2019 Road Needs Study

Pelham NIAGARA

ARA

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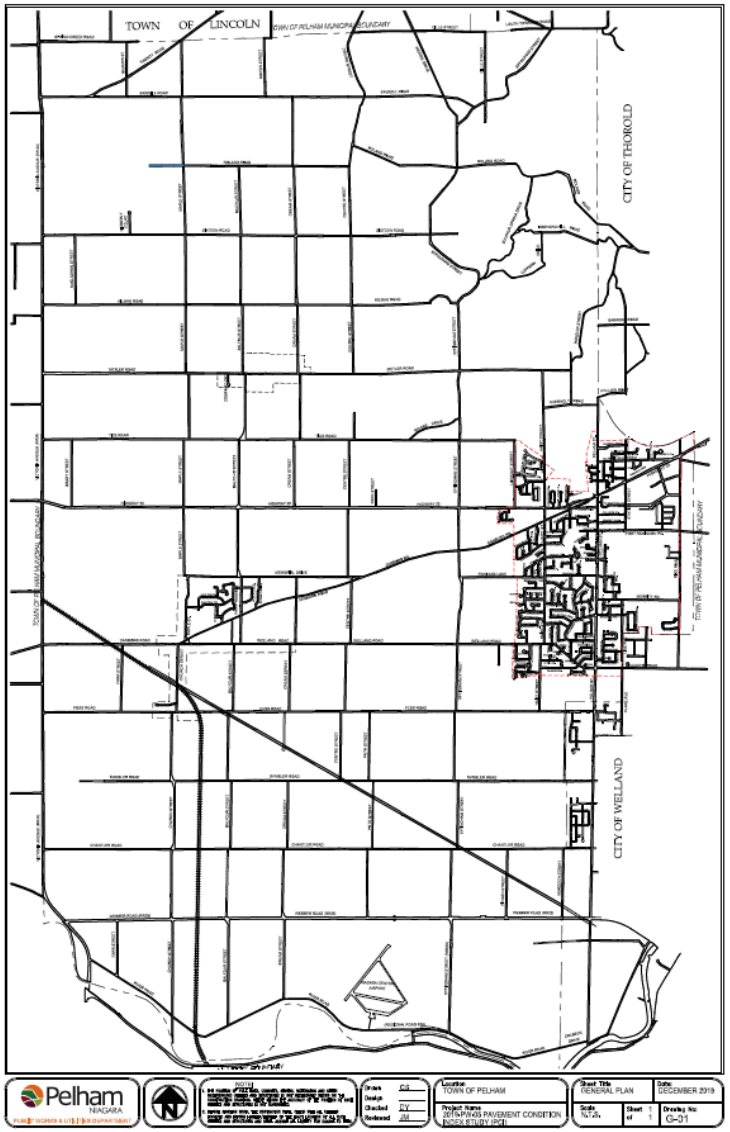
Senior Engineer

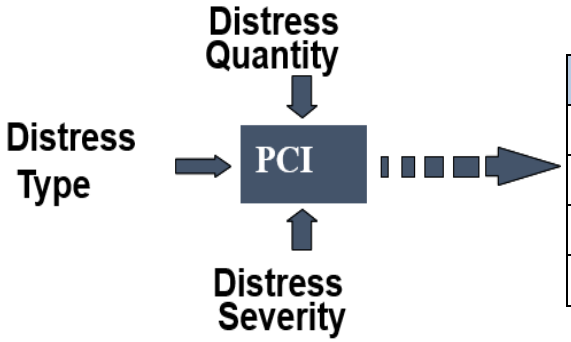
Project Mandate

- Complete pavement evaluations for 605 road inventory sections (243 kms)
  - Asphalt concrete (HCB) = 98 kms (41%)
  - Chip seal (LCB) = 144 kms (59%)
- Total pavement area = approx. 1.5 million



Pavement Inspections

- Inspected in accordance with MTO pavement surface condition manuals
- Determination of pavement condition index (PCI)



PCI Range	Condition
76 - 100	Very Good
61 – 75	Good
51 – 60	Fair
0 – 50	Poor

PCI Values by Section

Pelham NIAGARA

Section Rating
Town of Pelham - 2019

June 04, 2020

Sorted by Section

Section	Name	From-To	PCI
000100.010	Wessel Drive	Oille Street - Sawmill Road	62.0
000100.020	Wessel Drive	Sawmill Road - Effingham Street	64.0
000101.010	Oille Street	Wessel Drive - Effingham Street	63.0
000101.030	Oille Street	Effingham Street - End	65.0
000102.010	Louth Townline Road	Pelham Road - End	53.0
000104.010	Effingham Street	Oille Street - North Limit	91.0
000104.020	Effingham Street	Sawmill Road - Oille Street	92.0
000104.030	Effingham Street	Sawmill Road - Wessel Drive	92.0
000104.040	Effingham Street	Wessel Drive - Roland Road	92.0
000104.050	Effingham Street	Roland Road - Sixteen Road	92.0
000104.060	Effingham Street	Sixteen Road - Luffman Drive	83.0
000104.070	Effingham Street	Luffman Drive - Kilman Road	80.0
000104.080	Effingham Street	Kilman Road - Metler Road	81.0
000104.090	Effingham Street	Metler Road - Moore Drive	77.0
000104.100	Effingham Street	Moore Drive - Tice Road	60.0
000104.110	Effingham Street	Tice Road - Highway 20 (RR20)	51.0

ARA

Station Street– HCB (Good) PCI = 73

Kevin Drive – HCB (Fair) PCI = 55

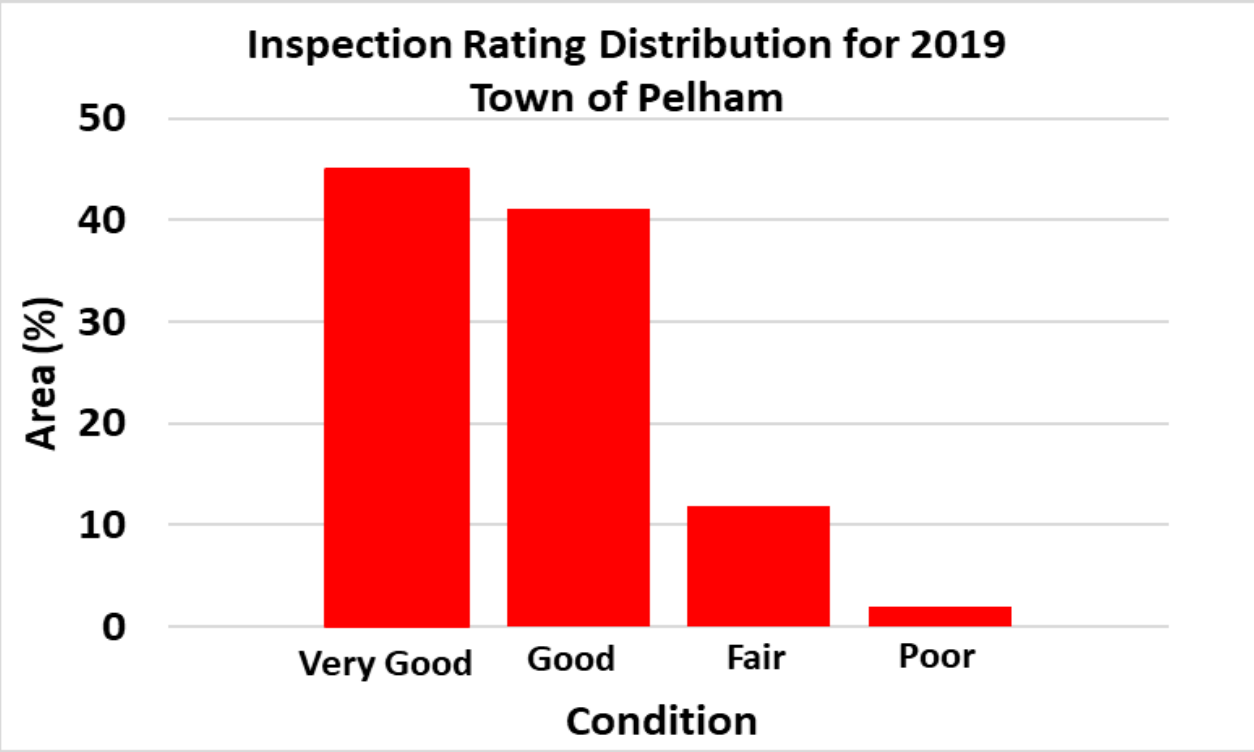
Spencer Lane – HCB (Poor) PCI = 49

Tice Road – LCB (Good) PCI = 72

Pancake Lane– LCB (Fair) PCI = 60

Balfour Street– LCB (Poor) PCI = 47

Overall PCI Rating Distribution

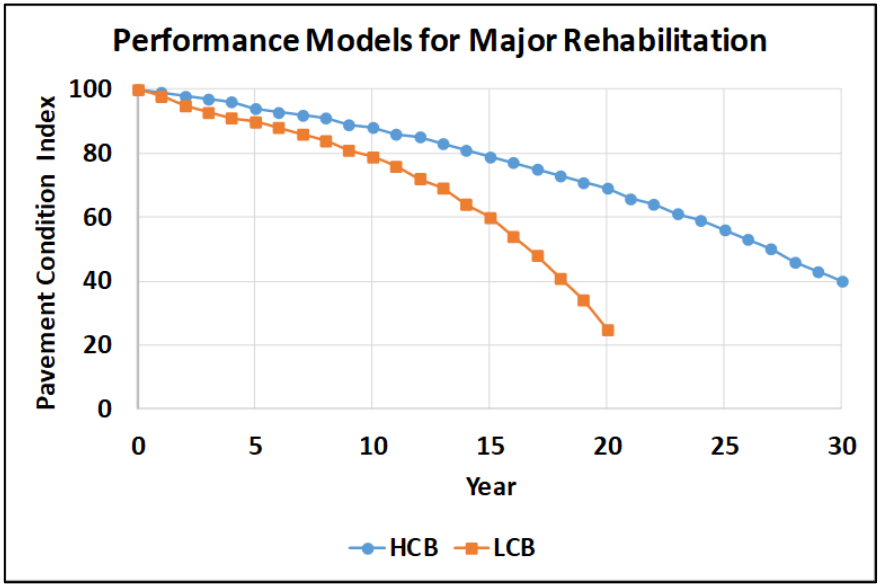


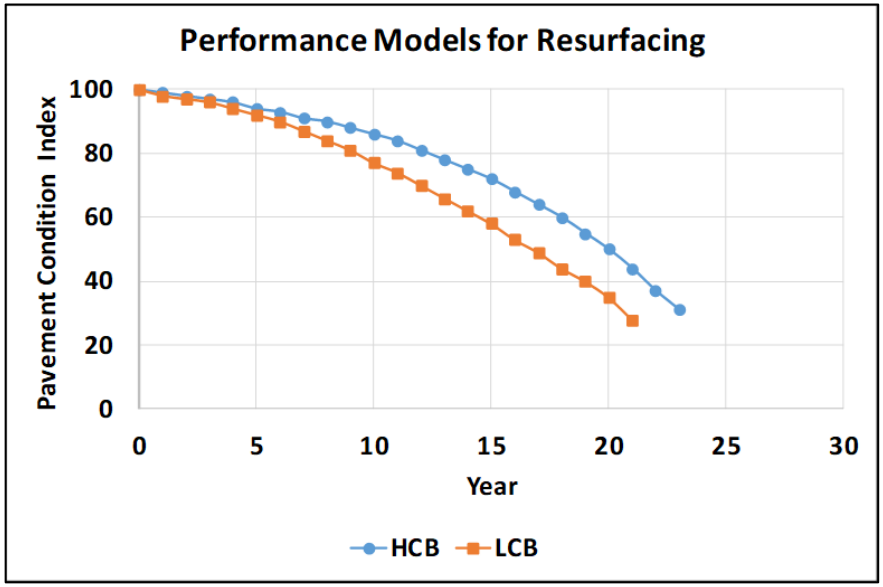
Primary Distress Deduct Influence

HCB		LCB	
Distress	**Influence (%)**	**Distress**	**Influence (%)**
Distortion	21.8	Alligator	19.7
Raveling	16.8	Distortion	18.2
Longitudinal Wheel Track	9.3	Rutting	15.2
Rutting	8.8	Edge Cracking	12.8
Longitudinal Wheel Track Alligator	7.6	Edge Breaks	11.2

Performance Models

- 4 models developed
- 2 for each pavement surface type
- 1 for each of resurfacing and major rehabilitation

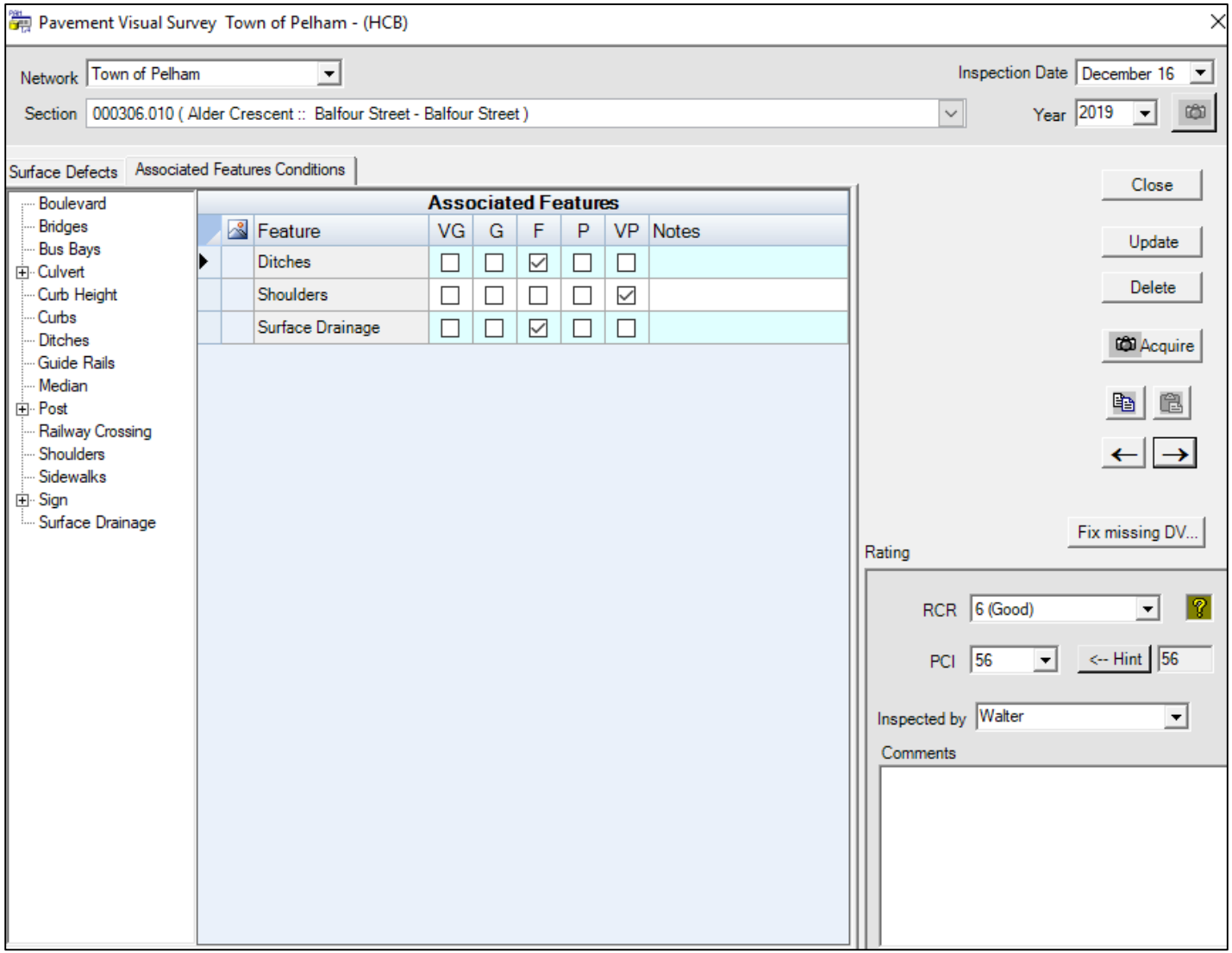




Present Network Value and Priority Index

Section	Name	From	To	Surface Type	2019 PCI	2019 PNV	2019 PPI
100.01	Wessel Drive	Oille Street	Sawmill Road	LCB	62	37	93
100.02	Wessel Drive	Sawmill Road	Effingham Street	LCB	64	37	103
101.01	Oille Street	Wessel Drive	Effingham Street	LCB	63	37	110
101.03	Oille Street	Effingham Street	End	LCB	65	42	107
102.01	Louth Townline Road	Pelham Road	End	LCB	53	33	87
104.01	Effingham Street	Oille Street	North Limit	HCB	91	80	105
104.02	Effingham Street	Sawmill Road	Oille Street	HCB	92	85	120
104.03	Effingham Street	Sawmill Road	Wessel Drive	HCB	92	85	105
104.04	Effingham Street	Wessel Drive	Roland Road	HCB	92	71	96
104.05	Effingham Street	Roland Road	Sixteen Road	HCB	92	71	96
104.06	Effingham Street	Sixteen Road	Luffman Drive	HCB	83	53	100
104.07	Effingham Street	Luffman Drive	Kilman Road	HCB	80	78	120
104.08	Effingham Street	Kilman Road	Metler Road	HCB	81	80	133
104.09	Effingham Street	Metler Road	Moore Drive	HCB	77	58	112
104.10	Effingham Street	Moore Drive	Tice Road	HCB	60	67	113
104.11	Effingham Street	Tice Road	Highway 20 (RR20)	HCB	51	30	106
104.12	Effingham Street	Highway 20 (RR20)	Canboro Road	HCB	81	80	133
104.13	Effingham Street	Canboro Road	Pancake Lane	HCB	63	37	110
104.14	Effingham Street	Pancake Lane	Welland Road	HCB	60	28	100
104.15	Effingham Street	Welland Road	Foss Road	LCB	61	37	86
104.16	Effingham Street	Foss Road	Sumbler Road	LCB	55	65	94
104.17	Effingham Street	Sumbler Road	Chantler Road	LCB	52	65	100
104.18	Effingham Street	Chantler Road	Webber Road (RR29)	LCB	63	70	93
107.01	Maple Street	Sawmill Road	Twenty Road (RR69)	LCB	60	35	97
107.02	Maple Street	Roland Road	Sawmill Road	LCB	87	74	100
107.03	Maple Street	Kilman Road	Sixteen Road	LCB	54	33	97
107.04	Maple Street	Metler Road	Kilman Road	LCB	57	35	97
107.05	Maple Street	Tice Road	Metler Road	LCB	79	58	116
107.06	Maple Street	Highway 20 (RR20)	Tice Road	LCB	49	30	91
107.07	Maple Street	Memorial Drive	Highway 20 (RR20)	LCB	79	58	84
107.08	Maple Street	Sandra Drive	Memorial Drive	HCB	73	36	111
107.09	Maple Street	Canboro Road	Sandra Drive	HCB	67	32	100
107.10	Maple Street	Sixteen Road	Roland Road	LCB	88	74	95

Associated Features



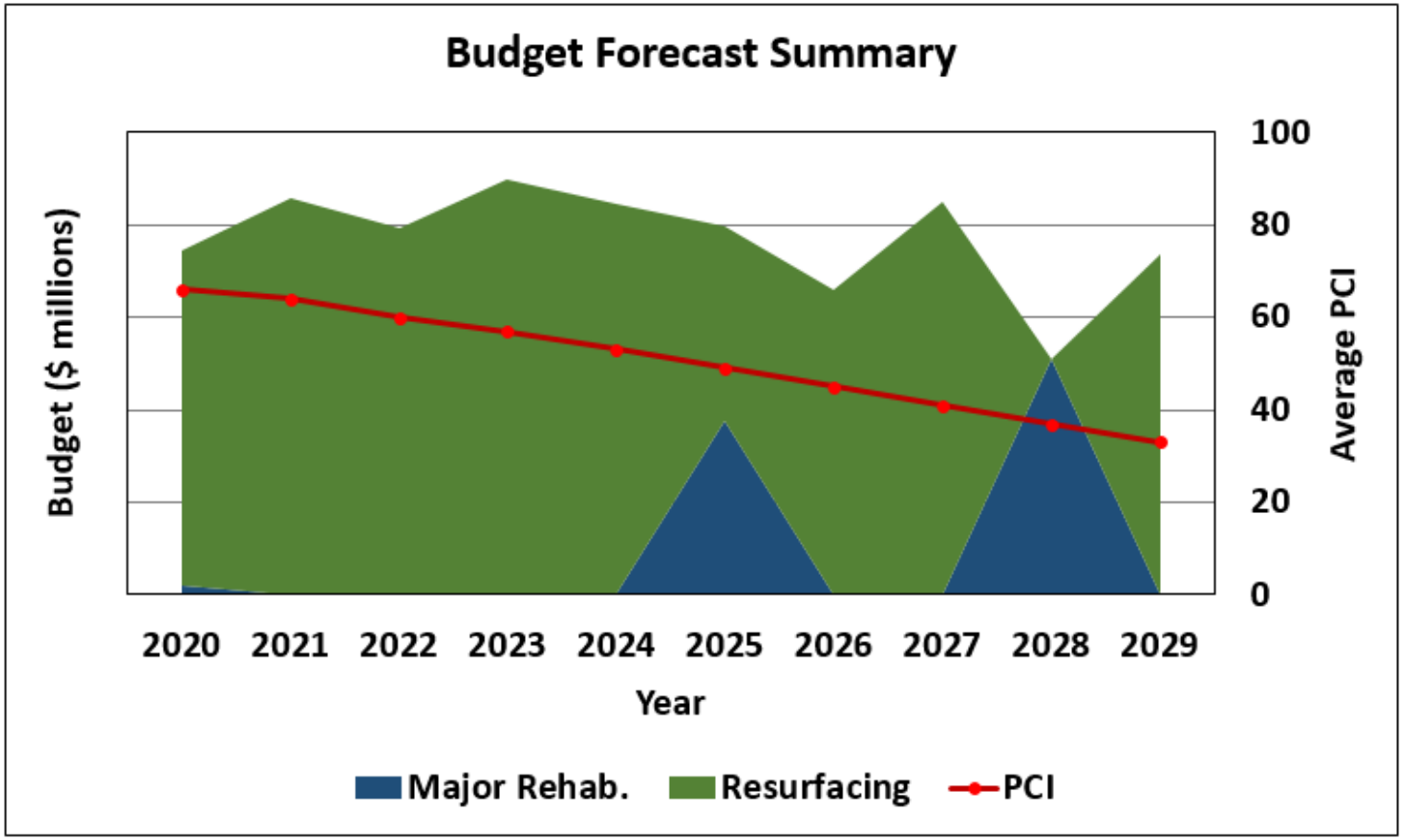
Budget Forecast

- 4 Road Needs 10 Year Forecast Alternatives
  - Unrestricted budget – based on action taken when PCI falls to 60 for resurfacing and 45 for major rehabilitation
  - $450,000/yr. (current budget)
  - Maintain network PCI at 69 (2019 level)
  - Maintain network PCI at 72
- 3 Additional Forecast for Council Meeting
  - $1,000,000/yr.
  - $1,500,000/yr.
  - $2,000,000/yr.

Budget Forecast (Current $450,000/yr.)

Year	Major Rehab ($)	Rehabilitation ($)	Yearly Total ($)	Network PCI
2020	$10,563	$361,700	$372,263	66
2021	$0	$429,638	$429,638	64
2022	$0	$396,016	$396,016	60
2023	$0	$449,248	$449,248	57
2024	$0	$422,670	$422,670	53
2025	$187,600	$210,340	$397,940	49
2026	$0	$330,724	$330,724	45
2027	$0	$425,551	$425,551	41
2028	$254,313	$0	$254,313	37
2029	$0	$368,465	$368,465	33
Total	**$452,475**	**$3,394,352**	**$3,846,827**	

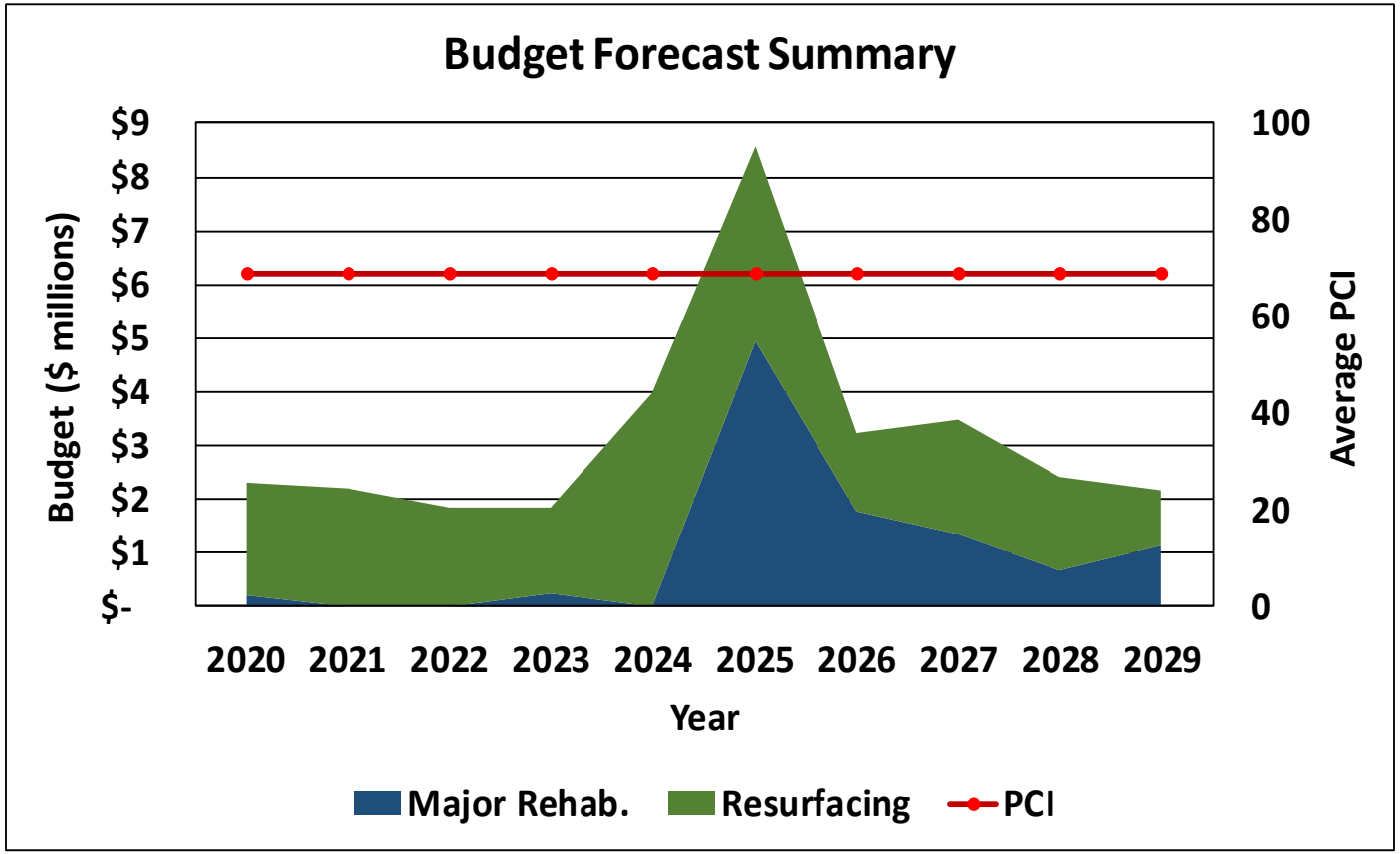
Budget Forecast (Current $450,000/yr.)



Budget Forecast (Maintain Current PCI)

Year	Major Rehab ($)	Rehabilitation ($)	Yearly Total ($)	Network PCI
2020	$198,162	$2,103,489	$2,301,652	69
2021	$-	$2,188,029	$2,188,029	69
2022	$-	$1,842,993	$1,842,993	69
2023	$254,313	$1,587,501	$1,841,813	69
2024	$-	$3,977,801	$3,977,801	69
2025	$4,948,872	$3,618,525	$8,567,397	69
2026	$1,778,880	$1,467,326	$3,246,207	69
2027	$1,355,478	$2,116,975	$3,472,453	69
2028	$679,993	$1,725,290	$2,405,283	69
2029	$1,118,520	$1,039,325	$2,157,845	69
Total	**$10,334,218**	**$21,667,254**	**$32,001,472**	

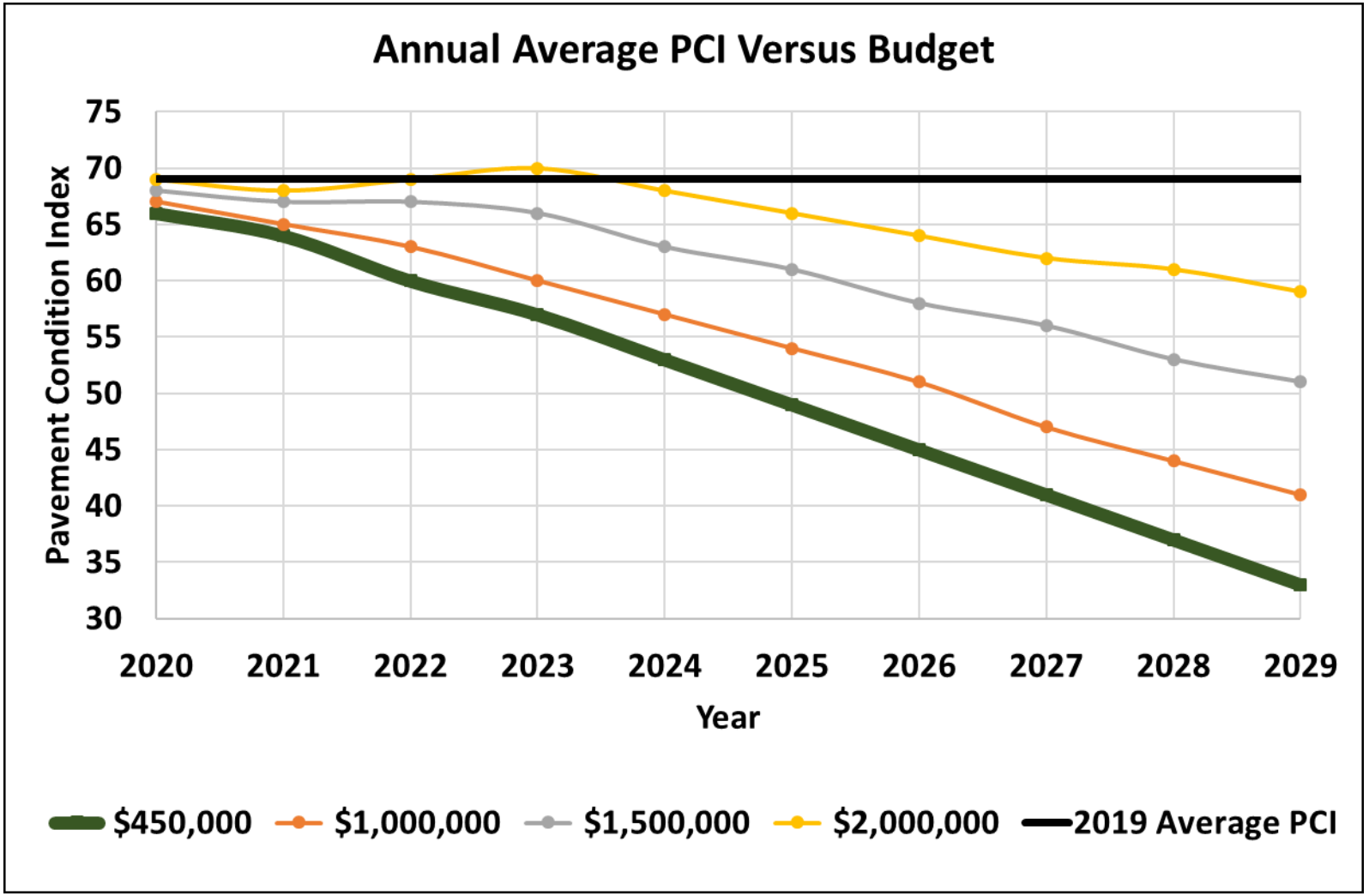
Budget Forecast (Maintain Current PCI)



Rehabilitation and Resurfacing Priorities for 2020

- PMS system uses the PCI, pavement surface distresses and prioritization based on previous performance to determine a suggested program for 2020
- Staff use this list along with other local factors to prioritize and select rehabilitation candidates based on the available budget

Average Annual PCI Versus Budget



Average PCI in 2029 Based on Budget Scenarios

Annual Budget	Average Network PCI in 2029
$ 450,000*	33
$ 1,000,000	41
$ 1,500,000	51
$ 2,000,000	59

* Current annual budget (2019 PCI = 69)

Short Term Maintenance Needs for 2020

Recommended Action	Designation	General Selection Criteria
Deep Patching	M1	Alligator cracking present, high severity, few to intermittent extent
Shallow Patching	M2	Alligator cracking present, low to medium severity, few to intermittent extent
Crack Sealing	M3	Any cracking present except alligator cracking, low to medium severity, extent frequent or extensive

Action	Designation	Cost ($)
Deep Patching	M1	$ 70,481
Shallow Patching	M2	$ 28,799
Crack Sealing	M3	$ 2,737
Total		**$ 102,016**

Summary – Network Budgeting

- Overall condition of road network is in good condition with an average 2019 PCI of 69
- Current $450,000 annual budget insufficient to maintain the current network average PCI (will reduce to 33 in 2029)
- An annual budget of $3.2 million would be needed to provide a stable network condition (PCI = 69)

Summary – Pavement Preservation

- Preventive maintenance funding should be stand alone funding.
- Construction history data is poor (should be updated annually).