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1.0 INTRODUCTION

1.1 Study Context

The Manitoba Government is investigating routes for a future all-weather road¹ (AWR) system in northern Manitoba, linking presently isolated communities to the existing provincial trunk highway/provincial road network. The new AWR system would support social and economic development of these remote communities, while being located and built in an environmentally responsible manner, respectful of traditional activities, culture and land values of First Nations communities.

In late 2014 Manitoba Infrastructure and Transportation (MIT) retained SNC-Lavalin Inc. to undertake a route selection study for an all-weather road (AWR) from York Landing to Ilford, as well as a future AWR link from these communities to Provincial Road (PR) 280.

The community of York Landing (York Factory First Nation) located on the south side of Split Lake (a widening of the Nelson River) are serviced in the summer months by a ferry, the MV Joe Keeper, that transports cars, trucks and passengers across Split Lake between York Landing and PR 280, located on the north side of Split Lake. PR 280 is accessed via a local provincial road through the community of Tataskweyak (Split Lake) (Tataskweyak Cree Nation). A winter road provides an overland and ice crossing of Split Lake when the ferry is no longer able to operate. Weather permitting, the York Landing airport provides year round scheduled daily airline service.

The community of Ilford, (War Lake First Nation), located about 30 km east of York Landing, is serviced year round, on a 2-3 days per week basis, by VIA Rail which operates along the Hudson Bay Railway (HBR) between The Pas and Churchill, and in the winter by a generally overland winter road (there are a number of stream crossings) to York Landing. Air charter service can also be available at the airport, weather permitting, year round.

1.2 Study Goals

Broadly speaking, the goals of connecting with an AWR the communities of York Landing/York Factory First Nation and Ilford/War Lake First Nation to each other, as well as to PR 280, (Ilford is already connected to VIA Rail service operating on the Hudson Bay Railway) are as follows:

- Reduced costs of living (both monetary and in terms of time) associated with travelling between York Landing and Ilford and major provincial centres
- Reduced impassability; year-round access between York Landing and Ilford

¹ A provincial all all-weather road (AWR) is open to traffic all year; is often a gravel road, with dust control where necessary; in rugged terrain is usually posted for speeds in the range 60-80 km/h; and is normally wide enough for trucks to pass each other. Sometimes bridges may be restricted to one lane operation.

- Improved quality of life by providing increased accessibility to educational and health facilities, shopping, recreational opportunities and other nearby services
- Local economical benefits from enhanced trade/exchange of services between nearby communities
- Employment opportunities from enhanced accessibility

1.3 Previous Work and Additional Background

1.3.1 Phase 1- Northern Manitoba Remote Communities Transportation Network Study

The two communities were included in an earlier study completed in August 2012, titled, “Northern Manitoba Remote Communities Transportation Network Study” which covered a large area of northern Manitoba (see Figure 1.1), and including, in a clockwise direction, starting in northwestern Manitoba, the communities of Pukatawagan, Brochet, Lac Brochet, Tadoule Lake, Churchill, Shamattawa, Ilford, York Landing, Pikwitonei and Thicket Portage. This is known as the Phase 1 Study, and the current assignment is known as the Phase 2 Study. Chapter 2 provides a synopsis of the material that was gathered for Ilford and York Landing.

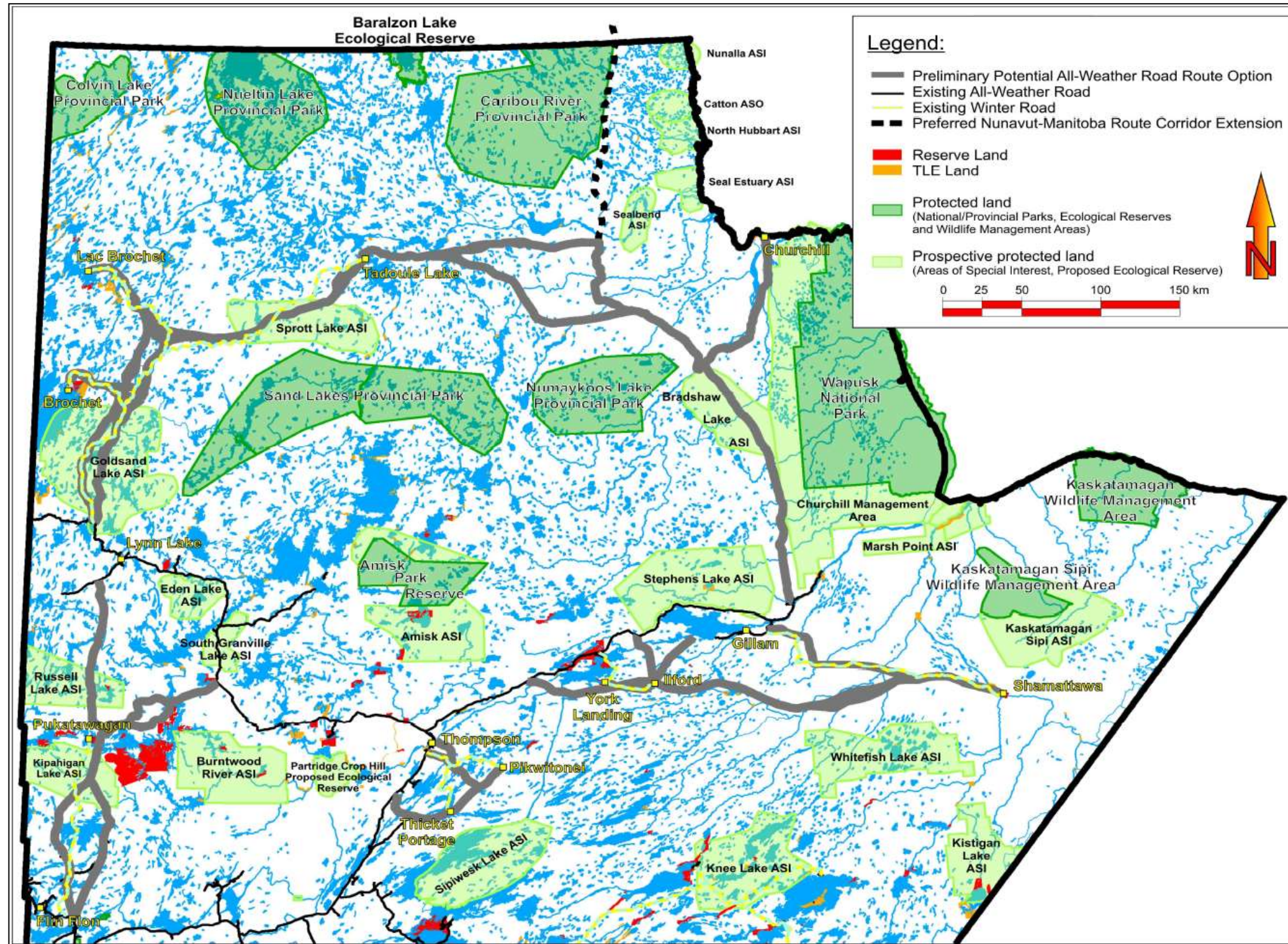
1.3.2 Other Background

This and earlier studies undertaken for MIT in relation to the transportation needs of York Landing and Ilford are listed in Table 1.1.

Table 1.1 York Landing – Ilford All-Weather Road Past Studies

Community	Study Title, Date, Author and Client
Multiple Communities	Northern Manitoba Remote Communities Transportation Network Study (NMRCTNS) – Phase 1 Report, August 2012, SNC-Lavalin Inc. for MIT
York Landing	All-Weather Road Servicing Options for York Landing – Public Consultation December 2001, Dillon Consulting Limited study for Manitoba Transportation & Government Services
Ilford	All-Weather Road Servicing Options for Ilford – Public Consultation December 2001, Dillon Consulting Limited study for Manitoba Transportation & Government Services
York Landing – Ilford	York Landing – Ilford Transportation Servicing Assessment, June 2011, Transportation Systems Planning and Development Branch for MIT
York Landing – Tataskweyak (Split Lake)	Preliminary Report containing the Condition Assessment Report of the MV “Joe Keeper” Ferry and Outline of Options and Recommendation for the Future Provision of Ferry Services to the Community of York Landing, Manitoba, August 2008, International Marine Consultants for MIT Northern Airports and Marine Operations

Figure 1.1: Northern Manitoba Transportation Study Phase 1 Scope



1.4 Study Scope

The study was undertaken over a period of about 15 months as described in the following summary of tasks which generally follow those set out in the MIT Terms of Reference for the study. In brackets are the numbers of the chapters in this Final Report that approximately correspond to the tasks.

Task 1	Review of Phase 1 Results/Confirmation of Route ² and Corridor Options ² (Chapters 2 and 3)
Task 2	Stakeholder and Initial Public Engagement (Chapter 4)
Task 3 & 4	Evaluation of AWR Routes, Ilford to York Landing to Aiken Point and Selection of Preferred Alignment (Chapters 5, 6 and 7)
Tasks 5 & 6	Evaluation of AWR Corridors York Landing/Ilford to PR 280 and Selection of Preferred Alignment (Chapters 5, 6 and 7)
Task 7	Final Public Engagement (Chapter 8)
Task 8	Final Analysis and Recommendations (Chapters 9 and 10)

1.5 Study Organization

The study was undertaken by a multi-disciplinary team managed by SNC-Lavalin Inc. reporting to the MIT Project Director. Oversight was provided by a Technical Working Group and Project Steering Committee. Significant input and comment was received from a Stakeholder Advisory Group. The consultant team organization for the project, as well as the corresponding reporting structure to the client, is shown in Figure 1.2.

Figure 1.2: Study Team Organization



2.0 ENVIRONMENTAL SCAN: REVIEW OF MATERIAL FROM PHASE 1

Iford and York Landing were included in an earlier study completed in August 2012, titled, “*Northern Manitoba Remote Communities Transportation Network Study*” which covered a large area of northern Manitoba. The current assignment to establish preferred alignments for all-weather roads is known as the Phase 2 of the Study. This chapter provides a synopsis of the material that was gathered for Iford and York Landing. The Phase 1 Study included the following work:

- Transportation engineering analysis, including discussion on road development standards
- Preliminary social and economic scoping findings
- Preliminary natural environmental analysis
- Identification of AWR corridor options to link all of the presently isolated communities to the existing provincial trunk highway/provincial road system

During the Phase 1 study a number of corridor alternatives were identified for AWR routes connecting York Landing to Iford, and beyond to PR 280 (see Figure 2.1).

2.1 Corridor Alternatives: Iford to York Landing

In Phase 1, two corridor alternatives were proposed for the all-weather road from York Landing to Iford; the main difference being whether the road was routed north or south of Moose Nose Lake. See Figure 2.1.

The corridor alternative south of Moose Nose Lake paralleled the Hudson Bay Railway (HBR) for a portion of its length, and also paralleled the existing winter road. The corridor alternative north of Moose Nose Lake paralleled an existing Manitoba Hydro Transmission Line

In both cases, following established transportation and/or utility corridors helps minimize the net impact of infrastructure on the natural environment, as much of the area that would be disturbed by the new road has already been disturbed, and thus the incremental impact is smaller than a Greenfield alignment. The south option also has the advantage of enabling the use of the winter road corridor for construction access while the all weather route is being built.

Both corridors generally follow gently rolling topography, the terrain predominantly consisting, closer to the communities, of thin till over bedrock terrain. There are local occurrences of wetlands, small lakes, organic deposits and granular material. There are no known Areas of Special Interest in the corridors, and no major water crossings are required.

2.2 Corridor Alternatives: PR 280 Connection

In the Phase 1 study, three separate corridor options were developed to connect the communities of York Landing and Ilford to PR 280. A key requirement during Phase 1 was that the entire route consist of an all-weather road; in other words, solutions involving a ferry crossing were not included in the scope. These three options are shown in

Figure 2.1, and each is summarized below.

2.2.1 York Landing to PR 280 via Kelsey Generating Station

Initially the first alternative proposed AWR crossing of the Nelson River was to use the existing Kelsey Dam. The terrain along this corridor is predominantly a mix of till and bedrock (till blanket & till veneer). After the initial identification of this alternative, information obtained from Manitoba Hydro precluded using the dam for a public all-weather road on account of security issues as well as, the dam not having been designed to accommodate a public road e.g. there is a critical corner on the existing service road over the powerhouse and spillway that significantly limits the size of a tractor trailer that can pass over the dam. For these reasons this alternative corridor was shifted to be downstream from the dam.

There are several other major water crossings required on this segment of corridor. They include the Aiken River (~35-50 m wide), the Grass River (~160 m wide) and the Burntwood River (~125-150 m wide). Total construction length to connect Ilford to PR 280 via Kelsey Dam is approximately 86 km. Travel distance from Ilford to Thompson using this routing is about 174 km and from York Landing to Thompson, about 154 km.

2.2.2 Ilford & York Landing to PR 280 via Birthday Rapids

Initially the second option for connecting Ilford and York Landing to PR 280 went from Ilford north to PR 280 via a new crossing of the Nelson River at Birthday Rapids. This corridor had one major crossing, of the Nelson River (~330 m wide). The terrain along this corridor is predominantly a mix of till and lacustrine deposits.

Construction length for this option including the York Landing to Ilford connection, totals approximately 67 km. Travel distances from Ilford and York Landing to Thompson are approximately 208 km and 238 km, respectively.

Because Birthday Rapids has potential as a future hydro electric generation site it was decided to shift this potential AWR crossing of the Nelson River upstream to a point just east of the outflow from Split Lake.

2.2.3 Ilford & York Landing to PR 280 via Keeyask Generating Station

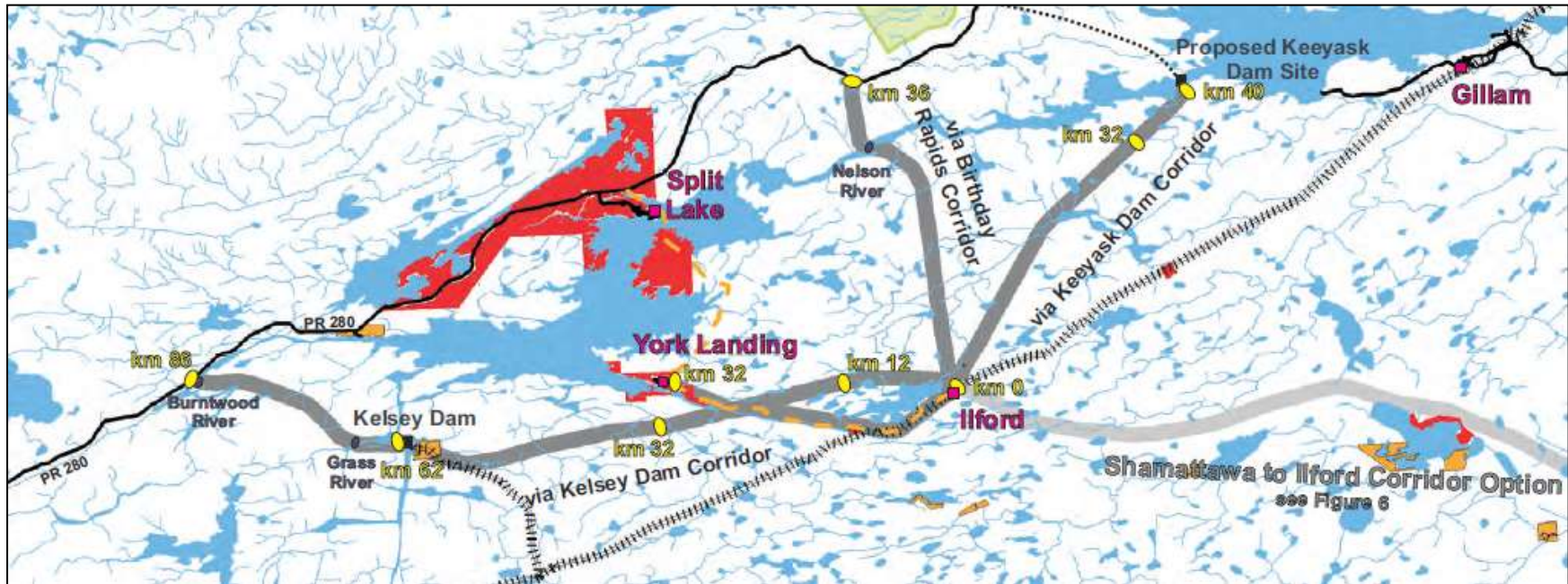
The third alternative AWR corridor was to connect Ilford and York Landing to Manitoba Hydro's under-construction Keeyask generating station. This would then provide access to PR 280 via the completed dam and the new, already-constructed north access road from Keeyask to PR 280. The dam has a scheduled in-service date of 2022.

As part of the Manitoba Hydro project, a south access road is also to be constructed to the generating station from Gillam, along the south shore of Stephens Lake to the dam, thus connecting to PR 280 north of the Nelson River. There are no major water crossings along the corridor segment between Ilford and the Keeyask dam. Manitoba Hydro will need to be contacted to ascertain any issues they may have, including security, with a public road crossing the Nelson River atop the new dam.

The terrain along this corridor is predominantly a mix of till and lacustrine deposits with an average amount of peat.

Total construction length to connect York Landing to Ilford then to the new Keeyask south access road at the dam site (the road that connects to PR 280) is approximately 72 km. Travel distance from Ilford to Thompson using this corridor is approximately 256 km and from York Landing to Thompson is approximately 288 km.

Figure 2.1: NMRCTNS Phase 1 York Landing and Ilford All-Weather Road Corridor Alternatives



2.3 Social Environment Issues and Demographics

The study area includes the York Landing, York Factory First Nation, the Ilford, War Lake First Nation and the Tataskweyak (Split Lake) Cree Nation communities and their respective Community Interest Zones. York Landing/York Factory First Nation has a population of about 462 on-reserve or close by, and about 833 elsewhere. Ilford/War Lake First Nation has a population of about 136 on the reserve or close by, and about 171 elsewhere. Tataskweyak Cree Nation has an on-reserve population of about 2,469 or close by, and about 1,311 elsewhere. See Table 2.1 for populations within or close to the communities. York Landing and Ilford/War Lake communities have high unemployment rates; and existing employment is dominated by the provision of public services. The area surrounding these communities is part of the Split Lake (Tataskweyak) Traditional Land Use Area (section 8) and is used for a variety of Traditional Land Uses, including fishing, hunting, trapping, berry picking and medicinal plant gathering. A number of registered traplines are listed in the area.

Table 2.1: Community Populations (December 2015)

	On Reserve	On Crown Land nearby	Total
York Landing / York Factory First Nation	395 + 49* = 444	18	462
Ilford / War Lake First Nation	95 + 6* = 101	35	136
Tataskweyak (Split Lake) / Tataskweyak Cree Nation	2350 + 116* = 2466	3	2469

* Other Band

Several Treaty Land Entitlements (TLEs) occur within the study area:

- The York Factory First Nation (Treaty No. 5)
 - Kelsey Site TLE (1092 acres) along the Kelsey Dam corridor; and
 - Old Fish Camp TLE (1019 acres) along the Kelsey Dam corridor.
- War Lake First Nation (Treaty No.5)
 - Moose Nose Lake TLE,(35 acres) on the south side of Moose Nose Lake;
 - Landing River (Aikens River) TLE (142 acres) on the south side of Moose Nose Lake; and
 - North of Ilford, TLE (1 acre).

The Keeyask Dam AWR corridor option passes by Butnau Lake where a section of land on the shore of the lake has been designated as First Nation Permit and Fee Simple Lands (21 acres). A portion of this corridor option also passes through the Fox Lake Cree Nation Special Consultation Area A.

The study area is located within the provincial Forest Management Unit 86, under the Northern Flood Agreement and within the Split Lake (Tataskweyak) Resource Management Area.

As the Route Selection Study has progressed, the locations and boundaries of the Treaty Land Entitlement areas were plotted on the study area mapping, making sure the all-weather corridor and route alignment options were located to avoid them, even if in some cases the communities may prefer to have an all-weather route relatively close by TLE areas, in order to facilitate land access.

2.4 Transportation Context

The transportation modes that are available in each community is summarized in Table 2.2. Although York Landing is shown as not having rail access, in winter it is possible for residents to use the railway by travelling to/from Ilford on the winter road.

Table 2.2: Transportation Mode Availability

Community	Air	Rail	Marine/ Ferry	Winter Road
York Landing / York Factory FN	Yes	No	Yes	Yes
Ilford / War Lake FN	Yes	Yes	No	Yes

The current, and in some cases, historic availability and cost of these existing transportation modes are as follows:

Air Travel:

York Landing

- Scheduled flights with Perimeter Aviation, (see Table 2.3)
- Flights 5 days a week (Monday to Friday)
- The cost for a flight between York Landing and Thompson is \$385 for a round trip flight

Table 2.3: Air Travel Schedule at York Landing

From Thompson to York Landing	From York Landing to Thompson
Departs 12:00 pm Arrives 12:30 pm	Departs 12:45 pm Arrives 1:15 pm

Ilford

- No scheduled service
- The cost of a charter flight between Ilford and Thompson is in the range \$1400-\$2600 for a round trip flight

Via Rail:

Ilford

- Trains run 3 times a week (Sunday, Wednesday and Friday)
- Departs from Ilford at 6:53 AM arrives in Thompson at 11:00 AM
- Departs from Thompson at 5:00 PM arrives in Ilford 9:36 PM
- The cost is \$42.00 for a round trip ticket
- Length of “typical” shopping day 16 hours

MV Joe Keeper Ferry:

York Landing to Tataskweyak (Split Lake) and return

- This ferry operates 6 days a week (Wednesday to Monday)
- The ferry capacity is 16 cars, or 2 semi-trailer trucks, or 1 semi-trailer truck and 4-5 cars
- There are 2 round trips (York Landing to Tataskweyak) a day starting from 8:00 AM running till 6:00 PM
- The average length of the ferry season is 5 months from end of May to end of October, (see Table 2.4)
- The MV Joe Keeper has a limited estimated remaining service life and an estimated replacement value of \$12 to \$18 million

Table 2.4: Historic Length of Ferry Season

Year	First Run	Close of Season
2005	May 29	Oct 31
2006	May 18	Nov 3
2007	May 18	Nov 1
2008	Jun 10	Nov 3
2009	Jun 5	Nov 3
2010	May 11	Oct 31
2011	Jun 7	Nov 5
2012	May 28	Nov 2
2013	May 31	Oct 31
2014	Jun 4	Nov 5
2015	May 27	

Winter Road:

York Landing to Ilford, and York Landing to PR 280

- The average length of the winter road season is 2 months from end of January to end of March, (see Table 2.5)

Table 2.5: Historic Length of Winter Road Season

Year	Opening Date	Closure Date
2007-2008	Jan 26, 2008	Mar 28, 2008
2008-2009	Jan 26, 2009	Mar 27, 2009
2009-2010	Jan 28, 2010	Mar 12, 2010
2010-2011	Jan 19, 2011	Mar 28, 2011
2011-2012	Feb 12, 2012	Mar 18, 2012
2012-2013	Jan 22, 2013	Mar 28, 2013
2013-2014	Jan 22, 2014	Mar 28, 2014
2014-2015	Feb 6, 2015	Mar 26, 2015

Shoulder Seasons: (No ferry service or winter road service)

York Landing

- Spring Shoulder Season: The average length of the spring shoulder season is 2 months from end of March to end of May
- Fall Shoulder Season: The average length of the fall shoulder season is 3 months from end of October to end of January
- Total length of shoulder seasons is about 5 months i.e. York Landing can only be accessed by air during a 5 month period, in the spring from end of March to end of May, and in the fall/winter, from end of October to end of January.

2.5 Natural Environment Challenges

New all weather roads generally create positive economic benefits, but negative environmental effects that often can only be partially mitigated. The construction process includes substantial disturbance outside of the road alignment, such as borrow pits and staging areas. Culverts and crossings can lead to sedimentation and erosion in rivers and lakes. All weather roads may lead to a demand for side roads, which in turn create more access to previously unsettled land. They may fragment habitat and encourage new road-side shrub vegetation, which attracts other species usually not found in undisturbed boreal forest. They may promote increases in hunting and fishing pressures, sometimes on populations of animals and fish that cannot withstand that pressure. Roads may also be used by predators such as wolves to gain access to range that may have been difficult to access in the past. Careless travelers or vehicle collisions along all weather roads may also increase the risk of forest fires.

The study area contains a number of Species at Risk that are protected under the federal Species at Risk Act (SARA) and/or the Manitoba Endangered Species and Ecosystems Act (MESEA), including boreal woodland caribou, shortjaw cisco, rusty blackbird, common nighthawk, olive -sided flycatcher, and whip-poor-will (see Table 2.6). The table also indicates species that have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The study area is part of the winter range of Pen Island caribou, a population of coastal migratory woodland caribou that migrate between northeast Manitoba and northwest Ontario.

Figure 2.2: Photo of a Migratory Woodland Caribou (Photo Credit: Pixabay)



SNC-Lavalin contacted the Manitoba Conservation Data Centre in December 2014 to identify occurrences of listed species in the study area. Several occurrences were identified, including rusty blackbird, common nighthawk and olive-sided flycatcher. In the event these occurrences or other listed species or sensitive habitat areas are identified within the project footprint, preliminary mitigation strategies will need to be identified to avoid or minimize impacts resulting from construction activities. Avoidance strategies could include the use of an alternative alignment that does not disturb listed species or sensitive habitat, making modifications or choosing alternatives to construction methods, or the establishment of setbacks around these features prior to construction commencement.

Table 2.6: Species at Risk with the Potential to Occur in the Study Area

Taxon	Common Name	Scientific Name	MESEA	SARA	COSEWIC
Mammal	Woodland caribou	<i>Rangifer tarandus caribou</i>	Threatened	Schedule 1, threatened	Threatened
Fish	Shortjaw cisco	<i>Coregonus zenithicus</i>	N/A	Schedule 2, threatened	Threatened
Bird	Rusty blackbird	<i>Euphagus carolinus</i>	N/A	Schedule 1, special concern	Special concern
Bird	Common nighthawk	<i>Chordeiles minor</i>	Threatened	Schedule 1, threatened	Threatened
Bird	Olive-sided flycatcher	<i>Contopus cooperi</i>	Threatened	Schedule 1, threatened	Threatened
Bird	Whip-poor-will	<i>Caprimulgus vociferus</i>	Threatened	Schedule 1, threatened	Threatened

Watercourse crossings along the selected route will likely require review and potential authorization by the Department of Fisheries and Oceans Canada (DFO) prior to construction. During construction, measures will need to be implemented to avoid and mitigate harm to fish. If there is likely to be serious harm to fish after the application of avoidance and mitigation measures, then a plan to undertake offsetting measures would need to be developed. None of the watercourses in the area are on the List of Scheduled Waters under Transport Canada's Navigation Protection Act (NPA), therefore we believe no Transport Canada approvals will be required.

The project is not located within any currently known National Parks, Provincial Parks, or other protected areas. Stephens Lake Area of Special Interest (ASI) is located north of PR 280 and outside of the study area.

3.0 CONFIRMATION OF PRELIMINARY ROUTE & CORRIDOR OPTIONS

At the start of the current study (Phase 2), key stakeholders were consulted to confirm the corridors that would be moved forward for public consultation, to avoid presenting options that were either infeasible or imposed significant constraints. Sections 3.3, 3.4 and 3.5 describe the option refinements that resulted.

3.1 Preliminary Stakeholder Engagement

This engagement consisted of early communication by e-mail, between February 2nd and 4th, 2015 from the MIT Assistant Deputy Minister (ADM), to provincial and federal government departments who would have an interest in the study, as well as the Manitoba Metis Federation, and public/private agencies such as VIA Rail, Omnitrac, MB Hydro and others (for a complete list of stakeholder contacts see Appendix A).

Subsequent to the ADM's communication, SNC-Lavalin sent emails to solicit the thoughts and questions from the each of the Stakeholder Advisory Group (SAG) representatives, regarding the different route options being considered for the All-Weather Road (AWR) between York Landing and Ilford, and corridor connection options between these two communities and Provincial Road 280. In some cases SNC-Lavalin followed up by having teleconferences with stakeholders.

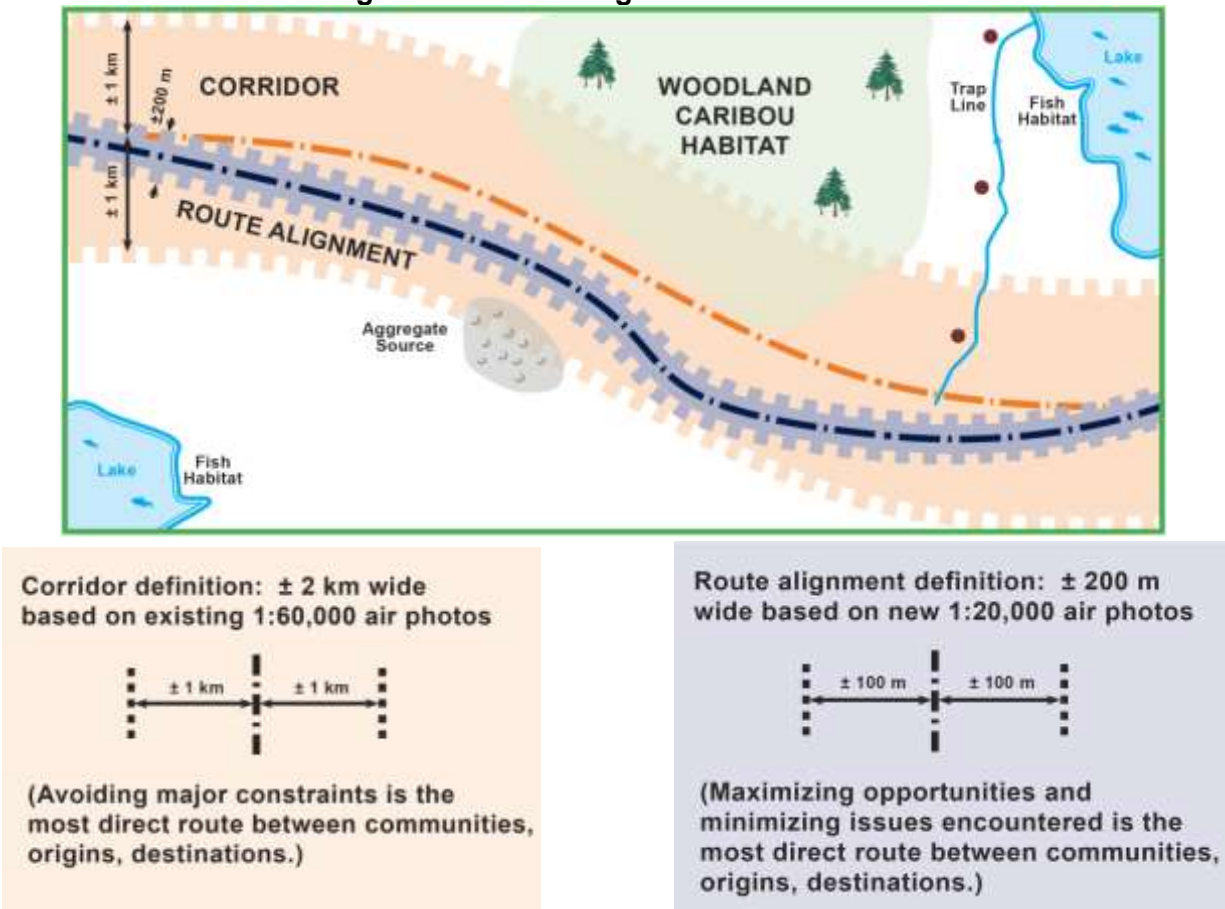
Discussion and communication with MB Hydro at the start of Phase 2 resulted in refinement of the three corridor options that crossed the Nelson River. Although MB Hydro had been represented on the Technical Liaison Group during Phase 1, no in depth discussion with them had been held on the challenges of crossing the Nelson River, the flows and levels of which are controlled by MB Hydro in order to facilitate the generation of hydro electric power.

The resulting refined options (described below) were presented to, and endorsed by the Technical Working Group and the Project Steering Committee, and also discussed at a meeting with the Chiefs of York Landing, Ilford and Tataskweyak, prior to the Round 1 community open houses discussed in Section 4.

3.2 Route Alignment vs. Highway Corridor

For purposes of this discussion, a corridor is defined as an approximate 2 km wide band of interest containing a number of route alignment options. A route alignment is defined as a narrower band of interest approximately 200 m wide within which the final AWR alignment can be located (see Figure 3.1)

Figure 3.1: Route Alignment vs. Corridor



3.3 Alignments for Ilford to York Landing

During the initial phase of the Northern Manitoba Transportation Network Study, two all-weather road (AWR) route alternatives for connecting York Landing and Ilford/War Lake were generated (see Figure 3.2):

- Route Option 1 north of Moose Nose Lake being about 25 km long between common points
- Route Option 2 south of Moose Nose Lake being about 26 km long between common points

Upon review with key stakeholders, these two options were confirmed for presentation and discussion with key stakeholders and the public.

3.4 Alignment for York Landing to Aiken Point

York Landing requested consideration for relocating the MV Joe Keeper ferry terminal from its present location to a new one on the north shore of Aiken Point west of the community. The rationale given for this was as follows:

- It would reduce the current approximate 2-hour duration of the ferry trip to about one-hour, enabling more round trips than the maximum of 2 per day
- By moving to a location with a stronger current, the ice free period within which the ferry could operate could likely be extended from about 5 months, by about one month to 6 months

This concept was supported by MIT Northern Airports & Marine Operations (NAMO). As a result of this request, an AWR extension from York Landing to Aiken Point was added to the road network under investigation. This route extension is also illustrated in Figure 3.2.

3.5 Corridors for PR 280 Connection (to Ilford and York Landing)

During the initial phase of the Northern Manitoba Transportation Network Study three corridor alternatives for connecting the above two communities across the Nelson River to PR 280 were also generated. Upon review with key stakeholders, the refinements were made and they are described below and illustrated in Figure 3.3.

Corridor 1 – Via Kelsey Dam: this was moved to be downstream of the Kelsey Dam to avoid going over the powerhouse and spillway, since the existing road on the dam had severe geometric constraints, not having been designed to carry a public road. Furthermore Manitoba Hydro had security concerns with crossing the dam. Because of the high cost of a permanent fixed link bridge, it was decided, that if feasible, the Nelson River and also the Burntwood River would be crossed using cable ferries.

Corridor 2 – Via Birthday Rapids: this was shifted upstream to be near the Nelson River outflow from Split Lake. This location was considered in order to avoid potential conflicts, should a dam ever be considered at or near Birthday Rapids. Because of the high cost of a permanent fixed link bridge, it was decided, that if feasible, the Nelson River would be crossed here using a cable ferry.

Corridor 3 – Via Keeyask Dam: The location of this corridor, connecting to a future access road that would cross the Nelson at the MB Hydro Keeyask Dam was considered acceptable to MB Hydro, as long as it did not interfere with an associated river

impoundment dike. The dam is currently under construction. MB Hydro intends to build the proposed South Access Road, which will connect the dam to Gillam.

Figure 3.2: Route Options

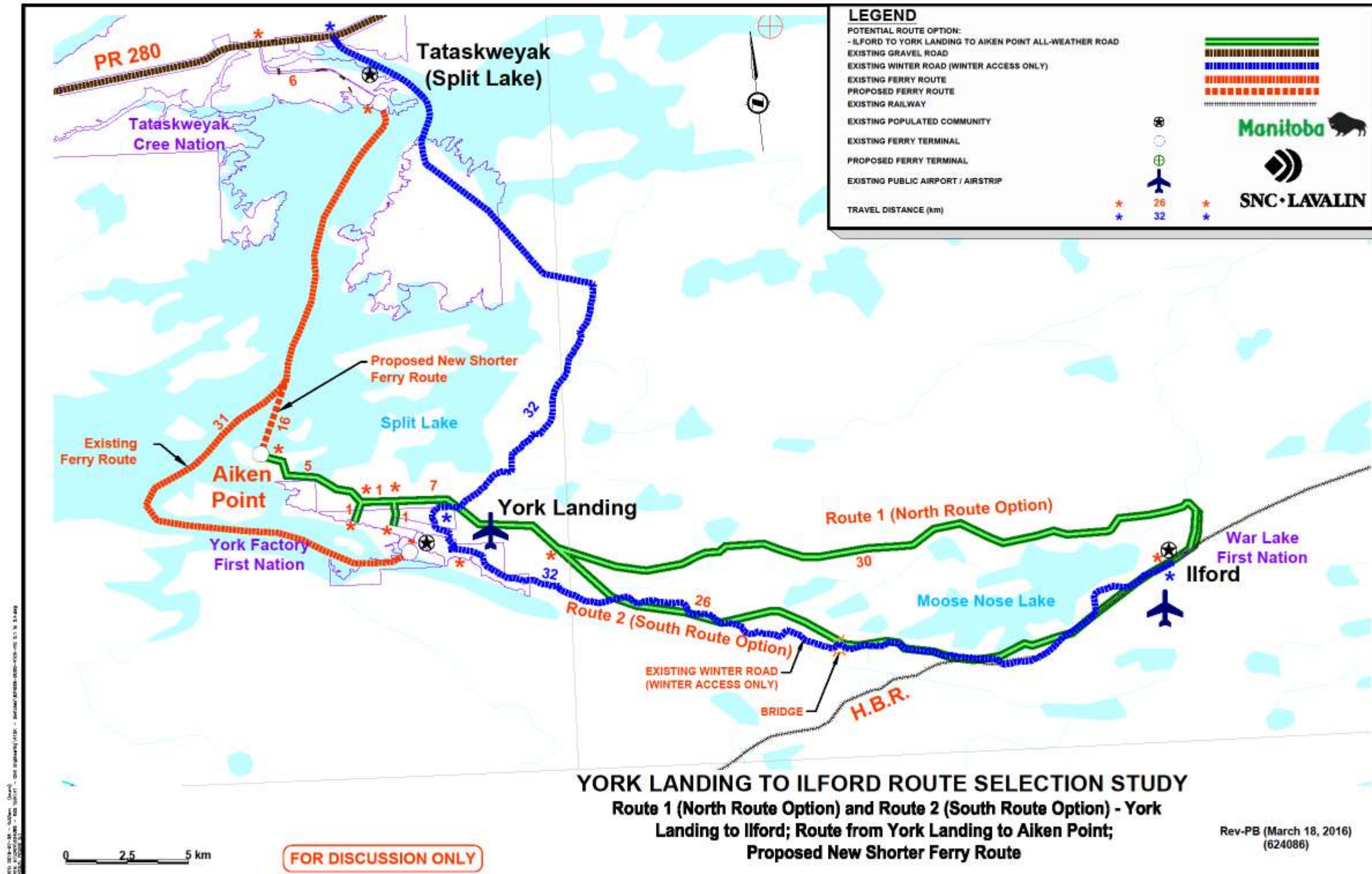
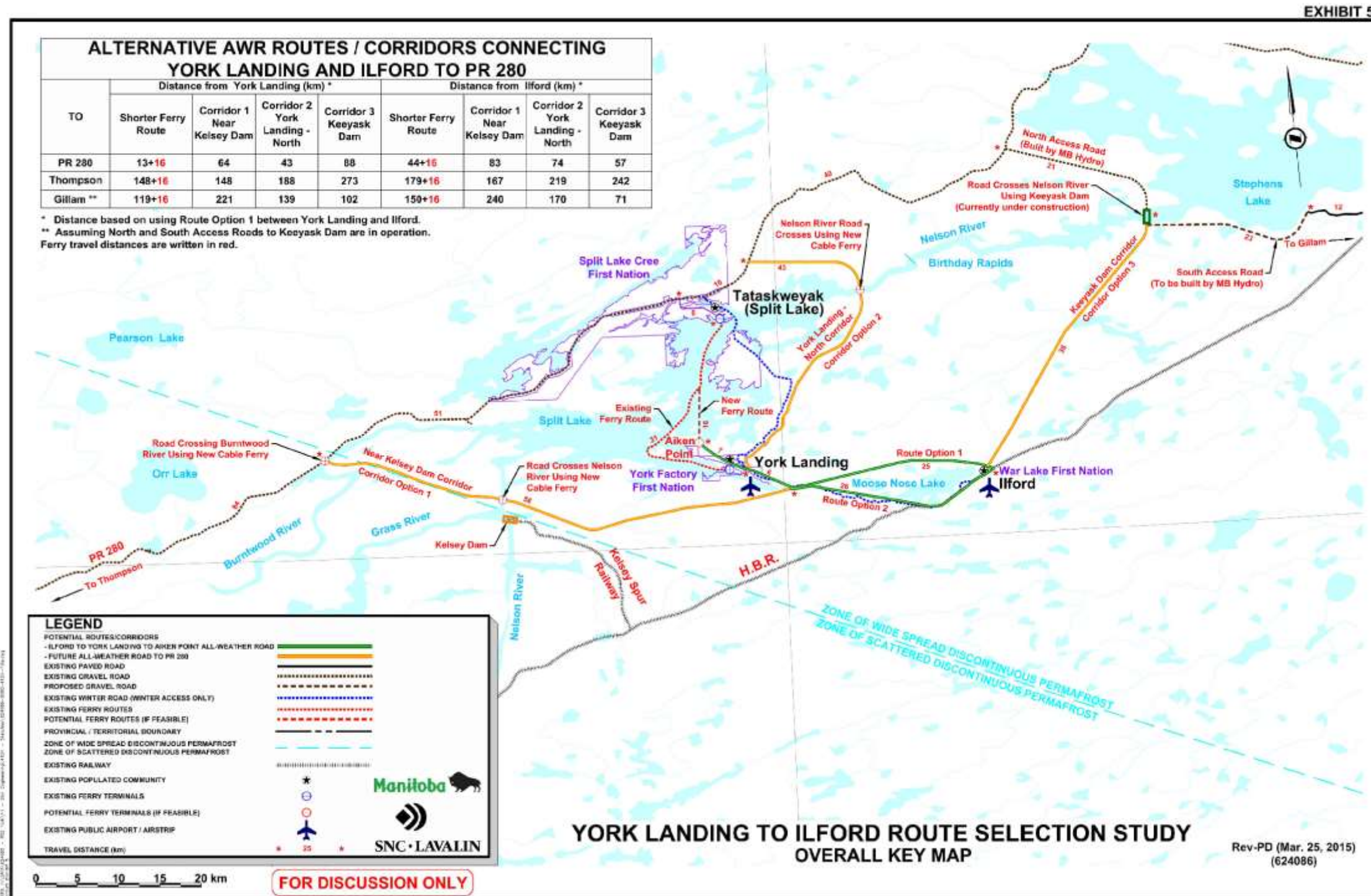


Figure 3.3: York Landing to Ilford PR 280 Corridors – all options



4.0 INITIAL PUBLIC ENGAGEMENT & STAKEHOLDER WORKSHOP

4.1 Summary of Initial Public Engagement Format

Several different forms of public engagement materials were developed to both inform the communities of the study and its findings, options, and next steps developed to date, as well as to solicit their thoughts and feedback on said findings, options and next steps.

Open Houses

Open houses were held in Ilford (War Lake First Nation), York Landing (York Factory First Nation), and Split Lake (Tataskweyak Cree Nation) on April 28-30, 2015.

Community Opinion Survey

During the public engagement meetings in Ilford, York Landing and Tataskweyak (Split Lake), attendees were asked to fill out a questionnaire style survey.

On-Line Access to Information

An online webpage was set up by Manitoba Infrastructure and Transportation to share the latest information on the study. Display boards, mapping of the proposed route and corridor options, presentation slides, and the community opinion survey that were shared during the open house were available for download.

Social Community Survey

A Social Community Survey was undertaken by study team members by interviewing community members who held key occupations (e.g. school principals, housing managers, airport managers and health care workers) within the community.

Traditional Knowledge Survey

A Traditional Knowledge Survey was conducted with Fishers, Hunters, Trappers, Resource Gatherers, Community Guides and Elders.

4.2 Open House Results

The public engagement sessions held in Ilford, York Landing and Tataskweyak (Split Lake) in late April, 2015 were attended by staff from MIT and from the consultant team (SNC-Lavalin). A total of 116 people attended the public engagement meetings, and they were encouraged to ask questions and identify issues and opportunities associated with the project. Staff made notes on their discussions with community members; the latter were also invited, as previously noted, to mark up the study maps provided on tables in the meeting room.

Material included display boards and mapping of the proposed corridor and route alternative options, which were hung along the walls of the room. Additional maps were provided on tables, for participants to draw on or otherwise show the project team any issues they wanted to discuss. A PowerPoint presentation was delivered to each community, roughly one hour into the open house (i.e. when the attendance level was generally at its peak). The information provided in the presentation was very similar to that presented on the display boards.

The presentation acted as a “get to know/introduction” opportunity for the community to meet the study team, and also provided a good opportunity to provide information to community members who prefer oral rather than written information. Comments and questions from community members were also welcomed. Copies of the display boards and presentation slides are provided in Appendix C.

4.3 Community Opinion Survey Results

The community opinion survey consisted of a series of questions asking community members what their overall opinions of the proposed AWR routes and corridors were, and how they believed the presence of the AWR would impact their communities from a number of different perspectives (e.g. education, health services, economy, community values, natural environment). Checkboxes were provided, as well as space for community members to write additional comments if desired. A map was also provided on the back of the form, if respondents wished to explain/illustrate a point cartographically. A sample Community Opinion Survey is provided in Appendix C.

4.3.1 Questionnaire Answers

As noted previously, all attendees were asked to fill out a questionnaire style survey, and 70 attendees filled out surveys, distributed by community as shown below.

Place	Date	Attendance	Number of Surveys
Ilford	April 28, 2015	32	25
York Landing	April 29, 2015	47	29
Tataskweyak (Split Lake)	April 30, 2015	37	16
Totals		116	70

The information in the responses is valuable as an indicator of general opinion of a community, as shown in the following questions and responses:

1. Overall, what do you think about a potential all-weather road between York Landing and Ilford?

94% of 69 responses were in favour, 6% against. Those against were from Tataskweyak (Split Lake); support for a connection from Ilford to York Landing and Aiken Point was unanimous in York Landing and Ilford.

2. Overall, what do you think about a potential all-weather road to connect Ilford and York Landing to the provincial highway network?

95% of 66 responses were in favour, 5% against. Those against were from Tataskweyak (Split Lake); support for a connection to PR 280 was unanimous in York Landing and Ilford. Note that Tataskweyak (Split Lake) is already connected to Provincial Road 280.

3. How do you think a road connecting Ilford to York Landing and Aiken Point will affect education opportunities for young people?

	Education opportunities will improve	Education opportunities will stay the same	Education opportunities will get worse
Ilford	21 (84%)	4 (16%)	
York Landing	24 (80%)	6 (20%)	
Tataskweyak (Split Lake)	2 (15%)	8 (57%)	4 (28%)
Total	47 (68%)	18 (26%)	4 (6%)

4. How do you think connecting Ilford and York Landing to the provincial highway network will affect education opportunities for young people?

	Education opportunities will improve	Education opportunities will stay the same	Education opportunities will get worse
Ilford	21 (84%)	3 (12%)	1 (4%)
York Landing	25 (83%)	3 (10%)	2 (7%)
Tataskweyak (Split Lake)	8 (53%)	5 (33%)	2 (14%)
Total	54 (77%)	11 (16%)	5 (7%)

5. How do you think a road connecting Ilford to York Landing and Aiken Point will affect overall health in your community?

	Community health will improve	Community health will stay the same	Community health will get worse
Ilford	21 (84%)	4 (16%)	
York Landing	22 (76%)	6 (20%)	1 (4%)
Tataskweyak (Split Lake)	4 (30%)	7 (54%)	2 (16%)
Total	47 (70%)	17 (25%)	3 (5%)

6. How do you think connecting Ilford and York Landing to the provincial highway network will affect overall health in your community?

	Community health will improve	Community health will stay the same	Community health will get worse
Ilford	22 (88%)	3 (12%)	
York Landing	21 (81%)	5 (19%)	
Tataskweyak (Split Lake)	3 (23%)	8 (62%)	2 (15%)
Total	46 (72%)	16 (25%)	2 (3%)

7. How do you think a road connecting Ilford to York Landing and Aiken Point will affect your community's economy?

	Local economy will improve	Local economy will stay the same	Local economy will get worse
Ilford	22 (88%)	2 (8%)	1 (4%)
York Landing	25 (83%)	5 (17%)	
Tataskweyak (Split Lake)	6 (43%)	7 (50%)	1 (8%)
Total	53 (77%)	14 (20%)	2 (3%)

8. How do you think connecting Ilford and York Landing to the provincial highway network will affect your community's economy?

	Local economy will improve	Local economy will stay the same	Local economy will get worse
Ilford	23 (88%)	2 (8%)	1 (4%)
York Landing	25 (83%)	5 (17%)	
Tataskweyak (Split Lake)	6 (46%)	6 (46%)	1 (8%)
Total	54 (78%)	13 (19%)	2 (3%)

Questions 9, 10 and 11

The following questions 9, 10 and 11 were open ended questions. Key themes in the responses are summarized in section 4.3, Summary of Community Opinion Survey Comment Themes.

9. What specific economic opportunities do you see for your community, if any?

10. What are some of the positive impacts on your community and family life if a road is built in this area?

11. What are some of the negative impacts on your community and family life if a road is build in this area?

12. When you travel away from your community, where do you go most often?

	York Landing	Iford	Tataskweyak (Split Lake)	Thompson	Gillam	Winnipeg
Iford	9		11	24	6	17
York Landing		8	12	29	7	12
Tataskweyak (Split Lake)	2	2		12	4	9
Total	11	10	23	65	17	38

13. How do you think a road connecting Iford to York Landing, Aiken Point and the provincial highway network, will affect natural environment along the route?

	Natural environment will improve	Natural environment will stay the same	Natural environment will get worse
Iford	10 (48%)	9 (43%)	2 (9%)
York Landing	8 (32%)	13 (52%)	4 (16%)
Tataskweyak (Split Lake)	1 (8%)	5 (42%)	6 (50%)
Total	19 (33%)	27 (47%)	12 (20%)

4.3.2 Summary of Community Opinion Survey Comment Themes

In addition to responses to specific questions in the survey, many respondents added comments in each of the main subject headings. Several of the questions asked for separate opinions about connecting Iford to York Landing, and connecting both to the provincial highway system, but there was considerable repetition in responses to both aspects. Key themes emerged. Below, we have summarized the key themes of opinion for: support for the potential road; education opportunities; overall health in the community; economic opportunity in the community; and effects on the natural environment.

Themes related to opinions on a potential road linking Iford and York landing, and Iford, York Landing connecting to the provincial highway system:

- Will reduce isolation with year-round access
- Simplify, speed travel to other communities and to Thompson
- Will generate more business
- Will decrease cost of living – goods should be cheaper
- Good alternative to expensive air travel and unreliable railroad

Themes related to opinions on whether a potential road linking Ilford to York Landing and Aiken Point, and from connecting Ilford and York Landing to the provincial highway system will improve educational opportunities for young people include:

- Better access to secondary school or college = more opportunity
- Easier, cheaper for students to get in and out
- More interaction with outside world
- Better access to work experience
- In Tataskweyak (Split Lake) Lake, a few felt there has been no real change since they were connected to PR 280

Themes related to opinions on whether a potential road linking Ilford and York landing, and Ilford, York Landing connecting to the provincial highway system will affect the overall health of the community:

- Better access to health services in Thompson, Gillam and Winnipeg, including emergency services and hospitals
- Better access could mean better health professionals coming to the community
- Concerns about better access bringing more alcohol and drugs to the community
- Better more convenient access could mean cheaper medical supplies

Themes related to opinions on whether a potential road linking Ilford and York landing, and Ilford, York Landing connecting to the provincial highway system will affect the community economy: (Question 9)

- More business activity all round
- Cheaper and better variety of goods with less freight cost
- Some costs may not change; fuel for example
- More opportunity to complete building projects, hold workshops, etc

Themes related to opinions on the positive impacts on the community of a potential road linking Ilford and York landing, and Ilford, York Landing connecting to the provincial highway system: (Question 10)

- Families can get together to socialize more often
- Better commerce, better access, shorter wait times for ordered goods
- Any-time access to main road in case of emergencies
- Cheaper goods, more variety
- More freedom to come and go

Themes related to opinions on the negative impacts on the community of a potential road linking Ilford and York landing, and Ilford, York Landing connecting to the provincial highway system: (Question 11)

- More alcohol and drugs moving into community, along with attendant social problems
- More access to hunting, trapping areas and other traditional use areas by other people outside of the community
- More traffic and related issues, like vehicle accidents
- Potentially may affect cultural integrity of isolated communities

Themes related to opinions on how a potential road linking Ilford and York landing, and Ilford, York Landing connecting to the provincial highway system might affect the natural environment along the route:

- Expect impacts, especially during construction; past hydro projects had great impacts
- An environmental assessment will reduce impacts
- Improved access for hunting and fishing, and habitat disturbance
- New routes may change animal movements and behaviours
- Could disrupt, raise water levels
- Garbage, pollution
- Road would cause only localized and short-term damage

Additional Comment:

An attendee at the York Landing community open house asked if a facility could be considered at Ilford, to enable road vehicles such as cars and trucks to be loaded onto or off of an HBR train, thus providing, when the AWR between York Landing and Ilford was completed, year round vehicular access via Thompson, to the rest of the provincial highway system.

4.4 Social Community Survey Results

The intent of this survey was to collect key community profile information that would assist during the multiple account evaluation phase of the study, by providing additional information to help qualitative and quantitative assessment of the social impacts that a road would have. A sample Social Community Survey is provided in Appendix C.

In addition to the Community Opinion Survey questionnaires provided to all attendees, one-on-one interviews were held with key community members such as school principals, housing managers, airport managers and health care workers. The original intent was to administer the specific sub-section of each survey to the corresponding community member (e.g. the school principal for education matters, where they would provide information on the grades available in the community, the number of students and teachers, graduation rates, where students go for secondary education etc.). In practice, many individuals interviewed were able to provide substantially more community information beyond those areas directly related to their occupation. This proved especially useful, as some members of the community that we intended to be interviewed were not available. Finally, many of these same individuals were able to provide valuable insights into the overall benefits, drawbacks and issues surrounding the proposed AWRs, particularly as they related to how increased access to/from the rest of the province would affect the community. In total, four interviews were completed in Ilford and three in each of York Landing and Tataskweyak (Split Lake).

The insights and comments from these interviews are tabulated below. In the left column are the key comments from the interviewees. In the right, there are notes on how the comments relate to the road corridor options and, where appropriate, the feedback from the questionnaires.

Ilford Interviews:

Comments from Interviewees	How comments relate to proposed roads and corridors
<p>Ilford: Assistant Airport Manager</p> <ul style="list-style-type: none"> • No scheduled flights • Mostly government employees / representatives using the airports • local-medical emergencies • provincial government pays • poor visibility can sometimes delay flights • Manitoba Hydro uses airport to access their infrastructure • local community uses trains mainly 	<ul style="list-style-type: none"> • Comments suggest access to York Landing or to the provincial highway system would improve transportation options for Ilford. • No scheduled flights and mostly train use creates the sense of isolation

Comments from Interviewees	How comments relate to proposed roads and corridors
<p>Iford: Assistant Northern Store Manager</p> <ul style="list-style-type: none"> • Toiletries and gas brought in on winter road • Most goods come in on train every couple of weeks 	<ul style="list-style-type: none"> • Reliance on winter roads may become limited with climate change, placing more emphasis on the benefits of an all weather road
<p>Iford: School Principal</p> <ul style="list-style-type: none"> • Grades 1-8, 2.5 teachers, class size 15 • 1 community police • Some days of school lost for travel • Drugs/gangs – already a problem due to train – could get worse • No bank or ATM – have to go to Thompson for cash • Everyone takes train to Thompson for shopping • AWR means easier to bring frozen foods and fresh produce • Medical appointments difficult to schedule – train late, miss appointment 	<ul style="list-style-type: none"> • More reflections of the isolation of the community; • Sees potential benefits of healthier eating • AWR means fewer lost school days • More reliable medical appointments

York Landing Interviews:

Comments from Interviewees	How comments relate to proposed roads and corridors
<p>York Landing : Health Services</p> <ul style="list-style-type: none"> • Clinic open 8:30 am-5:00 pm, 2.5 nurses and 3 community health workers • Doctor comes once/ 2 weeks • Both prenatal care and women’s health are ticked • Dentist • Baseball played in community 	<ul style="list-style-type: none"> • Health services likely better in York Landing than in Ilford
<p>York Landing : Acting Principal</p> <ul style="list-style-type: none"> • School is K-6, average class size is 25; 4 teachers • Also one class of 15 grade 7-8; one teacher • Clinic has 4 nurses and 6 community health workers • Three local police, 8 fire fighters • Grocery store, gas station, recreational 	<ul style="list-style-type: none"> • Comments about tendency for high school students to drop out and return home because of homesickness • Suggestion that this might be more manageable if a road made more frequent home visits possible, this reducing homesickness and increasing the likelihood of school being

Comments from Interviewees	How comments relate to proposed roads and corridors
<p>centre with VLTs and smoke shop</p> <ul style="list-style-type: none"> • Comments suggest a road would make it easier for high school kids in Cranberry Portage, Thompson and Winnipeg to return home on weekends. • Homesickness causes students to drop-out of school in other communities (e.g. Thompson); many who drop-out never complete school • Easier for intercommunity sports events • Concerns due to easier access for alcohol/drugs to enter the community 	<p>completed</p> <ul style="list-style-type: none"> • Any road access has the potential to increase access to drugs and alcohol in the community

Tataskweyak Interviews:

Comments from Interviewees	How comments relate to proposed roads and corridors
<p>Tataskweyak (Split Lake): Housing Manager</p> <ul style="list-style-type: none"> • 2 police, school park and 2 other parks, arena, youth centre, baseball diamond and outdoor track • Aside from Northern Store, one fast food outlet • Motel with 16 rooms • No auto service in town • Smoke shop owned by band • Commented that most people go to Thompson to shop but those on social assistance must use store credits in local store 	<ul style="list-style-type: none"> • Odd there is no auto service in town, since Tataskweyak (Split Lake) is connected to the PR 280, tire service would be expected as a minimum. • Social assistance recipients must use store credits in local store. The temptation to buy cheap and filling food would be great. • Not clear how this would be affected by the road corridor proposals

Comments from Interviewees	How comments relate to proposed roads and corridors
<p>Tataskweyak (Split Lake): Principal, Chief Sam Cook School</p> <ul style="list-style-type: none"> • Grades K-12, avg class size of 18 • Also a mature student program, grades 9-12 • 90% do stay. 10% get sent out, most make it into post secondary • Drugs/gangs = very easy to come in. Keeping York Landing & Ilford out of the reserve should be a positive. • PR 280 - worse since Keeyask dam, worse into winter. Ferry traffic is not too bad/disruptive. • 40% stay. 60% post sec. (25% come back, Thompson - stay – University College of the North, Thompson, Winnipeg - more come back.) 	<ul style="list-style-type: none"> • Maintenance on PR 280 may be an issue • With the road, drugs/gangs easy to enter community • Percentages of students who leave for school or go away to college and stay away or come back may not be influenced by new roads, since Split Lake is already connected by PR 280

4.5 Traditional Knowledge Surveys

The main goal of this survey was to identify areas of interest used or known by these community members, that would potentially be impacted if the road was aligned through, across or close to the areas (e.g. waterway crossings, lakeshore or inland). Due to the potentially confidential nature of the information provided (some interviewees would likely prefer to keep their more productive fishing, hunting and trapping locations private), the results of the surveys will not be directly provided. Instead, the findings have been compiled into a number of areas that could potentially have an impact if the road were to traverse through them, and these areas will be avoided if possible during the corridor and route alignment refinement process, and if not able to be avoided, will have these impacts accounted for in the Multiple Account Evaluation used to select a preferred route or corridor option. A sample Fisher, Hunter, Trapper, Resource Gatherer and Community Guide Survey is provided in Appendix C.

Surveys were conducted in the communities of Ilford/War Lake, York Landing/York Factory and Tataskweyak/Split Lake by First Nations coordinators appointed through the project. Persons were asked a series of questions about fishing, hunting, trapping, resource gathering (berries, medicinal plants, firewood), trails and where sacred or special places were. Many, but not all responders, marked areas of specific interest on 1:50,000 or 1:200,000 topographic maps of the study area showing optional routes/corridors for the AWR road system. It is assumed that some members of these communities were missed in this survey, so there may be other areas of interest that have not been revealed. Sources of information remain anonymous, as agreed. The summary below is intended as a means of helping to scope and focus further environmental scoping and assessment efforts.

The map notations were transferred onto a master map overlay for each of Fisher, Hunter/Trapper, Gatherer, Community Guide and Elder. Individual respondents were not identified.

Each time a respondent showed an area where they fished, hunted, gathered resources or guided, it was noted on the map overlay as an “interest”. There were some areas on each map where numerous interests were shown in the same local area.

The areas with multiple interests are considered more “sensitive” than areas with no or few apparent interests, from the standpoint of the information stemming from the local users. In other words, when considering route or corridor options, the areas with multiple interests need more attention in the environmental scoping and assessment: they should be either avoided, or special mitigation/compensation plans and arrangements made. These plans would then be reported back to the communities for reaction. This does not mean that all sensitive and high value habitats in the study area have been identified; only the areas where members of local communities do their hunting, fishing, trapping, and gathering.

4.5.1 Fisher Survey Results

Eleven surveys were requested from the Ilford, York Landing and Tataskweyak (Split Lake) communities. Not all respondents submitted maps with notations. Note that individual respondents remain anonymous.

Responses show multiple fishing interests on Moose Nose Lake and along the Aiken River at specific points. One point is at Moosecoot IR #3, which is noted as a walleye spawning area. Another is on the Aiken River approximately 10 km farther west at a rapids, also noted as a walleye spawning area. There were multiple interests shown along the south shore line of Split Lake, with several interests shown near the lower part of the Aiken River, in the channel where the ferry travels near York Landing and at the mouth of Ripple River. Other points of interest are spread around the area, including some fishers that indicated the whole of the central basin of Split Lake, the area around Birthday Rapids, and where the Kelsey corridor option (Corridor 1) meets PR 280 at the Odei and Burntwood Rivers. It is unlikely that a road alignment would affect fishing in Split Lake, other than to possibly improve access and thereby increase the number of fishers. There were no apparent existing fishing interests that would be affected by Route Option 1 along the north shore of Moose Nose Lake.

On the basis of these findings, if the Route Option 2 south of Moose Nose Lake is recommended, some efforts are needed to avoid the Aiken River, or find suitable mitigations if an alignment near the river is unavoidable. Other areas of fishing interest do not appear to be affected by other corridor options, except perhaps the aforementioned convergence of the Kelsey Dam corridor with PR 280. In that case, more detailed information about the specific fishing interest could be collected.

4.5.2 Hunter Survey Results

Thirteen respondents filled out surveys as hunters; 4 from Ilford, 8 from York Landing, and one from Tataskweyak (Split Lake). Few respondents were specific about what animals they hunted, where. One respondent circled the whole study area as their hunting territory. Respondents occasionally reported hunting both woodland and barren ground caribou, but when marking hunting areas they were not specific about which areas yield which sub-species.

Mapped notations showed numerous interests along both route options 1 and 2, west all the way to Aiken Point. There were more interests on route option 2. The areas around Moose Nose Lake and Moosecoot IR #3 appear to be intensively hunted, as are lake areas to the south. Again there were numerous hunting interests along the south shore of Split Lake over to the mouth of Mistake River, with several interests noted there specifically. Based on responses, there were several interests in hunting along the power line north of Moose Nose Lake, and along the railway tracks between Ilford and Moosecoot IR #3.

Moose were identified along the power line in route option 1. Caribou were noted at Moose Nose Lake, just north of route option 1, and in or just south of route option 2. Other hunting was intense around York Landing, and to the west at Aiken Pt.

Overall there was quite a lot of hunting activity along the potential proposed routes/corridors. There appeared to be fewer interests in route option 1 than 2, and there were multiple hunting interests in or adjacent to the Kelsey Corridor option south and west of York Factory FN. There were interests on and adjacent to other corridors but they were fewer.

Based on these findings, the scoping of environmental impacts should acknowledge the effects of road building on the hunting practices as revealed through this survey, as well as on the wildlife populations that support them. The principal issues will be the extent that a road right of way opening will serve as a barrier to the movement of some animals (potentially caribou), an attraction to others as early stage vegetation is encouraged in the cleared right of way (potentially moose), and as a new access route for predators (particularly wolves). These effects could mean a change in the distribution of wildlife populations and subsequent changes in hunting success by people in local communities.

4.5.3 Trapper Survey Results

Seven respondents identified themselves as trappers; two from Ilford, four from York Landing and one from Split Lake. All except one also identified themselves as hunters, reported in the previous section. Not all trappers responded with trapping areas drawn on the map provided. Where this information was included, then it was added to the hunter map overlay at 1:200,000. These notations were usually a circle drawn on the map. It cannot be verified that the areal extent of each trapping area is accurately portrayed, but they provide a general indication. Two respondents identified they use registered traplines, #2 and #17, but these were not drawn on the maps provided. The location of these traplines is presumably available from Manitoba Conservation.

There were numerous trapping areas well away from the proposed routes/corridors. However, there were also numerous trapping interests either directly on or adjacent to the various proposed routes/ corridors. The area of most intensive trapping was east, west, north and south of the community of York Factory/York Landing on Split Lake. As well, the area in the vicinity of the small lakes associated with the mouth of the Mistake River was a hot spot, where cabins were also noted.

Three small trapping areas were noted adjacent to the Kelsey Dam Corridor Option 1 west of the Nelson River. No trapping areas were reported along the York Landing North Corridor Option 2, north of the power line to Split Lake IR# 171A. There were few trapping areas reported along the Keeyask Dam Corridor Option 3 east of Ilford.

Based on these findings, it appears that from the standpoint of potential conflicts with traplines, the Kelsey Dam corridor option has the most, with the Keeyask Dam corridor the least. Subsequent environmental impact assessment should focus on the potential effects of road corridors on fur-bearers, and the extent to which trapping activity will be affected. Appropriate mitigation strategies may be required.

4.5.4 Resource Gatherer Survey Results

Eleven participants responded in this category; one from Ilford, seven from York landing and three from Tataskweyak. This involved where community members gathered berries, medicinal plants and firewood. Several of the respondents did not provide map locations. It is understandable that local people may be reluctant to reveal the best berry picking and other areas. Several respondents indicated they berry pick by boat, suggesting a near-shore focus. Others simply identified areas where they collected “plants”, the types not specified. There seemed to be a special interest on the rights of way of the hydro lines for berry picking. This is consistent with the growth habit of berry plants that require open areas.

Plants typically listed included Labrador tea, sweetgrass, blue-, rasp- and cloud-berries and moss berries (cranberries).

4.5.5 Community Guide Survey Results

Six respondents provided information on this category, which relates to a listing of sites to be aware of when planning the location of an AWR; two from York Landing and four from Tataskweyak. Included were sites with archaeological interest, cemeteries and/or burial sites, sacred sites, skidoo/ATV trails, traditional use areas or walking trails.

Few respondents were specific. Rather, the preference was to outline large areas on maps. Respondents reported the difficulty in knowing exactly where on a map a site might be. People reported that they knew where they were on the land, but not necessarily where that was on a map. It is assumed that the large areas outlined represent a mixture of uses. The traditional use category included hunting and fishing areas that were identified in the hunting section, above. It was noted that ski-doo and ATV trails for the most part follow existing power lines or winter road routes.

It is possible that six responses are not enough and more community information is required. However, based on the information mapped, there appeared to be few conflicts with the proposed routes and corridors. Ski-doo trails were shown along the Near Kelsey Dam Corridor Option 1, but it seems unlikely that this would be a conflicting use. A sacred site was identified at the north east end of the Keeyask Dam Corridor Option 3.

4.5.6 Additional Comments

One Traditional Knowledge Survey respondent from York Landing made some specific comments about the ferry/barge landing at York Landing. The intent seemed to be that since a road extension was made in 2002 during a low-water event, it's only a few more km to build a road to the potential (subject to feasibility) new landing at Aiken Point.

A second comment summarized the results of the 11 Traditional Knowledge Surveys, conducted for Tataskweyak (Split Lake). In a June 5, 2015 letter to Dan Highway at SNC-Lavalin in Winnipeg, John Flett, Community Coordinator, wrote, in part, that *“Everyone interviewed have also indicated that whichever route/option is selected will have very little impact on hunting and berry picking areas.”*

4.6 Initial Public Engagement Key Findings

The key take-away messages were those the project team would work with moving forward with the next steps in the study. Some recommendations related to the impacts the road alignment would have, while others had more to do with the impacts relating to the level of access the road would provide, rather than the exact alignment of the road itself. For example, a road from York Landing to Ilford will provide both communities with an increase in opportunities to access Thompson, but whether the road runs north or south of Moose Nose Lake is largely irrelevant.

Key Findings were as follows:

- An AWR between Ilford, York Landing and Aiken Point had overwhelming support in Ilford and York Landing, and had mixed support in Tataskweyak (Split Lake), although that community may be impacted the least from a new road. The Project Team proceeded on the basis that an AWR route from Ilford to York Landing and Aiken Point is desired by each of these latter two communities.
- Few individuals appeared to express a preference between Route Option 1 and 2. From a fishing perspective, Route Option 1 may be preferable, although any negative impacts to fishing from Route Option 2 could likely be mitigated with careful planning, design and construction. The Project Team would consider the feedback that was received, but the route option selection would likely be also be heavily influenced by the technical feasibility/constructability of each route.
- Relocating the ferry terminal from York Landing to Aiken Point, and constructing an AWR connection between these two locations was seen as being the single most urgent priority, as it would solve some of the ferry capacity issues York Landing is currently experiencing. It was also seen as a pre-requisite to completing the AWR connection to Ilford, so as to avoid over-burdening the ferry.
- An AWR connection from Ilford and York Landing to PR 280 had overwhelming support in Ilford and York Landing, and had mixed support in Tataskweyak (Split Lake). In particular, some Tataskweyak (Split Lake) residents expressed concern about increased uncontrolled access of people and goods through their reserve resulting from Ilford and York Landing traffic. Aligning the AWR routes in a manner that avoids providing direct access to the Tataskweyak reserve would help partially address concerns from this community. The Project Team was to proceed on the basis that an AWR connection from Ilford to York Landing to PR 280 is generally acceptable to Tataskweyak, but would endeavor to avoid developing AWR alignments that run directly through that community. On a related note, relocating the northern ferry terminal from Tataskweyak to somewhere outside of the main built up community was seen by some, if it was feasible, as a positive development.
- No clear consensus emerged on the preferred corridor to connect York Landing and Ilford to PR 280. Some stakeholders favoured Corridor Option 3, on the basis that it was the cheapest, and most likely to be built. (Cost impacts are directly incorporated into the Multiple Account Evaluation). On the other hand, several members of the public commented orally that if Option 3 (Keeyask Dam) were to be built, they would want the ferry

service to remain operational, which suggested that it was not seen as being a preferable travel choice compared to the ferry. Corridor Option 1 (near Kelsey Dam) was seen as the most direct/efficient, but tempered with recognition that it was the most expensive, and may take longer to fund and build. Corridor Option 1 was also noted as having impacts to moose habitat. Corridor Option 2 (York Landing-North) appeared to have comparatively fewer impacts, and was also seen as a “compromise” option between the cheapest (Option 3) and most useful from a transportation perspective (Option 1) choices. Corridor Option 2 also provided convenient access from the Tataskweyak community on the north side of Split Lake to their IR lands (IR No.171A and IR No.171B) on the south side of the lake.

- Several areas of importance for fishing, hunting, trapping, resource gathering or other important community sites were identified. These were to be avoided where possible when refining the AWR alignments, and, with careful planning of the alignments, might not be significantly negatively impacted by any of the proposed routes/corridors.

4.7 Stakeholder Workshop September 15, 2015

As noted earlier in Section 4.1 of this report, following emails sent out by the MIT ADM in early February 2015, SNC-Lavalin sent follow up emails to solicit thoughts and questions from each of the Stakeholder Advisory Group (SAG) representatives, regarding the different options being considered for the AWR between York Landing and Ilford, and the connection between these two communities and Provincial Road 280. Subsequently SLI sent further route and corridor information to all the stakeholders, and in some cases communicated with them by teleconference.

A key event in the communications with stakeholders was a Workshop with the Project Steering Committee, the Technical Working Group and the Stakeholder Advisory Group, held in Winnipeg on September 15, 2015, to update all committee and group members on the status of the study; introduce the draft multiple account evaluation (MAE) of the two route options and three corridor options; and provide opportunities for input, feedback and responses from the members present. Minutes of this meeting, and a copy of the PowerPoint Presentation given by SNC-Lavalin team members, are included in Appendix B. No new AWR route or corridor options were suggested by attendees, but useful comments were made about potential impacts associated with route and corridor options.

During presentation of the draft Multiple Account Evaluation, a strong case was made by some present, to give due weight to the construction cost criteria within the financial account, since not giving due consideration to the high cost of northern road construction could seriously delay project implementation.

Following the workshop, SNC-Lavalin communicated further with SAG agencies in order to obtain, where essentially needed, comments in writing. The following is a listing of SAG agencies that provided feedback:

- Fisheries and Oceans Canada
- Historic Resources Branch, Archaeological
- Manitoba Conservation and Water Stewardship
- Manitoba Conservation – Wildlife Branch
- Manitoba Health, Healthy Living and Seniors
- Manitoba Hydro
- Manitoba Metis Federation
- MIT Northern Airports & Marine Operations
- Northern Association of Community Councils
- OmniTrax
- Royal Canadian Mounted Police
- Transport Canada
- VIA Rail

5.0 FINAL REFINEMENT OF ROUTE AND CORRIDOR OPTIONS

5.1 Refinement of Route and Corridor Options

This section provides a review of the process that was undertaken to refine route alignment options (Aiken Point to Ilford) and corridor options (connection to PR 280) based on information collected in Chapters 2-4 (Environmental Scan: Review of Material from Phase 1, Confirmation of Route and Corridor Options, and Public Engagement and Stakeholder Workshop). In addition to information collected via the aforementioned, new aerial photography had been obtained for purposes of mapping route alignment and corridor options between Aiken Point, York Landing and Ilford.

5.1.1 New Aerial Photography for Mapping

At the start of the study, existing 1:60,000 stereoscopic aerial photography was obtained covering the entire area of study for the Ilford to York Landing and Aiken Point route options, as well as for the Ilford/York Landing to PR 280 corridor options.

In June 2015, new 1:20,000 stereoscopic aerial photography was flown for the two route options between Ilford and York Landing, as well as the single route alignment from York Landing to Aiken Point. This photography was used to refine the road alignment for these two options, and the ferry connection. The 1:20,000 scale of the photography was chosen to enable functional design of the resulting preferred route option, and the connection to Aiken Point, during further development of the AWR project subsequent to completion of the route selection study.

1:20,000 aerial photography was also collected for the river crossing areas for two of the three corridor options (Corridor #1 at the Nelson and Burntwood River crossings; Corridor #2 at the Nelson River crossing), to assist with refining corridor options, based in part on the feasibility of where ferry terminals at each river crossing could be built, and the ease with which an AWR could access them. Collaboration with Manitoba Infrastructure and Transportation (MIT)'s Northern Airports and Marine Operations (NAMO) was required to address this issue.

5.1.2 MIT Guidance

MIT indicated that all AWR route or corridor network alignment options should, where feasible, maintain through route continuity on Provincial Crown Land, rather than passing through First Nation Lands. Connections to populated communities within First Nations were clearly essential; however, it is desirable for residents in one community to connect to the existing provincially operated AWR transportation system (roads or ferries) and the Hudson Bay Railway, without having to travel through another community. Application of this principle led to refinements to the AWR alignments i) between Ilford and Aiken Point, to accommodate a bypass of York Landing, as well as ii) between York Landing and Ilford, to accommodate, in the

case of Corridor 3 being preferred, a future bypass of Ilford/War Lake. Feedback from the communities in Round 1 also gave support to the application of this principle.

Input to the alignment of the proposed Aiken Point terminal road connection came from MIT's Northern Airports and Marine Operations (NAMO), after they conducted, in the summer of 2015, a marine survey to determine, for the MV Joe Keeper, a preferred new southern ferry terminal, located along the north shore of Aiken Point. Their proposed location is near the 3rd bay from the west tip of the peninsula. As well as NAMO undertaking this marine survey, the ferry captain also sailed the MV Joe Keeper into this location to further confirm the feasibility of this proposed terminal point.

In order to minimize early construction costs, if the connection to Aiken Point is built before the AWR between York Landing and Ilford, MIT recommended using as much as possible of an existing road running west from York Landing and south of the airport, before the jump off point for the proposed road to the new ferry terminal.

5.1.3 Geo-scientific AWR alignment and analysis (by J.D.Mollard)

a) Alignment Criteria

In refining the AWR alignments within the previously identified broad brush route and corridor options, a number of social, cultural, environmental, economic, and engineering factors were considered and listed below.

- Where possible, finding suitable terrain with firm soils and surficial geological deposits for the road foundation, with granular materials close by for building the road
- Protecting the natural environment – flora, fauna and fisheries resources
- Where known, respecting historical sites, artifacts, archaeological resources, local cultural and traditional land uses, and Treaty Land Entitlements
- Selecting the most direct, economically feasible and environmentally acceptable route between communities and the existing provincial AWR system
- Choosing an appropriate design classification and speed for the AWR; roadway top width and side slopes; right-of-way width and width to be cleared of vegetation
- Minimizing the length of water crossings for bridges and culverts; at potential ferry locations, looking for low/moderate current; deep water without excessive fluctuations in level; shallow banks; and proximity to ferry operating employees

b) Ilford to York Landing Route Refinement – Sub-Option Development

Working from the new 1:20,000 aerial photography, employing the factors outlined above, J.D. Mollard developed the following refined AWR route alignments, detailed in Appendix H.

- A single alignment for a route from York Landing to the proposed ferry terminal at Aiken Point. The route is located across IR land where it connects to the existing road system in York Landing, but avoids crossing Split Lake IR land in the vicinity. It can

connect, without going through York Landing IR land, to either of 2 sub-options for an AWR to Ilford.

- 2 AWR route alignment sub-options, north of Moose Nose Lake, N1 and N2, between York Landing and Ilford. These sub-options sought to follow the hydro transmission line corridor as a means of minimizing environmental impacts. One of these, N1 follows much more closely than the other.
- 2 AWR route alignment sub-options, south of Moose Nose Lake, S1 and S2, between York Landing and Ilford. These two sub-options sought to follow the winter road corridor as a means to minimizing the environmental impacts. The winter road is close to the Aiken River. One of the sub-options, S2, was located further from the river than the winter road in order to minimize potential environmental impacts should a fuel spill occur. Both of these parallel the Hudson Bay Railway for a portion of their length.

c) Ilford / York Landing to PR 280 Corridor Refinement – Sub-Option Development

Working from the existing 1:60,000 aerial photography, J.D. Mollard developed 2 sub-options within each of the 3 corridor alternatives connecting to PR 280. In all cases the sub-options overlapped for some distance within a particular corridor.

The corridors and their sub-options were variously described on the air photo base as follows:

- Corridor 1 Near Kelsey: Corridor Sub-options 1A and 1B;
- Corridor 2 York Landing –North: Corridor Sub-options 2A and 2B;
- Corridor 3 Keeyask: Corridor Sub-options 3A and 3B.

Based on the analysis of the air photos and other geotechnical data, the surficial geology along all the route and corridor alignments was estimated, subject to future confirmation from on-ground observations and exploratory drilling. The soils and rock encountered are classified under categories such as glacio-lacustrine, till, swamp, granular, muskeg, and bedrock. The relative ease of construction of an AWR over these different ground conditions varies significantly, so relative ease of construction factors (RECFs) were defined for each segment of proposed road over each type of soil or rock encountered. RECFs are generally used as a surrogate for the unit construction cost per kilometre of an AWR.

5.1.4 All-Weather Road Profile Details

From an overview of 1:50 000 and 1:200 000 topographic mapping the following approximate elevation/terrain data becomes evident:

Between York Landing Airport, elevation 622 ft, and Ilford Airport, elevation 642 ft, there is a gradual rise of 20 feet over a distance of about 32 km, the length of the existing winter road, with some hummocky, rocky outcrops encountered along the way.

Between York Landing/Ilford the corridor options encounter the following approximate elevations:

Corridor 1:

Elevation 625 ft part way between York Landing and Ilford, then over a distance of 57 km, dropping to elevation 600 ft at PR 280 near the Burntwood River crossing, with, except at water crossings, generally flattish terrain between, and frequent hummocky, rocky outcrops.

Corridor 2:

Elevation 622 ft at York Landing Airport, then over a distance of 41 km, dropping to elevation 600 ft at PR 280, just east of Tataskweyak, with, except at water crossings, generally flattish terrain between, and frequent hummocky, rocky outcrops.

Corridor 3:

Elevation 642 ft at Ilford Airport, then over a distance of 40 km dropping to an elevation of 500 ft near Keeyask Dam, with generally flattish terrain between and occasional hummocky, rocky outcrops.

5.1.5 Conclusions of Route and Corridor Refinement

The shortest or shorter of the refined route and corridor sub-options are shown in Figures 5.1 to 5.4 and are as follows:

- i) York Landing to Aiken Point:
 - The common portion of Route 1 (North Route Option) and Route 2 (South Route Option) is based on the alignment of route sub-options N1, S1 and S2.
- ii) York Landing to Ilford:
 - Route 1 (North Route Option) is based on the alignment of route sub-option N1
 - Route 2 (South Route Option) is based on the alignment of route sub-option S2
- iii) Ilford to PR 280:
 - Near Kelsey Dam Corridor is based on the alignment of corridor sub-option 1A
 - York Landing – North Corridor is based on the alignment of corridor sub-option 2B
 - Keeyask Dam Corridor is based on the alignment of corridor sub-option 3B.

Appendix H contains maps on an air photo base, of all the refined AWR routes and corridors, with their construction lengths tabulated, as well as the lengths of terrain (soil and rock) types encountered, along with the associated RECF values. The appendix also contains a legend describing soil and rock characteristics, as well as the corresponding RECF values.

Travel distances between the two communities and important landmarks located within and adjacent to the study area are shown on Figures 5.1 to 5.4 following. These distances include select construction lengths derived from the route and corridor options described above. Where route and corridor sub-options were developed, the one chosen for inclusion in the travel distance table was the shorter or shortest of the sub-options.

Figure 5.1: Route 1 (North route Sub-Option 2) and Route 2 (South Route Sub-Option 2) – York Landing to Ilford and Route from York Landing to Aiken Point

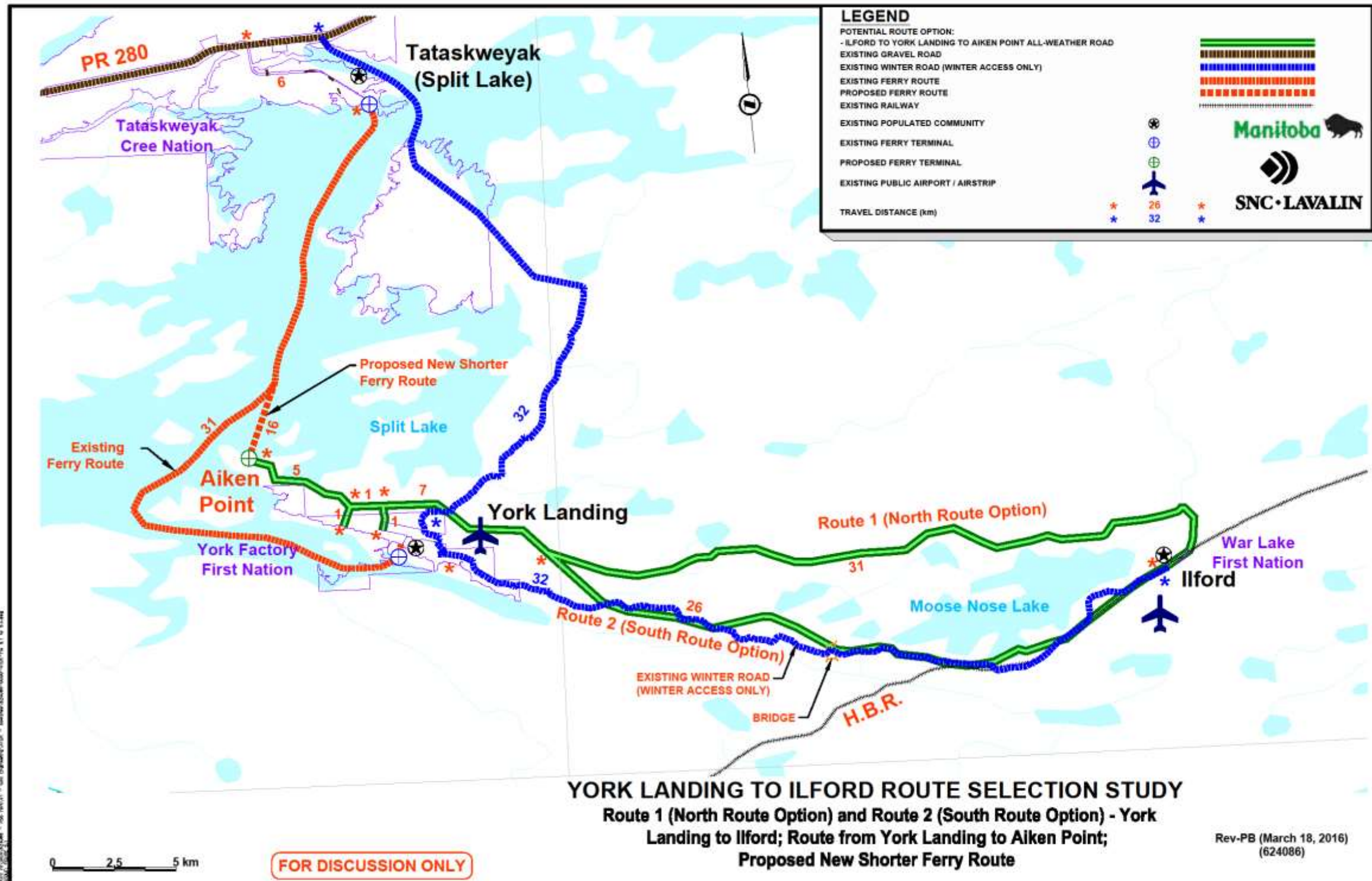


Figure 5.2: Corridor Option 1A – Near Kelsey Dam Corridor

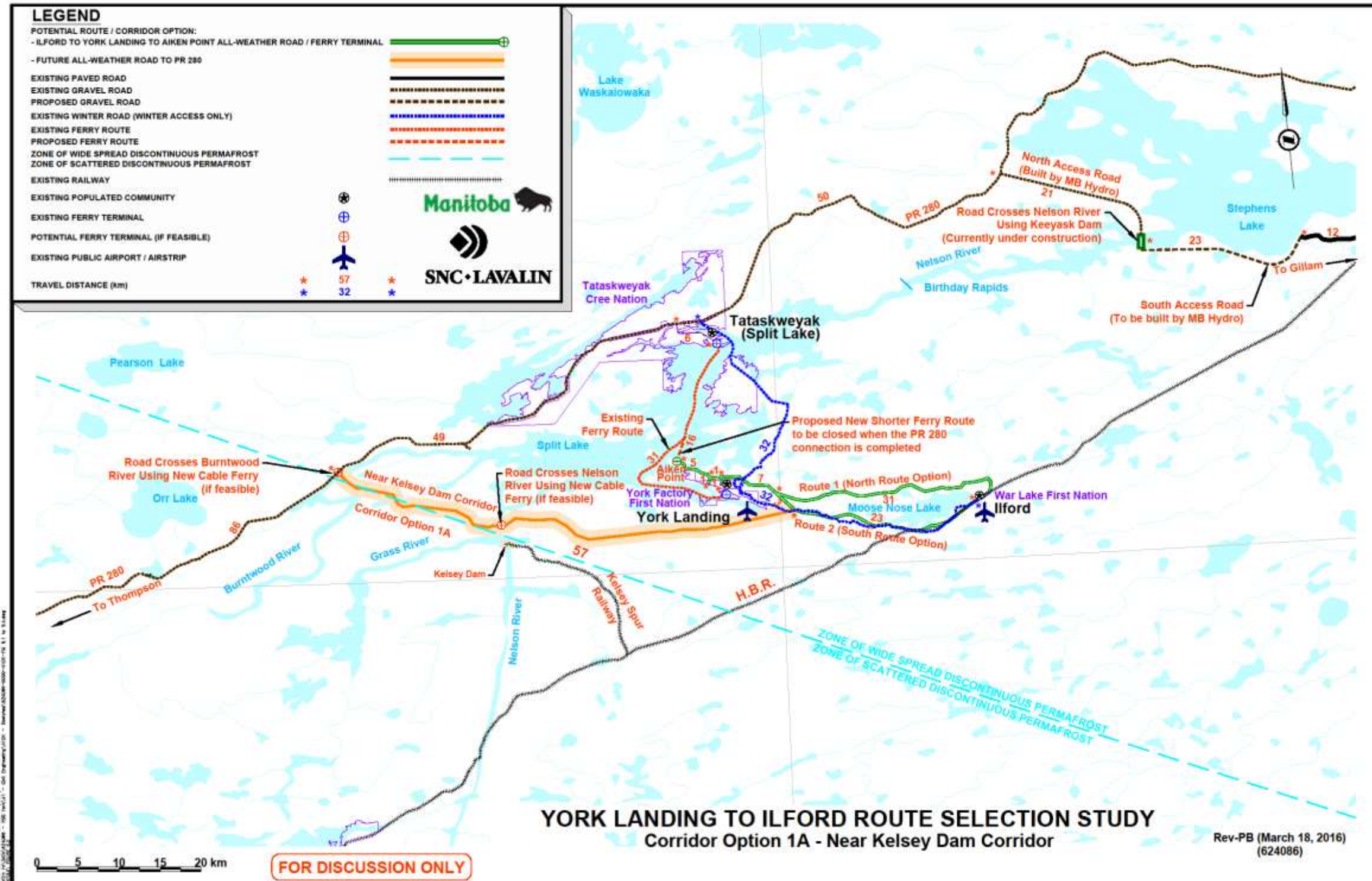


Figure 5.3: Corridor Option 2B – York Landing – North Corridor

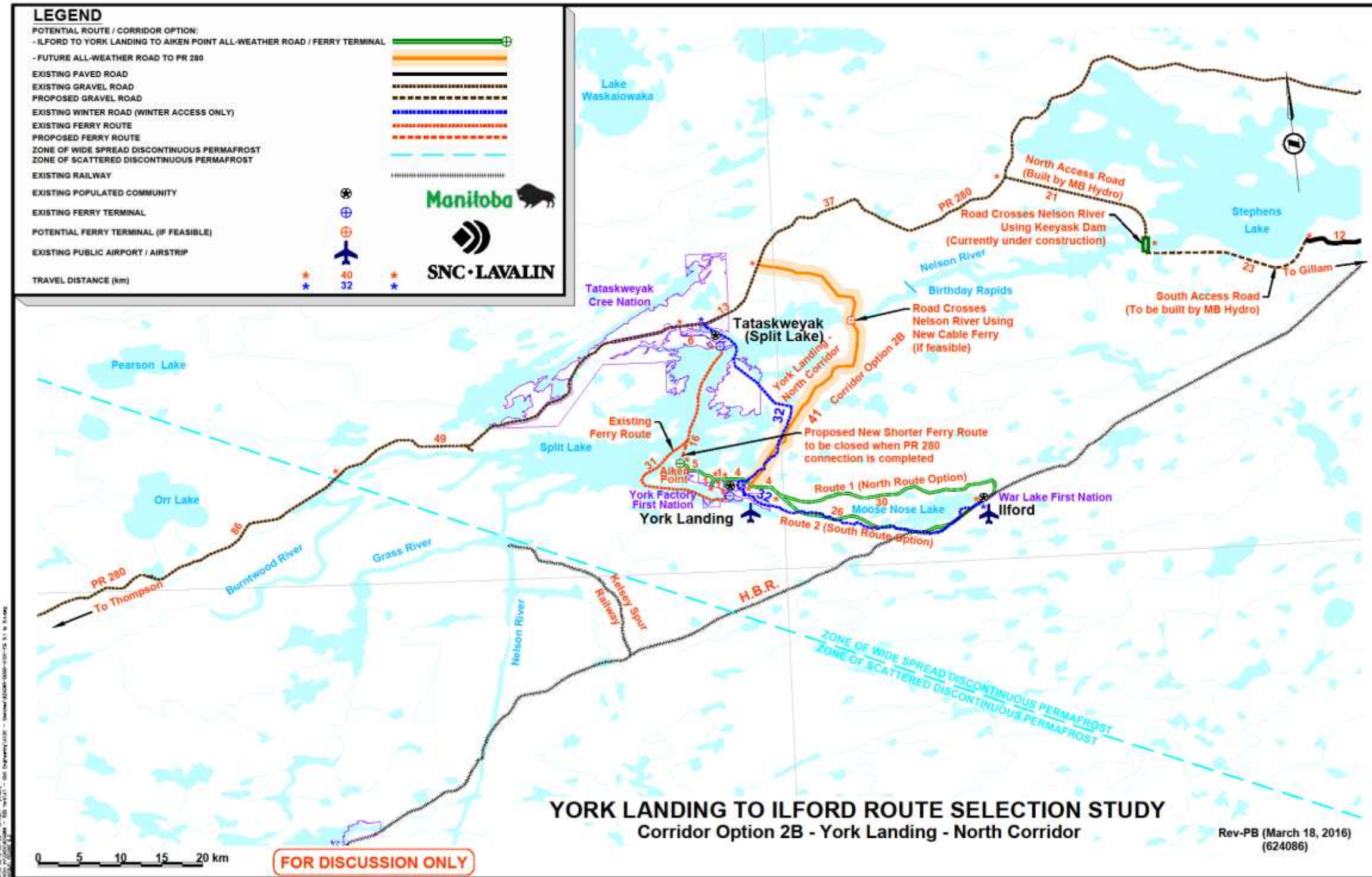
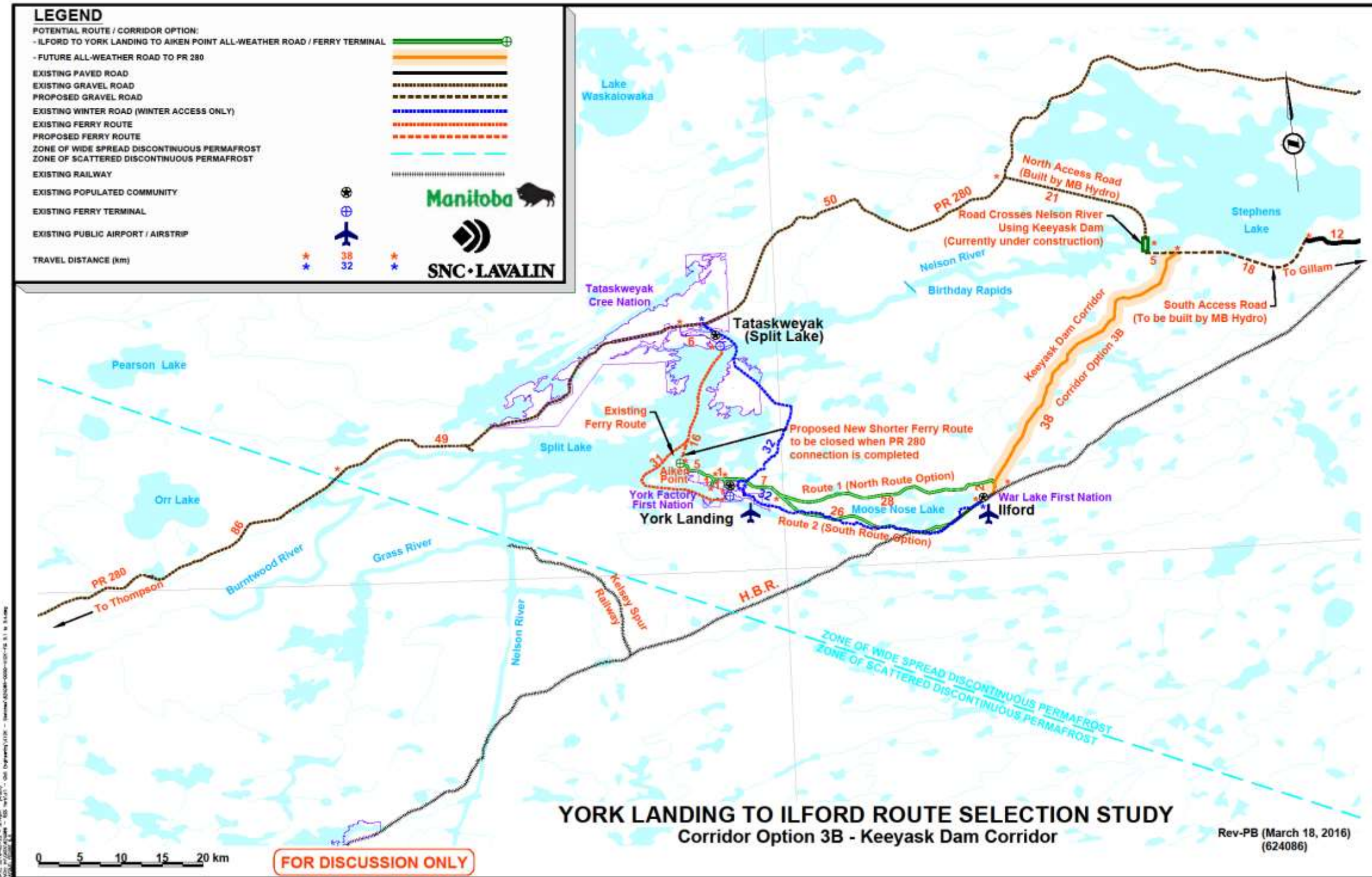


Figure 5.4: Corridor Option 3B – Keeyask Dam Corridor



6.0 ALL-WEATHER ROAD CLASSIFICATION, DESIGN AND COSTING

6.1 Introduction

A key element of the evaluation the route and corridor options is the estimated cost of construction for the various alternatives. Evaluation of estimated costs requires a determination of the design standards to be used in the construction of the proposed all-weather road. Design standards are based on the highway or roadway classification and the volume and type of traffic that will use the all-weather road. The following sections outline the process of establishing the anticipated traffic type and volume, the proposed classification, and the basic design standards to be used for construction of the roads. The final section of this chapter details the process and considerations that were employed to establish estimated costs for the options and includes estimated costs for each.

6.2 Traffic Projections

The future traffic demands for the AWR route and corridor options were projected to a 25-year horizon using 2 different methods. One method (gravity model) was used to estimate the overall travel demand, and a second method (Multiple Account Evaluation) was used to estimate freight transport. The latter is a subset of the former. Freight transport is identified separately because of the importance of this component of travel; this component is critical for both the economy and survival of the community. The methodology and the resulting projections are discussed in separate subsections below.

6.2.1 Overall Travel Demand – Gravity Model

Overall travel demand was estimated using a mathematical model based on an analogy to gravitational forces. In the case of gravity, the gravitational pull between 2 planets increases as the mass of the planets increase, and decreases as the distance between them increases. Similarly, the attraction (travel demand) between 2 communities increases as the size of each community (population) increases, and decreases as the travel time between them increases. Furthermore, the travel demand decreases disproportionately as the travel time increases.

Using such a model, the overall travel demands between York Landing and Ilford, and for each of the three corridor options connecting to PR 280, were projected for year 2040; the results are illustrated as annual average daily traffic (AADT) in vehicles per day, in Figures 6.1 through 6.3. The mathematical details of the model assumptions, calibration, and future demand calculations are provided in Appendix E.

Figure 6.1 - Corridor Option 1A, 2040 AADT Projections (vpd)

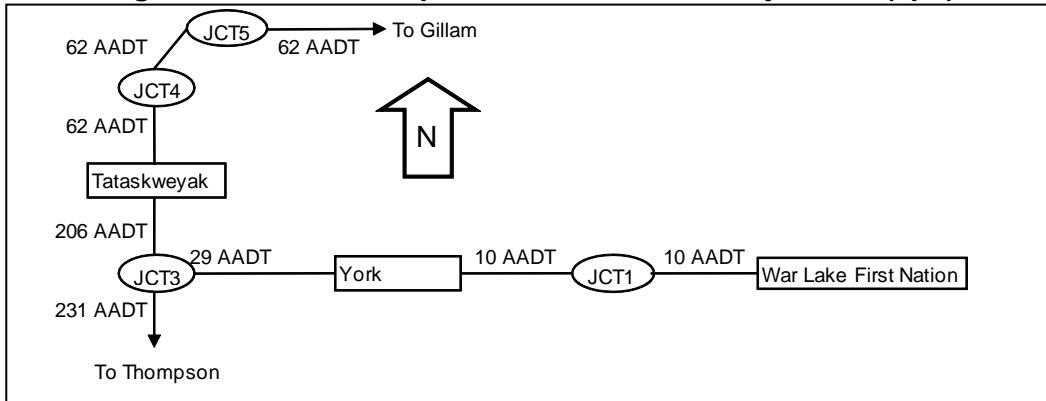


Figure 6.2 - Corridor Option 2B, 2040 AADT Projections (vpd)

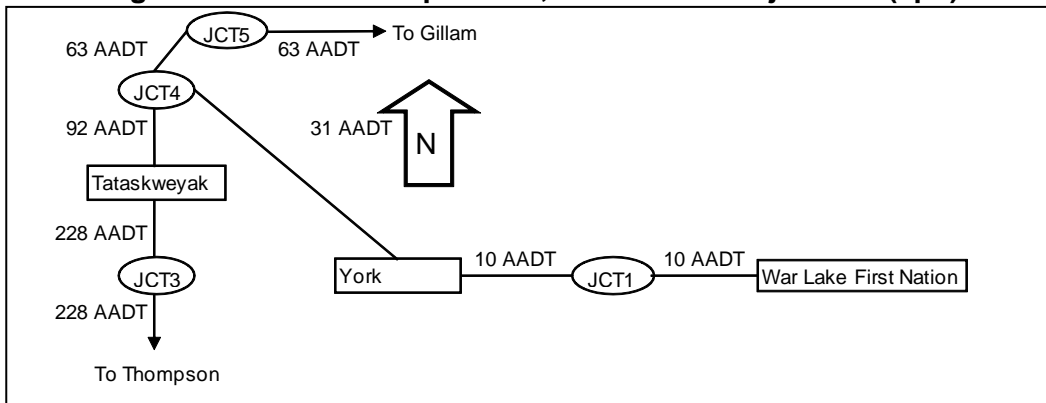
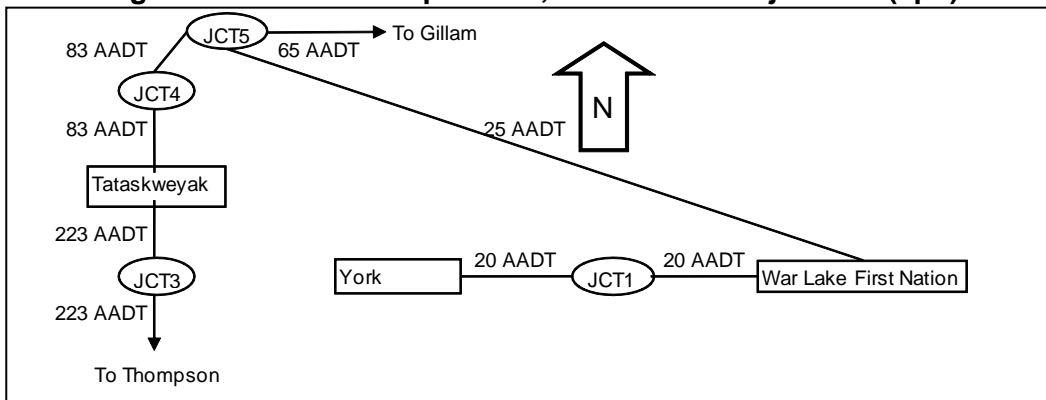


Figure 6.3 - Corridor Option 3B, 2040 AADT Projections (vpd)



6.2.2 Freight Transport – Projection by Multiple Account Evaluation

The 2040 truck traffic was estimated based on the results obtained from the Multiple Account Evaluation (MAE) discussed later in Section 7.0. The projections are summarized in Table 6.1.

Table 6.1: 2040 Truck Traffic Projections

Corridor Options	2040 Trucks per day	
	York Landing (Veh/day)	Ilford (Veh/day)
Corridor Option 1A	0.41	0.07
Corridor Option 2B	0.41	0.07
Corridor Option 3B	0.41	0.07

These projections take into account the shift from air and personal freight transport to commercial freight transport, due to more reliable and uninterrupted access along an AWR network. They also take into account the anticipated reduction in truck volumes as a consequence of the increased load capacity for trucks when the AWR's are introduced. With almost a doubling of load capacity³, fewer trucks are required to transport the same amount of freight. Additionally, the volumes appear lower because they would be distributed throughout the year, rather than being concentrated over a relatively short period during the winter road season.

6.2.3 Interpretation of Results

The results of both the gravity model and the MAE based projections indicate small differences in travel demand between the AWR corridor options. This is a consequence of the relatively small populations and the relatively long distances between communities. Figures 5.6 - 5.8 indicate little difference in travel demand between the long distance trips (higher travel times).

Despite the similar travel demand, there are significant differences between the options; depending on the destination, the distance experienced by travelers, will in some cases be lengthy, and can be estimated by referring to Figures 5.2, 5.3 and 5.4 shown previously in this report.

³ Commercial freight payload capacity on winter roads is 15 tonnes per truck. This could increase to 29 tonnes per truck on an AWR.

6.3 Functional Classification

The current population of York Landing/York Factory First Nation is 462 persons and that of Ilford/War Lake First Nation is 136 persons. Based on MIT's current Highway Functional Classification System for Rural Provincial Highways in Manitoba, an AWR between these two communities would warrant a functional classification of Collector B for the proposed link connecting the communities to each other. Considering the combined population of the 2 communities (being 598) a functional Collector A is warranted for the proposed AWR link connecting the two communities to the existing provincial highway/road network via PR 280.

The proposed AWR link from York Landing to a new MV Joe Keeper ferry terminal at Aiken Point, although initially a provincial MIT responsibility, is intended, in the long term, to become a local road after York Landing and Ilford are connected to PR 280 and the ferry service is discontinued. For this reason MIT have indicated functional classification of this proposed road as a Local will be satisfactory.

6.4 Proposed All-Weather Road and Bridge Design Criteria

6.4.1 Design Considerations and Basic Design Standards

The 25-year traffic projections estimated by SNC-Lavalin (see the previous section 5.2) indicate that all of the proposed AWR links, between Aiken Point, York Landing, Ilford and PR 280, will likely experience 2040 annual average daily traffic (AADT) volumes of significantly less than 300 vehicles per day (vpd) (SNCL projections for 2040 are AADTs less than 100 vpd), and annual average daily truck traffic (AADTT) of less than 15 vehicles per day.

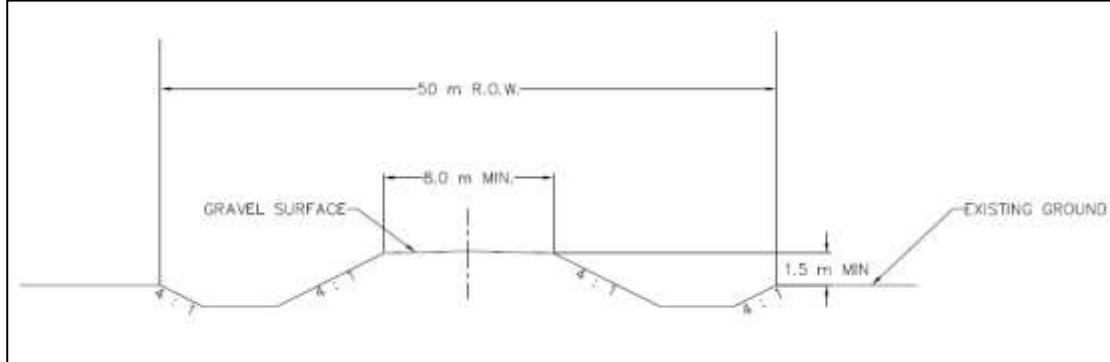
Current MIT Standard

According to MIT Transportation Planning Policy: TP 2/98 Table 1, a gravel surface type 2-lane Collector road, with the features listed below, would have an appropriate standard range to service the needs of projected 10-year AADT volumes of under 300 vpd between York Landing, Ilford and PR 280. See Figure 6.4 Rural Collector Undivided (Current Standard).

- Top width (roadbed width) in the range 8-8.4 m
- Design Speed in the range 80-100 km (depending on whether the terrain is flat, rolling or rugged)
- 4:1 side slopes

Since the route and corridor options are located over the Canadian Shield the terrain could be classified as rugged, indicating a maximum Design Speed of 80 km/h; however since the projected 2040 AADT is less than 100 vpd, a roadbed width of 8 m rather than 8.4 m is felt to be an appropriate choice within MIT current standards.

Figure 6.4 Rural Collector Undivided (Current Standard)



This AWR current standard includes the following advantages and disadvantages:

Advantages:

- Standard is widely used in the rest of the province and would therefore provide a level of comfort and reduced workload for unfamiliar drivers from elsewhere coming to the communities
- High travel speed accompanied by low travel times e.g. averaging 80 km/h, the journey time from York Landing to Ilford, a distance of < 40 km would be about 30 minutes
- The 8 m width is generous, enabling trucks from opposite directions to pass with ease; also for a single line of vehicles to readily pass graders when the road is undergoing maintenance
- 4:1 side slopes allow for an errant vehicle to run off the road, recover and drive back onto the road

Disadvantages:

- High Design Speed range may encourage speeding above the posted limit as well as more overtaking of slower vehicles i.e. a greater speed differential between vehicles
- If collisions occur, they will likely be severe, resulting in serious injuries or death
- High speeds increase likelihood of cracked or broken windshields, and may increase roadway wear and tear, resulting in greater maintenance costs
- Need for long protective barriers at approaches to bridges or hazards
- High construction costs, potentially reducing nearer term affordability
- The higher the Design Speed, the greater the impact on the natural environment
- The greater the roadway width, the bigger the drawdown on local aggregate resources e.g. sand, gravel and rock, reducing their availability for future maintenance of the AWR or other community needs

Possible Alternative Standards

At various stages throughout the conduct of this study, the desire was expressed to consider lower cost options for development of the proposed AWR. In order to address this desire, SNC-Lavalin investigated the possibility of employing a lesser classification and design standard than that identified in MIT's Transportation Planning Manual.

MIT's Transportation Planning Manual does not address roads classified as Local, as in most cases they are considered a municipal responsibility, SNC-Lavalin conducted a brief literature review⁴ to ascertain if there were Canadian or American guidelines for low volume roads (LVRs) that might be appropriately applied to the proposed York Landing to Aiken Point AWR, and also possibly, as a fall back lower cost option, for the York Landing to Ilford to PR 280 AWR connections.

Both the TAC and AASHTO guidelines suggest a 6.6 m roadway width is appropriate for a low volume road, with the following parameters as suggested by each agency.

- TAC Guideline for ADT less than 100; trucks less than 15 ADTT:

Design Speed	60-70 km/h
Roadway Width	6.6 m
Side Slopes	3:1 desirable / 2:1 maximum

- AASHTO Guideline for ADT ≤ 400 (Rural Areas)

Design Speed	90-100 km/h
Roadway Width	6.6 m

The TAC criteria apply to 2-lane, low volume earth or gravel roads. The AASHTO criteria shown apply to local roads used for major access, recreational and scenic uses, primarily serving drivers who are familiar with the roadway. The criteria can also apply where volumes are < 400 vpd to roads functionally classified as Collectors.

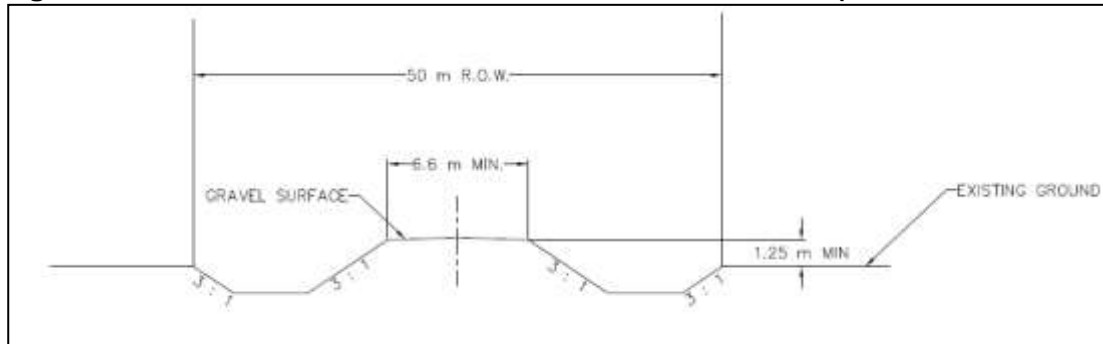
The TAC Synthesis for Special Roads states that Canadian jurisdictions tend to refer to Special Roads as recreational roads, resource access roads, service roads, local roads, property access roads, and, more commonly, low-volume roads; furthermore that Chapter H in the 1986 TAC guide provided the most comprehensive design guideline for Special Roads compared to any other design document available in Canada or the United States Research Articles.

SNC-Lavalin is suggesting the TAC LVR guideline be used as the basic design standard for the York Landing to Aiken Point AWR (Local Road), and possibly, as a lower cost, lower

⁴ TAC Geometric Design Guide for Canadian Roads, January 1986 Chapter H, Low-Volume Roads
 AASHTO Guidelines for Geometric Design of Very Low Volume Local Roads (AADT<400) 2001.
 TAC Primer: Synthesis of Practices of Geometric Design for Special Roads, May 2013

environmental impact option, as a minimum basic design standard for the York Landing to Ilford, and Ilford to PR 280 AWRs (Collector Roads). See Figure 6.5 Rural Local Undivided/Rural Collector Undivided (Minimum Standard).

Figure 6.5 Rural Local Undivided/Rural Collector Undivided (Minimum Standard).



If this minimum standard i.e. 6.6 m top width, Design Speed 60-70 km/h, 3:1 side slopes was used for the York Landing to Ilford, and York Landing/Ilford to PR 280 AWRs (Collector Roads), it would have, in all likelihood, compared with the current design standard described above i.e. 8-8.4 m top width, Design Speed 80-100 km/h, 4:1 side slopes, the following advantages and disadvantages:

Advantages:

- Significantly lower construction cost, potentially increasing nearer term affordability
- Reduced impact on the natural environment
- Reduced roadbed width likely encouraging lower speeds
- Lower speeds likely resulting in less serious injuries when collisions occur
- Reduced drawdown on locally available aggregate resources needed for road construction, maintenance and other community needs

Disadvantages:

- Travel times between key origins and destinations will be slightly longer e.g. averaging 70 km/h, the journey time from York Landing to Ilford would be about 34 minutes, 4 minutes longer than with the desirable standard
- The workload for commercial truck drivers will be nominally greater, assuming a truck width of 2.6 m not including mirrors, as they will need to be more careful when passing a truck in the opposite direction, since, not allowing for the mirrors, there will be only 6.6-5.2 = 1.4 m of “freeboard” on the roadway top width. However it is noted that daily volumes of commercial trucks are, on average, anticipated to be very small.
- 3:1 side slopes should enable an errant vehicle to run off the road without overturning, however it may not be possible for the driver to drive back onto the road without towing assistance. Since tow trucks should be available in York Landing or Ilford, which are less than 35 km from each other, a run-off road incident between these 2 communities,

should not prove a great hardship. Between the York Landing/Ilford AWR and PR 280, travel distances vary from 57 km to 40 km, depending on the corridor option selected, and the wait time for a tour would be of course longer.

- The road design may seem unfamiliar to drivers from elsewhere coming to the communities. However the majority of traffic will likely have originated from the communities, enabling drivers to become quickly familiar with the characteristics of the road design; also since the communities are at “the end of the road”, the road cannot be used by unfamiliar long distance through traffic.

Additional Design Considerations

Further design considerations for the Rural Local and Rural Collector AWR’s (AADT < 100) are proposed as follows:

- Loading for Roadway: Roadway structure design should be as needed for a B1 Route (Highway Traffic Act), and capable of accommodating a maximum prescribed gross vehicle weight (GVW) of 47,630 kg. Subject to onsite geotechnical conditions, a typical cross section with minimum layer design is as follows; Sub-base comprised of a minimum of 500 mm of 150 mm diameter minus blast rock over a non-woven geo-textile, 75 mm sand cover above the rock and a Granular Base material comprised of 100 mm of Traffic gravel Type “D” modified.
- Loading for Bridges: Since the AWR system may take delivery of heavy loads, it is recommended that, as referenced in Transportation Planning Policy: TP 2/98 the bridges should be designed to handle an HSS 30 design vehicle.
- Bridge Width: The minimum bridge width for a permanent structure which is capable of accommodating 2 lanes of traffic is 9.6 m. For temporary structures (e.g., a one lane Bailey, Acrow or Meccano Bridge) a minimum bridge width of 4.3 m is recommended.
- Hydraulic Capacity and Navigation Clearances at Bridges: During the functional design phase of the project, hydraulic studies will be needed to ensure bridges crossing streams or rivers have sufficient capacity to accommodate design year flows. Furthermore it will be important to engage the local communities of York Landing, Ilford/War Lake and Tataskweyak, and in particular fishers, hunters and trappers, to ascertain the horizontal and vertical navigation clearances required where bridges cross waterways that need to be accessible to small watercraft. The Traditional Knowledge surveys conducted with fishers, hunters and trappers in the spring of 2015, asked for information on water routes used by community members who engage in these pursuits. Although several said they travelled by boat, it was not clear whether any of them needed to cross the route and corridor options for this purpose, so further clarification will be essential during the functional design phase.
- AWR Profiles: Although digital terrain model (ground elevation) data was collected in June 2015, during the aerial survey of the Aiken Point to York Landing to Ilford study corridor, the development of ground profiles along the AWR route options was beyond the scope of the current route selection study, and will need to be undertaken in the future within the functional design of the selected route and corridor options.

From an overview of 1:50,000 and 1:200,000 topographic mapping the following conclusions may be drawn regarding the anticipated AWR profiles. Also refer to sidebar for details.

- The profiles will generally be flat ($\ll 1\%$).
- The terrain has hummocks/rocky outcrops along the routes and corridors.
- The hummocks are likely less than 25 feet tall along the routes (less than the contour interval of the 1:50,000 scale mapping). Similarly, the hummocks are likely less than 50 feet tall along the corridors (less than the contour interval of the 1:200,000 scale mapping).
- Where hummocks are encountered, the preferred treatment is to align the road around the hummock rather than blast through the rock.

Therefore the net impact of profile on the construction cost is not considered significant at this stage of investigation and cannot be accounted until the subsequent stage of functional design.

- In order to develop approximate construction cost estimates, it was necessary to make some assumptions about the average height of the AWR profile above existing ground along the above route and corridor options, and these are as follows.
 - For the 80 km/h, 8 m roadbed width, 4:1 side slope design: Minimum embankment height in the range of 1.25 to 1.5 m (4-5 ft) over frost susceptible soils: This height is considered appropriate to provide a satisfactory foundation considering snow clearing and drifting snow, engineering and economic considerations. Excavations in ice-rich, fine-grained soil materials should be avoided. Conventional road construction methods may be used where the foundation materials, such as bedrock without ice in cracks, or clean non-frost susceptible sand and gravel without ice, are stable upon thawing.
 - For the 6.6 m roadbed width, 3:1 side slope designs (Design Speeds in the range 60-70-80 km/h): Minimum embankment height in the range of 1.0 to 1.25 m (3-4 ft). This lower height reduces the vertical drop in the case of an off-road collision, to compensate for the steeper side slopes.

6.5 Cost Estimates

Roadway Construction Cost Estimates

The construction unit cost for all AWR route and corridor options were derived from the East Side of Lake Winnipeg (ESLW) Transportation Network Study prepared by SNC-Lavalin Inc. in 2011. These unit costs were 'back calculated' in the following steps.

- a) Start off with the Class D Capital Cost Estimates (in 2010 dollars) developed during the ESLW study. These estimates utilized known costs for various road structure components such as gravel, sand, crushed rock, shot rock, common excavation, rock excavation and composite excavation, which were derived from northern rates for similar types of projects, as gleaned from tenders and projects completed for MIT.
- b) Remove the soft costs represented by engineering fees (15%), project management fees (10%) and contingency (20%).
- c) Divide the construction cost by the length of the road.
- d) Adjust the unit cost from 2010 to 2015 dollars using a compound inflation rate of 2% per annum.
- e) Adjust the unit cost proportionate to the cross sectional area of the road prism between the ESLW road and the subject study's road (reflecting the volume difference of material). A comparison of the different relevant road prisms are summarized in Table 6.2.

Table 6.2: Comparison of Study Assumptions

Study	Date of Cost Estimate	Road Prism (Cross Section)			
		Road surface width	Side slopes	Average Height above Grade	Cross Section Area
ESLW	2010	10 m	4:1	1.5 m	24 m ²
York Landing to Ilford	2015	8 m	4:1	1.5 m	21 m ²
		6.6 m	3:1	1.25 m	13 m ²

The construction unit costs for the two cross sections of this current study identified in Table 5.2 are \$1.67 M/km and \$1.04 M/km respectively, in 2015 dollars.

For the current study, the construction cost of each option was calculated using the unit costs derived above, multiplied by the option's length, and adjusted by the RECF. JD Mollard Associates analyzed the terrain and ground conditions using the available aerial photos and developed the RECF for each route and corridor option.

Since the construction costs are estimated at the conceptual planning level, the range of precision is likely between -25% and + 50%. Subsequent functional and detailed design along the preferred AWR network will enable a greater level of confidence in project costs

Mobilization Costs

When constructing AWRs in remote areas of northern Manitoba, consideration needs to be made for the mobilization of workers, worker accommodation, construction equipment and materials.

We note that the ESLW estimates likely included mobilization costs, and further that compared with York Landing and Ilford, the communities located on the East Side of Lake Winnipeg are very remote, with road access only being available by winter road e.g. the winter road from Bloodvein to Island Lake is 291 km long, and from near Sea Falls ferry to Oxford House 213 km long. By contrast the communities of York Landing and Ilford, although remote, are much closer to the provincial road system PR 280 and the Hudson Bay Railway (HBR).

When construction of the AWR system between Aiken Point, York Landing and Ilford begins, mobilization to York Landing could occur for up to 2 months via the 32 km long existing winter road from PR 280 at Tataskweyak; and, for up to 5 months, by ferry from PR 280 at Tataskweyak. Note that mobilization to Ilford could be year round from the HBR.

While mobilization to the 3 corridor options could be facilitated by early construction of a winter road in the corridor, access to these options could also be year round from PR 280; from the under construction Keeyask South Access Road; or from the HBR. As a consequence, it is suggested that the unit costs we have derived from AECOM's ESLW estimates can, for the 8 m roadbed width, 4:1 side slopes, and design speed range 60-80 km/h, be assumed to include mobilization.

For the Nunavut Manitoba Route Selection study that was completed for MIT and others in November 2007, a construction cost estimate included mobilization of equipment for the 1100 km long selected route. The estimate included the following figures:

• Mobilization of equipment, Lump sum	\$50,000,000
• Engineering 7%	\$80,500,450
• Contingency 7%	\$80,500,450
• Total construction cost	\$1,311,007,410

Examining these figures we note the net construction cost, not including engineering and contingency was \$1,150,006,510 of which mobilization accounts for 4.3 percent. From another perspective the per km mobilization cost in 2007 was about $\$50,000,000 \div 1100$ or about \$45,000 per km. It is noted that mobilization to the NU-MB AWR route will be to a corridor on the west side of Hudson Bay that is considerably more difficult to access than the York Landing to Ilford area.

Although the cost estimate for the 6.6 m roadbed width option in the York Landing to Ilford study could be increased by a few more percent (maximum 4% of the cost of the 8 m roadbed

width option), it is felt this would imply a greater level of accuracy than is currently warranted at this route selection phase of the project.

Water Crossing Construction Cost Estimates

The water crossing component represents bridges and culverts that allow vehicles to cross over bodies of water. Cost estimates for water crossings were developed for the crossing locations and crossing length identified by JDMA. Crossing structures were divided into three types, such as river and water crossings (with an estimated channel width >30 m), creek crossings (with an estimated channel width of 5 to 30 m), and small culverts. The cost for small culverts was assumed to be \$0.02 M per bridge (2015 dollar). For permanent AWR bridges, MIT agreed that a unit cost of \$8,000 per m² (2015 dollar) is appropriate.

Ferry Cost Estimates

Several of the alignments traversed lakes, requiring a ferry to cross. MIT's Northern Airports & Marine Operations (NAMO) currently operates the MV Joe Keeper between York Landing and Tataskweyak (Split Lake) at a cost of \$650,000 per year. In addition, NAMO also undertakes a capital upgrade every 4 years at a cost of \$500,000 for the ferry route. For relocating the ferry terminal to Aiken Point, MIT indicated that the construction for dolphin and landing development would cost \$1M and \$600,000 respectively.

Note: The estimated cost to replace the MV Joe Keeper is \$12 to \$18 million.

For cable ferries, MIT suggested that the cost to construct a new cable ferry system is approximately \$5M with an annual operating cost of \$400,000 per year.

Maintenance Cost Estimates

The base case is the existing winter road networks linking Ilford and York Landing and Tataskweyak (Split Lake) and York Landing. The annual maintenance and construction costs for winter roads, as suggested by MIT, are approximately \$1,000 per km and \$2,000 per km (2015 dollar) respectively.

The proposed AWR options include gravel roads. MIT suggested that the annualized maintenance cost for gravel roads is \$3,771 per km (2015 dollar). The cost is an aggregate amount including maintenance for the summer and winter months for gravel application, dust abatement, grading, spot road repairs, brush clearing, drainage, sign repair, culvert maintenance and winter snow clearing.

Annual bridge maintenance costs, as suggested by MIT, would be \$3,000 per bridge for a permanent AWR bridge and \$1,000 per bridge for a temporary AWR bridge (i.e., Acrow bridge), all in 2015 dollars.

Non-Capital Cost Estimates

The last component represents engineering (15% applied to capital), project management (10% applied to capital), and contingency (20% applied to the sum of capital, engineering, and project management). These non-capital project costs translate to the equivalent of 50% of the overall capital cost.

Total Project Cost Estimates

Project cost estimates for the route and corridor options are summarized in Table 6.3.

Table 6.3: Project Cost Estimate (\$ Million in 2015)

SEGMENT	Option	Project Component	cross section	
			8 m	6.6 m
York Landing to Ilford	S2	road	51.34	31.78
		water crossings	0.22	0.22
		non-capital expenses	25.78	16.00
		total	77.33	48.00
	N1	road	62.10	38.45
		non-capital expenses	32.13	20.30
	total	96.38	60.90	
York Landing to Aiken Point		road		5.74
		water crossings		0.00
		new ferry terminal		1.60
		non-capital expenses		3.67
		total		11.01
York Landing / Ilford to PR280	1A	road	94.61	58.57
		water crossings	5.68	5.68
		cable ferry capital cost	10.00	10.00
		non-capital expenses	55.15	37.13
		total	165.45	111.38
	2B	road	63.88	39.54
		water crossings	4.26	4.26
		cable ferry capital cost	5.00	5.00
		non-capital expenses	36.57	24.40
		total	109.71	73.20
	3B	road	61.73	38.21
		water crossings	1.93	1.93
non-capital expenses		31.83	20.07	
total		95.49	60.22	

7.0 MULTIPLE ACCOUNT EVALUATION: SELECTION OF OPTIONS

7.1 Multiple Account Evaluation (MAE) Criteria

Multiple Account Evaluation (MAE) is a process of evaluating major capital investments, taking into account both quantifiable and non-quantifiable criteria or “accounts”. It entails the systematic documentation and assessment of the engineering, environmental, financial and other relevant implications of alternative plans and projects in order to determine the advantages and disadvantages they entail. A preferred routing emerges as the one with the least constraints, and the most benefits.

Capital investment projects traditionally involve a benefit/cost analysis, in which benefits and costs are quantified and presented in the net present value. Multiple account methodology explicitly recognizes that not all costs and benefits can be expressed in dollar terms. These include community impacts, environmental impacts and economic impacts. Also, even where dollar estimates are developed, multiple account methodology does not combine these estimates into one measure of net benefits. Instead, the accounts are kept separate, so that evaluators may consider and evaluate the accounts individually.

Four accounts were used for the evaluation of the route and corridor options. These are discussed below.

a) Financial Account

This is the present value of the capital, maintenance and rehabilitation costs and salvage values over a 25-year project life at a discount rate of 6% for each route and corridor option. All dollar amounts are expressed in 2015 dollars and discounted to year 0 (current year 2015). The incremental costs are compared relative to the status quo base case using the existing transportation system. Project benefits start to accrue the year after AWR construction is completed. Residual value reflects the value of the asset continuing in its current use beyond the end of the 25-year planning period and is included in the financial account as a recoverable. It is estimated to be 100% of the property value, 80% of the construction value and 0% of engineering.

The costs reflects the standard MIT cross section (design speed in the range of 70 to 80 km/hr, a gravel top width of 8.0 m, an average height above existing ground of 1.5 m with 4:1 side slopes). Assumptions and methodologies used to estimate the project costs for the route and corridor options are summarized in Section 6.5.

b) Transportation Benefits Account

This account typically captures direct costs incurred by users of the transportation system in the base case (no AWR) and each of the proposed AWR options. The change (usually a reduction) in direct user costs for any option is the measure of the benefit of that option over the base case scenario.

Direct user costs include freight transport and passenger travel; freight savings stem from a mode shift from air to road, while passenger travel cost savings come from a shift to surface transport from air and from a reduction in travel distance and increased speed along the proposed AWR. The user costs have also been divided separately into costs of passenger vehicles, passenger time, collisions, and induced benefits.

All benefits are assessed over a 25-year planning period and discounted to a single present value at the 6% discount rate used in this analysis. Based on population projections, annual growth in demand over the planning period is estimated at 1.1 %.

c) Social/Community Account

This documents the external effects of the proposed AWR road on the communities and their social values as perceived by the communities. Evaluation criteria include the impacts of the AWR access to communities (positive and negative); impacts in term of employment, costs of living, quality of life, health care, education and land use; and impacts on water quality and wildlife, and the protection of archaeological and cultural artifacts.

Based on the findings from the stakeholder and public engagement, the options were evaluated by the Consultant Team. The perceived impacts of the AWR along each route option were scored relative to the conditions today (i.e. winter road only).

d) Natural Environment Account

This account is intended to provide an overview assessment of the project impacts on the natural environment. Criteria under this account include habitat protection, wildlife populations, watershed values, fish populations, heritage values and protected areas.

The general approach of the MAE was to establish weights for each account and scores for each route or corridor option. The sum of weighted scores for each alternative was used to rank the alternatives such that a preferred route and corridor could be identified. Based on the technical analysis and community/stakeholder engagement findings for the alternatives, the Consultant Team agreed on the definition and relative weights for each account and criteria within each account, and scored each alternative against the defined criteria in terms of how each alternative met the project goals.

The perceived impacts of the AWR along each route/corridor option were scored relative to the conditions today. When evaluating potential hunting and trapping conflicts, this was done from the point of view of local hunters and trappers. Road access may increase the hunting access to recreational hunters from the south, but from the local hunter point of view, who largely hunt for subsistence and not for recreation, more public access is seen as a negative effect.

7.2 Evaluation of Route Options for Ilford to York Landing Connection

7.2.1 Financial Costs

As shown in Table 7.1, Route Option 2 (S2) is considered more favourable in the Financial Account since it has the shortest length (35 km) and lowest capital cost (\$77.3 M). Compared to the base case scenario (winter road), the incremental cost will be \$49.7 million in 2015 Dollars.

Table 7.1: MAE Financial Account (\$ Million in 2015) for Route Selection

Agency Costs (\$ Million, 2015 Dollars)	Base	Route 1 (N1)	Route 2 (S2)
Network Length (km)	32.0	40	35
Capital Cost*	\$0.0	\$72.0	\$57.8
Maintenance & Resurfacing	\$0.9	\$1.4	\$1.3
Residual Value	\$0.0	(\$10.6)	(\$8.5)
Total (Present Value)	\$0.9	\$62.8	\$50.5
Incremental Costs		\$61.9	\$49.7

* Based on 8 m gravel top width, 4:1 side slopes

7.2.2 Transportation Benefits

The benefit account for the base case (existing winter road) and the two route options is shown in Table 7.2. Route Option 2 (S2) would be considered more favourable in this account since the option results in more direct connection and less travel distance between the two communities.

Table 7.2: MAE Transportation Benefit Account (\$ Million in 2015) for Route Selection

User Costs (\$ Million, 2015 Dollars)	Base	Route 1 (N1)	Route 2 (S2)
Passenger Vehicles	\$0.07	\$0.05	\$0.04
Passenger Time	\$0.17	\$0.04	\$0.04
Collisions	\$0.01	\$0.02	\$0.01
Total User Costs	\$0.25	\$0.11	\$0.09
Incremental Benefits		\$0.14	\$0.16
Induced Benefits		\$0.41	\$0.45
Total Incremental Benefits		\$0.55	\$0.61

7.2.3 Social and Community Assessment

The evaluation of the social and community account is summarized in Table 7.3 below.

Table 7.3: MAE Social/Community Account for Route Selection

Social / Community	Base	Route 1 (N1)	Route 2 (S2)
Education Opportunities	0	1	1
Health Care	0	0.8	0.8
Heritage/Archeological	0	-1	-2
Community (Civil) Services	0	0.8	0.8
Enforcement	0	0.8	0.8
Social Interactions	0	0.8	0.8
Local Business/Employment	0	1	1
Employment	0	0.8	0.8
Cost of Commodities	0	1.3	1.3

Where: +2=significantly better; +1=better, 0=neutral; -1=worse; -2=significantly worse

Both route options have significant support from affected communities. Communities strongly believe connecting Ilford to York Landing and Aiken Point will improve education opportunities for young people, improve the health of the community, and improve the local economy. Communities also recognized the benefits of reduced costs for the shipment of bulk goods, building supplies and fuel into the communities, as well as more opportunities to visit friends and family, do shopping and participate in recreational and cultural events. On the other hand, there are some concerns over increased access to alcohol and drug use, and the potential effects on cultural integrity of isolated communities. Historical Resources Branch, Archaeological, has indicated that Route 1 (N1) generally follows an existing hydro corridor, would likely have less heritage/archaeology impacts than Route 2 (S2).

7.2.4 Natural Environment

The impacts of each route option on the natural environment were evaluated by the Consultant Team and scored as shown in Table 7.4 below.

Based on the findings from the Traditional Knowledge Survey and Stakeholder feedback, there are likely higher quality moose habitat and winter caribou occurrences along Route 1 (N1). Also, a large forest fire in 2013 torched approximately half of Route 1 (N1) and a small amount of Route 2 (S2). In the shorter term, wintering caribou may avoid these burned areas, so there would be less conflict with the road. However in the longer term, as the new forest matures, the road link between Ilford and York Landing will get busier as caribou start to re-use the area,

posing a higher risk to the animals. Therefore the table reflects the longer term potential conflicts with wintering caribou.

Table 7.4: MAE Natural Environment Account for Route Selection

Natural Environment	Base	Route 1 (N1)	Route 2 (S2)
Potential hunting conflicts	0	-1	-2
Potential trapping conflicts	0	0	0
Recreation	0	1	1.5
Effects on moose winter range	0	-1	-0.5
Effects on caribou calving	0	0	0
Conflict with known caribou winter habitat	0	-1	-0.5
Potential stream crossing issues	0	-1.5	-1
Emissions	0	0	0

Where: +2=significantly better; +1=better, 0=neutral; -1=worse; -2=significantly worse

7.2.5 Selection of Preferred Route Option

The MAE results for the route option selection are summarized in Table 7.5. The weights assigned to each account for the MAE are 70% for financial account, 20% for Transportation Benefit Account, and 5% each of Environmental and Social/Community accounts. Based on discussion between the consultant team and those present during the September 2015 meeting with the Project Steering Committee, the Technical Working Group and the Stakeholder Advisory Group, a higher weight was suggested for the financial account because the availability of funding will most likely dictate the implementation time for this project, i.e., the more economical option will most likely occur sooner. Both York Landing and Ilford communities have indicated their desire for this project to move into the construction phase as early as possible, fast tracking the assessment of identified environmental and social/communities issues needing to be mitigated.

Based on the MAE results shown in Table 7.5, Route Option 2 (S2) is the preferred route option to connect the communities of Ilford and York Landing. Route Option 1 is ranked higher under the social and community account and environmental accounts because it has less heritage/archaeology impacts and potential conflicts with fishing. Route Option 2 (S2) yields lower cost under the financial account (largely due to its shorter length) and slightly higher benefit under the user benefit account.

Overall with the pre-defined weights assigned to each account, Route Option 2 (S2) has a higher ranking than Route Option 1 (N1).

Table 7.5: MAE – Route Options

Weights		Length (km)	32	40	35
A	B				
Account	Sub-Account		Existing	Route 1 (N1) North Option)	Route 2 (S2) (South Option)
		Account	2015 Millions \$		
		FINANCIAL			
		Capital	\$0.0	\$72.0	\$57.8
		Maintenance & Resurf	\$0.9	\$1.4	\$1.2
		Residual Value	\$0.0	(\$10.6)	(\$8.5)
		Present Value	\$0.9	\$62.8	\$50.5
70%	100%	Incremental Cost		\$61.9	\$49.7
		TRANSPORT USERS			
		Travel Time (Hrs) 1-way to Thompson	2.13	0.57	0.50
		Travel Time Cost	\$0.2	\$0.0	\$0.0
		Collisions Cost	\$0.0	\$0.0	\$0.0
		Vehicle Operating Costs	\$0.1	\$0.0	\$0.0
		Total User Costs	\$0.3	\$0.1	\$0.1
		Incremental Benefit		\$0.1	\$0.2
		Induced Benefits		\$0.4	\$0.4
20%	100%	Total Benefits		\$0.6	\$0.6
		NPV		(\$61.4)	(\$49.1)
		B/C Ratio		0.009	0.012
		ENVIRONMENTAL	Scores		
5%		Potential hunting conflicts	0	-1	-2
	10%	Potential trapping conflicts	0	0	0
	10%	Recreation	0	1	1.5
	15%	Effects on moose winter range	0	-1	-0.5
	15%	Effects on caribou calving	0	0	0
	15%	Conflict with known caribou winter habitat	0	-1	-0.5
	15%	Potential stream crossing issues	0	-1.5	-1
	10%	Minimize greenhouse gas emissions	0	0	0
	100%	= Sum (A x B x Score)	0.00	-0.03	-0.02
		SOCIAL/COMMUNITY	Scores		
5%		Education Opportunities	0.0	1.0	1.0
	10%	Health Care	0.0	0.8	0.8
	25%	Heritage	0.0	-1.0	-2.0
	10%	Community (Civil) Services	0.0	0.8	0.8
	5%	Enforcement	0.0	0.8	0.8
	10%	Social Interactions	0.0	0.8	0.8
	5%	Local Business/Employment	0.0	1.0	1.0
	15%	Employment	0.0	0.8	0.8
	10%	Cost of Commodities	0.0	1.3	1.3
	100%	= Sum (A x B x Score)	0.00	0.02	0.01
100%		OVERALL RANKING		-0.70	-0.57

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7.3 Evaluation of Corridor Options for PR 280 Connection

7.3.1 Financial Costs

The project costs for the 3 corridor options are shown in Table 7.6. It is assumed that Corridor 1 would be in service later than Corridors 2 and 3 due to its longer construction time, and therefore affect when the benefits will start accruing.

Corridor Option 1A has the shortest route to Thompson for York Landing and Ilford residents, however, this option has the longest new road construction (57 km) and will require two major river crossings (Nelson River and Burntwood River). This option is ranked last with the highest agency costs (\$84.7 M, 2015 Dollars).

Corridor Option 2B requires 41 km of road construction (\$79.8 M, 2015 Dollars). Since it will intercept PR 280 in the middle between Thompson and Gillam: travel times to these two major communities will be well balanced. This option does require a crossing at the Nelson River, requiring a cable ferry if it is deemed feasible.

Corridor Option 3B requires 43 km of new road construction including a future 3 km long bypass of Ilford. It does not require any Nelson River crossing because it can utilize the proposed road on top of the Keeyask Dam, therefore, this option is the cheapest to construct.

In conclusion, Corridor Option 3B is more favourable in the financial account since it has the lowest agency cost (\$57.2 M, 2015 Dollars). Corridor Option 2 is ranked second in this account \$65.4 M, followed by Corridor Option 1 (\$71.3 M).

Table 7.6: MAE Financial Account (\$ Million in 2015) for Corridor Selection

Agency Costs (\$ Million, 2015 Dollars)	Base	Corridor 1A	Corridor 2B	Corridor 3B
Network Length (km)	32	57	41	43**
Winter Road	\$2.7 to \$3.0	\$2.0	\$1.2	\$0.8
Ferry	\$9.5 to 10.4	\$11.2	\$7.7	\$0
AWR Construction*	\$0.00	\$77.8	\$79.8	\$77.9
AWR Maintenance	\$0.00	\$1.2	\$1.7	\$2.2
Residual Value Recovery		-\$7.6	-\$12.4	-\$14.4
Total	\$12.2 to 13.4	\$84.7	\$78.0	\$69.4
Incremental Costs		\$71.3	\$65.4	\$57.2

* Based on 8 m gravel top width, 4:1 side slopes. See Appendix F

** Includes 3 km bypass of Ilford

7.3.2 Transportation Benefits

Corridor Options 1 (1A) and 2 (2B), with the shorter travel distances to York Landing and Ilford from Thompson generate the highest incremental benefits compared to the base case scenario with winter road travel. These two options generate an incremental benefit of approximately \$7.0 M to 8.0 M respectively for savings generated from passenger time. In contrast, Corridor Option 3 (3B) with the longest travel distance to Thompson, only generates \$4.3 M of savings from passenger vehicles and passenger time.

As shown in Table 7.7, both Corridor Options 1 (1A) and 2 (2B) are considered more favourable in the transportation benefit account, which were estimated to generate incremental benefits of \$6.8 M and \$7.8 M (2015 Dollars) respectively. As mentioned above, Corridor Option 3 (3B) generates the lowest incremental benefits of \$4.3 M (2015 Dollars).

Table 7.7: MAE Transportation Benefit Account (\$M in 2015) for Corridor Selection

User Costs (\$ M, 2015 Dollars)	Base	Corridor 1A	Corridor 2B	Corridor 3B
Passenger Vehicles	\$18.4 to \$20.2	\$15.9	\$13.4	\$13.9
Passenger Time	\$13.2 to \$14.6	\$11.6	\$10.5	\$12.0
Freight	\$4.4 to \$4.8	\$3.9	\$3.3	\$3.3
Total User Costs	\$33.2 to \$37.5	\$31.4	\$27.4	\$29.1
Incremental Benefits	-	\$6.1	\$7.3	\$4.1
Induced Benefits	-	\$0.7	\$0.5	\$0.2
Total Incremental Benefits		\$6.8	\$7.8	\$4.3

7.3.3 Social and Community Assessment

The evaluation of the social and community account is summarized in Table 7.8 below.

An AWR connecting Ilford and York Landing to the provincial highway network has overwhelming support in Ilford and York Landing, and has mixed support in Tataskweyak (Split Lake). Some Tataskweyak (Split Lake) residents expressed concern about increased uncontrolled access of people and goods through their reserve resulting from Ilford and York Landing traffic. They felt aligning the AWR routes in a manner that avoids providing direct access to the Tataskweyak reserve would help partially address the concerns. On the other hand, some Tataskweyak residents were in favor of Corridor 2, as it would provide access to their lands south of the Nelson River.

Table 7.8: MAE Social/Community Account for Corridor Selection

Social / Community	Base	Corridor 1	Corridor 2	Corridor 3
Social / Community Connection	0	0.5	2.0	0.5
Local Business/Employment	0	1.5	1.5	1.0
Heritage/Archeological	0	-2.0	-0.5	-0.5
Community Support	0	1.8	2.0	1.5
Access to Lands / Resources	0	1.0	2.0	1.0
Build Sooner	0	0.0	1.0	2.0
Route Availability / Reliability	0	0.0	1.0	2.0

Where: +2=significantly better; +1=better, 0=neutral; -1=worse; -2=significantly worse

Some stakeholders and York Landing and Ilford residents favoured Corridor Option 3, on the basis that it is the least expensive connection to PR 280 so as to improve likelihood of road construction. On the other hand, some commented that if Option 3 were to be built, they would want the ferry service to remain operational, which suggests that it is not seen as being a preferable travel choice compared to the ferry. Corridor Option 1 is seen as the most direct/efficient, but tempered with recognition that it is the most expensive, and may take longer to fund and build. Corridor Option 2 was seen as a “compromise” option between the cheapest (Option 3) and most useful from a transportation perspective (Option 1) choice.

7.3.4 Natural Environment

The impacts of each route option on the natural environment were evaluated by the Consultant Team and scored as shown in Table 7.9 below.

Corridor 1 has the most impact on the natural environment as compared to the other corridors. Based on the findings from the Traditional Knowledge Survey, there are multiple hunting interests in or adjacent to Corridor 1 south and west of York Factory FN. There are interests on and adjacent to other corridors but they are fewer. Corridor 2 has likely less quality moose habitat and lower winter caribou occurrences. Corridor 3 has less impact on fisheries resources with the least number of water crossings.

Table 7.9: MAE Natural Environment Account for Corridor Selection

Natural Environment	Base	Corridor 1	Corridor 2	Corridor 3
Potential hunting conflicts	0	-2	-1	-1
Potential trapping conflicts	0	-2	-0.5	-1
Potential fishing conflicts	0	-2	0	0
Recreation	0	1.5	1	0.5
Effects on moose winter range	0	-1	-1	-2
Effects on caribou calving	0	0	-0.5	-1
Conflict with known caribou winter habitat	0	0	-1	-2
Potential stream crossing issues	0	-2	-1	-0.5
Emissions	0	-0.5	-1	-1.5

Where: +2=significantly better; +1=better, 0=neutral; -1=worse; -2=significantly worse

Almost three-quarters of the length of the Corridor 3 route was involved in the 2013 forest fire. A small area at the north end of Corridor 2 was also burned. These burns will likely be avoided by migrating and wintering caribou for the foreseeable future, but eventually they will re-enter these areas as the new forest matures. The area near Corridor 3 was the most likely to be used by migrating caribou, particularly from the Penn Island herd, and long term, the existence of a road in Corridor 3 still poses a greater risk to these animals than the other corridors, as traffic on the road increases and caribou begin to utilize the area in winter.

There are numerous trapping interests either directly on or adjacent to the various proposed corridors. There are five traplines along Corridor 1, three traplines along Corridor 2 and four along Corridor 3.

7.3.5 Selection of Preferred Corridor Option

Overall, the preferred corridor must be identified by balancing all these multiple accounts. Under the Financial Account, Corridor Option 3 is clearly the cheapest to build due to its shortest length and therefore the most likely to get built sooner. However, the net Transportation Benefit of Corridor Option 3 is the lowest of the three due to the longer travel distance to Thompson. In terms of the Social/Community benefits and environmental constraints, Corridor Option 2 appears to be preferred, although the scores for Corridors 2 and 3 are close. Corridor 2 edges out 3 by a few points in both the social and environmental accounts. Several areas of importance for fishing, hunting, trapping, resource gathering or other important community sites were identified. These will be avoided where possible when refining the AWR alignments, and, with careful planning of the alignments, may not be significantly negatively impacted by any of the proposed corridors.

Based on the MAE results shown in Table 7.10, Corridor Option 3 is the preferred route option with a slightly higher score than Corridor Option 2. The deciding factor is the low construction

cost and timing of construction, which will likely receive more favourable consideration from the communities. However, Corridor Option 2 is a viable option since it provides better connection to Thompson compared to Corridor Option 3 and it is cheaper than Corridor Option 1.

It's drawback is the cost to build and operate a cable ferry at the Nelson River crossing for the foreseeable future, noting also a cable ferry crossing of the Nelson River will be less reliable than a road crossing atop the Keeyask Dam.

Table 7.10: MAE – Corridor Options

Weights						
A	B		Length (km)	57	41	43
Account	Sub-Account			South	Middle	North
		Account		Corridor 1A	Corridor 2B	Corridor 3B
		FINANCIAL		2015 Millions \$		
		Winter Road		(\$1.0)	(\$1.6)	(\$1.9)
		Ferry Operations		\$0.8	(\$2.1)	(\$6.6)
		New Route		\$77.8	\$79.8	\$77.9
		ASR Maintenance		\$1.2	\$1.7	\$2.2
		Residual Value Recovery		(\$7.6)	(\$12.4)	(\$14.4)
		Incremental Cost		\$71.3	\$65.4	\$57.2
70%	100%					
		TRANSPORT USERS		Present Value (\$mill) at 6%		
		Passenger Vehicles		\$3.20	\$4.04	\$3.05
		Passenger Time		\$2.19	\$2.24	\$0.19
		Freight		\$0.75	\$0.98	\$0.83
		Induced Benefits		\$0.66	\$0.49	\$0.22
		Incremental Benefits		\$6.80	\$7.75	\$4.29
		Net Present Value		-\$64.49	-\$57.67	-\$52.92
20%	100%		B/C Ratio	0.10	0.12	0.07
5%		ENVIRONMENTAL		Scores		
	10%	Potential hunting conflicts		-2	-1	-1
	10%	Potential trapping conflicts		-2	-0.5	-1
	10%	Potential fishing conflicts		-2	0	0
	5%	Recreation		1.5	1	0.5
	15%	Effects on moose winter range		-1	-1	-2
	15%	Effects on caribou calving		0	-0.5	-1
	20%	Conflict with caribou winter habitat		0	-1	-2
	10%	Potential stream/river crossing issues		-2	-1	-0.5
	5%	Minimize greenhouse gas emissions		-0.5	-1	-1.5
	100%	=Sum (A x B x Score)		-0.05	-0.03	-0.06
5%		SOCIAL/COMMUNITY		Scores		
	20%	Social/Community Connection		0.5	2.0	0.5
	15%	Local Business/Employment		1.5	1.5	1.0
	20%	Education Opportunities		-2.0	-0.5	-0.5
	15%	Community Support		1.8	2.0	1.5
	10%	Access to Lands/Resources		1.0	2.0	1.0
	10%	Community (Civil) Services		0.0	1.0	2.0
	10%	Route Availability/Reliability		0.0	1.0	2.0
	100%	=Sum (A x B x Score)		0.01	0.06	0.04
		Local Business/Employment				
100%		OVERALL RANKING		-0.66	-0.54	-0.53

7.4 Route and Corridor Selection: Conclusions

7.4.1 York Landing to Aiken Point

The recommended 5.8 km long AWR route from York Landing to a new sheltered, deep water MV Joe Keeper ferry terminal at Aiken Point is shown on the previous Figure 5.1, and in more detail on an air photo base in Appendix H. The route, which apart from its connection to York Landing, is located on Provincial Crown Land, is a continuation of the road that was built west from York Landing in 2002, during a period of low lake levels, to provide emergency access to a temporary terminal for the ferry to Tataskweyak.

The new AWR is proposed to be a Rural Local Road, under the jurisdiction of MIT outside the York Factory First Nation IR boundary, until such time in the future as an AWR connection to PR 280 is completed, when the ferry service can be withdrawn. In keeping with a Local Road classification, the road to Aiken Point is proposed to have a Design Speed of 60 km/h; a roadbed width of 6.6 m; and side slopes of 3:1.

The estimated capital cost of the road, including the new ferry terminal is \$11.01 million (\$2015). Relocating the ferry terminal to Aiken Point, shortens the travel time across Split Lake to Tataskweyak and PR 280, from about 2 hours to one hour, enabling more runs per day, and effectively increasing the ferry system capacity. The new terminal is anticipated to provide an additional month of ice free service compared with the existing terminal location.

Since York Landing currently experiences up to 5 months per year with no winter road access or ferry access, to and through Tataskweyak to PR 280, and also experiences unsatisfied demands for ferry service at peak periods, the priority for building the AWR to Aiken Point, along with the new ferry terminal, is considered the number one priority for implementation.

7.4.2 Ilford to York Landing

The recommended AWR route from York Landing to Ilford is the 35 km long Route 2 (South Route Option) shown on the previous Figure 5.1, and in more detail on an air photo base in Appendix H, where it is designated as sub-option S2. Apart from its connection to York Landing, the route is located on Provincial Crown Land.

The new AWR is proposed to be a Rural Collector Road, under the jurisdiction of MIT outside the York Factory First Nation IR boundary. In keeping with a Collector Road classification, the road is proposed to have a horizontal Design Speed of 80 km/h; a vertical Design Speed of 70 km/h; a roadbed width of 6.6 m; and side slopes of 3:1. Dependent on future traffic growth and availability of funds, the vertical design speed could be increased to 80 km/h, the roadbed width widened to 8 m, and the side slopes flattened to 4:1.

The recommended route is south of Moose Nose Lake and generally follows the existing winter road corridor, as well as the HBR corridor for the last stretch into Ilford.

Members of the Stakeholder Advisory Group (SAG) indicated a preference for a location south of Moose Nose Lake based on minimizing impacts to terrestrial wildlife and fisheries resources. Sub-option S2 is generally further from the Aiken River than sub-option S1, which is considered desirable in case of a fuel spill or other incident that could harm the aquatic environment. Compared with a route north of Moose Nose Lake, a route south of the lake also encounters, subject to on-ground geotechnical investigations, more potential aggregates that can be used to construct the road. A route plan in Appendix H, on air photo base, illustrates the location of aggregate resources.

During the next phase of work, functional design, an effort should be made, if feasible, to avoid running the AWR alignment on top of the winter road alignment, since during AWR construction, it would be desirable not to interfere with community traffic using the winter road.

The estimated capital cost of the road, including water crossings is:

- For the 6.6 m roadbed width/3:1 side slopes: \$48 million (\$2015)
- For the 8 m roadbed width/4:1 side slopes: \$77 million (\$2015)

Ilford/War Lake has round trip rail service to Thompson 3 days per week. Sometimes schedules are disrupted because of freight train priorities; also on occasion because of rail maintenance work or derailments. Winter road service via York Landing to and through Tataskweyak to PR 280, is generally available for 2 months each year.

Completion of an AWR route between York Landing and Ilford will benefit both communities:

- It will provide year round access to the HBR for the York Landing community
- During the period when Split Lake is ice free (about 5 months each year) and open to ferry travel, Ilford/War Lake residents will have an alternative to travelling by train
- Freight movements needed to resupply both communities throughout the year will see a potentially significant improvement
- Opportunities for travelling outside the communities for employment, medical appointments, education and recreation will be significantly improved
- Ilford/War Lake residents, businesses, health and educational staff will have access to scheduled air services at York Landing

Since realizing the above benefits is seen by the 2 communities as a necessary social imperative, completion of an AWR from York Landing to Ilford is seen as a high priority, 2nd only to completing the York Landing to Aiken Point AWR connection.

7.4.3 York Landing | Ilford to PR 280

The recommended AWR corridor from York Landing/Ilford to PR 280 is the 40 km long Keeyask Dam Corridor, Corridor Option 3B, shown on the previous Figure 5.4, and in more detail on an

air photo base in Appendix H. Corridor Option 3B is effectively shorter than Corridor Option 3A, when taking into account the soils crossed and the resultant relative ease of construction factors (RECFs). Corridor Option 3B runs NNE from Ilford, follows an existing trail to a hydro-electric transmission line junction, then continues until it intersects the under construction South Access Road being constructed by MB Hydro, east of the under construction Keeyask Dam. In order to enable traffic to and from York Landing to avoid travelling through Ilford to access this corridor (Option 3B), a bypass of Ilford and the War Lake IR, will need to be constructed when the corridor is implemented. Two schematic bypass options, one north of Ilford and one to the south, are also shown in Appendix H. The corridor is located on Provincial Crown Land.

The new AWR corridor is proposed to be a Rural Collector Road, under the jurisdiction of MIT. In keeping with a Collector Road classification, the road is proposed to have a horizontal Design Speed of 80 km/h; a vertical Design Speed of 70 km/h; a roadbed width of 6.6 m; and side slopes of 3:1. Dependent on future traffic growth and availability of funds, the vertical design speed could be increased to 80 km/h, the roadbed width widened to 8 m, and the side slopes flattened to 4:1.

Corridor Option 3B is recommended to provide the AWR connection to PR 280, rather than corridor options 1A (Near Kelsey Dam Corridor shown previously in Figure 5.2) or 2B (York Landing-North Corridor, shown previously in Figure 5.3), for the following reasons:

- It does not require cable ferries to cross the Nelson or Burntwood Rivers to connect to PR 280, since MB Hydro will be providing a public road on the Keeyask Dam to meet this need
- Because the corridor does not need ferries, it will be a more reliable route and have greater potential traffic capacity
- The capital cost and future operating costs are less than with the other corridor options
- The corridor encounters, subject to on-ground geotechnical investigations, significantly more potential construction aggregates than the other corridors, thus reducing haul distances and cost when construction takes place. Maps showing potential aggregates along the 3 corridor options are included in Appendix H.
- The corridor has less water crossings than the others
- The corridor puts Gillam, distant 70 km from Ilford, within potential daily commuting distance for employment, shopping, medical services and higher education

Construction of an AWR in Corridor 3B, as the third and last MIT priority in this area, likely preceded by a winter road to facilitate construction of the permanent road, completes the MIT's strategic policy intent to connect York Landing and Ilford to the existing provincial highway system in a reliable, safe and efficient manner, thus supporting their social needs as well as providing access to the human resource potential of these communities.

Compared to the other corridors, Corridor 3B may have a future impact on caribou, when the boreal forest devastated by the fire of 2013 grows back. When and if this conflict occurs in the future, a number of wildlife/traffic management measures may need to be implemented.

8.0 FINAL PUBLIC ENGAGEMENT

8.1 Public Engagement Materials and Results

The results of the evaluation of route and corridor options referenced in Section 5 of this report, along with the recommendations relating to preferred options, were relayed to the Ilford/War Lake and York Landing communities via public open house meetings on November 24, 2015. Owing to a death in the community it was not possible to meet with Tataskweyak (Split Lake). The scope of the second round public engagement included a PowerPoint presentation, a walkthrough of wall exhibits with one-on-one discussions with study team members, and a plenary discussion, question and answer period.

The presentation and exhibits covered the following topics (please see a copy of the presentation in Appendix D):

- Relocation of the MV Joe Keeper ferry terminal to Aiken Point
- Qualitative evaluation of the 2 AWR route options, north and south of Moose Nose Lake, between York Landing and Ilford
- Qualitative evaluation of the 3 corridor options to connect York Landing and Ilford to PR 280

The recommendations were:

- Relocate York Landing ferry terminal to Aiken Point and build an all-weather road from York Landing to Aiken Point
- Use Route 2 (south of Moose Nose Lake) to connect York Landing and Ilford
- Over the long term, a road along Corridor 3 (via Keeyask) should connect York Landing and Ilford to PR 280

The open house meetings were held in the communities on the following dates:

- Ilford/War Lake First Nation Tuesday afternoon November 24, 2015
- York Landing/York Factory First Nation Tuesday evening November 24, 2015
- Tataskweyak (Split Lake) Cree Nation was to be Wednesday November 25, 2015 but cancelled owing to a death in the community. It has still not been possible to meet with Chief Beardy or his Councillors to present the study recommendations, although they are available on the MIT web site.

8.2 Key Findings

Iford/War Lake: About 10 people, including Chief Betsy Kennedy attended this community open house. Feedback from the community included support for all of the above recommendations with some important provisos:

- Give the same priority to building the AWR between York Landing and Iford, as to the AWR between York Landing and Aiken Point
- Since drivers between York Landing and Iford will be familiar with the road, using less than the full (provincial) standards should be acceptable
- Build the AWR connection between Aiken Point, York Landing and Iford as soon as possible

York Landing: About 16 people, including Chief Ted Bland attended this community open house. Feedback from the community included support for all of the above recommendations with an important proviso:

- Build the AWR connection between Aiken Point, York Landing and Iford as soon as possible
- Bring forward the priority for building the AWR between Iford and Keeyask Dam. The Chief said he understood MB Hydro is already constructing the South Access Road between the Keeyask Dam and Gillam, with this road likely to be finished before a public road is available on the dam. Connecting in this way would provide an AWR connection to the rest of the provincial AWR system without needing to travel by ferry in the spring-summer-fall season or by ice road across Split Lake in the summer.

9.0 FUTURE PHASES: PLANNING, DESIGN AND CONSTRUCTION

Based on the findings from Chapter 5: Route and Corridor Selection regarding the preferred options, it is anticipated that the proposed all-weather road network will be developed sequentially in phases as follows:

Phase 1: York Landing to Aiken Point (new ferry terminal); 6 km gravel road

Phase 2: York Landing to Ilford; 35 km gravel road south of Moose Nose Lake – follows winter road corridor

Phase 3: Ilford to Keeyask Dam South Access Road; 43 km gravel road including 3 km bypass of Ilford

For the development of each of the three phases of the proposed all-weather road (i.e. York Landing to Aiken Point; York Landing to Ilford; and Ilford to the Keeyask South Access Road) the following planning, design and construction process will be followed:

- I. Functional Design & Additional Planning Assessment
- II. Environmental Permitting and Approvals
- III. Detailed Design/Pre-construction Activities
- IV. AWR Construction Activities

Dependent upon available resources and budget, the work would be staggered over a number of years, synchronized with the proposed work staging of the entire AWR network.

9.1 Functional Design & Additional Planning Assessment

Following completion of this Route Selection Study, it is estimated that about two years would be required for functional design and engineering, environmental assessment and right-of-way designation and acquisition. The key activities in the technical process would include the following:

Functional Design and Engineering

- Corridor Protection: withdraw quarries, within a 1 mile (1.6 km) corridor on each side of the preferred route and corridor alignments within the 3 AWR connections (total corridor width 2 miles, i.e. 3.2 km).
- Survey & Mapping: conduct ground-control for the existing 1:20,000 aerial photography between Aiken Point, York Landing and Ilford; acquire new ground controlled 1:20,000 aerial photography between Ilford and Keeyask; provide 1 m contours at select bridge locations and community road tie-ins.
- Geotechnical & Materials: conduct geotechnical investigation at select locations to confirm foundation requirements at river crossings, treatment for thaw settlement and erosion issues, and sourcing of construction aggregates.
- Road Design: develop vertical and horizontal alignment for the selected AWR routes; identify sources of construction materials, preliminary drainage requirements and right-of-way units for land assembly; develop layouts for road tie-ins to the proposed Aiken Point

ferry terminal, community access roads, as well as other roads, trails, airports and the Hudson Bay Railway station.

- Bridge/Structural and Culvert Design: conduct preliminary design of river and stream crossings along the selected routes, including hydrology and foundation design.
- Cost Estimating & Constructability Review: provide cost estimates at functional design level and constructability review to ensure value for money at an early design stage.
- Environmental Mitigation: confirm impacts to the natural environment arising from the Environmental Assessment, and prepare conceptual designs of mitigation measures.

Additional Planning Assessment

- Confirm the existing locations of First Nation Reserve boundaries, Treaty Land Entitlements and Trap Line areas and ascertain any planned expansions to these areas.
- Identify and confirm renewable and non-renewable resource and harvesting data in study area (e.g. caribou, quarries, mining and mineral extraction, fisheries, forestry etc.).
- Conduct field surveys at select locations to confirm presence of unique features, such as fisheries and wildlife values, woodland and barren lands caribou including the Penn Island herd, planned parks or protected areas, archaeological and cultural artefacts, and sensitive areas identified through the Traditional Knowledge Surveys undertaken during the Route Selection Study.
- Consult further with Manitoba Conservation, Fisheries and Oceans Canada and other regulatory agencies to confirm requirements for environmental impact assessment and permitting processes.
- Identify potential project-specific mitigation strategies.

9.2 Environmental Permitting and Approval

MB Conservation and the Canada Environmental Assessment Agency have been contacted regarding the environmental permitting requirements for the 3 phases of the proposed all weather road from York Landing to Aiken Point; from York Landing to Ilford; and from Ilford to Keeyask. Both agencies were of the opinion that the three phases could be permitted separately due to the likelihood of potentially lengthy time periods between development of the three AWR segments. If the schedule is tighter than as follows, it may be necessary to combine segments for review.

The provincial and federal environmental assessment process is described in the following section and other potential environmental approvals and permits are listed in Appendix J.

Federal Permitting

The *Canadian Environmental Assessment Act, 2012* (CEAA 2012) applies to projects described in the Regulations Designating Physical Activities (SOR/2012-147) and projects located on federal lands.

The proposed project does not meet the threshold for a “designated project” under section 25(c) of the schedule in the regulations, where “*the construction, operation, decommissioning and abandonment of a new all-season public highway that requires a total of 50 km or more of new right of way*” is listed as subject to CEAA 2012. The three segments of road (Priority 1, 2 and 3) have different purposes, and if their proposed development is separated by large periods of time, they would not be considered one development, even through their planning is related. Section 25(c) of the schedule would only apply if MIT decided to construct the Priority 2 and 3 roads at the same time in which case CEAA 2012 would apply because the project would exceed the 50 km threshold.

A portion of the Priority 1 road is on federal land, hence, subject to CEAA 2012. For projects on federal lands that are not designated projects, CEAA 2012 requires that before federal authorities make any decision that would allow a project to proceed, they must determine whether a project is likely to cause significant adverse environmental effects. The federal authority (Indigenous and Northern Affairs Canada) would need to self-assess the project to determine whether or not it is likely to cause significant adverse environmental effects.

Other federal permits/approvals that may be required include are included in Appendix J.

Note: On June 20, 2016 the federal government launched a “comprehensive review of federal environmental and regulatory processes to restore public trust,” hence it is possible there will be changes to the federal legislation in the coming months/years.

Provincial Permitting

According to the Classes of Development Regulation 164/88 under Manitoba’s *Environment Act*, a two lane road at a new location is considered a Class 2 development and requires an

Environment Act Licence (EAL). All three roads would be subject to an assessment under the Act, with the exception of the portion of the Priority 1 road that falls on federal lands and is not within the Province of Manitoba's jurisdiction. The three segments of road (Priority 1, 2 and 3) have different purposes and their proposed development is separated by large periods of time, hence, they would most likely be approved through separate environmental assessments. It is possible that the Priority 1 and 2 could be approved under the same environmental assessment; however, MIT will probably prefer to keep them separate because of timing. They may not have all of the environmental assessment and design information required for Priority 2 when applying for Priority 1, hence combining them could delay Priority 1.

Manitoba is currently proposing to change the *Environment Act*. This assessment of permitting requirements is based on existing legislation however may change by the time all three roads are developed. Other potential permits/licenses required by the Province of Manitoba are also included in Appendix J.

Consultation

Subsection 35(1) of the *Constitution Act*, 1982, provides that "the existing aboriginal and treaty rights of the aboriginal peoples of Canada are hereby recognized and affirmed. Under the Act, the Government of Manitoba recognizes it has a duty to consult in a meaningful way with Aboriginal communities when any proposed provincial law, regulation, decision or action may infringe upon or adversely affect the exercise of a treaty or Aboriginal right of that Aboriginal community.

It is anticipated that under the Government of Manitoba's current *Interim Provincial Policy for Crown Consultations with First Nations, Métis Communities and Other Aboriginal Communities*, consultation would be warranted for all three road segments.

9.3 Detailed Design, Pre-construction Activities

Following a 1-2-year minimum period for the functional design and environmental assessment of the recommended AWR connections, up to three years would be required for detailed design and other AWR pre-construction activities.

The key activities in the technical process will include the following:

- Detailed Design and Pre-Construction Activities such as stockpiling of materials.
- Winter Road Priorities
 - Maintain the annual winter road program by building near the alignment of the future AWR connection to the extent feasible
 - It is noted that a winter road from York Landing to Aiken Point would only be considered if it would benefit winter construction activities for the AWR, since the ferry service between the new terminal and Tataskweyak will only occur for about 6 months around the summer season
 - The preferred AWR between York Landing and Ilford generally follows the existing winter road corridor. During construction of the AWR, some shifting of the winter road alignment may be necessary to avoid AWR construction activities interfering with general intercommunity traffic movement.
 - Option S2 between York Landing and Ilford shows 9 water crossings of up to 5 m along the preferred route alignment. Construction of permanent culverts or bridges at the above locations in advance of AWR construction could extend the operational season for the winter road system prior to completion of the entire AWR system.
- Ferry Priority

It is recommended that the MV Joe Keeper ferry service be improved and augmented prior to the construction of the bulk of the AWR system. This will entail building the approximate 6 km long AWR from York Landing to Aiken Point; constructing a new landing for the ferry; installing a dolphin to restrain the ferry when moored and, if necessary, to deflect moving ice; and provision of a small building to house ferry staff and pedestrian ferry passengers. After the AWR between York Landing, Ilford and Keeyask is open to traffic, the MV Joe Keeper ferry service can be terminated.

Note: The 40-year old MV Joe Keeper i.e. the Split Lake ferry, has a limited remaining service life. The estimated cost to replace the ferry is \$12 to \$18 million. If road construction of the link to PR 280 is delayed beyond the remaining life of the ferry, the province will be expected to either undertake significant refitting or replace the ferry.
- Permanent Bridge/Culvert Priorities

To extend the operational life of the winter road system, if it is revised as noted above, it is recommended that permanent bridges or culverts be built wherever feasible along the proposed AWR routes.

9.4 All-Weather Road Construction Activities

Construction of the AWR network could start following functional engineering, environmental assessment, detailed design and pre-construction activities. Subject to the availability of funds and provincial priorities, a multi-year phasing plan is suggested for the construction of the AWR system, consisting of three priority packages in the sequencing of the AWR construction:

- **Priority 1:** AWR from York Landing to new ferry terminal at Aiken Point, for immediate isolated community benefit, by extending MV Joe Keeper ferry service from about 5 months per year, to about 6 months per year; shortens ferry route and travel time by about 50%, enabling, if needed, up to 4 rather than 2 round trips per day; based on 2 trips per day, annual wear and tear on ferry is significantly reduced:
 - Provide 6 km long gravel road from York Landing to Aiken Point and construct new ferry terminal
- **Priority 2:** AWR from York Landing to Ilford, for immediate benefit to two isolated communities, by providing year round rail access for York Landing, as well as ferry transportation option for Ilford for about 6 months per year:
 - Provide 35 km long gravel road from York Landing to Ilford, south of Moose Nose Lake- following existing Winter Road corridor and portion of railway corridor, along DFO preferred alignment Route 2 (South Route, Sub-option S2)
- **Priority 3:** AWR from Ilford to the Keeyask South Access Road to provide assured year round AWR access to the Manitoba all-weather provincial highway/road network
 - 43 km gravel road from Ilford to Keeyask (Corridor 3B) including bypass of Ilford. A winter road could be built first in Corridor 3B to facilitate AWR construction

Table 9.1 summarizes the AWR connections to be constructed according to the above priorities, along with possible implementation periods, the connection construction lengths and capital costs. The phasing of the AWR construction is further depicted in Figure 9.1.

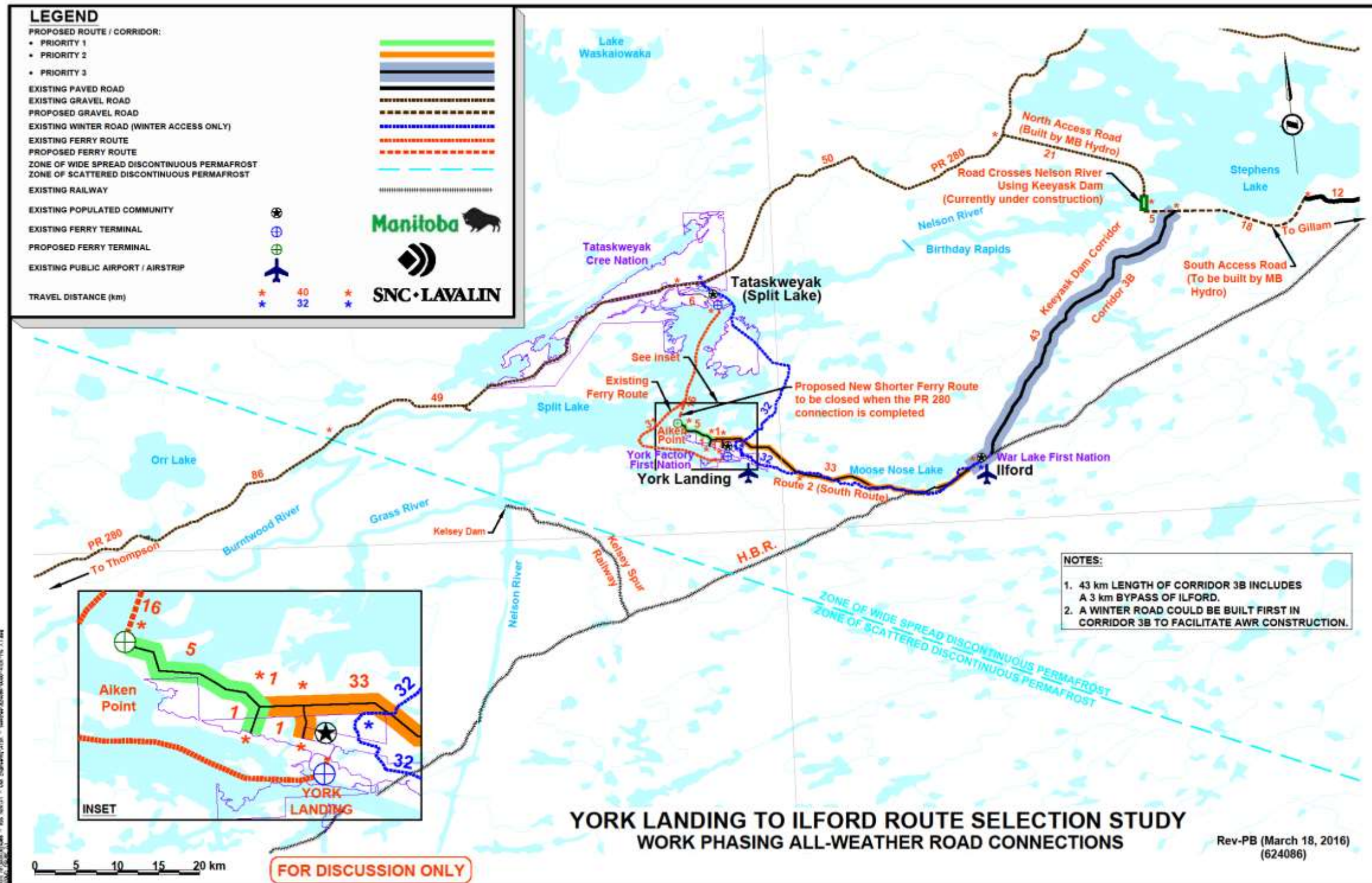
Table 9.1: AWR Priority Segments, Lengths and Costs

Approximate Time Frame for Development (years)**	Segment Priority/ Description	Segment Length (km)	Capital Cost* (\$ Million)
Up to 4 years to construct	<u>Priority 1:</u> York Landing to new ferry terminal at Aiken Point	5.8 km	\$11 (6.6 m top width, 3:1 sideslopes)
Up to 7 years to construct	<u>Priority 2:</u> York Landing to Ilford – Route 2 south of Moose Nose Lake	35 km	\$77 (8.0 m top width, 4:1 sideslopes) \$48 (6.6 m top width, 3:1 sideslopes)
Up to 7 years to construct	<u>Priority 3:</u> Ilford to Keeyask South Access Road – Corridor 3B	43 km	\$95 (8.0 m top width, 4:1 sideslopes) \$60 (6.6 m top width, 3:1 sideslopes)
Total network		83.8 km	\$183 (8.0 m top width, 4:1 sideslopes) \$119 (6.6 m top width, 3:1 sideslopes)

*Note: *For the AWR segments, construction costs per segment for gravel road are estimated using an average net basic construction cost of \$1.04 M per km for 6.6 m top width and \$1.67 M per km for 8.0 top width (2015 Dollars). The capital costs in the table include a new ferry landing and dolphin at Aiken Point, all required culverts and permanent bridges; 15% engineering, 10% project management and 20% contingency. The range of precision of the construction costs is estimated to be between -25% and +50%.*

*Note: **Approximate time frame for development is subject to provincial priorities and availability of funding.*

Figure 9.1: Work Staging All-Weather Road Connections



10.0 RECOMMENDATIONS

10.1 Introduction

This chapter includes a summary of the recommendations for preferred alignments for the proposed development of all-weather roads in the vicinity of the communities of Ilford and York Landing. The summary includes a discussion of potential benefits and beneficiaries resulting from the development of each of the proposed all-weather road segments. In addition, the chapter includes a discussion of issues associated with all-weather road development and how these issues have been approached at this preliminary planning stage.

10.2 Study Recommendations: Rationale, Benefits and Beneficiaries

10.2.1 Recommendation 1: All weather road connection from York Landing to a new MV Joe Keeper ferry terminal at Aiken Point

Relocate York Landing ferry terminal to Aiken Point to significantly reduce ferry travel times; build an all-weather gravel road from York Landing to Aiken Point along the route alignment shown in Appendix H.

AWR Route Selection Rationale:

- Route maximizes use of an existing community road running along the north bank of the Aiken River outflow to Split Lake
- AWR route alignment is the most effective, safe and reliable in light of its length; the terrain and soils; construction and maintenance costs; and ease of staging
- Route ties to a sheltered, deep water bay on Aiken Point that has been proven suitable for a new terminal for the MV Joe Keeper ferry
- Route avoids Split Lake IR No. 171 B, but is close enough to facilitate access to it
- Route has flexibility to connect to an AWR route to Ilford without encroaching on York Factory First Nation IR land

Benefits:

- Reduced ferry travel time from about 2 hours to 1 hour
- Extended ferry season from about 5 months to 6 months
- Enabling of up to 4 sailings per day if needed in peak periods
- Less fuel consumption, green house gas emissions and wear and tear on the ferry, thereby extending its life, or the life of any replacement vessel
- Access to a sheltered deep water landing site, less likely to be affected by fluctuations in the level of Split Lake resulting from climate change or MB Hydro operations

Beneficiaries:

- Residents of York Landing with less travel time to PR 280, and less likelihood of being left behind
- Agencies of the Federal Government providing services in York Landing e.g. medical, education and police services, since staff will spend less time travelling
- Companies doing business with York Landing since they will have access to potentially more frequent ferry service, with greater ferry capacity and less travel time
- Province of Manitoba, in particular MIT Northern Airports and Marine Operations, with reduced marine vessel operating, maintenance and replacement costs

10.2.2 Recommendation 2: All weather road connection from York Landing to Ilford

Use Route 2 (Sub-option S2 south of Moose Nose Lake) to connect York Landing and Ilford with an all-weather gravel road, as shown in Appendix H.

AWR Route Selection Rationale:

- Most effective, safe and reliable route in light of its length; the terrain and soils; construction and maintenance costs; and ease of staging
- Compared with a route north of Moose Nose Lake, route has moderate environmental impact due to shorter length of new road construction; it is also much closer to potential construction aggregates; and has greater potential for early implementation since it shares common corridors with the existing winter road and the Hudson Bay Railway
- Compared with Sub-option S1, also south of Moose Nose Lake, Route S2 is further from the Aiken River; its longest water crossings are in the range 0-5 m, compared with a greater than 10 m crossing along Route S1; it is also preferred by the Department of Fisheries and Oceans. Potential impacts on fisheries resources can be mitigated through careful design, by observing appropriate construction techniques and timing windows

Benefits:

- Ferry access to PR 280 for about 6 months from Ilford, with year round access to scheduled air service at York Landing
- Provision of rail access year round to York Landing
- Elimination of the need to build and maintain a winter road every year
- Assured intercommunity access in the event that climate change precludes the implementation of winter roads
- Provision of improved community access, for York Landing and Ilford, to fishing, hunting, trapping and berry picking
- In case of fire or other emergency, access to back up services from the neighbouring community
- Ability to share services between the communities such as waste management and air services

Beneficiaries:

- Community residents and service providers, who will have greater freedom to travel, for whatever purpose
- Agencies of the Federal Government providing services in York Landing e.g. medical, education and police services, since staff will spend less time travelling
- Companies doing business with York Landing and Ilford, who will spend less time travelling
- Provider of scheduled air service at York Landing, who will have a larger pool of passengers to draw from
- VIA Rail who currently service Ilford, will have a larger pool of passengers to draw from
- Federal Government and MIT who will see a reduction in the winter road construction and operation budget
- Traditional resource gatherers
- Emergency services, who can be shared between the 2 communities

10.2.3 Recommendation 3: All weather road connection from Ilford to Keeyask South Access Road

Over the longer term, construct a gravel road along Corridor 3 (Sub-option 3B) (via Keeyask) to connect York Landing and Ilford to PR 280, as shown Appendix H.

AWR Corridor Selection Rationale:

- Gravel road construction distance is about the same as Corridor 2 (North from York Landing, Sub-option 2B) but encounters marginally better soils
- Crosses Nelson River on Keeyask Dam and does not require cable ferry service as do Corridor 1 (near Kelsey Dam) and Corridor 2
- Moderate environmental impact e.g. caribou impacts, can be mitigated through careful construction and operation practices
- Has the least number of water crossings of all 3 corridor options, therefore less impact on fisheries resources
- Most direct access to employment opportunities; shopping; medical, police, educational and other services at Gillam (population in 2011 census, 1281)
- Closer to significantly more potential construction aggregates than the other two corridors, Corridor 1 near Kelsey Dam, Corridor 2 north from York Landing

Benefits:

- Year round access between York Landing, Ilford and PR 280, as well as the rest of the provincial highway/road system
- Significantly improved community re-supply
- Reduced transportation costs for all
- Improved access for both communities to fishing, hunting, trapping and berry picking

- Further improved access to regional medical services, high school and higher education, job opportunities, shopping and recreation
- Elimination of the need to operate MV Joe Keeper ferry
- Elimination of the need to build and maintain a winter road every year between York Landing and Tataskweyak
- Assured intercommunity access in the event that climate change precludes the implementation of winter roads across the land or water bodies such as Split Lake

Beneficiaries:

- Community residents and service providers, who will have greater freedom in choice of travel times, for whatever purpose
- Agencies of the Federal Government providing services in York Landing and Ilford e.g. medical, education and police services, since staff will spend less time travelling
- Companies needing access to, or doing business with York Landing and Ilford, who, not being bound by the ferry schedule, will have greater flexibility in when to deliver goods and services
- Federal Government and MIT who will see a reduction in their winter road construction and operation budget
- Traditional resource gatherers
- Regional businesses and employers such as MB Hydro who will have readier access to labor resources among York Landing and Ilford residents
- Omnitrax, the current owners and operators of the Hudson Bay Railway. An AWR in Corridor 3B, coupled with the proposed Keeyask South Access Road provides an effective bypass of a long stretch of the railway, providing potential access for emergency rail crews and equipment, should the railway become inoperable due to washouts or subsidence at the interface of permafrost/non-permafrost ground conditions.

It is noted that the benefits of providing AWR access to remote communities must be balanced against potential negative impacts to the natural environment and the community, such as have been touched on earlier in this document. Based on stakeholder and community feedback, as well as previous experience in the north, construction of AWRs into remote communities can have potentially negative impacts such as increased accessibility for drugs, alcohol and out of town criminal elements; also easier access for hunters and fishers from other parts of the province, Canada or the United States, leading to over hunting and overfishing, with a consequent depletion of wildlife and fisheries resources needed to supplement the diet of local community residents. However provision of the ASRs can also enable mitigation of negative impacts e.g. the roads will provide easier community access for law enforcement agencies such as the RCMP, and improved boreal forest access for wildlife conservation officers. As the planning and development of the AWR system progresses a number of steps will be taken, and where feasible incorporated into the road design and construction methods, to further minimize negative impacts of development.

10.3 Next Steps

The following is a brief summary of next steps that will need to be undertaken to continue with development of the all-weather roads as identified in section 10.2 [“Study Recommendations: Rationale, Benefits and Beneficiaries”](#):

- Prepare an implementation plan outlining staging of preliminary work (i.e., pre-construction activities) and construction for the 3 priority segments of the project needing to be staged over a multiyear period, with timing as determined by provincial priorities and the availability of funding.
- Proceed with preliminary work as outlined including functional and detailed engineering design, hydrology and bridge design, geotechnical investigations, and detailed natural and social environmental studies; all of which are needed to further define the route and corridor alignments as well as right-of-way requirements.
- Prepare detailed estimates of construction and maintenance quantities, cost estimates, right-of-way areas and acquisition costs.
- Move to secure the recommended routes and corridor. Protection would need to cover mineral exploration, new mines, quarry access rights, community expansion and development, forestry, and as necessary, fishing, hunting and trapping activities.
- Conduct, as necessary official consultation with the First Nations and Northern Affairs communities along and affected by the recommended routes and corridor.
- Secure formal environmental permits and approvals for the 3 project segments.

**APPENDIX A:
MEMBERSHIPS OF
PROJECT STEERING COMMITTEE,
TECHNICAL WORKING GROUP
AND STAKEHOLDER ADVISORY GROUP**

**APPENDIX B:
MEETING MINUTES:
PROJECT STEERING COMMITTEE;
TECHNICAL WORKING GROUP;
STAKEHOLDER ADVISORY GROUP (INCLUDES POWERPOINT
PRESENTATION);
MEETING WITH CHIEFS AND COUNCILORS**

APPENDIX C:
ROUND 1 PUBLIC ENGAGEMENT MATERIALS:
POWERPOINT PRESENTATION,
COMMUNITY OPINION SURVEY,
SOCIAL COMMUNITY SURVEY,
TRADITIONAL KNOWLEDGE SURVEY, INCLUDING JOHN FLETT
LETTER

**APPENDIX D:
ROUND 2 PUBLIC ENGAGEMENT MATERIALS:
POWERPOINT PRESENTATION,
COMMUNITY ENGAGEMENT QUESTIONNAIRE**

**APPENDIX E:
TRAFFIC PROJECTIONS**

**APPENDIX F:
CONSTRUCTION COST ESTIMATES**

**APPENDIX G:
MULTIPLE ACCOUNT EVALUATION**

APPENDIX H:
JD MOLLARD MAPS OF ROUTES AND CORRIDORS:
TERRAIN AND WATER CROSSING DATA,
AGGREGATE AND BEDROCK BORROW SOURCE AREAS,
TERRAIN LEGEND, ILFORD BYPASS, BURN AREA (2013)

**APPENDIX I:
SNC-LAVALIN MAPS:
EXHIBITS 1 - 5**

**APPENDIX J:
ENVIRONMENTAL PERMITTING AND APPROVAL**