# Planning Tool of Access Management – Not Always Frontage Roads

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Paper prepared for presentation at the September 22-25 Session of the 2013 Conference of the Transportation Association of Canada, Winnipeg, Manitoba

## Abstract.

The conversion/upgrading of Highway 16 between Highway 36 and Range Road 2-3 is not expected to occur for at least another 20 or more years but undertaking an access management study in advance provides local users and municipal officials with a blueprint for planning along the corridor in preparation for when access will be controlled and limited to interchanges only.

The Highway 16 corridor has multiple intersections, driveways and farm accesses that connect directly to the highway interspersed with interchanges near larger towns. The area has several environmental features as well as a local road network that accommodates varying uses ranging from the movement of farming equipment and school buses to oil and gas maintenance vehicles. The typical frontage road approach to access management between interchanges was not conducive to the nature of the area and could not be implemented in some areas due to natural features. A plan was needed that would meld into the local area and be considered as non-intrusive as possible.

This paper will present the thought processes, consultation approach and various factors that were considered during the development of the plan that could be implemented in phases, were flexible enough to accommodate the changes that might occur over the next 20 plus years and could be endorsed by the various towns, villages, hamlets and counties along this section of Highway 16.

## Introduction

As established by legislation, Highway 16 will become an access controlled freeway facility spanning the entire width of the Province of Alberta in the future. The Province is developing access management strategies for this future change along Highway 16, with the intent of eliminating all existing at-grade accesses onto the highway but still maintaining the ability for all affected properties in the area to access Highway 16 via the future interchanges. The upgrading of Highway 16 to the controlled access facility is expected to occur at various timeframes depending on the location along the Highway.

In 2005, Alberta Transportation completed a study for the Highway 16 corridor, the *Highway 16 Freeway Corridor Management Study, Jasper Park Boundary to Lloydminster.* The study provided recommendations for interchange locations, at varying spacing (approximately 13 km to 20 km), along Highway 16 for the ultimate conversion of the highway to an access controlled freeway standard.

Development is occurring around Lloydminster and the towns, villages, and hamlets along the Highway 16 corridor in eastern Alberta. Closure of accesses and changes to the overall road network adjacent to Highway 16 will impact this development. This study was prepared to provide an access management plan for the section of Highway 16 between Highway 36 and Range Road 2-3 to address the need to maintain access to existing development in the study area, to address access issues related to development pressures in the counties, and to address safety issues associated with access to the highway.

The conversion of Highway 16 along this section to an access controlled freeway facility is not expected to be completed for another 20, 30, or more years. It will also develop in

stages, likely starting from the two more densely-populated areas surrounding Lloydminster and Vegreville, which are at either end of the study area, and progressing inwards towards the geographic centre of the corridor. Development of an access management plan for the controlled-access freeway facility provides the towns, villages, hamlets, counties, and Province with a guide for assessing development proposals within the immediate vicinity of the Highway 16 corridor. Knowing the proposed access management road network prior to the implementation of the interchanges, provides the populated centres with the ability to plan their growth and expansion accordingly to take advantage of the future network. The development of an access management plan at an early stage provides a guide that is expected to be continually updated as the populated centres grow and other factors in the area change (such as construction of new road infrastructure).

## Study Area

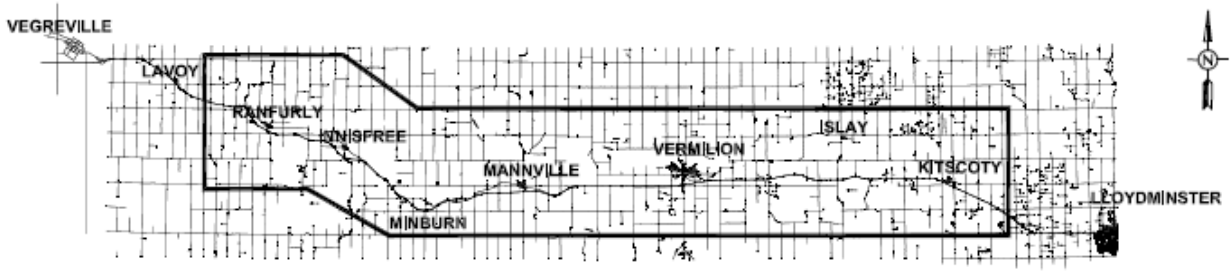



***Figure 1–Project Study Area***

The study area extended approximately 115 km along Hwy 16, from Hwy 36 on the west side in the County of Minburn, to Range Road 2-3 to the east in the County of Vermilion River, Alberta. The northern and southern boundaries varied along the highway, enclosing approximately two full sections (3.2 kilometres) to the north of the highway and two full sections (3.2 kilometres) to the south. The northern and southern limits of the study area varied in distance from Highway 16 because of the location of the existing parallel road network and the natural features that created a discontinuous parallel road network.

The character of the area is rural, with predominantly agricultural land use at the time of the study. The area is interspersed with lease roads and well sites for the oil and gas industry, which are mainly concentrated on the eastern side in the County of Vermilion River. Some of these farms and well sites currently have direct access from Hwy 16.

The region consists of rolling terrain with several areas of locally steeper terrain. Numerous lakes and small, unnamed water bodies are scattered throughout the region. The area also includes provincial parks and recreational areas.

Several small towns, villages, and hamlets are within the study area.

## Existing Conditions Assessment

It is important to understand the existing conditions of the study area in order to determine what needs and constraints might influence the development of the access management alternatives. Some of the existing needs and constraints may be removed

by the time the highway is converted to an access-controlled facility and the access management plan is implemented; other needs and constraints may be “show stoppers” (for example crossing of protected areas; non traversable terrain, etc.) and may require alternative solution consideration. To best address the requirements of the study area, it was important to understand which factors would influence the development of alternatives and which factors were short-term and would not warrant the same level of consideration.

## Social Environment

The majority of the study area is rural scattered with a few more densely populated centres with a variety of services. The rural area has various facilities scattered throughout the study area, including: churches, community halls, landfill sites, and cemeteries. Knowing where these facilities are located is important when developing the possible access management alternatives.

Cemeteries require special consideration. It is preferable to minimize or avoid impact to the cemetery property to ensure no grave sites are disturbed. If the adjacent roadway requires widening to develop the facility as an access management alternative, any widening should occur to the side of the road opposite the cemetery. If realignment of the road is required, it should also occur away from the cemetery if possible.

COMMUNITY CEMETERY

A unique feature of the area that needed to be considered was the numerous cattle crossings under Highway 16. Some understanding of the use, ownership, and requirement for these crossings needed to be developed.

## Road Network

Highway 16 is currently a rural, 4-lane, divided highway consisting of approximately 70 at-grade intersections or driveways with direct access onto the highway.

The previously mentioned 2005 Freeway Corridor Management Study recommended interchanges at 7 locations within the study area, some of which will be subject to further refinement for determining the exact location due to the vicinity roadway connections and topography. The 2005 study did not specify the interchange types so a generic interchange envelope was used for this study for the determination of the minimum distance required for an adjacent intersection along the intersecting roadway.

TOWNSHIP ROADS

The existing road network within the study area consists of township roads, regional roads, local

access roads, and lease roads for access to oil and gas well sites. The majority of these roadways are rural, unpaved, gravel roads with ditches on either side. The width of the roads vary from extremely narrow, just wider than a vehicle, to over 8-m wide. Some of the roadways closer to the populated areas have paved or oiled surfaces.

Some of the roadways that were initially considered as alternatives for re-routing traffic are impassable and/or not used during the winter and were eliminated for further consideration.

There are several driveways to private homes, farms, or businesses that currently have direct access to Highway 16. Closure of these accesses will isolate these lands and will likely require consideration of unconventional solutions, such as design exceptions or eventual buyout and reconfiguration of the properties.

## Canadian National Railway

CANADIAN NATIONAL RAILWAY CROSSING

Canadian National Railway (CNR) has an active rail line on the north side of Highway 16. The line is located directly adjacent to and often in close proximity to Highway 16. In several areas, the rail line moves to the north and intersects or travels parallel to several range roads and township roads. The right-of-way and crossing constraints imposed by the proximity of the rail line to both Highway 16 and other roads affects the available access management options, including road improvements or possible new service roads paralleling Highway 16. Any railway crossings within an access management option needs to be reviewed for general concerns and determination of potential ways to improve safety including the improvement of the road profile at the crossing, and the addition of stop arms, bells, and signals.

CNR indicated that their main concern is that of large tractor trailer units encroaching upon the rail tracks. This is caused by the lack of storage distance between the highway and the rail line and the queuing that occurs when vehicles are waiting to turn onto Highway 16 or other intersecting roads near the tracks. Eliminating the at-grade accesses to Highway 16 would mitigate many of the existing problem areas close to Highway 16.

## School Bus Routes

There are many school bus routes within the two school districts in the study. The routes cross or access Highway 16 directly. These school routes need to be revised when Highway 16 is converted to a controlled-access facility. Knowledge of the roads used by the school districts is useful in assessing the overall impacts of the proposed access management alternatives, since one alternative may require less school bus rerouting than another.

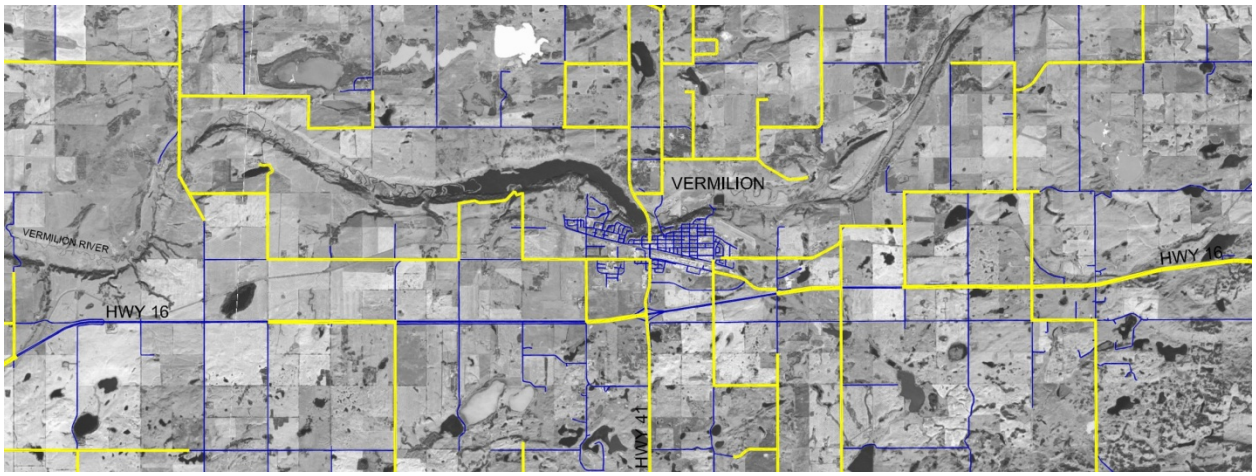



***Figure 2 – Some of the area school bus routes***

## Current Traffic Flow

The existing traffic information was very limited. The limited traffic volume information that was available from the local towns was projected to the 20-year timeframe using a basic 2 percent annual growth rate. The traffic volume on the roads that will be closed was approximated using the assumption that similar characteristic roads in the area will exhibit similar traffic volumes. The estimated traffic volume on the roadways that would be closed was rerouted to the surrounding road network. If the total of the estimated traffic volume of the roadway and the rerouted volume was near the traffic volume that would trigger an upgrade in road classification, then the traffic volume was flagged as requiring possible further investigation. In most cases, the traffic volumes expected to be rerouted were low and would have limited impact on the option selected.

## Emergency Service Areas

Emergency services, such as fire and ambulance, are provided for the counties through agreements with the service providers in local towns, villages, and hamlets.

Police services are provided by the Royal Canadian Mounted Police (RCMP) from four stations within the study area. There are no local police forces within the study area.

Through discussions with various emergency service providers and county officials, it was determined that there are currently several high-incident areas along Highway 16. Most of the locations are at the proposed interchange locations and the safety issues of the location would be improved by implementing an interchange.

The impact to response times for incidents is one of the emergency services' main concerns. Changes in access could potentially impact response time, as well as route options, for responding. The preferred response time to an incident is within 14 minutes of receiving a call.

## Utilities

There are many utility company facilities within the study area. They range from gas lines, overhead and underground power lines, transmission towers, fibre optic cables, communication lines, pipelines, and others. Knowing where the utilities are located and

what the utility companies' expansion plans are provides an understanding of the constraints for new road construction or roadway facilities upgrade.

The oil and gas industry has many lease roads and oil and gas tanks, most of which are concentrated within the eastern portion of the study area. There are numerous companies, with facilities in the area. There are various types of well sites in the area, including: standing, suspended, producing, and abandoned sites.


OIL TANKS

Understanding the operations of these facilities, including: access requirements, access routes, and vehicle types used provides a basis to assess the impact of the alternatives under consideration.

The oil and gas companies operate well sites that were typically accessed on a daily basis using half-ton to one-ton trucks. Product hauling or water hauling is undertaken with the use of tandem-axle or tri-axle trailers. Oversized rigs and tractor-trailer combinations may be used for well site servicing.

## Topography

The topography of the study area is rolling terrain with many large water bodies, rivers, streams, and numerous smaller wet areas or ponds. This type of terrain presents numerous geometric challenges, especially in the valleys near the rivers and lakes. The topographical features of the study area create the potential for steep grades, tight curves, sightline issues, visibility and erosion concerns, and slope issues.

The existing road network includes steep grades, ranging from 5 to 9 percent in some areas, with even higher grades near the water bodies and rivers. In some instances, the steep grades and sharp, tight turns can limit large truck access, make some sections of the road network impassable during the winter, and constrain the roads because of safety concerns. In some places, the topography issues have caused the existing road network to be discontinuous because of the location of water bodies or extremely steep grades.

The large number of water bodies within the study area provides the potential for water crossing concerns, as well as erosion, sedimentation, and stability issues. For example, the Vermilion River and its corresponding tributaries are difficult to cross with a road because the grades near the river can be as steep as 15 percent.

## Environmental Overview

The entire footprint of the study area is located within the 'white zone' of Alberta and encompasses a wide range of prairie topography within the central parkland natural sub-region. The project crosses through or is adjacent to several major environmentally-important areas, including: Vermilion Provincial Park, Birch Lake Bird Sanctuary, and the Kenilworth environmentally sensitive area (ESA).

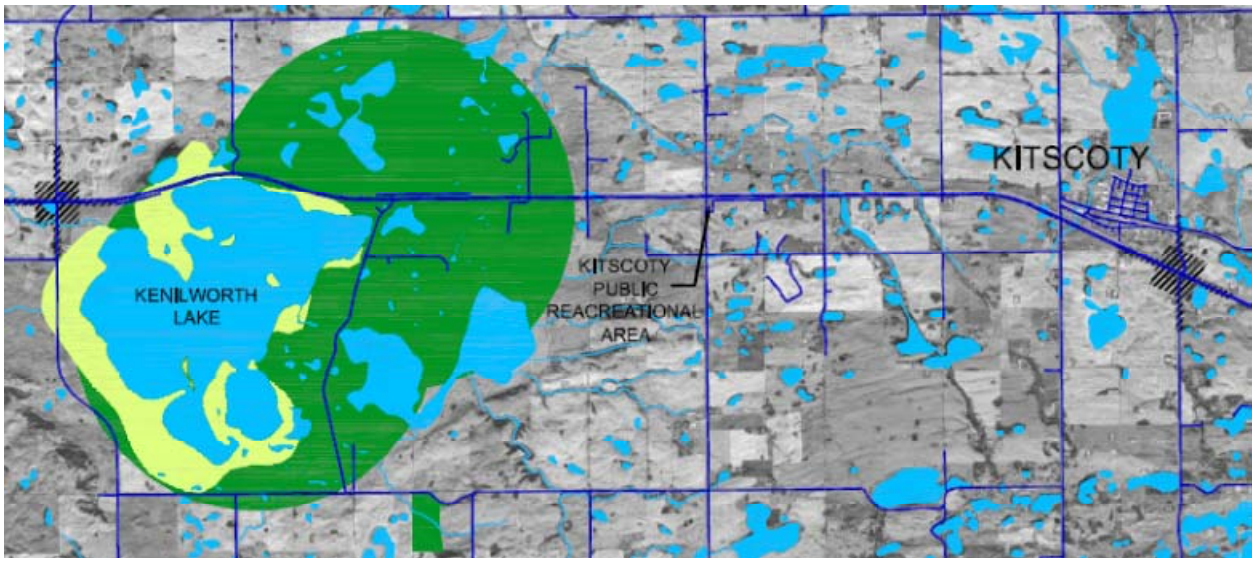



***Figure 3 – Sample of environmentally sensitive area within the study area***

The large number of small, ephemeral or permanent ponds and wetlands within the study area play an important role during the migratory season as rest-stops and feeding areas. These areas may pose issues for proposed new road construction or expansion of existing facilities by restricting the potential location of new roads or the ability to widen existing roads.

Vermilion Lake is listed as an ESA and is one of the most productive wetlands in the province. There is also an abundance of Ducks Unlimited projects in the immediate area. Kenilworth Lake is an ESA of national significance, as it is the most important duck-staging area in the Aspen Parkland of Canada. There are 92 known nesting sites for the Eared Grebe along the shores of Kenilworth Lake. The Birch Lake Bird Sanctuary is home to a known Blue Heron colony and has a 1,000 metre setback at all times for high-disturbance activities. Construction in the vicinity of the bird sanctuary is restricted from March to October.

There are several other sensitive flora and fauna species in the study area that must be considered when assessing possible road network modifications.

The provincial park areas within the study area will constrain road construction activities with “no net loss” and “replacement-in-kind” philosophies applied on any disturbed area.

## Historical Resources Overview

An historical resources overview was performed and identified a number of potential significant historical sites within the area.

Three historical building sites were also identified within the study area. The Canadian Bank of Commerce Building in Innisfree, built in 1906/1907 is an historical landmark dating back to the origin of the town’s name. The Alberta Government Telephones Exchange Building in Mannville was the first Alberta Government Telephone (AGT) building in Alberta and was built in 1917. As well as the Beitel School (1906 to 1946), located just north of Highway 16, east of the Town of Vermilion which is not designated as an historical building, but has significance for the community.

## Alternative Development

The existing conditions assessment confirmed that the area under study is very diverse in nature and local culture and that a frontage road approach would not suit the varying uses of the area and the environmental features present. Creative thinking as well as collaboration with the local counties and the public was required. The goal was to create an access management solution that could be seen as something to work towards, that the local counties could accept and integrate into their planning for the area.

The basic objective for the development of access alternatives was to provide area residents and other users of the road network with a different means of reaching the same destination, after elimination of direct access to/from the Highway 16 corridor, while attempting to minimize the associated impacts on travel times, the environment, local communities and the construction (and other) costs associated with implementation of access management alternatives. In this regard, during the preliminary development and evaluation of alternatives, preference was given to those options that would utilize existing road infrastructure as much as possible.

For the purpose of developing alternatives, the study area was divided into a series of segments bounded on the east and west by the future (or existing) interchanges, or by the study area limits. Alternatives were developed for each segment, for both the north and south sides of Highway 16, since the conditions and extents of the existing road networks varied on each side.

Some access management route alternatives developed early in the process were not carried forward into the evaluation stage. Certain routes were identified that:

- were redundant (that is, were very similar to another route being carried through to the evaluation), or
- would clearly be too costly to construct, based on land acquisition requirements and/or physical constraints, or
- would clearly have unacceptable impacts on the region (for example, social impacts, environmental impacts, excessive out-of-way travel, etc.).

For efficiency, such routes were eliminated from further evaluation.

## Roadway Design Criteria

With the objective of utilizing existing roads to reconnect people with the highway at the future interchange locations, it was inevitable that there would be some existing roads in the study area that would require upgrading to accommodate extra traffic. It was also possible that some new road segments might need to be constructed as part of the recommended access management solution. In both cases, establishment of an appropriate set of roadway geometric design standards was necessary.

As some of the existing rural roads considered for use in the access management plan may be substandard in width, the selection of a minimum acceptable cross-section is an important step. These cross-section and horizontal/vertical geometric design criteria were used in the development of alternatives. Certain alternatives were eliminated early in the process based on the selected design criteria as road widening or obtaining an

acceptable grade was not possible without significant construction costs and property impacts.

Considering the low-to-moderate volumes of traffic anticipated on most of the roads within the study area, a rural gravel road cross-section design standard was selected for new road segments to be constructed and for local roads that will require upgrading.

The selected cross-section, based on a 90 km/h design speed, corresponds to the current speed conditions in the study area, as all county roads are currently limited to 80 km/h posted speed unless otherwise noted. It is noted that during implementation/construction/ upgrades of the road network, consideration may be given to varying from the standard if necessary to accommodate existing site-specific conditions and constraints.

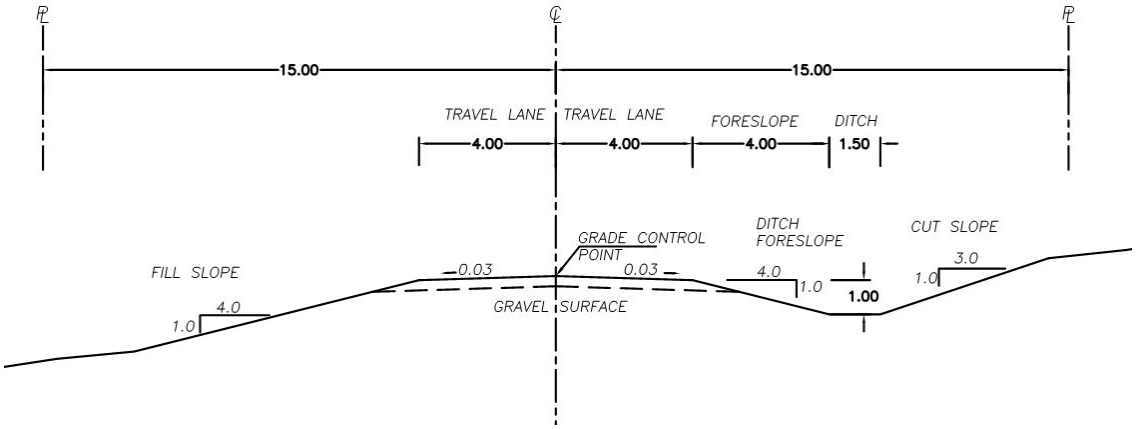


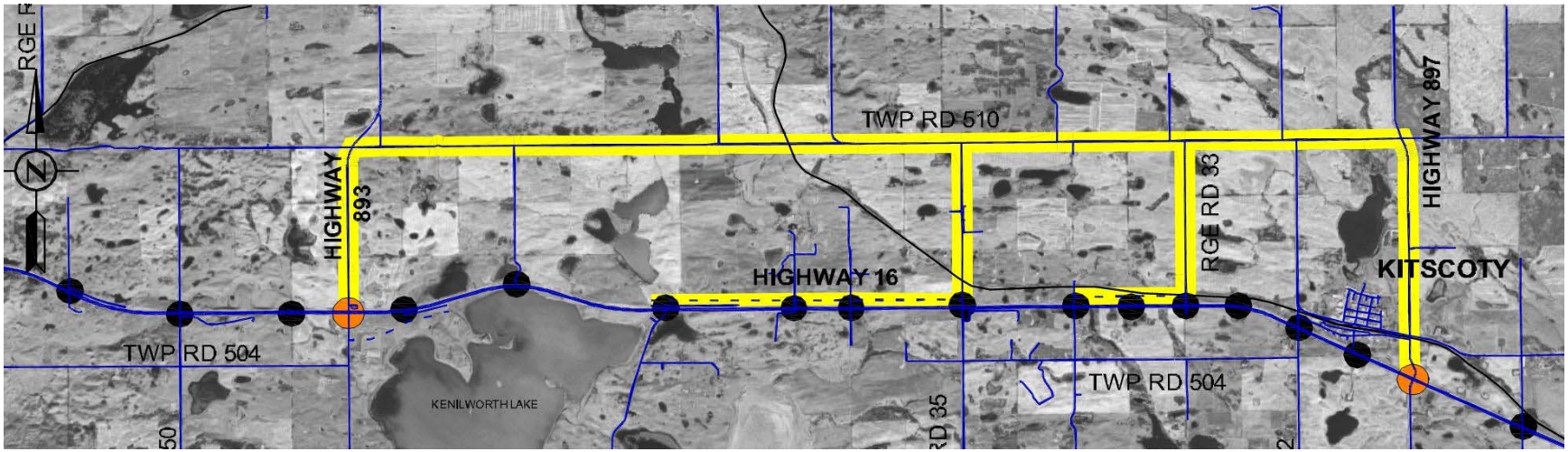

***Figure 4 – Design cross-section***

## Alternatives

The study area was divided into sections between the future interchange locations as well as north and south of the highway. Each section between interchange location had differing numbers of route options (and in some cases, sub-options) to evaluate for roadway connections, depending on the location and condition of existing roads and the influence of constraints, such as bodies of water. While the alternatives were separated by sections, there was consideration given to how the alternatives for each section interrelated to the section immediately to the east and west, in order to maintain some level of consistency/continuity between the sections along the full study corridor.

The following figures provide a sample of the type of alternative development route options that were developed for all sections within the study.

**NORTH OPTION 1**




**NORTH OPTION 2**

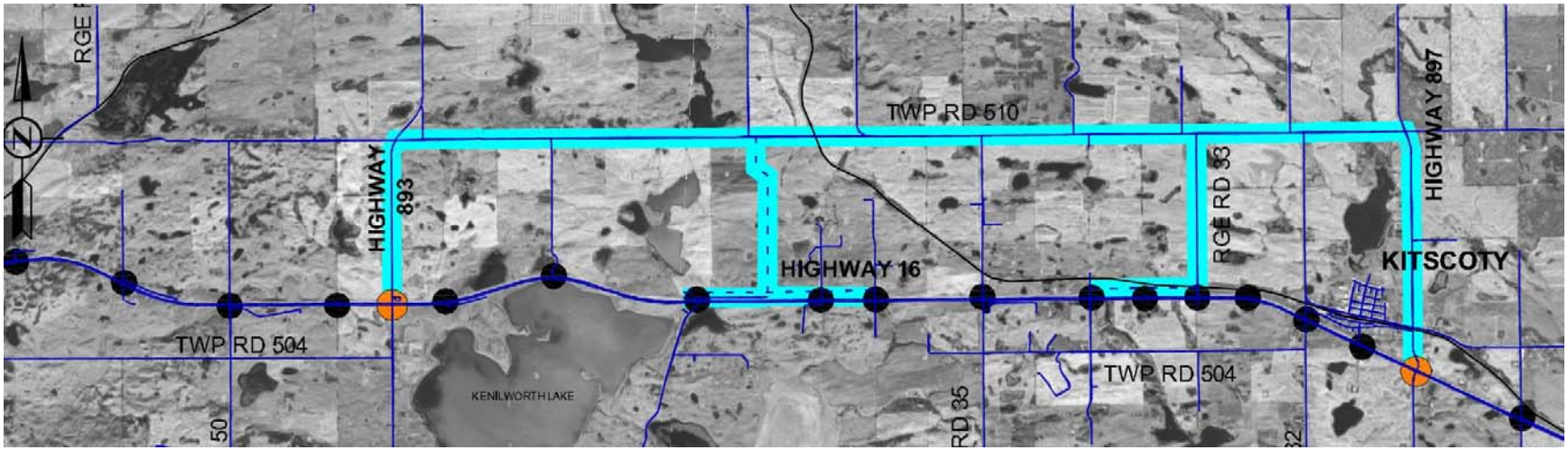
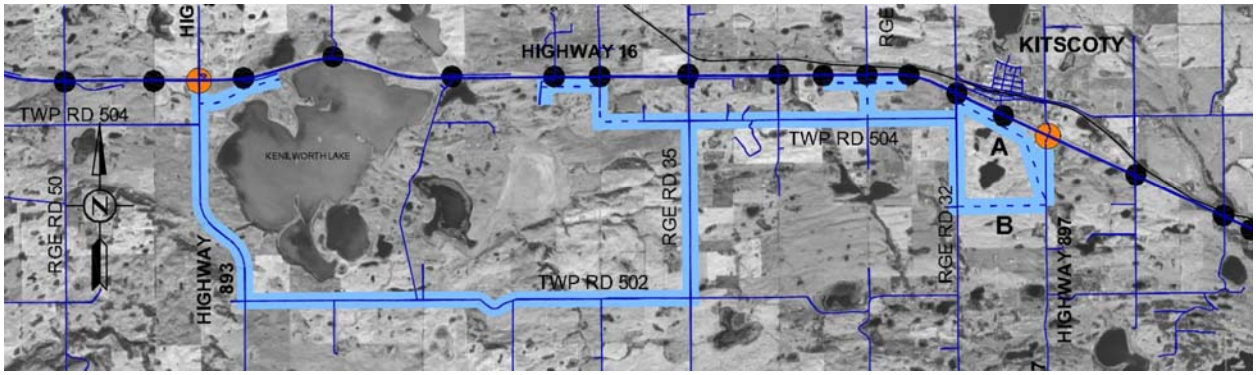
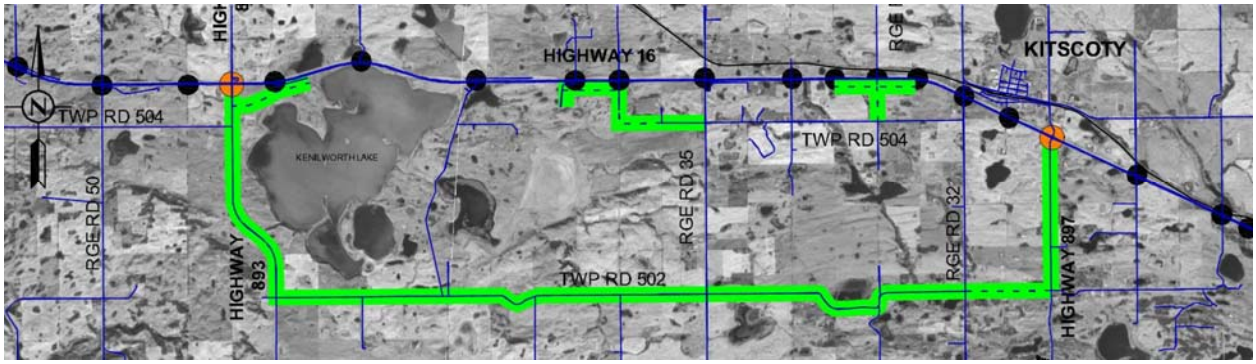



***Figure 5 – Sample north side section option***

**SOUTH OPTION 1**




**SOUTH OPTION 2**




**SOUTH OPTION 3**

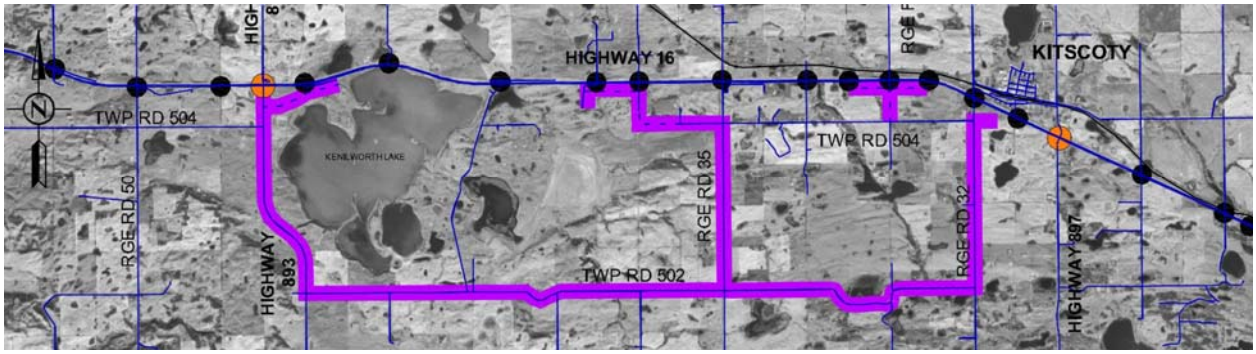



***Figure 6 – Sample south side section options***

## Evaluation Methodology

The alternatives were evaluated in accordance with the approved design criteria, as well as with comparative evaluation criteria developed for this study. Through the evaluation process, slight modifications may be identified for the alternatives for each section. Such changes, optimizing the road configurations and/or minimizing costs, typically arise during detailed, side-by-side comparison of options and the review of options against the evaluation criteria.

Evaluation criteria were used to determine which alternatives best satisfy the intent of the study. For the purposes of the study, it was determined that a formal weighted and ranked evaluation process was not necessary to accomplish the study objectives, and a basic comparative evaluation process was, instead, used to select the recommended plan.

***Table 1. Evaluation Criteria***

| Criteria | Description | Unit(s) of Measure |
|---|---|---|
| Traffic | • Assessment of current network's operational capacity along with potential perceived impact from additional traffic on local and collector roads, including review of extent of increase in out-of-way travel. | • Classification change requirement<br>• Minor, Moderate, Major |
| Geometry | • Determination of vertical and horizontal curve and grade constraints.<br>• Determination of requirements for accommodation of multi-axle vehicles. | • Description of issues<br>• Quantification of number of improvements required<br>• Minor, Moderate, Major |

***Table 1. Evaluation Criteria – cont'd***

| | | |
|---|---|---|
| Constructability | • Determination of the ease of construction and staging potential (qualitative description and subjective measure of the impact).<br>• Determination of the impact to the surrounding road network and community during construction (subjective measure of perceived disruption and associated inconvenience).<br>• Determination of permit requirements (construction, environmental, constraints, time of construction). | • Description of issues<br>• Number of permit issues<br>• Minor, Moderate, Major |
| Safety | • Measure of the impacts to the operational safety of the roadway (qualitative description and subjective measure of relative impacts). | • Description of issues<br>• Minor, Moderate, Major |
| Utilities | • Determination of any conflicts with existing or proposed utilities, as well as potential relocations (both quantitative and subjective measures of impacts). | • Number of utility conflicts/length of relocation<br>• Type of utility<br>• Minor, Moderate, Major |
| Social | • Determination if any additional land is required (quantitative measure).<br>• Determination of impacts to communities during and after construction (both descriptive and subjective measures of impact) | • Description of issues<br>• Calculation of land area (ha) required<br>• Minor, Moderate, Major |
| Environmental/ Heritage | • Determination of potential for environmental impacts, including impacts to known environmental/historical sites or water bodies (both descriptive and subjective measures of impact). | • Description of issues<br>• Minor, Moderate, Major |
| Cost | • Determination of order of relative magnitude of cost of alternative compared to other alternatives, including: road construction, utility relocation, environmental mitigation, and other possible factors related to cost | • Minor, Moderate, Major |

The study area segment between the interchanges at Minburn and Mannville, and the segment between the Vermilion and Hwy 893 interchanges, each had only one north and one south access management alternative possibility. Within these areas, existing infrastructure is available to provide full access between the interchanges without significantly impacting out-of-way travel times or leaving isolated properties when the accesses to Highway 16 are closed. Therefore, evaluation matrixes were deemed unnecessary for these segments.

Each alternative was assessed against each evaluation criterion and a detailed table developed with an overall unit of measure assessed at the end of the description. Although, in some instances, non-continuous routes were evaluated to be better than a continuous route, the overall benefits of a continuous route were deemed to outweigh the cost/ disadvantages of a non-continuous alternative.

The following table provides a sample of what the final evaluation tables looked like. This table demonstrates one of the sections that had a route that was evaluated as a better route but the recommended route provided a continuous route which was considered to outweigh a non-continuous route in this instance.

***Table 2. Sample evaluation table for one of the south sections***

| ***Criteria*** | South Option 1AC | South Option 1AD | South Option 1BC | South Option 1BD | South Option 2 | South Option 3 | South Option 4A | South Option 4B |
|---|---|---|---|---|---|---|---|---|
| *Traffic* | MINOR | MINOR | MINOR | MINOR | MINOR | MODERATE | MAJOR | MAJOR |
| *Geometry* | MODERATE | MODERATE | MODERATE | MODERATE | MINOR | MAJOR | MODERATE | MINOR |
| *Constructability* | MINOR | MAJOR | MINOR | MAJOR | MAJOR | MODERATE | MINOR | MINOR |
| *Safety* | MINOR | MODERATE | MINOR | MODERATE | MAJOR | MODERATE | MAJOR | MAJOR |
| *Utilities* | MODERATE | MAJOR | MODERATE | MAJOR | MODERATE | MODERATE | MINOR | MINOR |
| *Social* | MODERATE | MAJOR | MINOR | MAJOR | MAJOR | MODERATE | MODERATE | MINOR |
| *Environmental/ Heritage* | MINOR | MAJOR | MINOR | MAJOR | MAJOR | MODERATE | MINOR | MINOR |
| *Cost* | MODERATE | MAJOR | MODERATE | MAJOR | MAJOR | MAJOR | MINOR | MINOR |
| | | | RECOMMENDED | | | | | |

## Consultation Approach

To obtain public input regarding the access management alternatives and recommended solutions, public open houses were held from 4 p.m. to 8 p.m. after the alternative development stage and the recommended alternative stage of the project to allow the interested public to submit comments. For each of the open houses, identical sessions were held on consecutive nights at two locations within the study area to accommodate as many people as possible with minimal travel required. Each open house was well advertised in local newspapers, as well as on community websites. Flyers were included with the delivery of the monthly gas bills to area residents within

the Town of Vermilion. Open house flyers were also circulated with local newsletters. Those who attended the first open house were also directly notified by email or phone call of the second open house if they had requested to be notified on the comment sheet at the first open house.

The primary focus of the initial open house was to provide information regarding the study, present possible route choice alternatives for local road access and connection to/from the future interchange locations, and present the next steps in the study. The display panels created for the open house detailed the study area, including locations/boundaries of: existing communities, social centres, ESAs, and other existing conditions that would impact the selection of access routes through the area. Display boards illustrating the alternative routes were also created for public review and comment. Over the course of two nights, a total of 65 participants attended the initial open house. A total of 14 comment sheets were received. The primary concerns raised by the area residents and other stakeholders were regarding land access for farmers owning properties north and south of Highway 16, plans for the Highway 16/Highway 897 intersection near Lloydminister, and the anticipated timeline for upgrading Highway 16 to full access control. The following is a summary of comments received at the first open house with the number after the comment indicating the number of similar comments received.

| **Written Comments** | **Number Received** |
|---|---|
| • Support for North Option 1 (Hwy 36 to Innisfree) | 4 |
| • Support for South Option 1 (Hwy 36 to Innisfree) | 4 |
| • Suggestions/comments on options shown | 2 |
| • Concerns with farmers who own land on the north and south side of Hwy 16 | 3 |
| • Kitscoty interchange is a concern | 2 |
| • Great work, please keep informed | 1 |
| • Changes will provide a safer situation | 1 |
| • Current flooding issues with Mannville intersection | 1 |
| • How will this affect businesses and who will pay for signs, promotional items and etc. | 1 |
| • Why does Hwy 16 need to close all accesses when QEII still has some accesses | 1 |
| • Access issues for school transportation | 1 |
| • Support for South Option 2 (Hwy 36 to Innisfree) | 1 |
| • The need to stagger the construction/closures of interchanges and access roads | 1 |
| • Concerns with Vermilion – Hwy893 southern options, what are options as landowners | 1 |
| • Suggest funds go towards healthcare | 1 |

**Verbal Comments**

- Residences do not like large farm equipment going through towns
- Suggestion of Ranfurly bridge
- Local businesses are worried about how closures will affect their businesses
- Concern over length of gravel roads travelled to reach Hwy 16 interchanges
- Kitscoty area residences expressed concern over possibly not having access to Hwy 897 interchange from the west
- Concern with increased distances for hauling and transportation of large farm equipment for farmers with farmland on both sides of Hwy 16
- What will the new “upgraded” roads be like, i.e. paved, widened, graveled, etc.
- What is the timing for the eventual closures
- Current Kitscoty intersection (Hwy 897 & Hwy 16) is unsafe and residences would like to know if this interchange conversion can happen in advance of the other proposed interchanges
- Many residences made comparisons to QEII and the fact that it still contains at grade accesses
- Farmers do not like driving though the town with equipment as it may pose a safety issue

The second set of open houses was held to present the recommended access management plan for Highway 16 when it is upgraded to an access-controlled freeway facility. A total of 37 participants attended the two open houses with 2 comment sheets received. The displays created showed the evaluation matrices used to determine the recommended plan, as well as large displays showing the recommended route in plan view. Concerns expressed by those attending included questions regarding whether or not the improved county roads would be paved or gravel-surfaced, whether the recommended plan will be revised in the future, and questions regarding farming access to fields on the north and south side of Highway 16.

Overall, the response from the public was generally positive. Local residents appeared to realize that the study was meant as a guideline for future planning, to be implemented once the area reaches a point where the upgrade of Highway 16 to an access-controlled facility is deemed appropriate (likely, many years into the future).

## Recommended Plan

The evaluation process, combined with the consultation process, resulted in identification of the preferred alternative for the areas north and south of Highway 16 throughout the study area. The recommended route was developed based upon all known existing infrastructure currently in place. The main goal in this exercise was to determine a creative solution that would utilize existing infrastructure and reduce the construction of additional service roads that would subsequently need to be maintained by the counties. Instead, improving existing infrastructure will provide the counties with an improved/upgraded inventory of roads that are already under their control and their maintenance programs.

The implementation of the recommended route will need to be planned and coordinated properly, as the study area spans a distance of approximately 115 km.

During the evaluation process, four of the eight evaluation matrices determined that a non-continuous route was advantageous or equivalent to the other options by comparison, strictly due to evaluation factors such as cost. Contrary to the findings of the evaluation comparison process, three out of the four routes (for which a non-continuous route scored highest) are instead recommended to be continuous routes as the benefits of providing a continuous route between interchanges was considered to outweigh the disadvantages in each of these specific cases.

## Implementation of the Plan

The conversion of Highway 16 to a fully access-controlled freeway facility will likely not occur for many years. When the traffic volumes on Highway 16 approach levels that suggest that the upgrade/conversion is necessary, the recommended access management plan should be reviewed to determine if any adjustments are required. Any such review should be done only after the locations and classification of all of the future interchanges are complete and preliminary interchange plans have been prepared. For example, the counties may have constructed new roads (roads that were not considered in this study) by that time that could be used for access management purposes. Similarly, the counties may have upgraded (or even closed) some existing roads within the study area. Area properties may also have been developed or redeveloped, resulting in a need to revisit accessibility issues.

Ideally, implementation of the access management plan should be staged to allow Highway 16 and local road users to become accustomed to the new access arrangements. This will allow for smoother integration into the existing road network. The transition to an access-controlled freeway should begin at either end of the current study area, with implementation rolling out towards the existing Vermilion interchange.

## Conclusion

This study illustrated that frontage roads are not always the solution for access management and development of creative solutions that can integrate into the local roadway development plans and area culture and viewpoints can be achieved and endorsed by the area residents and local jurisdictions.

The recommended plan made use of existing road infrastructure (with upgrades, where needed) where feasible, complemented by strategically-selected new road segments. Whenever practical, preference was given to the provision of continuous routes between the future interchanges to minimize out-of-way travel for all types of area road users, including emergency vehicles.

By using/upgrading existing infrastructure and reducing the construction of additional service roads, the County of Minburn and the County of Vermilion River will have an improved road inventory instead of additional road inventory to maintain.

Implementation of the recommended route should be done in stages, allowing area residents and other users of the area road network to adjust to the elimination of direct at-grade accesses to Highway 16.

Access management plans should be flexible and used as a guide when the implementation is many years in the future. This study's recommended access management plan will likely not be implemented for 20 or more years, when the traffic volumes reach the necessary level for reclassification of Highway 16. The details of the recommended plan should be re-examined closer to the time of implementation. This will allow for the recommended plan to be updated to reflect any changes that may have come into effect over time, and also to take into account new road infrastructure that may have been constructed by the counties, as new or improved county roads may provide a better access management solution than would the currently-recommended alternatives.

## References


CH2M HILL Canada Limited. 2009. Highway 16 Access Management Plan, Final Report #R-1065, Plan No. P-3355. Technical report prepared for Alberta Transportation. December.

Stantec Consulting Ltd. 2005. *Hwy 16 – Freeway Corridor Management Study, Jasper Park Boundary to Lloydminster, Final Report #R-924.* Technical report prepared for Alberta Infrastructure and Transportation. September.

Stantec Consulting Ltd. 2002. *Highway 16 – Functional Planning Study. Future Realignment Around Lloydminster*. Technical report prepared for Alberta Transportation and Saskatchewan Highways and Transportation. File: 135-55075. October.

Alberta Transportation 1995, updated 1999. *Highway Geometric Design Guide*.


## Acknowledgments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