IGNACE AREA INFRASTRUCTURE: MUNICIPAL INFRASTRUCTURE STUDY

September 9, 2022

wsp

QUALITY MANAGEMENT

Issue / Revision	**Final**
Prepared By:	David Spacek, P.Eng.
Checked By:	Meghan MacMillan, MCIP, RPP
Authorized By:	Meghan MacMillan, MCIP, RPP

ACRONYMS AND ABBREVIATIONS

Term	Details
AECL	Atomic Energy of Canada Ltd.
APM	Adaptive Phased Management
CD	Census Division
IAWG	Ignace and Area Working Group
MBCHCH	Mary Berglund Community Health Centre
NHS	National Household Survey
NWMO	Nuclear Waste Management Organization
NWO	Northwestern Ontario
The Project	APM Project
Township of Ignace	The Township or Ignace
Wabigoon LSB	Local Service Board of Wabigoon

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1 INTRODUCTION

1.1 BACKGROUND AND CONTEXT

Since 2010, the Township of Ignace (Ignace) has been involved in a process of learning about the Nuclear Waste Management Organization's (NWMO's) Adaptive Phased Management (APM) Project for the long-term management of Canada's used nuclear fuel. The two remaining siting areas in the process are the Ignace area and the South Bruce area. The NWMO plans to complete all preliminary assessment work and to select one siting area to host the APM Project by 2023.

Preliminary studies suggest that the APM Project can be implemented safely in the Ignace area for a repository that will contain, and isolate used nuclear fuel from people and the environment for the long timeframes required.

Further detailed studies are required to fully assess the potential impacts of the APM Project. Building on previous work and engagement completed to-date, the NWMO and the Township of Ignace are working together to prepare a suite of community studies that will be shared broadly with the residents of Ignace and with other study area communities. The list of socio-economic community studies is included as Appendix A. The information acquired through these studies is expected to help Ignace leadership and residents make informed decisions about whether the APM Project is a good fit for their community, and if they are willing to consider hosting it and under what circumstances and terms.

Note to Reader

This and other community studies are preliminary and strategic in nature, all intended to identify possible consequences (e.g., to municipal infrastructure) in the Township of Ignace. Using information about the APM Project known at this point in time, these studies will describe a range of possible consequences that are the subject of specific and separate studies. For each possible consequence, potential options and strategies will be offered to leverage opportunities and/or mitigate possible negative consequences/effects.

It is important to note that these community studies (developed collaboratively by NWMO and the Township of Ignace) being investigated at this time are not the formal or final baseline or effects studies that will be part of the Impact Assessment as conducted under the regulatory process for the APM Project governed by the Impact Assessment Agency of Canada. Effects assessment will be undertaken at a later date following the conclusion of the siting process, and the initiation of the formal regulatory process.

Community studies will ultimately inform the APM Project hosting agreement between the NWMO and the Township as Ignace. As well, they will provide pertinent information for agreements with the City of Dryden and potentially other regional agreements. The study will:

a) Explore in more detail the questions, aspirations and topics of interest expressed by the community through the Township of Ignace project visioning process;

b) Assist the NWMO and the Township of Ignace in developing and identifying possible programs and commitments that ensure the Project will be implemented in a manner that fosters the well-being of the Township of Ignace and communities in the Ignace area and the region;

c) Advance learning and understanding on topics of interest to communities in the Ignace area and the region; and

d) Provide the community with information it has requested to help them make an informed decision in the case of the Township of Ignace and continue to inform dialogue with communities in the Ignace area and region prior to the conclusion of the site selection process in 2023.

The NWMO is committed to working collaboratively to ensure questions, concerns, and aspirations are captured and addressed through continuous engagement and dialogue.

The NWMO will independently engage with Wabigoon Lake Ojibway Nation and other Indigenous communities to understand how they wish to evaluate the potential negative effects and benefits that the Project may bring to their communities.

1.2 LAND ACKNOWLEDGEMENT

It is acknowledged that the lands and communities discussed in this report are primarily situated on the traditional territory of the Anishinaabe people of Treaty 3, and the Métis Nation.

1.3 PURPOSE AND SCOPE

This Municipal Infrastructure Study is one of four Infrastructure Studies completed by WSP Canada Inc. The overall objective of this study was to first complete an assessment of existing conditions, which was then followed by an assessment of changes that could occur, and an assessment of options or strategies to leverage opportunities or mitigate impacts. This study collected information related to existing municipal infrastructure, including capacity, demand, and the needs of the Township of Ignace.

Specific objectives included:

- Review and analyses of the water treatment and distribution system
- Review and analyses of the wastewater treatment and conveyance system
- Review and analyses of the stormwater management network
- Review and analyses of the road infrastructure
- Review and analyses of the solid waste management system
- Review and analyses of the power/telecommunications network

The study objectives are to:

- Evaluate the needed expansion of the municipal infrastructure to support housing and other development needs that arise with the project, and
- Identify options for the supply of needed infrastructure or enhancements for both the project and the other developments, including timing of necessary expansions.

1.3.1 SPATIAL BOUNDARIES

This Municipal Infrastructure Study focuses on the Township of Ignace since it is projected that the Project may increase its population by about 80 percent by 2046, compared to a potential increase of 5 percent in the rest of the local study region. This means that the potential consequences for municipal infrastructure are greatest in Ignace and somewhat muted in the rest of the local study area which includes: the City of Dryden, the Municipality of Machin, the Village of Wabigoon, the Municipality of Sioux Lookout, and unincorporated communities along Highway 17, including Dinorwic, Dyment, Borups Corner, Upsala, and along Highway 599, including Valora and Silver Dollar. It is our opinion that the trends displayed for Ignace will be the “critical case” for the entire Local Study Area.

1.3.2 TEMPORAL BOUNDARIES

The temporal boundary for the Municipal Infrastructure Study is as follows:

Table 1-1: Temporal Boundaries for Municipal Infrastructure

NEAR-TERM (2024 TO 2033)	MID-TERM (2033 TO 2043)	LONG-TERM (2043 AND BEYOND)
Aligns with the end of site preparation phase and design and construction start in 2033. This includes the construction of the Centre of Expertise in the Township of Ignace.	Aligns with the construction ending in 2042 and operations start in 2043.	Operations.

2 METHODOLOGY

2.1 GENERAL APPROACH

The general approach to the study was to review the existing municipal infrastructure so that the impacts on the APM project can be reviewed. The municipal infrastructure reviewed in this study includes potable water, sanitary sewers, storm sewers, municipal roads, solid waste, power, and telecommunications. The goal is to determine the baseline conditions on each of the above infrastructure components, then determine what impacts, if any, the APM project will have on the infrastructure.

The Municipal Infrastructure work plan was developed into five steps.

- Step 1: Information Gathering and Data Collection
- Step 2: Change Analysis
- Step 3: Options and Ideas Assessment
- Step 4: Engagement
- Step 5: Reporting

2.2 DATA COLLECTION / INFORMATION SOURCES

The following information was collected primarily from the Township of Ignace with additional information being used to validate assumptions. Projected population and housing increases due to the APM project that were used in analyzing changes and options were produced by InterGroup Consultants Ltd.

Data was collected through primary and secondary sources through the following activities to characterize existing conditions without the APM Project:

- Review existing reports.
- Discuss historical issues with Public Works Department staff (see detail below in subsection 2.2.1).
- Review current construction standards used for local road reconstruction projects.
- Understand current level of maintenance.
- Review of Township Geographic Information Systems (GIS) network / information.
- Review of Township Assets.
- Conduct internal meetings with WSP Asset Management Specialist.

A Baseline Presentation with the Ignace and Area Working Group (IAWG) was conducted on April 21, 2022, to present the key findings.

The study then shifted to summarizing potential changes due to implementation of the APM Project through the following activities:

- Identify gaps in future maintenance schedules.
- Identify additional traffic loading on roads and additional stormwater loading on collection system.
- Identify additional loading on sanitary collection network and Wastewater Treatment Plant.
- Identify additional loading on water distribution system and Water Treatment Plant.

- Identify additional loading on Solid Waste Management system.
- Identify climate aspects that may affect the longevity of road assets.

A Change and Options Presentation with the IAWG was then conducted on May 16, 2022, to present the findings.

Information sources included but were not limited to:

- Previous studies on water distribution and sewer system.
- Standard construction details used for water main and sewer installation.
- General history of road reconstruction / maintenance practices in Ignace.
- Water distribution system maps.
- Storm and sanitary sewer system maps.
- Asset Management Inventory Plan.
- Ignace Capacity Study (2021).
- Ignace Official Plan (2021).
- Various Ministry of Natural Resources and Forestry (MNRF)/ and Ministry of the Environment, Conservation and Parks (MECP) Reports.
- Ignace Waste Disposal Site Design and Operations Plan - DRAFT (2021).

2.2.1 KNOWLEDGE HOLDER INTERVIEWS / QUESTIONNAIRES

WSP conducted a joint interview with staff members from the Township of Ignace Public Works Department, as well as the Township Clerk, to better understand the level of maintenance and construction practices related to Municipal Infrastructure.

In general, the interview yielded the following key points:

- There are no road infrastructure plans to either re-construct existing roads or build new ones in the immediate future.
- Currently the public works department is having difficulty keeping up with annual road maintenance.
- Pine Street, West Street, Davey Lake Road and Balsam Street were resurfaced approximately 12 years ago.
- Most roads have never been touched (other than maintenance needed to fix localized potholes) since original subdivision construction in the 1970s. No information is available which identifies construction standards used (i.e., substrate thicknesses).
- Lily Pad Road was paved in 2021.
- No complete road reconstruction (i.e., sewers, watermain, base, subbase) has occurred to their knowledge.

2.2.2 IGNACE AND AREA WORKING GROUP MEETINGS

To support the baseline and community studies, the Ignace and Area Working Group (IAWG) was established. IAWG membership consists of representatives from the Township of Ignace as well as other area municipalities and communities, service providers, businesses, civil society, and other interests, both local and regional. The Township of Ignace and NWMO have prepared reports noting the IAWG's input.

The IAWG provided community knowledge throughout the community studies to ensure local perspectives were considered. IAWG meetings relevant to the Municipal Infrastructure study took place on:

- April 21, 2022 (IAWG Meeting #10): Presentation of the Baseline Study for Municipal Infrastructure to the IAWG
- May 19, 2022 (IAWG Meeting #12): Presentation of the Change Analysis and Options Assessment for Municipal Infrastructure to the IAWG

Feedback was also received from IAWG, Township of Ignace, and the NWMO via the Baseline and Change and Options presentation review, approval, and dry run sessions. Feedback from the IAWG was received during virtual breakout room sessions that followed the Baseline and Change and Options presentations. This information was incorporated into this report.

2.2.3 OTHER KEY INFORMATION AND DATA SOURCES

WSP also utilized past projects from other Northern Ontario communities (including Nipigon, Terrace Bay, and Massey) to validate certain assumptions used in the change analysis such as typical waste generation rates, waste densities, stormwater management policies, and design demands for Water Treatment Plants in similar sized communities.

2.2.4 STUDY LIMITATIONS

Municipal infrastructure studies, such as Capacity Studies or Servicing Reviews typically happen at the "pipe-level". This means quantifying existing flows and conditions in each branch/node of the system prior to adding proposed flows to see if they are allowable or require the system to resized, increase pressure, etc. Due to the specific design details of the APM Project (Centre of Expertise and Deep Geological Repository) being widely unknown at this time, proposed flows and where they will be entering the distribution system, and other details are undefined. The Township of Ignace was also not able to provide a model of their existing water and sewer networks, meaning existing pipe flows were also undefined. Lastly, the impact on municipal infrastructure is largely population based and only Ignace metrics were provided (the rest of the study area was lumped together). Considering this, WSP decided to conduct a high-level review on the Township of Ignace's municipal infrastructure utilizing more global capacity metrics (e.g., capacity of the Water Treatment Plant compared to the capacity of a sanitary main on Garden Street between East Street and Pine Street) to create a general picture of the changes, upgrades, and level of maintenance that could be expected.

The Municipal Infrastructure Study did not include site visits and surveys to create a model of the water and sewer systems. The analyses performed are at a high level and focused on the Township of Ignace only.

Other data sources, which included previous reports, studies, as well as information found online also had limitations as there was no assurance that these sources of information were current, complete, or correct.

2.3 ASSESSMENT

The assessment contained in this report was completed following the baseline analysis of municipal infrastructure. The assessment completed an analysis of how the APM project could potentially impact existing municipal infrastructure within the Local Study Area, through the temporal boundaries of the project, as outlined in Section 1.3.2 of this report.

Population projections, based on the project's temporal boundaries, were developed for both the Township of Ignace and the Local Study Area within *Northwest Community Studies Growing the Population and Opportunities* Report (InterGroup, 2022). To ensure consistency through the suite of community studies, WSP also used these population projections to inform our analysis of assessment impacts on other community infrastructure.

The assessment was completed by comparing the population projection against the baseline data / information on existing conditions that was collected. This assessment ultimately resulted in the development of demand assumptions placed on the municipal infrastructure through the phases of the APM project, based on the population growth and population characteristics (i.e., temporary workers, families, etc.) each phase of the project is expected to generate.

After collecting relevant background information on the Township of Ignace's municipal infrastructure through the sources described in the sections above, such as capacity, materials, age, operations, and level of maintenance, a description of the current system state was achieved.

WSP then utilized the population projections for the Township of Ignace with the APM project produced by InterGroup to determine the effects it might have on the Township's municipal infrastructure.

Following the identification of the effects imposed by the APM project on Ignace, options were developed that would address these effects. These options were produced from WSP's experience on a wide variety of municipal infrastructure projects in communities of similar size in Northern Ontario. Reference projects that WSP has been involved with in similar sized communities include watermain replacements, storm sewer upgrades, water treatment plant upgrades, sewage collection and treatment, as well as full road reconstruction projects.

3 EXISTING CONDITIONS

This section describes the existing conditions (baseline analysis) within the municipal infrastructure in the Township of Ignace.

3.1 GENERAL

This section of the study considers the municipal infrastructure components as it relates to baseline population projections. These are the population projections that would likely occur without the APM project. Information on baseline population projections was taken from the *Northwest Community Studies Growing the Population and Opportunities* report prepared by InterGroup Consultants Ltd. in May 2022. The report identified three baseline population projections as follows:

- Conservative Average – this shows the population of Ignace decreasing to 1,065 (following current trends)
- Potential Average – this shows the population of Ignace increasing to 1,415 (if forestry operations continue and some of the mining projects in Northwestern Ontario come online)
- Optimistic Average – this shows the population of Ignace increasing to 1,800 (this uses the historical growth rate of Ontario according to Statistics Canada)

The InterGroup report identified the long-term (Operations phase) baseline population project for Ignace to be 1,265. Therefore, the long-term baseline population without the APM project is estimated to be 1,265 for the purposes of this study.

3.2 WATER TREATMENT AND DISTRIBUTION

Based on Northern Waterworks' 2018 Annual Report on the Ignace Drinking Water System: "the Ignace Drinking Water System (DWS) is classified as a large municipal residential system and is composed of the Raw Water Pumping Station (RWPS), the Ignace Water Treatment Plant (WTP), and the Ignace water distribution system. The system is owned by the Corporation of the Township of Ignace and is operated, maintained and managed by Northern Waterworks Inc. Potential pathogenic organisms are removed and inactivated by chemical coagulation (as required), membrane filtration and free chlorine disinfection processes.

The source water intake structure is located approximately 440 m from the RWPS in Kekwanzik (Michel) Lake. Source water flows by gravity and through screens into two intake wells located at the RWPS. Pumps then transfer water from the intake wells to the WTP through a 3.1 km transmission line. The RWPS also includes an optional Zebra Mussel control system consisting of a sodium hypochlorite chemical feed system."

A Community Capacity Study was prepared by Urban Systems in March 2021. This report identified that the existing water treatment plant [in Ignace] was built in 2009 and has a 50-year useful life. The plant has a capacity of 2,730 m^3/day and is designed to serve a maximum population of 2,400. According to the operator of the water treatment plant (Northern Waterworks Inc.), the operational capacity of the facility is limited to serving a population of approximately 1,870 people, or approximately 2,000 m^3/day. This operational capacity is determined through experience from operating the plant.

Using the baseline population of 1,265 people, Ignace's Drinking Water System would operate at 53% of its rated capacity based on population. For reference, the peak flow in 2018 hit 54% of the rated capacity of the water treatment plant. Northern Waterworks is responsible for tracking the condition of the water network and identifying capital needs that the Township should consider.

In 2018, the Township of Ignace invested in water treatment maintenance, equipment repairs and replacement, including:

- 5 replacements
- 2 repairs

- 4 maintenance jobs

The Table below provides a summary of the age and condition of various components of the Water Distribution and Treatment system. This data comes primarily from the Township's 2013 Asset Management Plan (AMP). The average age metric was updated for 2022.

The Township is currently in the process of developing an updated AMP which will produce a more detailed description of scheduled replacements and budgetary allocations.

Table 3-1: Water Distribution and Treatment System Existing Conditions

FACILITY	QUANTITY	AVERAGE AGE	EXPECTED LIFE	CONDITION ASSESSMENT/COMMENTS
Water Lines	46 sections (23.97 km)	45 years	80 years	– Cost benefit analysis suggested before making repairs on the system – Review of information suggests 80 years is a reasonable useful life
Water Hydrants	142	46 years	80 years	– Observations and measurements of defects made in 2013 on every hydrant – Review of information suggests 80 years is a reasonable useful life
Water Valves	140	47 years	50 years	– Cost benefit analysis suggested before making repairs on the system – Recent failures suggest 50 years is a reasonable useful life
Water Treatment Plant	1	13 years	50 years	– Good condition, no incidents of regulatory non-compliance during most recent inspection (November 2018) – Peak flow recorded in 2018 only utilized 54% of plant's capacity – Review of information suggests 50 years is a reasonable useful life

Despite the majority of the watermains being installed in the 1970s (according to GIS records) only 3 watermain breaks have been recorded in the past 10 years (Urban Systems Ltd., 2021). Watermains are primarily cast iron and PVC (according to GIS records) with diameters of 6-10 inches. Existing water valves will begin to require replacement by 2025. With the exception of water valves, all other existing water systems infrastructure presented in the Asset Management Plan appear to be in good working condition and will not require replacement until approximately 12 years into the Operations phase of the APM project.

Issues regarding occasionally freezing water service lines at 237 houses in the Township have been identified. In 2019, JML Engineering completed a study on how to address this issue. The water service lines appeared to be periodically freezing in cold winters due to having been originally installed within the frost zone. This occurrence was more pronounced near the

streets where the insulating snow is removed, and where the service lines are most shallow. A high-water table was also believed to be heightening the impact of frozen ground conditions. Replacing the water service lines at a depth below frost was the most desired solution with the least amount of risk going forward, however, due to the high cost, an Aqua-Flo unit to keep the water circulating inside the water service line was recommended to be installed in 187 homes at an estimate of $631,125.00 + HST (JML Engineering, 2019). The number of homes who installed the units is unknown at this time.

3.3 SANITARY SEWERS AND SEWAGE TREATMENT

Based on Urban Systems' 2021 Township of Ignace Community Capacity Study: "the Township's existing wastewater treatment plant was built in the 1980s and has a 50-year useful life (approaching end of life). The plant has a capacity of 2,536 m^3/day and is designed to serve a maximum population of 2,400."

Although the Wastewater Treatment Plant was designed to serve a population of 2,400 people, performance and operational limits of the plant hinder its ability to reach those levels (Urban Systems, 2021). The current wastewater treatment plant would not support the baseline population of 1,265 people. This means the WWTP would require upgrades and/or expansion to meet the baseline demands. Due to the age of the facility, it will already have to be replaced or significantly upgraded regardless in approximately a decade due to it reaching the end of its design life.

The wastewater treatment plant is currently 63% utilized (on paper), however operationally at its limit. 297 lots which receive water servicing do not receive sanitary servicing. The 297 lots which receive municipal water but no sanitary servicing have their own septic systems and are therefore not connected to the wastewater collection and treatment system. Northern Waterworks is responsible for tracking the condition of the Water Network and identifying capital needs that the Township should consider (Urban Systems, 2021).

Using the baseline population of 1,265 people, Ignace's Wastewater Treatment Plant should operate at 53% of its rated capacity based on population; however as noted above, the performance and age of the facility is limited its ability to achieve full design capacity.

The Table below provides a summary of the age and condition of various components of the Sanitary Sewers and Sewage Treatment system. This data comes primarily from the Township's 2013 Asset Management Plan (AMP). The average age metric was updated for 2022.

Table 3-2: Sanitary Sewers and Sewage Treatment Existing Conditions

FACILITY	QUANTITY	AVERAGE AGE	EXPECTED LIFE	CONDITION ASSESSMENT/COMMENTS
Sanitary Sewers	43 sections (15.31 km)	45 years	80 years	– Cost benefit analysis suggested before making repairs on the system – Review of information suggests 80 years is a reasonable useful life
Sanitary Manholes	181	46 years	60 years	– Observations and measurements of defects made in 2013 on approx. 2/3 of manholes – Condition assessments suggest 60 years is a reasonable useful life

Wastewater Treatment Plant	1	~40 years	50 years	– Approaching end of design life – Limited spare capacity – Review of information suggests 50 years is a reasonable useful life

According to the Township's GIS records almost all sanitary pipes are asbestos cement pipe, 200-300mm diameter, and installed in the early 1970s. The existing sanitary manholes and sewers will not require replacement until approximately 2036 and appear to be in good working condition despite their age. The existing wastewater treatment plant is projected to require replacement by 2032.

There have been no reported performance issues with the wastewater treatment plant.

3.4 STORMWATER MANAGEMENT

Minimal work has been recorded on the Townships storm sewer network. Unlike sanitary sewers and watermains, the pipe material for storm sewers was not recorded in the Township's GIS records; however, they were also installed in the early 1970s. To WSP's knowledge, no information exists regarding additional stormwater infrastructure (e.g., retention / detention ponds).

The Table below provides a summary of the age and condition of various components of the Stormwater Management System. This data comes primarily from the Township's 2013 Asset Management Plan (AMP). The average age metric was updated for 2022.

Table 3-3: Stormwater Management Facilities Existing Conditions

FACILITY	QUANTITY	AVERAGE AGE	EXPECTED LIFE	CONDITION ASSESSMENT/COMMENTS
Storm Sewers	20 sections (3.81 km)	38 years	80 years	– Cost benefit analysis suggested before making repairs on the system – Review of information suggests 80 years is a reasonable useful life
Culverts	4	24 years	50 years	– No inspections of existing culverts have been completed – 50 years is a reasonable useful life for culverts

Storm Units	– 141 drywells – 11 catch basins – 1 oil grit separator (OGS) – 153 total units	21 years	60 years	– No inspections of existing storm units have been completed – Review of information suggests 60 years is a reasonable useful life

3.5 ROAD INFRASTRUCTURE

Based on Urban Systems' 2021 Township of Ignace Community Capacity Study: "the major Township corridors are West Street, Sorenson Avenue, Davey Lake Road, and Pine Street. Main Street is a Provincial Highway. These corridors are currently two-way streets. West Street and Sorenson Avenue were resurfaced in the early 2000s. Davey Lake Road looks to be in fair condition, budget for resurfacing in the next 10 years. Pine Street looks to need resurfacing in next 5 years."

West Beach Drive received surface treatment in 2017. Lily Pad Road was resurfaced in 2021 and the Ignace Plaza was built in 2021 as well.

Currently the Township Public Works department is having difficulty keeping up with annual road maintenance. The public works department noted that they are not aware of any instances in which a complete road reconstruction (i.e., sewers, watermain, base, subbase) has occurred in Ignace.

The Table below provides a summary of the age and condition of various components of Road Infrastructure. This data comes primarily from the Township's 2013 Asset Management Plan (AMP). The average age metric was updated for 2022.

Table 3-4: Road Infrastructure Existing Conditions

FACILITY	QUANTITY	AVERAGE AGE	EXPECTED LIFE	CONDITION ASSESSMENT/COMMENTS
Roads (i.e., roadbed, shoulders, pavement etc.)	– 50 asphalt sections(20.45 km) – 8 gravel sections (5.42 km)	40 years	50 years	– The Township has many roads over 30 years old that still exhibit adequate conditions – These 30-year-old roads still have ~15 years remaining before repairs are required – Observations and measurements of defects were made in 2013 on random road samples
Sidewalks	– 8 concrete sections (3.59 km) – 5 asphalt sections (2.65 km)	32 years	50 years	– 50 years is a reasonable useful life for sidewalks – Observations and measurements of defects were made in 2013 on random road samples
Parking Lots	5 (8,577 m^2 total)	37 years	50 years	– The Township has a 43-year-old parking lot that should last another 8 years

Using the baseline population of 1,265 people compared to the current population of 1,202 (2016 Census), an additional 63 people will require accommodations by the year 2043. The new accommodations in Ignace would likely include some new homes in addition to other accommodations such as apartments and short-term rentals. The construction of new homes would be required to support the baseline population projections. This would likely come from development of the Pine Street subdivision, as well as other rural properties around Ignace.

3.6 SOLID WASTE MANAGEMENT

The Township of Ignace manages its own curbside garbage collection and operates the Ignace Waste Disposal site. The site is utilized by several adjacent unorganized townships in the surrounding area for an estimate of approximately 5,000 resident users served by the landfill (Pinchin Ltd., 2021). The municipality is currently in the process of developing its Waste Management Strategic Plan that includes recycling and other waste diversion initiatives.

Approval of waste material for drop-off is at the discretion of landfill staff. Any material rejected by the attendant will be discarded as directed by the attendant, including removal from the waste disposal site. The site has a remaining capacity of 175,000 m^3 as of 2009 (Pinchin Ltd., 2021).

Figure 3-1: Ignace Landfill Location (Pinchin Ltd., 2021)

Extrapolating the remaining capacity in 2009 to today (2022) and using current population (1,202 people), the expected landfill capacity would be approximately 146,000 cubic metres.

Using the baseline population of 1,265 people and a typical waste generation of 1.75kg/person/day, the projected Annual Waste Generation would be approximately 2,308 cubic metres per year of compacted fill. Extrapolating from the remaining capacity in 2009, the remaining landfill capacity would be approximately 63 years of remaining capacity assuming the waste is properly compacted. When proper compaction methods are used, the typical density of compacted waste is 350 kilograms per cubic meter.

There are various methods for the compaction of solid waste and different equipment will provide different levels of compaction. In order to achieve the longest possible life of the waste disposal site, the township of Ignace should strive to achieve the maximum compaction levels possible.

3.7 POWER GRID & TELECOMMUNICATIONS

The figure displayed below presents the existing transmission lines in the Study area along with associated Voltages. Details on the existing power system in Ignace, such as current and remaining capacity, sub-station infrastructure etc. was not provided at this time.

Circuit(s)	Location	Voltage (kV)
D26A	Mackenzie x Dryden	230
F25A	Mackenzie x Fort Frances	230
K23D	Dryden x TCPL Vermill Bay x Kenora	230
K24F	Fort Frances x Kenora	230
N93A	Mackenzie x Marmion Lake x Atikokan	230
K21W, K22W	Kenora x Whiteshell (Manitoba Hydro)	230
A21L, A22L	Mackenzie x Lakehead	230
M23L, M24L	Marathon x Lakehead	230
15M1	Kenora x Rabbit Lake	115
29M1	Ignace x Camp Lake x Valora x Mattabi	115
A3M	Mackenzie x Moose Lake	115
B6M	Moose Lake x Sapawe x Shabaqua x Stanley x Murillo x Birch	115
D5D	Dryden x Domtar Dryden	115
F1B	Fort Frances x Burleigh	115
F3M	Fort Frances x Internat Fls (Minnesota Power)	115
K2M	Kenora x Norman	115
K3D	Dryden x Sam Lake x Eton x Vermilion Bay x Rabbit Lake	115

Figure 3-2: Existing Transmission Lines in Study Area (Hydro One Networks Inc., 2017)

The following is a list of companies that offer phone, internet, mobility and television utilities to Ignace region:

Bell Canada

Services Provided: Phone, Internet, Mobility, TV

Shaw Direct

Services Provided: Internet, TV

TBay Tel

Services Provided: Mobility

Xplorenet

Services Provided: Satellite Internet

Starlink

Services Provided: Satellite Internet

Celerity Telecom Inc

Services Provided: Fibre Optic Internet

Figures 3-3 through 3-5 below display Bell, Shaw and TBay Tel coverage in the study area.

Ignace Area Infrastructure: Municipal Infrastructure Study

The Township of Ignace, the Northwest Innovation Centre (Thunder Bay), and Celerity Telecom Inc. have also been working collaboratively to provide high speed fibre optic infrastructure and service to the Ignace Community. Construction has started in June 2022.

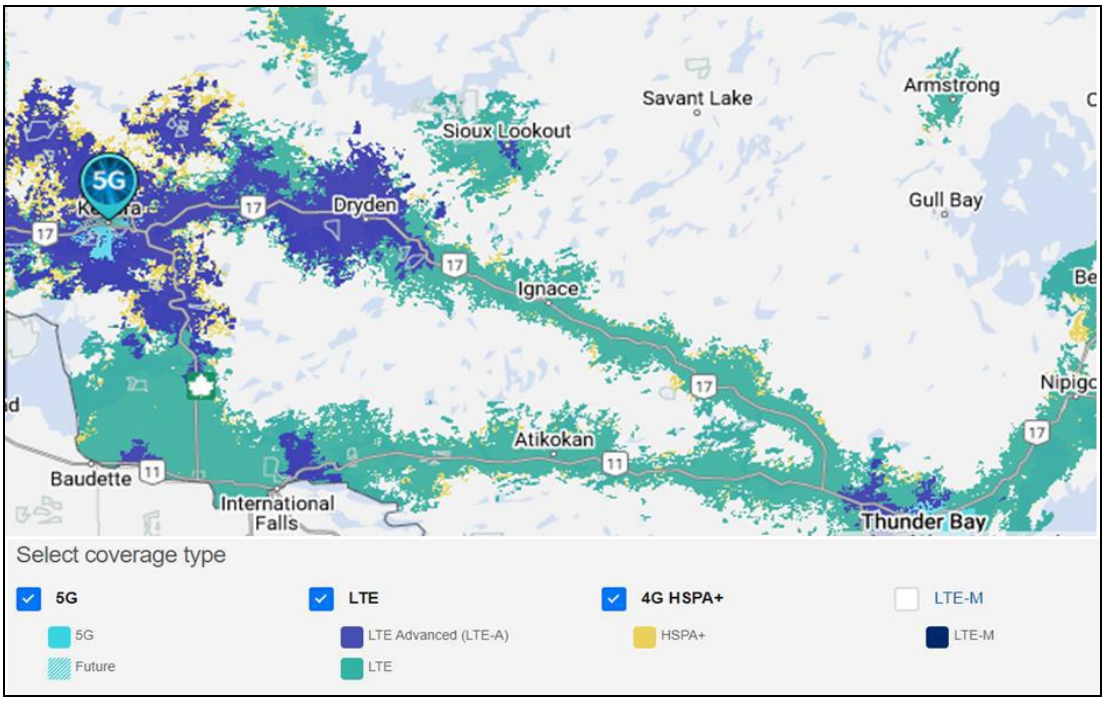

Figure 3-3: Bell Coverage Map in Study Area

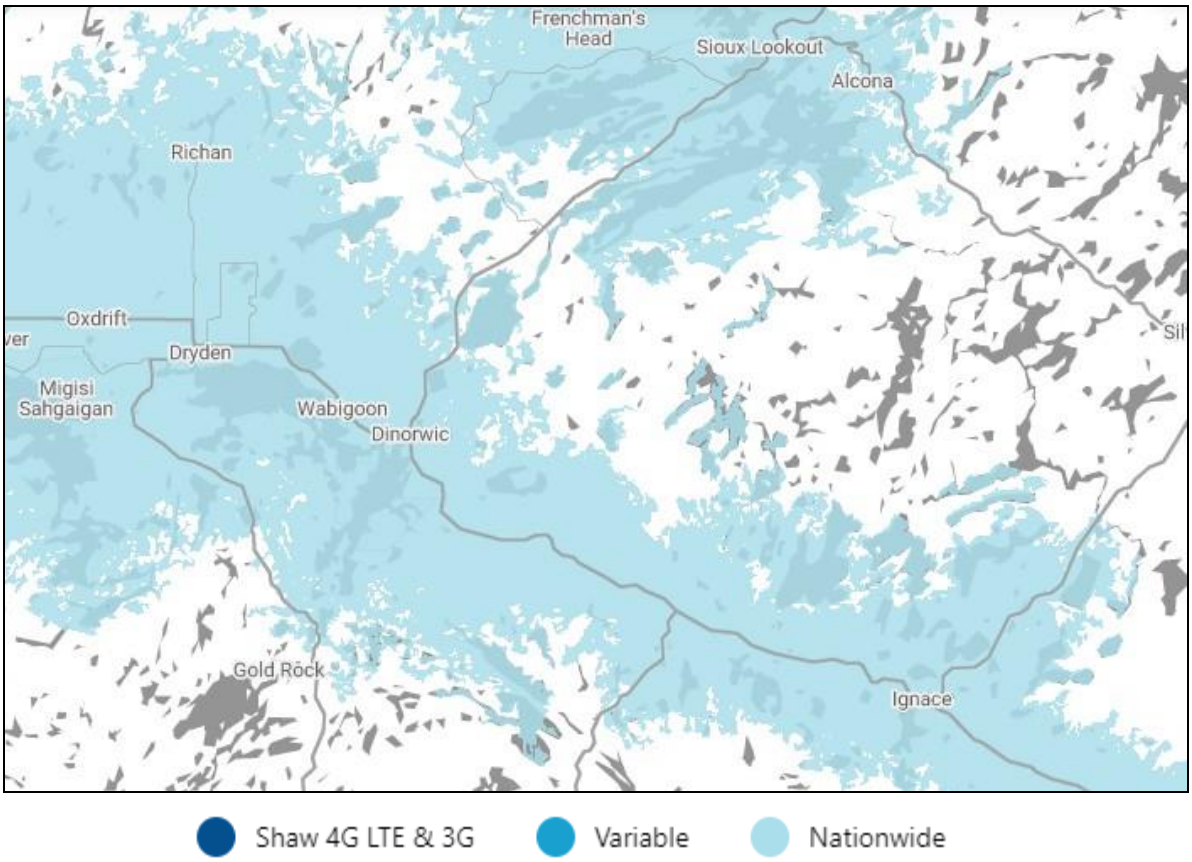

Figure 3-4: Shaw Coverage Map in Study Area

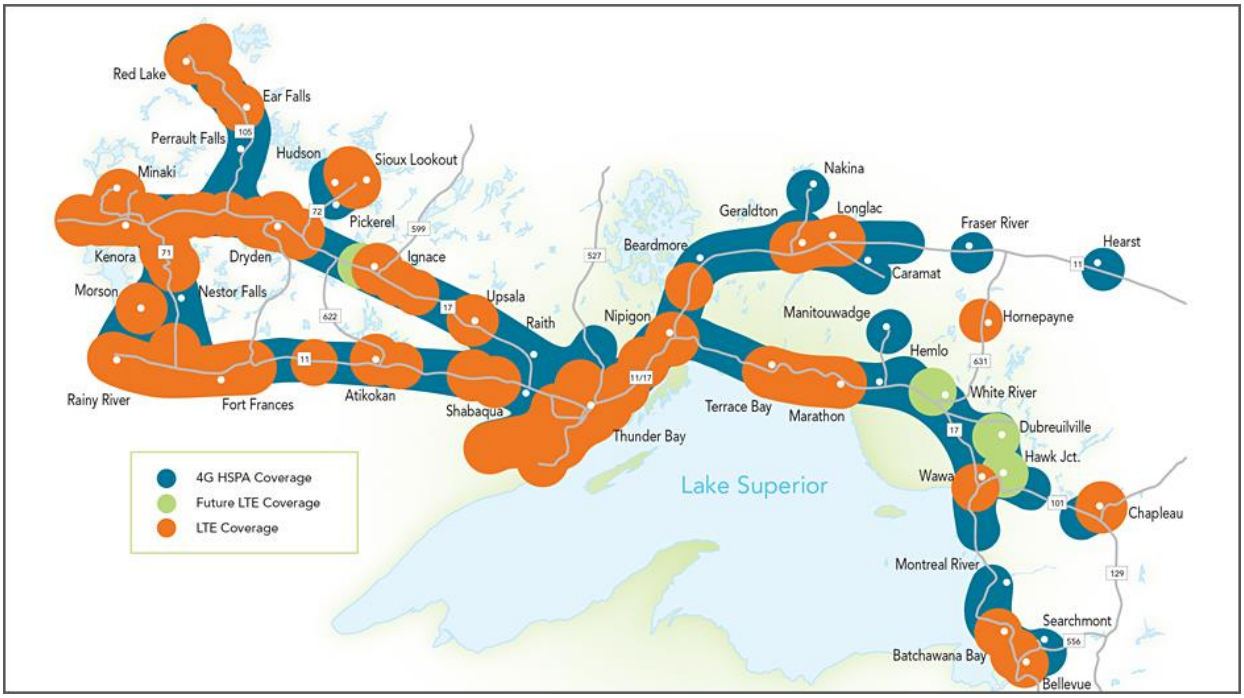

Figure 3-5: TBay Tel Coverage Map

4 APM PROJECT CHARACTERISTICS RELEVANT TO THE STUDY

4.1 POPULATION PROJECTIONS

The APM project comprises two components, the Deep Geological Repository (DGR) facility as well as the Centre of Expertise (COE), expected to be located in Ignace. The DGR facility will be located approximately 40 km west of the Township of Ignace and will contain much of its own municipal infrastructure (e.g., water and wastewater treatment plants). Therefore, the greatest impact on the Township's municipal infrastructure will stem from the increase in population due to the APM project, and bringing services to the Centre of Expertise. Below is a summary of Ignace's expected population and housing increase for each phase of the APM project. These projections will be used to assess the effects of the APM project on the Township as well as the options available to address these effects. It is noted that the increase in population for Ignace for this study will be based on the net difference between the baseline population of 1,265 people, and the population increase in Ignace as a result of the APM project.

The population projection charts have been included below including a brief description.

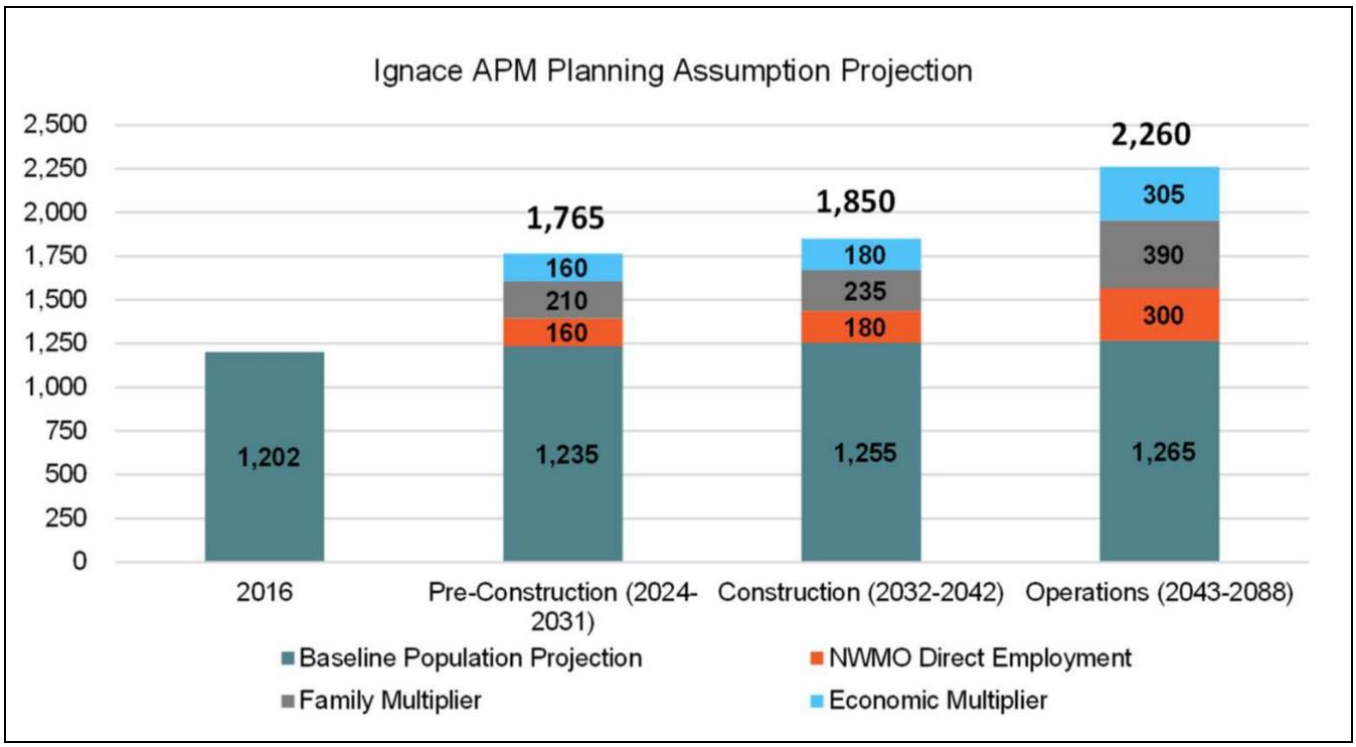

Figure 4-1: Township of Ignace Projected Population Growth with APM Project (InterGroup, 2022)

The breakdown of population growth for Ignace from the APM project is as follows:

- +530 pre-construction (years 2024-2031)
- an additional +65 for the Construction (years 2032-2042)
- an additional +400 during Operations (years 2043-2088)
- +995 Total (Approximately 80% population increase above baseline projection)

Most growth is projected to occur in the pre-construction phase.

This population growth and the impacts on housing were summarized in a memo entitled "Ignace and Region, Population, Housing, and Labour Assumptions" prepared analyzed by Avaanz Ltd in March 2022. The accommodations projections were as follows:

- Pre-construction: +160 over baseline
- Construction: an additional 20 over pre-construction (+180 over baseline)
- Operations: an additional 120 over construction (+300 over baseline)

This projection does not include labour coming from outside the local study area, which will require temporary accommodation.

4.2 CENTRE OF EXPERTISE

Below are details related the Centre of Expertise (COE) from the Deep Geological Repository Conceptual Design Report Crystalline / Sedimentary Rock.

The Centre of Expertise is currently planned to be built in Ignace. The building could be tied into the Township's existing sanitary collection and water distribution systems, directly adding demand to treatment and conveyance facilities. The centre will also rely on the town's solid waste facilities for its non-hazardous waste generated at the facility. The population projections for Ignace included the staffing of the new Centre of Expertise.

Based on information provided by the NWMO (2021):

> A Centre of Expertise will be established in the community selected to support ongoing detailed site evaluation. The centre will be in the community, as determined with people who live in the area. Its purpose will be to support the multi-year testing and assessment of the site on technical safety and community well-being related dimensions, which are key components of the site selection process. The Centre of Expertise will be home for an active technical and social research program and a technology demonstration program during this period, involving scientists and other experts in a wide variety of disciplines, including geoscience, engineering, environmental, socioeconomic, and cultural impact assessment fields.
>
> An engineering test facility will be located at the Centre of Expertise. Potential activities in the engineering test facility may include testing of prototype systems for the Used Fuel Packaging Plant (UFPP) (e.g., mock fuel handling, container welding, copper coating, etc.), as well as the development of container placement equipment for the underground repository. The engineering test facility may also house demonstration equipment to show key repository packaging and container placement processes.
>
> The Centre of Expertise may be expanded to support construction and operation of the deep geological repository. The centre will become a hub for knowledge sharing across Canada and internationally. Artist renderings of what the Centre of Expertise could look like are shown in the Figure below.
>
> Design details of the Centre of Expertise will be developed with the interested community, potentially affected First Nation and Métis communities and surrounding municipalities with their preferences in mind.

Figure 4-2: Centre of Expertise Concepts (NWMO, 2021)

5 PRELIMINARY ANALYSIS / EFFECTS ASSESSMENT

This section outlines the range of potential effects on municipal infrastructure as a result of the APM project. The effects on municipal infrastructure have been categorized into 'minor', 'medium', and 'major' impacts. For the purposes of this report, these impacts are defined as follows:

- Minor: an increase in use of the infrastructure asset that has little-to-no impact on the asset's current capacity. The asset will continue to be utilized and able to operate as per the current conditions. This can be described as the status quo.
- Medium: an increase in use of the municipal infrastructure that will have an impact on the asset's current capacity. The asset will continue to be utilized and be able to operate as per the current conditions, however, may require additional maintenance or upkeep due to increased usage.
- Major: a notable increase in use of the municipal infrastructure that will have a significant impact on the asset's current capacity. The asset will likely require replacement and/or expansion to increase its capacity.

5.1 WATER DISTRIBUTION AND TREATMENT

As outlined in section 4.1, the population of Ignace is projected to increase with implementation of the APM project to about 2,260 by project end. This is close to an 80% population increase relative to the baseline growth projection for the same time period.

The Township's water treatment plant (WTP) has an operational capacity which can serve a maximum population of approximately 1,870, which will carry the township through pre-construction and construction; however, the plant will require additional capacity for the operations phases of the APM project. The plant was built in 2009 with a 50-year design life and therefore would be projected to require replacement in 2059. At this time, the Township will have a better understanding of the actual populations and will be in a better position to determine if a full replacement of the WTP is required, or if the current system can be upgraded to provide the level of service required.

The water treatment plant is a membrane plant, meaning the water is pumped under pressure through a barrier to screen out unwanted constituents, as opposed to conventional slow sand filtration where water passes through the filter medium by gravity. This configuration requires a smaller footprint, however, typically maintenance and replacement of the membranes is more costly when compared to replacing the sand in conventional filters.

The direct impacts on the water treatment plant from the APM project will be an increased "wear and tear" on the equipment as it will need to run for longer durations to keep up with the demand. Pumps and chemical dosing systems that are currently running several hours a day to treat the water will need to run longer each day thus increasing the wear on the pumps. Similarly, the membranes in the water treatment plant will need to replaced more frequently. One factor that decreases the lifespan of membrane filters is the number of backwash cycles the membranes experience. An increase in the treated water output will result in an increase in the number of backwash cycles required to keep the membranes clean.

From an operational cost perspective, the increase flow through the water treatment plant will also mean increased energy costs, as well as increased chemical costs (sodium hypochlorite, membrane cleaning chemicals, and neutralization chemicals). Staffing costs may also increase to address additional equipment maintenance. The additional costs associated with increased energy and chemical costs would be marginal and likely offset by the increased number of rate-payers of the system.

The Maximum Serviceable Population for the water treatment plant is summarized below:

	Population	**Remaining Serviceable Population**
Operational Capacity of Water Treatment Plant	1,870	n/a
Current Population (2016 Census)	1,202	668 people
Baseline Population (2043+) (without APM project)	1,265	605 people
APM Project : Pre-Construction phase (2024-2031)	1,765	105 people
APM Project : Construction phase (2032-2042)	1,850	20 people
APM Project : Operation phase (2043+)	2,260	- 390 people (insufficient capacity)

It is also noted that an increased population would also result in an increase in the number of rate payers. This increase in rates collected should offset the increased operations and maintenance costs for the water treatment plant and distribution system. Rates charged to the users of the water system should be reviewed on an annual basis to ensure full cost recovery from the operations.

The distribution system was designed to serve the current population and is limited to where the current developments exist (under existing roads). The APM project will require a significant expansion to the distribution system to connect the projected 300 new accommodations required in Ignace by project end. When a distribution system is expanded new booster pumping stations may also required to deliver the water at an appropriate pressure and flow. The existing distribution system piping will continue to age and will require repairs and replacement as higher demands are placed on the system. Since watermains are typically only replaced when the number of breaks exceeds the desired level of service, the extent of replacement is difficult to quantify.

The Centre of Expertise could potentially be a large building in Ignace and would carry a significant water demand for the projected 120 to 180 occupants. The building may also require a large demand for fire flow. The specific details on servicing the new Centre of Expertise will be dependent on the final site of the centre. The site-selection process for the new centre would need to consider all aspects of municipal infrastructure and should be addressed in a Municipal Servicing Report which is specific to the Centre of Expertise.

5.2 SANITARY SEWERS AND SEWAGE TREATMENT

The wastewater treatment plant (WWTP) was designed to serve a maximum population of 2,400 people, however, is limited in its ability to service a population much greater than it currently serves due to the performance and age of the facility. The current wastewater treatment plant would not support the baseline population projections, nor would it support the projected 2,260 people (by the Operations phase) for the APM project. This means the wastewater treatment plant would require expansion to meet the increased demand from the APM project by the early stages of the Operations phase. Due to the age of the facility, it will already have to be replaced or significantly upgraded regardless in approximately a decade due to it reaching the end of its design life.

The direct impacts on the wastewater treatment plant from the APM project will be an increased “wear and tear” on the equipment as it will need to run for longer durations to keep up with the demand. Pumps and chemical dosing systems that are currently running several hours a day to treat the water will need to run longer each day thus increasing the wear on the pumps.

From an operational cost perspective, the increase flow through the wastewater treatment plant will also mean increased energy costs, as well as increased chemical costs (sodium hypochlorite, coagulation chemicals). Staffing costs may also increase to address additional equipment maintenance.

The sanitary sewer network will require significant expansion to connect to the projected 300 new permanent homes that will be built in the Township by project end. Sanitary sewer systems are predominantly gravity driven. Depending on the topography and the elevations of the existing sanitary sewers, sewage pumping stations may be required if the required slope for the sewer is not achievable due to existing sewers being too shallow.

Furthermore, there are some areas within Ignace which are not currently connected to the sanitary sewage system. These include homes along West Street, Sorenson Avenue, and Lakeshore Drive. It may be possible to connect these areas to the sewage collection system with a combination of gravity sewers and pumping stations or a low-pressure sewer system.

The Centre of Expertise (COE) could potentially be a large building in Ignace and would carry a significant demand on the sewage system for the projected 120 to 180 occupants. Based on sewage flow estimates from the Ontario Building Code for office workers, this could be in the range between 9,000 and 13,500 litres per day for the facility. For comparison purposes, sewage flows for a typical household are between 1,000 and 1,500 litres per day. This may impact the final site selection for the COE facility.

The Maximum Serviceable Population for the wastewater treatment plant is summarized below:

	Population	**Remaining Serviceable Population**
Operational Capacity of Wastewater Treatment Plant	Limited spare capacity	0
Current Population (2016 Census)	1,202	0
Baseline Population (2043+) (without APM project)	1,265	- 63 (insufficient capacity)
APM Project : Pre-Construction phase (2024-2031)	1,765	- 563 (insufficient capacity)
APM Project : Construction phase (2032-2042)	1,850	- 648 (insufficient capacity)
APM Project : Operation phase (2043+)	2,260	- 1,058 (insufficient capacity)

An increased population would result in an increase in the number of rate payers. This increase in rates collected should offset the increased operations and maintenance costs for the wastewater treatment plant. Rates charged to the users of the system should be reviewed on an annual basis to ensure full cost recovery from the operations.

As outlined above, the wastewater treatment plant does not currently have operational capacity to support baseline population growth. Furthermore, the facility is reaching the end of its expected life and will require replacement in approximately 10 years, regardless of whether the APM project moves forward in the community.

5.3 STORMWATER MANAGEMENT

The existing storm sewer piping network (200-600 mm diameter), is sufficient for residential growth; however, the collection system will need to be expanded into any new subdivisions. As many small subdivisions in Northern Ontario employ roadside ditches instead of storm sewers, the cost of expansion when compared to sanitary and water systems, could be significantly less.

In general, an increase in new development will also mean an increase in “hard surfaces” such as pavement (roads) and roof tops. This will decrease the amount of rainfall infiltration and will increase the amount of surface runoff into the existing storm sewer network, or existing ditches and waterways. This can have an impact on the amount of sediment and

pollutants carried into local waterways. With no controls in place, stormwater pollution can impact water quality and result in the reduction and loss of aquatic life and diversity.

The Centre of Expertise would be a relatively large building in Ignace, and therefore will be required to develop a Stormwater Management Plan as a part of the design. This plan needs to display how the proposed stormwater infrastructure (e.g., retention pond, infiltration gallery, level spreader, etc.), will keep the post development flows equal to that of the pre-development flows. This means no demand will be added to the Townships existing storm network.

5.4 ROAD INFRASTRUCTURE

The current capacity of the Ignace roadways is sufficient for residential growth throughout the APM project, as streets require 5,000 vehicles/day to justify twinning (Urban Systems Ltd., 2021). No expansions would be needed to support the population increase from the APM project (only local roads in new subdivisions etc.).

Increased road surface deterioration is expected with such a significant population increase combined with the region's harsh winter climate. More maintenance will be required on the local (residential) roads (e.g., pothole repairs). Truck (commercial) traffic to the Deep Geological Repository will be from the highway and should not impact the residential streets. From discussions with the Township's public works department, they are already having difficulty keeping up with annual road maintenance.

Loading from heavy vehicles is a rapid accelerator to road surface deterioration, especially on local roads that were not designed to bear the additional weight. Construction details of the Center of Expertise are still unknown at this time, and it is unclear if the site will incorporate its own access road for construction or utilize local roads in Ignace. Depending on the location selected for the new centre, some consideration may be required for additional wear and tear on local roads.

5.5 SOLID WASTE MANAGEMENT

As described previously, the Township manages its own curbside garbage collection service and landfill. The municipality is currently in the process of developing a Waste Management Strategic Plan including recycling and waste diversion opportunities. The landfill had a remaining capacity of 175,000 m^3 as of 2009 (Pinchin Ltd., 2021).

While the life expectancy of the landfill site was estimated to be approximately 63 years without the APM project, the increased population from the APM project will have an impact on the facility. Base on the 2009 capacity estimate of 175,000 cubic metres, and assuming the Township will start more aggressive compaction of the solid waste starting in 2023, the landfill would expect to be filled by 2056. This however, can be increased with good solid waste management including waste diversion practices such as recycling.

The completed Waste Management Strategic Plan will provide recommendations to the Township regarding whether they should close their landfill, expand, or divert waste in the next 20-40 years. As previously described above, the APM site plans on directing non-hazardous waste to a local landfill or other waste management facility; however, this does not necessarily mean it will end up in Ignace. As Ignace would already be accommodating the greatest population growth (~80% by project end) in the study area and housing the Centre of Expertise, it is more likely that the APM site diverts its non-hazardous waste via regional waste hauler, such as Green for Life Environmental (GFL) or Waste Management Inc. (WM) or to a larger municipality's landfill site that has greater capacity.

The amount of solid waste going to the landfill site will increase as a result of the increased population in the Township of Ignace.

5.6 POWER GRID & TELECOMMUNICATIONS

Since the APM site is located outside the Township of Ignace, the power requirements for the DGR facility are not expected to impact the town. Any impacts would come from the increased population in the Township of Ignace which would require new utility poles and powerline extensions to service any new subdivisions. Generally, increasing the number of homes by 300 would not require substantial alteration to the existing power grid.

The Centre of Expertise is planned to contain engineering testing facilities and laboratories and therefore may require a significant power input.

WSP does not anticipate the APM project to hinder telecommunications servicing in the region. New fibre optic infrastructure and service extensions will be required in new subdivisions. As the Township is currently implementing these fibre optic services, an accurate estimate of the cost of these extensions would be possible.

5.7 SUMMARY

The table below summarizes the effects of the Centre of Expertise and project related population growth on the Township of Ignace. Impacts are defined as follows:

- Minor: an increase in use of the infrastructure asset that has little-to-no impact on the asset's current capacity. The asset will continue to be utilized and able to operate as per the current conditions. This can be described as the status quo.
- Medium: an increase in use of the municipal infrastructure that will have an impact on the asset's current capacity. The asset will continue to be utilized and be able to operate as per the current conditions, however, may require additional maintenance or upkeep due to increased usage.
- Major: a notable increase in use of the municipal infrastructure that will have a significant impact on the asset's current capacity. The asset will likely require replacement and/or expansion to increase its capacity.

Table 5-1: Effects of Centre of Expertise and Project-Related Population Growth

MUNICIPAL INFRASTRUCTURE	IMPACTS	COMMENTS
Water Distribution and Treatment	Minor	– The Existing Water Distribution System is aging, but not impacted by the APM project. – The Distribution System will require expansion to connect to the projected new permanent homes in the community. – Additional capacity of the water treatment plant to support a larger population will be required during Operations phase; however the facility will be reaching it useful life by that time regardless of the project.
Sanitary Sewers and Sewage Treatment	Minor	– Existing sanitary sewers are aging, but not impacted by the APM project. – The sanitary sewer system will require expansion to connect to the projected new permanent homes in the community. – Sewage Treatment Facility has capacity for all phases of the APM project; however, will reach the end of its expected life within the next 10 years and as a result, will have to be replaced or significantly upgraded regardless of the APM project.
Stormwater Management	None	– Storm sewers will not be impacted by the APM project.
Road Infrastructure	Medium	– Road infrastructure is aging and will experience increased wear and tear due to the increased traffic from increased population.
Solid Waste Management	Medium	– The life expectancy of the landfill site will decrease (to approx. 2056) as a result of the increased population in the Township of Ignace.
Power Grid & Telecommunications	Minor	– The APM project is not expected to impact the power grid & telecommunications.

6 OPTIONS ASSESSMENT

NOTE TO READER

This section provides an overview of possible options to mitigate negative consequences or to enhance positive outcomes. They are presented by the authors to foster discussion only. They do not represent commitments or actions for the NWMO, the Township of Ignace, or other parties. The final decisions on actions and commitments will be made at a future date.

The most significant and notable effect of the APM project on municipal infrastructure for the Township of Ignace is the increase in population that the project will generate through its various temporal phases. The Centre of Expertise will also employ approximately 120 staff members during the operations phase of the project. While not all the members will necessarily reside in Ignace, there may be an impact from the additional staff in the community while they are working at the facility.

6.1 WATER DISTRIBUTION AND TREATMENT

Table 6-1: Water Distribution and Treatment - Summary Determination of Need

PHASE	ESTIMATE OF ADDITIONAL DEMAND	WTP NEEDS	DISTRIBUTION NETWORK NEEDS
Pre-Construction (2024 - 2031)	+160 Permanent Households, Approx. 160,000 L/day	– Has sufficient capacity – Increased maintenance will be required – Increased operations cost (energy and chemical usage)	– New watermain extensions required to new housing developments (piping, valves, hydrants, etc.) – Additional pumping stations may be required
Construction (2032 - 2042)	+20 Permanent Homes Approx. 20,000 L/day	– Increased rate of equipment replacement is expected – Increased operations cost (energy and chemical usage)	
Operations (2043 - 2088)	+120 Permanent Homes Approx. 120,000 L/day	– WTP does not have the capacity (upgrades or a new WTP will be required)	

Centre of Expertise	– Multi-Storey Building, Engineering Test Facilities, (maximum projected 180 workers in pre-construction phase) – More information on the water demand of certain testing activities is required to produce an estimate of the Centre's overall water demand	– WTP has sufficient capacity (overall), however the location of the facility will need to ensure the water distribution network can provide the necessary flows	– Location of new Centre would need to be defined to confirm the distribution system capacity at that location – New watermain extensions may be required

It is noted that the location of the Centre of Expertise is yet to be determined. This means that the Township will have input on where the centre is ultimately built. If the water demand of the Centre is deemed to be too great for the municipal system (depending on location), the option of the Centre incorporating its own water source and treatment could be explored (private well). It is also noted that a facility with laboratories and testing facility would include sprinkler systems. This is relevant because the required fire flow is much more significant is much greater if a building is non-sprinklered (i.e., hydrants).

Water Treatment Plant Options: The water treatment plant has an operational capacity to supply 2,000 m^3/day and has sufficient capacity to support the growth for the first two phases of the APM project (pre-construction and construction). With the increased demands on the water treatment plant, there will be increased operations and maintenance costs required to operate the facility. As the number of service connections is increased, the rate base will also increase resulting in additional funds. Should the additional revenues generated from the new customers be insufficient to cover the overall increased operations costs, a rate increase for existing and new water users may be required. The impact would be spread across all current water users.

This option would be easy to implement in a short amount of time with a low degree of complexity, as it would generally involve a new by-law in order to increase the rates in the Township's water billing system. The Township would have the ability to implement this option without the need to involve other responsible authorities.

Water Distribution System Options: The water distribution system is aging and as such will likely have leaks in the distribution system. These leaks can be problematic since they require the water treatment plant to produce more water than is used by the customers. This provides additional strain on the water treatment plant. Given the age of the distribution system, leak studies should be completed, and a work plan established to repairs and/or replace the pipes in an effort to reduce leaks.

New dwellings will require connection to the municipal system. Depending on elevation differences, a booster pumping station may be required to deliver water at an appropriate pressure and flow. The need for a booster pumping station would be captured in a Preliminary Design stage and therefore could be budgeted for accordingly when the project shifts to design and construction.

Ignace has two primary future development nodes already established: the Cedar Street subdivision industrial area and the Pine Street subdivision residential area as seen in the Figure 6-1 below (Urban Systems Ltd., 2021). Each node has been identified as a key future growth area required to accommodate anticipated population growth and employment land needs. Only a portion of the area has municipal water servicing and the existing lots do not contain the capacity for all new homes brought by the APM project, however, both nodes have undergone an existing subdivision process and have registered subdivision plans that outline the surveyed boundaries and dimensions of lots and location and widths of road

rights-of-way (Urban Systems Ltd., 2021). This will aid the Township in accommodating growth during the early phases of the APM project as developing greenspace would take significantly longer. It is noted that the Cedar Street subdivision would accommodate industrial uses, but not residential development.

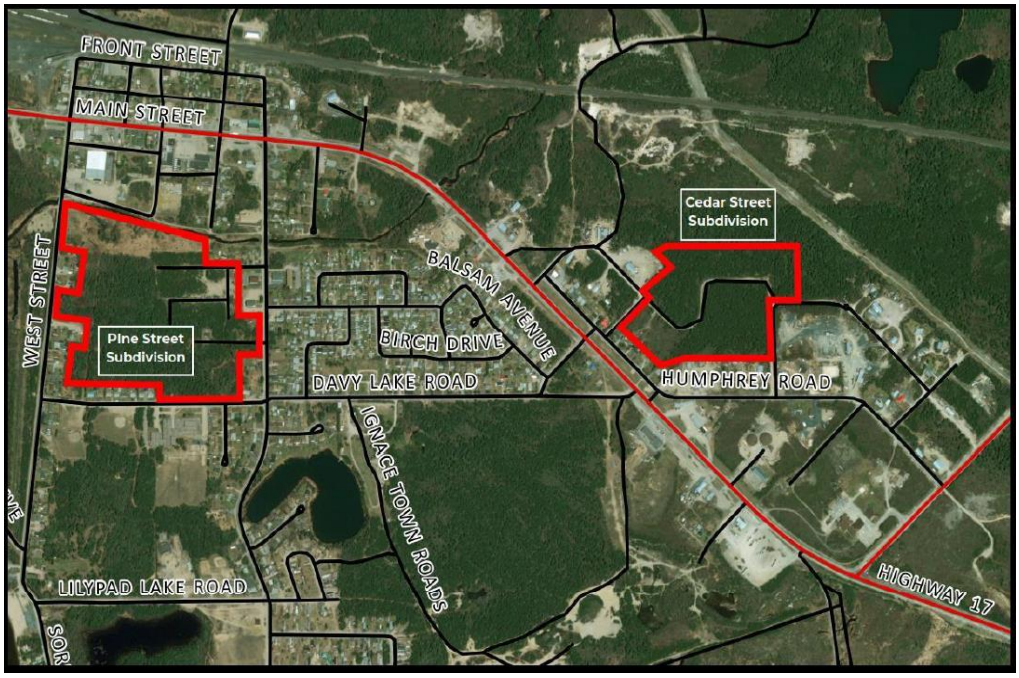

Figure 6-1: Ignace Future Growth Areas (Urban Systems Ltd., 2021)

The current depth for frost penetration in Ignace is 2.2 metres (JML Engineering, 2019). All new watermains and services should be constructed below this depth. Where this depth is not achievable, the installation of rigid insulation over the pipes is recommended to protect the pipes and the pipe bedding from freezing.

In areas where the water distribution system will be expanded to service new housing developments, the design and construction would need to adhere to the design guidelines published by the Ministry of Environment Conservation and Parks (MECP). Approvals from the MECP will be required prior to expanding the water distribution network. This option would take significantly longer to implement with involvement from other responsible authorities.

6.2 SANITARY SEWERS AND SEWAGE TREATMENT

Table 6-2: Sanitary Sewers and Sewage Treatment - Summary Determination of Need

PHASE	ESTIMATE OF ADDITIONAL DEMAND	WWTP NEEDS	COLLECTION NETWORK NEEDS
Pre-Construction (2024 - 2032)	+160 Permanent Homes, Approx. 105,600 L/day	– Does not have sufficient capacity (note: the WWTP does not have capacity even without the APM project) – Nearing end of design life, requires	– New sanitary extensions required to new housing developments – Additional sewage pumping stations
Construction (2033 - 2042)	+20 Permanent Homes Approx. 13,200 L/day		

Operations (2043 - 2088)	+120 Permanent Homes Approx. 79,200 L/day	replacement in ~10 years	may be required
Centre of Expertise	– Multi-Storey Building, Engineering Test Facilities (maximum projected 180 workers in pre-construction phase) – Approx. 13,500 L/day	– Has sufficient capacity	– Location of new Centre would need to be defined to confirm the conveyance system capacity at that location

As mentioned in the previous section, the location of the Centre of Expertise will be determined with people who live in the area. This means that the Township will have input on where the centre is ultimately built. If the sanitary sewage output of the Centre is deemed to be too great for the municipal systems capacity, the option of the Centre incorporating its own sewage treatment could be explored (e.g., septic system).

Wastewater Treatment Plant Options: The current wastewater treatment plant would not support the projected total population growth related to the APM (2,260 people by operations phase). This means the WWTP would require expansion to meet the increased demand from the APM project by the early stages of the Operations phase. Due to the age of the facility, it will already have to be replaced or significantly upgraded regardless in approximately a decade due to it reaching the end of its design life. Below are a range of options the Township may consider:

- **Conduct an assessment and repairs to the existing wastewater treatment plant to bring its capacity up to the original design capacity of the plant.** This would provide capacity for all phases of the APM project; however, given the age of the current plant (nearing end of design life ~10 years), and major components possibly requiring replacement before the original design capacity is required, it would likely not be the preferred option. It is more of a "band aid" solution that will have to be revisited and require constant monitoring and maintenance. This option will require MECP consultations and approvals
- **Expand the existing wastewater treatment plant to accommodate the increased flows.** Expanding the WWTP would be the preferred option depending on the condition of large components, such as settling tanks. If large infrastructure like concrete tanks are still in good working condition, significant money can be saved by only replacing mechanical equipment and adding additional components as needed. This option would also avoid a Municipal Class Environmental Assessment process. The Township could explore implementing septic systems on a portion of the new permanent homes or subdivisions while the WWTP is expanded. This option will require MECP consultation and approvals. It may require additional land (depending on the size of the current property) and will require significant upgrades to the plant.
- **Construct a new wastewater treatment plant.** If expansion is deemed to be unfeasible due to poor condition of the existing facility or inadequate space in surrounding lands for expansion, a new WWTP would have to be constructed. The Municipal Class Environmental Assessment for facilities of this size usually take 1-2 years to complete. The Township could explore implementing septic systems on a portion of the new permanent homes or subdivisions while the new WWTP is constructed. This option requires a Municipal Class Environmental Assessment and will require MECP consultations and approvals. It may require the purchase of additional lands and may require a new sewage pumping station (dependent on where the new wastewater treatment plant is relocated).

In general, the Township should stay current with provincial funding initiatives for infrastructure improvements.

Sewage Collection Network Options: Similar to the water distribution network, the options for the sewage collection system are somewhat limited. The new dwellings will require connection to the municipal system; however, as

mentioned above, the Township could explore placing a select number of new homes on private septic systems in conjunction with the plan chosen for the WWTP. This would have to be decided with input from the new homeowners.

As mentioned in the previous section, Ignace has two primary future development nodes already established - the Cedar Street subdivision industrial area and the Pine Street subdivision residential area. Each node has been identified as a key future growth area required to accommodate anticipated population growth and employment land needs. Only a portion of the area has sanitary servicing and the existing lots do not contain the capacity for all new homes brought by the APM project; however, both nodes have undergone an existing subdivision process and have registered subdivision plans that outline the surveyed boundaries and dimensions of lots and location and widths of road rights-of-way. This will aid the Township in accommodating growth during the early phases of the APM project as developing greenspace would take significantly longer.

The current depth for frost penetration in Ignace is 2.2 metres. All new sanitary sewers and services should be constructed below this depth. Where this depth is not achievable, the installation of rigid insulation over the pipes is recommended to protect the pipes and the pipe bedding from freezing.

The requirement for sewage pumping stations would be captured in a Preliminary Design stage and therefore could be budgeted for accordingly when the project shifts to design and construction.

6.3 STORMWATER MANAGEMENT

Table 6-3: Stormwater Management - Summary Determination of Need

PHASE	ESTIMATE OF ADDITIONAL DEMAND	STORMWATER COLLECTION NETWORK NEEDS
Pre-Construction (2024 - 2032)	+160 Permanent Homes	– Existing mains have capacity – New storm sewer extensions or ditches required – New catch basins and culverts in new subdivisions
Construction (2033 - 2042)	+20 Permanent Homes	
Operations (2043 - 2088)	+120 Permanent Homes	
Centre of Expertise	– Multi-Storey Building, Engineering Test Facilities (maximum projected 180 workers in pre-construction phase)	– Construction site runoff control

As mentioned in the previous sections, the location of the Centre of Expertise will be determined with people who live in the area. This means that the Township will have input on where the centre is ultimately built. If the Centre was constructed within the community, a Stormwater Management Plan would be required as a part of the detailed design. This plan would provide all details related to managing the increased stormwater runoff produced by the impervious area of the building, parking lots, etc. It would also describe where the water leaves the site, and whether the existing storm

network has capacity to tie into or if another form of storage and discharge is required, such as an infiltration gallery underground.

During construction of the Centre, an erosion and sediment control plan will be required by the Contractor to mitigate sediment entering the storm network and ultimately local waterbodies.

Stormwater Management Options: Stormwater management could be implemented in a variety of ways in the new subdivisions/residential expansions.

For example, storm sewers and catch basins can be used, or alternatively roadside ditches. Ditches are a much cheaper alternative and are commonly employed in small subdivisions in Northern Ontario. It is noted that the primary future development nodes (the Cedar Street subdivision industrial area and the Pine Street subdivision), were planned to utilize drainage through an overland system consisting of ditches and culverts and an underground system involving the installation of 300- 450 mm stormwater mains and catch basins, respectively (Urban Systems Ltd., 2021).

Another consideration with storm sewers is that, unlike sanitary sewers and watermains, they do not necessarily have to connect to the existing network. Sewage must ultimately flow to the sewage treatment plant and water must ultimately flow from the water treatment plant; however, stormwater can be discharged to a variety of locations. This gives the Township much more flexibility when compared to sanitary and water systems expansion and could carry significantly less cost.

It is our understanding that Ignace currently has no Stormwater Management Policy in place. With no quality controls in place, stormwater pollution can impact water quality and result in the reduction and loss of aquatic life and diversity. The Township may consider implementing a Stormwater Management Policy considering the increased residential growth. This would involve establishing a steering committee to review the benefits of establishing a municipal stormwater management policy (for quantity control as well as quality control). Climate Change should also be considered as it may increase the frequency and intensity of storm events (resulting in increased potential for localized flooding, increased sediment transport to local waterways, increased erosion in ditches and waterways).

6.4 ROAD INFRASTRUCTURE

Table 6-4: Road Infrastructure - Summary Determination of Need

PHASE	ESTIMATE OF ADDITIONAL DEMAND	ROAD INFRASTRUCTURE NEEDS
Pre-Construction (2024 - 2032)	+530 new residents	– Has geometric capacity – Medium/Major Impact: we expect a noticeable increase in road maintenance activities due to increased traffic. The Township is already struggling to keep up with current road maintenance.
Construction (2033 - 2042)	+65 new residents	
Operations (2043 - 2088)	+400 new residents	

It is noted that the primary future development nodes already established (the Cedar Street subdivision industrial area and the Pine Street subdivision) have minimal road infrastructure already installed (Urban Systems Ltd., 2021). Furthermore, these subdivisions will not be able to house the entirety of the growth brought by the APM project over all phases. The cost of new of road infrastructure is directly related to the water, storm, and sanitary networks. A new road construction contract would encompass complete replacement of all “linear infrastructure” and as such would be

budgeted for as a lumped item. If the Township decided to implement a subdivision with ditches and individual septic beds, then the cost of the road infrastructure would decrease as well. Typically, neighbourhoods with ditches do not contain curb, gutter and sidewalk which is a significant budget item in these types of contracts.

Regarding the increased maintenance of existing roads due to the population and thus traffic increase, the Township has limited options. Many municipalities in Northern Ontario struggle to keep up with road maintenance. Generally, the options are as follows:

- **Keep the Asset Management Plan updated, and schedule road reconstruction/maintenance projects based on the plan**. The Township is currently in the process of updating their AMP. This is an essential task and with a significant population growth, the AMP should be updated more frequently than the standard 5 years. This would also involve hiring a consultant and preferably one who specializes in AMPs in towns expecting large growth.
- **Stay current with provincial funding initiatives for infrastructure improvements.**
- **If there are specific deficiencies with current roads, then take this into account in the design and construction of new roads and sub-divisions** (e.g., water services freezing, installed above frost depth).

6.5 SOLID WASTE MANAGEMENT

Table 6-5: Solid Waste Management - Summary Determination of Need

PHASE	ESTIMATE OF ADDITIONAL DEMAND	SOLID WASTE MANAGEMENT NEEDS
Pre-Construction (2024 - 2032)	+530 new residents	– Remaining landfill capacity to be determined in Township's Waste Management Strategic Plan – Medium Impact: there will be an increase in garbage collection services to ~300 new permanent homes
Construction (2033 - 2042)	+65 new residents	
Operations (2043 - 2088)	+400 new residents	

The Township has already commenced a Waste Management Strategic Plan which will outline a 20–40-year plan on the most preferred option of managing solid waste. For example, the most feasible option may be to decommission the existing landfill and divert all waste to a neighbouring municipality's landfill. As the Pre-Construction phase of the project is set to commence by 2024 this plan should account for the potential increase in population due to the APM project; however, it is unknown if this was the approach of the consultant as the APM project is not yet confirmed to be built in Ignace.

An approximate increase in population of 80% by project end is substantial regarding community waste generation and landfill capacity. This growth also does not account for the potential of the APM site directing its non-hazardous waste to the Ignace landfill. An additional Solid Waste Management Planning Study would most likely need to be implemented in approximately 20 years (following the Construction phase) to re-assess the Township's options (i.e., the preferred option from the current Waste Management Strategic Plan may no longer be viable). These studies involve the hiring of consultant and for communities of similar size to Ignace, can be expected to be in the range of $100,000 to $200,000.

Construction of a new landfill is a very detailed and costly undertaking. Like a new wastewater treatment plant, this type of project would require an Environmental Assessment, MECP consultations and approval and possibly the purchase of additional lands. It is unknown at this time if a new landfill will be required in Ignace in the future,

however, it can also be an opportunity to increase revenue within the community by accepting waste from surrounding areas.

6.6 POWER GRID & TELECOMMUNICATIONS

It is our understanding that the specific utility providers would ensure the necessary power and telecommunications infrastructure needed to support the APM project once it is in place. If upgrades to the Power and Telecommunication systems are required for the project, the overall impact on the communities would likely improve as these systems would be upgraded to meet the requirements of the new facilities.

For example, Hydro One has already commenced the Environmental Assessment process to bring more power to the study area via a new transmission line (Hydro One Networks Inc., n.d.):

> The Waasigan Transmission Line is a proposed new double-circuit 230 kilovolt transmission line between Lakehead Transformer Station (TS) in the Municipality of Shuniah and Mackenzie TS in the Town of Atikokan, and a new single-circuit 230 kilovolt transmission line between Mackenzie TS and Dryden TS in the City of Dryden. Demand for more electricity is anticipated as early as the mid-2020s, and we are undertaking the development work now, including an environmental assessment, so we are ready to support the region's electricity needs.

7 SUMMARY

7.1 KEY FINDINGS

- **Water Distribution and Treatment:**
  - The water treatment plant has capacity to support pre-construction and construction; however, will require additional capacity to support the operations phase of the project.
  - Increased maintenance for the Water Treatment Plant will be required for both baseline and APM population projections.
  - The water distribution system will need to be expanded to reach new housing, for both baseline and APM population projections; it may require replacing old pipes that are connected to new.
  - The water distribution system is aging (some will require replacement as they fail, regardless of the APM project).
  - Leak studies should be conducted on the aging water distribution piping.

- **Sanitary Sewers and Sewage Treatment:**
  - The wastewater treatment plant does not have capacity to support baseline population, nor APM population projections.
  - The wastewater treatment plant is reaching its useful life and will need replacing or major upgrades within the next 10 years (by 2032).
  - The sanitary collection system will need to be expanded to reach new housing developments.
  - The sanitary sewers are aging (some will require replacement as they fail regardless of the APM project).

- **Stormwater Management:**
  - A stormwater system will need to be developed in new residential areas.
  - Stormwater drainage studies should be completed to review potential flooding problems.
  - The Township of Ignace should implement stormwater management policies for both storm runoff quantity and quality.
  - Designs for new developments (residential, commercial, institutional) should include stormwater management.

- **Road Infrastructure:**
  - Road networks will need to be expanded to reach new housing.
  - The road infrastructure is aging and ongoing maintenance will be required (regardless of the APM project); however, increased maintenance will be required on existing roads due to increased traffic.

- **Solid Waste Management:**
  - The existing landfill site has capacity for both baseline population and APM population projections provided proper compaction is achieved.

- Methods to further extend the life of the landfill include enhanced compaction methods (to 600 kg/m3), as well as waste diversion.

– **Power Grid & Telecommunications Road Infrastructure:**

- Powerlines and fibre-optic are continually expanding to reach new households.

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APPENDICES

Appendix A

List of Full Suite of Community Studies

Study Name	Study Proponent	Lead Consultant
Community and Culture	NWMO	InterGroup Consultants and Scatliff+Miller+Murray
Local and Regional Economics and Finance	NWMO	Hardy Stevenson and Associates Ltd
People and Health	NWMO	InterGroup Consultants Ltd
Infrastructure	Township of Ignace	WSP
Tourism	Township of Ignace	Urban Systems

Appendix B

Ignace and Area Working Group for Community Studies

Meeting #10
April 21, 2022

Agenda

1. Opening
   - Land Acknowledgment
   - Safety Moment
   - Introductions
2. Community Studies Updates (baseline information)
   - Transportation and Emergency Response
   - Municipal Infrastructure
   - Tourism
3. Closing and Next Steps

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Land Acknowledgment

NWMO Reconciliation Statement Ceremony, July 18, 2018

Safety Moment

Introductions

Ignace & Area Working Group

Community Studies Baseline Presentation: Transportation & Emergency Response Study

April 21, 2022

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Agenda

- Purpose & Intended Outcomes of Transportation & Emergency Response Study
- Study Timeline
- Data Collection
- Snapshot of the Region
- What We Heard
- What Change Could We See?
- Next Steps

Purpose & Intended Outcomes

- **Purpose**: To review the existing transportation and emergency services conditions, analyze the effect of the APM project in the area and assess potential options to mitigate potential negative impacts and leverage positive impacts.
- **Intended Outcome**: To help Ignace leadership and residents make informed decisions about whether the APM Project is a good fit for their community, and if they are willing to consider hosting it and under what circumstances and terms.

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Study Timeline

Information Gathering & Data Collection
(Feb 2022 – Apr 2022)

Working Group Baseline Presentations
(April 21)

Assessment of Existing Conditions
(Feb 2022 – Apr 2022)

Traffic Operations: Dryden, Ignace and Highway 17 between both towns

Emergency Services: Region facilities with focus on Ignace and Dryden

Change Analysis – 3 Scenarios
(May 2022)

2023 – 2032: Pre-Construction

2033 – 2042: Facility Construction

2043+: Facility Operations

Options and Ideas Assessment
(May 2022)

Final Reporting
(June 2022)

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Data Collection

Background Review: Review of Regional / Municipal Plans, Strategies, and Studies (in progress)

Interviews: Consulting team conducted 4 interviews in total (Ignace Public Works, Ignace & Dryden OPP, NWMO Transportation Engagement Representative, and Northwest EMS within Region) with 2 pending (Fire & MTO)

Traffic & Collision Data: MTO highway traffic volume data (1988-2016). Collision data and additional traffic volume data pending.

Emergency Call Data: 5 year historical call data pending

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Background Document Review

Township of Ignace Official Plan (2020)

Purpose

Establish a vision, guiding principles and policies to manage and direct development and change within the Township to 2045

Key Takeaways

- **Growth Management**
  - There may be a need for additional residential land to meet the 2038 demand, as well as additional employment land depending on the growth scenario
- **Goal 5 – Enhance Mobility and Transportation**
  - Development of sidewalks, pathways and trails
  - Design roads as complete streets
  - Importance and enhancement of Highway 17
  - Opportunities for alternative modes of inter-community transportation
- **General Land Use Policies** – Pedestrian Supportiveness and Active Transportation
- **Servicing and Roads** – to be coordinated with land use planning to serve the needs of residents and businesses
- **Schedule B – Land Use Designations**
  - Conceptual **Pedestrian Crossing** (Future) at **Hwy 17 / Pine Street** and **Hwy 17 / Davy Lake Road**

Background Document Review

Ignace Community Capacity Study (2021)

Purpose

- Long-term view of 20 years ahead to proactively plan for a population of 4,000 (growth as a result of several planned large-scale resource and industrial projects in the area)
- Analyzes the Township's current infrastructural capacity to identify existing servicing gaps and anticipate future community needs

Key Takeaways

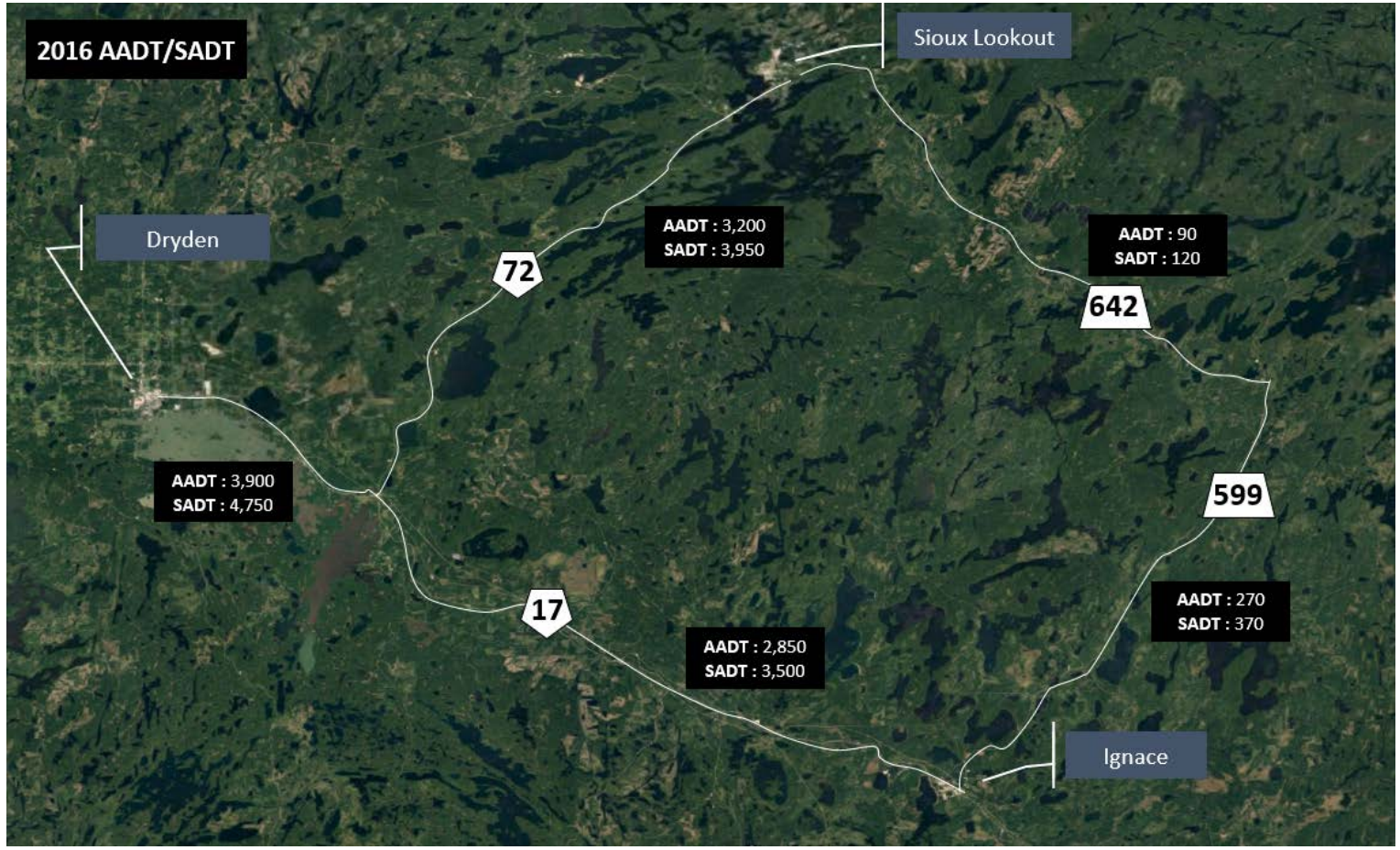
- Demand for services through an ageing population, influx of workers (APM), etc.
- **Fire Protection**
  - The fire department has one 0.80 FTE staff (Executive Assistant to Fire Chief) and multiple volunteer positions
  - About 3 FTE staff and 25 volunteers will be needed for a population of 4,000
- **Emergency Medical Services**
  - No on-call physicians in Ignace
  - Additional staff and a 24/7 on-site crew may be required for a population of 4,000
- **Primary Future Developments**
  - Pine Street Subdivision
  - Cedar Street Subdivision

Snapshot of the Region - Demographics

- Population of Ignace – 1,206 (2021 Census)
- Minimal population growth (0.3% annually) in region (Ignace, Dryden, Sioux Lookout and Wabigoon) since 2016.
- Three-quarters (75%) of dwelling units in region are single-family detached house, well above the provincial average (54%)
- Nearly half (45%) of the residents in Ignace over 55 years old, whereas the rest of the region has less than a third (32%) of their population with the same age demographic.
- The employment rate in the region (59%) is aligned with the provincial average (60%).

Snapshot of the Region – Traffic

- Summer volumes average 20% higher than annual average
- Highway 17 between Dryden and Highway 72 has highest average traffic volume
- Limited annual growth along Highway 17 and 72 between Ignace and Dryden (-1% to 1%)



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Snapshot of the Region – Highway 17 Geometry

Passing Lanes

- Between Dryden and Ignace:
  - **7 westbound** passing lanes
  - **6 eastbound** passing lanes

Speed Limits

- Posted speed limit is primarily **90 km/h**
- Transitions to **70 km/h** near Ignace and Dryden
- **50 km/h** throughout Ignace and Dryden

Shoulders

- Presence of **gravel** and **paved** shoulders with **varying widths** and **conditions**

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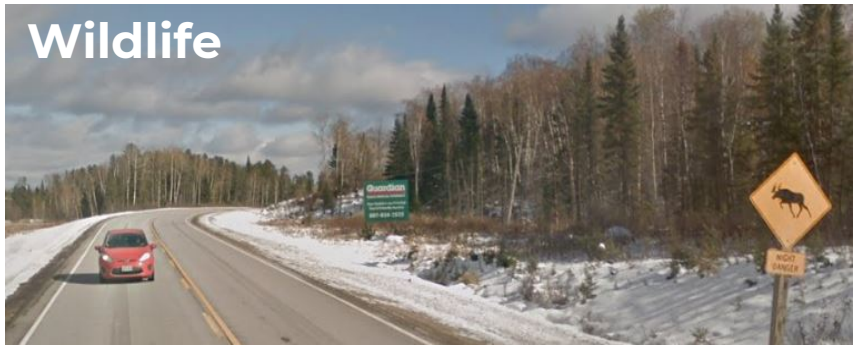
Snapshot of the Region – Highway 17 Geometry

Other Potential Hazards



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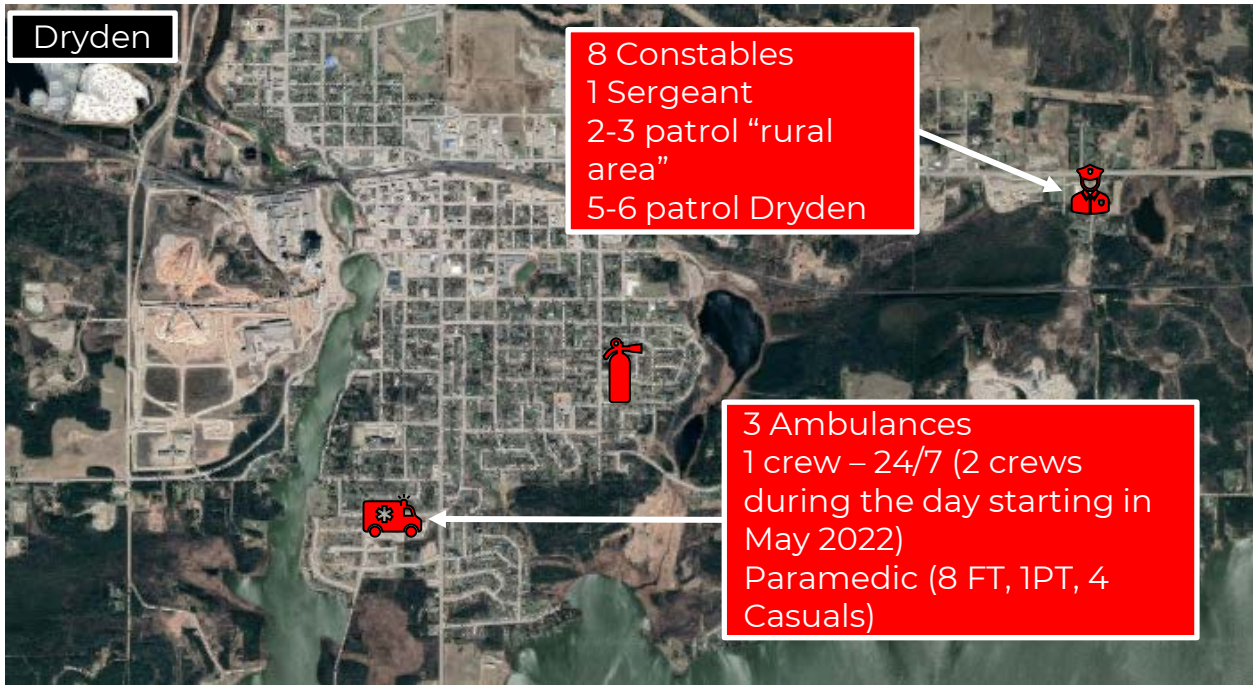
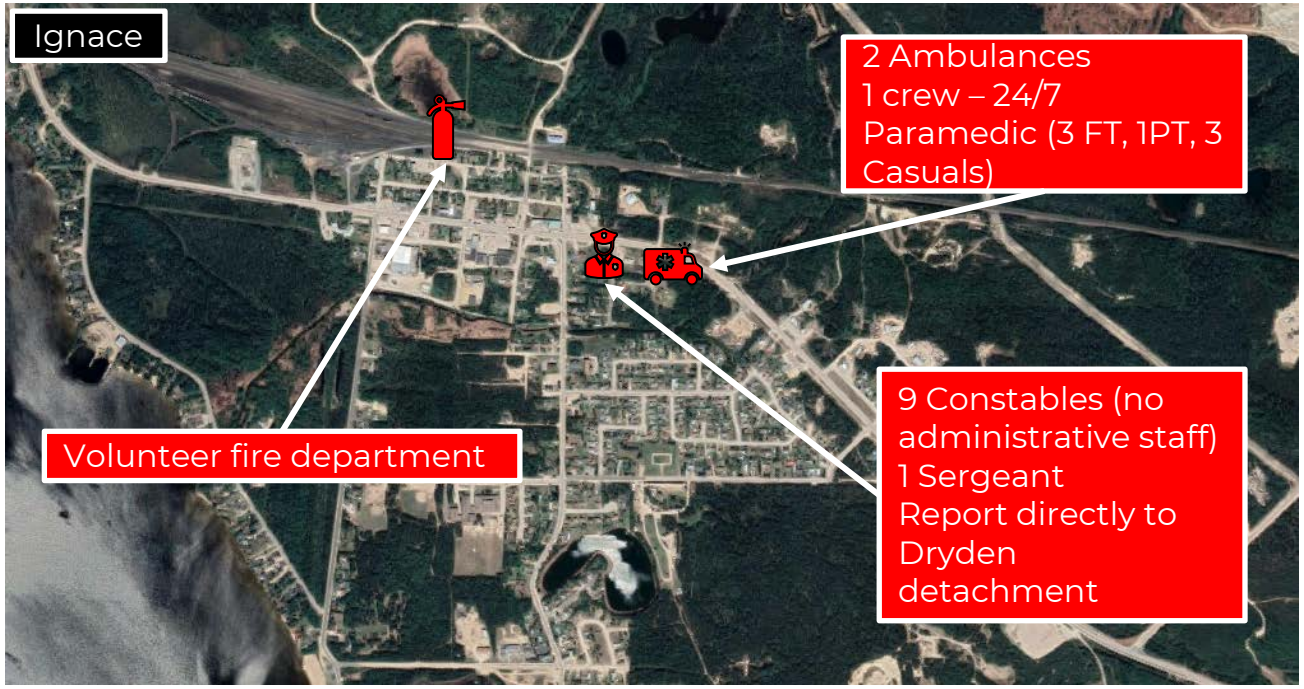
Snapshot of the Region – Emergency Services





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Snapshot of Region – Dryden Regional Airport

Staffing:

- 5 full-time and 1 seasonal staff member
- Additional staff in the event of an emergency

Services:

- Certified airport that can host regular commercial service
- Bearskin Airlines has 7 flights, 6 days per week between Thunder Bay, Dryden and Winnipeg
- The terminal has acted as an evacuation hub during forest fires

Capacity/Equipment:

- Limited in aircraft hangar space (10-15 privately-owned hangars)
- Runway is suitable for a 737 aircraft (cargo or approx. 150 passengers)
- Capacity for 3-4 737s at a time

Protocols:

- Operations manual updated annually
- Airport has its own Emergency Plan (includes the OPP, fire and ambulance on site)
- No formal manual for aircrafts landing in an evacuation situation, but ramp and runway management would be followed
- Presence of an Instrument Landing System (ILS) that allows aircrafts to land in any weather condition

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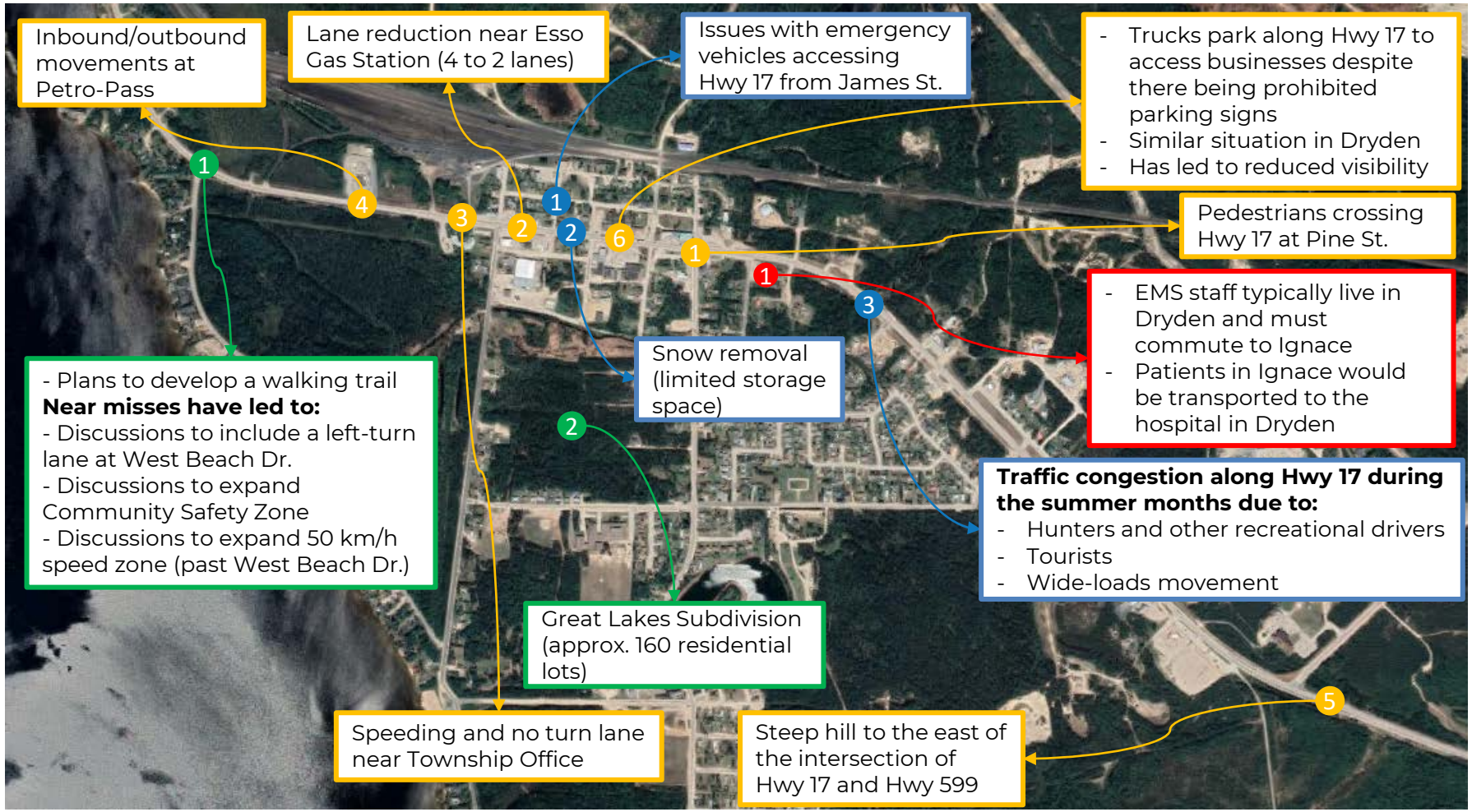
What We Heard – Ignace

- Emergency Issues / Considerations
- Safety Concerns
- Operational / Maintenance Issues
- Road Modifications / Other



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What We Heard – Highway 17 between Ignace and Dryden

Emergency Issues / Considerations

- Approx. 30 min drive between Dryden and Ignace
- Hwy 17 remains open to emergency vehicles in the event of a closure
- EMS staffing is more so based on call frequency (oversees Ignace and Dryden)
- EMS typically receives many more calls compared to the number of patients transported

Safety Concerns

- Passing lanes are prone to higher collision rates (aggressive driving)
- Sharp turns and speeding west of Ignace
- Commercial motor vehicles – aggressive or unsafe driving (even during poor weather conditions)
- General area of concern near Hwy 622 (dangerous driving)

Operational / Maintenance Issues

- Regional approach for highway closures and coordinated with other OPP detachments
- Lack of heavy tow operators between Thunder Bay and Winnipeg
- No official emergency detour route (has led to community isolation and traffic congestion during highway closures

Road Modifications / Other

- Twinning of Hwy 17 has been a consideration
- Realignment of Hwy 17 west of Hwy 622 has led to a reduction in collisions

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APM – What Change Could We See?

- **Safety Protocols in the Event of Nuclear Waste Related Incident**
  - Potential training requirements for emergency services in the Region
  - Road closure procedures according to hazard level (i.e. duration and affected area)
- **Population of Ignace**
  - Expected to increase by approx. 50% (+600 people) for the Facility Construction scenario and nearly double (+995 people) for the Facility Operations scenario
- **Emergency Response Capacity**
  - Increase in OPP staffing, etc.
- **Traffic Operations**
  - No change in level of service of highway operation with construction vehicles, etc.
  - Additional road maintenance on Ignace main streets due to an increase in traffic volumes

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Next Steps

Confirmation of Existing Conditions:

- Upon receipt of outstanding data, the collision and traffic analysis will be completed

Complete Change Analysis:

- Review additional traffic volumes and distribution of volumes at a network level
- Review link volumes to identify changes to capacity and problem areas related to demand. This will include the daily distributions to identify peaks.
- Identify collision forecasts on network links based on problem areas
- Assess spatial coverage for emergency response based on population projections to identify any gaps

Identification of Potential Mitigation Measures:

- Additional capacity for emergency services
- Roadway geometry alterations
- Improve pedestrian safety at local intersections

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Ignace & Area Working Group

Community Studies Baseline Presentation: Municipal Infrastructure

April 21, 2022

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Agenda

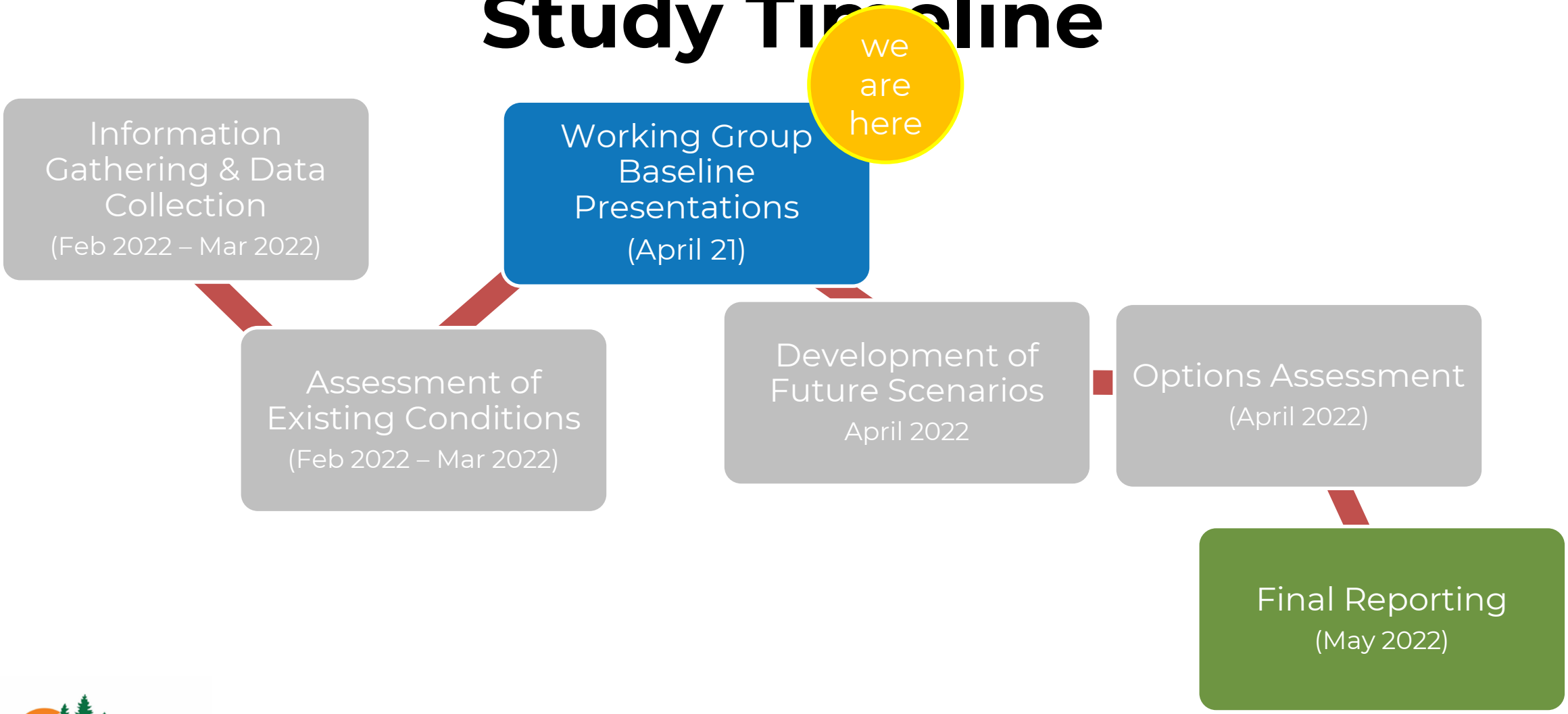
- Purpose & Intended Outcomes of Municipal Infrastructure Studies
- Project Timeline
- Study Area Description
- Baseline Information / Findings
- Next Steps

Purpose & Intended Outcomes

- **Purpose**: To collect information related to existing municipal services, capacity, demand and needs.

- **Intended Outcome**: To help Ignace leadership and residents make informed decisions about whether the APM Project is a good fit for their community, and if they are willing to consider hosting it and under what circumstances and terms.

Study Timeline



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Project Scope & Assumptions

- **Study Area / Spatial Boundaries:**
  - **Overall Study** - Township of Ignace, Dryden, Machin, Wabigoon, Sioux Lookout & unincorporated communities along Highway 17 and Highway 599
  - **Today's Presentation** – Township of Ignace

- **APM Project Timing / Temporal Boundaries:**
  - 2023 – 2032: Site Preparation / Pre-Construction
  - 2033 – 2042: Facility Construction
  - 2043+: Facility Operations

Baseline Information: Water Distribution and Treatment

- Existing water treatment plant built in 2009 with 50-year useful life
- The plant is currently 30% utilized with maximum daily demand of 1,500 m3/day (capacity of 2,730 m3/day)
- Only three watermain breaks recorded in the past ten years
- Distribution system serves approximately 1,450 people

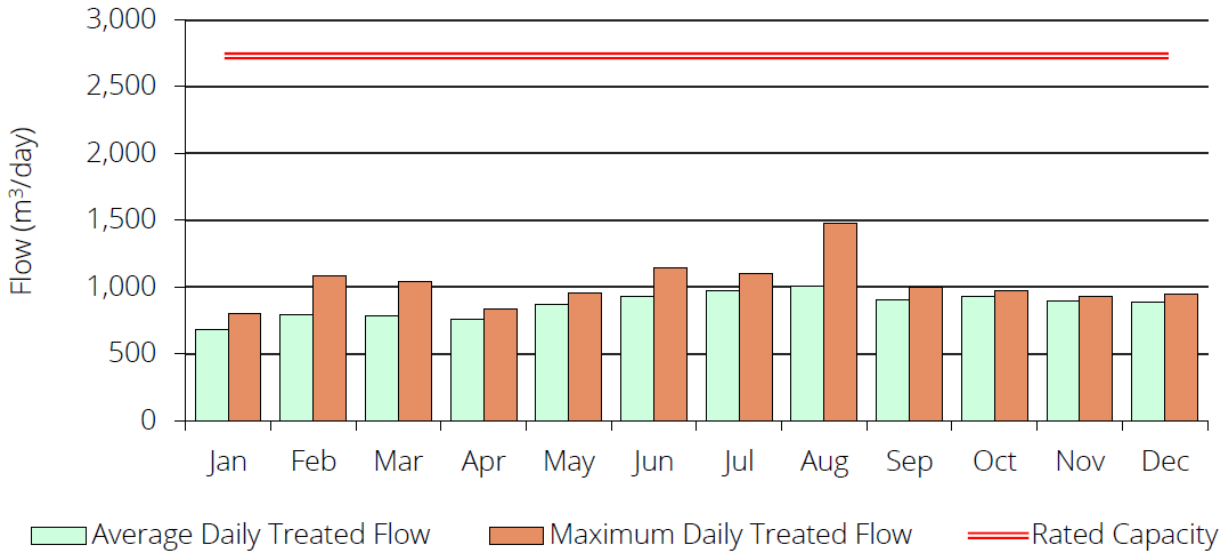

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Figure 1. 2018 average and maximum daily treated water flows
2018 Annual Drinking Water Report Prepared by Northern Waterworks Inc.

Baseline Information: Water Distribution and Treatment

Facility	Quantity	Average Age	FRC Useful Life	Condition Assessment / Comments
Water Lines	• 46 sections • 23.97 km	45 years	80 years	• Cost benefit analysis suggested before making repairs on the system • Review of information suggests 80 years is a reasonable useful life
Water Hydrants	142	46 years	80 years	• Observations and measurements of defects made in 2013 on every hydrant • Review of information suggests 80 years is a reasonable useful life
Water Valves	140	47 years	50 years	• Cost benefit analysis suggested before making repairs on the system • Recent failures suggest 50 years is a reasonable useful life
Water Treatment Plant	1	13 years	50 years	• Good condition, no incidents of regulatory noncompliance during most recent inspection (November, 2018) • Peak flow recorded in 2018 only utilized 54% of Plant's capacity • Review of information suggests 50 years is a reasonable useful life

Note: FRC = Future Replacement Cost (from 2013 Ignace AMP)

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Baseline Information: Water Distribution and Treatment Gaps

- The plant has capacity of 2,730 m3/day , designed to serve maximum population of 2,400
- Only able to service ~1,200 additional residents
- Occasional freezing of water service lines at 237 houses due to original installation within frost depth
- Water valves projected to require replacement in near future

Baseline Information: Water Distribution and Treatment Summary

Strengths:

- Relatively new membrane water treatment plant
- Currently operating far below capacity

Weaknesses:

- Membrane plants typically require more frequent maintenance
- Possible expansion required to service population increase from APM project
- Distribution system ~45 years old in most areas
- Water services freezing

Baseline Information: Sanitary Sewers and Sewage Treatment

- Existing wastewater treatment plant built in 1980s with 50-year useful life
- The plant is currently 60% utilized (capacity of 2,536 m3/day) with 297 lots serviced by water who do not receive sanitary service
- Minimal work recorded on sanitary sewer network, asbestos pipe, installed early 1970s

Baseline Information: Sanitary Sewers and Sewage Treatment

Facility	Quantity	Average Age	FRC Useful Life	Condition Assessment / Comments
Sanitary Sewers	• 43 sections • 15.31 km	45 years	80 years	• Cost benefit analysis suggested before making repairs on the system • Review of information suggests 80 years is a reasonable useful life
Sanitary Manholes	181	46 years	60 years	• Observations and measurements of defects made in 2013 on approx. 2/3 of manholes • Condition assessments suggest 60 years is a reasonable useful life
Wastewater Treatment Plant	1	~40 years	50 years	• Approaching end of design life • Only 60% utilized • Review of information suggests 50 years is a reasonable useful life

Note: FRC = Future Replacement Cost (from 2013 Ignace AMP)

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Baseline Information: Sanitary Sewers and Sewage Treatment Gaps

- The plant has capacity of 2,536 m3/day
- Only able to service ~700 additional residents
- Treatment Plant and Distribution system projected to require replacement in near future

Baseline Information: Sanitary Sewers and Sewage Treatment Summary

Strengths:

- Adequate condition despite age suggests quality original construction as well as operating/maintenance procedures

Weaknesses:

- Wastewater treatment plant has minimal remaining capacity
- Distribution system is predominantly asbestos pipe and ~45 years old

Baseline Information: Storm Water Management

- Minimal work recorded on storm sewer network
- Pipe material not recorded in GIS, installed early 1970s
- To WSP's knowledge, no information exists regarding additional Stormwater infrastructure (e.g., retention/detention pond)

Baseline Information: Stormwater Management

Facility	Quantity	Average Age	FRC Useful Life	Condition Assessment / Comments
Storm Sewers	• 20 sections • 3.81 km	38 years	80 years	• Cost benefit analysis suggested before making repairs on the system • Review of information suggests 80 years is a reasonable useful life
Culverts	4	24 years	50 years	• No inspections of existing culverts have been completed • 50 years is a reasonable useful life for culverts
Storm Units	• 141 drywells • 11 catch basins • 1 oil grit separator (OGS) ***153 total***	21 years	60 years	• No inspections of existing storm units have been completed • Review of information suggests 60 years is a reasonable useful life

Note: FRC = Future Replacement Cost (from 2013 Ignace AMP)

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Baseline Information: Storm Water Management Gaps

- Storm sewer piping network, 200-600mm diameter, sufficient for residential growth

- Additional Stormwater infrastructure (e.g., retention/detention pond, infiltration gallery, etc.) may be required at the Center of Expertise site

Baseline Information: Storm Water Management Summary

Strengths:

- Storm units and culverts only ~20 years old

Weaknesses:

- Storm sewer network ~40 years old, material unknown
- Capacity metrics of the system unknown

Baseline Information: Road Infrastructure

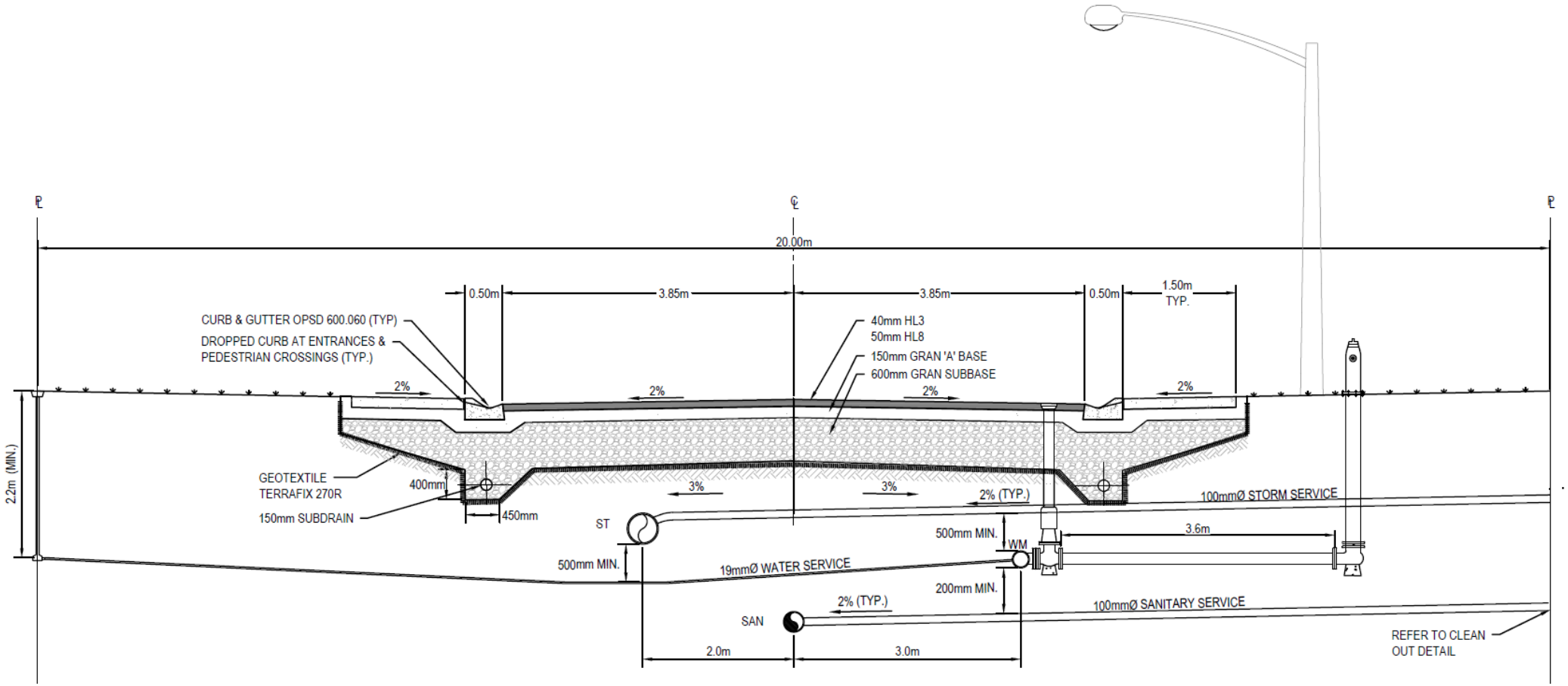

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Figure 2. Typical Municipal Road Cross Section
WSP 2021

Baseline Information: Road Infrastructure

- West Street and Sorenson Avenue have recently been resurfaced
- Davey Lake Road looks to be in fair condition, resurfacing required in next ~10 years
- Pine Street looks to need resurfacing in next 5 years.

Baseline Information: Road Infrastructure

Facility	Quantity	Average Age	FRC Useful Life	Condition Assessment / Comments
Roads (i.e., roadbed, shoulders, pavement etc.)	• 50 asphalt sections (20.45 km) • 8 gravel sections (5.42 km)	40 years	50 years	• The Township has many roads over 30 years old that still exhibit adequate conditions • These 30 year old roads still have ~15 years remaining before repairs are required • Observations and measurements of defects were made in 2013 on random road samples
Sidewalks	• 8 concrete sections (3.59 km) • 5 asphalt sections (2.65 km)	32 years	50 years	• 50 years is a reasonable useful life for sidewalks • Observations and measurements of defects were made in 2013 on random road samples
Parking lots	5 (8,577 m2 total)	37 years	50 years	• The Township has a 43 year old parking lot that should last another 8 years

Note: FRC = Future Replacement Cost (from 2013 Ignace AMP)

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Baseline Information: Road Infrastructure Gaps

- The current capacity of the roadways is sufficient for residential growth

- Truck access to the site will be via highway

Baseline Information: Road Infrastructure Summary

Strengths:

- Adequate condition despite age suggests quality original construction as well as operating/maintenance procedures
- Population increase from APM project not expected to require road widening, expansion, or geometry alteration
- West Street and Sorenson Avenue have recently been resurfaced

Weaknesses:

- Road structure ~40 years old in most areas
- Maintenance required in the next 5 years regardless of population increase

IGNACE
Explore Our Possibilities

wsp

Baseline Information: Solid Waste Management

- Township manages its own curbside garbage collection service and landfill
- The municipality is currently in process of developing Waste Management Strategic Plan including recycling and waste diversion opportunities
- Site has remaining capacity of 175,000 m^3 as of 2009 (2021 Pinching – Ignace Waste Disposal Site Draft Design & Operations Plan)

:

Figure 3. Township of Ignace Landfill Location

2021 Pinchin – Ignace Waste Disposal Site Draft Design & Operations Plan

Baseline Information: Solid Waste Management Gaps

- No landfill issues have been conveyed to WSP at the time of this presentation
- Existing landfill capacity will need to be estimated moving forward to determine if additional population waste generation is a concern
- APM facility also plans on directing non-hazardous waste to a local landfill

Baseline Information: Power Grid

Circuit(s)	Location	Voltage (kV)
D26A	Mackenzie x Dryden	230
F25A	Mackenzie x Fort Frances	230
K23D	Dryden x TCPL Vermill Bay x Kenora	230
K24F	Fort Frances x Kenora	230
N93A	Mackenzie x Marmion Lake x Atikokan	230
K21W, K22W	Kenora x Whiteshell (Manitoba Hydro)	230
A21L, A22L	Mackenzie x Lakehead	230
M23L, M24L	Marathon x Lakehead	230
15M1	Kenora x Rabbit Lake	115
29M1	Ignace x Camp Lake x Valora x Mattabi	115
A3M	Mackenzie x Moose Lake	115
B6M	Moose Lake x Sapawe x Shabaqua x Stanley x Murillo x Birch	115
D5D	Dryden x Domtar Dryden	115
F1B	Fort Frances x Burleigh	115
F3M	Fort Frances x Internat Fls (Minnesota Power)	115
K2M	Kenora x Norman	115
K3D	Dryden x Sam Lake x Eton x Vermilion Bay x Rabbit Lake	115

:

Figure 4. Existing Transmission Lines in Study Area
2017 Hydro One Northwest Ontario Regional Infrastructure Plan

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wsp

Baseline Information: Power Grid Gaps

- The APM site's power supply will be from a high voltage overhead line branching off from regional power grid

- WSP does not anticipate power grid capacity to be an issue at this stage

Baseline Information: Telecommunications

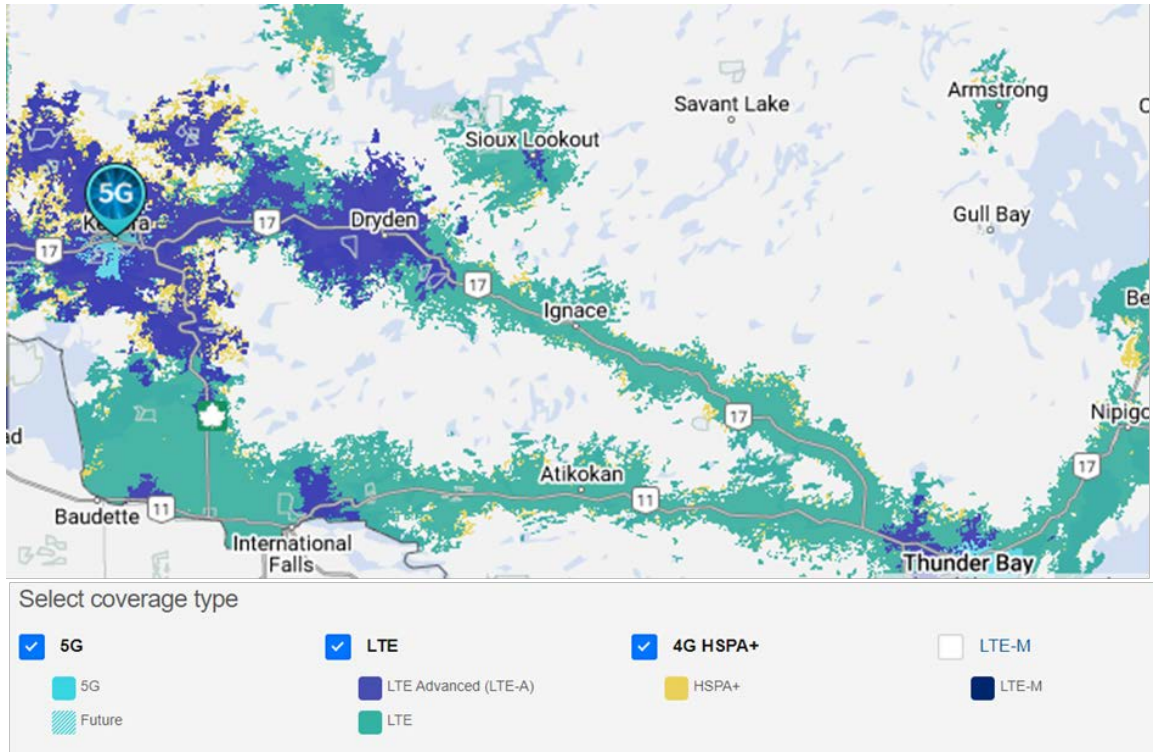

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Figure 5. Bell Coverage Map in Study Area
Bell.ca/Mobility/Our_network_coverage

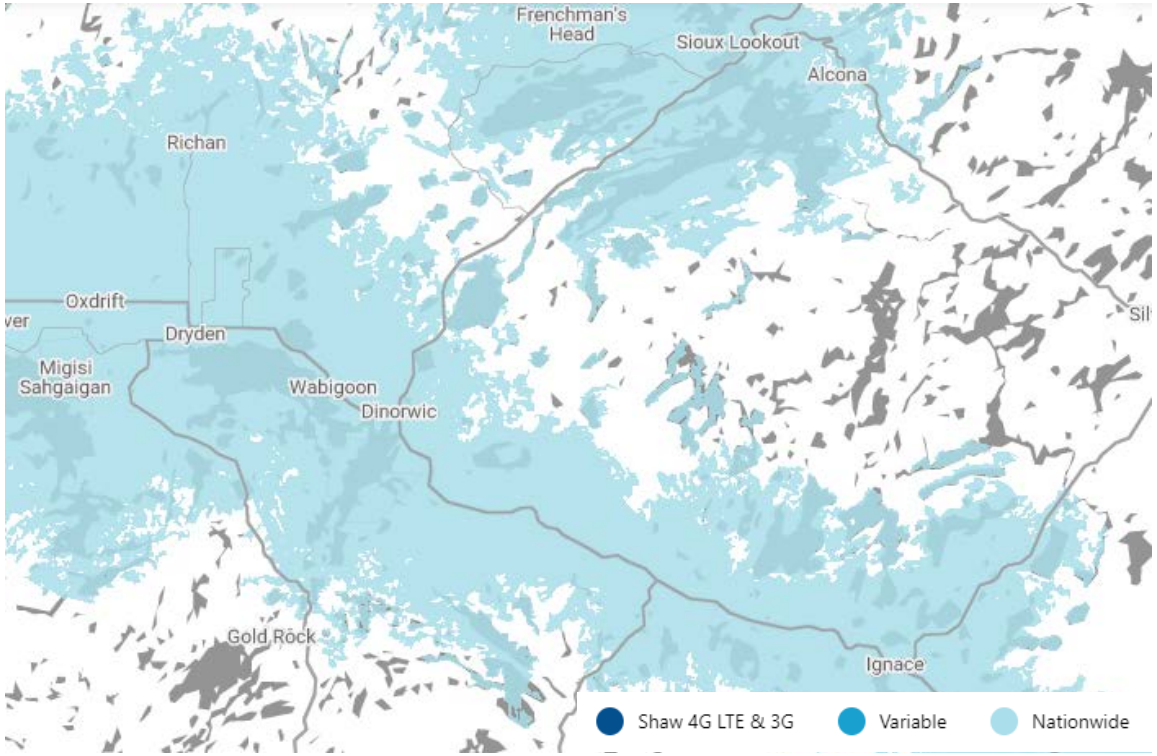

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Figure 6. Shaw Coverage Map in Study Area
Shawmobile.ca/en-CA/network-coverage

Baseline Information: Telecommunications Gaps

- WSP does not anticipate the APM project to hinder telecommunication servicing in the region

Next Steps

Municipal Infrastructure:

- Summary of projected demands and needs for municipal facilities in Ignace, resulting from the APM project
- Recommend strategies to leverage positive APM opportunities and mitigate negative APM consequences on municipal facilities in Ignace

Breakout discussion

IGNACE AND AREA WORKING GROUP

TOURISM BASELINE PRESENTATION

URBAN SYSTEMS

IGNACE
Explore Our Possibilities

APRIL, 21ST 2022

CONTENTS

1. Introductions
2. Community Study Update
   - Background Context
   - Tourism Market Overview
   - Cell Phone Data Review
3. Interview Strategy
4. Project Benchmarks
5. Next Steps

IGNACE TOURISM CONTEXT

IGNACE BACKGROUND PROJECTS SUMMARY

- Over the last decade, Ignace has developed new policies and strategies to guide its future and is prepared for the right investments to propel sustainable growth and development in the community and region.

Key Background Documents:

- Township of Ignace: Community Capacity Study, 2021
- Township of Ignace Community Strategy, 2019-2024
- Township of Ignace: Final Draft Official Plan, 2018
- Township of Ignace Background Report: Official Plan and Zoning By-Law Review, 2018-2019
- Township of Ignace: Community Improvement Plan, 2018
- Township of Ignace: Community Profile, 2018
- Mary Berglund Community Health Centre Hub Strategic Plan, 2020-2025
- Draft Community Profile: Township of Ignace, 2013
- NWMO Ignace Project Visioning Community Conversations, 2020

URBAN SYSTEMS

IGNACE BACKGROUND PROJECT SUMMARIES

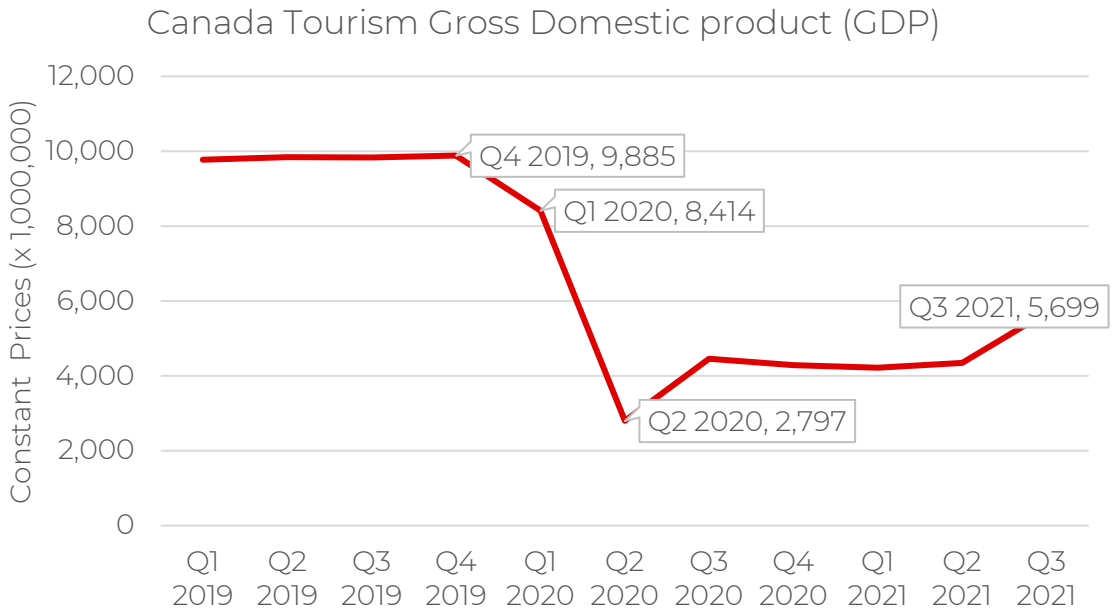
- Tourism is identified as a sustainable economic development opportunity and key community assets are highlighted. Ignace is ready to showcase its small-town charm and proximity to the natural environment to visitors.
- It has rich natural resources which offers several exciting activities, including hunting, fishing, harvesting, snowmobiling and much more to residents and visitors alike.

URBAN SYSTEMS

TOURISM MARKET BACKGROUND

IMPACT OF COVID-19

- Across Canada the GDP of the tourism sector has been badly hit
- In Resource-Based Tourism Operators study it is suggested these businesses saw up to 95% decline in tourism
  - Most clients come from US
- Reopening border critical
- Need to attract more Canadians



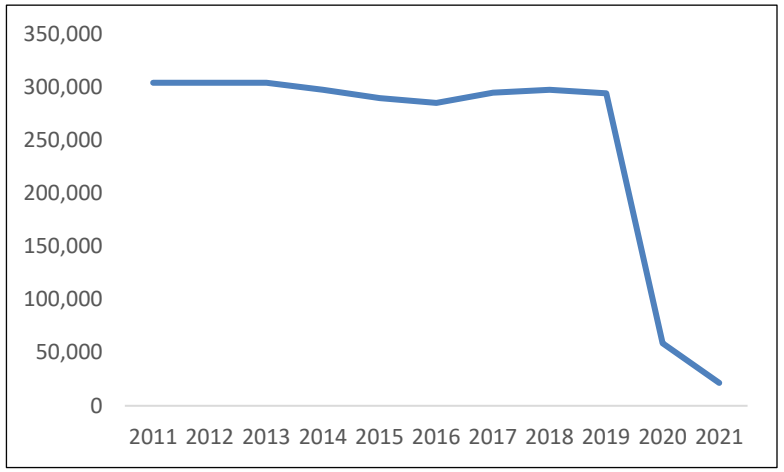
URBAN SYSTEMS

BORDER CROSSINGS

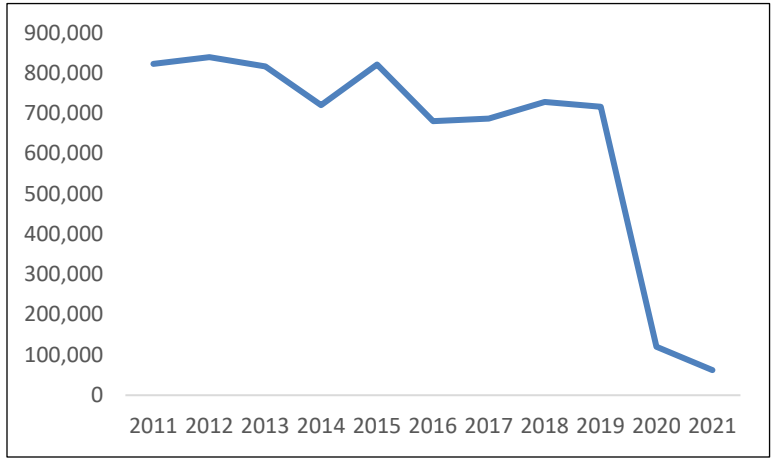
URBAN SYSTEMS

BORDER CROSSINGS

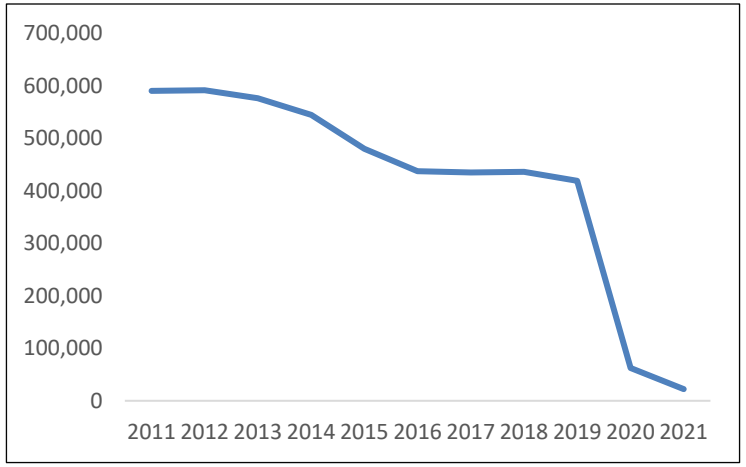
RAINY RIVER/BAUDETTE



FORT FRANCES/INTERNATIONAL FALLS



PIGEON RIVER/GRAND PORTAGE



URBAN SYSTEMS

TRENDS IN TRAVELER INTERESTS

Booking.com released 2022 travel predictions based upon their own consumer research.	
58%	**Of travellers agree it's important that their trip is beneficial to the local community at their destination."**
64%	**of travellers agree that technology will be more important than ever while on vacation.**
63%	**of travellers believe that technology is important in controlling health risks when traveling, with 62% agreeing that technology helps to alleviate their travel anxiety."**

URBAN SYSTEMS

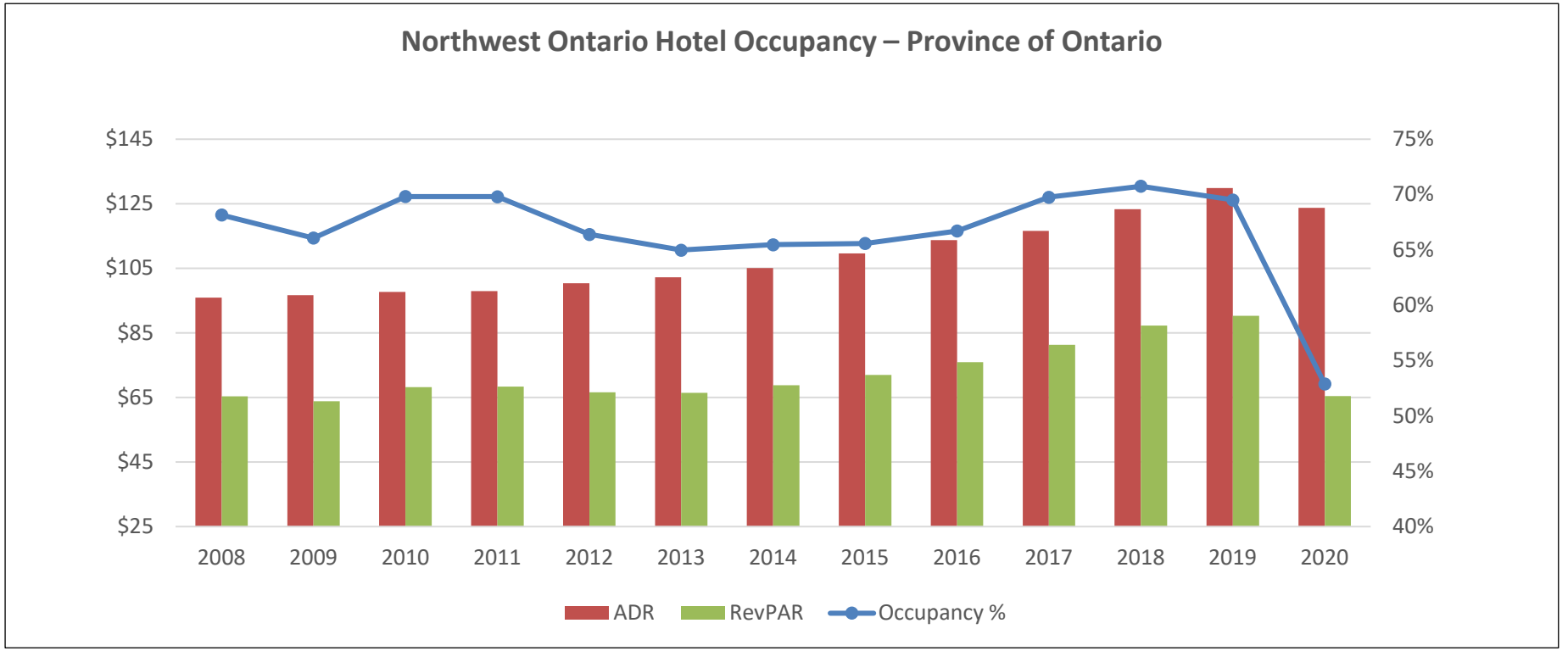
ACTIVITIES OF VISITORS TO NORTHWEST ONTARIO

Activities Undertaken During the Visit – Provincial Ministry of Tourism

1	Any Outdoor/Sport Activity
2	Restaurant or bar
3	Shopping
4	Sightseeing
5	Boating
6	Fishing
7	Camping
8	Wildlife/Bird Watching
9	National/Provincial Parks
10	Canoeing

URBAN SYSTEMS

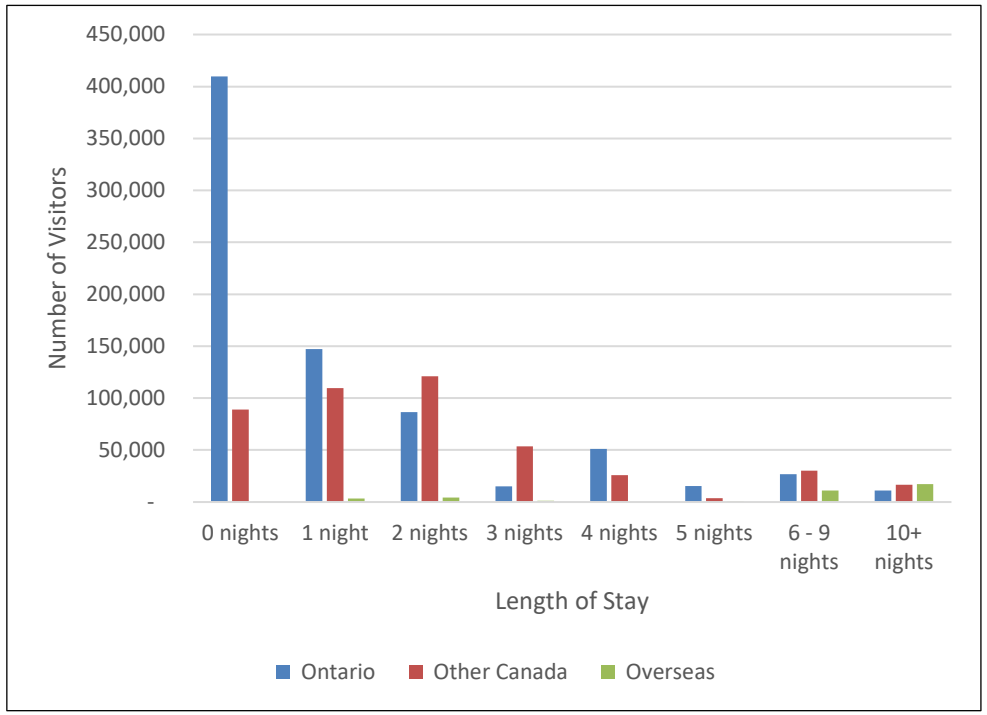
HOTEL OCCUPANCY



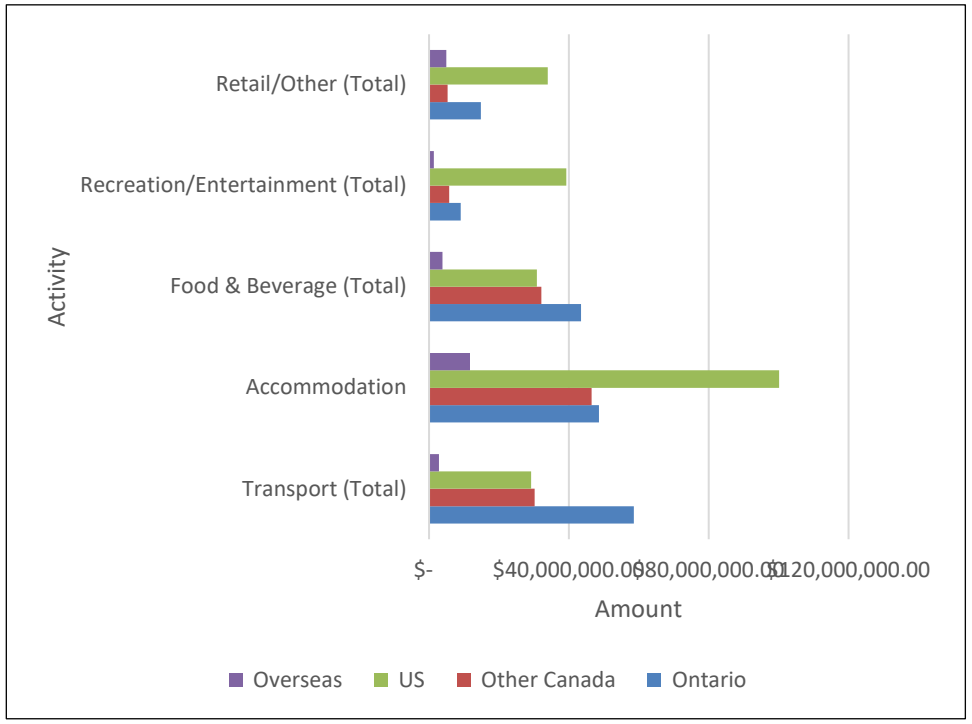
- Before the pandemic – hotel occupancy of over 70% indicates a strong market and potential for additional hotel space

LENGTHS OF STAYS & SPENDING

Lengths of Stays (2019) – Province of Ontario



Spending (2019) – Province of Ontario



IGNACE COMMUNITY EVENTS

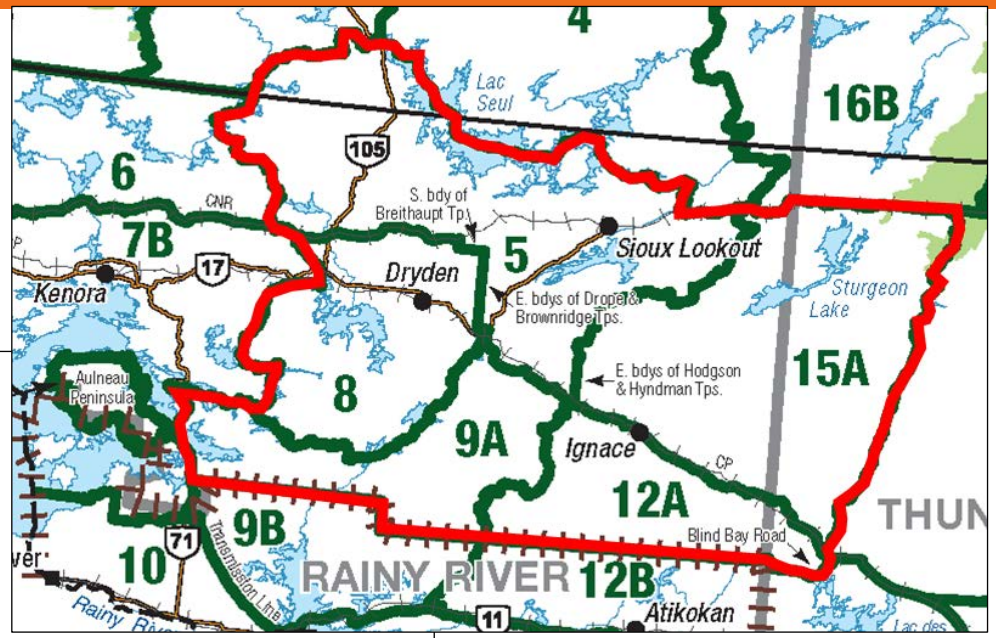
- Ignace hosts many community events for a diverse range of participants
- **White Otter Days** and **Winter Carnival** are popular events (hockey tournament, fishing derby, slo pitch tournament)
- Events designed for children and families include **Kids Fest** (fun outdoor festival) and the **Christmas Parade**

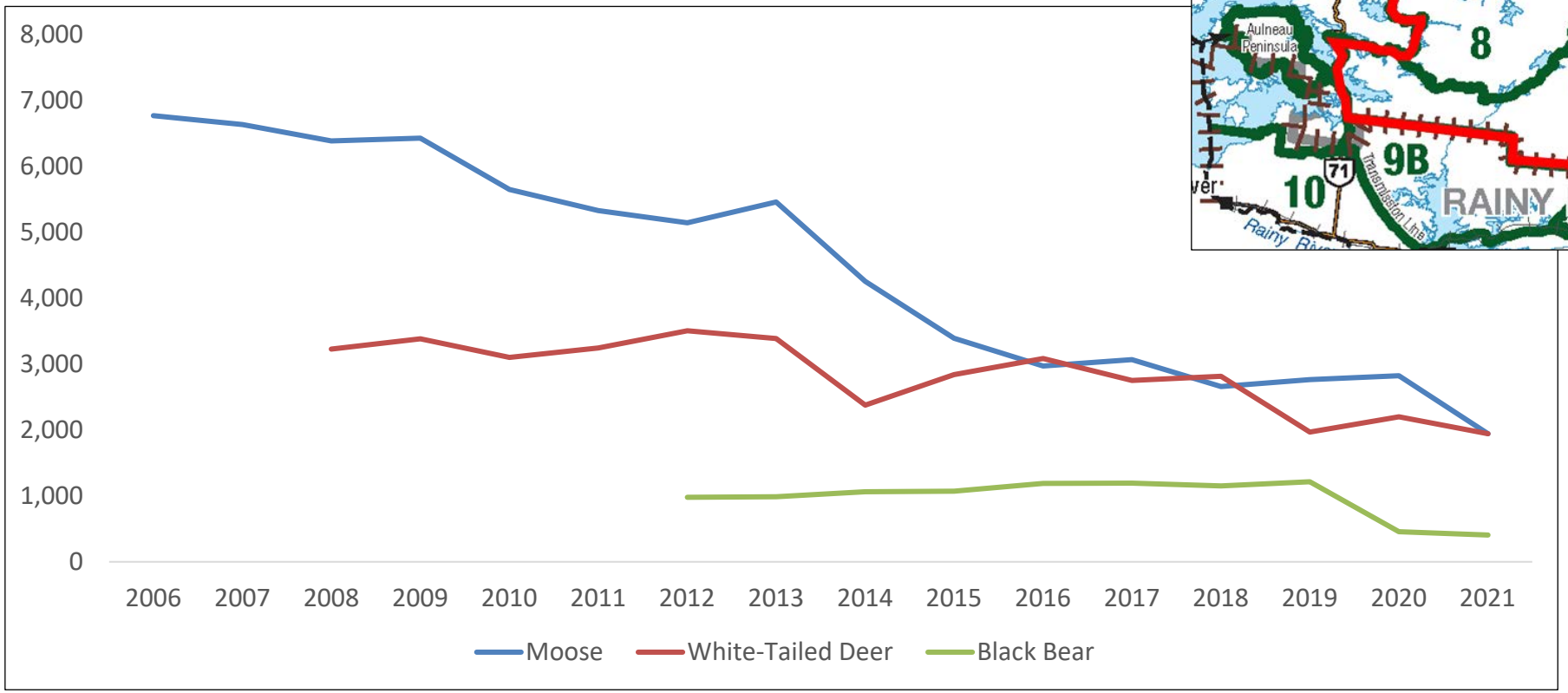
Event	Date
Community Sliding Party	January
Lego Builds	3rd Thursday/month
Poker Derby	February
Family Ice Fish Derby	February
Winter Carnival	All of March
White Otter Days	June 29th to July 1st
Canada Day	July 1st
Slo Pitch Tournament	3rd weekend in July
Kids Fest	August 12th
Teddy Dear Picnic	Grandparents Day – September
Community Fall Harvest Dinner	3rd Saturday in October
Family Sleigh Rides	1st Saturday in December
Christmas Parades	2nd Friday in December

URBAN SYSTEMS

ACTIVE HUNTERS

- Wildlife Management Units: 5, 8 9A, 12A, 15A



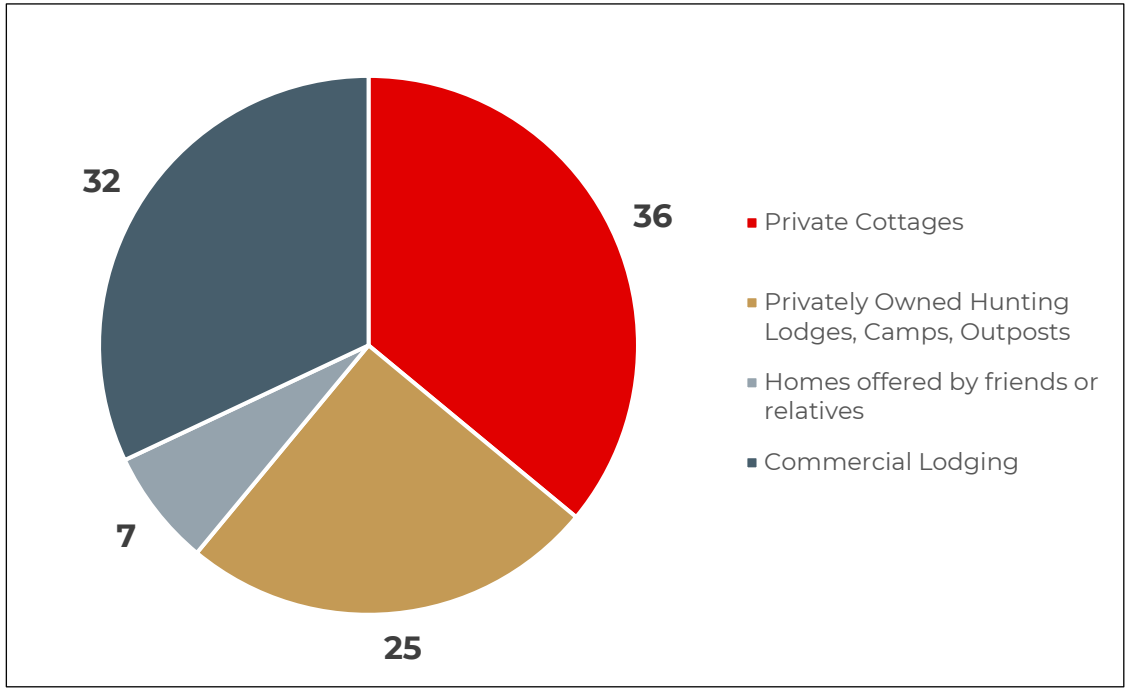


ACTIVE HUNTERS

Hunters' Characteristics

91% men	**Almost all hunters in Northern Ontario are men. Men dominate the hunting tourism market across Canada and the United States.**
50 years old	**The average age of Hunters in Northern Ontario is almost 50 years. Very few hunters are younger in age, (18 – 24 years)**
6 nights	**Northern Ontario's hunters are on pleasure trips that last about six nights.**

Where Hunters Stay

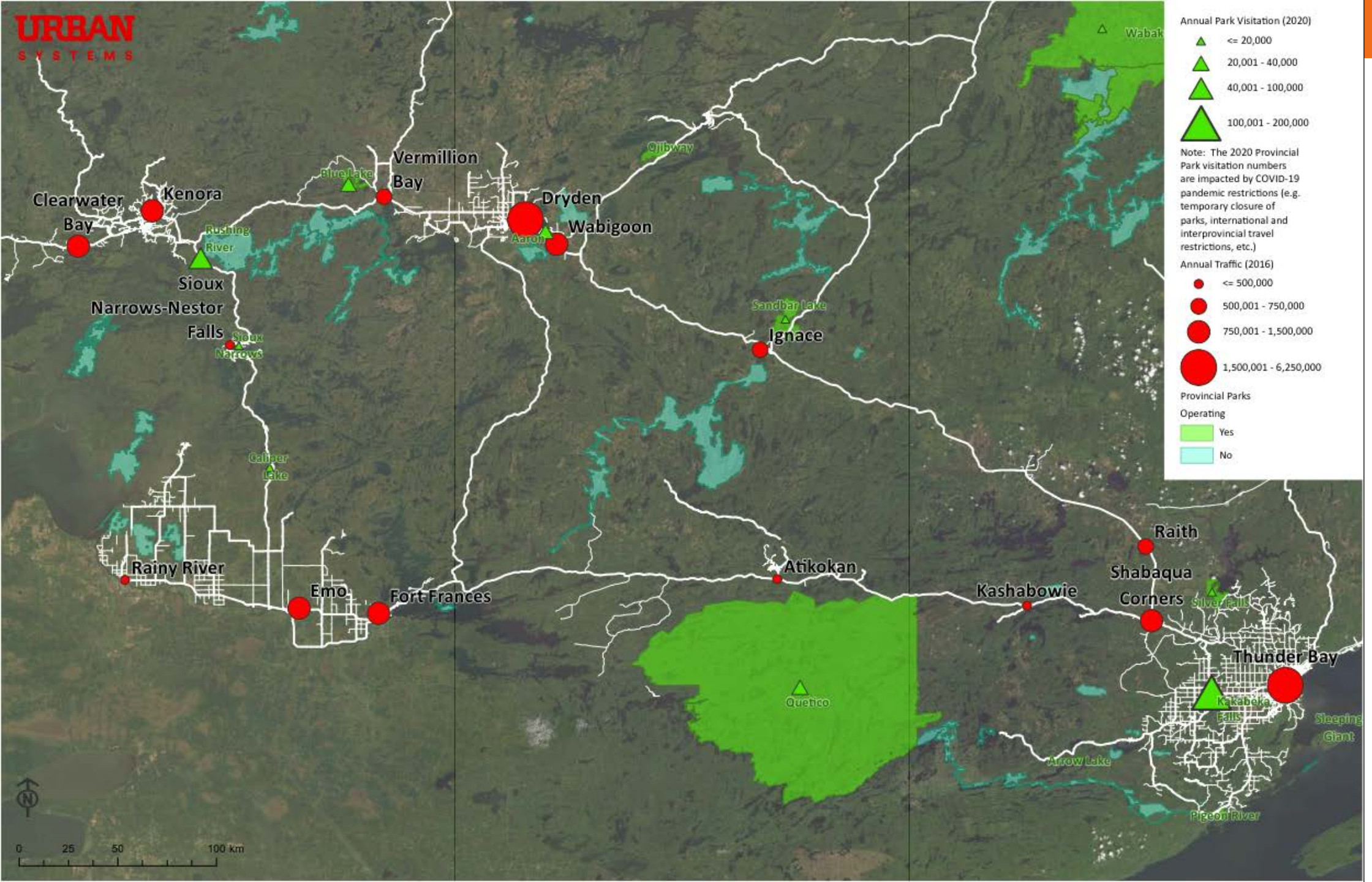


URBAN SYSTEMS

NEARBY PROVINCIAL PARKS

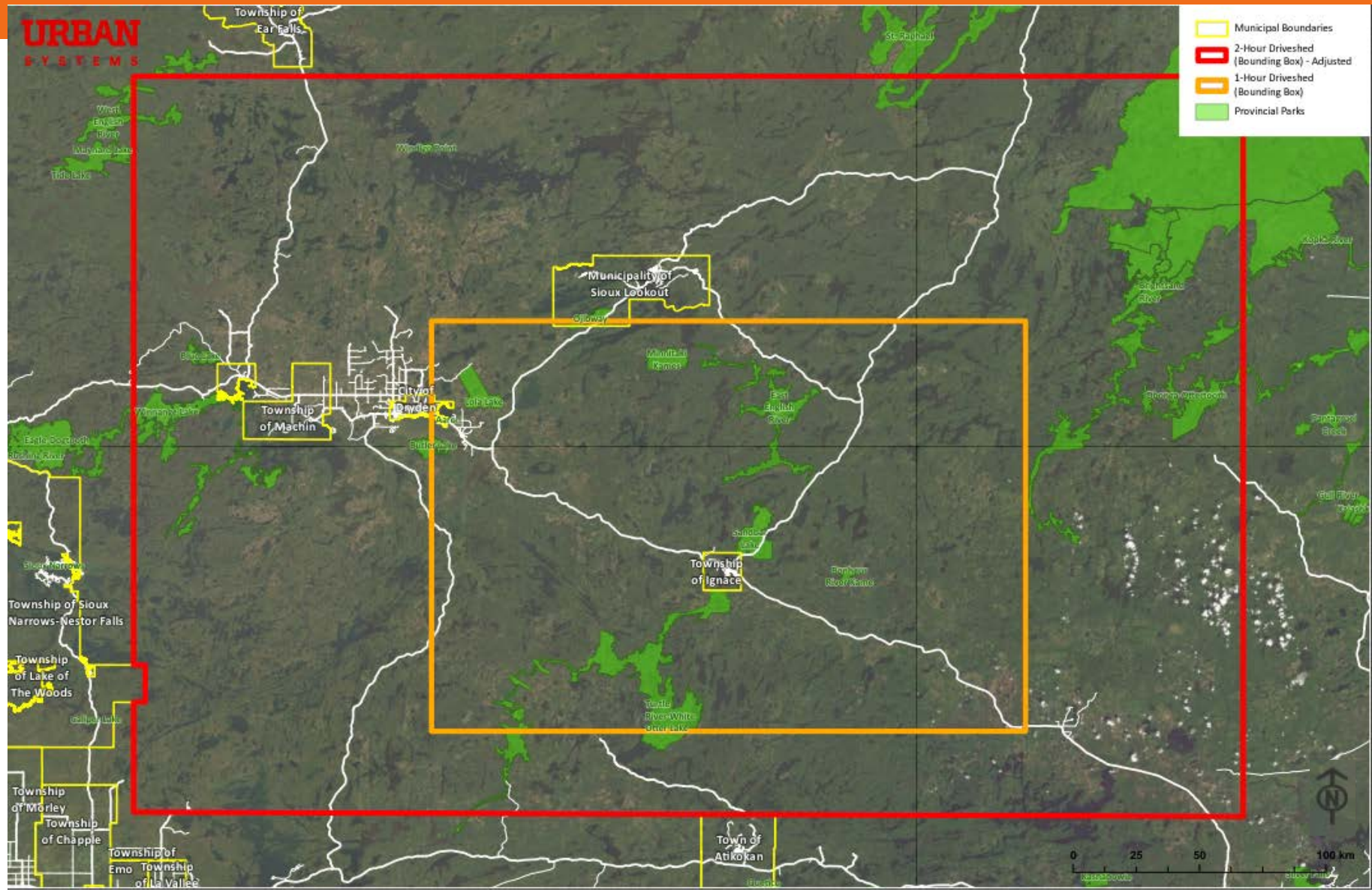
Clockwise from top left: **Aaron Provincial Park, Turtle River-White Otter Lake Provincial Park, Sandbar Lake Provincial Park.**

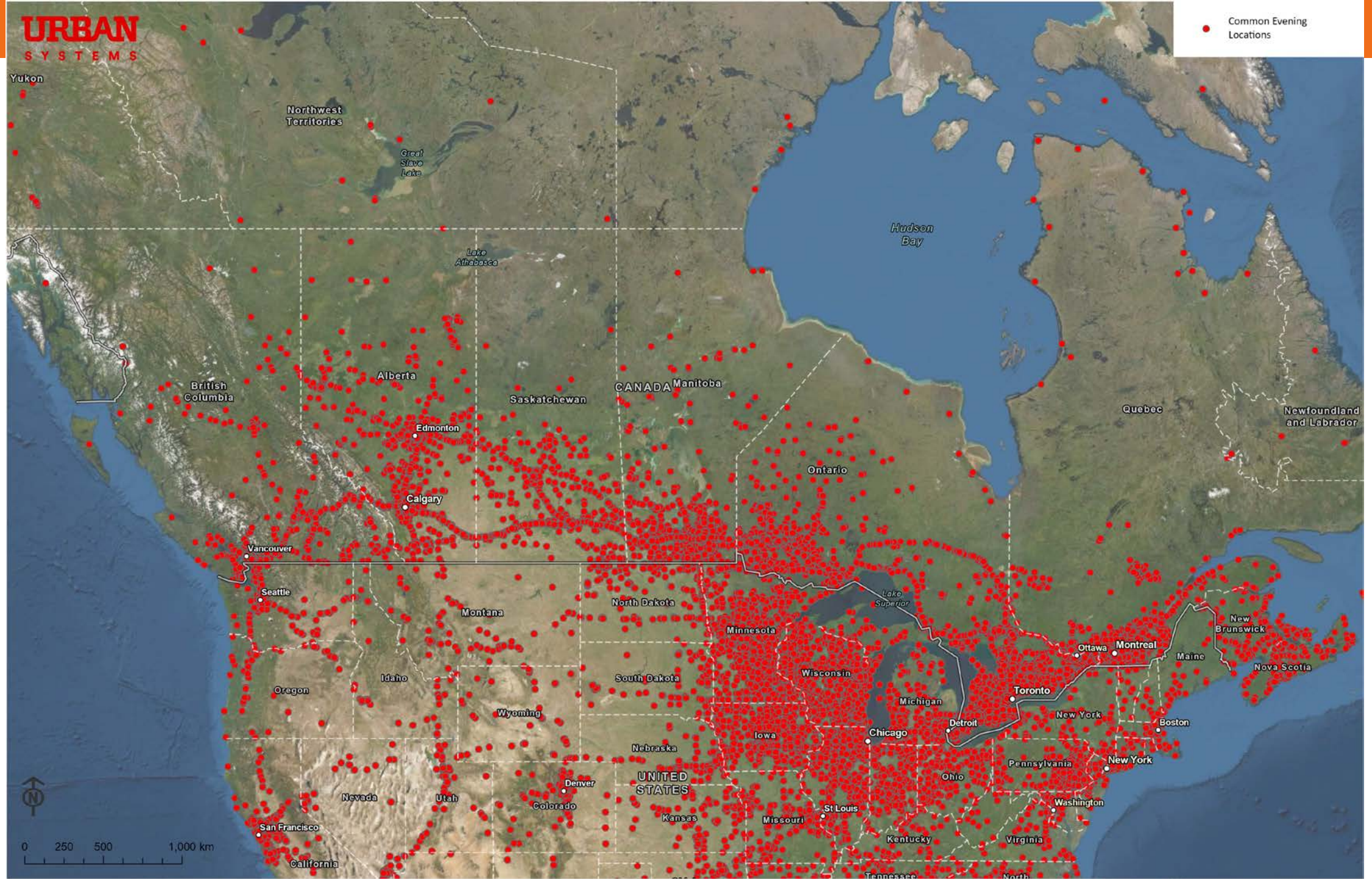
URBAN SYSTEMS

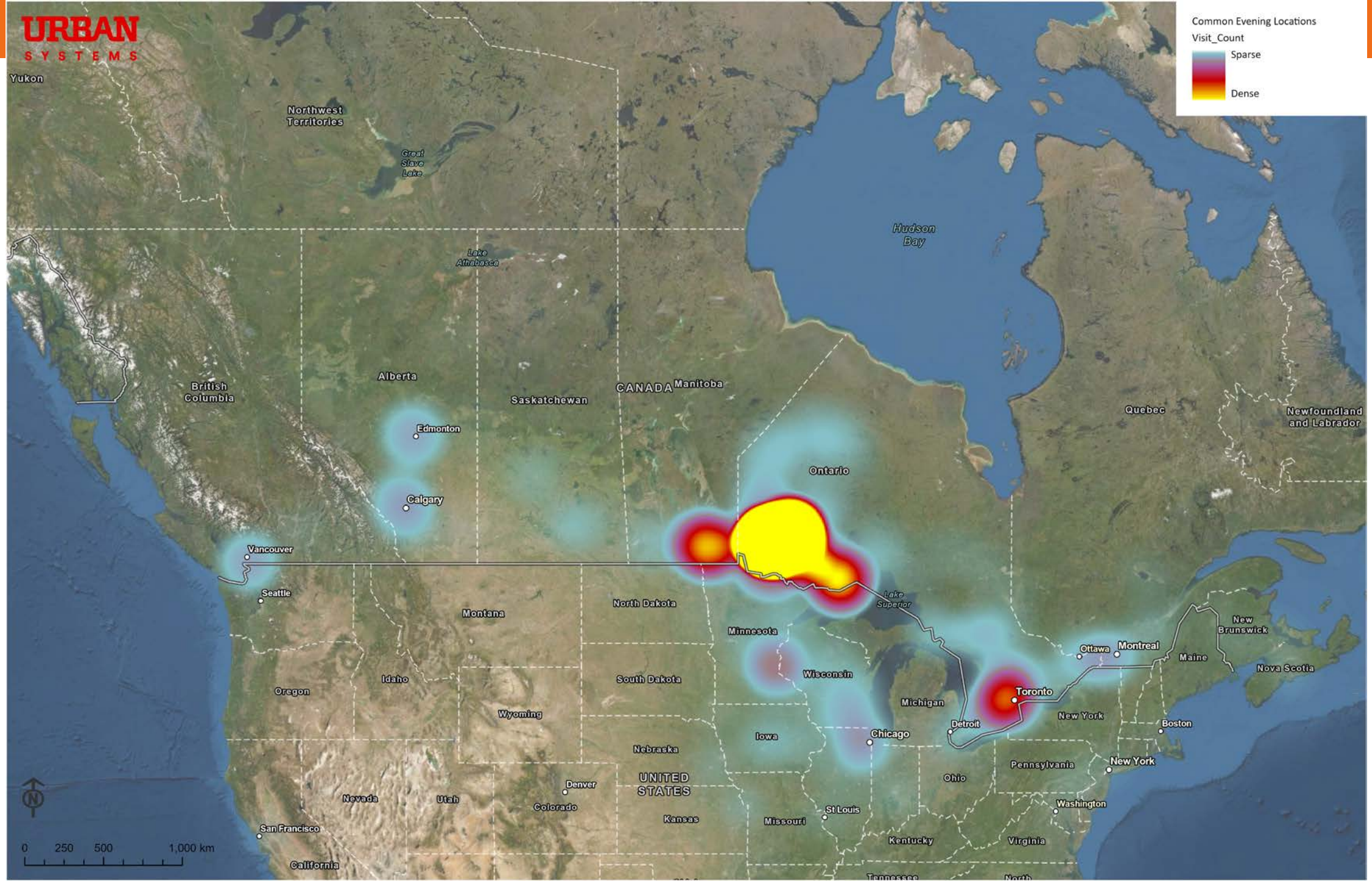

URBAN SYSTEMS
Annual Park Visitation (2020)
<= 20,000
20,001 - 40,000
40,001 - 100,000
100,001 - 200,000
Note: The 2020 Provincial Park visitation numbers are impacted by COVID-19 pandemic restrictions (e.g. temporary closure of parks, international and interprovincial travel restrictions, etc.)
Annual Traffic (2016)
<= 500,000
500,001 - 750,000
750,001 - 1,500,000
1,500,001 - 6,250,000
Provincial Parks
Operating
Yes
No
Wabakimi
Ojibway
Blue Lake
Vermillion Bay
Clearwater Bay
Kenora
Rushing River
Dryden
Aaron
Wabigoon
Sioux Narrows-Nestor Falls
Sioux Narrows
Sandbar Lake
Ignace
Caliper Lake
Rainy River
Emo
Fort Frances
Atikokan
Raith
Shabaqua Corners
Kashabowie
Silver Falls
Thunder Bay
Kakabeka Falls
Sleeping Giant
Quetico
Arrow Lake
Pigeon River
0
25
50
100 km

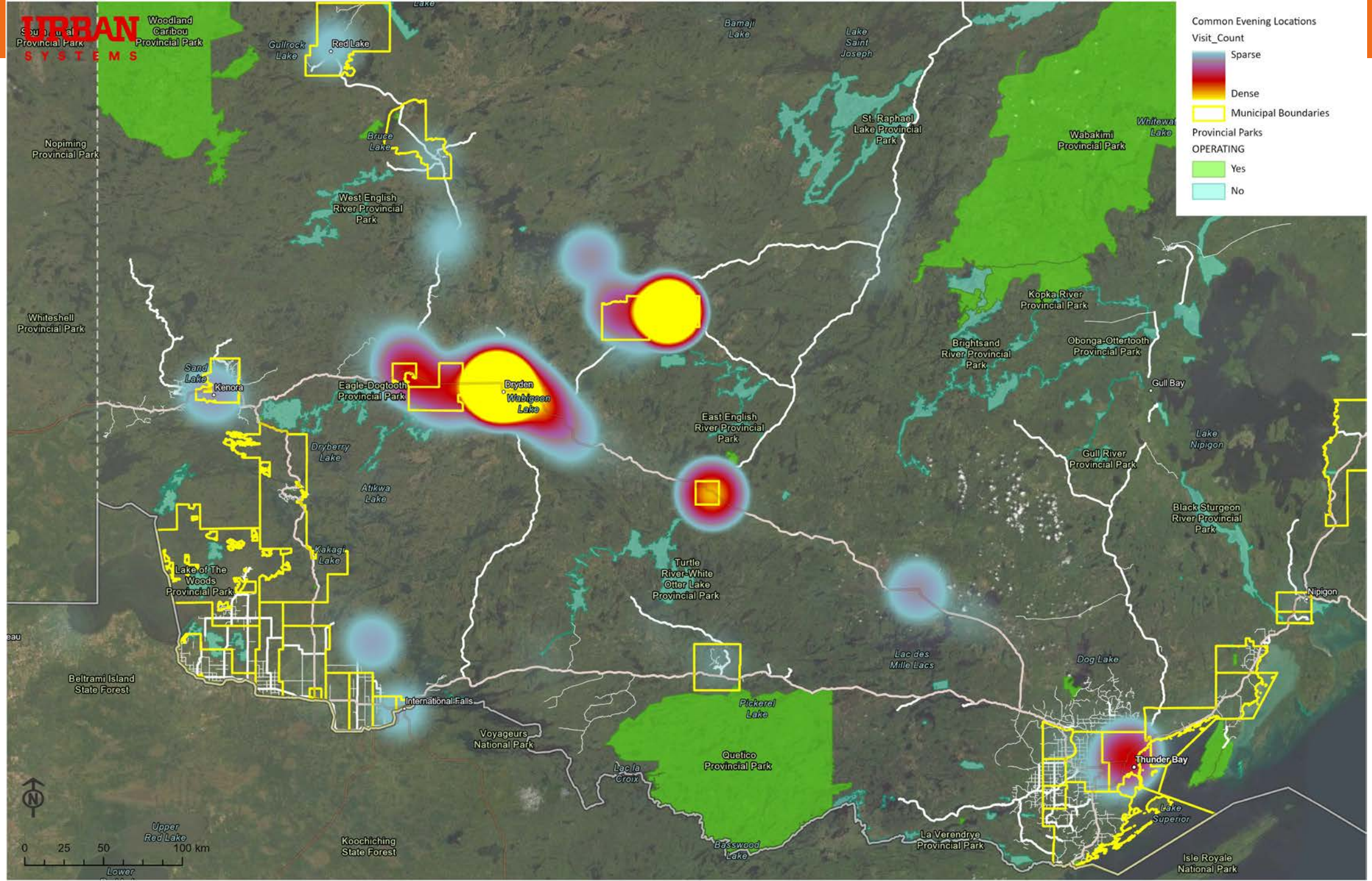
CELL PHONE DATA

- Area based on a 2-hour drive shed from 2019
- Data allows to see where visitors to Ignace area are from (Common Evening Location)
- Will allow more analysis of visitors to specific locations within subject area




URBAN SYSTEMS
Common Evening Locations
Yukon
Northwest Territories
Great Slave Lake
Hudson Bay
Lake Athabasca
Alberta
British Columbia
Saskatchewan
CANADA
Manitoba
Quebec
Newfoundland and Labrador
Edmonton
Ontario
Calgary
Vancouver
Seattle
Montana
North Dakota
Lake Superior
Minnesota
New Brunswick
Ottawa
Montreal
Maine
Nova Scotia
Wisconsin
Idaho
South Dakota
Oregon
Toronto
Michigan
Wyoming
New York
Detroit
Boston
Chicago
Iowa
Nebraska
Pennsylvania
New York
UNITED STATES
Ohio
Denver
Nevada
Utah
Colorado
Washington
St Louis
Kansas
Missouri
San Francisco
Kentucky
Virginia
California
Tennessee
0 250 500 1,000 km


URBAN SYSTEMS
Common Evening Locations
Visit_Count
Sparse
Dense
Yukon
Northwest Territories
Great Slave Lake
Hudson Bay
Lake Athabasca
British Columbia
Alberta
Saskatchewan
CANADA
Manitoba
Quebec
Newfoundland and Labrador
Edmonton
Calgary
Ontario
Vancouver
Seattle
Montana
North Dakota
Lake Superior
Minnesota
New Brunswick
Ottawa
Montreal
Maine
Nova Scotia
Wisconsin
South Dakota
Idaho
Oregon
Toronto
Michigan
Wyoming
New York
Detroit
Boston
Chicago
Iowa
Nebraska
Pennsylvania
New York
UNITED STATES
Ohio
Denver
Nevada
Utah
Colorado
Washington
St Louis
Kansas
Missouri
San Francisco
Kentucky
Virginia
California
0 250 500 1,000 km


URBAN SYSTEMS
Common Evening Locations
Visit_Count
Sparse
Dense
Municipal Boundaries
Provincial Parks
OPERATING
Yes
No
Woodland Caribou Provincial Park
Red Lake
Guillrock Lake
Bamaji Lake
Lake Saint Joseph
St. Raphael Lake Provincial Park
Wabakimi Provincial Park
Whitewater Lake
Nopiming Provincial Park
Bruce Lake
West English River Provincial Park
Whiteshell Provincial Park
Kopka River Provincial Park
Brightsand River Provincial Park
Obonga-Ottertooth Provincial Park
Gull Bay
Sand Lake
Kenora
Eagle-Dogtooth Provincial Park
Dryden
Wabigoon Lake
East English River Provincial Park
Dryberry Lake
Atikwa Lake
Gull River Provincial Park
Lake Nipigon
Black Sturgeon River Provincial Park
Kakagi Lake
Lake of The Woods Provincial Park
Turtle River-White Otter Lake Provincial Park
Nipigon
Beltrami Island State Forest
International Falls
Lac des Mille Lacs
Dog Lake
Pickerel Lake
Voyageurs National Park
Quetico Provincial Park
Thunder Bay
Lac la Croix
Lake Superior
La Verendrye Provincial Park
Basswood Lake
Isle Royale National Park
Upper Red Lake
Koochiching State Forest
Lower
0 25 50 100 km

INTERVIEW STRATEGY

INTERVIEW STRATEGY

- Create engagement strategy and share with project team
- Confirm list of potential interviewees
  - If any potential interviewees have already been interviewed, additional participation will be confirmed.
- Create specific survey questions for each type of interviewee
- List of interview subjects

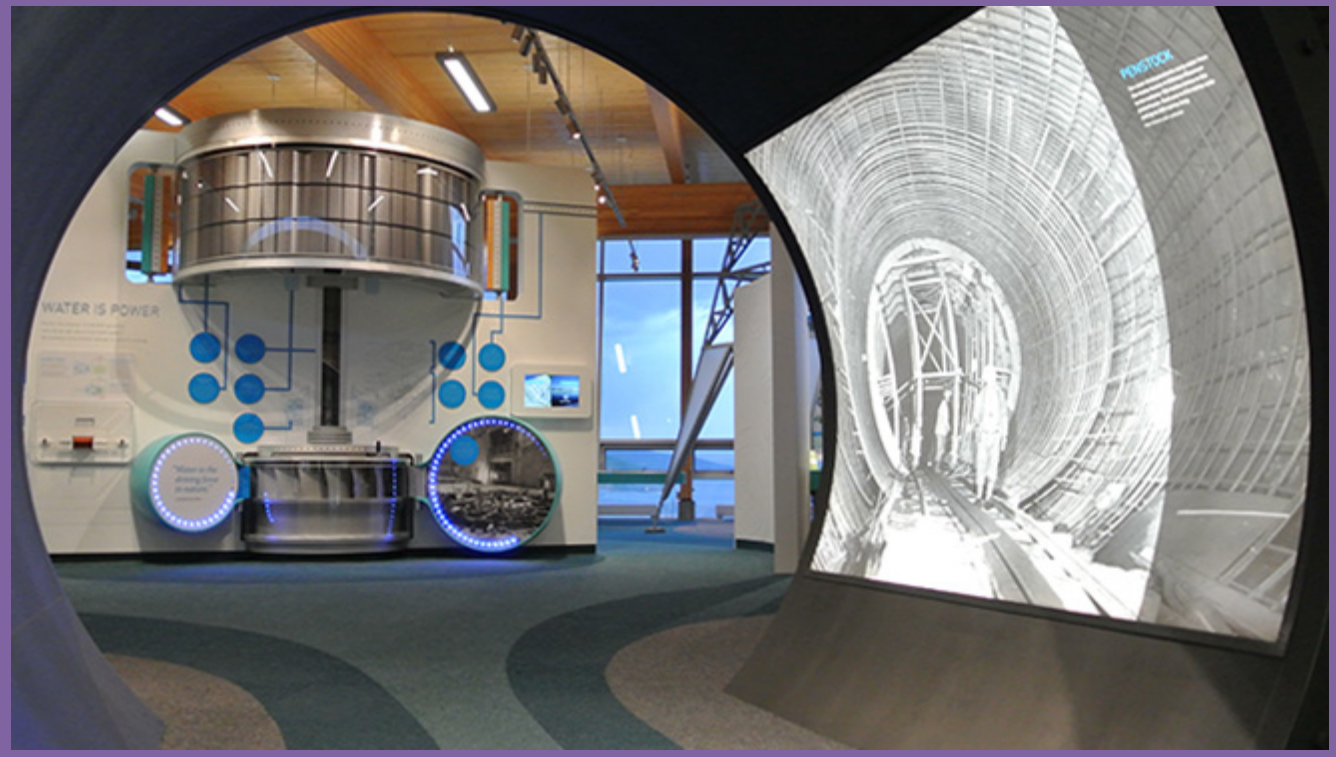
Interview subjects in each of the following categories:

- Outdoor / Nature Tourism
- Accommodations & Hospitality
- Parks & Campgrounds
- Indigenous Tourism
- Industrial Project Visitor Centres

PROJECT BENCHMARKS

W.A.C. BENNET DAM

- **Location**: Hudson's Hope, BC
- **Size**: 6,500 square feet
- **Uses**: Visitor Centre, outdoor exhibits, school groups, travel trade, possible event space,
- **Revenue Sources:** Admissions, gift shop, tours
- **Other unique facts / possible lessons:**
  - The centre is currently closed due to COVID, but set to re open for the 2022 season.



SQUAMISH LIL'WAT CULTURAL CENTRE

- **Location**: Whistler, BC
- **Size**: 38,000 square feet, 4.45 acre site
- **Uses**: Cultural Centre, outdoor exhibits, school groups, travel trade, event space, cultural performances, services and tours, training
- **Revenue Sources:** Admissions, gift shop, tours, event rentals, travel trade, restaurant
- **Other unique facts / possible lessons:**
  - Travel trade has become the SLCC's greatest source of revenue. Pre-pandemic the centre provided a venue and catering for bus tour breakfast service.

‘KSAN HISTORIC VILLAGE

- **Location**: Hazelton, BC
- **Size**: 15,000 square feet (approx. across 7 buildings)
- **Uses**: Visitor Centre, outdoor exhibits, school groups, travel trade, event space,
- **Revenue Sources:** Admissions, gift shop, tours, screen printing, restaurant, RV park, Events
- **Other unique facts / possible lessons:**
  - Food service is key to serve bus tours.
  - Diversify revenue sources
  - Keep people coming back
  - Don’t underestimate operations costs

KWANLIN DUN CULTURAL CENTRE

- **Location**: Whitehorse, YK
- **Size**: 45,000 square feet
- **Uses**: Cultural programming, event and meeting space, public library
- **Revenue Sources:** Cultural programming, event and meeting space rentals, audio and catering services, leasing space to library
- **Other unique facts / possible lessons:**
  - Ensure building has enough space for intended revenue generating office space
  - Have clear mandate on building's purpose

URBAN SYSTEMS

MONT TERRI ROCK LABORATORY

- **Location**: Sainte-Ursanne, Switzerland
- **Size**: 10,000 square feet (approx. above ground)
- **Uses**: Visitor Centre, training and education centre, deep geological repository
- **Revenue Sources:** training and education tours, funding from Nagra Cooperative (nuclear power plant assoc. and Swiss Gov.), meeting space
- **Other unique facts / possible lessons:**
  - Operations are funding through the tariffs nuclear waste emitters are required to pay

URBAN SYSTEMS

OIL SANDS DISCOVERY CENTRE

- **Location**: Fort McMurray, AB
- **Size**: 27,000 square feet
- **Uses**: Visitor Centre, theatre, meeting space, gift shop, children's activity centre, outdoor exhibits
- **Revenue Sources:** Admissions, gift shop, meeting space and event rentals, educational materials, summer camps
- **Other unique facts / possible lessons:**
  - Event rentals were not possible during COVID
  - Education focused mandate offers several opportunities

NEXT STEPS – SUMMARIZED

- Inventory & review existing tourism assets & events
  - SWOT
- Outreach
  - Finalize engagement strategy
  - Confirm list and conduct interviews
- Profiles
  - Refine profiles relevant to COE
  - Find and create profiles for tourism opportunities / attractions
- Cell phone data
  - Undertake more detailed analysis of the data
- Outline potential impacts of COE on tourism industry
- Determine COE Scenarios
  - Based on profiles outline options for COE development including pros & cons of each scenario
- Tourism Scenarios
  - Find and create profiles for tourism opportunities / attractions

URBAN SYSTEMS

QUESTIONS

1. ARE THERE ANY GAPS IN OUR RESEARCH SO FAR?
2. CAN YOU SUGGEST ANY ADDITIONS TO THE FOLLOWING:
   - Community events and activities of interest
   - Local/Regional Attractions
   - Potential Interviewees
3. DO YOU HAVE ANY OTHER COMMENTS OR QUESTIONS?

THANK YOU

J.P. RAULOT-LAPOINTE, MBA

- jprlapointe@urbansystems.ca

MIKE WAKELY, MCP

- mwakely@urbansystems.ca

URBAN SYSTEMS

Closing and Next Steps

Appendix C

Glossary of Terms

Term	Definition
Adaptative management	Adaptive management is defined consistent with the CNSC's definition of adaptive management (REGDOC-3.6): A planned and systematic process for continuously improving management practices (primarily environmental) by learning from their outcomes. For an environmental assessment it involves, among other things, the implementation of new or modified mitigation measures over the life of the Project to address unanticipated environmental effects. Note: the need to implement adaptive management measures may be determined through an effective follow-up program.
Adaptive Phased Management (APM) Project	The Deep Geological Repository and other required infrastructure for the safe, long-term management of Canada's used nuclear fuel.
Community	The use of the term 'community' (a group of people living either in the same place or having a particular characteristic in common) will be qualified to specify the specific community of reference.
Community Studies Purpose	Community studies will inform the primary APM Project hosting agreement between the NWMO and the Township of Ignace. In addition, they will provide pertinent information for agreements with the City of Dryden as well as other potential regional agreements.
Ignace Area	Delineates the general area surrounding the potential APM Project location Deep Geological Repository in Northwestern Ontario; mainly comprising of City of Dryden, Machin, the Local Service Board of Wabigoon, the Local Service Board of Melgund (Dyment and Borups Corner), and Sioux Lookout. The area is located in Treaty #3 within the traditional territories of multiple Indigenous and Métis communities.
Ignace and Area Working Group	The Township of Ignace and the NWMO have established a working group inclusive of the Township of Ignace, Wabigoon Lake Ojibway Nation, and other Indigenous and non-Indigenous local and regional community members and observers to collaboratively design and implement baseline and community studies to provide a basis for achieving informed decision making related to the APM Project.

Term	Definition
Local Study Area	The Local Study Area refers to the communities/areas most likely to experience future direct, indirect, and induced impacts of the APM Project - both positive and negative. For the purposes of the baseline studies, the potential "host" community (i.e., Ignace) is considered central to the Local Study Area, while other communities may be included on a topic-by-topic basis relative to potential future impacts and cumulative impacts. The Local Study Area will vary by baseline component/study as well as phase of the Project. For example, for workforce the Local Study Area includes communities that can commute to the Revell Site or the Centre of Expertise within an hour drive. This means that Ignace, Dryden, Sioux Lookout (for the Revell Site) and Machin (for the Revell Site) and unincorporated municipalities constitute the primary Local Study Area (micro labour-shed). This micro labour-shed includes settlement areas (unincorporated communities) between Dryden, Ignace, and Sioux Lookout. The preliminary spatial boundaries are as follows: • Ignace; • Dryden; • Machin; • Sioux Lookout; • The Local Service Board of Melgund; and • The Local Service Board of Wabigoon.
Neighboring Community	Communities in Northwestern Ontario surrounding the Project or included in both Local and Regional Study Areas (i.e., Dryden, Sioux Lookout, Machin, and unincorporated municipalities).
Neighboring Community Leadership	For the purpose of engagement on draft materials, neighboring community leadership in this context refers to municipal administrative leadership inclusive of the Local Service Board of Wabigoon, the Local Service Board of Melgund, etc.
Potential Municipal Host Communities	Two municipal siting communities remain in the process. These are the Township of Ignace and the Municipality of South Bruce. Ignace has participated in the NWMO's site selection process since initiation in 2010.
Project Site	Used to describe the location of the primary APM infrastructure including the Deep Geological Repository, and ancillary infrastructure to support operations.

Term	Definition
Regional Study Area	The Regional Study Area refers to the area used to provide context for each component and may also experience future impacts of the APM Project (both positive and negative). During the future impact assessment, cumulative effects will be considered within the Regional Study Area. The Regional Study Area will also vary by baseline component/study as well as phase of the Project. In some instances, the regional boundaries are either narrowly defined by the area within the Kenora District or more broad in scope such as the labour baseline for example: • Atikokan; • Kenora; • Thunder Bay; • Steinbach; and • Winnipeg.
Revell Site	Revell Batholith Temporary Withdrawal Area.
Rights Holders	First Nation and Métis communities who have asserted and or hold recognized treaty and/or Indigenous rights and whose Traditional Territories include the Project site.
Siting Area	In the context of the Community Studies for Northwestern Ontario, 'siting area' refers to the Ignace Siting Area defined above for 'Ignace Area'.
South Bruce Area	Delineates the general area surrounding the potential APM Project location in southwestern Ontario; mainly comprising Bruce County (excluding the South Bruce Peninsula) and northern portions of Huron County, but not extending to the shores of Lake Huron. The area is located in Treaty #45 1/2 in the traditional territory of the Saugeen Ojibway Nation as well as the asserted traditional territories of Métis communities.
Spatial Boundaries as defined in Baseline Design Report	Spatial boundaries vary by topic and will be refined over the course of engagement. It is anticipated spatial boundaries will reflect inputs from local governments, the public, Indigenous communities, federal and provincial government departments and agencies, and other interested parties, consistent with the Tailored Guidelines template. Two general spatial study areas are considered as part of the Community Studies that referred to as the Local Study Area and Regional Study Area.