

Road Needs Study

Corporation of the Municipality of Calvin

Final Report

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Jp2g Project # 25-5304A

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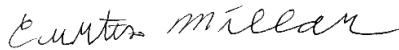


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Executive Summary

Jp2g Consultants Inc. was retained by the Municipality of Calvin to complete a Road Needs Study of their municipal road system to determine a priority list for road improvements within the Municipality. Two Jp2g Civil Engineering staff members conducted the road condition review in October 2025, observing the existing conditions of the roads, assigning road condition ratings, and providing recommendations for spot improvements, specific maintenance and construction works.

The results of the study indicated the road network will require a total of \$2.52 million over the next 5 years. This is an annual average expenditure of approximately \$503K. An additional \$1.19 million (in 2025 dollars) of road improvements are recommended in years 6-10.

In addition to the road needs, a number of additional considerations are noted within the report. It is recommended that the Municipality prioritize the safety concerns related to intersection configurations and sight lines concerns at intersections, road speed limit review (specifically at curves in the horizontal and vertical alignment) and flatten steep ditches or provide roadside safety barriers (such as guide rails).

1 Introduction

1.1 Project Background

The Municipality of Calvin has retained Jp2g Consultants to conduct a Road Needs Study to analyze the municipal roadway system and the following components: road condition assessment and methodology used; roadside conditions related to drainage, ditching, brushing and signage; assess road section by road section with asset IDs from the municipality's current asset inventory; summarize the required maintenance and recommended optimum timelines; and provide estimated costs of proposed practical improvements to eliminate deficiencies and to bring the municipal road system to proper standards.

The purpose of this study is to:

- Inform the Council on the existing conditions and needs of the road system.
- Develop the most cost-effective long-term maintenance and construction strategy, considering budgetary limits.
- Provide a projection of the future conditions and adequacy of the road system.
- Present a suggested year by year work plan, operating and capital budget for ten years.
- Inform and update the Municipality's Asset Management Plan

Roads, like equipment, wear out or deteriorate over time and must be rehabilitated or replaced at predetermined intervals. Failure to properly maintain and rehabilitate the road system components at the appropriate time will result in ever increasing costs and risk of full replacement of the road and its components at a premature date. To ensure that the Municipality of Calvin is obtaining cost effectiveness for its investment in the road system, the condition of the existing road system must be monitored and a maintenance and construction strategy for the future must be established. A Road Needs Study provides the fundamental background documentation and is a good basis to determine cost effective maintenance and construction strategies for the road system.

1.2 Study Methodology

The methodology for this study was in general accordance with the Ministry of Transportation (MTO) "Road Management Plan for Small Lower Tier Municipalities – Methods and Inventory Manual" [1].

Direction was provided by the Municipality to perform the following:

- Site investigation of the existing road network to review the following elements:
 - Visually assess the surface treatment for surface distresses and frost heave locations
 - Visually assess the granular surface condition and frost heave locations
 - Review the surface widths and crossfalls and shoulder widths
 - Review areas of roadside hazard conditions
 - Review surface rutting (where applicable)
 - Review drainage items (ditching, culvert replacements, rock removals, brushing)
- Compile and input the data from our site investigations into the Municipality's GIS shape files
- Prepare a Road Needs Study Report, addressing the following:
 - Road maintenance needs analysis (recommendations) based on life cycle forecast for capital budgeting.
 - Timing for major and minor repairs (immediate, 1-5 years, 6-10 years)
 - Recommendations for on-going maintenance requirements.
 - Recommendations for minimum budget levels for operating and capital expenditures.

Evaluation of the bridges within the Municipality of Calvin was completed in November 2023 under a separate study. Therefore, the bridges were not assessed as part of this study.

The Transportation Association of Canada (TAC) “Geometric Design Guide for Canadian Roads: Chapter 11 – Special Roads” [2] was used when analyzing the road geometry design and providing typical cross-section recommendations as part of this study. Chapter 11 provides design guidance for special roads such as low-volume rural roads, including gravel roads. The chapter also includes discussion on when 1-lane 2-way roads could be considered and provides guidance for roadside safety for low-volume roads.

2 Road System Breakdown

As of October 2025, the Municipality of Calvin Road System consists of approximately 64.5 km of roads. The road surfaces are a mixture of LCB (Low Class Bituminous) and gravel surfaced roads, as summarized in Table 1. All roads maintained by the Municipality are classified as Rural.

Table 1 – Municipality of Calvin Roads System Surface Type Summary

Surface Type	Length
LCB (Low Class Bituminous)	11.7 km
Gravel	52.8 km
TOTAL	64.5 km

3 Road System Inventory

The Road Inventory and Needs Summary Table in Appendix D includes information such as road geometry (length, surface width, shoulder width, platform width), travelled way lane type (2-lane 2-way vs 1-lane 2-way), surface type (LCB vs gravel), traffic counts, condition rating, observations (from site investigation), recommended improvements, and estimated improvement costs. The roads are separated into sections from intersection to intersection, with section numbers that match the Municipality’s asset management dataset.

4 Condition Ratings

In order to classify the roads, a visual inspection of the road section was performed and classified with a condition rating between 1-10. A score of 10 being newly constructed or in excellent condition and a score of 1 indicated the road has failed and significant efforts are needed to fully reconstruct the road. The rating was determined through visual inspections during the field review and took into account the rating of the road surface but also took into account other components of the road including drainage facilities such as storm drains and ditches, roadside elements such as roadway & travelled way widths, brushing needs, shouldering, sight line distances and horizontal and vertical alignment of the roads.

Table 2 provides a further explanation of the Structural Condition associated with the Condition Rating. Possible actions for maintenance, rehabilitation and reconstruction are also noted for both Low Class Bituminous (LCB) and Gravel roads. The “Possible Actions” noted in this table are to address the structural condition of the roadway only. Additional actions may be required to address other roadside concerns (ditching, brushing, widening, etc.).

In October of 2025, two of Jp2g Consultants Civil Engineering staff met with staff from Municipality of Calvin and conducted field reviews of all the roads maintained by the Municipality and assigned updated condition ratings. The ratings between similar roads of similar condition may vary slightly due to their usage and surroundings, however the variation is not anticipated to have a significant impact upon the need for improvements just the hierarchy on when the roads are scheduled for improvement. A map of the Municipality Road System indicating the 2025 Road Conditions Ratings and road surface type is provided in Appendix A.

Table 2 – Condition Ratings and Road Segment Conditions

Condition Rating	Road Segment Condition	Possible Actions
10 to 8	Good Structural Condition. Some local improvements may be warranted.	LCB – Consider cold patching trouble spots and minor crack sealing. No rehabilitation expected within 5-year plan period. Gravel – Normal maintenance activities should maintain current condition rating. No rehabilitation expected within 5-year plan period.
7 to 6	Average/Fair Structural Condition. Continued improvements may be required.	LCB – Consider crack sealing roadway when condition is approximately 7 to prevent water from affecting road base. Roads may require rehabilitation at a condition of approximately 6. Gravel – Normal maintenance activities should maintain current condition rating. Roads may require gravel resurfacing and/or widening.
5 or 4	Poor Structural Condition. Improvements required throughout road system.	LCB – Road requires rehabilitation and may warrant full-depth reconstruction. Gravel – Road requires gravel resurfacing and/or widening
3 or less	Very Poor Structural Condition. Poor riding condition and possible Safety hazard.	LCB – Full-depth reconstruction of the roadway Gravel – Road requires gravel resurfacing and/or widening. Full-depth reconstruction of the roadway may be warranted.

LCB (surface treated) road surfaces should be resurfaced within their life span before the road base is allowed to deteriorate and suffer structural damage. Failure to resurface within the designated timelines can result in premature failure of the road base, and result in a need for reconstruction. The volume of truck traffic, overall traffic volumes, the existing road base construction standards/condition and roadside drainage will also impact the road surface life span.

The condition ratings have been projected for a 5-year period for the purpose of scheduling capital maintenance items using the results of this Road Needs Study and typical life spans for the road surface types. Gravel road conditions were not projected forwards as it is assumed that normal maintenance activities are sufficient to maintain the roads in constant condition. The total kilometers of anticipated road that are considered to require scheduled capital projects over the next 5 years is approximately 14.07 km.

The lifespan of a double surface treated road surface (including LCB) ranges from 15 years (with a ‘good’ structural road base) to as short as 5 years (with a ‘poor’ structural road base with underlying structural problems, inadequate drainage, weak subgrade material, etc.). For the purposes of this report, LCB surfaces will be assumed to have a life span of 10 years, under normal conditions. With the continued monitoring of road conditions over time, it is anticipated that this assumed life span may be increased or decreased.

The condition rating of each road section is projected to decrease by a fixed amount per year, based upon the assumed life expectancy. Given a 10-year life cycle, an assumed rehabilitation once the road reaches a condition rating of 5, this means the condition rating of a street will decrease by 0.5 points per year.

LCB

$$\frac{5 \text{ Point Condition Rating}}{10 \text{ Year Life Cycle}} = 0.5 \text{ points per year}$$

Roads with condition ratings of 5 or less have reached the end of the lifespan of the surface and are in need of improvement. If road rehabilitation does not occur at these predetermined condition ratings, reconstruction

may be necessary, as the road base material becomes compromised by moisture intrusion over time. The longer that scheduled rehabilitation is deferred, the greater the risk that total reconstruction will be required instead, and at a much greater cost. Roads having a condition rating of approximately 5 should typically be accorded to a higher priority for capital rehabilitation or reconstruction works. The road should be closely monitored for evidence of safety concerns, surface breakup and any issues remedied with appropriate spot maintenance.

Gravel road condition ratings are noted on the map in Appendix A and are not considered to change due to continued routine maintenance and ongoing upgrading of the granular top surface. Any noted deficiencies that are not related to depth or width should be dealt with through spot improvements and maintenance items rather than as a capital budgeting item. Upgrading a road surface is always to be considered as a capital item.

5 Road Construction Needs

The Road Inventory and Needs Summary Table in Appendix D provides the condition ratings for each road section, a summary of the onsite investigation observations, and recommended spot improvements, specific maintenance and construction works.

A brief summary of the various types of spot improvements, specific maintenance and construction activities are explained in the sections below.

5.1 Spot Improvements

Spot improvements are typically recommended on road sections that are generally structurally and geometrically adequate for most of its length, but require some type of road, roadside or drainage improvement at isolated location(s).

5.1.1 Brushing

- Brushing overgrown trees, bushes and tall grass within 150m of intersections; or
- Brushing along length of road section (assumed 25% of road length, both sides)

5.1.2 Ditching

- Roadside ditch spot cleanout (assumed 25% of road length, both sides); or
- Flattening steep ditches so slope is 3H:1V or flatter

5.1.3 Guiderails

- Installation of steel beam guiderails (approximately 100m either side of road) at steep ditches or other roadside hazards
- Install guiderail end treatments at each exposed end of the guiderail system

5.1.4 Spot Dig-outs

- Excavate to subgrade in select areas where the base or subbase has failed
- Add new Granular B subbase, and Granular A base
- Repair surface (grading for gravel roads, double surface treatment for LCB roads)

5.1.5 Shouldering (spot areas)

- Grade shoulder to cut down “berm” (remove humps in shoulders to provide continuous slope to ditch)
- 100mm Granular ‘A’ (1.0m wide) and grade at 4% slope (re-establish 0.5m shoulder and 0.5m rounding) (assumed 25% of road length, both sides)

5.1.6 Construct Turnaround (dead-end roads)

- Tree removal (clearing and grubbing)
- Earth excavation
- 150mm depth Granular ‘A’ (construct turnaround as per OPSD 500.010 [3])

Note: Does not include any land acquisition or easements that may be required.

5.1.7 Construct Turnout (1-lane, 2-way roads)

- Tree removal (clearing and grubbing)
- Earth excavation
- 150mm depth Granular 'A' (construct turnout as shown in drawing TO-1 in Appendix F)

Note: Does not include any land acquisition or easements that may be required.

5.2 Specific Maintenance

Specific maintenance improvements are activities that maintain the existing level of service and can improve the quality of the road.

5.2.1 Shouldering (entire road section)

- Grade shoulder to cut down "berm" (remove humps in shoulders to provide continuous slope to ditch)
- 100mm Granular 'A' (1.0m wide) and grade at 4% slope (re-establish 0.5m shoulder and 0.5m rounding)

5.2.2 Gravel Resurfacing, incl shoulders

- 100mm Granular 'A' lift for entire road section
- Grade shoulder to cut down "berm"
- 100mm Granular 'A' shoulder (1.0m wide) and grade at 4% slope (re-establish 0.5m shoulder and 0.5m rounding)

5.3 Construction

Construction improvements are activities that improve the structural adequacy or geometry of the road.

5.3.1 Gravel Resurfacing and Widening

- 100mm Granular 'A' lift for entire road section and widen, including shoulders, at 4% cross-fall
 - 1-lane, 2-way roads: minimum 4.0m roadway width, plus 0.5m rounding both sides
 - 2-lane, 2-way roads: minimum 7.0m roadway width (includes 0.5m shoulders both sides), plus 0.5m rounding both sides

5.3.2 LCB Overlay - Rural Road Rehabilitation

- Spot Improvements prior to overlay (Grinding or Padding)
- Double Surface Treatment (2 Lifts of LCB)
- 100mm Granular 'A' shoulders (1.0m wide) and grade at 4% slope (re-establish 0.5m shoulder and 0.5m rounding)

5.3.3 Full-Depth Processing - Rural Road Reconstruction

- Full-depth in-place processing (pulverize) of existing asphalt and granular base (approx. 250mm depth)
- 150mm Granular 'A' base
- Woven geotextile (if warranted)
- Double Surface Treatment (2 lifts of LCB)
- 100mm Granular 'A' shoulders (1.0m wide) and grade at 4% slope (re-establish 0.5m shoulder and 0.5m rounding)

5.4 Benchmark Costing

Benchmark unit rates have been developed based on recently completed construction projects in Municipality of Calvin and within the nearby Renfrew County. The rates have been applied to the different road sections for various types of recommended road improvements based on the unit (i.e. length or area). The unit rates are summarized in Table 3 below. Normal maintenance activities (such as grading and re-establishing the crown on gravel roads, winter sanding and snow clearing, etc.) are considered normal maintenance needs and are not

included in the costing. Additional costs for site specific features that were not observed (such as bedrock, and shallow culverts) have not been included in the costing and would have to be considered during the detailed design phase of works. All costing is reported using present day values and does not include the any consideration of tariffs.

Table 3 – Municipality of Calvin Benchmark Costing Summary

ITEM	2025 UNIT RATE	UNIT
Asphalt/LCB Removal	\$ 8.00	m ²
Earth Excavation	\$ 20.00	m ³
Pulverize	\$ 2.50	m ²
Granular 'A' - Road (per tonne)	\$ 40.00	t
Granular 'A' - Road (100mm)	\$ 8.00	m ²
Granular 'A' - Road (150mm)	\$ 12.00	m ²
Granular 'B' - Road (300mm)	\$ 30.00	m ²
Geotextile	\$ 2.50	m ²
Granular 'A' Shouldering (incl. cut down "berms", 100mm Granular A)	\$ 10.00	m
Ditching	\$ 12.00	m
Double Surface Treatment	\$ 11.00	m ²
Road Cross Culverts	\$ 1,000.00	m
Entrance Culverts	\$ 750.00	m
Brushing	\$ 7.00	m
Construct turnout (incl tree removal, earth excavation, 150mm Granular 'A'), excl land acquisition	\$ 4,975.00	ea
Construct turnaround - OPSD 500.010 (incl tree removal, earth excavation, 150mm Granular 'A'), excl land acquisition	\$ 10,475.00	ea
Guiderail	\$ 330.00	m
Guiderail (End treatments)	\$ 19,000.00	set

6 Road Needs Summary

6.1 Existing Program

The Municipality currently does not have an annual budget for Capital Works.

Based on past Road Improvements data (from 2022 to 2025) provided by the Municipality, it appears the Municipality resurfaces on average 5.0 km of their gravel roads per year. In 2024, the Municipality also overlaid approximately 2.0 km of LCB roads (with a single surface treatment), and roto-milled another 2.0 km of LCB roads (with double surface treatment). However, there are no records of when the LCB roads were rehabilitated or reconstruction prior to 2024. The annual budget for roadside works (such as ditching, brushing, etc.) is unknown. Based on the Benchmark Costing, it is assumed that the Municipality spent an average of \$230,000 per year on gravel resurfacing and an unknown amount on rehabilitation or reconstructing LCB roads.

6.2 5-Year Program

Based on the Roads Needs Study, the road network will require a total of \$2.52 million over the next 5 years. This is an annual average expenditure of approximately \$503K. The proposed roads requiring capital works over the next 5 years and a yearly cost breakdown is summarized in Table 4 below. The road improvements have been prioritized not only based on their condition ratings, but also based on other factors such as traffic volumes, and trying to keep costs consistent year over year. The complete Road Needs Costs Yearly Breakdown and Capital Planning Summary table can be found in Appendix E. A map showing the recommended road improvements over the next 5 years can be found in Appendix C.

Table 4 – Summary of roads recommended for improvements and annual cost breakdown.

Section Number	Road Name	From	To	Section Length (km)	2025 Condition Rating (Jp2g)	2026	2027	2028	2029	2030
RD_5301_5	Peddlers Dr	HWY 630	Donalds Rd	2.02	6	\$595,700				
RD_5301_1	Peddlers Dr	HWY 630	Peaceful Lane	2.04	5		\$480,500			
RD_5301_4	Peddlers Dr	Daventry Rd	Boundary Rd	2.05	5			\$483,900		
RD_5301_3	Peddlers Dr	Donalds Rd	Pautois Rd	1.87	6				\$454,700	
RD_5301_6	Peddlers Dr	Pautois Rd	Daventry Rd	0.19	6				\$46,200	
RD_5311	Beach Rd	HWY 630	End	0.2	5					\$22,000
RD_5319_1	Beckett Ln	Galston Rd	East Dead End	0.05	5					\$15,300
RD_5316	Gated Rd	Peddlers Dr	Northerly	1.05	5					\$68,400
RD_5305_1	Suzannes Rd	HWY 630	Donalds Rd	2.63	6					\$199,800
RD_5305	Suzannes Rd	Donalds Rd	Dead End	1.55	6					\$111,500
RD_5303	Pautois Rd	Peddlers Dr	Northerly	0.32	6					\$27,300
RD_5330	Peddlers Dr	Peddlers Dr	911-2682	0.1	6					\$10,500
						\$595,700	\$480,500	\$483,900	\$500,900	\$454,800

Based on the capital works expenditures of the road network within the past few years, it is assumed that the current budget will not cover all the costs associated with the proposed road works over the next 5 years. The Municipality may look at some of the following options to cover the difference:

1. Develop an annual Capital Works budget to match the needs of the road
2. Apply for grants to cover the difference
3. Split up the road sections into smaller sections and spreading the construction costs over multiple years.

A few safety concerns related to the road system were observed during the site investigation. These safety concerns are noted in Section 7 below. A risk assessment should be conducted on the safety concerns and items with a high likelihood (high probability of an event happening) and a high severity of the consequences should be prioritized first.

6.3 Future Needs

Additional proposed road improvements are identified in the Appendix E table that could be completed in Years 6 to 10 (2031 to 2035), if funding allows. The total value for the additional improvements is \$1.19 million (in 2025

dollars) and are mainly focused on roadside improvements (i.e. brushing, ditching and shouldering) on the gravel roads. Many of these items could be addressed a little each year by developing annual programs for shouldering, ditching/ditch-cleanout and brushing.

7 Additional Considerations

During the site investigation, the Jp2g Consultants Civil Engineering staff noticed a few site conditions that warrant some additional considerations. Specific observations regarding localized road conditions and safety concerns are noted on Specific Road Condition/Safety Observations map in the Appendix B and summarized in Section 7.1 to Section 7.3 below.

Section 7.4 to Section 7.5 provides some additional recommendations to Municipal staff for future implementation of Capital works and maintenance programs.

7.1 Safety

7.1.1.1 *Speed Limit Review*

Most of the roads within the Municipality of Calvin are left unposted and therefore are treated as 80 km/hr limits. However, during the site investigation, it was observed that the operating speed on the gravel roads was generally less than 80km/hr, with many vehicles driving significantly less than 80km/hr. Even though posted speed limits are typically 10km/hr lower than the design speed of a road (or more), considerations should be made for the operating speed of a road. Therefore, design speeds referred to throughout this report is a reference point only, but should not be taken as the recommended posted speed limit.

As noted in TAC Chapter 11 [2], low design speeds are not always appropriate for special roads, as drivers do not adjust their speeds to the posted speed limit of a road, but rather to its physical limitations and traffic. Selecting low design speeds where terrain is open and flat is likely to increase collisions and driver costs. However, under difficult terrain conditions (such as rolling or mountainous terrains, or sharp horizontal curves), drivers accept lower speed operation. Design speed of 1-lane 2-way special roads should not exceed 50km/hr.

It is recommended that the Municipality conduct a speed review of their roads and introduce a posted speed limit on their gravel roads. At a minimum, it is recommended to conduct speed reviews at horizontal and vertical (hills) curves and post cautionary speed signage. Sight distances (as noted in the section below) will assist with determining the posted speed limits.

7.1.1.2 *Sight Distances*

The sight distance is the unobstructed distance a driver can see (typically ahead along a roadway) from any given point. The minimum stopping sight distance is the least sight distance required to come to a complete stop. Overgrown trees, tall grass and bushes affect visibility (i.e. sight lines) and therefore brushing at intersections and curves should be conducted annually. In accordance with TAC Chapter 11 [2], the minimum stopping sight distance on 2-lane 2-way special roads is 115m to 140m (depending on road conditions) based on a design speed of 80km/hr. Design speeds of 90km/hr have a stopping sight distance of 130m to 170m.

Minimum stopping sight distance for 1-lane 2-way special roads is 130m (based on a design speed of 50km/hr).

During the site investigation, there were various locations where there may be an insufficient sight distance to meet the minimum stopping sight distance requirement for the assumed speed limit. Some of the specific locations observed are noted on the map in Appendix B. It is recommended that the Municipality review sight distances on all their roads and consider implementing an annual brushing program, or post speed reductions where required to match the sight distance limitations.

7.1.1.3 Intersections

During the site investigation, four (4) intersections were observed to have configuration or sight line safety concerns that would not be rectified by regular roadside maintenance.

Galston Rd at Peddlers Dr

This intersection has multiple merge lanes, combined with yield conditions. Should multiple vehicles from the intersecting roads meet at the intersection at the same time, there is a potential for a collision. It is recommended that this intersection be reviewed, potentially remove merge lanes and re-aligned the road with new stop conditions.

Pratt Rd at Galston Rd

This intersection is very wide and has no lane delineation (i.e. there is the potential for vehicles to pull-up side by side when stopped at the intersection). There are also maintenance difficulties with this intersection (grading and snow clearing) associated to the wide turn. Lastly, limited sight lines make it difficult to see vehicles who are driving on Galston Rd. It is recommended that this intersection be narrowed to alleviate these issues.

Daventry Rd at Peddlers Dr

Peddlers Dr is one of the highest traffic volume LCB roads in the Municipality. The intersection where Daventry Rd meets Peddlers Dr has very limited line of sight to oncoming traffic from the west due to the horizontal and vertical alignment curves, and a large rock outcrop at the intersection. It is recommended that the speed and sight lines at this intersection be further reviewed.

Pautois Rd at Peddlers Dr

Similar to the Daventry Rd intersection, there are line of sight concerns with this intersection due to vertical and horizontal curves along the higher traffic Peddlers Drive. It is recommended that the speed and sight lines at this intersection be further reviewed.

The review, design and reconstruction of the above noted intersections have not been included in the 5-year capital works plan. However, the Municipality should consider doing a detailed review of these intersections to determine the best path forward to bring these intersections to proper design standard. In the short term, the Municipality should consider installing signage (reduce speed, hidden intersection, replace yield sign with stop signs, etc.) to address the immediate safety concerns.

7.1.1.4 Steep ditches

In a few locations, notably on Adams Road (between Pratt and Hwy 630), on Bronson Lake Road, and on Peddlers Drive (330m west of Donalds Rd), there were steep ditches in localized areas along the road sections. Steep slopes can create a significant safety risk to drivers as it makes it more difficult for a vehicle to recover if they leave the roadway. Slopes that are steeper than 3H:1V increases the likelihood of a vehicle tip or roll-over once it leaves the roadway. Aside from the roll-over risk, steep slopes can increase the severity of crashes and more dangerous collision impacts. From a maintenance perspective, steep side slopes erode quickly, decreasing the granular shoulder stability and increasing the maintenance needs of the specific road.

Ditches should have a maximum 3H:1V slope, and ideally 4H:1V (or flatter), to give drivers more space to recover and regain control if their vehicle leaves the road. In areas where steep slopes are unavoidable, the Municipality should consider guiderails to protect cars from leaving the road, especially on roads with high speed and high traffic.

It is recommended that flattening the steep side slopes on Adams Road and on Bronson Lake Road be prioritized. It is also recommended that guiderails be considered at the new culvert installation on Peddlers Dr (330m west of Donalds Rd) when this road section is reconstructed, to protect the traffic from the steep side slopes.

7.2 Railway Crossings

There are two (2) railway road crossings in the Municipality of Calvin, one crossing Boundary Road (approximately 1.1km south of Highway 17) and one crossing Suzannes Rd (approximately 630m east of Donals Road). According to Transport Canada's Grade Crossing Handbook [4], there are requirements for the road geometry (horizontal and vertical alignment) of the road approach, sight lines, and signage.

Grade crossings that existed prior to November 28, 2014, are grandfathered from some of the road geometry requirements set out in the Grade Crossing Regulations. If at any time a grade crossing sees a change to its location, gradient or crossing angle, the road geometry requirements are to be reviewed and the grade crossing must comply with the Grade Crossing Regulations.

Since the class of the track is unknown at the time of this study, minimum sightlines could not be calculated. It is recommended the Municipality determine the minimum sightlines requirements for this class of track and confirm the sightlines meet the minimum requirements.

The signage at both crossings should be upgraded to meet current standards, including a sign that indicates the number of tracks at the grade crossing. The existing railway crossing signs should also be reviewed for compliance with the current Grade Crossing Regulations signage requirements. A sign providing advanced warning of a grade crossing (Railway Crossing Ahead sign) with a sign specifying a recommended speed (Advisory Speed Tab sign), and a Stop Ahead sign may be warranted, depending on the sightline requirements.

7.3 Culverts

According to the inventory list provided, the Municipality of Calvin has 331 culverts. Approximately half of the culverts are cross-road culverts, while the remaining half are entrance culverts. Most of the culverts are CSP (corrugated steel pipe), with only 12 of the culverts identified as poly material. Records of the most recent inspections of all the culvert were from 2009. Several of the existing culverts were replaced this year as part of the road repairs required after the Municipality was subject to a severe storm and downburst in June 2025.

Many factors can affect the lifespan of a culvert, including groundwater pH, high flows through the culvert, stream flows with high sediment, and accelerated corrosion from road de-icing salts.

During the site investigation, the condition of some of the existing cross-road culverts (not replaced in 2025) was assessed. The site around the culverts were found to be stable (no soft shoulders, sink holes or cave-ins); There was no signs of distress on the LCB roads that could be contributed solely to culvert failure; There was no structural deformation and there was no visible evidence of soil infiltration when looking through the culverts. There was some evidence of rusting, but due to poor visibility of the culvert bottoms it could not be determined if the bottoms of the culverts (inverts) had rusted through. Generally, the culverts were considered in good to fair condition.

It is recommended the Municipality do an updated condition review of all the culverts. When a section of the road has significant rehabilitation or reconstruction works, the culverts should be inspected again to determine if they should be replaced. It is recommended that any culverts that need replacement be replaced with HDPE culverts, as HDPE has a longer lifespan than CSP.

7.4 Frost Heaves

Frost heaves form when water in the ground freezes and expands, pushing up against the gravel road or hard pavement, creating a bump in the road. Sometimes frost heaves transition to a sag once ice melts. Frost heaves are typically caused by frost-susceptible soils (such as silts, very fine sands mixed with silt, and some clays), poor roadway drainage (i.e. roads without a crown to allow water to drain off), high groundwater table beneath the road, and are more likely to occur around culverts.

The best time to review frost heaves is during the spring thaw. This is when the frost heaves are most prevalent and the extent of the heave and proposed corrective actions can be determined. Due to the time of year when the site investigation was conducted, frost heaves were not observed. However, the Municipality provided a map and marked out in the field locations of repeated seasonal frost heaves. It should be noted that some of the frost heaves marked in the field were near culverts, and therefore are assumed to be related to typical frost-heave around culverts. However, it should be noted that some of the frost heaves marked were not located near culverts or low points in the road.

To prevent frost heave at culverts, one of the best prevention methods is to install well-draining material (such as Granular 'A' or Granular 'B') around the culverts during installation, instead of backfilling with native material. Installing frost tapers at culvert installations as per OPSD 803.030 [3], insulating with extruded polystyrene (XPS) insulation (typically at shallow culvert locations), and replacing culverts with HDPE are other ways to help prevent frost heaves at culvert locations.

Other ways to improve drainage to prevent frost heaves include: Grade roadway surface to ensure crossfall slopes towards ditches; Slope the subgrade (below the Granular 'A' road base) towards the ditches, and ensure ditches are deeper than the bottom of the granular base to ensure groundwater flows to the ditches; Introduce a geotextile to separate the base from frost-susceptible soils (if warranted); or increase the thickness of the granular base or subbase (thicker material means it takes longer for frost to reach the underlying frost-susceptible subgrade material).

7.5 Typical Cross-Sections

In 2020, the Transportation Association of Canada (TAC) published the "Geometric Design Guide for Canadian Roads: Chapter 11 – Special Roads" [2] as it was recognized there a need to provide design guidance for special roads such as low-volume rural roads, resource roads, recreational roads, and winter roads. The chapter also includes discussion on when 1-lane 2-way roads could be considered and provides guidance for roadside safety for low-volume roads. With the low traffic volume on the Municipality of Calvin roads, Chapter 11 was used as a basis for evaluating the road geometry as part of this study. To assist the Municipality with rehabilitation and reconstruction of their roads in the future, four (4) typical road cross sections have been provided and are included in Appendix F.

Drawing R1 is a typical rural cross section for double surface treatment (LCB) roads. This detail shows the reconstruction efforts for the roadway, including pulverizing the existing surface, installing woven geotextile (if warranted), installing new lift of Granular 'A' base, then a double surface treatment. Note that this reconstruction option creates a grade raise on the road, so there should be consideration given to removing the existing base and/or subbase if there are grade raise constraints. This cross-section is for 2-lane 2-way roads, based on a design speed of 80km/hr. If the road is based on a design speed of 90 km/hr, the roadway width should be increased to a minimum of 8.4m, which includes a travelled lane of 7.4m (3.7m lane widths) and a 0.5m shoulder on either side. Humps or "berms" in the gravel shoulders should be graded so the shoulders have a continuous slope to promoted water to drain off the road to the ditches.

Drawing RG-2 is a typical rural cross section for 2-lane 2-way gravel roads (based on a design speed of 80 km/hr). This detail shows the reconstruction efforts for the gravel roadway, including installing woven geotextile (if warranted), installing new lift of Granular 'B' subbase, and installing new lift of Granular 'A' base/road surface. It should be noted that gravel roads typically do not require full reconstruction as normal maintenance activities maintain the existing condition of the road. Therefore, rehabilitation efforts for a gravel road would typically include the addition of new lift of Granular 'A' base/road surface. Similar to the typical cross-section for LCB roads, humps or "berms" in the gravel shoulders should be graded to promoted water to drain off the road to the ditches. The roadway width on special gravel roads is dependant on the design speed and the average daily truck traffic.

Drawing RG-1 is a typical rural cross section for 1-lane 2-way gravel roads. One-lane two-way roads can be used to provide access to isolated communities, recreational sites, or resource developments and are located off a higher classification of road. These roads are short, serve a single purpose and are not part of a continuous route. For reasons of safety, the one-lane two-way roads may only be considered if the average daily traffic (ADT) is less than 50 vehicles/day and the design speed is 50 km/h or less. If the road conditions encourage operating speeds in excess of 50 km/hr, a 1-lane 2-way should not be considered. On 1-lane 2-way roads, turnouts are required at a maximum of 300m spacing, to allow passing on this type of road. Turnouts should have clear sight lines between them. A typical detail for a turnout is included in Appendix F (refer to TO-1).

There are a number of dead-end roads within the Municipality of Calvin that would be a suitable candidate for 1-lane 2-way gravel roads.

8 Conclusion

This report has been compiled to provide Municipality of Calvin with a list of present and projected road improvements associated with the Municipality's road system. It should be used as a reference document to plan future road improvements to ensure that the maximum benefit is being achieved from the roads budget funding.

It is recommended that the Municipality of Calvin develop an annual budget for Capital Works. Based on this study, it is estimated that the annual expenditure is between \$480K and \$595K over the five (5) year plan to rehabilitate and maintain the roads. The recommended road sections requiring improvements are noted in Table 4. Road improvements should be recorded on an annual basis as they are completed.

In addition to the road needs, a number of additional considerations have been noted within the report. It is recommended that the Municipality prioritize the safety concerns related to intersection configurations and sight lines, road speed limit review (specifically at curves in the horizontal and vertical alignment) and flatten steep ditches or provide roadside barriers (such as guide rails).

9 Acknowledgements

This report was funded by the Canadian Government through the Canada Community Building Fund.

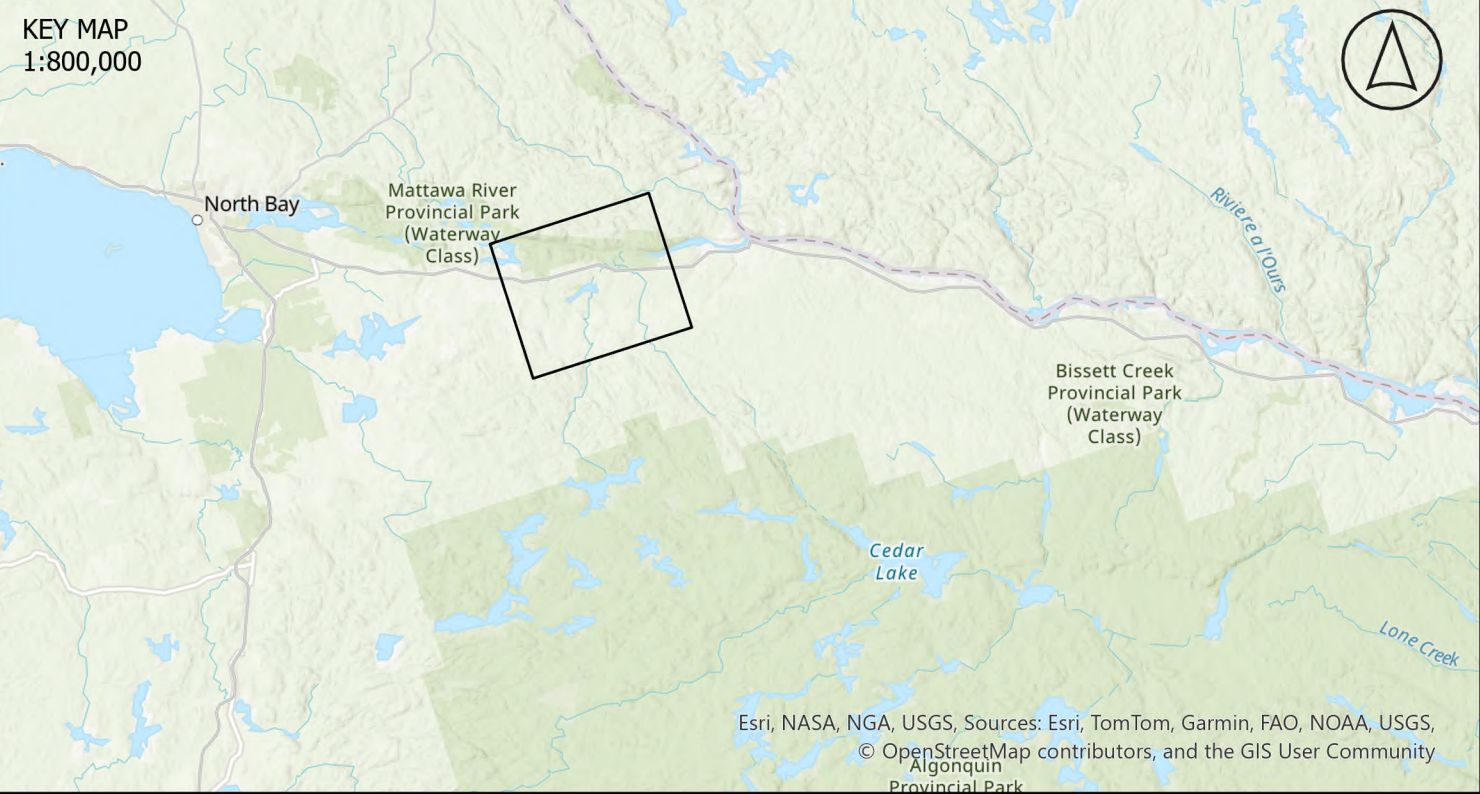


10 References

- [1] *1987 Roads Management Plan for Small Lower Tier Municipalities: Methods and Inventory Manual*. Ontario Ministry of Transportation, May 1987.
- [2] Transportation Association of Canada, “Geometric Design Guide for Canadian Roads: Chapter 11 – Special Roads”, Ottawa, ON, Mar. 2020. Publication code: PTM-GEODES11-E.
- [3] Ontario Ministry of Transportation Library. “TechPubs Portal.” [Online]. Available: <https://www.library.mto.gov.on.ca/SydneyPLUS/TechPubs/Portal/tp/opsViews.aspx>
- [4] Government of Canada, “Grade Crossings Handbook,” Transport Canada, Ottawa, ON, Nov. 2023. [Online]. Available: https://tc.canada.ca/sites/default/files/2023-11/gcr_handbook_en.pdf



Appendix A: 2025 Road Condition Rating Map



DISCLAIMER NOTES:

MAPS ARE NOT INTENDED TO BE USED FOR LEGAL PURPOSES OR TO IDENTIFY EXACT LOCATIONS OF MAP ELEMENTS. VERIFICATION AND SURVEY OF EXISTING CONDITIONS ARE REQUIRED TO CONFIRM ACTUAL LOCATION OF EXISTING CONDITIONS AND/OR PROPOSED ELEMENTS. ALL LOT AND CONESSION NUMBERS TO BE USED AS REFERENCES ONLY.

LEGEND

JP2G CONDITION RATING (2025)

- 1 - 3
- 4 - 5
- 6 - 7
- 8 - 10
- Undefined

JP2G SURFACE TYPE (2025)

- -

GR
- LCB

PROJECT

MUNICIPALITY OF CALVIN
ROAD NEEDS STUDY

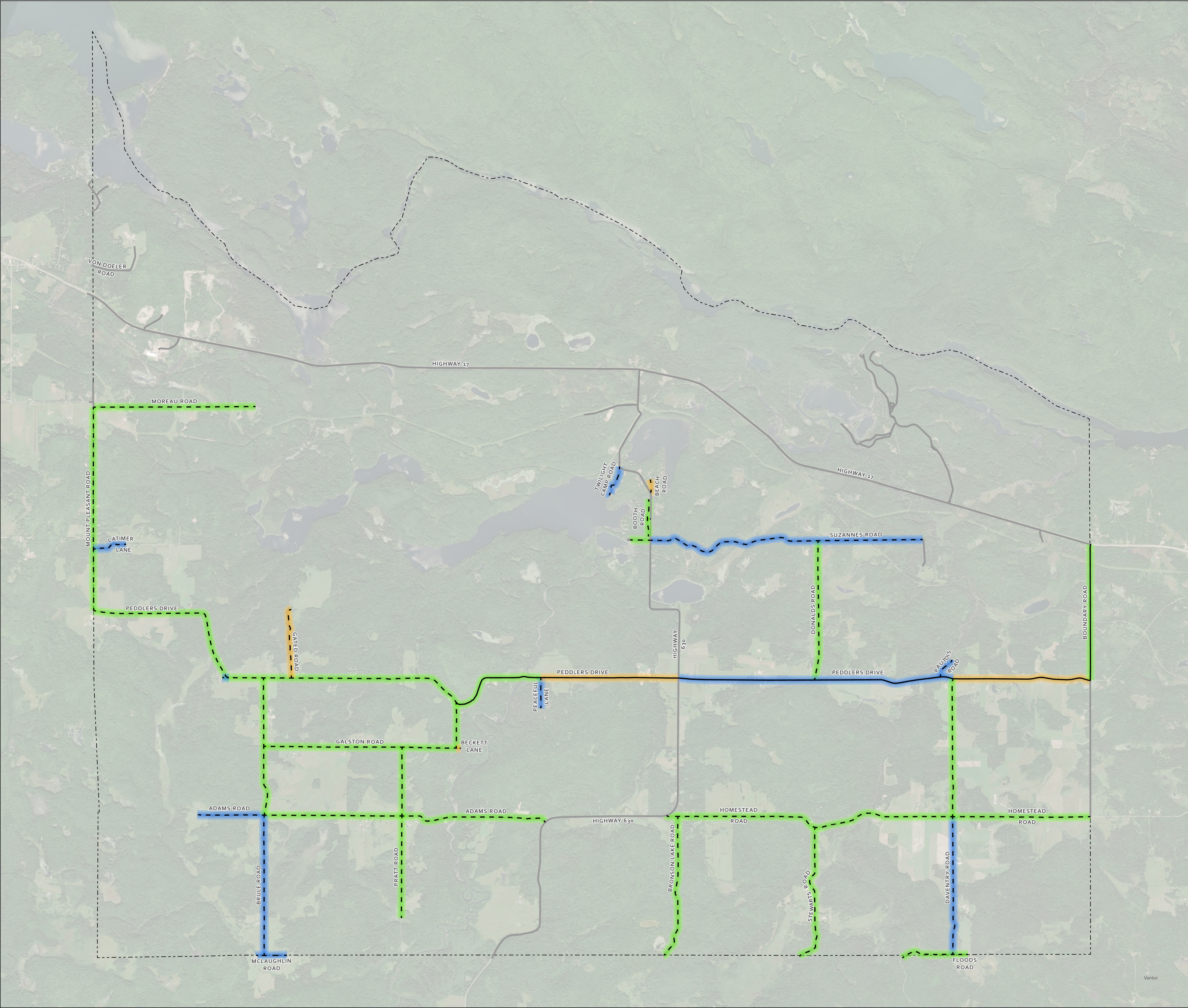
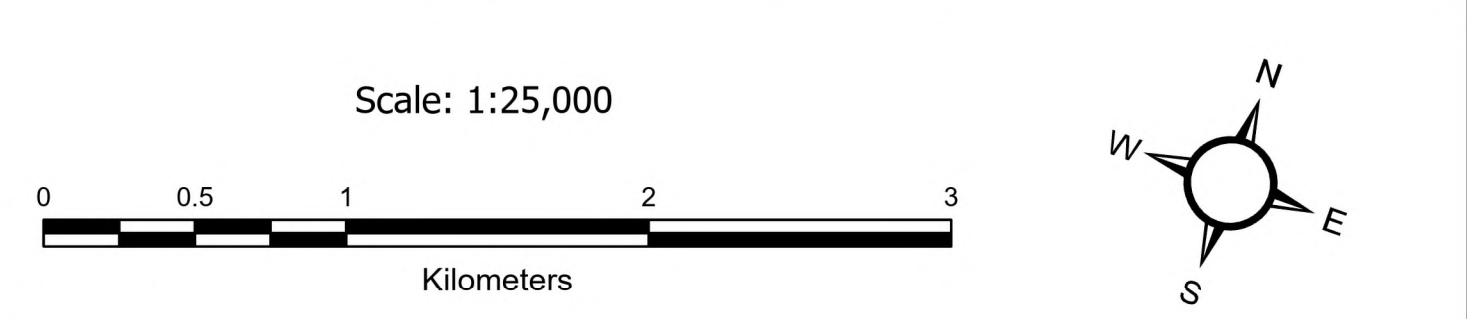
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2025 ROAD CONDITIONS MAP



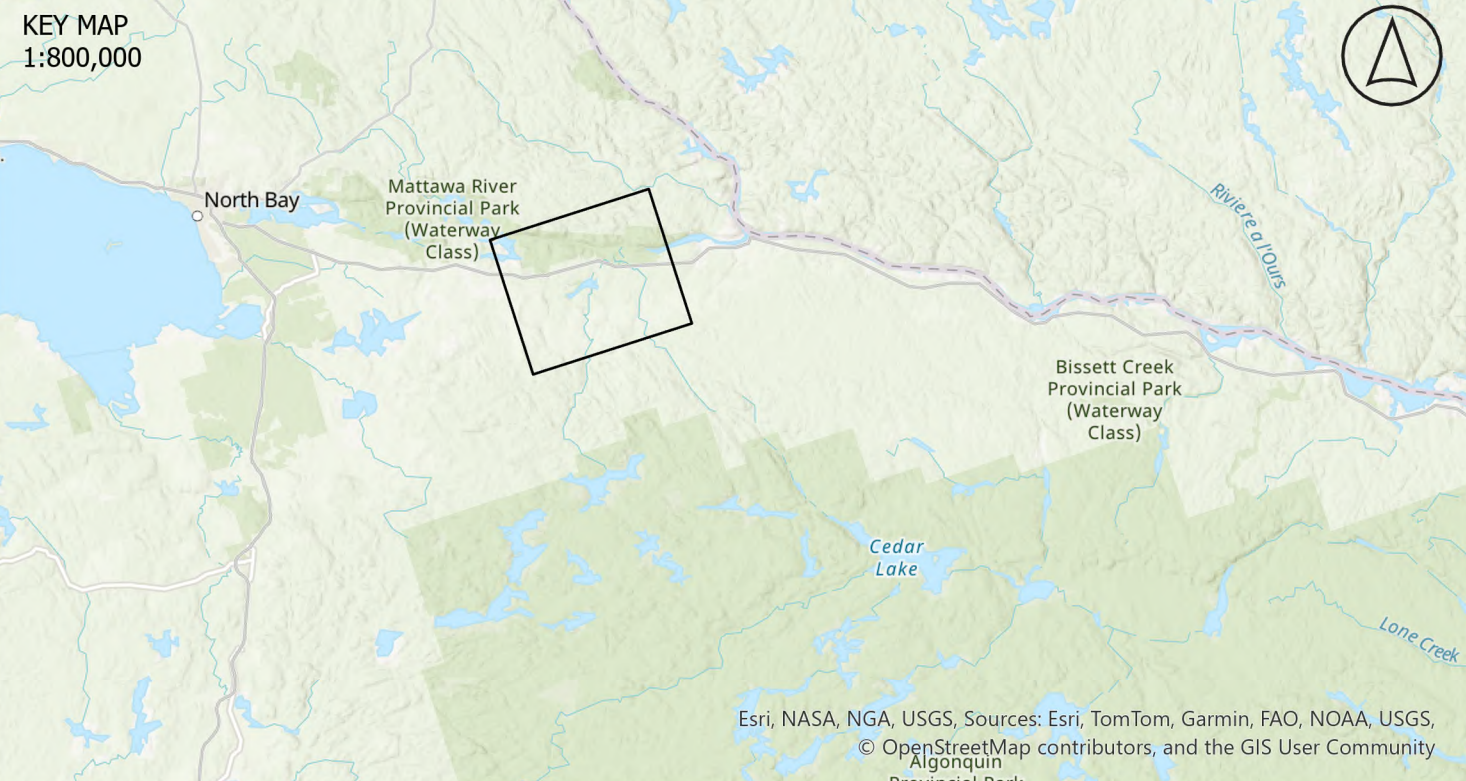
Jp2g Consultants Inc.
ENGINEERS • PLANNERS • PROJECT MANAGERS

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REVIEWED: KN	MAP NO.: 1 / 1	
APPROVED: KN	DATE: 11/24/2025	





Appendix B: Specific Road Condition/Safety Observations Map



DISCLAIMER NOTES:

MAPS ARE NOT INTENDED TO BE USED FOR LEGAL PURPOSES OR TO IDENTIFY EXACT LOCATIONS OF MAP ELEMENTS. VERIFICATION AND SURVEY OF EXISTING CONDITIONS ARE REQUIRED TO CONFIRM ACTUAL LOCATION OF EXISTING CONDITIONS AND/OR PROPOSED ELEMENTS. ALL LOT AND CONESSION NUMBERS TO BE USED AS REFERENCES ONLY.

LEGEND

JP2G SURFACE TYPE (2025)

- - GR
- LCB

NOTE: JP2G OBSERVATIONS DISPLAYED IN RED TEXT

PROJECT

MUNICIPALITY OF CALVIN
ROAD NEEDS STUDY

TITLE

SPECIFIC ROAD CONDITON/SAFETY
OBSERVATIONS

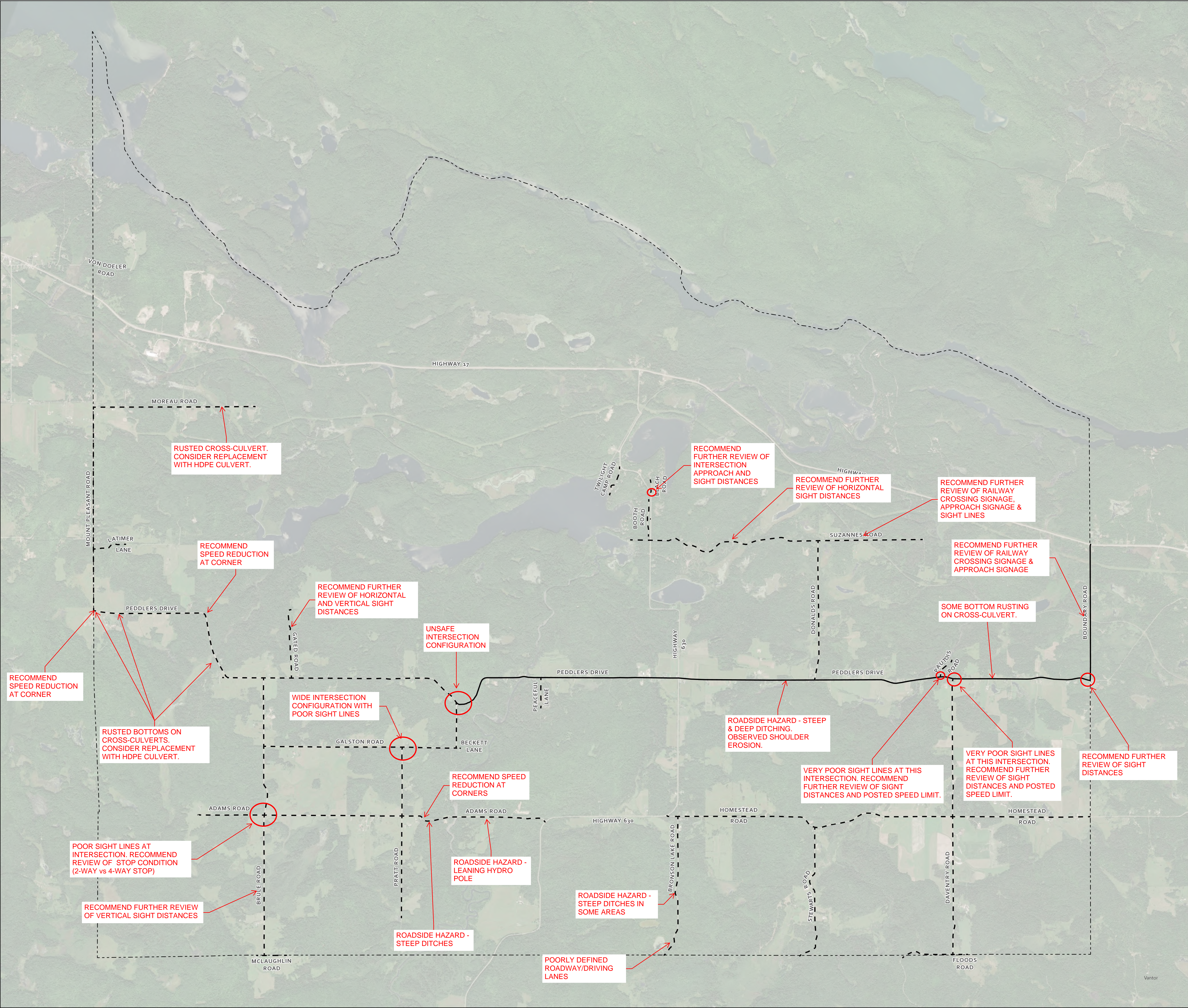
 **Jp2g Consultants Inc.**
ENGINEERS • PLANNERS • PROJECT MANAGERS

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APPROVED: KN	DATE: 11/24/2025	

Scale: 1:25,000

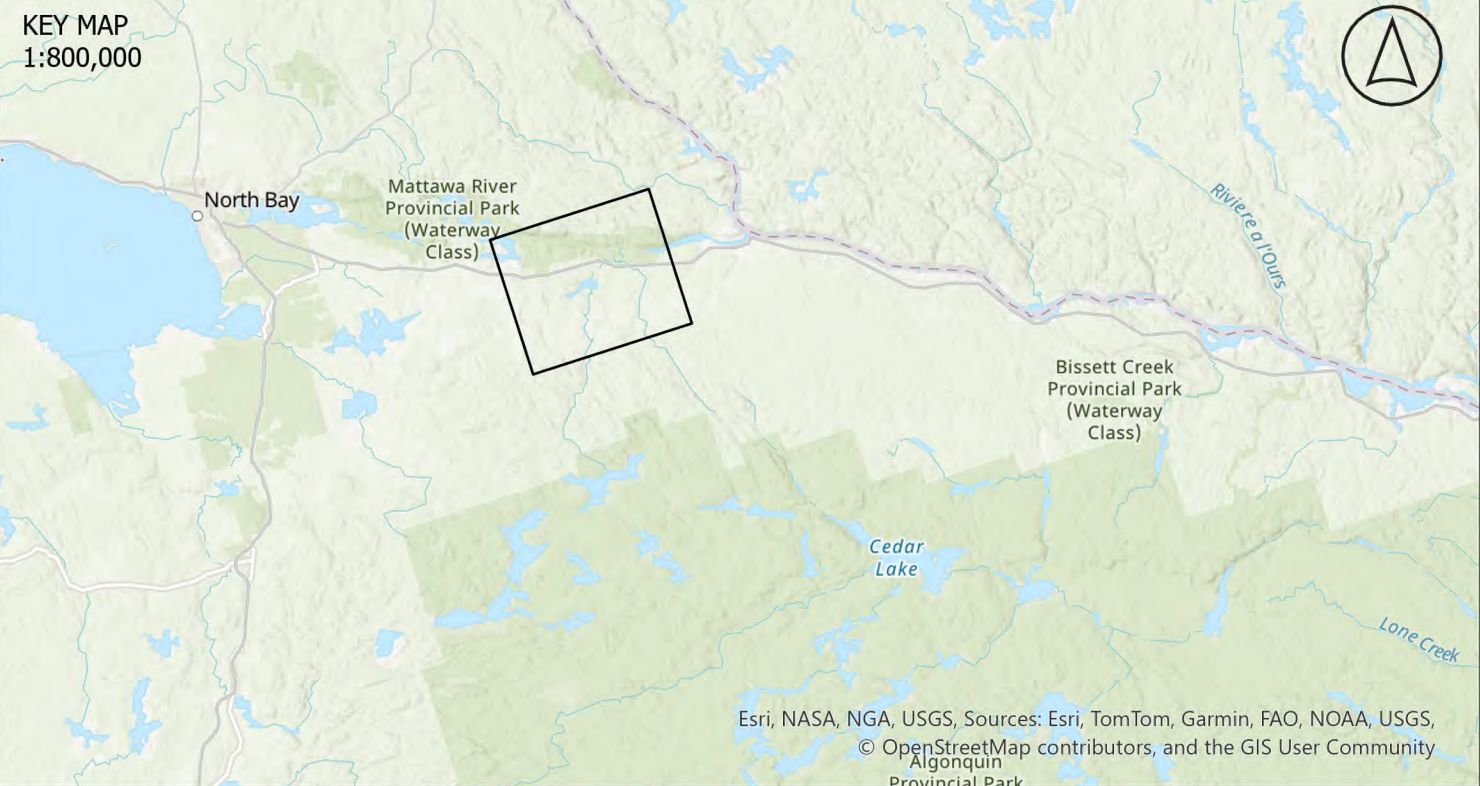

Kilometers







Appendix C: Recommended Improvements Map



DISCLAIMER NOTES:

MAPS ARE NOT INTENDED TO BE USED FOR LEGAL PURPOSES OR TO IDENTIFY EXACT LOCATIONS OF MAP ELEMENTS. VERIFICATION AND SURVEY OF EXISTING CONDITIONS ARE REQUIRED TO CONFIRM ACTUAL LOCATION OF EXISTING CONDITIONS AND/OR PROPOSED ELEMENTS. ALL LOT AND CONESSION NUMBERS TO BE USED AS REFERENCES ONLY.

LEGEND

RECOMMENDED YEARS FOR IMPROVEMENT


- 2026
- 2027
- 2028
- 2029
- 2030
- OTHER

PROJECT

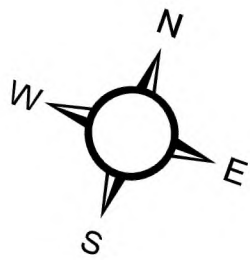
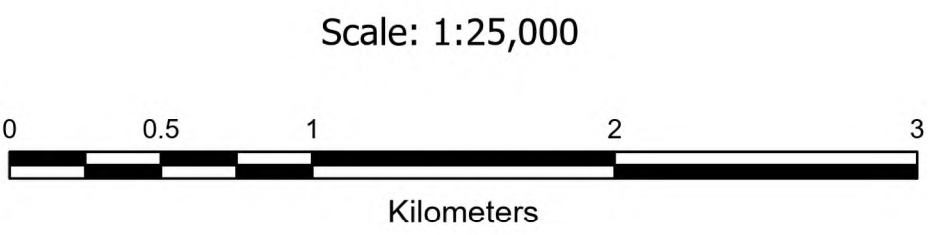
MUNICIPALITY OF CALVIN
ROAD NEEDS STUDY

TITLE

RECOMMENDED ROAD
IMPROVEMENTS BY YEAR

 **Jp2g Consultants Inc.**
ENGINEERS • PLANNERS • PROJECT MANAGERS

DESIGNED: PL	CLIENT NO.: 25-5304A	SPATIAL REFERENCE Name: NAD 1983 CSRS UTM Zone 17N PCS: NAD 1983 CSRS UTM Zone 17N GCS: GCS North American 1983 CSRS Datum: North American 1983 CSRS Projection: Transverse Mercator
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APPROVED: KN	DATE: 12/11/2025	





Appendix D: Road Inventory and Needs Summary Table

Calvin Township Roads Needs Study - Road Inventory and Needs Summaries																					
Section Number	Road Name	From	To	Section Length (km)	Surface Width (m)	Shoulder Width (m)	Platform Width (m)	Travelled Way Lane Type	Surface Crossfall (%) ¹	Roadside Environment	Surface Type	2009 Annual Ave. Daily Traffic (AADT)	2025 Ave. Daily Traffic (ADT)	Last Improvement	2009 Condition Rating	2025 Condition Rating (Jp2g)	2025 Costing	Observations	Spot Improvements	Specific Maintenance	Construction Works
RD_5321_1	Adams Rd	Brule Rd	Pratt Rd	2.04	6.5	N/A	6.5	2-lane, 2-way	N/A	Ditch	GR	50	58	2022 - 4" gravel lift	6	9	\$42,900.00	Brushing Required Cut down shoulders to reestablish 7.0m roadway Road has been graded recently	Brushing (at intersection - 150m either side)	Shouldering (incl cut down "berm") to re-establish 0.5m shoulders on either side	
RD_5321	Adams Rd	Pratt Rd	HWY 630	2.19	6.5	1	8.5	2-lane, 2-way	N/A	Ditch	GR	50	93		6	9	\$56,940.00	Ditching completed in the last few years, foreslope of ditch is very steep in areas Areas that require shoulders to be cut down Road has been graveled since the storm Some hydro poles are leaning	Flatten ditches (3H:1V max)	Shouldering (incl cut down "berm")	
RD_5321_2	Adams Rd	Brule Rd	Westernly	0.99	7	N/A	7	2-lane, 2-way	N/A	Ditch	GR	50	unknown		5	7	\$63,480.00	Minor washouts along shoulders Brushing required Cut down shoulders and complete ditch clean out Sight line issues at the intersection with Brule, adding 4-way stop control may help (further review required)	Brushing (at intersection - 150m either side); Spot ditch cleanout (assumes 25% of road);	Gravel Resurfacing, incl shoulders	
RD_5311	Beach Rd	HWY 630	End	0.2	3	N/A	3	1-lane, 2-way	N/A	Ditch	GR	49	unknown		6	5	\$18,975.00	Sight line and alignment issues at intersection with HWY 630 Undefined road allowance (road connects to HWY 630 in 2 areas, road splits in areas). More of an entrance than a road. Road surface is sandy. Road suitable candidate for 1-lane, 2-way traffic, but needs widening	Re-establish/redefine intersection at HWY 630; Brushing (at intersection - 150m either side); Establish turn-around at end		Gravel resurface and widen
RD_5319_1	Beckett Ln	Galston Rd	East Dead End	0.05	4	1	6	1-lane, 2-way	N/A	Ditch	GR	49	unknown		4	5	\$13,175.00	Lots of washouts, water not getting to ditch No turn around at dead end Cut down shoulders Ditch clean out required Road suitable candidate for 1-lane, 2-way traffic	Establish turn-around; Spot ditch cleanout (assumes 25% of road);	Gravel Resurfacing, incl shoulders	
RD_5310_1	Booth Rd	Booth Rd	Northerly	0.29	5.5	1	7.5	2-lane, 2-way	N/A	Ditch	GR	49	46	2025 - 4" gravel lift	7	9	\$5,000.00	Grading required at turnaround Minor brushing required	Grade/compact turnaround		
RD_5310_2	Booth Rd	Booth Rd	Southerly	0.26	6	1	8	2-lane, 2-way	N/A	Ditch	GR	49	46	2025 - 4" gravel lift	7	9	\$5,000.00	Grading required at turnaround, after grading, compact granular material	Grade/compact turnaround		
RD_5310	Booth Rd	HWY 630	Booth Rd	0.05	6	1	8	2-lane, 2-way	N/A	Ditch	GR	49	46	2025 - 4" gravel lift	6	9	-	No observations			
RD_5300	Boundary Rd	Taggart Lake Rd	HWY 17	2.02	7.3	1	9.3	2-lane, 2-way	3.8-4.6	Ditch	LCB	199	326	2024 - Roto-Milled, 3"gravel lift, Double Surface Treatment	7	10	-	Minor shoulder erosion near intersection with Peddlers			
RD_5309	Bronson Lake Rd	Homestead Rd	Township Limit	2.14	6.5	0.5	7.5	2-lane, 2-way	N/A	Ditch	GR	49	unknown		7	8	\$42,840.00	Road condition transitions to a 7 condition rating after steep hill Road is not well defined in area of steep hill (wide ungraded section along road - turnout?) Bedrock outcrop at turnaround Stop sign should be closer to intersection with Homestead Brushing required Foreslope of ditch is steep Frost heave / dip near Homestead intersection Gravel added and ditching completed since storm	Flatten ditches (3H:1V max) where too steep;	Gravel Resurfacing (after steep hill)	
RD_5322_1	Brule Rd	Galston Rd	Adams Rd	1.03	6	1	8	2-lane, 2-way	N/A	Ditch	GR	60	50		7	8	\$7,250.00	Sight line issues at intersection with Adams Rd, minor horizontal sight line issues at first curve Cut down shoulders in areas Road has been ditched in the past 3 years	Brushing (at intersection - 150m either side); Shouldering (incl cut down "berm") in some areas		
RD_5322	Brule Rd	Peddlers Dr	Galston Rd	1.01	7	N/A	7	2-lane, 2-way	N/A	Ditch	GR	60	92		7	8	\$16,160.00	Stop sign height appears low, far from intersection. Road has been graded recently Ditch clean out required, ditch establishment required in areas Cut down shoulders in areas	Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm");	
RD_5322_2	Brule Rd	Adams Rd	McLaughlin Rd	2.08	6	1	8	2-lane, 2-way	N/A	Ditch	GR	60	28		7	7	\$52,080.00	Evidence of rock outcrops Minor washouts on shoulders Vertical sight line issues on crest curves Brushing required Cut down shoulders as required Grade raise in low areas required (wet in spring)	Brushing (assumes 25%); Grade raise in low areas	Shouldering (incl cut down "berm");	
RD_5306_1	Daventry Rd	Homestead Rd	Floods Rd	2.05	6	0.5	7	2-lane, 2-way	N/A	Ditch	GR	50	64	2023 - 4" gravel lift	6	7	\$60,475.00	Grading required in areas Brushing required Cut down shoulders and ditch clean out required	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm");	
RD_5306	Daventry Rd	Homestead Rd	Peddlers Dr	2.04	6	1	8	2-lane, 2-way	N/A	Ditch	GR	50	72		6	8	\$17,340.00	Sight line issues at intersection with Peddlers Dr Grading required, crown needs to be reestablished Minor washouts on road edge near intersection with Homestead Rd. Possible vertical sight line issue at hill Brushing required in areas, areas require shoulders to be cut down Frost heave / dip noted at top of hill	Brushing (assumes 25%); Shouldering (incl cut down "berm") in some areas;		

Calvin Township Roads Needs Study - Road Inventory and Needs Summaries																					
Section Number	Road Name	From	To	Section Length (km)	Surface Width (m)	Shoulder Width (m)	Platform Width (m)	Travelled Way Lane Type	Surface Crossfall (%) ¹	Roadside Environment	Surface Type	2009 Annual Ave. Daily Traffic (AADT)	2025 Ave. Daily Traffic (ADT)	Last Improvement	2009 Condition Rating	2025 Condition Rating (Jp2g)	2025 Costing	Observations	Spot Improvements	Specific Maintenance	Construction Works
RD_5603_2	Daventry Rd	Floods Rd	Westernly	0.5	4	1	6	1-lane, 2-way	N/A	Ditch	GR	50	unknown		5	8	\$9,725.00	Township only plows approximately the first 500m of the road History of water of the road at the culverts Brushing and ditch clean out required Road suitable candidate for 1-lane, 2-way traffic	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road); Construct turnout		
RD_5304	Donalds Rd	Suzannes Rd	Peddlers Dr	2.07	6.5	0.5	7.5	2-lane, 2-way	N/A	Ditch	GR	49	8	2025 - 3" gravel lift	6	9	\$22,770.00	Foreslope of ditch is too steep Cut down shoulders in areas Road was ditched in 2025	Flatten ditches (3H:1V max) where too steep; Shouldering (incl cut down "berm") in some areas;		
RD_5327	Floods Rd	Daventry Rd	Easternly	0.22	5	N/A	5	1-lane, 2-way	N/A	Ditch	GR	30	unknown		5	8	\$2,090.00	Grading required Brushing and ditch clean out required Road suitable candidate for 1-lane, 2-way traffic	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)		
RD_5319	Galston Rd	Peddlers Dr	Beckett Ln	0.66	6	1	8	2-lane, 2-way	N/A	Ditch	GR	10	unknown		6	9	\$3,960.00	Speed reduction recommended at sharp corner at Beckett Ln. Very poor sight lines at intersection with Peddlers. Ditch establishment required in areas Gravel appears to have been added to road this year (2025), culverts have been replaced since storm	Spot ditch cleanout (assumes 25% of road)		
RD_5317	Galston Rd	Pratt Rd	Beckett Ln	0.79	6	1	8	2-lane, 2-way	N/A	Ditch	GR	50	unknown	2024 - 4" gravel lift	-	9	\$4,740.00	Speed reduction recommended at sharp corner at Beckett Ln. Intersection very wide at Galston/Pratt - Sight line issues at intersection Ditch establishment required in areas	Spot ditch cleanout (assumes 25% of road)		
RD_5317_1	Galston Rd	Brule Rd	Pratt Rd	2.06	6	N/A	6	2-lane, 2-way	N/A	Ditch	GR	50	unknown		5	8	\$60,770.00	Brushing and ditch clean out required Ditch establishment required in areas Cut down shoulder Gravel appears to have been added recently	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm") to re-establish 0.5m shoulders on either side	
RD_5316	Gated Rd	Peddlers Dr	Northerly	1.05	4	N/A	4	1-lane, 2-way	N/A	Ditch	GR	5	unknown		5	5	\$59,000.00	Speed posted as 50km/h Roadway much lower than shoulders Gravel has been added in low areas of road, other areas is evident that no gravel has been added for some time If road is to be upgraded, widening may be required Brushing required Limited ditching Grade raise or cut down shoulders Turn around area is very narrow Road suitable candidate for 1-lane, 2-way traffic	Construct turnouts (3); Widen turnaround	Gravel Resurfacing, incl shoulders	
RD_5308	Homestead Rd	HWY 630	Bronson Lake Rd	0.17	6	1	8	2-lane, 2-way	N/A	Ditch	GR	49	94	2023 - 4" gravel lift	7	9	\$3,995.00	Short section, road in good condition Ditch cleanout required Cut down shoulders	Brushing (assumes 25%)	Shouldering (incl cut down "berm")	
RD_5308_1	Homestead Rd	Bronson Lake Rd	Stewarts Rd	2.09	6	1	8	2-lane, 2-way	N/A	Ditch	GR	50	94	2023 - 4" gravel lift	6	9	\$61,655.00	Sight line issues at intersection with Stewarts Rd Ditch cleanout and brushing required Cut down shoulders	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm")	
RD_5308_3	Homestead Rd	Daventry Rd	Boundary Rd	2.04	6	1	8	2-lane, 2-way	N/A	Ditch	GR	50	99		6	9	\$60,180.00	Washouts along road edge in areas Brushing and ditch clean out required Cut down shoulders	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm")	
RD_5308_2	Homestead Rd	Stewarts Rd	Daventry Rd	2.09	6	0.5	7	2-lane, 2-way	N/A	Ditch	GR	50	94	2023 - 4" gravel lift	6	9	\$43,000.00	Minor washouts on shoulders, water not getting to ditch Establish ditch or gutter near bridge Cut down shoulders	Spot ditch cleanout (100m)	Shouldering (incl cut down "berm")	
RD_5314	Latimer Ln	Mt Pleasant Rd	Easternly	0.51	5	1	7	2-lane, 2-way	N/A	Ditch	GR	2	unknown		5	7	\$39,035.00	Review stop sign location - many need to be closer to intersection Gravel added on hill Turn around requires improvement Road suitable candidate for 1-lane, 2-way traffic	Establish turn-around at end	Gravel Resurfacing, incl shoulders	
RD_5323	McLaughlin Rd	Brule Rd	Westernly	0.11	5.5	N/A	5.5	1-lane, 2-way	N/A	Ditch	GR	30	unknown		5	7	\$15,315.00	Turn around at laneway is narrow, requires gravel. Soft in spring Shoulders are high on the north side of road Road suitable candidate for 1-lane, 2-way traffic	Establish turn-around at end	Gravel Resurfacing, incl shoulders	
RD_5323_1	McLaughlin Rd	Brule Rd	Easternly	0.34	5.5	N/A	5.5	1-lane, 2-way	N/A	Ditch	GR	30	unknown		5	7	\$18,190.00	Washouts on edges at hill Ditch cleaning required Brushing required in areas Cut down shoulders Road suitable candidate for 1-lane, 2-way traffic	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Gravel Resurfacing, incl shoulders	

Calvin Township Roads Needs Study - Road Inventory and Needs Summaries																					
Section Number	Road Name	From	To	Section Length (km)	Surface Width (m)	Shoulder Width (m)	Platform Width (m)	Travelled Way Lane Type	Surface Crossfall (%) ¹	Roadside Environment	Surface Type	2009 Annual Ave. Daily Traffic (AADT)	2025 Ave. Daily Traffic (ADT)	Last Improvement	2009 Condition Rating	2025 Condition Rating (Jp2g)	2025 Costing	Observations	Spot Improvements	Specific Maintenance	Construction Works
RD_5315	Moreau Rd	Mt Pleasant Rd	Easternly	2.4	6	N/A	6	2-lane, 2-way	N/A	Ditch	GR	49	57	2025 - 4" gravel lift	5	9	\$46,800.00	Speed complaints from residents on road Ditch cleanout and brushing required Move stop sign closer to intersection Culvert in low area may be too small Low area before 911-444 has history of being soft. Gravel added and culverts replaced this year Frost heaves in several areas on this road. No evidence of culvert at first heave, culvert at second heave. Gravel required at turn around	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm") to re-establish 0.5m shoulders on either side	
RD_5313	Mt Pleasant Rd	Moreau Rd	Latimer Ln	1.95	7	N/A	7	2-lane, 2-way	N/A	Ditch	GR	300	163	2024 - 4" gravel lift	7	9	-	Steep vertical alignment near 911-573 South lane near 911-573 has cross fall issues. Washout issues in some areas. Washouts on shoulders near culvert 100mm gravel lift added recently, ditching completed this year (2025)			
RD_5313_1	Mt Pleasant Rd	Latimer Ln	Peddlers Dr	1.95	7	0.5	8	2-lane, 2-way	N/A	Ditch	GR	300	163	2023 - 4" gravel lift	7	9	\$39,000.00	Sections of road with inconsistent cross fall Shoulders high on the west side of roadway Grade raise required in low area Brushing required in areas Sign for corner at Peddleton difficult to see Recommend reviewing speed limit at intersection with Peddlers Grade raise or cut down shoulders on east side of road Potential culvert replacement		Shouldering (incl cut down "berm");	
RD_5303	Pautois Rd	Peddlers Dr	Northermly	0.32	6	1	8	2-lane, 2-way	N/A	Ditch	GR	2	unknown		5	6	\$23,520.00	Water trapped on NE side at turnaround Grading required Unsure of drainage outlet Washout on shoulder at intersection with Peddlers Brushing required Road suitable candidate for 1-lane, 2-way traffic	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Gravel Resurfacing, incl shoulders	
RD_5318	Peaceful Lane	Peddlers Dr	Southernly	0.46	6	1	8	2-lane, 2-way	N/A	Ditch	GR	5	unknown		6	7	\$33,810.00	Limited crown / crossfall Ditch clean out required Ditch establishment required in areas Shoulders high in areas History of washouts on shoulders in large rains Road suitable candidate for 1-lane, 2-way traffic	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Gravel Resurfacing, incl shoulders	
RD_5301_2	Peddlers Dr	Galston Rd	Gated Rd	2.59	7	N/A	7	2-lane, 2-way	N/A	Ditch	GR	150	63		5	8	\$76,405.00	Very poor sight lines at intersection with Galston Rd LCB ends shortly after 911-1952. LCB section in similar condition to previous LCB sections Bedrock evident in ditch Bridge requires repair (storm damage) Complete speed limit review - primarily on corners Ditch cleanout required Several frost heave locations noted by township Cut down shoulders Brushing required Road graded recently	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm");	
RD_5301_4	Peddlers Dr	Daventry Rd	Boundary Rd	2.05	7	1	9	2-lane, 2-way	varies	Ditch	LCB	150	288		7	5	\$442,800.00	Complete speed review (reduction may be warranted) Wheel track rutting Heaving and rutting Inconsistent cross fall Edges breaking Minor cracking throughout Shoulders washing out near intersection (Cut down shoulders) Patching has been completed on road Recommend adding an LCB apron to intersections (sacrificial apron to protect LCB road surface)		Shouldering (incl cut down "berm");	Full-Depth Processing
RD_5302_1	Peddlers Dr	Gated Rd	Brule Rd	0.41	7	N/A	7	2-lane, 2-way	N/A	Ditch	GR	150	63		6	8	\$10,660.00	Cut down shoulders Ditch clean out required	Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm");	
RD_5302	Peddlers Dr	Brule Rd	Mt Pleasant Rd	3.2	7	N/A	7	2-lane, 2-way	N/A	Ditch	GR	150	135		7	8	\$85,200.00	Hydro poles in ditch line Some areas of shoulders present Review speed limit at corner near 911 - 2945 Ditch clean out required Frost heave at top of hill near 911 - 2945 Cut down shoulders Hydro pole leaning shortly after Brule Areas where ditch clean out has been completed Potential 2 culverts to be replaced	Spot ditch cleanout (assumes 25% of road); Replace cross culverts	Shouldering (incl cut down "berm");	
RD_5301_3	Peddlers Dr	Donalds Rd	Pautois Rd	1.87	6	1	8	2-lane, 2-way	varies	Ditch	LCB	150	216	2024 - Single Surface Treatment (No milling)	7	6	\$403,920.00	Wheel track rutting Heaving and rutting Longitudinal cracking on edge of asphalt Edges breaking in areas Inconsistent cross fall / crown Review speed limit at blind corner near Pautois Rd Cut down shoulders Longitudinal and transverse cracking near Bridge Surface treated in 2024 (overlay) from 911 - 687 to Daventry Surface is better in the section that was recently redone but the granular road base is very poor		Shouldering (incl cut down "berm");	Full-Depth Processing (incl widen to 7m travelled way)

Calvin Township Roads Needs Study - Road Inventory and Needs Summaries																					
Section Number	Road Name	From	To	Section Length (km)	Surface Width (m)	Shoulder Width (m)	Platform Width (m)	Travelled Way Lane Type	Surface Crossfall (%) ¹	Roadside Environment	Surface Type	2009 Annual Ave. Daily Traffic (AADT)	2025 Ave. Daily Traffic (ADT)	Last Improvement	2009 Condition Rating	2025 Condition Rating (Jp2g)	2025 Costing	Observations	Spot Improvements	Specific Maintenance	Construction Works
RD_5301_5	Peddlers Dr	HWY 630	Donalds Rd	2.02	7	0.5	8	2-lane, 2-way	varies	Ditch	LCB	150	216		7	6	\$578,320.00	Wheel track rutting Alligator cracking in areas (more longitudinal than alligator) Inconsistent cross fall Edges breaking Brushing required Hump at cross culvert Cut down shoulders Washout on shoulders at relocated cross culvert Review need for guiderail at relocated cross culvert Patching has been completed on road surface	Guiderails	Shouldering (incl cut down "berm");	Full-Depth Processing
RD_5301_6	Peddlers Dr	Pautois Rd	Daventry Rd	0.19	7	1	9	2-lane, 2-way	not measured ²	Ditch	LCB	150	216	2024 - Single Surface Treatment (No milling)	7	6	\$41,040.00	Review speed limit and sight lines at corner Heaving and rutting in areas		Shouldering (incl cut down "berm");	Full-Depth Processing
RD_5301_1	Peddlers Dr	HWY 630	Peaceful Lane	2.04	7	1	9	2-lane, 2-way	4.2-5	Ditch	LCB	150	72		7	5	\$452,880.00	Wheel track rutting Punching in areas Ditching is okay, some areas require cleanout Cut down shoulders Pothole patching completed Road deteriorating at edge	Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm");	Full-Depth Processing
RD_5301	Peddlers Dr	Peaceful Ln	Galston Rd	1.49	7	1	9	2-lane, 2-way	2.3-3.6	Ditch	LCB	150	63		7	8	\$55,015.00	Heaving Transverse cracking Intermediate longitudinal cracking One lane bridge Wheel track rutting Edge of asphalt deteriorating Brushing required in areas Cut down shoulders Area at bottom of hill is worse than remainder of road Large rut at bottom of hill	Brushing (assumes 25%); Spot road digout (at severe wheel track rutting at bottom of hill)	Shouldering (incl cut down "berm");	
RD_5330	Peddlers Dr	Peddlers Dr	911-2682	0.1	5	N/A	5	1-lane, 2-way	N/A	Ditch	GR	unknown	unknown		N/A	6	\$9,000.00	Poor turn around Narrow entrance to some residents Transitions into an unmaintained road Road suitable candidate for 1-lane, 2-way traffic	Establish turn-around at end	Gravel resurfacing	
RD_5320	Pratt Rd	Galston Rd	Adams Rd	1.02	6	N/A	6	2-lane, 2-way	N/A	Ditch	GR	50	20		7	8	\$36,520.00	Yield sign appears too far back at intersection with Galston Intersection very wide at Galston Sight line issues at intersection with Galston Ditch clean out required Frost heave noted by township Cut down shoulders	Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm") to re-establish 0.5m shoulders on either side	
RD_5325	Pratt Rd	Adams Rd	End	1.6	5	N/A	5	2-lane, 2-way	N/A	Ditch	GR	49	unknown	2022 - 4" gravel lift	6	8	\$41,600.00	Only 2 911 numbers on maintained section No ditch on east side Road drains towards Adams along edge of gravel Cut down shoulders	Spot ditch cleanout (assumes 25% of road)	Shouldering (incl cut down "berm") to re-establish 0.5m shoulders on either side	
RD_5324	Stewarts Rd	Homestead Rd	Township Limit	0.9	5	N/A	5	1-lane, 2-way	N/A	Ditch	GR	2	16	2024 - 2" gravel lift	4	8	\$36,500.00	Speed limit posted at 50km/h Turn around at 911-183 Brushing required Ditch clean out required Cut down shoulders Road suitable candidate for 1-lane, 2-way traffic	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road); Construct turnouts (2)	Shouldering (incl cut down "berm");	
RD_5305_1	Suzannes Rd	HWY 630	Donalds Rd	2.63	6.5-5.5	0.5	6.5	2-lane, 2-way	N/A	Ditch	GR	49	11		5	6	\$172,265.00	Review speed limit of road (80km/h appears too high) Inconsistent road width No real defined ditch Sight line issues throughout section Rock out crop at first corner Brushing required Cut down shoulders	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)		Gravel resurfacing and widening, incl shoulders
RD_5305	Suzannes Rd	Donalds Rd	Dead End	1.55	6	0.5	7	2-lane, 2-way	N/A	Ditch	GR	49	6		5	6	\$96,100.00	Road rides rough Larger stones (aggregate) on surface Cut down shoulders Brushing completed. Ditch clean out required Road suitable candidate for 1-lane, 2-way traffic	Spot ditch cleanout (assumes 25% of road)	Gravel resurfacing, incl shoulders	
RD_5305_2	Suzannes Rd	HWY 630	Westernly	0.3	6	0.5	7	2-lane, 2-way	N/A	Ditch	GR	30	31	2025 - 4" gravel lift	5	9	\$8,100.00	Boat launch at end of road Tree in center of turn around Cut down shoulders Brushing required at intersection with HWY 630; Road suitable candidate for 1-lane, 2-way traffic	Brushing (at intersection - 150m either side)	Shouldering (incl cut down "berm");	
RD_5312	Twilight Camp Rd	HWY 630	End	0.49	4	1	6	1-lane, 2-way	N/A	Ditch	GR	49	49	2025 - 4" gravel lift	5	8	\$4,655.00	Narrow road Minor ditching but no evidence of ponding on road Brushing required Road suitable candidate for 1-lane, 2-way traffic	Brushing (assumes 25%); Spot ditch cleanout (assumes 25% of road)		

Notes:

1. Surface crossfall (%) was not measured on the gravel roads since gravel surfaces are not rigid, and the material shifts and deforms depending on traffic and weather conditions. Therefore, static measurements of the crossfall on gravel surfaces result in inconsistent readings that don't reflect the intended design or functional reality.
2. Due to safety concerns with limited line of sight, the surface crossfall on Peddlers Drive between Pautois Rd and Daventry Rd was not measured.



Appendix E: Road Needs Costs Yearly Breakdown and Capital Planning Summary Tables

Calvin Township Roads Needs Study - Capital Planning Summary

Section Number	Road Name	From	To	Section Length (km)	Surface Type	2009 Annual Ave. Daily Traffic (AADT)	2025 Ave. Daily Traffic (ADT)	2025 Condition Rating (Jp2g)	2025 Costing	Proposed Activity	Recommended Year for Improvement
RD_5301_5	Peddlers Dr	HWY 630	Donalds Rd	2.02	LCB	150	216	6	\$578,320.00	Full-Depth Processing; Shouldering; Guideraills	2026
RD_5301_1	Peddlers Dr	HWY 630	Peaceful Lane	2.04	LCB	150	72	5	\$452,880.00	Full-Depth Processing; Shouldering; Ditching	2027
RD_5301_4	Peddlers Dr	Daventry Rd	Boundary Rd	2.05	LCB	150	288	5	\$442,800.00	Full-Depth Processing; Shouldering	2028
RD_5301_3	Peddlers Dr	Donalds Rd	Pautois Rd	1.87	LCB	150	216	6	\$403,920.00	Full-Depth Processing (incl widen to 7m travelled way); Shouldering	2029
RD_5301_6	Peddlers Dr	Pautois Rd	Daventry Rd	0.19	LCB	150	216	6	\$41,040.00	Full-Depth Processing; Shouldering	2029
RD_5311	Beach Rd	HWY 630	End	0.2	GR	49	unknown	5	\$18,975.00	Gravel resurface and widen; Brushing (intersection); Construct turnaround	2030
RD_5319_1	Beckett Ln	Galston Rd	East Dead End	0.05	GR	49	unknown	5	\$13,175.00	Gravel Resurfacing; Shouldering; Ditching; Construct turnaround	2030
RD_5316	Gated Rd	Peddlers Dr	Northerly	1.05	GR	5	unknown	5	\$59,000.00	Gravel Resurfacing; Shouldering; Construct turn-outs; Widen turnaround	2030
RD_5330	Peddlers Dr	Peddlers Dr	911-2682	0.1	GR	unknown	unknown	6	\$9,000.00	Gravel resurfacing; Construct turnaround	2030
RD_5305_1	Suzannes Rd	HWY 630	Donalds Rd	2.63	GR	49	11	6	\$172,265.00	Gravel resurfacing and widening; Shouldering; Brushing Ditching	2030
RD_5305	Suzannes Rd	Donalds Rd	Dead End	1.55	GR	49	6	6	\$96,100.00	Gravel Resurfacing; Shouldering; Ditching	2030
RD_5303	Pautois Rd	Peddlers Dr	Northerly	0.32	GR	2	unknown	6	\$23,520.00	Gravel Resurfacing; Brushing; Shouldering;	2030
RD_5321_2	Adams Rd	Brule Rd	Westernly	0.99	GR	50	unknown	7	\$63,480.00	Gravel Resurfacing; Shouldering; Brushing (intersection); Ditching	2031-2035
RD_5314	Latimer Ln	Mt Pleasant Rd	Easternly	0.51	GR	2	unknown	7	\$39,035.00	Gravel Resurfacing; Shouldering; Construct turnaround	2031-2035

Proposed Capital Costs (by Year) ¹					Post-2030 Condition Rating ²
2026	2027	2028	2029	2030	
\$595,700.00					8
	\$480,500.00				8.5
		\$483,900.00			9
			\$454,700.00		9.5
			\$46,200.00		9.5
				\$22,000.00	10
				\$15,300.00	10
				\$68,400.00	10
				\$10,500.00	10
				\$199,800.00	10
				\$111,500.00	10
				\$27,300.00	10
					7
					7

Calvin Township Roads Needs Study - Capital Planning Summary

Section Number	Road Name	From	To	Section Length (km)	Surface Type	2009 Annual Ave. Daily Traffic (AADT)	2025 Ave. Daily Traffic (ADT)	2025 Condition Rating (Jp2g)	2025 Costing	Proposed Activity	Recommended Year for Improvement
RD_5323	McLaughlin Rd	Brule Rd	Westernly	0.11	GR	30	unknown	7	\$15,315.00	Gravel Resurfacing; Shouldering; Construct turnaround	2031-2035
RD_5323_1	McLaughlin Rd	Brule Rd	Easternly	0.34	GR	30	unknown	7	\$18,190.00	Gravel Resurfacing; Shouldering; Brushing; Ditching	2031-2035
RD_5318	Peaceful Lane	Peddlers Dr	Southernly	0.46	GR	5	unknown	7	\$33,810.00	Gravel Resurfacing; Shouldering; Brushing; Ditching	2031-2035
RD_5306_1	Daventry Rd	Homestead Rd	Floods Rd	2.05	GR	50	64	7	\$60,475.00	Shouldering; Brushing; Ditching	2031-2035
RD_5322_2	Brule Rd	Adams Rd	McLaughlin Rd	2.08	GR	60	28	7	\$52,080.00	Shouldering; Brushing; Grade raise	2031-2035
RD_5317_1	Galston Rd	Brule Rd	Pratt Rd	2.06	GR	50	unknown	8	\$60,770.00	Shouldering; Brushing; Ditching	2031-2035
RD_5309	Bronson Lake Rd	Homestead Rd	Township Limit	2.14	GR	49	unknown	8	\$42,840.00	Flatten ditches; Gravel Resurfacing (after steep hill)	2031-2035
RD_5603_2	Daventry Rd	Floods Rd	Westernly	0.5	GR	50	unknown	8	\$9,725.00	Brushing; Ditching; Construct turnout	2031-2035
RD_5327	Floods Rd	Daventry Rd	Easternly	0.22	GR	30	unknown	8	\$2,090.00	Brushing; Ditching	2031-2035
RD_5325	Pratt Rd	Adams Rd	End	1.6	GR	49	unknown	8	\$41,600.00	Shouldering; Ditching	2031-2035
RD_5302	Peddlers Dr	Brule Rd	Mt Pleasant Rd	3.2	GR	150	135	8	\$85,200.00	Shouldering; Ditching; Replace cross-culverts	2031-2035
RD_5322	Brule Rd	Peddlers Dr	Galston Rd	1.01	GR	60	92	8	\$16,160.00	Shouldering; Ditching	2031-2035
RD_5306	Daventry Rd	Homestead Rd	Peddlers Dr	2.04	GR	50	72	8	\$17,340.00	Shouldering; Brushing	2031-2035
RD_5301_2	Peddlers Dr	Galston Rd	Gated Rd	2.59	GR	150	63	8	\$76,405.00	Shouldering; Brushing; Ditching	2031-2035
RD_5302_1	Peddlers Dr	Gated Rd	Brule Rd	0.41	GR	150	63	8	\$10,660.00	Shouldering; Ditching	2031-2035
RD_5301	Peddlers Dr	Peaceful Ln	Galston Rd	1.49	LCB	150	63	8	\$55,015.00	Shouldering; Brushing; Spot dig out	2031-2035
RD_5322_1	Brule Rd	Galston Rd	Adams Rd	1.03	GR	60	50	8	\$7,250.00	Shouldering; Brushing (intersection)	2031-2035

Proposed Capital Costs (by Year) ¹					Post-2030 Condition Rating ²
2026	2027	2028	2029	2030	
					7
					7
					7
					7
					7
					8
					8
					8
					8
					8
					8
					8
					8
					8
					5.5
					8

Calvin Township Roads Needs Study - Capital Planning Summary

Section Number	Road Name	From	To	Section Length (km)	Surface Type	2009 Annual Ave. Daily Traffic (AADT)	2025 Ave. Daily Traffic (ADT)	2025 Condition Rating (Jp2g)	2025 Costing	Proposed Activity	Recommended Year for Improvement
RD_5312	Twilight Camp Rd	HWY 630	End	0.49	GR	49	49	8	\$4,655.00	Brushing; Ditching	2031-2035
RD_5320	Pratt Rd	Galston Rd	Adams Rd	1.02	GR	50	20	8	\$36,520.00	Shouldering; Ditching	2031-2035
RD_5324	Stewarts Rd	Homestead Rd	Township Limit	0.9	GR	2	16	8	\$36,500.00	Shouldering; Brushing; Ditching; Construct turnouts	2031-2035
RD_5319	Galston Rd	Peddlers Dr	Beckett Ln	0.66	GR	10	unknown	9	\$3,960.00	Ditching	2031-2035
RD_5317	Galston Rd	Pratt Rd	Beckett Ln	0.79	GR	50	unknown	9	\$4,740.00	Ditching	2031-2035
RD_5313_1	Mt Pleasant Rd	Latimer Ln	Peddlers Dr	1.95	GR	300	163	9	\$39,000.00	Shouldering	2031-2035
RD_5308_3	Homestead Rd	Daventry Rd	Boundary Rd	2.04	GR	50	99	9	\$60,180.00	Shouldering; Brushing; Ditching	2031-2035
RD_5308	Homestead Rd	HWY 630	Bronson Lake Rd	0.17	GR	49	94	9	\$3,995.00	Shouldering; Brushing	2031-2035
RD_5308_1	Homestead Rd	Bronson Lake Rd	Stewarts Rd	2.09	GR	50	94	9	\$61,655.00	Shouldering; Brushing; Ditching	2031-2035
RD_5308_2	Homestead Rd	Stewarts Rd	Daventry Rd	2.09	GR	50	94	9	\$43,000.00	Shouldering; Ditching	2031-2035
RD_5321	Adams Rd	Pratt Rd	HWY 630	2.19	GR	50	93	9	\$56,940.00	Shouldering; Flatten ditches;	2031-2035
RD_5321_1	Adams Rd	Brule Rd	Pratt Rd	2.04	GR	50	58	9	\$42,900.00	Shouldering; Brushing (intersection)	2031-2035
RD_5315	Moreau Rd	Mt Pleasant Rd	Easternly	2.4	GR	49	57	9	\$46,800.00	Shouldering; Brushing; Ditching	2031-2035
RD_5310_1	Booth Rd	Booth Rd	Northernly	0.29	GR	49	46	9	\$5,000.00	Grade/compact turnaround	2031-2035
RD_5310_2	Booth Rd	Booth Rd	Southernly	0.26	GR	49	46	9	\$5,000.00	Grade/compact turnaround	2031-2035
RD_5305_2	Suzannes Rd	HWY 630	Westernly	0.3	GR	30	31	9	\$8,100.00	Shouldering; Brushing (intersection)	2031-2035
RD_5304	Donalds Rd	Suzannes Rd	Peddlers Dr	2.07	GR	49	8	9	\$22,770.00	Shouldering; Flatten ditches;	2031-2035
RD_5313	Mt Pleasant Rd	Moreau Rd	Latimer Ln	1.95	GR	300	163	9	-	-	
RD_5310	Booth Rd	HWY 630	Booth Rd	0.05	GR	49	46	9	-	-	
RD_5300	Boundary Rd	Taggart Lake Rd	HWY 17	2.02	LCB	199	326	10	-	-	

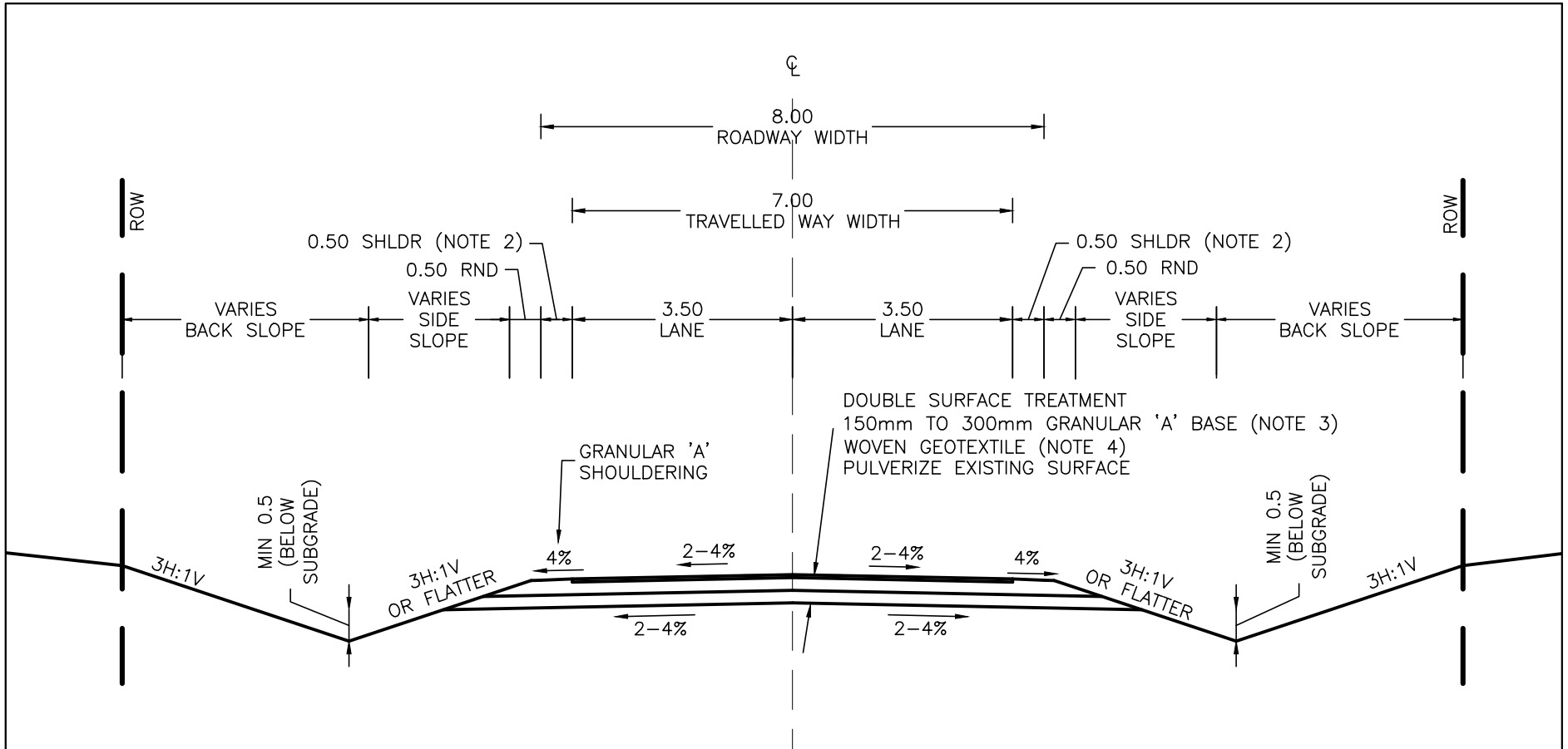
Notes:

1. Capital costs include a 3% increase (year over year) on the cost of construction works to account for inflation. Costs are rounded to the next hundred.
2. The "Post-2030 Condition Rating" indicates what the road condition rating would be after the construction works are implemented in 2030.
- LCB roads would deteriorate at a rate of 0.5 points per year (from date of construction works), however it is assumed gravel roads will not change their rating due to continued loose top maintenance.

Proposed Capital Costs (by Year) ¹					Post-2030 Condition Rating ²
2026	2027	2028	2029	2030	
					8
					8
					8
					9
					9
					9
					9
					9
					9
					9
					9
					9
					9
					9
					9
					9
					9
					7.5
TOTAL:	\$595,700.00	\$480,500.00	\$483,900.00	\$500,900.00	\$454,800.00



Appendix F: Typical Road Cross Sections



NOTES:

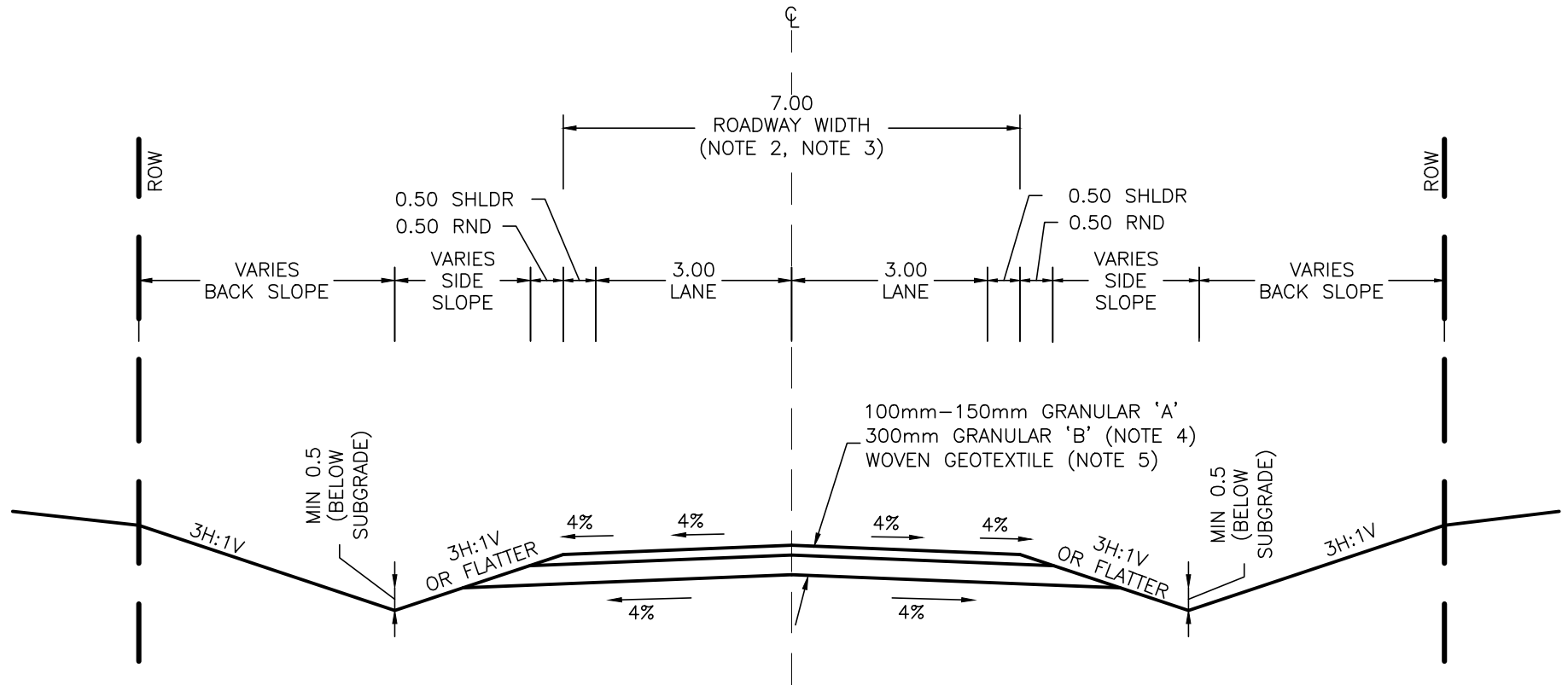
1. ALL UNITS IN METERS UNLESS OTHERWISE NOTED.
2. WHERE TRAFFIC BARRIERS ARE USED, INCREASE SHOULDER WIDTH BY 0.5m ON TRAFFIC BARRIER SIDE, PLUS WIDTH TO SUPPORT FOR THE BARRIER.
3. DEPTH OF GRANULAR 'A' BASE TO BE AS PER GEOTECHNICAL RECOMMENDATIONS
4. WOVEN GEOTEXTILE TYPICALLY ONLY INSTALLED WHERE SEPARATION IS NEEDED BETWEEN THE SUBGRADE AND GRANULAR MATERIALS.
5. CROSS SECTION ELEMENTS AND DIMENSIONS AS PER "TAC GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS CHAPTER 11: SPECIAL ROADS", BASED ON DESIGN SPEED OF 80km/hr



**TYPICAL RURAL SURFACED ROAD
CROSS SECTION**
LCB SURFACE - TWO-LANE, TWO-WAY ROADS

**NOT TO
SCALE**

R1



NOTES:

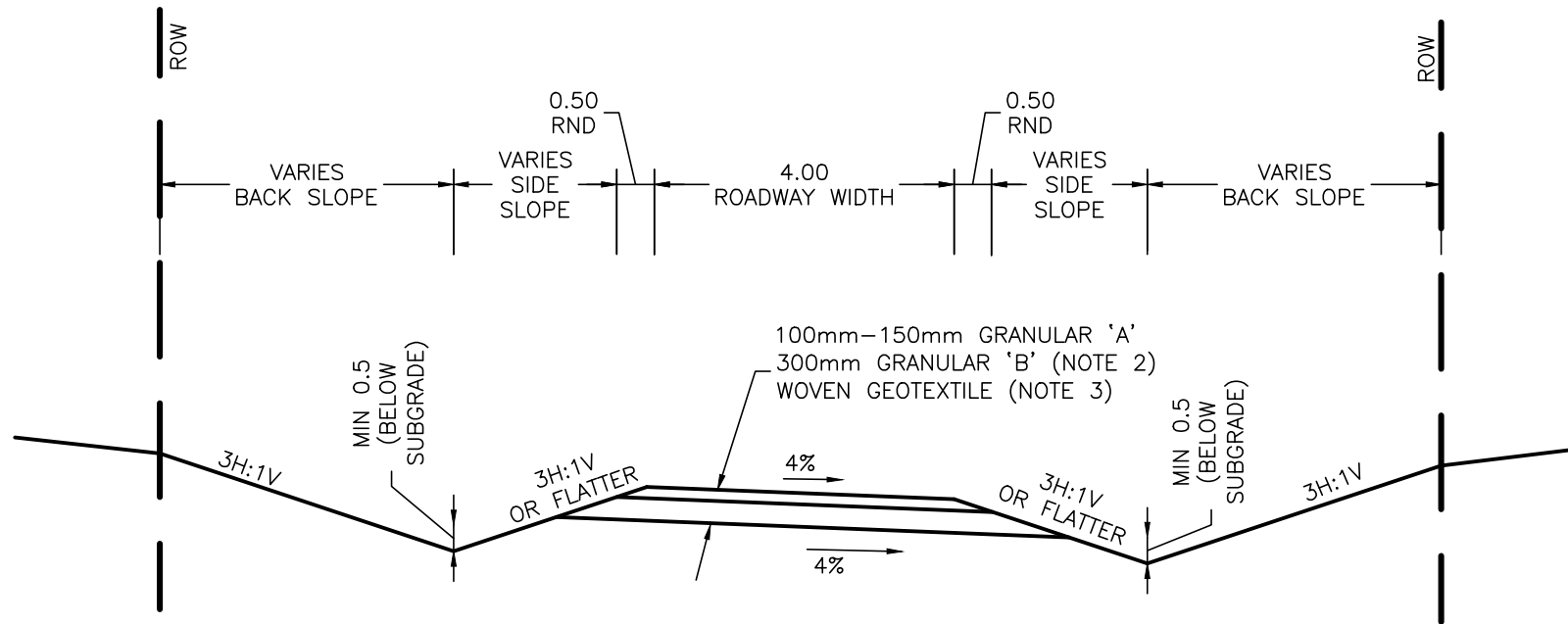
1. ALL UNITS IN METERS UNLESS OTHERWISE NOTED.
2. WHERE TRAFFIC BARRIERS ARE USED, INCREASE ROADWAY WIDTH BY 0.5m ON TRAFFIC BARRIER SIDE, PLUS WIDTH TO SUPPORT FOR THE BARRIER.
3. ROADWAY WIDTH (LANES PLUS SHOULDERS): MIN 7.0m (<15 AVERAGE DAILY TRUCK TRAFFIC) OR MIN 7.4m (>15 AVERAGE DAILY TRUCK TRAFFIC)
2. GRANULAR 'B' ONLY REQUIRED IF RECOMMENDED BY GEOTECHNICAL ENGINEER IN AREAS CONSIDERED FOR FULL DEPTH DIGOUT OR FULL RECONSTRUCTION. TYPICALLY ONLY GRANULAR 'A' IS ADDED FOR GRAVEL ROAD REHABILITATION.
3. WOVEN GEOTEXTILE TYPICALLY ONLY INSTALLED IN FULL RECONSTRUCTION, WHERE SEPARATION IS NEEDED BETWEEN THE SUBGRADE AND GRANULAR MATERIALS.
4. CROSS SECTION ELEMENTS AND DIMENSIONS AS PER "TAC GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS CHAPTER 11: SPECIAL ROADS", BASED ON DESIGN SPEED OF 80km/hr



**TYPICAL RURAL GRAVEL ROAD
CROSS SECTION**
GRAVEL SURFACE - TWO-LANE, TWO-WAY ROADS

**NOT TO
SCALE**

RG-2



REQUIREMENTS TO CONSIDER ONE-WAY, TWO-LANE ROADS:

- A. MAXIMUM DESIGN SPEED OF 50km/hr.
- B. AVERAGE DAILY TRAFFIC (ADT) < 50 VEHICLES/DAY.
- C. TYPICALLY USED TO PROVIDE ACCESS TO ISOLATED COMMUNITIES, RECREATIONAL SITES, OR RESOURCE DEVELOPMENTS.
- D. ROADS ARE SHORT, SERVE A SINGLE PURPOSE, AND ARE NOT PART OF A CONTINUOUS ROUTE.
- E. TURNOUTS ARE REQUIRED, NO MORE THAN 300m APART. REFER TO DRAWING TO-1 FOR MORE DETAILS.

NOTES:

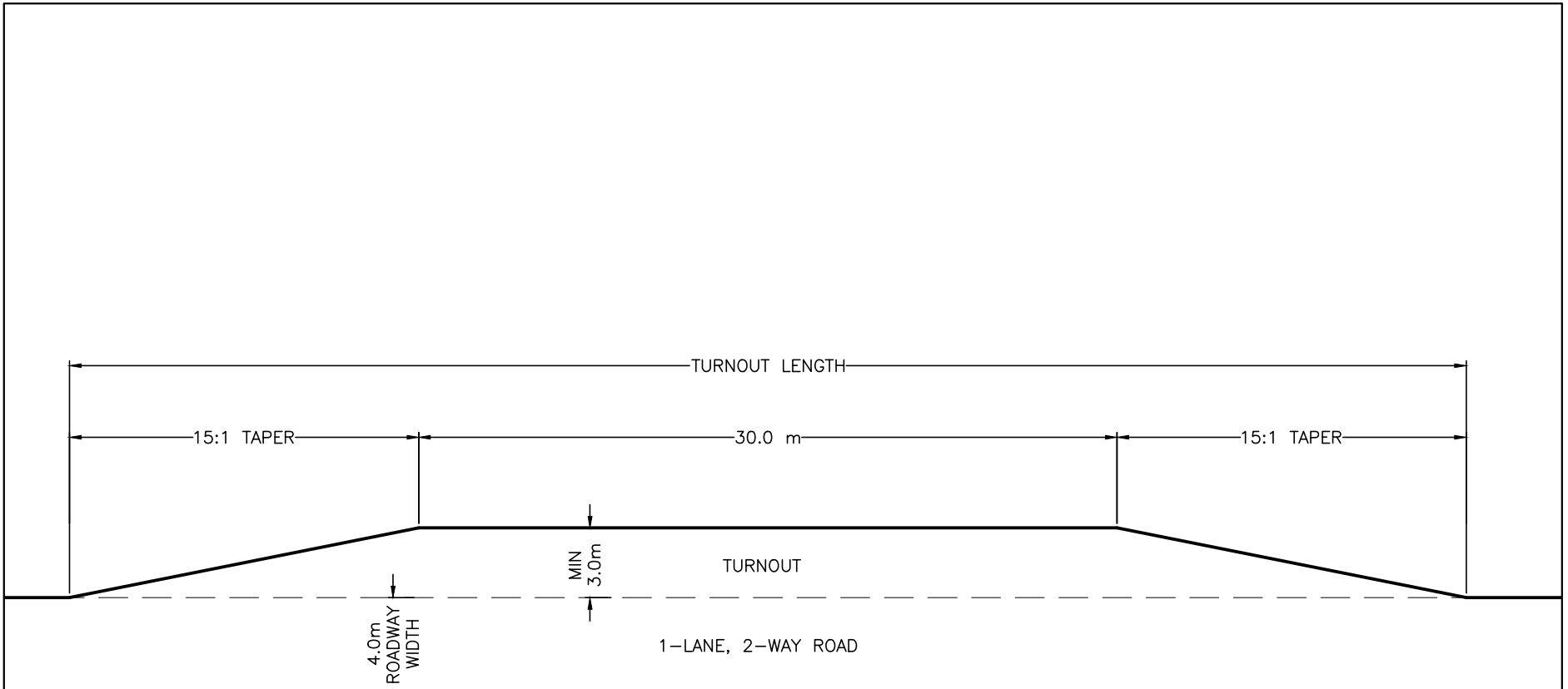
1. ALL UNITS IN METERS UNLESS OTHERWISE NOTED.
2. GRANULAR 'B' ONLY REQUIRED IF RECOMMENDED BY GEOTECHNICAL ENGINEER IN AREAS CONSIDERED FOR FULL DEPTH DIGOUT OR FULL RECONSTRUCTION. TYPICALLY ONLY GRANULAR 'A' IS ADDED FOR GRAVEL ROAD REHABILITATION.
3. WOVEN GEOTEXTILE TYPICALLY ONLY INSTALLED IN FULL RECONSTRUCTION, WHERE SEPARATION IS NEEDED BETWEEN THE SUBGRADE AND GRANULAR MATERIALS.
4. CROSS SECTION ELEMENTS AND DIMENSIONS AS PER "TAC GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS CHAPTER 11: SPECIAL ROADS", BASED ON DESIGN SPEED OF 50km/hr OR LESS



**TYPICAL RURAL GRAVEL ROAD
CROSS SECTION**
GRAVEL SURFACE - ONE-LANE, TWO-WAY ROADS

**NOT TO
SCALE**

RG-1



**TYPICAL RURAL GRAVEL TURNOUT
PLANVIEW**
GRAVEL SURFACE - ONE-LANE, TWO-WAY ROADS

**NOT TO
SCALE**

TO-1