



BURNSIDE

2023 Road Needs Study Update Municipality of Grey Highlands



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Agenda

- Purpose
- Road Network Inventory
- Traffic Estimates
- Hardtop Road Condition/Needs
- Gravel Road Condition/Needs
- Lifecycle Improvement Matrix, Degradation Curves, Useful Life
- Improvement Costs
- Improvement Priority
- Upgrading of Surface Type (Gravel to Hardtop)
- Other Road Needs

Purpose

- Road and Traffic Inventory
- Condition Assessment
- Review Maintenance/Improvement Strategy & Priorities
- Review Other Road Needs

Road Inventory

Road Summary by Surface Type

Surface Type	Length (centerline km)	Surface Type (%)	Notes
Asphalt (HCB)	172.35	25.55%	Includes a total of 81.30 km of shared boundary roads.
Surface Treatment (LCB)	45.97	6.82%	
Gravel (GST)	456.13	67.63%	
Earth (ETH)	0.03	0.01%	
Total	674.48	100.00%	

Road Summary by Roadside Environment

Roadside Environment	Length (centerline km)	Roadside Environment (%)
Urban	9.12	1.35%
Semi-Urban	47.80	7.09%
Rural	617.56	91.56%
Total	678.60	100.00%

Road Inventory Map

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Replace with Grey Highlands Maps

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Traffic Estimates

- AADT – traffic counts collected by the Municipality throughout recent years

AADT Traffic Range (vehicles/day)	Total Inventory (km)
0 – 49	203.16
50 – 199	272.41
200 – 499	139.83
500 – 999	54.82
1000 – 1999	2.18
5000 – 5999	1.74
8000 – 9999	0.35
Total	674.48

Hardtop Road Condition

- PCI based on severity/density of 15 distresses

Qualitative Description of Hardtop Road Network

PCI Range	Condition	Length of Road (Centerline km)	Percentage of Total Length
90 to 100	Excellent	99.21	14.71%
75 to 89	Good	158.10	23.44%
65 to 74	Fair	120.35	17.84%
50 to 64	Poor	124.39	18.44%
Below 50	Very Poor	172.44	25.57%
Total	-	674.48	100.00%

Gravel Road Condition

- Structural Adequacy based on severity/density of 6 distresses
- Drainage Adequacy based on 6 conditions affecting drainage

Template for Life Cycle Road Improvements

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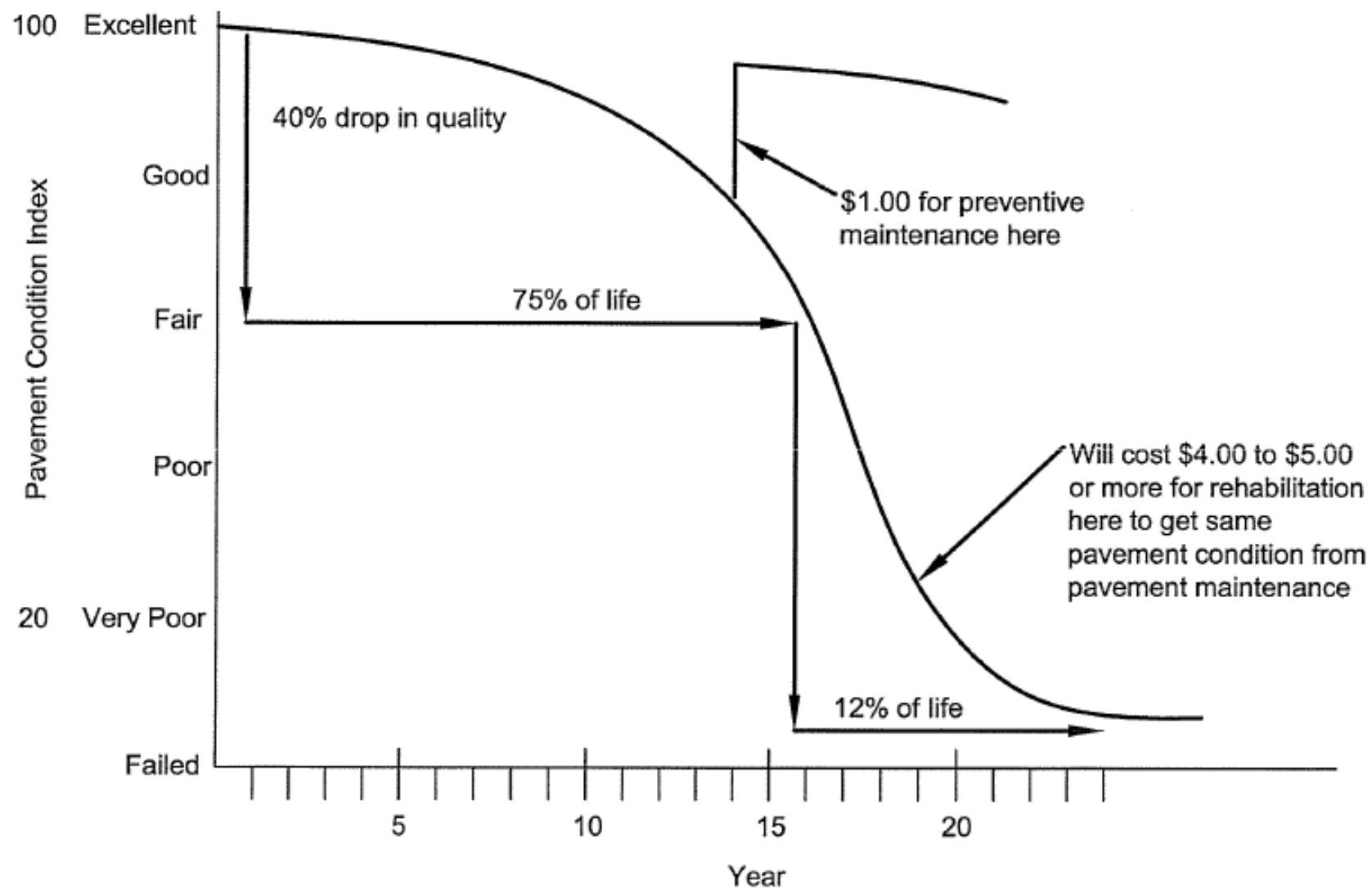
Improvement	Urban – Hardtop (Any AADT)				Semi-Urban or Rural – Hardtop (HCB/LCB)				Semi-Urban or Rural - Gravel			
	Typical Trigger Year	HCB	LCB	Distress Triggers	Typical Trigger year	AADT>=500	AADT<500	Distress Triggers	Typical Trigger Year	Rural with AADT>=400 or Semi-Urban (Any AADT)	Rural with AADT<400	Distress Triggers
Routine Maintenance (RM)	4 to 7	Crack sealing [\$0.75 per m ²]	N/A (Responsive Maintenance)	PCR = 15 to 17	4 to 7	HCB – Crack sealing [\$0.75 per m ²] LCB – N/A (Responsive Maintenance)	HCB – Crack Sealing [\$0.75 per m ²] LCB – N/A (Responsive Maintenance)	PCR = 15 to 17	Variable	Maintenance Gravel + Calcium Chloride [\$0.55 per m ²]	Maintenance Gravel + Calcium Chloride [\$0.55 per m ²]	OCR = 51 to 95
Preventive Maintenance (PM)	10 to 15	Double Micro-surfacing [\$8 per m ²]	Double Micro-surfacing [\$8 per m ²]	RBCR = 15 to 18 OR PCR = 11 to 14	10 to 15	Double Micro-surfacing [\$8 per m ²]	Slurry Seal [\$4 per m ²]	RBCR = 15 to 18 OR PCR = 11 to 14	N/A	N/A	N/A	N/A
Resurface (R)	25 to 35	Mill + 1 HMA (50 mm) [\$22 per m ²]	One HMA Overlay (40 mm) [\$11 per m ²]	RBCR = 9 to 14 OR PCR = 6 to 10	25 to 35	One HMA Overlay (40 mm) + Patching + Nominal Shoulder Repair [\$30 per m ²]	One HMA Overlay (40 mm) + Patching + Nominal Shoulder Repair [\$30 per m ²]	RBCR = 9 to 14 OR PCR = 6 to 10	N/A	N/A	N/A	N/A
Rehabilitation (REH)	50 to 60*	Full depth removal + Granular A + two HMA (50mm each) + Spot curb replacement [\$40 per m ²]	Full depth removal + Granular A + two HMA (50mm each) + Spot curb replacement [\$40 per m ²]	RBCR = 6 to 8 OR PCR = 0 to 5	50 to 60*	Pulverize + Granular A + 2 HMA (50 mm each) [\$30 per m ²]	Pulverize + Granular A + one HMA (50 mm) [\$30 per m ²]	RBCR = 6 to 8 OR PCR = 0 to 5	Variable*	One HMA (50 mm) + Nominal base strengthening + nominal shoulder/ditch repair [\$50 per m ²]	Partial base strengthening + nominal shoulder/ditch repair [\$39 per m ²]	OCR = 31 to 50
Reconstruction (REC)	50 to 60*	Full depth removal + two HMA (50 mm each) + Total base and curb replacement + nominal storm sewer adjustment [\$89 per m ²]	Full depth removal + two HMA (50 mm each) + Total base and curb replacement + nominal storm sewer adjustment [\$89 per m ²]	RBCR = 0 to 5	50 to 60*	Full depth removal + two HMA (50 mm each) + Total base replacement + nominal shoulder/ditch repair [\$85 per m ²]	Full depth removal + 1 HMA (50 mm) + Total base replacement + nominal shoulder/ditch repair [\$73 per m ²]	RBCR = 0 to 5	Variable*	1 HMA (50 mm) + Total base replacement + nominal shoulder/ditch repair [\$67 per m ²]	Total base replacement + nominal shoulder/ditch repair [\$55 per m ²]	OCR = 0 to 30

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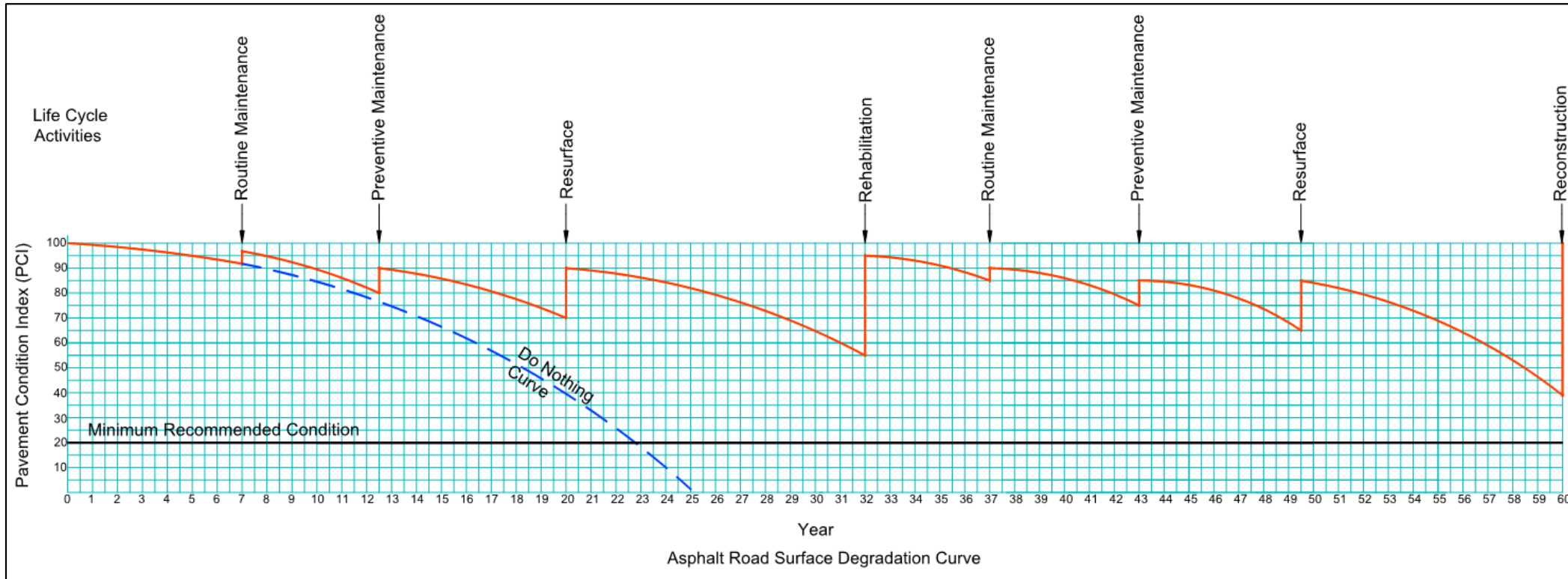
Replace with GH matrix

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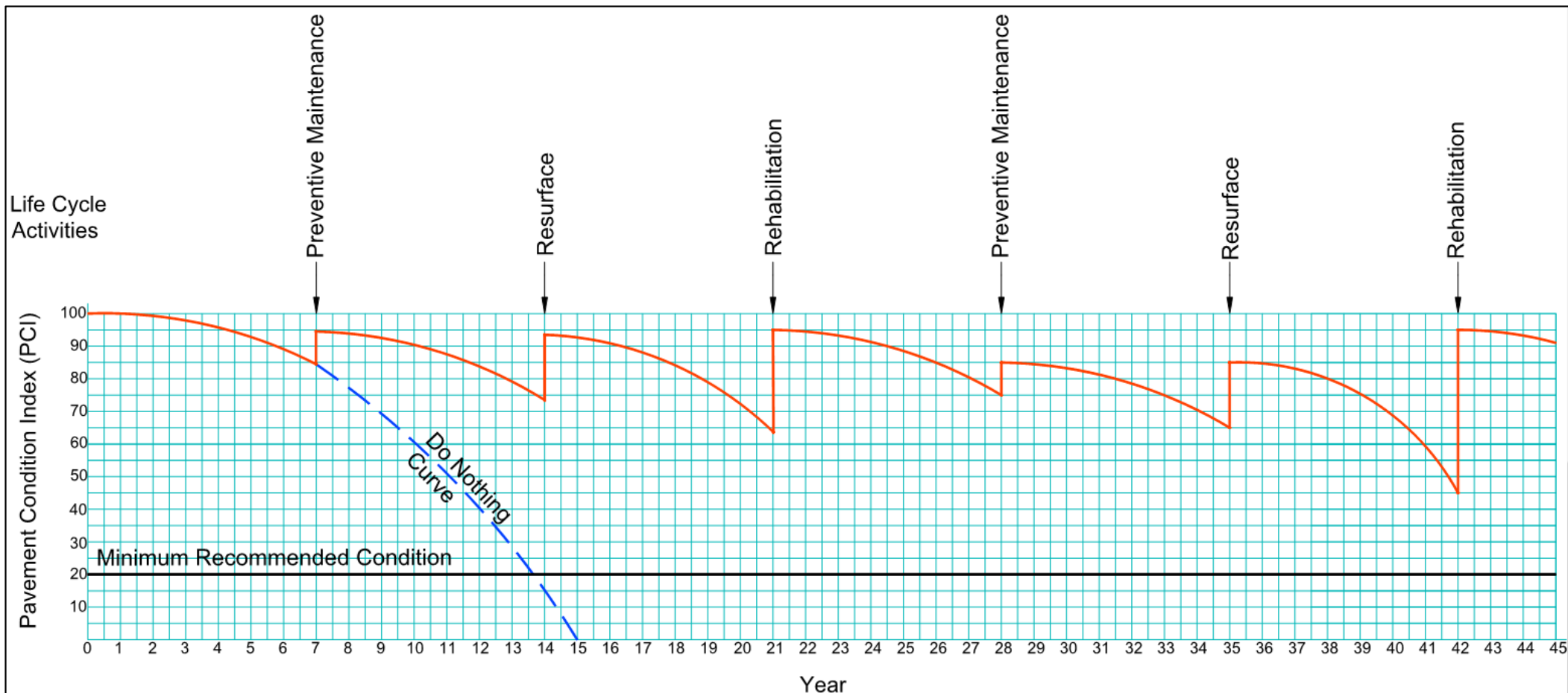


Typical Variation in Pavement Conditions as a Function of Time

Benefit of Applying Preventive Maintenance – Asphalt (HCB) Road Service Life



Benefit of Applying Preventive Maintenance – Surface Treated (LCB) Road Service Life



Hardtop Improvement Costs

- Improvements completed by contract and Municipality forces
- “Now” needs based on current Pavement Condition Index. Future improvement costs will increase with ongoing deterioration

Municipality of Grey Highlands Hardtop Road (“NOW”) Needs

Improvement Need Type	Amount of Hardtop Road Needs		
	Cost (in CAD Dollars)	Length (in kilometres)	Percentage of Total Hardtop Length
No Current Improvement Need	N/A	46.05	21.09%
Routine Maintenance	\$281,127	56.61	25.93%
Preventive Maintenance	\$2,181,984	61.29	28.07%
Resurface	\$6,828,332	34.13	15.63%
Rehabilitation	\$3,871,077	18.68	8.56%
Reconstruction	\$766,420	1.57	0.72%
Total	\$13,928,940	218.32	100.00%

Municipality of Grey Highlands Gravel Road Needs

Improvement Need Type	Amount of Gravel Road Needs		
	Cost (in CAD Dollars)	Length (in centerline kilometres)	Percentage of Total Length
Routine Maintenance (Maintenance Gravel)	\$1,332,177	297.61	65.25%
Rehabilitation	\$28,371,530	104.83	22.98%
Reconstruction	\$20,407,011	53.32	11.69%
Total	\$50,110,717	456.13	100.00%

- Ongoing gravel maintenance (grading, calcium application) not shown in above table
- Rehabilitation budget shown represents full rehabilitation, however due to the low AADT localized spot improvements should be completed

Other Road Needs

- Upgrading for higher traffic or development
- Vertical or horizontal deficiencies
- Deficient widths
- Deficient drainage
- Coordination with bridge/culvert works

Main Conclusion and Recommendations

- The results of this RNS may be incorporated into the Municipality's ongoing Asset Management studies and Capital Planning work.
- It is recommended that an annual budget be established to apply cost-effective routine and preventive maintenance treatments to hardtop roads
- It is recommended that updates to the condition ratings for the road network be completed every 3 to 5 years to assess ongoing deterioration rates and resulting improvement requirements