



Level of Service (LOS) Framework

Winter conference



LOS and O.Reg. 588/17



Level of Service Approach

- The regulation requires a description of levels of service for core infrastructure assets, including:
 - Community (customer) level – images and/or description of what the end-user experiences
 - Technical level – using metrics that describe what the organization provides

Example: Bridges

Service attribute	Community levels of service	Technical levels of service
Scope	<ul style="list-style-type: none"> Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists). 	<ul style="list-style-type: none"> % of bridges in the municipality with loading or dimensional restrictions

2018-01-26

MFOA

**Table 4-2
Sample Community Expectations**

Department	Services	Applicable Assets	Community Expectations
Transportation Services	Roads	Road base, surface, bicycle lanes, turning lanes, etc.	"Smooth roads that take me where I need to go without too much congestion"
	Bridges and Culverts	Structure, deck, surface, etc.	"Sturdy bridges that take me where I need to go without too much congestion"
	Sidewalks	Sidewalks	"Sidewalks that I can walk safely on to key areas of the Community"
	Streetlights	Poles, fixtures, etc.	"Streetlights that work so I don't have to walk in the dark"
	Traffic Lights	Poles, lights, controllers, etc.	"Traffic lights are placed where needed to ensure smooth and safe traffic flow"
	Transit	Vehicles, facilities, equipment, etc.	"Access to public transit to allow me to get where I need to go on a reasonable schedule"



Project Idea/Proposal

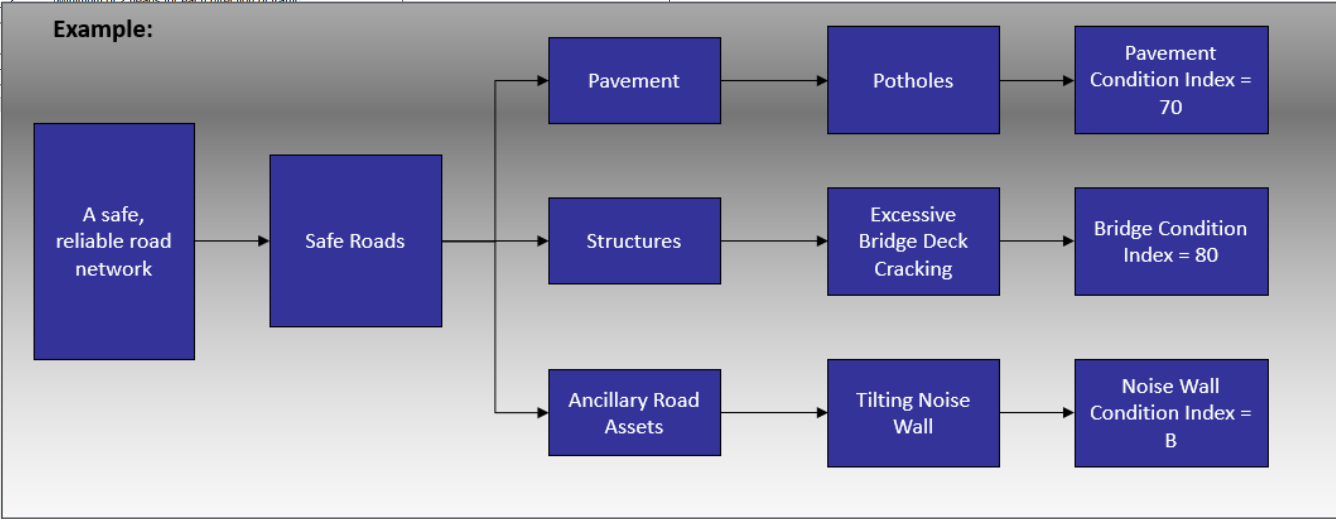
Objective

- Develop guidance for transportation assets (roads and bridges) that combines condition, cost, risk, and consequence of failure.



Level of Service

Service	CLOS	Major Service Delivery Risks	Risk Events	Preliminary Risk Profile	TLOS	KPIs
Transportation	Safe, secure & reliable roads	Bridge/major culvert failures	Severely cracked/failed structural components	?	Minimum bridge condition index = 80	Annual percentage of structures below 80, Annual percentage of km/road segments below 72, Annual percentage of noisewalls not meeting X Annual number of rough road complaints
			Undermining of structure	?		
			Settlements at the approaches	?		
		Road/pavement failures	Improper safety features	?	Minimum pavement condition index = 72	
			Excessive cracking	?		
			Excessive settlements	?		
			Rough pavement surface	?		
		Roadside asset failures	Potholes	?	Minimum condition rating = X	
			Rutting	?		
			Poor drainage	?		
Mechanical signal failures	Tilting, crumbling or collapsed noise wall	?	Minimum condition rating = X			
	Tilting, crumbling or collapsed retaining wall	?				
	Loss of a signal head	?	Minimum of 2 heads for each direction of traffic			
	Loss of controller	?				
Storm system failures	Loss of other signal components	?				
	Collapsed storm pipes	?				
		Pump failures	?			





Preliminary Ideas

Common Road Classification

- Adopt MMS (O.Reg. 239/02)
- Rough conversions
 - Freeway – Class 1
 - Arterial – Class 2
 - Collector – Class 3/4
 - Local – Class 5/6

CLASSIFICATION OF HIGHWAYS

Column 1 Average Daily Traffic (number of motor vehicles)	Column 2 91 - 100 km/h speed limit	Column 3 81 - 90 km/h speed limit	Column 4 71 - 80 km/h speed limit	Column 5 61 - 70 km/h speed limit	Column 6 51 - 60 km/h speed limit	Column 7 41 - 50 km/h speed limit	Column 8 1 - 40 km/h speed limit
53,000 or more	1	1	1	1	1	1	1
23,000 - 52,999	1	1	1	2	2	2	2
15,000 - 22,999	1	1	2	2	2	3	3
12,000 - 14,999	1	1	2	2	2	3	3
10,000 - 11,999	1	1	2	2	3	3	3
8,000 - 9,999	1	1	2	3	3	3	3
6,000 - 7,999	1	2	2	3	3	4	4
5,000 - 5,999	1	2	2	3	3	4	4
4,000 - 4,999	1	2	3	3	3	4	4
3,000 - 3,999	1	2	3	3	3	4	4
2,000 - 2,999	1	2	3	3	4	5	5
1,000 - 1,999	1	3	3	3	4	5	5
500 - 999	1	3	4	4	4	5	5
200 - 499	1	3	4	4	5	5	6
50 - 199	1	3	4	5	5	6	6
0 - 49	1	3	6	6	6	6	6



Preliminary Ideas

Condition Impacts of Defects/Deformations/Cracks

- Change in PCI

Asphalt

Wheel Track Rutting		V. Sligh	Slight	Moderate	Severe	V. Severe
3		0.5	1	2	3	4
Few	0.5	3	4.5	7.5	10.5	13.5
Intermittent	1	4.5	6	9	12	15
Frequent	2	7.5	9	12	15	18
Extensive	3	10.5	12	15	18	21
Throughout	4	13.5	15	18	21	24

Surface Treated

Flushing		Slight	Moderate	Severe
2		1	2	3
Intermittent	1	4	6	8
Frequent	2	6	8	10
Extensive	3	8	10	12

Gravel

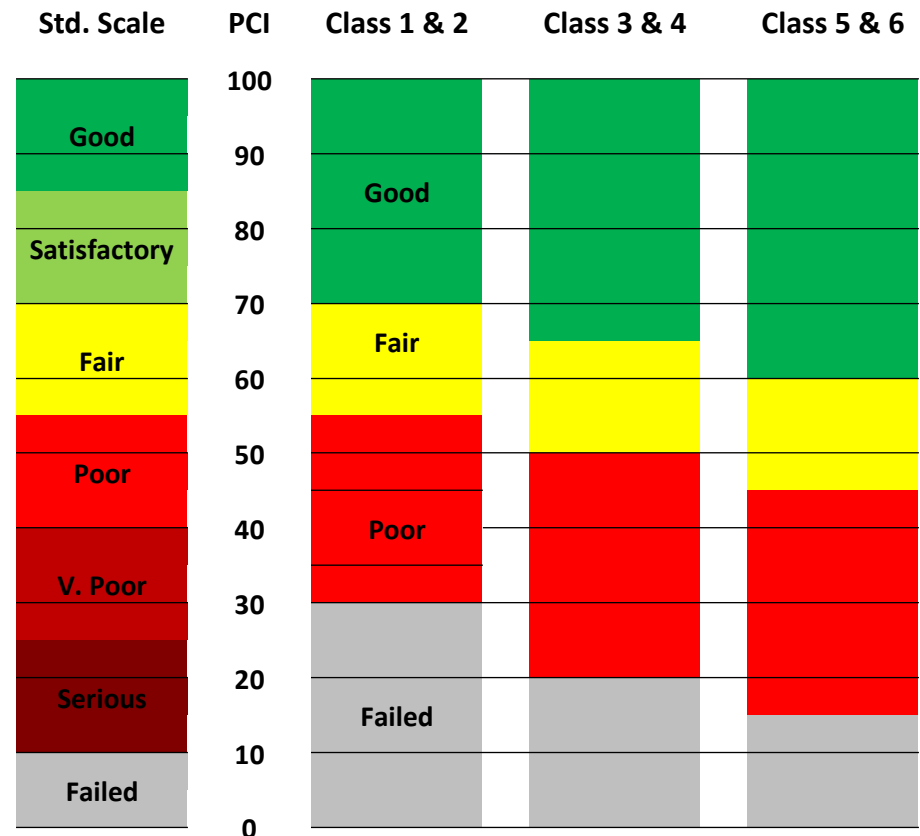
Potholes		Slight	Moderate	Severe
2		1	2	3
Intermittent	1	4	6	8
Frequent	2	6	8	10
Extensive	3	8	10	12



Preliminary Ideas

Common PCI Ratings

- MTO methodology
- Based on road classification (Class) or pavement type (asphalt, concrete, surface treated, or gravel)
- PCI(avg) weighted upon network distribution





Preliminary Ideas

Describe Pavement Condition

- PCI -74 (Good)
 - Ravelling – Slight and Frequent
 - Distortion – Moderate and Intermittent
 - Centre Line Crack – Slight and Intermittent
 - Pavement Edge Crack – Severe and Extensive
 - Transverse Crack – Severe and Extensive





Policy Statement

<u>Regulation Asset Group</u>	<u>Major Asset Class</u>	<u>Service Level Policy</u>	<u>Lifecycle/ Deterioration Rate</u>
"Core Municipal Assets"	Hard Surface Roads (1 lift, 2 lift and Surface treated)	<p>Class 3 roads be rehabilitated or reconstructed at a PCI of 65 Class 4 roads be rehabilitated or reconstructed at a PCI of 60 Class 5 roads be rehabilitated or reconstructed at a PCI of 60</p> <p>The asset registry must be updated at least once per year to reflect the current condition whether the condition be inspected or not (those not inspected will be updated based on lifecycle standards).</p>	<p>We consider the remediation point of a roadway to be a PCI of 60 and we estimate that it takes approximately 20 years to go from 100 to 60 based off scenario 2</p>
"Core Municipal Assets"	Gravel Roads	<p>Service level for gravel roads is the minimum maintenance standard for gravel roads . See page 3 Ontario regulation 588/17. Repair will include grading and if required an application of additional granular material. If reggrading is done more than 6 times during non-winter periods, then other alternatives should be considered such as surface treatment including asphalt and or reconstruction.</p> <p>For all gravel roads that have been graded immediately following the half load season the PCI will be assumed to be 90. Each grading will reduce the PCI by 5 units until such times as the PCI drops to 60. If the PCI drops below 60 over 2 consecutive years, the road will be deemed to require surface treatment or asphalt conversion.</p> <p>Further, assuming that an inspection of the gravel base has been undertaken to ensure adequacy. When the average daily traffic exceeds 400 vehicles the Township will consider a hard surface treatment to the surface.</p> <p>The asset registry must be updated at least once per year to reflect the current condition whether the condition be inspected or not (those not inspected will be updated based on lifecycle standards)</p>	<p>5 points per grading</p>
"Core Municipal Assets"	Bridges and Culverts	<p>To inspect according to Ontario structure inspection manual and to adjust the BCI based on the recommendations of the qualified engineer and to include all repairs that exceed the capital threshold in the capital budget to the schedule recommended by the qualified engineer.</p> <p>The asset registry must be updated at least once per year to reflect the current condition whether the condition be inspected or not (those not inspected will be updated based on lifecycle standards)</p>	<p>50 Year expected Life</p>



Final Outcome

Outcomes

- Managed risk
- Managed LOS
- Improved budget/spending decisions

Roads

	Year 1	Year 2	Year 3	Year 4	Year 5
Assets Meeting LOS	85%	83%	84%	77%	79%
Cost (\$M)	\$6.352	\$3.035	\$7.495	\$8.107	\$10.428
Risk	Low	Low	Low	Medium	Medium



Take away

Request

- We are asking for the participation of 5-10 municipalities in participating in a user group to assist in validating the LOS Framework
- Contact; John Tarantino
jet@marmak.ca
905 458.6686 ext 225