



**City of Kingston
Information Report to Council
Report Number 24-043**

To: Mayor and Members of Council
From: Brad Joyce, Commissioner, Infrastructure, Transportation & Emergency Services
Resource Staff: Luke Follwell, Director, Engineering Services
Date of Meeting: January 9, 2024
Subject: Annual Update on Planned Road Projects Including Road Condition Information

Council Strategic Plan Alignment:

Theme: 3. Build and Active and Connected Community

Goal: 3.4 Improve road condition, performance, and safety.

Executive Summary:

Council Priority 3.4.1C requires staff to provide an annual report on planned road projects including road condition information. In June 2023, the bi-annual road condition survey was completed on the City of Kingston road network. This data has been analyzed and the summary of the results presented in this report. Utilizing the road condition information, staff have identified road assets for maintenance, rehabilitation and/or reconstruction in 2024. A preliminary list of planned road projects is also included in this report.

Over the four-year period from 2019-2022, investments in the road network averaged \$6.2M annually resulting in 65 lane kilometres per year of rehabilitation across the network. In 2023, \$7M was invested resulting in 76 lane kilometres of road rehabilitation. This continued investment in the road network has stabilized the overall condition index (OCI) with a continued increase over the four-year period from 56.7 in 2019, (Fair rating) to 57.8 in 2021 (Fair rating) to the current overall condition of 60.5 in 2023 (Good). Significant investments are still required across the entire road network to maintain this rating and to reach recommended target OCIs.

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Staff will continue to collaborate with internal departments, development applications and Utilities Kingston to align road work with other priorities where possible. Exhibit A provides a draft project list of roads and segments that are planned for maintenance, rehabilitation and/or reconstruction in 2024. Once the 2024 capital budget has been finalized and approved, a complete list of projects will be shared with Council and updated on the City's website through the My Neighbourhood application. The My Neighbourhood application includes descriptions of each project including the scope of work, expected timelines, and contact information for the staff person leading the project.

Recommendation:

This report is for information only.

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Authorizing Signatures:

ORIGINAL SIGNED BY COMMISSIONER

**Brad Joyce, Commissioner,
Infrastructure, Transportation &
Emergency Services**

ORIGINAL SIGNED BY CHIEF

ADMINISTRATIVE OFFICER

**Lanie Hurdle, Chief
Administrative Officer**

Consultation with the following Members of the Corporate Management Team:

Paige Agnew, Commissioner, Development & Growth Services	Not required
Jennifer Campbell, Commissioner, Community Services	Not required
Neil Carbone, Commissioner, Corporate Services	Not required
David Fell, President & CEO, Utilities Kingston	Not required
Peter Huigenbos, Commissioner, Major Projects & Strategic Initiatives	Not required
Desirée Kennedy, Chief Financial Officer & City Treasurer	Not required

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Options/Discussion:

Engineering Services manages a network of 1,815.6 lane kilometres of road in the City of Kingston, of which 1,511 are asphalt, 253.6 surface treated, 50.0 granular, and 0.5 concrete pavers. Maintaining a network of this size requires knowledgeable resources and a significant amount of data collection and analysis. Selecting which roads to repair in any given year, within the approved budget envelope, is a comprehensive process. A summary of the total lane kilometres for each road classification across the City is shown in Table 1.

Table 1: Road Network Summary - Lane Kilometres (km's)

Road Classification	Arterial (km)	Collector (km)	Local (km)	Total (km)	%
Asphalt	478.3	137.1	896.1	1,511.5	83.3%
Surface Treatment	5.5	0.0	248.1	253.6	14.0%
Granular*	0.0	0.0	50.0	50.0	2.8%
Concrete pavers	0.4	0.0	0.1	0.5	0.0%
TOTAL	484.2	137.1	1,194.3	1,815.6	100.0%
% of entire network	26.7%	7.6%	65.8%	100.0%	

*Granular roads are not rated in the bi-annual inspection data below

Pavement condition surveys are conducted bi-annually (since 2019) to collect data on the condition of asphalt and surface treated road surfaces in the city. Granular roads are not included in the bi-annual inspection. Granular roads are visually inspected by Public Works regularly. Once the data is collected and verified it is entered into the City's asset management software, analyzed, and used to identify future road work. Except for arterial roads, the City is meeting the recommended target OCI across the network. The inspected overall condition index for 2023 is summarized in Table 2.

Table 2: Inspected Overall Condition Index (2023) - Lane Kilometres (km's)

Rating	Arterial (km)	Collector (km)	Local (km)	Total (km)	%
Very Good (80 – 100)	32.9	16.8	148.9	198.6	10.9%
Good (60 – 79.9)	125.8	29.3	391.2	546.3	30.1%

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Rating	Arterial (km)	Collector (km)	Local (km)	Total (km)	%
Fair (40 – 59.9)	244.4	55.6	371.1	671.1	37.0%
Poor (20 – 39.9)	77.2	35.4	173.5	286.1	15.8%
Very Poor (0 – 19.9)	3.8	0	59.7	63.5	3.5%
Not Rated	0	0	50.0	50.0	2.8%
TOTAL	484.1	137.1	1,194.4	1,815.6	100.0%
Average OCI	59.6	61.2	60.6	60.5	
Target OCI	65.0	60.0	55.0		

Preventative maintenance programs reduce the need for full reconstruction and allow more work to be done over a greater portion of the network. The condition of Kingston’s roads is a direct result of several years of insufficient investment. However, in the four-year period from 2019-2022, investments were significantly increased to \$6.2M annually resulting in 65 lane kilometres per year of rehabilitation across the network. In 2023, \$7M was invested resulting in nearly 76 lane kilometres of road rehabilitation. The result of this continued investment in the road network has stabilized the OCI with a slight increase from 57.3 (Fair) to the current OCI of 60.5 (Good). Significant investments are still required across the entire road network to maintain this rating and to reach recommended target OCIs. The road rehabilitation summary is shown in Table 3.

Table 3: Road Rehabilitation Summary

Details	Average (2019-2022)	2023
Annual Budget (rounded)	\$6.2M	\$7.0M
Annual lane kilometres (km's)	65.3	75.82
% of the overall network	3.6%	4.17%
Lane Kilometres (TOTAL) since 2018	264.2	340.01
% of entire network (TOTAL) since 2018	14.6%	18.71%
Inspected OCI	57.3	60.5

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Background

In addition to pavement condition data, establishing the capital program also requires consideration of additional factors to prioritize road projects. For example, conditions being equal, roads with a higher traffic volume are typically ranked as a higher priority as they typically provide the means for goods to be exchanged, commerce to flourish, emergency routes, and commercial enterprises to generate revenue. The City of Kingston classifies its roads based on the following three functional classifications.

Arterial: All cross-city corridors consisting of 2 to 4 or more lanes, spaced at 1 to 2-kilometre intervals with daily traffic counts exceeding 10,000 vehicles per day. The recommended minimum target OCI for arterials is 65.

Collector: Continuous and discontinuous cross-city and inter-district corridors that are 2 to 4 lanes across and have a center line stripe or a designated bus route. The average daily traffic count falls in the 1,000 to 10,000 vehicle per day range. The recommended minimum target OCI for collectors is 60.

Local: The majority of road segments consisting of all residential roads not defined as Arterial or Collector. The recommended minimum target OCI for locals is 55.

Staff are also advancing Councils strategic priorities related to 3.4.1 “Improve the overall state of the City’s roads through maintenance and capital planning.”

- A. Invest an additional \$35M over 4 years to repair roads in poor condition.
 - a. Included as part of budget submission.
- B. Complete long-term asset management plan for roads and structures (Q4 2024)
 - a. Planned to start in Q1 2024
- C. Provide annual report on planned road projects including road condition (Q4 2023)
 - a. This report includes the annual update for 2024 including a preliminary list of planned road projects in Exhibit A.
- D. Develop and implement a means of tracking pothole repairs and develop metrics which can be reported to EITP (Q2 2024)
 - a. Application is under development and will be reported in 2024.

Analysis

The key to a successful pavement management program is to develop a reasonably accurate roadway performance model and identify the optimal timing and rehabilitation and preventative maintenance strategies. Pavement roughness and surface distress surveys were conducted by Stantec in June 2023 as part of our bi-annual analysis.

Principles of Pavement Management

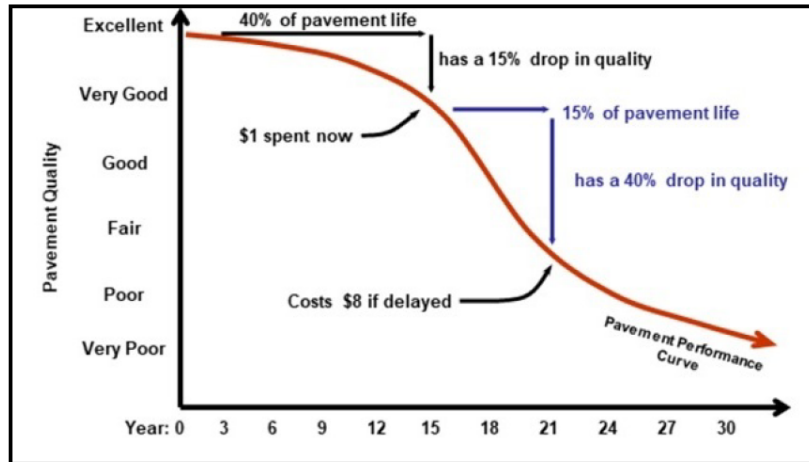
A pavement management system is a set of tools or methods that assist staff in finding optimal strategies for providing and maintaining pavements in a serviceable condition over a given time

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period. The intent is to identify the optimum level of long-term funding to sustain the network at a predetermined level of service, while incorporating local conditions and constraints. Figure 1 illustrates the relationship between pavement deterioration and lifecycle costs.

Figure 1: Pavement Deterioration and Lifecycle Costs



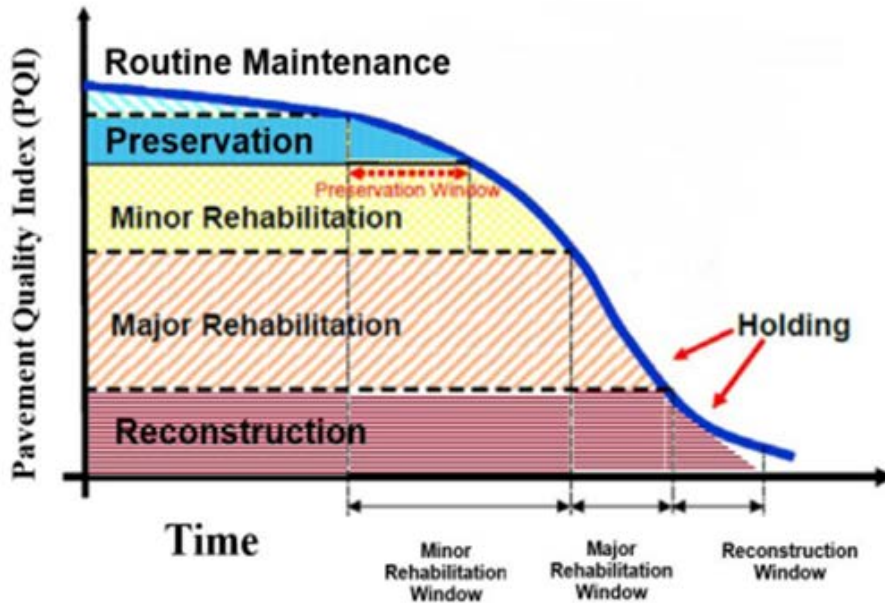
Roads repaired while in good condition will cost less over their lifetime than roads left to deteriorate to a poor condition. Pavements typically deteriorate rapidly once they hit a specific threshold so a \$1 investment after 40% lifespan is much more effective than deferring maintenance until heavier overlays or reconstruction are required just a few years later. The key is to develop practices that delay the inevitable total reconstruction for as long as practical yet remaining within the target zone for cost effective rehabilitation.

As illustrated in Figure 2, a wide range of intervention types are available for road preservation and maintenance. To maximize return on investment, the interventions need to be timely and appropriate.

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Figure 2: Loss in Pavement Quality over time and Role of Pavement maintenance and rehabilitation



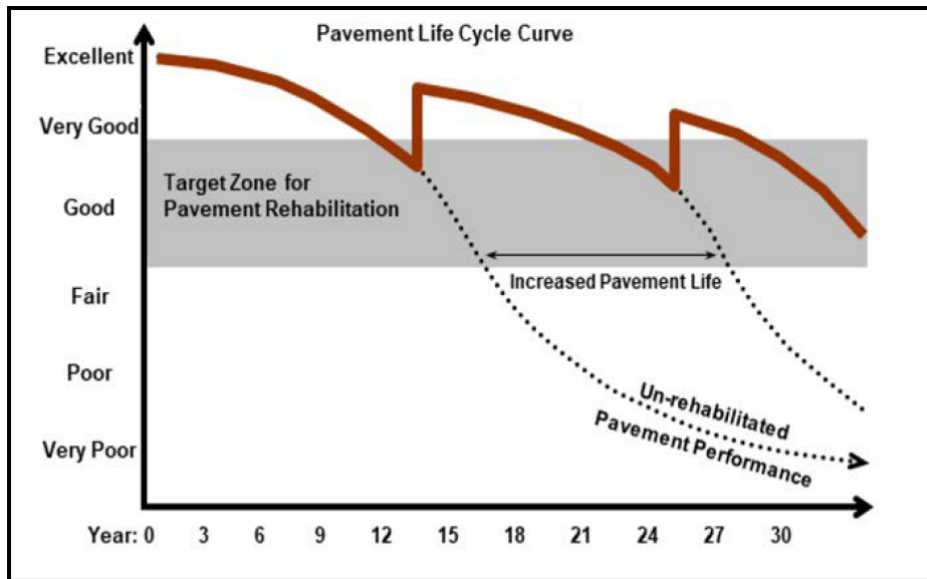
While this is an accepted asset management strategy, it is challenging to get residents to accept that, due to the high cost of reconstruction, roads rated as Poor to Very Poor are often deferred until full funding is available, in favour of completing more streets that can be rehabilitated at lower costs, resulting in a greater net benefit to the network and the community. This challenge is greater when there is a backlog of roads in poor condition.

Council has committed to addressing roads in these categories by investing an additional \$35M into our road network over a four-year term. Figure 3 below illustrates the concept of extending pavement life through the application of timely rehabilitations.

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Figure 3 - Pavement Lifecycle Costs:



Existing Policy/By-Law

None

Notice Provisions

None

Financial Considerations

None

Contacts:

Luke Follwell, Director, Engineering Services 613-546-4291 extension 3139

Other City of Kingston Staff Consulted:

Anthony Simmons, Manager, Construction, Engineering Services

Melanie Knowles, Project Manager, Engineering Services

John Piranio, Asset Management Coordinator, Engineering Services

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Exhibits Attached:

Exhibit A – Draft 2024 Road Projects List

2024 Draft List of Road Projects

Road (Segments)

Abbey Dawn Road (Highway 2 to north of flood zone)
Aberdeen Street (Johnson Street to Earl Street)
Anne Street (Elizabeth Street to Mary Street)
Catarqui Woods Drive (Centennial Drive to Andersen Drive)
Centennial Drive (Gardiners Road to Robinson Court)
Collingwood Street (Couper Street to Union Street)
Couper Street (Collingwood Street to Albert Street)
Creekford Road (Cloggs Road to Gardiners Road)
Deer Ridge Drive (Highway 2 to North)
Earl Street (Victoria Street to Collingwood Street)
Elizabeth Street (Anne Street to Victoria Street)
Elva Avenue (Highway 2 to Sterling Avenue)
Front Road / King Street West (Utilities Kingston)
Gardiners Road (Centennial Drive to Fortune Crescent)
Gates Boulevard (Highway 2 to LaSalle Boulevard)
John Counter Boulevard (Maple Street to Ascot Lane)
King Street (Victoria Street to Collins Bay Road)
King Street East (Place D'armes to Cul-de-sac)
Lancaster Drive (Limestone Dive to Jasper Court)
LaSalle Boulevard (West end to East end)
Leeman Road (Unity Road to Spooner Road)
Maple Lawn Drive (Battersea Road to West end)
Mary Street (Anne Street to Victoria Street)
McMahon Avenue (Jane Street to Avenue Road)
Montreal Street (Briceland Street to Cassiday Street)
Orser Road (Highway 38 to Babcock Road)
Pine Grove Rd (Highway 15 to Boundary Rd)
Queen Street (Ontario Street to Water)
Ridge Road (Elva Avenue to Gates Boulevard)
Sand Hill Road (Highway 15 to 2865 Sand Hill Road)
Seabrooke Road (Highway 15 to North)
Shannon Road (Highway 15 to 6th Concession)
Spooner Road (Leeman Road to Perth Road)
St Lawrence Avenue (Highway 2 to Treasure Island)

Union Street (Victoria Street to Albert Street)
Victoria Street (Elizabeth Street to Mary Street)
Victoria Street (Johnson Street to Union Street)
Westbrook Road (Bur Brook Road to Unity Road)
Wise Street (Megan's Street to Woodbine Road)
Woodburn Road (Joyceville Road to Hitchcock Road)

Scope Still To Be Confirmed

Birchwood Drive at Brackenwood Drive
Catarauqui Woods Drive at Catarauqui Woods Park
Norman Rogers Drive at Centennial PS
Norman Rogers Drive at St Thomas More CS
Queen Mary Road at Robert Wallace Drive
Van Order Drive at LCVI
Wiley Street at Drennan Street

Crack Sealing Program
Microsurfacing Program