NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Ignace Area Infrastructure: Transportation and Emergency Response Study

APM-REP-06300-0230

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This report has been prepared by WSP under contract to the Township of Ignace. The report has been reviewed by the NWMO, but the views and conclusions are those of the authors and do not necessarily represent those of the NWMO.

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IGNACE AREA INFRASTRUCTURE:

TRANSPORTATION AND EMERGENCY RESPONSE STUDY

October 28, 2022

QUALITY MANAGEMENT

Issue/Revision	**FINAL DRAFT**
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ACRONYMS AND ABBREVIATIONS

Term	Details
AECL	Atomic Energy of Canada Ltd.
APM	Adaptive Phased Management
CD	Census Division
IAWG	Ignace and Area Working Group
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 (the Township or Ignace) has been involved in a process of learning about the Nuclear Waste Management Organization's (NWMO) Adaptive Phased Management (APM) Project (the 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 2024. Preliminary studies suggest that the 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.

Studies have been ongoing since 2010; however, further studies are required to fully assess the potential socio-economic 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. The list of socio-economic community studies is included in **Appendix A**. The information acquired through these studies is expected to help the Township of Ignace leadership and residents make informed decisions about whether the Project is a good fit for their community, if they are willing to consider hosting it and if so, under what circumstances and terms.

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

Note to Reader

This and other community studies are preliminary and strategic in nature, all intended to identify possible consequences (e.g., to workforce development, youth economic development) in the Township of Ignace, and other local area and regional communities. Using information about the APM Project known at this point in time, these community 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 of 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 2024.

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

The Transportation and Emergency Services Studies are two elements of the Infrastructure Study, due to their overlapping and common review elements they have been combined into a single report. The overall objective of this study is to review the future scenarios to ascertain what impacts, both positive and negative, the implementation of the APM project would have on the Township of Ignace and the surrounding areas. The Infrastructure Study also reviewed the community recreation facilities, and civil infrastructure such as water, sewer and solid waste supply and demand for the Township of Ignace, and in local study area communities. These impacts are documented in separate reports.

The specific intentions of this study include:

- Collect data and information to identify the existing conditions such as travel patterns, capacity demands, safety issues, and the spatial and call characteristics for historical emergency response (emergency capacity).
- Summarize potential changes related to transportation and emergency service requirements as a result of the APM Project by each of the three phases defined in Section 4.
- Identify the impacts, both positive and negative, with potential options for mitigation if required.
- Engage local stakeholders such as public works and local emergency response groups to discuss existing constraints and capacities with current operations and to identify any gaps in existing operations (e.g., personnel or equipment) and historical issues that could have an influence on future development.

1.3.1 SPATIAL BOUNDARIES

The focus for the Transportation and Emergency Services Study is identified as the Township of Ignace with a broader review for the influences of and on the surrounding communities, namely the City of Dryden; Municipality of Machin; Village of Wabigoon; Sioux Lookout; and unincorporated communities along Highway 17, including Dinorwic, Dyment, Borups Corner, Upsala; and along Highway 599, including Valora and Silver Dollar. The region is defined by the Kenora Area district.

1.3.2 TEMPORAL BOUNDARIES

The temporal boundary for the Transportation and Emergency Services Study is divided into three phases:

Pre-Construction (2024 to 2032)	Construction (2033 to 2042)	Operations (2043 and beyond)
Aligns with the end of the site preparation phase (2032) and start of design and construction (2033). This includes the construction of the Centre of Expertise in the Township of Ignace (to be completed by 2028).	Aligns with the end of construction (2042) and start of operations (2043). The focus of the project will be at the APM Revell Project Site.	Aligns with the start of operations at the facility and the end of the construction (2043). Will continue for over 40 years.

2 METHODOLOGY

2.1 GENERAL APPROACH

Broadly, the methodology to the Transportation and Emergency Response Study is followed by three steps:

- ✓ Carry out Data and Information Collection
- ✓ Conduct Change Analysis
- ✓ Assessment of Options

The data and information were collected to develop an understanding of the existing conditions within the study area (as defined in Section 1.3.1) and include both quantitative (traffic counts, collision history, etc.) and qualitative (stakeholder interviews) inputs. Following an assessment of the existing conditions to establish a baseline, the Change Analysis reviewed the potential implications of the APM project expected for the three project phases (pre-construction, construction, operations). Finally, based on the outcome of the first two steps, a variety of options were identified to mitigation impacts identified.

2.2 DATA COLLECTION / INFORMATION SOURCES

The data collected was for the purpose of identifying the existing conditions related to transportation and emergency services, such as travel patterns, capacity demands, safety issues, and emergency response call types and frequency (emergency capacity). The following subsections summarize the data source information collected.

2.2.1 KNOWLEDGE HOLDER INTERVIEWS

Interviews were held with key stakeholders within the Township of Ignace and the surrounding area to identify additional potential information sources, obtain insight on potential changes caused by the APM Project from their responsibility perspective, and identify potential options for managing the changes related to one or more of the Community/Infrastructure Studies in conjunction with other data and information sources. As it relates to transportation and emergency services, and based on the organization's mandate, role, and work in the study area, five organizations were identified to have important information to help understand existing conditions, emerging trends, potential changes, and options for managing such changes, challenges, and opportunities, as well as policies and practices.

The organizations interviewed for the transportation and emergency services study are listed in **Table 2-1**. A list of questions for discussion was distributed in advance of each interview and is provided in **Appendix B**. Key findings from the interviews to supplement this study are summarized throughout Section 3.

The Ministry of Transportation Ontario (MTO) was also contacted by email with a list of questions related to potential infrastructure projects within their planning horizon or potential issues raised within the study area plans.

Table 2-1: Summary of Interviews

Interview	Date	Type	Representatives
Ignace Public Works	March 18, 2022	Transportation	Clerk and Foreman
Ontario Provincial Police (OPP)	March 21, 2022	Emergency Services	Sergeants from the Ignace and Dryden Detachments
Transportation Engagement, NWMO	March 25, 2022	Transportation	Manager
Northwest Emergency Medical Service (EMS)	April 6, 2022	Emergency Services	Director/Chief of EMS
Ignace Fire Department	April 22, 2022	Emergency Services	Deputy Fire Chief
Emergency Services Engagement, NWMO	August 16, 2022	Emergency Services	NWMO Engineering Staff
Emergency Services Engagement Follow-Up, NWMO	August 19, 2022	Emergency Services	NWMO Staff

Through discussions with stakeholders during the knowledge holder interviews, the input received for transportation and emergency services were organized into the following four themes:

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

2.2.2 TRAFFIC AND COLLISION DATA

Transportation data for the study area was collected from several sources. The MTO Online Technical Publications were referenced for the Average Annual Daily Traffic (AADT) and Seasonal Average Daily Traffic (SADT) from 1988-2016 with more recent average daily counts (ADT) provided directly from MTO where available. The list of highway segment locations with counts is below, where more recent data was provided the date is shown in parenthesis.

- Highway 17 between Dryden and Highway 72 (2020)
- Highway 17 between Highway 72 and Highway 622 (2019)
- Highway 17 between Highway 622 and Ignace (2019)
- Highway 599 between Ignace and Highway 642
- Highway 642 between Highway 599 and Sioux Lookout (2018)

- Highway 72 between Sioux Lookout and Highway 17 (2018)

Local turning movement counts through the populated areas of Ignace and Dryden on Highway 17 were not available.

In addition to the traffic data as noted above, MTO provided collision data through the study network from January 2017 through April 2022. The collision data included relevant information such as classification, lighting conditions, driver action, road surface conditions, etc.

For future scenarios, NWMO provided projections related to the APM project for the Township of Ignace. This data included population projections for all three phases, and vehicle trip projections for the Construction and Operations periods. Vehicle trip data for the pre-construction phase was not available from the Township of Ignace or the NWMO for this study.

2.2.3 OTHER KEY INFORMATION AND DATA SOURCES

In addition to the data noted above, relevant policy documents, emergency response data, background reports and geographic information systems (GIS) data was requested.

GIS data was provided for the Township of Ignace including shapefiles for: Land Use, Municipal Boundaries, Roads, Railroads, Wetlands, Watercourses, Aquatic Natural Features, Fire Halls, Ambulance Services and Hospitals. Similar GIS data was requested for other areas within the study area but was not received.

Policy and background documents received and considered during the preparation of this report for both transportation and emergency services include the list below and are referenced in Section 8:

- Northwest Community Studies: Growing the Population and Opportunities (Intergroup, 2022)
- Ignace Area Community Studies: Economics and Finance Labour Baseline (HSAK, 2022a)
- Ignace Area Community Studies: Economics and Finance Housing Study (HSAK, 2022b)
- Township of Ignace: Final Draft Official Plan (WSP, 2020)
- Township of Ignace Background Report: Official Plan and Zoning By-Law Review 2018-2019 (WSP, 2019)
- Ignace Community Capacity Study (Urban Systems, 2021)
- Community Studies Planning Assumptions – Ignace Traffic (NWMO, 2021a)
- Community Studies Planning Assumptions (NWMO, 2021b)
- Deep Geological Repository Conceptual Design Report (NWMO, 2021c)
- Dryden Regional Airport Strategic Plan (The Loomex Group, 2021)
- Township of Ignace: Emergency Response Plan (Ignace, 2021)
- #CycleON: Province-Wide Cycling Network Study (MTO, 2018)
- OPP Dryden Detachment 2020-2022 Action Plan (OPP, 2020)
- Township of Ignace: Asset Management Plan (PSD, 2020)

2.3 ASSESSMENT

The data and information, as summarized within this section, was analyzed to identify potential options to mitigate identified impacts. The development and selection of potential mitigation options was established by using professional judgement and experience. It should be noted that at the Impact Assessment stage of the project, a more in-depth analysis will be required for both transportation and emergency services.

2.4 DATA AND ANALYSIS RATIONALE AND EXCLUSIONS

The approach to carrying out the transportation and emergency response analysis included the following rationale:

Traffic Data Collection:

MTO AADT was available from 1988-2016 from MTO's open data. As part of this study, MTO provided more recent traffic data; however, it was limited in the number of locations available and were for limited days (i.e., single day counts only). Upon review of the data, the AADT values provided up to 2016 were utilized for the analysis based on the following rationale:

- Single day counts are prone to large daily and / or seasonal fluctuation.
- The more recent single day counts indicated large discrepancies in the growth rates as compared to the annual growth rates based on the AADT; this is due to the limited locations; single day counts and counts that are carried out in isolation as opposed to validated with those within the area. Annual growth rates, according to the single day counts, ranged from -6% to +35% within close range sections of highway, which does not reflect the growth observed over the previous 30 years.

Data Classification/Relevance:

Any quantifiable analysis was limited by the level of detail available in the data and information provided. For example, peak hour counts were not available for large potions of the road network; and therefore, the analysis reviewed the impacts over the day with the available AADT and SADT data.

While data was received from the emergency service providers of the Township of Ignace Fire Department and the Ignace and Dryden OPP Detachments (i.e., call data) some data was not relevant from an infrastructure perspective and therefore not used (for example, all call data provided by the OPP was related to crimes (i.e., violence, drugs, property) and not traffic incidents). In this instance, the volume of the call data was more relevant than the occurrence that led to the call.

3 EXISTING CONDITIONS

3.1 BACKGROUND DOCUMENT REVIEW

The following background documents were reviewed based on their relevance to transportation and emergency services to identify current and future plans, development opportunities and emergency response protocol.

Township of Ignace Official Plan

Township of Ignace's Official Plan (WSP, 2020) establishes a vision, guiding principles and policies to manage and direct development and change within the Township to 2045. The Official Plan includes six overarching goals that support the vision and will guide the Township over the planning horizon. The key information to be carried forward into this study includes the fifth goal which is to Enhance Mobility and Transportation as follows:

- Encourage the development of sidewalks, pathways, and trails to promote healthy and active transportation in new developments and/or in roadway modifications/upgrades.
- Design roads as complete streets, where possible, to allow pedestrians, cyclists, and motorists of all ages and abilities to move safely along roadways.
- Recognize the importance of Highway 17 / Main Street to the community's mobility and promote its enhancement, including a future pedestrian crossing.
- Promote opportunities for alternative modes of inter-community transportation including shuttle bus and taxi services.

In addition, Schedule B – Land Use Designations provides conceptual future pedestrian crossings at the intersections of Highway 17 at Pine Street and Highway 17 at Davy Lake Road.

When reviewing options to mitigate impacts of the APM project as they relate to transportation, the consideration of complete streets to accommodate all ages and abilities will be considered as well as the locations identified as requiring pedestrian access (i.e., pedestrian crossovers).

Ignace Community Capacity Study

The Ignace Community Capacity Study (Urban Systems, 2021) provides a long-term view looking 20 years ahead to proactively plan for a population growth to 4,000 people because of several planned large-scale resource and industrial projects in the area including, the Ring of Fire mining development located in the James Lowlands in Northern Ontario. The study analyzes the Township's current infrastructure capacity to identify existing servicing gaps and anticipate future community needs. The Community Capacity Study included a gap analysis of municipal assets (municipal services, emergency services, etc.)

The study indicates that there will be a demand for services through an aging population and influx of workers related to the APM project with the conclusion brought forward into this study that with a population of 4,000, no roadway expansion would be required.

To accommodate the growth in population within Ignace, two subdivisions were identified as part of the study: Pine Street and Cedar Street with the Pine Street subdivision specifically mentioned as consideration for additional housing related to the APM project.

The anticipated population growth in Ignace due to the APM project will not reach the 4,000 that is projected in the Ignace Community Capacity Study (see Section 4). However, given that the Community Capacity Study takes into consideration the higher population, the information provided will be used as a reference point for required improvements in Ignace.

Township of Ignace: Emergency Response Plan

The Township of Ignace's Emergency Response Plan (Ignace, 2021) provides key officials, agencies, and departments within the Township of Ignace with general guidance for initial emergency response and their associated responsibilities for a range of emergencies including, for example, transportation accidents involving hazardous materials. The Emergency Response Plan identifies the Emergency Operations Control Group (EOCG), composed of a group of officials, who will direct and control all emergency operations in situations that affect property and the health, safety, and welfare of the community, such as a forest fire, severe power outage, and hazardous waste spill. Depending on the nature and magnitude of the emergency, a coordinated response by several agencies under the direction of EOCG is required, in which the response is distinct from regular day-to-day operations carried out by first response agencies, including firefighting, police and ambulance.

Information relevant to this study includes the response to accidents involving hazardous materials pertaining to rail accidents and road or industrial accidents. In these cases, incidents are typically reported to the Ontario Provincial Police (OPP) and the Ignace Volunteer Fire Department with the following actions identified:

- Action by the fire department includes the request of details of any hazardous materials involved, the dispatch of fire crews to the scene, and the identification as to whether an evacuation is required for the "Immediate Danger Area" identified.
- The OPP will dispatch officers to the scene to secure the "Immediate Danger Area" as instructed by the fire department. The actions of the fire department and OPP are similar for rail accidents and road or industrial accidents, although it is noted that less information concerning the hazardous material may be available for road or industrial accidents.

The Canadian Transport Emergency Centre (CANUTEC) and the Ministry of Environment should be contacted as soon as possible in cases involving road or industrial accidents. If it is necessary to evacuate any resident of the Township of Ignace, the City of Dryden will be the primary receiving community. If the emergency prevents the use of Highway 17 to Dryden, the main alternate routes are by Highway 17 to Thunder Bay, by train along the Canadian Pacific Railway to Thunder Bay, or by Highway 622 to Atikokan.

The emergency response to incidents outside the APM site will be relevant when discussing the effects of the APM on Highway 17 and Ignace with regards to the transportation and handling of used nuclear fuel.

#CycleON: Province-Wide Cycling Network Study

In 2013, #CycleON: Ontario's Cycling Strategy was released by the MTO to encourage and enhance cycling as a core mode of transportation used for commuting, recreation, and tourism within Ontario through an identified Province-Wide Cycling Network of existing and proposed on and off-road routes. The Cycling Strategy provides a framework for Ontario's cycling policy and programs, a vision for 2033, guiding principles, goals, strategic directions, and actions. The #CycleON Action Plan 2.0 was released in 2018 as the five-year update to Action Plan 1.0. Based on the Province-Wide Cycling Network Study released in 2018 to complement previous work by MTO and its partners, a Province-Wide Cycling Network has been established to include a preliminary route alignment and a suggested level of separation for cycling facility types.

Within the study area, Highway 17 between Ignace and Dryden forms part of the Province-Wide Cycling Network for the Northwestern Region. This segment is a proposed on-road route where on-road cycling routes are located within the road right-of-way and proposed cycling routes have either been identified and adopted in municipally endorsed master plans or are currently in the design and implementation stages. The proposed level of separation for this segment is designated such that a bike lane with pavement markings and regulatory signage be provided in urban areas and paved shoulders with a

minimum width of 1.5m be provided in rural areas. Maps of the Province-Wide Cycling Network within the study area are provided in **Appendix C**.

When reviewing options to mitigate the impacts of the APM project as they relate to transportation, the consideration of cycling facilities to accommodate active transportation will be considered to supplement the fifth goal of the Township of Ignace's Official Plan.

3.2 DEMOGRAPHICS

The Census data was provided for the municipalities nearest the APM including Ignace (Statistics Canada,2022a), Dryden (2022b), Sioux Lookout (2022c), and Wabigoon (2022d). Over 60% of the region's nearly 15,000 residents live in either Dryden (7,749) or Ignace (1,202). While the population of the region has diminished since the closing of the mines in Ignace in the early 1990s, the region's population has remained steady with the growth rate relatively flat over the past five years. Per the Statistics Canada Census, the region (Ignace, Dryden, Sioux Lookout and Wabigoon) has seen minimal population growth (0.3% annually) from 2016 to 2021.

As one may expect in a rural area, three-quarters (75%) of dwelling units in the region are single-detached dwellings, well above the provincial average (54%). The distribution is far greater in Ignace where 91% of dwelling units are single-detached.

As for age demographics, nearly half (45%) of the residents in Ignace are over 55 years old, whereas the rest of the region has less than a third (32%) of their population with the same age demographic. Finally, the employment rate in the region (59%) is aligned with the provincial average (60%). However, the employment rate in Ignace is much lower at 48%. See **Appendix D** for a complete summary of the Census data.

3.3 ROAD NETWORK

3.3.1 ROAD CHARACTERISTICS

HIGHWAY 17

Highway 17 is part of Ontario's Provincial Highway Network and is classified as a King's highway (primary route). It forms part of the Trans-Canada Highway and is maintained by the MTO. Within the study area, Highway 17 runs on an east-west alignment and passes through Ignace and Dryden. Relevant road characteristics on Highway 17 west of Ignace towards Dryden were identified through a desktop review and are summarized in **Table 3-1**.

Table 3-1: Highway 17 Roadway Characteristics

Characteristics	Location (Source: Google Street View)
— Two-lane, two-directional roadway with a painted centreline — Presence of gravel and paved shoulder with varying widths and conditions	
— 7 westbound passing lanes — 6 eastbound passing lanes — Approximately half of the passing lanes align in both travel directions (i.e., four total lanes)	
— Posted speed limit of 90 km/h in rural areas and transitions to 70 km/h on approaches to/from Ignace and Dryden	

— Potential hazards along Highway 17 include, but are not limited to:
  — Wildlife (no defined wildlife crossings)
  — Steep grades
  — Hikers and cyclists
  — Sightline issues at horizontal curves
	

IGNACE MAIN STREET

The section of Highway 17 that runs through Ignace (otherwise known as Main Street) is a two-lane two-way roadway with the exception of a four-lane section between Rand Street N and approximately 500m east of Lakeshore Drive. Operations are free flowing such that there are no signalized intersections in the corridor and stop-control on side streets only. Ignace's Main Street has a posted speed limit and Community Safety Zone of 50 km/h. Cyclists through Ignace operate within the vehicle lanes as there are no dedicated cycling facilities. There are sidewalks on both sides of Highway 17 between Rand Street S to approximately 150 m west of West Street with varying surface types (i.e., concrete and asphalt) and boulevard widths to

separate pedestrians from motor vehicles. However, there are no pedestrian crossings to connect the north and south sides of Highway 17 and side streets do not delineate a designated crosswalk at the intersection with Highway 17.

During the knowledge holder interviews, there were some operational and maintenance issues identified primarily along Highway 17 within Ignace as indicated below:

- It has been noted that there are issues with emergency vehicles accessing Highway 17 from James Street, shown in **Figure 3-1**, in which the fire hall is located directly north at the end of James Street. The egress point for emergency vehicles has sightline issues such that other vehicles travelling along Highway 17 may have a difficult time seeing emergency vehicles coming out of James Street, which is a two-way road. Residents have expressed that James Street should be a one-way street with southbound traffic only.

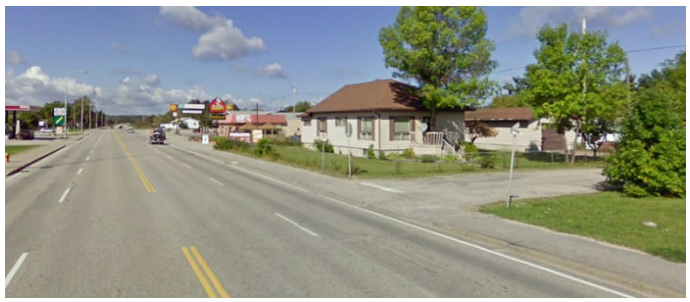


Figure 3-1: Intersection of Highway 17 / James Street Looking West (Source: Google Street View)

- MTO is responsible for maintaining the Highway 17 corridor for snow removal. However, there is limited space between residences/businesses and the highway such that snow piling has been an issue and MTO has solely been clearing the north side of the highway. The Township of Ignace has entered into an agreement with MTO for the municipality to be responsible for partial snow removal on the south side of the highway.
- Traffic congestion is experienced along Highway 17 during the summer months due to hunters and other recreational drivers, tourists, and the movement of wide or oversized truck loads that exceed legislated limits, which is regulated by the Ontario *Highway Traffic Act*.

3.3.2 PLANNED ROAD MODIFICATIONS

Planned road modifications have been identified through a review of the Township of Ignace's Asset Management Plan and MTO's 5-year capital plan, as well as some historical discussions that were identified through the knowledge holder interviews.

IGNACE

The Township of Ignace's Asset Management Plan (PSD, 2020) lists the 10-year capital cost requirements between 2020 and 2029 to meet the projected capital requirements and maintain the current level of service for various categories of existing municipal infrastructure. The asset categories include Ignace's road network (tax-funded asset and municipally owned and maintained by the Public Works Department), which is further broken down into culverts, paved roads, sidewalks, signs, and streetlights. Required capital costs that the Township should allocate towards funding rehabilitation and replacement needs have been assigned for paved roads in 2024, 2025, and 2026 and sidewalks in 2023 and 2028. Based on the Township's road network inventory, there are approximately 3 km of gravel roads and 20 km of paved roads. Approximately 70% of the current state of Ignace's road network is in fair or better condition based on asset age and field condition, and approximately 60% of the road network has a remaining service life of 6 to 10 years. In general, the demand for infrastructure is subject to change over time based on a combination of internal and external factors, including population and employment growth from the APM project, which may require new infrastructure or upgrading existing infrastructure.

Table 3-2 describes the Township's current approach for the lifecycle management of paved roads.

Table 3-2: Township of Ignace's Lifecycle Management Strategy – Paved Roads (PSD, 2020)

Activity Type	Description of Current Strategy
Maintenance	— Annual winter control activities to meet Minimum Maintenance Standards including road and sidewalk plowing, snow removal, and sanding — Pothole patching is completed on an as-needed basis
Rehabilitation	— Road rehabilitation activities are limited and there is no formal program in place for resurfacing on a regular basis — Township roads have exceeded their original life projections and have not exhibited significant surface deterioration
Replacement	— Full road reconstruction has not been required often in recent history, but is expected to increase over the next 5 to 10 years as most roads will approach the end of their useful life — Most municipal roads were constructed around the same time (early 1970s) and are expected to last approximately 50 years before requiring reconstruction

During the knowledge holder interviews, it was mentioned that near misses have been observed along Highway 17 near West Beach Drive with vehicles coming out of West Beach Drive and transport trucks travelling along the bend on Highway 17 from the west. As a result of these near misses, the following road modifications have been discussed with MTO and are shown in **Figure 3-2**:

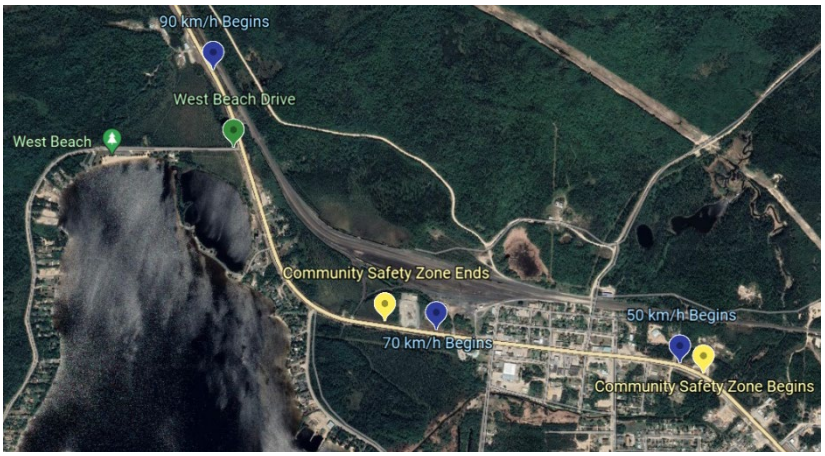


Figure 3-2: Posted Speed Limits and Community Safety Zone in Ignace (Westbound Traffic)

- Include a northbound left-turn lane at the intersection of Highway 17 / West Beach Drive
- Expand Community Safety Zone
- Extend 50 km/h speed zone past West Beach Drive

In addition, there are plans to develop a walking trail from the Township office to West Beach along Highway 17 and to be extended to connect with Lakeshore Drive and the boardwalk at Lilypad Lake.

The Ontario Highways Program is intended to provide highway expansion and rehabilitation projects that are planned or underway based on government funding to repair and expand provincial highways and bridges. MTO works to ensure that maintenance practices, standards, highway infrastructure, and communication protocols are continuously improved.

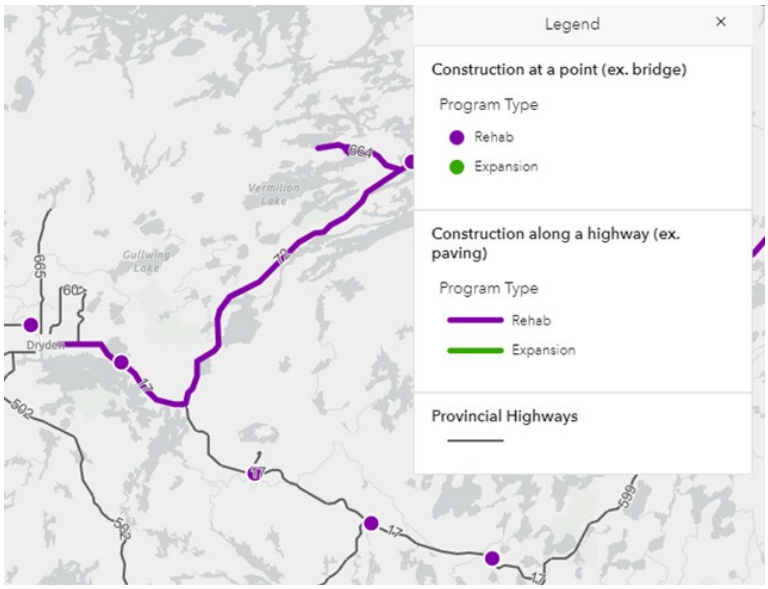


Figure 3-3: 2022 Ontario Highways Program (MTO, 2022)

The twinning of Highway 17 to provide a divided highway has been a consideration reported during the knowledge holder interviews. However, based on a review of the MTO's 5-year capital plan within the study area, this has not been identified as a priority. Along Highway 17 between Dryden and Ignace and as represented in **Figure 3-3**, there are four structure improvements planned that involve either culvert or bridge rehabilitations with a target completion year ranging from 2023 to 2025. In addition, there are rehabilitation plans for road resurfacing between Dinorwic and Dryden with a target completion year between 2024 and 2025. A detailed list of road modifications along Highway 17 between approximately 45 km east of Ignace and 45 km west of Dryden as part of MTO's 5-Year Plan is provided in **Appendix E**.

3.3.3 EMERGENCY DETOURS

There is no official emergency detour route from the Kenora Bypass 17 and 17A to Shabaqua Corners at the junction of Highway 17 and Highway 11, which has led to community isolation and traffic congestion during highway closures. When there are highway closures between those areas, the highway is typically completely closed and there are no vehicle movements. The longest closure in the area has been approximately three days and in such an event, the OPP look to provide services to vehicles that are stranded on the highway. It has anecdotally been reported that there has been a large increase in the number of highway closures in 2022 and as often as on a daily basis primarily due to inclement weather and/or collision related. Collisions that have occurred to the east and west of Ignace have led to the OPP closing Highway 17 at Highway 599 easterly and at the Petro Pass westerly resulting in a backlog of transport trucks along the highway in Ignace. These incidents impact the mobility of residents within town as there are limited passing spots along Highway 17 other than at the Petro-Pass.

In addition, it has been reported that there is a lack of heavy tow operators between Thunder Bay and Winnipeg, with approximately four heavy tow operators in the region. These heavy tow operators will also receive and attend to calls outside of this region, leaving some communities without a readily available heavy tow service. A heavy tow operator in Ignace may travel as far as Winnipeg to respond to a call, leaving Ignace without a heavy tow operator for an entire day. In the event of a major collision involving two or more heavy vehicles requiring multiple tow vehicles, the time it would take to reopen the highway would increase based on the lack of available equipment as well as weather conditions depending on the timing of snow clearing.

Highway closures across the Northwest Region vary from year to year and are primarily impacted by winter weather conditions. MTO's winter maintenance contractors are required to meet ministry service standards and contract requirements. During the winter season, contractors are required to always be ready for dispatch and they also track winter weather and storm forecasts. MTO also monitors its contractors' operations to ensure timely response to winter weather and storms, including the spreading of salt or sand within the first 30 minutes of the start of a storm, plowing when snow accumulates over 2 cm, and the continuation of operations until the highway surface is restored to an appropriate level of service within specific timelines after the storm ends.

3.3.4 PLANNED DEVELOPMENTS IN IGNACE

As shown in **Figure 3-4**, Great Lakes Subdivision (or Pine Street Subdivision) is a future development in Ignace that will have approximately 160 residential lots. The subdivision will be bounded by Beaver Street to the north, Davey Lake Road to the south, Pine Street to the east and West Street to the west. The timing of the development is uncertain, but there are plans to clear the land in the area during the Summer of 2022 and determine community housing needs. No traffic study or planning developments have been undertaken for this subdivision.

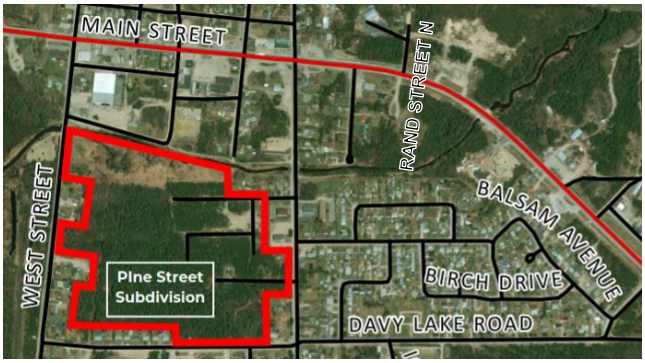


Figure 3-4: Ignace Future Residential Development (Urban Systems, 2021)

MTO is aware of a potential development located on the north side of Highway 17, west of Agimak River and extends to Rand Street North. The proposal is in the preliminary stages and may include a restaurant and motel on-site. MTO has not received any site plans to comment on at the timing of this report.

3.4 TRAFFIC VOLUMES

The available posted data for the AADT and SADT (2006 to 2016) were reviewed. The 2016 AADT and SADT volumes on highways in the Dryden, Ignace and Sioux Lookout areas are shown in **Figure 3-5**. The highest AADT volumes were observed on Highway 17 between Dryden and Highway 72 at 5,950 vehicles per day with volumes decreasing east of Highway 72 towards Ignace to 2,850 vehicles per day. Highways 599 and 642 were both noted to have low AADT volumes, not exceeding 300 vehicles per day. Highway 72 connects Sioux Lookout to Highway 72 and has AADT volumes at 3,200 vehicles per day. Traffic volumes generally increase for the summer months by approximately 23%.

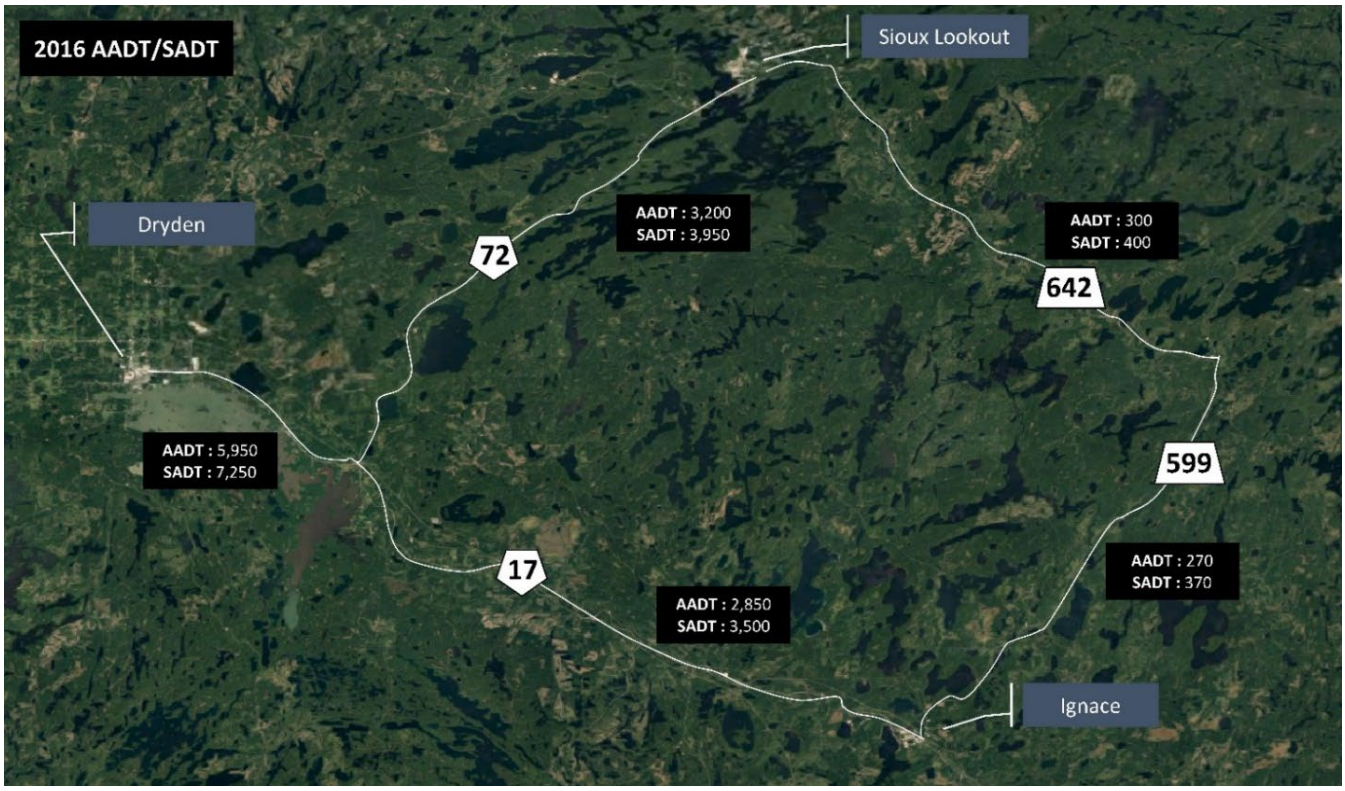


Figure 3-5: Regional Average Daily Traffic Volumes

Annual growth rates from 2006 to 2016 for both AADT and SADT were identified as very low or decreasing throughout the region, shown in **Figure 3-6**. Highway 72 and Highway 17 between Dryden and Highway 72 did not see any growth. Highway 17 between Highway 72 and Ignace has experienced a 1% annual growth in AADT, and 1% annual volume decrease in summer months. The AADT and SADT both show an annual decrease in volumes by 4% on Highway 599 while 7% and 6% annual has been observed on Highway 642 for the AADT and SADT respectively. It is noted that this higher growth rate is as a result of the extremely low initial volumes (AADT of 220 and SADT of 300) and only represents an absolute volume change of 80 and 100 for AADT and SADT respectively. Peak hour traffic volumes were available throughout the region; however, it is noted that typically peak hour volumes represent about 10% of the total volumes.

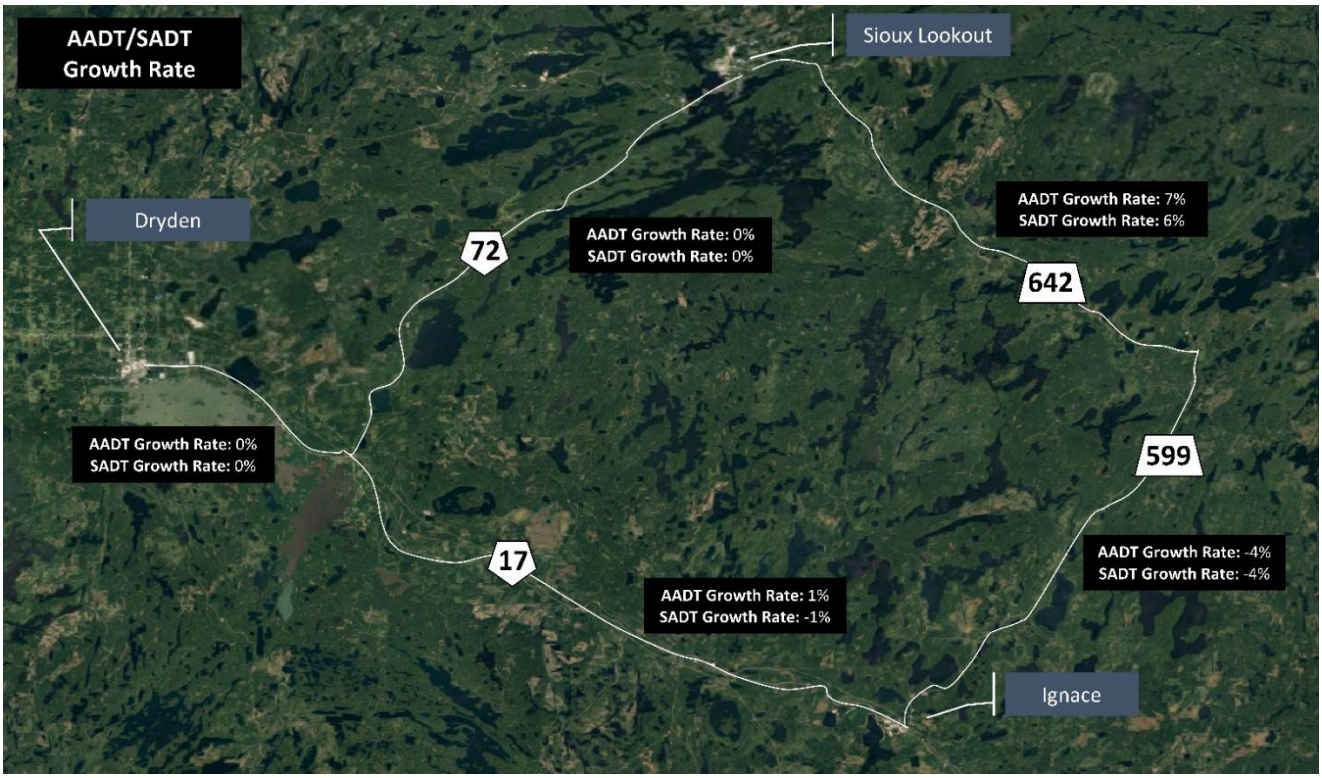


Figure 3-6: Regional Traffic Volume Growth Rates

With the AADT volumes available along Highway 17 (and neighbouring highways), a high-level analysis of the traffic conditions along Highway 17 was carried out. The Highway Performance Monitoring System by the U.S. Federal Highway Administration provides a simplified calculation method for determining highway capacity level of service (LOS). The LOS of a transportation facility is a performance measure that represents quality of service from the traveler's perspective. The Highway Capacity Manual (HCM) defines six LOS, ranging from A to F where 'A' represents the best operating conditions and 'F' represents the worst.

A rural two-lane highway on flat terrain with a speed limit of approximately 90 kph (55 mph) and an estimated truck percentage of 10% operates at a LOS 'A' with an AADT less than 13,900. The highest AADT within the study area road network is on Highway 17 east of Dryden with an AADT of 5,950 and SADT of 7,250. The observed growth rate on the same segment of highway is 0%. Utilizing a conservative annual growth rate of 1% to establish a baseline (2022) condition, the LOS for this segment of Highway 17 would not shift away from LOS A. The remainder of segments would also be at a LOS A.

3.5 COLLISIONS HISTORY

3.5.1 CORRIDOR-WIDE ANALYSIS

Five years of historical collision history is available for the period of 2017 to 2021, in this time there has been a general decrease in the number of collisions for all types of collisions: fatalities, injuries, and property damage only (PDO) on Highway 17 between Dryden and Ignace. The trend lines are shown in **Figure 3-7.** Collisions, fatalities, and injuries have all decreased when comparing 2017 to 2021.

The number of collisions decreased from 2017 to 2021. The number of fatalities decreased from three in 2017 and two in 2018 to zero in 2019 and 2020. There was one fatality in 2021. The number of non- fatal collisions decreased from 2017 to 2019 had an increase in 2020 and then decreased again in 2021 however not to the same level as previously experienced in 2018 and 2019. The decrease from 2017 to 2019 indicates that the trend was not solely due to the COVID-19 pandemic, however it may have had an influence on the number of collisions in 2020 and 2021. In contrast, the 2018 Ontario Road Safety Annual Report showed a 3% growth in total collisions along MTO highways from 2017 to 2018. More recent Safety Reports have not been publicized by the MTO at the time of this analysis. According to the 2018 Ontario Road Safety Annual Report, collisions along provincial highways (divided, undivided, multi-lane, etc.) have increased annually by 2% from 2009 to 2018. In contrast, total collisions along Highway 17 between Ignace and Dryden have steadily decreased by 7% over the past five years.

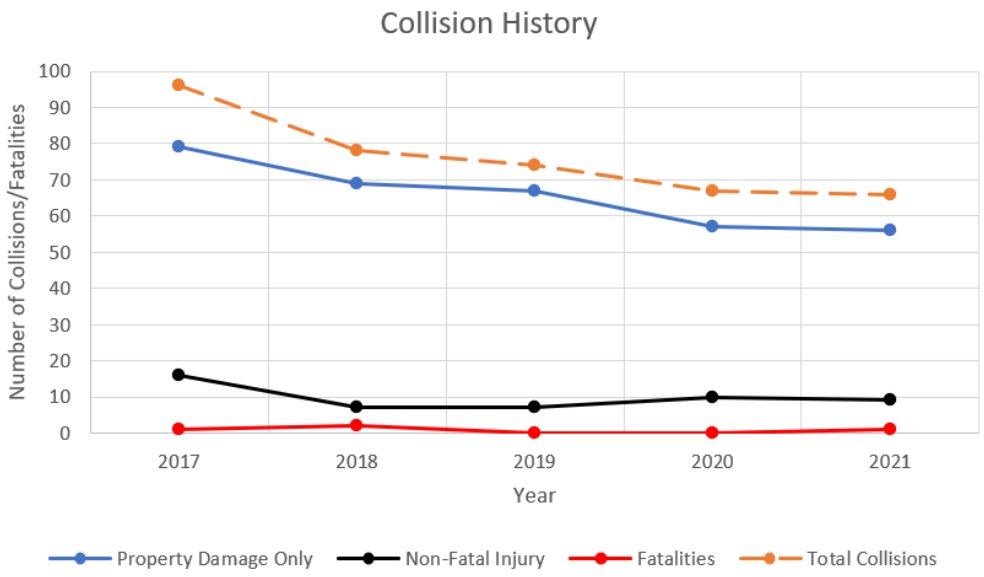


Figure 3-7: Highway 17 Collision History

A more in-depth review of the collision data was carried out to identify any trends in the factors contributing to the collisions. From 2017 through 2021, there were 267 collisions on Highway 17 from the west limits of Dryden to the east limits of Ignace. Of these collisions, 26% (70) occurred during daylight with clear visibility and dry road conditions. When considering all weather and road conditions, collisions involving wildlife or domestic animals contributed to 31% of collisions. While the collisions involving wildlife occur throughout the study area, they are most prominent between Dryden and Wabigoon.

Skidding/sliding collisions made up 22% of collisions with approximately 67% of those collisions occurring at horizontal or vertical curvature on the Highway. Eighty-two percent (82%) of collisions within the five years of data reviewed involved single vehicle collisions and of the remaining collisions six percent (6%) were sideswipe collisions and six percent (6%) were rear end collisions.

A review of where the collisions are occurring indicates that there are increased incidents of skidding/sliding/running off the road type incidents at the horizontal curves of Highway 17 near Six Mile Corner between Dryden and Wabigoon and between Paesel Road and Turgeon Road just east of Wabigoon. In addition, there is a general increase in the number of collisions occurring in locations where the highway widens to three or four lanes (passing lane locations). This data is consistent with information provided during the knowledge holder interviews with emergency services.

Of the non-single vehicle collisions, 58% occurred on a straight and level roadway followed by 22% on a straight roadway on a hill, indicating that very few multi-vehicle collisions occur due to the existing roadway geometry.

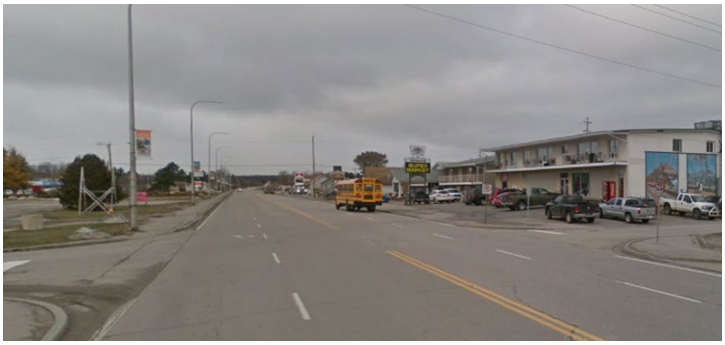
During the knowledge holder interviews, it was stated that there are transport trucks that are aggressive on Highway 17, even during poor weather conditions, particularly in passing lane locations. There are tighter radius curves to the west of Ignace and just west of Highway 622; as well, both sides of the Revell site entrance (potential entrance location) are areas of safety concern due to unsafe driving. Another area of concern noted is just east of Highway 622 and west of Raleigh Lake. The collision analysis did not identify a distinctive collision pattern at these locations. Five-year historical collisions at the horizonal curve on Highway 17 just west of Parker Road included wildlife (2), skidding/sliding (2), hitting a fixed object (2) and debris falling off vehicle (1). Just west of Highway 622, the most common cause for collisions in the historical data reviewed was related to wildlife.

Based on the data the most common contributing factors to collisions on Highway 17 between Dryden and Ignace would be related to lighting/visibility (darkness) and the presence of animals. It is noted that there has been a reduction in collisions at the horizontal curve of Highway 17 west of Highway 622 since its realignment in 2018 (approx.). **Appendix F** includes several maps detailing collisions along Highway 17 by classification, driver action, year, initial impact and sequence of events.

3.5.2 KNOWLEDGE HOLDER IDENTIFIED PROBLEM AREAS

Table 3-3 includes several safety concerns along Highway 17 within Ignace that were identified anecdotally during the knowledge holder interviews. These areas were reviewed in the context of existing infrastructure and the collision data available. It is noted that Highway 17 is maintained under MTO's jurisdiction and therefore the infrastructure or lack of infrastructure on Highway 17 would the responsibility of MTO.

Table 3-3: Identified Problem Areas in Ignace

Safety Concerns	Location (Source: Google Street View)
There are pedestrians crossing Highway 17 at Pine Street to access the grocery store on the north side of the highway. No pedestrian crossing currently exists and pedestrians are crossing four vehicle lanes with vehicles not always obeying the posted speed limit. The four-legged intersection is configured as a two-way stop control on the minor road (Pine Street) only. Between 2017 and 2022 there were no collisions at this intersection.	

Safety Concerns	Location (Source: Google Street View)
Heavy vehicles park along Highway 17 within Ignace despite the presence of prohibited parking signs to access merchants or make relatively short stops. This has led to reduced visibility for people entering or exiting Ignace. A similar situation is occurring in Dryden due to the lack of places for trucks to stop and park. Between 2017 and 2022 there were five collisions along Highway 17 in Ignace. There was no indication that these were caused by parked trucks.	
Inbound and outbound movements at the Petro-Pass. Between 2017 and 2022 there were three collisions near the Petro Pass, two resulting in property damage and one non-fatal injuries. All three were rear-end collisions caused by a vehicle slowing down due to road conditions or a turning movement. The implementation of auxiliary turning lanes may be a potential option to reduce the risk of collisions.	
During the winter months, snow removal has been a concern primary on the south side of the highway between McLeod Street and West Street. This area is constrained such that there may be conflict with pedestrians and vehicles adjacent to the highway and it prevents pedestrians from safely passing. The sidewalk is narrow for snow removal vehicles and there are conflict points between Highway 17 and snow removal vehicle maneuvers that extend onto the highway. As a result of insufficient snow storage space, there have been sightline issues from high snowbanks as well.	

Safety Concerns	Location (Source: Google Street View)
There is a warning sign for a steep grade to the east of the intersection of Highway 17 / Highway 599 as vehicles enter Ignace from the east. While there is a westbound right-turn auxiliary lane on approach to Highway 599, westbound vehicles are travelling at high speeds and their speeds can be hard to judge for left-turning vehicles from Highway 599, especially during the winter months. Between 2017 and 2022 there was one collision in proximity to the intersection.	

3.6 EMERGENCY SERVICES

The Township of Ignace and the City of Dryden are both served by OPP Detachments, Northwest EMS Ambulance Bases, and designated fire halls. The Dryden Regional Health Centre, located in Dryden, is a 24-hour hospital with emergency room. Ignace is served by a business-hour based clinic and health centre, the Mary Berglund Community Health Centre, where doctors are available weekly or bi-weekly only. No further evaluation of hospitals has been provided within this report as the focus of emergency services is from the transportation perspective (i.e., network operations and safety, etc.) as opposed to services offered from an institution. The NWMO has indicated that the implications of the APM project as related to hospitals is primarily driven by staffing and resourcing.

The following emergency services and their locations within the Township of Ignace are shown in **Figure 3-8**:

- **Ignace OPP Detachment:** #502 Highway 17, Ignace, Ontario
- **Northwest EMS Ignace Ambulance Base:** 301 Rand Street, Ignace, Ontario
- **Ignace Fire Department:** 315 Front Street, Ignace, Ontario
- **Mary Berglund Community Health Centre:** 1100 Main Street, Ignace, Ontario

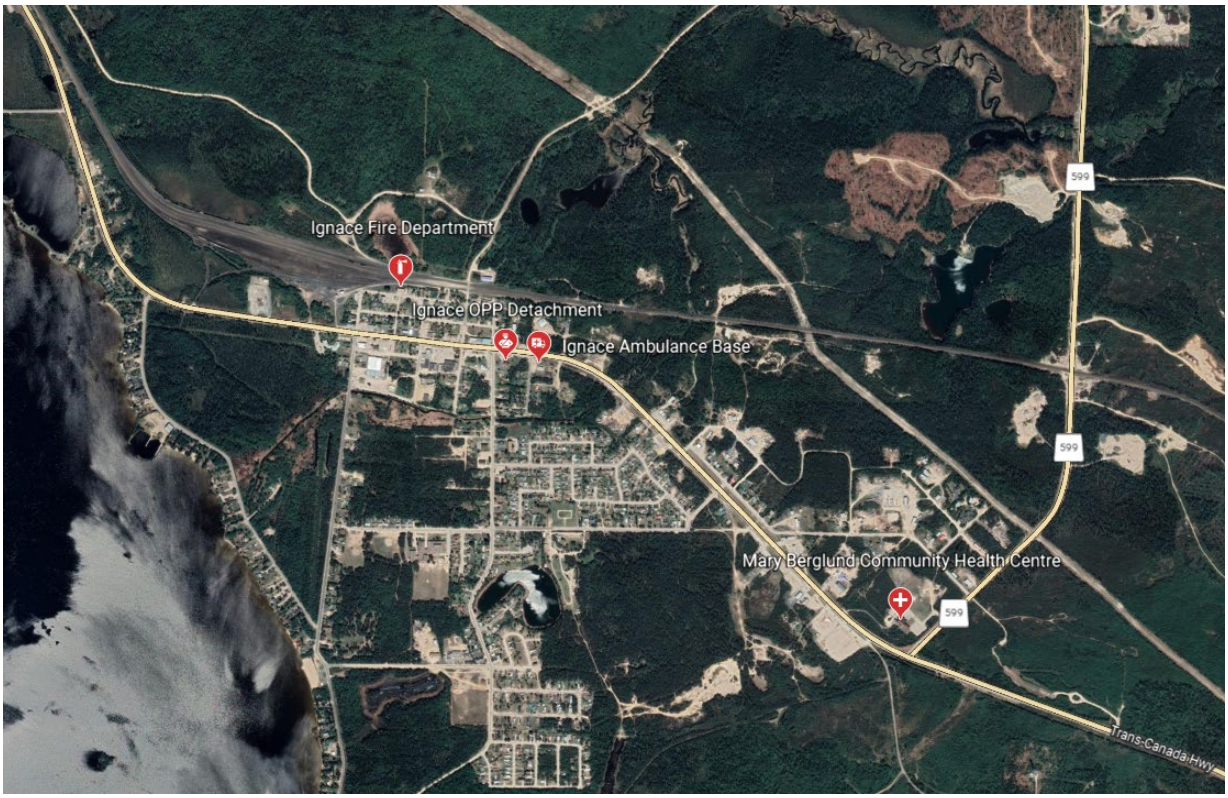


Figure 3-8: Location of Emergency Services within the Township of Ignace

The following emergency services and their locations within the City of Dryden are shown in **Figure 3-9**:

- **Dryden OPP Detachment:** 15550 Highway 17 E, Dryden, Ontario
- **Northwest EMS Dryden Ambulance Base:** 58 Goodall Street, Dryden, Ontario
- **Dryden Fire Service (Hall #1):** 189 Colonization Avenue S, Dryden, Ontario
- **Dryden Fire Service – Hall #2 (Barclay Fire Hall):** 14378 Highway 17, Dryden, Ontario
- **Dryden Regional Health Centre:** 58 Goodall Street, Dryden, Ontario

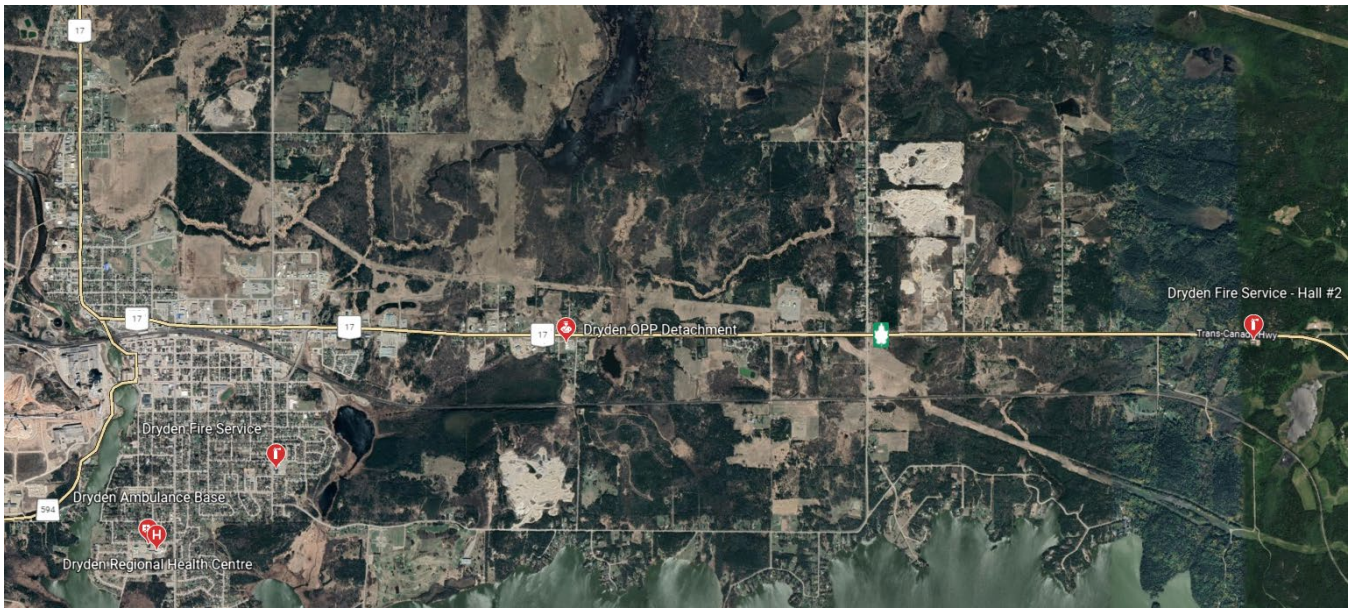


Figure 3-9: Location of Emergency Services within the City of Dryden

Within the broader Kenora District, which includes the communities identified in Section 1.3.1, there are eleven (11) OPP stations, thirteen (13) paramedic service stations, and thirteen (13) fire stations/facilities. A list of these Emergency Service Providers and their locations is provided in **Appendix G**. In addition, there are three volunteer fire departments located in Machin, Wabigoon and Oxdrift that are outside of Dryden's municipal boundary.

Additional information on the operations of each of these emergency services within Ignace and Dryden are summarized in the following sub-sections. It is to be noted that data and information being reported as it relates to emergency services in Dryden is obtained from public sources only and has not been confirmed with municipal staff.

3.6.1 ONTARIO PROVINCIAL POLICE

The Dryden detachment of the OPP is the division office and covers the area along Highway 17 between Triangle Lake (just west of Vermillion Bay) to the west of Dryden and English River to the east of Dryden, as shown in **Figure 3-10**. The Dryden OPP detachment area overlaps with the Ignace detachment and the Dryden detachment itself consists of and typically operates with four (4) platoons with eight (8) constables plus one (1) sergeant on duty each day. The platoons are typically split such that 2-3 constables patrol what is known as the "rural area", which also covers Highway 17. The remaining 5-6 constables are assigned to the City of Dryden. In addition, the OPP have a sub-office in Vermillion Bay that is infrequently utilized.

A satellite OPP office is located within the Township of Ignace and the Ignace police detachment consists of nine (9) full-time constables and one (1) sergeant that report directly to the Dryden detachment. In addition, there are no administrative staff in Ignace and any administrative-related work is sent to Dryden. There are generally two constables assigned at a time, which is sufficient to cover the basic needs of the Township and Highway 17. However, there are times where there may be a shortage of available staff and additional coverage may need to be called in from elsewhere. There are also times that the Ignace detachment covers short-falls of the Dryden office if they are operating over capacity.

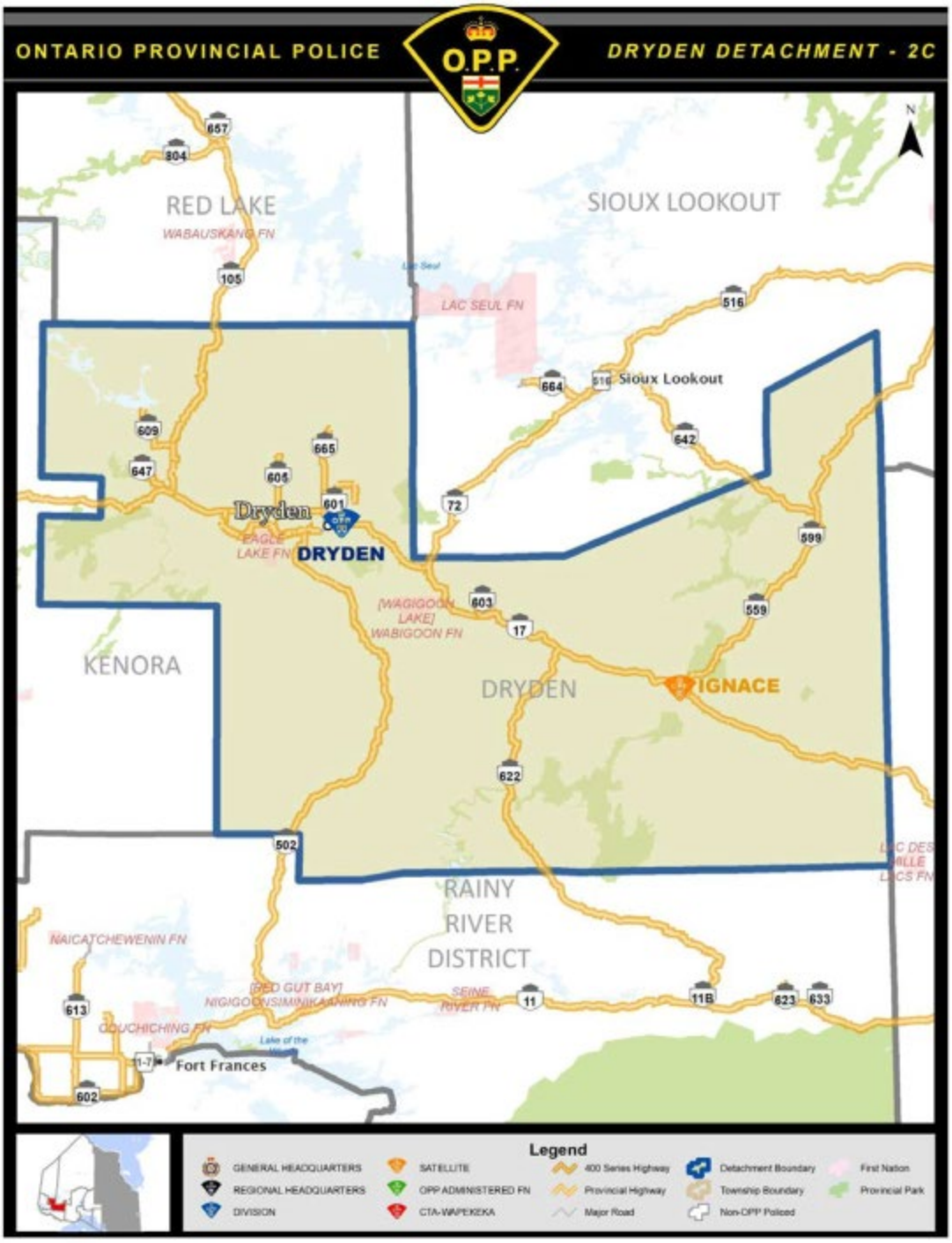


Figure 3-10: Dryden OPP Detachment Area (OPP, 2020)

As shown in **Table 3-4**, the OPP emergency call history in Ignace and Dryden has increased steadily since 2017. There has been an annual increase of 10% in calls. The primary cause of the increase is calls related to the Mental Health Act.

Table 3-4: OPP Emergency Call Frequency (Dryden OPP Detachment, 2022)

Occurrence	2017	2018	2019	2020	2021
Violence	309	368	370	385	381
Property-Related	581	656	798	738	662
Drugs	79	105	114	152	122
Mental Health Act	88	154	167	279	334
Total	**1057**	**1283**	**1449**	**1554**	**1499**

3.6.2 NORTHWEST EMERGENCY MEDICAL SERVICES

Northwest EMS operates paramedic services across the entire Kenora District (100,010 sq. km. coverage area) in Northwestern Ontario on a 24-hour basis and oversees Ignace and Dryden. There are nine ambulance bases throughout Kenora District, two of which are in Ignace and Dryden. The ambulances used are Type III, which have the capacity to carry two patients on stretchers. There is currently a fleet of 30 vehicles for the district (KDSB, 2022).

Within the immediate area of the APM project, vehicle boundaries are approximately halfway between Ignace and Dryden for their respective ambulance bases. More specifically, Borups Corners is the boundary between Ignace and Dryden, where the Ignace Ambulance Base would cover up to English River to the east and Dryden would cover up to the Experimental Lakes area to the west. Overall, vehicles can travel anywhere within the district, but can also travel outside of the district as Northwest EMS is based on a provincial EMS system.

A regular crew would include two paramedics and for smaller bases, they are available during the day from 7 AM to 7 PM and the same two paramedics are on-call at night. For calls received for Highway 17 collisions, both paramedics and fire services may be called at the same time depending on the accident. In the event of a highway closure between Ignace and Dryden, the highway is not strictly closed off to ambulances.

While emergency vehicles can access the highway during closures of Highway 17, these closures have an impact on staffing due to paramedics being “suitcase medics” such that EMS staff typically live in Dryden or outside Ignace and must commute to Ignace. If the highway is closed, staff cannot get through to Ignace to relieve staff on duty at the Ignace Ambulance Base. Poor weather conditions such as large snow falls can also contribute to staff commuting issues as well. It is noted that there is a decrease in the number of calls during road closures as there are fewer accidents.

The typical call volume for Ignace per year was stated as approximately 300 calls with no significant changes experienced over the past few years. Dryden has experienced an increase in call volumes, which can be attributed but not limited to social issues including mental health and drugs/alcohol addiction. Staffing is primarily based on call frequency as opposed to population and the capacity of each crew is approximately 2,500 calls per year but is also dependent on the dispersion of the calls. The example was given of Sioux Lookout which has a smaller population compared to Ignace yet more crews on duty at a given time.

There is no hospital located within Ignace and the medical building does not have a fulltime doctor on call. As such, Ignace is served by the regional hospital in Dryden. It has been stated that many residents in Ignace do not want to be transported by ambulance to the hospital in Dryden as they would not have transportation to return to Ignace. It was also stated that of the EMS calls, typically 50% result in cancelled calls (i.e., the ambulance is called off before getting to the scene, which are generally decided by OPP when arriving and assessing the scene).

A project is currently underway to build an ambulance base in Vermillion Bay within the Township of Machin over the next two years. In Dryden, a new ambulance base was recently constructed with the capacity to accommodate 8 vehicles and will serve as the new Northwest EMS headquarters once it opens (by end of 2022).

IGNACE AMBULANCE BASE

The Ignace Ambulance Base is owned by the Kenora District Services Board and includes two bays. The vehicle fleet consists of two ambulances (one frontline and one backup) and staffing includes the following:

- 1 crew – 24/7 (on duty during the day and on-call at night)
- Paramedics (3 full-time, 1 part-time, and 3 casuals)
- 1 Paramedic Coordinator

Figure 3-11: Northwest EMS Ignace Ambulance Base (KDSB, 2022)

DRYDEN AMBULANCE BASE

The Dryden Ambulance Base is leased from Dryden Hospital and includes three bays. A new eight-bay ambulance base is currently under construction and is to be in operation by the end of 2022. This new base will serve as a facility for the larger Kenora District. The Dryden vehicle fleet currently consists of:

- 3 Ambulances – 1 frontline, 1 backup, and 1 spare
- 1 Multi-Casualty Support Vehicle
- 1 Emergency Response Vehicle (support/command)

Figure 3-12: Northwest EMS Dryden Ambulance Base (KDSB, 2022)

The Multi-Casualty Support Vehicle provides support and emergency supplies to paramedics in the event of a major disaster or multi-casualty incident. The Emergency Response Vehicle is a Ford F150 vehicle designed to assist in the operation of an ambulance service and meets the Ministry of Health, Emergency Health Services requirements.

Staffing includes the following:

- 2 crews – 24/7 (2 on-site day crews and 1 night crew as of May 2022)
- Paramedics (8 full-time, 1 part-time, and 4 casuals)
- 1 Superintendent of Operations (oversees central region operations for the Dryden, Red Lake and Ear Falls bases)

3.6.3 FIRE SERVICES

IGNACE FIRE DEPARTMENT

The Ignace Fire Department offers volunteer fire services with fourteen (14) active members with the ability to have twenty-five (25) members per the fire department's policy. These members have no set schedule, are all local and are required to live within the Ignace Township limits and operate on a 24/7 pager basis with no guarantee of the number of responders to a call due to non-mandatory requirements aside from guidelines and policies that are put in place. The Fire Clerk is the only

full-time employee; firefighters do not receive compensation for being on call/pager but there is remuneration for responding to fire calls. Wabigoon has the closest fire department to Ignace and is used as additional support when there are not enough volunteer firefighters to respond to a call. Other fire departments may be called upon, but in the event of a highway call that the Ignace Fire Department cannot respond to, Wabigoon's volunteer fire department is typically the back-up. The four-vehicle fleet consists of two pumper trucks, one rescue vehicle for highway response (extrication) and a designated half-ton truck.

The district dispatch boundary for the Ignace Fire Department pertaining to hazardous materials and extrication includes the following:

Township Boundaries

- Township of Ignace south of the CPR tracks
- Ignace Airport Road off Highway 17 West
- Sawmill Road off Highway 17 West
- Ignace Dump and Golf Course off Highway 599 North
- West Beach Road off Highway 17 West
- Water Treatment Plant on Railway Street off East Street North
- Tower Hill on Highway 17 East

Extrication

- Highway 17 West – Basket Lake Road
- Highway 622 South (Junction off Highway 17) – Turtle River
- Highway 17 East – English River Bridge
- Highway 599 North – Highway Junction 516 – Savant Lake

The following is an estimate of the typical number of firefighters that are to respond to specific emergency calls:

- **Out of town calls on the highways:** 3 to 6 firefighters
- **In town calls (fire related):** Up to 10 firefighters or more
- **Other calls such as ambulance assist, gas meter/smells and campfires are up to the decision of the Fire Chief:** Up to 5 firefighters depending on the situation

The Five-Year Emergency Response Report was provided by the Township of Ignace Fire Department (2022) and is summarized in **Table 3-5**. From 2017 to 2021, the average number of calls in a year was fairly consistent with the lowest number of calls being 47 in 2019 and the highest number of calls in 2021 at 68. The most common calls were accidents/extrications followed by fires. As shown in the table, there were occasions where the Ignace Fire Department assisted other agencies with their emergencies. It is to be noted that the Five-Year Emergency Response Report does not include information on response times, number of responders, dispatch origins, and any fatalities, which would be valuable in the detection and monitoring of service deficiencies. In addition, it was noted that emergency vehicles may be held up by railway traffic when responding to calls north of the railway tracks. There are two main roadways that cross the railway tracks at grade: East Street and Highway 599.

Table 3-5: 5-Year Emergency Response Report (Ignace Fire Department, 2022)

Call Type	2017	2018	2019	2020	2021	5-Year Total
Accident/Extrication	19	17	14	20	24	**94**
Fires	16	15	16	9	17	**73**
Public Hazards	11	8	3	4	15	**41**
Alarms	12	3	1	10	4	**30**
Calls Cancelled	5	5	9	8	5	**32**
Assist Other Agencies	1	3	4	3	3	**14**
Total:	**64**	**51**	**47**	**54**	**68**	**-**

The existing fire hall does not meet current building code standards, does not meet current firefighting standards, and is located adjacent to the CPR tracks within the disaster zone. In the event of a disaster on the railway close to Ignace, having the fire hall located within a disaster zone may prohibit response due to volunteer firefighters being unable to access the fire hall. Discussions within the Town have brought forward two potential new fire hall locations: the area behind the Ignace Ambulance Base (potentially populated by the Ignace Community Gardens), and the land beside the Public Works Department building located at 121 Lily Pad Road. A full assessment for the location of calls and response time would be required to identify the best location for a new fire hall.

DRYDEN FIRE SERVICE

Dryden Fire Service has a second fire hall with its own vehicle fleet and equipment known as Hall #2 or Barclay Fire Hall. Staffing of both Hall #1 and #2 is on a hybrid basis such that is operates with full-time and volunteer staff. Dryden's fire services have a response area of up to 100 km away for vehicle rescue/extrication.

3.6.4 AIRPORT SERVICES

DRYDEN REGIONAL AIRPORT

The Dryden Regional Airport is a certified airport, located at 1012 Highway 601 approximately 6 km northeast of the City of Dryden, that can host regular commercial service and has five (5) full-time staff and one (1) seasonal staff member, who are employed by the City of Dryden. Dryden Regional Airport is the closest certified airport to the Township of Ignace and proposed APM site and has an Instrument Landing System (ILS) that allows aircraft to land in any weather condition.

The airport manages approximately 10,000 to 12,000 aircraft movements annually and supports the following activities:

- Aerial firefighting
- General aviation
- Corporate charters
- Scheduled passenger service
- Search and rescue operations
- Medical evacuation flights

Airport services as related to transportation and emergency services are offered by the following airport tenants:

- Bearskin Airlines - Seven flights, six days per week between Thunder Bay, Dryden and Winnipeg
- MAG Aerospace Canada

- Ministry of Natural Resources and Forestry (MNRF) Fire Management Centre
- Expedition Helicopters
- Provincial Helicopters

The following pertain to the capacity of Dryden Regional Airport:

- 10 to 15 privately-owned hangars for aircraft storage that are rented out to tenants
- One runway approximately 6,000 feet in length that can be considered as two depending on landing direction
- The runway is suitable for a 737 aircraft for cargo or passengers and can host three or four 737s. The capacity of a 737 aircraft is approximately 150 people.
- Depending on the type and size of aircraft and duration they to taxi on the runway, an aircraft can land every two minutes. For helicopters, the duration is shorter.

Depending on the extent and frequency of forest fires, airport services are busiest during the summer months with the Ministry of Natural Resources and Forestry (MNRF). **Figure 3-13** illustrates the layout of Dryden Regional Airport as related to emergency response and identifies the locations of the various service offerings.

The Airport currently has additional staff from the City of Dryden and The Loomex Group in the event of an emergency. The terminal has acted as an evacuation hub during forest fires and can accommodate up to 200 people at a given time during an evacuation.

In terms of airport protocols, the operations manual is updated annually and there is no formal manual for aircraft landing in an evacuation situation, however ramp and runway management would be followed. In addition, the airport has its own Emergency Plan, which includes the OPP, fire, and ambulance on site (The Loomex Group, 2021).

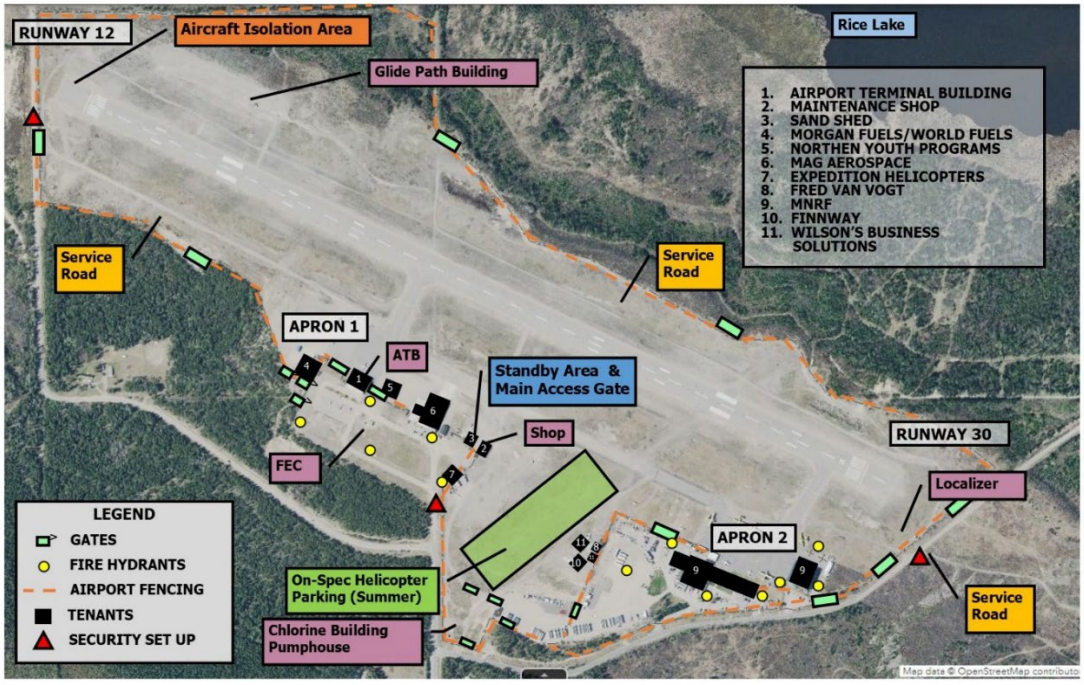


Figure 3-13: Dryden Regional Airport Emergency Response Layout Map (City of Dryden, 2017)

The airport is essential for transporting patients from Dryden to larger health centres or cities for urgent medical care. The Dryden Regional Health Centre relies on the airport to bring surgeons and other specialists into the community for patient treatments. Northwest EMS relies on the airport to transfer patients to other airports as EMS does not have the capacity to do so on its own. In addition, the Dryden Regional Health Centre does not have a helipad. The OPP do not depend on the airport as they mainly use Red Lake and Sioux Lookout airport.

IGNACE MUNICIPAL AIRPORT

The Ignace Municipal Airport does not have operational status and at this time is only being used by a private company (WSP, 2019). Dryden Regional Airport and Thunder Bay International Airport are the closest airports to Ignace that are served by major Canadian airlines. Additionally, Ignace Airways provides a seaplane charter service throughout Northwestern Ontario.

EXISTING CONDITIONS SUMMARY

1. Annual growth rates for traffic volumes from 2006 to 2016 for both AADT and SADT are very low or decreasing throughout the region.
2. There is a general increase in traffic volume during the summer months of approximately 22%.
3. The collision data reflects an overall decrease in the total number of collisions (fatality, injury, PDO) between Ignace and Dryden.
4. The number of collisions decreased from 2017 to 2021. The number of fatalities decreased from three in 2017 and two in 2018 to zero in 2019 and 2020.
5. The typical emergency medical services call volume for Ignace per year has been approximately 300 calls with no significant changes experienced over the past few years.
6. From 2017 to 2021, the average number of fire services calls in a year was fairly consistent with the lowest number of calls being 47 in 2019 and the highest number of calls in 2021 at 68.
7. Upgrades to the fire hall in Ignace are required, as is the potential relocation to be outside the rail line disaster zone.
8. Dryden Airport currently has protocols in place to manage a mass evacuation for forest fires.

4 APM PROJECT CHARACTERISTICS RELEVANT TO THE STUDY

4.1 LABOUR FORCE

Due to its proximity to the NWMO APM project to the Township of Ignace, many social and economic changes could be seen in the Township and surrounding area. Throughout the three phases of the project, the workforce population will vary from 200 during the Pre-Construction phase, to 640 during Construction and up to 700 during Operations (HSAK, 2022a).

The residency planning assumptions from the Northwest Studies Growing the Population and Opportunities Study (InterGroup Consultants, 2022) identifies that not all APM employees throughout the three project phases will be residing in Ignace. Most employees during the pre-construction phase are expected to reside in Ignace, whereas during the construction and operations phases, more than half are expected to reside in other nearby communities within and outside of the local study area.

4.2 POPULATION

The Growing the Population and Opportunities Study (InterGroup Consultants, 2022) presents three baseline population trends which includes a continued decrease population projection (1,065 by 2046), modest growth population projection (1,415 by 2046) and an optimistic population projection that serves as an upper bound to baseline population projections (1,800 by 2046). As mentioned in Section 3.1, the Ignace Community Capacity Study (Urban Systems, 2021) has developed a strategy to accommodate a population growth of up to 4,000 assuming implementation of other significant projects in the region (i.e., Ring of Fire) in addition to the APM project. It is not anticipated that the APM project alone will lead to growth of the population of Ignace to reach the upper bound of 4,000 residents as identified in the Ignace Community Capacity Study.

With only the APM project, the population is expected to grow at different rates for each phase of the project as shown in **Table 4-1**. The family and economic multiplier were developed by Intergroup's Growing the Population and Opportunities Study (2022).

Table 4-1: Expected Ignace Population Growth (Intergroup Consultants, 2022)

Project Phase	Workers	Family Multiplier	Economic Multiplier	Total
Pre-Construction	160	210	160	530
Construction	180	235	180	595
Operations	300	390	305	995

4.3 HOUSING

To accommodate the increase in population due to the APM project, additional housing is expected within the study area. The Ignace Community Studies: Economics and Finance Housing Study (HSAK, 2022b) correlates the amount of housing directly to the required workforce (i.e., 1 housing unit per employee). Therefore, there would be an expected increase of 160 housing units during the Pre-Construction phase, 180 during Construction and 300 during Operations. Unlike the population assumptions, there were no family or economic multipliers added to the analysis. Within the Township of Ignace, the new housing is expected to be within the Pine Street subdivision Development area located north of Davey Lake Road between West Street and Pine Street.

Workers from outside the local study area are largely anticipated to reside in an on-site "Work Camp" during the construction phase. This housing, which is expected to accommodate the 360 workers from outside the study area, will be built during the pre-construction phase and decommissioned during the operations phase.

4.4 TRAFFIC VOLUMES

Per the NWMO's Community Studies Planning Assumptions – Ignace Traffic Memo (NWMO, 2021a), vehicle traffic due to the APM project will be greatest during the first two years of the construction phase and then continue, at a lower rate, throughout the rest of the construction phase and the entirety of the operations phase. Overall, the traffic can be split into three categories:

- Movement of excavated rock material from the site to the Excavated Rock Material Area (ERMA), which is expected to be within 5km of the site.
- Movement of staff to and from the site
- Movement of materials/supplies to the site

The movement of excavated rock material to the ERMA is expected to be located outside the APM's Deep Geological Repository's (DGR) fence, as shown in **Figure 4-1**. It is assumed that those volumes will not be required to travel along Highway 17 based on the ERMA's proximity to the APM site.

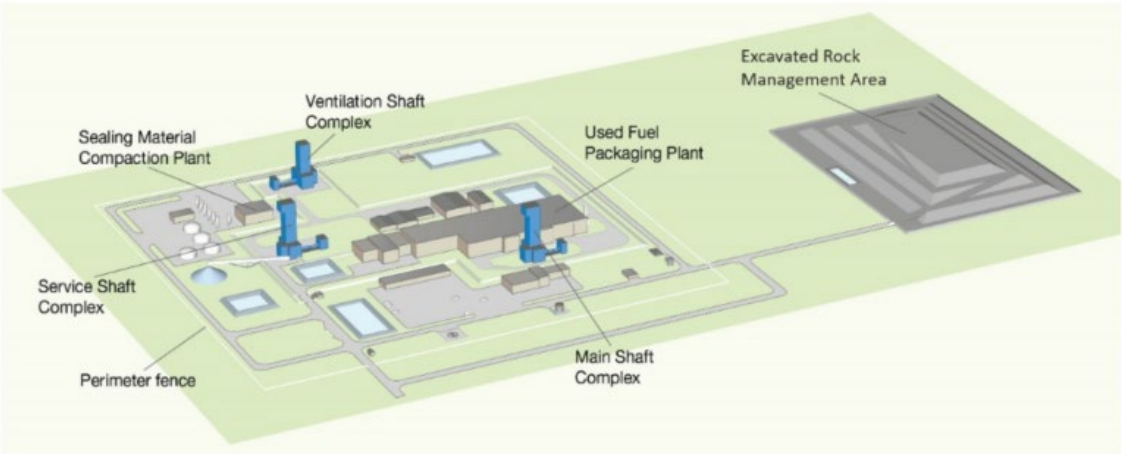


Figure 4-1: DGR Main Surface Facilities (NWMO, 2021b)

Traffic data estimates were not provided for the pre-construction phase. The haul bulk material truck volumes are expected to vary from year to year during the construction phase and remain consistent during the operations phase, as shown in **Table 4-2.** The full list of estimated internal (within the Deep Geological Repository [DGR] site) and external (to/from Ignace or other communities) traffic volumes is detailed in **Appendix H.**

Table 4-2: Weekly Round Trips by Vehicle Type (NWMO, 2021a)

Vehicle Type	Construction	Operations
Bus	148	131
Personal Vehicle	329	290
Flatdeck/Non-Nuclear Waste Truck	20-38	43
Used Fuel Transportation Packages Trucks	-	16
Light Duty Vehicles	-	16
Haul Bulk Material Truck	33 - 1,541	61

As noted above, most of the haul bulk material trucks during the construction phase are required to transport the excavated rock material to and from the ERMA, which is expected to take place within the APM site (i.e., internal trips) and will not have an influence on the local road network or Ignace. Buses, personal vehicles, and flatdeck/waste trucks were considered as external trips destined to the APM site via Highway 17 and will likely lead to increased demand on roads and emergency services. The daily external trips combined for both the AM and PM peak hours are expected to be in the range of 80 to 125 vehicles during the construction phase and 70 to 110 vehicles during the operations phase. This represents the number of inbound/outbound vehicle trips generated by the APM site based on a five-day work week and an estimated 40% to 60% of those trips occurring during the peak hours when most commuters are expected to travel to and from the APM site around working hours.

4.5 ON-SITE EMERGENCY SERVICES

The Deep Geological Repository Conceptual Design Report (NWMO, 2021c) provides information on the facilities and infrastructure required for an underground repository to safely receive, package, and emplace the used nuclear fuel. As part of operational safety and radiation protection during the operational phase, site security and emergency response planning will be amongst the management systems and programs in place. Emergency response requirements are incorporated in the design of the facility (e.g., fire protection and suppression, egress and refuge, secondary repository egress, etc.) as well as the identification of services to support response (e.g., mine rescue, fire rescue) for the various phases of the DGR. Other management systems and programs include nuclear material safeguards, radiation protection, and worker occupational health and safety. It is to be noted that a future work package scheduled for 2024 will include the scope of work for site security and emergency response planning, including staffing numbers, shift coverage during the operations phase, and other logistics.

The APM site will be a non-nuclear site until operations begin after the construction period. It is to be noted that only a portion of the site will be designated as a nuclear zone such that buildings which handle, or store used nuclear fuel will be located within a Protected Area. The Used Fuel Packaging Plant (UFPP), as shown in **Figure 4-1**, is the only location for

potential exposure to the used nuclear fuel since it is the receiving, unloading, and transfer point from the external interim storage sites prior to placement in the underground repository. While radiological exposure is limited with the use of a multi-barrier system, it is a possibility from incoming used nuclear fuel shipments.

The APM site will have on-site emergency response services, including site security, fire, and medical services, as listed below:

- For security purposes, certain areas of the surface facilities will have restricted access and will be located within a Protected Area using double perimeter fencing, lighting, and intruder detection systems to prevent unauthorized access and physical protection of nuclear material. Personnel and vehicular access to the Protected Area will be strictly controlled by way of checkpoints and security gates with radiation monitors. The Protected Area will include the UFPP, in which the certified road transportation packages containing the used nuclear fuel will be received then unloaded. The used fuel is then packaged into a Used Fuel Container using multiple processing systems for dispatch and placement in the underground repository. Operations that involve the handling of used nuclear fuel will be completed within enclosures that are heavily shielded and using remote tool handling to minimize worker dose. The Security Monitoring Room will serve as a UFPP support system and will contain the main security monitoring systems and personnel. The Security Monitoring Room will accommodate four security team members per shift and the remaining members will be on standby in the event of an emergency. In general, the entire DCR surface facility will be surrounded by a fence to provide controlled access to vehicles and persons, as well as to prevent intrusion of wildlife.
- In addition to heavily controlling those who enter and exit the UFPP, thermoluminescent dosimeters are worn by employees and upon exiting the facility, a full-body scan is conducted to detect any potential contamination. In the event of contamination being detected, standard Radiation Protection Principles are utilized including standard cleaning products and techniques. On rare occasions, contamination may require employees to remove contaminated clothing and/or shower. Additionally, a decontamination room in the UFPP will be available to dispose of contaminated equipment.
- A fire hall will be provided and will be equipped with detection and monitoring equipment for any fire hazards or smoke from any of the DGR facility operations. Firefighters will be on duty each shift, with other fire team members on standby in the event of an emergency. Two large municipal fire trucks will be available with telescopic ladders, hoses, pumps, and all other typical fire-fighting tools. The fire hall will be located within the Administration Building, which is the first building that most staff and visitors will come across at the DGR facility and will be supported by the Security Monitoring Room. The pump house area will accommodate the potable, fresh, and firewater distribution pumps.
- While a fully functional hospital will not be provided on-site, a nursing station and first aid area with consultation rooms and a doctor's office will be provided within the Administration Building. A full-time nurse practitioner will be on duty for all shifts. In addition, a dedicated helicopter landing pad will be available with the capability of receiving a single helicopter.
- The underground repository layout will include the Services Area which will have a large permanent refuge station and portable refuge stations for workers and visitors in the event of an emergency. The permanent refuge station will be equipped with safety and rescue equipment such as a fire extinguisher, eyewash station, first aid kit, emergency food and drink rations, and stretchers.

The primary personnel involved in handling any emergency will be a part of an Emergency Response Team (ERT)/Mine Rescue Team (MRT) and would also be supported by on-site firemen and first aid attendants. External emergency services may be required for additional support for surface and non-nuclear related events. Emergency events that are underground

and nuclear related, such as mine rescue operations, will depend on reciprocal agreements with other mine sites in the area for support.

Depending on the ultimate site layout and future safety assessment, the APM site is to be located several kilometers away from Highway 17 with no foreseeable reason at the timing of this report for having to close the highway in an emergency event on site. If an external emergency event occurs along Highway 17 within a specific radius of the site, it is possible that on-site emergency services may be dispatched to assist with the incident.

APM PROJECT CHARACTERISTICS SUMMARY

1	The workforce will vary from 200 during the Pre-Construction phase, to 640 during Construction and up to 700 during Operations.
2	The expected Ignace population increase will vary from 530 during the Pre-Construction phase, to 595 during the Construction and up to 995 during Operations.
3	There would be an expected increase of 160 housing units during the Pre-Construction phase, 180 during Construction and 300 during Operations in Ignace.
4	The daily external trips combined for both the AM and PM peak hours are generally expected to be in the range of 80 to 125 vehicles during the construction phase and 70 to 110 vehicles during the operations phase.
5	On-site emergency services will include a fire hall, decontamination room, nursing station, first aid area, and permanent and portable refuge stations.
6	Emergency events that are underground and nuclear related, such as mine rescue operations, will depend on reciprocal agreements with other mine sites in the area for support.

5 PRELIMINARY ANALYSIS / EFFECTS ASSESSMENT

5.1 TRANSPORTATION

5.1.1 OPERATIONAL AND MAINTENANCE ISSUES

IGNACE

Based on the current road infrastructure conditions and impacts from the APM project, there will be little to moderate impact on the Ignace road network. As described in Section 3.3, there are various safety concerns along Highway 17 through Ignace, however the collision history presented in Section 3.5 indicated that there was no pattern or specific problem location. With that said, Ignace Public Works indicated that additional road maintenance (repaving or full reconstruction) would be required on main streets within Ignace with an increase in traffic (i.e., related to the APM project). These roads include Pine Street, Davy Lake Road, West Street and Balsam Street.

APM Project Effect – Minor Increase in traffic volumes:

- Could make access from James Street to Highway 17 worse for emergency vehicles
- Traffic congestion experienced during the summer months could increase slightly
- Repaving or full reconstruction of main streets within the Township likely required

HIGHWAY 17

The APM project will provide minimal impact on the roadway conditions of Highway 17. From Section 4.4, an average of 90 vehicle trips are expected to be added to the road network during the AM and PM peak hours combined for the operations period. However, the pre-existing concerns related to a lack of official emergency detour route from the Kenora Bypass 17 and 17A to Shabaqua Corners at the junction of Highway 17 and Highway 11 will remain.

APM Project Effect – Access to APM site is from Highway 17:

Lack of heavy tow operators between Thunder Bay and Winnipeg results in longer highway closures when there are incidents which could result in:

- Delays for vehicles accessing APM site
- Incidents involving vehicles destined to APM site adding to number of highway closures

5.1.2 SAFETY CONCERNS

IGNACE

The collision history from 2017 to 2021 indicates no consistent pattern or trend at locations within Ignace as highlighted during the knowledge holder interviews (see Section 3.5.2). However, an increase in traffic volume along Highway 17 within Ignace may further highlight those safety concerns and locations.

APM Project Effect – Minor increase in traffic volumes:

- Additional number of conflicts with pedestrians crossing Highway 17 (Pine Street) could increase probability of incident. No collisions in last 5 years
- Additional number of conflicts with inbound/outbound movements at Petro-Pass could increase probability of incident. There have been 3 collisions near the Petro Pass in the last 5 years
- Potential for additional heavy vehicles parking along Highway 17 (vehicles destined to APM Site)

HIGHWAY 17

As indicated in Section 4.4, a slight increase in heavy vehicles is expected during the construction phase of the APM project. From the Guide for Reducing Collisions Involving Heavy Trucks from the Transportation Research Bureau[1], the following information is provided:

- Drivers of heavy trucks appear to engage in fewer unsafe driving practices than do drivers in general. Analysis of driver-related factors in crashes between large trucks and passenger vehicles indicates that passenger vehicle driver errors are cited in more than two-thirds of these crashes.
- Studies of vehicle highway speeds in North America indicate that drivers of heavy vehicles generally exceed posted speed limits less often, and by smaller margins, than drivers of light vehicles. This conclusion is different than that provided anecdotally during the knowledge holder's interviews.
- Heavy truck crashes are more likely to result in serious injuries and fatalities than are crashes involving only light vehicles.
- The factors contributing to truck crashes are many and include other drivers, environmental characteristics, vehicle conditions, truck driver errors, and operational practices.

As stated in Section 3.5, there has been a decline in the total collisions (PDO, non-fatal and fatal) on Highway 17 between Dryden and Ignace since 2017. The anticipated impact due to the APM project would likely be an increase in the severity of collisions due to an expected increase in heavy vehicles traveling along Highway 17. However, given the low volumes along

[1] NCHR 500 Vol 13 – A Guide for Reducing Collisions Involving Heavy Trucks, Washington, Transportation Research Bureau, 2004

Highway 17 and minimal increase in heavy vehicles during AM and PM peak hours, the shift from PDO collisions to non-fatal and fatal collisions is expected to be minimal.

APM Project Effect – Minor increase in traffic volumes:

- Potential for slight increase in collisions. 267 collisions on Highway 17 between Dryden and Ignace in last 5 years primarily related to lighting / visibility (darkness) and the presence of wildlife

APM Project Effect – Access to APM site is from Highway 17:

- Dependent on location of access, sightline problems may be introduced with existing curvature/geometry of the Highway
- MTO permit for access within Highway right-of-way is required once a geometric design is available

5.1.3 CAPACITY

The baseline operational conditions on Highway 17 are, at a high-level, operating at a LOS A (see Section 3.4). In the section of road network with the highest volumes (Highway 17 near Dryden) the baseline (2022) traffic vehicle volumes applying a worse case scenario of 1% annual growth rate had an expected AADT of 6,300, less than the threshold of 13,900 AADT for a LOS of A on a rural two-lane highway (estimated percentage of heavy trucks 10%). The addition of the related APM traffic volumes (see Section 4.4), the LOS for this highest volume section remains LOS A. Furthermore, within the town of Ignace the current population is just over 1,200 and the APM project would expect to nearly double that population to 2,200 (reaching a similar population to 1986, before the mines closed). Given the Ignace Community Capacity Study (Ignace, 2021) indicated that there was sufficient roadway capacity for a population of up to 4,000, the resulting population from the APM project alone results in no need for additional roadway capacity within Ignace.

APM Project Effect – Increase in population resulting in added vehicle volumes:

- No new roads or expansions required; there is sufficient capacity for a population up to 4,000 (per Ignace Community Capacity Study) which is higher than the projected population that accounts for the APM project in place
- Level of Service along Highway 17 not anticipated to change from LOS A
- No widening of Highway 17 required and not within MTO's 5-Year Capital Plan

5.2 EMERGENCY SERVICES

5.2.1 TRANSPORTATION OF GOODS

In the event of a used nuclear fuel related incident, a standardized approach to transportation incident response involving dangerous goods/hazardous materials will be followed as per the Transport Canada's Emergency Response Guidebook. A safety protocol, in association with Transport Canada's Canadian Transport Emergency Centre (CANUTEC), will be required in the event of an incident. Safety protocols follow a graded approach, and most of all transport incidents will not require direct

involvement from CANUTEC. While the minimum response level would be to notify NWMO's Emergency Operations Centre, a radiation protection surveyor would only be dispatched to the scene in the event of significant damage to the transportation package containing the used nuclear fuel. It is noted that an incident involving used nuclear fuel may be treated differently compared to other classes of dangerous goods (i.e., explosives, gases, flammable liquids, flammable materials, oxidizing substances, toxic, corrosive, etc.).

The protocol followed by local emergency response teams will include road closure procedures that are put in place according to hazard level for which local emergency responders are already trained. In other words, an emergency event has an associated hazard level that determines the duration for which the specific event needs to be attended to before the road is permitted to be reopened. The hazard level also dictates the affected area such that a certain radius from the incident site will need to be blocked off to the public.

Re-opening roads may take longer in the event of a used nuclear fuel related incident. After first responders complete their work, the Canadian Nuclear Safety Commission (CNSC) will monitor the clean-up (i.e., specialists from Thunder Bay that are trained to handle and treat nuclear waste). A full-scale response including CNSC presence at the incident site is typically only required for severe accidents involving significant damage or suspected breach of the used nuclear fuel transportation package. Most incidents will not require this level of response.

Additionally, based on the interview with the NWMO's Manager of Transportation Engagement, it was made abundantly clear that the precautions taken by the NWMO (including the multi-barrier system) make the used nuclear fuel transportation process extremely safe and any incidents would not result in any long-term public risks.

APM Project Effect – Used nuclear fuel vehicles on road network:

In the event of a used nuclear fuel related incident:

- A standardized approach to transportation incident response involving dangerous goods/hazardous materials will be followed as per the Transport Canada's Emergency Response Guidebook. Responders are already trained on how to handle a variety of incidents involving dangerous goods, including used nuclear fuel which is categorized as Class 7 – Radioactive Substances.
- Emergency services will follow existing protocols for road closure procedures as documented in the Township of Ignace Emergency Response Plan

A multi-barrier system makes the transport process extremely safe and any incident would not result in any long-term public risks.

5.2.2 ONTARIO PROVINCIAL POLICE

With an increase in population in Ignace, a larger police facility and additional police officers would be required with the notion that an increase in population will result in an increase of calls; however, this would be assessed by the OPP at the time.

In the event of a highway closure, a regional approach and coordination with other OPP detachments is required. If Highway 17 is closed within the study area, it creates a bottleneck for the Thunder Bay OPP or Thunder Bay Police Service to the east and the Kenora area to the west, the coordination with other OPP detachments is imperative for the provision of services for affected vehicles. This would continue in the future.

APM Project Effect – Increase in population:

- Staffing is sufficient to cover the basic needs of the Township of Ignace and Highway 17 currently; if an increase in calls occurred additional staffing resources may be necessary

APM Project Effect – Minor increase in traffic volumes:

- The probability of a collision increases as well as probability of Highway 17 closures - a regional approach and coordination with other OPP detachments to continue in the event of a highway closure due to the increase in vehicle volumes. While the probability of these events increases with the increase in vehicle volumes, given the current low frequency of these events and low change in the overall volumes increase in probability is also very low.

5.2.3 NORTHWEST EMERGENCY MEDICAL SERVICES

The current Ignace Ambulance Base service typically receives 300 calls per year, below the threshold of 2,500 calls per year where additional services would be needed; therefore, there is capacity within the existing service. If the number of calls were to increase they could be accommodated at the existing base with current crews before an extra crew and/or vehicle would be required.

Where the Ignace ambulance service may experience capacity constraints is if the increased population results in additional transfers to the Dryden Hospital. A transfer to the Hospital will take more than an hour round trip plus any waiting time at the hospital; with a single crew this would leave Ignace with no paramedic service available. Given the ambulance bay expansion plans in the Region, current Ignace crews being below their call capacity, and presence of medical staff on site of the APM, the APM project is unlikely to result in the requirement for additional Northwest EMS staffing.

Lastly, based on discussions with NWMO staff, there would be no need for local hospitals to have any particular health and safety accommodations for the UFPP including decontamination facilities.

APM Project Effect – Increase in population:

- Could provide additional pool of people for EMS staff resources locally (currently EMS staff typically live in Dryden and are commuting into Ignace)
- Increased calls requiring transfer to Regional Hospital in Dryden could result in times Ignace has no paramedic coverage due to travel time
- Staffing based on call frequency; additional staff resources likely not necessary based on capacity alone

5.2.4 IGNACE FIRE DEPARTMENT

An increase in the population due to the APM project would likely result in an increase in the number of emergency calls. The fire department is volunteer based and staffed according to the population and number of emergency calls to ensure enough volunteers respond to an incident. An increase in the number of calls would likely result in an increase in volunteers required; the population increase would however also increase the pool of potential volunteers to draw from.

While the relocation requirement of the fire hall is not a direct result of the APM project, should the fire hall be required to accommodate an expanded fire service due to an increase in population/calls, the existing building would not meet the building/firefighting code requirements and would need to be upgraded. At such time, a new location would be recommended.

As noted in Section 3, emergency vehicles may incur delay when responding to calls north of the railway tracks. Housing development north of the rail tracks would not be recommended, which aligns with the planned development in Ignace.

APM Project Effect – Increase in population:

- May result in volunteer firefighting services needing to recruit more volunteers of which there is current capacity to accommodate approximately 10 additional volunteers, and consideration should be given to transition the Fire Chief to a full-time employee based on comparisons of municipalities of similar sizes (additional analysis required and APM project to potentially expedite the process)
- Increase in population results in a higher tax base and could provide the opportunity to expand services through a fire hall relocation
- Additional pool of potential volunteers to draw from – difficulty recruiting currently as volunteers need to reside in Ignace

5.2.5 DRYDEN REGIONAL AIRPORT

The Conceptual Design Report (NWMO, 2021c) includes many safety measures and protocols to minimize the necessity of an emergency evacuation. In the unlikely event of an evacuation, there is sufficient capacity at the Dryden Regional Airport. The Airport is capable of managing a regional evacuation in the case of a forest fire by processing up to 200 people at a given time; an evacuation as a result of an incident at the APM site would be smaller than this larger example provided. No additional capacity is required at the Dryden Airport due to the APM project.

APM Project Effect – Presence of APM Project Site:

Dryden Regional Airport

- Minimal chance APM Site within Region could result in Evacuation by Air
- No additional airport or runway capacity required
- Additional staff from the City of Dryden and The Loomex group available in an emergency event
- The volumes of people requiring evacuation during a forest fire event is larger than what would be needed to accommodate an evacuation at the APM Site

Ignace Municipal Airport

- Potential to revitalize and use existing infrastructure

PRELIMINARY ANALYSIS / EFFECTS ASSESSMENT SUMMARY

1	A minor increase in traffic volumes within Ignace and along Highway 17 results in no change to Level of Service on Highway 17.
2	An increase in heavy vehicle volumes does increase the potential for more severe collision along Highway 17. However, given the relative increase in heavy vehicles during the peak hour (less than 5%) the probability of these collisions and resulting impact is expected to be minimal.
3	Emergency services will follow existing protocols for road closure procedures as documented in the Township of Ignace Emergency Response Plan.
4	Existing OPP staff provides necessary coverage for the Township of Ignace and Highway 17; if an increase in calls occur additional staffing resources may be necessary.
5	EMS and Ignace Fire Department staffing is based on call frequency; preliminary review indicates that there is sufficient capacity however an increase in calls could results in additional staff resource requirements.
6	No additional airport or runway capacity required at Dryden Regional Airport.

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.

6.1 TRANSPORTATION

6.1.1 OPERATIONS AND MAINTENANCE

As identified in previous sections, the increase in population will have an impact on the overall traffic volumes and thereby the probability of collisions; however, as the hourly traffic volume increase is low, the impacts are anticipated to be negligible as a result of the APM project.

With the population in Ignace doubling as a result of the APM project operations planning horizon, consideration should be given to support the revitalization of Ignace's main street (Highway 17) as a complete street per the Township of Ignace's Official Plan to better serve the community and all residents both new and existing. A reconstruction should consider:

- Implementing the cycling infrastructure recommended in the Province-Wide Cycling Network with the inclusion of a bike lane through town or higher order facility such as a cycletrack built into the cross section;
- Implementing the pedestrian crossings at the intersections of Highway 17 / Pine Street and Highway 17 / Davy Lake Road according to the Township of Ignace's Official Plan with consideration of making these raised crossings to provide additional traffic calming (i.e. reduced speeds) through town;
- Additional traffic calming measures, particularly within the Community Safety Zone to reduce speeds and illegal parking through the area with the use of streetscaping;
- Continue discussions to extend the limits of the Community Safety Zone and 50 km/h speed zone;
- Implementing a maintenance boulevard to better accommodate pedestrians on the south side of Highway 17 and maintain ongoing discussions with MTO to manage snow removal and storage along Highway 17 within Ignace not only to deal with sightline issues from high snow piling, but for the maintenance implications of cycling facilities;
- Make accesses along Highway 17 more visible by implementing better signage for driver awareness purposes, such as at the Petro-Pass which is used by heavy vehicles; and
- Develop waiting area for parked trucks in Ignace to reduce sightline concerns in the Township.

6.1.2 SAFETY

HIGHWAY 17

There is a correlation between population, increased traffic volumes and an increased probability of collisions and as such, the increase in population in Ignace as a result in the APM project is likely to increase the number of collisions in close proximity to Ignace. For instance, the number of collisions is greater near Dryden where the population is higher compared to Ignace. It is noted that in the area west of Ignace, where the APM project is planned, the total number of collisions is fairly low with most collisions being attributed to road/environmental conditions and wildlife.

Similar to Operations and Maintenance, there is no requirement to implement additional safety measures along Highway 17 or through Ignace as a result of the APM project. However, to prevent existing issues from persisting or worsening, some countermeasure opportunities to reduce the likelihood of collisions should be considered. These opportunities include:

- Adapt parking availability along Highway 17 in Ignace: Based on concerns from the knowledge holder interviews, restricting availability may provide an opportunity to improve driver sightlines and reduce the possibility of collision within Ignace.
- Place fencing along Highway 17: Considering the number of collisions with wild animals it may be beneficial to strategically place fencing along certain stretches of the highway.
- Additional enforcement and/or speed cameras: Implement some enforcement near/within reduced speed zones
- Implementation of auxiliary lane at Petro Pass to reduce the likelihood of rear-end collisions. Current westbound lane geometry shows the passing lane ending just upstream of the access to the Petro Pass. Extension of passing lane has potential to reduce the likelihood of collisions.

SITE ENTRANCE

The exact location of the site entrance for the APM project has not yet been identified or designed. The entrance location and details will be determined as part of the site plan development. As the entrance is off a provincial highway under the jurisdiction of the Ministry of Transportation, Ontario (MTO), the design requirements for the geometry of the entrance will need to conform to the current MTO design standards at the time of development, and an entrance permit must be obtained from the MTO's Highway Corridor Management Office. MTO will be responsible for the review and approval of the entrance from the Highway to the MTO right-of-way.

The current guidance to design the entrance would be the MTO Commercial Site Access Policy and Standard Designs Manual (January, 1994). The design would need to satisfy geometric, drainage and safety design requirements including but not limited to the following:

- **Design Vehicles & Turning radius:** The turning radius of the design vehicle (i.e. governing vehicle size), based on the wheel base dimensions, identifies the available space required for a vehicle to make a turn. This provides the effective 'apron' of the entrance at the Highway.
- **Visibility & Sightlines:** Sightlines are considered in the design and reviewed during the approval process by MTO for both the horizontal and vertical alignments of the roadway. Standard sightline distances will be reviewed for the posted speed on Highway 17 and will take into account curves in the road, hills or grade changes, vegetation, etc.
- **Auxiliary Lanes & Turn Tapers:** During the design of the entrance any auxiliary lanes will be identified and are based on the volumes on the highway, turning volumes, vehicle composition and design speed. Auxiliary lanes could include deceleration lanes for right turning vehicles entering the site (i.e., eastbound) to move out of the through traffic lane; acceleration lanes for right turning vehicles leaving the site to enter into the flow of traffic; or a dedicated

left turn lane for vehicles turning into the site from Highway 17. The auxiliary lanes can be warranted based on traffic volumes, design speeds or sight distances (i.e., the potential for rear end collisions).

- **Traffic Signals:** Traffic signals are located where they are warranted. The warrant is based on the total amount of traffic in the busiest 8-hours, conflicting movements within the busiest 8-hours, existing collisions and potential conflicts with vulnerable users. Given the projected volumes at the entrance, a traffic signal is not expected to be warranted.
- **Illumination:** Illumination is mainly installed to prevent collisions in locations with a high night-time accident potential. Illumination necessitated by development adjacent to the highway at private or commercial entrances is normally the responsibility of the associated property owner. The requirements for illumination are outlined in the MTO Directive: PLNG-B-05 Ministry Policy for Highway Illumination (May 2002).

The permit application and approval process will follow the MTO's Corridor Management policies, guidelines, best practices, and specifications for: managing building and land use, encroachments, access and signage as currently outlined in the MTO Highway Corridor Management Manual (HCMM) (September 2018). A synopsis of the land development review requirements and Highway Corridor Permits Process, including timelines, is provided in **Appendix I**. Once additional details are known for the APM project entrance location, a pre-consultation should be set up with the MTO such that all expectations are clearly understood by all parties.

6.2 EMERGENCY SERVICES

6.2.1 TRANSPORTATION OF GOODS

Transportation of used nuclear fuel is a defined scenario in the Emergency Response Guidebook that is a reference for emergency responders. NWMO is committed to engaging with first responders in the region to promote awareness of the APM project and to identify if there are any training/capacity gaps with communities along potential transportation routes.

6.2.2 ONTARIO PROVINCIAL POLICE

In accordance with the results of the knowledge holder interview, OPP would not require additional staffing with the projected population growth of the APM project. There would be a preference to add administrative help in the Ignace detachment, however for the most part the current staffing in Ignace is adequate for the town and highway.

If the population grows beyond that of the projections from the APM project, then there may be a requirement for re-structuring within the Dryden Detachment Area and if it would still necessitate the Ignace detachment to fall within it. In this event, the Ignace detachment would likely require additional staffing.

6.2.3 NORTHWEST EMERGENCY MEDICAL SERVICES

Overall, the emergency medical services provided by Ignace, nearby towns and within the APM site are sufficient for the APM project. An increase in calls would be monitored by Northwest Emergency Medical Services.

6.2.4 IGNACE FIRE DEPARTMENT

Per the Ignace Community Capacity Study (2021), if Ignace were to reach a population of 4,000 (not anticipated with only the APM project), then the Ignace Fire Department would require 3 full-time employees and 25 volunteers. Consequently, a larger fire hall and an additional fire truck would be needed to accommodate the expanded services. The service gap calculation was based on a per capita estimate of nearby fire departments (Sioux Lookout, Dryden, and Atikokan). As a comparison, the Town of Atikokan had a population of 2,753 with 2 full-time staff (Fire Chief and By-law Enforcement Officer) and 24 volunteers at the time of the Ignace Community Capacity Study. As mentioned in Section 3.6.3, there are currently 14 volunteers at the Ignace Fire Department. Therefore, if the population were to grow to the APM projections shown in Section 4 (e.g., the upper bound population projection of 1800 by 2046 plus 995 additional population during operations of the APM), then consideration should be given to hire 1-2 full-time staff and recruit additional volunteers to accommodate an increase in the number of calls. This would require the relocation and construction of a new facility for the Ignace Fire Department.

6.2.5 DRYDEN REGIONAL AIRPORT

Overall, the airport already has evacuation plans in place related to forest fires and additional capacity is available for the requirements of an evacuation required due to the APM project.

OPTIONS ASSESSMENT SUMMARY

1	Minor increase in traffic volumes within Ignace as a result of the population increase will increase the probability of collisions; consideration to geometric changes at entrances on Highway 17 is suggested.
2	With doubling Ignace's population as a result of the APM project, consideration to support the revitalization of Ignace's main street (Highway 17) to a Complete Street is recommended.
3	A new entrance within MTO ROW will need to conform to MTO Design Standards at time of site plan development to ensure adequate lanes, turning radii, sightlines etc. are provided to address any new turning movement conflicts.
4	No additional training to handle a used nuclear fuel related emergency event is required for local emergency response teams aside from APM project awareness. Responders are already trained on how to handle a variety of incidents involving dangerous goods, including used fuel which is categorized as Class 7. Existing Emergency Response Plans may require updating.
5	OPP would not require additional staffing with the projected population growth of the APM project. Number of calls are to be monitored as staffing is based on call frequency.
6	Ignace ambulance service may experience capacity constraints if the transfers to the hospital in Dryden increase. Number and length of calls are to be monitored.
7	Additional 1-2 full-time staff may be required as well as an increase in the number of fire department volunteers; a spatial analysis recommended to identify if changes required to current volunteer-based service.
8	No actions required by Dryden Regional Airport. Capacity and emergency response plan are already in place.

7 SUMMARY

7.1 KEY FINDINGS

The implementation of the APM project in Ignace and the surrounding region will have minor impacts overall on the transportation and emergency response conditions.

Existing Conditions:

- Population of Ignace and region consistent over last five years. Other demographics show an aging population that reside primarily in single-detached houses.
- Limited traffic volume growth along Highway 17 and nearby highways since 2006.
- Collision history from 2017 to 2021 indicate that all collisions (PDO, non-fatal and fatal) have decreased over time. In contrast, the number of collisions provincially has increased during the same time period.
- The collision analysis identifies that only a quarter of incidents occurred during preferred driving conditions (daylight, dry road surface and clear conditions). Collisions involving wild animals on Highway 17 are the leading cause for collisions during these conditions.
- The knowledge holder interviews discussed potential operational and maintenance issues along Highway 17 throughout the study area.
- Emergency Services in Ignace are adequate for current population and needs.

APM Project Characteristics Relevant to the Study

- Anticipated labour force for APM project will result in significant population and housing growth in Ignace (i.e. doubling in population).
- Traffic volume increases for Ignace will be greatest during the construction phase. It is estimated that 70 to 110 additional vehicles will travel on roadways outside the site in the AM and PM peak hours combined during the operations phase. Less than 10% of external trips will be heavy vehicles for both the construction phase and operations phase.
- On-site emergency services are expected to be sufficient for the APM project.

Preliminary Analysis/Effects Assessment

- Adding heavy vehicles to the road network will not result in any highway capacity constraints but may increase the severity of collisions. There have been 3 fatal vehicle collisions since 2017. However, it is noted that the relative increase in heavy vehicles on the road is small and therefore the probability of these collisions is low.
- OPP, EMS and Ignace Fire Department staffing is based on call frequency; additional staff resources may be necessary and would be monitored.
- No additional airport or runway capacity required at Dryden Regional Airport.

Options Assessment

- While there are no capacity issues on Highway 17, there may be some opportunity to improve road conditions and reduce specific types of collisions as the probability of collisions increases with increased traffic volumes.
- With the increase in population and use of local roads in Ignace consideration should be given to improving the facilities on Highway 17 through Ignace to be a complete streets model and accommodate users of all ages and abilities for all modes.
- No additional training to handle a used nuclear fuel related emergency event is required for local emergency response teams aside from APM project awareness. Existing Emergency Response Plans may require updating.
- Additional 1-2 full-time staff may be required as well as an increase in the number of fire department volunteers to accommodate an increase in the number of calls based on comparisons with towns and municipalities of comparable size and population. A spatial analysis is recommended to identify if changes required to current volunteer-based service. Call data including distance of call, response time and type of call would be required for the analysis.

7.2 ENGAGEMENT ON DRAFT TRANSPORTATION AND EMERGENCY SERVICES REPORT

A timeline of the engagement on the draft report is provided below:

- June 8th, 2022: WSP provides the draft report for commentary
- June 28th, 2022: Presentation and discussion of project/report findings with NWMO Working Group
- July-August 2022: Reception of draft report comments from NWMO Working Group
- August 9th and 12th 2022: Follow-up meetings to discuss draft report comments with NWMO Working Group
- August 16th and 19th, 2022: Additional meeting with NWMO Emergency Services to address comments from draft report
- September 9th, 2022: Submission of final report
- September 23rd, 2022: Reception of final report (first submission) comments from NWMO Executive Committee
- October 3rd, 2022: Second submission of final report
- October 4th, 2022: Reception of final report (first submission) comments from NWMO Engineers
- October 7th, 2022: Second submission of final report to address comments from NWMO Engineers
- October 28th, 2022: Third submission of final report to address additional comments from NWMO staff

8 REFERENCES

City of Dryden. (2017). Dryden Airport. Link: https://www.dryden.ca/en/explore/resources/Images/Airport/CYHD-Layout-Map-1.jpg. Accessed May 26, 2022.

Hardy Stevenson and Associates, Avaanz, Keir Corp (HSAK). (2022a). Ignace Area Community Studies: Economics and Finance. Labour Baseline. June 17, 2022.

Hardy Stevenson and Associates, Avaanz, Keir Corp (HSAK). (2022b). Ignace Area Community Studies: Economics and Finance. Housing Study. July 12, 2022.

Ignace. (2021). Township of Ignace Emergency Response Plan. Revised 2021.

Ignace Fire Department. (2022). 5-Year Emergency Response Report. Received May 19, 2022.

InterGroup Consultants. (2022). Northwest Community Studies. Growing the Population and Opportunities. June 17, 2022.

Kenora District Services Board (KDSB). (2022). Northwest Emergency Medical Services (EMS). Link: https://kdsb.on.ca/our-services/emergency-medical-services/. Accessed May 26, 2022.

Ministry of Transportation of Ontario (MTO). (2018). #CycleON Action Plan 2.0.

Ministry of Transportation of Ontario (MTO). (2022). Ontario's Highway Programs. Link: https://www.ontario.ca/page/ontarios-highway-programs. Updated February 21, 2022. Accessed May 26, 2022.

Nuclear Waste Management Organization (NWMO). (2021a). Community Studies Planning Assumptions – Ignace Traffic. November 24, 2021.

Nuclear Waste Management Organization (NWMO). (2021b). Community Studies Planning Assumptions. November 10, 2021.

Nuclear Waste Management Organization (NWMO). (2021c). Deep Geological Repository Conceptual Design Report. Crystalline/Sedimentary Rock. September 2021.

Ontario Provincial Police (OPP). (2020). 2020-2022 Action Plan. Dryden Detachment.

Ontario Provincial Police (OPP). (2022). Five-Year Emergency Call History 2017-2021. Dryden Detachment.

PSD Research Consulting Software. (2020). Township of Ignace Asset Management Plan. May 2020.

Statistics Canada. (2022a). (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released August 17, 2022.

Statistics Canada. (2022b). (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released August 17, 2022.

Statistics Canada. (2022c). (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released August 17, 2022.

Statistics Canada. (2022d). (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released August 17, 2022.

The Loomex Group. (2021). Dryden Regional Airport Strategic Plan 2021. City of Dryden.

Urban Systems. (2021). Community Capacity Study. Township of Ignace. March 21, 2021.

WSP. (2020). Township of Ignace Final Official Plan. November 2020.

WSP. (2019). Township of Ignace Background Report. Official Plan and Zoning By-Law Review 2018-2019. March 2019.

Appendix A

LIST OF COMMUNITY STUDIES

Study Name	Study Proponent	Lead Consultant
Community and Culture	NWMO	InterGroup Consultants Ltd 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

INTERVIEW QUESTIONS

Ignace Area Infrastructure Study - Questionnaire

Public Works

Is there a traffic data contact that has been used in the past? Are there existing traffic counts that can be shared?

Are there any road modifications planned with MTO and Ignace roads?

Any future developments known that would require new site accesses onto Highway 17?

Any future large development sites known that would change existing travel patterns?

If traffic volumes were to increase, has any thought been given to what additional roadway measures would be required?

Has there been any operational issues noted for trips along Highway 17 through Ignace (e.g., delay at intersections, poor sightlines, tight turning radii, safety concerns, maintenance problems)? Any sites where signals have been discussed in the past as a requirement?

If a shuttle bus between the temporary housing and the NWMO APM site were to exist, what locations should be considered for a stop? Would partnerships with local businesses be an option?

What benefits would the local community expect from this project? Roadway improvements? Increase in business? Increase in Active Transportation (i.e. cycling or pedestrian) facilities?

Any issues with emergency response, or requirements you are aware of?

Emergency Services - Police

Has there been any operational issues noted for emergency service trips along Highway 17 (e.g., delay at intersections, poor sightlines, tight turning radii, safety concerns, maintenance issues)? Any key areas where collisions occur?

Problem areas for passing/slow vehicles/climbing trucks?

What are the most common calls requiring response?

Are there any known wildlife crossings along the Highway 17 corridor?

What contingency routes are put in place if Highway 17 is closed? Any designated Emergency Detour Routes?

What happens when the highway is closed? How often is the highway closed?

Where are the current police stations in the region?

Emergency Services – Ambulance

Where are the current hospitals/clinics/ambulance bays in the region? Age of ambulance bay facility?

For ambulance centres how many staff as a whole, how many on shift at a time, is it 24 hours?

Clarify the areas covered by different centres.

Percentage of calls related to highway/collisions?

Has there been any operational issues noted for emergency service trips along Highway 17 (e.g., delay at intersections, poor sightlines, tight turning radii, safety concerns)?

What contingency routes are put in place if Highway 17 is closed? Do these closures result in any issues for paramedics?

Any issues with responding to events/incidents on the Highway, in Ignace, In Dryden?

If the APM project is sited in Northwest Ontario, there is expected to be a population growth in Ignace and surrounding communities. How do you think an increase in population would affect paramedic abilities to provide service? At what number of increased population? What additional resources (equipment or staff) would be required for an increase in population in Ignace?

Data Request – would you be able to provide the number of calls/year by type for the past five years?

Emergency Services - Fire Services

Where are the current Fire Stations in the region (map)? Age of facility?

What vehicles housed at each station?

How may staff as a whole, how many on shift at a time, is it 24 hours?

Which stations are volunteer vs. full time? Do response rates differ?

Clarify the areas covered by different Stations.

Has there been any operational issues noted for emergency service trips along Highway 17 (e.g., delay at intersections, poor sightlines, tight turning radii, safety concerns)? Any issues responding to incidents on the Highway?

What contingency routes are put in place if Highway 17 is closed? Do these closures result in any issues for fire services?

If the APM project is sited in Northwest Ontario, there is expected to be a population growth in Ignace and surrounding communities. How do you think an increase in population would affect fire services? At what number of increased population? What additional resources (equipment or staff) would be required for an increase in population in Ignace?

Data Request – would you be able to provide the number of calls/year by type for the past five years?

MTO

Are there any road modifications planned with MTO and Ignace roads? 5-year plan?

Any future developments known that would require new site accesses onto Highway 17?

Has there been any determination of traffic threshold before twinning facility? If traffic volumes were to increase, has any thought been given to what additional roadway measures would be required?

Has there been any operational issues noted for trips along Highway 17 through Ignace, between Ignace and Dryden, in Dryden (e.g., delay at intersections, poor sightlines, tight turning radii, safety concerns, maintenance problems)? Any sites where signals have been discussed in the past as a requirement?

There is currently no designated Emergency Detour Route – how often is highway closed by reason (crash, weather) and for what duration? Has there been any discussion about having some sort of redundancy routing?

NWMO Engineers – Emergency Services

What emergency services are planned at the APM site? Will these services be exclusive to the APM site, or will they extend beyond the site?

Will there be any facilities on site specifically for emergency situations?

How many staff members will there be and how many will be on shift at a time?

Will there be an Emergency Response Plan for the Ignace site? If so, what plans/training would be included? Would the plan be required to be approved by other governing bodies?

What additional resources/help would the NWMO require from the Township?

What training would be required for non-APM Emergency Services staff (i.e., OPP, volunteer fire fighters, etc.)?

Where will staff members be based out of? Will there be on-site accommodation or will staff members generally be living in Dryden and Ignace?

In the event of an on-site emergency, could shutdown protocols involve closing sections of Highway 17?

Anything for decontamination – evacuation?

NWMO Staff – Decontamination

Are there any decontamination areas/rooms planned for the DGR site? The understanding is that the Used Fuel Packaging Plant (UFPP) will be the only location on site that may require this.

If so, will these rooms require additional staff?

What additional resources/help would the NWMO require from the Township?

Would local hospitals (Dryden) require similar decontamination rooms?

Are there any studies that are planned or ongoing for further analysis?

Appendix C

PROVINCE-WIDE CYCLING NETWORK

MAP 7: PROVINCE-WIDE CYCLING NETWORK NORTHWESTERN REGION

MINISTRY OF TRANSPORTATION

Ontario

wsp

Province-wide Network

On-Road
- Existing
- Proposed

Off-Road
- Existing
- Proposed
- The Great Trail
- Great Lakes Waterfront Trail
- Greenbelt Cycling Route

- Primary Highway
- Secondary/Tertiary Highway
- Route Border Crossing
- MTO Regional Boundary

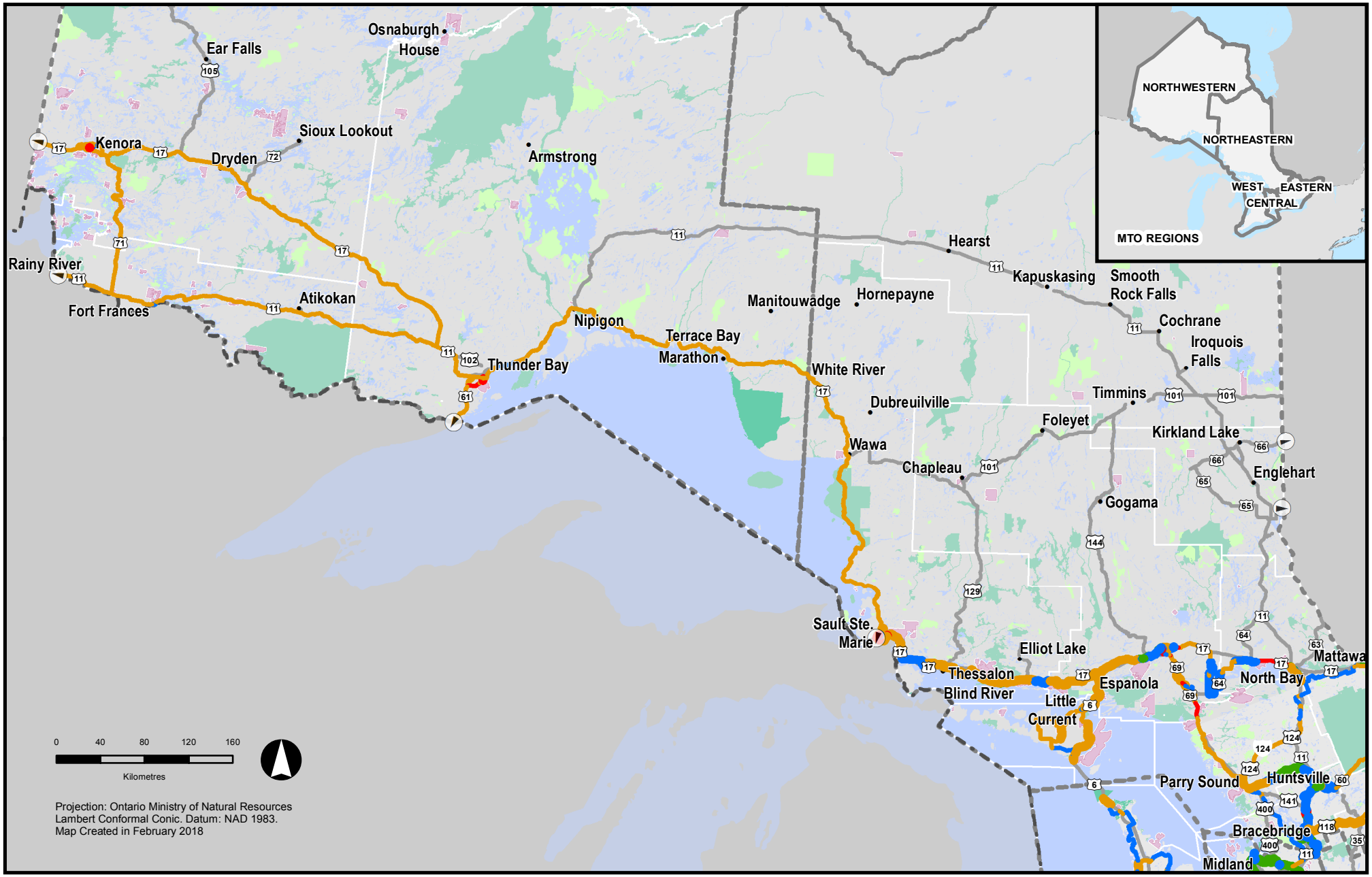
- First Nations Reserve Lands
- Provinces Outside Ontario
- Federal Parkland
- Provincial Parkland
- Conservation Reserve
- Built Up Area

THIS MAP IS FOR DISCUSSION – NOT FOR NAVIGATION.

This map illustrates routes identified through an iterative study process as part of the province-wide cycling network. This network concept is intended to inform and guide future cycling infrastructure decisions with the long-term goal of establishing a connected and consistent network.

The routes shown on this map include both existing and proposed cycling facilities. All routes illustrated are subject to further evaluation. Existing routes are based on data provided from multiple sources and route conditions have not been verified through field investigation. Existing facilities may not meet current provincial guidelines. All routes require a detailed feasibility study prior to implementation.

Please note: Not all First Nation communities are shown on this map due to scale. All communities are shown on the online map of the cycling network on the Ministry of Transportation web site.



MAP 11: LEVEL OF SEPARATION
PROVINCE-WIDE CYCLING
NETWORK NORTH OVERVIEW

MINISTRY OF TRANSPORTATION

Ontario wsp

Level of Separation

DESIGNATED	SHARED
Existing	Existing
Proposed	Proposed

OFF ROAD	SEPARATED
Existing	Existing
Proposed	Proposed

- Primary Highway
- Secondary/Tertiary Highway
- Route Border Crossing
- MTO Regional Boundary

- First Nations Reserve Lands
- Provinces Outside Ontario
- Federal Parkland
- Provincial Parkland
- Conservation Reserve
- Built Up Area

THIS MAP IS FOR DISCUSSION – NOT FOR NAVIGATION.
This map illustrates routes identified through an iterative study process as part of the province-wide cycling network. This network concept is intended to inform and guide future cycling infrastructure decisions with the long-term goal of establishing a connected and consistent network.
The routes shown on this map include both existing and proposed cycling facilities. All routes illustrated are subject to further evaluation. Existing routes are based on data provided from multiple sources and route conditions have not been verified through field investigation. Existing facilities may not meet current provincial guidelines. All routes require a detailed feasibility study prior to implementation.
Please note: Not all First Nation communities are shown on this map due to scale. All communities are shown on the online map of the cycling network on the Ministry of Transportation web site.

Appendix D

CENSUS SUMMARY

Appendix: Census Summary

Population	Ignace	Dryden	Sioux Lookout	Wabigoon	Total	Ontario
2021	1,206	7,388	5,839	419	14,852	14,223,943
2016	1,202	7,749	5,272	373	14,596	13,448,494
Annual Growth	0.1%	-0.9%	2.1%	2.4%	0.3%	5.8%

Population Distribution	Ignace	Dryden	Sioux Lookout	Wabigoon
2021	8%	50%	39%	3%

Dwelling (2016)	Ignace	Dryden	Sioux Lookout	Wabigoon	Total	Ontario
Total Occupied dwellings	565	3,360	2,020	145	6,090	
Single-detached house	91%	74%	71%	90%	75%	54%
Attached dwelling	8%	23%	25%	7%	22%	46%
Movable dwelling	1%	3%	5%	3%	4%	0%

Age (2016)	Ignace	Dryden	Sioux Lookout	Wabigoon	Total	Ontario
0-14	12%	15%	20%	20%	17%	17%
15-54	43%	48%	55%	46%	50%	53%
55+	45%	37%	25%	34%	33%	30%

Labour (2016)	Ignace	Dryden	Sioux Lookout	Wabigoon	Total	Ontario
Labour Force	540	3970	2965	120	7595	7,141,675
Employment Rate	48%	62%	67%	43%	59%	60%
Unemployment Rate	9%	8%	6%	15%	7%	7%

Household Income (2016)	Ignace	Dryden	Sioux Lookout	Wabigoon	Total	Ontario
Under $50,000	43%	35%	26%	79%	34%	66%
$50,000 to $100,000	32%	33%	33%	17%	32%	25%
Over $100,000	25%	32%	41%	4%	33%	9%

Appendix E

MTO 5-YEAR PLAN

Structures & Rest Area Improvements - 2022 to 2026			
GWP	**Project Location**	**Length**	**Construction Year**
6109-17-00	CPR overhead at Martin, 9 km west of English River, east of Ignace	n/a	2024
6035-20-00	Rest Area Rehabilitation on Hwy 17 at Lodge Lake	n/a	2022
6048-21-00	Gulliver River Bridge, 10 km east of Hwy 599, east of Ignace	n/a	2026
6064-18-00	Osaquan and Melgund Creek Culverts, 8 and 56 km west of Ignace and Shoshowae Creek Culvert, 10 km west of Dryden	n/a	2024
6030-19-00	Revell River No. 3 Bridge, 1 km east of Hwy 622, west of Ignace	n/a	2024
6007-21-00	Jackfish Lake Rest Area Improvements	n/a	2022
6105-17-00	Thunder Creek Bridge, east of Dryden	n/a	2023
6117-17-00	Wabigoon River Bridge, 2 km west of Hwy 665, Dryden	n/a	2023
6050-21-00	Beaver Creek Bridge, 9 km west of Hwy 605, Machin	n/a	2026

Pavement Rehabilitation - 2022 to 2026			
GWP	**Project Location**	**Length**	**Construction Year**
6705-15-00	English River westerly, east of Ignace	35.2 km	2022 (Carryover)
6049-20-00	4.5 km west of Hwy 599 at Ignace, easterly	19.4 km	2026
6035-19-00	West of Hwy 72 at Dinorwic westerly, Dryden	26.1 km	2025
6178-14-00	East of Hwy 105 at Vermilion Bay easterly, Machin	18.7 km	2024
6057-20-00	East of Hwy 105 at Vermilion Bay westerly, Machin	35.1 km	2026

Appendix F

SUPPLEMENTAL COLLISION ANALYSIS

Ignace Collisions Classification

Dryden

Legend

Classification

- Property Damage Only
- Non-Fatal Injury
- Fatal Injury

N

0 0.75 1.5 3 km

Hoey Rd
Zealand Lake
Wottowicz Rd
Morton Rd
Morton Rd
Groves Rd
Rice Lake
Ghost Lake Rd
Ghost Lake
Dryden Regional Airport
429 m
466 m
665
601
Pronger Rd
Lyle Rd
Zealand Rd
Airport Rd
Two Mile Corner
437 m
601
Leach Rd
Thiel Rd
Thiel Rd
Ryczko Rd
Boozhoo Ave
Wice Rd
1st St
Pioneer St
416 m
Thunder Lake Rd
17
10
17
415 m
Dryden
St-Charles St
Wilde St
Van-Horne Ave
Rutter's Bay
Canard Lake
Six Mile Corner
Thunder Lake
Birchcliff Cres
Sandy Beach Rd
Shelley Ln
10
Ledyard Island
Wabigoon Lake
Elm Bay
Anderson Island
Picnic Island
Seagull Island
Wabigoon Lake
Bonny Bay
Copeland Island
Devil's Island
Copeland Island
Grenville Island
McIntyre Dr
Larson Bay
Fox Island

Ignace Collisions Classification

Wabigoon / Dinorwic

Legend

Classification

- Property Damage Only
- Non-Fatal Injury
- Fatal Injury

N

0 0.75 1.5 3 km

Hoffstrom's Bay
Nursery Rd
Normans Rd
439 m
Dump Rd
Hughs Brk
6 & 13 Rd
Anderson Rd
474 m
Hartman Township Rd
Kelpyn Bay
Christie's Island
Maggrah Rd
Cemetary Rd
Wabigoon
Falls Rd
Nugget Creek
Barrit Bay
Armstrong Rd
Green Island
Muskie Bay
449 m
Wee Sandy Lake
Dinorwic
Southworth Concession 5
Dinorwic Lake
418 m
Olsen Lake
Robertson Rd
17
72

Ignace Collisions Classification

Dyment

Legend

Classification

- Property Damage Only
- Non-Fatal Injury
- Fatal Injury

N

0 0.75 1.5 3 km

Finlayson Lake
Battle Creek
Avery Lake
Melgund Lake Rd
515 m
Battle Creek
Trans-Canada-Hwy
Paesel Rd
463 m
Turgeon Rd 1
Melgund Lake
Kennabutch Lake
Kennabutch Lake
476 m
Jackfish Lake
Burnet Lake
Dinorwic Lake
Creed Lake
Dyment
443 m
603
Burning Lake
17
Borups Corners
River Rd
Meglund Road 2
Long Lake River
Minnin Lake Rd
Sandy Point Road 2

Ignace Collisions Classification

Tache

Legend

Classification

- Property Damage Only
- Non-Fatal Injury
- Fatal Injury

Ignace Collisions Classification

Raleigh

Legend

Classification

- Property Damage Only
- Non-Fatal Injury
- Fatal Injury

N

0 0.75 1.5 3 km

Garneau Lake
Countess Lake
Oval Lake
Hook Lake
Bulrush Lake
Eagle Rd
Bulrush Rd
522 m
539 m
Trans-Canada-Hwy
17
622
West Rd
Revell River
Weaver Rd
Barrel Rd
Raleigh
Crooked Bay Rd
Raleigh Lake Rd
Bending Creek
East Revell Lake
Revell Lake
Crocker Bay
Raleigh Lake

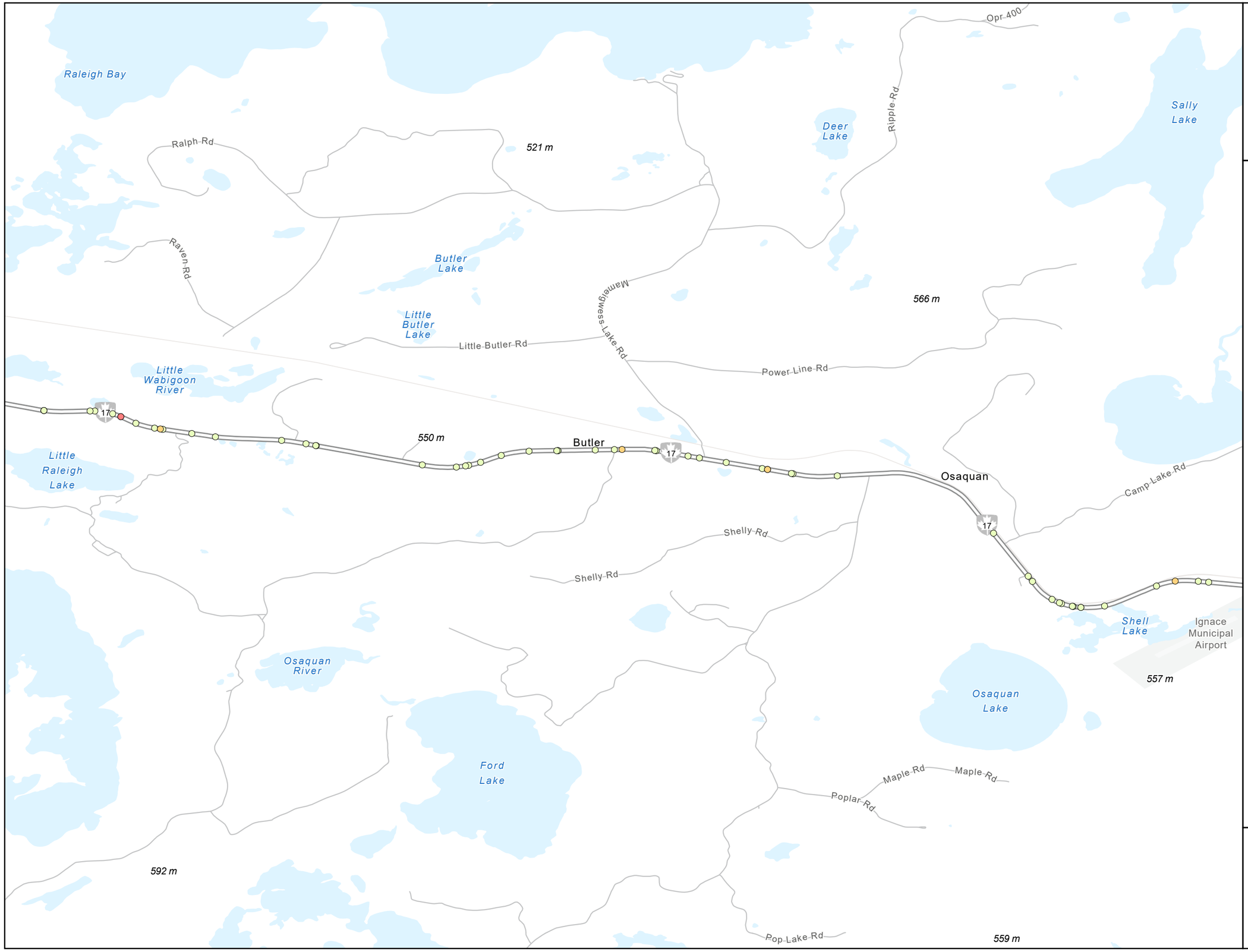
Ignace Collisions Classification

Bulter / Osaquan

Legend

Classification

- Property Damage Only
- Non-Fatal Injury
- Fatal Injury



N

0 0.75 1.5 3 km

Ignace Collisions Classification

Ignace

Legend

Classification

- Property Damage Only
- Non-Fatal Injury
- Fatal Injury

N

0 0.75 1.5 3 km

Indian Lake

Sandbar Lake

518 m

526 m

Camp Lake Rd

quan

17

Michel Lake

499 m

599

Shell Lake

Ignace Municipal Airport

557 m

Great Lakes Rd

Pickerel Bay

Parker Rd

Osaquan Lake

Ignace

West St

Davy Lake Rd

Humphrey Rd

aple Rd

Trans-Canada-Hwy

Old HWY-17

543 m

Notman

Agimak Lake

559 m

Moose Bay

Fox Lake

Trans-

Camp Ten Bay

Calf Lake

Bull Lake

Ignace Collisions Driver Actions

Dryden

Legend

Driver Action

- Disobeyed Traffic Control
- Driving Properly
- Exceeding the Speed Limit
- Failed to Yield Right of Way
- Following too Close
- Improper Lane Change
- Improper Passing
- Improper Turn
- Lost Control
- Speed too Fast for Conditions
- Speed too Slow
- Other

N

0 0.75 1.5 3 km

Wottowicz Rd
Hoey Rd
Zealand Lake
Morton Rd
Morton Rd
Groves Rd
Rice Lake
Ghost Lake Rd
Ghost Lake
Dryden Regional Airport
665
601
429 m
466 m
Pronger Rd
Lyle Rd
Zealand Rd
Two Mile Corner
601
Airport Rd
437 m
Leach Rd
Thiel Rd
Thiel Rd
Ryczko Rd
Thunder Lake Rd
Wice Rd
1st St
Pioneer St
Boozhoo Ave
416 m
17
10
17
415 m
Dryden
Rutter's Bay
Canard Lake
Six Mile Corner
Thunder Lake
St-Charles St
Wilde St
Van-Horne Ave
Birchcliff Cres
Sandy Beach Rd
Shelley Ln
Ledyard Island
Wabigoon Lake
Elm Bay
Anderson Island
Picnic Island
Seagull Island
Wabigoon Lake
Bonny Bay
Copeland Island
Devil's Island
Copeland Island
Grenville Island
McIntyre Dr
Larson Bay
Fox Island

Ignace Collisions Driver Actions

Wabigoon / Dinorwic

Legend

Driver Action

- Disobeyed Traffic Control
- Driving Properly
- Exceeding the Speed Limit
- Failed to Yield Right of Way
- Following too Close
- Improper Lane Change
- Improper Passing
- Improper Turn
- Lost Control
- Speed too Fast for Conditions
- Speed too Slow
- Other

N

0 0.75 1.5 3 km

Hoffstrom's Bay
Nursery Rd
Normans Rd
439 m
Dump Rd
Hughs Brk
6 & 13 Rd
Anderson Rd
474 m
Hartman Township Rd
17
Maggrah Rd
Kelpyn Bay
Christie's Island
Nugget Creek
Cemetary Rd
Wabigoon
Falls Rd
Barrit Bay
Armstrong Rd
Green Island
Muskie Bay
449 m
72
Wee Sandy Lake
Dinorwic
Southworth Concession 5
Dinorwic Lake
418 m
Olsen Lake
Robertson Rd
Trans-Canada Hwy

Ignace Collisions Driver Actions

Dyment

Legend

Driver Action

- Disobeyed Traffic Control
- Driving Properly
- Exceeding the Speed Limit
- Failed to Yield Right of Way
- Following too Close
- Improper Lane Change
- Improper Passing
- Improper Turn
- Lost Control
- Speed too Fast for Conditions
- Speed too Slow
- Other

N

0 0.75 1.5 3 km

Finlayson Lake
Battle Creek
Avery Lake
Melgund Lake Rd
515 m
Battle Creek
Trans-Canada-Hwy
Paesel Rd
463 m
Turgeon Rd 1
Melgund Lake
Kennabutch Lake
Kennabutch Lake
476 m
Jackfish Lake
Burnet Lake
Dinorwic Lake
Creed Lake
Dyment
443 m
603
Burning Lake
7
17
Borups Corners
River Rd
Meglund Road 2
Long Lake River
Minnin Lake Rd
Sandy Point Road 2

Ignace Collisions Driver Actions

Tache

Legend

Driver Action

- Disobeyed Traffic Control
- Driving Properly
- Exceeding the Speed Limit
- Failed to Yield Right of Way
- Following too Close
- Improper Lane Change
- Improper Passing
- Improper Turn
- Lost Control
- Speed too Fast for Conditions
- Speed too Slow
- Other

N

0 0.75 1.5 3 km

Adair Lake
Tache
Vanevery Lake
469 m
486 m
504 m
Revell sa
Bogg Lake South Rd
Revell B
Bogg 1
Tache Dr
Basket Lake Rd
Trans-Canada-Hwy
17
Pyatt Lake
Sandflat Rd
6 205 Rd E
481 m
Twin River Rd
514 m
Dyment Rd
Patent Rd
Troys Rd

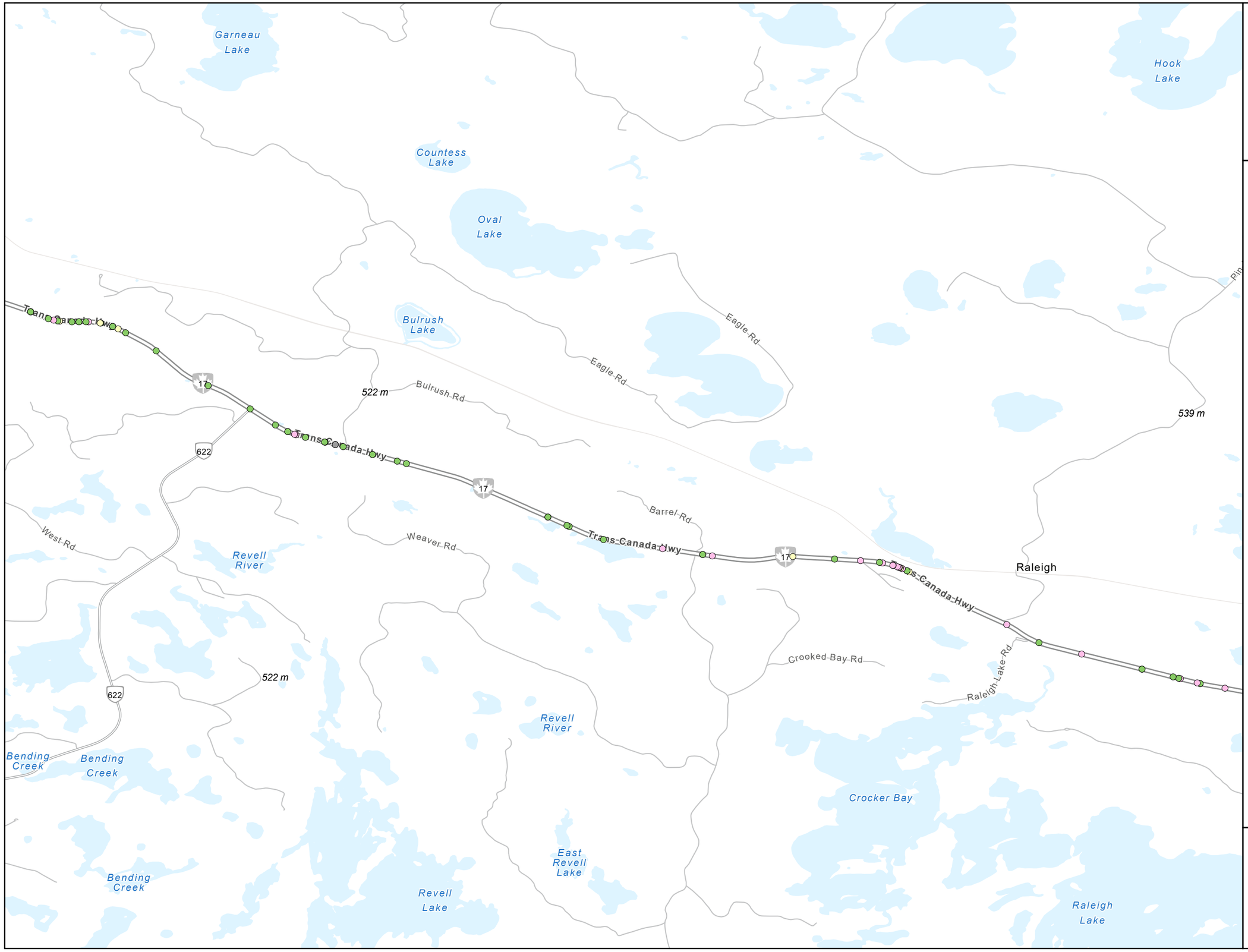
Ignace Collisions Driver Actions

Raleigh

Legend

Driver Action

- Disobeyed Traffic Control
- Driving Properly
- Exceeding the Speed Limit
- Failed to Yield Right of Way
- Following too Close
- Improper Lane Change
- Improper Passing
- Improper Turn
- Lost Control
- Speed too Fast for Conditions
- Speed too Slow
- Other

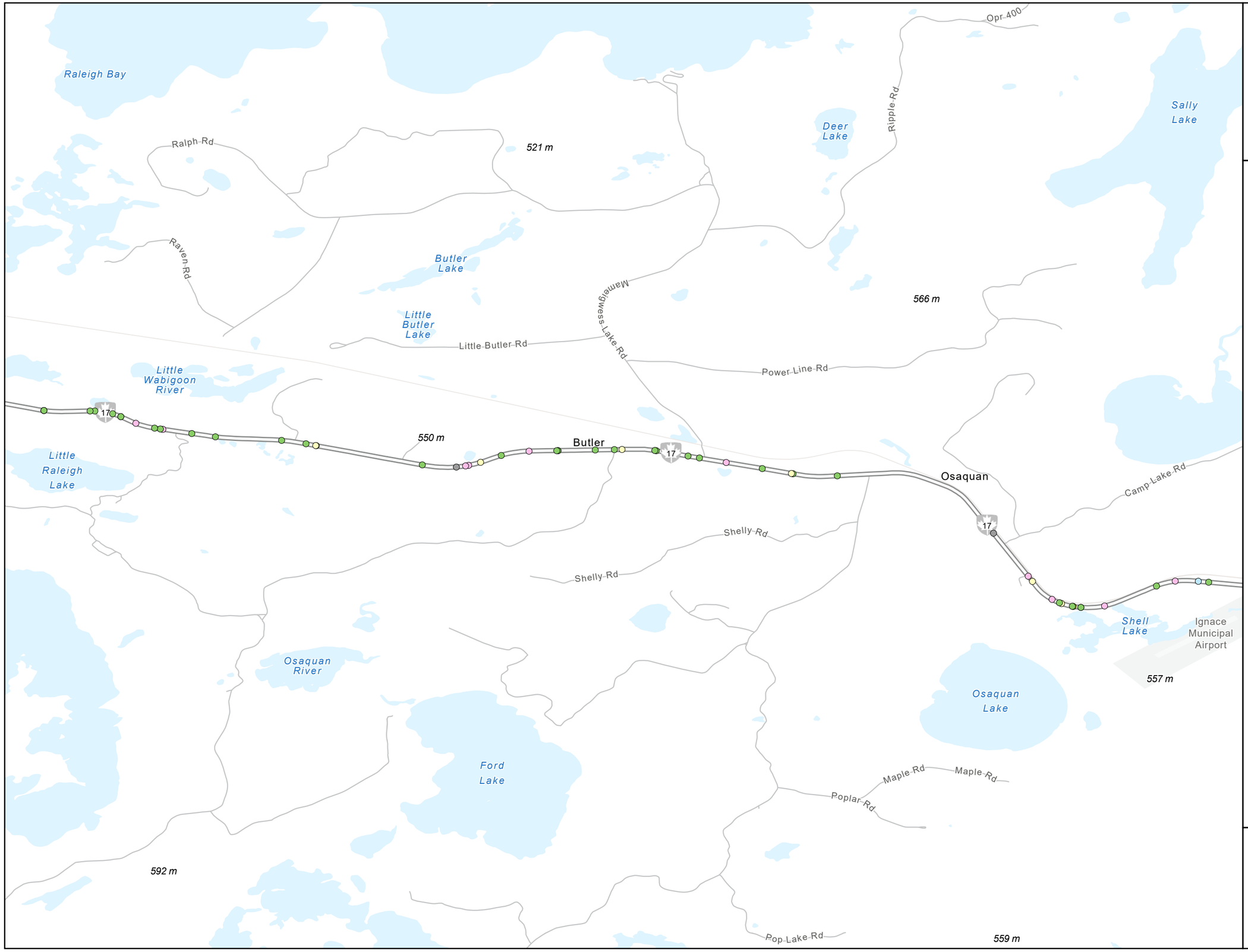


N

0 0.75 1.5 3 km

Ignace Collisions Driver Actions

Bulter / Osaquan



Legend

Driver Action

- Disobeyed Traffic Control
- Driving Properly
- Exceeding the Speed Limit
- Failed to Yield Right of Way
- Following too Close
- Improper Lane Change
- Improper Passing
- Improper Turn
- Lost Control
- Speed too Fast for Conditions
- Speed too Slow
- Other

N

0 0.75 1.5 3 km

Ignace Collisions Driver Actions

Ignace

Legend

Driver Action

- Disobeyed Traffic Control
- Driving Properly
- Exceeding the Speed Limit
- Failed to Yield Right of Way
- Following too Close
- Improper Lane Change
- Improper Passing
- Improper Turn
- Lost Control
- Speed too Fast for Conditions
- Speed too Slow
- Other

N

0 0.75 1.5 3 km

Indian Lake
Indian Lake
Sandbar Lake
518 m
Michel Lake
526 m
Camp Lake Rd
quan
17
599
499 m
Great Lakes Rd
Shell Lake
Ignace Municipal Airport
17
557 m
Pickerel Bay
Parker Rd
Osaquan Lake
Ignace
West St
Davy Lake Rd
Humphrey Rd
599
aple Rd
Trans Canada Hwy
Old HWY-17
543 m
Notman
Agimak Lake
559 m
Moose Bay
Fox Lake
17
Trans
Camp Ten Bay
Calf Lake
Bull Lake

Ignace Collisions By Year

Dryden

Legend

Year

- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

N

0 0.75 1.5 3 km

Wottowicz Rd
Hoey Rd
Zealand Lake
Morton Rd
Morton Rd
Groves Rd
Rice Lake
Ghost Lake Rd
Ghost Lake
Dryden Regional Airport
665
601
429 m
466 m
Pronger Rd
Lyle Rd
Zealand Rd
Two Mile Corner
601
Airport Rd
437 m
Leach Rd
Thiel Rd
Thiel Rd
Ryczko Rd
Thunder Lake Rd
Wice Rd
Boozhoo Ave
1st St
Pioneer St
416 m
17
17
17
415 m
Dryden
St-Charles St
Wilde St
Van-Horne Ave
Rutter's Bay
Canard Lake
Six Mile Corner
Thunder Lake
Birchcliff Cres
Shelley Ln
Sandy Beach Rd
Ledyard Island
Wabigoon Lake
Elm Bay
Anderson Island
Picnic Island
Seagull Island
Wabigoon Lake
Bonny Bay
Copeland Island
Devil's Island
Copeland Island
Grenville Island
McIntyre Dr
Larson Bay
Fox Island

Ignace Collisions By Year

Wabigoon / Dinorwic

Legend

Year

- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

N

0 0.75 1.5 3 km

Hoffstrom's Bay
Nursery Rd
Normans Rd
439 m
Dump Rd
Hughs Brk
6 & 13 Rd
Anderson Rd
474 m
Hartman Township Rd
17
Maggrah Rd
Kelpyn Bay
Christie's Island
Nugget Creek
Cemetary Rd
Wabigoon
Falls Rd
Barrit Bay
Armstrong Rd
Green Island
449 m
72
Wee Sandy Lake
Dinorwic
Muskie Bay
Southworth Concession 5
Dinorwic Lake
418 m
Olsen Lake
Robertson Rd
Trans-Canada Hwy

Ignace Collisions By Year

Dyment

Legend

Year

- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

N

0 0.75 1.5 3 km

Finlayson Lake
Battle Creek
Avery Lake
Melgund Lake Rd
515 m
Battle Creek
Paesel Rd
463 m
Trans-Canada Hwy
Turgeon Rd 1
Melgund Lake
Kennabutch Lake
Kennabutch Lake
476 m
Jackfish Lake
Burnet Lake
Dinorwic Lake
Creed Lake
Dyment
443 m
603
Burning Lake
7
17
Borups Corners
River Rd
Meglund Road 2
Long Lake River
Sandy Point Road 2
Minnin Lake Rd

Ignace Collisions By Year

Tache

Legend

Year

- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

Adair Lake

Tache

Vanevery Lake

469 m

486 m

504 m

Revell sa

Bogg Lake South Rd

Revell B

Bogg 1

Trans-Canada-Hwy

Tache Dr

Basket Lake Rd

17

Pyatt Lake

Sandflat Rd

6 205 Rd E

481 m

Twin River Rd

514 m

Dyment Rd

Patent Rd

Troys Rd

N

0 0.75 1.5 3 km

Ignace Collisions By Year

Raleigh

Legend

Year

- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

N

0 0.75 1.5 3 km

Garneau Lake
Countess Lake
Oval Lake
Hook Lake
Bulrush Lake
Eagle Rd
Bulrush Rd
522 m
539 m
17
622
Trans-Canada-Hwy
Barrel Rd
Weaver Rd
West Rd
Revell River
Raleigh
Crooked Bay Rd
Raleigh Lake Rd
Bending Creek
East Revell Lake
Revell Lake
Crocker Bay
Raleigh Lake

Ignace Collisions By Year

Bulter / Osaquan

Legend

Year

- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

N

0 0.75 1.5 3 km

Raleigh Bay
Ralph Rd
521 m
Deer Lake
Ripple Rd
Opr 400
Sally Lake
Raven Rd
Butler Lake
Little Butler Lake
Little Butler Rd
Manetagwess Lake Rd
566 m
Power Line Rd
Little Wabigoon River
17
550 m
Butler
Little Raleigh Lake
Osaquan
Camp Lake Rd
Shelly Rd
Shelly Rd
Osaquan River
Shell Lake
Ignace Municipal Airport
557 m
Osaquan Lake
Ford Lake
Maple Rd
Maple Rd
Poplar Rd
592 m
Pop Lake Rd
559 m

Ignace Collisions By Year

Ignace

Legend

Year

- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

N

0 0.75 1.5 3 km

Indian Lake
Sandbar Lake
518 m
Michel Lake
526 m
Camp Lake Rd
quan
17
599
499 m
Great Lakes Rd
Shell Lake
Ignace Municipal Airport
557 m
Pickerel Bay
Parker Rd
Osaquan Lake
Ignace
West St
Davy Lake Rd
Humphrey Rd
Trans-Canada-Hwy
Old HWY-17
543 m
Notman
Agimak Lake
Moose Bay
559 m
Fox Lake
Camp Ten Bay
Calf Lake
Bull Lake

Initial Impact

Dryden

Legend

Initial Impact

- Angle
- Approaching
- Other
- Rear End
- Sideswipe
- Single Motor Vehicle - Other
- Single Motor Vehicle - Unattended
- Turning Movement

N

0 0.75 1.5 3 km

Initial Impact

Wabigoon / Dinorwic

Legend

Initial Impact

- Angle
- Approaching
- Other
- Rear End
- Sideswipe
- Single Motor Vehicle - Other
- Single Motor Vehicle - Unattended
- Turning Movement

N

0 0.75 1.5 3 km

Hoffstrom's Bay
Nursery Rd
Normans Rd
439 m
Dump Rd
Hughs Brk
6 & 13 Rd
Anderson Rd
474 m
Hartman Township Rd
17
Kelpyn Bay
Christie's Island
Maggrah Rd
Cemetary Rd
Wabigoon
Falls Rd
Nugget Creek
Barrit Bay
Armstrong Rd
Green Island
449 m
72
Wee Sandy Lake
Dinorwic
Muskie Bay
Southworth Concession 5
Dinorwic Lake
418 m
Olsen Lake
Robertson Rd
Trans-Canada Hwy

Initial Impact

Dyment

Legend

Initial Impact

- Angle
- Approaching
- Other
- Rear End
- Sideswipe
- Single Motor Vehicle - Other
- Single Motor Vehicle - Unattended
- Turning Movement

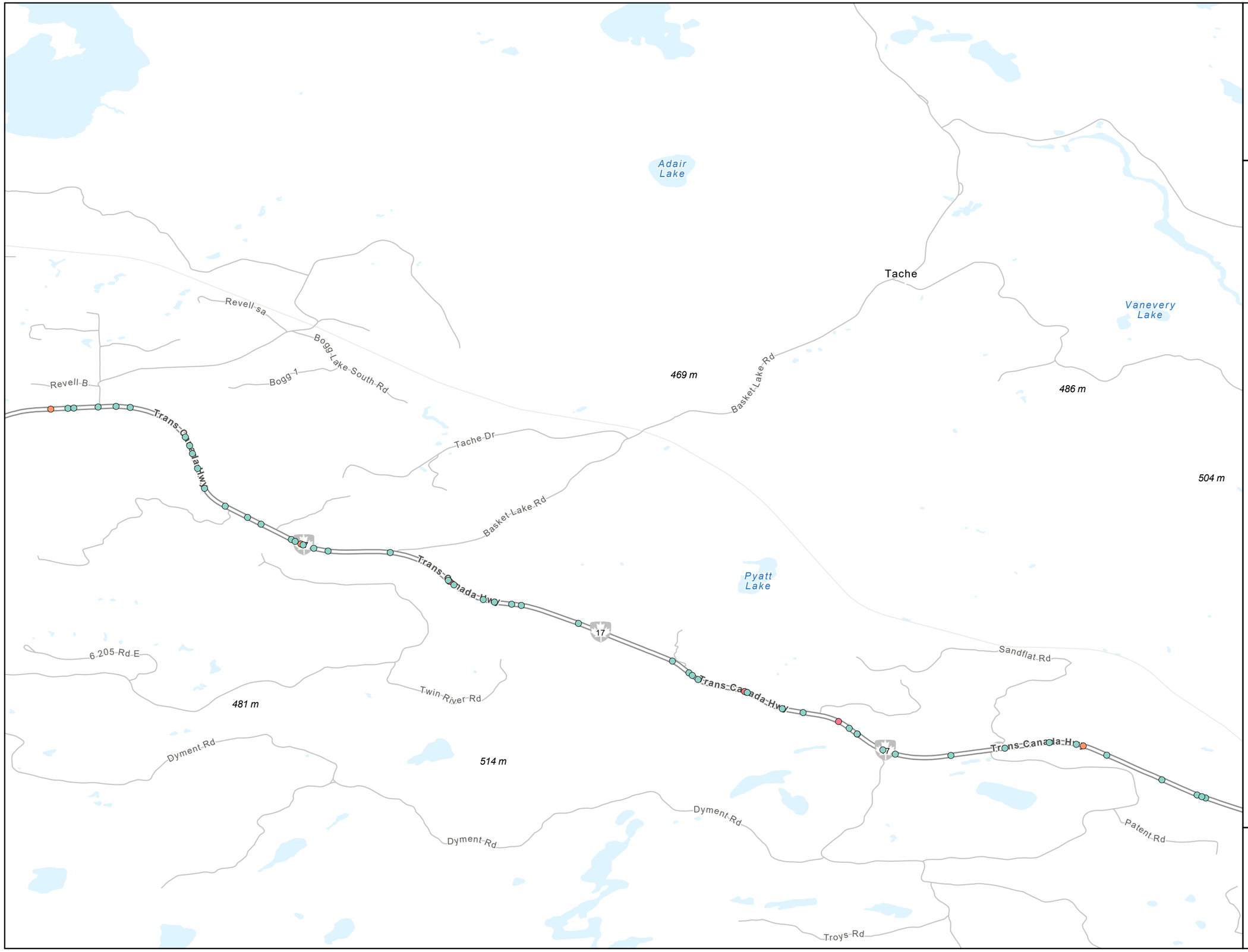
N

0 0.75 1.5 3 km

Finlayson Lake
Battle Creek
Avery Lake
Melgund Lake Rd
515 m
Battle Creek
Trans-Canada Hwy
Paesel Rd
463 m
Turgeon Rd 1
17
Melgund Lake
Kennabutch Lake
Kennabutch Lake
Jackfish Lake
Burnet Lake
476 m
Dinorwic Lake
Creed Lake
Dyment
443 m
603
7
Burning Lake
17
Borups Corners
River Rd
Meglund Road 2
Long Lake River
Sandy Point Road 2
Minnin Lake Rd

Initial Impact

Tache



Legend

Initial Impact

- Angle
- Approaching
- Other
- Rear End
- Sideswipe
- Single Motor Vehicle - Other
- Single Motor Vehicle - Unattended
- Turning Movement

N

0 0.75 1.5 3 km

Initial Impact

Raleigh

Legend

Initial Impact

- Angle
- Approaching
- Other
- Rear End
- Sideswipe
- Single Motor Vehicle - Other
- Single Motor Vehicle - Unattended
- Turning Movement

N

0 0.75 1.5 3 km

Initial Impact

Bulter / Osaquan

Legend

Initial Impact

- Angle
- Approaching
- Other
- Rear End
- Sideswipe
- Single Motor Vehicle - Other
- Single Motor Vehicle - Unattended
- Turning Movement

N

0 0.75 1.5 3 km

Raleigh Bay
Ralph Rd
521 m
Deer Lake
Ripple Rd
Opr 400
Sally Lake
Raven Rd
Butler Lake
Little Butler Lake
Little Butler Rd
Manetagwess Lake Rd
566 m
Power Line Rd
Little Wabigoon River
17
550 m
Butler
Little Raleigh Lake
Osaquan
Camp Lake Rd
Shelly Rd
Shelly Rd
Shell Lake
Ignace Municipal Airport
557 m
Osaquan River
Osaquan Lake
Ford Lake
Maple Rd
Maple Rd
Poplar Rd
592 m
Pop Lake Rd
559 m

Initial Impact

Ignace

Legend

Initial Impact

- Angle
- Approaching
- Other
- Rear End
- Sideswipe
- Single Motor Vehicle - Other
- Single Motor Vehicle - Unattended
- Turning Movement

N

0 0.75 1.5 3 km

Indian Lake
Sandbar Lake
Michel Lake
Shell Lake
Ignace Municipal Airport
Osaquan Lake
Pickerel Bay
Agimak Lake
Moose Bay
Fox Lake
Camp Ten Bay
Calf Lake
Bull Lake
Ignace
Notman
Camp Lake Rd
Great Lakes Rd
Parker Rd
West St
Davy Lake Rd
Humphrey Rd
Trans-Canada-Hwy
Old HWY-17
518 m
526 m
499 m
557 m
543 m
559 m
17
599

Sequence Of Events 1

Dryden

Legend

Sequence of Events 1

- Fixed Objects - Cable Guide Rail
- Fixed Objects - Crash Cush / End Treat
- Fixed Objects - Ditch
- Fixed Objects - Pole (Sign, Parking Meter)
- Fixed Objects - Rock Face
- Fixed Objects - Snowbank / Drift
- Fixed Objects - Steel Guide Rail
- Fixed Objects - Tree, Shrub, Stump
- Moveable Objects - Cyclist
- Moveable Objects - Domestic Animal
- Moveable Objects - Other
- Moveable Objects - Other Motor Vehicle
- Moveable Objects - Unattended Vehicle
- Moveable Objects - Wild Animal
- Other Events - Debris Falling Off Vehicle
- Other Events - Debris On Road
- Other Events - Fire / Explosion
- Other Events - Jackknifing
- Other Events - Other
- Other Events - Ran Off Road
- Other Events - Rollover
- Other Events - Skidding / Sliding

N

0 0.75 1.5 3 km

Zealand Lake
Rice Lake
Ghost Lake
Dryden Regional Airport
Hoey Rd
Wottowicz Rd
Morton Rd
Groves Rd
Ghost Lake Rd
429 m
466 m
437 m
416 m
415 m
665
601
Pronger Rd
Lyle Rd
Zealand Rd
Airport Rd
Two Mile Corner
Leach Rd
Thiel Rd
Ryczko Rd
Thunder Lake Rd
Wice Rd
1st St
Pioneer St
Boozhoo Ave
17
Dryden
Arthur St
Wilde St
Van-Horne Ave
Birchcliff Cres
Sandy Beach Rd
Rutter's Bay
Canard Lake
Six Mile Corner
Thunder Lake
Shelley Ln
Ledyard Island
Elm Bay
Bonny Bay
Wabigoon Lake
Anderson Island
Seagull Island
Picnic Island
Copeland Island
Devil's Island
Grenville Island
McIntyre Dr
Larson Bay
Fox Island

Sequence Of Events 1

Wabigoon / Dinorwic

Legend

Sequence of Events 1

- Fixed Objects - Cable Guide Rail
- Fixed Objects - Crash Cush / End Treat
- Fixed Objects - Ditch
- Fixed Objects - Pole (Sign, Parking Meter)
- Fixed Objects - Rock Face
- Fixed Objects - Snowbank / Drift
- Fixed Objects - Steel Guide Rail
- Fixed Objects - Tree, Shrub, Stump
- Moveable Objects - Cyclist
- Moveable Objects - Domestic Animal
- Moveable Objects - Other
- Moveable Objects - Other Motor Vehicle
- Moveable Objects - Unattended Vehicle
- Moveable Objects - Wild Animal
- Other Events - Debris Falling Off Vehicle
- Other Events - Debris On Road
- Other Events - Fire / Explosion
- Other Events - Jackknifing
- Other Events - Other
- Other Events - Ran Off Road
- Other Events - Rollover
- Other Events - Skidding / Sliding

N

0 0.75 1.5 3 km

Hoffstrom's Bay
Nursery Rd
Normans Rd
439 m
Dump Rd
6 & 13 Rd
Anderson Rd
474 m
Hartman Township Rd
Hughs Brk
17
Maggrah Rd
Kelpyn Bay
Christie's Island
Nugget Creek
Cemetary Rd
Wabigoon
Falls Rd
Barrit Bay
Armstrong Rd
Green Island
Muskie Bay
449 m
72
Wee Sandy Lake
Dinorwic
Southworth Concession 5
Dinorwic Lake
418 m
Olsen Lake
Robertson Rd
Trans-Canada Hwy

Sequence Of Events 1

Dyment

Legend

Sequence of Events 1

- Fixed Objects - Cable Guide Rail
- Fixed Objects - Crash Cush / End Treat
- Fixed Objects - Ditch
- Fixed Objects - Pole (Sign, Parking Meter)
- Fixed Objects - Rock Face
- Fixed Objects - Snowbank / Drift
- Fixed Objects - Steel Guide Rail
- Fixed Objects - Tree, Shrub, Stump
- Moveable Objects - Cyclist
- Moveable Objects - Domestic Animal
- Moveable Objects - Other
- Moveable Objects - Other Motor Vehicle
- Moveable Objects - Unattended Vehicle
- Moveable Objects - Wild Animal
- Other Events - Debris Falling Off Vehicle
- Other Events - Debris On Road
- Other Events - Fire / Explosion
- Other Events - Jackknifing
- Other Events - Other
- Other Events - Ran Off Road
- Other Events - Rollover
- Other Events - Skidding / Sliding

N

0 0.75 1.5 3 km

Finlayson Lake
Battle Creek
Avery Lake
Melgund Lake Rd
515 m
Battle Creek
Trans-Canada-Hwy
Paesel Rd
463 m
Turgeon Rd 1
Melgund Lake
Kennabutch Lake
Kennabutch Lake
476 m
Jackfish Lake
Burnet Lake
Dyment
Dinorwic Lake
Creed Lake
443 m
603
Burning Lake
17
Borups Corners
River Rd
Meglund Road 2
Long Lake River
Minnin Lake Rd
Sandy Point Road 2

Sequence Of Events 1

Tache

Legend

Sequence of Events 1

- Fixed Objects - Cable Guide Rail
- Fixed Objects - Crash Cush / End Treat
- Fixed Objects - Ditch
- Fixed Objects - Pole (Sign, Parking Meter)
- Fixed Objects - Rock Face
- Fixed Objects - Snowbank / Drift
- Fixed Objects - Steel Guide Rail
- Fixed Objects - Tree, Shrub, Stump
- Moveable Objects - Cyclist
- Moveable Objects - Domestic Animal
- Moveable Objects - Other
- Moveable Objects - Other Motor Vehicle
- Moveable Objects - Unattended Vehicle
- Moveable Objects - Wild Animal
- Other Events - Debris Falling Off Vehicle
- Other Events - Debris On Road
- Other Events - Fire / Explosion
- Other Events - Jackknifing
- Other Events - Other
- Other Events - Ran Off Road
- Other Events - Rollover
- Other Events - Skidding / Sliding

N

0 0.75 1.5 3 km

Sequence Of Events 1

Raleigh

Legend

Sequence of Events 1

- Fixed Objects - Cable Guide Rail
- Fixed Objects - Crash Cush / End Treat
- Fixed Objects - Ditch
- Fixed Objects - Pole (Sign, Parking Meter)
- Fixed Objects - Rock Face
- Fixed Objects - Snowbank / Drift
- Fixed Objects - Steel Guide Rail
- Fixed Objects - Tree, Shrub, Stump
- Moveable Objects - Cyclist
- Moveable Objects - Domestic Animal
- Moveable Objects - Other
- Moveable Objects - Other Motor Vehicle
- Moveable Objects - Unattended Vehicle
- Moveable Objects - Wild Animal
- Other Events - Debris Falling Off Vehicle
- Other Events - Debris On Road
- Other Events - Fire / Explosion
- Other Events - Jackknifing
- Other Events - Other
- Other Events - Ran Off Road
- Other Events - Rollover
- Other Events - Skidding / Sliding

N

0 0.75 1.5 3 km

Sequence Of Events 1

Bulter / Osaquan

Legend

Sequence of Events 1

- Fixed Objects - Cable Guide Rail
- Fixed Objects - Crash Cush / End Treat
- Fixed Objects - Ditch
- Fixed Objects - Pole (Sign, Parking Meter)
- Fixed Objects - Rock Face
- Fixed Objects - Snowbank / Drift
- Fixed Objects - Steel Guide Rail
- Fixed Objects - Tree, Shrub, Stump
- Moveable Objects - Cyclist
- Moveable Objects - Domestic Animal
- Moveable Objects - Other
- Moveable Objects - Other Motor Vehicle
- Moveable Objects - Unattended Vehicle
- Moveable Objects - Wild Animal
- Other Events - Debris Falling Off Vehicle
- Other Events - Debris On Road
- Other Events - Fire / Explosion
- Other Events - Jackknifing
- Other Events - Other
- Other Events - Ran Off Road
- Other Events - Rollover
- Other Events - Skidding / Sliding

N

0 0.75 1.5 3 km

Raleigh Bay
Ralph Rd
521 m
Deer Lake
Ripple Rd
Opr 400
Sally Lake
Raven Rd
Butler Lake
Little Butler Lake
Manetagwess Lake Rd
566 m
Little Butler Rd
Power Line Rd
Little Wabigoon River
17
550 m
Butler
Little Raleigh Lake
Osaquan
Camp Lake Rd
Shelly Rd
Shelly Rd
Shell Lake
Ignace Municipal Airport
557 m
Osaquan River
Osaquan Lake
Ford Lake
Maple Rd
Maple Rd
Poplar Rd
592 m
Pop Lake Rd
559 m

Sequence Of Events 1

Ignace

Legend

Sequence of Events 1

- Fixed Objects - Cable Guide Rail
- Fixed Objects - Crash Cush / End Treat
- Fixed Objects - Ditch
- Fixed Objects - Pole (Sign, Parking Meter)
- Fixed Objects - Rock Face
- Fixed Objects - Snowbank / Drift
- Fixed Objects - Steel Guide Rail
- Fixed Objects - Tree, Shrub, Stump
- Moveable Objects - Cyclist
- Moveable Objects - Domestic Animal
- Moveable Objects - Other
- Moveable Objects - Other Motor Vehicle
- Moveable Objects - Unattended Vehicle
- Moveable Objects - Wild Animal
- Other Events - Debris Falling Off Vehicle
- Other Events - Debris On Road
- Other Events - Fire / Explosion
- Other Events - Jackknifing
- Other Events - Other
- Other Events - Ran Off Road
- Other Events - Rollover
- Other Events - Skidding / Sliding

N

0 0.75 1.5 3 km

Indian Lake
Sandbar Lake
518 m
quan
Camp Lake Rd
526 m
17
Michel Lake
599
499 m
Shell Lake
Ignace Municipal Airport
557 m
Great Lakes Rd
Pickerel Bay
Parker Rd
Osaquan Lake
Ignace
West St
Davy Lake Rd
Humphrey Rd
aple Rd
Trans-Canada-Hwy
Old HWY-17
543 m
Notman
Agimak Lake
559 m
Moose Bay
Fox Lake
Camp Ten Bay
Calf Lake
Bull Lake

Appendix G

NWMO EMERGENCY SERVICE PROVIDERS AND MUNICIPAL DATA

Police Force	Division/Station	Street Address	City	Province
OPP	Atikokan	HWY-622	Atikokan	ON
OPP	Dryden	15550 HWY-17	Dryden	ON
OPP	Ear Falls	HWY-105	Ear Falls	ON
OPP	Emo	HWY-11	Emo	ON
OPP	Ignace	17 HWY-17	Ignace	ON
OPP	Kenora	20A Anderson Rd	Kenora	ON
OPP	Rainy River	622 Atwood Ave	Rainy River	ON
OPP	Fort Frances	320 Portage Rd Ave	Fort Frances	ON
OPP	Sioux Lookout	62 Queen Street	Sioux Lookout	ON
OPP	Sioux Narrows-Nestor Falls	HWY-71	Sioux Narrows-Nestor Falls	ON

Service Provider_Agency	Station	Street Address	City	Postal Code	Province	Catchement ON
Northwest EMS	Nestor Falls	7 Airport Rd	Nestor Falls	P0X1K0	ON	
Northwest EMS	Ignace	301 Rand St	Ignace	P0T 1T0	ON	
Northwest EMS	Sioux Narrows	10 Fickas Rd	Sioux Narrows	P0V 1N0	ON	
Northwest EMS	Kenora (HQ)	80 14th St N	Kenora	P9N 3W7	ON	
Northwest EMS	Dryden	58 Goodall St	Dryden	P8N 2Z2	ON	
Northwest EMS	Sioux Lookout	3 Meno-Ya-Win Way	Sioux Lookout	P9T 1B8	ON	
Rainy River District Social Services Administration Board	Atikokan	114 Dorothy Street	Atikokan		ON	East to Shabaqua, overlapping with Superior North EMS between Shebandowan and Shabaqua West to Mine Centre, overlapping with Fort Frances Base from Mine Centre to Siene River bridge North to Kenora District Line, South to the USA border.
ORNGE	Kenora	1621C Airport Rd	Kenora	P9N 0B6	ON	
Northwest EMS	Kenora (2)	2378 Hwy 17 E	Kenora	P9N 0G8	ON	
Rainy River District Social Services Administration Board	Emo	32 Florence Street	Emo		ON	East to Devlin, overlapping with Fort Frances Station between Emo and Devlin West to Stratton, overlapping with Rainy River Station North to Kenora District Line, South to the
Rainy River District Social Services Administration Board	Rainy River	708 Atwood Avenue	Rainy River		ON	East to Emo, overlapping with Emo Station between Emo and Stratton; West to the USA border/Lake of the Woods; North to Kenora District Line; South to the USA border
Rainy River District Social Services Administration Board	Fort Frances	801 Scott Street	Fort Frances		ON	East to Seine River, overlapping with Atikokan Station between Seine River and Mine Centre West to Emo, overlapping with Emo Station from Devlin; North to Kenora District
Superior-North EMS	Upsala	North Rd	Upsala	P0T 2Y9	ON	

NAME	ADDRESS *	CITY	MUNICIPAL	PROV	POST_CODE	Staffing of Organization (Paid/Volunteer/Hybrid)	Organization Level
ATIKOKAN FIRE STATION	101 GOODWIN ST	ATIKOKAN	ATIKOKAN	ON	P0T1C0		
DRYDEN FIRE SERVICE	189 COLONIZATION AVE S	DRYDEN	DRYDEN	ON	P8N2M6	Hybrid	Local
DRYDEN FIRE SERVICE - HALL 2	HIGHWAY 17 E	DRYDEN	DRYDEN	ON		Hybrid	Local
FORT FRANCES FIRE DEPARTMENT	320 PORTAGE AVE	FORT FRANCES	FORT FRANCES	ON	P9A3P9		
IGNACE FIRE DEPARTMENT	115 FRONT STREET	IGNACE	IGNACE	ON	P0T1T0	Volunteer	Regional
KENORA FIRE AND EMERGENCY SERVICE	2866 HWY 17	KENORA	KENORA	ON	P0X1H0		
STATION 2		NESTOR FALLS	SIOUX NARROWS-NESTOR FALLS	ON			
NEWBURY FIRE STATION	317 6 ST	RAINY RIVER	RAINY RIVER	ON	P0W1L0		
SIOUX LOOKOUT FIRE DEPARTMENT	39 5 AVE	SIOUX LOOKOUT	SIOUX LOOKOUT	ON	P8T1K9		
SIOUX LOOKOUT FIRE MANAGEMENT HEADQUARTERS	237 HWY 72	SIOUX LOOKOUT	SIOUX LOOKOUT	ON	P0V1X0		
SIOUX LOOKOUT MENO YA WIN HEALTH CENTRE	69 FRONT ST	SIOUX LOOKOUT	SIOUX LOOKOUT	ON	P8T1A1		
STATION 1		SIOUX NARROWS	SIOUX NARROWS-NESTOR FALLS	ON			
UPSALA FIRE DEPARTMENT	9 NORTH ROAD	UPSALA	THUNDER BAY, UNORGANIZED	ON	P0T2Y0	Volunteer	Local

Appendix H

APM TRAFFIC VOLUME ESTIMATES

NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Tel. 416.934.9814
Fax 416.934.9526
Toll Free 1.866.249.6966

22 St. Clair Avenue East, Sixth Floor
Toronto, Ontario M4T 2S3, Canada
www.nwmo.ca

Appendix A

HATCH | GOLDER MEMBER OF WSP

Nuclear Waste Management Organization
Repository Design Development
Traffic Study Inputs - Ignace and South Bruce Sites

nwmo

Ignace Site

Trips Information					Frequency - Trucks/Week (Round Trip)										
					Construction Period (Year)										Operations Period Years 11-56
Commodity Code	Material Type	Input or Output from Site?	Vehicle Type	Vehicle Capacity	1	2	3	4	5	6	7	8	9	10	Typical Year
Y	Excavated Rock (to/from ERMA)	Output	Haul Truck	50T Construction / 40T Operations	1297	1285	80	151	179	197	175	117	25	5	37
N/A	Personnel	Input/Output	Bus	20 People	148	148	148	148	148	148	148	148	148	148	131
N/A	Personnel	Input/Output	Personnal vehicle	1 Person	329	329	329	329	329	329	329	329	329	329	290
A	Site Development	Input	Haul Truck	50T	216	216	0	0	0	0	0	0	0	0	0
B	Mining	Input	Flatdeck Truck	20T	0	0	3	5	7	8	8	6	2	1	1
C	Concrete[1]	Input	Bulk Material Trucks	50T Construction/ 30T Operations	25	26	63	142	212	254	210	131	39	26	3
D	Roadworks, Drainage & Paving	Input	Bulk Material Trucks	50T Construction/ 30T Operations	0	26	0	0	0	0	0	0	0	0	0
E	Earthwork	Input	Haul Truck	50T Construction/ 30T Operations	3	2	0	0	0	0	0	0	0	2	0
F	Architectural	Input	Flatdeck Truck	20T	1	1	4	7	10	11	9	5	1	1	0
L	Electrical Equipment	Input	Flatdeck Truck	20T	1	0	1	1	1	1	1	1	1	1	0
M	Mechanical Equipment	Input	flatdeck truck/oversized load	20T	1	2	1	2	1	1	1	1	1	1	12
O	Mobile Equipment	Input	flatdeck truck/oversized load	20T	0	1	0	0	0	0	0	1	1	1	0
P	Pipework & Fittings	Input	Flatdeck Truck	20T	1	1	1	2	2	2	3	3	1	1	1
S	Structural Steel	Input	Flatdeck Truck	20T	2	2	1	2	1	1	1	1	2	1	2
W	Wire & Cable	Input	Flatdeck Truck	20T	1	1	1	1	2	2	2	2	1	1	1
X	Miscellaneous Supplies	Input	Flatdeck Truck	20T	1	1	1	1	0	1	1	1	1	1	18
Z	Bentonite	Input	Bulk Material Trucks	30T	0	0	0	0	0	0	0	0	0	0	21
I1	Used Fuel Transportation Packages[2]	Input	UFTP Trucks	1 ea	0	0	0	0	0	0	0	0	0	0	16
I2	UFTP and BTP Escort Vehicles[2]	Input	Light duty vehicle	1 ea	0	0	0	0	0	0	0	0	0	0	16
G	Fuel and Lubricants[3]	Input	Fuel Trucks/ Flatdeck trucks	varies	6	6	6	6	6	6	6	6	6	6	4
K	Waste and Recycling[3]	Output	Waste Trucks	TBD	6	6	6	6	6	6	6	6	6	6	4
				Total (To/From ERMA)	1297	1285	80	151	179	197	175	117	25	5	37
				Contingency	10	10	10	10	10	10	10	10	10	10	10
				Total (To/From Off-Site)	751	778	575	662	735	780	735	651	549	536	530

Notes:
1 The concrete batch plant gets constructed in Year 1. After this year, concrete quantities refers to bulk materials to make concrete on site.
2 ~16 UFTP trucks/week (round trip) based on 625 UFTPs / year over a 9 month period. This number will vary based on the shipment of UFTPs or BTPs and load restrictions, as per "Deep Geological Repository Transportation System Conceptual Design Report Crystalline / Sedimentary Rock".
3 It is assumed that the fuel, lubricants and waste quantities for the construction period will be 1.5 times the Operations period amounts.

Appendix I

MTO LAND DEVELOPMENT REVIEW AND HIGHWAY CORRIDOR MANAGEMENT PERMITS SYNOPSIS

MTO Land Development Review and Highway Corridor Management Permits Synopsis

The following is a synopsis of the Land Development Review requirements and Highway Corridor Management Permits process for when a new access is required within a provincial highway right-of-way.

Land Development Review:

- **Pre-Consultation:** The MTO strongly encourages early consultation such that stakeholders can grasp a clear picture of the MTO review process, requirements, personnel to engage, and timelines; as well as the expectations regarding associated planning, design and construction including engineering consultant qualifications. Early and continued consultation by municipalities, land developers and other stakeholders helps ensure that all expectations are clearly understood at the beginning of a project and provides the following key benefits including any concerns regarding impacts of a proposal on provincial highway operations and safety so that they can be addressed and resolved before plans are carried forward, streamlining the latter stages of review.
- **Highway Access Management:** Highway Access Management is the process that manages entrances onto provincial highways, at highway interchanges and intersections, and onto municipal roads in the vicinity of a provincial highway within an MTO Controlled Area. Highway access is often a vital component in the MTO land development review process. When feasible access is secured for a property early in the planning process, it paves the way for other design work which is inherently more flexible.
- **Traffic Impacts:** A Traffic Impact Study (TIS) is a study intended to assess the impact of a proposed development on the existing transportation network infrastructure. It identifies the on-site and off-site measures to be undertaken in order to maintain or enhance the transportation system's performance after the development is built and operational. The current parameters, policies, guidelines, methods and assumptions for the preparation of a TIS submission are outlined in the MTO General Guidelines for the Preparation of Traffic Impact Studies, Feb 2021.
- **Storm Water Management:** MTO reviews Storm Water Management for land development proposals and other works that may have an impact on a provincial highway. Storm Water Management is often a key component of the MTO development review process, helping to strengthen the management of highway drainage works and preserve the integrity of highway infrastructure. This currently follows the MTO Stormwater Management Requirements for Land Development Proposals, 2009 (Rev 2022-04).

Highway Corridor Management Permits:

Permits are issued by MTO's Highway Corridor Management Offices under the Public Transportation and Highway Improvement Act. In the case of the APM Project this would be the Kenora Office. Applications are reviewed to ensure they follow all policy rules and guidelines. An MTO Permit may be required if you are planning to construct on or adjacent to a provincial highway. Permit types include Building and Land Use, Entrance, Sign, and Encroachment.

- **Sign:** If the APM project requires the erection of a sign or advertising device on the property within 400m (¼ mile) of any provincial highway right-of-way, a permit may be required. There are certain restrictions as

to setback, size and location, that are considered when issuing sign permits. The MTO requires 30 business days to process the permit application and communicate a decision.

- **Building and Land Use:** A Building and land use permit may be required for the commercial development, based on the land use and the proximity of the construction to a provincial highway. The MTO processing time varies from 20 business days for basic commercial, 60 business days for comprehensive minor, or longer for comprehensive major (Subject to Environmental Assessment).
- **Entrance**: The ministry controls all residential and commercial entrances to provincial highways and all entrances must be constructed to ministry standards. An entrance permit is warranted when: a new entrance to a highway is constructed from a commercial development, an existing residential or commercial entrance is upgraded or modified. The MTO requires 20 business days for basic commercial, and 60 business days for comprehensive commercial permits.
- **Encroachment:** Typically, an encroachment is any installation or works, upon, under or within the limits of a provincial highway right-of-way placed by someone other than MTO. Encroachments may include signs, survey work, banners, acceleration and deceleration lanes, curbs, gutters, sidewalks, safety islands, sewers, pipelines, coaxial or fibre optic cable, or other works or structures that may during the construction, installation, or maintenance thereof, obstruct, cause material to be deposited upon, enter upon, take up, bridge over, tunnel under or in any way interfere with the land within the limits of a highway or the roadway or any structure forming a part of the highway. The MTO requires 35 business days to process the permit application and communicate a decision.

When submitting applications for Highway Corridor Management permits, all relevant supporting documents: drawings, plans, photos, supporting reports (i.e. Storm-water Management, Traffic Impact Study), or other related documents need to accompany the submission.

What is the purpose of Access Management?

The purpose of access management is to provide safe and efficient access to land development while protecting the role of the provincial highway network by:

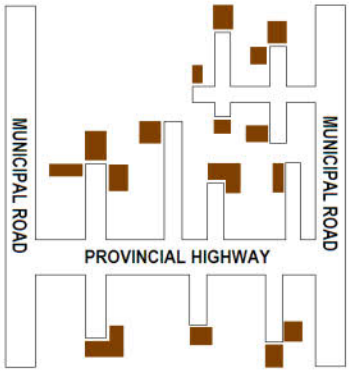
- protecting the mobility (people/ goods movement) and functionality (safety/operation) of the provincial highway network
- promoting a municipal roadway network that supports development (sustainability)
- avoiding costly/challenging remedial measures such as highway widening or by-passes

How does Access Management promote coordination of land use planning with transportation planning?

Access management helps to balance the movement of people and goods by coordinating land use planning and the design of access between highways and land development. It encompasses a range of methods that promote safe and efficient travel (i.e. goods movement, transit, active transportation, etc.) by reducing conflicts in the vicinity of the provincial highway transportation system. These methods include different treatments for rural and urban highway situations.

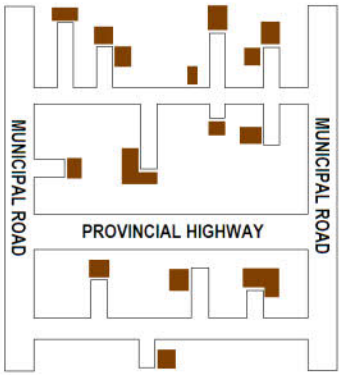
We encourage municipalities and stakeholders to consider the following principles when planning their development:

- access from the municipal road network rather than direct provincial highway access
- appropriate spacing between intersections and entrances, and from interchange ramps
- good traffic flow is an essential component of successful development
- good access management protects municipal roads and provincial highways to meet current and projected travel needs



Development Pattern <u>not</u> likely to be approved

- Too many access connections along the highway
- Results in congestion and impacts driver safety



Development Pattern likely to be approved

- Access connections along the municipal road vs. the highway
- Results in good traffic flow and preserves driver safety

Where can you find more information about MTO Access Management policies?

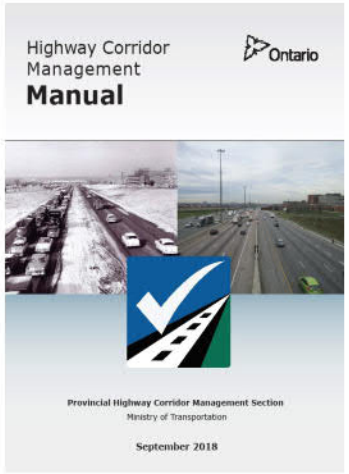
The MTO has incorporated the majority of its Highway Corridor Management policies, best practices and specifications within its Highway Corridor Management Manual.

Chapter 4 of the manual is dedicated to Access Management and includes a clear set of principles, policies and standards to promote consistency across the provincial highway network and to help municipalities and stakeholders (e.g. property owners, developers and agencies) incorporate access management into their planning process.

Links to the manual and other important resources can be found on the back of this brochure.

The Manual provides useful information, such as:

- principles, benefits and best practices of access management
- application of the Manual in the Greater Toronto and Hamilton Area (GTHA)
- access spacing policies and standards
- highway designation and classification systems



How will the Highway Corridor Management Manual help you?

The Manual should be referenced by anyone looking to develop land adjacent to a provincial highway and / or construct a new entrance (e.g. residential, commercial, or public road) onto a provincial highway or in the vicinity of a highway intersection or interchange ramp.

It will help you understand MTO's access management principles, policies, standards and documentation requirements and how decisions are made during the permit approval process. In addition, it will help you determine what you need to submit when applying for an Entrance Permit and/or Building and Land Use Permit.

Ministry of Transportation

When do you need a permit from MTO?

The table below provides a summary of when you need a permit under the statutory authority of the *Public Transportation and Highway Improvement Act* .

Summary of when you need an MTO permit:	
An MTO permit is required if you want to...	**Within ...**
Place a building, structure, entrance or any road	• 45 m of the limit of any highway • 180 m of the centre point of any intersection (on King's highways) • 395 m of the centre point of any intersection/interchange (on controlled-access highways…e.g. Highway 401)
Place a sign	• 400 m of the limit of the highway
Change the use of land in a way that will generate a large amount of traffic	• 800 m of the limit of the highway

Ontario

Ministry of Transportation

Is Access Management something new?

No. In fact the Ministry of Transportation has been controlling access onto its highways since 1939 when the 'The Highway Improvement Act' was amended to allow the Lieutenant Governor in Council to make regulations prohibiting or regulating the opening of private roads and entrances onto the highway. The current version of the Act is the *Public Transportation and Highway Improvement Act*.

Do you have questions about MTO's Access Management Policies?

Access Management policies and guidance can be found in Chapter 4 of the MTO Highway Corridor Management Manual. Download a PDF copy of the manual from the resources section of MTO's Highway Corridor Management website:
http://www.mto.gov.on.ca/english/highway-bridges/highway-corridor-management/index.shtml

You may submit a general inquiry through the MTO Highway Corridor Management System (HCMS) for more information. HCMS offers a range of other on-line services including permit application:
https://www.hcms.mto.gov.on.ca/

A listing of Corridor Management Offices can be found in the contacts section of MTO's Highway Corridor Management website:
http://www.mto.gov.on.ca/english/highway-bridges/highway-corridor-management/index.shtml

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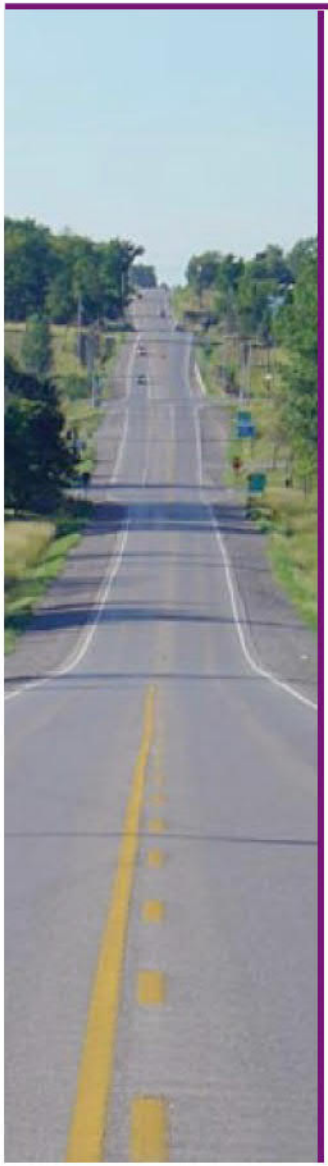
Ontario

Ministry of Transportation (MTO)

Access Management



Information for Those Considering Access to a Provincial Highway or Adjacent Roads

Ontario

Appendix J

GLOSSARY OF TERMS

J

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.