Municipality of
Middlesex Centre

2022 Road Needs Study

Stantec

Agenda

1. Background Information
2. Network Condition
3. Budget Analysis

Safety Moment

Tick Safety

4 tick tactics to keep in mind when heading out into nature

1

KNOW YOUR ENVIRONMENT

Be aware of areas where ticks live and thrive. Stay on trails.

2

CHECK YOURSELF

After spending time in nature, do a thorough body check.

3

RAISE YOUR PROTECTIVE BARRIER

Wear long-sleeved shirts and long pants to keep your skin protected from ticks.

4

REPEL

Use insect repellent on clothing that may come in contact with grass and brush.

Introduction

Background Information

Background Information

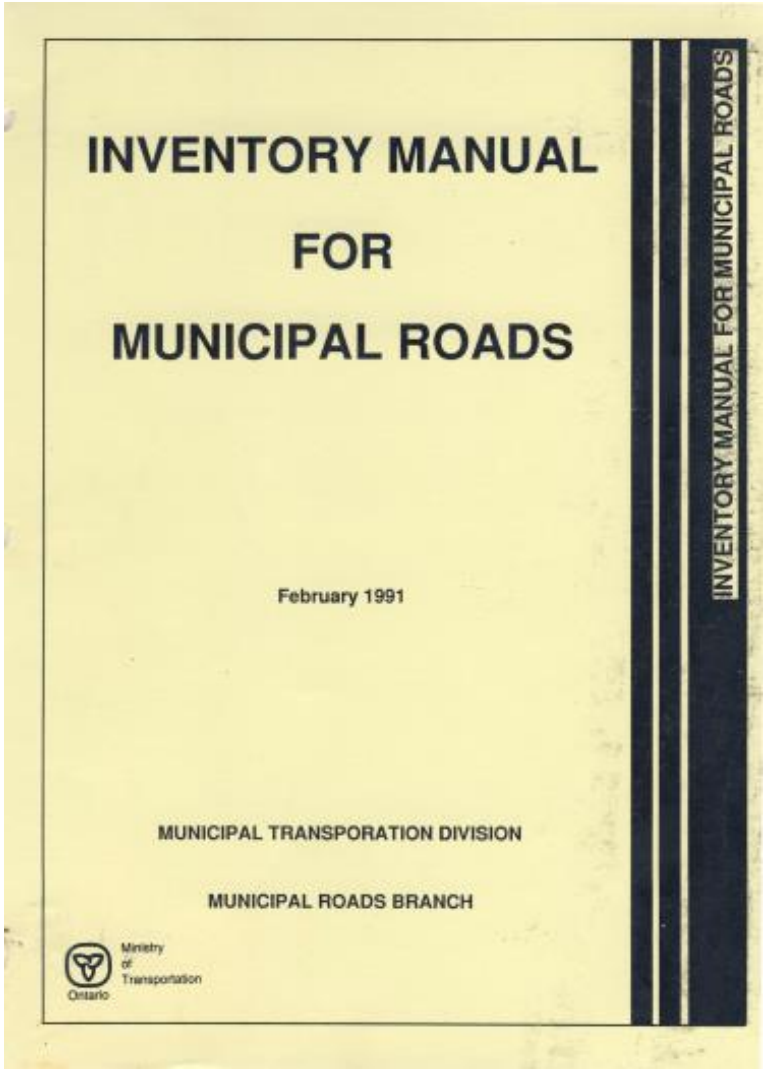
Field Collection was completed according to the Inventory Manual for Municipal Roads, 1991

The entire network was collected including boundary roads, only the hard surfaces (HCB, LCB) were included as part of the budget analysis.

Results of the Field Collection were uploaded into Stantec's RoadMatrix pavement management software for analysis.

Background Information

Inventory Manual



Data Collection was completed using the Inventory Manual for Municipal Roads.

Inventory Manual

- RNS initiated by MTO in the 1970’s to provide equitable funding subsidy to municipalities, many municipalities discontinued the practice when conditional funding stopped
- Concepts and Principle are sound
- Provides an updated summary of road condition ratings
- Provides current and future physical and financial needs of the road system.
- Data collection is visual, measurements were completed for surface and platform widths.

Field Collection

The following attributes were collected as part of the field investigation:

- Structural Adequacy
- Ride Quality
- Drainage
- Surface / Platform Widths
- Horizontal / Vertical Alignment Deficiencies
- Root Causes of Drainage Issues

An Overall Pavement Condition Index (PCI) was calculated for each section using the structural adequacy and ride quality for analysis in RoadMatrix.

Time of Need

A time of need is assigned to each category listed below for each section to help in the decision-making process:

- Structural Adequacy
- Drainage
- Geometrics
- Surface Width
- Capacity

The TON is a prediction of time until reconstruction is required, the categories are as follow:

- NOW
- 1-to-5 Year
- 6-to-10 Year
- Adequate

Examples of TON – Structural Adequacy

Now

1 to 5

6 to 10

Adequate

Background Information

Ride Ratings

POINT RATING

(1 0) - If the section affords a fully adequate standard of service, with no annoyance or discomfort.

(09 to 07) - If it is possible to maintain the lesser of the Minimum Tolerable Average Operating Speed **(Item 91)** the legal Speed Limit **(Item 51)** with only a noticeable amount of annoyance to the driver due to sway, vibration or steering effort, but with no noticeable feeling of hazard.

(06 to 04) - If maintaining even the lesser of the Minimum Tolerable Average Operating Speed **(Item 91)** or the legal Speed Limit **(Item 51)** results in either a "tug-of-war" with a too-steep or uneven crown, or a feeling that the car is taking undue punishment.

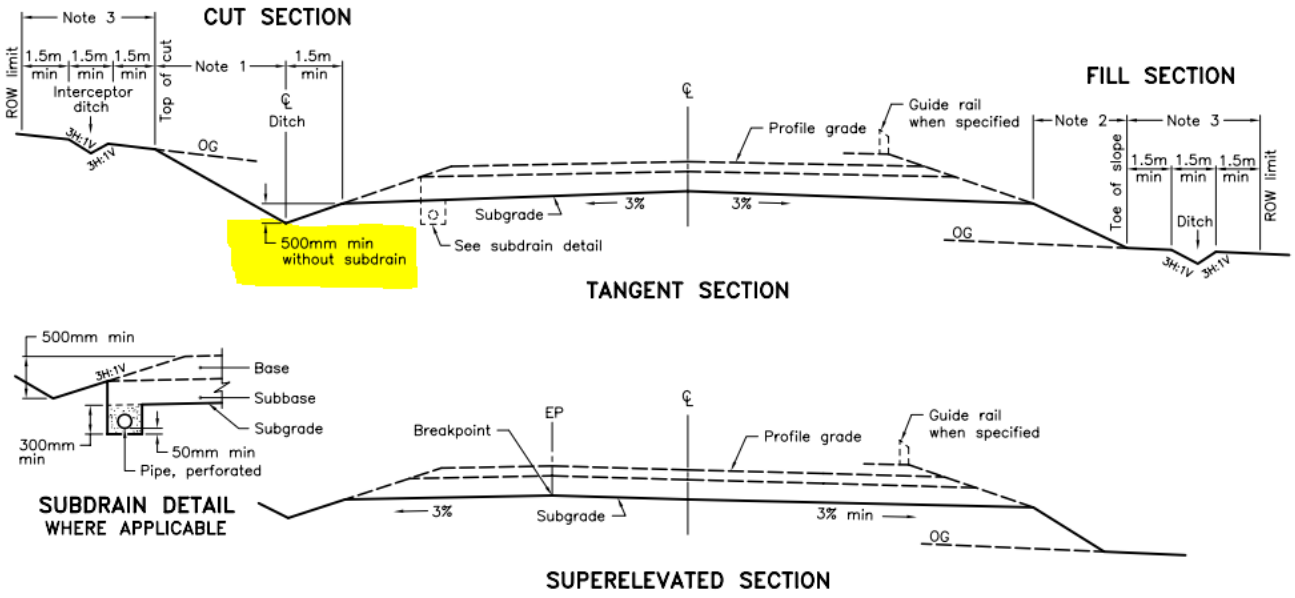
(03 to 01) - If the surface irregularities are so severe that a driver will tend to reduce speed considerably, possibly even steering an irregular course, or if the crown is so steep as to be hazardous in winter.

Background Information

Drainage Ratings

Point Ratings

(1 5)	If the cross-section and drainage are fully adequate.
(1 4) to (1 2)	If the height of grade line, cross-section elements and/or culvert and/or ditch capacity is somewhat below the standard that would be provided if the road were re-built, and the maintenance effort is somewhat higher than normal.
(11) to (0 8)	If excessive maintenance is required to provide adequate service, or if poor drainage conditions sometimes impede safe traffic movements.
(0 7) to (0 1)	If there are times when the road becomes impassable because of flooding or if there is an excessive maintenance effort required to prevent this.



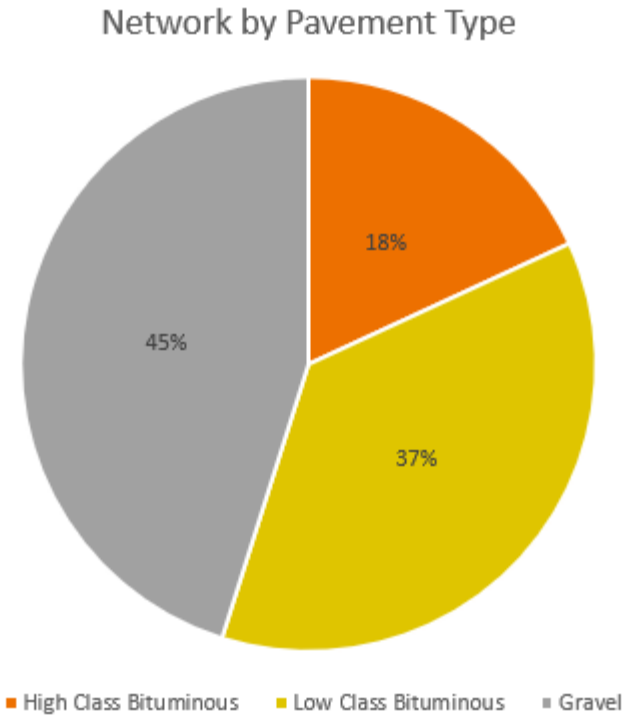
Network Condition

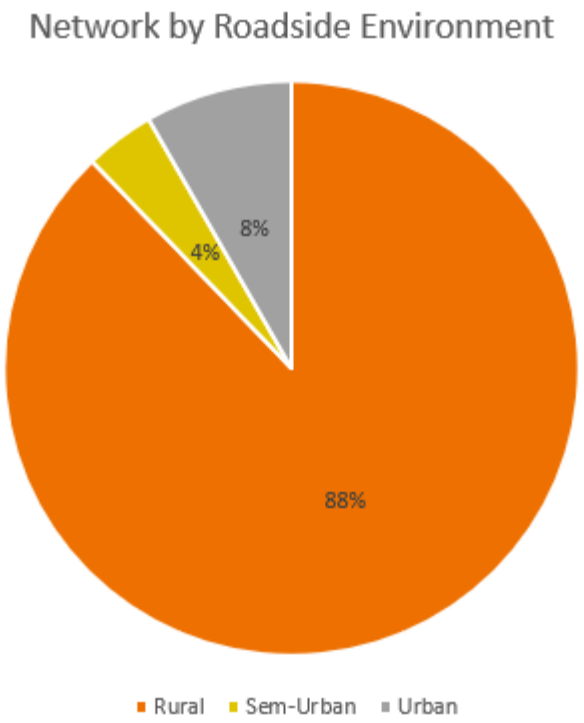
Road Needs Results

The goal of the RNS was to help provide the following information to help develop appropriate rehabilitation programs:

- Network Breakdown
- Network Condition
- Network Rehabilitation Requirements
- Rehabilitation Timing
- Rehabilitation Costs

Network Breakdown



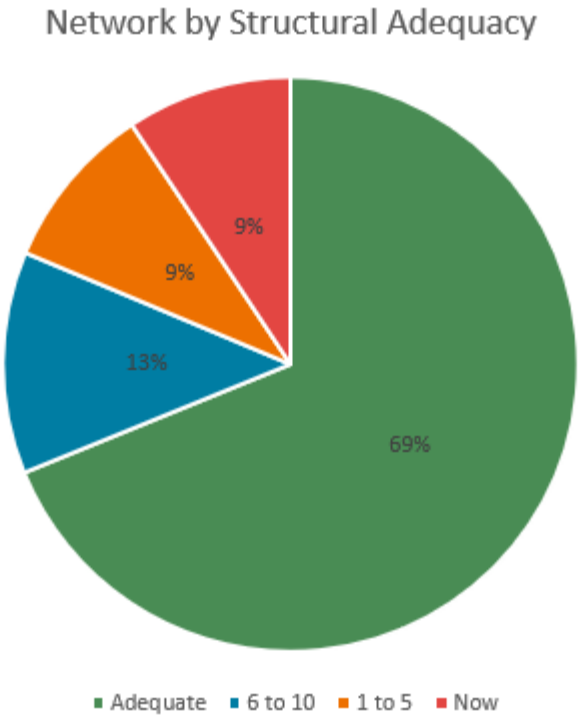


Pavement Type	CL-KM	% CL-KM
High Class Bituminous	109.1	18.1%
Low Class Bituminous	221.7	36.8%
Gravel	272.1	45.1%
Total	602.9	100%

Roadside Environment	CL-KM	% CL-KM
Rural	529.4	88%
Semi – Urban	23.6	4%
Urban	49.9	**8%**
Total	602.9	100%

Network Condition

The structural adequacy of the pavement is a good indicator of network condition.



Overall PCI of the network was 70, which is the Council approved target PCI for the network.

Network Critical Deficiencies

Critical Deficiencies were aggregated for the various deficiency types:

- **Surface Type Deficiency** – Gravel Roads that should be upgraded to Surface Treated and Surface Treated to Hot Mix Asphalt, based on AADT
- **Surface Width Deficiency** – Pavement Width Deficiency based on width of the pavement and the classification of the section, higher traffic results in higher minimum surface width
- **Structural Adequacy Deficiency** – Pavement condition in the now need category resulting in reconstruction of the section
- **Geometric Deficiency** – Inadequate vertical or horizontal curves or stopping sight distances
- **Drainage Deficiency** – Drainage issues resulting in temporary flooding of the pavement section

Network Critical Deficiencies

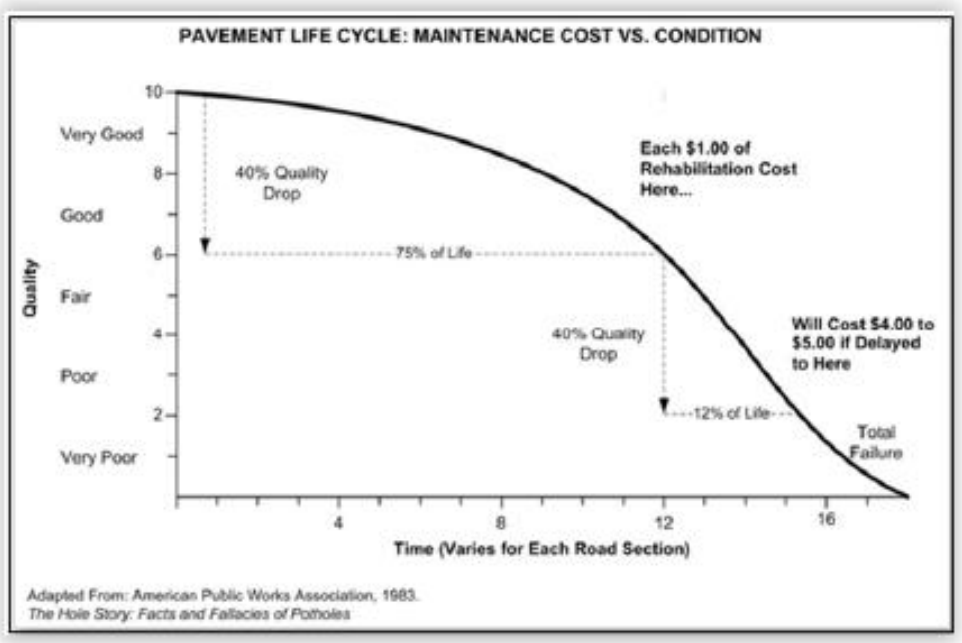
Deficiency	Total Cost ($)
Multiple Deficiencies	$ 3,506,989
Surface Type Deficiencies – 1-5 Yr Need	$ 899,493
Surface Type Deficiencies – 6-10 Yr Need	$ 3,714,082
Surface Width Deficiencies	$ 6,986,075
Structural Adequacy Deficiencies	$ 3,121,204
Geometric Deficiencies	$ 2,628,400
Drainage Deficiencies	$ 266,684
Total	$ 29,535,341

If critical deficiencies are not addressed they can lead to shorter service lives or open up the Municipality to potential liability.

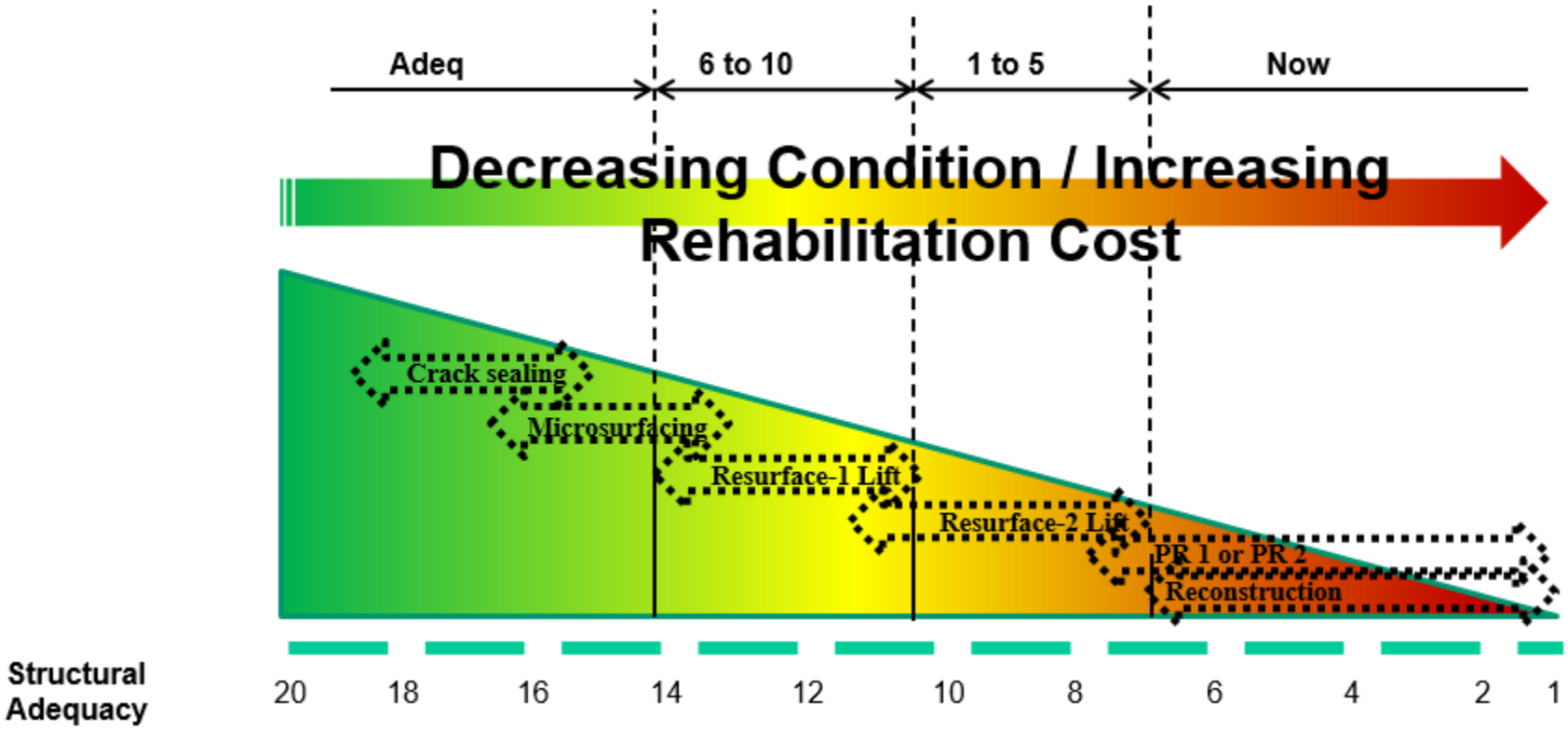
Budget Analysis

Rehabilitation Timing

- Prioritization should not be based on repairing the roads in the worst condition
- Modern pavement management philosophy is to keep the good roads in good condition, maintaining the good roads is a better return on investment.

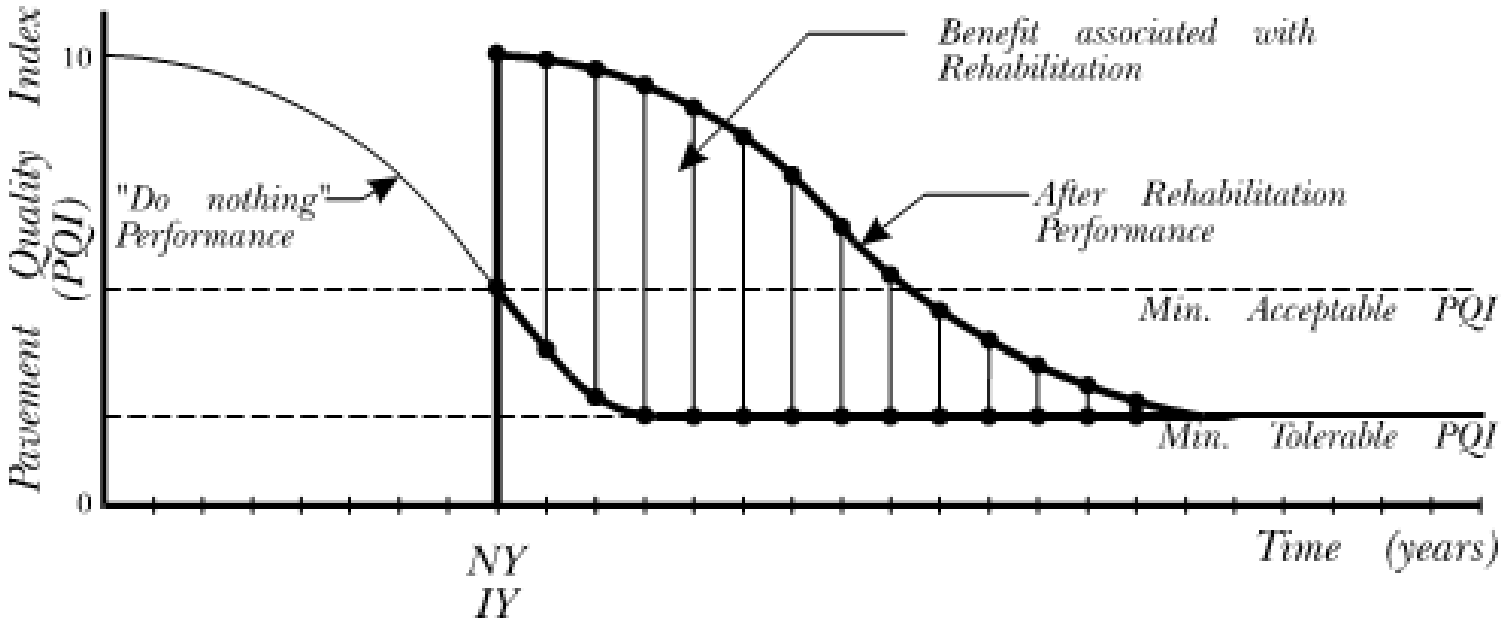


Rehabilitation Timing



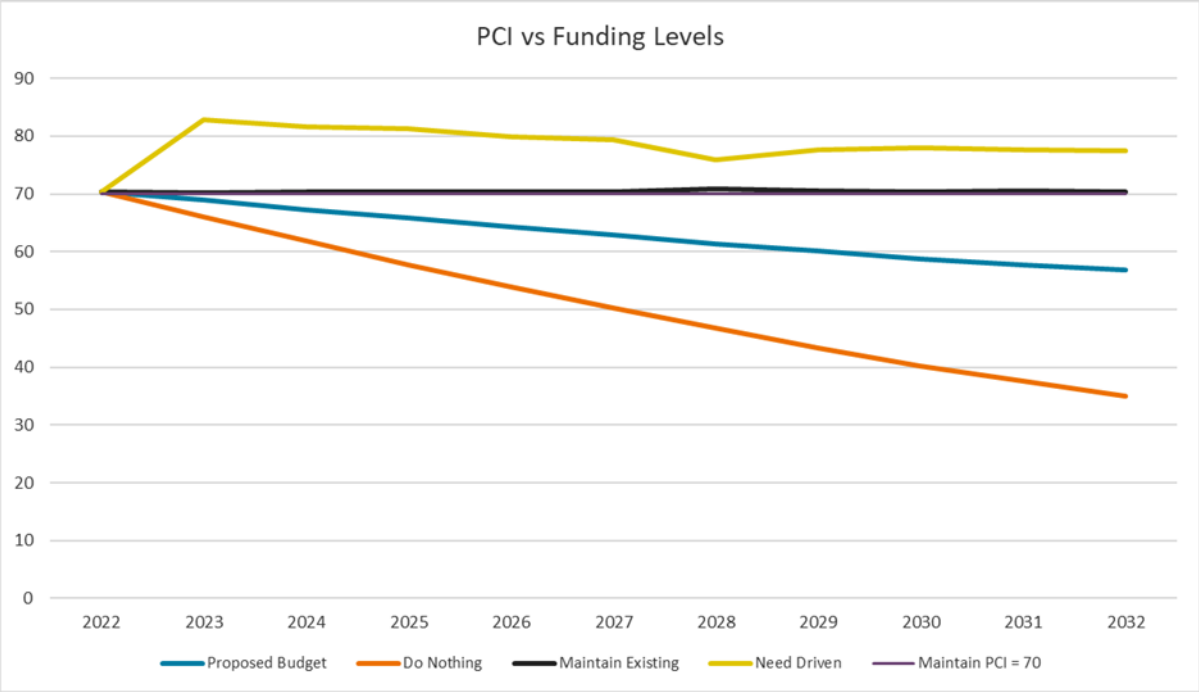
As structural adequacy decreases, the cost for rehabilitation increases

Rehabilitation Timing



Road Needs Results

Budget Analysis Results



Budget Scenario	Total 10-Year Funding	Overall Score (/100) (2022)	Overall Score (/100) (2032)
Do Nothing	$0	70.3	35.0
Maintain PCI = 70 (HCB / LCB)	$12.3M / $10.9M	70.3	70
Unlimited Funding	$25.3M	70.3	77.6
Proposed Budget	**$17.4M**	**70.3**	**56.8**

MTO AC Price Index

http://www.onasphalt.org/mtopriceindex/

	2018	2019	2020	2021	2022	2023
Jan	$588.60	$809.80	$709.60	$617.25	$917.50	$1,182.00
Feb	$588.60	$809.80	$709.60	$617.25	$917.50	$1,182.00
Mar	$657.00	$826.40	$767.25	$732.00	$1,065.45	$1,138.00
Apr	$689.50	$850.25	$757.00	$749.80	$1,156.00	
May	$713.75	$860.00	$729.00	$781.50	$1,270.00	
Jun	$761.80	$872.00	$711.00	$819.00	$1,356.00	
Jul	$828.50	$864.00	$705.60	$862.60	$1,394.00	
Aug	$873.60	$836.60	$716.25	$891.00	$1,380.00	
Sep	$880.50	$807.75	$688.75	$893.50	$1,324.80	
Oct	$870.00	$787.00	$662.40	$904.60	$1,246.50	
Nov	$809.80	$709.60	$617.25	$917.50	$1,182.00	
Dec	$809.80	$709.60	$617.25	$917.50	$1,182.00	

- Asphalt Cement Prices vary with the cost of Oil
- Consistently $500 to $800 from 2017 to 2020
- Up to a peak of $1,394 in July 2022
- Can do less work with same budget in recent years and could be a major concern moving forward

Questions?