"Level of Service Framework"

Prepared for:

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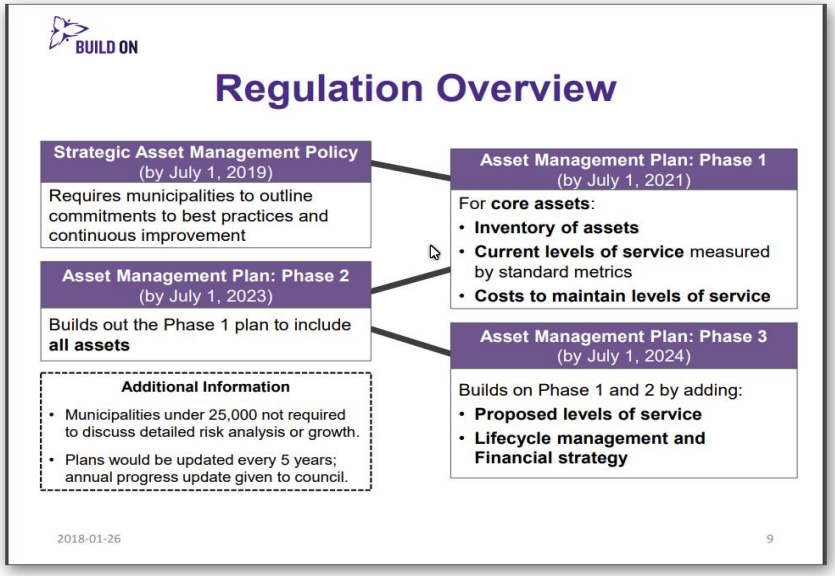
Glossary of Terms

Level of Service	Technical Level of Service (TLOS) is measured through a performance condition indexes, remaining useful life, inspections or various asset attributes including number of deficiencies.
Baseline weight	Baseline Weight is a numeric value assigned to each asset category as a starting position or handicapping. Baseline weight enables the municipality to prioritize the asset category with relationship to other municipal assets.
POF	Probability of failure (POF) is a rationalized value for level of service, derived from either the condition rating of an asset or the remaining useful life.
COF	Consequence of failure (COF) is rationalized from 5 key attributes associated to risk. These are environmental, financial, health and safety, legal and operational conditions. These conditions, descriptions and details outline the severity of the consequence associated with each attribute.
Risk	Risk is a combination as POF and COF which identifies the ramifications associated with a lack of action.
Risk Matrix	Risk matrix corresponds to conditions ranging from negligible to serious • **Very High Risk:** Maximum risk mitigation measures should be in place, together with recovery plans, and availability of critical spares. • **High Risk:** Risk mitigation measures should be in place providing layers of deterrence, high probability of detection, and rapid effective response. Insurance coverage is essential but may not be able to provide adequate coverage to prevent significant liability. • **Moderate Risk:** Risk should be managed by the introduction of mitigation strategies and operational procedures. • **Low Risk:** Minimal risk mitigation measures necessary. Risk should be managed through operational procedures, or accepted as a low business risk.
MMS O.Reg. 239/02	Minimum maintenance standards were developed to provide municipalities with a defence against liability from actions arising with regard to levels of care on roads and bridges. Regulation 239/02, which came into force on November 1, 2002, contains the minimum maintenance standards
O.Reg. 588/17	On January 1, 2018, Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure came into effect. The regulation sets out requirements for municipal asset management planning to help municipalities better understand their infrastructure needs and inform infrastructure planning and investment decisions

Phase-in Schedule

July 1, 2019: Date for municipalities to have a finalized strategic asset management policy that promotes best practices and links asset management planning with budgeting, operations, maintenance and other municipal planning activities.

July 1, 2022: Date for municipalities to have an approved asset management plan for core assets (roads, bridges and culverts, water, wastewater and storm water management systems) that identifies current levels of service and the cost of maintaining those levels of service.



July 1, 2023: Date for municipalities to have an approved asset management plan for all municipal infrastructure assets that identifies current levels of service and the cost of maintaining those levels of service.

July 1, 2024: Date for municipalities to have an approved asset management plan for all municipal infrastructure assets that builds upon the requirements set out in 2023. This includes an identification of proposed levels of service, what activities will be required to meet proposed levels of service, and a strategy to fund these activities

Asset Management Objectives

A municipality's asset management plan must include the following:

For each asset category, the current levels of service being provided, determined in accordance with the following qualitative descriptions and technical metrics and based on data from at most the two calendar years prior to the year in which all information required under this section is included in the asset management plan:

For each asset category, a summary of the assets in the category, the replacement cost of the assets in the category, the average age of the assets in the category, determined by assessing the average age of the components of the assets, the information available on the condition of the assets in the category, and a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate.

For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service as described in paragraph 1 for each of the 10 years following the year for which the current levels of service are determined and the costs of providing those activities based on an assessment of the following: The full lifecycle of the assets, the options for which lifecycle activities could potentially be undertaken to maintain the current levels of service and the risks associated with the options.

Council Responsibility

- Member of council play an important role in validating municipal level of service. Not only through the policies that they adopt, the yearly review and the ongoing involvement when levels are adversely effected.
- Council must be educated on the asset management strategies which comprise of lifecycle events in order to reduce risk impact.
- Council's responsibility is to provide direction to staff while supporting qualified staff in their choices.

Level of Service Policies

The core purpose of a municipality is to provide services to residents and other stakeholders. Physical assets are simply a portion of what is required to deliver the various levels of service as determined by the municipality. The municipality needs to ensure that the infrastructure performs to meet the level of service goals at an affordable and sustainable cost. An objective of Levels of Service analysis is to find a balance between the expected levels of service and the cost of providing that level of service.
Determining municipal level of service policies requires first developing a baseline for acceptable and affordable levels of service. This is done by first examining present-day service levels, community needs, regulatory or legal obligations and the cost of service delivery. Once present-day service levels have been examined, this baseline can be compared against level of service expectations.

The Process

Levels of Service analysis may involve:

1. Developing
    - Customer vs. Technical Levels of Service
    - Current vs. Expected Levels of Service
    - Use of Performance Measures
    - Financial validation

2. Communication
    - Receive input from staff and citizens
    - Communicate the Levels of Service to stakeholders
    - Council approval of Levels of Service strategies

3. Update
    - Updating the Levels of Service Analysis on a yearly basis

Ongoing Review, Updates and, Improvements

The frequency of these reviews should be established and followed by staff as part of the Asset Management Policy.

Comparing Current Levels of Service to Expected Levels of Service

If current Levels of Service equates to what service level is currently provided, expected Levels of Service outlines the overall objective or target Levels of Service to be reached at some point in time. The amount of time it will take to reach expected Levels of Service depends on the municipality's assumptions within the asset management planning process.

Level of Service Overview

The Ontario Reg. 588/17, Asset Management Planning for Municipal Infrastructure identifies Level of Services (LOS) as a key component of an asset management strategy. As a result, municipal councils were expected to adopt an Asset Management policy by July 1, 2019, and an Asset Management Plan (AMP) containing a LOS by July 1, 2022.

Level of Service requires asset category, performance measurement, a current measurement, a target measurement, an achievement date, an approximate cost and a priority assigned to each performance measurement.

AMPs typically comprise of theoretical models which need to be vetted against operational models concluding with practical realities. LOS can be considered the practical component of an AMP. Operational and practical data is used to establish and validate LOS which in turn will feed into the financial component. This closed-loop approach will either validate the AMP or indicate required changes to the financial strategy. LOS is a key driver which influences asset management decisions, and depending on asset type can be either condition or age based.

LOS outlines the overall quality, performance, availability and safety of the service being provided. LOS contains four distinct categories:

- Financial
- Municipal Risk
- Community Expectations
- Technical Component

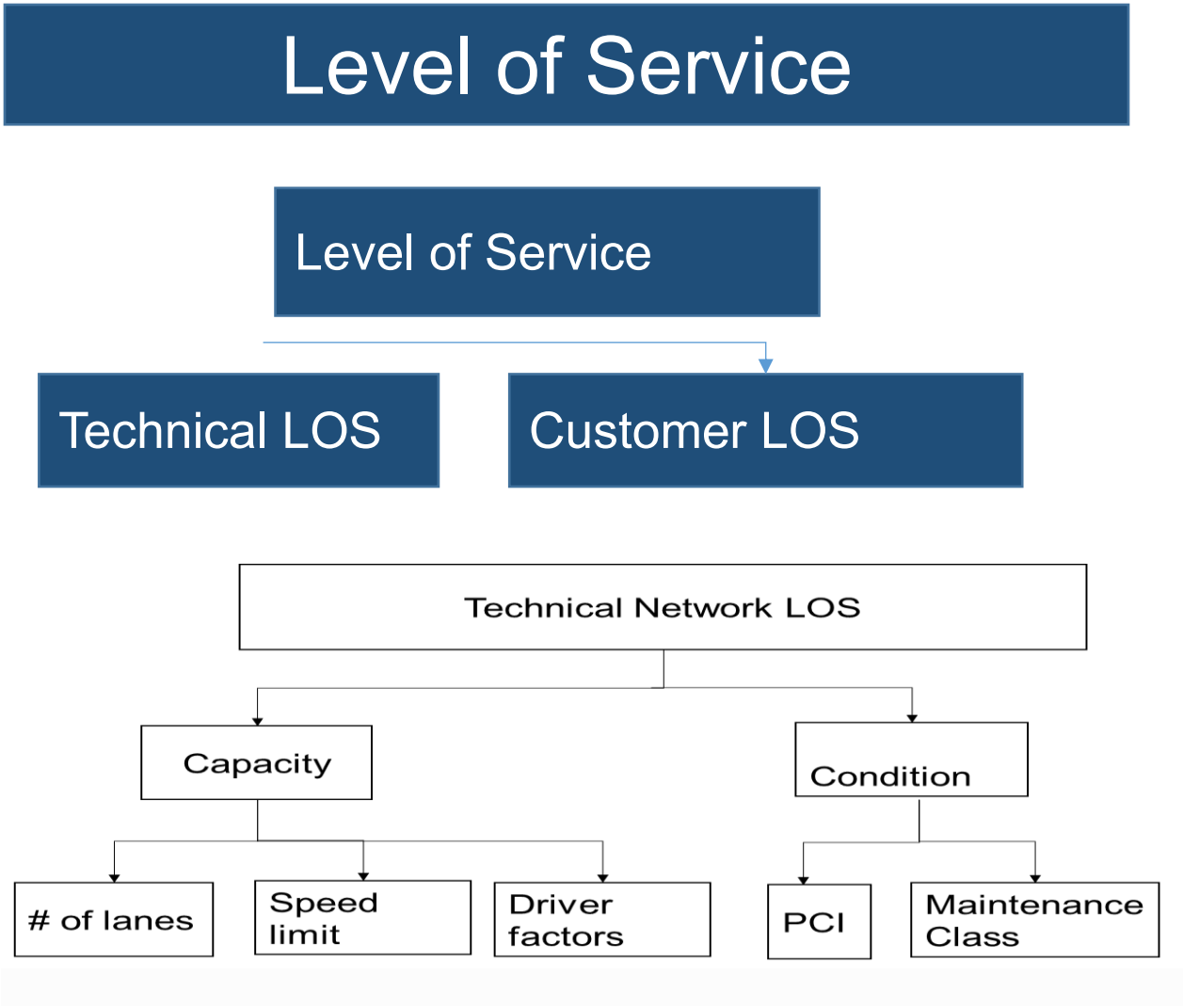
LOS is a balance between user expectations for overall quality, performance, availability and safety versus affordability.

Customer levels of service outline the overall quality, performance, availability and safety of the service being provided. Level of Service is a balance between user (customer) expectations for overall quality, performance, availability and safety of infrastructure assets with a cost that is affordable. At some point it is necessary to ensure that the services provided, due in fact reflect the community's priorities and expectations. It may also be important to determine if the services provided are at a level that the community finds acceptable or if those service levels should be increased or decreased.

LOS Matrix

Each asset category can have its own Key Performance Indicator, current measurements, target measurements, achievement date, approximate costs associated to each component and a priority listing based on staff and council consensus. Technical Levels of Service (TLOS) outline the operating, maintenance, rehabilitation, and renewal strategies. Technical levels of service outline the operating, maintenance, rehabilitation, renewal and upgrade activities expected to occur. Technical Levels of Service must be considered that also look at the risk associated with providing the service. Proposed targets for customer and technical levels of service must be included as part of the asset management strategy. Performance measures should be developed and the actual results achieved reported and updated annually.

Determining the desired Levels of Service for core asset type is achieved with consideration of a number of factors including costs, user expectations and government mandated and minimum requirements.
The target levels of service must be reviewed on a regular basis to determine if they are appropriate and achievable. Consideration should be given to risk and cost in the development of target levels of service.
All assets carry a level of risk for their users. Generally when conducting risk assessment, two key factors that come into consideration are frequency of use and cost of improvement. Acceptable levels of risk may vary depending on their frequency of use.



Key Performance Indicators (KPI)

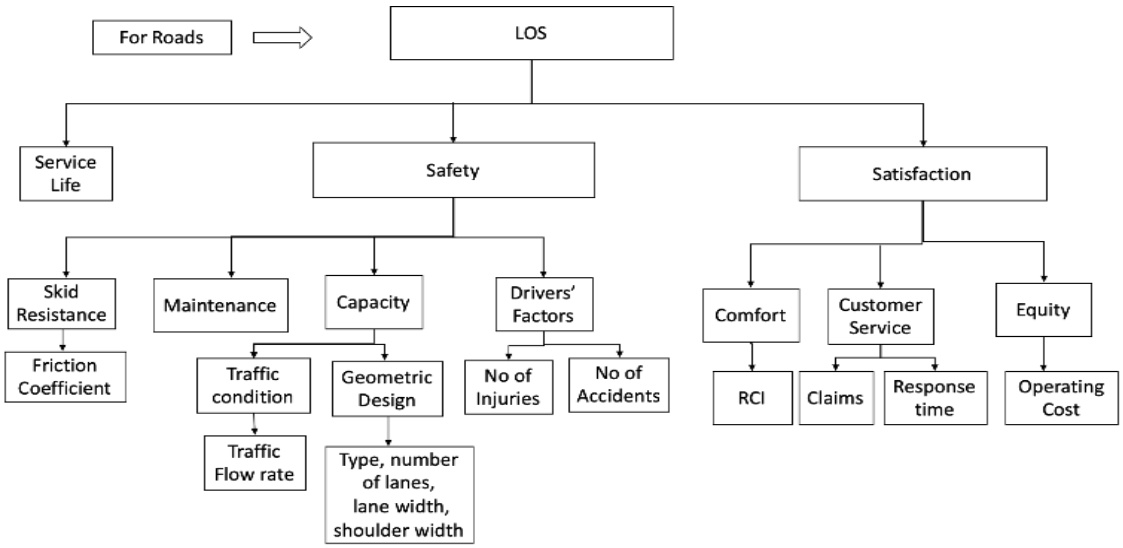
Key Performance Indicators include:

- Severity of failure (for roads MMS versus non mms)
- Duration of failure (within MMS regulation)
- Number of citizen requests
- Type of deficiency or failure

Roads LOS Hierarchy

Level of service is probability of failure connected to consequence of failure; safety versus satisfaction. For municipal roads, an LOS framework comprises of;

- Adopting a methodology based on minimum standards Ontario Reg. 239/02.
- Utilizing existing roads needs studies.
- Utilizing electronic road patrol program.
- Citizen engagement strategy.
- Financial implications.



Roads Key Performance Indicators (KPI)

Road Performance Measurements may include:

- Riding comfort Index (RCI)
- Surface distress Index (SDI)
- Structural Adequacy Index (SAI)
- Pavement Condition Index (PCI)
- Pavement Quality Index (PQI)

Roads LOS Objective

The regulation requirements:

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity.	Number of lane-kilometers of each of arterial roads, collector roads and local roads as a proportion of square kilometers of land area of the municipality.
Quality	Description or images that illustrate the different levels of road class pavement condition.	1. For paved roads in the municipality, the average pavement condition index value. 2. For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor).

The Municipality's Commitment

The municipality has established a PCI rating for the target level of service for roads by classifying road segments based on surface types and the Minimum Maintenance Standard 389 (traffic and speed) others.

The desired level of service for municipal roads is to maintain an average weighted condition rating of the entire road network based on each asset category such as HCB, LCB, and gravel.

The municipal road network should be evaluated through completion of the 10 Year Roads Improvement Plan.

The rating system consists of a number 1 through 100. For the purposes of this LOS, the following assumptions were made for road deterioration rates:

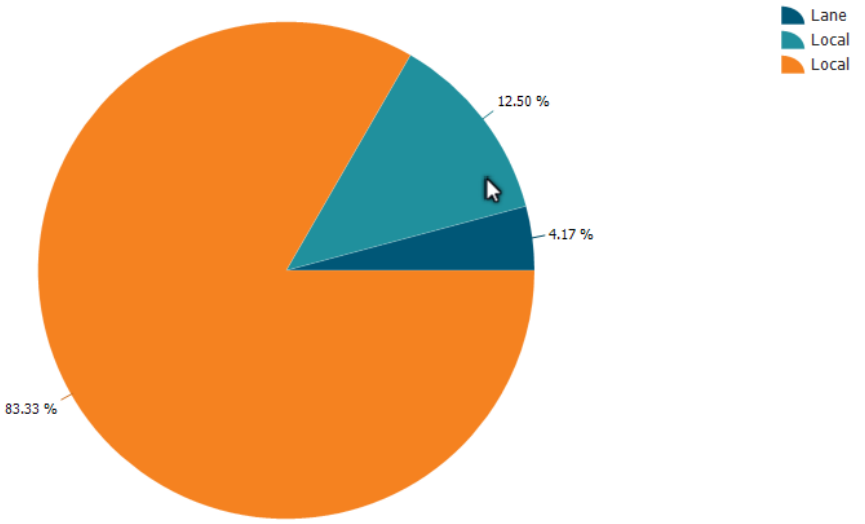
- Gravel Roads - Condition rating is maintained with regular maintenance
- Low Class Bituminous Roads - Condition rating reduced by 1 PCI per year
- High Class Bituminous Roads - Condition rating reduced by 2 PCI per year

Condition rating

Existing & Target Road Condition Rating		
Surface Type	Existing Rating	Target Rating
H.C.B. (Asphalt)	72	70
Gravel	76	70
Earth	50	50

LINEAR ASSETS BY CLASSIFICATIONS

Road Section



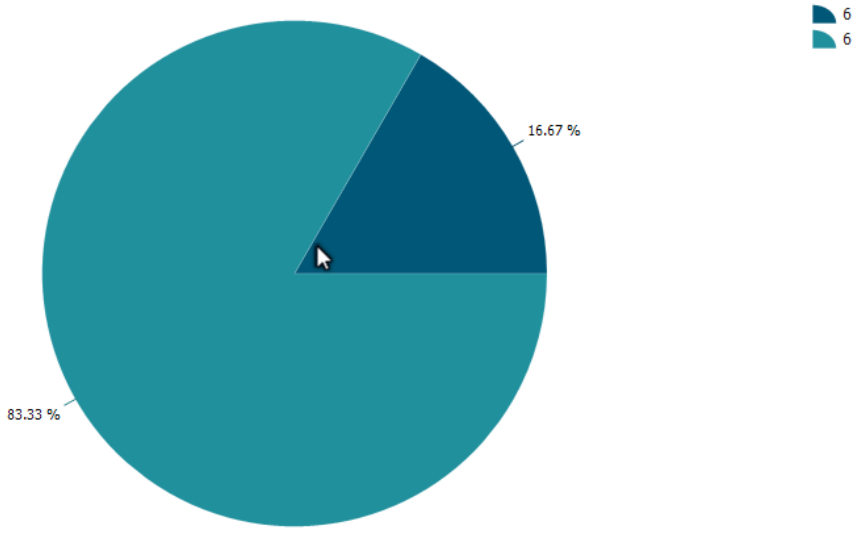
CLASSIFICATION	SURFACE TYPES	No. OF ASSETS	LENGTH (In Meters)
Lane	High Class Bituminous (HCB)	1	3680
Local	High Class Bituminous (HCB)	3	1210
Local	Gravel	20	35780

Sum Assets: 24 Sum Length: 40670 Meters

Total Assets: 24 Total Length: 40670 Meters

LINEAR ASSETS BY MAINTENANCE CLASS

Road Section



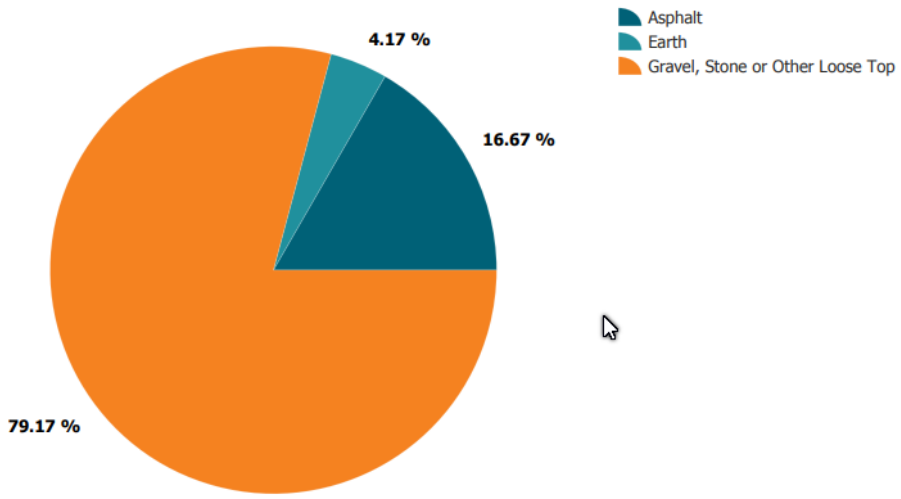
MAINTENANCE CLASS	SURFACE TYPES	No. OF ASSETS	LENGTH (In Meters)
6	High Class Bituminous (HCB)	4	4890
6	Gravel	20	35780

Sum Assets: 24 **Sum Length:** 40670 Meters

Total Assets: 24 **Total Length:** 40670 Meters

LINEAR ASSETS BY MATERIALS

Road Section



MATERIAL	SURFACE TYPE	No. OF ASSETS	LENGTH (In Meters)
Asphalt	High Class Bituminous (HCB)	4	4890
Earth	Gravel	1	870
Gravel, Stone or Other Loose	Gravel	19	34910

Sum Assets: 24 **Sum Length:** 40670 Meters

Total Assets: 24 **Total Length:** 40670 Meters

Images of Roads

Sample of LCB road

Sample of Gravel Road

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
ASSET NAME	FROM	TO	COMMENTS	LENGT	LOCATION	WIDTH	MATE	AREA	CLASS	MAI	SURRO	TRAFFIC	SPEE	DRAINA	CONDITI	WINTER	LIFE	DATE
Adelard Road	Highway 17	Highway 17	4.0 km Emergency maintenance	3680	Bissett Creek 46.211526 - 78.020209	6.5 m	Asphalt	23920	Lane	6	Cottage	ADT 0	40	Ditch	POOR	NO	50	1960-01-01
Ashport Road	Highway 17	Francoeur Road	1.3 km year round maintenance 1.3-2.5 Emergency maintenance	2450	Mackey 46.171417 - 77.797426	6.5 m	Gravel, Stone	15925	Local	6	Rural	ADT 42	50	Ditch	FAIR	YES	100	1960-01-01
Boat Launch Rd	Loggers Rd	Boat Launch		290	Stonecliffe 46.213998 - 77.893797	6.5 m	Gravel,	1885	Local	6	Rural	ADT 12	50	Ditch	GOOD	YES	100	1960-01-01
Boudreau Road	Highway 17	Chokecherry Lane	0.3 km year round maintenance	320	Mackey 46.172496 - 77.793593	6.5 m	Gravel,	2080	Local	6	Rural	ADT 18	50	Ditch	FAIR	YES	100	1960-01-01
Buckshot Road	Yates	Buckshot Road	Emergency maintenance only	870	Stonecliffe 46.215875 -77.895484	6.5 m	Earth	5655	Local	6	Rural	ADT 0	50	Surface	POOR	NO	100	1960-01-01
Cotnam Road	Highway 17	Cotnam Road	0.1 km year round maintenance	170	Deux Rivieres 46.246773 - 78.30610	6.5 m	Asphalt	1105	Local	6	Rural	ADT 6	50	Ditch	FAIR	YES	50	1960-01-01
Crossing Road	McIsaac Drive	Trapper	0.1 Km year round maintenance	100	Bisset Creek 46.224304 - 78.060438	6.5 m	Asphalt	650	Local	6	Rural	ADT 0	50	Ditch	FAIR	YES	50	1960-01-01
Desjardins Road	Mackey Creek	Desjardins Road	0.3 km year round maintenance	380	Mackey 46.160317 - 77.809203	6.5 m	Gravel,	2470	Local	6	Rural	ADT 6	50	Ditch	FAIR	YES	100	1960-01-01
Donnelly Road	Highway 17	Donnelly Road	1.8 km year round maintenance	1120	Mackey 49.171569 - 77.797518	6.5 m	Gravel,	7280	Local	6	Rural	ADT 6	50	Ditch	FAIR	YES	100	1960-01-01
Dunlop Cresent	Highway 17	Highway 17	0.9 km year round maintenance	940	Deux Rivieres 46.251952 -78.286813	6.5 m	Asphalt	6110	Local	6	Rural	ADT 30	50	Ditch	FAIR	YES	50	1960-01-01
Francoeur Road	Ashport Road	Ashport rd	Emergency Maintenance Only	2700	Mackey 46.172118 -77.94302	6.5 m	Gravel,	17550	Local	6	Private	ADT 12	50	Ditch	FAIR	YES	100	1960-01-01
Harvey Creek Road	Highway 17	Harvey Creek Road	0.9 km year round maintenance	770	Mackey 46.177410 - 77.768331	6.5 m	Gravel,	5005	Local	6	Rural	ADT 24	50	Ditch	FAIR	YES	100	1960-01-01
Jennings Road	Highway 17	Old Mackey Park	5 km year round maintenance	7170	Mackey 46.170828 - 77.821205	6.5 m	Gravel,	46605	Local	6	Rural	ADT 36	50	Ditch	FAIR	YES	100	1960-01-01
Jobidon Road	Highway 17	Jobidon Road	0.3 km year round maintenance	390	Mackey 46.174566 - 77.782668	6.5 m	Gravel,	2535	Local	6	Rural	ADT 6	50	Ditch	FAIR	YES	100	1960-01-01
Kenny Road	Highway 17	Highway 17	0.7 km maintained 0.7-1.8- Emergency	3130	Mackey 46.179573 - 77.843536	6.5 m	Gravel, Stone	20345	Local	6	Rural	ADT 0	50	Ditch	FAIR	YES	100	1960-01-01
Loggers Road	Township Hall	Yates Road / Boat	0.7 km year round maintenance	460	Mackey 46.214450 - 77.896185	6.5 m	Gravel,	2990	Local	6	Rural	ADT 12	50	Ditch	FAIR	YES	100	1960-01-01
Mackey Creek Road	Highway 17	Desjardins Road	2.5 km to bus turn around year round maintenance	11260	Mackey 46.169385 - 77.818128	6.5 m	Gravel, Stone	73190	Local	6	Rural	ADT 72	50	Ditch	FAIR	YES	100	1960-01-01
McIsaac Drive	Highway 17	McIsaac Drive	1.1km year round maintenance	1060	Bisset Creek 46.222466 - 78.065225	6.5 m	Gravel,	6890	Local	6	Rural	ADT 12	50	Ditch	FAIR	YES	100	1960-01-01
Pine Valley Road	Highway 17	Loon Valley	0.3 km year round maintenance	320	Stonecliffe 46.198761 - 77.881119	6.5 m	Gravel,	2080	Local	6	Rural	ADT 6	50	Ditch	FAIR	YES	100	1960-01-01
Plains Camp Road	Jennings Road	Plain Camp Road	Emergency maintenance only	1150	Mackey 46.190967 - 77.825143	6.5 m	Gravel,	7475	Local	6	Rural	ADT 0	50	Ditch	FAIR	NO	100	1960-01-01
Rivermead Road	Jobidon Road	Voyager Lane	0.3 km maintained year round	510	Stonecliffe 46.175810 - 77.782521	6.5 m	Gravel,	3315	Local	6	Rural	ADT 12	50	Ditch	FAIR	YES	100	1960-01-01
Township Hall Road	Highway 17	Township Hall Road	0.3 km year round maintenace	580	Stonecliffe 46.212541 - 77.893847	6.5 m	Gravel,	3770	Local	6	Rural	ADT 12	50	Ditch	GOOD	YES	100	1960-01-01
Trappers Rd	Crossing Road	Harmony Lane		570	Bisset Creek- -46.225140- 78.060438	6.5 m	Gravel,	3705	Local	6	Cottage	ADT 0	50	Open		YES	100	1960-01-01
Yates Road	Highway 17	Yates Road	0.4 km year round maintenance	280	Stonecliffe 46.213253 - 77.897261	6.5 m	Gravel,	1820	Local	6	Rural	ADT 6	50	Ditch	FAIR	YES	100	1960-01-01

BRIDGES AND CULVERTS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	Percentage of bridges in the municipality with loading or dimensional restrictions.
Quality	1. Description or images of the condition of bridges and how this would affect use of the bridges. 2. Description or images of the condition of culverts and how this would affect use of the culverts.	1. For bridges in the municipality, the average bridge condition index value. 2. For structural culverts in the municipality, the average bridge condition index value.

Bridges and structural culverts of greater than 3 meter spans consist of many different components with varying life expectancies, generally ranging from 50 to 75 years. The condition of a bridge is evaluated by completing mandatory biennial OSIM inspections which provide detailed condition ratings of all the components of each structure. The condition of the various components is described by one of four ratings, being Excellent, Good, Fair or

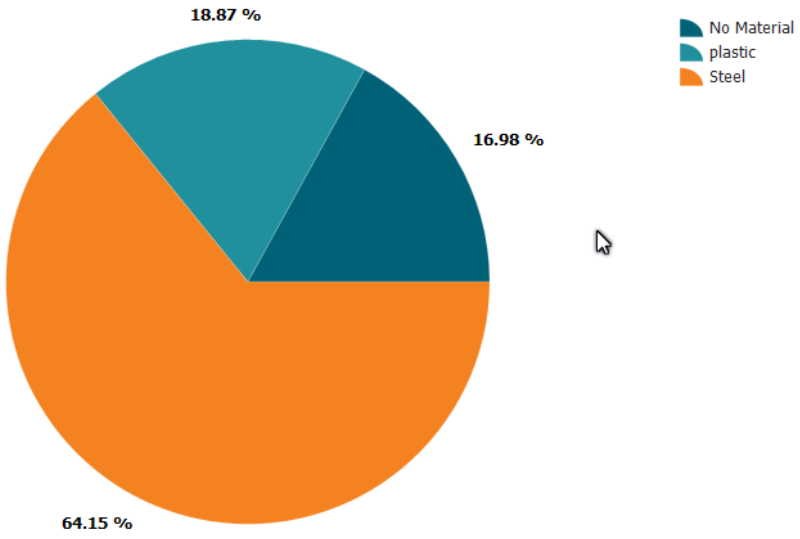
- No Load Posting of Structure
- Two lane crossing
- Guiderail protected with proper end treatments
- Good sight lines on the approaches to the water crossing

The following is recommended to meet desired levels of service for structures:

- Complete OSIM inspections as mandated by Ontario Regulation 104/97 Standards for Bridges
- Implement studies and repairs as outlined in OSIM reports

POINT ASSETS BY MATERIALS

Culvert <3m



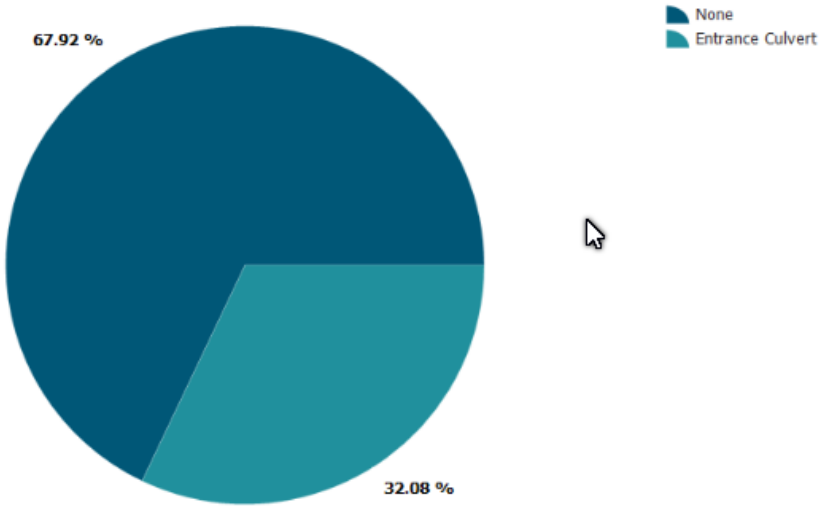
MATERIAL	SURFACE TYPE	No. OF ASSETS	LENGTH (In Meters)
No Material		18	138.1
plastic	Plastic	20	178
Steel	Corrugated Steel Pipe (CSP)	68	773.36

Sum Assets: 106 Sum Length: 1089.46 Meters

Total Assets: 106 Total Length: 1089.46 Meters

POINT ASSETS BY SURROUNDING ENVIRONMENT

Culvert <3m



SURROUNDING ENVIRONMENT	SURFACE TYPE	No. OF ASSETS	LENGTH (In Meters)
None		13	97.3
Entrance Culvert		5	40.8
None	Plastic	4	24
Entrance Culvert	Plastic	16	154
None	Corrugated Steel Pipe (CSP)	55	643.96
Entrance Culvert	Corrugated Steel Pipe (CSP)	13	129.4

Sum Assets: 106 Sum Length: 1089.46 Meters

Total Assets: 106 Total Length: 1089.46 Meters