Peterborough County

Operation of Off-Road Vehicles on County Roads

Final Report – June 2022

paradigm TRANSPORTATION SOLUTIONS LIMITED

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1 Introduction

1.1 Overview

Off-road vehicles (ORVs) are a popular form of recreation for outdoor enthusiasts in Ontario. These vehicles can also serve an important utilitarian function in rural and remote communities, especially in case of emergencies, provided users obey the law and follow safety precautions.

In Ontario, the *Highway Traffic Act* regulates the operation of ORVs on public highways. Under the legislation and related Ontario Regulation 316/03, municipalities have the authority to pass by-laws to define if, where, and when ORVs can travel on their roads.

The Council of the County of Peterborough (County) first passed a by-law governing the operation of All-Terrain Vehicles (ATVs) on County roads in November 2011 (By-law No. 2011-69). The County subsequently updated the by-law in 2012, 2013, and 2016. By-law No. 2016-35 (the ORV By-law), which remains in effect today, sets out the rules for the operation of ORVs on Peterborough County roads. The current by-law limits ORV access to 11 roadway sections in the Township of Havelock-Belmont-Methuen.

The County initiated a review of the ORV By-law in 2018, which resulted in County Council referring the matter to the Transportation Master Plan Update. Undertaking the review as part of the broader master plan study would allow for a more comprehensive, systematic, and consultative assessment of the myriad financial, safety, economic, and health considerations related to the operation of ORVs on County roads.

This report summarizes the findings of the ORV By-law review completed as part of the **2022 Peterborough County Transportation Master Plan Update**.

1.2 Decision-Making Process

At its meeting on June 2, 2021, County Council approved the six-stage decision-making process illustrated in **Figure 1.1** to guide the ORV By-law review. **Table 1.1** summarizes the tasks completed for each stage of the process. The *italicized text* denotes tasks revised or added in response to direction received from County Council on December 15, 2021 after presenting the proposed recommended strategy for consideration during Stage 5.

Engagement with the public, agencies, First Nations, lower-tier municipalities, and other stakeholders played a critical role in the decision-making process. Feedback received through the different outreach initiatives provided valuable insight into community and stakeholder sentiment related to the operation of ORVs on County roads and helped inform the recommended strategy. The **Engagement Summary Report** in **Appendix A** summarizes the activities conducted and feedback received through this process.

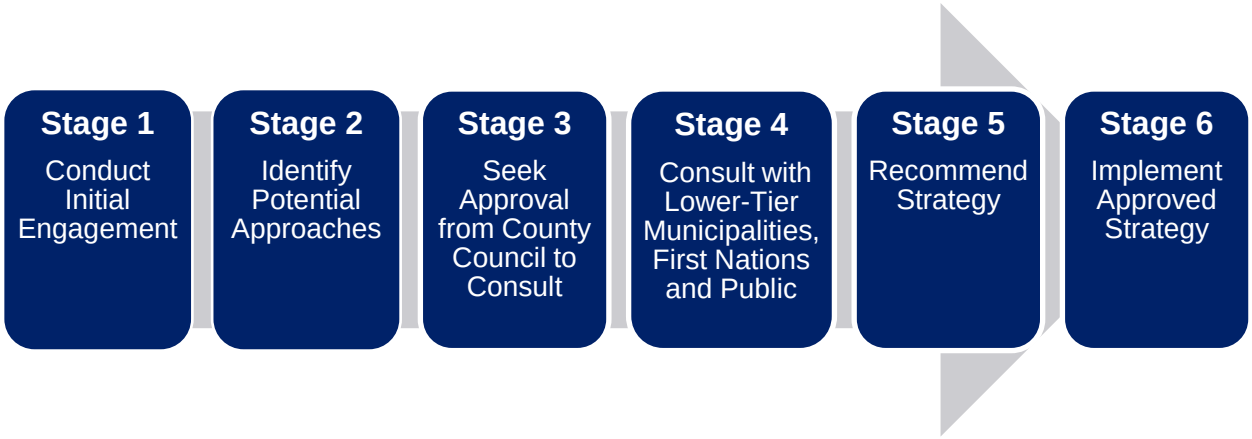


FIGURE 1.1: THE COUNTY'S DECISION-MAKING PROCESS

1.3 This Report

The remainder of the **Operation of Off-Road Vehicles on County Roads Report** is structured as follows:

- **Chapter 2** outlines the **context for the by-law review**, summarizing the regulatory framework applying to the operation of ORVs on public roads in Peterborough County and routes currently available for ORV use;
- **Chapter 3** details the **considerations** influencing development of the recommended strategy;
- **Chapter 4** summarizes the **recommended strategy** for addressing the operation of ORVs on County roads and documents the steps followed in developing the plan;
- **Chapter 5** identifies a series of **complementary actions** to support implementation of the recommended strategy;
- **Chapter 6** describes the **potential financial implications** for the County and its lower-tier municipalities of implementing the recommended strategy; and
- **Chapter 7** summarizes the study **conclusions and recommendations**.

A series of three appendices support the report.

TABLE 1.1: DECISION-MAKING PROCESS TASKS

Process Stage	Tasks
Stage 1 Conduct Initial Engagement	• Issue Notice of Commencement • Carry out ORV surveys • Seek input from stakeholders on issues and opportunities • Initiate engagement with lower-tier municipal staff and First Nations
Stage 2 Identify Potential Approaches	• Research and identify potential approaches for addressing the operation of ORVs on County roads • Provide update to Transportation Master Plan Steering Committee
Stage 3 Seek Approval from County Council to Consult	• Seek approval from County Council to consult with lower-tier municipalities, First Nations, and public on potential approaches and implementation considerations
Stage 4 Consult with Lower-Tier Municipalities, First Nations and Public	• Meet with lower-tier municipal staff and First Nations representatives to discuss potential approaches and implementation considerations • Present to lower-tier municipal councils • Conduct online public consultation
Stage 5 Recommend Strategy	• Develop strategy (preferred approach and implementation) for the operation of ORVs on County roads based on feedback received • Present *proposed* recommended strategy to Transportation Master Plan Steering Committee and County Council *for endorsement in principle and authorization to release* • *Circulate proposed recommended strategy to lower-tier municipalities and First Nations and request response* • *Meet with lower-tier municipal staff and First Nations representatives to discuss recommended strategy and present to lower-tier municipal councils on request* • Present final recommended strategy to Transportation Master Plan Steering Committee and County Council for approval
Stage 6 Implement Approved Strategy	• Implement approved strategy for the operation of ORVs on County roads (e.g., by-law amendments, signing, etc.) • Conduct educational campaign to inform community of strategy and implications

2 Context for By-law Review

This chapter highlights the regulatory framework applying to the operation of ORVs on public roads in Peterborough County and routes currently available for ORV use.

2.1 Provincial Legislation

The *Highway Traffic Act* regulates the operation of motorized and other vehicles on public roads in Ontario. Section 191.8 of the Act specifies the provisions related to ORV use. Subsections (2.1) and (3) state:

(2.1) A regulation made under subsection (2) may,

(a) provide that a provision of the regulation that permits the operation of off-road vehicles on a highway or part of a highway does not apply with respect to a highway or part of a highway that is under the jurisdiction of a municipality if the municipality by by-law prohibits such operation; or

(b) prescribe limitations on the authority of a municipality to pass a by-law under clause (3)(a) permitting the operation of off-road vehicles or classes of off-road vehicles on any highway within the municipality that is under the jurisdiction of the municipality, or on any part or parts of such highway.

(3) The council of a municipality may pass by-laws,

(a) permitting the operation of off-road vehicles or classes of off-road vehicles on any highway within the municipality that is under the jurisdiction of the municipality, or on any part or parts of such highway, subject to any limitations prescribed under clause (2.1)(b);

(b) prohibiting the operation of off-road vehicles on any highway within the municipality that is under the jurisdiction of the municipality, or on any part or parts of such highway, in accordance with a regulation under clause (2.1)(a);

(c) prescribing a lower rate of speed for off-road vehicles than that prescribed for off-road vehicles by regulation on any highway within the municipality that is under its jurisdiction, or on any part or parts of such highway, including prescribing different rates of speed for different highways or parts of highways.

Municipal by-laws may also prescribe times of operation.

The *Off-Road Vehicles Act* regulates the operation of ORVs in Ontario but does not apply to their use on public roads. Subsection 2 (2) of the Act does allow a holder of a driver's licence to drive an ORV:

- Directly across a highway; or
- On a highway, if the vehicle is designed to travel on more than two wheels and the driver is,
  - A farmer using the vehicle for agricultural purposes, or
  - A person licensed to trap furbearing mammals, if the person is using the vehicle for trapping purposes,

  and the vehicle or a vehicle drawn by it bears a slow-moving vehicle sign.

Ontario Regulation 316/03, the regulation referenced in Section 191.8 of the *Highway Traffic Act*, lists the motorized vehicle types designed for off-road use. The following types are allowed on-road if permitted by municipal by-law and meet the requirements of the *Highway Traffic Act* and the *Off-Road Vehicles Act*:

- **Single Rider All-Terrain Vehicles (ATV)** travel on four tires, have a seat designed to be straddled by the operator, have handlebars for steering control, and must be designed by the manufacturer to carry a driver only and no passengers.
- **Two-Up All-Terrain Vehicles (ATV)** are equipped with straddle-style seating and designed and intended for use by an operator or an operator and only one passenger.
- **Recreational Off Highway Vehicles (ROV)** have two abreast seats, are typically built with a hood, and use a steering wheel instead of a motorcycle steering handlebar.
- **Utility Terrain Vehicles (UTV)** are generally designed for utility rather than for recreational purposes, similar characteristics to an ROV, and typically feature a box bed.
- **Extreme-Terrain Vehicles (XTV)**, or Argos, have six or more wheels and are capable of riding in multiple terrains, including through water. Tracked versions are not permitted on road and are restricted to off-road use only.
- **Off-Road Motorcycles (ORM)** are two wheeled, with varying configurations including, but not limited to: recreational ORMs, trail ORMs, or competition ORMs.

The following rider and passenger safety requirements apply where ORVs are permitted on roadways in Ontario:

- All riders and passengers must wear an approved motorcycle helmet.
- Riders must have a valid G2/M2 or greater driver's license when operating on a permitted road.
- All ORVs must be registered with the Ministry of Transportation, Ontario (MTO) and have a valid permit. This includes vehicles that are operated exclusively on one's own property.

- ORVs cannot be registered to anyone under the age of 16.
- Riders must travel at speeds less than the posted speed limit.
- A seat belt must be worn, where provided by the manufacturer.
- The number of occupants is limited to the number of available seating positions.
- Persons under 16 years of age are not permitted to drive an ORV except on land occupied by the vehicle owner and while under close supervision of an adult.
- ORVs must be insured under an automobile insurance policy.

Enforcement personnel have instituted a zero tolerance for those who choose to ride without the necessary documentation. Those riding without a license or insurance face stiff penalties and fines.

ORVs are permitted to operate on the shoulders of select provincial highways, including sections of Highway 28 in Peterborough County, pursuant to the regulation.

Prior to January 1, 2021, similar operation of ORVs on all municipal roads had to be enabled by by-law. With amendments to Ontario Regulation 316/03 that came into effect in 2021, ORVs are now allowed to operate on lower-tier municipal (township) roadways within the County unless specifically prohibited by by-law. It is noted this amendment did not impact the County, with an enabling by-law still required to permit the operation of ORVs on County roads.

2.2 Municipal By-laws

The current ORV By-law sets out the rules governing the operation of ORVs on Peterborough County roads. The by-law provides direction on:

- Permitted roadways;
- Speed limits;
- Equipment requirements;
- Exhaust systems;
- Times and requirements of operation;
- Prohibited lands;
- Travel direction; and
- Exempted users

Like other by-laws for predominately rural municipalities, the ORV By-law focuses on nuisance and safety factors with provisions to:

- Set ORV speed limits to 20 km/h in 50 km/h zones and 50 km/h in zones allowing 50 km/h or more;
- Prohibit ORV operation between 9:00 PM and 8:00 AM; and
- Prohibit ORV operation at decibel levels above the manufacturer's recommendation.

The by-law also explicitly states that ORVs are permitted:

- On short sections of County road for the purpose of connecting trails on public or private property;
- Only on sections of County road that have gravel shoulders at least 1.5 metres in width; and
- Only on sections of County road where requests have been made by Township Councils that have an ORV by-law in effect. At present, ORVs are only permitted to operate on the 11 County road sections in the Township of Havelock-Belmont-Methuen shown in **Figure 2.1**, per Schedule A of the by-law. The County has installed signs on these roads to inform the public that ORV access is permitted.

All lower-tier municipalities in the County, except the Township of Cavan-Monaghan (By-law No. 2020-62), permit the operation of ORVs on some or all roads under their jurisdiction. **Table 2.1** lists the municipal by-laws enacted to regulate ORV use (as of the date of this report). The Township of Asphodel-Norwood is preparing a by-law considering public consultation, stakeholder response, and the approach of the County. The Townships of Otonabee-South Monaghan and Selwyn do not intend to introduce by-laws at present, relying on provincial legislation to govern use.

TABLE 2.1: LOWER-TIER MUNICIPALITY OFF-ROAD VEHICLE BY-LAWS

Lower-Tier Municipality	By-law No.
Municipality of Trent Lakes	B2020-109
Township of Douro-Dummer	2019-11
Township of Havelock-Belmont-Methuen	2021-022
Township of North Kawartha	2021-0026

Several municipalities bordering Peterborough County also permit the operation of ORVs on some or all road segments under their jurisdiction. **Table 2.2** lists the adjoining municipalities with by-laws (as of the date of this report). The Municipality of Port Hope does not permit ORVs on its roads.

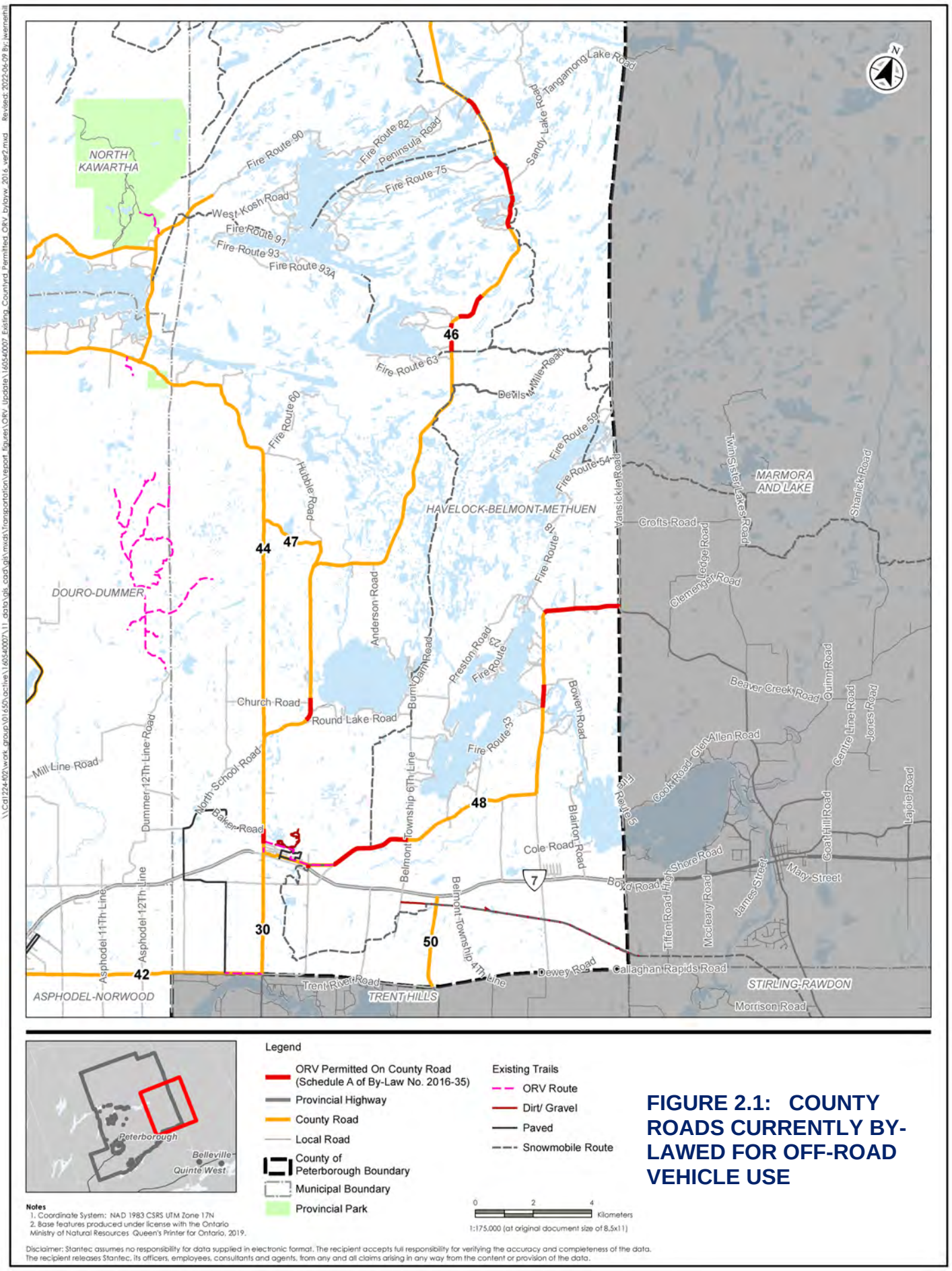


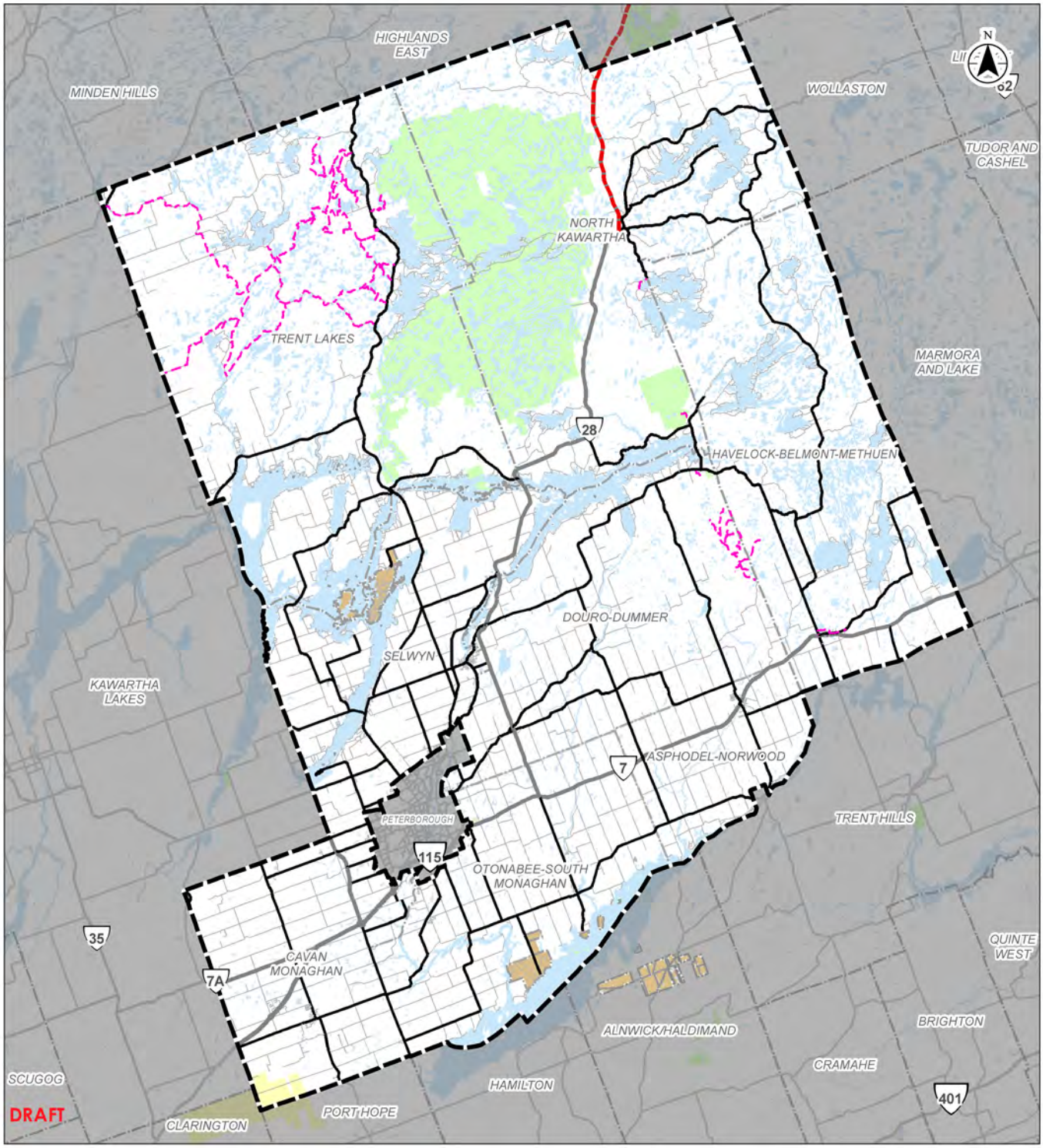
FIGURE 2.1: COUNTY ROADS CURRENTLY BY-LAWED FOR OFF-ROAD VEHICLE USE

TABLE 2.2: ADJOINING MUNICIPALITY OFF-ROAD VEHICLE BY-LAWS

Adjoining Municipality	By-law No.
City of Kawartha Lakes	2019-077
County of Northumberland	
Township of Alnwick/Haldimand	50-2009, 133-2020
Municipality of Trent Hills	2016-07
County of Haliburton	4014
Municipality of Highlands East	2020-67
Township of Minden Hills	15-95
County of Hastings	
Township of Faraday	25-2015
Township of Marmora and Lake	2015-31
Township of Stirling-Rawdon	476-05
Township of Wollaston	05-2021

2.3 Existing Off-Road Trails

Figure 2.2 shows the existing off-road ORV trails in Peterborough County. The current network does not connect across the County, with only a few off-road routes available in the northwest and southeast areas for travel. In most cases, users must trailer or drive their ORVs on public roads to reach trails. As such, road access is very important to riders.



Legend

- Existing ORV Route
- Provincial Highway ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park
- Ganaraska Forest

0 5 10 Kilometers

1:500,000 (at original document size of 8.5x11)

FIGURE 2.2: EXISTING OFF-ROAD VEHICLE TRAILS

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

3 Considerations

This chapter outlines the possible benefits, potential consequences, and public sentiment the County must balance in addressing the operation of ORVs on County roads. These considerations influenced development of the recommended strategy described in **Chapter 4** and factored into the assessment of alternatives, specifically.

3.1 Reported Benefits

ORVs offer a form of recreation for a broad range of users, including trail riding and adventure tourism. Participating in an ORV organization or club provides social opportunities for its members in addition to recreational amenity. ORVs also present an affordable transportation option for farming and travel within rural areas and to/from community amenities and can provide an alternate means of travel for individuals with mobility or accessibility concerns.

Riding an ORV can offer health benefits. According to a study published by the American College of Sports Medicine[1], ORV riding is a recreational activity with moderate intensity cardiovascular demand and fatigue-inducing muscular strength challenges, particularly for the upper body muscular system. The report suggests that operating an ORV increases caloric expenditure and is similar in aerobic demand to many other recreational, self-paced sporting activities, such as golf, rock climbing, and alpine skiing. Another article by the same authors published in the Health & Fitness Journal of Canada[2] noted habitual off-road riders appeared to have higher levels of mental and physical functioning, possibly due to their participation in this recreational activity.

ORV use contributes to the local economy. An economic impact study completed by Smith Gunther Associates Ltd. for the Canadian Off-Highway Vehicle Distributors Council reported that Ontario residents spent as much as $974 million on activities related to the ownership and operation of ATVs and ROVs in 2015.[3] Case studies from similar jurisdictions in Canada and the United States also support the argument that ORV tourism is a good investment and helps spur economic activity.

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1 Burr, Jamie F., Jamnik, Veronica K., Shaw, Jim A., and Gledhill, Norman. Physiological Demands of Off-Road Vehicle Riding. *Medicine & Science in Sports & Exercise.* American College of Sports Medicine. 2010.

2 Burr, Jamie F., Jamnik, Veronica K., and Gledhill, Norman. Health-related Quality of Life of Habitual Recreational Off-Road Vehicle Riders. *Health & Fitness Journal of Canada*. June 30, 2010.

3 Smith Gunther Associates Ltd. *National, Provincial, and Territorial Economic Impacts of ATVs and Side-By-Sides 2015: Final Report*. September 19, 2016

3.2 Potential Consequences

The potential consequences for municipalities of allowing ORVs to operate on public roads include[4]:

- Private property damage and trespassing (issues may be more prevalent as ORVs access municipal roads)
- Public property damage
- Financial impacts on policing and education
- Specialized enforcement equipment (do police have the required equipment to pursue operators breaking the rules?)
- Increased municipal maintenance requirements
- Increased municipal liability
- Increased staff resources (to maintain the roads and enforce the rules)
- Need for road safety audits (assessments) (to address the risks/threats to the safe operation of ORVs on the shoulder and road allowance)
- Impact to trails systems (if ORVs are allowed on roads, will this put pressure on the municipality to allow them on their trail systems?)

The following sections highlight the three factors considered to have the most significant influence on the decision concerning the operation of ORVs on County roads.

3.2.1 Safety and Liability

ORV user collisions and injuries are less common than incidents involving other motor vehicles but the potential for and severity of these incidents often serve as motivation for limiting the operation of ORVs on public roads.

Peterborough Public Health (PPH) provided data on injuries related to ORV use in the County between 2003 and 2018[5]. Over this 15-year period, area hospitals reported 1,862 ORV-related injuries requiring an Emergency Department visit, with 1,718 of the injuries sustained in off-road incidents and the remaining 144 related to on-road events. This equates to an average of 116 injuries annually, of which about 8% occurred on a roadway. It should be noted ORV injury trends were not observed to increase or decrease over time.

In addition to the PPH data, the County provided six years (2015-2020) of georeferenced collision data to assess the prevalence of ORV-related crashes on roads

[4] Frank Cowan Company. Risk Management Considerations for ORV/ATVs on Municipal Roads.
[5] Letter from Peterborough Public Health dated September 11, 2020

in the County. As **Figure 3.1** illustrates, most occurred near existing trails, with fewer collisions recorded north of Kawartha Highlands Provincial Park and within the south-central areas of the County. Interestingly, the Township of Cavan Monaghan, which prohibits ORVs from operating on roads under its jurisdiction, experienced more reported collisions than the Townships of Otonabee-South Monaghan and Asphodel-Norwood, which do not prohibit ORV use on its roadways.

Province-wide, MTO reported 349 fatal and personal injury collisions involving "Other Road Users", which include ATV, snowmobile, and moped drivers and passengers, in 2020. Eight resulted in death, meaning fatalities comprised slightly above 2% of all injury collisions. By comparison, approximately 6% of injury collisions involving motorcyclists were fatal.[6]

In 2018, the last time MTO reported more detailed collision statistics, ORVs and snowmobiles comprised about 8% of all registered vehicles in Ontario but accounted for only 95 collisions, or less than 0.02% of collisions for all vehicle types. The collision rate for combined ORVs and snowmobiles was 11.8 collisions per 100,000 vehicles, while the same statistic for passenger automobiles was 4,271 collisions per 100,000 vehicles.[7]

The responsibility for safety related to the operation of ORVs on public roads rests with both the operator and the road authority. If a collision occurs, liability or blame can be directed to one or both parties. However, with joint and several liability[8], the County may still be responsible to compensate the plaintiff for the entire amount of a settlement even if is determined that the municipality conducted itself in the most responsible manner possible. For this reasons, careful consideration should be given to the following risk management concerns:

- *Does the County have the resources to manage increased maintenance and inspection responsibilities? In the event of a loss, the courts would look to maintenance and inspection records to see if minimum maintenance standards were being met; and*
- *From a liability perspective, is this the type of activity that the County would want its insurance program exposed to?*

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6 MTO. http://www.mto.gov.on.ca/english/publications/pdfs/preliminary-2020-orsar-selected-statistics.pdf. Last accessed November 22, 2021.

7 MTO. http://www.mto.gov.on.ca/english/publications/pdfs/ontario-road-safety-annual-report-2018.pdf. Last accessed on November 22, 2021.

8 Joint and several liability is a component of tort law in Ontario that allows a plaintiff to recover the entire claim for damages from one of several negligent defendants. Simply put, if one of the parties is 50% responsible for the loss, (meaning her/his several liability is 50%) but is unable to pay that portion of the damages, the injured party can collect the remaining damages from the other negligent parties, who are "jointly" liable to the plaintiff for the loss. This concept is established in the *Ontario Negligence Act*. (Ontario Good Roads Association)

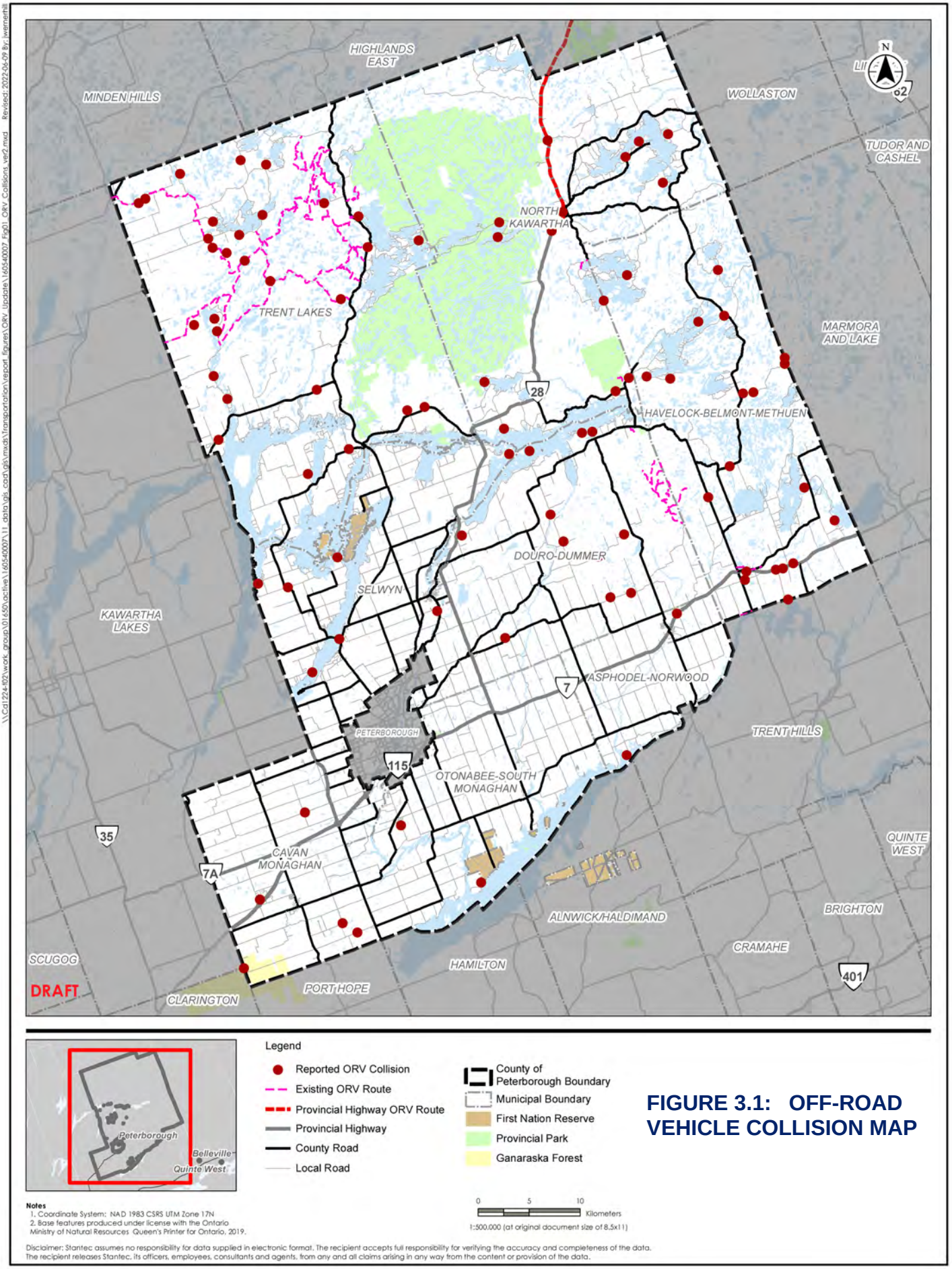


FIGURE 3.1: OFF-ROAD VEHICLE COLLISION MAP

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

Expanding the number of County roads where the operation of ORVs is permitted, or any other material change to current ORV By-law, could increase the County's level of risk exposure. In the past, the County's insurer has stressed the importance of ensuring the municipality completes its due diligence before considering changes to ORV regulations. Specifically, sections of shoulder that contain objects that impede ORV travel, which would force an ORV onto the regular travelled portion of the road and create a hazard to other road users, should be reviewed.

3.2.2 Enforcement

The lower-tier municipalities in the County contract individually with the Ontario Provincial Police (OPP) and/or the Peterborough Police Service (PPS) (Township of Cavan Monaghan and Township of Selwyn for the Lakefield ward) for police services within their respective jurisdictions. The County bears no responsibility for policing.

OPP bills municipalities for police services using a base cost per property plus an amount for calls for service. PPS charges a set amount based on the service contract.

OPP and PPS are responsible for enforcing *Highway Traffic Act* and *Off-Road Vehicles Act* provisions in the County, including regulations pertaining to the operation of ORVs on County roads. At present, ORV enforcement falls within current service levels.

No alternative eliminates policing costs entirely, even a scenario prohibiting ORVs from operating on County roads. In this case, police may still receive calls about ORVs using the roadways, as opposed to complaints about users disobeying specific by-law provisions like speed limits and hours of operation. Regardless of the reason, police must still respond to the call for service.

3.2.3 Infrastructure

ORVs operating on public roads must travel on shoulders (or as close as possible to the edge of the road if a shoulder in unavailable) and obey/follow all pavement markings and traffic signs. The availability of adequate sight visibility, for both the ORV operator and other drivers, is also an important requirement.

The following summarizes the key infrastructure considerations pertaining to the operation of ORVs on County roads:

- **Roadway Shoulder Condition** – Several County road sections provide limited or no shoulders. In cases where shoulders exist, their condition may be less than desirable for ORV operation due to deferred maintenance. Inconsistent/inadequate shoulder conditions pose a concern given the current ORV By-law specifies a minimum shoulder width of 1.5 metres for ORV use.

- **Traffic Signage** – Under the *Highway Traffic Act*, the County must install appropriate regulatory and warning signs for ORVs to operate on County roads. In the absence of guidance in the Ontario Traffic Manual, the County should consider placing speed advisory signage on roadways with a posted 80 km/h speed limit to identify the maximum speed limit of 50 km/h to guide ORV users and for police enforcement purposes. Other warning signs (i.e., "Share the Road", "Stay on Travelled Portion of Road", "ORVs Travel in Single File", etc.) should also be considered to provide positive guidance for ORV riders.
- **Pavement Markings** – Pavement markings applied to the travelled road surface are a road safety feature intended to guide road users. While travelling on a County road, a yellow line applied to the centre of the roadway and white line applied to the edge of pavement adjacent to the road shoulder indicates to a vehicle operator the appropriate direction of traffic flow. To an ORV operator, the white edge line also indicates the location where the ORV may be operated. At present, the County does not mark edge lines on all County roads but is considering changing this practice through the Transportation Master Plan Update.
- **Clear Zones** – The County has a Clear Zone policy supported by annual budget amounts. The policy aims to provide an unobstructed and passable area adjacent to the travelled road surface clear of obstacles and traversable by a vehicle leaving the road. The County has resolved several clear zone issues in recent years, but a number remain.

3.3 Public Sentiment

Respondents to an online public survey available on the County's website between July 31 and September 11, 2020 offered their views on allowing ORVs to operate on County roads. **Table 3.1** summarizes the feedback received, organized by common themes into two broad categories:

- Why people are concerned about the operation of ORVs on County roads; and
- Benefits people report about the operation of ORVs on County roads.

Not surprisingly, the prospect of ORV use on public roads engendered widely differing public sentiment. The comments received from survey participants echoed the reported benefits and potential consequences of operating an ORV highlighted above.

TABLE 3.1: PUBLIC SENTIMENT CONCERING OFF-ROAD VEHICLE USE ON COUNTY ROADS

Why People are Concerned About the Operation of ORVs on County Roads	Benefits People Report About the Operation of ORVs on County Roads
• Designed for trails, not intended for use on roads • Trespassing • Property damage/damage the land • Reckless/underage/impaired/ dangerous driving • Littering • Impacts to sensitive natural environment • Impacts to quality of life/excessive noise • Air pollution • Speeding/lack of enforcement • Pedestrian/cyclist safety • Dirt, rocks, and sand thrown onto the paved shoulder, making it more dangerous for cyclists • Environmentally friendly/healthier activities, such as hiking, walking, cycling, canoeing, etc., not encouraged • Liability	• Recreation/outdoor activities • Social/community group activities/ outings • Family activities/outings • Economic benefits to local community • Tourism • Access to local businesses/villages for fuel, groceries, hardware, restaurants/ coffee shops and accommodations • Connections to neighbouring municipalities • Use by a broad demographic • Alternative mode of travel for residents (into rural community cores for supplies, etc.) • Better and/or more direct access to trails, reduced need to trailer ORVs to off-road network

4 Recommended Strategy

This chapter summarizes the recommended strategy for addressing the operation of ORVs on County roads and documents the steps followed in developing the plan, which reflect the decision-making process detailed in **Figure 1.1** and **Table 1.1**.

4.1 Alternatives

The County considered three potential approaches for addressing the operation of ORVs on County roads:

Alternative 1	Alternative 2	Alternative 3
Allow ORVs to Operate on All County Roads	Allow ORVs to Operate on Select County Roads	Prohibit ORVs from Operating on All County Roads

The following describes the alternatives and key considerations for each:

Alternative 1 – Allow ORVs to Operate on All County Roads

This scenario would involve amending (or replacing) the ORV By-law to permit the operation of ORVs on all County roads. ORV users would benefit from being able to operate their vehicles on any County road, with improved linkages to off-road trails and adjoining municipalities, plus better access to community amenities.

Key considerations with this option include:

- Some portions of the County road network may not be suitable for the operation of ORVs, which could pose safety concerns and cause damage to the roadway infrastructure;
- With limited off-road routes available, ORVs will mainly operate on roadways;
- Potential adverse impacts to safety, public and private property, and the environment, as previously noted; and
- Increased risk exposure, maintenance and inspection, signage, and enforcement.

Alternative 2 – Allow ORVs to Operate on Select County Roads

This scenario, an extension of the “status quo”, would involve amending (or replacing) the ORV By-law to “open up” more County roads for ORV use. ORV users would benefit from additional locations to legally operate their vehicles beyond current provisions. Establishing a broader network of routes would also increase connections to local businesses, providing a positive economic impact for communities.

Key considerations with this option include:

- Portions of the County road network not suitable for the operation of ORVs could be restricted, helping to alleviate potential safety concerns and damage to the roadway infrastructure;
- With limited off-road routes available, ORVs will mainly operate on roadways;
- Potential adverse impacts to safety, public and private property, and the environment, as previously noted, but fewer than Alternative 1; and
- Increased risk exposure, maintenance and inspection, signage, and enforcement, but less than Alternative 1.

Alternative 3 – Prohibit ORVs from Operating on All County Roads

This scenario would involve replacing the ORV By-law with a new regulation prohibiting the operation of ORVs on all County roads. ORV users would not enjoy access to any County roads, eliminating linkages to off-road trails and adjoining municipalities, as well as community amenities.

Key considerations with this option include:

- Elimination of ORV access alleviates potential adverse impacts to safety, public and private property, and the environment, as previously noted;
- Risk exposure, maintenance and inspection, and signage concerns mitigated; and
- Enforcement requirements remain, albeit different in nature.

Alternatives 1 and 3 represent somewhat straightforward “all or nothing” scenarios, where the County would enact a by-law to either permit or restrict ORVs from operating on all roads under its jurisdiction. Alternative 2, the intermediate approach of designating some but not all County road sections for ORV use, covers a wider range of possibilities. This option affords the County latitude to tailor the solution to the needs of individual lower-tier municipalities while still establishing an effective network of routes connecting ORV riders to key points of interest.

4.2 Assessment

Table 4.1 summarizes the assessment completed to identify the preferred approach for addressing the operation of ORVs on County roads. The assessment compared direct and indirect benefits and costs associated with ORV use on County roads to identify the alternative offering the greatest benefit at the least cost.

TABLE 4.1: COMPARATIVE ASSESSMENT OF ALTERNATIVE APPROACHES FOR ADDRESSING THE OPERATION OF OFF-ROAD VEHICLES ON COUNTY ROADS

Criteria	Alternative 1 Allow ORVs to Operate on All County Roads	Alternative 2 Allow ORVs to Operate on Select County Roads	Alternative 3 Prohibit ORVs from Operating on All County Roads
Benefits			
Improves transportation affordability	●	●	○
Encourages tourism	●	●	○
Improves access to community amenities	●	●	○
Improves recreational access and physiological health	●	●	○
Supports agricultural uses	●	●	○
Supports public health and safety	◐	◐	◐
Respects sensitive land uses	○	●	●
Benefits Ranking	**2**	**1**	**3**
Costs			
Requires by-law enforcement	●	●	●
Requires roadway upgrades	○	◐	●
Requires additional roadway maintenance	○	◐	●
Requires new wayfinding/ signage	◐	○	◐
Costs Ranking	**3**	**2**	**1**
Summary			
Overall Ranking	**2**	**1**	**3**

LEGEND: ○ ◐ ●

Less Preferred → More Preferred

Alternatives 1 and 2 both offer benefits in terms of transportation affordability (by providing a lower cost travel option), tourism, access to community amenities and recreation, physiological health (due to more physical activity), and support for agricultural uses, with Alternative 1 slightly edging out Alternative 2 in certain categories due to the broader ORV network coverage. By contrast, Alternative 3, which is effectively the "do nothing" (or less) scenario, would not materially improve any of these criteria.

For public health and safety (risk of injury or property damage) and protection of sensitive land uses, Alternative 1 received the lowest score as certain County roads traverse potentially sensitive land uses and/or pose safety concerns for the operation of ORVs. Alternatives 2 and 3 scored more favourably than Alternative 1, provided ORV use is limited to County roads that minimize safety risks and/or are outside sensitive natural areas with Alternative 2.

Defining exact costs is difficult at this point. All alternatives present enforcement costs, with Alternative 1 likely posing slightly lower costs than the other two options. For Alternative 1, enforcement would be limited to administering Highway Traffic Act and County ORV By-law infractions associated with the operation of ORVs on municipal roadways, whereas Alternatives 2 and 3 would likely generate additional service calls to address ORVs travelling on roads not permitted for use.

Prohibiting the operation of ORVs on all (Alternative 3) or some (Alternative 2) County roads results in lower costs for roadway upgrades, maintenance, and wayfinding/signage than options allowing ORV use on all (Alternative 1) or some (Alternative 2) roadways. While the presence of a shoulder was one of the qualitative factors considered in identifying the ORV network concept for Alternative 2, some sections of road likely require shoulder improvement to facilitate more regular ORV use.

Based on the assessment summarized in Table 4.1, Alternative 2 (Allow ORVs to Operate on Select County Roads) is the preferred approach for addressing the operation of ORVs on County roads.

4.3 Off-Road Vehicle Network Development (Alternative 2)

Selecting Alternative 2 infers the County would consider allowing ORVs to operate on any County road under the "right" circumstances. By defining those conditions, road segments deemed unsuitable for ORV use can be excluded from further consideration. With these roadways screened out, the focus becomes identifying a connected network of routes that best serves users. The network should avoid interrupted links that require riders to dismount and trailer to their ultimate destination.

The process to define the preferred County road ORV network involved the following steps:

- Conduct **quantitative road segment assessment** to identify County road segments suitable for the operation of ORVs from a technical (safety) perspective.
- Undertake **qualitative network-wide assessment** to confirm the County road segments forming the preferred ORV network.

Appendix B provides further details of the ORV network development.

4.3.1 Quantitative Road Segment Assessment

Using geospatial (GIS) and traffic data provided by the County, a composite score (maximum 100%) was calculated for each County road segment based on the quantitative assessment criteria and weightings listed in **Table 4.2**. The criteria were weighted to reflect their relative influence on/contribution to safe ORV operation on public roads, with the rationale for the assigned weighting provided in the table. The data source for determining the criteria value is also noted.

TABLE 4.2: QUANTITATIVE ASSESSMENT CRITERIA FOR OFF-ROAD VEHICLE NETWORK

Criteria	Weighting	Rationale for Weighting	Source
Traffic Volumes	35%	Highly correlated to collision potential for ORVs.	Traffic count data
Speeding (Based on 85%ile observed vehicle speed)	30%	Highly correlated to collision potential for ORVs.	Traffic count data
Posted Speed Limit	15%	Desire for ORVs to use lower-speed roadways. Highly correlated to collision severity for ORVs.	GIS data (roadways)
Truck Utilization	10%	Desire to separate ORVs from truck traffic. Highly correlated to collision severity for ORVs.	Traffic count data
Road Surface	5%	ORVs can travel on most surfaces, but road surface is generally correlated to size/quality of shoulder.	GIS data (roadways)
History of ORV Collisions	5%	Too few ORV collisions have occurred to infer the overall safety of the individual roadways for ORV use.	Collision data

Figure 4.1 illustrates the quantitative assessment scores, depicting the County road segments scoring higher and lower than 50%. Road segments scoring less than 50% were generally eliminated from further consideration for the operation of ORVs as the study team viewed this value as a reasonable threshold for determining suitability. Certain segments with scores below 50% were still considered for ORV use if satisfying

other objectives like route continuity. For example, short sections of County Road 46 received scores lower than 50%. But since the remainder of the roadway met the 50% threshold, the ORV network concept incorporated the entire length of the road to provide a continuous north-south connection between two established trail systems.

4.3.2 Qualitative Network-Wide Assessment

The shortlist of County road segments satisfying the minimum quantitative score threshold for the operation of ORVs were then assessed qualitatively, with the aim of establishing a connected route network. **Table 4.3** lists the qualitative network-wide assessment factors, with descriptions of their use and data source noted in the table. Feedback received from the public, stakeholders, First Nations, and lower-tier municipal staff through the initial stages of the decision-making process aided in defining the factors and their application.

TABLE 4.3: QUALITATIVE ASSESSMENT FACTORS FOR OFF-ROAD VEHICLE NETWORK

Factor	Comment	Source
Connectivity to Existing ORV Network	Access to other segments of the ORV network from the roadway	GIS data
Connectivity to Trails/ Nature	Access to ORV trails, hiking trails, and parks	GIS data
Connectivity to Population Centres	Access to (but not through) settlements and communities	GIS data
Avoidance of Noise-Sensitive Land Uses	Limiting ORVs from operating within conservation or settlement areas	GIS data (land use)
Driver's Road Violation Expectation	Roads where automobile drivers might anticipate encountering other slow-moving vehicles along the roadways, such as tractors	GIS data (land use)
Avoidance of Sidewalks/ Multi-Use Paths	Restricting ORVs from operating on roads with high pedestrian/cyclist activity	Virtual inspection using Street View
Presence of Suitable Road Shoulders	Wide road shoulder to support safe operation of ORVs	Virtual inspection using Street View

The qualitative assessment process entailed a desktop review of the County road segments carried forward from the quantitative analysis based on the factors listed in **Table 4.3** using Google Street View and other geospatial (GIS) data. Segments improving network connectivity and addressing other areas of possible concern received more favourable consideration.

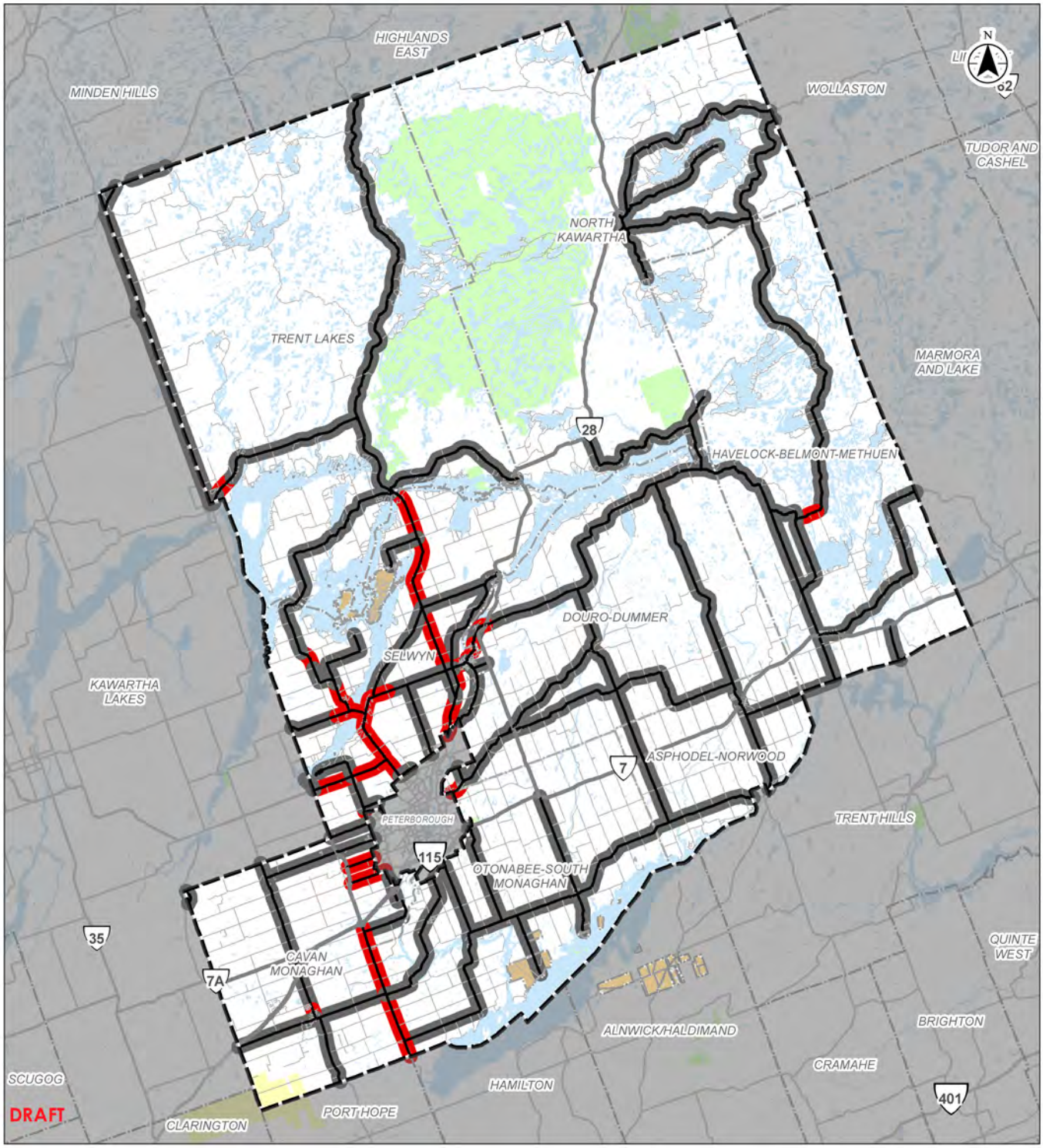


FIGURE 4.1: QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

Carrying out a desktop review of this nature is efficient and provides useful insight as an initial step but should be supplemented by a field check of key roadway attributes, including shoulders, roadsides, pavement surfaces, sidewalks, and multi-use paths. The site visit will also confirm current conditions in case of discrepancies with digital images. **Section 5.2** proposes road condition assessments as a complementary action to the recommended strategy for this purpose.

Two surveys conducted as part of the community engagement program in Stage 1 of the decision-making process also helped in rationalizing the potential ORV network. The first survey identified locations of concern with ORV operation (i.e., noise and pollution, speeding, general safety issues, and underage drivers) and value for ORV users (i.e., priority transportation and recreation routes, and tourist attractions). In the second survey, participants provided further comments on issues and locations, and identified existing or desirable routes for the operation of ORVs.

Further network refinements were carried out following the qualitative assessment to ensure the preferred ORV routes served their intended purpose. The refinement process focused on adding or removing road segments from the network to address site specific considerations.

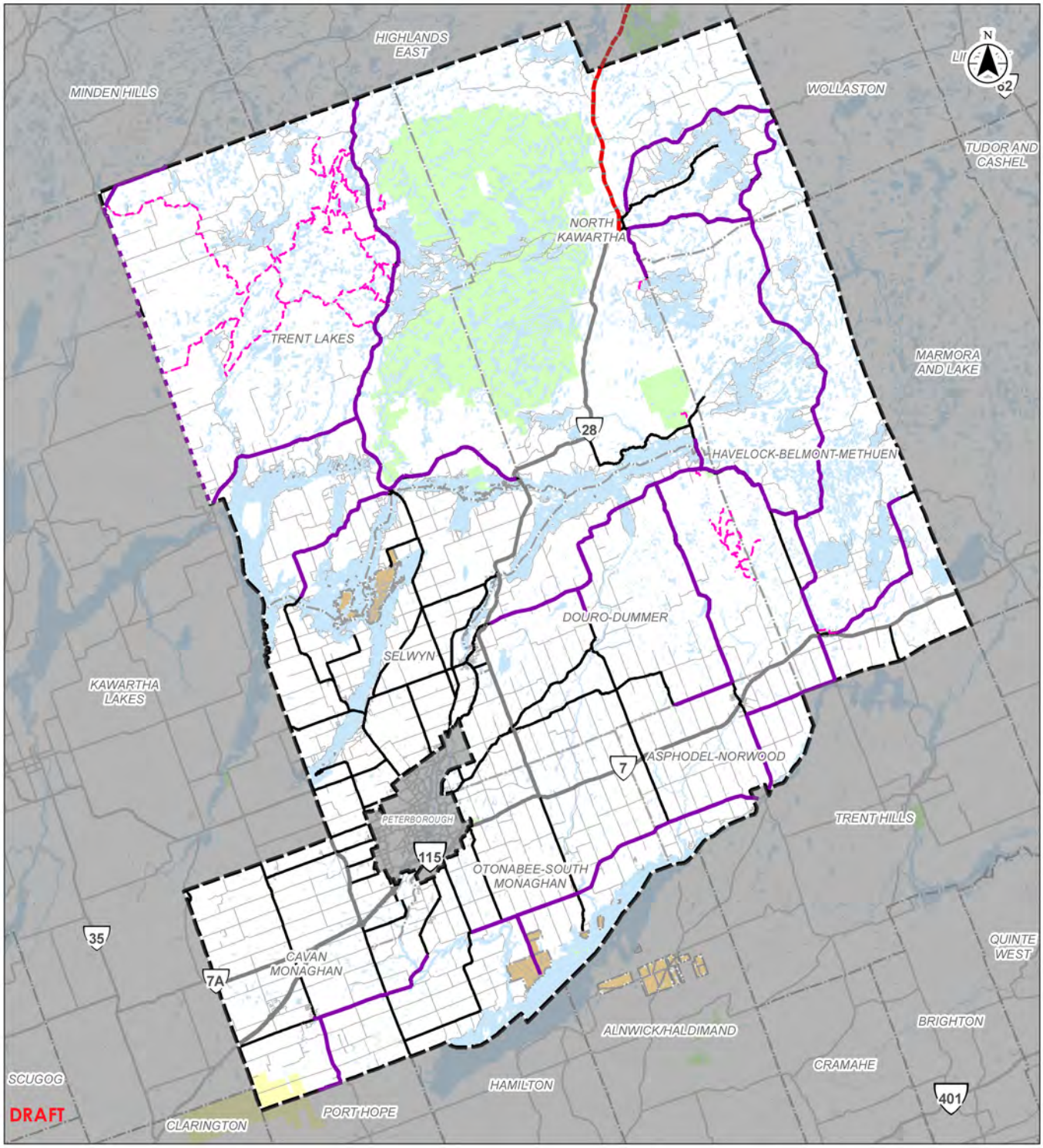
4.3.3 Initial Network Concept

Figure 4.2 illustrates the initial ORV network concept presented to participants and stakeholders in Stage 4 of the decision-making process. Throughout this consultation phase, the study team clearly articulated that this version of the network plan was being presented solely for illustrative purposes and likely required further refinement.

It became evident from the feedback received in Stage 4 that the preliminary ORV network concept required further consideration, as anticipated. While the network routes reflected input received through earlier stages of the study, its configuration posed concern for some lower-tier municipalities. For example, route continuity in certain areas relied on roads under township jurisdiction, which the County has no authority over.

The level of support for allowing ORVs to operate on County roads, in general, also differed by municipality. Some lower-tier and adjoining municipalities expressed concern, given the inevitable pressure to follow suit and permit ORVs to operate on roads under their jurisdiction. By contrast, other townships requested all County roads in their municipality be designated for ORV access to complement local by-laws.

These inconsistencies suggested the need for further consultation with the lower-tier municipalities in identifying the County roads permitted for ORV use in each jurisdiction.



Legend

- Potential ORV Route Subject to Further Review
- Preferred County Road ORV Route
- Provincial Highway ORV Route
- Existing ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park
- Ganaraska Forest

0 5 10 Kilometers

1:500,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

FIGURE 4.2: INITIAL OFF-ROAD VEHICLE NETWORK CONCEPT

4.4 Consultation with Lower-Tier Municipalities

County staff presented the draft recommended strategy to County Council on December 15, 2021. At the meeting, Council resolved (Resolution No. 509-2021):

That the Staff Report INF 2021-038 Transportation Master Plan Steering Committee – ORV Use on County Roads be received;

That Alternative 2, allowing off-road vehicles use on select County Roads, outlined in the report from the consultant, be supported in principle;

That staff and the consultant be directed to consult further with the lower-tier townships for off-road vehicle use in their townships; and

That a report be brought back to Council in the spring of 2022 outlining the comments and preferences of each township.

Conferring with the lower-tier municipalities and First Nations enabled the County to ensure compatibility with local objectives, which differ by jurisdiction, and afforded the opportunity to "customize" the approach for each township, consistent with the current ORV By-law.

Table 4.4 summarizes the lower-tier municipal responses to the request from County Council for comments and preferences of each township. All municipalities except the Townships of Cavan Monaghan and Douro-Dummer concurred with Approach 2 and supported the recommended strategy for the operation of ORVs on County roads. Cavan Monaghan and Douro-Dummer have requested no County roads be opened to ORV use within their respective municipal limits. By contrast, the Townships of Havelock-Belmont-Methuen, Otonabee-South Monaghan, and North Kawartha requested the inclusion of additional County roads in the ORV network.

The Curve Lake and Hiawatha First Nations did not object to the proposed recommended strategy but noted that they, and other Williams Treaties First Nations, are rights holders and not stakeholders in the process. With Peterborough County situated in the Treaty 20 area, where the Williams Treaties First Nations have harvesting rights, limiting ORV use on the County road system would restrict their ability to access lands where they hunt, fish, and undertake other such activities.

4.5 Preferred Approach and Network

Consultation with the lower-tier municipalities confirmed Approach 2 as the preferred approach for addressing the operation of ORVs on County roads. **Figure 4.3** illustrates the preferred ORV network of County roads, which reflects the input received from the townships. **Appendix C** provides detailed plans showing the ORV networks for each municipality.

TABLE 4.4: LOWER-TIER MUNICIPAL RESPONSES TO DRAFT RECOMMENDED STRATEGY

Municipality (Date of Council Resolution)	Concur with Alternative 2?	Comments and Preferences
Asphodel-Norwood (March 22, 2022)	Yes	• Supports inclusion of County Road 2, County Road 42, County Road 45 and Dummer-Asphodel Road as ORV routes • Supports ongoing communication and consultation with lower-tier municipalities with respect to developing and launching public educations and communication program
Cavan Monaghan (April 4, 2022)	No	• Does not approve any County Roads to open up as proposed ORV network in Township
Douro-Dummer (June 7, 2022)	No	• Does not support any expansion of ORV permitted use on Township or County roads • Continue to permit exemption for Agricultural and Trap Line Maintenance use of ORVs on roads as permitted under the *Highway Traffic Act*
Havelock-Belmont-Methuen (March 15, 2022)	Yes	• Endorses map provided by County as first preference for ORV use on County Roads in Township with amendment to include Ontario Street/ George Street/County Road 48 (Havelock)/County Road 48 (Cordova); and map created by Township staff as second preference • Clearly identify that Mathison Conservation Area is excluded in its entirety for ORV use
North Kawartha (March 1, 2022)	Yes	• Requests following County Roads be added to proposed ORV network: a. Burleigh Street (County Road 620A) b. Balmer Road (County Road 54) • Requests ORVs be allowed to enter and pass through hamlet areas to access businesses. For greater certainty, this includes access to Apsley and all other applicable Hamlets.

TABLE 4.4: LOWER-TIER MUNICIPAL RESPONSES TO DRAFT RECOMMENDED STRATEGY

Municipality (Date of Council Resolution)	Concur with Alternative 2?	Comments and Preferences
		• Supports integrated ORV network that includes County and local roadways that cross Municipal boundaries • Supports allowing ORV use on County Roads to further economic development and tourism for Township • Requests ORVs be allowed to use paved sections of County Roads in accordance with *Highway Traffic Act* • Requests County undertake all necessary steps, including maintenance to roadways and shoulders, to allow for legal operation of ORVs on County Roads in Township no later than May 20, 2022
Otonabee-South Monaghan (March 7, 2022)	Yes	• Staff report received for information. • Subsequent correspondence from staff confirmed support for Alternative 2 and indicated no objection to potential ORV network concept • Requested the section of Heritage Road from County Road 2 to Lang Road be included in the proposed County ORV routes
Selwyn (April 12, 2022)	Yes	• No objection to proposed approach for use of off-road vehicles on County Roads (Alternative 2), which would provide for ORV use on County Roads meeting requirements of qualitative and quantitative assessment criteria and contributing to coordinated ORV trail network
Trent Lakes (March 22, 2022)	Yes	• Supports proposal by County for integrated ORV network, which includes all County Roads within Municipality

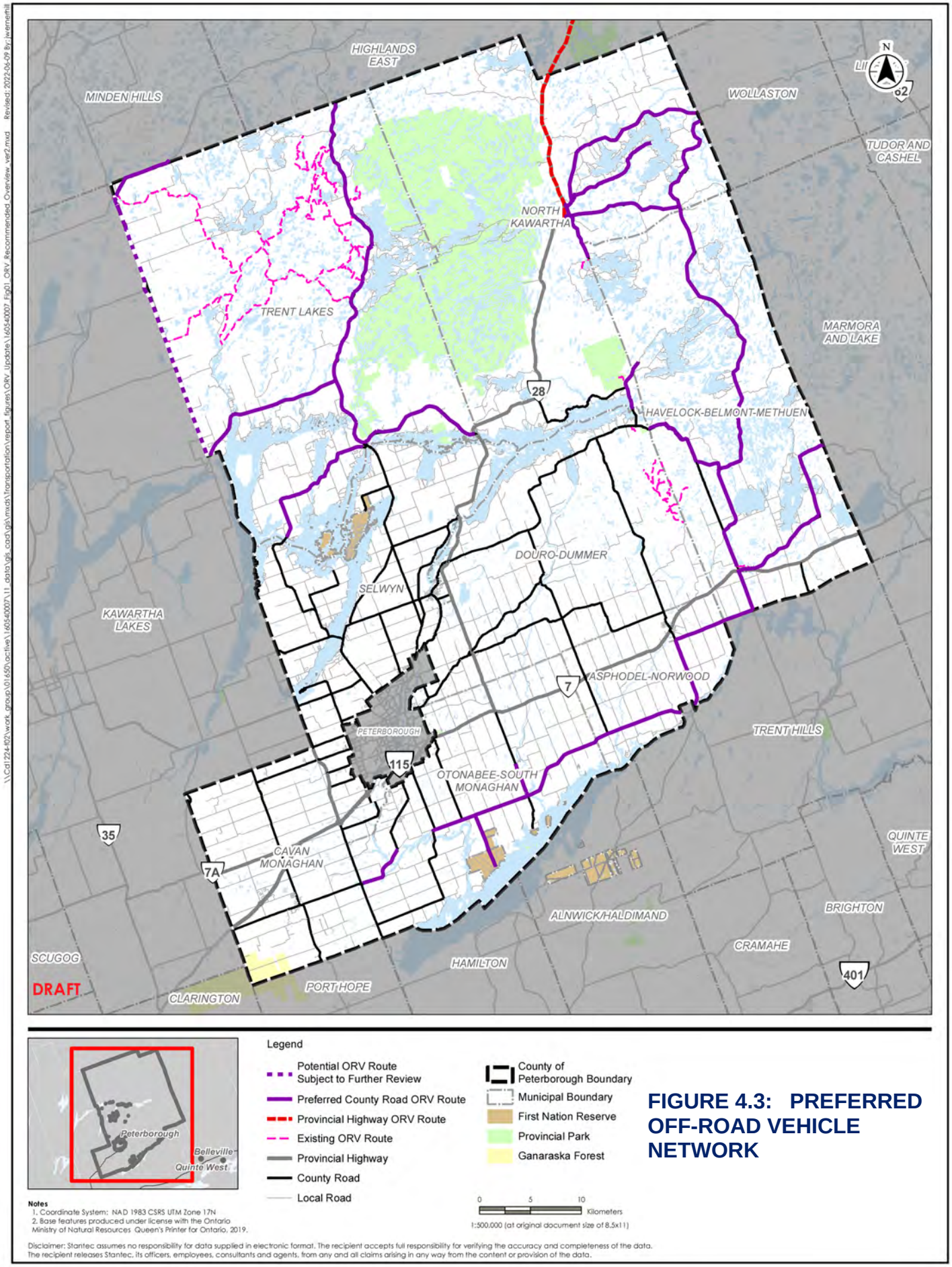


FIGURE 4.3: PREFERRED OFF-ROAD VEHICLE NETWORK

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

5 Complementary Actions

This chapter identifies a range of complementary actions to support implementation of the recommended strategy in **Chapter 4**.

5.1 County Off-Road Vehicle By-law Update

The County should update the current ORV By-law to incorporate recent revisions to statute law, specifically the changes to Ontario Regulation 316/03 that expanded the list of vehicles considered to be ORVs, and the additional road segments comprising the preferred ORV network. Based on feedback from the OPP, the Township of Havelock-Belmont-Methuen ORV by-law could serve as a model for the County's update.

When updating the by-law in the future, the County may wish to incorporate additional restrictions on ORV operation in urbanized areas such as hamlets. Any revisions to the by-law should respond to common objections to the operation of ORVs expressed, recognizing further restrictions could impact the economic benefits communities expect to realize from increased ORV traffic. If localized restrictions of this type are contemplated, a focused consultation should be undertaken to determine the priorities of each community and establish support for the preferred approach.

5.2 Road Condition Assessments

The County should undertake more detailed road condition assessments prior to incorporating additional County road segments into the ORV By-law, consistent with guidance previously provided by the County's insurer. These assessments would supplement the desktop reviews completed for the initial ORV network concept and should assess/ update:

- Widths of the pavement and shoulder, if any;
- Condition of the pavement and shoulder;
- All accessible and unprotected fixed object hazards (e.g., guiderail end, bridge abutment, tree, parked vehicles, etc.);
- All accessible and unprotected moving object hazards (e.g., pedestrians, bicycles, railroad trains, trucks, buses, animals, etc.);
- All other potential hazards that may be located on or beside the road;
- Whether signing and pavement markings are appropriate for all hazards found; and
- Anything on the road a driver (especially a new one) might find surprising, confusing, or requiring complex manoeuvres.

5.3 Public Education and Communication Program

The County should develop a public education and communication program in consultation/collaboration with the lower-tier municipalities and other interested parties. The purpose of the program would be to:

- Inform ORV users on how to safely operate their vehicles on County roads; and
- Remind other drivers how to safely interact with ORVs.

The program would also allow the County to exercise due diligence, which would help mitigate certain liability risks.

Using a variety of tools to help ensure that messaging is conveyed to a broad demographic, the program should clearly communicate:

- The County roads permitted for the operation of ORVs;
- Local points of interest (i.e., off-road trail networks, participating community businesses and amenities within and beyond the County, other suitable destinations);
- Local ORV organizations and associated member benefits;
- Safe operation of ORVs, particularly on roadways with high volumes of traffic travelling at higher speeds;
- The significance of protected natural areas to help foster a culture of respect and awareness and minimize damage to resources;
- Need for respect of the “rules of the road” and responsible operator behaviour on and off the road;
- Relevant provincial legislation and associated penalties for infractions; and
- Restrictions set forth in the ORV By-law, including timing windows, permitted speeds, etc.

Potential program actions include:

- Informing the public (via newspaper/radio/social medial website) that ORVs are allowed/not allowed to operate on County roads;
- Specifying the County roads and times of operation in all communications; and
- Posting signage as drivers approach the designated roads, such as “You are now entering an area where ORVs are allowed to operate. Please share the road.”

As part of the public education and communication program, the County should consider creating an ORV Ambassador Program comprising representatives of ORV

user groups and/or individuals residing and/or working in participating communities and/or adjacent to designated roadways. Potential ambassador duties could include:

- Monitoring roadways permitted for ORV operation periodically and alerting authorities when a violation is observed;
- Serving as role models and educating on-road ORV riders about safety, the importance of protecting/respecting the environment, and staying on designated roads per the ORV By-law requirements;
- Assisting riders unclear about the designated network and associated restrictions, and directing users to permitted roadways; and
- Responding to questions from other riders and/or community members.

5.4 Off-Road Vehicle Advisory Committee

The County should consider forming an ORV Advisory Committee (potentially reporting to County Council) to serve as a forum for communication and conflict resolution pertaining to the operation of ORVs on County roads. The committee, comprising community members representing a broad range of expertise and interests (e.g., ORV users, transportation (including active transportation), enforcement, economic development, etc.), could also aid the County with implementation of the recommended strategy, addressing issues and challenges that may arise. The group would be especially helpful in offering advice with respect to policy development and the proposed public education and communication program.

6 Potential Financial Impacts

This chapter describes the potential financial implications for the County and its lower-tier municipalities of implementing the recommended strategy.

6.1 Enforcement

Allowing ORVs to operate on more County roads, as contemplated by the recommended strategy, has the potential to escalate the number of enforcement requests. With exact call volumes and locations difficult to predict, **Table 6.1** provides order of magnitude estimates of additional policing costs for several different scenarios based on the blended hourly rate for a constable (range after factoring in wages, benefits, and vehicle costs) under the Township of Havelock-Belmont-Methuen contract with the OPP. The calculations in the table assume:

- Police enforce the ORV By-law provisions every day of the year (365 days). Seasonal enforcement scenarios would cost less.
- One or two additional constables could provide the enhanced level of service for ORV By-law enforcement, comprising either one officer from each police service (OPP and PPS) or multiple officers from the same service (likely OPP given the area covered). Additional officers would cost more.
- Police resources can be shared across municipalities contracting with that service (primarily OPP), consistent with the contracts currently in place.
- Different levels of additional effort, from as little as two hours per day up to eight hours daily, could effectively meet enforcement requirements.
- Specialized vehicles (like ORVs) and equipment would cost extra.

TABLE 6.1: COSTS FOR ADDITIONAL POLICE SERVICE SCENARIOS

Hours of Additional Service Daily	Additional Constables			
	1		2	
	$80/hour	$100/hour	$80/hour	$100/hour
2	$58,400	$73,000	$116,800	$146,000
4	$116,800	$146,000	$233,600	$292,000
6	$175,200	$219,000	$350,400	$438,000
8	$233,600	$292,000	$467,200	$584,000

Based on these myriad assumptions, additional enforcement, if needed, could cost the lower-tier municipalities, collectively, between about $60,000 and $600,000 annually based on the scenarios examined. The distribution of these costs between the eight

townships is difficult to project but will depend, to some degree, on the extent of the preferred ORV network within each municipality.

As noted, the lower-tier municipalities would bear the costs for any increase in police enforcement as the jurisdictions responsible for providing this service in Peterborough County. That said, their policing contracts do not explicitly recognize enforcement of ORV by-laws on County and/or local municipal roads as a separate or enhanced level of service. Other items, like hours of service and/or number of officers, typically form the basis of their service standards and, ultimately, the financial terms of the policing agreements. As such, the lower-tier municipalities would not experience an immediate financial impact but could encounter higher costs or lower levels of service for other types of calls in future years if enforcement demands grow due to allowing ORV to operate on select County roads.

6.2 Roadway Improvements and Maintenance

From the County's perspective, the cost to upgrade and maintain the County road segments forming the preferred ORV network would pose the most significant financial impact. The magnitude of one-time and on-going costs will depend on the state and condition of the road segments comprising the network. **Table 6.2** summarizes the types of infrastructure improvements and maintenance potentially required.

TABLE 6.2: POTENTIAL ROADWAY IMPROVEMENT AND MAINTENANCE REQUIREMENTS TO PERMIT OFF-ROAD VEHICLE USE

Item	One-Time Improvement	On-going Maintenance
Shoulders	• Grading of existing shoulders to improve state • Construction of new shoulders	• Grading • Mowing
Clear Zones	• Construction to remove, relocate, and/or protect objects (typically roadside)	• Grading • Mowing
Traffic Signs	• Installation of regulatory and warning signs	• Repair, maintenance, replacement of signs
Pavement Markings	• Placement of white edge line markings	• Pavement marking refresh

It is difficult to quantify the total additional roadway improvement and maintenance costs associated with the preferred ORV network at present. The road condition assessments proposed in **Section 5.2** would provide some of the information needed to estimate costs more precisely. In some cases it may be possible to phase the costs for identified improvements over time as capital budgets permit.

6.3 Insurance

The financial analysis has assumed the County's insurance premiums would not increase immediately if ORVs are allowed to operate on more County roads per Alternative 2, based on previous guidance. The magnitude of any future increases will depend on claim history and potential risk exposure. Continued and further measures the County can take to help mitigate risk include:

- Posting speed limits for ORVs;
- Establishing inspection and maintenance requirements;
- Updating existing road policies, procedures, and documentation;
- Properly maintaining gravel shoulders and drop-offs for common law duty of care purposes;
- Reviewing the sufficiency of shoulders used to permit the operation of ORVs; and
- If ORVs must operate on the travelled portion of the roadway, ensuring stopping sight distance constraints on the roadway (i.e., horizontal and vertical alignment) would not cause a motorist overtaking an ORV to take evasive action to avoid a collision with the slower moving vehicle.

The road condition assessments proposed in **Section 5.2** would provide some of this information.

6.4 Complementary Actions

Table 6.3 provides high-level cost estimates to undertake the complementary actions proposed in **Chapter 5**. Most involve an initial cost to collect information or initiate the program and ongoing annual costs to continue delivering the service.

6.5 Staff Resources

Outside the items listed in **Table 6.2** and **Table 6.3**, the additional cost for staff resources to implement the recommended strategy is likely modest, although limited availability exists today due to other competing priorities.

TABLE 6.3: COSTS FOR COMPLEMENTARY ACTIONS

Item	Estimated Cost	Comments
County Off-Road Vehicle By-law Update	n/a	County staff to complete
Road Condition Assessments	$0 - $30,000 initial $0 - $5,000 annually	Initial cost to collect information to complete the review by County staff ($0) or with the assistance of a consultant ($30,000). Annual operating cost to keep the data current.
Public Education and Communication Program	$50,000 - $100,000 initial $10,000 - $25,000 annually	Initial cost to develop and launch program with assistance of consultant. Annual operating cost to deliver program.
Off-Road Vehicle Advisory Committee	$1,000 annually	Nominal annual cost to operate committee

7 Conclusions and Recommendations

7.1 Conclusions

Off-road vehicles are becoming a more popular form of recreation for outdoor enthusiasts in Ontario. These vehicles also serve an important utilitarian function in rural and remote communities, especially in case of emergencies, provided users obey the law and follow safety precautions.

With recent changes in provincial legislation, the operation of ORVs on public roads is becoming more common, especially in rural communities like Peterborough County. Given the myriad safety, environmental, liability, financial, and nuisance considerations related to their use, and divergent public opinion on the matter, the County is prudent to revisit the regulations pertaining to ORV use on County roads and update its ORV By-law to reflect these contemporary provisions.

The recommended strategy (**Chapter 4**) and complementary actions (**Chapter 5**) set out in this report attempt to balance the many competing priorities and considerations pertaining to the operation of ORVs on County roads. Although expanding use permissions to additional County roads will increase the County's potential exposure, the assessment completed through this study provides a foundation for a rationale approach to allowing their operation under specific conditions.

7.2 Recommendations

Based on the findings of this study, it is recommended that Peterborough County:

1. Adopt **Alternative 2 (Allow Off-Road Vehicles to Operate on Select County Roads)** as the preferred approach for addressing the operation of off-road vehicles on County roads.
2. Approve and implement the preferred County road off-road vehicle network illustrated in **Figure 4.3** (and **Appendix C**).
3. Amend the (or repeal and adopt a new) County's Off-Road Vehicle By-law based of the recommended strategy detailed in this report.
4. Conduct road condition assessments to confirm the suitability of the identified County road segments for the operation of off-road vehicles and identify potentially needed roadway improvements.
5. Develop and launch a public education and communication program in consultation/collaboration with the lower-tier municipalities and other interested parties, following enactment of the by-law amendments.
6. Consider establishing an Off-Road Vehicle Advisory Committee.

Appendix A

Engagement Summary Report (under separate cover)

Appendix B

County Road Off-Road Vehicle Network Development

1. Approach

The process to define the initial County road ORV network concept involved the following five steps:

1. Review of Existing Context – Evaluate current ORV trails and connections, ORV types, and current and relevant legislation.

2. Stakeholder Consultation – Consider feedback received from major stakeholders (i.e., Peterborough Public Health) and members of the public to create a map of all desired routes that meet high-level safety criteria.

3. Quantitative Road Segment Assessment – Use geospatial (GIS) and traffic data provided by Peterborough County to score individual road segments for overall safety based on a variety of factors. Road segments with a failing score (less than 50%) were generally eliminated from further consideration.

4. Qualitative Network-wide Assessment – Assess remaining segments of the network for factors for which data could not be quantitatively analyzed, such as connectivity to trails, amenities, and population centres, as well as the potential presence of road shoulders, sidewalks/existing bicycle routes, sensitive land uses (e.g., public schools). Potential routes through township roads were considered in this stage to help fill gaps in the County Road network.

5. Refine Network – Consider initial feedback received from County and lower-tier municipal staff and make refinements as necessary.

The following sections details Steps 3, 4, and 5 of the process.

2. Quantitative Road Segment Assessment (Step 3)

2.1 Criteria

A series of criteria were developed to assess the appropriateness of each County road for ORV operation. **Table B.1** lists the quantitative assessment criteria applied. These technical criteria were weighted to reflect their relative influence on the safety of ORV operation on public roads, with the rationale for the weighting assigned explained in the table. The data source is also noted.

TABLE B.1: QUANTITATIVE ASSESSMENT CRITERIA FOR OFF-ROAD VEHICLE NETWORK

Criteria	Weighting	Rationale for Weighting	Source
Traffic Volumes	35%	Highly correlated to collision potential for ORVs.	Traffic count data
Speeding (Based on 85%ile observed vehicle speed)	30%	Highly correlated to collision potential for ORVs.	Traffic count data
Posted Speed Limit	15%	Desire for ORVs to use lower-speed roadways. Highly correlated to collision severity for ORVs.	GIS data (roadways)
Truck Utilization	10%	Desire to separate ORVs from truck traffic. Highly correlated to collision severity for ORVs.	Traffic count data
Road Surface	5%	ORVs can travel on most surfaces, but road surface is generally correlated to size/quality of shoulder.	GIS data (roadways)
History of ORV Collisions	5%	Too few ORV collisions have occurred to infer the overall safety of the individual roadways for ORV use.	Collision data

2.2 Criteria Scoring

The following summarizes the scoring system (before weighting) for the quantitative assessment criteria:

Traffic Volumes

Score determined by dividing the traffic volume for the subject County road segment by the maximum observed volume for all road segments (which was 10,000 vehicles per day) and calculating the complementary percentage score. For example, a roadway carrying 2,500 vehicles per day would receive a score of 75%, computed as 1 – 2,500/10,000.

Segments with less traffic score higher that locations with more volume.

Speeding

Score determined by subtracting the 85%ile observed speed for the subject County road segment from the posted speed limit, dividing by 30 (km/h), and calculating the complementary percentage score for road sections with a speed differential (observed minus posted) between 0 km/h and 30 km/h. For example, a roadway with an 85%ile

observed speed of 15 km/h over posted would receive a score of 50%, computed as 1 – 15/30. Segments with differentials greater than the 30 km/h threshold were assigned a score of 0%, while sections with observed speeds at or below the posted limit received a score of 100%.

Segments with higher observed speeds score lower than locations with lower speeds up to a threshold of 30 km/h, above which all sections score the minimum (0%).

Posted Speed Limit

Score determined by ranking the County road segment on a sliding scale, with 0% assigned for posted speed limits of 80 km/h (or higher) and 100% for limits of 40 km/h (or lower). For example, a roadway with a posted speed limit of 60 km/h would receive a score of 50%, computed as (80 – 60)/40.

Segments with lower posted speeds score higher that locations with higher limits.

Truck Utilization

Score determined by dividing the truck percentage for the subject County road segment by the maximum observed truck percentage for all road segments (which was 30%) and calculating the complementary percentage score. For example, a roadway carrying 10% trucks would receive a score of 66%, computed as 1 – 10/30.

Segments with fewer trucks score higher that locations with more heavy vehicles.

Road Surface

Score of 100% assigned to County road segments with paved road surfaces (as they are more likely to have a defined road shoulder) and 50% to segments with unpaved surfaces.

ORV Collision History

Score of 100% assigned to County road segments without any history of ORV collisions and 0% to segments with at least one recorded ORV collision. No road segment was observed to have more than one recorded ORV collision.

2.3 Assessment Process

The quantitative assessment process involved scoring each County road segment based on the criteria listed in **Table B.1**, and further described above, using geospatial (GIS) and traffic data provided by the County. **Table B.2** shows a sample of the data assembled for the assessment, which was completed using Microsoft Excel.

TABLE B.2: SAMPLE ASSESSMENT DATA

OBJECTID	AADT	LENGTH	FULL_STREE	ROAD_CLASS	SPEED_LIMI	PAVEMENT_S	Truck %	85% Obs. Speed	Obs. Speeding	Collision
1	1350	434.227	KING STREET WEST	Arterial	50	Paved	4%	61	11	0
2	3350	1098.358	MOUNT PLEASANT ROAD	Arterial	80	Paved	4%	85	5	0
3	3350	4056.763	MOUNT PLEASANT ROAD	Arterial	80	Paved	4%	85	5	0
4	3800	894.499	SHERBROOKE STREET WEST	Arterial	80	Paved	3%	85	5	0
5	3800	2186.924	SHERBROOKE STREET WEST	Arterial	50	Paved	3%	85	35	0
6	1150	2559.571	COUNTY ROAD 620	Arterial	80	Paved	5%	97	17	0
7	300	782.603	BALMER ROAD	Arterial	60	Paved	5%	58	-2	0
8	3050	422.351	QUEEN MARY STREET	Arterial	80	Paved	6%	80	0	0
9	1400	234.382	KING STREET EAST	Arterial	50	Paved	5%	61	11	0
10	1400	3169.667	KING STREET EAST	Arterial	50	Paved	5%	61	11	0

Table B.3 provides a sample of the roadway segment scores for the different criteria based on the scoring system described above.

TABLE B.3: SAMPLE CRITERIA SCORES

		Score					
Object ID	Road	ORV Collision	Traffic	Truck	Speed Limit	Speeding	Road Surface
1	KING STREET WEST	1.00	0.87	0.87	0.75	0.62	1
2	MOUNT PLEASANT R	1.00	0.67	0.87	0.00	0.82	1
3	MOUNT PLEASANT R	1.00	0.67	0.87	0.00	0.82	1
4	SHERBROOKE STRE	1.00	0.62	0.90	0.00	0.85	1
5	SHERBROOKE STRE	1.00	0.62	0.90	0.75	0.00	1
6	COUNTY ROAD 620	1.00	0.89	0.83	0.00	0.45	1
7	BALMER ROAD	1.00	0.97	0.83	0.50	1.00	1
8	QUEEN MARY STREE	1.00	0.70	0.80	0.00	1.00	1
9	KING STREET EAST	1.00	0.86	0.83	0.75	0.64	1
10	KING STREET EAST	1.00	0.86	0.83	0.75	0.64	1

Table B.4 provides a sample of the quantitative assessment scoring results for the roadway segments. The individual criteria scores in **Table B.3** were multiplied by the weightings in **Table B.1** and summed to derive the final scores.

TABLE B.4: SAMPLE QUANTITATIVE ASSESSMENT SCORING RESULTS

Object ID	Road	Final Score	Pass/Fail
1	KING STREET WEST	78.9%	PASS
2	MOUNT PLEASANT RC	66.5%	PASS
3	MOUNT PLEASANT RC	66.5%	PASS
4	SHERBROOKE STREE	66.1%	PASS
5	SHERBROOKE STREE	52.0%	PASS
6	COUNTY ROAD 620	62.7%	PASS
7	BALMER ROAD	89.8%	PASS
8	QUEEN MARY STREE	72.3%	PASS
9	KING STREET EAST	78.8%	PASS
10	KING STREET EAST	78.8%	PASS

County road segments scoring less than 50% were generally eliminated from further consideration for ORV operation. **Table B.5** lists the eliminated segments and their final scores (Object ID refers to the specific road segment within the GIS database). Segments with a final score of 50% or higher received a “PASS” and moved forward to the qualitative assessment process (Step 4).

TABLE B.5: COUNTY ROAD SEGMENTS ELIMINATED FROM CONSIDERATION FOR OFF-ROAD VEHICLE OPERATION

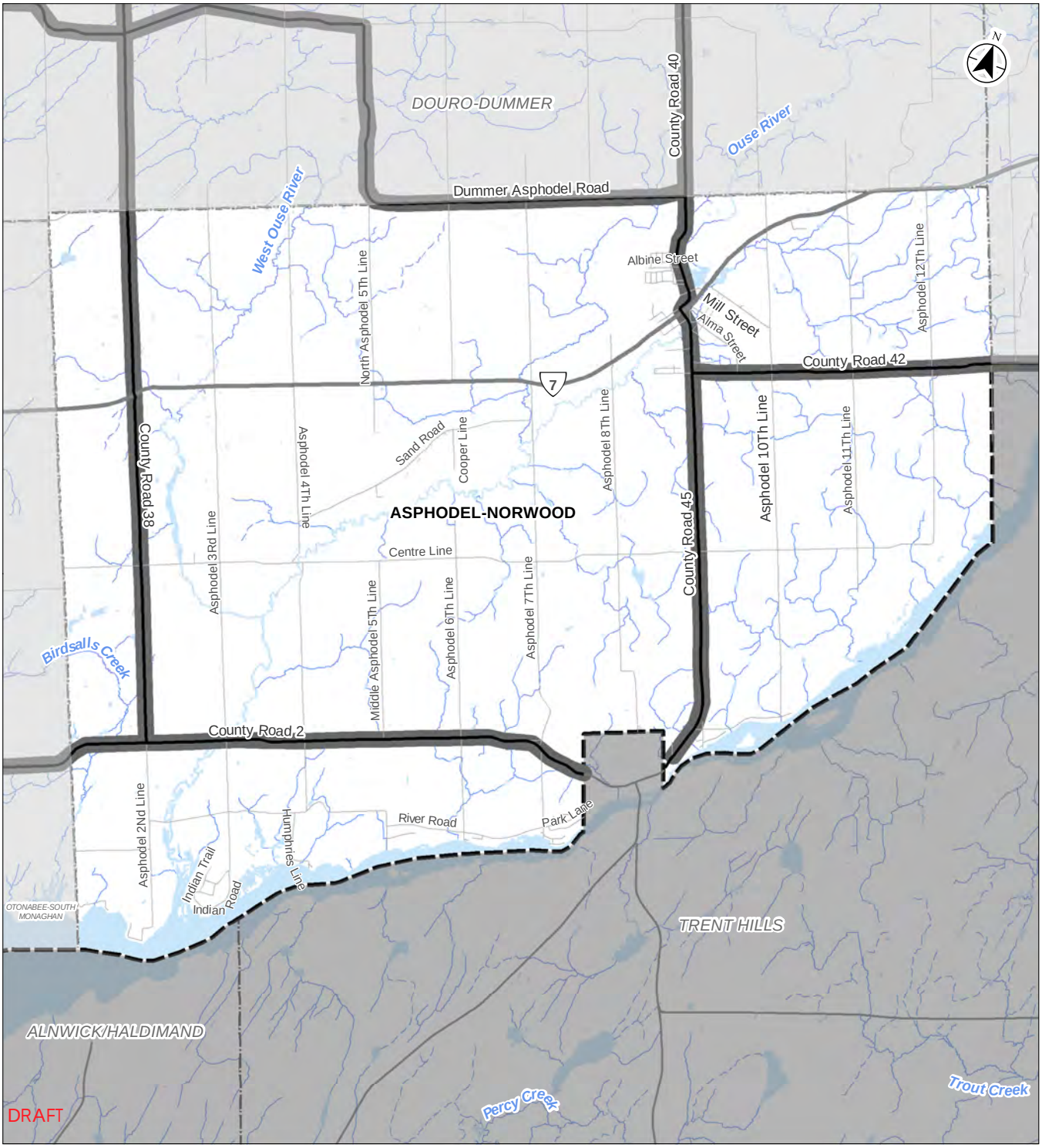
Object ID	Road	Final Score
478	8TH LINE	49.6%
482	8TH LINE	46.6%
13	ACKISON ROAD	47.6%
450	BRIDGE STREET	42.8%
451	BRIDGE STREET	42.8%
112	BUCKHORN ROAD	45.5%
113	BUCKHORN ROAD	45.5%
114	BUCKHORN ROAD	45.5%
115	BUCKHORN ROAD	45.5%
116	BUCKHORN ROAD	45.5%
117	BUCKHORN ROAD	45.5%
102	BUCKHORN ROAD	43.2%
103	BUCKHORN ROAD	43.2%
104	BUCKHORN ROAD	43.2%
105	BUCKHORN ROAD	43.2%
106	BUCKHORN ROAD	43.2%
107	BUCKHORN ROAD	43.2%
108	BUCKHORN ROAD	43.2%
109	BUCKHORN ROAD	43.2%
110	BUCKHORN ROAD	43.2%
111	BUCKHORN ROAD	43.2%
6	CHEMONG ROAD	28.1%
500	CHEMONG ROAD	27.8%
489	CHEMONG ROAD	27.6%
490	CHEMONG ROAD	27.6%
491	CHEMONG ROAD	27.6%
492	CHEMONG ROAD	27.6%
493	CHEMONG ROAD	27.6%
494	CHEMONG ROAD	27.6%
582	COUNTY ROAD 28	44.8%
580	COUNTY ROAD 28	43.0%
309	COUNTY ROAD 4	49.6%
225	COUNTY ROAD 46	49.1%
227	COUNTY ROAD 46	49.1%
89	JAMES A GIFFORD CAUSEWAY	48.5%
461	LAKEFIELD ROAD	38.3%
675	LAKEFIELD ROAD	38.3%
462	LAKEFIELD ROAD	24.2%
464	LAKEFIELD ROAD	24.2%
529	LANSDOWNE STREET WEST	43.1%
530	LANSDOWNE STREET WEST	43.1%
501	LINDSAY ROAD	43.0%
502	LINDSAY ROAD	43.0%
503	LINDSAY ROAD	43.0%
504	LINDSAY ROAD	43.0%
505	LINDSAY ROAD	43.0%
619	LINDSAY ROAD	43.0%
620	LINDSAY ROAD	43.0%
531	NORTH MONAGHAN PARKWAY	46.7%
532	NORTH MONAGHAN PARKWAY	41.6%
533	NORTH MONAGHAN PARKWAY	41.6%
662	NORTH MONAGHAN PARKWAY	41.6%
446	QUEEN STREET	48.9%
447	QUEEN STREET	48.9%
449	QUEEN STREET	48.9%
80	ROBINSON ROAD	40.6%
81	ROBINSON ROAD	40.6%
82	ROBINSON ROAD	40.6%
83	ROBINSON ROAD	40.6%
84	ROBINSON ROAD	40.6%
85	ROBINSON ROAD	40.6%
86	ROBINSON ROAD	40.6%

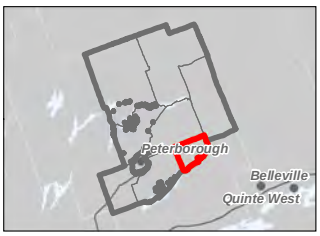
TABLE B.5: COUNTY ROAD SEGMENTS ELIMINATED FROM CONSIDERATION FOR OFF-ROAD VEHICLE OPERATION

Object ID	Road	Final Score
581	COUNTY ROAD 28	43.0%
583	COUNTY ROAD 28	41.1%
611	COUNTY ROAD 28	37.7%
579	COUNTY ROAD 28	35.4%
612	COUNTY ROAD 28	35.1%
584	COUNTY ROAD 28	33.6%
585	COUNTY ROAD 28	33.6%
586	COUNTY ROAD 28	33.6%
587	COUNTY ROAD 28	33.6%
588	COUNTY ROAD 28	33.6%
630	COUNTY ROAD 28	33.0%
631	COUNTY ROAD 28	33.0%
443	COUNTY ROAD 29	49.2%
402	COUNTY ROAD 36	49.2%
410	COUNTY ROAD 36	49.2%
307	COUNTY ROAD 4	49.6%
87	ROBINSON ROAD	40.6%
88	ROBINSON ROAD	40.6%
75	TARA ROAD	49.7%
525	TUPPER STREET	49.5%
526	TUPPER STREET	49.5%
477	WARD STREET	49.6%
479	WARD STREET	49.6%
480	WARD STREET	49.6%
495	WARD STREET	41.8%
496	WARD STREET	41.8%
497	WARD STREET	41.8%
498	WARD STREET	41.8%
463	WATER STREET	24.2%
663	WHITTINGTON DRIVE	45.3%
485	YANKEE LINE	46.2%
488	YANKEE LINE	46.2%

It is noted that certain segments with scores below 50% were still considered for ORV operation if satisfying other objectives, like route continuity. For example, short sections of County Road 46 received scores lower than 50%, as noted in **Table B.5**. But since the remainder of the roadway met the 50% threshold, the potential ORV network concept included the entire road to provide a north-south connection between two established trail systems.

Figure B.1 to **Figure B.8** illustrate the quantitative assessment scores by lower-tier municipality, depicting the County road segments scoring higher and lower than 50%. Road segments scoring less than 50% were generally eliminated from further consideration for the operation of ORVs as the study team viewed this value as a reasonable threshold for determining suitability. Certain segments with scores below 50% were still considered for ORV use if satisfying other objectives like route continuity. For example, short sections of County Road 46 received scores lower than 50%. But since the remainder of the roadway met the 50% threshold, the ORV network concept incorporated the entire length of the road to provide a continuous north-south connection between two established trail systems.





Legend

- County Roads Scored Above 50%
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary

0 1 2 Kilometers

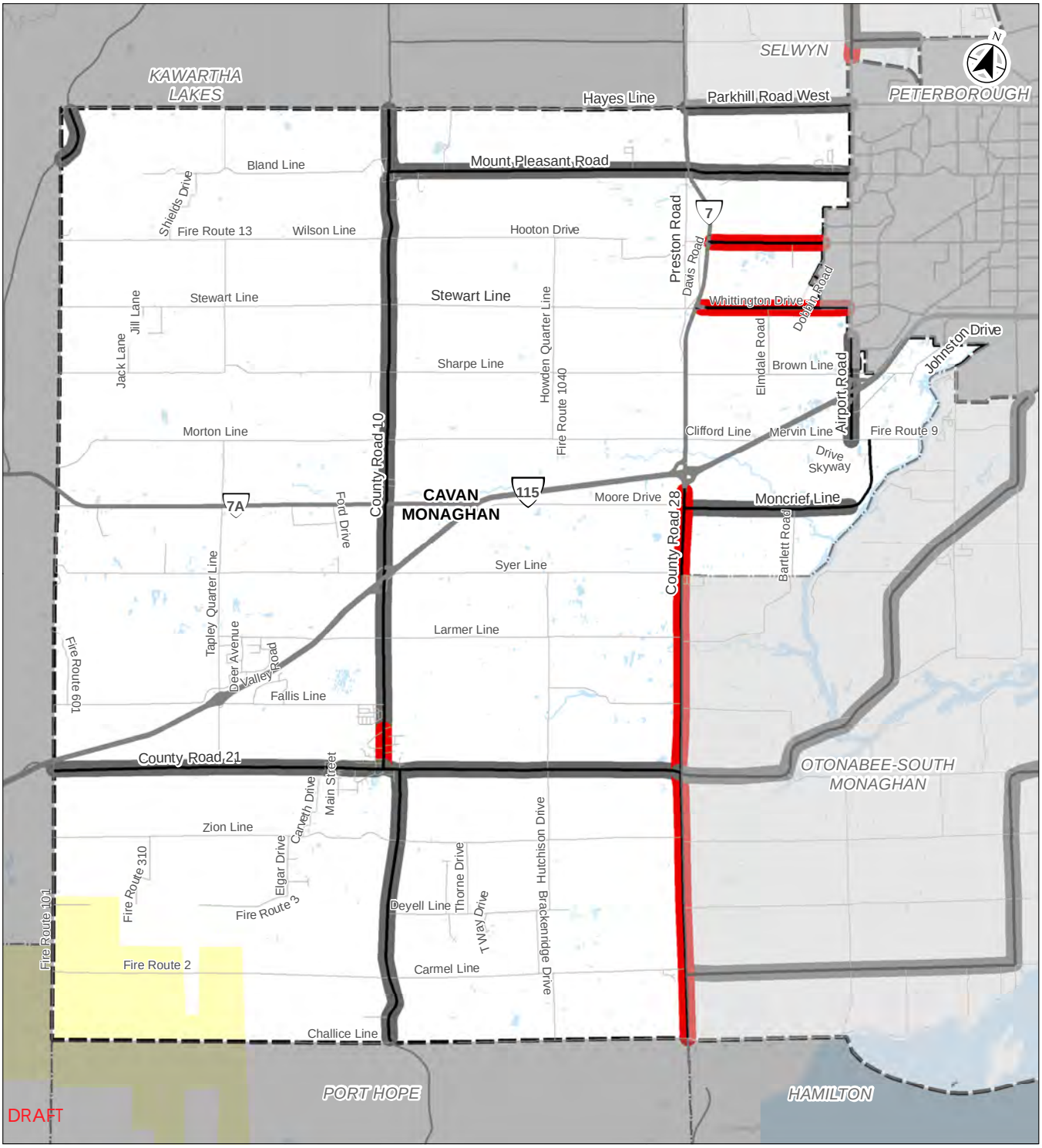
1:100,000 (at original document size of 8.5x11)

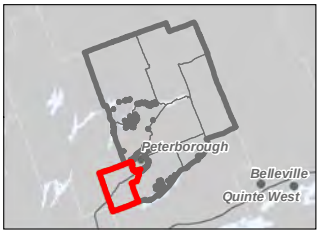
Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

FIGURE B.1

QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK – TOWNSHIP OF ASPHODEL-NORWOOD





Legend

- County Roads Scored Below 50%
- County Roads Scored Above 50%
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Ganaraska Forest

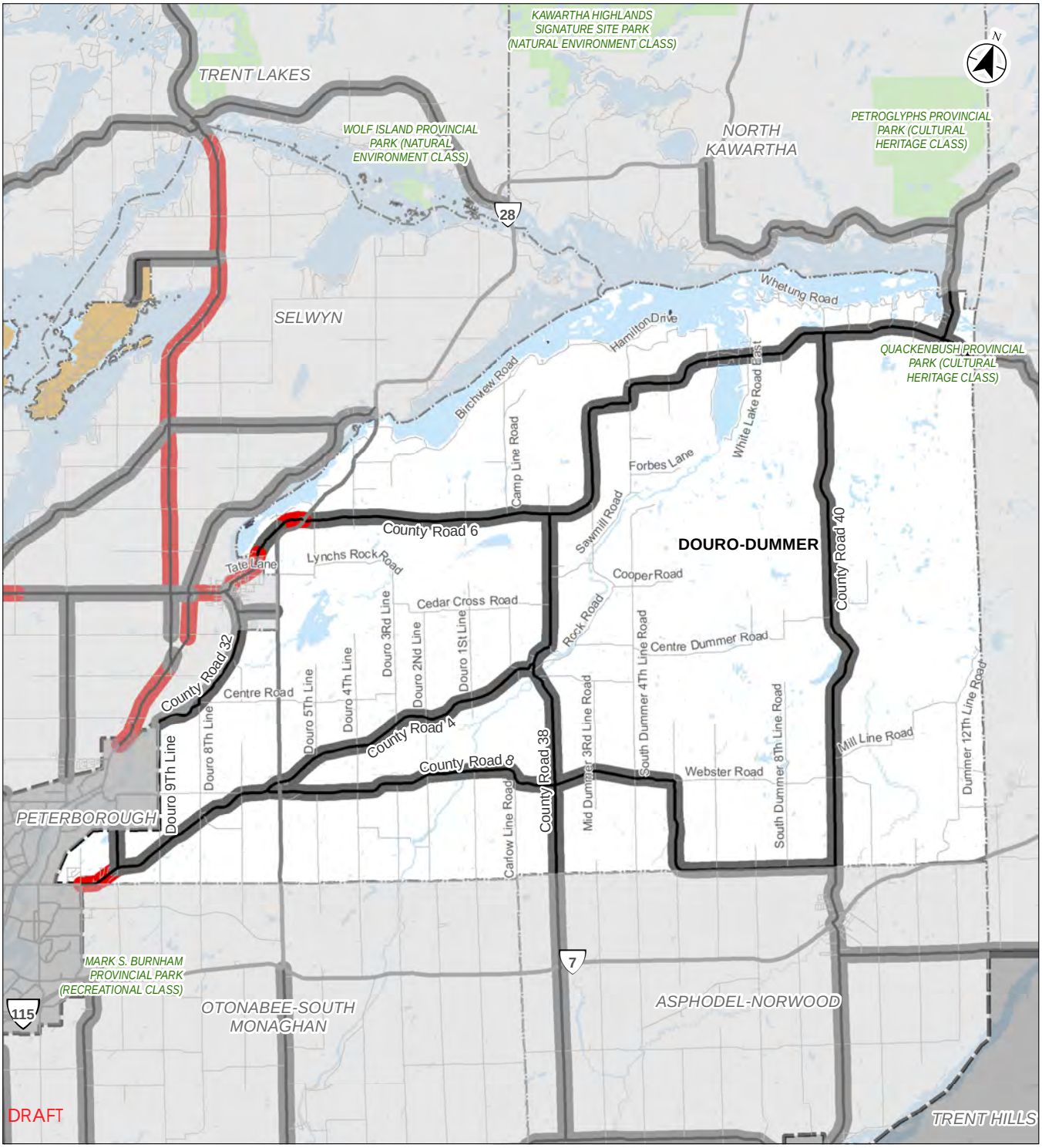
0 1 2 Kilometers

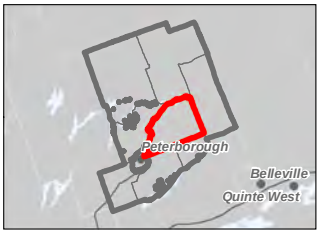
1:125,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

FIGURE B.2

QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK – TOWNSHIP OF CAVAN MONAGHAN





Legend

- County Roads Scored Below 50%
- County Roads Scored Above 50%
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2 4 Kilometers

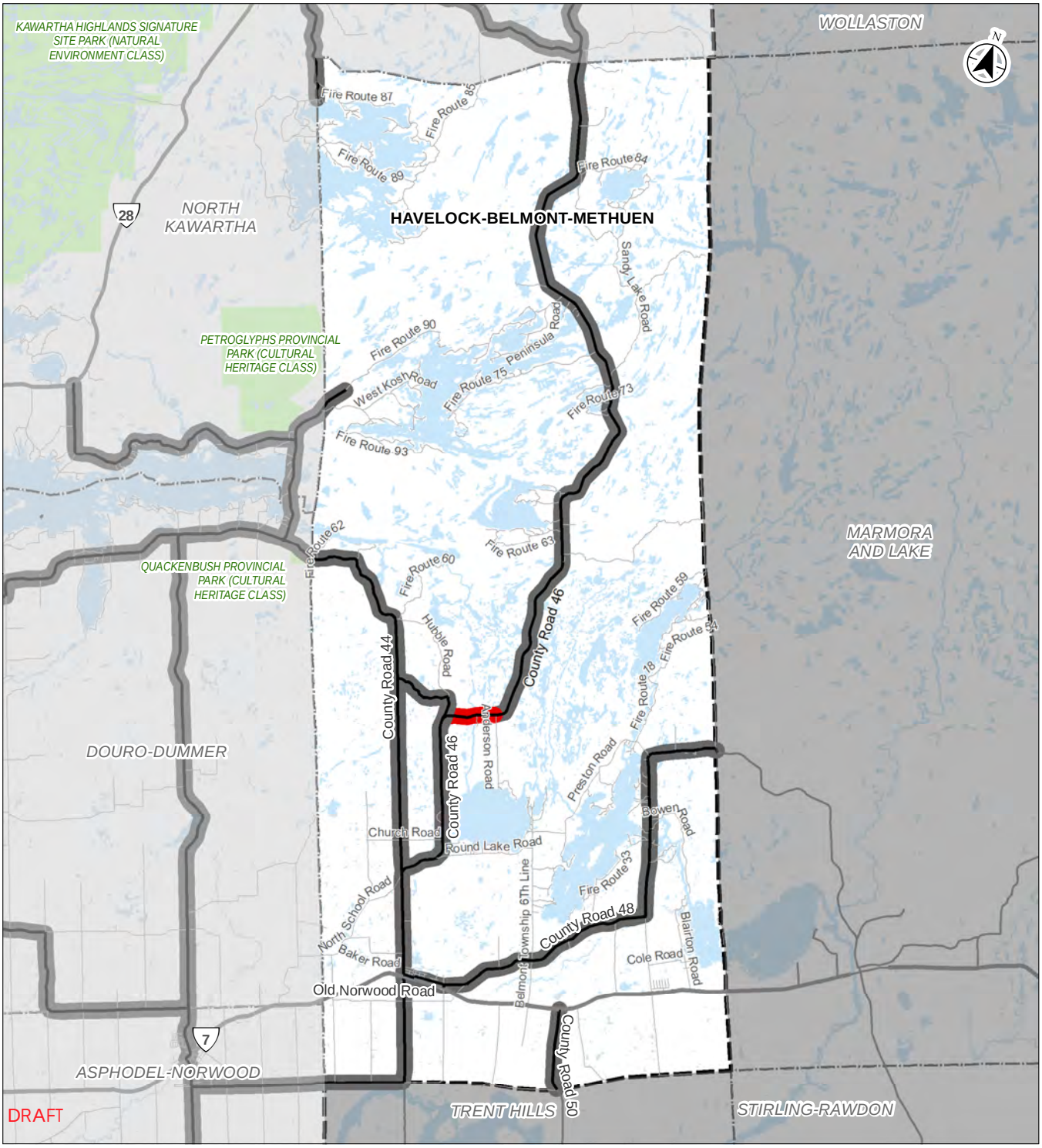
1:200,000 (at original document size of 8.5x11)

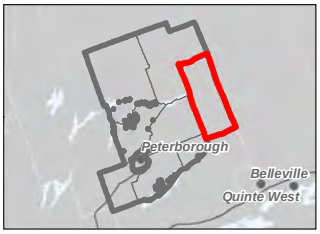
Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

FIGURE B.3

QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK – TOWNSHIP OF DOURO-DUMMER





Legend

- County Roads Scored Below 50%
- County Roads Scored Above 50%
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2.5 5 Kilometers

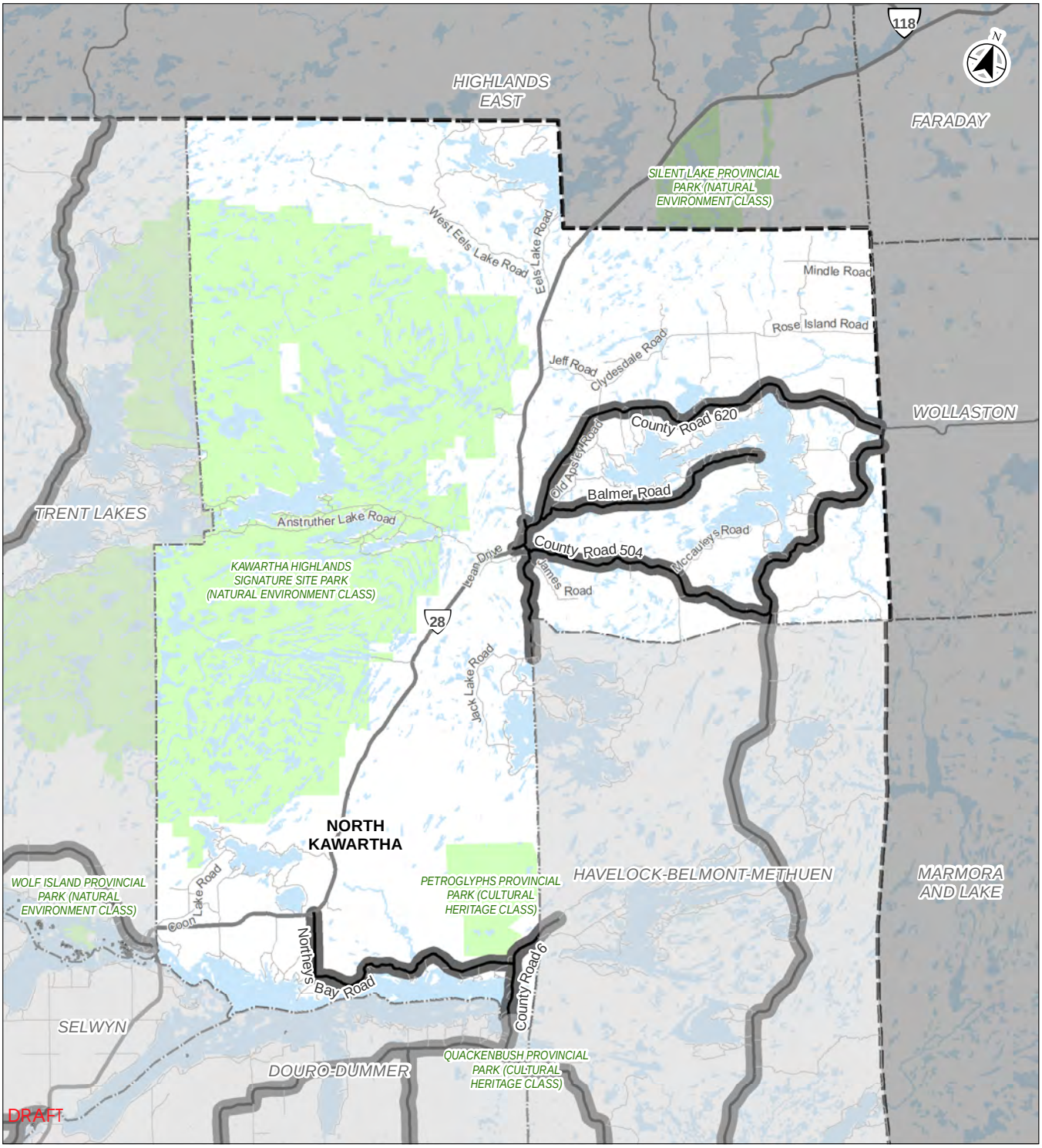
1:225,000 (at original document size of 8.5x11)

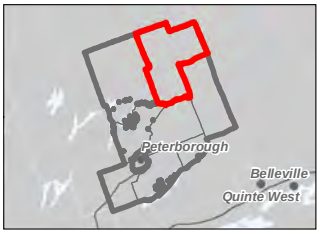
Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

FIGURE B.4

QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK – TOWNSHIP OF HAVELOCK-BELMONT-METHUEN





Legend

- County Roads Scored Above 50%
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2.5 5 Kilometers

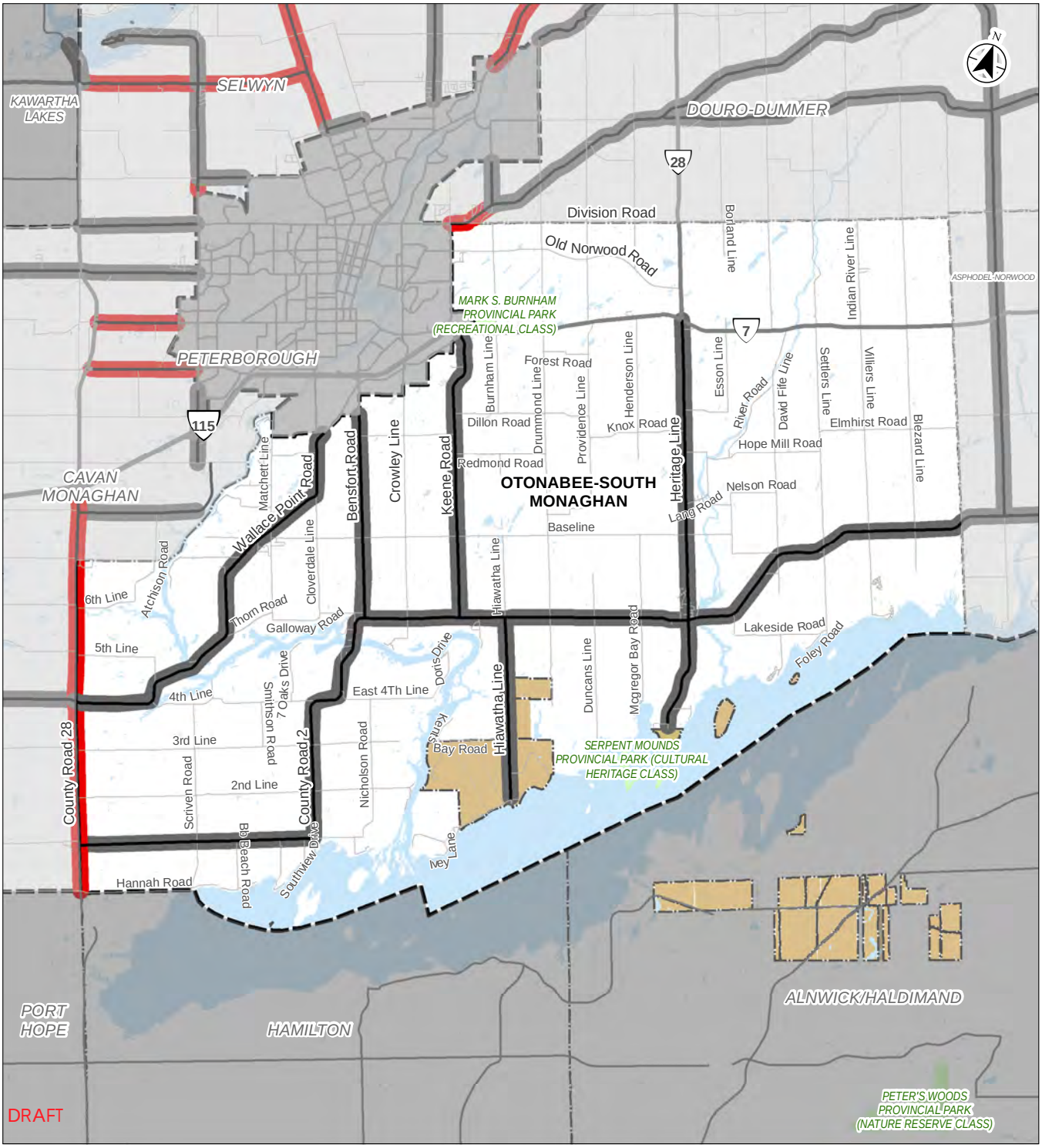
1:250,000 (at original document size of 8.5x11)

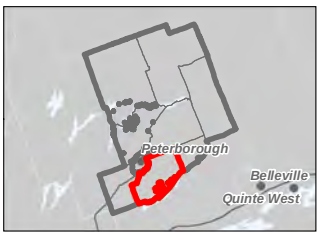
Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

FIGURE B.5

QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK – TOWNSHIP OF NORTH KAWARTHA





Legend

- County Roads Scored Below 50%
- County Roads Scored Above 50%
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2 4 Kilometers

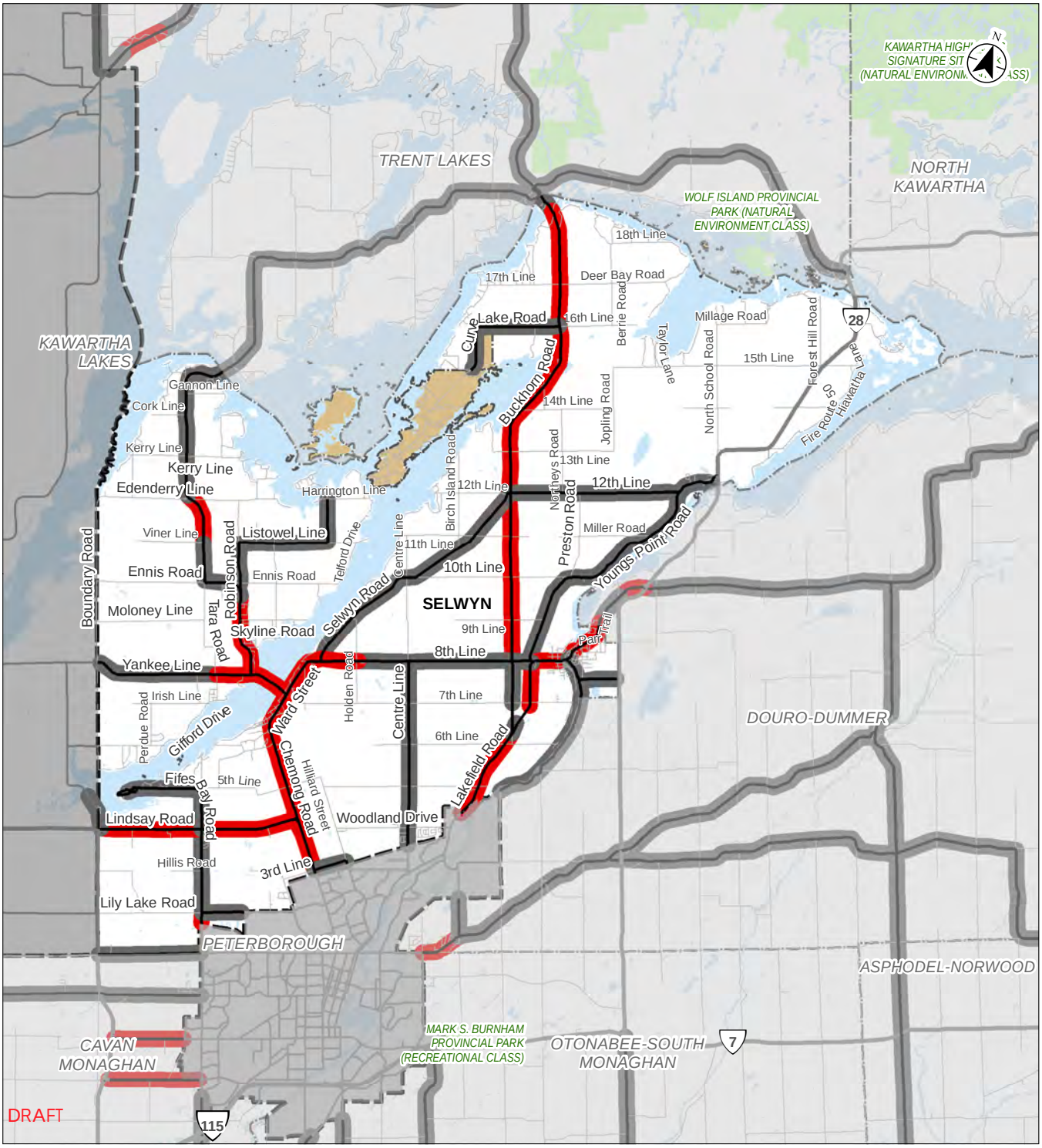
1:175,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

FIGURE B.6

QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK – TOWNSHIP OF OTONABEE-SOUTH MONAGHAN

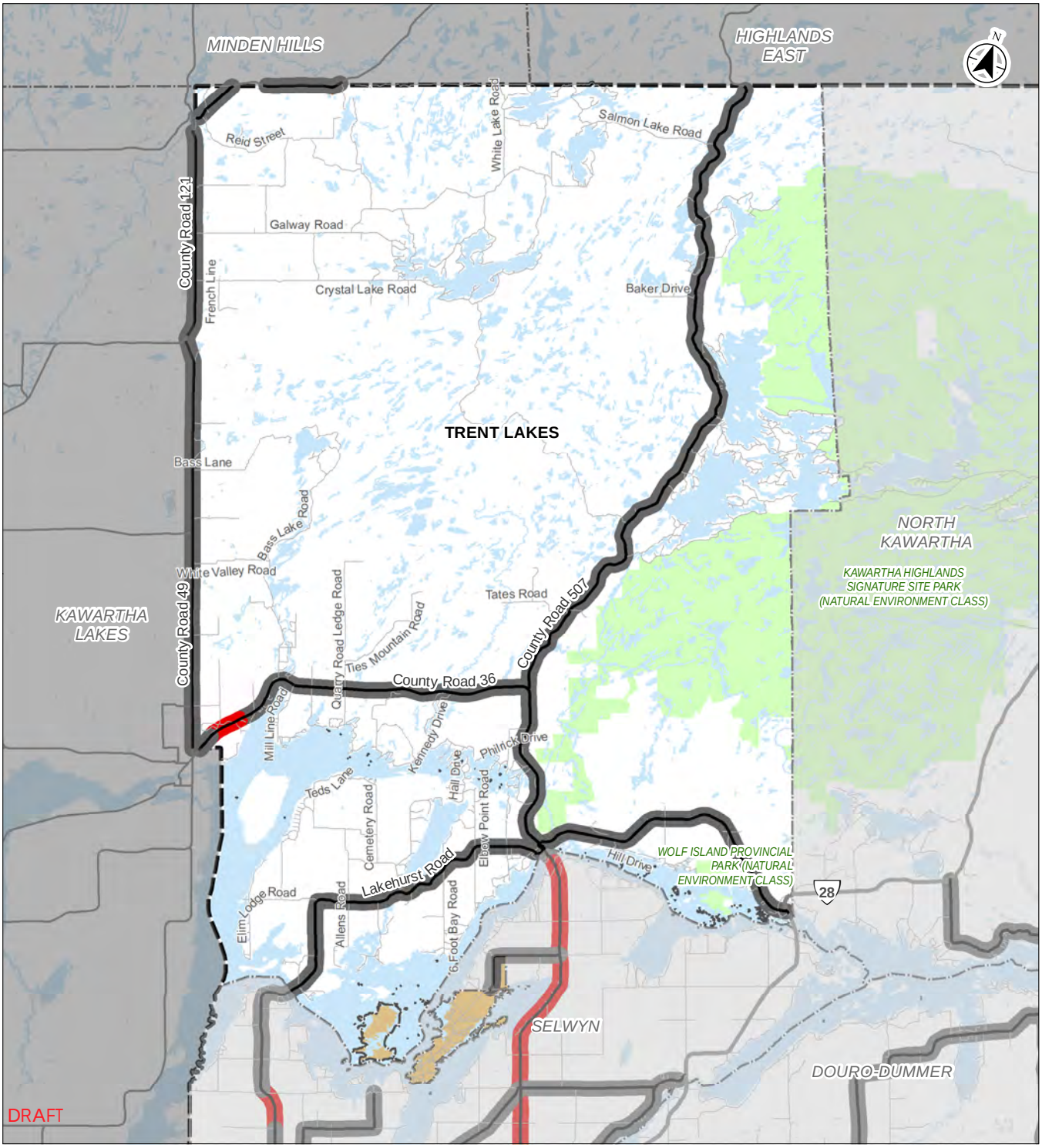


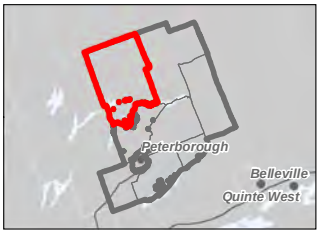
Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

1:200,000 (at original document size of 8.5x11)

FIGURE B.7

QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK – TOWNSHIP OF SELWYN





Legend

- County Roads Scored Below 50%
- County Roads Scored Above 50%
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2.5 5 Kilometers

1:250,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources Queen's Printer for Ontario, 2019.

FIGURE B.8

QUANTITATIVE ASSESSMENT SCORES FOR OFF-ROAD VEHICLE NETWORK – MUNICIPALITY OF TRENT LAKES

3. Qualitative Network-Wide Assessment (Step 4)

3.1 Factors

The shortlist of County road segments satisfying the minimum quantitative score threshold for the operation of ORVs was then subjected to a qualitative assessment based on the factors listed in **Table B.6**. The aim of this phase was to help to establish proper connections between segments of the network, in consideration of potential roads within a lower-tier municipality's jurisdiction that could be recommended to fill these gaps where no viable County Roads could be used as an alternative.

TABLE B.6: QUALITATIVE ASSESSMENT FACTORS FOR OFF-ROAD VEHICLE NETWORK

Factor	Comment	Source
Connectivity to Existing ORV Network	Access to other segments of the ORV network from the roadway	GIS data
Connectivity to Trails/ Nature	Access to ORV trails, hiking trails, and parks	GIS data
Connectivity to Population Centres	Access to (but not through) settlements and communities	GIS data
Avoidance of Noise-Sensitive Land Uses	Limiting ORVs from operating within conservation or settlement areas	GIS data (land use)
Driver's Road Violation Expectation	Roads where automobile drivers might anticipate encountering other slow-moving vehicles along the roadways, such as tractors	GIS data (land use)
Avoidance of Sidewalks/ Multi-Use Paths	Restricting ORVs from operating on roads with high pedestrian/cyclist activity	Virtual inspection using Street View
Presence of Suitable Road Shoulders	Wide road shoulder to support safe operation of ORVs	Virtual inspection using Street View

3.2 Assessment Process

GIS Evaluation

Using the County-supplied GIS data, the conceptual network was first assessed against the following five criteria listed in the table:

- Connectivity to existing ORV network
- Connectivity to trails/nature

- Connectivity to population centres
- Avoidance of noise-sensitive land uses
- Driver's road violation expectation

Comparing the network to the mapping in **Figure B.9** allowed for a greater understanding of the degree of connectivity the network provided, and where improvements could be made to complete the network. Certain County roads in low-traffic agricultural/rural areas were added to the network because of the benefit to connectivity, and as noted, potential roads within the lower-tier municipal road jurisdiction were considered where county roads did not exist. This strategy is similar to development of municipal cycling networks, where low-traffic routes are often included in the network in the absence of dedicated cycling infrastructure.

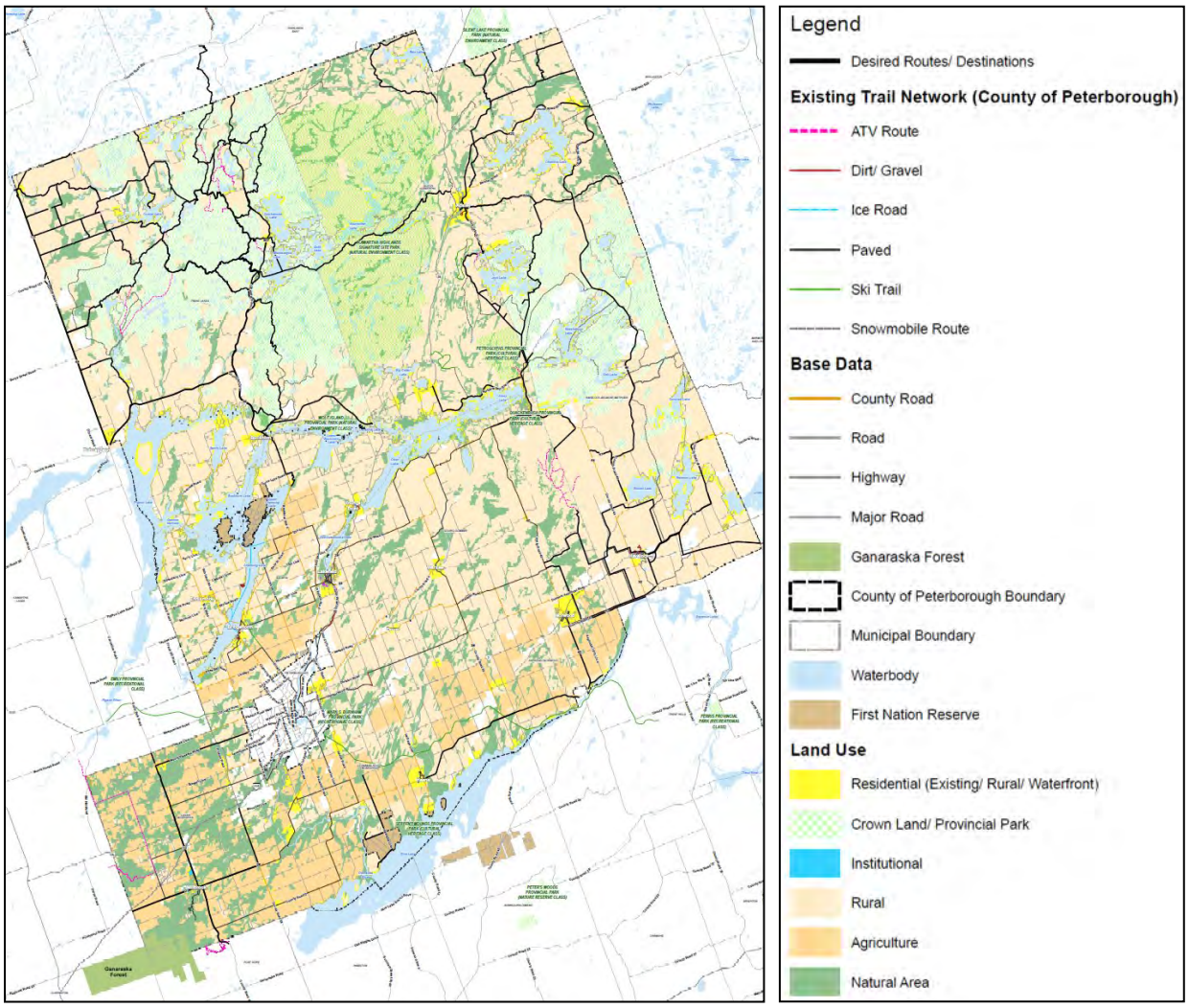


FIGURE B.9: ARCGIS LAND USE MAP

Desktop Review

Virtual inspection of the network was conducted for the following two criteria:

- Avoidance of sidewalk/multi-use paths
- Presence of suitable road shoulders

The review of the County's road network was completed as a desktop exercise and generally relied upon Google Street View, as shown in **Figure B.10**, to spot check road shoulders, sidewalks, and multi-use paths in areas suspected to be of concern (e.g., a roadway approaching a settlement area or a roadway that overlapped with the County's Active Transportation Network).

FIGURE B.10: SAMPLE OF DESKTOP REVIEW IMAGE

Carrying out a desktop review of this nature is efficient and provides useful insight as an initial step but presents some limitations, as each road segment was not visually inspected and/or present-day conditions could not be confirmed. Preferably, this review should be supplemented by a field check of key roadway attributes, including shoulders, roadsides, pavement surfaces, sidewalks, and multi-use paths. The site visit will also confirm current conditions in case of discrepancies with digital images. **Section 5.2** proposes road condition assessments as a complementary action to the recommended strategy for this purpose.

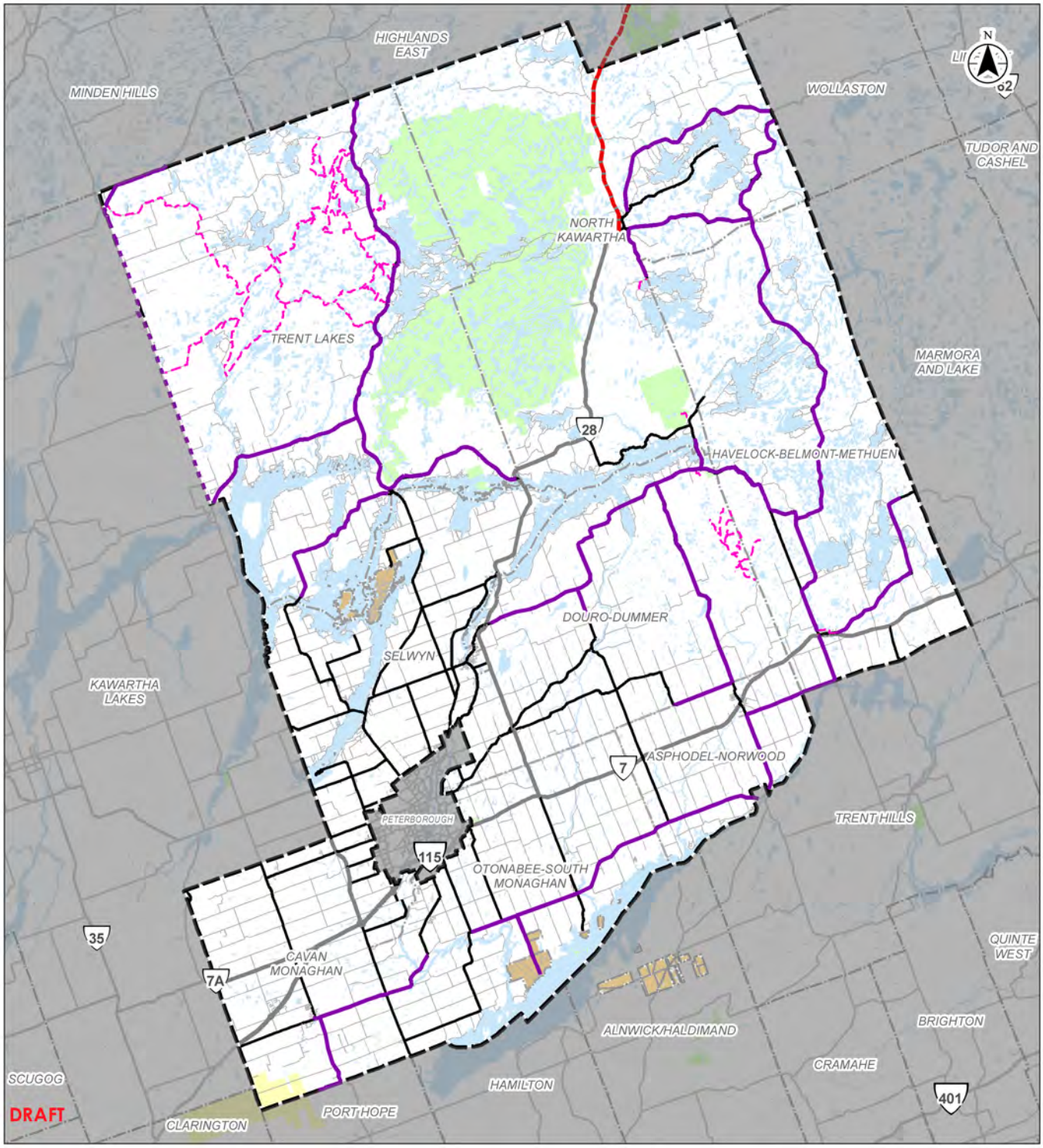
4. Network Refinement (Step 5)

Following a presentation of the initial network concept to County staff, the study team made the following refinements to the assessment and network. The qualitative assessment criteria and qualitative assessment factor adjustments noted below are already reflected in **Table B.1** and **Table B.6**, respectively:

- Road class was removed from the quantitative assessment criteria and a weighting was added to the traffic volume criterion.
- The quantitative assessment passing threshold was lowered from 60% to 50% to reflect the change due to the refinement above and to provide more clarity.
- Several roads were added or removed, based on initial feedback from County staff as well as further consideration. These included:
  - Addition of County Road 6 (south of Stony Lake), which passed technical assessment and improves connection to Lakefield/village/amenities.
  - Removal of County Road 6/Northey's Bay Road (north of Stony Lake) due to higher truck volumes reportedly observed and proximity to existing residential properties.
  - Removal of County Road 9 and 'T-intersection' with County Road 10 given that a direct link to the existing ATV trail could be achieved via recommended lower-tier municipal roads located within the Municipality of Port Hope and Township of Cavan-Monaghan.
  - Removal of County Road 21 due to limited road width and sensitive adjacent land uses within this segment. Further, extensive public concerns were expressed in relation to ORV operation in the Millbrook area. However, public feedback also expressed the desire by ORV users to access the village and Ganaraska Forest. As such, an east-west link to Glamorgan was proposed to be achieved via lower-tier municipal road (Zion Road, Cavan-Monaghan).
- Several County road segments identified by stakeholders were based on their knowledge of local context (i.e., high truck volumes unidentified by traffic counts, lack of suitable road shoulder, available parking for ORVs within community cores).

5. Initial Network Concept

Figure B.11 illustrates the initial ORV network concept presented to participants and stakeholders in Stage 4 of the decision-making process. The concept was further refined in subsequent stages of the review, ultimately resulting in the preferred ORV network depicted in **Figure 4.3** in the report.



Legend

- Potential ORV Route Subject to Further Review
- Preferred County Road ORV Route
- Provincial Highway ORV Route
- Existing ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park
- Ganaraska Forest

0 5 10 Kilometers

1:500,000 (at original document size of 8.5x11)

Notes

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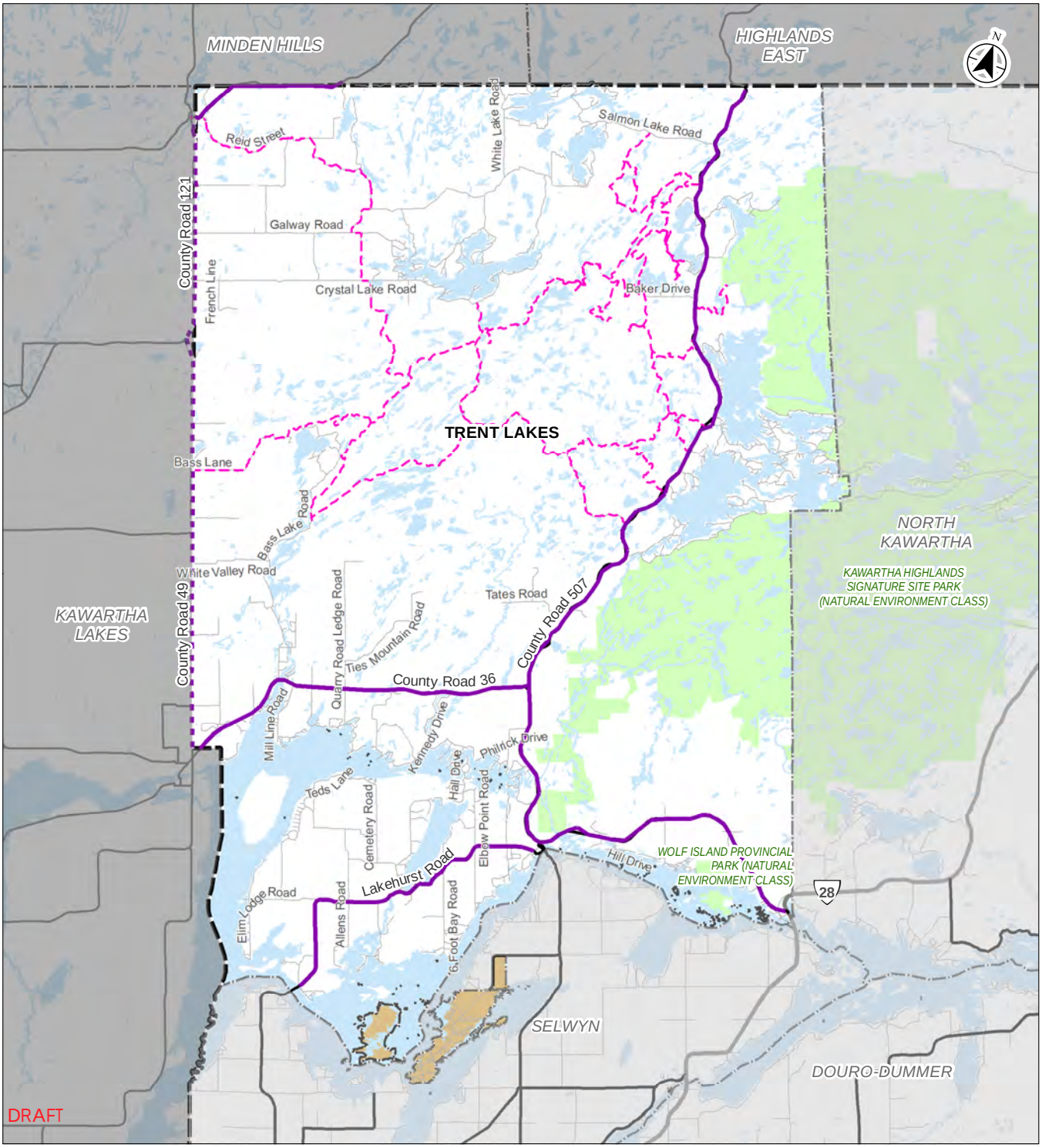
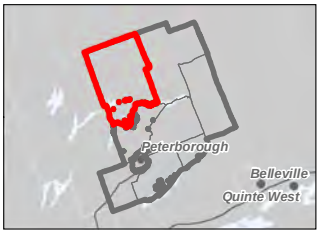
FIGURE B.11: INITIAL OFF-ROAD VEHICLE NETWORK CONCEPT

Appendix C

Preferred Off-Road Vehicle Network by Municipality





Legend

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- Preferred County Road ORV Route
- Existing ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2.5 5 Kilometers

1:250,000 (at original document size of 8.5x11)

Notes

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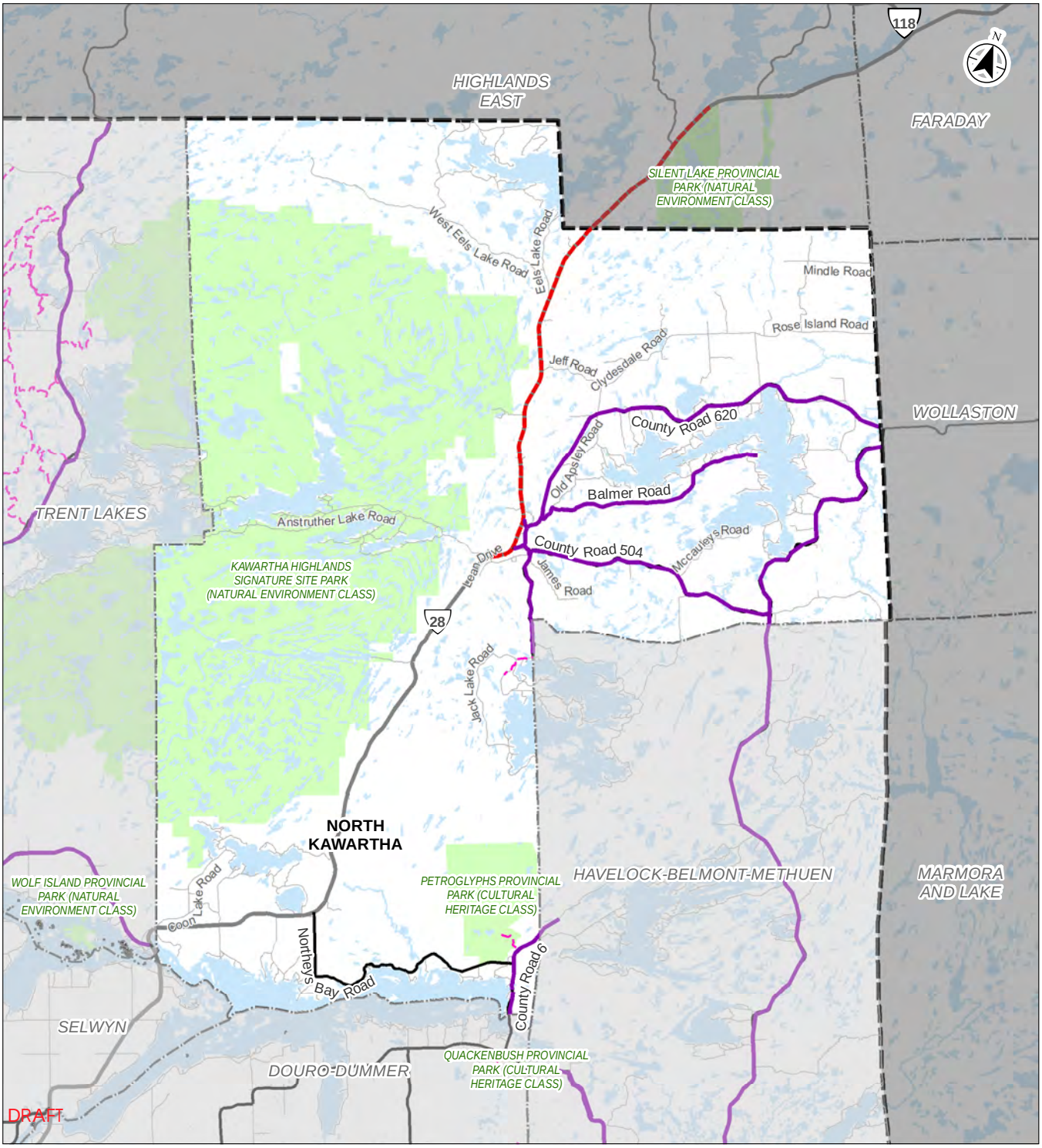

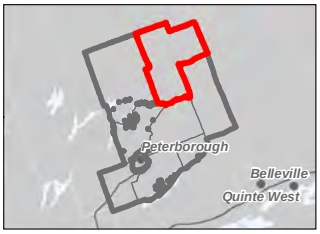

Legend

- Preferred County Road ORV Route
- Provincial Highway ORV Route
- Existing ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2.5 5 Kilometers

1:250,000 (at original document size of 8.5x11)

Notes

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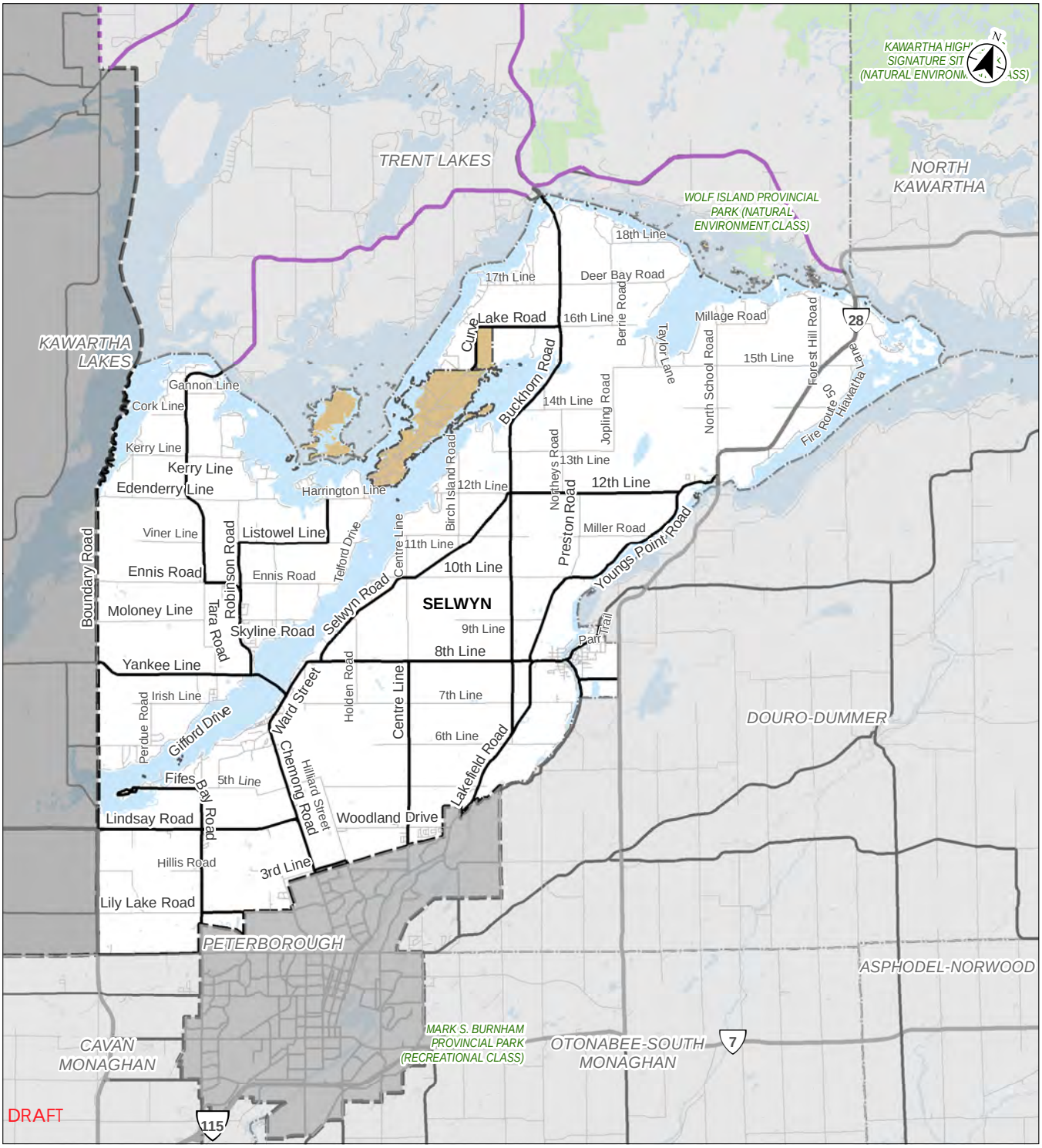

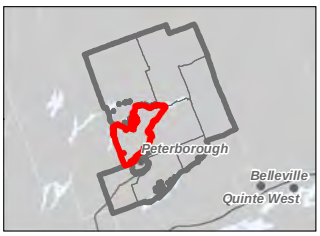

Legend

- Potential ORV Route Subject to Further Review
- Preferred County Road ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2 4 Kilometers

1:200,000 (at original document size of 8.5x11)

Notes

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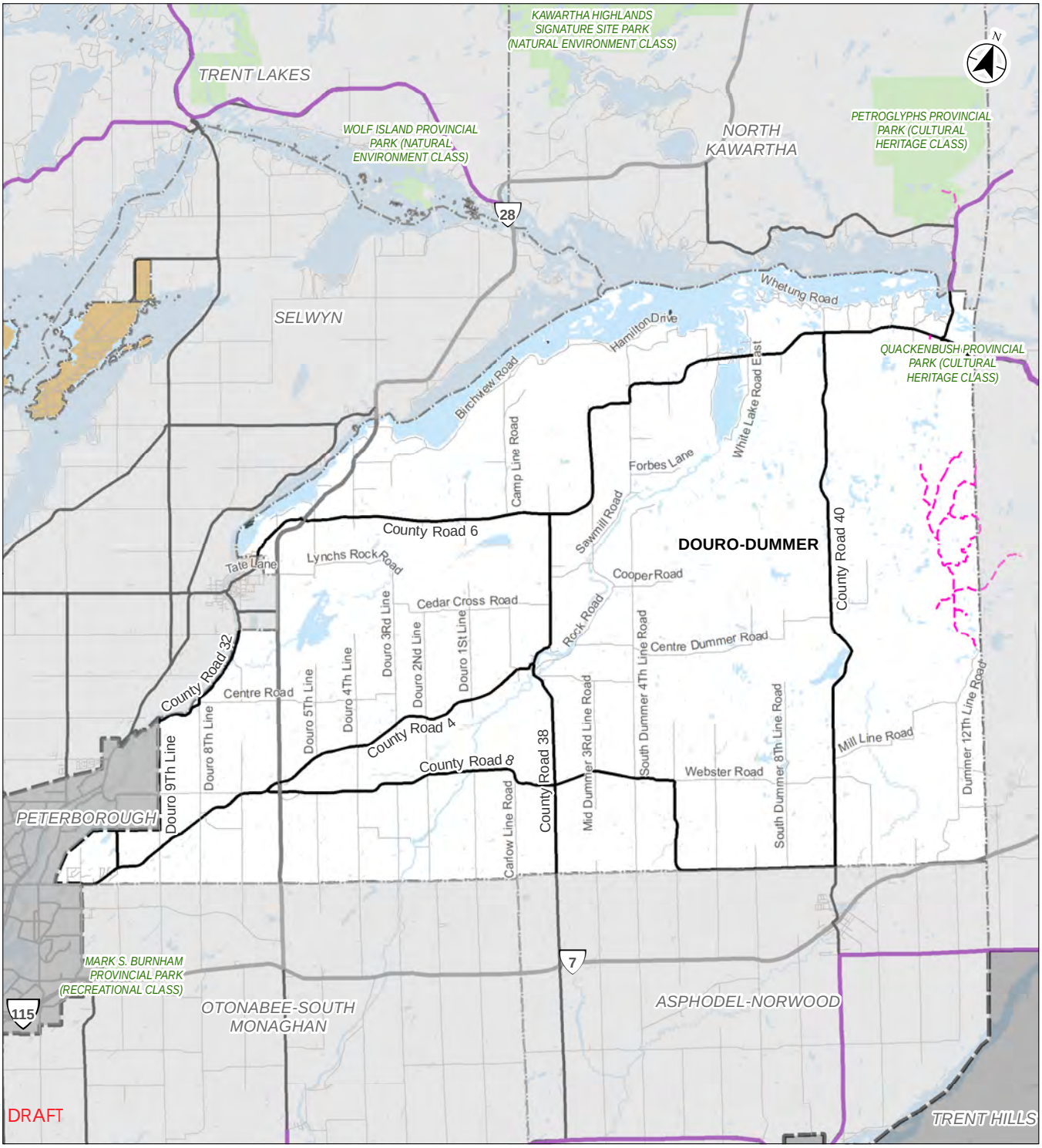

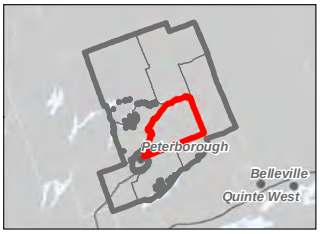

Legend

- Preferred County Road ORV Route
- Existing ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2 4 Kilometers

1:200,000 (at original document size of 8.5x11)

Notes

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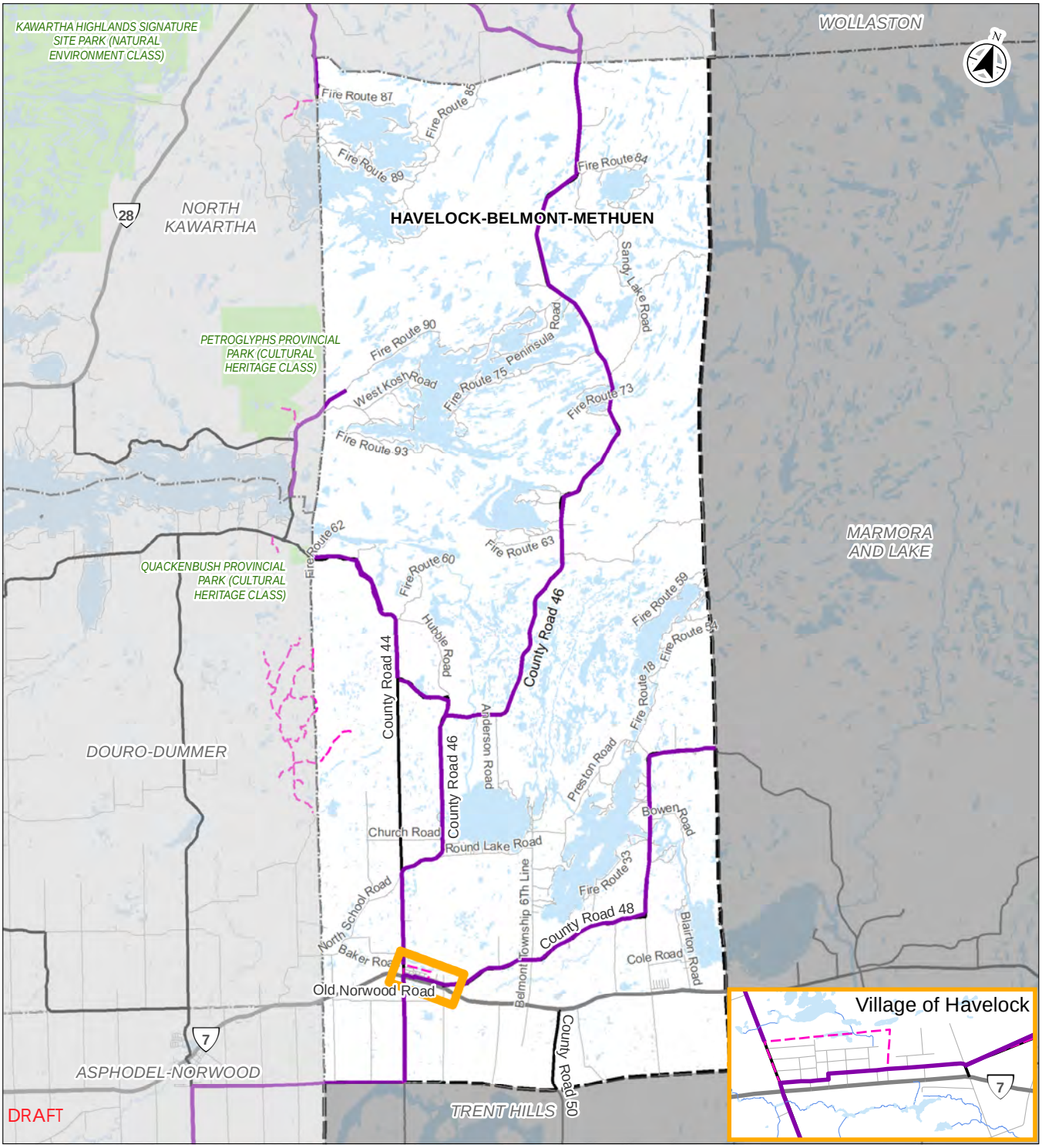

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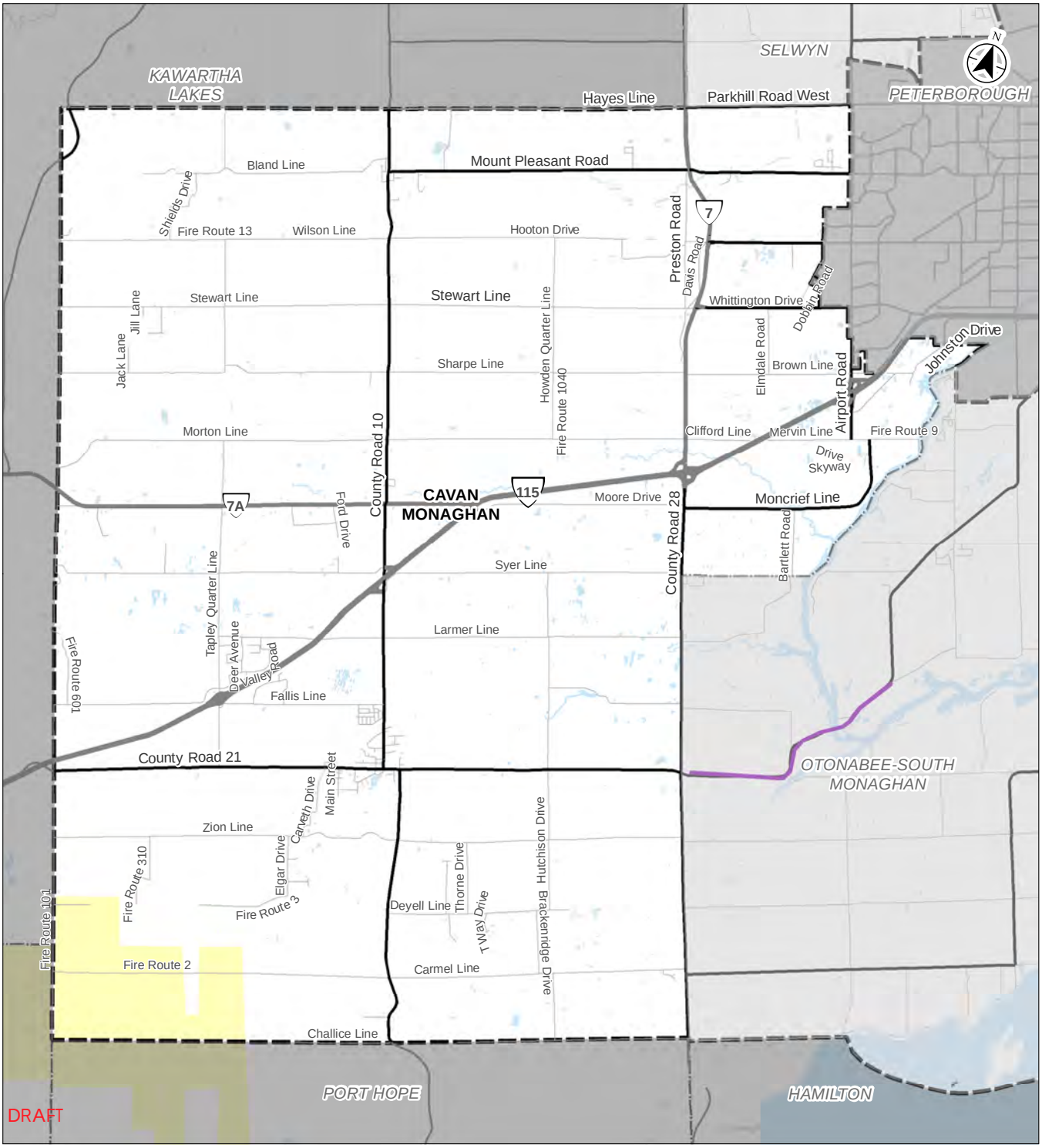

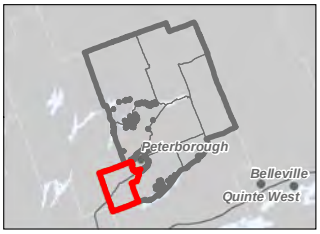

Legend

- Preferred County Road ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Ganaraska Forest

0 1 2 Kilometers

1:125,000 (at original document size of 8.5x11)

Notes

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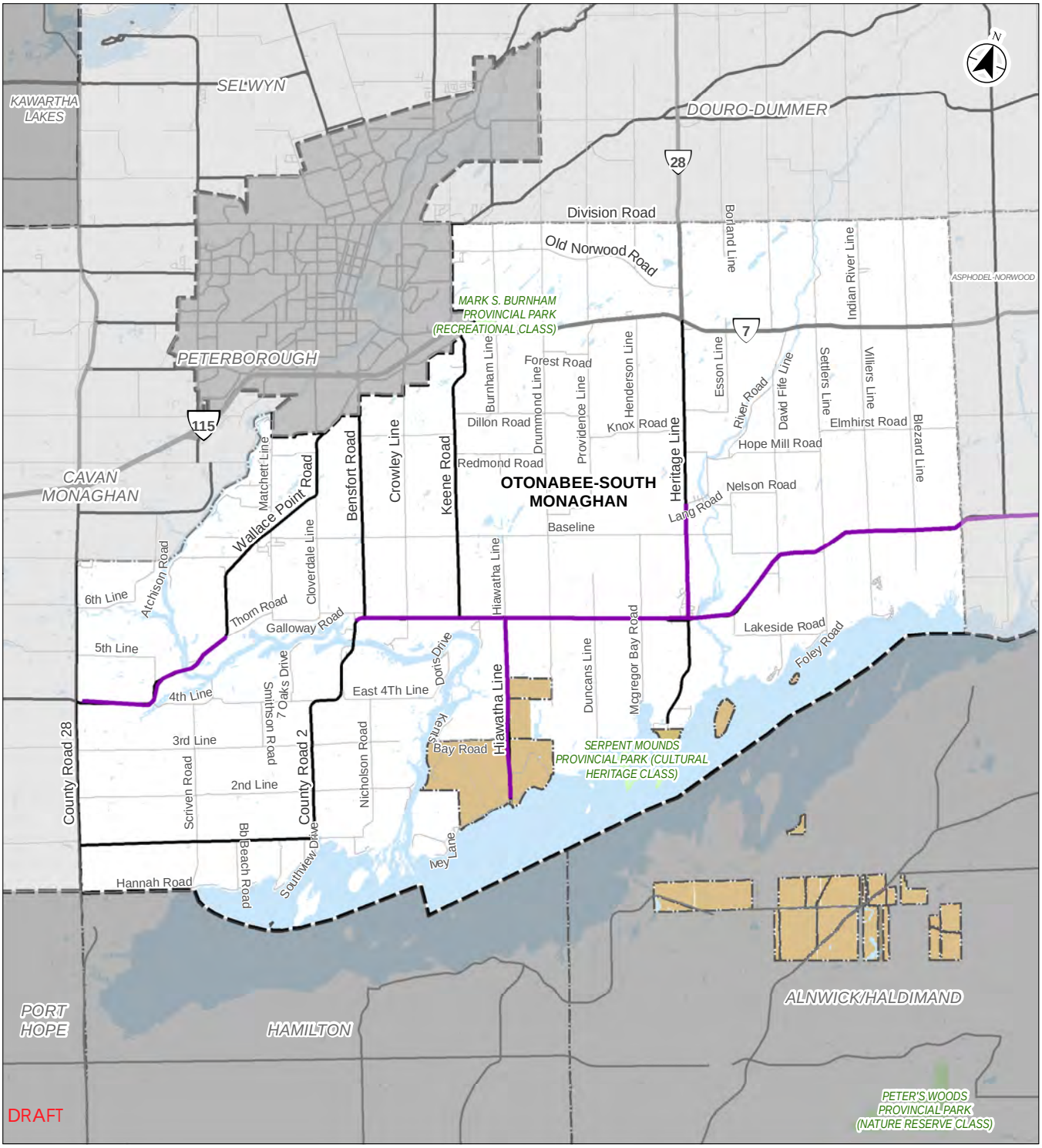

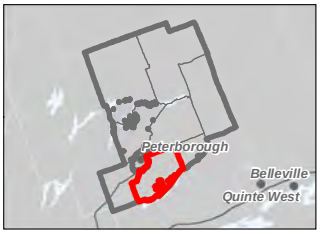

Legend

- Preferred County Road ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary
- First Nation Reserve
- Provincial Park

0 2 4 Kilometers

1:175,000 (at original document size of 8.5x11)

Notes

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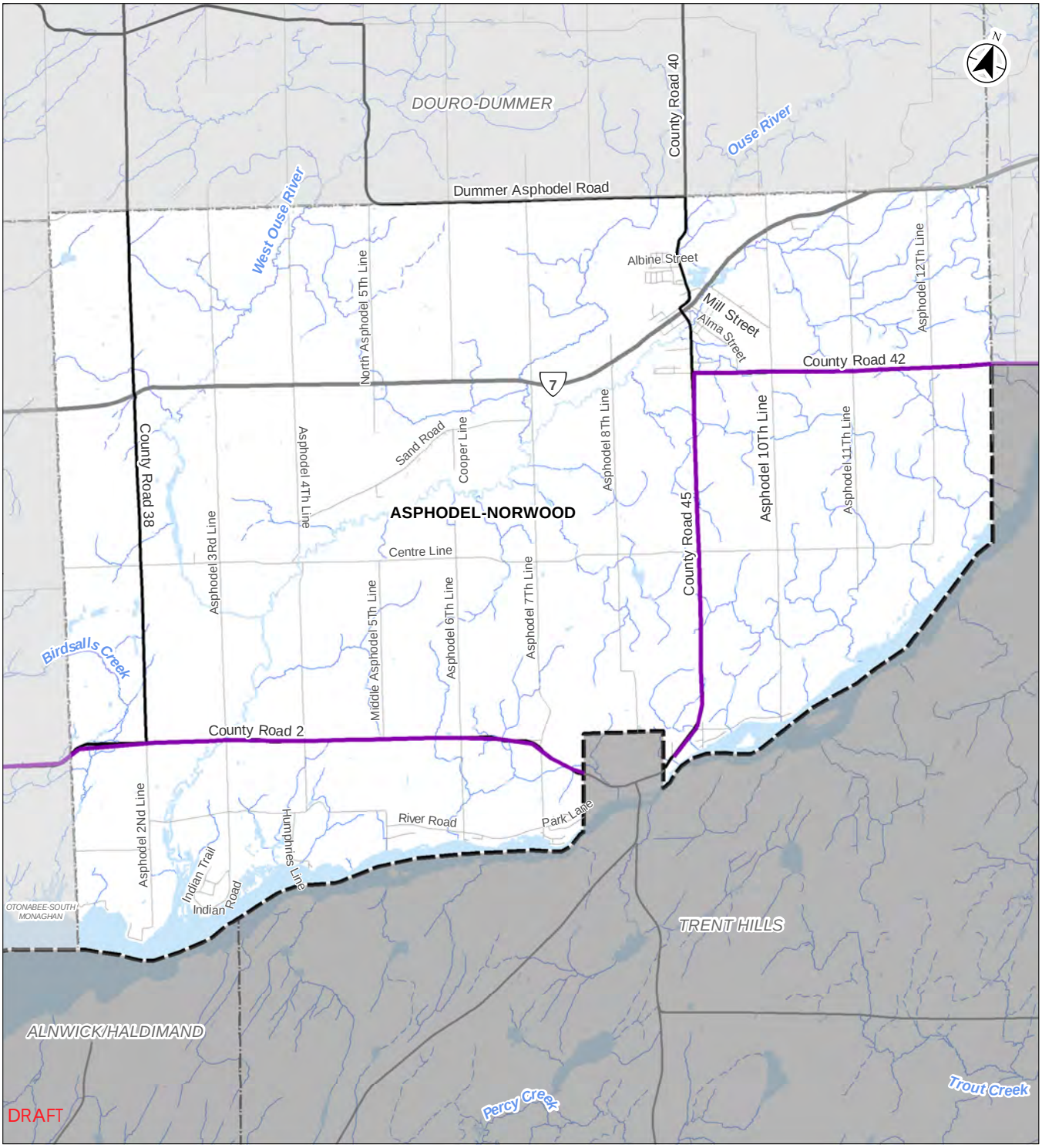

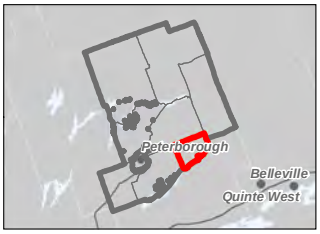

Legend

- Preferred County Road ORV Route
- Provincial Highway
- County Road
- Local Road
- County of Peterborough Boundary
- Municipal Boundary

Notes

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0 1 2 Kilometers

1:100,000 (at original document size of 8.5x11)