2016 Road Needs Study

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Report Overview

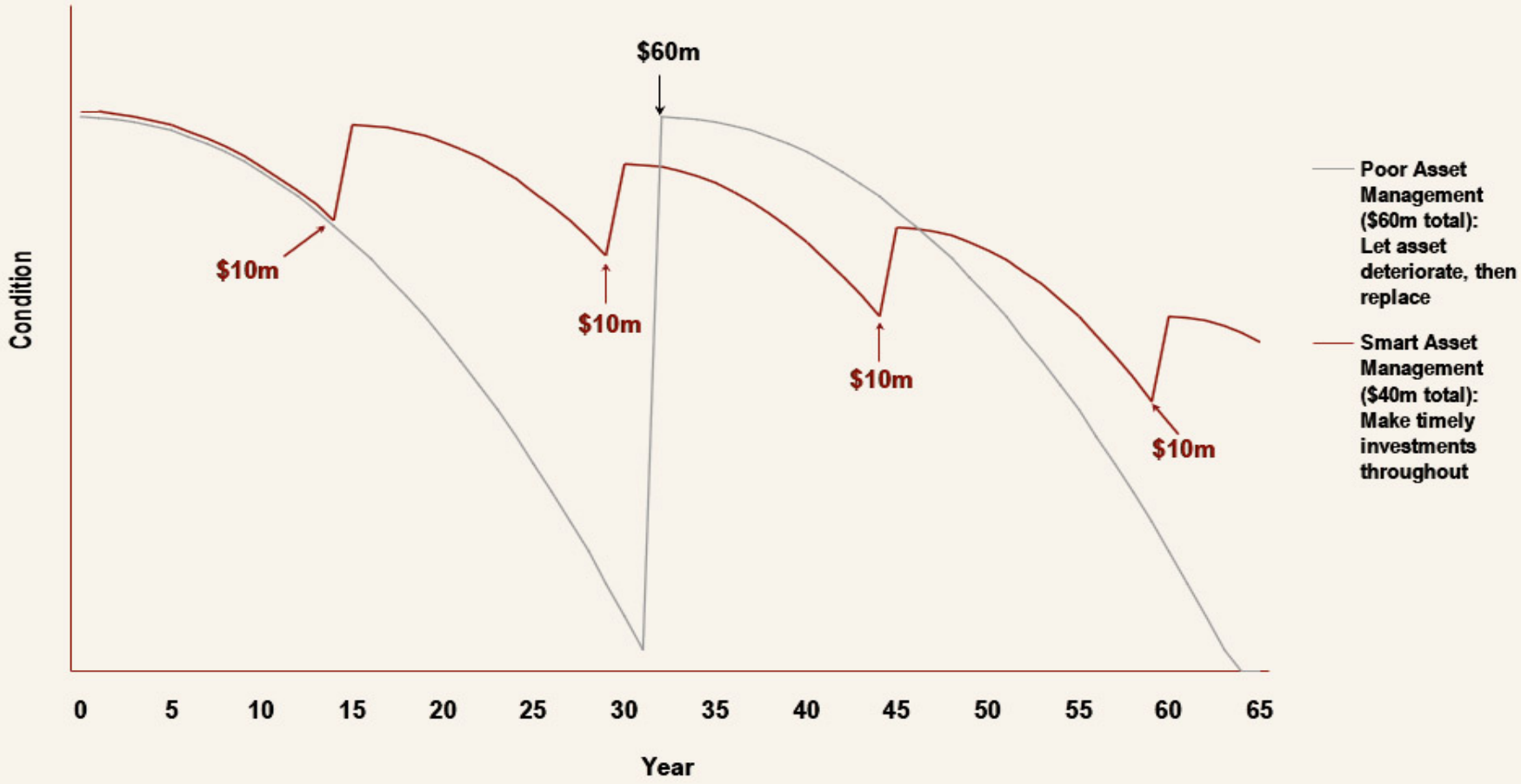
1. Introduction
2. Study Methodology
3. Road Standards
4. Benchmark Costs
5. Historical Spending and Past Condition Ratings
6. Condition of Existing Road System
7. Ten-Year Capital Plan Options

Why Develop a Road Needs Study?

- Inform Council on existing conditions and needs of road system
- Formulate a cost-effective construction schedule within current/proposed budgetary limitations
- Provide a projection of future adequacy of the road system
- Provide a suggested year by year work plan (10-years)

Figure 1

Small but Timely Renewal Investments Save Money



(Resource from "Building Together, Guide for Municipal Asset Management Plans", Ministry of Infrastructure, Ontario)

Study Methodology

1. Inventory System (Condition Ratings);
2. Benchmark Costing;
3. Select Renewal Option;
4. Capital Costs;
5. 10-Year Program.

Inventory System (Condition Ratings)

- Assign a rating of 1-10

AVERAGE CONDITION RATING	SYSTEM CONDITION
8 to 10	Good structural condition.
	Some local improvements may be needed.
5 to 7	Average structural condition.
	Some continued improvement may be needed.
Less than 5	Poor structural condition.
	Substantial improvement needed throughout total road system.

- Assign a rate of deterioration:
  - 0.23/yr for asphalt roads
  - 0.47/yr for surface treated roads

Road Standards

- Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads;
- Ontario Provincial Standards (OPS) for Roads and Municipal Services;
- Ontario Traffic Manual;
- Ministry of Transportation of Ontario (MTO), Drainage Management Manual

Benchmark Costs

ITEM	Unit Price	
Earth Excavation, Grading	$12.00	per cubic metre
Earth Excavation, Ditching	$17.00	per metre
Road Widening per Shoulder	$31.00	per metre
Removal – Pulverize	$1.00	per square metre
Removal – Asphalt	$5.00	per square metre
Removal – Mill Wear Course	$6.00	per square metre
Removal – Concrete Curb	$7.00	per metre
Removal – Concrete Sidewalk	$21.00	per square metre
Remove and Replace 16m x 600mm Diameter CSP	$5,796.00	each
Granular A	$15.00	per tonne
Granular B	$15.00	per tonne
Single Surface Treatment (SST)	$3.00	per square metre
Double Surface Treatment (DST)	$6.00	per square metre
Asphalt – Wear Course	$116.00	per tonne
Asphalt – Base Course	$116.00	per tonne
Iron Adjustment	$580.00	each
Concrete Sidewalk	$99.00	per square metre
Concrete Barrier Curb	$87.00	per metre
Topsoil & Sod	$17.00	per square metre
Rout & Seal	$2.90	per metre
Rejuvenating Oil	$1.74	per square metre

Rehabilitation Options – Surface Treated Rural Roads

CODE	DESCRIPTION	UNIT PRICE ($ per km)
LCB-R1	Resurfacing Single surface treatment 6.0m wide	$20,000
LCB-R2	Partial Depth Reconstruction Pulverize or scarify, 50-150mm G.A., double surface treatment, 10% spot drainage improvements, culvert replacement & 10% contingency	$111,000
LCB-R3	Full Depth Reconstruction Earth exc., 150mm G.A., 300mm G.B., DST, culvert replacement, engineering, geotechnical and 10% contingency	$419,000

Rehabilitation Options – Asphalt Rural Roads

CODE	DESCRIPTION	UNIT PRICE ($ per km)
HCB-R1	Resurfacing 40mm lift of HL3 asphalt by 6.0m and 10% contingency	$78,000
HCB-R2	Partial Depth Reconstruction Pulverize, 50-150mm G.A., 50mm lift of HL4 asphalt, shouldering, 10% spot drainage improvements, culvert replacement & 10% contingency	$165,000
HCB-R3	Full Depth Reconstruction Remove asphalt, earth exc., 150mm G.A., 300mm G.B., 50mm lift of HL4 asphalt, shouldering, culvert replacement, engineering, geotechnical and 10% contingency	$526,000
HCB-R4	Rout and Seal Routing of Cracks	$5,000
HCB-R6	Rejuvenating Oil Oil that penetrates an asphalt surface and restores the maltene to asphalt ratio	$11,000

Rehabilitation Options – Asphalt Semi-Urban Roads

CODE	DESCRIPTION	UNIT PRICE ($ per km)
HCB-S1	Resurfacing 40mm Lift of HL3 asphalt by 8.0m wide, adjust iron, asphalt keys, tie-in driveways and 10% contingency	$102,000
HCB-S2	Partial Depth Reconstruction Remove asphalt, earth exc., 150mm G.A., 50mm lift of HL4 asphalt, shouldering, adjust iron, tie-in driveways, road & driveway culvert replacement, 10% spot drainage and 10% contingency	$234,000
HCB-S3	Full Depth Reconstruction Remove asphalt, earth exc., 150mm G.A., 300mm G.B., 50mm HL4 asphalt, shouldering, adjust iron, tie-in driveways, road & driveway culvert replacement, drainage, engineering, geotechnical & 10% contingency	$758,000
HCB-S4	Rout and Seal Routing of Cracks	$5,000
HCB-S6	Rejuvenating Oil Oil that penetrates an asphalt surface and restores the maltene to asphalt ratio	$11,000

Rehabilitation Options – Asphalt Urban Roads

CODE	DESCRIPTION	UNIT PRICE ($ per km)
HCB-U1	Resurfacing 40mm Lift of HL3 asphalt by 8.5m wide, adjust iron, milling and 10% contingency	$157,000
HCB-U2	Partial Depth Reconstruction Remove asphalt, 10% curb and sidewalk repairs, earth exc., 150mm G.A., 40mm lift of HL3 and 40mm lift of HL4 asphalt, adjust iron and 10% contingency	$397,000
HCB-U3	Full Depth Reconstruction Remove asphalt, curbs and sidewalk, earth exc., 150mm G.A., 300mm G.B., 2 lifts of asphalt, adjust iron, curbs, sidewalk, tie-in driveways and lawns, geotechnical, engineering and 10% contingency	$1,259,000
HCB-U4	Rout and Seal Routing of Cracks	$5,000
HCB-U6	Rejuvenating Oil Oil that penetrates an asphalt surface and restores the maltene to asphalt ratio	$11,000

Historical Spending

- Historical Budgeted Costs for Transportation Services:

2011	2012	2013	2014	2015
$1,066,000	$210,000	$228,333	$180,333	$452,333

- Forecast Budgets:

Category	2017	2018	2019	2020	2021
Capital	$407,700	$423,200	$393,200	$407,800	$383,700
OCIF Funding	$91,198	$129,492	$201,591		

Category	2022	2023	2024	2025	2026
Capital	$382,200	$403,100	$397,150	$415,950	$387,000

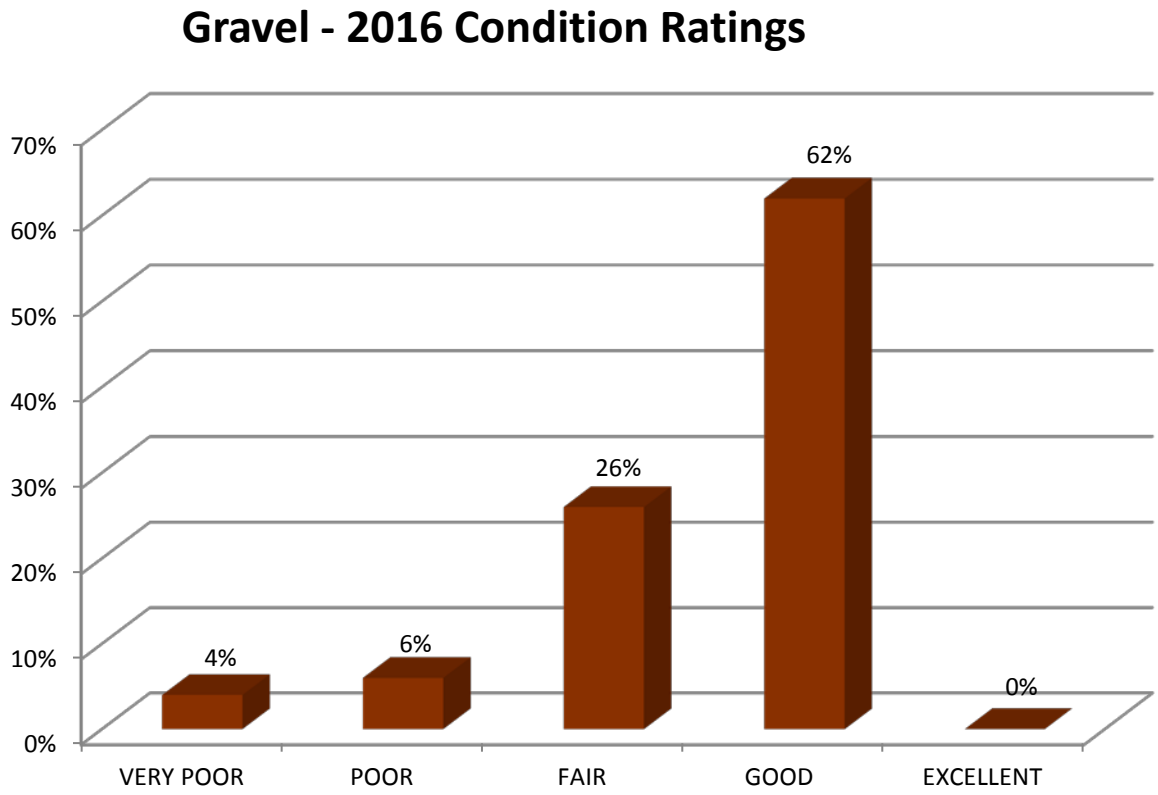
Past Condition Ratings

Surface Type	Total Length (km)	Condition Rating	
		2011	2016
Gravel (Year Round)	208.50	6.50	6.27
Surface Treated (LCB)	75.10	5.91	5.03
Asphalt (HCB)	79.16	5.44	5.10
ALL	362.76	6.11	5.76
Hard Surface Only	**154.26**	**5.69**	**5.07**

Existing Condition of Road System (2016)

Surface Type	Current Total Length (km)	Current Average Condition Rating	Optimum Average Condition Rating
Gravel	208.50	6.27	**6.0**
Surface Treated (LCB)	75.10	5.03	**6.0 – 6.5**
Asphalt (HCB)	79.16	5.10	**6.5 – 7.0**
ALL	362.76	5.76	-
Hard Surface Only	**154.26**	**5.07**	**-**

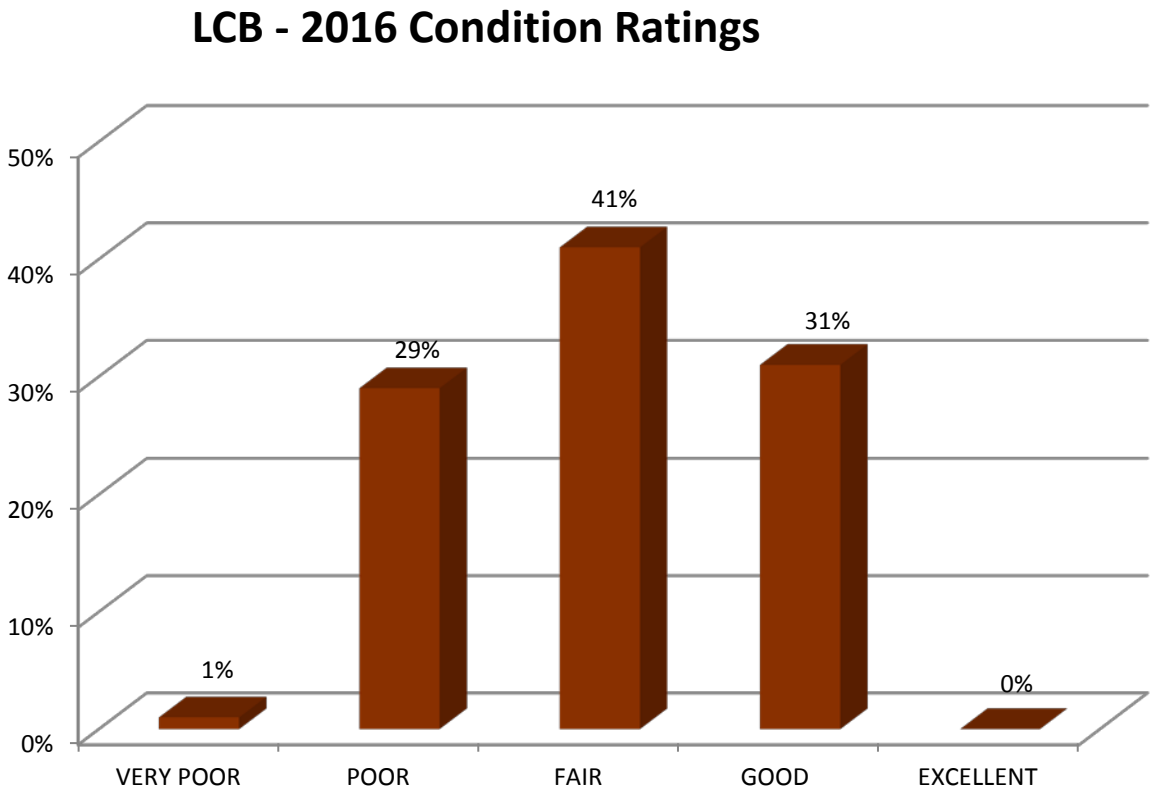
Condition of Existing Roads – Loose Top (Gravel)



- Very Poor = <2
- Poor = 3, 4
- Fair = 5, 6
- Good = 7, 8
- Excellent = 9, 10

Optimum = 6.0

Condition of Existing Roads – Surface Treated (LCB)



- Very Poor = <2
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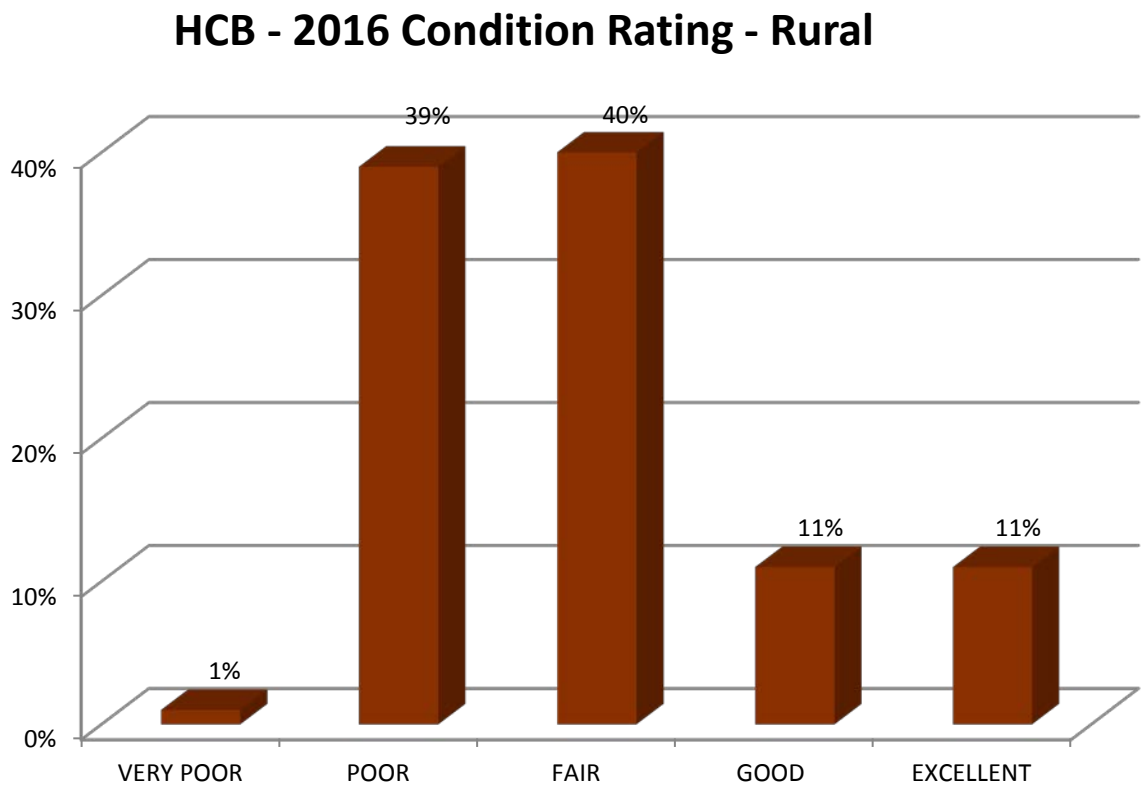
- Fair = 5, 6
- Good = 7, 8
- Excellent = 9, 10

Optimum = 6.0 – 6.5

Condition of Existing Roads – Asphalt – Rural (HCB-R)



- Very Poor = <2
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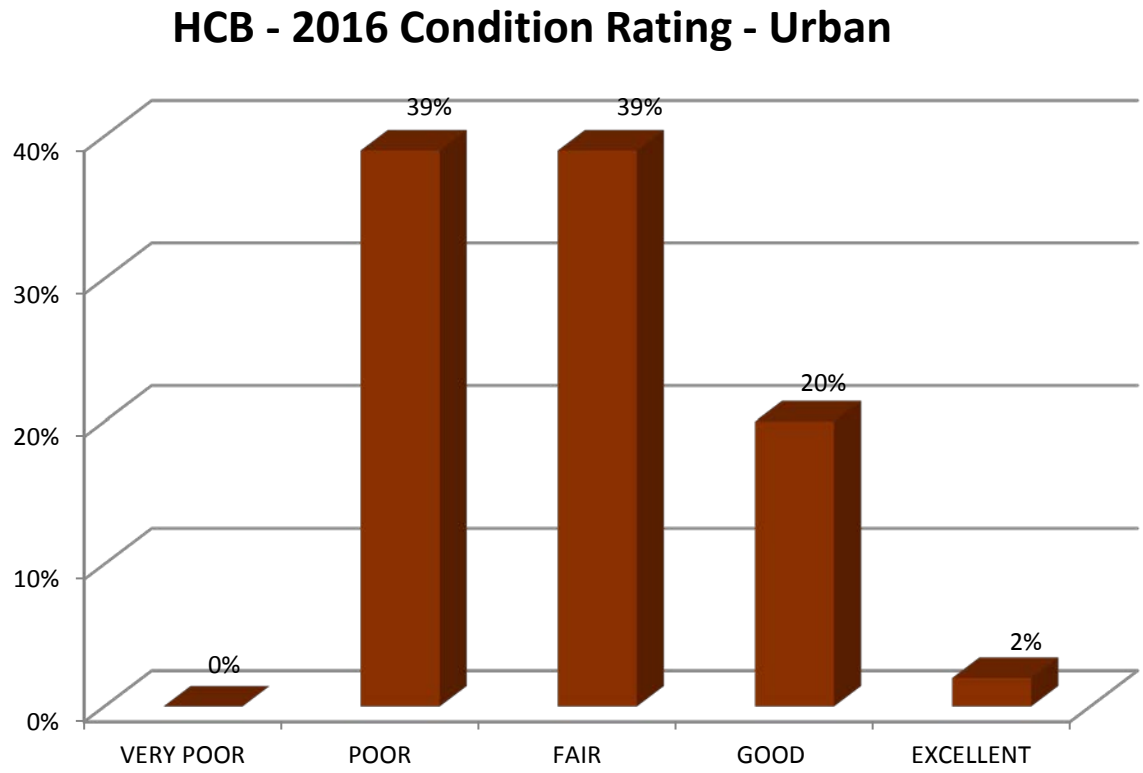
- Good = 7, 8
- Excellent = 9, 10

Optimum = 6.5 – 7.0

Condition of Existing Roads – Asphalt – Urban (HCB-S/U)



- Very Poor = <2
- Poor = 3, 4
- Fair = 5, 6
- Good = 7, 8
- Excellent = 9, 10

Optimum = 6.5 – 7.0

Ten-Year Capital Plan

- Proposed $4 million in capital spending over next 10 years

- Effect on Weighted Average Condition Rating:

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Do Nothing	5.76	5.61	5.46	5.33	5.21	5.13	5.06	4.99	4.91	4.85	4.81
Ten-Year Plan	**5.76**	**5.66**	**5.61**	**5.51**	**5.42**	**5.40**	**5.36**	**5.34**	**5.32**	**5.29**	**5.27**

- Overlay > Pulverize & Pave > Partial Depth Reconstruction > Full Depth Reconstruction
- AADT
- Proximity

Financials

- Proposed $ 4.0 million capital spending over next 10 years,
- Shortfall of $ 6.9 million to maintain current condition rating over next 10 years,
- Shortfall demonstrates the Municipality's roads are underfunded

Questions?

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