

# **MUNICIPALITY OF OLIVER PAIPOONGE**

## **FORMAL REPORT - CONDITION RATINGS FOR MUNICIPALITY OF CONMEE ROADWAYS**

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## 1 INTRODUCTION

The Municipality of Oliver Paipoonge is responsible for capturing the Municipality of Conmee's assets and liabilities. A large portion of Conmee's assets are within their roadway system. This report provides a summary of the road assessments, treatment costs and treatment strategies completed by Laine McKay (Civil Engineering Intern) in the summer of 2020. The information within this report is strictly limited to assessing the Pavement Condition Rating for both the Asphalt Concrete and Gravel roadways within the Municipality. Condition assessments of other assets located on the Municipalities road networks such as signs, bridges and culverts are excluded from this report.

The assessments made throughout this study were done so based on the subjective procedures outlined in the following Ministry of Transportation Manuals:

- SP-024 Manual for Condition Rating of Flexible Pavements (Ministry of Transportation, 2016)
- SP-025 Manual for Condition Rating of Gravel Roads (Ministry of Transportation, 1989)

The road sections assessed in the Municipality of Conmee are all Flexible Pavements. The types of flexible pavements within the Municipality are Asphalt Concrete Pavement (HCB), and Gravel. All roadways are composed of an Aggregate surface course with the exception of one small section on Holland Road W which is composed of Asphalt Concrete.

Each section of roadway will be assessed to obtain a Pavement Condition Rating (PCR). The Pavement Condition Rating is a value between 0-100 that represents the physical condition of the roadway. The PCR can be obtained manually using subjective analysis or by using advanced technologies. All pavement condition ratings within this report are obtained manually using subjective analysis. Along with the PCR, all roadway lengths will be measured and recorded.

## 2 METHODOLOGY

### 2.1 Condition Assessments

Information for each asset in the Municipality of Conmee can be found within "CityWide Solutions". Each roadway is broken up into smaller subsections that span from intersection to intersection and are listed as their own asset ID number as shown below:

**Asset 223 - Hunt Road - From: Highway 11/17 To: Maxwell Road**

**Figure #1. Roadway Subsection**

Field assessment forms used to assess Asphalt Concrete and Gravel surfaces are utilized to obtain the PCR. All pavement condition ratings are carried out in late summer to assure that

there is little to no frost in the ground. Specific notes and pictures are also recorded to highlight more serious and urgent distresses/issues.

## **2.2 Roadway Classification (According to Oliver Paipoonge System)**

The Municipality of Oliver Paipoonge has a roadway classification system in place which allows them to group similar roadways. In order to create a strategy for treating the different roadways in the Municipality, the roadways must be sorted into separate “classes”. All roadways within the Municipality of Conmee can be grouped into the “Low Class” roadways. A description of a “Low Class” roadway is listed below:

### **Low Class Roadways**

Low Class roads are subjected to low volumes, loads and speeds. As a result, a basic base capable of supporting 8 tonnes with a surface of Flexible Pavement or Gravel. Low Class roads are capable of having a perfect road **PCR of 80** for Gravel Roads and a **PCR of 90** for Paved Roads.

## **2.3 Treatment Summaries**

According to the Municipality of Oliver Paipoonge road treatment strategy, Gravel roadways are eligible for the Regular Maintenance and Reconstruction strategy. The PCR will dictate the type of treatment that the roadway is eligible for. The 2 treatment summaries are listed and described below:

### **1. Regular Maintenance**

The Regular maintenance summary includes costs covered by the Municipalities operating budget and is applied to help preserve the condition of the roadway and prevent future deterioration. Regular Maintenance is done on all roads regardless of the PCR rating. Regular maintenance is the only treatment that roadways with a PCR over 70 will receive. For Gravel Roadways, Maintenance Grading and Granular Distribution are the typical treatments associated with the Regular Maintenance summary.

### **2. Expansion/Reconstruction**

The Expansion/Reconstruction summary is intended to address both functional and structural distresses. This treatment summary is intended to bring the roadway to a near perfect state. It is designed to promote structural capacity and a high level of serviceability. Gravel roadways are also eligible for expansion, which corresponds to applying a Bituminous Surface Treatment. A detailed breakdown of the treatments corresponding to each road class, along with the cost per kilometer are shown in the results section.

Moving forward with the Municipality of Conmee’s road systems, it is intended to begin Surface Treating select roadways. As a result, some current roadways will be eligible for the Expansion summary. Applying a Bituminous Surface Treatment to a Gravel roadway will upgrade it to a “Middle Class Roadway”.

## 2.4 Trigger PCR's

The treatment summary that a roadway is eligible for is based on the PCR of the roadway. The approximate PCR's that trigger each treatment summary are shown below:

Low Class Roadways	Regular Maintenance	60-80
	Reconstruction	40-59

**Table #1:** Trigger PCR's

As previously stated, Bituminous Surface Treatments are the plan for the Municipality of Connees roadways moving forward. The chosen roadways for the Expansion treatment summary will either require significant prep work or very little prep work. As a result, two separate Expansion treatments/costs will be established to estimate the cost of upgrading either case. Roadways with a PCR greater than 70 will require little prep work and the cost of upgrading will be much less than a roadway with a PCR lower than 70. Cost estimates will be provided in the results section.

### Approximate PCR Ratings after Treatment Has Been Applied

1. Regular Maintenance: Done on all roadways, intended to prolong serviceability and slow deterioration.
2. Expansion/Reconstruction: Provides a new PCR of 80-90 (Depending of Roadway Class)

The new PCR's after a treatment has been applied are highly variable. It depends on the extent of construction and also the quality of construction.

## 2.5 Cost Estimates

All treatment summaries will have cost estimates associated with them. These cost estimates will be based on current Northwestern Ontario contractor unit prices for the year of 2020. Quantities will be determined based on previous road construction projects in the Municipality of Oliver Paipoonge and will be prorated on a per kilometer basis.

### 3 RESULTS

#### 3.1 Pavement Condition Ratings

After assessing all roadways within the Municipality of Conmee, some notable statistics have been gathered. All condition assessments have been made for each segment of roadway. The following table shows the weighted PCR averages and the overall recorded length:

Total Length (km)	Average PCR
67.0	67.7

**Table #2.** 2020 Pavement Condition Ratings

**Note:** These statistics are excluding Wolfe Rd and Briggs Rd. Wolfe Rd was not deemed a serviceable road and Briggs Rd is the Municipal gravel pit road.

#### 3.2 Treatment Summaries with Costs

Each treatment summary cost is based on the typical quantities for each item. The cost per unit is obtained from current northwestern Ontario contractor prices.

#### Expansion and Reconstruction Cost/km

Reconstruction (Gravel)			
Treatment	Unit	Quantity/km	Cost/unit
Granular "B" Gravel (100mm)	m3	900	\$17.00
Granular "M" Gravel (150mm)	m3	1350	\$18.00
Ditch Construction	m	300	\$15.00
Ditch Cleanout	m	700	\$10.00
Road Excavation	m3	1200	\$10.00
Filter Cloth	m2	2000	\$3.50
		Cost/km	<b>\$70,100.00</b>

**Table #3:** Gravel Road Reconstruction Cost/km



<b>Expansion (Surface Treatment Upgrade, PCR &gt;70)</b>			
<b>Treatment</b>	<b>Unit</b>	<b>Quantity/km</b>	<b>Cost/unit</b>
Granular "M" Gravel (52mm)	m3	416	\$18.00
Double Surface Treatment	m2	7000	\$5.50
Line Painting	km	1	\$1,000.00
		Cost/km	<b>\$46,988.00</b>

**Table #4:** Gravel Road Expansion (<70) Cost/km

<b>Expansion (Surface Treatment Upgrade, PCR &lt;70)</b>			
<b>Treatment</b>	<b>Unit</b>	<b>Quantity/km</b>	<b>Cost/unit</b>
Granular "M" Gravel (150mm)	m3	1200	\$18.00
Road Excavation	m3	300	\$10.00
Granular "B" Gravel	m3	300	\$17.00
Filter Cloth	m2	500	\$3.50
Double Surface Treatment	m2	7000	\$5.50
800/900mm CSP	km	1	\$4,000.00
Ditch Construction	m	300	\$15.00
Ditch Cleanout	m	700	\$10.00
Line Painting	km	1	\$1,000.00
		Cost/km	<b>\$86,450.00</b>

**Table #5:** Gravel Road Expansion (>70) Cost/km

Please note that 2 cost estimates have been made for the Expansion treatment summary as the roadways in better conditions (PCR>70) will require much less prep work than the roadways with a lower PCR (PCR<70).

The lengths of existing roadways that are currently within each treatment summary are shown below:

Roadway Class	Treatment Summary	Eligible (km)
Low Class	Regular Maintenance	56.6
	Reconstruction	10.4

**Table #6.** Lengths of Eligible Roadways for each Treatment Summary

#### 4 DISCUSSION

After assessing all roadways within the Municipality of Conmee, a few aspects became very apparent. Although all of the roads are composed of a gravel surface course, they are not all constructed equally. Many roadways such as Kivipelto Rd, are a 1.5 lane roadway with very poor road shape, poor drainage and overgrowth. On the other hand, roadways such as Hunt Rd, have excellent road width, good crown, adequate ditching and nice surface course of "M" gravel. Different roadways serve different purposes and the roadways with a high number of active lots should be held to a higher standard than a roadway with 1 lot on it. For this reason, it may be acceptable to be satisfied with a lower PCR for the low traffic roadways. It was also apparent that poor road shape caused water to flow/drain across it, deteriorating many road surfaces. The pictures below demonstrate a deteriorated surface due to water flow:



**Figure #2/3:** Surface Deterioration due to Poor Roadway Shape

The surface deterioration in the above pictures is a result of flat and reverse crown along with limited ditching. Improved ditch construction/cleanout should be an emphasis along with proper roadway shaping when grading.

## **5 CONCLUSION**

The objective of this report was to obtain Pavement Condition Ratings and to estimate the costs of maintaining/upgrading the Municipality of Conmee's roadways. The average PCR for the roadways is 67 which corresponds to a "fairly good" classification. As shown in Table #6, a small portion of the roadways are eligible for the reconstruction treatment summary. In comparison, the majority of roadways are only eligible for the Regular Maintenance treatment summary. Moving forward, it is highly suggested to take advantage of the newly reconstructed roadways in the Municipality and apply a bituminous surface treatment. Lastly, a strong emphasis should be put on updating and improving the information within Citywide Solutions.



## 6 APPENDIX A

Asset ID	Name	Location	Surface Material	Length (km)	2020 PCR
91	Pifer Road	Cemetery Road	Gravel	0.32	70
93	Hume Road W	Highway 11/17 to End	Gravel	0.2	70
97	Hume Road E	Torrie Road to End	Gravel	0.5	67
99	Torrie Road	Hume Road to Holland Road	Gravel	0.9	64
101	Torrie Road	Holland Road to End	Gravel	0.8	56
103	Holland Road East	Highway 11/17 to Torrie Road	Gravel	3.2	66
105	Holland Road East	Torrie Road to End	Gravel	0.15	62
107	Holland Road West	Highway 11/17 to Maxwell Road	High Class Bituminous	1.5	45
109	Holland Road West	Maxwell Road to Enders Road	Gravel	1.5	77
111	Holland Road West	Enders Road to Sovereign Road	Gravel	1.6	76
119	Hunt Road	Sovereign Road to End	Gravel	2.4	69
121	Lundstrom Road E	Highway 11/17 to End	Gravel	1.6	60
123	Lundstrom Road W	Highway 11/17 to Maxwell Road	Gravel	1.6	67
125	Fleming Road	Sovereign Road to Strom Road	Gravel	3.9	67
135	Mokomon Road East	Highway 11/17 to Ilkka Drive	Gravel	0.2	62
137	Mokomon Road East	Ilkka Drive to End	Gravel	2.2	50
139	Pajamaki Road	Ilkka Drive to End	Gravel	0.9	65
141	Teitto Road	Highway 11/17 to End	Gravel	0.7	59
143	Kivipelto Road	Highway 11/17 to End	Gravel	0.6	47
145	Oikonen Road	Highway 11/17 to End	Gravel	0.5	58
149	Pokki Road	Enders Road to End	Gravel	2.5	65
151	Olson Road	Sovereign Road to End	Gravel	2.6	65
153	Ilkka Drive	Highway 11/17 to Mokomon Road	Gravel	1.7	69
155	Ilkka Drive	Mokomon Road to Pajamaki Road	Gravel	0.3	70
157	Ilkka Drive	Pajamaki Road to Highway 11/17 North Entrance	Gravel	0.51	55
159	Wiljala Drive	Highway 11/17 South to Wolfe Road	Gravel	0.4	61
161	Wiljala Drive	Wolfe Road to Highway 11/17 North Entrance	Gravel	0.7	66
163	Enders Road	Hunt Road to Holland Road	Gravel	2.4	74
169	Sovereign Road	Fleming Road to Hunt Road	Gravel	0.8	73
171	Sovereign Road	Hunt Road to Olson Road	Gravel	0.7	74
173	Sovereign Road	Olson Road to Holland Road	Gravel	1.5	76
175	Sovereign Road	Holland Road to End	Gravel	0.8	74
177	Maxwell Road	Hunt Road to Holland Road	Gravel	2.4	78
179	Maxwell Road	Holland Road to Lundstrom Road	Gravel	1.6	77
181	Maxwell Road	Lundstrom Road to Mokomon Road	Gravel	3.6	56
183	Maxwell Road	Mokomon Road to End	Gravel	0.5	60
185	Maxwell Road South	Hunt Road to End	Gravel	0.15	70
218	Hume Road E	Highway 11/17 to Torrie Road	Gravel	3.3	65
223	Hunt Road	Highway 11/17 to Maxwell Road	Gravel	1.8	79
225	Hunt Road	Maxwell Road to Enders Road	Gravel	1.61	80
227	Hunt Road	Enders Road to Sovereign Road	Gravel	1.6	78
239	Mokomon Road West	Highway 11/17 to Maxwell Road	Gravel	1.4	67
241	Mokomon Road West	Maxwell Road to Enders Road	Gravel	1.5	66
243	Mokomon Road West	Enders Road to Tienhaara Road	Gravel	1.4	65
245	Mokomon Road West	Tienhaara Road to End	Gravel	1.3	66
251	Enders Road (surface)	Holland Road to Pokki Road	Gravel	3.2	79
252	Enders Road (surface)	Pokki Road to Mokomon Road	Gravel	1.5	76
147	Wolfe Road	Wiljala Drive to End	Gravel	N/A	N/A
187	Briggs Road	Highway 11/17 to End	Gravel	N/A	N/A