.5 m in the study area. Although subsurface aquifers are present, they are sufficiently deep so as not to impact construction, with the exception of deep foundations of structures.

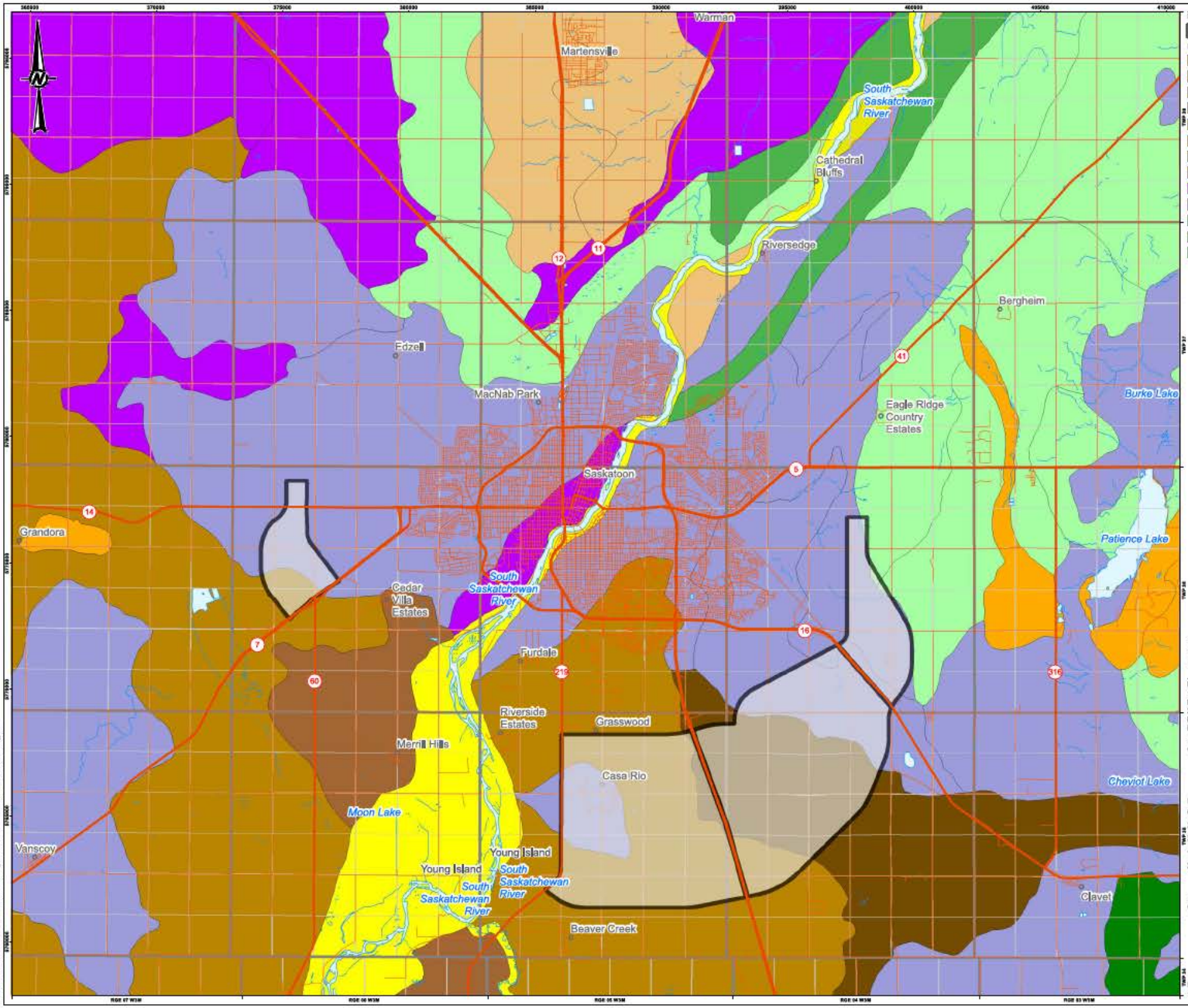
5.1.3 Slope Stability

Within the study area, no existing slopes were identified that may cause issues. However, fluctuations in the groundwater table, moisture conditions or changes to surface drainage patterns could cause slopes in trenches or other excavations to become unstable over time.

5.1.4 Roadway Embankments

The geotechnical considerations for roadway embankment construction will vary depending on the type of material being used to construct the embankment. In general embankments constructed out of sands will provide good support and can reduce the thickness of the pavement structure that is required. If poorly graded silty sands are encountered, they could be susceptible to frost action. Therefore, silts are not recommended for subgrade or embankment construction. Clays require special consideration if used for embankment construction. Clays are expansive and compressive in nature and generally have lower load-bearing capacity than other soils. They could lead to thicker pavement structure requirements and settlement may occur over a longer period of time as pore water pressures dissipate. Glacial till will provide good consistent subgrade support and will tend to reduce the thickness of the required pavement structure.

Groundwater will affect the behaviour of soils. Dewatering to lower possible high groundwater tables may be required to help expedite consolidation settlement.



LEGEND

- STUDY AREA

SURFICIAL GEOLOGY

- ALLUVIAL
- ALLUVIAL PLAIN
- EOLIAN
- EOLIAN HUMMOCKY
- EOLIAN PLAIN
- GLACIOFLUVIAL HUMMOCKY
- GLACIOFLUVIAL PLAIN
- GLACIOFLUVIAL TERRACE
- GLACIOLACUSTRINE DELTA
- GLACIOLACUSTRINE PLAIN
- MORAINAL ERODED
- MORAINAL PLAIN
- MORAINAL UNDULATING

0 2.5 5

1:150,000 KILOMETRES

NOTE(S)

1. STUDY AREA IS DIGITIZED APPAROXIMATELY FROM PDF SOURCE AT 1:200,000. ACCURACY IS NOT GUARANTEED

REFERENCE(S)

1. SURFICIAL GEOLOGY: GEOLOGICAL ATLAS OF SASKATCHEWAN, SASKATCHEWAN RESEARCH COUNCIL, 2008.
2. CANVEC BASE DATA: © DEPARTMENT OF NATURAL RESOURCES CANADA, 2012. ALL RIGHTS RESERVED.

NAD 83 UTM ZONE 13N

CLIENT

Associated Engineering

PROJECT

GEOTECHNICAL DESKTOP SCREENING
SASKATOON FREEWAY
SASKATOON, SASKATCHEWAN

TITLE

SURFICIAL GEOLOGY

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-06-22
DESIGNED	TF
PREPARED	SBM
REVIEWED	TF
APPROVED	PGB

PROJECT NO.	CONTROL	REV.	FIGURE
1531310	1000	0	2

5.2 GEOTECHNICAL CONSIDERATIONS FOR THE WEST STUDY AREA

In the West study area, surficial geology consists primarily of glaciolacustrine plain with some areas denoted as eolian plain. Tills and sand and gravel units of the Saskatoon Group extend to about 75m below the ground surface. The Geotechnical Desktop Study indicates that surficial aquifers are present throughout the west study area. The groundwater table is generally in the range of 3 to 6m below ground surface, but could be as shallow as 1.5m below ground surface.

5.2.1 Subsidence

A potash mine is located to the west of the west study area. Mining activities are known to have occurred near, and possible within the west study area. The following paragraphs were provided by Golder Associates subsequent to the finalization of their report. They present a high level discussion of subsidence related to potash mining.

The Study Area for the South Saskatoon Freeway is in the vicinity of the PotashCorp Cory potash mine, particularly on the west side of Saskatoon. Surface subsidence is known to occur due to mining; the amount of subsidence and affected area are a function of various factors, including: the thickness of extracted materials; depth of mining; dip of mining zone; competence and nature of mined and surrounding strata; near surface geology; geological discontinuities; fractures and lineaments; in-situ stresses; degree of extraction; surface topography; ground water; mine area; method of mining; rate of advance; backfilling; time; and structural characteristics. Accurate estimation of the magnitude and rate of vertical and horizontal movements is complex given the number of interrelated factors affecting subsidence. In addition, the impacts to surface features/structures is time-dependant, as subsidence may occur over a period of many years.

Details of PotashCorp Cory's mine plan and mining methods are confidential, but based on publicly available knowledge, the mining horizon is at a depth of about 1 000 m below the ground surface, typical mine drift heights are about 3.5 m, and the extraction ratio for conventional potash mines in Saskatchewan (i.e., the portion of the reserve that is actually extracted by mining) is in the range of 35%. The maximum subsidence that occurs over potash mines (at the point in time where the drifts have completely closed) may be estimated by multiplying the drift height by the extraction ratio; for the approximate values provided, this would be 3.5 m x 0.35 = 1.225 m. Subsidence affects areas around the perimeter of the mine workings (i.e., not just directly above the mine workings), with subsidence decreasing to zero at some point away from the drifts. For the conditions near Saskatoon, the distance where subsidence becomes zero can be approximated by drawing a line at a 45 degree angle from the edge of the mine workings to the surface, which would be a distance of approximately 1 000 m for a mining depth of 1 000 m. If the subsidence is assumed to be linear, the change in surface slope due to subsidence (once all subsidence has occurred) would be 1.225/1000 = 0.001225 m/m, or about 1 mm/m of horizontal distance.

By comparison, the self-weight consolidation of an embankment constructed of cohesive material compacted to 95 to 98 percent of the Standard Proctor Maximum Dry Density is often estimated to be in the

order of 1 to 1.5 percent of the fill height. For a 10 m high embankment, this equates to 100 to 150 mm of settlement, not including settlement of the foundation soils.

There are many unknowns with respect to assessing the potential impacts of subsidence related to potash mining on the proposed South Saskatoon Freeway (exact location of the freeway related to mine workings, timing, mining details, etc.); however, based on the high-level assessment presented above, the potential differential settlement due to subsidence (in the order of 1 mm/m of horizontal distance) is less than the potential settlements due to roadway/embankment construction, and thus, subsidence from potash mining is not expected to have a significant impact on the proposed South Saskatoon Freeway.

5.3 GEOTECHNICAL CONSIDERATION FOR THE SOUTHEAST STUDY AREA

In the Southeast study area, surficial geology consists primarily of glaciolacustrine plain and eolian hummocky. The south part of the study area includes some area designated as eolian plain. Tills and sand and gravel units of the Saskatoon Group extend to between 55m and 120m below the ground surface. The Geotechnical Desktop Study indicates that surficial aquifers are present throughout the bulk of the southeast study area while the Saskatoon Floral aquifer exists within the study area starting southwest of Highway No. 16 and extending northeast of Highway No. 16. The groundwater table is generally in the range of 3 to 6m below ground surface, but could be as shallow as 1.5m below ground surface.

5.4 FUTURE STUDY

More detailed geotechnical investigation including field investigation and engineering analysis is recommended as part of a future study to confirm groundwater levels, slope stability and the suitability of native materials for subgrade. The additional geotechnical investigation and analysis should also identify any specific construction requirements.

6 Heritage and Environmental Assessment

Associated Environmental completed an Environmental Screening Study as part of the South Saskatoon Freeway General Location Study. The Environmental Screening Study is included in Appendix C and summarized in the following section.

Existing available information sources that were consulted as part of the desktop study included:

- Plans
- Maps
- Figures
- Aerial photographs
- Interviews
- Existing databases including:
  - The Saskatchewan Conservation Data Center
  - The Biodiversity Website (HABISask)
  - GeoSask
  - The Committee on the Status of Endangered Wildlife in Canada status reports, Schedule 1 of Species at Risk (SARA)
  - The Government of Saskatchewan's Bird's Atlas
  - The Water Security Agency's Water Well Information Database
  - The Saskatchewan Soil Information Database

The project area is dominated by cultivated land with areas of hayland and native grassland. Land use within the study area consists of mainly agricultural activities with numerous country residential districts. There are smaller areas that are zoned as conservation and commercial districts.

Refer to Figure 6-1 for an overall view of the project with the alignment options as well as environmental features discussed below. There are no designated areas (e.g., national or provincial park lands, historic parks, park reserves, wildlife habitat protection lands, game preserves, Fish and Wildlife Development Fund Lands, PFRA pastures, etc.) identified within the study area. Ducks Unlimited has not identified any conservation or protected areas within the study area. Several protected species have a moderate to high potential to be present within the study area. Water features include wetlands and the West Swale. The recommended alignment for the west section (W-2) avoids impacts to the West Swale and the recommended alignment for the east section (SE-1) minimizes impacts to wetlands and is on the fringe of the area identified for rare plants. Additional study is required to determine specific requirements during construction including any required mitigation measures.

The following recommendations are made for future study:

- A biological assessment is recommended to confirm the presence of protected plant and animal species along with the characterization of potentially impacted wetlands.

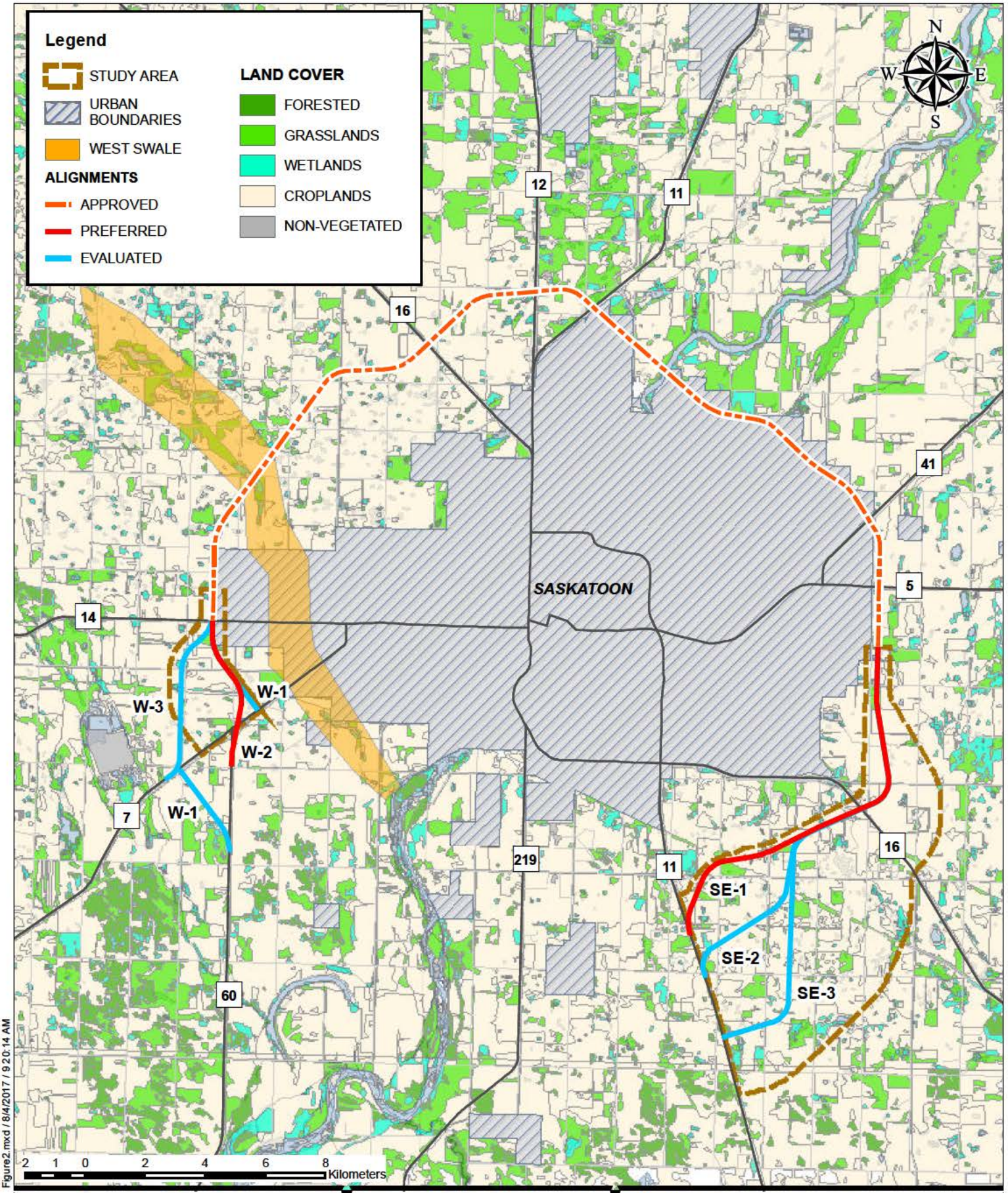


Figure2.mxd / 8/4/2017 / 9 20:14 AM

Associated Environmental

PROJECT NO.: 20154611.000
DATE: 04Aug2017
DRAWN BY: D. TOTH

FIGURE 2
LAND USE

Ministry of Highways

Saskatoon Freeway-Environmental Desktop Screening

- Field surveys will need to be conducted at the appropriate time, according to provincial guidelines. The routes all pass through similar types of habitat. Once the field investigations have been completed, more specific recommendations can be made on the proposed alignments.
- Avoid larger wetlands in the area to continue to provide larger tracts of habitat for the species present.
- If required, maintain adequate vegetative buffers around the west swale to provide multiple benefits including:
  - Wildlife habitat, erosion protection, and improved water quality (filtration of sediment and nutrients).
- The results of the heritage resource screening determined that there were no known heritage sites recorded within the quarter sections where the preferred alignment occurs.

7 Design Criteria

According to the Terms of Reference, the Saskatoon Freeway is planned as a high speed free flow facility. The following sections identify the functional requirements for the Saskatoon Freeway and outline the recommended geometric design standards.

7.1 FUNCTIONAL REQUIREMENTS

7.1.1 Traffic Forecast

MHI provided traffic volumes for the Saskatoon Freeway. The traffic volumes were based on the model that was prepared for the TDM project with the Saskatoon Freeway added. The traffic volumes assumed a 500,000 population horizon, which will occur in 2041 based on current projections. The model matched the options that are currently proposed for the south Saskatoon freeway.

Traffic volumes derived from the model for the 500,000 population horizon are summarized in Table 7-1.

Table 7-1
Traffic Volume Projections

Segment	PM Peak Period				Daily	
	Direction	Cars	LT	HT	AADT	TAADT
Hwy 7 to Hwy 14	NB	189	16	53	4,400	1,200
	SB	148	8	42		
Hwy 5 to 8th St E	NB	1,703	39	54	34,600	2,900
	SB	1,544	69	145		
8th St E to Hwy 16 E	NB	2,183	63	69	36,800	3,400
	SB	1,223	78	150		
Hwy 16 E to Hwy 11 S	NB	219	18	32	6,200	1,700
	SB	250	21	99		

7.1.2 Number of Lanes and Phasing

Historically, the factors used to determine whether to construct two or four lanes have been related to:

- Traffic volume
- Whether the highway is part of the National Highway System
- Collision history in the case of existing roadways
- Proximity to urban centres
- Number of access points
- Need for passing opportunities due to variation in travel speeds and type of vehicles

- Comparison with other potential projects on the Capital Plan.

TAC describes the "typical" lower limit of traffic volume of a rural freeway as 8,000 vpd, and for an urban freeway as 20,000 vpd, while the typical upper limit of a rural expressway (defined as including at-grade intersections) is 12,000 vpd. No typical upper limit is defined for an urban expressway, while the typical upper limit for an urban arterial is described as 30,000 vpd. (TAC GDG 2017 Tables 2.6.4 and 2.6.5). Typical traffic volume ranges as described by TAC are summarized in Table 7-2.

Table 7-2
Typical Daily Traffic Volume Ranges (TAC, 2017)

Classification	Rural	Urban
Arterial	<12,000	5,000 - 30 000
Expressway	n/a	>10,000
Freeway	>8,000	>20,000

Table 7-3 summarises the potential classification of each segment based on the typical volumes found in TAC.

Table 7-3
Classification Based on Typical Daily Traffic Volume

Segment	Forecast AADT	Classification
Hwy 7 to Hwy 14	4,400	Arterial
Hwy 5 to 8th St E	34,600	Freeway
8th St E to Hwy 16 E	36,800	Freeway
Hwy 16 E to Hwy 11 S	6,200	Arterial

The Transportation Research Board's Highway Capacity Manual, 6th Edition (2016) describes the base capacity of a freeway travel lane as 2,400 passenger car-equivalent vehicles per hour, at a free flow speed of 113 km/h (70 mph) (p. 12-8). Passenger car-equivalent (pce) volume is defined as the number of cars, plus the number of trucks multiplied by an adjustment factor. The adjustment factor provided for level terrain is 2.0 (p. 12-35).

Table 7-4
PM Peak Hour Passenger-Car Equivalent Volume

Segment	Direction	Cars (vph)	Trucks (tph)	Demand Flow (pce/hr)
Hwy 7 to Hwy 14	NB	189	69	327
	SB	148	50	248
Hwy 5 to 8th St E	NB	1,697	91	1,879
	SB	1,565	210	1,985
8th St E to Hwy 16 E	NB	2,191	130	2,451
	SB	1,247	224	1,695
Hwy 16 E to Hwy 11 S	NB	219	50	319
	SB	250	120	490

The HCM also provides a table of the maximum service flow rates per lane to be used for planning purposes, based on the target level of service (p. 12-50).

Table 7-5
Maximum Base Flow Rate for Planning Purposes

Target LOS	Max Base Flow Rate (pce/hr/ln)
C	1,690
D	2,080
E	2,400

The HCM also lists lane capacity adjustment factors for various weather events. Most notably, a factor of 0.91 is given for “severe cold” which it defines as temperatures below -15°C (p. 11-43). Other weather factors are also provided; however, highways are not generally planned for the most severe weather that could exist, but ought to be planned for typical conditions. Temperatures below -15°C could be considered typical in Saskatchewan.

The HCM also provides an adjustment factor to account for unequal distribution of traffic throughout the peak hour, called the Peak Hour Factor or PHF. The HCM suggests a PHF for freeway segments should be in the range of 0.85 to 0.98 (p. 12-34). A PHF of 0.92 is assumed for planning purposes.

Based on the two adjustment factors, Table 7-6 describes the maximum adjusted flow rate, and Table 7-7 summarizes the number of basic lanes required to achieve the target level of service in the PM peak period for the 500,000 population horizon.

Table 7-6
Maximum Adjusted Flow Rate for Planning Purposes

Target LOS	Max Adjusted Flow Rate (pce/hr/ln)
C	1,420
D	1,740
E	2,010

Table 7-7
Basic Lane Requirements for Target LOS

Segment	Direction	Demand Flow (pce/hr)	Number of Lanes per Direction		
			for LOS C	for LOS D	for LOS E
Hwy 7 to Hwy 14	NB	327	1	1	1
	SB	248	1	1	1
Hwy 5 to 8th St E	NB	1,879	2	2	1
	SB	1,985	2	2	1
8th St E to Hwy 16 E	NB	2,451	2	2	2
	SB	1,695	2	1	1
Hwy 16 E to Hwy 11 S	NB	319	1	1	1
	SB	490	1	1	1

The table above accounts only for the basic number of lanes, and does not consider merging, diverging, or weaving levels of service; in the case of one-lane segments, time following and the related undivided highway level of service was also not considered.

7.1.3 Conclusion

Based on typical traffic volumes and capacity requirements, Table 7-8 summarizes the minimum recommended basic functional requirements for each segment at the 500,000 population horizon, expected for the year 2041.

Table 7-8
Minimum Functional Requirements for 2041

Segment	Functional Classification	Number of Lanes
Hwy 7 to Hwy 14	Rural Arterial	2
Hwy 5 to 8th St E	Freeway	4
8th St E to Hwy 16 E	Freeway	4
Hwy 16 E to Hwy 11 S	Rural Arterial	2

The segments on each end of the study area, from Highway 7 to Highway 14 in the southwest and from Highway 16 to Highway 11 in the southeast would have sufficient capacity with one lane in each direction, and would be within the typical traffic volume range of a rural arterial highway through the 500,000 population horizon. The remainder of the study area, from Highway 5 in the east to Highway 16 in the southeast would require two lanes in each direction and would be well above the typical lower traffic volume limit of a rural freeway.

The vision for the Saskatoon Freeway is to be a four-lane divided, fully access-controlled facility throughout its length. However, construction of the second set of lanes (twinning) and certain interchanges, for example at Grasswood Road, could be deferred on the segments from Highway 7 to Highway 14 in the southwest and from Highway 16 to Highway 11 in the southeast.

7.2 GEOMETRIC DESIGN STANDARDS

The appropriate design classification for the road is D130-7430, and the design criteria is outlined in Table 7-9 below.

Table 7-9
Recommended Geometric Design Standards

Design Parameter	Value	Comments	Source
Design Speed	130 km/h		SKS 2.2.1-A
Superelevation Rate (max)	0.6 m/m		SKS 2.1.2-C
Minimum Radius	950m	Min. Rad. Not included in Std. Plan No. 20210 for Vdes = 130 km/h and emax = 0.06	TAC Table 2.1.2.6

Design Parameter	Value	Comments	Source
Right of Way Width	101.4 m – 141.4m	101.4 m is base ROW additional 20 m per side is req'd for service roads	SKS 2.2.0-B
Interchange Control Circle	500m 800m	Service Interchange System Interchange	
Structure Type		Standard Pavement N15, 15 yr design life	SKS 2.2.1-B
Surface Type		Asphalt Concrete	SKS 2.2.1-B
Road Top Width:			
• Total Top Width	11.4 m		
• Main Lane Right	3.7 m		SKS 2.2.2-B
• Main Lane Left	3.7 m		SKS 2.2.2-B
• Outer Shoulder	3.0 m		SKS 2.2.4-A
• Inner Shoulder	1.0 m		SKS 2.2.4-A
Surfacing Structure Cross Slope			
• Main Lane Right	2%		SKS 2.1.5-A
• Main Lane Left	2%		SKS 2.1.5-A
• Outer Shoulder	5%		SKS 2.1.5-A
• Inner Shoulder	2%		SKS 2.1.5-A
Subgrade Cross Slope	3%		SKS 2.1.5-A
Sideslopes			
Fills < 3.5m	6:1		SKS 3.1.4-B
3.5m < Fills < 7.0m	Varies	Toe of slope at 21 m from subgrade shoulder line	SKS 3.1.4-B
Fills > 7.0m	3:1		SKS 3.1.4-B

Design Parameter	Value	Comments	Source
Outside Ditch			
• Ditch Cross Slope	3%		SKS 3.1.4-A
• Ditch Depth (min)	≥ 1.1 m	1.2 m desirable	SKS 3.1.4-A
• Ditch Width	≥ 8 m		SKS 3.1.4-A
• Backslope (max)	3:1	4:1 desirable until top of backslope reaches 37 m from centreline	SKS 3.1.4-A
Median Ditch			
• Cross Slopes	3% to 6%		SKS 2.1.5-A
• Ditch Depth	0.5 m to 1.5 m		SKS 2.2.5-A
• Ditch Width	≥ 8 m	32 m between median shoulder lines	SKS 2.2.5-A

8 Cost Estimate

The main components of the Saskatoon Freeway include construction of the freeway alignment and the junctions, which consist of interchanges and flyovers. Interchanges can be classified as either systems interchanges or service interchanges. Systems interchanges are typically built where free flow access is required on both the main road and the intersecting street. Service interchanges are built where free flow access is required on the main road, while stop conditions are permitted on the intersecting street.

For the purposes of the cost estimate, full buildout was assumed for the Saskatoon Freeway including two lanes in each direction and interchanges at all access points. Costs for the freeway alignment were measured in kilometres of two-lane section. Unit cost data was compiled from bid trends and reviewed to determine an average cost per kilometre of two-lane section. This cost was compared to available planning level cost estimates that have been completed in the past. It was determined that an average cost per kilometre for a two-lane section is $3,000,000. This was used to determine the cost of constructing the alignment. The two-lane section cost was multiplied by two assuming a divided highway and then multiplied by the length of the alignment to determine the cost of constructing the Saskatoon Freeway. Service roads will also be required through sections of the Saskatoon Freeway. The cost for service roads is in addition to the costs noted above. Service road requirements will be determined as part of future planning work.

Data on interchanges that have recently been constructed was collected to determine appropriate costs for flyovers, service and systems interchanges for the Saskatoon Freeway. Input was also received from MHI on costs that they have seen on previous projects. The information on service interchange costs was readily available, while there is limited information on systems interchanges.

Examples of Service Interchanges:

Interchange	Scope of Work	Cost
Warman and Martensville Interchanges Project	2-Svc Ints.	$60,000,000
McOrmand/Boychuk Interchanges Project	2-Svc Ints.	$50,000,000
South Circle Drive	5-Svs Ints., 10km Fwy	$300,000,000

Examples of Systems Interchanges:

Interchange	Scope of Work	Cost
Regina Bypass	12 Ints., 45km Hwy	$1,200,000,000
PTH 59-PTH 101 Interchange (Winnipeg)	1-Systems Int.	$204,000,000

These average costs were used to calculate the capital cost of each option. The average interchange costs were as follows:

Overpass/Flyover	$20,000,000
Service Interchange	$30,000,000
System Interchange	$125,000,000

The estimated capital cost of the various options is summarized below:

West Options	Cost
Option W-1	$337,000,000
Option W-2	$318,000,000
Option W-3	$328,000,000

Southeast Options	Cost
Option SE-1	$716,000,000
Option SE-2	$720,000,000
Option SE-3	$769,000,000
Option SE-4	$841,000,000
Option SE-5	$807,000,000

The cost estimate is summarized in Appendix D. A more detailed cost estimate should be developed as the planning for the Saskatoon Freeway is advanced. This can be done once the horizontal and vertical geometry have been finalized and the interchange configurations have been determined.

9 Design Considerations

9.1 WEST (HIGHWAY NO. 14 TO HIGHWAY NO. 7)

Constraints

Other than the terminal, the area has limited development including a small number of individual acreages. An existing grade separated railway crossing is also located just east of the study area at Highway No. 7 with a railway yard located east of the crossing. Utility coordination is required for all options, and relocation or other measures to accommodate existing utilities may be required. Significant utility corridors in the area include a TransGas pipeline corridor running east to west, and located north of the intersection of Highway No. 7 and Highway No. 60; and a water pipeline crossing Highway No. 7 just south of its intersection with Highway No. 60. Utility corridors can be seen on Figure 9-1. Coordination should be undertaken with affected utilities during future planning to determine specific requirements.

As directed by MHI, a southwest connection from Highway No. 7 to Highway No. 219 including a south river crossing was not considered. If this connection was required in the future, it would have a significant effect on the feasibility of the options that are proposed resulting in changes to the options or the development of entirely new options. It should be noted that a future connection further south could be considered without impacting the recommended option.

Limited options are possible in the west given the shorter distance and tight spacing of the existing roads in the area that need to be accommodated.

Access Management

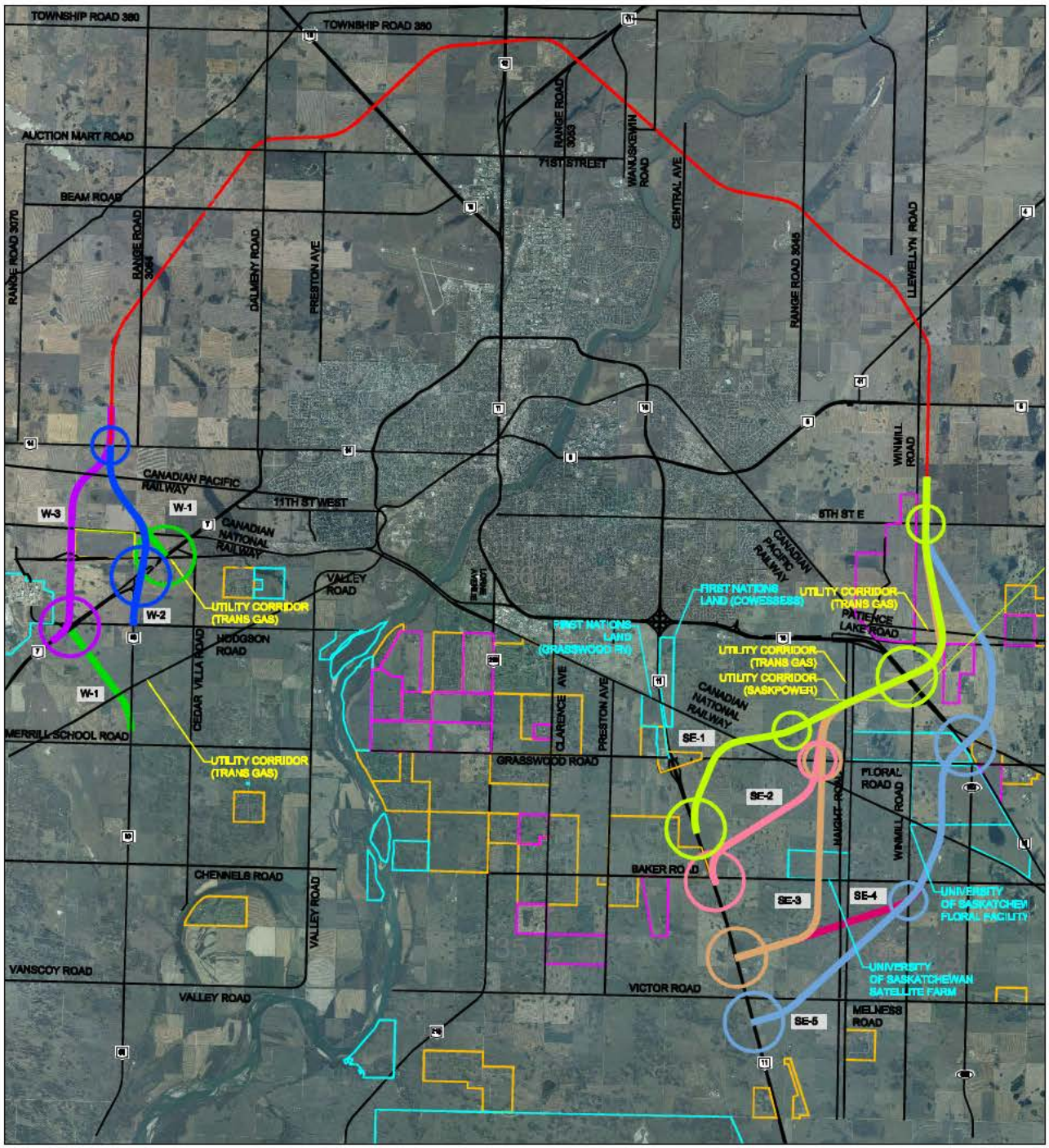
Saskatoon Freeway

According to the traffic projections generated by the Travel Demand Model project, traffic on this section of the Saskatoon Freeway will be approximately 4400 vehicles per day. According to RSMM 430-30, an access management level of R-3 is required for traffic volumes ranging from 2000 to 7000. It is anticipated that opportunities for access to the Saskatoon Freeway will be available at Highway No. 14 and Highway No. 7/Highway No. 60.

Highway No. 7

Highway No. 7 is part of the National Highway System. The existing traffic volume on the roadway is 8900 vehicles per day. The traffic volume will exceed 9000 vehicles per day in the near future. Therefore, in accordance with RSMM 430-30 in the Roadside Management Manual, the access management level should be R-1. During the Technical and Steering Committee meetings, it was discussed that Highway No. 7 may fall under the jurisdiction of the City or the RM inside the Saskatoon Freeway. This may result in a reduction to the posted speed limit and the opportunity for additional access points on Highway No. 7 in between the Saskatoon Freeway and the City. However, the access management level would remain unchanged outside of the Saskatoon Freeway. The existing intersecting roads along Highway No. 7 do not

ALIGNMENT OPTIONS
SOUTH SASKATOON FREEWAY



LEGEND

- EXISTING DEVELOPEMENT
- PROPOSED DEVELOPEMENT
- OTHER JURISDICTIONS
- APPROVED ALIGNMENT
- INDIVIDUAL RESIDENCES AND BUSINESSES

LEGEND

- SYSTEMS INTERCHANGE CONTROL CIRCLE
- SERVICE INTERCHANGE CONTROL CIRCLE

Government of Saskatchewan
Ministry of Highways & Infrastructure

FIGURE 9-1
ALIGNMENT OPTIONS

Associated Engineering

meet the minimum spacing identified in the access management section of the Roadside Management Manual.

Highway No. 14
Highway No. 14 is a provincial highway. According to the Saskatchewan Ministry of Highways and Infrastructure 2015 Traffic Volume Map, the existing AADT in 2015 was 3400. According to RSMM 430-30, the recommended access management level for Highway No. 14 is R-3.

Highway No. 60
Highway No. 60 is a provincial highway. According to the Saskatchewan Ministry of Highways and Infrastructure 2015 Traffic Volume Map, the existing AADT in 2015 was 1400. According to RSMM 430-30, the recommended access management level for Highway No. 60 is R-4.

Construction of the west section of the Saskatoon Freeway may impact existing access roads. Construction of the Saskatoon Freeway recommended alignment (W-2) will impact Range Road 3064. Several parcels have existing accesses off Range Road 3064. Access to all parcels will need to be maintained. Access requirements for individual parcels were not included in the scope of this project, but they will be a key consideration in the future phases of the planning process. Access to individual parcels should be provided using existing grid roads where possible. Development of new grid roads or service roads along the Saskatoon Freeway may be required to address the access requirements.

Alignment Options

Three alignment options were developed west of the City for the connection from Highway No. 14 to Highway No. 7. Options W-1, W-2 and W-3 as well as some design considerations are shown on Figure 9-1. The tie in point west of the City is where the approved alignment for the North Saskatoon Freeway terminates at Highway No. 14. The recommended alignment (W-2) is shown in red on Figure 9-2.

Option W-1
Of the three options, Option W-1 is the closest to the City. Option W-1 requires realignment of Highway No. 60 to the west to provide sufficient spacing from the Saskatoon Freeway Interchange on Highway No. 7 to the intersection of Highway No. 60 and Highway No. 7. With the realignment of Highway No. 60, the intersection spacing meets MHI standards for access control level R-1. The proposed realignment of Highway No. 60 would intersect with Highway No. 7 at the existing PotashCorp mine access road intersection resulting in a four-legged intersection. A railroad overpass would be required to cross the CN Rail line north of ILTA Grain.

. Cedar Villa Road (CVR) (Range Road 3063) intersects Highway No. 7 approximately 450 m east of the proposed Saskatoon Freeway intersection. The location of CVR would need to be reviewed to determine if CVR requires realignment to maintain access onto Highway No. 7 due to the proximity of the interchange to the existing intersection.

RECOMMENDED OPTION

HIGHWAY 14 TO HIGHWAY 7
SOUTH SASKATOON FREEWAY

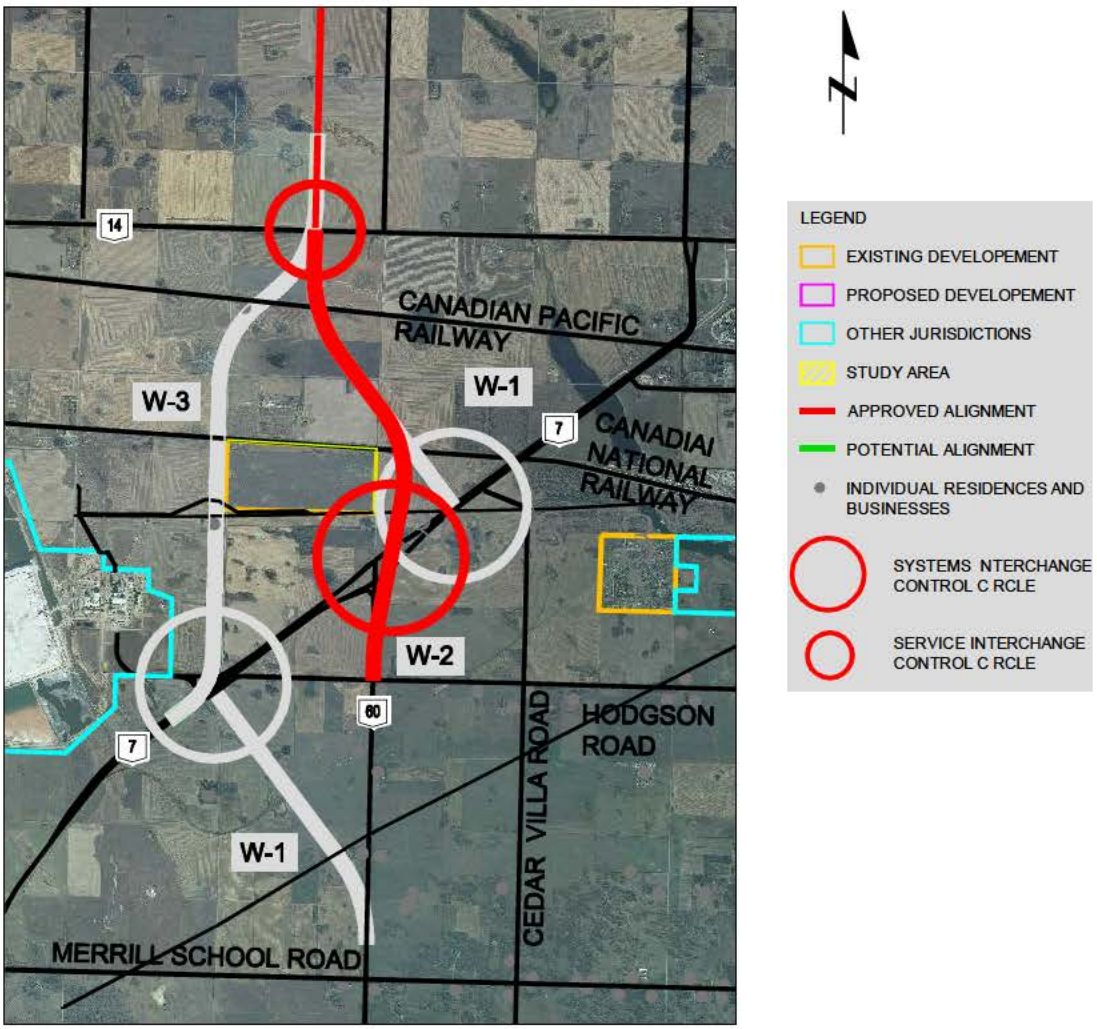


FIGURE 9-2
RECOMMENDED OPTION (WEST)

Option W-2

Option W-2 follows generally the same alignment as Option W-1 north of Highway No. 7. This option connects the Saskatoon Freeway north of Highway No. 7 to Highway No. 60 south of Highway No. 7 resulting in a four-legged interchange between Saskatoon Freeway to the north, Highway No. 60 to the south with Highway No. 7 as the intersecting roadway. A minor realignment of Highway No. 60 south of Highway No. 7 is required for this option. Option W-2 crosses the CN Rail line as well as the spur line requiring a railroad overpass. Spacing between the interchange at Saskatoon Freeway, Highway No. 7 and Highway No. 60 and the intersection of Highway No. 7 and the mine access road does not meet MHI requirements for intersection spacing on a facility with an access control level of R-1. As shown, the intersections are spaced at 2.3 km. The Mine Access road would need to be realigned to achieve the minimum spacing for a permanent access point. Similarly, the spacing between the Saskatoon Freeway/Highway No. 60/Highway No. 7 interchange and the CVR intersection with Highway No. 7 is insufficient for Access Control Level R-1. It is assumed that the speed and access control level will be reduced between the Saskatoon Freeway and the City to allow for more closely spaced intersections. Another option would be to realign CVR to achieve the proper spacing.

Option W-3

Option W-3 involves a slight realignment of the Saskatoon Freeway north of Highway No. 14. This could result in difficulties if the Saskatoon Freeway/Highway No. 14 intersection is to be staged as an interim at grade intersection to achieve a proper intersection angle without introducing excessive skew, but would be acceptable for interchange construction. Option W-3 has a reverse curve offsetting the alignment west of the property. A railroad overpass would be required to cross the CN Rail line north of . In addition, . Saskatoon Freeway intersects Highway No. 7 at the same location as the Mine Access road. As such, the mine access road would need to be incorporated into the Saskatoon Freeway/Highway No. 7 interchange. This could be difficult to accommodate given the configuration of the intersecting roads and the mix of traffic involved. There is limited spacing to the existing Highway No. 60 intersection for this option meaning that Highway No. 60 would need to be realigned to meet the required intersection spacing for Access Control Level R-1 along Highway No. 7.

9.2 SOUTHEAST (SOUTH OF HIGHWAY NO. 5 TO HIGHWAY NO. 11)

Constraints

Many existing and proposed developments have been identified in the southeast section of the Saskatoon Freeway. Developments located between Highway No. 11 and Highway No. 16 mainly consist of single family residences and acreages. Developments located northeast of Highway No. 16 include the East Floral industrial subdivision and the City of Saskatoon Rosewood subdivision. An existing Rawlco radio tower is located SW of Highway No. 16. The options all impact acreages or single family residences to a varying degree, but generally avoid direct impacts to multi-parcel subdivisions.

Many proposed developments are located within the study area, but all proposed developments have been put on hold until the alignment of the Saskatoon Freeway has been determined. Once the alignment is approved, the development restriction will be reduced to a 500 m corridor, allowing development to proceed in the remainder of the study area.

Utility coordination is required for all options, and relocation of some utilities may be required. Significant utility corridors in the area include a SaskTel line running east to west south of 8th Street East (Township Road 364), a SaskPower ROW north of Patience Lake Road (Highway No. 394) and a high voltage overhead power line crossing Highway No. 16 south of the preferred option (SE-1) and bending directly west and crossing the preferred option (SE-1) west of Highway No. 16. Utility corridors can be seen on Figure 9-1. Coordination with affected utilities should be completed during future planning to determine specific requirements.

Access Management

Saskatoon Freeway

According to the traffic projections generated by the Travel Demand Model project, traffic will be approximately 36,800 vehicles per day between 8th Street and Highway No. 16 and 6,200 between Highway No. 16 and Highway No. 11. According to RSMM 430-30, an access management level of R-1 is required for traffic volumes greater than 9,000 vehicles per day, while an access management level of R-3 would be appropriate for traffic volumes ranging from 2,000 to 7,000 vehicles per day. MHI may want to consider adopting an access management level of R-1 for the entire southeast alignment for consistency. It is anticipated that opportunities for access to the Saskatoon Freeway will be available at Township Road 364 (8th Street), Highway No. 16 and Highway No. 11. An additional opportunity for access is available between Highway No. 16 and Highway No. 11 based on the available spacing along the Saskatoon Freeway between the two highways.

Highway No. 16

Highway No. 16 is on the National Highway System. According to MHI's 2015 Traffic Volume Map, the average annual daily traffic on Highway No. 16 was 9,480 vehicles per day in 2015. This volume warrants an access management level of R-1 per RSMM 430-30 in the Roadside Management Manual.

Highway No. 11

Highway No. 11 is on the National Highway System. The MHI 2015 Traffic Volume Map indicates that the average annual daily traffic on Highway No. 11 was 11,360 in 2015. An access management level of R-1 is required in accordance with RSMM 430-30 in the Roadside Management Manual.

During the Steering and Technical Committee meetings, it was discussed that the design classification, posted speed and/or access management level on Highway No. 11 and Highway No. 16 may be reduced in between the Saskatoon Freeway and the City to allow for additional access opportunities along the roadways. However, the access management level would remain unchanged outside of the Saskatoon Freeway.

The alignments that were developed generally avoid existing roads. Although it may be more cost effective to upgrade existing roads than to build a new road, the Saskatoon Freeway is intended to be an access controlled facility. Therefore, accesses to any properties along the existing roads that are upgraded would be impacted resulting in the need to reconfigure the accesses and construct service roads where required. In addition, many single family dwellings are located near existing roads with a thin layer of trees to provide screening for the homes. Construction of the Saskatoon Freeway along an existing road may result in a negative impact to adjacent residents, such as impacting the screening, and potentially impacting their yards. Whereas, if the Saskatoon Freeway is built away from an existing road, the existing road can be used as a service road maintaining access to the adjacent properties.

Construction of the southeast section of the Saskatoon Freeway may impact existing access roads. Although the Saskatoon Freeway largely avoids impacts along existing road alignments, it will cross several RM roads including Haight Road (Range Road 3044), Range Road 3045, Range Road 3050 and Floral Road (Township Road 360). These grid roads can either be closed at the Saskatoon Freeway, or overpasses can be constructed, maintaining access across the Saskatoon Freeway without providing direct access to the Saskatoon Freeway. Access to all parcels will need to be maintained once the Saskatoon Freeway is constructed. Access requirements for individual parcels were not included in the scope of this project, but they will be a key consideration in the future phases of the planning process. Access to individual parcels should be provided from existing grid roads where possible. Access can also be provided by developing new grid roads or constructing service roads adjacent to the Saskatoon Freeway.

Alignment Options

Five alignment options were identified in the southeast quadrant connecting the tie in point on the approved alignment south of Highway No. 5 to Highway No. 11. Options SE-1, SE-2, SE-3, SE-4 and SE-5 are shown on Figure 9-1. The recommended alignment (SE-1) is shown in red on Figure 9-3.

Option SE-1

Option SE-1 is the closest to the City. It is also the option that is closest to the alignment previously proposed for the southeast section of the Saskatoon Freeway, and it avoids significant impacts to existing and proposed multi parcel developments and University land.

For this option, there is an opportunity for a future service interchange at 8th Street East. Patience Lake Road (Highway No. 394) will likely cross the Saskatoon Freeway on a flyover. The CP Railway tracks are parallel to Highway No. 16 at the proposed Saskatoon Freeway/Highway No. 16 interchange location with minimal spacing. This is the case through the majority of the study area and will complicate the design of the Saskatoon Freeway/Highway No. 16 interchange. Relocation of the railway or Highway No. 16 may be required.

RECOMMENDED OPTION

HIGHWAY 5 TO HIGHWAY 11 SOUTH
SOUTH SASKATOON FREEWAY

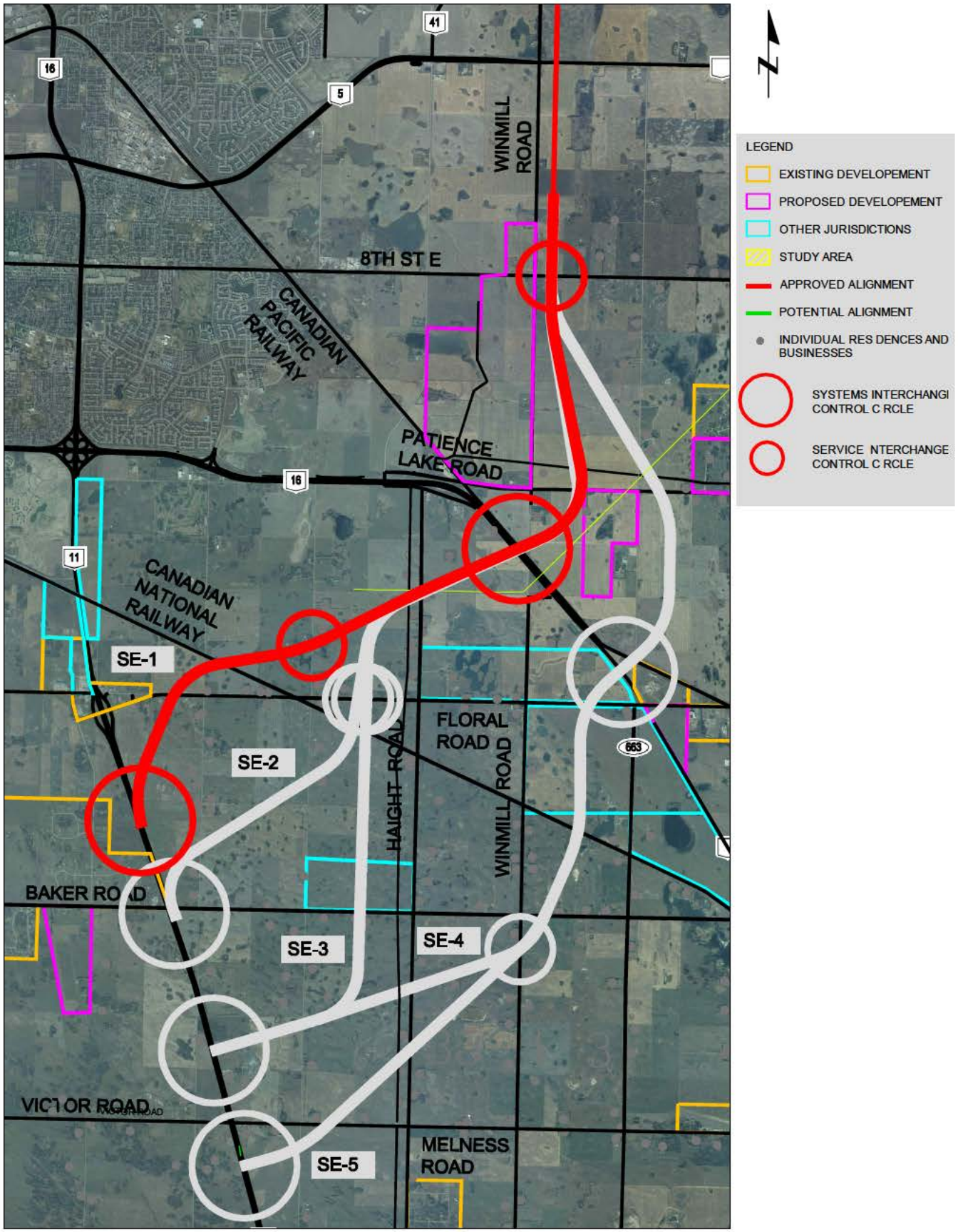


FIGURE 9-3
RECOMMENDED OPTION (SOUTH EAST)

The railroad tracks diverge from Highway No. 16 outside of the study area along Highway No. 16. An interchange location outside the study area was considered, but several issues were identified related to an alignment southeast of the study area. The issues include a higher construction cost, additional landowner impacts, impacts to the university land and varied topography resulting in steeper road grades to avoid deep cuts and/or high fills. After discussing the alignment outside the study area where additional separation from the railroad tracks is available with the Project Team, it was decided that the issues outweighed the benefits. Therefore, it was not given further consideration.

Options are available for interchange construction at a location with minimal separation from the railroad tracks. It is recommended that either Highway No. 16 or the railroad tracks be relocated to allow for interchange construction. Depending on the finalized alignment and interchange configuration, the Rawlco radio tower may be impacted. An image is included in Appendix E to show how this situation was addressed in another location. See Figure E-1. For the interchange shown, the highway was relocated to provide between 100 m and 150 m clearance to the railroad tracks. In the included example, a systems interchange was constructed with the bulk of the ramp construction on the side of the highway that is not constrained by the railroad tracks. There is minimal ramp construction on the same side of the highway as the railroad tracks resulting in minimal additional cost. This issue is common to Options SE-1, SE-2 and SE-3.

Alignment SE-1 intersects Highway No. 11 closest to the Grasswood Commercial Node (GCN). The concept envisioned for Option SE-1 is a 'Y' interchange at Saskatoon Freeway/Highway No. 11. There may be an opportunity to upgrade the existing at-grade intersection of Highway No. 11 and Floral Road (Township Road 360) to a grade separated interchange if future study confirms that adequate spacing exists between the ramp terminals on Highway No. 11 to allow for safe operations, however a lower posted speed may be required on Highway No. 11.

An interchange is also possible between Highway No. 11 and Highway No. 16 on the Saskatoon Freeway. An interchange at Range Road 3045 would make a logical choice as interchange spacing requirements would be met. An interchange at Floral Road (Township Road 360) would allow for better access to the GCN as well as Saskatoon Freeway traffic bound for the City. However interchange spacing along the Saskatoon Freeway would not meet the Access Management requirements. Safe operation may be possible depending on the configuration of the interchange at the Saskatoon Freeway and Highway No. 11 and the resulting ramp terminal spacing. With an interchange at Floral Road (Township Road 360) and Saskatoon Freeway, Floral Road (Township Road 360) could serve as a lower speed connector to provide some of the movements that would not be provided at the Highway No. 11 and Saskatoon Freeway interchange. With a reduced speed along Floral Road (Township Road 360), access opportunities could be available for the existing and planned future development in the GCN. An image is included in Appendix E as an example of how this could be designed with minimal impact on Floral Road (Township Road 360) and Baker Road (Township Road 354). See Figure E-2. Further discussion with MHI is required to determine what access control will be required on Highway No. 11 north of the Saskatoon Freeway.

Option SE-2

Option SE-2 is further from the City than Option SE-1, allowing additional room for development in between the existing City limit and the Saskatoon Freeway. Option SE-2 avoids significant impact to existing and proposed multi-parcel developments and University land.

For this option, the roadway and railway flyovers and interchange locations from 8th Street East (Township Road 364) to Highway No. 16 are common to Option SE-1. Option SE-2 also crosses Highway No. 16 and the CP railway tracks in a similar location to Option SE-1. Refer to the Options SE-1 description for further discussion on interchanges and flyovers for Option SE-2.

Option SE-2 would have a service interchange at the intersection of Saskatoon Freeway and Floral Road (Township Road 360). This would provide access to businesses and residents along Floral Road (Township Road 360) as well as existing and planned future development in the GCN. The Floral Road (Township Road 360)/Highway No. 11 intersection could be upgraded to a diamond interchange when traffic volumes warrant if future study confirms safe operations once details of the interchange designs are known.

Option SE-2 intersects Highway No. 11 at the existing Highway No. 11/Baker Road (Township Road 354) intersection. A systems interchange could be constructed at Highway No. 11/Saskatoon Freeway. The systems interchange would impact the existing Baker Road (Township Road 354) intersection requiring realignment of Baker Road (Township Road 354) to allow for continued access onto Highway No. 11 from Baker Road (Township Road 354).

Option SE-3

Option SE-3 is similar to Option SE-2 from the tie in south of Highway No. 5 to just south of Floral Road (Township Road 360). Option SE-3 avoids significant impact to existing and proposed multi-parcel developments. Option SE-3 impacts the University satellite farm.

For this option, the roadway and railway flyovers and interchange locations from 8th Street East (Township Road 364) to Highway No. 16 are common to Option SE-1. Option SE-3 also crosses Highway No. 16 and the CP railway tracks in a similar location to Option SE-1. Refer to the Options SE-1 description for further discussion on interchanges and flyovers for Option SE-3.

Option SE-3 would have a service interchange at the intersection of Saskatoon Freeway and Floral Road (Township Road 360). This would provide access to businesses and residents along Floral Road (Township Road 360) as well as existing and planned future development in the GCN. The Floral Road (Township Road 360)/Highway No. 11 intersection could be upgraded to a diamond interchange when traffic volumes warrant if future study confirms safe operations once details of the interchange designs are known.

Option SE-3 intersects Highway No. 11 in between Baker Road (Township Road 354) and Melness Road (Township Road 352). A systems interchange could be constructed at Highway No. 11/Saskatoon Freeway. Realignment of Baker Road (Township Road 354) and Melness Road (Township Road 352) would be required to maintain access and meet the spacing requirements of an R-1 access management level along Highway No. 11. The posted speed along with the access management level could be reduced north of the

Saskatoon Freeway on Highway No. 11, and Baker Road (Township Road 354) access to Highway No. 11 may be permitted without realignment. This would have to be confirmed in future phases of planning.

Option SE-4

Option SE-4 is the furthest from the City. Option SE-4 avoids significant impact to existing and proposed multi-parcel developments. Option SE-4 impacts University land as it runs through the middle of the Floral Facility.

For this option, there is an opportunity for a future service interchange at 8th Street East (Township Road 364). Patience Lake Road (Highway No. 394) will likely cross the Saskatoon Freeway on a flyover. South of Patience Lake Road (Highway No. 394), the alignment allows for a 90-degree intersection with Highway No. 16 at a point where there is some separation between the CP Railway tracks and the highway. An interchange design may be possible at this location without relocating Highway No. 16. However, the Saskatoon Freeway would be elevated for an extended length resulting in significant additional cost.

Southwest of Highway No. 16, the alignment curves south crossing Floral Road (Township Road 360). An interchange at Floral Road (Township Road 360) would not be possible without significant realignment of Floral Road (Township Road 360) as it is too close to the proposed interchange at Saskatoon Freeway and Highway No. 16. However, Option SE-4 allows for an interchange at Baker Road (Township Road 354). Similar to the previous options, the Floral Road (Township Road 360)/Highway No. 11 intersection could be upgraded to a diamond interchange when traffic volumes warrant if future study confirms safe operations once details of the interchange designs are known.

Option SE-4 intersects Highway No. 11 south of Melness Road (Township Road 352). A systems interchange could be constructed at Highway No. 11/Saskatoon Freeway. The systems interchange would impact the existing Melness Road (Township Road 352) intersection with Highway No. 11. However, Melness Road (Township Road 352) could be realigned to maintain access to Highway No. 11 provided the spacing requirements are met.

Option SE-5

Option SE-5 is the furthest from the City for the north portion of the alignment. Option SE-5 avoids significant impact to existing and proposed multi-parcel developments. Option SE-5 impacts University land running through the Floral Facility.

For this option, there is an opportunity for a future service interchange at 8th Street East (Township Road 364). Patience Lake Road (Highway No. 394) will likely cross the Saskatoon Freeway on a flyover. South of Patience Lake Road (Highway No. 394), the alignment allows for a 90-degree intersection with Highway No. 16 at a point where there is some separation between the CP Railway tracks and the highway. An interchange design may be possible at this location without relocating either Highway No. 16 or the railroad tracks. However, the Saskatoon Freeway would be elevated for an extended length resulting in additional construction cost.

Southwest of Highway No. 16, the alignment curves south crossing Floral Road (Township Road 360). An

interchange at Floral Road (Township Road 360) would not be possible without significant realignment of Floral Road (Township Road 360) as spacing requirements are not met along the Saskatoon Freeway to the proposed interchange at Saskatoon Freeway and Highway No. 16. Option SE-5 allows for an interchange at Baker Road (Township Road 354). Similar to the previous options, the Floral Road (Township Road 360)/Highway No. 11 intersection could be upgraded to a diamond interchange when traffic volumes warrant if future study confirms safe operations once details of the interchange designs are known.

South of Baker Road (Township Road 354), Option SE-5 bends west and intersects Highway No. 11 in between Baker Road (Township Road 354) and Melness Road (Township Road 352). A systems interchange could be constructed at Highway No. 11/Saskatoon Freeway. Realignment of Baker Road (Township Road 354) and Melness Road (Township Road 352) would be required to maintain access and meet the spacing requirements of an R-1 access management level along Highway No. 11. The posted speed along with the access management level could be reduced north of the Saskatoon Freeway on Highway No. 11 to allow Baker Road (Township Road 354) to maintain access to Highway No. 11 without realignment. This would have to be confirmed in future phases of planning.

10 Stakeholder and Public Engagement

The South Saskatoon Freeway General Location Study project included a public engagement component consisting of letters mailed to landowners in the study area, stakeholder meetings and public information sessions. Public consultation was done at three stages of the project. Comment sheets were available during each stage of the public consultation process to give an opportunity for members of the public to provide comments and input on all aspects of the design including the process, scope of work and recommendations.

The MHI database was consulted and no TLE land was found within the study area. Although there are no known direct impacts to the three First Nations with land holdings near the project area, meetings were held with English River, Cowessess, Fishing Lake and Whitecap Dakota First Nations.

MHI undertook a Duty to Consult review for the entire South Saskatoon Freeway study area at the commencement of the study. The only potential area of impact was found to be within the southwest quadrant between Highway 7 and Highway 219, identified as Wilson Island and located on the South Saskatchewan River. (Legal land location: NW & SW 30-35-5-W3, SW 19-35-5-W3). As the decision was made to remove the southwest quadrant from further study, the Duty to Consult was no longer triggered.

Several key stakeholder groups were identified. A list can be found below along with details of stakeholder consultation:

- City of Saskatoon, RM of Corman Park, SREDA, Ministry of Government Relations – Community Planning and Greater Saskatoon Chamber of Commerce
    - The above groups had representation on the Technical and/or Steering Committee.
- North Saskatoon Business Association
- Meewasin Valley Authority
- University of Saskatchewan
- Ministry of Environment
- Ministry of Agriculture
- Water Security Agency
- Central Area Transportation Planning Committee
- Whitecap Dakota First Nation
- Cowessess First Nation
- English River First Nation
- Fishing Lake First Nation
- Grasswoods Indian Reserve No. 192J
- Utility Companies
    - SaskTel
    - SaskPower
    - Sask Energy
    - Trans Gas
- Saskatoon Trucking Association

- Saskatoon North Partnership for Growth (P4G) group
- Individual stakeholders within the area of study
    - Private Landowners
    - Developers

Details of the meetings can be found in Appendix F.

10.1 PUBLIC INFORMATION SESSION #1

The first round of public consultation occurred in the summer of 2015. Letters were mailed to the landowners within the entire study area and between the current City limits and the study area. In total, approximately 1100 letters were mailed. The letters notified landowners of the project and the upcoming Public Information Session. A template letter can be seen in Appendix F.

The Public Information Session was held on June 25th, 2015 at the German Concordia Club. Several potential alignment options were presented at the Public Information Session along with some information on the project. Those in attendance at the Public Information Session were given the opportunity to talk to the project team members and provide comments by submitting the comment sheets either at the meeting or via email during the comment period.

A summary of the June 25th Public Information Session can be found in Appendix F. Over 400 people attended and 275 people provided email addresses for communication. A total of 57 people completed and submitted comment sheets at the meeting and approximately 50 more comment sheets were received by the comment deadline. Details of the comments that were received can be found in the summary included in Appendix F. Typical comments were as follows:

- Avoid existing developments.
- Support for the furthest south route. This was likely related to the SW section and the connection from Highway No. 219 and Highway No. 11. These sections were eliminated prior to the second Public Information Session and subsequently, comments tended to favour the option closest to the City.
- Concerns about impacts to existing development between Highway No. 219 and Highway No. 11.
- Concerns that changes from the original plan will create difficulties.
- Concerns about loss of value to land/property due to proximity of major roadway.
- Is south route/bridge necessary?
- East side connection more important than west.

Following the Public Information Session, the material was posted on the Ministry of Highways and Infrastructure website for review, and to assist people in providing comments.

10.2 PUBLIC INFORMATION SESSION #2

A second round of public consultation occurred in the fall of 2015 that included similar activities to the first round of public consultation. Letters were mailed to landowners within the study area. A template letter is included in Appendix F. These letters notified landowners of the project and the Public Information Session,

which was held on November 19th, 2015. Three alignment options that were under consideration were presented for both the southeast and west sections of the Saskatoon Freeway.

At the Public Information Session, the results of a cost benefit analysis to assess the Saskatoon Freeway in the SW quadrant of the City as well as the connection from Highway No. 219 to Highway No. 11 were presented. The results of the cost benefit analysis indicated that while a route closer to the City would attract more traffic, it would result in additional impacts to existing and proposed development. If the alignment was shifted further away from the City, the impacts would be reduced, but the flood plain is much wider further away from the City. Since the bridge would have to span the flood plain, the cost of an alignment further from the City would be significantly higher due to the additional bridge costs. Another factor that was considered is that the section of Circle Drive from Highway No. 7 to Highway No. 11 is currently under capacity and would continue to have sufficient capacity until well into the future for traffic if the southwest section of the Saskatoon Freeway is not built. It was concluded that a connection from Highway No. 7 to Highway No. 219 was not warranted, and without the connection from Highway No. 7 to Highway No. 219, a connection from Highway No. 219 to Highway No. 11 is also not warranted as it would see limited truck traffic and would result in significant impacts to existing single and multi-parcel developments. The connection from Highway No. 7 to Highway No. 219 and from Highway No. 219 to Highway No. 11 were eliminated from the scope of work of the study. However, it was noted that a future connection from Highway No. 7 to Highway No. 219 would be possible at Victor Road or further south.

Information on the West Connector Route was also presented at the second Public Information Session in November as a potential interim measure to delay the requirement for the west Saskatoon Freeway.

Members of the project team were available to discuss the project and answer questions. Meeting attendees were again given the opportunity to submit comment sheets with feedback on the project and the information that was presented. A summary of the November 19th Public Information Session can be found in Appendix F. More than 400 people attended the Public Information Session, and more than 90 comment sheets were completed. The summary in Appendix F includes details of the comments that were received. The feedback that was received is summarized below:

- For the Highway No. 5 to Highway No. 11 connection, there was a preference for an alignment that is consistent with previously approved route. The shortest, most easterly route and affects least number of homes was preferred.
- For the Highway No. 14 to Highway No. 7 connection, there were concerns with how and where western options will connect to existing major road routes and proximity of alignment to existing and planned arterial and residential areas.

The material that was presented at the November Public Information Session was also posted on the Ministry of Highways and Infrastructure website for review after the meeting and throughout the comment period. Subsequent to the November 19th Public Information Session, members of the project team met with directly affected landowners upon request.

10.3 ONLINE ENGAGEMENT

An online engagement process occurred in May 2017. A project overview was given as well as some background information on the project. The results of the option analysis were posted on the Ministry of Highways and Infrastructure website, including the results of the option analysis which indicated that Option SE-1 and Option W-2 were the preferred alignments. Comment sheets were available so people viewing the alignments could offer feedback on the results of the analysis. In total, the website was viewed approximately 5500 times. The videos were viewed a combined 2300 times. Additional feedback was received in the form of comments and emails. A summary of the feedback that was received can be found in Appendix F.

Leading up to the Online Engagement session, letters were sent to all landowners in the project area. The letter that was mailed out prior to the online engagement in May 2017 invited directly affected landowners to meet with the project team. Meetings were held leading up to the online engagement, the weeks of May 1st, and May 8th. Additional meetings were also held subsequent to the online engagement process on June 2nd. A total of 31 meetings were held. Key comments at the landowner meetings are listed below:

- Some landowners were concerned about the development restriction and wanted to clarify if and when the development restrictions would be lifted
- Landowners expressed concern about the land acquisition process including how the property value would be assessed and expropriation.
- Some landowners asked about the corridor width and what development setbacks are required.
- There were some questions on the anticipated schedule for the project including the land acquisition process and ultimately construction of the Saskatoon Freeway
- There was some concern about how the Saskatoon Freeway would affect the value of nearby property.
- Some landowners wondered about access to their property, especially if their land is severed. They also asked about access to the City once the Saskatoon Freeway is built
- There was some concern about drainage
- Some landowners were concerned about traffic volumes on existing roads as well as existing signage
- There was support for the Saskatoon Freeway and the resulting safety benefits
- One landowner expressed a concern that the alignments had changed from those shown at the original Public Information Session.
- Some landowners asked about noise impacts and if a noise berm would be constructed.
- Some landowners asked if it was possible to realign the roadway. It was noted that the recommended alignment was shown on the figures and the centreline could shift up to 250m in either direction during future planning.

The comments that were received through the stakeholder and public engagement component of the project were addressed to the extent possible during and after the meetings. However, some of the questions that were asked focused on the schedule for the project and the land acquisition process. At the time of this study, there is still some uncertainty on the schedule for the project and how the project will affect each individual property. As the planning process is advanced, there will be more certainty on the

schedule and impacts to specific landowners. Landowners will need to be engaged as part of the future planning process to ensure they are kept up to date on the status of the project and the ongoing planning work that is required.

11 Option Evaluation

11.1 EVALUATION CRITERIA

The Saskatoon Freeway will provide an alternate route for traffic bound for destinations within the City as well as commuter traffic. The Saskatoon Freeway will also provide a bypass route for provincial and truck traffic that wouldn't otherwise need to enter the City. These main goals along with other general project goals such as minimizing impacts and cost were used to establish the decision criteria for use in the Triple Bottom Line evaluation.

Nine evaluation criteria were developed for review by the Technical and Steering Committees. The criteria have been identified within environmental, economic, and social groupings. The nine criteria are listed below along with a brief description of each one.

Environment Criteria

1. Impact on the Natural Environment (Air, Water, Land and Wildlife) – Infrastructure projects of the size represented in this study can have a significant impact on the natural environment. Typical impacts include disruption of natural water drainage, reduction of air quality, and reduction of productive agricultural land. As a critical criterion, impact on the natural environment was considered using the results of the desktop environmental screening, which identified the locations of sensitive environmental receptors that could be impacted by the Saskatoon Freeway. No protected species were identified in the project area for which impacts can't be mitigated. Therefore, the main differentiator in this criterion is wetland impacts and total area within the construction limits.

2. Minimize Impacts to Agricultural Land Use – The land surrounding the project is on the rural/urban fringe of Saskatoon. A significant amount of farmland is included in the study area. The goal of this criterion is to account for the desire to minimize impacts on agricultural land. No consideration was given to the various types of farmland such as cultivated land versus land used for grazing or ownership such as private farmland versus University land. The options were ranked based on the total area within the construction limits within areas that results in impacts to agricultural land.

Economic Criteria

3. Lifecycle Cost Comparison Capital & Operational Cost – In general terms, the alternative with the lowest lifecycle cost was given the highest score. Lifecycle cost consists of overall capital cost and operating and maintenance cost. This criterion is measured using order of magnitude estimates of the cost of construction and maintenance.

4. Facilitate and Promote Future Regional Economic Growth and Development – Each alternative has differing degrees of impact on these activities, through travel time, directness, ease of access and other considerations. The likelihood of each alternative to be conducive to facilitating economic growth was evaluated under this criterion. Other factors that were considered include induced demand and the resulting traffic volumes as well as the ability of each option to support growth and development between the

Saskatoon Freeway and the City within the RM of Corman Park. Options that create orphan properties were not seen as conducive to facilitating economic growth. The City of Saskatoon and the RM of Corman Park have based future development plans on the previous alignment for the Saskatoon Freeway in the southeast quadrant. Therefore, options with the least amount of deviation from the previous alignment received the most merit under this evaluation criterion.

5. Efficient and Effective Bypass/Truck Route – The Saskatoon South Saskatoon Freeway will serve as the main link between highways on the National Highway System including Highway No. 7, Highway No. 11 and Highway No. 16 and a bypass around the City for public and commercial traffic including large trucks that wouldn't otherwise have a reason to enter the City. Travel times for traffic with origins and destinations outside of the City using the Saskatoon Freeway were assessed to rank the options under this criterion.

6. Optimize Existing and Future Regional Road Network – The Saskatoon Freeway will provide an alternate route for commuters, especially for the communities in the southeast and west of the City. This criterion assessed how well the Saskatoon Freeway fits within the regional road network and contributes to the efficiency of travel routes and times within the regional road network including rural roads, connecting roads and roads within the City. Consideration was given to travel times to and from locations within the City to rank the options. The Saskatoon Freeway is an access controlled facility. Options that require the closure of existing roads would tend to reduce the ranking under this evaluation criterion, while options with greater potential for access to existing roads would receive a higher ranking.

Social Criteria

7. Access – The South Saskatoon Freeway will ultimately be a free-flow facility, with no at-grade direct access to surrounding property. However, surrounding property must have some form of access. This criterion is intended to capture the ability of each alternative to provide access from the Saskatoon Freeway to property in the vicinity of each interchange via the crossing roadway. The Saskatoon Freeway may also be a barrier to access by cutting off access roads to the City that may currently be used.

8. Geometric Compliance and Safety – All options are geometrically compliant and safe. The overall performance of the Saskatoon Freeway is impacted by the explicit geometric design criteria that are defined in the study. For the most part, a range of acceptable values are defined for the geometric design criteria, commonly referred to as the design domain. This criterion was assessed by determining if the option achieves values at the high end of the design domain or closer to the low end. Design criteria considered include location and spacing of interchanges, intersection angles, curve radii, deflection angles and tangent lengths. Safety was assessed by comparing the number of conflict points on each alignment as well as the relative complexity of the interchanges included in each option.

9. Impact on Adjacent Landowners – The degree to which the corridor has an intrusive impact on the standard of living of the adjacent landowners was assessed under this criterion based on number of impacted landowners. The ranking of options was based on the number of landowners directly impacted by the Saskatoon Freeway as well as proximity of the Saskatoon Freeway to existing development. More densely developed areas were given more consideration than individual landowners to reflect that more people will be affected, and impacts to commercial development were also considered.

11.2 CRITERIA RANKING

The nine criteria identified for the comparison were evaluated against each other in a pair-wise comparison to determine how much weight to place on each category. Table 11-1 illustrates the matrix comparing the criteria. In the table, criteria in columns were compared with criteria in rows. Each comparison was assigned a numerical value between 0 and 4 (0 meaning the row criteria was more important, 4 meaning the column criteria was more important). The columnar total was converted to a percentage weight. The totals and weights for the criteria are presented at the bottom of the table.

Table 11-1
Option Comparison Criteria

Criteria	Impact on Natural Environment	Minimize Impacts to Agricultural Land	Lifecycle Cost Comparison	Facilitate and Promote Economic Growth and Development	Efficient and Effective Bypass/Truck Route	Optimize Existing and Future Regional Road Network	Access	Geometric Compliance and Safety	Impact on Adjacent Landowners
Impact on Natural Environment	–	2	4	3	4	3	3	3	3
Minimize Impacts to Agricultural Land	2	–	4	3	4	4	3	3	4
Lifecycle Cost Comparison	0	0	–	2	1	2	1	1	1
Facilitate and Promote Economic Growth and Development	1	1	2	–	2	2	1	1	1
Efficient and Effective Bypass/Truck Route	0	0	3	2	–	2	1	1	1
Optimize Existing and Future Regional Road Network	1	0	2	2	2	–	1	1	1
Access	1	1	3	3	3	3	–	3	2
Geometric Compliance and Safety	1	1	3	3	3	3	1	–	1
Impact on Adjacent Landowners	1	0	3	3	3	3	2	3	–
Totals (144)	7	5	24	21	22	22	13	16	14
Weighted Totals (%)	**5**	**3**	**17**	**15**	**15**	**15**	**9**	**11**	**10**

Based on the criteria matrix analysis in the above table, the criteria that were used to rank the alignment alternatives were weighted as follows:

- Lifecycle Cost Comparison: 17%
- Efficient and Effective Bypass/Truck Route: 15%
- Optimize Existing and Future Regional Road Network: 15%
- Facilitate and Promote Economic Growth and Development: 15%
- Geometric Compliance and Safety: 11%
- Impact on Adjacent Landowners: 10%
- Access: 9%
- Impact on the Natural Environment: 5%
- Minimize Impacts to Agricultural Land: 3%

11.3 OPTION EVALUATION

Each option was evaluated based on the criteria developed above and assigned a ranking. A ranking with a higher numerical value indicates better performance in each category. For the west section, a ranking of 3 is the best and a ranking of 1 is the worst. For the southeast section, a ranking of 5 is the best and a ranking of 1 is the worst. The ranking in each criterion was then multiplied by the weighting, and the resulting numbers were summed for each option. Based on this calculation, an overall score was obtained for each option. The option with the highest score is the preferred option. This ranking procedure and the results are presented in Table 10-2 for the west section and Table 10-3 for the southeast section.

The option ranking under some of the evaluation criteria is subjective. The options were discussed during Technical Committee Meeting #4. Rankings were determined for each option based on the discussion and they are included in the table. The option ranking under other evaluation criteria is objective and measurable. The following paragraphs explain how each criterion was measured and summarizes the results.

West Option Ranking

Impact on the Natural Environment (Air, Water, Land and Wildlife) – Each option includes some wetland impacts. This can be seen on Figure 2 in the Environmental Screening Study in Appendix C. Option W-1 impacts a wetland between Highway No. 14 and the CN Railway and Option W-2 and W-3 cross a narrow stretch of wetlands running east to west, north of Highway No. 7. The ranking under this evaluation criterion was assigned based on the footprint of each option. The number of interchanges, flyovers and railway overpasses were similar for each option. Therefore, the length of each option was used as the basis for comparison. Option W-1 was the longest at 7.9 km followed by Option W-3 at 6.9 km. The shortest option was Option W-2 at 6.0 km resulting in the highest ranking under this criterion.

Minimize Impacts to Agricultural Land Use – The bulk of the land in the study area is agricultural. Similar to Impact on the Natural Environment, length was used as the basis for comparison of the options under this criterion. The highest ranking option was W-2 followed by W-3 and W-1 respectively.

Lifecycle Cost Comparison Capital & Operational Cost – Capital costs were estimated using a unit cost per kilometre and average costs for the various types of interchanges, flyovers and railway overpasses based on historical cost data from recent projects. The resulting capital costs ranged from Option W-2 at $318,000,000 to Option W-1 at $337,000,000. The cost of Option W-3 was estimated at $328,000,000. Because the costs for Option W-1 and W-3 were relatively close, they were each assigned a rank of 2, while Options W-2 was assigned a rank of 3. Maintenance costs will also be a function of length of road to be maintained and won't change the rankings that were assigned based on capital cost. The costs of engineering fees, landowner impacts and property costs are not included in the estimated capital costs. The costs noted above represent high level estimates and should be confirmed during future planning.

Facilitate and Promote Future Regional Economic Growth and Development – This criterion considered the impact on existing commercial and industrial businesses in the vicinity of the route and their ability to expand their operations.

. None of the options will result in significant impacts to the businesses. Consideration was also given to which route option creates more land fragmentation resulting in orphaned or undevelopable land, and which option provides the greatest opportunity to enable internal land access between the route and the City. Option W-1 and W-2 ranked lower than Option W-3 as they are closer to the City and limit the opportunity for access onto Highway No. 7 in between Saskatoon Freeway and the City. They also create a small triangle property between Highway No. 7, Saskatoon Freeway and the CN Railway that would be difficult to develop due to access restrictions. Option W-1 ranked lower than W-2 as it requires the realignment of Highway No. 60, which creates a small triangle shaped property in between Highway No. 60, Hodgson Road and Saskatoon Freeway with access constraints due to the Highway No. 60 realignment.

Efficient and Effective Bypass/Truck Route – Travel times for the west section were assessed based on a truck traveling from Calgary (Highway No. 7) and proceeding to the North Saskatoon Freeway. Distances were measured between common points at either end of the alignment options along the lengths of the alignments. The distances measured were 7.2 km, 8.2 km and 8.5 km for Option W-3, W-2 and W-1 respectively. It was assumed that the speeds were relatively consistent for each option and so the ranks were assigned based on the lengths that were measured. The lengths measured for Option W-3 was the shortest so it was assigned a rank of 3. The lengths measured for Option W-1 and W-2 were relatively close and 1.0 to 1.3 km longer than Option W-3. This won't result in significant additional travel time. Therefore, Option W-1 and W-2 were each assigned a rank of 2.

Optimize Existing and Future Regional Road Network – Key considerations under this criterion were the ability to maintain a highway to highway connection at Highway No. 60 and an assessment of future roadway continuity. Consideration was also given to how many road closures are required as a direct result of the route. Option W-1 and Option W-2 would require the realignment of Cedar Villa Road, while Option W-3 would require the realignment of Hodgson Road. Option W-2 ranked the highest as it allows for route continuity between Highway No. 60 and Saskatoon Freeway. It also offers the best opportunity for an interchange at the Saskatoon Freeway and Highway No. 7 by incorporating Highway No. 60. Option W-1

ranked the second highest as it provides a good opportunity for interchanges at both Highway No. 7/Highway No. 60 and Highway No. 7/Saskatoon Freeway, but route continuity is less desirable for this option. Option W-3 ranked the lowest as the spacing from the Highway No. 7/Saskatoon Freeway to Highway No. 7/Highway No. 60 is insufficient to allow for an interchange at Highway No. 60. Also, route continuity is less desirable for this option.

Access – The main consideration for the rankings under this criterion was the opportunities for access. Specifically, are there access concerns as a result of the alignment? It is assumed that direct access will be allowed off Highway No. 7 between the Saskatoon Freeway and the City. Option W-1 and W-2 ranked lower than Option W-3 as they are closer to the City and limit the opportunity for access onto Highway No. 7 in between the Saskatoon Freeway and the City. Option W-1 ranked lower than W-2 as it requires the realignment of Highway No. 60, which creates a small triangle shaped property in between Highway No. 60, Hodgson Road and the Saskatoon Freeway. It may be difficult to provide access to the remaining land in this area.

Geometric Compliance and Safety – All of the options will be geometrically compliant and safe. Therefore, each option was assigned a rank of 3.

Impact on Adjacent Landowners – The primary consideration for ranking under this evaluation criterion was direct impact to dwellings followed by proximity damage (dwelling within 110 m of the freeway ROW) and disruption damage (dwelling within 190 m of the freeway ROW). In the event of a tie in the above categories, impacts to yard sites were considered. Option W-1 and W-2 didn't appear to directly impact any dwellings, while option W-3 impacted two dwellings. The proximity and disruption damages for Option W-1 and W-2 were similar so consideration was given to impacts to yard sites. Both Option W-1 and W-2 impacted a yard site. Therefore, Option W-1 and W-2 were ranked the highest followed by Option W-3.

Table 11-2
Options Comparison

Criteria	Weight (%)	Option W-1		Option W-2		Option W-3	
		Rank	Score	Rank	Score	Rank	Score
Impact on Natural Environment	5	1	5	3	15	2	10
Minimize Impacts to Agricultural Land	3	1	3	3	9	2	6
Lifecycle Cost Comparison	17	2	34	3	51	2	34
Facilitate and Promote Economic Growth and Development	15	1	15	2	30	3	45
Efficient and Effective Bypass/Truck Route	15	2	30	2	30	3	45
Optimize Existing and Future Regional Road Network	15	2	30	3	45	1	15
Access	9	1	9	2	18	3	27
Geometric Compliance and Safety	11	3	33	3	33	3	33
Impact on Adjacent Landowners	10	2	20	2	20	1	10
Total Score	**100**		**179**		**251**		**225**

Based on the ranking procedure described above, Option W-2 scored the highest followed by Option W-3 and Option W-1 had the lowest score.

Some concern was expressed that one option may be ranked higher than another on a specific criterion while the difference between the two options may not be all that significant. This could lead to a recommended option that is not significantly better than the other evaluated options. Efforts were made to avoid this situation by assigning the same ranking to the options in question resulting in a tie. In addition, the project team completed a sensitivity analysis by reviewing the Lifecycle Cost Comparison, which was the criterion with the highest weight. If all options were assigned the same ranking under this criterion, the overall option ranking would remain unchanged.

Southeast Option Ranking

Impact on the Natural Environment (Air, Water, Land and Wildlife) – Wetlands were identified in the southeast section near the intersection of Floral Road (Township Road 360) and Winmill Road (Range Road 3043). Option SE-1, SE-2 and SE-3 do not significantly impact these wetlands, whereas Option SE-4 and SE-5 do result in impacts to the wetlands. Consideration was also given to the footprint of each option. The number of interchanges and railway overpasses were similar for each option. There was some difference in the number of flyovers, but this shouldn't have a major effect on the footprint. Therefore, the length of each option was used as the primary basis for comparison. Of the options that don't impact the wetlands, Option SE-1 was the shortest at 13.7 km followed by Option SE-2 at 14.1 km followed by Option SE-3 at 16.1 km. Option SE-4 was the longest option at 18.1 km and Option SE-5 was slightly shorter at 17.6 km.

Minimize Impacts to Agricultural Land Use – The bulk of the land in the study area is agricultural. Similar to Impact on the Natural Environment, length was used as the basis for comparison of the options under this criterion so the rankings for this criterion are the same as for Impact on the Natural Environment.

Lifecycle Cost Comparison Capital & Operational Cost – Capital costs were estimated using a unit cost per lane kilometre and average costs for the various types of interchanges, flyovers and railway overpasses based on historical cost data from recent projects. The resulting capital costs ranged from Option SE-1 at $674,000,000 to Option SE-4 at $753,000,000. The capital cost of Option SE-2 was estimated at $679,000,000 while the capital cost of Option SE-3 was estimated at $717,000,000 and the capital cost for Option SE-5 was estimated at $747,000,000. The costs for Option SE-1 and SE-2 are relatively close so they were both assigned a rank of 5. The remaining options were ranked based on their respective capital costs. Option SE-3 was assigned a rank of 3, Option SE-5 was assigned a rank of 2 and Option SE-4 was assigned a rank of 1. Maintenance costs will also be a function of length of road to be maintained and won't change the rankings that were assigned based on capital cost. The costs of engineering fees, landowner impacts and property costs are not included in the estimated capital costs. The costs noted above represent high level estimates and should be confirmed during future planning.

Facilitate and Promote Future Regional Economic Growth and Development – This criterion considered the impact on existing commercial and industrial businesses in the vicinity of the route and their ability to expand their operations as well as planned future developments. Preference was given to the options that were closer to the previous proposed alignment as the City's, RM's, and local landowner's plans for future development are based on the previous proposed alignment. Consideration was also given to which route option creates more land fragmentation resulting in orphaned or undevelopable land. Option SE-1 ranked the highest followed by Option SE-2, followed by Option SE-3. Their alignments are similar from south of Highway No. 5 to just beyond the interchange Highway No. 16. Ranking was assigned based on the Highway No. 11 interchange location with the interchange closest to the City receiving the highest ranking and the further away from the City the lower the ranking. Option SE-4 and SE-5 share similar alignments from south of Highway No. 5 to Baker Road. They both create orphan property near the interchange of Highway No. 16 and Saskatoon Freeway. The interchange for Option SE-5 at Highway No. 11 is closer to the City and ranks higher than Option SE-4.

Efficient and Effective Bypass/Truck Route – Travel times for the southeast section were assessed based on a truck traveling from Regina (Highway No. 11 South) and proceeding to the North Saskatoon Freeway. Distances were measured between common points at either end of the alignment options along the lengths of the alignments. The distances measured were 18.8 km, 18.9 km, 19.1 km, 20.1 km and 20.4 km for Option SE-2, SE-3, SE-4, SE-1 and SE-5 respectively. It was assumed that the speeds were relatively consistent for each option and so the ranks were assigned based on the lengths that were measured. The lengths measured for Option SE-2, SE-3 and SE-4 were relatively similar. Therefore, they were all assigned a rank of 5. Option SE-1 and SE-5 were assigned ranks of 4 as they are slightly longer than the other options.

Optimize Existing and Future Regional Road Network – Key considerations under this criterion were the ability to maintain highway to highway connections at all the major intersecting roadways. Consideration was also given to how many road closures are required as a direct result of the route.

Option SE-1 ranked the highest with a 5 as it results in minimal disruption to existing major grid roads. An overpass will be required at Patience Lake Road and a closure or overpass will be required at Haight Road. For Option SE-1, interchanges are proposed at 8th Street, Highway No. 16, Grasswood Road and Highway No. 11. Construction of a service interchange may be possible at Highway No. 11 and Grasswood Road depending on the configuration of the interchange of Highway No. 11 and the Saskatoon Freeway. Additional investigation will be required as part of future planning.

Option SE-3 was assigned a rank of 4 as it requires an overpass or closure at Baker Road in addition to those required by Option SE-1. For Option SE-3, interchanges are proposed at 8th Street, Highway No. 16, Grasswood Road and Highway No. 11.

Option SE-2 was assigned a rank of 3 as it requires closure of the Highway No. 11/Baker Road intersection or a realignment of Baker Road to maintain access to Highway No. 11 in addition to the overpasses or closures required by Option SE-1. For Option SE-2, interchanges are proposed at 8th Street, Highway No. 16, Grasswood Road and Highway No. 11.

Option SE-5 was assigned a rank of 2 as it requires an overpass at Patience Lake Road, and overpass or closure at Grasswood Road, an overpass or closure at Winmill Road and an overpass or closure at Haight Road. Interchanges are proposed at 8th Street, Highway No. 16, Baker Road and Highway No. 11.

Options SE-4 was assigned a rank of 1 as it requires an overpass or closure at Melness Road in addition to those required by Option SE5. For Option SE-4 interchanges are proposed at 8th Street, Highway No. 16, Baker Road and Highway No. 11.

Access – Rankings were assigned under this criterion based on which route provides the greatest opportunity for convenient local access within the route. Factors that were considered include how many existing accesses are directly impacted or otherwise affected by the alignment, and the opportunities to provide access to the remaining developable land was also assessed. Option SE-1 and SE-2 both impact the fewest driveways at three, while Option SE-3 and SE-4 impact four driveways and Option SE-5 impacts

seven driveways. In addition to direct driveway impacts, accesses were affected by road closures and the shape and size of remaining developable land.

Option SE-1 was assigned a rank of 5 due to the low number of directly affected driveway accesses. It also provides good access to the Grasswood Commercial Node business area. Opportunities for access to the remaining developable land is generally good.

Option SE-3 was assigned a rank of 4 as it also directly affects a small number of local accesses. Although spacing along Highway No. 11 isn't sufficient for interchanges at Baker Road and Melness Road, they could maintain access as at-grade intersections until access control is implemented on Highway No. 11. They would then need to be realigned to be upgraded to interchanges. Similar to Option SE-1, opportunities for access to the remaining developable land is generally good.

Option SE-2 was assigned a rank of 3. Although it directly impacts a small number of driveway accesses, it will affect the existing intersection of Highway No. 11 at Baker Road, requiring the closure of the intersection or the realignment of Baker Road to maintain access to Highway No. 11. With the exception of the impact to Baker Road, opportunities for access to the remaining developable land is generally good.

Option SE-5 was assigned a rank of 2. It directly affects a larger number of driveway accesses, and it will create difficulties in providing access to the land surrounding the Highway No. 16/Saskatoon Freeway interchange. Similar to Option SE-3, it allows continued access to Highway No. 11 for Baker Road and Melness Road with a requirement for realignment in order to upgrade these intersections to interchanges.

Option SE-4 was assigned a rank of 1 as it results in the most impacts to existing driveway accesses and requires realignment of both Baker Road and Melness Road to maintain access on Highway No. 11 due to access control requirements.

Geometric Compliance and Safety – All of the options will be geometrically compliant and safe. Therefore, each option was assigned a rank of 5.

Impact on Adjacent Landowners – The primary consideration for ranking under this evaluation criterion was direct impact to dwellings followed by proximity damage (dwelling within 110 m of the freeway) and disruption damage (dwelling within 190 m of the freeway). In the event of a tie in the above categories, impacts to yard sites were considered. Option SE-1 did not appear to directly impact any dwellings, Option SE-4 impacted one dwelling, Option SE-2 and SE-5 impacted two dwellings and Option SE-3 impacted four dwellings. Option SE-5 resulted in proximity damage to six dwellings while Option SE-2 only resulted in proximity damage to two dwellings. Therefore, Option SE-1 was assigned a rank of 5, Option SE-4 was assigned a rank of 4, Option SE-5 was assigned a rank of 3, followed by Option SE-2 and SE-3 with ranks of 2 and 1 respectively.

Table 11-3
Options Comparison

Criteria	Weight (%)	Option SE-1		Option SE-2		Option SE-3		Option SE-4		Option SE-5	
		Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Impact on Natural Environment	5	5	25	4	20	3	15	1	5	2	10
Minimize Impacts to Agricultural Land	3	5	15	4	12	3	9	1	3	2	6
Lifecycle Cost Comparison	17	5	85	5	85	3	51	1	17	2	34
Facilitate and Promote Economic Growth and Development	15	5	75	4	60	3	45	1	15	2	30
Efficient and Effective Bypass/Truck Route	15	4	60	5	75	5	75	5	75	4	60
Optimize Existing and Future Regional Road Network	15	5	75	3	45	4	60	1	15	2	30
Access	9	5	45	3	27	4	36	1	9	2	18
Geometric Compliance and Safety	11	5	55	5	55	5	55	5	55	5	55
Impact on Adjacent Landowners	10	5	50	2	20	1	10	4	40	3	30
Total Score	**100**		**485**		**399**		**356**		**234**		**273**

* Assumes University land impacts can be mitigated.

Based on the ranking procedure described above, Option SE-1 scored the highest followed by Option SE-2, Option SE-3 and Option SE-5. Option SE-4 had the lowest score.

A sensitivity analysis was completed on the southeast options, similar to the west options and the results were the same. For details, refer to page 11-7.

12 Conclusion and Recommendations

The scope of work for the project is to complete a General Location Study for the South Saskatoon Freeway. The main goals for the Saskatoon Freeway are to provide a bypass route for traffic that wouldn't otherwise need to enter the City, to accommodate commuting traffic and traffic bound for destinations within the City. Three alignment options for the West section and five alignment options for the Southeast section were developed. These options were evaluated using the Triple Bottom Line method that included nine specific evaluation criteria. The criteria reflect the goals of the project. Option W-2 and Option SE-1 ranked the highest in the Triple Bottom Line evaluation and therefore are the recommended alignments as summarized below.

The west section includes a relatively short alignment that connects Highway No. 14 and Highway No. 7. Option W-2 is the recommended route. It connects the Saskatoon Freeway to Highway No. 60 at Highway No. 7. Option W-2 avoids the identified constraints to the extent possible and will accommodate commuter and truck traffic.

For the southeast section, Option SE-1 is the recommended option. Option SE-1 is relatively similar to the previous alignment that was proposed so it will maintain some consistency with the City's development plans as well as the development plans in the Grasswood Commercial Node. It avoids significant impacts to existing and proposed multi parcel developments and University land. It also provides an effective bypass route for truck traffic and it will also be most attractive to commuter traffic as it is the option that is closest to the City.

Once the alignment for the South Saskatoon Freeway has been finalized, the next step would be to develop a construction staging plan which identifies an order of priority for construction of the different sections of the Saskatoon Freeway. It is also recommended that MHI advance the planning by completing functional design work for both the west and southeast sections of the Saskatoon Freeway. It would also be appropriate to update any of the functional planning work that was previously completed as necessary.

During the functional planning phase, the alignments would be confirmed, horizontal and vertical geometry and interchange configurations would be developed. The width of the corridors would also be reduced, resulting in a reduction of the area that is currently under a development restriction. Specific areas that require additional study during the next phases of project development include:

- Access requirements for all parcels throughout the study area
- Confirm intersection spacing along Highway No. 7 and Highway No. 14 in the west section, and Highway No. 11 and Highway No. 16 in the southeast.
- Determine interchange configurations in the southeast section including the interchange at the Saskatoon Freeway and Highway No. 16, and the Saskatoon Freeway and Highway No. 11.
    - The contemplated interchange configuration at the junction of the Saskatoon Freeway and Highway No. 11 is a 'Y' interchange. It will not offer all movements at the junction of the Saskatoon Freeway and Highway No. 11. Additional movements can be accommodated at

adjacent interchanges. The location of the adjacent interchanges will depend on ramp spacing and available weaving distance.

- The contemplated interchange configuration at the Saskatoon Freeway and Highway No. 16 would need to accommodate a rail crossing adjacent to Highway No. 16. This will result in a requirement to relocate Highway No. 16 or the railroad tracks to achieve some clearance between the highway and the tracks. It will also result in additional clearance requirements for the Saskatoon Freeway to cross overtop of the railroad and Highway No. 16.

- Finalize permanent access locations along the Saskatoon Freeway and determine if RM roads that cross the Saskatoon Freeway alignment, but won't have permanent access points will be closed, or will have overpasses.
- Connectivity of RM roads via internal roadway system to the Saskatoon Freeway at permanent access points.
- As country residential development along Highway No. 11 south continues to occur, establishing permanent access points should be looked at along the Highway No. 11 south corridor. Consideration could be given to a future southwest link of the Saskatoon Freeway.
- Complete utility coordination to determine specific requirements at each crossing.
- Complete geotechnical field work to confirm the suitability of native materials for subgrade, groundwater levels and slope stability.
- Complete additional environmental investigation including field work as follows:
  - A biological assessment is recommended to confirm the presence of protected plant and animal species along with the characterization of potentially impacted wetlands.
  - Field surveys will need to be conducted at the appropriate time, according to provincial guidelines. The routes all pass through similar types of habitat. Once the field investigations have been completed, more specific recommendations can be made on the recommended alignments.
- The results of the heritage resource screening determined that there were no known heritage sites recorded within the quarter sections where the preferred alignment occurs.
- Consider accommodation of over dimensional loads on the Saskatoon Freeway.

Certification Page

This report presents our findings regarding the Saskatchewan Ministry of Highways and Infrastructure South Saskatoon Freeway General Location Study.

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

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Appendix A – Steering and Technical Committee – Meeting Minutes

Technical and Steering Committee Meeting #1 (April 24th, 2015):
This was the first meeting of the project team with the Technical and Steering Committees. MHI provided a brief introduction and some background on the project. The project scope of work was discussed along with the key objectives of the project. The known constraints were listed.

The public and stakeholder consultation component of the project includes stakeholder meetings as well as Public Information Sessions. Stakeholder meetings will be held with affected parties. A preliminary list of stakeholders has been provided by MHI. The format and timing of the Public Information Sessions will be setup in a come and go format. Preliminary options will be presented at Public Information Session #1, and input will be collected from those in attendance. At Public Information Session #2, the preferred option will be presented. It would be helpful to have land agents present at Public Information Sessions.

The duty to consult on Traditional Rights was mentioned. It was noted that MHI had already initiated the process.

Technical Committee Meeting #2 (May 28, 2015)
On May 28th, the project team met with the Technical Committee in preparation for the first Public Information Session. After MHI provided a brief introduction, the project team discussed the route variable matrix, which categorized the known constraints and assigned relative priority to each category. The route variable matrix was used to help determine the potential alignments to be presented at the Public Information Session.

The Communication Plan was presented by . The Communication Plan includes the schedule for the first round of Stakeholder meetings (June 1st to 25th) and Public Information Session #1 (June 25th). Letters will be mailed out to landowners in the project area on June 8th. It was suggested that a map could be included with the letter.

The presentation materials for the first Public Information session were discussed. It was noted that they should include the corridors and preliminary bridge crossing locations. The draft figures shall be submitted to MHI for review and approval.

Steering Committee Meeting #2 (June 11, 2015)
After a brief introduction by MHI, the Route Variable Matrix was discussed including the prioritization of factors that impact the alignment which were updated based on input from the Technical Committee.

The presentation material for Public Information Session #1 was discussed. It was agreed that background slides should be included to give Public Information Session attendees a feel for where the project is at. They should show the Approved North Alignment, conceptual planning of the south alignment, information on schedule and time frame leading up to construction.

presented the Communication Plan. Stakeholder Sessions will be ongoing from June 1st to June 25th. Letters were mailed out to residents inviting them to the Public Information Session. The format for the Public Information Session was discussed. suggested a come and go format with a questionnaire to allow the public to provide input. It was agreed that this would be appropriate.

Technical Committee Meeting #3 (July 14, 2015)
The results of Public Information Session #1 were shared as follows:

- Over 400 people in attendance
- 275 email addresses provided
- 57 comment sheets submitted at the meeting with over 50 submitted since

The Triple Bottom Line Evaluation criteria was discussed. AE provided an initial list of criteria in the environmental, economic and social categories. Some of the criteria did not seem appropriate considering the level of detail that the study is currently at and what information is available. AE subsequently reviewed and revised the list of evaluation criteria.

Preliminary alignment options were reviewed including 3 options in the west section (Highway No. 14 to Highway No. 7) and 5 options in the southeast section (south of Highway No. 5 to Highway No. 219). The location that the alignments intersected Highway No. 11 were set by the corridors that were available between Highway No. 219 and Highway No. 11. The alignments were updated and forwarded to the Technical Committee for review.

Technical Committee Meeting #4 (August 20, 2015)
MHI provided an update on the southwest section including a summary of the benefit cost analysis that was completed resulting in the elimination of the connection from the scope. A brief update on the West Connector Route was also provided.

It was noted that the alignments have been updated based on new information. In the west, the size of the constraint on the land was increased. It was also confirmed that an alignment in the southwest section is not required, and the connection from Highway No. 219 to Highway No. 11 was eliminated from the project scope of work as well.

The Triple Bottom Line evaluation criteria were discussed, along with the input provided by the Technical Committee. Clarification was received on a few of the criteria as follows:

- The previous southeast alignment was used to plan for future developments. As a result, options that deviate less from the previous alignment in the southwest may be assigned a higher ranking under the Facilitate and Promote Future Regional Economic Growth and Development criteria. Higher rankings should also be assigned to options that create less orphaned property.
- The Optimize Existing and Future Regional Road Network criterion and the Access criterion both consider impacts to access. Clarification was given that the Access criterion deals with individual residence accesses while the Optimize Existing and Future Regional Road Network criterion deals more with road closures.
- It was noted that all options should be geometrically compliant and safe. Some designs may be closer to the lower end of the design domain while others are closer to the high end of the design domain. The options will be scored based on an evaluation of each alignment with respect to the design domain.

The updated alignments were reviewed. AE presented a preliminary criteria weighting and option ranking for the Triple Bottom Line evaluation. Input was provided by the Technical Committee, where appropriate, on both the criteria weighting and option ranking.

Steering Committee Meeting #3 (October 21, 2015)
MHI provided a brief introduction. The results of the first public information session were discussed.

MHI provided the details of a benefit cost analysis to assess the requirement for the southwest quadrant that led to the decision to omit this portion of the alignment. It was noted that a bridge may ultimately be needed, but it can be provided further south. MHI also discussed the status of the West Connector Route (WCR) project. It was noted that information on the WCR will be included in the Public Information Session material for the South Saskatoon Freeway project as an alternative to the southwest connection.

It was noted that with the elimination of the southwest quadrant, the alignment options were reassessed. Updated alignment options were shown, including the preferred option for both the west and southeast study areas.

The remaining milestones were discussed including the second Public Information Session, a final Technical and Steering Committee meeting and the Draft and Final Reports for the project.

Steering Committee Meeting #4 (December 13, 2016)
MHI gave a brief introduction. The purpose of the meeting was to provide an update on the project and discuss the remaining work. AE discussed the summary of Public Information Session #2, the alignment options and evaluation.

Remaining work includes a final Public Information Session is planned and completion of the draft and final report. MHI indicated that they will be looking at advancing study for the project, likely focussing on sections of the north alignment.

Appendix B - Geotechnical Desktop Study – Saskatoon Freeway

June 22, 2017

REPORT ON

Geotechnical Desktop Study - Saskatoon Freeway, Saskatoon, Saskatchewan

Submitted to:
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REPORT

Report Number: 1531310

Distribution:

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was commissioned by Associated Engineering (Sask.) Ltd. (AE), on behalf of the Ministry of Highways and Infrastructure, to complete a "desktop" geotechnical screening as part of the planning process for the proposed Saskatoon Freeway, located in the Rural Municipality of Corman Park, south of the City of Saskatoon urban limits. The overall study area referenced is referred to as Phase I of the study and is shown on Figure 1. The study area includes a small area northwest of the Highway 7 and Highway 60 intersection (Highway 7/60) and a larger area that extends east of Highway 219, across the alignments of Highway 11 and Highway 16 to the foot of the Strawberry Hills located east of Saskatoon.

Golder's scope of work was to assess geotechnical conditions for the general study area on the basis of published geotechnical information. The study was completed as a desktop review, addressing local landforms and materials that may affect the proposed alignments and potential structures with respect to foundation requirements and embankment/excavation considerations. No intrusive investigation or soil testing was conducted for this study.

This report should be read in conjunction with "Information and Limitations of This Report" included in Appendix A. The reader's attention is specifically drawn to this information, as it is essential for proper use and interpretation of this report.

A copy of AE's proposed alignments within the study area is included in Appendix B.

2.0 GEOLOGY

2.1 General Description of Regional Geology

As glaciers retreated downslope to the north in the Saskatoon area, a lake basin formed. The basin became occupied by Lake Saskatchewan into which the South Saskatchewan River emptied, forming a delta south of the city. The history of deglaciation of the Saskatoon area is dominated by glacial Lake Saskatchewan, the delta formed south of the city and the evolving South Saskatchewan River (Christiansen & Sauer, 1994).

In general, the geology in this region comprises of surficial stratified deposits overlying a thick stratum of clayey glacial tills, overlying clay shale deposits (bedrock). The glacial deposits are divided into two groups based on the carbonate content and stratigraphic position (Sauer, 1991). The two groups are referred to as the younger Saskatoon Group which overlies the older Sutherland Group.

The Saskatoon Group is subdivided into the Battleford and Floral Formations on the basis of pre-consolidation pressures, structure, staining and carbonate content. The Battleford Formation is typically softer than the Floral Formation, massive and unstained and can be over 100 metres (m) thick in this area. The Floral Formation contains over-consolidated, jointed and stained tills that range in thickness from less than 1 m to 70 m. In some regions, the Upper and Lower Floral Formation tills are separated by the Riddell Member, which consists of sand and gravel.

The Sutherland Group is divided into the Warman, Dundurn and Mennon Formations. The Warman Formation ranges in thickness from less than 1 m to about 20 m in this area. The Dundurn Formation is composed of till and stratified drift and generally has more inter-bedded sand and gravel than the other formations in the Sutherland Group. The Mennon Formation ranges in thickness from less than 1 m to about 30 m. Tills of the

Sutherland Group have lower carbonate content, are more clayey and have a higher liquid limit than tills of the Saskatoon Group (Christiansen, 1991).

The Bearpaw Formation forms the bedrock surface over much of this region and is the youngest bedrock formation, overlying the Judith River and Lea Park Formations. The Bearpaw Formation is predominately marine silty clays and sands and thins as it progresses westward. The silts and clays of the formation have a low hydraulic conductivity; therefore, the top of the formation is considered an impermeable lower boundary for the groundwater system above.

2.2 Geology within the Study Area

The more southerly sections of the study area are generally located within an Eolian Plain or Eolian Hummocky land formation. The more northerly sections of the study area are located within a Glacio-lacustrine Plain (Saskatchewan Research Council, 2008). In general, the soils at surface within an Eolian Plain will include sands and silts and the terrain can be flat or undulating. The soils at surface within a Glacio-lacustrine Plain will generally consist of clays and silts and the terrain will generally be flat (Figure 2).

The surficial stratified drift present within the study area is the Haultain Formation. The Haultain Formation is considered to be part of the Saskatoon Group and comprises of up to 30 m of soft grey silt and clay inter-bedded with sand. Its contact with the underlying Battleford Formation is commonly gradational. The silts, clays and sands of the Haultain Formation were deposited in deeper parts of the pro-glacial Lake Saskatchewan as it shifted north with the retreating ice front. In general silt and sand are found at surface within the footprint of the study area northwest of Highway 7/60 and are underlain with clay and silt. The surficial stratified drift in the study area northwest of Highway 7/60 extends to about 15 m below surface. Within the footprint of the area east of Highway 219, there is generally a layer of sand and silt inter-bedded in the clay and silt deposits. The surficial stratified drift in the east section of the study area extends to between 25 m and 30 m below surface. As well, the Haultain Formation thins and may not be present in the north east corner of the east study area, near the Strawberry Hills (MDH, 2011).

The Saskatoon Group includes the Floral and Battleford Formations and in places, the Riddell Member (MDH, 2011). Within the study area northwest of Highway 7/60, a thin layer of sand and gravel lies between the Battleford and Floral Formations and the Battleford Formation itself, is fairly thin. In the east study area, the Battleford Formation is extensive (thick) between Highway 219 and Highway 16, where it starts to thin out and appears at surface. The reason for the thick stratum of Battleford Formation in this area is due to a feature referred to as the "Saskatoon Low". The Saskatoon Low is a salt collapse structure where the bedrock has collapsed as a result of dissolution of the Prairie Evaporate Formation. The collapse has filled with thick sediments of the Battleford Formation till and has been overlain by glacio-fluvial deposits of the Haultain Formation (Christiansen E. 2001). Within the study area northwest of Highway 7/60, the Riddell Member is present within the Floral Formation and ranges in thickness from less than 5 m to about 22 m. Within the east study area, near and northwest of Highway 16, the Floral Formation is bisected by the Forestry Farm Aquifer which is a major aquifer in the area. The Forestry Farm Aquifer is approximately 35 m below surface (MDH, 2011) and is discussed further in Section 3.1.

The tills and sand and gravel units of the Saskatoon Group extend to about 75 m below surface in the area northwest of Highway 7/60 and to between 55 m and 120 m below surface in the study area east of Highway 219.

The Sutherland Group includes only the Dundurn Formation within the study area footprints and is not consistently present below the footprint of the study area east of Highway 219. The Dundurn Formation pinches into the study area near Highway 219 and appears again near Highway 16 and is present northeast of Highway 16 (MDH, 2011).

The Bearpaw Formation is absent in the area northwest of the intersection of Highway 7/60 and is approximately 50 m to 150 m below surface within the footprint of the area east of Highway 219. The Judith River Formation and Lea Park Formation range from about 100 m to 150 m below surface and are not discussed further in this report (MDH, 2011).

3.0 HYDROGEOLOGY

3.1 Aquifers

Stratified deposits between the Sutherland and Saskatoon Groups and between the individual till formations within the groups, in general, represent the major aquifers within the Saskatoon region. The inter-bedded stratified deposit that occurs between the contact of the Sutherland Group and the Saskatoon Group has been informally called the Lower Floral Aquifer, an aquifer interpreted to be discontinuous in the region. The Lower Floral Aquifer has been encountered in thicknesses up to 53 m and at depths below ground surface between 3 m and 100 m. The Lower Floral Aquifer may at times be hydraulically connected to the Upper Floral Aquifer in the Saskatoon area. These hydro-stratigraphic units form important aquifers in the Saskatoon area, of which one is formally named the Forestry Farm Aquifer and is present approximately 35 m below the surface of the east study area, near and northeast of Highway 16. The continuity and hydraulic head data of the aquifer reveals a fairly flat surface and several discontinuities have been inferred within the Forestry Farm Aquifer. A number of groundwater investigations carried out in the area estimate that the hydraulic conductivity of this aquifer can be expected to be within the range of $1x10^{-6}$ to $1x10^{-3}$ metres per second (m/s). The groundwater flow in the Forestry Farm Aquifer is toward the South Saskatchewan River. Figure 3 shows the extents of the drift aquifers in the area, including the Floral and Battleford aquifers. (MDH, 2011). The drift aquifers are generally discontinuous and geotechnical investigations are required to determine their depth and extent within proposed alignment right-of-ways.

3.2 Groundwater

A query of the SaskWater water well database (SaskWater, 2000) indicated 234 water withdrawal wells and 66 water test holes/soil holes/observations wells within a 1.6 km radius of the study areas. The majority of the wells were completed within sand layers present in the Saskatoon Group at about 5 m and greater below ground surface. The well lithology logs showed that the stratigraphy in the area consisted primarily of sand, silt and clay underlain with till. In general groundwater levels ranged from about 3 m to 6 m below ground surface. A summary table, as well as individual water well records are included in Appendix C.

4.0 GEOTECHNICAL CONSIDERATIONS

Surficial soils within the study area are expected to consist of silts, sands and/or clays and silts with possibly some glacial till at surface at the northeast corner of the study area.

4.1 Embankments and Roadways

Embankments constructed with sand will provide good subgrade support and stable embankments and can reduce the thickness of pavement structure required. However, consideration should be given to the potential for encountering silty poorly graded sand which is highly frost susceptible or clean poorly graded sands which may require stabilization. Silts are highly frost susceptible and can cause significant movements in roadway and interchange embankments in Saskatchewan's climate. Frost action in silt subgrades can be mitigated by subgrade excavation and replacement with free draining granular material and by providing subgrade drainage. However, silts are not recommended for subgrade or embankment construction.

Clays used to construct the embankments require special consideration. Clays are expansive and compressive in nature, and generally have a lower load-bearing capacity than the sands or tills. The thickness of pavement structure required increases for embankment materials with a lower load-bearing capacity. Clays can also be difficult to work when wet and can require extended schedules for drying and conditioning. When using clay fill for the embankments, it is important to monitor pore water pressures which can increase and then dissipate slowly over an extended time period due to the low hydraulic conductivity of the soil. Consolidation of the clay soil material only occurs after the excess pore water pressure dissipates and stress is transferred to the soil structure. If pavement structures are constructed on clay embankments before most of the consolidation has occurred, the structures may crack and shift as the embankment settles. Dewatering measures to lower possible high groundwater tables may be required and placement of fill embankments well in advance of construction should be considered to expedite consolidation of the subgrade materials and reduce settlement damage. Instrumentation to monitor pore water pressures, settlement, and lateral deformation may be required in any approach embankments.

Glacial till may be found at surface near the northeast end of the study area. Utilizing low to medium plastic cohesive glacial tills to construct the roadway and interchange embankments will provide good consistent subgrade support and will reduce the thickness of pavement structure required to support the anticipated traffic loading. Glacial tills are also superior to clay for the construction of interchange embankments. According to the SaskWater well database, glacial till was recorded at depths of 10 m or greater below surface. It would be uneconomical to excavate to these depths for borrow material; till borrow from the northeast corner of the study area may be available for embankment construction, but could be limited in volume and would include a cost premium.

Groundwater levels in general averaged about 6 m below surface, but were as shallow as 1.5 m. Geotechnical investigations should be conducted to determine groundwater levels and to verify soil conditions.

Construction through any wetlands created by the water channels and sloughs would likely require dewatering, excavation of organic materials, and backfilling with more stable materials. Road grade construction through these types of areas may require use of geotextile materials to reduce the extent of subgrade excavation and backfill.

4.2 Foundations for Structures

Driven or cast-in-place pile foundations would be expected to be suitable for the soil conditions found at the site. Cast-in-place piles within the silt, sand and gravel surficial deposits may require sleeving. Boulders are commonly found at random or in layers within the Saskatchewan glacial tills. The Forestry Farm Aquifer is about 35 m below surface, but should be considered when determining pile lengths, excavations and cuts.

Concrete in contact with the soil should be produced with sulphate resistant Portland cement.

4.3 Slope Stability

The current areas of study would not be expected to have any existing slopes that may cause issues; however, slopes within trenches, excavations and cuts may become unstable over time depending on ground moisture conditions, fluctuations in the groundwater table and changes to surface drainage patterns.

5.0 CLOSURE

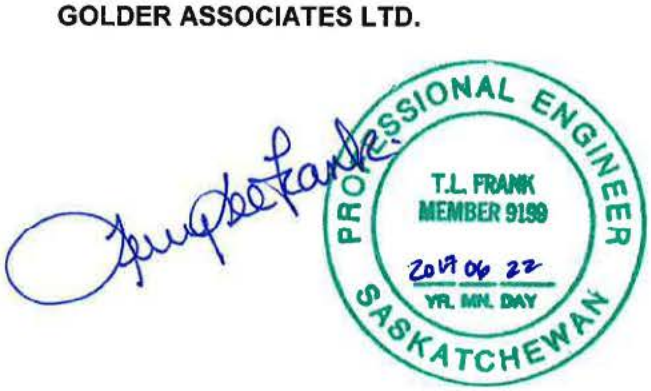
This report presents a summary of existing information obtained from Geology and Surficial Geology Maps and the records of water wells from the SaskWater database. Comments on suitability of native materials for subgrade, groundwater levels, and slope stability are general in nature and should be confirmed with a field investigation and engineering analysis to provide more detailed recommendations on a site specific basis.

The information presented in this report was gathered from existing information and provides general commentary on geotechnical conditions that may be encountered along the proposed road alignments. The contents of this report do not constitute a design in whole or in part, of any of the elements of any future work. Detailed geotechnical investigations will be required when a final alignment is determined.

We trust that this report addresses your current needs for this project. Please call if you wish to discuss this report or require any clarification.

Report Signature Page

GOLDER ASSOCIATES LTD.



Terry Frank, P.Eng., PMP
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Principal, Senior Geotechnical Engineer

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Association of Professional Engineers & Geoscientists of Saskatchewan

CERTIFICATE OF AUTHORIZATION

Golder Associates Ltd.
Number C0230

Permission to Consult held by:

Discipline	Sk. Reg. No.	Signature
Geotech	09199	

6.0 REFERENCES

Christiansen. (1991). *Pleistocene Stratigraphy of the Saskatoon area, Saskatchewan, Canada, an update.* Saskatoon: Canadian Journal of Earth Sciences.

Christiansen, E. (2001). Stratigraphy and structure of a Late Wisconsinan salt collapse in the Saskatoon Low, south of Saskatoon, Saskatchewan, Canada: an update. *Can. J. Earth Sci*, 1601-1613.

Christiansen, E., & Sauer, C. (1994). Geotechnique of Saskatoon and Surrounding Area, Saskatchewan Canada. Geological Association of Canada.

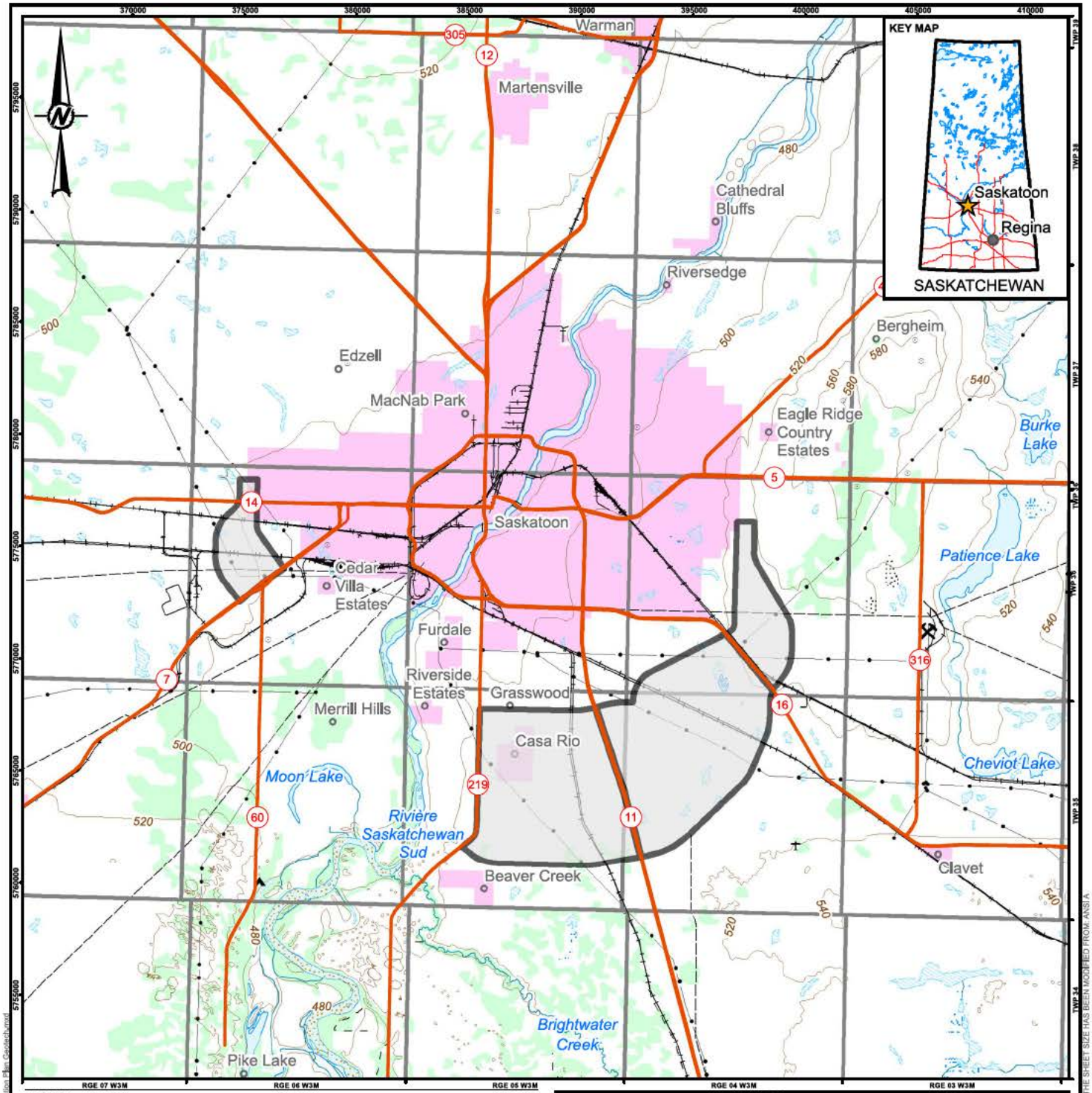
MDH. (2011). *Hydrogeology Mapping of NTS Mapsheet Saskatoon 73B prepared for Saskatchewan Watershed Authority.* MDH Engineered Solutions.

Saskatchewan Research Council. (2008). *Geological Atlas of Saskatchewan.* Saskatchewan Research Council.

SaskWater. (2000). *SaskWater Water Well Database.* SaskWater.

Sauer, E. (1991). *Engineering geology of Cretaceous and Tertiary deposits of Saskatchewan.* Saskatoon, Sk: University of Saskatchewan.

FIGURES



LEGEND

STUDY AREA

0 5 10

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REFERENCE(S)

1. NATIONAL TOPOGRAPHIC DATA BASE (NTDB) DATA: © DEPARTMENT OF NATURAL RESOURCES CANADA, 2007.
2. CANVEC HIGHWAYS: © DEPARTMENT OF NATURAL RESOURCES CANADA, 2012. ALL RIGHTS RESERVED.

CLIENT

Associated Engineering

PROJECT

GEOTECHNICAL DESKTOP SCREENING
SASKATOON FREEWAY
SASKATOON, SASKATCHEWAN

TITLE

GENERAL LOCATION PLAN

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-06-22
DESIGNED	TF
PREPARED	SBM
REVIEWED	TF
APPROVED	PGB

PROJECT NO.	PHASE	REV.	FIGURE
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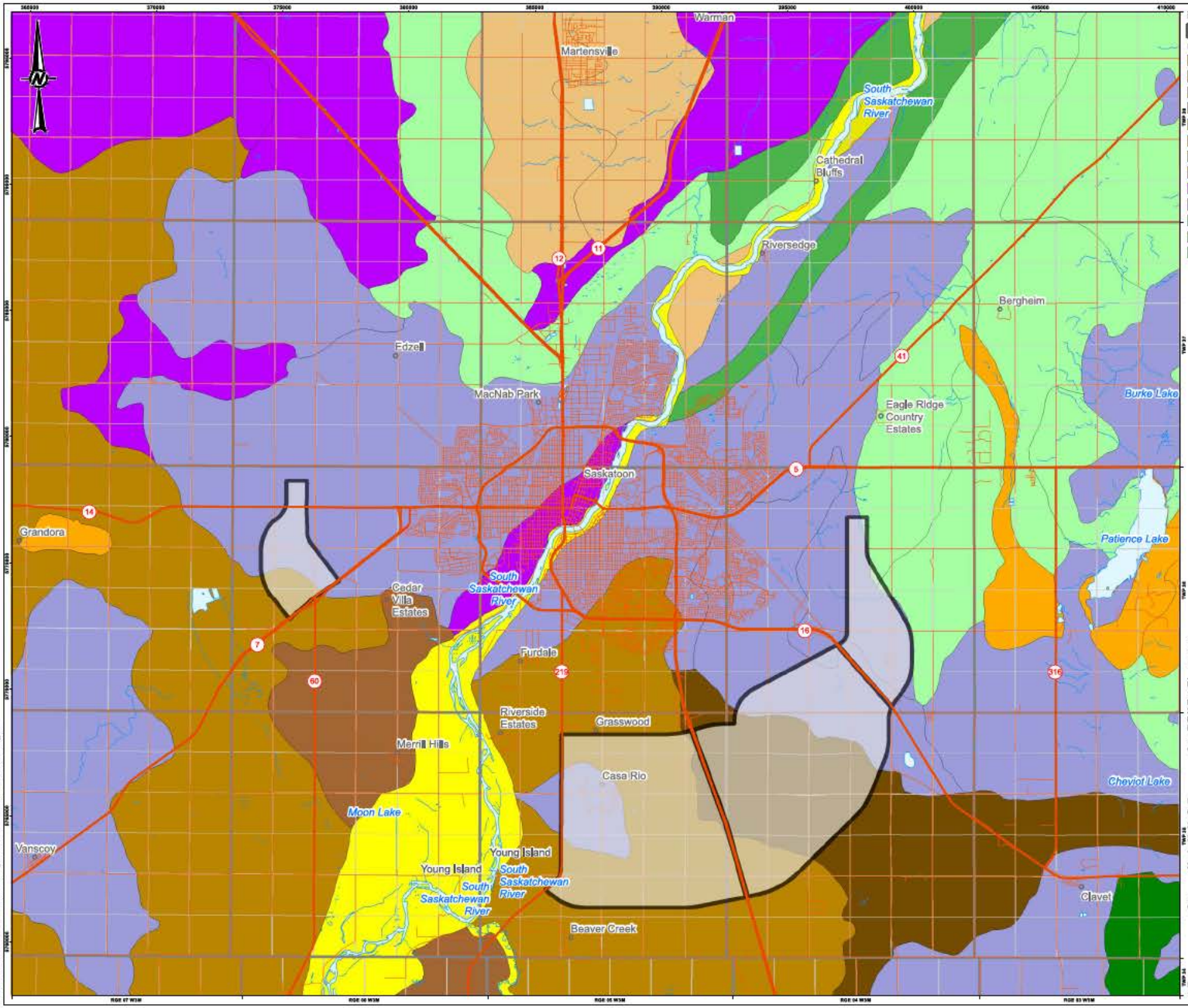

LEGEND

- STUDY AREA

SURFICIAL GEOLOGY

- ALLUVIAL
- ALLUVIAL PLAIN
- EOLIAN
- EOLIAN HUMMOCKY
- EOLIAN PLAIN
- GLACIOFLUVIAL HUMMOCKY
- GLACIOFLUVIAL PLAIN
- GLACIOFLUVIAL TERRACE
- GLACIOLACUSTRINE DELTA
- GLACIOLACUSTRINE PLAIN
- MORAINAL ERODED
- MORAINAL PLAIN
- MORAINAL UNDULATING

0 2.5 5

1:150,000 KILOMETRES

NOTE(S)

1. STUDY AREA IS DIGITIZED APPAROXIMATELY FROM PDF SOURCE AT 1:200,000. ACCURACY IS NOT GUARANTEED

REFERENCE(S)

1. SURFICIAL GEOLOGY: GEOLOGICAL ATLAS OF SASKATCHEWAN, SASKATCHEWAN RESEARCH COUNCIL, 2008.
2. CANVEC BASE DATA: © DEPARTMENT OF NATURAL RESOURCES CANADA, 2012. ALL RIGHTS RESERVED.

NAD 83 UTM ZONE 13N

CLIENT

Associated Engineering

PROJECT

GEOTECHNICAL DESKTOP SCREENING
SASKATOON FREEWAY
SASKATOON, SASKATCHEWAN

TITLE

SURFICIAL GEOLOGY

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-06-22
DESIGNED	TF
PREPARED	SBM
REVIEWED	TF
APPROVED	PGB

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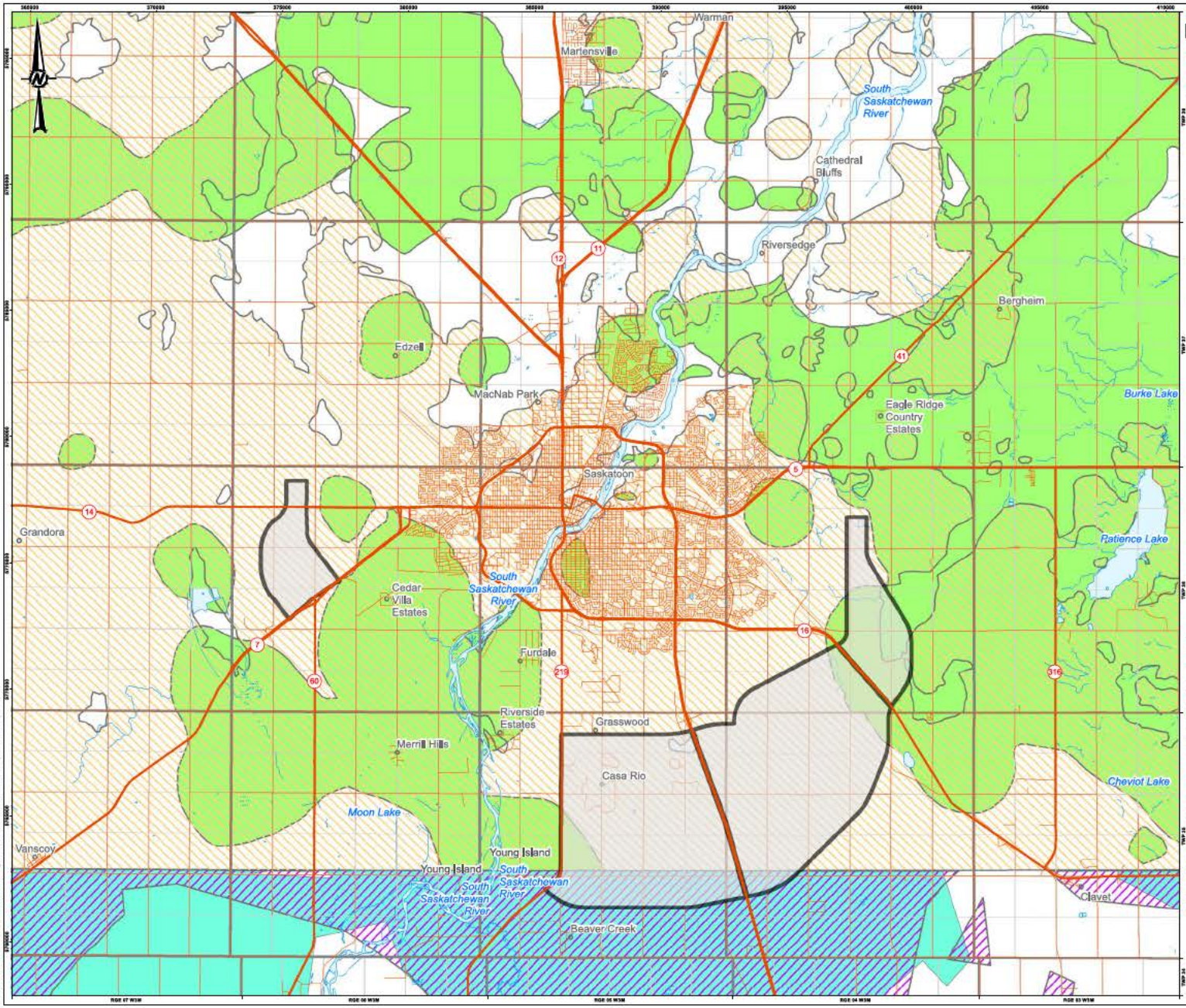


LEGEND

- STUDY AREA
- DRIFT AQUIFERS
  - SURFICIAL
  - INTERTILL
  - SASKATOON
  - SASKATOON FLORAL

0 2.5 5
1:150,000 KILOMETRES

NOTE(S)

1. STUDY AREA IS DIGITIZED APPAROXIMATELY FROM PDF SOURCE AT 1:200,000. ACCURACY IS NOT GUARANTEED

REFERENCE(S)

1. PROVINCIAL AQUIFER BOUNDARIES: SRC
3. PROJECT SPECIFIC AQUIFER BOUNDARIES: DERIVED FROM ROCKWORKS
2. CANVEC BASE DATA: © DEPARTMENT OF NATURAL RESOURCES CANADA, 2012. ALL RIGHTS RESERVED.
NAD 83 UTM ZONE 13N

CLIENT

Associated Engineering

PROJECT

GEOTECHNICAL DESKTOP SCREENING
SASKATOON FREEWAY
SASKATOON, SASKATCHEWAN

TITLE

SURFICIAL AQUIFERS IN THE STUDY AREA

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-06-22
DESIGNED	TF
PREPARED	SBM
REVIEWED	TF
APPROVED	PGB

PROJECT NO.	CONTROL	REV.	FIGURE
1531310	1000	0	3

APPENDIX A

Important Information and Limitations of this Report

IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

Standard of Care: Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

Basis and Use of the Report: This report has been prepared for the specific site, design objective, development and purpose described to Golder by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. Any change of site conditions, purpose, development plans or if the project is not initiated within eighteen months of the date of the report may alter the validity of the report. Golder can not be responsible for use of this report, or portions thereof, unless Golder is requested to review and, if necessary, revise the report.

The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without Golder's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, Golder may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client can not rely upon the electronic media versions of Golder's report or other work products.

The report is of a summary nature and is not intended to stand alone without reference to the instructions given to Golder by the Client, communications between Golder and the Client, and to any other reports prepared by Golder for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. Golder can not be responsible for use of portions of the report without reference to the entire report.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

Soil, Rock and Groundwater Conditions: Classification and identification of soils, rocks, and geologic units have been based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil, rock or geologic types or units may be transitional rather than abrupt. Accordingly, Golder does not warrant or guarantee the exactness of the descriptions.

IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT (cont'd)

Special risks occur whenever engineering or related disciplines are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions. The environmental, geologic, geotechnical, geochemical and hydrogeologic conditions that Golder interprets to exist between and beyond sampling points may differ from those that actually exist. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. **The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report.** The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

Sample Disposal: Golder will dispose of all uncontaminated soil and/or rock samples 90 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.

Follow-Up and Construction Services: All details of the design were not known at the time of submission of Golder's report. Golder should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of Golder's report.

During construction, Golder should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of Golder's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in Golder's report. Adequate field review, observation and testing during construction are necessary for Golder to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, Golder's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

Changed Conditions and Drainage: Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that Golder be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that Golder be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

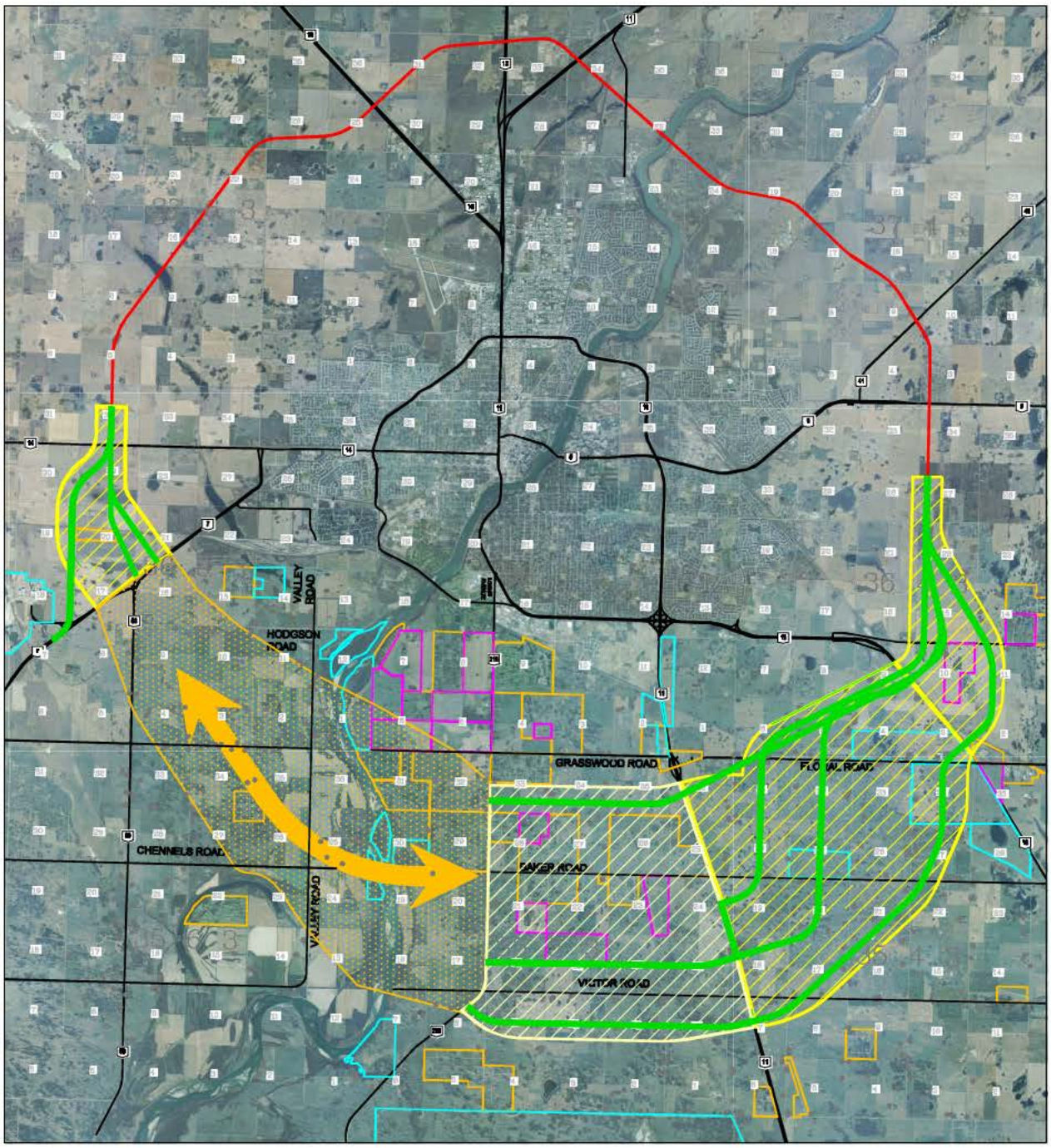
Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. Golder takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

APPENDIX B

AE Proposed Alignment Plan

SASKATOON SOUTH PERIMETER FREEWAY

STUDY AREA



LEGEND

- EXISTING DEVELOPEMENT
- PROPOSED DEVELOPEMENT
- OTHER JURISDICTIONS
- STUDY AREA
- STUDY AREA (LONG TERM PLAN)
- OPTIONAL STUDY AREA
- APPROVED ALIGNMENT
- POTENTIAL ALIGNMENT
- INDIV DUAL RESIDENCES AND BUSINESSES

Government of Saskatchewan

Associated Engineering

APPENDIX C

SaskWater Database Information

WWDR#	UTM_Zone	Northing	Easting	Wells_Quarter	Wells_Section	Wells_Township	Wells_Range	Wells_Meridian	Elevation	Completed	Bore_Hole_Depth (ft)	Bore_Hole_Depth (m)	Water_Level	Water_Use	Well_Use
220589	13	5767102	390133	SE	35	35	5	3	1669	1952.10.06	0	0	0		
031770	13	5769179	397744		3	36	4	3	0	1948.10.01	15	5	11	Domestic	Withdrawal
009539	13	5764893	389066	NW	23	35	5	3	1675	1973.04.09	18	5	12	Domestic	Withdrawal
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083329	13	5768059	392418	NW	31	35	4	3	1675	1986.06.04	22	7	0	Domestic	Withdrawal
047128	13	5762481	389009	SW	14	35	5	3	1675	1976.05.25	22	7	12	Domestic	Withdrawal
043815	13	5765717	389086	SW	26	35	5	3	1675	1975.05.06	24	7	18	Domestic	Withdrawal
031769	13	5768749	398966	SW	2	36	4	3	1700	1950.08.19	22	7	20	Domestic	Withdrawal
043761	13	5767968	396484	NE	33	35	4	3	1662	1974.11.20	26	8	0	Research	Observation
045657	13	5767960	397310	NW	34	35	4	3	1675	1976.03.24	25	8	0	Research	Water Test Hole
049257	13	5764052	390693	SW	24	35	5	3	1675	1977.04.14	26	8	0	Domestic	Withdrawal
045913	13	5767350	387485	SW	34	35	5	3	1650	1976.04.28	27	8	0	Domestic	Withdrawal
083606	13	5767752	387902		34	35	5	3	1650	1986.10.02	27	8	0	Domestic	Withdrawal
014488	13	5764052	390693	SW	24	35	5	3	1675	1974.05.09	27	8	8	Domestic	Withdrawal
043770	13	5768802	396507	SE	4	36	4	3	1688	1974.11.21	25	8	10	Research	Observation
043816	13	5766567	386638	NE	28	35	5	3	1650	1975.04.18	27	8	12	Domestic	Withdrawal
051688	13	5764000	393117	SE	19	35	4	3	1700	1977.09.19	27	8	13	Domestic	Withdrawal
043814	13	5764856	390709	NW	24	35	5	3	1675	1975.04.25	27	8	13	Domestic	Withdrawal
045656	13	5767960	397310	NW	34	35	4	3	1675	1976.03.23	30	9	0	Research	Water Test Hole
102459	13	5763212	392310	NW	18	35	4	3	1675	1992.09.15	29	9	0	Domestic	Withdrawal
077641	13	5764856	390709	NW	24	35	5	3	1675	1984.04.23	28	9	0	Domestic	Withdrawal
031772	13	5768818	395700	SW	4	36	4	3	1675	1969.04.24	31	9	0	Domestic	Withdrawal
012381	13	5771954	400660	SW	13	36	4	3	1700	1974.05.01	28	9	0	Domestic	Withdrawal
043762	13	5767968	396484	NE	33	35	4	3	1662	1974.11.20	30	9	6	Research	Observation
043766	13	5767968	396484	NE	33	35	4	3	1668	1974.11.20	30	9	8	Research	Observation
043767	13	5768802	396507	SE	4	36	4	3	1673	1974.11.21	30	9	9	Research	Observation
014489	13	5764856	390709	NW	24	35	5	3	1675	1974.05.09	28	9	13	Domestic	Withdrawal
100469	13	5764132	386579	SE	21	35	5	3	1675	1991.05.31	30	9	16	Domestic	Withdrawal
031897	13	5764917	387417	NW	22	35	5	3	1675	1963.04.02	32	10	0	Domestic	Water Test Hole
085022	13	5767969	395676	NW	33	35	4	3	1675	1987.05.25	34	10	0	Domestic	Withdrawal
031892	13	5763313	387372	NW	15	35	5	3	1675	1972.05.08	32	10	0	Domestic	Withdrawal
081711	13	5762528	386542	SE	16	35	5	3	1675	1985.07.29	32	10	0	Domestic	Withdrawal
031901	13	5765698	389896	SE	26	35	5	3	1675	1969.07.04	34	10	0	Domestic	Withdrawal
043769	13	5768802	396507	SE	4	36	4	3	1676	1974.10.28	32	10	12	Research	Observation
218798	13	5764017	392325	SW	19	35	4	3	1657	2009.10.16	33	10	12	Domestic	Withdrawal
085025	13	5763285	389029	NW	14	35	5	3	1675	1987.05.04	35	11	0	Domestic	Withdrawal
031920	13	5767350	387485	SW	34	35	5	3	1650	1969.07.02	36	11	0	Domestic	Withdrawal
043768	13	5768802	396507	SE	4	36	4	3	1676	1974.11.22	36	11	13	Research	Observation
031891	13	5763285	389029	NW	14	35	5	3	1675	1968.10.31	40	12	0	Domestic	Water Test Hole
045303	13	5763162	393922	NW	17	35	4	3	1675	1975.10.06	41	12	0	Domestic	Withdrawal
060564	13	5764779	393958	NW	20	35	4	3	1700	1979.06.14	40	12	0	Domestic	Withdrawal
102894	13	5763285	389029	NW	14	35	5	3	1675	1993.05.05	38	12	0	Domestic	Withdrawal
031900	13	5764088	389048	SW	23	35	5	3	1675	1970.07.26	39	12	0	Domestic	Withdrawal
058332	13	5764779	393958	NW	20	35	4	3	1700	1979.06.14	40	12	10	Domestic	Withdrawal
206470	13	5765663	391534	SE	25	35	5	3	1699	2005.07.14	38	12	10	Domestic	Withdrawal
109678	13	5765680	390727	SW	25	35	5	3	1670	1998.09.01	40	12	10	Domestic	Withdrawal
201950	13	5765698	389896	SE	26	35	5	3	1673	2004.05.07	41	12	11	Domestic	Withdrawal
063058	13	5765763	386624	SE	28	35	5	3	1660	1980.06.18	41	12	12	Domestic	Withdrawal
102933	13	5764738	394762	NE	20	35	4	3	1675	1993.05.05	40	12	16	Domestic	Withdrawal
092457	13	5764875	389877	NE	23	35	5	3	1675	1988.11.18	40	12	18	Domestic	Withdrawal
031898	13	5764917	387417	NW	22	35	5	3	1675	1963.04.02	39	12	22	Domestic	Withdrawal
047127	13	5766485	390745	NW	25	35	5	3	1675	1976.05.26	39	12	23	Domestic	Withdrawal
031890	13	5763285	389029	NW	14	35	5	3	1675	1968.11.01	40	12	24	Domestic	Withdrawal
208305	13	5765717	389086	SW	26	35	5	3	1673	2007.10.12	43	13	14	Domestic	Withdrawal

109499	13	5765663	391534 SE	25	35	5	3	1675 1998.08.17	43	13	20 Domestic	Withdrawal	
099867	13	5766109	389503	26	35	5	3	1675 1990.10.02	42	13	26 Domestic	Withdrawal	
103321	13	5764000	393117 SE	19	35	4	3	1650 1993.09.17	45	14	0 Domestic	Withdrawal	
055468	13	5767369	386658 SE	33	35	5	3	1650 1978.08.03	46	14	0 Domestic	Withdrawal	
119562	13	5771954	400660 SW	13	36	4	3	1782 2002.07.18	45	14	0 Domestic	Withdrawal	
110606	13	5765680	390727 SW	25	35	5	3	1673 1999.05.04	46	14	7 Domestic	Withdrawal	
108668	13	5765698	389896 SE	26	35	5	3	1673 1997.10.14	47	14	8 Domestic	Withdrawal	
110605	13	5765680	390727 SW	25	35	5	3	1673 1999.05.03	45	14	10 Domestic	Withdrawal	
106559	13	5766502	389916 NE	26	35	5	3	1675 1996.04.30	46	14	10 Domestic	Withdrawal	
056423	13	5767793	386273	33	35	5	3	1650 1978.05.30	45	14	10 Domestic	Withdrawal	
107053	13	5766502	389916 NE	26	35	5	3	1673 1996.10.15	46	14	14 Domestic	Withdrawal	
113599	13	5765698	389896 SE	26	35	5	3	1673 2001.04.30	45	14	14 Domestic	Withdrawal	
105758	13	5766502	389916 NE	26	35	5	3	1675 1995.08.17	47	14	15 Domestic	Withdrawal	
220186	13	5767968	396484 NE	33	35	4	3	1660 1976.12.31	50	15	0 Research	Soil Test Hole	
054164	13	5765554	396420 SE	28	35	4	3	1675 1978.04.28	50	15	0 Domestic	Withdrawal	
045909	13	5765628	393151 SE	30	35	4	3	1650 1976.04.28	48	15	0 Domestic	Withdrawal	
031767	13	5768017	394050 NW	32	35	4	3	1671 1972.10.27	50	15	0 Domestic	Withdrawal	
092864	13	5762873	389426	14	35	5	3	1675 1988.10.05	50	15	0 Domestic	Withdrawal	
223506	13	5765433	385937 SW	28	35	5	3	1667 2011.07.17	50	15	0 Domestic	Withdrawal	
108328	13	5765698	389896 SE	26	35	5	3	1673 1997.08.01	48	15	6 Domestic	Withdrawal	
110026	13	5765680	390727 SW	25	35	5	3	1673 1998.10.21	50	15	10 Domestic	Withdrawal	
110759	13	5765680	390727 SW	25	35	5	3	1675 1999.06.28	50	15	10 Domestic	Withdrawal	
111078	13	5764052	390693 SW	24	35	5	3	1673 1999.09.24	49	15	11 Domestic	Withdrawal	
106564	13	5766547	387461 NW	27	35	5	3	1675 1996.04.29	48	15	11 Domestic	Withdrawal	
101565	13	5764132	386579 SE	21	35	5	3	1675 1992.04.08	48	15	12 Domestic	Withdrawal	
110607	13	5765680	390727 SW	25	35	5	3	1673 1999.05.04	48	15	12 Domestic	Withdrawal	
110870	13	5765680	390727 SW	25	35	5	3	1673 1999.08.10	50	15	12 Domestic	Withdrawal	
106018	13	5766502	389916 NE	26	35	5	3	1675 1995.11.09	48	15	12 Domestic	Withdrawal	
106560	13	5766502	389916 NE	26	35	5	3	1675 1996.04.30	50	15	12 Domestic	Withdrawal	
106562	13	5766547	387461 NW	27	35	5	3	1675 1996.04.23	49	15	12 Domestic	Withdrawal	
105586	13	5764908	388232 NE	22	35	5	3	1675 1995.07.14	48	15	13 Domestic	Withdrawal	
217625	13	5764893	389066 NW	23	35	5	3	1673 2009.06.19	50	15	13 Domestic	Withdrawal	
202068	13	5765680	390727 SW	25	35	5	3	1673 2005.06.01	48	15	13 Domestic	Withdrawal	
107870	13	5764917	387417 NW	22	35	5	3	1673 1997.04.16	48	15	14 Domestic	Withdrawal	
201989	13	5766502	389916 NE	26	35	5	3	1673 2004.06.08	49	15	14 Domestic	Withdrawal	
104113	13	5765952	396026 NH	28	35	4	3	1675 1994.04.27	49	15	14 Domestic	Withdrawal	
102935	13	5767255	392398 SW	31	35	4	3	1700 1993.04.21	50	15	15 Domestic	Withdrawal	
100470	13	5764113	387401 SW	22	35	5	3	1675 1991.04.12	49	15	15 Domestic	Withdrawal	
086177	13	5764856	390709 NW	24	35	5	3	1675 1987.07.06	50	15	15 Domestic	Withdrawal	
102427	13	5765663	391534 SE	25	35	5	3	1675 1991.07.08	48	15	15 Domestic	Withdrawal	
110608	13	5765680	390727 SW	25	35	5	3	1673 1999.05.14	48	15	15 Domestic	Withdrawal	
102939	13	5766502	389916 NE	26	35	5	3	1675 1993.04.28	48	15	15 Domestic	Withdrawal	
106017	13	5766502	389916 NE	26	35	5	3	1675 1995.11.09	48	15	15 Domestic	Withdrawal	
110027	13	5765698	389896 SE	26	35	5	3	1673 1998.10.23	50	15	15 Domestic	Withdrawal	
109358	13	5765698	389896 SE	26	35	5	3	1670 1997.11.06	48	15	15 Domestic	Withdrawal	
106019	13	5765743	387437 SW	27	35	5	3	1675 1995.11.16	48	15	15 Domestic	Withdrawal	
048671	13	5762424	391467 SE	13	35	5	3	1675 1976.11.09	50	15	16 Domestic	Withdrawal	
105912	13	5764936	386604 NE	21	35	5	3	1675 1995.09.22	48	15	16 Domestic	Withdrawal	
102937	13	5764936	386604 NE	21	35	5	3	1675 1993.04.30	48	15	16 Domestic	Withdrawal	
211586	13	5764893	389066 NW	23	35	5	3	1673 2007.08.23	49	15	16 Domestic	Withdrawal	
104120	13	5764856	390709 NW	24	35	5	3	1675 1994.05.10	50	15	16 Domestic	Withdrawal	
106558	13	5766502	389916 NE	26	35	5	3	1675 1996.03.28	48	15	16 Domestic	Withdrawal	
110760	13	5766502	389916 NE	26	35	5	3	1675 1999.06.16	50	15	16 Domestic	Withdrawal	
106563	13	5766547	387461 NW	27	35	5	3	1675 1996.04.24	48	15	16 Domestic	Withdrawal	
105759	13	5765743	387437 SW	27	35	5	3	1675 1995.09.11	48	15	16 Domestic	Withdrawal	
106555	13	5764000	393117 SE	19	35	4	3	1675 1996.04.08	48	15	18 Domestic	Withdrawal	
101564	13	5763330	386559 NE	16	35	5	3	1675 1992.04.03	50	15	18 Domestic	Withdrawal	
105361	13	5764936	386604 NE	21	35	5	3	1650 1995.03.31	48	15	18 Domestic	Withdrawal	

108004	13	5765698	389896 SE	26	35	5	3	1673 1997.05.01	48	15	18 Domestic	Withdrawal	
105590	13	5765732	388253 SE	27	35	5	3	1675 1995.07.05	48	15	18 Domestic	Withdrawal	
105367	13	5765743	387437 SW	27	35	5	3	1650 1995.03.30	48	15	18 Domestic	Withdrawal	
104121	13	5767369	386658 SE	33	35	5	3	1650 1994.05.05	48	15	18 Domestic	Withdrawal	
105363	13	5764936	386604 NE	21	35	5	3	1650 1995.04.03	48	15	19 Domestic	Withdrawal	
103323	13	5766522	389108 NW	26	35	5	3	1675 1993.08.24	48	15	19 Domestic	Withdrawal	
109359	13	5765698	389896 SE	26	35	5	3	1670 1998.03.13	50	15	20 Domestic	Withdrawal	
110464	13	5767340	388299 SE	34	35	5	3	1673 1998.11.24	48	15	20 Domestic	Withdrawal	
102934	13	5765554	396420 SE	28	35	4	3	1675 1993.05.31	49	15	21 Domestic	Withdrawal	
105587	13	5764917	387417 NW	22	35	5	3	1675 1995.07.04	49	15	22 Domestic	Withdrawal	
105757	13	5764917	387417 NW	22	35	5	3	1675 1995.09.11	48	15	22 Domestic	Withdrawal	
108329	13	5765698	389896 SE	26	35	5	3	1673 1997.08.01	48	15	22 Domestic	Withdrawal	
104112	13	5764804	393131 NE	19	35	4	3	1700 1994.04.26	50	15	23 Domestic	Withdrawal	
104828	13	5764936	386604 NE	21	35	5	3	1670 1994.12.01	48	15	23 Domestic	Withdrawal	
106621	13	5764936	386604 NE	21	35	5	3	1675 1996.05.29	48	15	23 Domestic	Withdrawal	
097472	13	5763330	386559 NE	16	35	5	3	1675 1989.10.06	50	15	24 Domestic	Withdrawal	
105756	13	5764936	386604 NE	21	35	5	3	1675 1995.07.06	48	15	24 Domestic	Withdrawal	
105365	13	5764917	387417 NW	22	35	5	3	1650 1995.04.04	48	15	24 Domestic	Withdrawal	
114373	13	5763967	393939 SW	20	35	4	3	1673 2001.09.11	50	15	25 Domestic	Withdrawal	
102938	13	5764917	387417 NW	22	35	5	3	1675 1993.04.05	50	15	25 Domestic	Withdrawal	
105589	13	5765732	388253 SE	27	35	5	3	1675 1995.07.06	48	15	25 Domestic	Withdrawal	
107874	13	5765743	387437 SW	27	35	5	3	1673 1997.04.25	48	15	25 Domestic	Withdrawal	
106923	13	5764908	388232 NE	22	35	5	3	1673 1996.07.22	48	15	28 Domestic	Withdrawal	
031793	13	5774387	399882 NE	23	36	4	3	1790 1968.09.06	50	15	28 Domestic	Withdrawal	
085610	13	5767350	387485 SW	34	35	5	3	1650 1987.07.23	52	16	0 Domestic	Withdrawal	
219184	13	5763921	394746 SE	20	35	4	3	1657 2011.05.19	54	16	15 Domestic	Withdrawal	
110463	13	5765680	390727 SW	25	35	5	3	1673 1999.04.01	54	16	15 Domestic	Withdrawal	
105366	13	5765743	387437 SW	27	35	5	3	1650 1995.05.05	54	16	15 Domestic	Withdrawal	
099861	13	5764410	392730	19	35	4	3	1675 1990.11.21	54	16	15 Domestic	Withdrawal	
213967	13	5766451	392376 NW	30	35	4	3	1673 2008.08.29	52	16	16 Domestic	Withdrawal	
105360	13	5763313	387372 NW	15	35	5	3	1675 1995.05.09	52	16	16 Domestic	Withdrawal	
099160	13	5766179	386228	28	35	5	3	1650 1990.05.09	51	16	16 Domestic	Withdrawal	
109360	13	5765698	389896 SE	26	35	5	3	1670 1998.03.03	52	16	18 Domestic	Withdrawal	
106557	13	5764917	387417 NW	22	35	5	3	1675 1996.04.16	54	16	20 Domestic	Withdrawal	
088029	13	5765743	387437 SW	27	35	5	3	1675 1988.04.25	55	17	15 Domestic	Withdrawal	
211579	13	5762462	389823 SE	14	35	5	3	1673 2007.08.20	56	17	16 Domestic	Withdrawal	
201949	13	5764113	387401 SW	22	35	5	3	1673 2004.05.06	55	17	16 Domestic	Withdrawal	
096883	13	5766547	387461 NW	27	35	5	3	1650 1989.09.08	56	17	16 Domestic	Withdrawal	
213837	13	5763921	394746 SE	20	35	4	3	1673 2008.05.16	55	17	17 Domestic	Water Test Hole	
109245	13	5764017	392325 SW	19	35	4	3	1670 1998.04.24	55	17	21 Domestic	Withdrawal	
104111	13	5764804	393131 NE	19	35	4	3	1700 1994.04.25	55	17	22 Domestic	Withdrawal	
107869	13	5764917	387417 NW	22	35	5	3	1673 1997.03.21	55	17	22 Domestic	Withdrawal	
104462	13	5765732	388253 SE	27	35	5	3	1675 1994.09.19	55	17	25 Domestic	Withdrawal	
047554	13	5764856	390709 NW	24	35	5	3	1675 1975.05.20	57	17	41 Domestic	Withdrawal	
213836	13	5763921	394746 SE	20	35	4	3	1673 2008.05.16	60	18	0 Domestic	Water Test Hole	
234027	13	5765547	395608 SW	28	35	4	3	1663 2014.05.12	60	18	0 Domestic	Water Test Hole	
060591	13	5766433	393176 NE	30	35	4	3	1700 1979.09.13	60	18	0 Domestic	Withdrawal	
103288	13	5766536	388276 NE	27	35	5	3	1650 1993.07.19	58	18	0 Domestic	Withdrawal	
071221	13	5767720	389543	35	35	5	3	1650 1982.05.04	60	18	0 Domestic	Withdrawal	
050680	13	5767720	389543	35	35	5	3	1675 1977.07.06	60	18	0 Domestic	Withdrawal	
106125	13	5764875	389877 NE	23	35	5	3	1675 1995.05.19	60	18	10 Domestic	Withdrawal	
106124	13	5764875	389877 NE	23	35	5	3	1675 1995.05.17	60	18	12 Domestic	Withdrawal	
106122	13	5764875	389877 NE	23	35	5	3	1675 1995.05.19	60	18	12 Domestic	Withdrawal	
106123	13	5764893	389066 NW	23	35	5	3	1675 1995.05.16	60	18	13 Domestic	Withdrawal	
096278	13	5766485	390745 NW	25	35	5	3	1675 1989.09.10	58	18	13 Domestic	Withdrawal	
112626	13	5766547	387461 NW	27	35	5	3	1673 2000.11.02	60	18	14 Domestic	Withdrawal	
217623	13	5764875	389877 NE	23	35	5	3	1673 2009.06.17	60	18	15 Domestic	Withdrawal	
094805	13	5766502	389916 NE	26	35	5	3	1675 1988.05.17	58	18	15 Domestic	Withdrawal	

104461	13	5766536	388276	NE	27	35	5	3	1675	1994.09.12	60	18	15	Domestic	Withdrawal
106561	13	5765743	387437	SW	27	35	5	3	1675	1996.04.17	59	18	15	Domestic	Withdrawal
201947	13	5765547	395608	SW	28	35	4	3	1673	2004.05.03	60	18	17	Domestic	Withdrawal
201922	13	5763330	386559	NE	16	35	5	3	1683	2003.10.31	60	18	18	Domestic	Withdrawal
104460	13	5766522	389108	NW	26	35	5	3	1675	1994.09.30	60	18	18	Domestic	Withdrawal
105364	13	5764917	387417	NW	22	35	5	3	1650	1995.05.08	58	18	20	Domestic	Withdrawal
111714	13	5766547	387461	NW	27	35	5	3	1675	1999.11.24	60	18	20	Domestic	Withdrawal
110609	13	5766547	387461	NW	27	35	5	3	1673	1999.05.13	60	18	21	Domestic	Withdrawal
104829	13	5765763	386624	SE	28	35	5	3	1660	1994.12.01	58	18	22	Domestic	Withdrawal
031795	13	5773598	399059	SW	23	36	4	3	1780	1970.08.01	60	18	24	Domestic	Withdrawal
106705	13	5766351	396438	NE	28	35	4	3	1675	1996.07.08	60	18	25	Domestic	Withdrawal
108003	13	5764917	387417	NW	22	35	5	3	1673	1997.06.16	60	18	25	Domestic	Withdrawal
109361	13	5766547	387461	NW	27	35	5	3	1670	1997.11.12	60	18	25	Domestic	Withdrawal
105760	13	5765763	386624	SE	28	35	5	3	1675	1995.09.12	60	18	25	Domestic	Withdrawal
096882	13	5762528	386542	SE	16	35	5	3	1675	1989.09.22	60	18	26	Domestic	Withdrawal
120156	13	5767340	388299	SE	34	35	5	3	1683	2003.05.12	60	18	26	Domestic	Withdrawal
107872	13	5766547	387461	NW	27	35	5	3	1673	1997.04.22	62	19	0	Domestic	Withdrawal
107873	13	5765743	387437	SW	27	35	5	3	1673	1997.04.30	62	19	12	Domestic	Withdrawal
111077	13	5764917	387417	NW	22	35	5	3	1673	1999.10.21	62	19	18	Domestic	Withdrawal
108330	13	5765763	386624	SE	28	35	5	3	1673	1997.08.07	63	19	19	Domestic	Withdrawal
108670	13	5765763	386624	SE	28	35	5	3	1673	1997.09.11	62	19	21	Domestic	Withdrawal
108331	13	5767340	388299	SE	34	35	5	3	1673	1997.08.14	63	19	24	Domestic	Withdrawal
108327	13	5764908	388232	NE	22	35	5	3	1673	1997.08.15	63	19	28	Domestic	Withdrawal
031794	13	5774405	399074	NW	23	36	4	3	1785	1964.06.19	63	19	28	Domestic	Withdrawal
107323	13	5766547	387461	NW	27	35	5	3	1673	1996.10.03	61	19	29	Domestic	Withdrawal
105588	13	5764917	387417	NW	22	35	5	3	1675	1995.07.12	61	19	38	Domestic	Withdrawal
234054	13	5764893	389066	NW	23	35	5	3	1666	2014.07.05	66	20	0	Domestic	Withdrawal
031792	13	5774387	399882	NE	23	36	4	3	1790	1967.05.09	64	20	0	Domestic	Withdrawal
092456	13	5764893	389066	NW	23	35	5	3	1675	1988.11.09	64	20	14	Domestic	Withdrawal
219195	13	5766547	387461	NW	27	35	5	3	1647	2011.06.22	65	20	14	Domestic	Withdrawal
107052	13	5764917	387417	NW	22	35	5	3	1673	1996.10.15	66	20	15	Domestic	Withdrawal
213897	13	5767273	391572	SE	36	35	5	3	1673	2009.07.23	66	20	16	Domestic	Withdrawal
233940	13	5764893	389066	NW	23	35	5	3	1666	2014.06.03	65	20	17	Domestic	Withdrawal
102245	13	5765732	388253	SE	27	35	5	3	1625	1992.09.02	64	20	17	Domestic	Withdrawal
108326	13	5764936	386604	NE	21	35	5	3	1673	1997.08.01	65	20	19	Domestic	Withdrawal
106924	13	5764917	387417	NW	22	35	5	3	1673	1996.09.12	64	20	19	Domestic	Withdrawal
107054	13	5766547	387461	NW	27	35	5	3	1673	1996.09.10	66	20	20	Domestic	Withdrawal
111079	13	5765743	387437	SW	27	35	5	3	1673	1999.10.19	66	20	21	Domestic	Withdrawal
219185	13	5764893	389066	NW	23	35	5	3	1660	2011.05.20	65	20	22	Domestic	Withdrawal
103041	13	5765763	386624	SE	28	35	5	3	1675	1993.06.10	65	20	25	Domestic	Withdrawal
114376	13	5774405	399074	NW	23	36	4	3	1771	2001.09.26	65	20	25	Domestic	Withdrawal
118596	13	5765763	386624	SE	28	35	5	3	1683	2002.07.02	67	20	28	Domestic	Withdrawal
120157	13	5765663	391534	SE	25	35	5	3	1683	2003.07.18	66	20	33	Domestic	Withdrawal
234028	13	5765547	395608	SW	28	35	4	3	1663	2014.05.12	70	21	0	Domestic	Water Test Hole
234029	13	5765547	395608	SW	28	35	4	3	1663	2014.05.12	70	21	0		Water Test Hole
234030	13	5765547	395608	SW	28	35	4	3	1663	2014.05.12	70	21	0		Water Test Hole
224407	13	5764893	389066	NW	23	35	5	3	1667	2012.06.07	70	21	10	Domestic	Water Test Hole
224421	13	5764893	389066	NW	23	35	5	3	1667	2012.06.26	70	21	12	Domestic	Water Test Hole
110028	13	5767326	389129	SW	35	35	5	3	1673	1998.10.23	69	21	16	Domestic	Withdrawal
112074	13	5766547	387461	NW	27	35	5	3	1673	2000.08.31	70	21	20	Domestic	Withdrawal
108669	13	5766547	387461	NW	27	35	5	3	1673	1997.10.24	70	21	22	Domestic	Withdrawal
105362	13	5764936	386604	NE	21	35	5	3	1650	1995.05.05	68	21	28	Domestic	Withdrawal
228875	13	5764088	389048	SW	23	35	5	3	1670	2013.07.11	73	22	12	Domestic	Withdrawal
228859	13	5764893	389066	NW	23	35	5	3	1667	2013.06.06	73	22	20	Domestic	Withdrawal
229857	13	5764893	389066	NW	23	35	5	3	1666	2013.07.29	73	22	20	Domestic	Withdrawal
107871	13	5766547	387461	NW	27	35	5	3	1673	1997.04.18	72	22	30	Domestic	Withdrawal
081450	13	5767350	387485	SW	34	35	5	3	1650	1985.07.23	76	23	0	Domestic	Withdrawal
082742	13	5773598	399059	SW	23	36	4	3	1775	1985.07.07	75	23	24	Domestic	Withdrawal

107055	13	5766547	387461	NW	27	35	5	3	1673	1996.09.11	74	23	30	Domestic	Withdrawal
234031	13	5765547	395608	SW	28	35	4	3	1663	2014.05.12	75	23	50		Water Test Hole
051139	13	5762424	391467	SE	13	35	5	3	1675	1977.08.10	80	24	0	Domestic	Withdrawal
228981	13	5764893	389066	NW	23	35	5	3	1667	2012.07.06	78	24	12	Domestic	Withdrawal
095131	13	5767969	395676	NW	33	35	4	3	1675	1989.05.23	80	24	18	Domestic	Withdrawal
109500	13	5766547	387461	NW	27	35	5	3	1675	1998.07.08	80	24	20	Domestic	Withdrawal
203679	13	5763921	394746	SE	20	35	4	3	1673	2005.05.20	80	24	21	Domestic	Withdrawal
206522	13	5763921	394746	SE	20	35	4	3	1673	2005.09.24	80	24	35	Domestic	Water Test Hole
107056	13	5766547	387461	NW	27	35	5	3	1673	1996.09.13	88	27	30	Domestic	Withdrawal
099278	13	5767793	386273		33	35	5	3	1650	1990.07.27	91	28	20	Domestic	Withdrawal
109498	13	5762424	391467	SE	13	35	5	3	1675	1998.07.30	94	29	11	Domestic	Withdrawal
064131	13	5762424	391467	SE	13	35	5	3	1675	1980.11.12	95	29	12	Domestic	Withdrawal
220559	13	5768818	395700	SW	4	36	4	3	1653	1974.12.31	100	30	0		
120923	13	5768300	396600	SE	4	36	4	3	1677	1974.05.25	100	30	0	Research	Water Test Hole
080788	13	5773581	399866	SE	23	36	4	3	1790	1985.06.18	100	30	22	Domestic	Withdrawal
095633	13	5763162	393922	NW	17	35	4	3	1675	1989.08.04	100	30	39	Domestic	Withdrawal
066537	13	5767945	398114	NE	34	35	4	3	1715	1981.04.23	105	32	0	Domestic	Withdrawal
046738	13	5768787	397329	SW	3	36	4	3	1705	1976.05.31	107	33	0	Research	Observation
046739	13	5768787	397329	SW	3	36	4	3	1705	1976.05.31	107	33	0	Research	Observation
031779	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031780	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031781	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031782	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031783	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031784	13	5771954	400660	SW	13	36	4	3	1775		113	34	0	Research	Water Test Hole
031785	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
210584	13	5769000	397350	SW	3	36	4	3	1693	1976.05.31	112	34	18	Research	Observation
210585	13	5769000	397350	SW	3	36	4	3	1693	1976.05.31	112	34	18	Research	Observation
104810	13	5763967	393939	SW	20	35	4	3	1675	1994.05.02	110	34	22	Domestic	Withdrawal
031787	13	5771988	399028	SW	14	36	4	3	1775	1925.07.01	112	34	70	Domestic	Withdrawal
116862	13	5768991	397135	SW	3	36	4	3	1696	1987.07.28	118	36	0	Research	Soil Test Hole
009518	13	5768818	395700	SW	4	36	4	3	1674	1973.10.22	119	36	0	Domestic	Water Test Hole
211198	13	5769000	396713	SE	4	36	4	3	1686	1984.01.01	125	38	0	Research	Observation
009519	13	5770375	398171	SE	10	36	4	3	1740	1973.05.08	131	40	28	Domestic	Withdrawal
051315	13	5770340	399803	SE	11	36	4	3	1750	1977.05.19	142	43	0	Domestic	Water Test Hole
051299	13	5770340	399803	SE	11	36	4	3	1750	1977.05.20	162	49	0	Domestic	Withdrawal
079825	13	5765628	393151	SE	30	35	4	3	1700	1984.08.18	180	55	15	Domestic	Withdrawal
099578	13	5766074	391140		25	35	5	3	1675	1990.09.21	220	67	24	Domestic	Withdrawal
090913	13	5768749	398966	SW	2	36	4	3	1700	1988.10.06	222	68	19	Domestic	Withdrawal
013059	13	5769213	396109		4	36	4	3	1675	1974.09.20	230	70	0	Domestic	Water Test Hole
043763	13	5768768	398136	SE	3	36	4	3	1726	1975.07.17	290	88	0	Research	Water Test Hole
031786	13	5771954	400660	SW	13	36	4	3	1775		293	89	0	Research	Water Test Hole
043764	13	5769000	397350	SW	3	36	4	3	1715	1975.05.14	300	91	0	Research	Water Test Hole
211197	13	5768800	396900	SE	4	36	4	3	1686	1984.10.10	320	98	0	Research	Observation
212258	13	5769000	396713	SE	4	36	4	3	1686	1974.01.01	324	99	0	Research	Water Test Hole
043765	13	5768800	397200	SW	3	36	4	3	1703	1975.05.17	340	104	0	Research	Water Test Hole
116889	13	5772160	400463	SW	13	36	4	3	1781	1989.07.25	358	109	0	Research	Soil Test Hole
043772	13	5771400	398600	NE	10	36	4	3	1755	1975.05.17	360	110	0	Research	Water Test Hole
009516	13	5768787	397329	SW	3	36	4	3	1700	1973.10.22	389	119	0	Domestic	Water Test Hole
116890	13	5768991	397135	SW	3	36	4	3	1690	1989.07.27	397	121	0	Research	Soil Test Hole
211200	13	5769000	396713	SE	4	36	4	3	1674	1974.01.01	460	140	0	Research	Water Test Hole
031757	13	5764017	392325	SW	19	35	4	3	1680	1966.09.01	464	141	0	Research	Water Test Hole
031902	13	5765717	389086	SW	26	35	5	3	1675		467	142	0	Domestic	Water Test Hole
219555	13	5765521	388880	SW	26	35	5	3	1666		470	143	0		
219553	13	5763821	392125	SW	19	35	4	3	1653		479	146	0		
116917	13	5763821	392125	SW	19	35	4	3	1670	1991.07.03	479	146	0	Research	Soil Test Hole
211199	13	5769000	396713	SE	4	36	4	3	1670	1974.01.01	500	152	0	Research	Water Test Hole
009517	13	5768802	396507	SE	4	36	4	3	1671	1973.10.21	554	169	0	Domestic	Water Test Hole

045304	13	5768300	396100	SE	4	36	4	3	1669	1976.03.14	560	171	0 Research	Water Test Hole
043758	13	5767968	396484	NE	33	35	4	3	1663	1974.11.06	860	262	0 Domestic	Water Test Hole
220557	13	5771988	399028	SW	14	36	4	3	1765	1952.07.19	970	296	0	
220552	13	5768749	398966	SW	2	36	4	3	1712	1952.07.05	2882	878	0	
220240	13	5768553	398761	SW	2	36	4	3	1712		3206	977	0	
220240	13	5768553	398761	SW	2	36	4	3	1712		3206	977	0	
												23.75135135	16.0486486	

WWDR#	UTM_Zone	Northing	Easting	Wells_Quarter	Wells_Section	Wells_Township	Wells_Range	Wells_Meridian	Elevation	Completed	Bore_Hole_Depth (ft)	Bore_Hole_Depth (m)	Water_Level	Water_Use	Well_Use
220589	13	5767102	390133	SE	35	35	5	3	1669	1952.10.06	0	0	0		
031770	13	5769179	397744		3	36	4	3	0	1948.10.01	15	5	11	Domestic	Withdrawal
009539	13	5764893	389066	NW	23	35	5	3	1675	1973.04.09	18	5	12	Domestic	Withdrawal
031899	13	5764481	389464		23	35	5	3	1675		20	6	0	Domestic	Withdrawal
009538	13	5764893	389066	NW	23	35	5	3	1675	1973.04.12	21	6	9	Domestic	Withdrawal
031771	13	5768802	396507	SE	4	36	4	3	1675	1929.07.01	20	6	14	Domestic	Withdrawal
031766	13	5768043	393223	NE	31	35	4	3	1675	1969.04.02	24	7	0	Domestic	Withdrawal
083329	13	5768059	392418	NW	31	35	4	3	1675	1986.06.04	22	7	0	Domestic	Withdrawal
047128	13	5762481	389009	SW	14	35	5	3	1675	1976.05.25	22	7	12	Domestic	Withdrawal
043815	13	5765717	389086	SW	26	35	5	3	1675	1975.05.06	24	7	18	Domestic	Withdrawal
031769	13	5768749	398966	SW	2	36	4	3	1700	1950.08.19	22	7	20	Domestic	Withdrawal
043761	13	5767968	396484	NE	33	35	4	3	1662	1974.11.20	26	8	0	Research	Observation
045657	13	5767960	397310	NW	34	35	4	3	1675	1976.03.24	25	8	0	Research	Water Test Hole
049257	13	5764052	390693	SW	24	35	5	3	1675	1977.04.14	26	8	0	Domestic	Withdrawal
045913	13	5767350	387485	SW	34	35	5	3	1650	1976.04.28	27	8	0	Domestic	Withdrawal
083606	13	5767752	387902		34	35	5	3	1650	1986.10.02	27	8	0	Domestic	Withdrawal
014488	13	5764052	390693	SW	24	35	5	3	1675	1974.05.09	27	8	8	Domestic	Withdrawal
043770	13	5768802	396507	SE	4	36	4	3	1688	1974.11.21	25	8	10	Research	Observation
043816	13	5766567	386638	NE	28	35	5	3	1650	1975.04.18	27	8	12	Domestic	Withdrawal
051688	13	5764000	393117	SE	19	35	4	3	1700	1977.09.19	27	8	13	Domestic	Withdrawal
043814	13	5764856	390709	NW	24	35	5	3	1675	1975.04.25	27	8	13	Domestic	Withdrawal
045656	13	5767960	397310	NW	34	35	4	3	1675	1976.03.23	30	9	0	Research	Water Test Hole
102459	13	5763212	392310	NW	18	35	4	3	1675	1992.09.15	29	9	0	Domestic	Withdrawal
077641	13	5764856	390709	NW	24	35	5	3	1675	1984.04.23	28	9	0	Domestic	Withdrawal
031772	13	5768818	395700	SW	4	36	4	3	1675	1969.04.24	31	9	0	Domestic	Withdrawal
012381	13	5771954	400660	SW	13	36	4	3	1700	1974.05.01	28	9	0	Domestic	Withdrawal
043762	13	5767968	396484	NE	33	35	4	3	1662	1974.11.20	30	9	6	Research	Observation
043766	13	5767968	396484	NE	33	35	4	3	1668	1974.11.20	30	9	8	Research	Observation
043767	13	5768802	396507	SE	4	36	4	3	1673	1974.11.21	30	9	9	Research	Observation
014489	13	5764856	390709	NW	24	35	5	3	1675	1974.05.09	28	9	13	Domestic	Withdrawal
100469	13	5764132	386579	SE	21	35	5	3	1675	1991.05.31	30	9	16	Domestic	Withdrawal
031897	13	5764917	387417	NW	22	35	5	3	1675	1963.04.02	32	10	0	Domestic	Water Test Hole
085022	13	5767969	395676	NW	33	35	4	3	1675	1987.05.25	34	10	0	Domestic	Withdrawal
031892	13	5763313	387372	NW	15	35	5	3	1675	1972.05.08	32	10	0	Domestic	Withdrawal
081711	13	5762528	386542	SE	16	35	5	3	1675	1985.07.29	32	10	0	Domestic	Withdrawal
031901	13	5765698	389896	SE	26	35	5	3	1675	1969.07.04	34	10	0	Domestic	Withdrawal
043769	13	5768802	396507	SE	4	36	4	3	1676	1974.10.28	32	10	12	Research	Observation
218798	13	5764017	392325	SW	19	35	4	3	1657	2009.10.16	33	10	12	Domestic	Withdrawal
085025	13	5763285	389029	NW	14	35	5	3	1675	1987.05.04	35	11	0	Domestic	Withdrawal
031920	13	5767350	387485	SW	34	35	5	3	1650	1969.07.02	36	11	0	Domestic	Withdrawal
043768	13	5768802	396507	SE	4	36	4	3	1676	1974.11.22	36	11	13	Research	Observation
031891	13	5763285	389029	NW	14	35	5	3	1675	1968.10.31	40	12	0	Domestic	Water Test Hole
045303	13	5763162	393922	NW	17	35	4	3	1675	1975.10.06	41	12	0	Domestic	Withdrawal
060564	13	5764779	393958	NW	20	35	4	3	1700	1979.06.14	40	12	0	Domestic	Withdrawal
102894	13	5763285	389029	NW	14	35	5	3	1675	1993.05.05	38	12	0	Domestic	Withdrawal
031900	13	5764088	389048	SW	23	35	5	3	1675	1970.07.26	39	12	0	Domestic	Withdrawal
058332	13	5764779	393958	NW	20	35	4	3	1700	1979.06.14	40	12	10	Domestic	Withdrawal
206470	13	5765663	391534	SE	25	35	5	3	1699	2005.07.14	38	12	10	Domestic	Withdrawal
109678	13	5765680	390727	SW	25	35	5	3	1670	1998.09.01	40	12	10	Domestic	Withdrawal
201950	13	5765698	389896	SE	26	35	5	3	1673	2004.05.07	41	12	11	Domestic	Withdrawal
063058	13	5765763	386624	SE	28	35	5	3	1660	1980.06.18	41	12	12	Domestic	Withdrawal
102933	13	5764738	394762	NE	20	35	4	3	1675	1993.05.05	40	12	16	Domestic	Withdrawal
092457	13	5764875	389877	NE	23	35	5	3	1675	1988.11.18	40	12	18	Domestic	Withdrawal
031898	13	5764917	387417	NW	22	35	5	3	1675	1963.04.02	39	12	22	Domestic	Withdrawal
047127	13	5766485	390745	NW	25	35	5	3	1675	1976.05.26	39	12	23	Domestic	Withdrawal
031890	13	5763285	389029	NW	14	35	5	3	1675	1968.11.01	40	12	24	Domestic	Withdrawal
208305	13	5765717	389086	SW	26	35	5	3	1673	2007.10.12	43	13	14	Domestic	Withdrawal

109499	13	5765663	391534 SE	25	35	5	3	1675 1998.08.17	43	13	20 Domestic	Withdrawal	
099867	13	5766109	389503	26	35	5	3	1675 1990.10.02	42	13	26 Domestic	Withdrawal	
103321	13	5764000	393117 SE	19	35	4	3	1650 1993.09.17	45	14	0 Domestic	Withdrawal	
055468	13	5767369	386658 SE	33	35	5	3	1650 1978.08.03	46	14	0 Domestic	Withdrawal	
119562	13	5771954	400660 SW	13	36	4	3	1782 2002.07.18	45	14	0 Domestic	Withdrawal	
110606	13	5765680	390727 SW	25	35	5	3	1673 1999.05.04	46	14	7 Domestic	Withdrawal	
108668	13	5765698	389896 SE	26	35	5	3	1673 1997.10.14	47	14	8 Domestic	Withdrawal	
110605	13	5765680	390727 SW	25	35	5	3	1673 1999.05.03	45	14	10 Domestic	Withdrawal	
106559	13	5766502	389916 NE	26	35	5	3	1675 1996.04.30	46	14	10 Domestic	Withdrawal	
056423	13	5767793	386273	33	35	5	3	1650 1978.05.30	45	14	10 Domestic	Withdrawal	
107053	13	5766502	389916 NE	26	35	5	3	1673 1996.10.15	46	14	14 Domestic	Withdrawal	
113599	13	5765698	389896 SE	26	35	5	3	1673 2001.04.30	45	14	14 Domestic	Withdrawal	
105758	13	5766502	389916 NE	26	35	5	3	1675 1995.08.17	47	14	15 Domestic	Withdrawal	
220186	13	5767968	396484 NE	33	35	4	3	1660 1976.12.31	50	15	0 Research	Soil Test Hole	
054164	13	5765554	396420 SE	28	35	4	3	1675 1978.04.28	50	15	0 Domestic	Withdrawal	
045909	13	5765628	393151 SE	30	35	4	3	1650 1976.04.28	48	15	0 Domestic	Withdrawal	
031767	13	5768017	394050 NW	32	35	4	3	1671 1972.10.27	50	15	0 Domestic	Withdrawal	
092864	13	5762873	389426	14	35	5	3	1675 1988.10.05	50	15	0 Domestic	Withdrawal	
223506	13	5765433	385937 SW	28	35	5	3	1667 2011.07.17	50	15	0 Domestic	Withdrawal	
108328	13	5765698	389896 SE	26	35	5	3	1673 1997.08.01	48	15	6 Domestic	Withdrawal	
110026	13	5765680	390727 SW	25	35	5	3	1673 1998.10.21	50	15	10 Domestic	Withdrawal	
110759	13	5765680	390727 SW	25	35	5	3	1675 1999.06.28	50	15	10 Domestic	Withdrawal	
111078	13	5764052	390693 SW	24	35	5	3	1673 1999.09.24	49	15	11 Domestic	Withdrawal	
106564	13	5766547	387461 NW	27	35	5	3	1675 1996.04.29	48	15	11 Domestic	Withdrawal	
101565	13	5764132	386579 SE	21	35	5	3	1675 1992.04.08	48	15	12 Domestic	Withdrawal	
110607	13	5765680	390727 SW	25	35	5	3	1673 1999.05.04	48	15	12 Domestic	Withdrawal	
110870	13	5765680	390727 SW	25	35	5	3	1673 1999.08.10	50	15	12 Domestic	Withdrawal	
106018	13	5766502	389916 NE	26	35	5	3	1675 1995.11.09	48	15	12 Domestic	Withdrawal	
106560	13	5766502	389916 NE	26	35	5	3	1675 1996.04.30	50	15	12 Domestic	Withdrawal	
106562	13	5766547	387461 NW	27	35	5	3	1675 1996.04.23	49	15	12 Domestic	Withdrawal	
105586	13	5764908	388232 NE	22	35	5	3	1675 1995.07.14	48	15	13 Domestic	Withdrawal	
217625	13	5764893	389066 NW	23	35	5	3	1673 2009.06.19	50	15	13 Domestic	Withdrawal	
202068	13	5765680	390727 SW	25	35	5	3	1673 2005.06.01	48	15	13 Domestic	Withdrawal	
107870	13	5764917	387417 NW	22	35	5	3	1673 1997.04.16	48	15	14 Domestic	Withdrawal	
201989	13	5766502	389916 NE	26	35	5	3	1673 2004.06.08	49	15	14 Domestic	Withdrawal	
104113	13	5765952	396026 NH	28	35	4	3	1675 1994.04.27	49	15	14 Domestic	Withdrawal	
102935	13	5767255	392398 SW	31	35	4	3	1700 1993.04.21	50	15	15 Domestic	Withdrawal	
100470	13	5764113	387401 SW	22	35	5	3	1675 1991.04.12	49	15	15 Domestic	Withdrawal	
086177	13	5764856	390709 NW	24	35	5	3	1675 1987.07.06	50	15	15 Domestic	Withdrawal	
102427	13	5765663	391534 SE	25	35	5	3	1675 1991.07.08	48	15	15 Domestic	Withdrawal	
110608	13	5765680	390727 SW	25	35	5	3	1673 1999.05.14	48	15	15 Domestic	Withdrawal	
102939	13	5766502	389916 NE	26	35	5	3	1675 1993.04.28	48	15	15 Domestic	Withdrawal	
106017	13	5766502	389916 NE	26	35	5	3	1675 1995.11.09	48	15	15 Domestic	Withdrawal	
110027	13	5765698	389896 SE	26	35	5	3	1673 1998.10.23	50	15	15 Domestic	Withdrawal	
109358	13	5765698	389896 SE	26	35	5	3	1670 1997.11.06	48	15	15 Domestic	Withdrawal	
106019	13	5765743	387437 SW	27	35	5	3	1675 1995.11.16	48	15	15 Domestic	Withdrawal	
048671	13	5762424	391467 SE	13	35	5	3	1675 1976.11.09	50	15	16 Domestic	Withdrawal	
105912	13	5764936	386604 NE	21	35	5	3	1675 1995.09.22	48	15	16 Domestic	Withdrawal	
102937	13	5764936	386604 NE	21	35	5	3	1675 1993.04.30	48	15	16 Domestic	Withdrawal	
211586	13	5764893	389066 NW	23	35	5	3	1673 2007.08.23	49	15	16 Domestic	Withdrawal	
104120	13	5764856	390709 NW	24	35	5	3	1675 1994.05.10	50	15	16 Domestic	Withdrawal	
106558	13	5766502	389916 NE	26	35	5	3	1675 1996.03.28	48	15	16 Domestic	Withdrawal	
110760	13	5766502	389916 NE	26	35	5	3	1675 1999.06.16	50	15	16 Domestic	Withdrawal	
106563	13	5766547	387461 NW	27	35	5	3	1675 1996.04.24	48	15	16 Domestic	Withdrawal	
105759	13	5765743	387437 SW	27	35	5	3	1675 1995.09.11	48	15	16 Domestic	Withdrawal	
106555	13	5764000	393117 SE	19	35	4	3	1675 1996.04.08	48	15	18 Domestic	Withdrawal	
101564	13	5763330	386559 NE	16	35	5	3	1675 1992.04.03	50	15	18 Domestic	Withdrawal	
105361	13	5764936	386604 NE	21	35	5	3	1650 1995.03.31	48	15	18 Domestic	Withdrawal	

108004	13	5765698	389896 SE	26	35	5	3	1673 1997.05.01	48	15	18 Domestic	Withdrawal	
105590	13	5765732	388253 SE	27	35	5	3	1675 1995.07.05	48	15	18 Domestic	Withdrawal	
105367	13	5765743	387437 SW	27	35	5	3	1650 1995.03.30	48	15	18 Domestic	Withdrawal	
104121	13	5767369	386658 SE	33	35	5	3	1650 1994.05.05	48	15	18 Domestic	Withdrawal	
105363	13	5764936	386604 NE	21	35	5	3	1650 1995.04.03	48	15	19 Domestic	Withdrawal	
103323	13	5766522	389108 NW	26	35	5	3	1675 1993.08.24	48	15	19 Domestic	Withdrawal	
109359	13	5765698	389896 SE	26	35	5	3	1670 1998.03.13	50	15	20 Domestic	Withdrawal	
110464	13	5767340	388299 SE	34	35	5	3	1673 1998.11.24	48	15	20 Domestic	Withdrawal	
102934	13	5765554	396420 SE	28	35	4	3	1675 1993.05.31	49	15	21 Domestic	Withdrawal	
105587	13	5764917	387417 NW	22	35	5	3	1675 1995.07.04	49	15	22 Domestic	Withdrawal	
105757	13	5764917	387417 NW	22	35	5	3	1675 1995.09.11	48	15	22 Domestic	Withdrawal	
108329	13	5765698	389896 SE	26	35	5	3	1673 1997.08.01	48	15	22 Domestic	Withdrawal	
104112	13	5764804	393131 NE	19	35	4	3	1700 1994.04.26	50	15	23 Domestic	Withdrawal	
104828	13	5764936	386604 NE	21	35	5	3	1670 1994.12.01	48	15	23 Domestic	Withdrawal	
106621	13	5764936	386604 NE	21	35	5	3	1675 1996.05.29	48	15	23 Domestic	Withdrawal	
097472	13	5763330	386559 NE	16	35	5	3	1675 1989.10.06	50	15	24 Domestic	Withdrawal	
105756	13	5764936	386604 NE	21	35	5	3	1675 1995.07.06	48	15	24 Domestic	Withdrawal	
105365	13	5764917	387417 NW	22	35	5	3	1650 1995.04.04	48	15	24 Domestic	Withdrawal	
114373	13	5763967	393939 SW	20	35	4	3	1673 2001.09.11	50	15	25 Domestic	Withdrawal	
102938	13	5764917	387417 NW	22	35	5	3	1675 1993.04.05	50	15	25 Domestic	Withdrawal	
105589	13	5765732	388253 SE	27	35	5	3	1675 1995.07.06	48	15	25 Domestic	Withdrawal	
107874	13	5765743	387437 SW	27	35	5	3	1673 1997.04.25	48	15	25 Domestic	Withdrawal	
106923	13	5764908	388232 NE	22	35	5	3	1673 1996.07.22	48	15	28 Domestic	Withdrawal	
031793	13	5774387	399882 NE	23	36	4	3	1790 1968.09.06	50	15	28 Domestic	Withdrawal	
085610	13	5767350	387485 SW	34	35	5	3	1650 1987.07.23	52	16	0 Domestic	Withdrawal	
219184	13	5763921	394746 SE	20	35	4	3	1657 2011.05.19	54	16	15 Domestic	Withdrawal	
110463	13	5765680	390727 SW	25	35	5	3	1673 1999.04.01	54	16	15 Domestic	Withdrawal	
105366	13	5765743	387437 SW	27	35	5	3	1650 1995.05.05	54	16	15 Domestic	Withdrawal	
099861	13	5764410	392730	19	35	4	3	1675 1990.11.21	54	16	15 Domestic	Withdrawal	
213967	13	5766451	392376 NW	30	35	4	3	1673 2008.08.29	52	16	16 Domestic	Withdrawal	
105360	13	5763313	387372 NW	15	35	5	3	1675 1995.05.09	52	16	16 Domestic	Withdrawal	
099160	13	5766179	386228	28	35	5	3	1650 1990.05.09	51	16	16 Domestic	Withdrawal	
109360	13	5765698	389896 SE	26	35	5	3	1670 1998.03.03	52	16	18 Domestic	Withdrawal	
106557	13	5764917	387417 NW	22	35	5	3	1675 1996.04.16	54	16	20 Domestic	Withdrawal	
088029	13	5765743	387437 SW	27	35	5	3	1675 1988.04.25	55	17	15 Domestic	Withdrawal	
211579	13	5762462	389823 SE	14	35	5	3	1673 2007.08.20	56	17	16 Domestic	Withdrawal	
201949	13	5764113	387401 SW	22	35	5	3	1673 2004.05.06	55	17	16 Domestic	Withdrawal	
096883	13	5766547	387461 NW	27	35	5	3	1650 1989.09.08	56	17	16 Domestic	Withdrawal	
213837	13	5763921	394746 SE	20	35	4	3	1673 2008.05.16	55	17	17 Domestic	Water Test Hole	
109245	13	5764017	392325 SW	19	35	4	3	1670 1998.04.24	55	17	21 Domestic	Withdrawal	
104111	13	5764804	393131 NE	19	35	4	3	1700 1994.04.25	55	17	22 Domestic	Withdrawal	
107869	13	5764917	387417 NW	22	35	5	3	1673 1997.03.21	55	17	22 Domestic	Withdrawal	
104462	13	5765732	388253 SE	27	35	5	3	1675 1994.09.19	55	17	25 Domestic	Withdrawal	
047554	13	5764856	390709 NW	24	35	5	3	1675 1975.05.20	57	17	41 Domestic	Withdrawal	
213836	13	5763921	394746 SE	20	35	4	3	1673 2008.05.16	60	18	0 Domestic	Water Test Hole	
234027	13	5765547	395608 SW	28	35	4	3	1663 2014.05.12	60	18	0 Domestic	Water Test Hole	
060591	13	5766433	393176 NE	30	35	4	3	1700 1979.09.13	60	18	0 Domestic	Withdrawal	
103288	13	5766536	388276 NE	27	35	5	3	1650 1993.07.19	58	18	0 Domestic	Withdrawal	
071221	13	5767720	389543	35	35	5	3	1650 1982.05.04	60	18	0 Domestic	Withdrawal	
050680	13	5767720	389543	35	35	5	3	1675 1977.07.06	60	18	0 Domestic	Withdrawal	
106125	13	5764875	389877 NE	23	35	5	3	1675 1995.05.19	60	18	10 Domestic	Withdrawal	
106124	13	5764875	389877 NE	23	35	5	3	1675 1995.05.17	60	18	12 Domestic	Withdrawal	
106122	13	5764875	389877 NE	23	35	5	3	1675 1995.05.19	60	18	12 Domestic	Withdrawal	
106123	13	5764893	389066 NW	23	35	5	3	1675 1995.05.16	60	18	13 Domestic	Withdrawal	
096278	13	5766485	390745 NW	25	35	5	3	1675 1989.09.10	58	18	13 Domestic	Withdrawal	
112626	13	5766547	387461 NW	27	35	5	3	1673 2000.11.02	60	18	14 Domestic	Withdrawal	
217623	13	5764875	389877 NE	23	35	5	3	1673 2009.06.17	60	18	15 Domestic	Withdrawal	
094805	13	5766502	389916 NE	26	35	5	3	1675 1988.05.17	58	18	15 Domestic	Withdrawal	

104461	13	5766536	388276	NE	27	35	5	3	1675	1994.09.12	60	18	15	Domestic	Withdrawal
106561	13	5765743	387437	SW	27	35	5	3	1675	1996.04.17	59	18	15	Domestic	Withdrawal
201947	13	5765547	395608	SW	28	35	4	3	1673	2004.05.03	60	18	17	Domestic	Withdrawal
201922	13	5763330	386559	NE	16	35	5	3	1683	2003.10.31	60	18	18	Domestic	Withdrawal
104460	13	5766522	389108	NW	26	35	5	3	1675	1994.09.30	60	18	18	Domestic	Withdrawal
105364	13	5764917	387417	NW	22	35	5	3	1650	1995.05.08	58	18	20	Domestic	Withdrawal
111714	13	5766547	387461	NW	27	35	5	3	1675	1999.11.24	60	18	20	Domestic	Withdrawal
110609	13	5766547	387461	NW	27	35	5	3	1673	1999.05.13	60	18	21	Domestic	Withdrawal
104829	13	5765763	386624	SE	28	35	5	3	1660	1994.12.01	58	18	22	Domestic	Withdrawal
031795	13	5773598	399059	SW	23	36	4	3	1780	1970.08.01	60	18	24	Domestic	Withdrawal
106705	13	5766351	396438	NE	28	35	4	3	1675	1996.07.08	60	18	25	Domestic	Withdrawal
108003	13	5764917	387417	NW	22	35	5	3	1673	1997.06.16	60	18	25	Domestic	Withdrawal
109361	13	5766547	387461	NW	27	35	5	3	1670	1997.11.12	60	18	25	Domestic	Withdrawal
105760	13	5765763	386624	SE	28	35	5	3	1675	1995.09.12	60	18	25	Domestic	Withdrawal
096882	13	5762528	386542	SE	16	35	5	3	1675	1989.09.22	60	18	26	Domestic	Withdrawal
120156	13	5767340	388299	SE	34	35	5	3	1683	2003.05.12	60	18	26	Domestic	Withdrawal
107872	13	5766547	387461	NW	27	35	5	3	1673	1997.04.22	62	19	0	Domestic	Withdrawal
107873	13	5765743	387437	SW	27	35	5	3	1673	1997.04.30	62	19	12	Domestic	Withdrawal
111077	13	5764917	387417	NW	22	35	5	3	1673	1999.10.21	62	19	18	Domestic	Withdrawal
108330	13	5765763	386624	SE	28	35	5	3	1673	1997.08.07	63	19	19	Domestic	Withdrawal
108670	13	5765763	386624	SE	28	35	5	3	1673	1997.09.11	62	19	21	Domestic	Withdrawal
108331	13	5767340	388299	SE	34	35	5	3	1673	1997.08.14	63	19	24	Domestic	Withdrawal
108327	13	5764908	388232	NE	22	35	5	3	1673	1997.08.15	63	19	28	Domestic	Withdrawal
031794	13	5774405	399074	NW	23	36	4	3	1785	1964.06.19	63	19	28	Domestic	Withdrawal
107323	13	5766547	387461	NW	27	35	5	3	1673	1996.10.03	61	19	29	Domestic	Withdrawal
105588	13	5764917	387417	NW	22	35	5	3	1675	1995.07.12	61	19	38	Domestic	Withdrawal
234054	13	5764893	389066	NW	23	35	5	3	1666	2014.07.05	66	20	0	Domestic	Withdrawal
031792	13	5774387	399882	NE	23	36	4	3	1790	1967.05.09	64	20	0	Domestic	Withdrawal
092456	13	5764893	389066	NW	23	35	5	3	1675	1988.11.09	64	20	14	Domestic	Withdrawal
219195	13	5766547	387461	NW	27	35	5	3	1647	2011.06.22	65	20	14	Domestic	Withdrawal
107052	13	5764917	387417	NW	22	35	5	3	1673	1996.10.15	66	20	15	Domestic	Withdrawal
213897	13	5767273	391572	SE	36	35	5	3	1673	2009.07.23	66	20	16	Domestic	Withdrawal
233940	13	5764893	389066	NW	23	35	5	3	1666	2014.06.03	65	20	17	Domestic	Withdrawal
102245	13	5765732	388253	SE	27	35	5	3	1625	1992.09.02	64	20	17	Domestic	Withdrawal
108326	13	5764936	386604	NE	21	35	5	3	1673	1997.08.01	65	20	19	Domestic	Withdrawal
106924	13	5764917	387417	NW	22	35	5	3	1673	1996.09.12	64	20	19	Domestic	Withdrawal
107054	13	5766547	387461	NW	27	35	5	3	1673	1996.09.10	66	20	20	Domestic	Withdrawal
111079	13	5765743	387437	SW	27	35	5	3	1673	1999.10.19	66	20	21	Domestic	Withdrawal
219185	13	5764893	389066	NW	23	35	5	3	1660	2011.05.20	65	20	22	Domestic	Withdrawal
103041	13	5765763	386624	SE	28	35	5	3	1675	1993.06.10	65	20	25	Domestic	Withdrawal
114376	13	5774405	399074	NW	23	36	4	3	1771	2001.09.26	65	20	25	Domestic	Withdrawal
118596	13	5765763	386624	SE	28	35	5	3	1683	2002.07.02	67	20	28	Domestic	Withdrawal
120157	13	5765663	391534	SE	25	35	5	3	1683	2003.07.18	66	20	33	Domestic	Withdrawal
234028	13	5765547	395608	SW	28	35	4	3	1663	2014.05.12	70	21	0	Domestic	Water Test Hole
234029	13	5765547	395608	SW	28	35	4	3	1663	2014.05.12	70	21	0		Water Test Hole
234030	13	5765547	395608	SW	28	35	4	3	1663	2014.05.12	70	21	0		Water Test Hole
224407	13	5764893	389066	NW	23	35	5	3	1667	2012.06.07	70	21	10	Domestic	Water Test Hole
224421	13	5764893	389066	NW	23	35	5	3	1667	2012.06.26	70	21	12	Domestic	Water Test Hole
110028	13	5767326	389129	SW	35	35	5	3	1673	1998.10.23	69	21	16	Domestic	Withdrawal
112074	13	5766547	387461	NW	27	35	5	3	1673	2000.08.31	70	21	20	Domestic	Withdrawal
108669	13	5766547	387461	NW	27	35	5	3	1673	1997.10.24	70	21	22	Domestic	Withdrawal
105362	13	5764936	386604	NE	21	35	5	3	1650	1995.05.05	68	21	28	Domestic	Withdrawal
228875	13	5764088	389048	SW	23	35	5	3	1670	2013.07.11	73	22	12	Domestic	Withdrawal
228859	13	5764893	389066	NW	23	35	5	3	1667	2013.06.06	73	22	20	Domestic	Withdrawal
229857	13	5764893	389066	NW	23	35	5	3	1666	2013.07.29	73	22	20	Domestic	Withdrawal
107871	13	5766547	387461	NW	27	35	5	3	1673	1997.04.18	72	22	30	Domestic	Withdrawal
081450	13	5767350	387485	SW	34	35	5	3	1650	1985.07.23	76	23	0	Domestic	Withdrawal
082742	13	5773598	399059	SW	23	36	4	3	1775	1985.07.07	75	23	24	Domestic	Withdrawal

107055	13	5766547	387461	NW	27	35	5	3	1673	1996.09.11	74	23	30	Domestic	Withdrawal
234031	13	5765547	395608	SW	28	35	4	3	1663	2014.05.12	75	23	50		Water Test Hole
051139	13	5762424	391467	SE	13	35	5	3	1675	1977.08.10	80	24	0	Domestic	Withdrawal
228981	13	5764893	389066	NW	23	35	5	3	1667	2012.07.06	78	24	12	Domestic	Withdrawal
095131	13	5767969	395676	NW	33	35	4	3	1675	1989.05.23	80	24	18	Domestic	Withdrawal
109500	13	5766547	387461	NW	27	35	5	3	1675	1998.07.08	80	24	20	Domestic	Withdrawal
203679	13	5763921	394746	SE	20	35	4	3	1673	2005.05.20	80	24	21	Domestic	Withdrawal
206522	13	5763921	394746	SE	20	35	4	3	1673	2005.09.24	80	24	35	Domestic	Water Test Hole
107056	13	5766547	387461	NW	27	35	5	3	1673	1996.09.13	88	27	30	Domestic	Withdrawal
099278	13	5767793	386273		33	35	5	3	1650	1990.07.27	91	28	20	Domestic	Withdrawal
109498	13	5762424	391467	SE	13	35	5	3	1675	1998.07.30	94	29	11	Domestic	Withdrawal
064131	13	5762424	391467	SE	13	35	5	3	1675	1980.11.12	95	29	12	Domestic	Withdrawal
220559	13	5768818	395700	SW	4	36	4	3	1653	1974.12.31	100	30	0		
120923	13	5768300	396600	SE	4	36	4	3	1677	1974.05.25	100	30	0	Research	Water Test Hole
080788	13	5773581	399866	SE	23	36	4	3	1790	1985.06.18	100	30	22	Domestic	Withdrawal
095633	13	5763162	393922	NW	17	35	4	3	1675	1989.08.04	100	30	39	Domestic	Withdrawal
066537	13	5767945	398114	NE	34	35	4	3	1715	1981.04.23	105	32	0	Domestic	Withdrawal
046738	13	5768787	397329	SW	3	36	4	3	1705	1976.05.31	107	33	0	Research	Observation
046739	13	5768787	397329	SW	3	36	4	3	1705	1976.05.31	107	33	0	Research	Observation
031779	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031780	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031781	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031782	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031783	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
031784	13	5771954	400660	SW	13	36	4	3	1775		113	34	0	Research	Water Test Hole
031785	13	5771954	400660	SW	13	36	4	3	1775		112	34	0	Research	Water Test Hole
210584	13	5769000	397350	SW	3	36	4	3	1693	1976.05.31	112	34	18	Research	Observation
210585	13	5769000	397350	SW	3	36	4	3	1693	1976.05.31	112	34	18	Research	Observation
104810	13	5763967	393939	SW	20	35	4	3	1675	1994.05.02	110	34	22	Domestic	Withdrawal
031787	13	5771988	399028	SW	14	36	4	3	1775	1925.07.01	112	34	70	Domestic	Withdrawal
116862	13	5768991	397135	SW	3	36	4	3	1696	1987.07.28	118	36	0	Research	Soil Test Hole
009518	13	5768818	395700	SW	4	36	4	3	1674	1973.10.22	119	36	0	Domestic	Water Test Hole
211198	13	5769000	396713	SE	4	36	4	3	1686	1984.01.01	125	38	0	Research	Observation
009519	13	5770375	398171	SE	10	36	4	3	1740	1973.05.08	131	40	28	Domestic	Withdrawal
051315	13	5770340	399803	SE	11	36	4	3	1750	1977.05.19	142	43	0	Domestic	Water Test Hole
051299	13	5770340	399803	SE	11	36	4	3	1750	1977.05.20	162	49	0	Domestic	Withdrawal
079825	13	5765628	393151	SE	30	35	4	3	1700	1984.08.18	180	55	15	Domestic	Withdrawal
099578	13	5766074	391140		25	35	5	3	1675	1990.09.21	220	67	24	Domestic	Withdrawal
090913	13	5768749	398966	SW	2	36	4	3	1700	1988.10.06	222	68	19	Domestic	Withdrawal
013059	13	5769213	396109		4	36	4	3	1675	1974.09.20	230	70	0	Domestic	Water Test Hole
043763	13	5768768	398136	SE	3	36	4	3	1726	1975.07.17	290	88	0	Research	Water Test Hole
031786	13	5771954	400660	SW	13	36	4	3	1775		293	89	0	Research	Water Test Hole
043764	13	5769000	397350	SW	3	36	4	3	1715	1975.05.14	300	91	0	Research	Water Test Hole
211197	13	5768800	396900	SE	4	36	4	3	1686	1984.10.10	320	98	0	Research	Observation
212258	13	5769000	396713	SE	4	36	4	3	1686	1974.01.01	324	99	0	Research	Water Test Hole
043765	13	5768800	397200	SW	3	36	4	3	1703	1975.05.17	340	104	0	Research	Water Test Hole
116889	13	5772160	400463	SW	13	36	4	3	1781	1989.07.25	358	109	0	Research	Soil Test Hole
043772	13	5771400	398600	NE	10	36	4	3	1755	1975.05.17	360	110	0	Research	Water Test Hole
009516	13	5768787	397329	SW	3	36	4	3	1700	1973.10.22	389	119	0	Domestic	Water Test Hole
116890	13	5768991	397135	SW	3	36	4	3	1690	1989.07.27	397	121	0	Research	Soil Test Hole
211200	13	5769000	396713	SE	4	36	4	3	1674	1974.01.01	460	140	0	Research	Water Test Hole
031757	13	5764017	392325	SW	19	35	4	3	1680	1966.09.01	464	141	0	Research	Water Test Hole
031902	13	5765717	389086	SW	26	35	5	3	1675		467	142	0	Domestic	Water Test Hole
219555	13	5765521	388880	SW	26	35	5	3	1666		470	143	0		
219553	13	5763821	392125	SW	19	35	4	3	1653		479	146	0		
116917	13	5763821	392125	SW	19	35	4	3	1670	1991.07.03	479	146	0	Research	Soil Test Hole
211199	13	5769000	396713	SE	4	36	4	3	1670	1974.01.01	500	152	0	Research	Water Test Hole
009517	13	5768802	396507	SE	4	36	4	3	1671	1973.10.21	554	169	0	Domestic	Water Test Hole

045304	13	5768300	396100	SE	4	36	4	3	1669	1976.03.14	560	171	0 Research	Water Test Hole
043758	13	5767968	396484	NE	33	35	4	3	1663	1974.11.06	860	262	0 Domestic	Water Test Hole
220557	13	5771988	399028	SW	14	36	4	3	1765	1952.07.19	970	296	0	
220552	13	5768749	398966	SW	2	36	4	3	1712	1952.07.05	2882	878	0	
220240	13	5768553	398761	SW	2	36	4	3	1712		3206	977	0	
220240	13	5768553	398761	SW	2	36	4	3	1712		3206	977	0	
												23.75135135	16.0486486	

Appendix C - Saskatoon Freeway - General Location Study Environmental Screening Study

Associated Environmental

REPORT

Saskatchewan Ministry of Highways and Infrastructure

Saskatoon Freeway - General Location Study
Environmental Screening Study

September 2017

ISO 9001 and 14001 Certified | An Associated Engineering Company

CANADA'S BEST MANAGED COMPANIES Platinum member

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1 Introduction

1.1 PROJECT BACKGROUND AND OBJECTIVE

Associated Environmental Consultants Inc. (Associated) was retained by the Saskatchewan Ministry of Highways and Infrastructure (MHI) to conduct an Environmental and Heritage Screening Study as part of a general location study for the south portion of the Saskatoon Freeway. Highway No. 11 and Highway No. 16 are key components of the Highway System that go through the City of Saskatoon (COS) and the Rural Municipality of Corman Park No. 344 (RM). These highways are congested corridors with a mix of access controlled free flow interchanges, and high access signalized intersections. This existing highway system has been determined to be inadequate for current levels of traffic demand, impeding traffic flow, and restricting commercial and population growth.

A general route for a new freeway has been selected through a series of General Location and Functional Planning Studies. In addition, MHI has been planning the Saskatoon Freeway, and a bypass around the COS, for several years. MHI's main priorities consist of the connection from Highway No. 14 to Highway No. 7 and the connection from 8th Street to Highway No. 11.

The study area is split into north and southeast sections that are within the COS and the RM (Appendix A, Figure 1). This study area extends from Highway No. 14 to Highway No. 7 in the west and south of Highway No. 5 to Highway No. 11 in the southeast.

The objective of this study is to identify environmentally sensitive areas and natural features within the study area (Appendix A, Figure 1) and to provide recommendations for the protection and preservation of the area as part of future development.

1.2 ASSESSMENT METHODS

The methods used to complete this project included the following:

- A desktop study to gather available background data using readily available information about the project area (i.e. plans, maps, figures, aerial photographs, and interviews) and existing databases (i.e. the Saskatchewan Conservation Data Center, the Biodiversity Website (HABISask), GeoSask, the Committee on the Status of Endangered Wildlife in Canada status reports, Schedule 1 of Species at Risk (SARA), the Government of Saskatchewan's Bird's Atlas, the Water Security Agency's Water Well Information Database, and the Saskatchewan Soil Information Database).
- A preliminary heritage and archaeological screening assessment using the Government of Saskatchewan, Ministry of Parks, Culture and Sports, Developer's Online Screening Tool.
- An assessment of the potential impacts to the existing aquatic and terrestrial habitats (includes eco-region and vegetation, wildlife, and wildlife habitat, fisheries and aquatic resources, wetlands, land-use, soil capability, topography, and heritage resources) based on available preliminary development plans.
- Preparation of this report that summarizes the results of the study and provides recommendations to minimize project impacts.

1.3 REGULATORY OVERVIEW

The following sections outline the provincial and federal regulatory requirements considered for this desktop review. These regulatory requirements, along with general construction best management practices, form the basis of the future mitigation recommendations presented in Section 4 of this report.

1.3.1 Provincial Regulations

Wildlife Act

Under Section 50 (1) (a) of the Wildlife Act it is an offense to *"kill, injure, disturb, take, capture, harvest, genetically manipulate or interfere with or attempt to do any of those things to any designated species."* There are 15 *"wild species at risk"* identified in the Saskatchewan Wildlife Act. A Research Permit is required to conduct activities that may significantly affect listed species.

Environmental Management and Protection Act

The Environmental Management and Protection Act is intended to protect land, air and water resources. Any alteration of a shoreline, bed, bank or boundary, or removal of riparian vegetation of any watercourse, requires an Aquatic Habitat Protection Permit under Section 36 of the Act.

Wildlife Habitat and Protection Act

The Wildlife Habitat and Protection Act provides for the management, conservation, and protection of wildlife lands and wildlife by preventing the sale and alteration of certain Crown lands. The Act prevents the government from selling designated Crown land, and lessees require permission before any clearing, breaking, or drainage occurs. The philosophy of the Act is to conserve wildlife habitat while enabling compatible traditional uses to co-exist.

Heritage Property Act

The Heritage Property Act (Part III and IV, s.59, s.63, s.66) outlines the key provisions for protecting heritage resources in Saskatchewan. According to the legislation, heritage resources include Precontact Period and Historic Period archaeological sites, built heritage sites and structures of historical and/or architectural interest and palaeontological sites. Heritage Resources are regarded as a public resource; however, all heritage resources (e.g. artifacts) are the property of the Provincial Crown and are protected under The Heritage Property Act (s.66).

1.3.2 Federal Regulations

Committee of the Status of Wildlife in Canada and Species at Risk Act

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is the independent agency that determines the status of species in Canada. The Species at Risk Act (SARA) is a federal legislation that provides legal protection of wildlife and their habitats designated under Schedule 1 of the Act. This protection applies to aquatic species, migratory birds covered by the Migratory Birds Convention Act, and species that occur on federal lands in Canada. Federal lands are lands owned by the federal government, such as national parks, lands used by the Department of National Defence, reserve lands, and most of the land in the three territories. The purpose of the Act is to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and to encourage the management of other species to prevent them from becoming at risk.

It is an offence under Sections 32 and 33 of the SARA to kill, harm, harass, capture or take an individual of a listed species that is extirpated, endangered or threatened; possess, collect, buy, sell or trade an individual of a listed species that is extirpated, endangered or threatened, or its part or derivative; damage or destroy the residence of one or more individuals of a listed endangered or threatened species or of a listed extirpated species if a recovery strategy has recommended its reintroduction (Government of Saskatchewan, 2011).

Migratory Bird Convention Act (Migratory Birds Regulation)

The Migratory Bird Convention Act is a federal act that protects migratory birds and nests from indiscriminate harvesting and destruction. Specifically, the Act stipulates that *"no person shall disturb, destroy or take a nest, egg, nest shelter, or duck box of a migratory bird"* (Section 6[a]); and *"no person shall deposit, or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds"* (Section 35 [1]).

2 Environmental Overview

2.1 LAND USE AND DESIGNATED AREAS

The study area is split into west and southeast locations that are adjacent to the COS and within and outside of the city limits or within the RM. The west section generally sits in between Highway No. 14 and Highway No. 7, on the west side of the COS, extending slightly northward of Highway No. 14 adjacent to the previously selected north route (Appendix A, Figure 1). This area is approximately 1953 ha in size and is dominated by cultivated land with a few hayland and native grassland areas (Appendix A, Figure 2). The southeast section extends eastward from Highway No. 11 to a location just south of Highway No. 5. This area is approximately 5950 ha in size and is also dominated by cultivated land with areas of native grassland and hayland.

According to the land use within the study area (SKCDC, 2017), and a district zoning map (RM of Corman Park, 2010), the study area is dominated by agricultural activities with numerous country residential districts. While it appears that no industrial zoning is present, there are smaller areas that are zoned as conservation and commercial districts. At this time, a detailed search of the zoning of parcels within the study was not conducted, as residential areas have been identified as part of a constraints mapping exercise and the remainder of the parcels will have their zoning identified once the final route is selected.

There are no designated areas (e.g., national or provincial park lands, historic parks, park reserves, wildlife habitat protection lands, game preserves, Fish and Wildlife Development Fund Lands, PFRA pastures, etc.) identified within the study area (Appendix A, Figure 3). Ducks Unlimited has also not identified any conservation or protected areas within the study area (L. Boychuck, personal communication, 2015).

2.2 GROUNDWATER WELLS AND GROUNDWATER

A search of the Water Security Agency's (WSA) Saskatchewan Ground Water Resources GIS Web Mapping application for water well drilling records (WSA, 2017) identified approximately 417 wells within the study area. These wells are used for domestic water withdrawals, soil test holes, or for research purposes. Detailed information about each well can be obtained once the recommended route is approved.

It is important to note that the database does not contain or identify all the wells completed in the province, only those records that were submitted by drillers. Using the available driller's report well logs, Associated cannot estimate the ground water table level, as only well depths at the time of drilling are provided.

According to Acton et al. (1998), groundwater in the Ecoregion is associated with the drift that covers bedrock along with the bedrock itself. The Judith River Formation is prevalent throughout the Ecoregion with bedrock aquifers within its sandy and silty zones. Glacial aquifers are also widely distributed throughout the Ecoregion creating several aquifers that overlay each other throughout the sub-surface. Inter-till aquifers are the most common in the older and deeper Floral Formation. Additional aquifers present in the west section of the study area include the Tyner Valley Aquifer System (i.e. Judith River Aquifer and the Tyner Valley Aquifer), Sutherland Intertill Aquifers, Floral Intertill Aquifers and a Surficial Sand Aquifer (MDH, 2011).

2.3 ECOREGION AND VEGETATION

The project area is located within the Moist Mixed Grassland Ecoregion within the Prairie Ecozone. Trees and shrubby vegetation in this region generally occur along stream courses and permanent sloughs. The margins of the wetlands and small lakes are typically dominated by cattails, bulrushes, and sedges. The remaining land base is mostly agricultural crops and grasses with a number of flowering plants and shrubs found in the lower, moister areas (Acton et al., 1998). Native vegetation in this ecoregion is limited to non-arable pasture lands, where speargrasses (*Hesperostipa spp.*) and wheatgrasses (*Agropyron and Elymus spp.*), along with deciduous shrubs such as snowberry (*Symphoricarpos albus*), rose (*Rosa spp.*), chokecherry (*Prunus virginiana*), and wolf willow (*Elaeagnus commutate)* are among the more common species. Small aspen groves are typically found around the sloughs and are a characteristic feature of the landscape.

Most of the property is comprised of a cultivated field, which is often planted with wheat and canola. Cattails (*Typha latifolia*), trembling aspen (*Populus tremuloides*), Caragana (*Caragana arborescens*), willow (*Salix spp.*), sow thistle (*Sonchus arvensis*), and rushes (*Juncus spp.*) were found associated with low and seasonally wet areas throughout the project area.

2.4 SOIL AND TOPOGRAPHY

The Prairie Ecozone is closely correlated with semi-arid moisture conditions and dark brown soils. The majority of the area is comprised of glacial till, with numerous un-drained depressions or sloughs, and several large, level glacial lake plains. The regional slope is towards the north-east while the physiographic regions around the study area include the Saskatoon Plain and Moose Woods Sand Hills to the south (Acton and Ellis, 1978). These areas are characterized by undulating, sandy to clayey glacio-lacustrine plains and strongly rolling sand dunes with local, undulating, wind-scoured sand plains and glacio-fluvial plains, respectively.

The study area is relatively flat, with land generally sloping westward eventually draining surface water towards the South Saskatchewan River. Surface elevations of the project area range between 502 m to -540 m above sea level. Landforms associated with the soils present in the study area include shallow lacustrine plains with knoll and depression patterns and pitted outwash plains (Acton and Ellis, 1978).

The majority of soils in study area are classified as Asquith (A1), while smaller areas have Elstow (E1) and Bradwell (Br3) soils. These soils have been described by Acton and Ellis (1978) as having low to moderate amounts of organic matter, with permeabilities being moderate to high resulting in rapid to well drained soils with very low to low surface drainage. Moisture holding capacity is moderate to low, while slopes in the study area range from very gently (i.e. gradient of 0.5% to 2%) to moderately (i.e. gradient of 6% to 9%) sloping. Each of these soils are a part of the Orthic Dark Brown series. A smaller portion of Hanley (Hy 1 and Hy3) soils are also present with the Elstow soils. These soils have increased levels of salinity (particularly sodium salts) when compared to Elstow soils.

Agricultural capabilities range from Class 3 to Class 4, indicating moderately severe to severe limitations that restrict the range of crops or require special conservation practices (Acton and Ellis, 1978). There are limitations on the moisture availability and poor structure and/or permeability in the soil.

2.5 AQUATIC RESOURCES

The west portion of the study area is close to a wetland complex named the West Swale, which is located east of the study area, approximately 0.9 km to 2.3 km away (Appendix A, Figure 2). This swale is comprised of a series of permanent waterbodies that extend 17 km from the South Saskatchewan River, in a northwestern direction. This swale does not have a special designation but is a unique feature flowing into the river. The southeast portion of the study area is approximately 2.3 km to 3 km east of the South Saskatchewan River and 7.5 km west of Patience Lake. Patience Lake is a non-fish bearing waterbody that is directly adjacent to an active potash mine site. Another notable waterbody is a wetland complex (informally named the SE marsh) that covers an area of approximately 460 ha and is located along the east boundary of the study area. This complex appears to be comprised of permanent wetlands that are surrounded by agricultural lands.

Both portions of the study area have numerous wetlands interspersed throughout the landscape. These wetlands may contain water throughout the entire year but some areas are likely to dry out at times. These areas are likely to contain aquatic vegetation (i.e., cattails) and exposed soils. It is expected that all wetland classes (i.e. ephemeral, temporary, seasonal, semi-permanent, and permanent) would be present within the study area.

2.6 WILDLIFE AND WILDLIFE HABITAT

The Moist Mixed Grassland Ecoregion supports a variety of wildlife species with habitat comprised of grasslands, wooded grooves and wetlands (Acton et al., 1998). 51 species of mammals have been reported in this Ecoregion including; big brown bat (*Eptesicus fuscus)*, porcupine (*Erethizon dorsatum*), white-tailed jack rabbit (*Lepus townsendii*), meadow vole (*Microtus pennsylvanicus*), deer mouse (*Peromyscus maniculatus*), masked shrew (*Sorex cinereus*), thirteen lined ground squirrel (*Ictidomys tridecemlineatus*), and Richardson's ground squirrel (*Urocitellus richardsonii*). Larger mammals include; coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), red fox (*Vulpes vulpes*), mule and white-tailed deer (*Odocoileus hemionus* and *O. virginianus*) and pronghorn (*Antilocapra americana*). Common amphibians and reptiles that occur in the Ecoregion include; tiger salamander (*Ambystoma mavortium*), great plains toad (*Anaxyrus cognatus*), painted turtle (*Chrysemys picta bellii*), plains garter snake (*Thamnophis spp.*), boreal chorus frog (*Pseudacris maculate*), wood frog (*Lithobates sylvaticus*) and northern leopard frog (*Lithobates pipiens*).

2.7 PROTECTED SPECIES

One historical observations of a rare plant species and two occurrences of protected animals have been recorded within the study area (SKCDC, 2017) (Appendix A, Figure 4). The rare plant is northern blue-eyed grass (S3 - uncommon), which has a preferred habitat of moist grassy areas. The historical occurrences of protected animals include and two observations of loggerhead shrike (S3 – breeding). These species require tall shrubs and low trees that have dense leaves and low density.

Within a 10 km radius of the study area, two migratory bird concentration sites, 51 plant species, 11 animal species, and the northern leopard frog were identified as protected species (SKCDC, 2017). These species and their habitat preferences are summarized in Appendix B. The migratory bird concentration sites occur just south of Saskatoon, on the South Saskatchewan River and at the Forestry Farm within City limits.

Protected species having moderate to high potential to be present within the study area include:

- Bobolink (*Doluchonyx oryzivorus;* S5B and federally threatened) are found in grain fields and grasslands;
- Burrowing owl (*Athene cunicularia*; S2B and federally endangered) are known to prefer sparsely vegetated agricultural land and may nest in the lands that are adjacent to the wetland;
- Loggerhead shrike (*Lanius ludovicianus excubitorides*; S4B and federally threatened) are known to nest in grasslands, primarily native short-grass and mid-grass prairies. They have the ability to use some agricultural fields for feeding and raising young;
- Englemann's spike-rush (*Eleocharis engelmannii*; S2) occurs in sloughs and drying flooded areas of fields;
- Northern leopard frog (*Lithobates pipiens*; S3 and federally a species of special concern) prefers shallow marshes, moist uplands, permanent water bodies;
- Common nighthawk (*Chordeiles minor*; S4B,S5M and federally threatened) often found searching for insects at dusk, and prefers both rural and urban habitats including logged forest, recently burned forest, woodland clearings, prairies, plains, sagebrush, grasslands, open forests, and rock outcrops;

- Sprague's Pipit (*Anthus spragueii;* S3B, S3M and federally threatened) prefers native and seeded pastures to cropland or grazed pastures, uncultivated valleys and hillsides, or the grassy areas around alkaline sloughs and lakes; and
- Short-eared Owl (*Asio flammeus;* S3B,S2N,S3M and federally a species of special concern) uses a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations and old pastures. It also occasionally breeds in agricultural fields. Preferred nesting sites are dense grasslands.

2.8 HERITAGE RESOURCES

A search of the Government of Saskatchewan Developers' Online Tool was conducted to identify previously recorded heritage sites within the preferred alignment, as well as any applicable regulatory requirements for heritage resources (Govt Sask, 2017). This online tool is maintained by the provincial Heritage Conservation Branch.

The results of this screening determined that there were no known heritage sites recorded within the quarter sections where the preferred alignment occurs and are therefore not heritage sensitive.

3 Potential Environmental Effects

3.1 AQUATIC RESOURCES

The proposed project would result in the loss of wetlands within the roadway right-of-way, while the regular maintenance of the roadway (e.g. salt applications, snow removal, roadside mowing) has the potential to affect adjacent wetlands. Permanent infrastructure projects will increase impervious surfaces within a watershed, exposing nearby wetlands to potential contamination, such as increased salinity, sedimentation, hydrocarbons, metals, and nutrients (Kaushal et al., 2005; Paul and Mayer, 2001). Although contamination within surface water bodies can occur at any time, contaminants can accumulate within snow and ice, over the winter, and become concentrated within surface waters as a result of impervious surfaces spring melt water runoff, especially during periods of "first melt" and "end-melt". "First-melt" is typically associated with a higher concentration of dissolved contaminants (i.e., most soluble in water), whereas "end-melt" tends to facilitate the transfer of a higher proportion of particulates and hydrophobic contaminants to surface waters (Oberts et al., 2000). The same concepts can also be applied during storm events.

Despite low fish habitat potential and a lack of connectivity to other bodies of water, increased loading of both dissolved and solid phase contaminants to surface waters within the proposed project area may cause both acute and chronic effects (e.g., mortality and impairment of biological function) to various levels of the aquatic food chain including plankton, benthic invertebrates, and aquatic insects. Increased impervious surfaces will likely increase transportation of sediments and nutrients to the drainage ditches, which can act as a continuous and long-term source of pollution. Accumulated contaminants in these sediments can become re-dissolved or re-suspended into the water column under certain conditions (i.e., changing redox potentials, pH, and biodegradation). Excess nutrient accumulation can result in eutrophic conditions, which can lead to decreased dissolved oxygen concentrations and result in asphyxiation of aquatic organisms (Oberts et al., 2000).

There is also the potential for construction and development activities to indirectly impact the West Swale in the west section of the study area (Appendix A, Figure 2). Indirect effects include the potential for increased sedimentation within the swale as a result of adjacent construction activities (e.g., grading and clearing). Excessive sedimentation can cause a degradation of water quality leading to the degradation of natural habitat (e.g., negative effects on community composition and species diversity of vegetation and wildlife). As a result of the distance (>0.9 km) of the study area from the West Swale, direct effects (e.g. loss of habitat, diversity, and storm water management function) are not expected to occur in this section of the Saskatoon Freeway. If the swale was altered, removed or replaced by permanent infrastructure in other sections of the freeway beyond the current study area, direct impacts may be likely. An additional examination of the significance of the West Swale to the environment would be required to determine the potential direct impacts where the Freeway is proposed to cross the West Swale. A discussion with staff from Meewasin Valley Authority has indicated that little to no investigations have been completed at the West Swale to assess its value to the environment (R.Grilz, personal communication, 2017).

3.2 PROTECTED/LISTED SPECIES

Due to the presence of historic occurrences of rare plants and listed animals in the area, there is a potential to permanently destroy habitat that is used by species that have historic occurrences within the study area. Habitat for these species occurs in small pockets throughout the study area as most the area has been disturbed by agriculture and residential developments. Identification of these protected species within the recommended route may require additional mitigation prior to construction.

3.3 WILDLIFE AND WILDLIFE HABITAT

Minimal to moderate loss of wildlife habitat is expected because the majority of the land has been previously disturbed by agricultural activities and residential developments. The removal of trees, shrubs, and wetlands from the project area would decrease potential foraging habitat of small mammals, and resident and migratory bird species. Impacts to ground nesting birds (e.g., burrowing owl) may be significant during the clearing and construction of the proposed roadway on areas that are currently cultivated. However, any nests that are present are likely temporary and seasonal due to frequent cultivation and customary farming practices disturbing nesting habitat.

The wetlands, drainage swale, and immediately adjacent areas will be inhabited by aquatic, terrestrial, and avian species. Development impacts on the swale and wetlands adjacent to the selected route would temporarily restrict their use by song birds, waterfowl, and other small animals on the project area during construction. Wetland habitat within the footprint of the selected route would be destroyed and mitigation measures would be required.

Increased vehicle collisions with wildlife would also be expected, as larger wildlife (e.g. deer, moose, coyotes) and birds will cross the roadway. This impact could be lessened by the installation of appropriate signage to inform drivers on wildlife crossings, or by implementing reduced speed zones to reduce potential collisions in areas of higher wildlife use (e.g. treed areas or larger wetlands on both side of the roadway).

3.4 SOIL EROSION

Increased levels of sodium (from road salts) in meltwater runoff can readily exchange with calcium and magnesium in soils, degrading the soil structure and mobilizing organic matter from the agricultural land into the nearby drainage ditches. Snow melt runoff can also result in increased annual soil losses (Oberts et al., 2000). These erosional effects will depend on the source, quantity, and quality of the snow that is stored, and the quality and characteristics of the soils within the selected route.

3.5 HERITAGE RESOURCES

Since the results of the heritage screening, indicated that no heritage sensitivies occur near the preferred alignment, no further investigations will be required and submission of the Project to the provincial Heritage Conservation Branch is not necessary.

Surveillance during construction is recommended, as a best practise, to ensure that if heritage resources are uncovered during construction, a qualified person can be notified and the resource can be assessed, and, if deemed significant, any further destruction of the resource can perhaps be averted.

4 Mitigation Recommendations

4.1 PLANNING

- Completion of a biological assessment on the selected route and surrounding area will confirm the presence of protected plant and animal species along with the characterization of potentially impacted wetlands. Field surveys will need to be conducted at the appropriate time and according to provincial guidelines. This will ensure that valued ecosystem components receive appropriate mitigation;
- A hydrological study (e.g., flows, over flows, volume, climate, etc.) and engineering design (inlet culverts, potential outlet culverts, drain tile) of the swale crossing and other larger wetland complexes should be conducted to confirm its suitability for storm water management;
- Avoid larger wetlands in the area to continue to provide larger tracts of habitat for the species present and to provide storm water drainage and storage;
- If required, maintain adequate vegetative buffers around the West Swale to provide multiple benefits including wildlife habitat, erosion protection, and improved water quality (filtration of sediment and nutrients). The average width of the buffer area will depend on the adjacent land use, but is recommended to have a minimum range of 2 m to 30 m; and
- Avoid finalizing a route that would require the removal of larger tree and shrub stands, as these areas provide valuable habitat and ecological value to local residents. Preservation planting of trees may need to be considered in future development plans, and the Regional District's engineering and grading requirements.

4.2 CONSTRUCTION

- Development should avoid any land clearing, grading, or construction activities during sensitive breeding periods for amphibians (generally April to October), and breeding birds (April to July). If land clearing activities are proposed within this time period, wildlife and nesting surveys should be completed by a qualified biologist. If listed species are encountered prior to, or during land clearing, grading, or construction, workers should follow the Saskatchewan Activity Restriction Guidelines for Sensitive Species in Natural Habitats (SOME, 2017);
- If bird nests are identified on-site and appropriate mitigation cannot be applied, the management of buffer areas for bird nesting would apply. The recommended buffer area for high intensity activities (i.e. road construction) for most bird nesting areas is 500 m, all year round (SOME, 2017). If burrowing owl nests are observed near the selected route, a 500 m management buffer area is required and the Operation Burrowing Owl (OBO) Coordinator (obo@naturesask.ca) must be notified;
- The West Swale and adjacent wetlands should be protected during construction by use of sediment and erosion control techniques;
- Ensure all construction equipment is cleaned prior to entering the project area to prevent the spread of noxious weeds;
- Use signage or fencing to protect any valued natural features during development; and
- Plan to re-vegetate disturbed areas using native ground-cover seed mixes, according to MHI guidelines.

5 Summary

Overall, the majority of lands within the study area have been previously cultivated or disturbed in some way. Areas that might have potential for sensitive grassland (native) habitat need to be confirmed along with the presence of protected animal and plant species.

Impacts resulting from any proposed rezoning and intended land use are expected to be low. Disruption of habitat in and around the West Swale and larger wetland complexes during development of the project may be minimized by incorporating these areas as parks, storm water retention ponds and green space during the project planning.

Closure

This report was prepared for the Saskatchewan Ministry of Highways and Infrastructure to complete an Environmental and Heritage Screening Study as part of a general location study for the south portion of the Saskatoon Freeway.

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

Respectfully submitted,
Associated Environmental Consultants Inc.

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Associated Environmental

References

Acton, D.F. and J.G. Ellis. 1978. The soils of the Saskatoon Map Area 73-B Saskatchewan. Saskatchewan Institute of Pedology, Publication S4.

Acton et al. 1998. The Ecoregions of Saskatchewan. Canadian Plains Research Center, University of Regina. Regina, SK.

Boychuck, L. 2015. Personal communication (e-mail). Manager of GIS and Inventory Programs. Ducks Unlimited Canada. Regina, SK.

Corman Park. 2010. Corman Park District Zoning Map. Available at http://www.rmcormanpark.ca/page/planning_documents/

Kaushal, S.S., P.M. Groffman, G.E. Likens, K.T. Belt, W.P. Stack, V.R. Kelly, L.E. Band, G.T. Fisher. 2005. Increased salinization of fresh water in the northeastern United States. Proceedings of the National Academy of Sciences 102: 13517-13520.

Govt of Sask, 2017. Developers' online screening tool – land location search. Retrieved from http://www.pcs.gov.sk.ca/Default.aspx?DN=4a28a177-341a-420a-9ed9-7332f5044646&l=English

Grilz, R. 2017. Personal communication (telephone conversation). Resource Conservation Officer. Meewasin Valley Authority. Saskatoon, SK.

MDH Engineered Solutions (MDH). 2011. Hydrogeology Mapping of NTS Mapsheet Saskatoon 73B. Available at https://www.wsask.ca/Water-Info/Ground-Water/Mapping/Saskatoon-Mapsheet-73B/

Oberts, G.L., J. Marsalek, and M. Viklander 2000. Review of Water Quality Impacts of Winter Operation of Urban Drainage. Water Qual Res J Canada 35: 781-808.

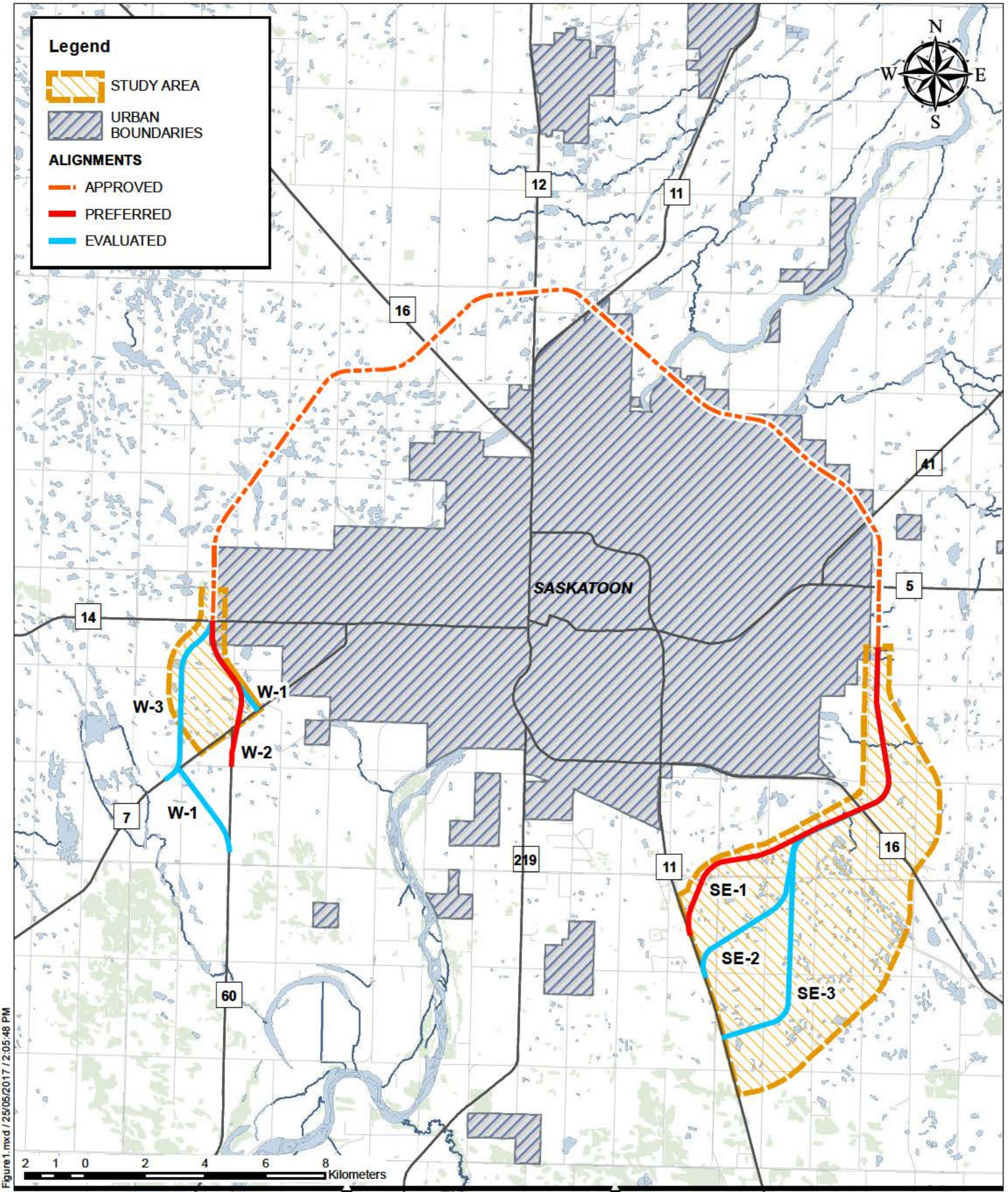
Paul, M.J., and J.L Meyer. 2001. Streams in the urban landscape. Annu. Rev. Ecol. Syst. 32: 333-336.

Saskatchewan Conservation Data Center (SKCDC). 2017. HABISask – Natural Features and Listed Species near 32-36-6 W3. Available at http://www.biodiversity.sk.ca/HABISask.htm

Saskatchewan Ministry of Environment (SMOE). 2017. Saskatchewan Activity Restriction Guidelines for Sensitive Species. Available at http://www.biodiversity.sk.ca/protocols.htm

Water Security Agency (WSA). 2017. Water Well Information Database. Data Portal (V.1.0 Beta). Available at https://gis.wsask.ca/

Appendix A - Figures



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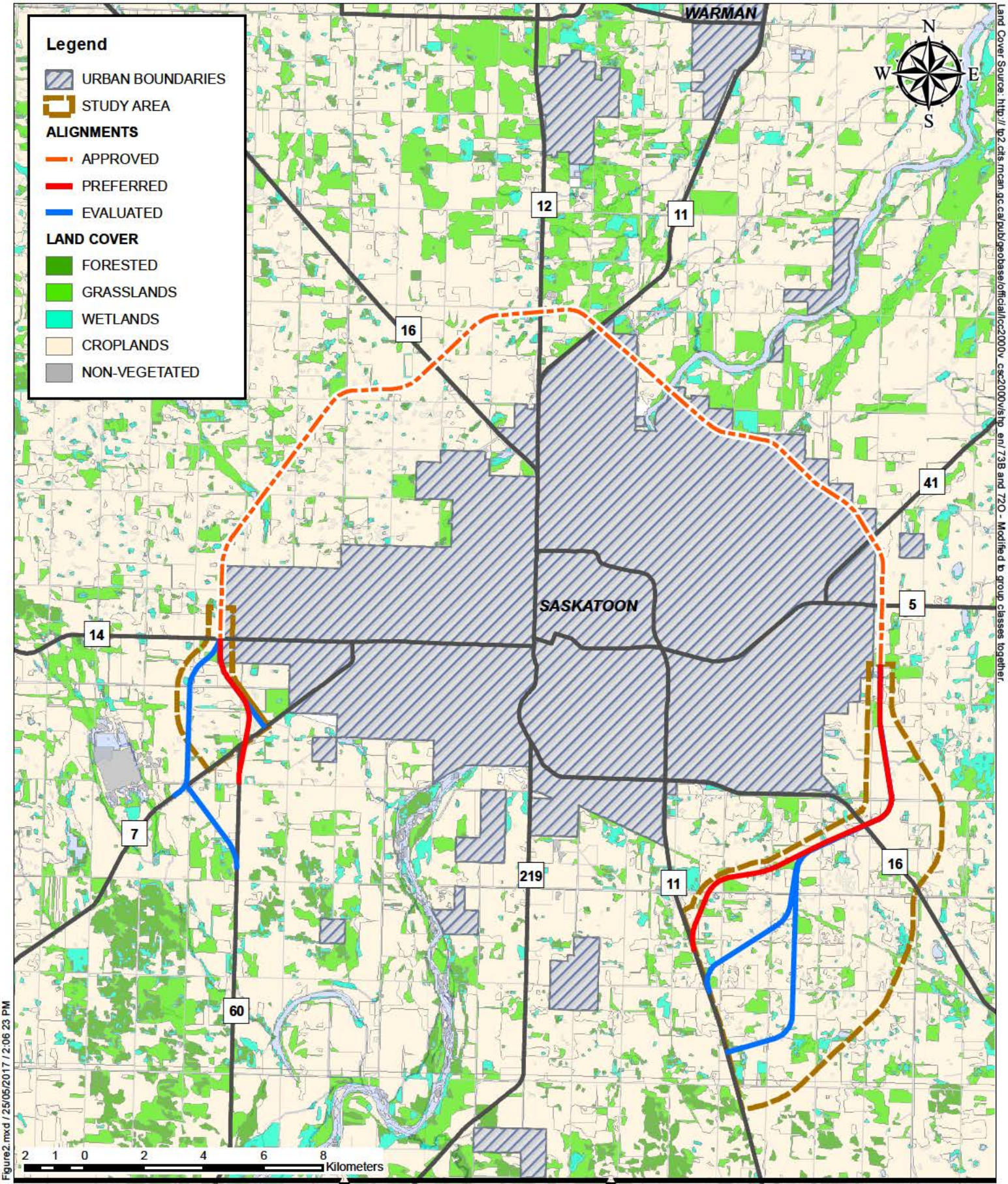
PROJECT NO.: 20154611.000
DATE: 25May2017
DRAWN BY: D. TOTH

FIGURE 1
STUDY AREA

Ministry of Highways

Saskatoon Freeway-Environmental Desktop Screening



Land Cover Source: http://ip2.cits.rncan.gc.ca/pub/geobase/official/lcc2000v_csc2000v/stp_en/73B and 72O - Modified to group classes together.

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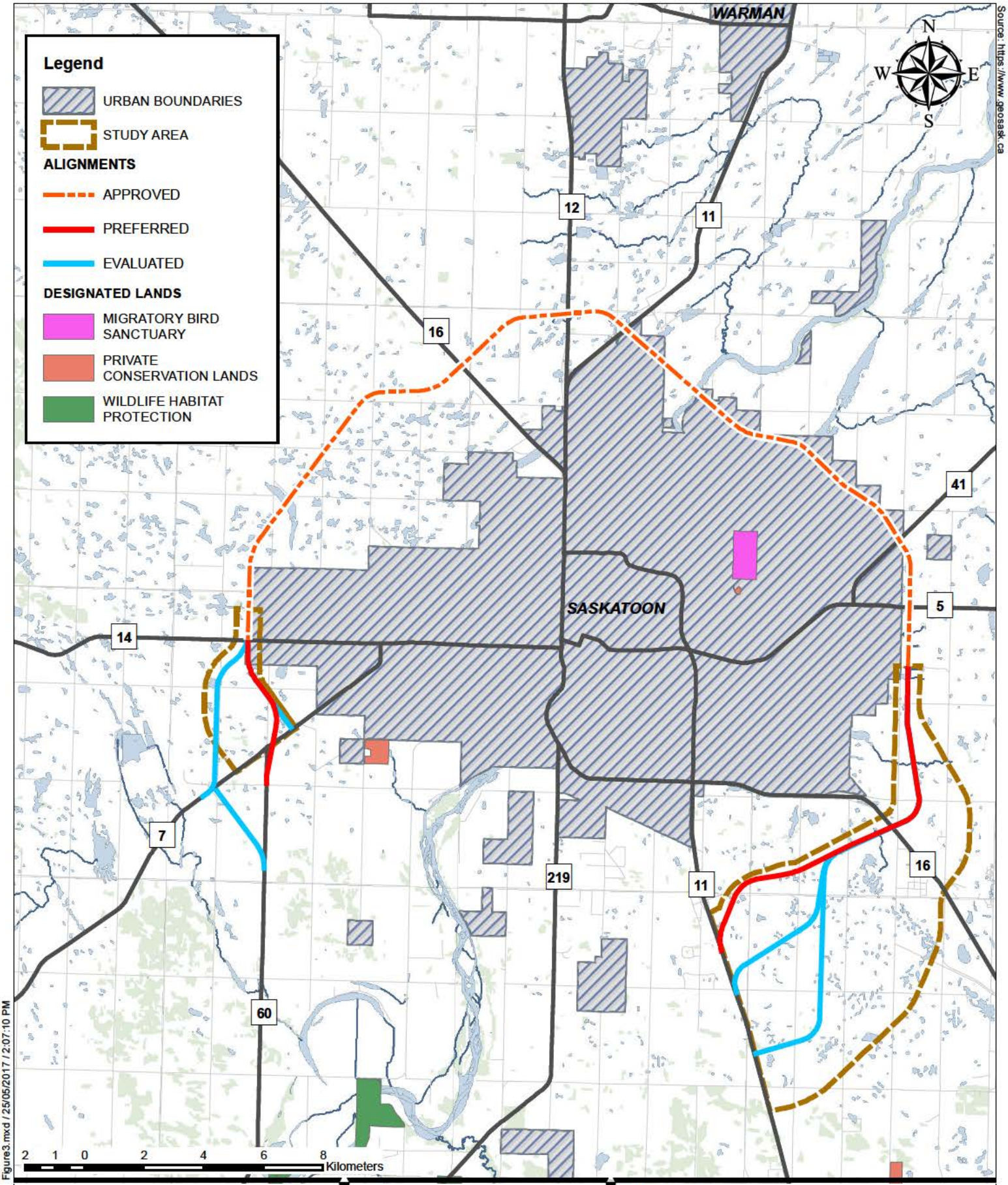
Associated Environmental

PROJECT NO.: 20154611.000
DATE: 25May2017
DRAWN BY: D. TOTH

FIGURE 2
LAND USE

Ministry of Highways

Saskatoon Freeway-Environmental Desktop Screening



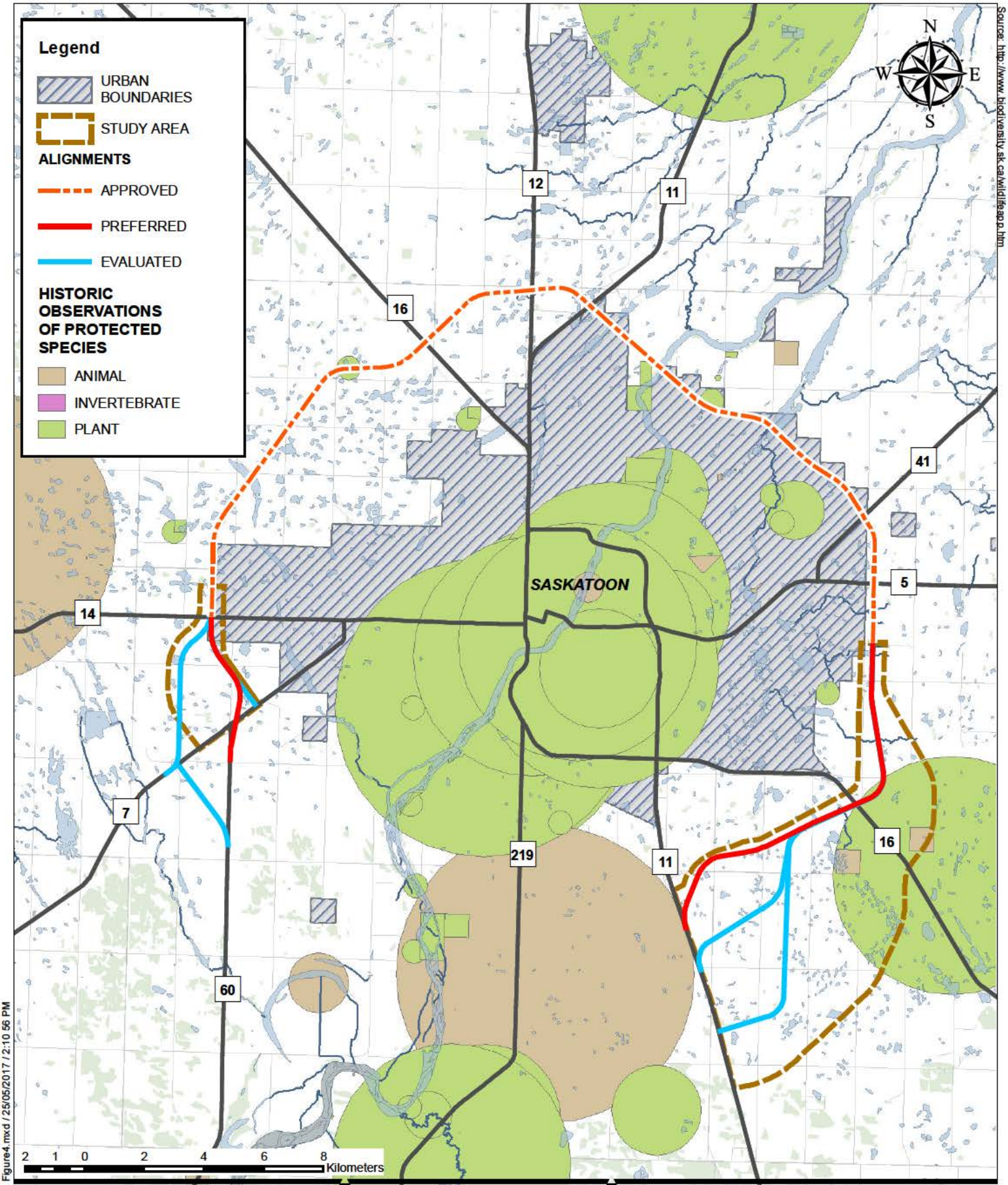
Associated Environmental

PROJECT NO.: 20154611.000
DATE: 25May2017
DRAWN BY: D. TOTH

FIGURE 3
DESIGNATED LANDS

Ministry of Highways

Saskatoon Freeway-Environmental Desktop Screening



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Associated Environmental

PROJECT NO.: 20154611.000
DATE: 25May2017
DRAWN BY: D. TOTH

FIGURE 4 HISTORIC OBSERVATION OF PROTECTED SPECIES

Ministry of Highways

Saskatoon Freeway-Environmental Desktop Screening

Appendix B - Protected Species Within 10 km

Common Name	Species	Habitat[1,2]	COSEWIC Status[2]	Provincial Ranking[3]
American Bugseed	*Corispermum americanum var. americanum*	Sandy prairie barrens, shores, sand-dune blowouts, roadsides, sandy wastelands and old fields	n/a	S3
Blue Wild Rye	*Elymus glaucus ssp. glaucus*	Moist to dry open woods and hillsides	n/a	S2
Blueflag	*Iris versicolor*	Marshy places, along roadsides, shores	n/a	S1
Bristle-leaved Sedge	*Carex eburnea*	Aspen and birch woods in sandy soil and prairie slopes of South Saskatchewan River bluffs north of creek along trails	n/a	S3
Bristly Gooseberry	*Ribes oxyacanthoides ssp. setosum*	Moist woods	n/a	S2
Bur Ragweed	*Ambrosia acanthicarpa*	Open, sandy sites, of dry sands and river draws	n/a	S2
Bushy Cinquefoil	*Potentilla supina ssp. paradoxa*	Sandy shorelines of lakes, reservoirs, and streams	n/a	S3
Columbia Needlegrass	*Achnatherum nelsonii ssp. dorei*	Dry plains, meadows and open woods	n/a	S3
Crawe's Sedge	*Carex crawei*	Dry to usually moist, open ground, often associated with calcareous gravels or limestone pavements, in wet meadows, fens, prairie swales, beach pools, shores, less commonly found in prairie patches along rights-of-way, streams, ditches, and quarries	n/a	S3
Crowfoot	*Viola pedatifida*	Dry gravelly hills, aspen bluffs, and prairie grassland	n/a	S3
Curved Yellow-cress	*Rorippa curvipes*	Muddy shores of lakes and ponds, stream beds and banks, edges of cultivated fields, wet roadside, meadows, seepage areas, ditches, creeks, gravel bars	n/a	S3
Downy Gentian	*Gentiana puberulenta*	Grasslands	n/a	SH
Dry Goosefoot	*Chenopodium desiccatum*	Originally found in open undisturbed soils, prairies, and sandy stabilized dunes, but it has spread to disturbed open areas	n/a	S3
Dwarf Clubrush	*Trichophorum pumilum*	Small depressed alkaline bog	n/a	S1

Common Name	Species	Habitat[1,2]	COSEWIC Status[2]	Provincial Ranking[3]
Early Cinquefoil	*Potentilla concinna var. concinna*	Meadows and vernally moist openings in conifer and aspen woodlands, sagebrush rangelands, prairie hillsides, rocky outcrops and ridges	n/a	S2
Engelmann's Spike-rush	*Eleocharis engelmannii*	Fresh shores, marshes, disturbed places	n/a	S3
Few-flowered Aster	*Almutaster pauciflorus*	Damp alkaline places, alluvial soils, with halophytic vegetation, inland salt marshes, along streams in ravines, ditches, in desert and dry prairie areas	n/a	S3
Hairy Bugseed	*Corispermum villosum*	Sand dunes, sandy and gravely shores, waste places	n/a	S2
Hooker's Bugseed	*Corispermum hookeri var. hookeri*	Sandy and gravely shores of rivers and streams, sand dunes, waste places	n/a	S2
Indian Milk-vetch	*Astragalus aboriginorum*	Sandy prairie slopes above east shore of South Sask. River	n/a	S3
Least Mousetail	*Myosurus minimus*	Wet fields, vernal pools, banks of streams and lakes	n/a	S3
Longstem Water-wort	*Elatine triandra*	Found in small mats in shallow water or wet to drying mud flats, sloughs on shores, in slough bottoms, and tilled field potholes, ditches and slow moving streams	n/a	S2
Marsh Felwort	*Lomatogonium rotatum*	Marshes	n/a	S3
Menzies' Catchfly	*Silene menziesii*	Open woodlands and forests, grasslands, gravelly places, river banks,	n/a	S3
Mingan Moonwort	*Botrychium minganense*	Mesic to wet woods, in wet meadows, mesic open aspen woods and ditches.	n/a	S1
Mucronate Blue-eyed-grass	*Sisyrinchium mucronatum*	Prairies, roadsides, moist open woods, rocky and sandy open shores	n/a	S3
Narrow-leaved Water Plantain	*Alisma gramineum*	Shallow fresh or brackish water or muddy shores	n/a	S3
Nevada Bulrush	*Scirpus nevadensis*	Lakeshores and river-flats, often brackish	n/a	S3

Common Name	Species	Habitat[1,2]	COSEWIC Status[2]	Provincial Ranking[3]
Northern Blue-eyed-grass	*Sisyrinchium septentrionale*	Moist grassy areas	n/a	S3
Pale Bulrush	*Scirpus pallidus*	Marshy areas	n/a	S3
Pallas' Bugseed	*Corispermum pallasii*	Sand dunes, sandy and gravely shores, waste places	n/a	S2
Pepperwort	*Marsilea vestita*	Slough bottoms	n/a	S3
Prairie Dunewort	*Botrychium campestre*	Prairies, dunes, grassy railroad sidings, and fields over limestone	n/a	S2
Red Bulrush	*Blysmopsis rufa*	Inland salt or brackish marshes or freshwater peatlands	n/a	S3
Red Elderberry	*Sambucus racemosa ssp. pubens*	Moist woods	n/a	S2
Red-stemmed Cinquefoil	*Potentilla rubricaulis*	Sandy lake and stream shores, open sandy forests, dry grassy slopes, sandy and loamy bluffs, rock crevices	n/a	S3
Rocky Mountain Sedge	*Carex saximontana*	Moist to dry, open prairies, pine, and deciduous woodlands, on ridges and slopes	n/a	S3
Sand-dune Wheatgrass	*Elymus lanceolatus ssp. psammophilus*	Dry praires, sandhills, and sandy shores (active sand dune blow-outs)	n/a	S2
Sandhills Cinquefoil	*Potentilla lasiodonta*	Sandy sites in prairies		S2
Small Dropseed	*Sporobolus neglectus*	Damp gravel between railway lines	n/a	S2
Smooth Arid Goosefoot	*Chenopodium subglabrum*	Sandy soils and sand dunes, in wind-eroded sand	Threatened	S3
Smooth Hawk's-beard	*Crepis runcinata ssp. hispidulosa*	Dry or moist alkaline meadows	n/a	S1
Smooth Wild Rose	*Rosa blanda*	Thickets, grassy verges, edges of woods, ditches, stream banks, gravelly and sandy flats	n/a	S1
Soft Wild Bergamot	*Monarda fistulosa var. mollis*	Hillsides, thickets, and in shady places	n/a	S3

Common Name	Species	Habitat[1,2]	COSEWIC Status[2]	Provincial Ranking[3]
Tall Beggar's-ticks	*Bidens frondosa*	Moist ground and ditches	n/a	S3
Tall Blue Lettuce	*Lactuca biennis*	Moist open woods, clearings	n/a	S3
Upright Narrow-leaved Pondweed	*Potamogeton strictifolius*	Submerged in wetlands	n/a	S2
White-top	*Erigeron strigosus*	Woods edges, fields, roadsides, and other open, disturbed sites	n/a	S3
Wood Lily	*Lilium philadelphicum*	Prairies, open woods, thickets, roadsides, powerline right-of-ways, meadows	n/a	S4
Yellow-rattle	*Rhinanthus minor ssp. minor*	Mesic to moist meadows, fields, pastures, roadsides and clearings	n/a	S2
Yukon Silverweed	*Potentilla anserina ssp. yukonensis*	Dry sandy and gravelly stream- and lakeshores, dry pastures, open dry pine forests, inland alkaline habitats, road verges and gravelly sites	n/a	S2
		Animals		
American Badger	*Taxidea taxus taxus*	Dry open areas with clay-like or sandy soil	Special Concern	S3
Barn Swallow	*Hirundo rustica*	Mud nests are often tucked under the eaves of barns and stables, on structures near playing fields, or under bridges.	Threatened	S5B, S5M
Bobolink	*Doluchonyx oryzivorus*	Grain fields and grasslands	Threatened	S5B
Burrowing owl	*Athene cunicularia*	Sparsely vegetated agricultural land and may nest in the lands that are adjacent to the wetland	Endangered	S2B
Common nighthawk	*Chordeiles minor*	Often found searching for insects at dusk, and prefers both rural and urban habitats including logged forest, recently burned forest, woodland clearings, prairies, plains, sagebrush, grasslands, open forests, and rock outcrops	Threatened	S4B, S5M

Common Name	Species	Habitat[1,2]	COSEWIC Status[2]	Provincial Ranking[3]
Horned Grebe	*Podiceps auritus*	Nests in freshwater and occasionally in brackish water on small permanent or semi-permanent ponds which last until autumn, but it also uses marshes and shallow bays on lake borders	Special Concern	S5B, S5M
Loggerhead shrike	*Lanius ludovicianus excubitorides*	Nest in grasslands, primarily native short-grass and mid-grass prairies. They have the ability to use some agricultural fields for feeding and raising young	Threatened	S4B
Northern Leopard Frog	*Lithobates pipiens*	Shallow marshes, moist uplands, permanent water bodies	Special Concern	S3
Olive-backed Pocket Mouse	*Perognathus fasciatus*	Sandy soil	n/a	S3
Piping Plover	*Charadrius melodus circumcinctus*	Isolated beaches and sand flats	Endangered	S3B
Short-eared Owl	*Asio flammeus*	Uses a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations and old pastures. It also occasionally breeds in agricultural fields. Preferred nesting sites are dense grasslands	Special Concern	S3B, S2N, S3M
Sprague's Pipit	*Anthus spragueii*	Prefers native and seeded pastures to cropland or grazed pastures, uncultivated valleys and hillsides, or the grassy areas around alkaline sloughs and lakes	Threatened	S3B, S3M

[1] Flora od North America http://www.efloras.org/flora_page.aspx?flora_id=1
[2] COSEWIC available at http://www.cosewic.gc.ca/eng/sct5/index_e.cfm
[3] Provincial Ranking available at http://www.biodiversity.sk.ca/SppList.htm

Appendix D - Cost Estimate

West Option		Overall Length (km)	# Sections (ea)	Mainline Length (km)	Cost	# Systems Interchanges (ea)	Cost	# Service Interchanges (ea)	Cost	# Flyovers (ea)	Cost	# Railway Overpasses (ea)	Cost	Utility/Rail Relocation (ea)	Cost	Total Cost	Contingency (50%)	Grand Total
	1	7.9	2	15.8	$47,400,000	1	$125,000,000	1	$30,000,000		$0	1	$20,000,000	2	$2,000,000	$224,400,000	$112,200,000	$336,600,000
	2	6	2	12	$36,000,000	1	$125,000,000	1	$30,000,000		$0	1	$20,000,000	1	$1,000,000	$212,000,000	$106,000,000	$318,000,000
	3	6.9	2	13.8	$41,400,000	1	$125,000,000	1	$30,000,000		$0	1	$20,000,000	2	$2,000,000	$218,400,000	$109,200,000	$327,600,000
South-East Option																		
	1	13.8	2	27.6	$82,800,000	2	$250,000,000	2	$60,000,000	2	$40,000,000	2	$40,000,000	4	$4,000,000	$476,800,000	$238,400,000	$715,200,000
	2	14.3	2	28.6	$85,800,000	2	$250,000,000	2	$60,000,000	2	$40,000,000	2	$40,000,000	4	$4,000,000	$479,800,000	$239,900,000	$719,700,000
	3	16.4	2	32.8	$98,400,000	2	$250,000,000	2	$60,000,000	3	$60,000,000	2	$40,000,000	4	$4,000,000	$512,400,000	$256,200,000	$768,600,000
	4	18.1	2	36.2	$108,600,000	2	$250,000,000	2	$60,000,000	5	$100,000,000	2	$40,000,000	2	$2,000,000	$560,600,000	$280,300,000	$840,900,000
	5	17.6	2	35.2	$105,600,000	2	$250,000,000	2	$60,000,000	4	$80,000,000	2	$40,000,000	2	$2,000,000	$537,600,000	$268,800,000	$806,400,000

Unit Costs (Direct Construction Capital Costs)

Mainline 2 lane section (incl. service road)	$3,000,000
Systems Interchange	$125,000,000
Service Interchange	$30,000,000
Flyover (Road & Rail)	$20,000,000
Utility Relocation	$1,000,000

Notes (SE)

Systems interchanges at Hwy 11 and Hwy 16.

Service interchanges at 8th Street, Floral Road or Baker Road, Grasswood/Highway 11

Overpasses at Patience Lake Road, CPR, CNR, Haight, Winmill, Baker Road, Victor Road

Notes (W)

Appendix E - Potential Interchange Configurations


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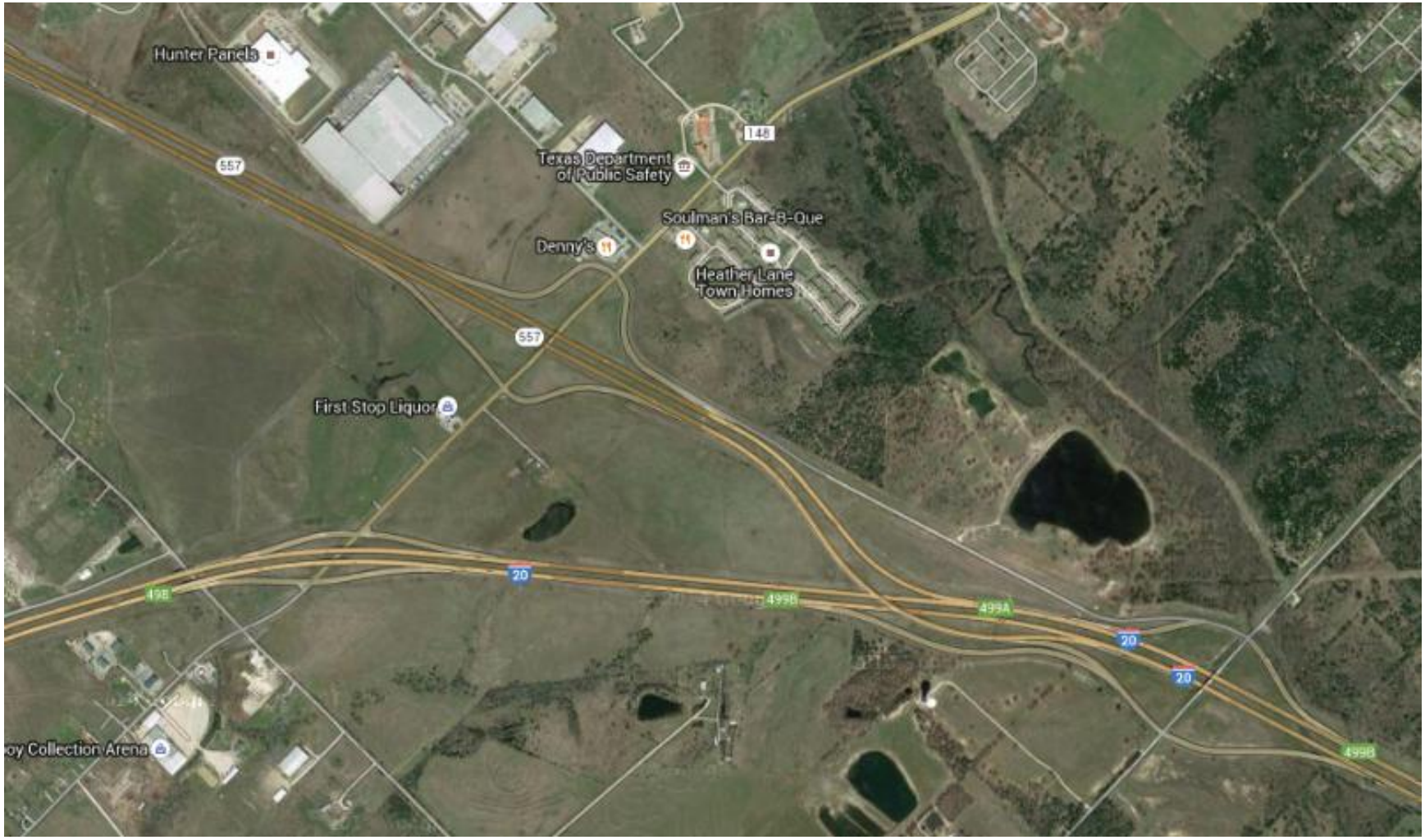
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Texas Department of Public Safety
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Soulman's Bar-B-Que
Denny's
Heather Lane Town Homes
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Appendix F - Stakeholder and Public Consultation

Stakeholder Meetings:

Stakeholder Meeting #1 - June 18th, 2015

Attendees:

29(1)	Ministry of Agriculture
29(1)	Sask Trucking Association

Ministry of Agriculture noted that some land required for the Saskatoon Freeway may be Crown Land. Coordination with the Ministry of Agriculture may be required.

Sask Trucking Association indicated that the connection from Highway No. 11 to Highway No. 16 is critical for the trucking industry. Oversized loads should be considered in planning for the Saskatoon Freeway. The Sask Trucking Association also noted that there are limited services along the highways around Saskatoon leading people to enter the City who might not otherwise need to do so. Zoning along the Saskatoon Freeway will be key in promoting development along the highway. This should be considered going forward.

Stakeholder Meeting #2 - June 19th, 2015

Attendees:

RM of Corman Park (Reeve)
RM of Corman Park
Resident
Sask Trucking Association
Sask Trucking Association

A private resident noted concerns about impact to his property. He felt the alignment is too close to the City. The resident also noted some concerns about the approved north route and suggested that the study may be outdated. He indicated that he would prefer if the alignment passed his house on the east side of his quarter section.

The RM of Corman Park was concerned about tying up land for an extended period of time because the alignment may change by the time they are ready to construct.

The Sask Trucking Association noted that the design should consider oversized and long combination vehicles.

All attendees echoed support for the Saskatoon Freeway.

Stakeholder Meeting #3 - June 22nd, 2015

Attendees:

Cowessess First Nation
Sask Trucking Association

Cowessess First Nation expressed concern about access to their property located east of Highway No. 11. With the construction of the Stonebridge overpass at Vic Road, their options for access are limited. The First Nation also expressed support for the Saskatoon Freeway.

The Sask Trucking Association noted that over dimension trucks currently travel from Keniston to Rosetown before proceeding to destinations further north to avoid the City. They also indicated that truckers look at mileage and services to determine their route. They typically need somewhere to stop for fuel, groceries etc. This should be considered in planning for the Saskatoon Freeway. Allowance for rest areas would also be beneficial.

The Sask Trucking Association confirmed that the heaviest truck route was from Regina north to Edmonton. Traffic bound for Calgary would take the Trans Canada Highway. Therefore, demand for a southwest connection would likely have low traffic volumes.

Stakeholder Meeting #4 - June 23rd, 2015

Attendees:

Sask Energy Distribution
Trans Gas
Dream Development
Sask Power Transmission
Meewasen Valley Authority
Clifton Associates (Silver Sky Development)
Clifton Associates (Silver Sky Development)
SaskTel
Crosby Hanna & Associates (Silver Sky Development)
Silver Sky Development

Sask Energy noted that they have low pressure lines to serve developments in the study area as well as junction stations east of Highway No. 11. However, no junction stations exist south of the Grasswood subdivision. Utility coordination may be required in the future.

Trans Gas has major lines that cross the proposed Saskatoon Freeway alignment. Trans Gas provided plans showing their pipelines in the project area.

Sask Power is interested in identifying utility corridors in the project area and would prefer to use the highway corridor at the outer edge of the right-of-way.

The representatives from the Silver Sky development were concerned about impacts to the proposed development.

Meewasin sites are shown along the river and indicated that these sites should be avoided as well as any ecologically sensitive or recreational sites. Meewasin approval will be required for bridge construction. It was noted that the Meewasin Valley Authority extends into the RM of Corman Park. It was also noted that there may be protected species in the river valley, specifically west of Highway No. 219. There may also be slumping slopes in the river valley. Meewasin Valley Authority suggested looking at a river crossing further south.

Sask Tel indicated that they would be interested in establishing a utility corridor within the Saskatoon Freeway right-of-way.

Stakeholder Meeting #5 - June 24rd, 2015
Attendees:

NSBA
English River First Nation
RM of Corman Park
Partnership for Growth (P4G)

Representatives from both the NSBA and the RM of Corman Park noted that it would be beneficial to finalize the north alignment, as uncertainty is holding up investment in the area.

English River First Nation was concerned about the effect of the project on traffic at the English River First Nation land. It was noted that if the connection from Highway No. 11 to Highway No. 219 was omitted, traffic would be routed up Highway No. 11 to head west across the south Circle Drive bridge. English River First Nation does not own any additional land in the project area but may consider purchasing additional land near the Saskatoon Freeway once the alignment is defined.

P4G expressed an interest in the location of the alignment in the southeast quadrant.

The RM of Corman Park noted that shifting the alignment south will have a significant impact on existing and proposed development in the area.

Stakeholder Meeting #6 - July 13th, 2015
Attendees:

University of Saskatoon
University of Saskatoon
University of Saskatoon
University of Saskatoon
University of Saskatoon VIDO Facility
University of Saskatoon
University of Saskatoon

The University is planning a complete reconstruction of facilities including the Western College of Veterinary Medicine. They need to know the location of the Saskatoon Freeway so they can finalize their plans. This must be done by the fall of 2015 to be eligible for funding.

The University is concerned about the impact of the Saskatoon Freeway on their land. They have some concerns about the impact of noise on the native hoofstalk. Any impact that results in a severance of their land would not be desirable. If the satellite farm were to be impacted they would require that it be replaced inside the Saskatoon Freeway.

The Vaccination for Infectious Diseases Organization (VIDO) is located in the northeast corner of the university land. The VIDO centre is a Level 2 facility and requires a minimum of 400m clearance to the highway.

Stakeholder Meeting #7 - July 17th, 2015

Attendees:

Fishing Lake First Nation
Fishing Lake First Nation
Fishing Lake First Nation

Fishing Lake First Nation owns land along Highway No. 219 that they are planning to develop. They had questions about the project schedule, the land acquisition process and access to their land. The land is currently zoned light industrial and they would like to rezone it to commercial.

Public Information Session # 1

June 8th, 2015

[inside address]
[inside address]
[inside address]

Dear [salutation]

South Perimeter Highway for Saskatoon – Information Session

The planning for South Perimeter Highway for Saskatoon is a continuing priority for the Saskatchewan Ministry of Highways and Infrastructure. A key element in the initial phase of planning is determining the route of the new highway. As a resident or landowner who could be potentially impacted by the location of Saskatoon's future South Perimeter Highway, you have an interest in the route of the highway. We encourage you to attend the upcoming public information session on June 25th, 2015.

Input from impacted residents, landowners and other stakeholders is key to the public engagement phase of the South Perimeter Highway General Location Study. The purpose of the General Location Study is to:

- Collect public and stakeholder input regarding possible routes
- Develop an infrastructure implementation plan outlining a phased approach to the construction of the south perimeter route
- Determine the appropriate general route and interchange locations.

Public Information Session set for Thursday, June 25, 2015

Attend the first information session. This come-and-go session is your opportunity to:

- Learn more about the South Perimeter Highway for Saskatoon
- Share your opinions and priorities on potential options for routes.

Representatives from the Ministry of Highways and Infrastructure, as well as the project consultant, Associated Engineering, will be on hand to provide information, answer questions and gather input.

SOUTH PERIMETER HIGHWAY GENERAL LOCATION STUDY
PUBLIC INFORMATION SESSION
Thursday, June 25, 2015
5:00 p.m. – 8:00 p.m. (come-and-go)
German Canadian Club Concordia
160 Cartwright St E, Saskatoon, SK

Be Part of the Process

Get connected to the planning process by providing your email address. You'll receive invitations to information sessions as well as updates and information specific to the project until October 2015. Just send an email with "South Perimeter Highway" in the subject line to Jon Medori at Associated Engineering at medorij@ae.ca. You can also check the Ministry of Highways and Infrastructure website for updated information.

Sincerely,

Jon Medori
Associated Engineering

Welcome

Saskatoon South Perimeter Freeway Information Session

June 25, 2015

Purpose

- Plan a high-speed freeway in the area (City of Saskatoon)
- Benefits
  - Improve safety
  - Improve traffic flow and alleviate congestion
  - General location study will allow for effective planning for future development
    - Land requirements, number of access pts to be determined at future planning stages

*Stakeholder and public input is critical to planning process

Background

- Saskatoon Perimeter Freeway planning work began in the late 1990's
- Current Approved Route
  - Highway 14 to Highway 5 north of the City

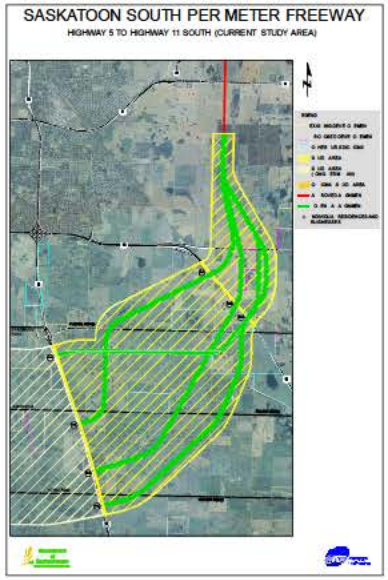
General Location Study

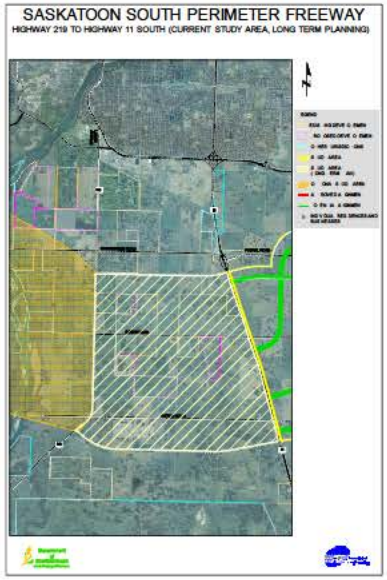
- Determine Route Location:
  - From Highway 14 West, south to Highway 7
  - From south of Highway 5, south to Highway 11 South, and west to Highway 219
  - Identify Route Constraints and discuss options
  - One-on-one meetings with key stakeholders and public open houses are being held
  - Following public engagement, the Ministry will report back to the community

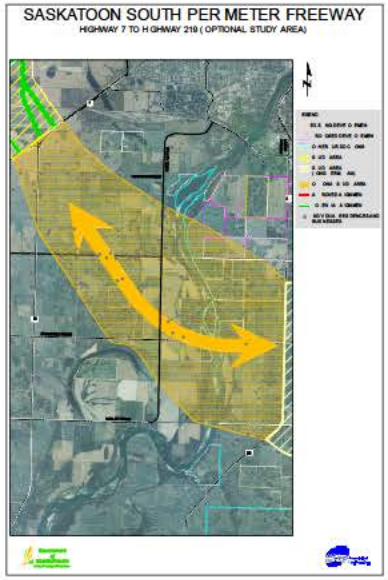
Study Area

Government of Saskatchewan

Associated Engineering







Project Schedule

- Public Information Session #1 – June 25th, 2015
- Ongoing stakeholder meetings
- Public Information Session #2 – Currently Scheduled for Early August
- Consultant Presents Final Options: late fall 2015
- Schedule May be Subject to Change

Next Steps

- Proceed to Functional Design
  - Environmental/Geotechnical Review
  - Access Management
  - Establish ROW
- No timeline or project cost has been established for construction

FAST CONSULTING
Community Intelligence

Saskatoon South Perimeter Freeway

GENERAL LOCATION STUDY

Public Information Session Summary

July 2015

Saskatoon South Perimeter Freeway
GENERAL LOCATION STUDY
Public Information Session Summary

Prepared for:

Associated Engineering
#1 - 2225 Northridge Drive
Saskatoon, SK

Ministry of Highways and Infrastructure
#18 - 3603 Millar Avenue
Saskatoon, SK

Submitted by:

FAST CONSULTING
Community Intelligence

117 - 3rd Avenue South
Saskatoon, Saskatchewan
S7K 1L6
Tel: (306) 956-3070
Fax: (306) 956-3663

July 2015

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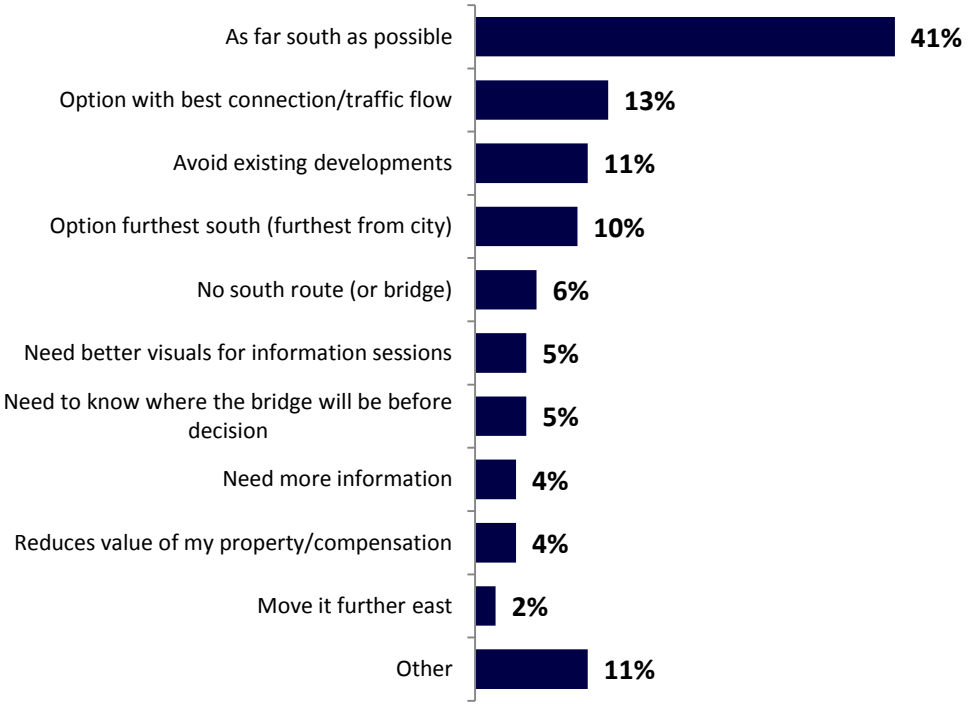
Executive Summary

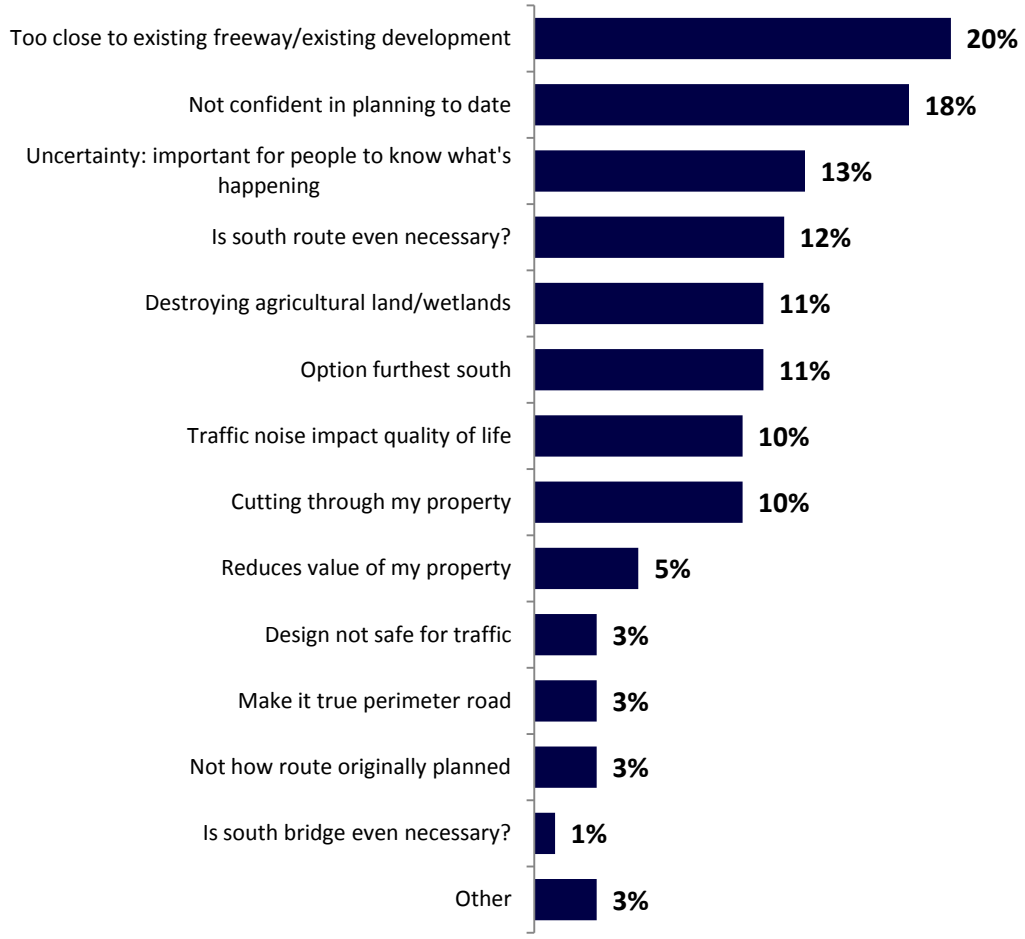
This report is a preliminary summary of the comments and feedback received by Fast Consulting during a Public Information Session for the Saskatoon South Perimeter Freeway General Location Study. The event was held on June 25th, 2015, from 5:00pm–8:00pm at the German Concordia Club in Saskatoon. Over 400 people attended the session: 398 people signed in, 327 provided an email address to receive further communication and 109 filled out a comment sheet.

Preferred Route Concept/Location



- Half (51%) of the public information session attendees say their preferred route is either ‘as far south as possible’ (41%) or ‘option furthest south (10%). Another 11% prefer the route that avoids existing development, 6% do not want a south route or bridge and 2% say a route further east.

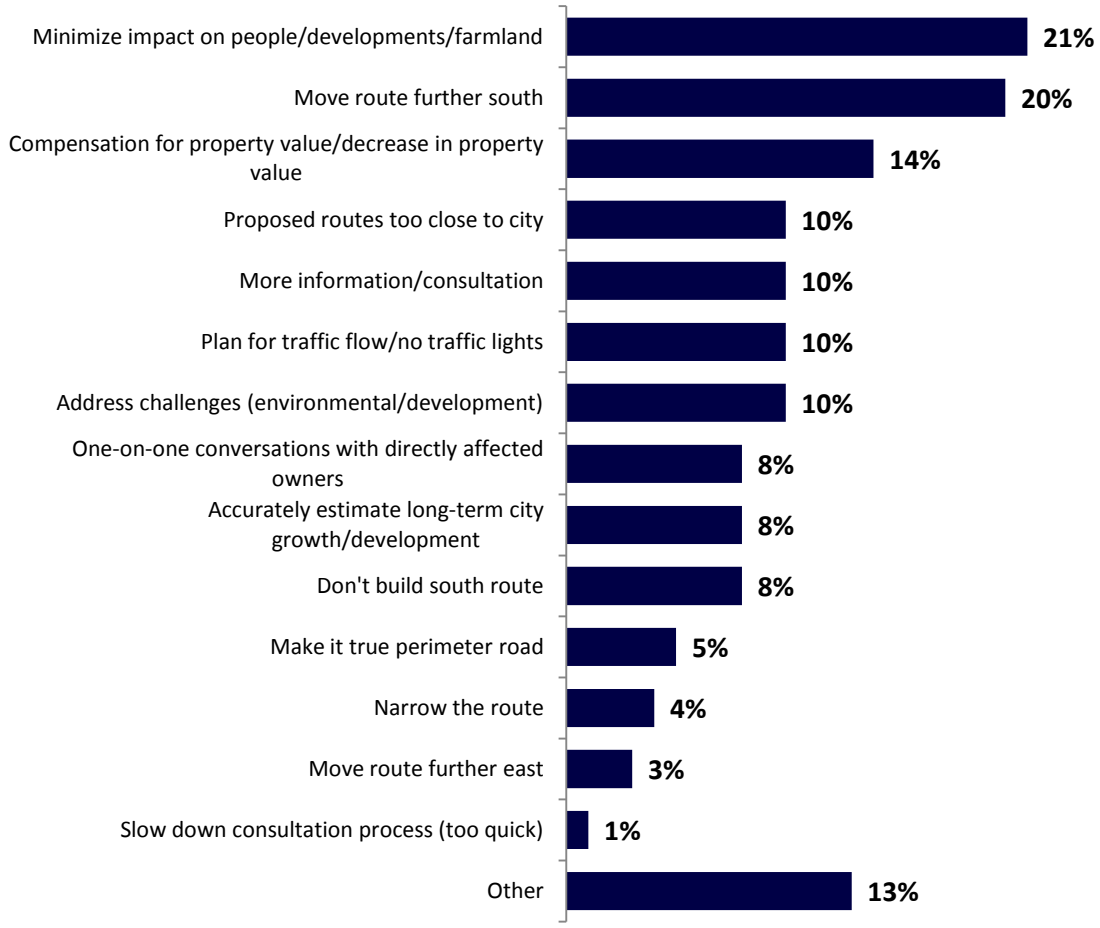
Concerns about Route



**Multiple response allowed*

- Attendees at the information session have a variety of concerns about the routes proposed for the South Perimeter Freeway. The most frequently cited concern (at 20% of responses) is that the proposed routes are too close to the existing freeway and/or existing development. This is echoed in the 10% of respondents who use this section to suggest choosing the option furthest south.
- Other frequently cited concerns include a lack of confidence in the planning process (18%), uncertainty (13%), questions whether a south perimeter freeway route is necessary (12%), destruction of valuable farmland/wetlands (11%), traffic noise (10%) and cutting through their property (10%).

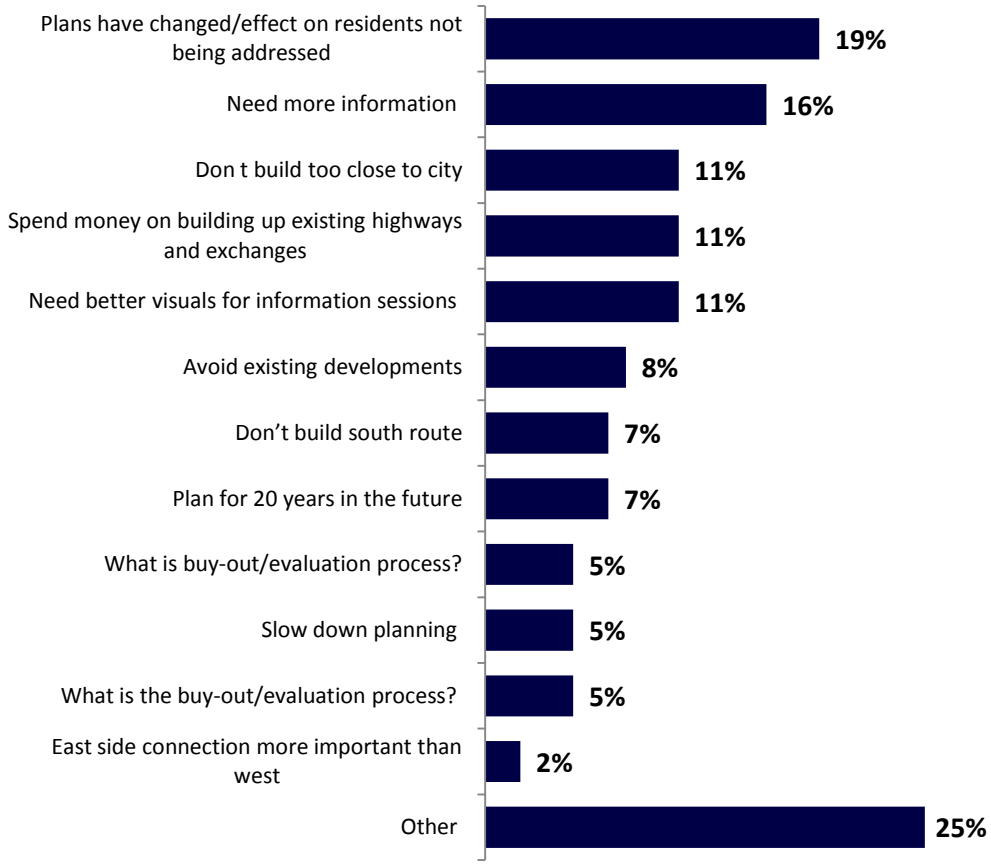
Suggestions for Addressing Route Concerns



**Multiple response allowed*

- Among respondents who have concerns about proposed South Perimeter Freeway routes, the two most-frequently cited suggestions for addressing those concerns are to minimize the impact on people, developments and farmland (21%) and to move the route further south (20%).
- Approximately 14% suggest addressing concerns about compensation for affected property owners for their property or the decrease in value of their property.
- Approximately 10% suggest more information/consultation on the project, 10% suggest planning for traffic flow/no traffic lights and 10% suggest addressing challenge (environmental, development, etc.) upfront.

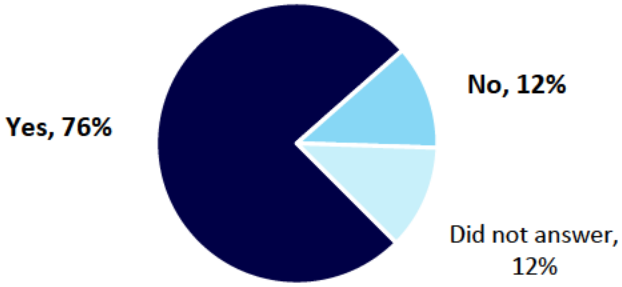
Other Comments



- When asked if they have other comments, respondents appear to take the opportunity to reiterate their chief concerns. The most frequently cited comment (19%) is that these new/changed plans for the South Perimeter Freeway will impact residents, and they do not feel those impacts are not being addressed.
- Approximately 16% want more information and 11% want better visuals presented at information sessions.
- Approximately 11% don't want the new freeway too close to the city and 8% want it to avoid existing developments, while 11% want the money spent on existing infrastructure.

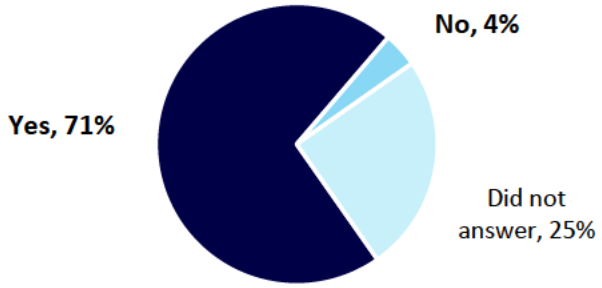
Satisfaction with Information Session

Do you feel the information session venue and timing were convenient?



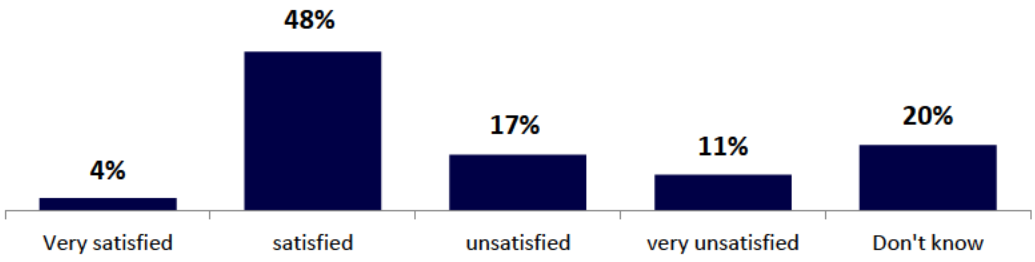
- Nearly all (91%) those who attended the information session agree that the venue and timing were convenient.

Were the hosts courteous and helpful in explaining the project?



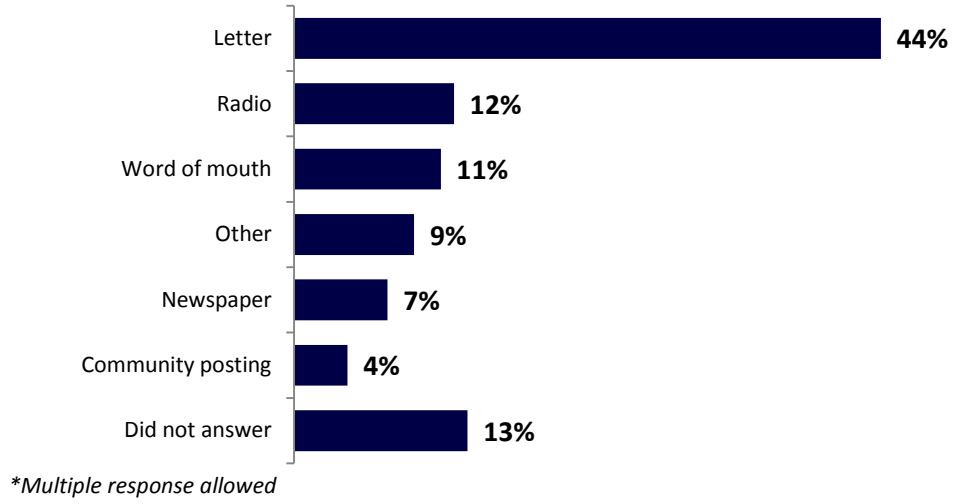
- Nearly all (96%) attendees also agree the hosts were courteous and helpful in explaining the project.

Overall, how satisfied are you with the public engagement process?



- The majority (69%) of information session attendees are satisfied with the public engagement process for the South Perimeter Freeway, while 24% are not.

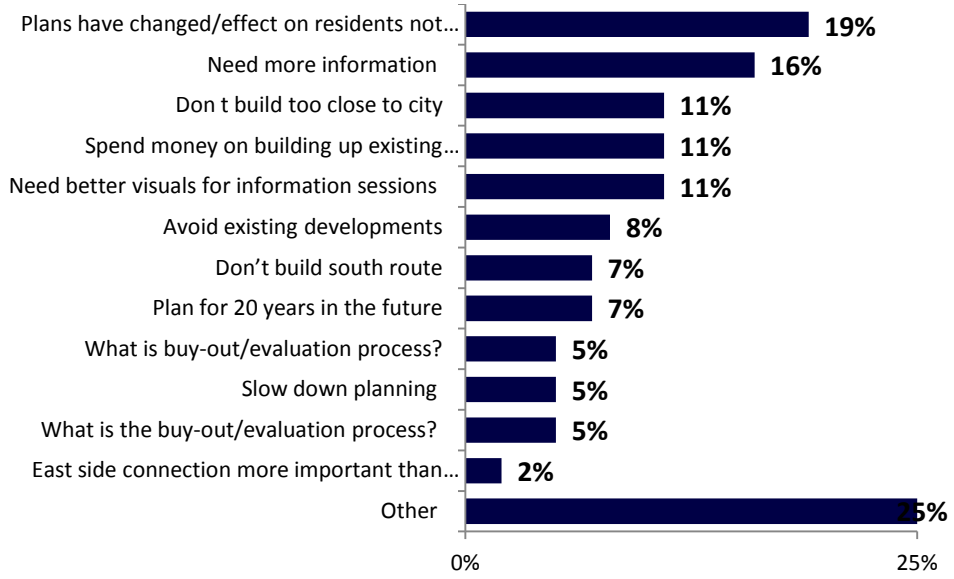
How did you hear about this information session?



**Multiple response allowed*

- More than half of attendees (56%) at the Public Information Session heard about the event through a letter delivered to their home. Approximately 21% heard about it through radio announcements, 12% through word of mouth, 12% through the newspaper and 9% through community postings.

Other Comments



Verbatim Comments

Preferred Route Concept/Location

To assist with the next steps of this planning study, please indicate your preference of the displayed concepts at the locations of interest to you, as well as any rationale you wish to share.

'As far south as possible' (34/83=41%)

- If there must be one, I'd prefer it to be as far south as possible to reduce congestion and allow for growth (as well as cost of properties).
- 11d. - too close to my own place!! Too big a swing out of the city means increased costs. C=2TIR. 11a to 16c are most logical to me.
- 16a looks like a more non-intrusive route between Highway 5 to Highway 11 and less risk to cause further flooding.
- 7B or 7C connecting to 11C or 11D - taking new highway out far enough for further growth.
- Any of them would be fine. Although I believe the route for this north might be small thinking. Perhaps the two proposed further south would be more aggressive but appropriate.
- Any southern route between Highway 11 and 7 needs to be south of Victor Road. That would allow room to grow for Saskatoon, shunned the highway away from affluent acreages, community halls, and the South Corman Park School.
- The City of Saskatoon continues to grow in a southerly direction through acreage development. Several projects are currently under development and more are proposed, Silver Sky being most recent. Choosing the northern-most route will permanently shut down this project according to news reports. All of the existing acreages within 2 km of the proposed northern-most route will be negatively affected in a significant way by freeway. Quality of life will be impacted, chosen primarily for peace and quiet and to be closer to nature. Of the two options presented, common sense would dictate that the second (southern-most) route is a logical one. A satellite view of the area shows that very few landowners would be affected by this route as it is primarily all farmland (which is significantly less costly to purchase than a multitude of established acreages). Furthermore, the southern-most route would allow for decades of continued acreage development south of the city.
- As discussed, the most southerly green route as possible.
- As far south as possible as it would not affect the school and least of all, the residents.
- Two southernmost routes would most strategically accommodate growth and development.
- As stated in 6, I prefer the most southerly route, south of Victor Road between Highway 11 and 219.
- Freeway should be further south.
- From Highway 5 to Highway 11 South. I chose 11-D and hate 11-A. From Highway 14 to Highway 7, I chose 7-C and hate 7-A and 7-B.
- Further south, this may accommodate Pike Lake region as well as decongest large trucks from Saskatoon.
- Furthest south possible to minimize affected people.
- Highway 5 to Highway 11. The furthest route south (11D).
- Hwy. 11 - 219 - furthest south possible.

- I chose this route because the other routes are more northerly and run through more populated areas.
- I prefer the southernmost two routes.
- I think it should run much farther south of the city.
- I think the southernmost alignment (south of Victor) makes the most sense.
- In the Highway 14 to Highway 7 study area - 7-C is the best route and 7-A is the worst route.
- In the study area for Highway 14 to Highway 7, I prefer 7-C. I do not like the 7-A and 7-B. In the study area for Highway 5 to Highway 11, I prefer 11-C I do not like the 11-A and 11-B
- Keep perimeter as far south and east as possible so that it is not within the city at time of completion.
- My preference would be the southernmost option (near Victor Road).
- My preference would be the southernmost option.
- My preference would be to use the most eastern flowing into the most southern route.
- Remove option 7a and 7b as they are unworkable and too restrictive to growth. Show alternatives down Range Road #3065 and west.
- Same as previously mentioned questions, the route furthest south.
- South of Victor Road.
- South west of Saskatoon.
- The bridge should be as far south as possible. It makes no sense to have another bridge so close to the Southbridge especially since the next bridge further south is it Outlook. The route should be as far south as possible so that it will continue to function as a perimeter highway well into the future even when Saskatoon expands. Circle Drive, which was to have been a perimeter highway, is now entirely within the city and cannot longer function in this role.
- Victor Road makes sense at the rate the area is growing.
- Victor Road preferred.

‘Option with best connection/traffic flow’ (11/83=13%)

- 11-C/16-B looks like the best choice from the flow of the road.
- It will allow easier connection to a highway segment running from Highway 11 to Highway 219. As "second best", the route involving junction 11B and 16A seems to be the most direct. Less roadway should translate to lower cost.
- Of the four concepts displayed, the route involving junction 11A is most desirable since it can take advantage of the highway infrastructure already in existence for the intersection of Floral Road and Highway 11 (less cost).
- Option 1 - North end of Dundurn camp, Option #2 - South of Grasswood Road, Option #3 - lease expensive - only have a 3/4 ring road with no connecting east/west highways by way of going south of city to much already built there.
- Route 11A most northern take from Highway 11 is the least disruptive to local traffic, school routes and households. This is easily the most preferred route.
- It has a better chance of connecting more seamlessly with Casa Rio, if connected with Victor Road or south and the old Highway 11, where easements will cause less disruption and loss of value and enjoyment to property owners.
- At Hwy 7 & Hwy 60 (Pike Lake Road) - seems like a logical extension of Hwy 60 north of Hwy 7 to provide quicker access to Hwy 14, Hwy 16 & north.
- Will the Perimeter Highway have an interchange crossing that crosses the major power corridor, CN track and Floral Road?
- As Highway 5 comes south, is there an interchange at Patience Lake Highway? If I had to choose one option shown at the open house I would choose the Baker Road option with River Bridge crossing to Highway 7. I am sure those acreage owners in the South would disagree but if we can’t move it further out, I think Baker Road is in the middle. Will the Perimeter Highway have an interchange crossing that crosses the major power corridor, CN track and Floral Road?

- New connectors and perimeter roads must avoid existing and already planned areas, as they are already congested (7A& 7B) and space for proper interchanges (no traffic lights) is limited.
- In the Highway 14 to Highway 7 study area - 7-C is the best route and 7-A is the worst route. 7-C will make the perimeter freeway from Highway 7 to Highway 219 much smoother. The perimeter freeway is just the first phase of planning. It may actually happen after 30 years from now. Thus, we are planning freeway route for people after 2045. After 2045, many people will drive through the intersection at Highway 7 and Highway 60 from south to the workplace at the city. If we choose the route 7-B and 7-A, these people have to cross the perimeter freeway. It will result in traffic jams on the freeway.

'Avoid existing developments' (9/83=11%)

- Prefer the southernmost two routes because they are the farthest from areas of relatively dense current development (Grasswood and Casa Rio).
- I think it should run much farther south of the city where there is less developed property.
- My preference would be to have the project well outside the residential area i.e. the southernmost area of the study this would also ensure the residential area closer to Highway 219 are not affected. Victor Road area seems more appropriate.
- Unless an extremely southern route is taken, if a south river crossing is contemplated, going through all the existing acreage developments in this area would become prohibitively expensive (i.e.: through "optional study area" and "study area long term plan").
- The right location should be as far south as possible near Victor Road to minimize disruption of already existing development such as Casa Rio, Riverside Estates, Furdale etc. This is likely a cheaper option and less disruptive.
- Avoid infringement on current residents in the proposed areas.
- A route involving junction 11D would be preferable as 1) it will interfere less with the inevitable developments that will occur closer to the south edge of the city (fewer landowners affected).
- South route needs to be kept far enough south so as to not interfere with existing developments (Crossmount, Grasswood Estates, Casa Rio, etc.). Not only financial costs should be considered but also disruption of people's lives.

'Option furthest south (furthest from city)' (8/83=10%)

- The furthest route from the city.
- We want the route that extends furthest away from the city.
- Perimeter by definition means "outer boundary." As such, the perimeter highway should encircle existing and proposed development around Saskatoon - as planned for 15-20 years from now. The 2 southernmost routes are best positioned to mitigate hazards and disruption with a freeway close to residences, bisecting commuter traffic routes and exposure to hazardous goods spills.
- My preference is for all segments of the perimeter freeway to be placed as far from Saskatoon as is reasonably possible, in order to provide for as much potential future land as we can.
- I think the southernmost alignment (south of Victor) makes the most sense. If you build this perimeter freeway too close in, pretty soon the city will pass it outwards. Will also be more convenient for trucker to bypass residential development areas & not go into Grasswood area at all. If it's to be a useful perimeter road, you should plan it to be a perimeter for 25-30 years and not just another road just out of the city.
- In planning for the future, it only makes sense to move south route farther away from city limits. Development planned for the north portion of south route. I highly oppose more northerly routes.
- I prefer the first and last of the proposed routes of connection between Highway 11 and 16. The one closest to Floral where I believe there will be more industrial type buildings or the one furthest from the city, where less landowners are affected. Because these I think would affect the least domestic landowners including me.
- Highway 5 and 11 - preference is 16c - furthest from a growing city is the most logical.

'No south route (or bridge)' (5 out of 83 respondents=6%)

- My quadrant is unknown - Highway 219 west across the river. Unsure this circle is needed. I believe it is on the north end, not sure about the south end. Is the Circle Drive South Bridge adequate for traffic flow? Will traffic studies be able to determine this?
- As #11 can be used as part of the perimeter highway, I have no preference for any route east of #11.
- My preference is no south route and bridge.
- The entire concept of a South Perimeter Freeway and the rationale for it are unsound. There is no traffic problem (i.e. congestion) that would not be solved by construction of a North Perimeter Freeway and use of Hwy 11/Circle Drive South traffic route.
- The south west area between Highway 7 and Highway 11 may not be needed.

'Uncertainty - Important for people need to know (Development freeze)' (5/83=6%)

- 34-35-5 W3LSD 1 & 2. 75 years of age, and now unable to sell this land because it is in the study area.
- Need to use existing right-of-ways as much as possible. Need to fix a route as soon as possible so all will know where the road will be. If it is put off, it will only be more difficult in the future, and more expensive.
- Property owners in the affected area deserve a clear, fixed timetable for completion of the necessary studies and decision date for the freeway route.
- SK Highways should just decide and get on with it.
- To allow constructive analysis, a more exact location for proposed road would be helpful. From reading boards project may never be built. Why the vague road location?

'Need better visuals for information sessions' (4/83=5%)

- Displayed concepts need to be better focussed with fewer options.
- Highway needs to bypass filter areas illustrated were poor and many people at meeting commented they couldn't read them need 3-D map would work better.
- Some of the photos need to be enlarged.
- Would be nice to have all this information for view on the City of Saskatoon website.

'Need to know where the bridge will be before decision' (4/83=5%)

- Need bridge location to be specified; until that is done how do you make a decision?
- Please display all of the road options in the southwest yellow area and possible bridge sites.
- The site of the require bridge should have been discussed much earlier.
- The site of the required bridge would be of great interest, as would any indication of ongoing discussions as they happen.

'Need more information' (3/83=4%)

- The boards of interest would be the proposed potential alignment routes. Rationale would be that the things seem to be moving quickly with this. A decision should not be made without collecting the information.
- The planning is based on the concept that is no longer current. This needs to be updated with the city to be effective. I do not like any of the proposed options as the city is no longer developing southward focus on the north.
- We need the proper information meeting first.

'Reduces value of my property/compensation' (3/83=4%)

- Compensation must be addressed in a fair manner not only for landowners directly affected but also for landowners who will incur a tremendous loss to the real aspect of ownership in the area.
- Areas including decreased property values, upheaval of failing, etc., etc.

- Another factor of concern is the de-valuing of the existing acreages and making them less attractive for potential purchasers should the northern-most route be chosen. Most acreage owners purchase and develop their properties for their long-term enjoyment, expecting to live on the properties for decades. By choosing the northern-most-most route, you will effectively limit the sellability and therefore the value of current acreage properties within 2 km of the freeway. You will essentially make many of these properties unmarketable.

'Move it further east' (2/83=2%)

- Re: the east section running north south, move the entire section from the west side of the ridge further east; over to the east side of the ridge.
- The proposed highway, if approved, will be built on lower elevation. Move further east and on higher elevation...this will be less intrusive. We have a number of sloughs on our property with a high alkaline level with a positive pressure. There will always be water in these areas.

'Make it a true perimeter road' (2/83=2%)

- For we do not want to have a 'Circle Drive' that takes 100 years to complete - Perimeter Rd should compass the 'perimeter of the city' and with P4G planning be a complete circle.
- Winnipeg is a good example of a perimeter highway, this is not as well thought out. The mistakes and planning the northern sections, including congestion and too close, should not be duplicated for these new perimeter highway.

'Other' (9/83=11%)

- Closest to Baker Road - too far out people may not use it. May be pricy going thru Casa Rio and Riverside estates.
- I feel more consideration should be given to the most northern area closest to Saskatoon as there is less chance of having issues with building in the flood plain as this would make construction more expensive and would have less environmental impact. Building south of Baker Road.
- I live on SW5-36-4 W3. I also own NE 6-36-4 W3. The existing proposed route was intersecting these two parcels at the corner of each.
- The university would be assisted by the road next to their operation and no one live there.
- 11d and 16c
- Approximately 10 years ago a study was done to determine the route for what is now the South Circle Drive Bridge and freeway. The initial route proposed was nearly identical, I believe, to what is proposed for the (North) South Perimeter Freeway route, which is just south of Grasswood Road. At the time, after consultation with the affected landowners and careful consideration of all the factor, the study determined that it was not a practical route, as in excess of 750 landowners would be directly affected by this route and significant number of million dollar plus properties would require expropriation. Additionally, the quality of life of hundreds more acreage owners, who are adjacent to the path of this route, would be affected by noise and other issue.
- All three south routes are further out then my land, but I would argue for the route that is near but not necessarily on Baker.
- One cannot pick the best route of the four outlined until the road west of Highway 11 is chosen. If you have no intention of putting in a road west of number 11 then please say so.
- Patience Lake Road and Freeborn Road - please consider positioning of SaskPower 230KVA towers, where the CP Rail mainline angles eastward from paralleling Hwy 16 before you anything else.

Concerns about Route

In general, do you have any concerns with the proposal to set the route location of the Saskatoon South Perimeter Freeway between Highway 5 East and Highway 14 West, south of the City of Saskatoon?

'South - not near existing freeway or existing development' (19/91=20%)

- Minimize encroachment into key new developments for Saskatoon.
- Allow future development and disturb as few residents as possible.
- If it is required, it should be south of Victor Road, to avoid the acreages between Stonebridge and Victor Road, and the school on Baker and RR3052 (Preston).
- Avoid the existing developments south of the city as much as possible.
- Do not build too close to the existing freeway road.
- I am and have serious concerns about the freeway coming through residential areas south of Grasswood Road between Highway 11 and 219. Based on the existing and future potential developments between Grasswood Road and Victor Road, I strongly advocate for the freeway to pass south of Victor Road between Highway 11 and 219.
- I feel that two of the four proposed routes are too close to the city and existing development.
- I think Victor Road being the route is too far south. There is more disruption to property along Victor Road.
- Our concerns are for the planned route of the parade Road from Highway 11 to Highway 16 in the south. Our suggestion for the perimeter road would be 11D and 16C (the far east). A second suggestion would be 11C and 16C (the far east). We believe that the proposed 11A and 16A and 11B and 16A proposed routes would be short sighted perimeter Road decisions.
- The first 2 proposed routes - closest to the city are in developing areas already - no room to expand. Which would seem very short-sighted instead of 'long term view' as mentioned in the P4G mandate (Saskatoon increasing to 500,000 population in 20 years.)
- The proposed route further out from the city makes the most logical sense of the proposed options.
- The route is obviously not far enough out of the city today let alone 15-30 years from now.
- The routing should be chosen to be in the most westerly portion of the southwest quadrant and the most easterly portion of the southeast quadrant. This will best meet commuters, travelers and long distance truck needs.
- The routing should be set father away from the city so as to minimize the disruption to developments that will occur between now and when the project actually gets underway (which will likely be decades into the future). In fact, the northern route is too close to the city and should be moved further out.
- The ultimate route needs to be: In the most westerly portion of the SW quadrant, and the most easterly portion of the SE quadrant of the proposed study area; and needs to meet the long-term needs of inner city commuters and most importantly needs of highway travellers, particularly long distance trucking.
- Yes, the most easterly southerly route allows development to occur in the areas closer to the city. There is considerably more development plans for the areas closer to city limits.
- Yes, not looking further into the future, and taking into account growth - it is too close to the city. If you don't want truck traffic through Saskatoon turn left at Kenaston.
- Yes, see map. Highway 7 and 14 should be connected down Range Road #3065. This corridor already exists.
- The whole Perimeter Highway route is too close to residential areas. It needs a complete rethink and be moved away from Saskatoon and area.

'Not confident with planning so far' (16/91=18%)

- I have serious concerns with the routes proposed for the Saskatoon South Perimeter Freeway.

- All four options align further east of their final approved alignment at Highway five when they cross Highway 16. Why was grid 3042 not chosen? Or any option further east why not align with an existing grid from Highway 10 to Highway five and beyond
- As long as when this is done there is proper forethought given to overpasses/underpasses, trains routed over and/or under roadways.
- For the portion from #5 East and #7 south of Saskatoon, I understand there is consideration of not building the section from #7 south and east to #11. This is very short-sighted and irresponsible.
- I have a great deal of concerns. The province has not been forthright in the S. Perimeter Highway discussions. Perimeter Highway means that circles the city - your presentation does not state that. The true south perimeter means a new Southbridge. new Southbridge will depend on traffic so projections. What a terrible statement does that mean all development will be held up until traffic flow is warranted. Government staff stated at meeting only two locations Bible for new Southbridge - Baker Road bring your Grasswood
- I understand the decision is to be made this fall for the route of the S. Perimeter Rd. the only information consultation at stakeholders landowners have received is one scheduled meeting a few more months prior to making a final decision for the route
- It needs a complete rethink and be moved away from Saskatoon and area. Building major roads like this adds to congestion because it encourages single occupant driving, and safety only comes at a cost because the city and surrounding area has to build million dollar structures to get over a high speed highway.
- New Southbridge and S. Circle Dr. gives easy East West access. If growth is a reason, for the city continue to grow-real estate market is dropping-lots of houses for sale. Cost of the new bridge over River Delta (Cranberry Flats). Building a freeway through dance world residential areas, Casa Rio, east side of Highway 11. Abandoning the original plan of building from Grasswood to Zimmerman Road - reasons?
- Not sure when project will proceed and area under consideration is so wide and vague that it is impossible to tell when it will go. Your media reps-suggest closer to city more use further out will be more expensive and not used.
- They knew the bridge not going to be built after Valley Road. It's going to be north. Your diagram is left there. When question water flood rules (500 meters) they said it going to be north then why are the plans not that way then. Felt being lied too.
- this process to date has provided very little firm information will greatly increasing the stress levels of many , many residents living southeast and southwest of Saskatoon. Information provided by the hosts well given politely was inconsistent the mats were poor quality. The hosts were unable to identify north-south roads and for the most part not familiar with the area
- Very concerned about process and illustrated pant plans depicting throat going through hilltop area around Baker Road. Information available at session was vague and hosts couldn't answer questions with any facts.
- While the venue was convenient, the fact that there was only one session - and that during the summer when many people are vacationing, was a concern.
- Yes! The timeline for narrowing down the study area between #11 and #7 is undefined and will most likely be longer than it needs to be.
- I have serious concerns with the routes proposed for the Saskatoon South Perimeter Freeway. For many years the RM of Corman Park Planning Maps, have clearly shown a proposed route for this freeway in proximity to Floral Road. I purchased my property off Baker Road on the basis of these maps and many other property owners/families and commercial enterprises have invested multiple millions of dollars south of Floral Road using these maps to guide their decisions. Routes 11-C and 11-D will devastate the unique growing rural community south of Floral Road and the families, farms and businesses therein.

'Uncertainty - Important for people need to know' (12/91=13%)

- Commercial designation for land south of Victor Road – will it change?

- Is it economical to close a major golf course (Willows) south of Saskatoon at any point (if this causes a problem with the highway plan)?
- It was difficult to know who to talk to. We have lived in Valley Road for 25 years. This is the first notification to the changes in the Valley.
- No concerns. It is essential to establish the route location as soon as possible to enable the RM of Corman Park and its residents make long-term and strategic decisions for planning and investing in development. Setting the route is a priority.
- Timeline - people not knowing and development held up. Establish the southwest portion if it is really needed as all highways would be connected without it.
- We live in the area where there is no proposed route yet. We would like to know how the route will be planned and what impact local residents will have.
- Yes, but too little information and too soon to know.
- Your initial study area was too large, too subjective.
- Commercial designation for land south of Victor Road
- Not sure when project will proceed and area under consideration is so wide and vague that it is impossible to tell when it will go.
- Important that SK Highways connect in order that development can proceed without delay and property owners have the knowledge of how their property will be affected.
- Hard to identify who to speak with. We have lived in Valley Road for 25 years, and it seems strange that this is the first official notification of this plan which we have received of a project which could seriously affect the value of our land.

'Question whether south route is even necessary' (11/91=12%)

- Huge expenditure based upon population increases that are theoretical extrapolations - possibly unnecessary?
- City is developing on the north end were all circulation problems exists. Why not connect the bypass with circle drive south that is already handling the traffic well.
- First point, do we need it? Calgary and Edmonton don't have one. Winnipeg does, and it's so big and far outside the city that it is quicker to go through the city.
- Traffic from north or south wishing to bypass the city can use the eastern loop. Traffic from the south wishing to go west can use the south bridge.
- I question whether a south route is even necessary. Accessing the north (proposed) route could connect to all highways.
- I think the northern route would be suitable to connect traffic from Highway 5 to Highway 14. Any option for a southern route would be redundant.
- It is insane to build it at 11a or 11b! Trucks would just go through the city anyway.
- The south perimeter freeway between Highway 7 on the west side to Highway 11 south to the east, is it really needed?
- I feel that some of the infrastructure that is already in place should be used instead.
- Linking Highway 5 to Highway 14 use Circle Drive S and put in overpass/underpass in Montgomery area to connect to 14. Expropriate the very north end of the Dundurn camp about 2 miles south of Victor Road for the linkage you want.
- If the conversations have been going on since the 1990s why were there no boards at the open house explaining the historical conversations and showing the previous routes that the Province tried to propose at that time? You need to remind people what the original intent of the Perimeter Highway was. Your slides say: improve safety, improve traffic flow and congestion. The question is for who? My understanding back in the day was that the Province was developing truck bypass routes for dangerous goods so they did not have to pass through major cities. I still believe dangerous goods routes are a good idea, but think the whole Perimeter Highway route is too close to residential areas. It needs a complete rethink and be moved away from Saskatoon and area. Building major roads like this adds to congestion because it encourages single occupant driving,

and safety only comes at a cost because the city and surrounding area has to build million dollar structures to get over a high speed highway.

'Option furthest south (furthest from city' (10/91=11%)

- Better that it is moved south in the Grasswood area as compared to the plan 12 years ago to go beside Grasswood Road. Was too close to city.
- Go out as far as possible (south of Victor Road) - short term pain for long term gain.
- I feel the option farthest south from the City, although more costly makes the most sense, considering how fast the City is growing.
- In my estimate it would be foolish to encroach on a well-established development when vacant lots are available further south.
- I see the proposed routes in green. Having regard to the gross underestimates as to how quickly Saskatoon has grown (i.e.: Stonebridge) the perimeter road (south) should be extremely south of the city.
- I think the highway should be placed further south if the city is going to continue to grow and develop in that direction 'make the corridor as far south as possible'.
- Take the road as far south as possible
- Yes, I believe it should go as far south as possible to all routes.
- Yes, it should be as far south as possible.
- Yes, suggest further south, avoid Baker Road and Casa Rio.

'Destroying agricultural land' (10/91=11%)

- Loss of important habitat (wetlands and grasslands) important at urban/rural interface for flood control.
- Building bridges over recreational areas such as cranberry flat ruins the area for citizens and creates ecological concerns.
- Concerned what part of the land will be affected. Looks like the roads are undecided.
- I feel that some of the infrastructure that is already in place should be used. It would keep costs down I believe and lessen the impact on the environment and the area residents, land and ecosystem.
- My biggest concern is that I would hope that not too much "Good" agricultural land be destroyed by development.
- Need to address: 1) how will natural water flow/drainage be impacted, 2) how will location and safety of high voltage lines be impacted and 3) where and how will last expropriation power be used?
- The proposed route area goes right through Moon Lake Valley - the Valley has been designated by the Water Security Agency as a flood plan. The Statement of Provincial Interest has restricted building in the Valley. Why is the Department of Highways exempt? A bridge and interchange will destroy the Valley.
- Where is the water going?
- Do not go through the good farm land go through the swampy/pasture type land.
- Risks of further flooding from more development. We have already lost 2 of our 10 acres over the last 5 years due to development north of Highway 16.

'Cutting through my property' (9/91=10%)

- We bought 91 acres of land some time ago and recently built a new home on this property. Our home is a state-of-the-art home. We have invested on landscaping and added a shelter-belt. Three of the three proposed routes run over our property as well as my house which is only 3 years old. The entire intersects our property.
- As a homeowner in the proposed study area I am very concerned with the prospect of the highway cutting through my residential area.

- I have concerns with a couple of the proposed connection routes from Highway 11 to Highway 16. My land and home are along one of the proposed routes and I am concerned about the implications of that.
- Nobody wants a freeway near their acreage.
- Route 16a from Highway 5 to Highway 11 goes directly over my property.
- Yes, some proposals are cutting thru property (high density).
- Yes, .
- Yes, we live at the in the centre of the proposed route.
- I have property within the Saskatoon planning district on Grasswood Road.

'Traffic noise volume destroy quality of life' (9/91=10%)

- An alignment along Baker Road would introduce a lot of impacts to acreage owners.
- Traffic noise 24 hours, 7 days a week, air population from constant traffic and quality of life loss.
- I must say, I find the proposal very concerning. There are numerous families who live in the area, as well as directly adjacent to Baker Road and this will affect in a negative way. As someone who recently moved their family from the city today acreage, I can say that families move to the country seeking peace and quiet, and a slower paced lifestyle (including traffic) as well as being closer to nature, compared to that of the city. Family spend enormous amounts of money buying land and building on it, with the expectation of quiet country living. It is very unfair to spring this proposal on families. I can imagine if the proposal is known about long ago it could very well have motivated people to buy and build on land, elsewhere. I have kids who've attended Country Kids Cooperative preschool located in the log cabin next to the school and one will start at South Corman Park School in the fall. School is very close to Baker Road as it is, so much so, that during outdoor play, teachers and parent helpers need to remind children to keep their distance from Baker Road. If I wanted to raise my kids close to freeway, I would've chosen to live in the city.
- Volume of traffic, noise and emissions.
- Yes, because the development I live in (Riverside Estates) is affected by the connection between #219 and the river. We already have a major development moving ahead at great speed (Silver Sky) that has a huge affect on us. I don't want a highway too!
- Yes, residential areas would probably be impacted negatively.
- Many residents live in the communities adjacent to Baker Road between Highway 11 and Highway 219. For this reason, big road is commonly used for walking, biking and ATVs (bikes, Ski-doos, quads) in addition, this area has our school (gr K-6) and playground which means many kids are playing in area and adjacent playground.
- Increased light and noise pollution and garbage.
- Too populated areas will cause great hardship and loss of quality of life.

'Reduces value of my property' (5/91=5%)

- I'm concerned that the highway may be in close proximity to my property thereby reducing its value.
- We have lived in Valley Road for 25 years, and it seems strange that this is the first official notification of this plan which we have received of a project which could seriously affect the value of our land.
- Yes, how will we be compensated for depreciation of our property?
- Concerns regarding proposals 16c and 16b between highway 5 to highway 11 as both routes border our property. Significant loss of property value.
- Property value decreasing or difficulties selling property in the future.

'Concerned this is not how route was originally planned' (3/91=3%)

- Commercial designation for land south of Victor Road – will it change?
- For many years the RM of Corman Park Planning Maps, have clearly shown a proposed route for this freeway in proximity to Floral Road. I purchased my property off Baker Road on the basis of

these maps and many other property owners/families and commercial enterprises have invested multiple millions of dollars south of Floral Road using these maps to guide their decisions. Routes 11-C and 11-D will devastate the unique growing rural community south of Floral Road and the families, farms and businesses therein.
- We voiced those after the 2004 meeting announcing the preferred east route. The UMA density study on which the route was based missed too many residences.

'Make it true perimeter road' (3/91=3%)
- Important that SK Highways connect in order that development can proceed without delay and property owners have the knowledge of how their property will be affected.
- Let's quit the debate and propose one that considers the cost of the south river crossing and the least interface with existing developments and heavy utilities. Let's just get on with it.
- The city needs a perimeter road so it's going to need to be south as well as north, east and west of the city - the whole perimeter. This gives better access to all citizens both in and out of the city.

'Concerned this design is not safe for traffic' (3/91=3%)
- Baker Road is a bus established local route to and from Clavet. Any perimeter Highway that transects these roads decreases safety on those routes that is the regional high school all children travel there to high school by vehicle or bus.
- I fully support the development of the South Perimeter Highway. Given the strong turnout at the open house, I expect all concerns related to the southeast portion have already been identified by the design team and the public. It's obvious the south east segment will take priority over the Southwest segment, but I strongly encourage the design team to have a look at potential Southwest routes during this consultation process. 11th St. in Saskatoon is becoming overloaded with out of town traffic, affecting the adjacent residential neighborhoods. It is important to consider preliminary routing for the south and southwest, before all potential roads are closed off by state development. If it is unlikely or not feasible to someday build the south and southwest segments, this finding should be shared openly and honestly with the public.
- Need to address: 1) how will natural water flow/drainage be impacted, 2) how will location and safety of high voltage lines be impacted and 3) where and how will last expropriation power be used?

'Question whether south bridge is even necessary' (1/91=1%)
- I question whether a south river crossing between Hwy 11 and Hwy 14 is necessary if a north crossing is in place. Traffic from north or south wishing to bypass the city can use the eastern loop. Traffic from the south wishing to go west can use the south bridge.

'Other' (3/91=3.2%)
- Doesn't concern me or my land...south does.
- Lots and lots.
- Yes, I am concerned about one of the proposed routes. That being the north most route on the southeast portion of the highway.

How to Address Concerns

If you have concerns, what considerations should be made to address those concerns?

'Minimize impact on people/development/farmland' (17/80=21%)

- The enjoyment of the property will be reduced drastically by noise and pollution and loss of space and agricultural land if the freeway will be there close by. On the map the freeway options / through peoples yards and properties with no regard to yard sides and population density or topography. If it turns out that south freeway may be necessary, why is there no consideration to use already existing routes?
- Further south would mean less disruption of homes and utilities and would be a much better route for the future.
- With housing density it would be less intrusive.
- Given already relatively dense population between Saskatoon and Baker Road.
- The density of acreage developments is a clear problem if there is a major highway running thru them.
- That disruption to existing and planned development be minimized as much as possible.
- Minimize the number of people affected.
- Proposal has the freeway running through higher populated areas. Saskatoon is growing and the proposed areas will be inside the city causing decreased quality of life for those living in the area.
- Choose lower density. Yes, more cost to government; otherwise loss of cost (property value) for us.
- Proposals include cost of light and noise pollution mitigation.
- Busy areas of highest, most (current) density should be avoided.
- Choose the route that affects the least amount of current developments and the fewest people even if it costs more.
- Do not go through prime farmland.
- I think it is obvious that the large number of multi-parcel acreages from the southern edge of Casa Rio and Casa Rio East rules out the highway running anywhere from that point and north. I think the study zone between #11 and the river can be shrunken so its northern border curves underneath Casa Rio and Casa Rio East.
- I understand that high density acreage loss is a big issue but loss of viable farm land is an issue too. I'm worried that option 11D puts a high speed semi bypass within 1/4 mile of my home.
- Make it clear that Perimeter Highway will not interfere with existing subdivisions and plan subdivisions that are north south of Baker Road. We are in process of developing and have spent thousands and thousands on project to date I need to be involved in highway decisions
- Please consider the families and residents living directly in the big room communities a project of this size should be placed further outside the residential in school area.

'Move it further south' (16/80=20%)

- Based on the 'green' potential alignment lines on your map, the only suitable option would be the most southerly one that runs south of Victor Road between highways 11 and 219.
- More south.
- We feel these two routes; 11A and 11B would not be far enough out produce benefits. With development happening in Greenbrier, Rosewood the new Costco etc. having the Perimeter Road far enough south needs to be considered.
- Highway should be further south.
- It should be further south. They talked about commuter traffic using it, majority of commuters going into the city - it is really for truck traffic - make it further south.
- Move it as far south as possible if it is indeed required.
- Move south.
- Move the highway south of Victor.
- Needs to be further south.

- Propose bypass as far south as possible.
- Take the road which is most south of the proposal.
- The highway must be located south of Baker Road.
- The perimeter highway should be south of Victor Road.
- The route should be moved further south where the banks of the river are at least at the same height - not so in the Valley.
- More conducive to long-term planning to have the routes further south.
- Move it further south.

'Compensate for value of property/decrease property value' (11/80=14%)

- This 800-meter swath has placed a freeze on any development of our property. We were planning on building a shop and installing a swimming pool. Now, our lives are on hold because of this proposed project. Our property holds so much promise and options for our lives. Our property defines our lives and choices we made to be here. It's an ideal property for the next 30 to 40 years. How do you compensate for that?
- We thought it we to run on Floral Road. It appears to cut through multiple properties and will greatly diminish property values and quality of life.
- Property value decrease.
- How are people going to be compensated; value of property will decrease due to noise and traffic?
- A wide purchase corridor to avoid devaluing existing established acreage properties.
- Compensation should be given to property owners whose property values have been reduced in an amount that will make up for the loss.
- Concern about reduced property value.
- I would prefer the route be further away from my land but understand others will have the same concern. I want to know that should routes be chosen that affect resale value, there will be some assurance of compensation or offer a fair market value
- We have concerns about what this perimeter highway will do to property value and local access road noise?
- But looks like I'd be outside the corridor so likely no compensation for the loss of value for my land and home. How do I recoup ? That's my retirement sitting on that land. Do we really need 80-year-old (what I'll be when this is built) family doctors trying to make up for those dollars lost?
- Property owners in the planning district are very anxious and worried. Their properties are a big investment, often all their savings and retirement income. Just the fact that they are inside the planning zone has reduced their property value. If they plan to subdivide, they can't do it. If they were planning to sell, they can't do it, not knowing where the potential freeway may be built.

'Challenges (flood plain, development)' (8/80=10%)

- Unbiased environmental assessments with value scribe to wetlands.
- Watershed, wildlife habitat, expense of the entire project.
- Any land that is to be used for this project should only be already broken land, not natural prairie or any type of land that is already designated "park" land.
- I do not like the way it cuts through the rural area.
- Flood rules and cost to high otherwise.
- There is a flood plain and a wide river in middle of proposed area. Will this flood plain and wide river affect location of proposed road?
- There is a potential snow dump planned and how this affects water concerns in .
- Watershed, wildlife habitat, expense of the entire project. If you must build try using the existing infrastructure's that are currently functioning very well and then supplement with interchanges to connect other roads. For example Dalmeny Road to southwest of city and her circle drive around the landfill continue towards Highway 11 and 16 , interchange to Zimmerman Road to Highway 5.

'Plan for traffic flow - no traffic lights' (8/80=10%)

- The concern would be that the 11A and 11B are too close to current developments and that they don't seem to flow well with the rest of the perimeter Road. The purpose of the perimeter Road is to improve safety, improved traffic flow and alleviate congestion.
- It would be for easier to connect across the highway 60 further south and use highway 60 as part of the route.
- A better connection along 11th St. W. would help traffic from both Hwy 14 and Hwy 7 access the south bridge. Alternatively, this traffic could use the north bypass, (admittedly adding some extra miles to their route).
- It is my opinion that one of the most significant constraints in selection of the SE portion of the perimeter road is there previous decision of where the NE quadrant is located. The following should be given consideration: (I) Safety and convenience of motorists. A smooth curve as opposed to one with more pronounced directional changes is preferred. This is especially important for long haul truckers, and I would point out the problems caused by the current connection of Highway 11 to Highway 7 using either 11th Street off Circle Drive or 22nd Street with its 90 degree turns. (ii) The City's rapid growth seems to have caught everyone off guard. No one knows for certain what will happen in the future, but the probability is that the City will continue to expand and traffic will increase. We just do not know at what rate.
- I wonder if there is enough traffic coming north on Highway 11 and 16 to go west on Highway 7 to Calgary.
- Make sure budgets are made to include the proper over/under passes and bypassing the area instead of traffic meeting and blocking.
- Please plan enough space to allow for traffic to flow without stopping for traffic lights and limit concrete barriers that restrict flow. Comparing Saskatoon to Edmonton in terms of flow, you could learn a lot from Anthony Henday in Edmonton, as well as the Whitemud.
- Would it be 4 lanes?

'Require more information/consultation' (8/80=10%)

- Provide detailed responses at future public meetings and on related website.
- Much better communication, a website is not sufficient.
- There should be much better communication and much earlier notification.
- There should have been two or three sessions to accommodate people who could not attend the first.
- Before any decisions are made, we desperately need a proper information and discussion meeting with all the stakeholders (residents of the planning district, RM, city, planners, engineers) to talk about the concerns. A bridge in the cranberry flat River Delta area will be tremendously expensive and destroy a beautiful recreational space, especially for people living in the city.
- We received no communication about this information session and her through word-of-mouth. We want to get information in the future.
- What was the rationale behind the current choices? This route, design has changed a few times already.
- Why would you freeze development on land that for sure will not be part of this route...i.e. on existing development or right next to it where there would be not access? Do you not understand the implications of this? Be realistic.

'Proposed routes are too close to the city' (8/80=10%)

- Given the city's growth, the highway should be as far out as possible.
- Make sure the proposed route will make sense in the long term. Build further out so Saskatoon has room to grow.
- The best solution for the perimeter highway is to build it as far from the current City limits as reasonably possible. This would ensure that for decades to come there would be a direct route outside the City limits for travellers, especially long haul truckers, with limited entry points and no

traffic lights or stop signs. This will not detract City commuters, with the use of exit and entry ramps from using the perimeter road to efficiently get from one quadrant of the City to another. The present Circle Drive in Saskatoon, while originally thought to provide a circle route outside the City, was not located far enough outside the City and there is now development on both sides of Circle Drive with multiple access points, traffic lights and the resulting bottleneck of traffic. The most westerly route in the proposed study area for the SE quadrant is not a smooth curve and is too close to existing City limits, being approximately one half mile or less in some places of the route. As stated above this can only lead to similar situations as now exists with circle Drive

- For the SE quadrant connecting highway 11 to highway 3, I encourage the Department to select a route on the most easterly portion of the current study area, which will meet the needs of travelers and the city for many decades.
- Do not get too close to existing freeways that Saskatoon already has.
- The number of existing communities and residences. The purpose of the proposed freeway is to get traffic around the city not through it in years to come , the development closer to the city will exist an impact on this roadway will be significant to the residence of this area.
- To close to the city and by the time that this project is completed the city is likely to have expanded up to our beyond perimeter highway. Avoid the SCP school. A larger ring, further from the city would move heavy transport away from residential areas, and allow the city to grow into the larger ring road (much like Henday in Edmonton.)
- A perimeter Highway needs to be as far out as possible. Based on current and future growth many sections are already too close to the city of Saskatoon. To meet the needs of travelers, commuters and tracking, easterly Road for the SE. Quadrant Connecting Highway 11 to Highway five is most viable, safe and practical.

‘Make development/growth is estimated accurately’ (6/80=8%)

- Highway should be further south if you are really looking 20 years in the future.
- Realistic evaluation of need (i.e. funnel traffic onto recently completed circle south road).
- Make sure that due diligence and forethought for any placement of the highway takes future into consideration and is anticipated before any permanent plans are made.
- My main concern is that the plans for a new bridge will be delayed for years, like the recent South Circle Drive Bridge.
- Take a look at your P4G mandate - will the city extend beyond the perimeter road to quickly (in 20 years). Not very realistic to think all growth will be in the north/east area and the expectation of 1,000,000 in future points to the validity of the road being further out of city.
- The road should contemplate growth of city and a cushion. Note how quickly Stonebridge developed (years faster than expected). By having perimeter road well south of city (i.e.: Baker Road). This will ensure it meets its goal of being on perimeter.

‘One to one conversation with owners directly affected’ (6/80=8%)

- We received no communication about this information session only through word-of-mouth. We want to get information in the future.
- Consultation needs to be done one-on-one with directly affected landowners as the project moves along. Existing development should have priority (i.e. residence) over planned development.
- Personalized information sessions with those who will be directly impacted by the proposal.
- The next meeting should involve the whole group presentation for consistent information is given included generous. Questions and answers.
- The proposed route up to tonight was intersecting my property at the two corners. This was ok. Why now is this being moved closer to my yard?
- The Province must immediately terminate any further consideration of routes 11-C and 11-D on the basis of their devastating social, environmental and financial impacts on the community. The sudden revelation of routes 11-C and 11-D has created an unacceptable level of stress, anxiety and

fear in the affected community that will lead to the financial and emotional destruction of families if they are not immediately removed from consideration.

'Don't build a south route' (6/80=8%)

- Consider a proposal to not build a south route.
- Do not intersect Baker and Metness Road with a perimeter highway.
- I firmly believe no new south bridge will ever be built and no South Perimeter Road west of Highway 11 is necessary
- The Perimeter Highway project does not need a Band-Aid where you only rethink a portion of a project. I think this open house is a Band-Aid. The project has never been about creating a circle the project has been about moving dangerous goods from Highway 11 South and Highway 16 South to Highway 11 North and Highway 16 North. You need to look at this whole alignment as one piece.
- Watershed, wildlife habitat, expense of the entire project, it shouldn't be built.
- Do not make a complete circle as the land south of the City as far down to Victor Road is already concentrated with development.

'Make it a true perimeter road' (4/80=5%)

- Need to move forward in planning a route around the entire city. Growth of the area will continue requiring such a route in the future.
- Make it truly a perimeter road - has anyone looked at Winnipeg - a true perimeter road.
- I would much prefer to see the example of the Winnipeg perimeter highway used as opposed to following the Circle Drive precedent.
- Take a lesson from the city of Winnipeg and move perimeter highway well outside the city.

'Narrow down the route' (3/80=4%)

- Narrow the route down ASAP.
- Narrow your area of study to begin with, if possible, then look at current land holdings, bricks and mortar, roadways etc. to narrow your area of interest even more. Then call for public consultation.
- Should have position of where bridge is going to cross south of Saskatoon and routes, not where is not going too.

'Move it further east' (2/80=3%)

- Given the recent eastside developments, moving the perimeter highway further east would be more beneficial and less disruptive as the rural population density would be less concentrated.
- The entire east route should be moved further east.

'Consultation is too quick - slow down' (1/80=1%)

- Slow down consultation process and repeat it as things progress.

'Other' (10/80=13%)

- If you must build, try using the existing infrastructure that is currently functioning very well and then supplement with interchanges to connect other roads. For example Dalmeny Road to southwest of city and her circle drive around the landfill continue towards Highway 11 and 16, interchange to Zimmerman Road to Highway 5.
- If the Department of Highways wants a perimeter road they can accomplish it by completing the north perimeter and extending it to Highway 7 and 60. The north perimeter should also extend to meet with Highway 16 as the plan therefore to form a perimeter around Saskatoon highways must join Valley Road to highway number seven and number 60. I believe Road 742 is near that direction Cedar Villa could be bypassed.

- Proposed highway route...start at Prairie View Road where it comes off highway 11, go west along section line, staying south of property at end of Range Road 3051, cross railway tracks, continue westerly to Clarence, slight turn southerly to cross highway 219, continue north westerly to river, on west side of river head toward potash mine, head northerly to highway 16. Some sort of interchange required at Preston and Clarence due to local traffic going north and south. A more advanced interchange such as cloverleaf at highway 11 and 219. This idea doesn't affect any local roads already built as they will also be required when the new highway is built. Interchange requirements on west side of river unknown by me.
- 11C or 11D gives good alignment for the future, misses south Saskatoon development and sends trucks around the city instead of through.
- Access to and from Floral Road to number 11 highway.
- Future commercial use of land with access to rail which is critical to economic growth of the region would be impossible with 7A or 7B...this should be ruled out.
- Join Highways 11 and 219 in the area of Dakota Dunes.
- The northern semi-circle of the route should be re-thought.
- Divert traffic east of Grasswood Esso on Highway 11 to the east and to the north as your green proposed lines show. This is less costly, as one less bridge needed and to go through existing developments south of city. Instead of a ring road you will have or 3/4 bypass once North Perimeter Road and maximize the use of Idywyld drive in the heart of Saskatoon with an under/overpass for trains and people etc. as this is a very direct route to the north.
- At the outset you should be aware that I have an ownership interest in the and are the third generation to reside in the farm home located there. 6.2) I did attend the open house meeting in Saskatoon on June 25, 2015, and did find it informative. Generally I was satisfied with the presentation and the hosts but would have preferred more notice. 6.3) Several of the hosts explained that in coming up with the four options for connecting highway 11 to the confirmed position north of 8th Street, Saskatoon, the following constraints were considered: (a) occupied yard site, (b) developments, (c) utilities - power and gas lines, (d) research and public use lands, and (e) crossing of major highways at as close as possible to 90 degrees, and that the following were not taken into account at this time but will be in the final selection: (f) geotechnical reports, (g) underground and aboveground water and the natural drainage flows, and (h) roads to cross and several parcels.

Other Comments

'Plans have changed/effect on residents not being addressed' (11 out of 57 responses=19%)

- Regardless what happens in two months or 10 years the value of my acreage has been greatly altered.
- Those of us living in or close to the areas involved will or have lost significant property value. Those of us who are seniors and contemplating retiring and moving are particularly vulnerable if not seriously hurt by just the proposal.
- Any additional public meetings where the concerned residents can be informed and state their concerns in an open and structured environment.
- Asked by host how I knew this. I lived in the neighbourhood and grew up there. I know the land and cost of it.
- Delays on this project have affected development by the RM and City.
- The catastrophic effects of this study on the health and well-being of the residents in the affected areas cannot be understated.
- The Village of Crossmount approved and is in the process of construction and you are proposing construction of a major highway next to this senior complex.
- Those residents and businesses on the route should receive particular notice, focus and attention.
- Very disappointed with the 2004 UMA study. If it had been accurately done we may not have this problem.
- Why is the new proposal coming closer to my yard? Is it to miss water bodies? Those water bodies are only there within the last 5 years due to wet years.
- Your firm should be meeting with local and landowners potentially affected in a more proactive fashion.

'Need more information' (9/57=16%)

- We note that the interchange of highway 11 and Floral Road is outside the study area. One has to question "why"?
- I'm disappointed that Corman Park published their possible sub-division maps with exclusion zones without including this information.
- Need to do what is in the overall public interest, not listen to what appears to be powerful backroom individuals in determining how to proceed.
- Overwhelming.
- Planning studies such as this one are highly manipulative often causing citizens to turn against each other. This form should have been sent as a word document so that ideas could've been expressed in a much more cohesive or understandable format.
- Please let ratepayers (Corman Park residents and city residents) know the final route ASAP.
- Thank you for the opportunity to provide comments. I look forward to the next meeting to learn more about the proposed routing.
- This will be a controversial piece of infrastructure no matter where it goes and as much information needs to be given to the public to help make informed decisions by both parties.
- What is the timeline for deciding the route and what is the timeline for construction of the highway?

'Don't build too close to city' (6/57=11%)

- Move the route further out of the city. If there are proposed developments look at each one on an individual basis. Not a blanket freeze.
- Plan for 20 years from now, so put the freeway as far as possible from the city.
- Planning any major road changes are always brought too close to the city. The fact that developments will continue during these information sessions and the completion date is not taken into consideration.

- It has to be south at least as south as 11C if not more.
- Someone (a speaker) at the meeting mentioned that the furthest south rank may not be a viable route because too far out. We think this is 'very short sighted' did not read the P4G predictions.
- South bypass perimeter highway should be south of city - not on the edge of it - have they considered truck traffic going east of Kenaston.

'Spend money on building up existing highways and exchanges' (6/57=11%)

- Build up existing roads/highways.
- South bypass perimeter highway should be south of city - not on the edge of it - have they considered truck traffic going east of Kenaston - build up existing roads/highways.
- Again, why do we need this? More important to use SK tax money more for SK taxpayers (i.e. more city freeways - more overpasses in Saskatoon) than for more-out-of-province traffic around and through the province.
- Spend money on improving existing highways, many of which are an embarrassment to the province.
- It would seem natural to take advantage of that existing roadway infrastructure for this perimeter highway so as to reduce costs. Such a decision would also impact fewer landowners since it would involve fewer new disruptions to land usage and developments.
- You do not have to build the Perimeter Highway from Highway 16 North to Highway 7. This should save the Province one billion dollars. Dangerous goods coming in on Highway 7 can use Dalmeny Highway to Highway 16 North or if they need to go east, they should use the new Baker Road Highway. The Perimeter Highway built on the west will dam the water channel and there are too many rail line crossings. The Perimeter Highway in the south is a must and the Perimeter Highway on the west should be optional. I attended an open house sponsored by SaskEnergy about a year ago where they proposed a gas corridor through the south and connecting to the southeast area. Haven't heard anything more from them but if they are installing this, maybe a Highway should be next to it. Do Provincial agencies speak to one another before having these open houses? After the Perimeter Highway is built the Highway between Circle Drive and Patience Lake is not needed by the Province. It could be used by the City to access their neighbourhoods. Why does the approved Perimeter Highway go through these two houses located at ? Is there going to be an interchange at Highway 41, it looks very close to Highway 5? I heard the City wants to remove the City portion of the highway to Aberdeen. What does this mean for Aberdeen Highway 41? The Province needs to work better with cities because the location of this Highway will create sprawl over the years. If the Perimeter Highway is built far away from Saskatoon in one direction that is hard to service and develop land in, there is a higher cost of future infrastructure needs to the City which in return will be looking towards the Province to fund. I feel these mistakes can be avoided if there is more thought to answering why and who are we benefiting by building a two Billion dollar Highway.

'Need better visuals for information sessions' (6/57=11%)

- Bigger renderings with more detail and more handouts would be better.
- Can graphics be printed in a crisper or larger format?
- Make the maps larger.
- The formal presentation as well as the boards and questions asking. Would be helpful.
- The map showing the routing for Highway five to Highway 11 is missing multiple residences, no gray circles. All of these homes would be negatively impacted and should have been included. I also have concerns that the map lists proposed developments that are not actually yet proposed to the City or RM of Corman Park. At least one is not officially proposed development with the RM of Corman Park and yet somehow it made it on the map.
- Maps on boards were too hard to access and too small for necessary details - like where I live … this would be better.

'Avoid existing developments' (2/57=8%)

- In the Highway 5 to Highway 11 study area, 11C is the best route and 11A is the worst route. 11A and 11B will affect many proposed and potential developments.
- Please respect the current developments. We moved to the country to get away from traffic noise - please don't ruin our peace.

'Plan for 20 years in the future' (4/57=7%)

- Plan for 20 years from now, so put the freeway as far as possible from the city.
- Planning any major road changes are always brought too close to the city. The fact that developments will continue during these information sessions and the completion date is not taken into consideration. A true ring road is a great idea-just make it big enough so we aren't replicating this process in the near future. Thanks!
- Make sure the road is a minimum of 2 lanes wide in each direction, 3 would be better if the city grows bigger.
- Visual what the area between Saskatoon and Victor Road will look like in 20 years from now. Or what it can look like if citizens can proceed to propose development and the RM can make informed decisions in full confidence and security that the rug won't be pulled out from under their feet in the future by a random decision. Trust and confidence is essential to achieve the greatest potential for this valuable land.

'Don't build a south route' (4/57=7%)

- I believe that too many wealthy - influential people Casa Rio, riverside golf club etc. would never allow a Southbridge if it affected their space - hence it will never be built. Therefore, why do the taxpayers east of Highway number 11 forced to choose a route?
- The planning needs to bypass the residential acreages that exist and be added to between Grasswood Road and Victor Road between Highways 11 and 219 and avoid the building of a freeway altogether.
- We feel the best alternative would be to expand the perimeter further south and east than any of the three suggested proposals.
- Your concern right now should be focused to the north route from Highway 11. Why are you even bothering with a route through the south west at this time?

'Slow down planning' (3/57=5%)

- Get more accurate with proposed plan options before presenting. This presentation just caused major concerns as presented. Slow down.
- We need time to absorb this.
- Information meeting is premature - it should have waited to a discussion on where road is proposed to be located.

'What is the buy-out/evaluation process?' (3/57=5%)

- Financial compensation is needed not only for people directly affected, but also for those who are hurt in the unknown time span (not knowing the route) and will be losing out by not being able to buy/sell/develop, etc.
- We would like to know about the buy-out process. How do they plan to acquire the land, and at what price? Especially the value of the property and home to us. There is nothing to compare this property to any other property. It's a loss of our life-savings, our dream home. This home is not a moveable object. We need answers to what will happen and when will the freeze be lifted?
- If you want to freeze development for years to come, just in case, buy the land now. Do not expect individuals to carry the burden and cost.

'East side connection more important than west' (1/57=2%)

- I would like to see a connection from the east side of the river to Hwy 60 to complete the perimeter road at same time.

'Other' (14/57=25%)

- Also, why not use the existing South Circle Drive Bridge? Roadways to connector NW freeway?
- Be placed on the email list to receive information as available.
- I live by Victor Road in the hamlet of Beavercreek so my suggestion me ultimately impact my property.
- I think these options would also better if alignment with Highway 5 was 1 mile east.
- If you want to build a true bypass, build one and stop the small town mentally.
- Let's avoid as much as possible the wiggles that produce a need for speed reduction over a short distance; i.e. what's wrong with a fly-over (overpass) that is 80 degrees instead of 90 degrees.
- People can't stop progress. There will always be a vocal minority but common sense must prevail. Move on with confidence.
- Thank you for the opportunity to submit feedback.
- Thanks for the opportunity.
- The land to the west of #3065 is poor and unsuitable for any other use and the road should utilize land which has little other use.
- Well presented.
- This site is very difficult to find boards as displayed at meetings in a format able to read and the P4G should have been mentioned at meetings.
- Why is the space for comments so small? Is the Highways Department trying to restrict the amount of public input?

Public Information Session #2

November 5, 2015

[inside address]
[inside address]
[inside address]

Dear [salutation]

Planning the Future South Saskatoon Freeway – Next Public Information Session

Planning for the South Saskatoon Freeway is a continuing priority for the Ministry of Highways and Infrastructure. The purpose of this study is to define the southern route location. The subsequent phase of study will work to define land requirements, access points, interchange configurations, etc.

As a preliminary stage in this process, residents, landowners and other stakeholders who could be potentially impacted by the location of the future South Saskatoon Freeway were invited to a public information session on June 25th, 2015. One of the main purposes of the initial Public Information Session was to collect public and stakeholder input regarding possible routes presented during the June session. More than 400 people attended and more than 100 people provided written comments at that time. Feedback from the June session has helped us narrow down the options to define a preferred South Saskatoon Freeway route.

A second public information session is planned for Thursday, November 19, 2015 where the preferred South Saskatoon Freeway alignment will be presented to the public. This come-and-go session is your opportunity to:

- Learn more about the preferred route for the South Saskatoon Freeway; and
- Share your opinions and priorities on the preferred route developed by the consulting team.

SOUTH SASKATOON FREEWAY GENERAL LOCATION STUDY
PUBLIC INFORMATION SESSION
Thursday, November 19, 2015
4:00 p.m. – 8:00 p.m. (come-and-go)
German Canadian Club Concordia
160 Cartwright St E, Saskatoon, SK

Representatives from the Ministry of Highways and Infrastructure, as well as the project consultant, Associated Engineering, will be on hand to provide information, answer questions and gather input about the preferred route. At this time, the public will have the opportunity to view and provide comments on the preferred South Saskatoon Freeway route. Following the November 19th session, all of the presented information will be available on the Ministry's website at http://www.highways.gov.sk.ca/openhouse/.

Should you have any questions, please contact Jon Medori at Associated Engineering at medorij@ae.ca.

We look forward to seeing you on November 19th.

Sincerely,

Jon Medori
Associated Engineering

November 5, 2015

[inside address]
[inside address]
[inside address]

Dear [salutation]

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We look forward to seeing you on November 19th.

Sincerely,

Jon Medori
Associated Engineering

Welcome

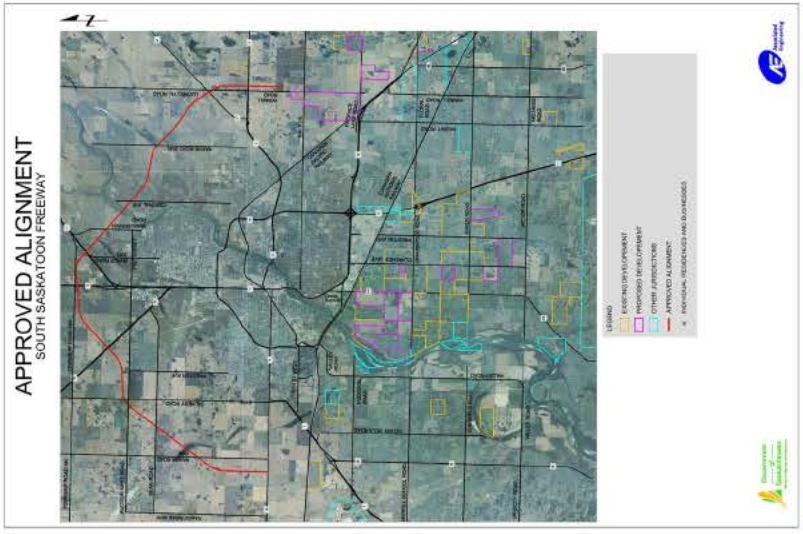
South Saskatoon Freeway Information Session #2

November 19, 2015

Purpose

To plan a high-speed freeway in the area (City of Saskatoon)

- Benefits of the freeway
  - Improve safety
  - Improve traffic flow and reduce congestion
- General location study will allow for effective planning for future development
  - Narrow the study zone to a 500 meter wide corridor
  - Access to freeway to be determined at future planning stages
  - The detailed design stage will determine land requirements
- Stakeholder and public input is critical to planning process



Summary: Public Information Session – June 25, 2015

- More than 400 people attended & more than 100 comment sheets completed
- General feedback included:
  - Avoid existing development
  - Furthest south route was preferable, west of Highway 11
  - Concerns about uncertainty and current development restraint
  - More support for east side connection than a west side connection
  - Concern with changes from original southeast alignment

Highway 7 to Highway 11 Analysis

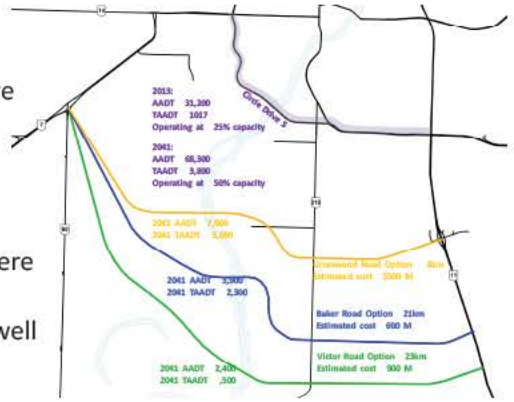
- RM of Corman Park, as well as public feedback from June 25 information session indicates a route further away from the city, between Highway 11 and Highway 219 is preferable
- MHI conducted an internal benefit/cost analysis to determine if the south west connection is required
- Analysis showed significantly increased cost and decreased use for routes further away from the city
- New connection from Highway 7 to Highway 11 not practical well into the future

Government of Saskatchewan

Associated Engineering

Highway 7 to Highway 11 Analysis

- Optional alignments provide marginal reduction in Circle Drive traffic volumes
- Based on City and RM future growth and development plans, there is sufficient capacity along Circle Dr. South well into the future



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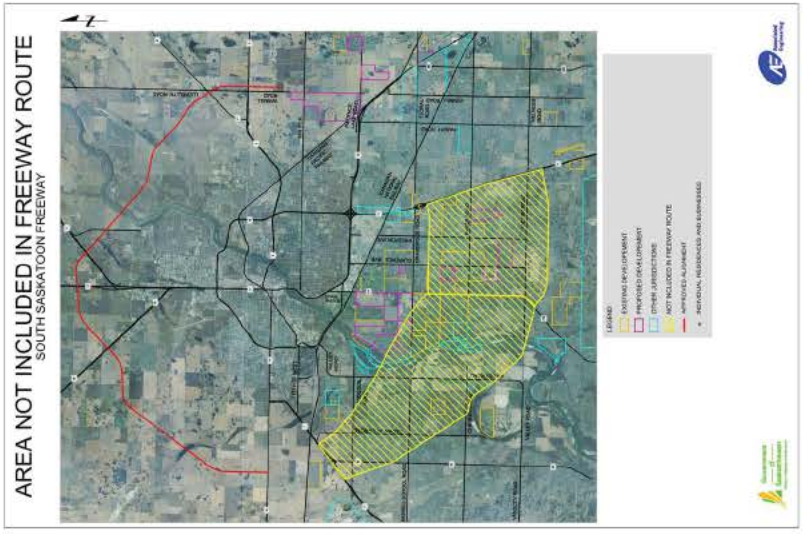

West Connector Route Feasibility Study

- Utilize South Circle Drive as the south west route
- Joint initiative between MHI, City of Saskatoon and RM of Corman Park
- Interim connector route until the West Saskatoon Freeway is constructed
- Provides an alternative to the southwest Saskatoon Freeway connection
- The West Connector Route will reduce congestion on Circle Drive N
- Public information session scheduled for Dec. 2 to gather public feedback

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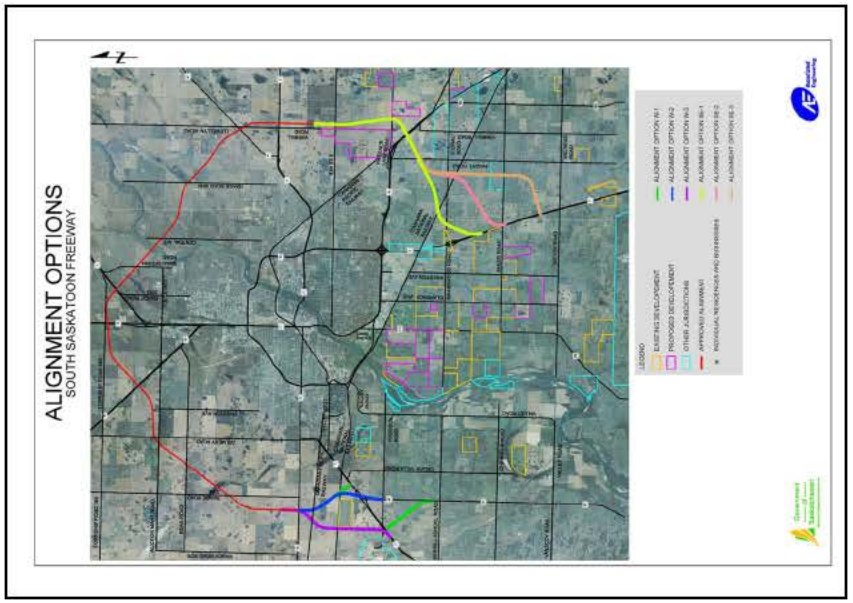

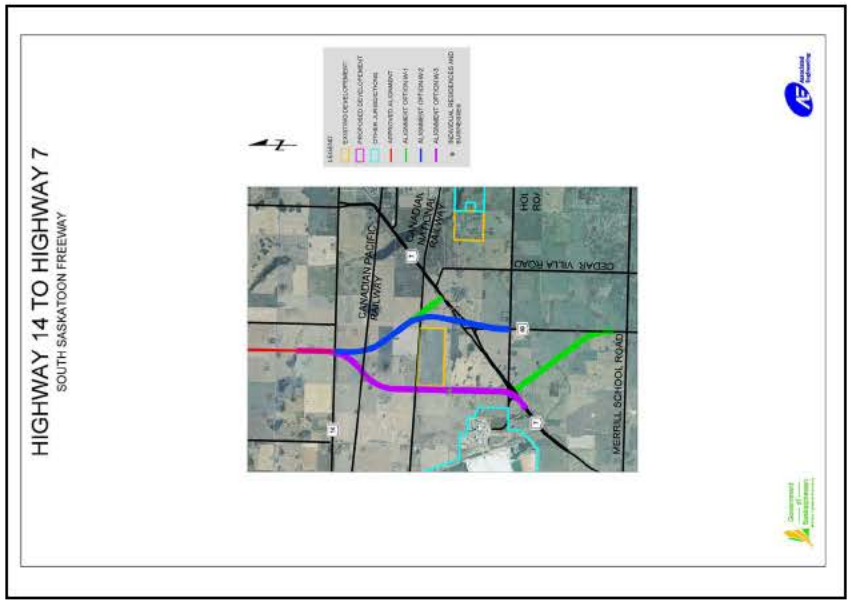

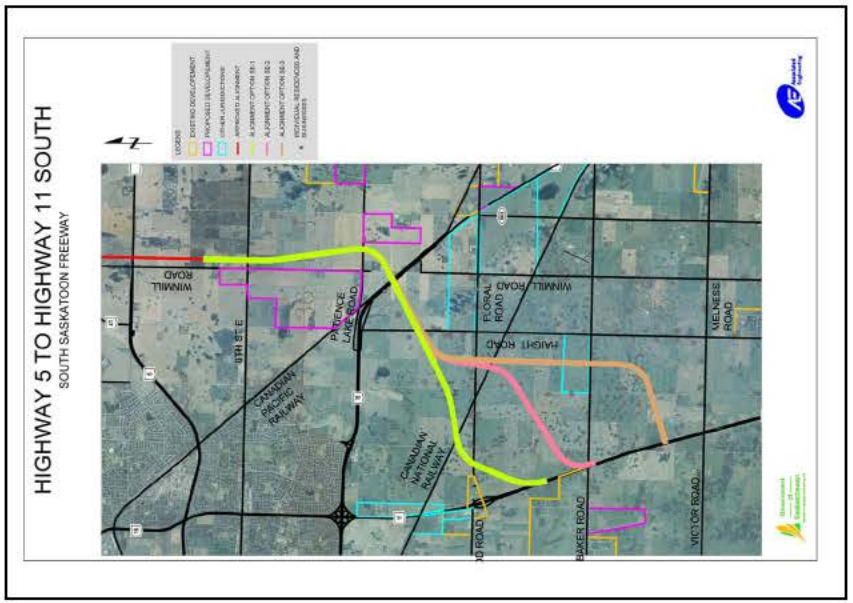

Evaluation Process

- Environmental criteria
  - Minimize impact on the natural environment
  - Minimize impact on agricultural land use
- Economic criteria
  - Assess capital and operational costs
  - Facilitate and promote future regional economic growth and development
  - Provide efficient and effective freeway route
  - Optimize existing and future regional road network
- Social criteria
  - Minimize impact on the adjacent landowners
  - Assess ability to provide access
  - Ensure geometric compliance and safety

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Next Steps

- Public Information Session #3 (spring 2016)
  - Provide preferred alignment
- Submit final report (summer 2016)
- Proceed to Functional Design
  - Environmental/Geotechnical Review
  - Access Management
  - Establish Right-of-Way
- No timeline or project cost has been established for construction

Thank You

Thank you for attending!

Comments are important to us, so please complete a comment sheet, which can also be found online: www.highways.gov.sk.ca/saskatoon_freeway

For more information, please contact:

-
- Jon Medori: medorij@ae.ca, 306-653-4969

FAST CONSULTING
Community Intelligence

Saskatoon South Freeway
GENERAL LOCATION STUDY
Public Information Session, November 19th, 2015
Summary of Feedback

Prepared for:
Associated Engineering
#1 - 2225 Northridge Drive
Saskatoon, SK

Ministry of Highways and Infrastructure
800 – 1855 Victoria Avenue, Regina, SK

Submitted by:
Fast Consulting
117 - 3rd Avenue S., Saskatoon, SK
Tel: (306) 956-3070

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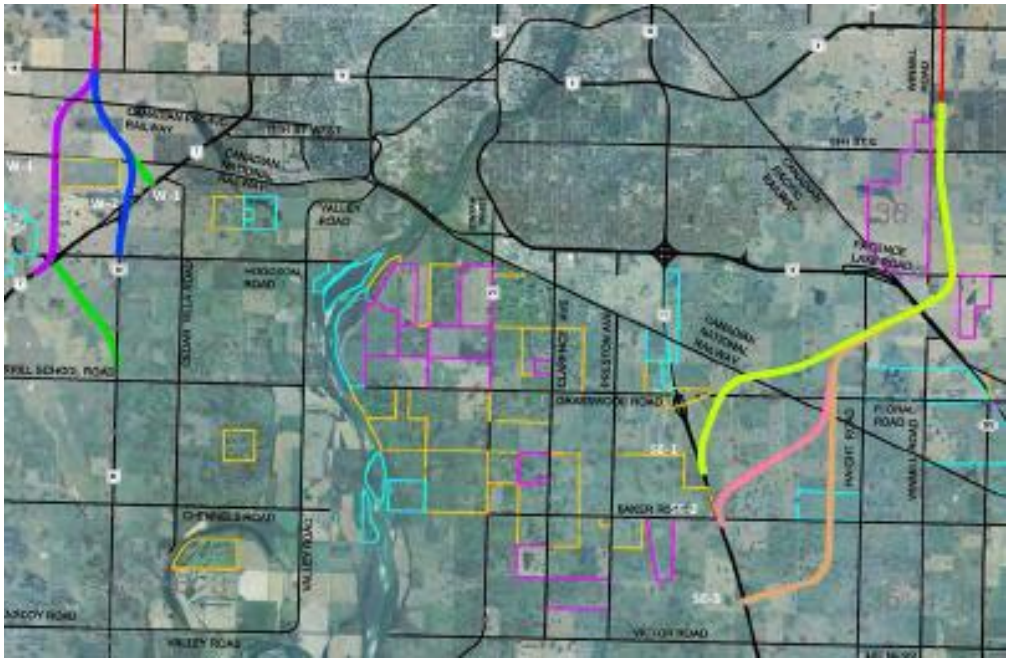
Session Summary

The following summarizes the comments and feedback received by Fast Consulting during a Public Information Session as part of the General Location Study for the Saskatoon South Freeway. The event was held on November 19th, 2015, 5:00pm–8:00pm at the German Concordia Club in Saskatoon.

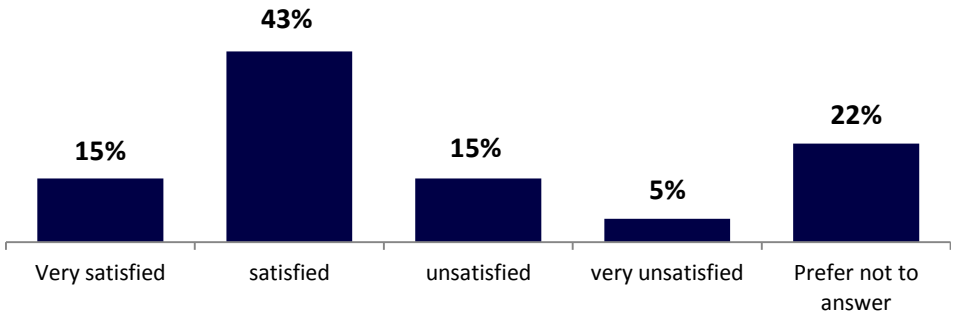
Approximately 447 people signed in. Of these, 89 filled out a comment sheet, which some left at the event and others e-mailed/mailed back to us. Based on this feedback:

- SE-1 is the most-preferred option for alignment between Highways 5 and 11 southeast of Saskatoon. More than half (58%) of those who commented prefer SE-1, compared to 15% who prefer SE-3 and 5% who prefer SE-2.
- W-3 is the most-preferred option for alignment between Highways 14 and 7 west of Saskatoon. Approximately 18% prefer the W-3 alignment option, 9% prefer W-2 and 6% prefer W-1. Another 26% have no concerns with any of the options.
- As illustrated in this summary, respondents provide a variety of qualifying factors and considerations regarding preferences.



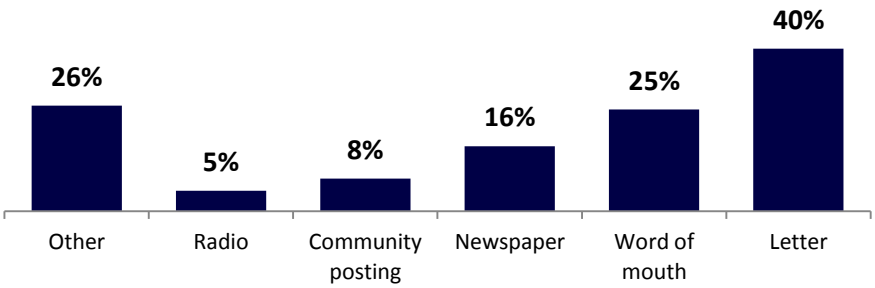
Satisfaction with Engagement Process

Overall, how satisfied are you with the public engagement process?



- The majority (58%) of the people who attended the Public Information Session *and completed the session satisfaction rating on a comment form (90 attendees)* indicate they are satisfied with the public engagement process for the South Freeway, compared to 20% who are unsatisfied and 22% who prefer not to answer (or have no opinion).
- Note: although approximately 447 people signed in to the event, the majority left without completing a comment form. Many people appeared satisfied with the session as a result of the southwest quadrant of the location study—the area between Highway 11 and Highway 7—being dropped from further consideration for location of the South Freeway.

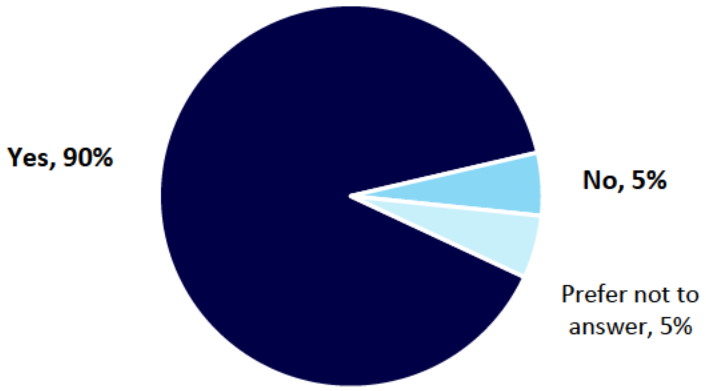
How did you hear about this information session?



**Multiple response allowed*

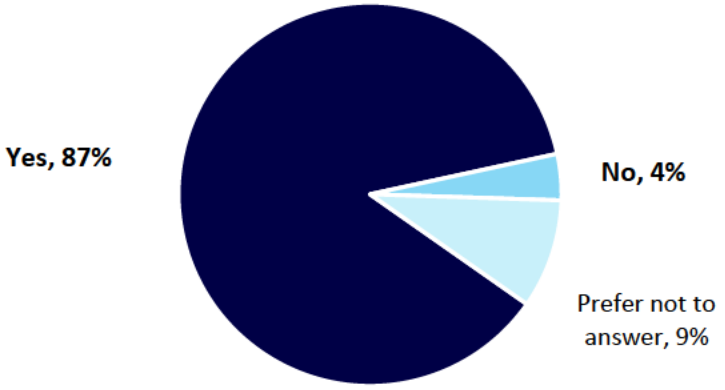
- Four out of 10 (40%) session attendees who completed a comment form heard about it via a letter delivered to their home. A quarter (25%) heard about it through word of mouth, 16% a newspaper advertisement/announcement, 8% a community posting and 5% a radio announcement.

Do you feel the information session venue and timing were convenient?



- Nearly all (90%) who attended the session and completed a comment form agree the venue and timing were convenient.

Were the hosts courteous and helpful in explaining the project?



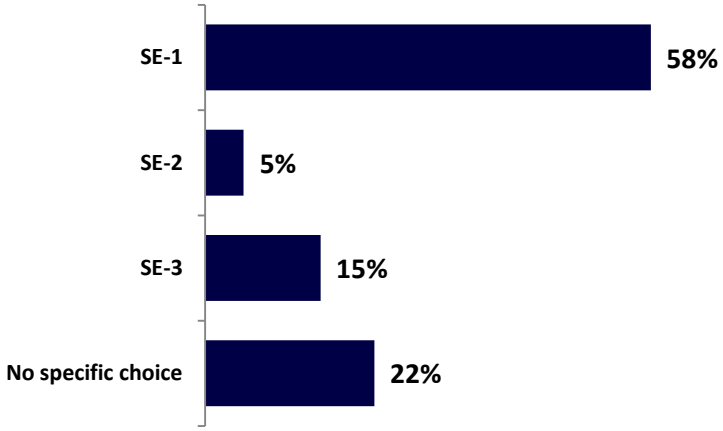
- Nearly all (87%) who attended the session and completed a comment form also agree that the hosts were courteous and helpful in explaining the project.

Preferred Route Alignment

SE-1, SE-2 or SE-3?

In general, do you have any concerns with the alignments between Highway 5 East and Highway 11 South, southeast of the City of Saskatoon?

Approximately 55 people commented when asked if they had concerns with the alignments (SE-1, SE-2, SE-3) southeast of Saskatoon. One comment letter mailed back to our firm was supported by 25 people/signatures (including the letter writer) from the southeast area. This letter was thus counted as 25 comments, bringing the total sample to 80 people in support of SE-1. (See verbatim comments below.)



The chart above illustrates the general consensus from the comments on the preferred route alignment southeast of Saskatoon:

- SE-1 is the most-preferred alignment option, at 59% of comments, followed by SE-3 at 15% and SE-2 at 5%. As illustrated in the verbatim comments, respondents provide a variety of qualifying factors regarding their preferences.

Verbatim Comments

Prefer SE-1

- If this alignment needs to be built, the shortest option (light green on map) between 11 and 16 should be considered. It will affect fewer people and will be more economical to build. Building a more southern route from the west side of the river to the east would incur huge cost. Plus, it would affect a lot of people and the beautiful river valley.
- Of the 3 routes being considered we feel that the most northerly route would be the best. That was originally the route that was planned and seems the most logical because it would join onto an area already developed for business etc.
- I would have thought there would have been a presentation this time. Prefer the Grasswood option. Least use of land and most likely lower in cost. Process not terribly useful.
- We had not received any information directly to our home, which would be nice if in a concerned area. Feel that SE-1 - would be the best. Least amount of destruction of viable agriculture/land on Baker Road and area. Using this route also protects Baker Road where many buses travel - safety for our

(children - our future.) It is closer to other development areas that may need roadway support as an access.

- This is the first I have heard of this process so not satisfied with the process to date. (SE-1) This would appear to me to be the least disruptive route to existing farms and acreages and yet provide very good access and very likely be a good economical option.
- Keep it as close to the city as possible.
- Prefer SE-1 close to businesses, furthest away from residential.
- SE-1 makes most sense, least impact upon residents. Close to existing commercial area.
- Prefer SE-1, makes most sense, most positive impact, least negative impact.
- How will the connections to our existing road network work? Kids who live west of Highway 11 attend grade 6 to 12 in Clavet. How will those buses cross this freeway? The lime green option closest to city seems the least disruptive to our natural community and allows Grasswood to expand into a more diverse and vibrant commercial hub.
- Route SE-1 is shorter and therefore less costly and will disrupt less land. Meanwhile there appears to be no advantages to SE-2 and SE-3. SE-3, in particular, seems to disrupt a great deal more land for no apparent benefit. If one intention is to provide areas for commercial development, there is already space available SE of Grasswood Esso.
- It makes far more sense to use the SE-1 northern route, which is what was originally proposed and uses the existing Highway 16 east of Circle Drive. This will minimize impact, and provide access to proposed commercial development in the Grasswood area. Also note that the City of Saskatoon Projected Growth Concept Plan Map shows the confirmed North perimeter route is consistent with the proposed SE-1 route in terms of distance from the city.
- My preference would be Option A as shown at the meeting, it was the most northerly one. Reasons? Less expensive. By taking most northern route, it does not disturb the inhabitants of the acreages in the area southeast of Saskatoon as much. That's an area where people purchased so they could enjoy the peacefulness of being out in the country. My friends out there particularly like the rolling countryside. There are lots of horseback riders there as well. Putting a highway through it will obviously crush the peacefulness of the 'being out in the country' feature of the area. Typically, businesses that serve highway traffic get established along the route. Keeping that closer to the city makes more sense. Possibly they'd draw customers from the city, most likely they would be drawing employees from the city. Plus, if it's the more northern route, that keeps the business development further away from the peaceful countryside of the southeast. The more northern route may be useful route to south end of the city dwellers heading north out of town to the lake with their trucks, trailers and boats (not a priority).
- The presentation of the material I feel could be better presented in an overall formal presentation. We would like to see the alignment option SE-1 chosen for the alignment. It shows that the confirmed North Perimeter road is consistent with the proposed SE-1 route. Argument against SE3. Cost, route is much longer over rolling landscape, safety-buses to Clavet and the city would have to cross 2 highways, inexperienced drivers (teenagers) have to cross the 2 highways. I believe there is an aquifer in this area, the valley that would be destroyed holds deer, fox, porcupines, badgers, owls and assorted water fowl, migratory stop for many bird species including Whooping Cranes.
- Alignment SE-2 and SE-3 are longer in length and would therefore cost more. They are also further from the city and will not be used as much. Extra length of SE-2 and SE-3 basically duplicate existing Highway 11.
- Your people should come to the homes of those people directly affected by the proposed route. We live in the path of one of the proposed routes (SE-3). We bought this land knowing that there was a proposed perimeter highway at Grasswood Road. The planned location of that highway influenced us to buy where we are right now. It would be least disruptive and most reasonable to choose the original

route of SE-1. SE-3, if chosen, will have a harmful impact upon our lives on many levels. It would be very expensive for all parties involved.

- Preference is for SE-1. This is close to a commercialized area and proximity to these businesses would be economically beneficial to them and the local economy. In addition, this route has less significant curves facilitating traffic flow and visibility. This should decrease accidents on the route especially in the winter. Baker and Melness roads affected by SE-2 and SE-3 are on the school bus routes raising concerns that there would be additional highway crossings and potential risk of accidents. In addition, use of the perimeter highway by local residents is best for those south of the proposed route. Location at SE-3 and to a lesser extent SE-2 would limit use of the highway by those living in the heavily developed areas between Highway 11 and 219 (i.e. Casa Rio, Casa Rio Estates, South Point etc.) as these residents would have to backtrack to pick up the perimeter highway. Location at SE-1 would make the route available to all these residents south of Grasswood along currently established commuting routes. The additional length of the SE-3 and SE-2 options would appear to increase costs associated with building and maintaining the road with no observed benefit. The SE-1 option is most consistent with the previous publicized route that helped shape the development plans of many of the people that purchased land in the area. SE-3 goes directly through 2 relatively new houses causing significant impact on these residents. From the published maps it did not appear that this occurred with other proposed routes. In addition, there is a valley which is a big part of the environment that would be severely impacted by SE-3. This valley is home to a large number of large game including moose and deer as well as many smaller species. It is also a migratory stop for a large number of wild birds including the Whooping Crane. Impact on the aquifer that feeds many of the wells serving as the water supply for local residents is unknown but of major concern. Given the large number of concerns with no visible benefits, it is challenging to see the merits of SE-3 and SE-2 proposed routes.
- I have concerns for acreages in close proximity to routes SE-2 and SE-3. SE-1 seems to be located in what I consider a pre-commercial area. All other routes negatively affect homes.
- The SE-1 route would align with a major overpass. From a planning perspective, this alignment seems much more logical than a far southern (SE-3). The northernmost route SE-1 creates a niche for a good size service centre at Grasswood by intersecting Highway 11 and the new perimeter. It will create more business for Esso and PetroCan station both located at Grasswood.
- We did not attend the information session but we have reviewed the proposed highway routes and want to express our support for SE-1. There are a number of safety, environmental and planning reasons to support route SE-1. The City of Saskatoon's Project Growth Concept Plan Map (as show on their website) shows that the confirmed North perimeter route is consistent with the proposed SE-1 route in terms of distance from the city (As opposed to SE-2 or SE-3). Safety is a key concern. Buses and high school students use Baker Road and a major route to Clavet school. A SE-3 route would require vehicles to traverse over two highways.
- We only favour the alignment option SE-1, the other two are too close to our property.
- SE-1 is likely the best route because it is the shortest, has the least amount of turns but it would still need to maintain the ability to travel East/West bound on Floral. Again if the Floral Road was allowed to continue alongside the CNR line and use the same overpass to allow for traffic to flow.
- [NOTE: THIS LETTER IS SUPPORTED BY 25 PEOPLE/SIGNATURES]: Further to our conversation this morning: First of all, I am very aware of the need for improved traffic flow in and around the City of Saskatoon. I hope the route chosen will accommodate alleviating some of the pressure in both areas. ECONOMIC CRITERIA. REASONS TO DEVELOP SE-1. Shortest route and through the most open land. Touching the least homes. I drove each of the roads and noticed on SE-1 that, if located just slightly north of where the proposed route crossed the railway tracks near Grasswood Service area, there seems to be a wide swath of open area with very few residences. EXPECTING DEVELOPMENT. This area has been on the map is a route possibility for a long time. There has been land purchased with the goal of non-residential development. I know people just a bit south of Grasswood/Floral area that purchased land, leveled it and only built and out building with no intention of building a home. I cannot

supply a name until I speak with them, perhaps they've already submitted comments. I will try to ask him to do so. SUPPORTS INTEGRATION WITH PRESENT CONSTRUCTION INTERCHANGE AT STONEBRIDGE. SE-1 could be developed to connect to the present interchange being built at Victor Road in Stonebridge. (I am nothing there is another Victor Road south on Highway in the country.) A connection with facilitate large movement of traffic out of Stonebridge to other parts of the city. At present, yes, the traffic gets out of Stonebridge but then just funnels back onto already clogged routes north and west on the present Circle Drive. ENVIRONMENTAL CRITERIA. REASONS TO NOT DEVELOP SE-2 NOR SE-3. HIGH COST OF AN EXTENDED ROUTE. As the perimeter highway is not likely to become a true circle, there is no financial justification of a proposal for a long expensive route through this area. SAVE THE TOPOGRAPHY IN THIS AREA. When my husband and I purchased our property in this area in 1992, we had spent the previous two or three years driving outside the city looking for possible sites. This area is unique and contains a sharply undulating landscape dotted with natural bush and water. You could be riding a horse 100 yards from my house and disappear down a hill only to rise again further along. This rolling land extending about 5 miles northwest/southeast would be drastically changed if it had a busy highway through it. WILDLIFE CORRIDOR TO THE RIVER. In addition to the usual dear, foxes, coyotes etc. expected in this area I have also seen moose on my land lately. I have also seen big tracks that look like a large dog but no toenail prints…and I hope I am wrong as to what I think it may be - cougar. HEALTHY CITIES NEED GREEN SPACES FOR THEIR CITIZENS. These areas have to be big and green enough to heal some of the stresses of modern hectic city living. More and more research is substantiating this idea. If our city ever grows to the 500,000 - 1 million as is dreamt by some, this topography may become a treasure open to many people. It would be a pity to follow the song, Big Yellow Taxi and "pave paradise to put up a parking lot" …sorry I digress. ENDANGERED SPECIES SUPPORT. Whooping Cranes have been spotted migrating and landing in this area as recently as 2 or 3 years ago. As I shared this morning it was suggested we do not report this to the media so as to protect the birds from further stress that much human attention would cause. I will ask more neighbors if they can give more sightings and years.

WATER MOVEMENT both above and below ground. It has been a topic of conversation regarding the problems the development of the Stonebridge area has had on water situations in Riverside Estates. Does a "dam" consisting of a highway change a land water ecosystem?

SOCIAL CRITERIA. SECOND IMPACT ON HOME ENJOYMENT DUE TO CITY EXPROPRIATION. The family living closest to the intersection of Baker Road and Highway 11 where originally displaced from their farm by the City in what is now the Rosewood Subdivision. Over many years they have worked tirelessly and spent much time and money in the development of the wetlands/Ducks Unlimited marshland area that is now in Rosewood. This unique ecosystem is now providing scientific data for further study and is used by educators and students from all over the city. The large park in that area has been recently opened as "Hyde Park" in recognition of their work and history in the area. They have contributed so much to the growth and betterment of the city. It would be a pity to have another branch of the highway literally in their backyard. There is also a home indicator dot missing from your maps used at the open house. On Ridge Road 3046 just north of Baker Road there is a home that is not mark as it was just built last year. They are part of the family that probably had the most farmland turned into triangular fields by the present Highway 11. The effect of which they have felt all their lives. Thank you for considering my thoughts. For the above reasons and more that I am assuming have been expressed by others, I support the "yellow green" SE-1 as the choice for the southeast portion of the proposed perimeter highway. This letter, although a personal statement, was shared with some of my neighbours who expressed a wish to add their names in support.

Prefer SE-2

- If I had to pick one of the options for the east side, I would pick Option 2 but I would re-align the Option 2 to cross Floral Road and the CN Rail at the crossing point so that there is only one Freeway overpass required and Floral stays open and CN still maintains their corridor.
- Our concern is that option SE-1 runs right beside our home. Another concern is that as the city grows how does this route help with the traffic? Our families already have had land expropriated by Highway 11 and we now feel it's about to happen again. [INTERPRETED AS SE-2 or SE-3]
- SE-3 would cause major problems through the entire length. High water table (aquifer not suitable for road construction); massive negative impact on agriculture, environment and residential area; highly uneconomical (too expensive), geological problems anticipated, valuable biotopes along SE-3 for wildlife, birds; interruption of aquifer could cause major problems reaching far out beyond road alignment. [INTERPRETED AS SE-1 or SE-2]
- The building up of wetlands will cause problems for home and business owners if SE-3 is chosen (flooding). If SE-3 is chosen we, the residents will be dealing with this and the gas line infrastructure. Please share infrastructure loads with other communities. Many kids and buses use Baker Road to access Clavet School the Highway placement of SE-3 puts kids at greater risk. Many of the residents of the SE-3 route are/were environmentalist, worked with animals etc. We protect native prairie/wetlands/migratory stops. Much land will be disrupted by gas infrastructure. Help us protect what is left. [INTERPRETED AS SE-1 or SE-2]
- SE-2 would be fine if the ability to travel eastbound onto Baker remained and we would still be able to travel east/west on Floral. If the route where the freeway crossed the CNR was moved further west could you not create an overpass that allowed for both vehicular and train traffic to occur as it is today?

Prefer SE-3

- We feel that a decision for the freeway at Victor Road area would be the best.
- Prefer SE-3 option
- The Haight Road is the best buy, requires better access similar to the other 2 proposals.
- Long as it goes south by Chennels Road and the land south of Merrill Hill is 'unfrozen'.
- We are interested in access to Highway 16 from Haight Road.
- Prefer option SE-3.
- Hosts seemed inaccessible because of so many people. Care should be taken to avoid developed areas. Also the area between Highway 5 and 11 has lots of water and drainage and ponding will need to be taken into consideration. Suggest alignment option SE-3.
- Should connect furthest from city to reduce traffic congestion and disruption of neighbours.
- I know that finances play the largest role always, but to have a freeway further outside the city would make more sense. This idea accommodates further growth of the city. I love the south bridge, it's too bad it's not seeing more use. But it bottlenecks at the north end.
- Yes #1 and #2. Our concerns include the integrity of our ground water supply with the proposed construction anywhere near Baker Road or North. Safety concerns with that much additional traffic at Baker Road and Highway 11. This is already a very busy intersection. [INTERPRETED AS SE-3]
- I had to call Ministry of Highways to find out when meeting was. Too short notice. Hosts were courteous but gave no info or feedback. Route needs to be on/or east of Freeborn Road and on/or south of Floral Road. Yes, major concerns. The preferred route needs to be in the most south and easterly location possible. The proposed location is too close to the city and presents a sharp corner and poor location to intersect Highway 16. It fails to provide a safe, efficient, and long-term traffic management solution.

General Comments (no specific preference)

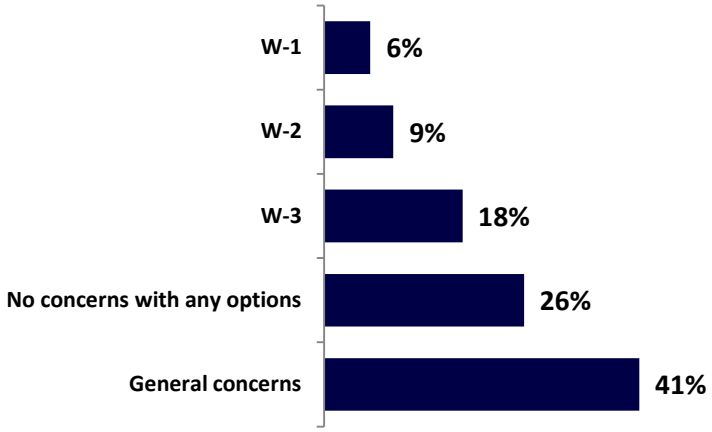
- It is wise to just use the new south bridge. Anything else would be far too expensive and is not necessary. It is less expensive to use the shortest possible route between Highway 11 and 16. People affected have to be compensated at much more than agriculture land value.
- Will facilitate travel east, west and north from Riverside Estates.
- We oppose all 3 alignment options. Directly effect our property adjustment.
- SE sections have a large supply of swamp land (can be noted in MMM Group Consultation report conducted last year) and rely on lagoon sewage (commercial and residential). If pushing water, it may affect certain aspects. Also flow and access of traffic from existing roads, (i.e. Floral Road onto new highway).
- Hard to get the hosts attention.
- Please write for non-engineers at public meetings. The material was full of technical jargon and very unclear and obfuscating - 'Optional alignments provide marginal restrictions' or 'ensure geographic compliance and safety'.
- Public not given the opportunity to question the entire premise for this biggest infrastructure project ever.
- There was a lack of consultation over the route changes between Highway 5 and 11 once the south west connecting portion was dropped. The routes on the SE side should then have been revisited with public consultation before the further out routes were dropped. It's affecting land owners; no contact or consultation has yet been made. In addition, the specific evaluation needs to be disclosed so that affected landowners have access to the information used to evaluate the routes. This includes all data even if in a preliminary form. Without this, the decision is made and landowners do not have a chance to respond. As stakeholders this information sharing is vital.
- The session wasn't really informative.
- (#5 no), seems like a very satisfactory decision by all perspectives.
- Without more information it is impossible to comment.
- Yes, I think its short-sighted and I feel the perimeter highway should go farther east to Highway 315 which is already a wide paved corridor and is only another 3-4 minutes east of the proposed road if you drive east at 60mph on Patience Lake Road.
- The entire east portion of the perimeter, starting at Highway 41 in the N and running south to the Patience Lake Road, should be moved further east. The ridge east of Saskatoon is the only elevated view of Saskatoon. That ridge is better suited to another development other than running a 4 lane Highway half-way up and along it. The land just over the ridge to the east is valued lower and fewer residences would be disturbed. The selection and fixing of the east section of that route was based on what I consider to be a flawed density study by UMA engineering and released at the 2004-02-05 meeting. The residences affected by that route notified all involved that the density study had missed a large number of residences affected by the route. Mine being one of them, I had built 5 years earlier, the house is quite visible and was missed by the density study, as were many others.
- Yes; I do have concerns. I have a quarter of land impacted that will be intersected at an In addition to the loss of land from the construction I will then have an orphaned piece of land to the north of the highway that will likely be very difficult to access for farming without travelling several extra miles. Moving the project further west (closer to the city by half mile) or further east by 2 miles get its away from me, which is ideal in my world. I am not looking to make my millions by selling land to the Province of Saskatchewan, but rest assured they will need to compensate me for full market value for land located within a mile of city development when they expropriate it.

- [APPEARS TO REFER TO JUNE SESSION] The ultimate route needs to be: 1. In the most westerly portion of the SW quadrant, and the most easterly portion of the SE quadrant of the proposed study area; and 2. Needs to meet the long term needs of inner city commuters and most importantly needs of highway travellers, particularly long distance tracking.
- Yes, Highway 5 is ok. I believe we should align the highway at Highway 16 to the old #11. Proceed south on old Highway 11 angling over to Tamke Road. Continue to Highway 219.
- and I think the exit from Highway 11 south is too close to the city. I would prefer an exit south of Victor/Melness Roads just north of SIR. Actually, an exit at Tamke Road would be better, however, it looks like there is already too much development in that area to make it feasible. After leaving #11 the new road would angle northeast to secondary Highway 663, then travel north to about 1 km south of Floral and then angling northwest to intersect the proposed alignment option #1 just south of the Patience Lake Road. An overpass could span both the CPR tracks and Highway #16 east of Windmill Road. The accompanying map shows the general route of east bypass.
- I personally find the entire process flawed, divisive and leading to a great deal of unnecessary anxiety on the part of local residents. During this entire process you failed to identify the need for a Perimeter Highway (now call a Freeway), state the principals that would be used to guide the decision making process for establishing a route or provide any kind of a time line for the construction of this Freeway. Without identifying these principals and providing facts you have directly and indirectly created a great deal of unnecessary anxiety amongst the local residents. As well, you have added to the stress, anxiety and rumour mill by not following your word. At the spring 2015 information meeting held at the German Concordia Club you mentioned that the 4 proposed routes for the South East Sector would be narrowed at the late summer meeting (implying that you would choose one). You indicated that the late summer meeting would take place late August or early September 2015. In fact, it did not happen until November 19, 2015. Leading to even further stress on local residents. The fact that you went from 4 proposed routes in the spring meeting to 3 in November 19 meeting has been troublesome. It is troubling that the three new proposed routes (November 19) are substantially different from the 4 originally proposed routes (spring of 2015). This change has added even more anxiety to the local residents.
- The most environmentally friendly and least costly southern route is the route that would follow Grasswood Road.
- We have a Stars helicopter landing site. As drivers on SE-3 come out of a 90 degree turn at night, they may be hit with the lights of a helicopter landing or taking off. Sudden lights may cause a high collision area.
- My preference is to see a route selected whereby current residents living between Highway 11 and Highway 16 continue to have access to either highway to get them back to Saskatoon. I do not like the proposed route SE-3 for these because assume that the Baker Road crossing and the Floral Road crossing would cease to exist. I live off of Baker Road and live at the corner of Baker Road and Haight Road. There are many residents that travel down Baker and Floral towards Highway 11. If both crossings are removed residents will be either forced to travel further east on Highway 16 to back track home or further south on Highway 11 to also back track home. We must maintain the ability to travel eastbound from Highway 11 on both of these roads.

W-1, W-2 or W-3?

In general, do you have any concerns with the three alignments between Highway 14 West and Highway 7 West, west of the City of Saskatoon?

Approximately 34 people commented when asked if they had concerns with the alignments between Highways 14 and 7 west of Saskatoon (W-1, W-2, W-3).



The chart above illustrates the general consensus from the 34 comments on the preferred route alignment west of Saskatoon:

- Approximately 6% prefer the W-1 alignment option, 9% prefer W-2 and 18% prefer W-3. Another 26% have no concerns with any of the options. The largest percentage (44%) have general concerns about the project overall. As illustrated in the verbatim comments, respondents provide a variety of qualifying factors regarding their preferences.

Verbatim Comments

Prefer W-1

- Prefer W1 option.
- We live on the corner of Highway 7 and 60. Option 2, very close to our house! [INTERPRETED AS W-1 OR W-3]

Prefer W-2

- Again, and I think it is necessary to plan a route asap as infill will take place very quickly. The accompanying map shows the general route for connecting Highway 7 and 14 at Highway 60 (the blue line) and then connecting to Highway 11 south of Victor Road.
- Someone told me the red line can't move but I don't know why this is because it has been moved almost everywhere else. The alignment options would be better if someone could think about the whole road alignment rather than just a small section and move the red line north of Highway 14 about 400m to the west or to the east so that there is no kink in the Freeway south of Highway 14. If I had to pick one option for the west side, I would pick Option 2 with the connection to Highway 7 not Option 2 with the connection to Highway 90.

- The two alignments on the map connecting to Highway 60 and the shorter alignment to Highway 7 should both be considered further. The one connecting to Highway 60 is likely the best to accommodate long term development in that area.

Prefer W-3

- Alignment option W-1 would be least desirable. Alignment option W-3 makes most sense.
- Alignment Option W-3 is the best solution and Alignment Option W-1 is the worst solution.
- My preference for what it's worth is option #3 FURTHER south.
- Option W-3 looks like a sensible option to allow more room for development, as this area is very close to the city now and to pass through onto Highway 7 is less than ideal.
- Yes, I support alignment option W-3 and oppose alignment option W-1.
- Yes, proposal 7A and 7B are not workable. 7C - it's the best route (western most route down 3065). [REFERS BACK TO JUNE 2015 SESSION; INTERPRETED AS W-3]

No Concerns

- No, simply because I don't live there.
- No concerns re Highway 14 West and Highway 7 West.
- No, it doesn't affect me.
- No problem on hearing they are due to be scraped! However, maybe a move could be made to lift the restriction on development so we could get on with life.
- No, because I have not studied the plan to the same degree and have less understanding of the local issues.
- No, but it is confusing that now there is no alignment for the SW side of the perimeter road. What are the proposed connections now?
- Not at this time.
- Not familiar but would look for least negative impact.
- We have no concerns.

General Comments (no specific preference)

- Don't know the area well.
- How can you plan a route east/west before you know where you are going on the 'connecting' on the South? 'The north and south must connect' AND before you spend .05 cents building the east or west you must know where you will connect! Thank you
- I hope 22nd St W and 11th Street NOT being considered. Are you kidding me!
- I'm especially concerned that the highway NOT go through the NE Swale. This is a huge mistake we will be condemned for by future generations. We will kill that precious rare ecosystem. Put the highway north of the swale or elevate it - or part of it - OVER the swale. This rare bit of natural prairie and its endangered inhabitants are worth it.
- Land is our resource as a province. We need to protect that area that actually uses the land to grow.
- Limited input from those attending.
- Our concern is what happens at Highway 7 and south of Highway 7, impacts on 11th Street and Cedar Villa Road?
- Our land 26-35-6 west of 3rd has been frozen all too long with no compensation.

- [NOTE: COMMENT SEEMS TO REFER TO JUNE SESSION] (6.1) At the outset you should be aware that I have an ownership interest in the NW 10-36-4 W3, and my son and wife also have an ownership interest in the said quarter and are the third generation to reside in the farm home located there. (6.2) I did attend the open house meeting in Saskatoon on June 25, 2015 and did find it informative. Generally, I was satisfied with the presentation and the hosts but would have preferred more notice. (6.3) Several of the hosts explained that in coming up with four options for connecting Highway 11 to the confirmed position north of 8th Street, Saskatoon, the following constraints were considered: (a) Occupied yard sites; (b) Developments; (c) Utilities - power and gas lines; (d) Research and public use lands, and (e) Crossing of major highways at as close as possible to 90 degrees, and that the following were not taken into account at this time but will be in the final selection; (f) Geotechnical reports; (g) Underground and above ground water and the natural drainage flows; and (h) Roads to cross and severed parcels. (6.4) It is my opinion that one of the most significant constraints in selection of the SE portion of the perimeter road is the previous decision of where the NE quadrant is located. (6.5) The following should be given consideration: (i) Safety and convenience of motorists. A smooth curve as opposed to one with more pronounced directional changes is preferred. This is especially important for long haul truckers, and I would point out the problems caused by the current connection of Highway 11 to Highway 7 using either 11th Street off Circle Drive or 22nd Street with its 90 degree turns. (ii.) The City's rapid growth seems to have caught everyone off guard. No one knows for certain what will happen in the future, but the probability is that the City will continue to expand and traffic will increase. We just do not know at what rate. The best solution for the perimeter highway is to build it as far from the current City limits as reasonable possible. This would ensure that for decades to come there would be a direct route outside the City limits for travelers, especially long haul truckers, with limited entry pints and no traffic lights or stop signs. This will not detract City commuters, with the use of exit and entry ramps, from using the perimeter road to efficiently get from one quadrant of the City to another. The present Circle Drive in Saskatoon, while originally thought to provide a circle route outside the City, was not located far enough outside the City and there is now development on both sides of Circle Drive with multiple access points, traffic lights, and the resulting bottleneck of traffic. (iii.) The most westerly route in proposed study area for the SE quadrant is not a smooth curve and is too close to existing City limits, being approximately one half mile or less in some places of the route. As stated above this can only lead to similar situations as now exists with Circle Drive. I would much prefer to see the example of the Winnipeg perimeter highway used as opposed to following the Circle Drive precedent. (6.6) For the SE quadrant connecting Highway 11 to Highway 5, I encourage the Department to select a route on the most easterly portion of the current study area, which will meet the needs of travellers and the City for many decades.
- Specifically, we own a passive solar home. We have planted over 5000 trees and shrubs obtained from Indian Head PRFA creating what the PRFA called 'Shelterbelts for Wildlife'. We have wanted to add solar collectors to our home but the technology has not been there until recently. As you may be aware, SaskPower is offering a Net Metering Program. Which makes a great deal of sense for this latitude. We wanted to take advantage of the SaskPower Net Metering Program but did not want to proceed with the capital outlay until we were certain of the location of the Perimeter Highway. Once we saw the 4 proposed routes that were made public in the spring of 2015 we saw that our home was NOT in the path of any of these 4 proposed routes. Using that information, we proceeded to invest nearly $30,000 to add a solar array to our home. The completion date was August 18, 2015. We were devastated when we received the information given by your company on November 19. 2015, showing one of the 3 new routes going directly through our property. Our house will be crushed and bulldozed.
- The lack of a south west connection leaves me confused. It shows a total lack of planning foresight. If this project ends up being, a tightly situated 'unfinished circle' it will become nothing but an overpriced hindrance to future development.
- Without more information it is impossible to comment.

Suggestions to Address Concerns

- A little more detail about the connection to Highway 7 would help. Also what does this do to traffic flow/density on Highway 7?
- As outlined in the response, move the east portion further east on the other side of the ridge.
- By making Tamke Road as the intersection at Highway 11 will ensure your outside city limits enough. At this location there is the Fed Co-op Gas Depot and Farm Centre, SIR Racetrack and community development.
- By moving the intersect further south, there would be less drop in our property value, far less traffic issues at Baker and Highway 11 and far better future opportunity to complete a 'south connection' across the river to join Valley Road. A drop in our property value is a significant concern for us as is the unwanted additional traffic at our highway access.
- Concerned with current development - effects of traffic, noise, increased land usages.
- Consider you have many people in limbo as to there prosperity sale, division etc.
- Considering the cost of these highways it is necessary to build in such a way that they are able to be used on a long term basis. The City of Saskatoon already has enough examples of poor planning - e.g. 42nd St, 22nd St and Circle Drive, etc.
- Ensure adequate access points to limit congestion.
- Favour alignment option W-3.
- Fully plotting on map in study the allowances of CENTRE LINE and BUFFER for east to west maximum distances TO SCALE. Also address more clearly how interchanges at Highway 5 (8th St) and Highway 10 work.
- Furthest from City.
- Go as far north and east of Highway 11 as you can.
- I am happy to hear that a south bridge and freeway west of the river will not proceed.
- I like alignment W-3.
- I mentioned a few considerations to how to correct the options in the comments above. However, all three options on the west will never be built because there are too many highway interchanges and rail line overpasses too close together. This is why I noticed you now have a board showing the west option I suggested in my initial email of using Highway 7 to Highway 16 North. Not sure why you are getting farmers all concerned with these three west options when Dalmeny Highway will be your west Freeway.
- If a high speed highway (Perimeter SE) would be needed the only remaining option would be SE-1 which has the least impact on area and it is the most logical and economical.
- If the city continues to expand at its current rate, it will move out to the alignment project within a few years. I would suggest moving the north south part of the expansion at least 2 (minimum) miles further east. The current plan is far from satisfactory from my perspective, but it does impact me less than either previous routes 16B or 16C. Moving option 16C further east by half mile gets it away from me, which I whole heartedly support.
- If the planning outcome does not show considerable favour for SE-2 or 3, then why not continue with SE-1 and leave proud home owners with their piece of quiet happiness. That is why we all live out there.
- Running a highway directly at our house and then turning it north at a near 90-degree angle 200 meters from our house seems like a very poor plan/design/idea on many levels (safety, comfort, value, access).
- SE corner should be on/or east of Freeborn Road and on/or south of Floral Road. This provides a safer, more gradual turn, is better protected from future development, provides faster, free flowing route.

Highways needs to figure out a way to work with the U of S as their lands are proving to be an absolute roadblock to achieve a viable and worth while project.

- Select alignment SE-1 and it will satisfy all concerns.
- Select Route SE-1.
- The further into the country you go the more impact there will be. The lives of many more acreage owners will be affected. There would also be a negative impact on the wildlife, migratory birds, etc. that rely on the area.
- The main objective of the three proposed Alignment Option W-1, W-2 and W-3 is to make the traffic flow between the approved alignment/freeway and Highway 7 West quickly and smoothly. Alignment Option W-3 is the shortest path and the best route. The Alignment Option W1 and W2 are the detours for the people between Highway 7 and the approved alignment in the north. If you are going to the approved alignment from Highway 7 south west, you will choose Alignment Option W-3 because it is the shortest path and it can also avoid traffic jam from Highway 60, and many proposed and potential development around Hodgson Road and Cedar Villa Estates.
- The most southern option (beige) affects a lot of people and natural wetlands. It is also longer and more expensive to obtain the land, build and maintain. If the alignment has to be built, and there is actually money in the coffers to do so, it would make the most sense to use the most northern route (green), which is also the closest to the original plan, staying close to Grasswood.
- The SE proposed routes need to be evaluated. Some were taken off without ANY public consultation. Highways needs to release the evaluation decision information so the public landowners can review and respond. Since the SW portion has been removed, the SE portion should also be scrapped.
- The SE-3 route should not be considered. SE-1 is the most suitable. Why: the northern most route will create a niche for a good service centre at Grasswood. It will not be good to go through any wetlands which is home to a lot of wildlife and fowl. It will not disrupt as many people living in the area as SE-3 route would.
- The southern most route runs right through the big wetland by Clement Farms, and further disrupting the natural flows of that water, and the water east toward the university farms. Routes SE-2 and SE-3 are longer and will destroy more natural habitat, waterways, fowl and animals. There are small valleys and buses that have deer, porcupines, badgers, owls and geese and whooping cranes use this area. A highway would not only destroy habitat but it would certainly lead to more vehicle accidents with wildlife.
- Try to minimize the impact on surrounding areas
- Use large parcel over small. Have sufficient access points so it becomes at least useful to the affected.
- We would prefer an exit south of Victor/Melness Roads just north of SIR. Actually, an exit at Tamke Road would be better, however, it looks like there is already too much development in that area to make it feasible. After leaving Highway 11 the new road would angle northeast to secondary Highway 663, then travel north to about 1 km south of Floral and then angling northwest to intersect the proposed alignment option #1 just south of the Patience Lake Road. An overpass could span both the CPR tracks and Highway 16 east of Windmill Road. The accompanying map shows the general route of east bypass. The accompanying map shows the general route for connecting Highway 7 and 14 at Highway 60 (the blue line) and then connection to Highway 11 south of Victor Road.
- Why it will no longer be a full perimeter road? Reasoning between suggested alignments?
- You are destroying 2 houses on Baker where right next door and west, the house burned down. Seems cruel to put our house on a hill at the end of a highway where our view will be a never ending view of lights coming at our house day and night. Please choose another route.

Other Comments

- All the people who bought farms, acreages etc., in this area did so because we desired to live outside of the city. We desired a more peaceful, quiet place in which to live. A place where we can also enjoy nature while raising families, etc. It just doesn't make sense to us that any route other than the one closest to the city would be considered.
- Another meeting is to be held in spring. Will decisions be more concrete at that time?
- By designing this without considering future expansion of the city. We see this as yet another 'semi-circle drive' which was impractical for many, many years. In pushing this connector further south future vision would not be restricted.
- Continue with consultation process, ensure all stakeholders have concerns addressed.
- Do we need this now that the economy is cooling down? Not really.
- I am concerned with this entire expensive project which seems based on projections and unsubstantiated rationale. What present congestion would be alleviated? The solution to congestion is not building more expensive roads. Do we really need to spend $2 billion (estimate) for easier truck travel to Edmonton? Why not build a high-speed train between Saskatoon and Regina - a route thousands of citizens travel weekly? Supporting cars and coal are yesterday realities. I am against this perimeter highway no matter which route you choose. Also, I don't want it through the N.E. Swale.
- I am pleased to see that the proposed options do not interfere with development already south of the city.
- I am pleased with the opportunity to provide input, and that the estimated traffic volumes for my area (Highway 11 west to the river) do not warrant a freeway for the foreseeable future.
- I appreciate the opportunity to have input for the decision making process. My major concern is we can't visualize the growth of the city 30 to 40 years from now, however, we need to plan our infrastructure to accommodate what may happen. In other words, our bypasses, that we build now, must be far away from the present city limits.
- I had a quick review of the online material for the latest public information session. I forwarded the info to those in our communication circle as well. It seems, correct me if I am wrong, that the initial study now indicates no southern loop is in the plans and circle drive south will suffice in the near term?
- I have attached the previous concerns of my father, from the previous meeting - his concerns still stand.
- I hope there will be serious investigation of concerns of local residents and these will be carefully weighed against those of the potential route. I am sorry but I fail to see the benefit of either SE-1 or SE-2.
- I live in Riverside Estates. Glad to hear the freeway can handle traffic for many more years. I realize that there will be expansion at some time in the future.
- I live on the 'new' Highway 219 and when completed, it ruined our life on our farm - noise, traffic, unwanted visitors - we had no consultation at all at the time of building. Now it is unsafe (speed, impaired drivers) and loud!
- I realize there is more to this decision than considering homes that are affected. But again, unless there is undisputable and substantial benefit, don't wreck a home.
- I think it is a very good idea to decrease heavy hauls through the city. The proposed routes seem well thought-out and should alleviate congestion within the city. Now, if only we could do something about the rail traffic in the city!
- I was extremely disappointed with the quality and accuracy of the 2004 UMA work. I believe it led to some incorrect decisions and an intransience to reconsider them.

- I was not able to attend your open house last night. I was wondering if you had any maps that you could e-mail to me that would show what was being proposed at the open house. We, at the Town of Delisle, have an interest in how traffic will flow in and around the west side of Saskatoon.
- I would like to comment again on the lack of information provided to the public at the open house. For example, the board says the purpose of this road is to improve safety and reduce congestion. If you are going to use the word safety, you need to back it up with data. Since this plan is only a concept you do not have any proof of this. In addition, there is little to no congestion out in the country so this must be City congestion. I think they can solve their own problems with the land they have. One of the boards talks about the study zone is 500m wide. This must be only for the options because for the red line around the City, there is development next to the line and there is no room to move the line 500m. You need to figure out this line now. The RM and City are approving land applications similar to the new business next to the CP rail line which is making the road kink. I think access needs to be thought of as part of the design because as we are hearing from Regina the cost of interchanges is making the Regina Bypass more expensive. This goes back to my comments about how existing highways and rail lines are going to be crossed and making sure we are not putting the RM, Saskatoon or the Province in financial debt by limiting the number of interchanges during alignment choice. At the first open house you said there was more support for the east side connection. I think this is only the case because the south option was not supported in the 90s and is still not supported today. If South Circle Bridge was shown as the initial option with the Highway 7 and Dalmeny Highway option shown, I think this would have been the route with the most support to move trucks around the city. One of the criteria used for this plan is to protect the natural environment. How is the red line doing this by cutting off natural drainage ponds on the west and east? More information on this should be talked about so surrounding lands are not flooded by rerouting the water. It looks like this project is being held off until after the election. I look forward to bring this up as part of election decisions. Please use this extra time to work on more detailed plans and backing up some of your claims.
- If you can delay development for 20 years, I probably won't care. In the interim use Zimmerman Road, which was in the original plan a few years ago.
- I'm disappointed the south route is being postponed until ...??? I doubt land will become much less expensive and there will be more development which will only increase costs tomorrow. The Victor Road route is ideal and should be pursued sooner than later otherwise the new roads may well be south of the Army Camp and Dakota reserve.
- In general, these developments are based on a continuing car/truck culture. Rail travel involves less population, is generally more efficient and requires less or no construction and less maintenance. But, this will most likely not be emphasized.
- In regards to cost and maintenance the shorter and most cost effective route is SE-1. The most costly route is SE-3. We also understand that two houses would have to be destroyed or worse, the proposed highway would be right outside their door. Finally, as property owners we purchased property that included an important 'asset' value of country peace and quite without noise and air pollution. Route SE-3 destroys this for the people directly in the route of SE-3 and for those of us with proximity of SE-3.
- More cost efficient as closer to the city. Less school buses on route SE-1. Lots of buses travel to Clavet not to mention teenagers travelling to Clavet.
- My concern is regarding the whole project. We need it to 'ease congestion' (allegedly) but anyone who does the least research knows building more roads does not help congestion. Essentially this looks to me like a HUGE taxpayer subsidy to the trucking industry, which will be the prime beneficiary. Instead we should be investing in light rail for commuters - revive our once very efficient and effective and much safer rail system. Carbon pricing is a reality and the assumption that we'll be using car/trucks in the future is definitely questionable. We've probably already reached 'peak car'.
- My husband and I waited with some anxiety through the summer and then through the fall for the next announcement concerning what was then called the Perimeter Highway. An announcement we had

been told at the first information meeting would be coming in August. I don't think you can begin to imagine my frustration when I received word on Nov 17 that after such a long delay, you did not plan to present a choice for the South Freeway route, but would offer options again at the open house on Nov 19. My frustration, impatience and anxiety turned to horror and rage when I found that you were suggesting three new proposed routes. The most southerly option passing right through our house site. It has taken me more than a week to calm to the point that I can write some coherent comments in response. Let me begin by saying that I think the need for any southeast section of the 'freeway' should be reconsidered with realistic city and transportation growth predictions. Given the current global and Canadian economies, world markets, and the growing movement away from fossil fuels, the need (even projected well into the future) seems at best questionable. Should such a realistic and careful reconsideration result in a decision to go ahead with the construction of a freeway in the area southeast to Saskatoon, then I would argue strongly that the route closest to the city be chosen as it would be the shortest and least expensive to build. Given the need for renewal of so much of the infrastructure throughout this province and country, we need to use our resources in the most rational and effective manner. Finally, I would argue that the most southerly or orange route option should not be chosen because it would be devastating to the lives of so many in our community, including ourselves. In our case, we built a passive solar/super-insulated home in 1979 with input from the National Research Council and the Saskatchewan Research Council. Over the next three decades, we have developed the yard and garden planting more than 3500 trees and shrubs. This summer when it appeared that, at worst, the proposed highway might touch the southeast edge of our property, we continued with the installation of a $26,000 bank of solar panels. This too the orange or most southerly option proposes to destroy. Our neighbours, the , have spent less time in the community, but have poured much financially and physically in to the development of a lovely new home on the 10 acres next door. They built there to be close to and to support who live very close by. This too would be destroyed. Gone too would be the peaceful lives that so many of our neighbours have worked hard to build, destroyed by the noise and pollution of a nearby freeway. Gone as well would be a large chunk of their and our property value - security planned retirement of many living in the immediate neighbourhood, including ourselves. This is very unfair to these residents who were encouraged by the RM to build in this area and who chose this are to be further away from the city and from the much more northerly route that they were led to believe would be used as a perimeter highway in the future. This orange (most southerly) route would cut through a large area of contiguous properties normally planted to alfalfa and alfalfa grass combinations. The area supports a large number of deer which would both be endangered by a freeway and endanger the lives of drivers on that freeway. The home site on our own property hosts not only deer, but the occasional moose in the winter, as well as badgers, porcupines, fox, ermine and coyotes. The dugout and sloughs are home to an assortment of migrating ducks and geese and have been the documented site of stopovers by whooping cranes. In addition, because our farm site has been planted with hundreds of bushes to provide habitat for them, it has been home to a variety of song birds, Flickers, Blue Jays, Grosbeaks, Waxwings, Junkels, and Downy Woodpeckers as well as Saw Whet, Great Horned and Snowy owls. Building the proposed orange route would destroy the habitat and lives of these birds and mammals as well. It would be environmentally devastating. For reasons of finance, fairness and environment, this most southerly route of the three proposed should not be chosen for a southern freeway if one is built.

- North Perimeter Bridge (approved route) too close to in-process Parkway Bridge
- Our land has been frozen for development for far too long. Processes such as this should be faster.
- Regarding the decision to not consider any connecting road between Highways 7 and 11, this is another example of short-sighted planning. Some location for such a highway should always be part of the plan for a ring road around Saskatoon.
- SE-1 route impacts on the least amount of valuable farmland. Once the route is chosen, the likelihood that land contained within the area between the city and the freeway will be developed more heavily is high. it makes sense to contain that development to an area already being developed and as I indicated in an earlier comment sheet, makes Grasswood commercial area an even more vital and vibrant area,

providing services and facilities for both the area around it and the city. I think if the freeway swings away from Highway 11 too far south, those businesses already at Grasswood will be negatively affected. There is a large wetland between Melness Road and Baker Road, between Highway 11 and Range Road 3045. If a freeway is constructed through this area, it will impact negatively on Clement Farms Greenhouse, a large highly successful greenhouse operation. Any homes sitting lower in this area, but not directly in the path of the freeway will be impacted by flooding due to flow redirections (culverts may help, but not 100%), and since they are not in the direct path, they likely are not subject to any compensation from Highways, and their insurance will likely not cover overland flooding despite that it was caused by human action, rather than Act of God. By the way, in this wetland I have regularly seen Blue Heron, Sandhill Cranes, at least a dozen varieties of ducks, Canada Geese, songbirds, and on one occasion, Whooping Cranes. I have also seen a Bald Eagle nearby to this wetland.

- Slight concern that we will have a freeway that looks like the old Circle Drive (3/4 of the perimeter) but definitely do not want to spend money on a freeway when the traffic levels do not warrant it and there are alternate routes available
- Many people bought out here because you told us that the highway was going in at Grasswood. Please stick with your original plan. Our property value will be destroyed and you will barely touch our land. We will hire a lawyer if this route is chosen (SE-3).
- We are considering action against all parties involved if route SE-3 comes to fruition. As explained by staff at the information session this route would not compensate us for our losses (avoids our house while destroying home and property values).
- Thank you for the invitation to the Public Information Session at the German Cultural Centre which we attended on November 19, 2015. The University operates a number of research facilities in areas near the proposed alignments between Highway 5 East and Highway 11 South. All proposed alignments avoid the most significant of these research facilities found on Floral Road, including VIDO-Intervac - a world-leading centre in developing vaccines and technologies against infectious disease - and the Livestock and Forage Centre of Excellence. The current proposed alignments would allow the University to continue these important research endeavours. The University's preferred route is proposed alignment SE-1. As mentioned above, SE-1 maintains an appropriate distance from our world-leading research facilities. Proposed alignment SE-2 is less favourable as it continues at the minimum acceptable distance to our facilities for a greater distance than SE-1. The University has significant objections to the proposed alignment SE-3. SE-3 bisects the southern portions of University research land. This land is used to support research cattle, and a major highway bisecting that facility would substantially impair the land's usability for that purpose, including creating safety concerns for the movement of cattle and research personnel. As well, the university would be required to purchase additional land due to loss of acres required for the freeway. Therefore, the University strongly recommends that the Ministry of Highways and Infrastructure pursue alignment SE-1 as the preferred alignment between Highway 5 East and Highway 5 South.
- Thank you for the opportunity to share our opinions regarding the Saskatoon so if perimeter Highway following the open house on November 19, 2015. We have reviewed the three proposed options for the southeastern aspect of the perimeter highway. Proposed route SE-1 appears most viable as it would result in most cost efficiency with less roadway to construct, less land, and fewer residents impacted. Viewing the City of Saskatoon's Projected Growth Concept Plan map, proposed route SE-1 is most consistent (in terms of distance from Saskatoon) with the confirmed north perimeter highway. Along proposed route SE-1, land is currently for sale, both north and south of the CN railway. Landowners on this route have been anticipating development for many years. Unlike proposed routes SE-1 and SE-2, residents along proposed route SE-3 are located over in adequate aquifer. Although some residents are connected to the city water pipeline, many depend on this aquifer, as there is substantial potable water. Wells are shallow and constructing a perimeter highway across proposed route SE-3 could damage the aquifer that many farms, acreages, and residents rely on. Proposed route SE-3, which appears to run through our property, would

devastate our family. This type of quiet acreage and farmland is something of a rarity within close proximity to Saskatoon. Our family has built a small, working agricultural farm in a quiet, pristine setting. This area needs to be seen to be truly appreciated. We are vehemently opposed to proposed route SE-3. This route and the path it takes would devastate this unique Saskatchewan landscape. We appreciate your attention in considering proposed route SE-1 as the only logical route for Saskatoon's perimeter Highway.

- The process seems very biased and the concerns of landowners are dismissed. Evaluation criteria have not been disclosed in full. This is essential for proper decision making. Financial information also needs to be disclosed. This process is not transparent.
- There are NO convincing data which would demonstrate that alignments SE-1, SE-2, SE-3 are needed (destruction of valuable land for agriculture, residential environment, wild life, biotopes which could not be repaired later).
- We attended the meeting last Thursday at the German Cultural Club. First, we were delighted to learn that all plans to extend the SSF west from Highway 11 South, across the South Sask River have been scrapped! However, we must still register our strong disapproval of all three options for extending the Freeway southwest from Highway 16 to connect with Highway 11 South. The cost of these options (estimated at $500-$900 million) is a GROSS WASTE of taxpayers' money. The simplest solution to the traffic seeking access to Highway 11 South is to route it west when it reaches Highway 16 until it reaches Highway 11 South at the existing Circle Drive intersection. If the Government has this amount of money to spend on highways, better by far to apply it to upgrading/repairing the existing roads, which by any measure are in such poor conditions.
- We own most of the land between CN and Highway 7. This land is required for future economic development. Range Road 3065 has already been significantly improved. Range Road 3064 crossing of CN should be shut.
- When will the next meeting be?
- Without a thorough understand of the guiding principles used to establish the existing 3 proposed routes it is difficult to make intelligent comments. Again, you seem to want to keep the resident affected by this development in the dark. However, using common sense as a guide here are a few things to consider. If cost is an issue it appears that Route SE-1 (the most northerly proposed route along Floral Road) is the shortest and likely the least expensive. This route appears to be continuous with the development of the north-eastern portion of this project. It is flat and is the approximate route that has been under consideration for the last 20 plus years. There has already been some light industry that has developed along this route (at the junction of this proposed route on Highway 11 and Floral Road/Grasswood Road.) Proposed Routes SE-2 and SE-3 are increasingly longer and I would expect that they would cost more. Proposed Route SE-3 should be removed from consideration. It is the most southerly proposed route and would pass through a small valley and some wetlands. There are a number of small hills involved. This wetland is an aquifer if that has any bearing on the project. There are environmental considerations and wildlife considerations to take into account (deer, moose, fox, badgers, coyotes, song birds, nesting owls, nesting hawks and water fowl - on numerous autumn migrations Whooping Cranes have landed for a day or so and some of these sightings have been reported to - just to name a few.). There are safety considerations with the 2 school bus routes that traverse daily twice a day between Highway 663 (the old Regina highway) and Highway 11. As this area is a school bus corridor there are teenagers driving to and from school daily. Unfortunately, I have no knowledge of the criteria and/or principals that were applied when making the decision to select the original 4 'proposed routes' and what caused these four routes to be abandoned for the next generation of 3 'proposed routes'. Therefore, it is very difficult to make any additional comments.
- Would be the least disruptive to land owners and safest. West of Highway 11 on Tamke Road is Federal reserve land for later expansion to Highway 7 and 14. Also access to the Casino on Highway 219.

- Like to discuss in person the following: alignment, cutting through section, possible sale of property, value, timing etc., realignment and routing behind house.
- My comments concern the proposed route SE-3. It seems to me that this route would cause the most negative impact given that it goes through a valley that is a habitat for deer, foxes, porcupines, waterfowl, is a migratory stop for birds including ducks, geese, and whopping cranes. It then goes onto crush 2 houses on Baker Road. I would have to assume this would significantly cost more and would also impact farms in the area. There is also a major wetland in the path that would first be destroyed and second could cause other issues with water in the area which would likely be costly to resolve. Water issues for residents in the area such as flooding would need to be addressed. Having a major route like this in the area would then mean that schools buses and young drivers would now have 2 major highways to cross in order to travel to Clavet. When you compare the distance from Saskatoon on the City of Saskatoon's Projected Growth Concept Plan Map (as shown on their website), the SE-1 route is more consistent with the North route. This also puts it in the Grasswood area, which is more commercial than any other area on the route, and having a perimeter highway there could aide in development of commercial interests in that area.
- In general, I have concerns with water drainage, with Proposal #2. I believe SE-1 would be the better option but would like to see Grasswood business area benefit from the highway. Once again I wish we would have known about the meeting before it happened. We were not the only people that this happened to. If I would have attended I would have asked questions, why these 3 routes were chosen and why the previous ones were dismissed. I also would have been better informed to complete this comment sheet. Our letter did not arrive in time for us to attend the meeting. We understand there will be a spring meeting and hope to be informed with more sufficient notice. Land development and sales are being greatly affected with the freeze implemented by the RM. How long will this last?
- What are the principles that lead to the decision making for both the need for this project and the location? What is the timeline for this project? You called a public information meeting in the spring of 2015 and gave 4 proposed routes telling the audience that one of these would be selected and presented to the residents in mid to late August 2015. That announcement was delayed until November 19, 2015 at which time you abandoned the original four 'proposed routes' and presented three different 'proposed routes'. Are there any principals at play in making these decisions?
- Given that the Southwest Connection is no longer planned in the foreseeable future, the Southeast Connection should also be deferred indefinitely. Traffic can be accommodated by simply expanding the existing components of Highway 11 north of the proposed perimeter road intersection, and Highway 16 west of the proposed Southeast Connection through to the existing cloverleaf at the intersection of these two highways. This cloverleaf could then be expanded or modified to accommodate the higher traffic volumes. Under this scenario, the Perimeter Road southbound from the North Bridge would simply terminate where it meets Highway 16 East.
- Utilizing the existing roadways and deferring indefinitely the construction of the Southeast connection would clearly and most effectively meet all of the criteria identified in the "Evaluation Process" slide from the Slide Presentation.
- Determining the best location for the Perimeter Road should be focused on exactly that – determining the best location. This is a permanent road that is likely to remain in place forever. To eliminate corridor options due to the potential difficulty of gaining agreement from one landowner is not in the best interests of any major stakeholder, including the Province of Saskatchewan, the City of Saskatoon, the RM of Corman Park, or the taxpayers of Saskatchewan. We must work with the University of Saskatchewan to ensure the best location is chosen for this road.
- The South Corridor intersects with Highway 16 in close proximity to an existing industrial park (the East Floral Industrial Park). This has been targeted as the major industrial development area to the southeast of Saskatoon. Choosing the South Corridor would greatly enhance the concentration of industrial activity in this area, as well as taking full advantage of private sector investment and infrastructure already in place.

Public Information Session #3

April 25, 2017
[inside address]
[inside address]
[inside address]

Dear [salutation]

South Saskatoon Freeway – Recommended Alignment

Long-term planning continues for the future Saskatoon Freeway. Work has been underway to finalize the general location study, which will identify the location of the freeway's southern route.

We are writing to inform you that your property is not directly impacted by the recommended alignment. As a result, the development restrictions will be removed from your property.

Previously, residents, landowners and other stakeholders were invited to a public information session on June 25, 2015, to collect input regarding possible routes. Feedback from the session was used to help develop options for the southern route of the Saskatoon Freeway. A second session was held on November 19, 2015, to share the options and receive feedback from stakeholders.

The Ministry of Highways and Infrastructure will be holding an online information forum to share the recommended route and receive feedback. By visiting www.saskatchewan.ca/saskatoon-freeway from May 12-26, 2017, you can learn more about the southern route for the Saskatoon Freeway and share your opinions regarding the route. The online forum will include complete information about the project, an explanation of the process and an opportunity to ask questions and receive answers.

The anticipated timeline to finalize the Saskatoon Freeway General Location Study is summer 2017. Subsequent planning for the future Saskatoon Freeway will take many more years as part of the ministry's long-range planning process. Once the planning process is complete, further time will be required to determine a construction strategy and timeline. While construction will not take place for many years and possibly decades, this initial phase will allow the necessary land to be protected, enabling municipalities, businesses and individuals to make informed decisions about land use as they plan for the future.

Should you have any questions prior to this date, you are invited to contact Jon Medori, Project Manager, Associated Engineering at medorij@ae.ca.

Sincerely,

Jon Medori
Associated Engineering

April 25, 2017
[inside address]
[inside address]
[inside address]

Dear [salutation]

South Saskatoon Freeway – Recommended Alignment

Long-term planning continues for the future Saskatoon Freeway. Work has been underway to finalize the general location study, which will identify the location of the freeway's southern route.

There is potential for the recommended route to impact your property. We would like to meet with you on May 11, 2017 during the day to discuss any questions or concerns you may have with regards to the route. Please contact Jon Medori, Project Manager, Associated Engineering at medorij@ae.ca to schedule a meeting.

Previously, residents, landowners and other stakeholders were invited to a public information session on June 25, 2015, to collect input regarding possible routes. Feedback from the session was used to help develop options for the southern route of the Saskatoon Freeway. A second session was held on November 19, 2015, to share options and receive feedback from stakeholders.

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We look forward to meeting with you.

Sincerely,

Jon Medori
Associated Engineering

Purpose

To plan a high-speed freeway in the area (City of Saskatoon)

- Benefits of the freeway
  - Improve safety
  - Improve traffic flow and reduce congestion
- General location study will allow for effective planning for future development
  - Narrow the study zone to a 500 meter wide corridor
  - Access to freeway to be determined at future planning stages
  - The detailed design stage will determine land requirements
- Stakeholder and public input is critical to planning process

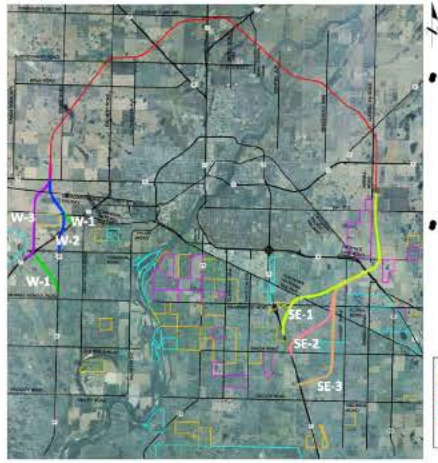
Welcome

South Saskatoon Freeway

May 12, 2017

Summary: Public Information Session – November 19, 2015

- More than 400 people attended and more than 90 comment sheets completed
- General feedback included:
  - Avoid existing development
  - Option SE-1 was preferred by most
  - Limited response for west options
  - Concerns about uncertainty and current development restraint
  - Shared consensus for removal of southwest segment from further study

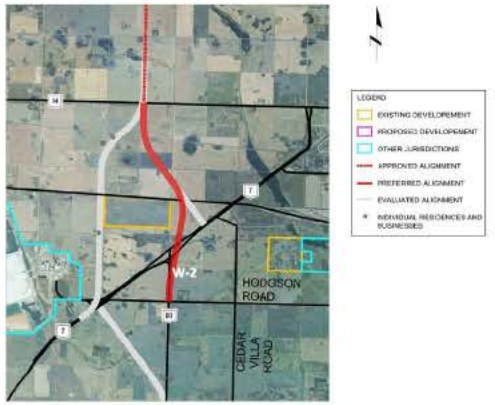


Background

- Approved North Saskatoon Freeway alignment
- Options for South Saskatoon Freeway alignment were presented on November 19, 2015

SOUTH SASKATOON FREEWAY

HIGHWAY 14 TO HIGHWAY 7 (RECOMMENDED ALIGNMENT IS **W-2**)



RECOMMENDED ALIGNMENTS

SOUTH SASKATOON FREEWAY

Evaluation Criteria

- Environmental criteria
  - Minimize impact on the natural environment
  - Minimize impact on agricultural land use
- Economic criteria
  - Assess capital and operational costs
  - Facilitate and promote future regional economic growth and development
  - Provide efficient and effective freeway route
  - Optimize existing and future regional road network
- Social criteria
  - Minimize impact on the adjacent landowners
  - Assess ability to provide access
  - Ensure geometric compliance and safety

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SOUTH SASKATOON FREEWAY

HIGHWAY 5 TO HIGHWAY 11

(RECOMMENDED ALIGNMENT IS **SE-1**)

Evaluation Criteria

West Options Comparison

Criteria	Weight (%)	Option W-1		Option W-2		Option W-3	
		Rank	Score	Rank	Score	Rank	Score
Impact on Natural Environment	5	1	5	2	10	3	15
Minimize Impacts to Agricultural Land	3	1	3	3	9	2	6
Lifecycle Cost Comparison	17	1	17	3	51	1	17
Facilitate and Promote Economic Growth and Development	15	1	15	3	45	3	45
Efficient and Effective Bypass/Truck Route	15	2	30	2	30	2	45
Optimize Existing and Future Regional Road Network	15	2	30	3	45	1	15
Access	9	1	9	2	18	3	27
Geometric Compliance and Safety	11	3	33	3	33	3	33
Impact on Adjacent Landowners	10	2	20	3	30	1	10
Total Score	100		162		266		213

Southeast Options Comparison

Criteria	Weight (%)	Option SE-1		Option SE-2		Option SE-3		Option SE-4		Option SE-5	
		Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Impact on Natural Environment	5	5	25	4	20	3	15	1	5	2	10
Minimize Impacts to Agricultural Land	3	5	15	4	12	3	9	1	3	2	6
Lifecycle Cost Comparison	17	5	85	5	85	3	51	1	17	2	34
Facilitate and Promote Economic Growth and Development	15	5	75	4	60	3	45	1	15	2	30
Efficient and Effective Bypass/Truck Route	15	4	60	5	75	3	45	5	75	4	60
Optimize Existing and Future Regional Road Network	15	5	75	3	45	4	60	1	15	2	30
Access	9	5	45	3	27	4	36	1	9	2	18
Geometric Compliance and Safety	11	5	55	5	55	5	55	5	55	5	55
Impact on Adjacent Landowners	10	5	50	2	20	1	10	4	40	3	30
Total Score	100		485		399		326		224		273

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Evaluation Criteria

Option Comparison Criteria

Criteria	Impact on Natural Environment	Minimize Impacts to Agricultural Land	Lifecycle Cost Comparison	Facilitate and Promote Economic Growth and Development	Efficient and Effective Bypass/Truck Route	Optimize Existing and Future Regional Road Network	Access	Geometric Compliance and Safety	Impact on Adjacent Landowners
Impact on Natural Environment	–	2	4	3	4	3	3	3	3
Minimize Impacts to Agricultural Land	2	–	4	3	4	4	3	3	4
Lifecycle Cost Comparison	0	0	–	2	1	2	1	1	1
Facilitate and Promote Economic Growth and Development	1	1	2	–	2	2	1	1	1
Efficient and Effective Bypass/Truck Route	0	0	3	2	–	2	1	1	1
Optimize Existing and Future Regional Road Network	1	0	2	2	2	–	1	1	1
Access	1	1	3	3	3	3	–	3	2
Geometric Compliance and Safety	1	1	3	3	3	3	1	–	1
Impact on Adjacent Landowners	1	0	3	3	3	3	2	3	–
Totals (144)	7	5	24	21	22	22	13	16	14
Weighted Totals (%)	5	3	17	15	15	15	9	11	10

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Thank You

Thank you for participating!

Comments are important to us, so please complete a comment sheet, which can be found online: **www.saskatchewan.ca/saskatoon-freeway**

For more information, please contact:

- Jon Medori: medorij@ae.ca
- Bojana Eberts: bojana.eberts@gov.sk.ca

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Next Steps

Typical transportation planning process

Roadway Planning (Timeline: 10-30 years in advance of construction)

- General Location: determines the general centerline of roadway , which has potential to shift 250m left or right of center

Saskatoon Freeway (Summer 2017)

- Functional Plan: determines access points, identifies environmental, heritage, geotechnical, and utility constraints
- Detailed Location: establishes road right-of-way, typically 101.4 meters, plus 20m on either side if service road is required for a total 141.4 meters (land acquisition process can begin)

Funding (Timeline: 0-5 years in advance of construction)

- Project is ranked against other provincial priorities and budget is allocated as the project moves up the priority list

Engineering/Construction (Timeline: project specific)

- Refines details like utility moves, interchanges, etc. Work begins and the project is managed for cost, schedule and quality

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Saskatoon Freeway Online Engagement

How did you hear about the online engagement forum?

Response	Count	
Media	20 *74.1%*	
Ministry of Highways & Infrastructure Letter	1 *3.7%*	
Word of Mouth	2 *7.4%*	
Other, please specify...	4 *14.8%*	
	Total: 27	

newsletter of Chamber of Commerce
Read it here first!
Skyscraper forum blog
MLA newsletter

How would you rate the online engagement forum vs. a traditional open house? Please give a reason for your answer.

Response	Count	
Prefer online forum	21 *91.3%*	
Prefer open house	2 *8.7%*	
	Total: 23	

unaware of this method of consultation until hearing recently from friend - doesn't allow informed comments
Like to show up and see everything in person

Access and time is better
Easier access
Easier for more people to access.
Easier for more people to access.
Better
Freedom to check out the project on my own time
easy access --it's internet era!
I'm a busy working mom and don't have a lot of free time to go places. Where as the internet, is at my fingertips
Not everyone can make it an open house for various reasons like time, location or child care
I would not likely attend an open house unless directly and strongly affected.
convenience and ease of access
I suspect by the time the open house is set, you guys already have your minds made up.
Yes, more convenient for work schedules.
I do.
Convenience
Easier to keep information straight.
No time for open house
more thought and less emotion
Greater number of people can be reached over time with advertisement
Government ok SK website
More inclusive.

Do you feel the online forum is more convenient? If not, please explain.

Response	Count	
Yes	23 *85.2%*	
No	4 *14.8%*	
	Total: 27	

Check anytime.
Have little kids don't need babysitter
not aware of this - public openhouses more widely advertised and more informative
More inclusive.

On a scale of 1 to 5, how would you rate the quality of the information you received? (1 is poor and 5 is excellent)

Response	Count	
5	1 *3.7%*	
4	9 *33.3%*	
3	10 *37.0%*	
2	5 *18.5%*	
1	2 *7.4%*	
	Total: 27	

On a scale of 1 to 5, how would you rate the public engagement process? (1 is poor and 5 is excellent)

Response	Count	
5	3 *11.1%*	
4	4 *14.8%*	
3	14 *51.9%*	
2	6 *22.2%*	
	Total: 27	

What changes can be made to improve your experience with the public engagement process?

Response	Count
	13 responses

I need a full scale map to see where the rout is, my land board s the rout
just make sure everyone is able to hear of it.
More specifically provide information for communities affected.
The page lacks information that is provided in the videos, I would like to see larger images of the proposed routes rather than pausing a youtube video.
On-line video stalled and would not finish. As far as a public engagement process, this is the first I have even heard of this project!
This engagement is far too preliminary and not time well spent. Consult when the project is closer to a reality.
Get the process going earlier and get the information out in a much clearer fashion
More notification about the project as a whole, this is the first I've heard of it.
Actually engage the public before the majority of the route is set. Also, move it well outside the city, so it actually works as a by-pass for the city, instead of being a poor mix of an urban freeway and a rural bypass which ends up disappointing everyone.
Better quality maps and videos that can be enlarged to full screen - why not make available on YouTube?
communities impacted by any proposals including communities within city limits should receive information about proposals
Post documents from past studies and decisions so that the history of the project can be reviewed
Social media