The Corporation of the City of Windsor

Value for money audit:
Road Infrastructure Maintenance Processes

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Final Internal Audit Report

April 29, 2022

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Executive summary

Road maintenance overview

The City of Windsor (the City) is responsible for the maintenance of road infrastructure throughout the municipality. The City has developed an inspection and condition rating program to assess the pavement condition of the various road assets. The results aid in identifying, prioritising, and planning for road rehabilitation, reconstruction, and maintenance needs. Planned road maintenance is accounted for in the City's capital budget. Smaller short term repairs such as pothole patching are accounted for in the operating budget.

Road assets noted

Metric	2018 Asset Management Plan (AMP) (m)	2018 Asset Management Plan (AMP) Replacement Value ($K)
C1 Arterial	9,847	$80,920
C1 Collector	96,504	$183,109
C2 Arterial	126,141	$593,772
C2 Collector	78,530	$133,326
Expressway	56,275	$198,698

Project purpose

We conducted a Value for Money (VFM)/Performance Audit of road infrastructure maintenance processes. Our approach was based on both Internal Audit and Performance Auditing approaches and frameworks in accordance with the Auditor General Charter. For the VFM audit, we focused on:

- a set of key performance indicators evaluated as part of this internal audit.

- internal controls and processes over the three key areas: regulatory compliance, road maintenance strategies/capital budget, and people, governance and technology.

Specific scope, objectives and exclusions are described in Appendix B.

What we did

To conduct our work we completed various activities including, but not limited to:

- Examined the progress made to comply with Table 4 in Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure since March 31, 2019 as it specifically relates to maintenance for road classifications which are in-scope on this project (effectiveness).

- Conducted a gap analysis of the road maintenance strategy documented in the 2018-2019 AMP against processes developed to implement those strategies to determine areas of improvement.

- Conducted a peer comparison analysis to determine if the spend for roads and the condition of roads is consistent among peers. Municipalities for comparison were selected based on their ability to fall within a defined range regarding population, weather conditions, level of government, inflation, city size and city density.

- We evaluated the road maintenance strategies that CoW included in their 2018-2019 AMP as compared to common practice guidelines from Federation of Canada Municipalities to determine if any key elements were missing.

- Performed a comparison of key job descriptions involved in road maintenance at CoW to current job descriptions of municipalities/relevant comparables to determine if the qualifications required are adequate.

- We conducted walkthroughs with key stakeholders in the road maintenance lifecycle to uncover any areas of concern regarding people, governance and technology.

- Data analysis was completed in regards to the KPI's agreed upon during scope finalization based on the level of data granularity that the City was able to provide.

Overall assessment	**VFM/Performance Metrics**: Although the original four performance measures were Not Assessed as originally agreed upon, we were able to obtain alternative data from the City to conduct an analysis for four Revised KPI's. Of these four revised performance measures, three were Attained and one was Partially Attained.
	A total of **four findings** were **identified** in the operational area whereas three considerations for improvements are raised over the review of the 2018-2019 AMP road maintenance strategies, lack of 2025 SCI projections and an apparent decline in road conditions of C1 arterials and expressways during 2016-2020.
Management comments	Management appreciates the findings and considerations for improvement contained in the report as it relates to improving the efficiency of the overall road maintenance process and are pleased with the results showing that we have an effective and efficient service. We agree as you noted that controls are properly designed and are operating effectively and no internal control weaknesses were noted as a significant control deficiency. That being said, Management continually strives to improve its road maintenance process so as to ensure the effective and efficient use of City resources. Detailed Management Action Plans and timelines to address the four findings identified in the report are presented below.
Name:	Chris Nepszy
Title:	Office of the Commissioner of Infrastructure Services
Date:	March 24, 2022

Summary of internal audit results

Report classification

In general, controls are properly designed and are operating effectively for the purpose envisaged. Given the nature of this internal audit, we are providing an overall assessment using performance auditing measures as well as standard internal controls assessment methods.

The purpose of this VFM review was intended to analyze various components of the road maintenance process to determine if any recommendations or insights could be provided to improve the efficiency of the overall process. Key tests performed included a regulatory component, an assessment of the 2018-2019 road maintenance strategies included in the 2018-2019 AMP, and an assessment of the design of governance, people and technology processes in place to achieve efficiency in operations throughout the road maintenance lifecycle.

As per professional standards and VFM practices, prior to conducting fieldwork for this VFM review, the performance measures were identified and agreed upon with management. These four performance objectives/measures formed the basis for evaluating the results of this VFM review. There are some recommendations for further improving the processes which have been noted in terms of process documentation and areas that may require further analysis to determine root cause. Further, during execution, it was noted that the required data sources were not reasonably available for all the performance measures and alternatives were considered where possible.

We examined the progress that the City has made to comply with Table 4 in the Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure since March 31, 2019. Upon review of the 2018-2019 AMP, evidence of the requirements listed were observed. No findings were identified.

We assessed the road infrastructure maintenance program strategies; implementation plans and current performance against the City's 2018-2019 AMP and common practice. Management provided documentation, supporting evidence and commentary for each strategy listed in the 2018-2019 AMP which included 16 strategies in total. Of the 16 strategies, 2 (12.5%) were identified as lacking support that progress was being made towards achieving the desired strategy. Management should consider reviewing the road maintenance strategies to determine if it needs to be removed or modified to align with the current needs of the City. The next AMP review and update is scheduled for the year 2023.

In addition, we reviewed the "Roads & Sidewalks - Priority Planning and Budgeting Process for Pavement Maintenance and Rehabilitation" from the Federation of Canadian Municipalities to determine if there were any gaps in common practice as it pertained to road maintenance strategies and processes. No gaps were identified.

We conducted an analysis where we identified and compared three MBNC municipalities selected based on inflation, population, size, density, average weather conditions and level of government. The following municipalities were identified for purposes of comparison: City of Hamilton, City of London, City of Winnipeg. We compared two indicators identified in the MBNC report as it related to road quality and road spending to determine if any trends could be identified. Upon review, it was noted that during 2017-2019, the City of Windsor had the lowest % of roads considered to be good to very good in comparison to these three municipalities, however, they spent an amount aligned with these municipalities in regard to maintaining the roads; however, the MBNC report does not provide enough information to determine the root cause. Please refer finding #3 for more details.

Lastly, we conducted a test where we assessed the design of governance, people and technology processes in place to achieve efficiency in operations throughout the road maintenance lifecycle. We conducted walkthroughs with various stakeholders and reviewed various process documents as it pertained to road maintenance to identify any areas of concern. We selected four positions applicable to road maintenance (Contracts Coordinator, Technical Support Manager, Maintenance Coordinator and Executive Director of Operations) and compared the requirements of these roles to the job postings from municipalities/private organizations looking to fill similar roles. We noted that the City of Windsor has strict qualification requirements to fill these roles. This provides comfort that the City is hiring competent individuals with the required skill set.

Performance-based audit results[1]

We worked with management to identify performance measures which could be used to measure the value and/or performance related to road infrastructure maintenance. The road infrastructure maintenance financial and operational performance objectives were established in coordination with the City's Public Works - Operations prior to the commencement of our field work. The results are based on our detailed review of the data provided by the City in regards to road quality, spending and funding.

Performance Objective	Assessment (% Attained)	Summary
1. Road quality: % of total paved lanes for in-scope road classification where paved lane km has a structural condition index of < 5 (Includes 2025 SCI Projections)	**Not Assessed**	Subsequent to the performance measures that were mutually determined it was noted that SCI projection data for 2025 was not readily available. As such we were unable to assess this KPI in its entirety. To attain some comfort, we agreed on a revised KPI
Revised KPI Road Quality: % of total paved lanes for in-scope road classification where paved lane km has a structural condition index of < 5 (Excludes 2025 SCI Projections)	**Attained 100%**	The City was able to provide the Mid-Year Road Needs Summary Reports for 2016-2020 where the percent (%) of adequate roads (SCI 1-4) SCI's could be determined. We were able to conduct an analysis for in-scope roads for the 2016-2020 period. Our analysis indicated the following: a) The condition of C1 arterials declined from 22.79% in 2016 to 11.49% in 2017 (a decline of 11.30%) and remained at 11.47% in 2018. However, the % of C1 arterial adequate roads increased significantly through 2020 to 29.80%,which exceeds the 2016 value of adequate roads of 22.79%. b) The condition of expressways declined from 2017 (18.73%) through 2019 (9.90%) by an amount of 9.93%. However, the % of adequate roads for expressways rose to 24.24% by 2020, which exceeds the % of adequate expressways roads in 2016 (16.06%)

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1 Performance rating scale and definitions contained in Appendix C.

Performance Objective	Assessment (% Attained)	Summary
		Although two of the in-scope function classes saw a notable decline in the % adequate roads during a period between 2016- 2020, neither function class saw a persistent decline through 2020. In fact, the ending % of adequate roads for both Expressways and C1 Arterials exceeded the 2016 amount.
		In addition, the analysis on the remaining in-scope function classes (C1 collector, C2 collector and C2 arterial) indicated a stable/flat trend from 2016-2020.
		Note: Projections for 2025 could not be provided, please refer to CFI 2 for more details.
		Please refer to Appendix A, KPI 1 for visuals.
2. Road rehabilitation spend: Variance in actual to planned spend per lane km by roadway treatment category was within 5%	**Not Assessed**	Subsequent to the performance measures that were mutually determined it was noted that without significant effort, management was unable to break down the cost by activity in the manner required to conduct this analysis . The City acknowledged that extensive budget monitoring by contract is performed, however, steps to break down the monitoring by road treatment category are not in place. As such we were unable to assess this KPI at the level of specification originally anticipated.
		To complete this analysis, we requested the budget and actual spending for 2016-2020 and projections for 2025 broken out by road rehabilitation treatments. Management indicated that the data for road rehabilitation cannot be easily broken up by type of road rehabilitation treatment as each tender in each project includes various types of rehabilitation treatments and function classes.
		It was also noted that management does not have an efficient way to allocate the "non-tender" costs to these rehabilitation treatment categories/function classes. *Please refer to finding #4.*
Revised KPI Road rehabilitation spend: Variance in actual to planned spend for the Road Rehabilitation category was within 5%.	**Attained 100%**	Management was able to provide the total budget and actual expenses for the road rehabilitation category for 2016-2020. The analysis based on the consolidated information indicated that the actual spend was on average overspent, by 4.41%. This falls within the 5% threshold. No exceptions noted. *Please refer to Appendix A, KPI 2 for visuals.*
Performance Objective	**Assessment**	**Summary**

	(% Attained)	
3. Road spend: Increase in funding allocation should be at least 1.16% (amount dedicated to tax levy for AMP)	Not Assessed	Subsequent to the performance measures that were mutually determined it was noted that without significant effort, management was unable to break down the funding in the manner required to conduct this analysis. As such we were unable to assess this KPI at the level of specification originally anticipated. To attain some comfort, we agreed on a revised KPI. To complete this analysis, we requested the funding sources for the various function classes (C1 & C2 Collector, C1 & C2 Arterial and Expressways) for 2016-2020, with projections for 2025. Management confirmed that funding cannot be broken down by function class (ie. Arterial, Collector and Expressways) as the budget is approved at a high level. Having the budget approved at "Road Infrastructure" level allows for greater flexibility. The City is able to compare budget and actuals for a PeopleSoft Project number, however the PeopleSoft Project number is not linked to the overarching Questica Project (Program) number. Management indicated that to compile budget and actual for the Questica project IDs would be time consuming as this would have to be compiled manually from PeopleSoft and there is no link between the systems. There are multiple PeopleSoft Project numbers for each Questica Project number.
Revised KPI: Road Spend Increase in funding allocation at the Capital Budget level.	**Attained 100%**	To revise this KPI, we looked at the individual capital budget for road spend for each year from 2016-2020 and the approved 2021 capital budget for years 2021-2030. We examined the % change in the budget for road spend from 2016-2030. The trend indicates an overall increase in road spending. The average trend indicates a year over year funding increase of 10.87%. *Please refer to Appendix A, KPI 3 for visuals.*
4. Road condition assessment: Road condition assessment over time with a target of no decline in score from 2016-2020 and projected improvements by 2025	Not Assessed	Subsequent to the performance measures that were mutually determined it was noted that SCI projection data for 2025 was not readily available. As such we were unable to assess this KPI in its entirety. To attain some comfort, we agreed on a revised KPI
Performance Objective	**Assessment (% Attained)**	**Summary**

Revised KPI: Road condition assessment over time with a target of no decline in score from 2016-2020.	Partially Attained 70-89.99% of performance measure	Management was able to provide mid-year data that would allow for the analysis of the SCI by function class (C1 & C2 Collector, C1 & C2 Arterial and Expressways) for the years 2016-2020. When conducting this analysis of a target of "no decline" in score from 2016-2020, we considered a negative change of 0.5 to be noteworthy. In addition, we considered whether the weighted average SCI at 2020 fell above or below the weighted average SCI value as at 2016 as an indicator of trend in road conditions. The analysis indicated the following: a). C1 Arterials: An overall decline in road condition when comparing the 2016 and 2020 weighted average SCI, and year over year decline in road conditions by an amount >=0.5 for the period 2016-2018. b). Expressways: An overall decline in road condition when comparing the 2016 and 2020 weighted average SCI, and year over year decline in road conditions by an amount >=0.5 for the period 2016-2019. *Note: Projections for 2025 could not be provided, please refer to CFI 2 for more details.* *Please refer to Appendix A, KPI 4 for visuals.*

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Internal controls assessment[2]

Based on the controls identified and tested, we have determined that there is reasonable evidence to indicate that:

#	Objective	Report classification				
		Optimally Controlled	**Managed**	**Some Improvement Opportunity**	**Major Improvement Opportunity**	**Unacceptable Risk Exposure**
1	The City has complied with Table 4 in Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure since March 31, 2019 as evidenced by the 2018-2019 AMP.	✔				
2	The City has clearly established road infrastructure maintenance program strategies and substantial implementation progress has been made towards most documented strategies.		✔			
3	The City has effective governance, people, and technology processes in place to achieve efficiency in operations throughout the road maintenance lifecycle.			✔		

During the audit, we noted the following good practices implemented by Public Works – Operations.

- A process has been implemented in which capital projects exceeding a specified threshold are required to be included in a separate report to Council outlining the reasons for the deficit. The requirement of disclosure depicts that concerns are raised to the highest level of authority and that the various departments are held accountable.

- The City of Windsor has an established 2018-2019 Asset Management Plan which includes timeframes and frequency of review of the various inputs that contribute to the AMP, such as the AM Policy, Corporate AMP, State of Infrastructure Report, Service Area AMPs, Review of AMP implementation progress and the Capital Budget. The level of detail and visualizations provided within the AMP provide the reader with clear and concise details regarding the quality and trends of the City's various assets. The AMP is expected to be reviewed and updated in 2023.

- Process/informational documents applicable to road maintenance are defined. In particular, the "Road & Alley Inspection Program Guide", excerpts from the "IMS Procedure Manual" and "2021 Road Conditions Ratings Map", amongst others. We inspected various policies applicable to road maintenance from the City's Dashboard. These policies identify the purpose, scope, responsible parties as well as governing rules and regulations.

- The City follows a process to allow for the coordination and planning of road maintenance projects through the Utilities Coordinating Committee. Visuals of future projects are also mapped for city-based items such as road construction, mill & pave, engineering, sewer rehabilitation and drainage rehabilitation.

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2 Rating scale described in Appendix C

The consolidation of various projects on the map of the city allows for efficient detection of overlap between projects.

We identified areas where internal control weakness exists, however, none were noted as a significant control deficiency. If implemented, our recommendations would serve to provide greater financial accuracy, operational effectiveness, and better leveraging of existing technology capabilities.

Management has provided comprehensive action plans, which we believe will address the deficiencies noted. Below we provide a summary of the findings noted as part of our work:

Summary of findings

#	Topic	Rating[3]		Management action plan
1	Establish a formal process relating to road maintenance coordination and road project deficiencies		Significant	The City will formalize its current process for identifying and addressing road deficiencies that may be under warranty.
			Moderate	
		X	Low	
2	Document a formal process to assist in identifying opportunities to merge related projects		Significant	The City will continue to work with the Utilities Coordinating Committee to identify opportunities to merge related projects. These meetings are documented through formal meeting minutes which are then distributed to committee members.

In addition, the City will continue to work with the Windsor Utility Commission with respect to merging lead watermain replacement with road rehabilitation projects. |
| | | | Moderate | |
| | | X | Low | |
| 3 | Investigate the root cause for the difference in results from the MBNC indicators for road maintenance spending and road quality | | Significant | Management will continue to work with the established MBNC expert panel and City internal processes that are in place, specifically:

A. Investigate and provide rationale for any year to year City measure result differences of +/- 10%.
B. Participate in the MBNC Road Expert Panel peer review of measure results prior to finalization of data for the annual MBNC Performance Measurement Report.
C. Compare City measure results to the median of MBNC |
| | | | Moderate | |
| | | X | Low | |

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3 See Appendix C for Basis of Finding Rating and Report Classification

				municipalities and provide rationale to Council for any differences of +/- 10%.
4	Explore options to enhance data granularity in regards to road treatment spending and funding allocation by function class	**X**	Significant	Management will continue to work with Asset Planning to finalize the implementation of the Assetic Predictor program, which will provide a formal process to effectively coordinate maintenance and address future projects through the prioritization of road work by type. Assetic Predictor will include enhanced data granularity in regards to road treatment spending and funding allocations. With respect to the tracking of expenditures, cost related to road rehabilitation cannot be easily categorised by type of treatment as each tender in each project includes various types of rehabilitation treatments and function classes. Opportunities for enhanced financial reporting will be investigated as we move forward with additional tools for automated procurement, budgeting and reporting. This will be addressed as opportunities to enhance our various systems arise.
			Moderate	
			Low	

Detailed findings

1. Establish a formal process relating to road maintenance coordination and road project deficiencies			Overall rating: Low
Impact:	Low	**Likelihood:**	Likely

Observation:

The City has an informal process for identifying and addressing road deficiencies that may be under warranty. In particular we noted the two following methods:

a) Correspondence via email between the City's Contract Supervisor and a Contractor indicating a list of outstanding deficiencies noted subsequent to the inspection. The deficiency list within this email did not include a timeline for rectification or the deficiency identification date.

b) Correspondence via document (Project Deficiency List) with a contractor that specified the project number, contractor, and date of substantial completion. A table was included in the document which included the deficiency item, the location, the date the deficiency was added as well as the date it was completed.

We noted that there is no formal process document established to guide and control activities within this process.

A process guiding the communication channel between the management team and the maintenance team does not exist. To ensure that road maintenance work is completed by the responsible party, communication between the two departments is crucial.

Implication:

A lack of established process for communicating and tracking outstanding deficiencies related to contractors may result in operational inefficiencies and having the City pay for work that might be under warranty.

Recommendation:

The City should consider developing a formal process to track and communicate with the contractors with respect to deficiencies noted. The process may include a standardized template to capture relevant and necessary details including but not limited:

- Contractor
- Project number
- Details of the deficiency
- The date the deficiency was identified
- Timelines for rectification of the issue

The overall process should also include a procedure to inspect roads under warranty that have a month left before warranty expires to make sure any remaining deficiencies can be communicated to the contractor prior to warranty expiration.

An overall tracking document should be maintained to track and follow up on the progress of the outstanding deficiencies.

A process to enable/guide coordination between the contract management team and the road maintenance team should be documented to ensure that timely communication is performed, and deficiencies are mitigated by the responsible parties. This may result in increased efficiencies between teams and cost savings.

Management Action Plan

Recommendation: The City will formalize its current process used to track and communicate with the contractors with respect to deficiencies noted. The process will capture relevant and necessary details including the: • Contractor; • Project number; • Details of the deficiency; • The date the deficiency was identified; and • Timelines for rectification of the issue. The process will include a procedure to inspect roads under warranty that have a month left before warranty expires to make sure any remaining deficiencies can be communicated to the contractor prior to warranty expiration. The process relating to tracking and following up on the progress of the outstanding deficiencies will be documented. Communication between the contract management team and the road maintenance team relating to mitigating deficiencies will also be documented.	Responsible party:	Manager, Contracts, Field Services, & Maintenance
	Due date:	2022 Q4

2. Document a formal process to assist in identifying opportunities to merge related projects	Overall rating: Low
Impact: Low **Likelihood:** Likely	

Observation:

A Utilities Coordinating Committee exists which helps in coordination and planning of future similar projects related to utilities including identifying areas of road construction, mill & pave, engineering, sewer rehabilitation, drainage rehabilitation. The consolidation map includes collective plans and provides indication of overlap between projects.

We also inspected email evidence of the City's attempt to merge other projects including Westminster storm sewer costs, and Windsor Utility Commission (WUC) project. Additionally, the City emails the Roads Need Study results (data report and map) to WUC each year upon completion of the road inspection program for their reference and use in planning & coordination of works.

Although the City provided evidence of various attempts to merge projects, of which some attempts were successful, a formal process documenting criteria to identify projects which can be potentially merged does not exist. Also, an overall communication and negotiation process to deal with the project managers does not exist.

Implication:

Absence of a formal process to identify opportunities to merge projects may lead to operational inefficiencies and missed opportunities to realize potential cost savings for the City.

Recommendation:

A formal process to document criteria for identifying opportunities to merge projects to create potential synergies and achieve economies of scale and efficiency in the process should be developed. The process should also include guidance / directions in regard to communication with the respective project managers.

A frequency to perform this exercise should be also defined, we would recommend annually as part of the annual planning exercise.

Management Action Plan		
Through regular meetings with the Utilities Coordinating Committee (documented with meeting minutes), Management will continue to work with the Utilities Coordinating Committee to identify opportunities to merge related projects. Similarly, the City will continue to work with the Windsor Utility Commission with respect to merging lead watermain replacement with road rehabilitation projects. Management will continue to work with Asset Planning to finalize the implementation of the Assetic Predictor program which will provide a formal process to effectively coordinate	**Responsible party:**	Manager, Contracts, Field Services, & Maintenance Senior Manager of Asset Planning
	Due date:	2024 Q1

maintenance and address future projects and deficiencies.		

3. Investigate the root cause for the difference in results from the MBNC indicators for road maintenance spending and road quality		Overall rating: Low	
Impact:	Low	**Likelihood:**	Likely

Observation:

We conducted a peer analysis regarding the key indicators related to road maintenance using the information from the 2019 Municipal Benchmarking Network Canada (MBNC) report. In selecting municipalities for comparison, we considered the following factors:

- Inflation
- Average Weather Conditions
- Level of Government
- Population
- City Size (Squared KM's)
- City Density

We selected the City of Hamilton, City of London, and City of Winnipeg to perform the analysis. The 2019 MBNC Report includes various measures for identifying municipalities' performance, relevant to peers, in regards to road maintenance and quality. We performed our analysis on the following two measures:

a) Percent of paved lane km where the condition is rated as good to very good

Note: This measure reflects the percent of paved lane km where no maintenance or rehabilitation action is required except for minor surface maintenance. Municipalities may use different approaches to assess and rate road conditions.

The average % of paved lane km where the condition was rated good to very good during the 2017-2019 period for City of Windsor and the selected comparators are as follows:

Average Road Conditions (2017-2019)
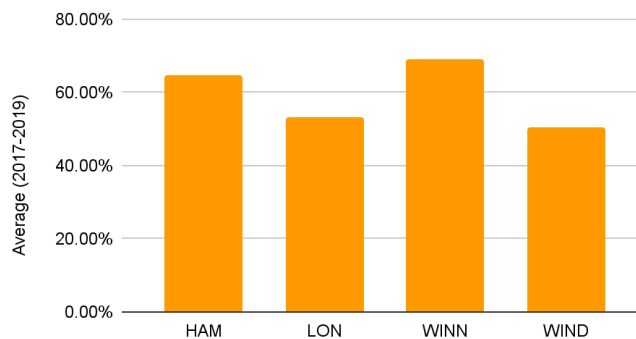
City of Windsor[4]: 50%   City of Hamilton: 65%
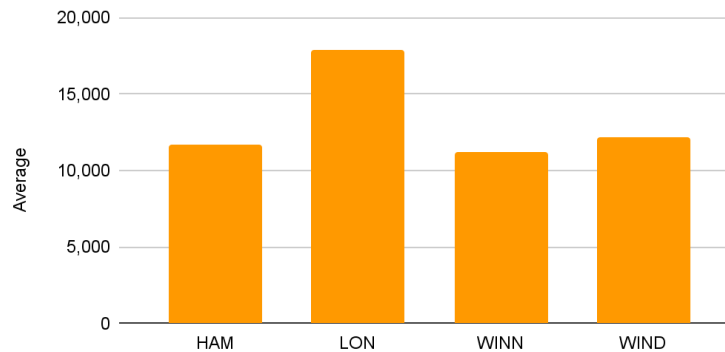
City of London: 53%   City of Winnipeg: 69%

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[4] The results of this analysis includes years 2017-2019. The results of KPI 3, seen in Appendix A, indicate a significant increase in the road infrastructure budget in 2020. It is acknowledged that the impacts of the increased spending on road infrastructure and the resulting impacts on the road condition are not reflected in this analysis.

b) Total Cost for Paved Roads per Lane Km (Hard Top) (in Thousands)
Note: This measure represents the total cost to maintain hard top (paved) roads. It includes operating costs and amortization associated with capital costs for paved road maintenance. A lane km is defined as a kilometre long segment of roadway that is a single lane in width. For example, a one km stretch of a standard two-lane road represents two lane km.

The average cost for paved roads per Lane Km (Hard Top) during the 2017-2019 period for the City of Windsor and the selected municipalities are as follows:

Total Average Cost for Paved Roads per Lane KM (2017-2019)

City of Windsor:	City of Hamilton:
$12,147	$11,697
City of London:	City of Winnipeg:
$17,908	$11,177

The results of this analysis indicate that the City of Windsor had the lowest % of roads ranked "Good to Very Good" even though the amount spent aligned with the selected municipalities in maintaining hard top roads. Management indicated that the method used to calculate the costs of paved roads per lane km may differ across municipalities based on the amortization method used for tangible capital assets and the method used to allocate overheads. In addition, whether or not a municipality includes laneways (ie. alleys) in the costs and lane km lengths can contribute to differences amongst municipalities in the result of this MBNC cost metric because laneways/alleys typically have a lower level of service. Management indicated that Windsor, being more southern in location, is typically subject to more freeze-thaw events which are damaging to road pavements. (Note: Management expressed concern regarding the inclusion of the City of Winnipeg as a comparator due to differing provincial reporting requirements, weather conditions, and a significant length of laneways included in the cost measure calculation; however the municipality has been used for other comparison previously and met the six factors considered by the internal audit project team).

Implication:
The results from the MBNC report may lead to ambiguities in public perception with respect to road maintenance spending and quality of roads.

Recommendation:

Management should investigate the root cause for the difference in results from the MBNC indicators with respect to road maintenance spending and quality of roads. We understand that the comparability of the result of the analysis, particularly regarding the City of Winnipeg, may be difficult given the difference in provincial reporting standards, inclusion or exclusion of laneways/alleys within the MBNC calculation and geographical concerns, particularly regarding weather conditions. However, the City of Winnipeg did fall within the acceptable range for various factors that resulted in its inclusion. Additionally, the exclusion of this municipality would not change the resulting conclusion.

Management should continue to independently conduct internal analysis of road quality indicators specified in the MBNC report and assess the results.

Management Action Plan		
Management appreciates the analysis performed by the Auditor on the two MBNC road measures as it suggests further analysis and comparison with other municipalities may lead to potential opportunities for improvement. Currently, internal and MBNC processes are in place to review and analyze our own data from year to year and to compare it to the group of 15 MBNC municipalities as a whole. Historically, the City's results have been consistent and in line with the median results of the MBNC municipalities. These results are reported annually to Council. As the audit suggests, there may be potential benefits in performing further analysis of other municipalities' data and processes. However, investigating for root causes of MBNC result differences between municipalities may prove challenging. For example, the Total Cost measure is based by definition on Ontario FIR financial calculations which are complex and have variability amongst municipalities with respect to amortization, expense allocation, etc. In addition, the MBNC Report & Road Expert Panel provide 7 Influencing Factors that affect comparability of these road measures between municipalities (eg. capitalization policy, maintenance standards / level of service, traffic volumes, weather, etc.). Through the MBNC program, further work is taking place at the expert panel level to develop service level profiles for all panels. Service level profiles will provide additional information to help inform measure results	**Responsible party:**	Manager, Contracts, Field Services, & Maintenance; Manager, Technical Support
	Due date:	A. 2022 Q3 B. 2022 Q4 C. 2023 Q1

and will aid in addressing differences amongst participating municipalities by providing additional insight into the root cause of data differences. This information could be used to supplement and enhance the annual MBNC reporting to both the public and to Council.

With respect to the three municipalities selected for comparison for the 2017-2019 time period, an analysis by Management yielded the factors outlined in the Observation Section for this Finding as well as the following observations:
- Windsor had the lowest average *Operating Cost for Paved Roads per Lane Km*
- Windsor had the highest average Amortization (depreciation of capital costs/assets) per lane km.
- London (nearest to Windsor in population, paved lane kms, & geographic location) had higher average *Total Cost for Paved Roads per Lane Km* and marginally better pavement condition.

In addition, it should be noted that Windsor's *Percent of Paved Roads Rated Good to Very Good* has increased from approximately 39% in 2004 to 50% in 2019. Amortization accounts for 76% of Windsor's *Total Average Cost* noted above and this represents the ongoing depreciation cost of historical and current capital improvements & roads added to the network.

Management will continue to work with the established MBNC expert panel and City internal processes that are in place, specifically:

A. Investigate and provide rationale for any year to year City measure result differences of +/- 10%.
B. Participate in the MBNC Road Expert Panel peer review of measure results prior to finalization of data for the annual MBNC Performance Measurement Report.
C. Compare City measure results to the median of MBNC municipalities and

provide rationale to Council for any differences of +/- 10%.		

4. Explore options to enhance data granularity in regards to road treatment spending and funding allocation by function class	Overall rating: Low
Impact: Low	**Likelihood:** Likely

Observation:

Two of the following agreed upon KPI's were not fully assessed due to the lack of data granularity. As a result, the required analysis and relevant results could not be identified. The two KPI's that could not be completed as originally intended were the following:

KPI 2: Variance in actual to planned spend per lane km by road treatment category
- To complete this analysis, we requested the budget and actual spending for 2016-2020 and projections for 2025 broken out by road rehabilitation treatments. The intention was to determine the volatility in actual spend to budgeted spend to uncover if there were any trends for consistent overspend or underspend and identify which particular road rehabilitation treatment methods were causing the greatest amount of variability.

Management communicated that data for road rehabilitation cannot be easily categorised by type of road rehabilitation treatment as each tender in each project includes various types of rehabilitation treatments and function classes. It was noted management does not have an efficient way to allocate "non-tender" costs to these rehabilitation treatment categories/function classes. Therefore, we were unable to conduct the analysis of this KPI at the level of specification originally anticipated.

The City is able to compare budget and actuals for a PeopleSoft Project number, however the PeopleSoft Project number is not linked to the overarching Questica Project (Program) number. Management has indicated that compiling budget and actual cost data for the Questica project IDs would be extremely time consuming as this would have to be compiled manually from PeopleSoft and there is no link between the systems. There are multiple PeopleSoft Project numbers for each Questica Project number.

KPI 3: Increase in Funding allocation

- To complete this analysis, we requested the funding sources for the various function classes (C1 & C2 Collector, C1 & C2 Arterial and Expressways) for 2016-2020, with projections for 2025. The intention was to determine if the amount of funding was increasing year over year at least by the amount of 1.16% (dedicated tax levy for AMP).

Management confirmed that funding cannot be categorized by function class (ie. Arterial, Collector and Expressways) as the budget is approved at a high level. Having the budget approved at "Road Infrastructure" level allows for greater flexibility.

Please refer to Appendix A, KPI 2 & KPI 3 for visuals.

Implication:

Lack of granularity requirements when reporting budgets and actuals in regards to road maintenance may result in the inability to perform analysis at a level of specificity that could provide valuable insights. The inability to identify trends in a timely manner may result in operational inefficiencies.

Recommendation:

Given the importance and investment in road infrastructure the City should clearly define meaningful key spending and funding allocation performance indicators by which progress, and performance may be measured. Once this is defined by management there should be an assessment to ensure that supporting data and records are collected in a manner sufficient to provide current, historical and, ideally, forecasted performance of these performance indicators.

The City should explore options to enhance data granularity. This may include performing a cost benefit analysis to determine if the benefits associated with obtaining additional resources would outweigh the expense. This in turn would allow the City to identify trends and provide timely analysis of information which may lead to enhanced transparency and operational effectiveness.

Management Action Plan

The City has invested in the Assetic Predictor software that is expected to assist in assessing the condition ratings of various assets (such as our roads and sewers) and in the prioritization of the repair and maintenance work related to those assets. Management will continue to work with Asset Planning to finalize the implementation of the Assetic Predictor program which will provide a formal process to effectively coordinate maintenance and address future projects and deficiencies. The program will also assist with prioritization of road work by type and provide the ability to develop and monitor budgets on a more granular basis. Assetic Predictor will include enhanced data granularity in regards to road treatment spending and funding allocations. Adjustment can then be made based on future needs such as road function class, budget availability, social and economic needs, etc. With respect to the tracking of expenditures, as noted, cost related to road rehabilitation cannot be easily categorised by type of treatment as each tender in each project includes various types of rehabilitation treatments and function classes. Despite this limitation, in 2022 enhancements were made to track road work costs related specifically to the EC Row Expressway. Under our current systems, this has created a tremendous amount of manual intervention to set-up and maintain this tracking for both Public Work Operations and Financial Planning staff. In order to roll this out to all roadways and maintenance types, significant staffing resources, along with process changes related to procurement and financial tracking, would be required.	**Responsible party:**	Executive Director, Operations Deputy Treasurer Financial Planning Senior Manager Asset Planning
	Due date:	2024 Q1

Opportunities for enhanced financial reporting will be investigated as we move forward with additional tools for automated procurement, budgeting and reporting. This will be addressed as opportunities to enhance our various systems arise.		

Considerations for improvement

<table>
<tr><td>1. Consider reviewing road maintenance strategies within AMP for strategies not being considered for implementation</td></tr>
</table>

Observation

The City of Windsor has an AMP in place which was last updated in 2018-2019 AMP. This AMP includes strategies for various road maintenance activities. Upon inquiry of the following two strategies, we noted:

a). Pre-commitments out up to five years for large projects

- Management indicated that pre-commitment approvals for five-year intervals are not obtained, rather the approval is obtained on an annual basis. As per management, the ability to pre-commit funds out to five years exists however it is not practical for road rehabilitation. Management's current stance is to deal with on a year-on-year basis.

b). *Specifications for utility cuts have been enhanced to help maintain the road segment integrity and retain proper condition rating and useful life projections.*

- Management provided evidence of improvement regarding the utility cut process that occurred during 2011-2012. However, management indicated that no additional progress has been made towards this strategy as the changes implemented in 2012 addressed the concern and no additional improvements were required.

Consideration

Management should consider reviewing the above noted road maintenance strategies to determine if it needs to be removed or modified to align with the current needs of the City. The next AMP review and update is scheduled for the year 2023.

<table>
<tr><td>2. Consider the viability of generating 2025 SCI projections</td></tr>
</table>

Observation:

The following two KPI's were agreed upon when the scope was finalised that would include SCI projections for 2025:

a). KPI 1: % of paved lane km where no maintenance or rehabilitation action is required (good to very good condition, having a Structural Condition Index 1-4

b). KPI 4: Road condition assessment over time with a target of no decline in score from 2016-2020 and projected improvement by 2025.

The analysis for KPI 1& KPI 4 included the analysis for the SCI values by function class (C1 & C2 Collector, C1 & C2 Arterial and Expressways). The data was originally requested for 2016-2020 and the projection for 2025. Management confirmed that funding is provided on a yearly basis, as a result, they cannot project future SCI's as they do not know specifically which roads will be given priority.

Consideration:
Upon completion of modelling in the Predictor software, Management should determine whether to include or exclude 5-year projections of SCI in the Asset Management Plan. [5]

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3. Consider defining realistic measurements or targets for monitoring road conditions

Observation:
KPI 4: Road condition assessment over time with a target of no decline in score from 2016-2020 and projected improvement by 2025 for specific in-scope function class roads (C1 & C2 Collector, C1 & C2 Arterial and Expressways).

For this KPI we considered two factors in generating our conclusions:

- A negative change of the weighted average SCI greater than or equal to 0.5, year over year from 2016-2020 for that specific in-scope function class would be noted.
- In addition, we considered whether the weighted average SCI at 2020 fell above or below the weighted average SCI value as at 2016 as an indicator of trend in road conditions. If the weighted average SCI for that particular in-scope function class for 2020 was above the value in 2016, this would indicate a decline in that particular function class's road condition.

The results of KPI 4 indicated a decline in road conditions, via the calculated weighted average SCI metric, for two in-scope function classes:

a). C1 Arterials: Weighted Average SCI saw an overall deterioration in condition from 2016 (SCI: 8.88) to 2020 (SCI: 11.26), a decline in condition of 2.38. In addition, a negative trend >=0.5 was exceeded in each year from 2016-2018. Although the Weighted Average SCI trend has shown some improvement from 2018-2020, the 2020 weighted average SCI exceeds that weighted average SCI during 2016.

b). Expressways: Weighted Average SCI saw an overall deterioration in condition from 2016 (SCI: 12.11) to 2020 (SCI: 14.09), decline in condition of 1.98. In addition, a negative trend that >=0.5 was exceeded in each year from 2016-2019. Although the Weighted Average SCI trend has shown some improvement from 2019-2020, the 2020 weighted average SCI exceeds the weighted average SCI during 2016.

Consideration:
This KPI was agreed to by management. It is recommended that management define a relevant measurement or target that aligns with the AMP in order to monitor road conditions. In particular, specific targets which specify acceptable tolerances for different roads and different segments may be beneficial.

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[5] Management provided screenshots and commentary regarding Predictor software currently being implemented for use by the City and WUC. The screenshots indicate that the City can forecast the road condition ratings based on current asset data. In addition, the software will have the sophistication to recommend road treatments as well as allocation for each type of road treatment. Management confirmed that this project has been in progress for 18 months and is near completion.

Appendix A: KPI Analysis

Revised KPI 1: % of total paved lanes for in-scope road classification where paved lane km has a structural condition index of < 5 (Excludes 2025 SCI projections)

Expectation to inform audit conclusion: % of total paved lanes for in-scope road classification where paved lane km has a structural condition index of < 5

Note: The graphs were developed using the Mid-Year reports provided by management. The % adequate roads were calculated as the adequate km (LN/L) for the specific in-scope function class, divided by the total km for that in-scope function class. Increases in the line graph indicate an improvement in the % of roads that are deemed adequate for that specific in-scope function class.

For the purposes of interpreting the results, the 2017 Mid-Year report results are reflected in 2016 in the graph below. The mid-year reports are generated in early to mid June once all scheduled inspections have been performed and all the inspection data processed to the Hansen system. Therefore, the inspections are actually performed closer to the year end of the previous year than the year end of the current calendar year. For example, an inspection performed in March/April 2017 is closer to the year end 2016 than it would be to year end 2017.

% Adequate Roads (SCI 1-4) by In-Scope Function Class
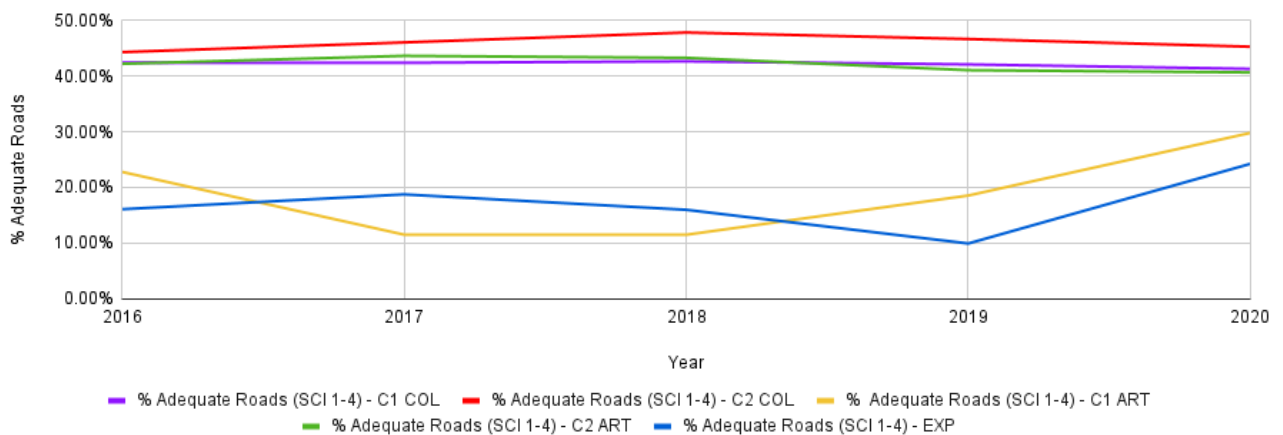
## % Adequate Roads (SCI 1-4) - Total Collector & Total Arterial
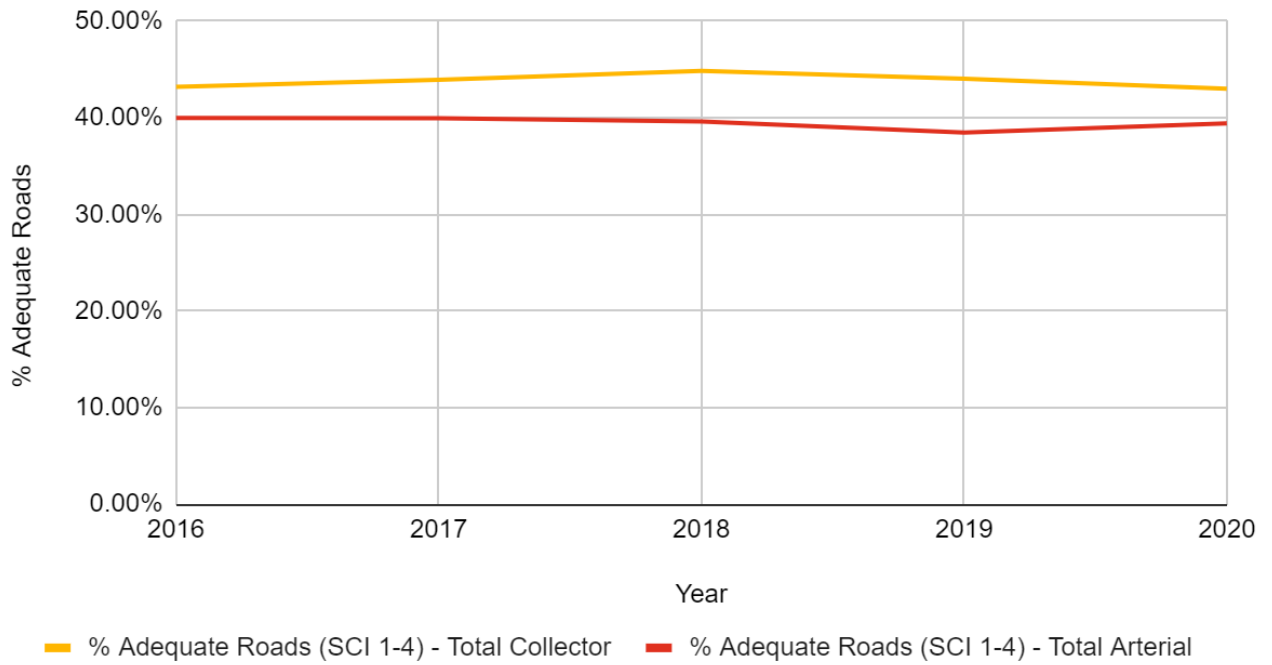
Legend:
— % Adequate Roads (SCI 1-4) - Total Collector   — % Adequate Roads (SCI 1-4) - Total Arterial

Revised KPI 2: Variance in actual to planned spend for the Road Rehabilitation category was within 5%
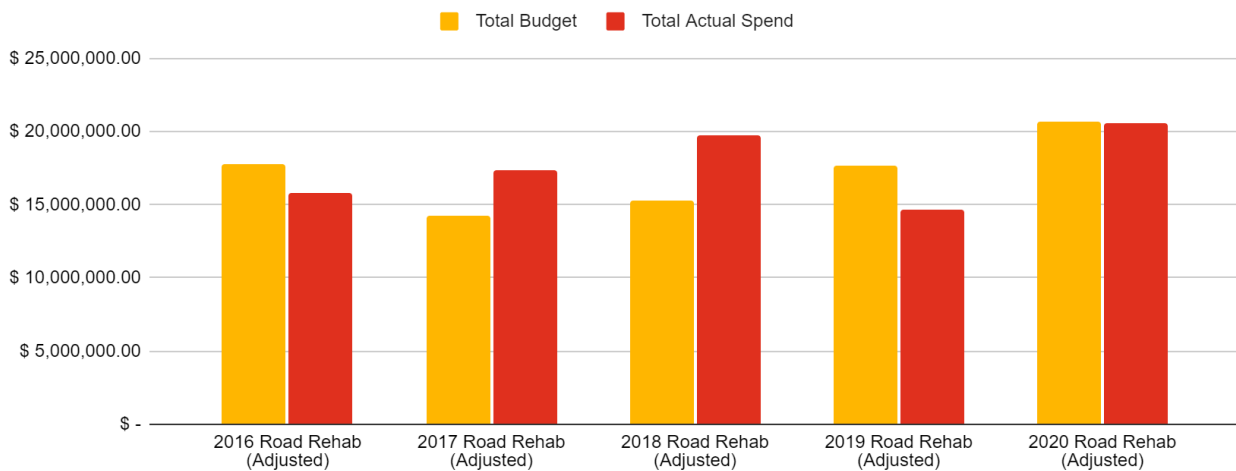
Expectation to inform audit conclusion: Less than 5% of plan

Note: For the purposes of this analysis, the City provided the road rehabilitation budget for 2016-2020 along with additional projects that would be considered road rehabilitation. The term "adjusted" in the graphs references the inclusion of the budget and actuals for road rehabilitation as well as the inclusion of the budgets and actuals that would be considered road rehabilitation projects.
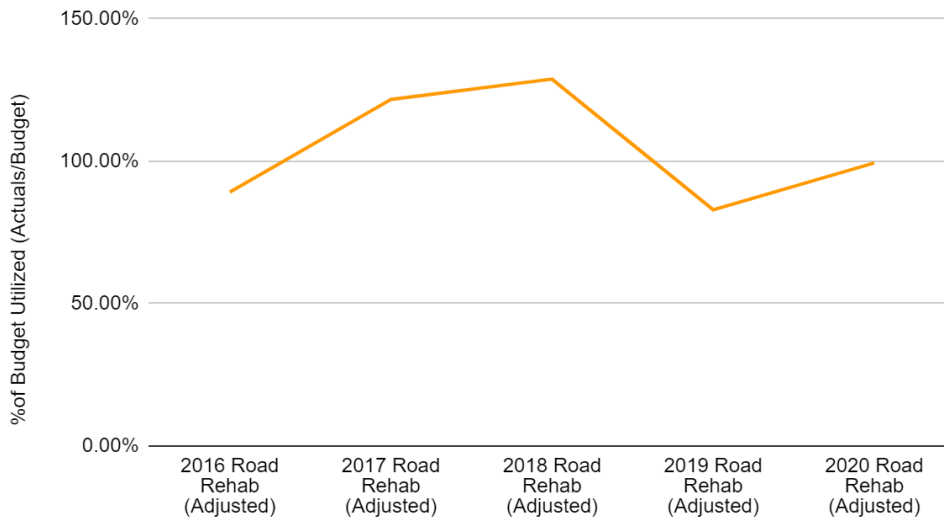
Adjusted Road Rehabilitation Budget (2016-2020)
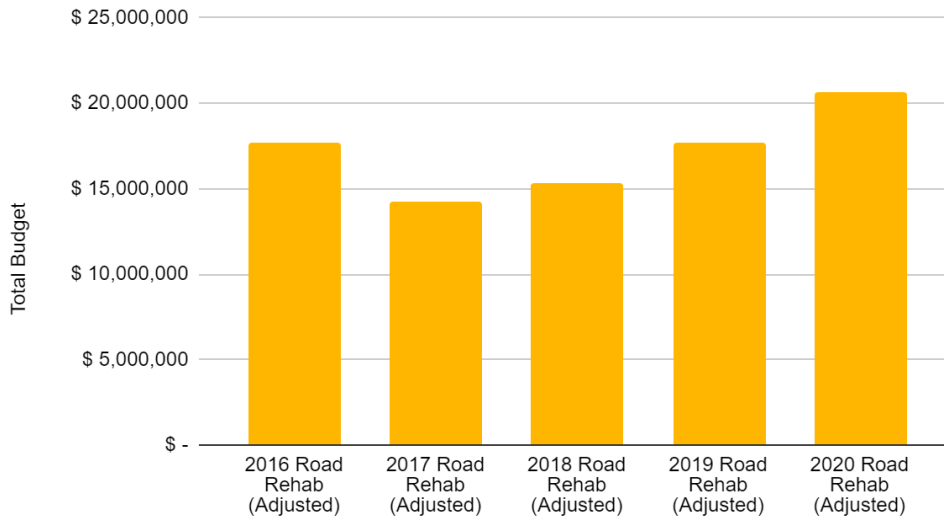
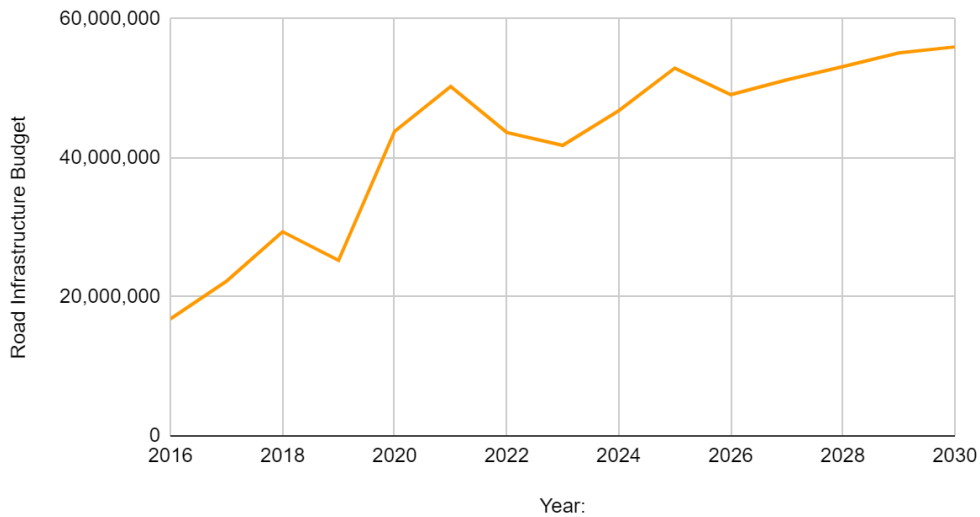## Total Budget vs Total Actual Spend (2016-2020)

% of Budget Utilized

Revised KPI 3: Increase in funding allocation at the Capital Budget level

Expectation to inform audit conclusion: Should be at least 1.16% per year (the amount of dedicated tax levy for AMP)

Road Infrastructure Budget vs. Year:

Revised KPI 4: Road condition assessment over time with a target of **no decline** in score from 2016-2020.

Expectation to inform audit conclusions: No decline in SCI from 2016-2020; projected improvement by 2025.
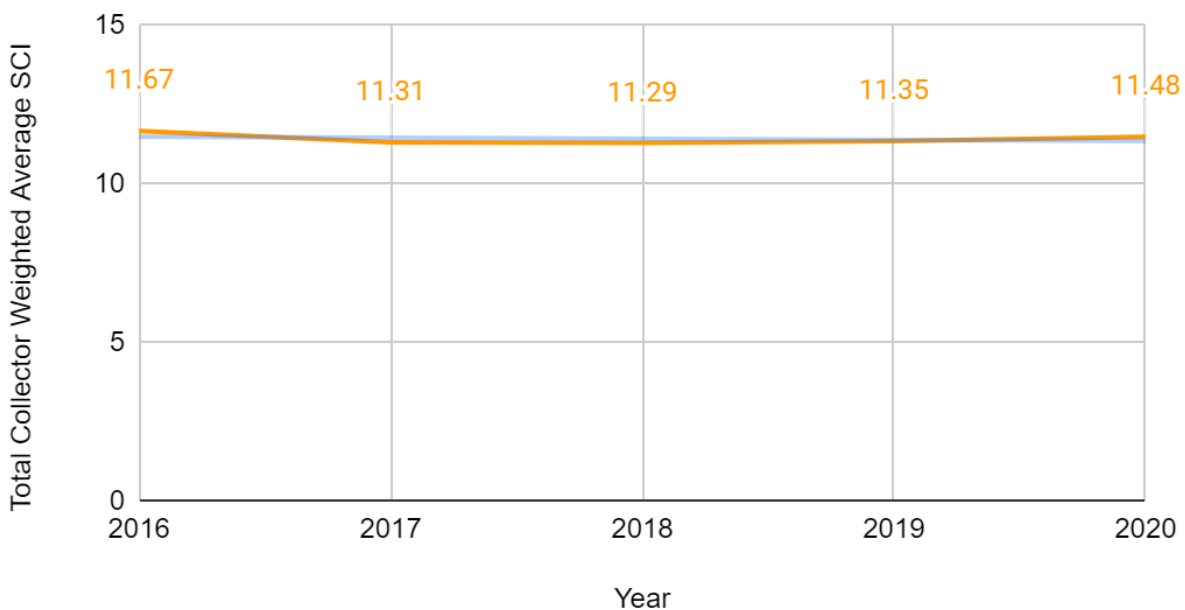
SCI	
20 - 100	Now Deficient
10 - 19	1 - 5 Year Deficient
5 - 9	6 - 10 Year Deficient
1 - 4	Adequate

Note: The graphs were developed using the Mid-Year excel reports provided by Management. The SCI was calculated as a weighted average for each in-scope function class from 2016-2020. An increase in the line graph indicates a decline in road condition for that specific in-scope function class.

For the purposes of interpreting the results, the 2017 Mid-Year report results are reflected in 2016 in the graph below. The mid-year reports are generated in early to mid June once all scheduled inspections have been performed and all the inspection data processed to the Hansen system. Therefore, the inspections are actually performed closer to the year end of the previous year than the year end of the current calendar year. For example, an inspection performed in March/April 2017 is closer to the year end 2016 than it would be to year end 2017.
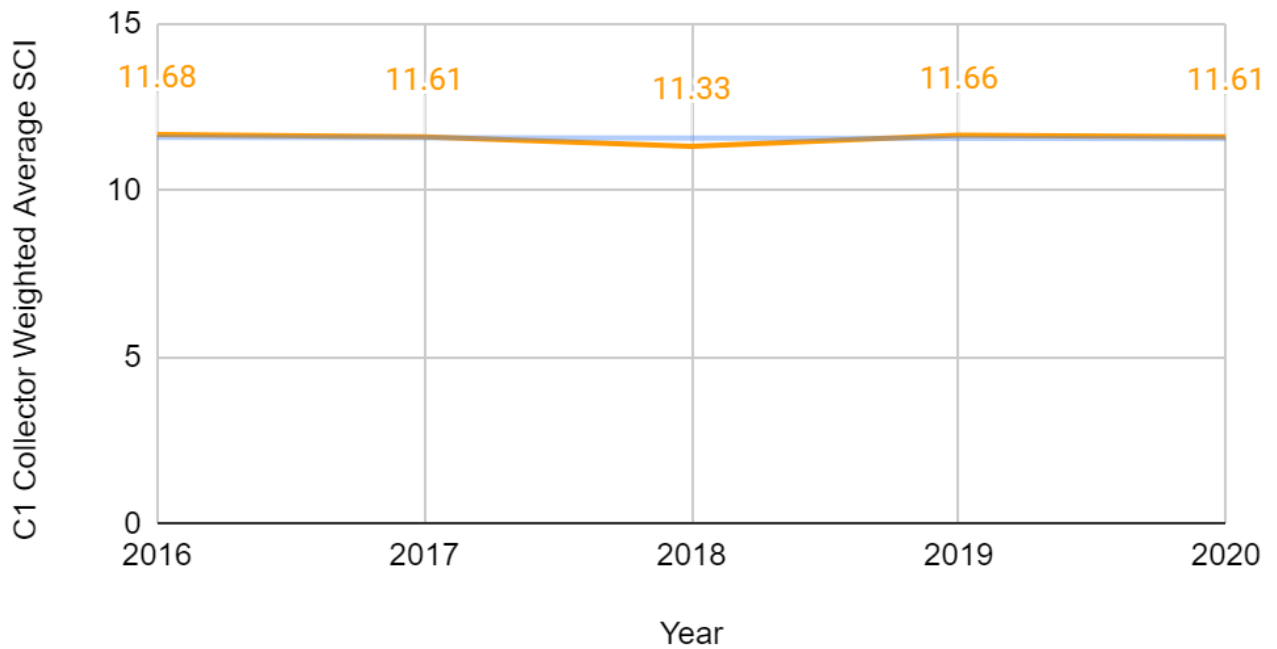
Collector Roads:

Total Collector: Weighted Average SCI remained relatively stable from 2016 through 2020. There were no instances of year over year increases in weighted average SCI by an amount greater than or equal to 0.5. In addition, the 2020 weighted average SCI of 11.48 showed improvement over the 2016 weighted average SCI result of 11.67.
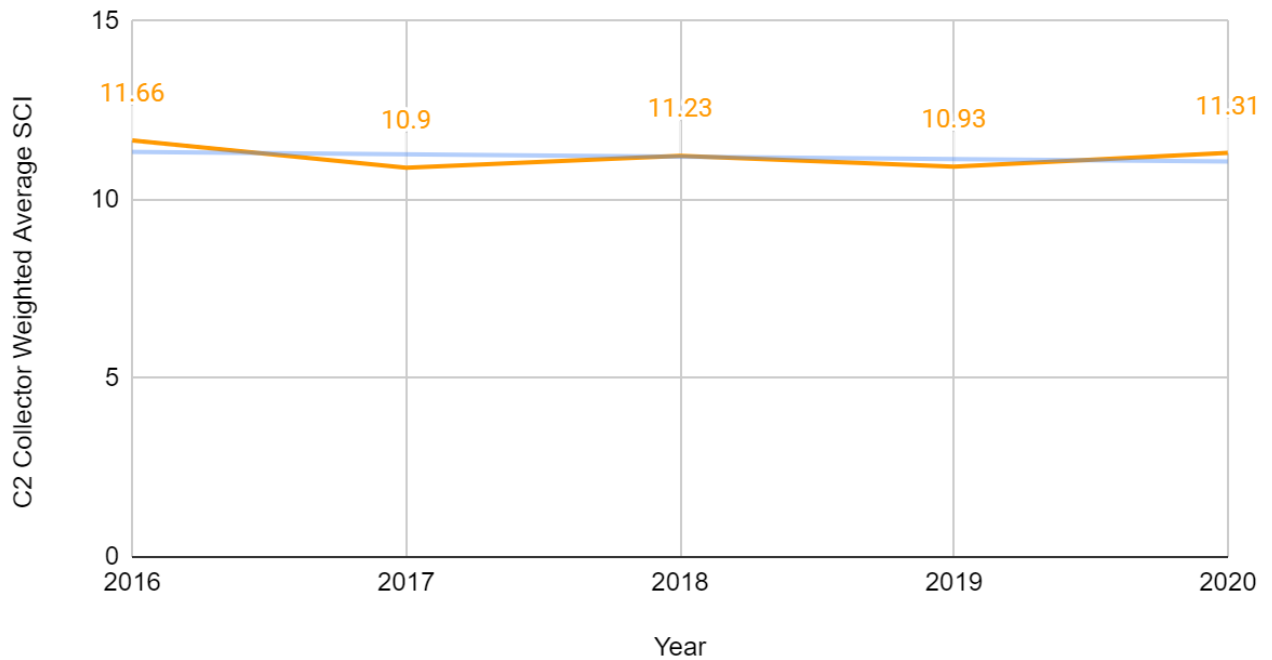
C1 Collector Weighted Average SCI

C1 Collector: Weighted Average SCI remained relatively stable from 2016 through 2020. There were no instances of year over year increases in weighted average SCI of an amount greater than or equal to 0.5 In addition, the 2020 weighted average SCI of 11.61 showed improvement over the 2016 weighted average SCI result of 11.68. No concerns were noted.

C2 Collector Weighted Average SCI

C2 Collector: Weighted Average SCI saw a decrease in SCI that was greater than 0.5 from 2016-2017, which indicates improvement in the condition of the in-scope function class. The weighted average SCI trend remained relatively stable from 2017 through 2020. In addition, the 2020 weighted average SCI of 11.31 showed improvement over the 2016 weighted average SCI result of 11.66. No concerns were noted.
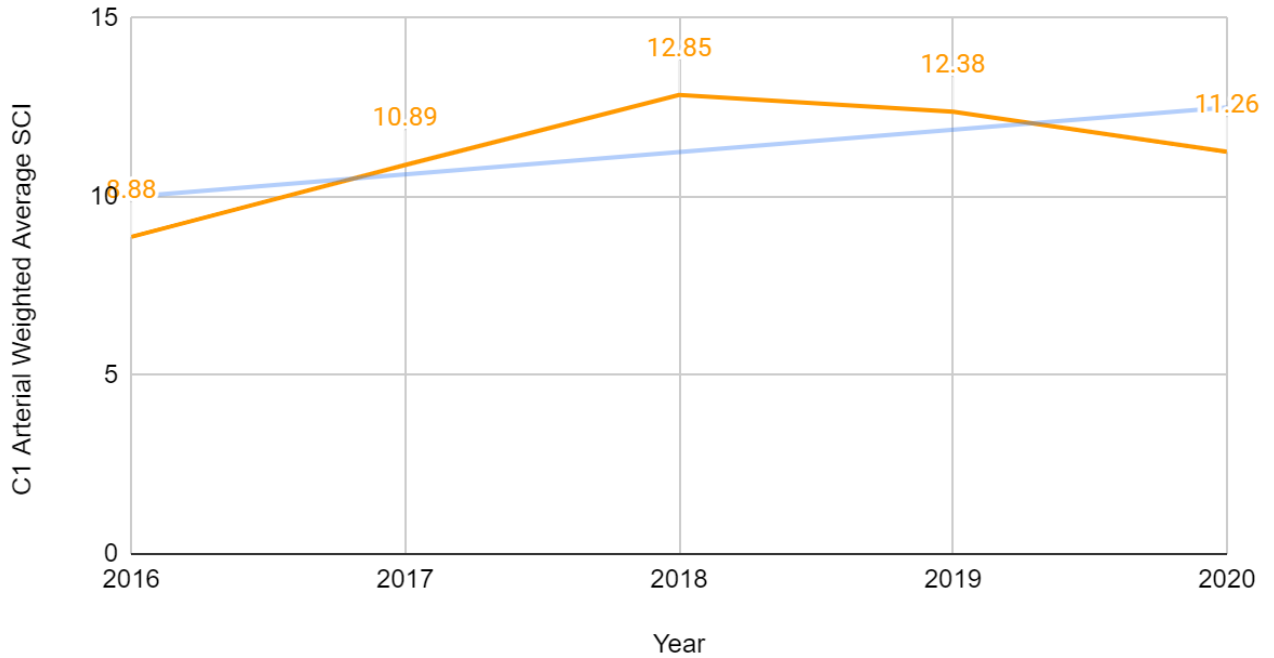
Arterial Roads:

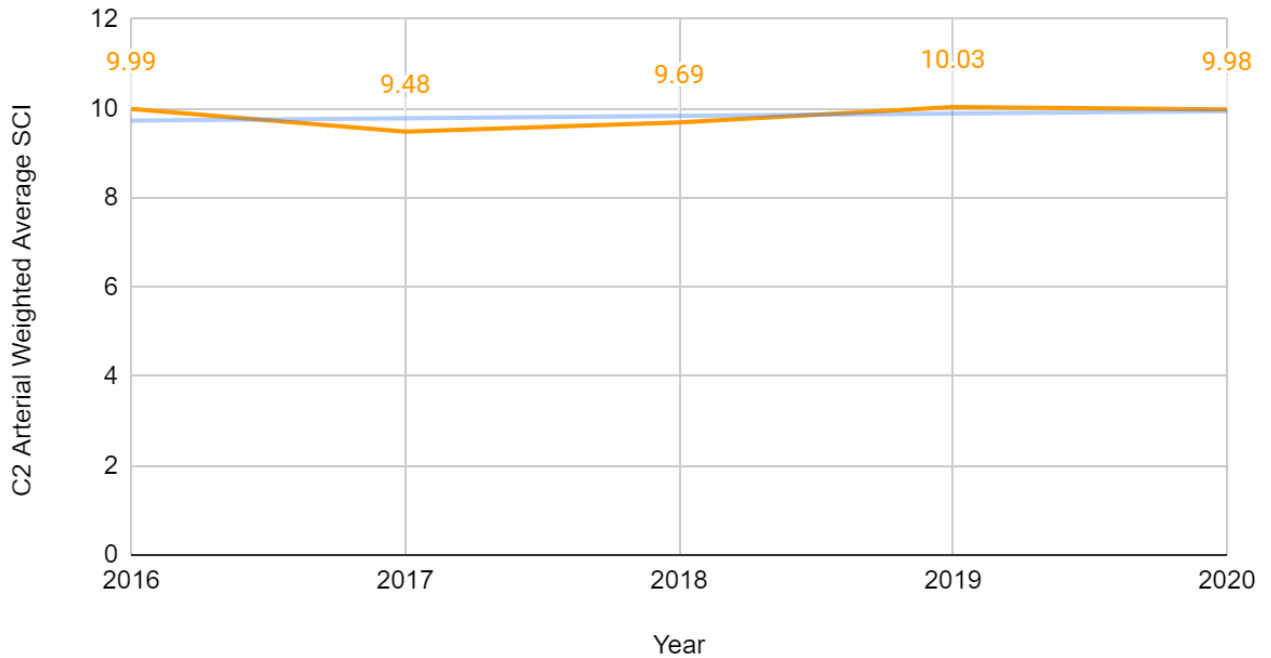### Total Arterial Weighted Average SCI
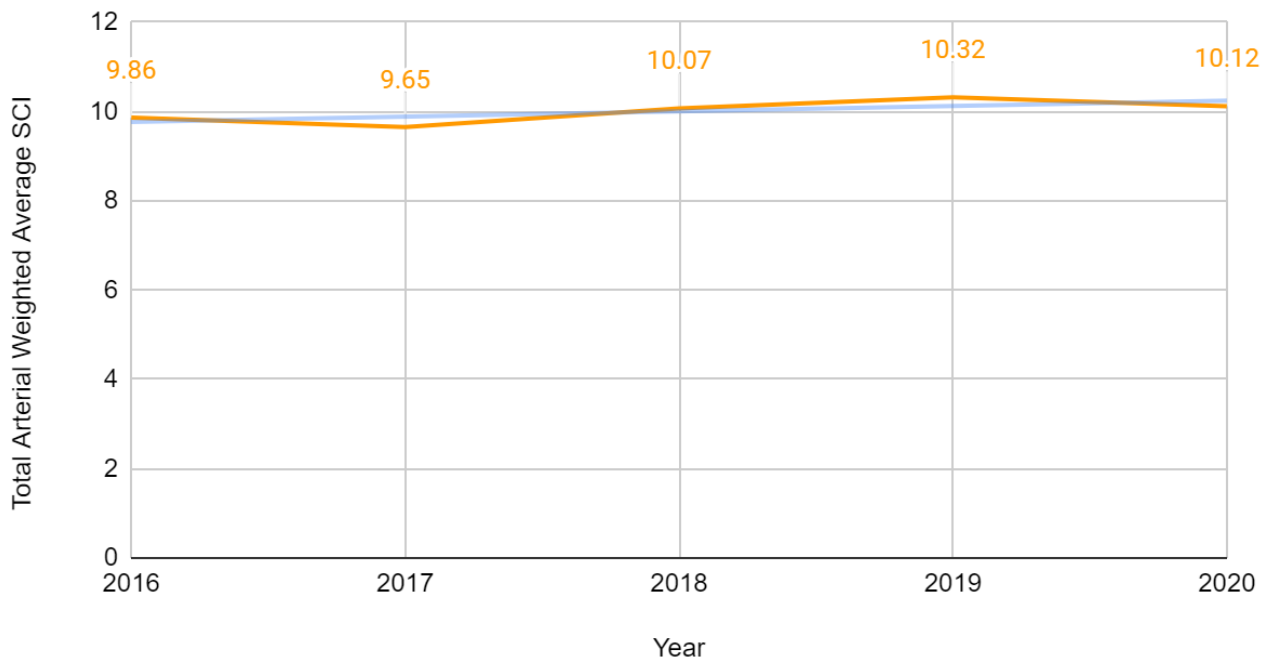
Total Arterials: Total Arterial Weighted Average SCI saw overall deterioration in condition from 2016 (SCI: 9.86) to 2020 (SCI: 10.12), a decline in condition of 0.26. No individual year over year comparison indicated a decline in road condition from 2016-2020 of an amount greater than or equal to 0.5. No concerns were noted.

C1 Arterial Weighted Average SCI

C1 Arterial: Weighted Average SCI saw an overall deterioration in condition from 2016 (SCI: 8.88) to 2020 (SCI: 11.26), a decline in condition of 2.38. In addition, a negative trend >=0.5 was exceeded in each year from 2016-2018. Although the Weighted Average SCI trend has shown some improvement from 2018-2020, the 2020 weighted average SCI exceeds that weighted average SCI during 2016. This is noted in CFI 3.
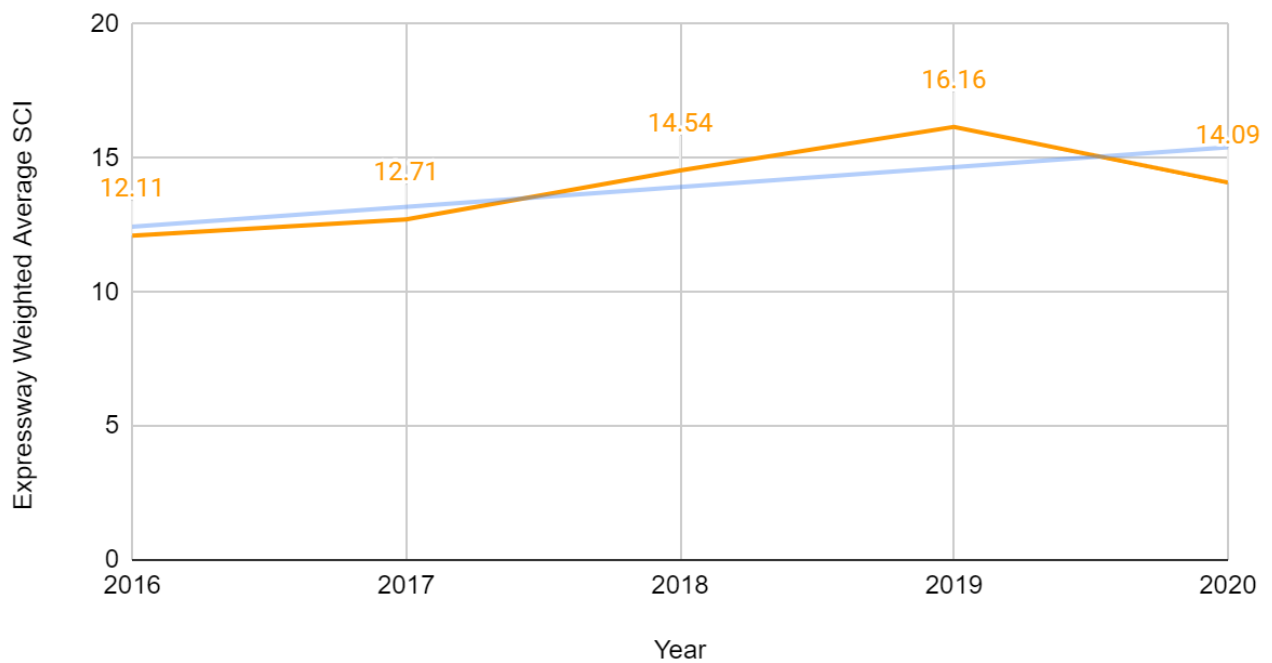
C2 Arterial Weighted Average SCI

C2 Arterial: Weighted Average SCI saw an overall improvement in condition from 2016 (SCI: 9.99) to 2020 (SCI: 9.98). There were no instances of year over year increases in weighted average SCI of an amount greater than or equal to 0.5. No concerns noted.

Expressways:

Expressway Weighted Average SCI

Expressway: Weighted Average SCI saw an overall deterioration in condition from 2016 (SCI: 12.11) to 2020 (SCI: 14.09), decline in condition of 1.98. In addition, a negative trend that >=0.5 was exceeded in each year from 2016-2019. Although the Weighted Average SCI trend has shown some improvement from 2019-2020, the 2020 weighted average SCI exceeds the weighted average SCI during 2016. This is noted in CFI 3.

Appendix B: Background, Scope and Objectives

Background

We conducted a Value for Money (VFM) /Performance Audit of road maintenance activities and processes based on the risks identified through discussion with key stakeholders. This was a value enhancement audit where the Internal Audit (IA) addressed risks including: Regulatory Compliance, Road Maintenance Strategies and Governance, People and Technology design processes.

Scope

The focus of this internal audit will be to evaluate the performance of the activities related to road infrastructure maintenance of core transportation assets, specifically the expressway, arterial roads, and collector roads. In particular Internal Audit worked with management to identify KPIs against which performance may be measured focusing on economy, efficiency and effectiveness of road maintenance activities. The KPIs were agreed with management prior to the audit kick off.

Performance objectives

In forming our audit conclusions, the following performance indicators were assessed for the past five fiscal years (2016-2020) and the projected 2025 fiscal year for the in-scope road infrastructure functional classification categories. Select municipal comparisons were made where information was available.

1. % of paved lane km where no maintenance or rehabilitation action is required (good to very good condition, having a Structural Condition Index 1-4)
2. Variance in actual to planned spend per lane km by roadway treatment category[6]
3. Increase in funding allocation[7]
4. Road condition assessment over time with a target of no decline in score from 2016-2020 and projected improvement by 2025

Revision: During fieldwork it was determined that all four mutually agreed to KPIs could not be assessed. As a result, four revised measures were used at a more aggregate level:

*   *Revised KPI 1: % of total paved lanes for in-scope road classification where paved lane km has a structural condition index of < 5 (Excludes 2025 SCI projections)*

*   *Revised KPI 2: Variance in actual to planned spend for the Road Rehabilitation category was within 5%*

*   *Revised KPI 3: Increase in funding allocation at the Capital Budget level.*

*   *Revised KPI 4: Road condition assessment over time with a target of no decline in score from 2016-2020.*

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6 Management was not able to readily provide information/data/analysis at the level of specificity for this measures - a revised KPI #2 was then used.

7 Management was not able to readily provide information/data/analysis at the level of specificity for this measures - a revised KPI #3 was then used.

Internal audit objectives

The focus of this internal audit was on the performance of the activities related to road infrastructure maintenance of core transportation assets. Specifically, maintenance activities related to the Arterial, Collector and Expressway road infrastructure functional classification categories were examined for economy, efficiency and effectiveness by conducting the following high-level audit activities:

1. Examine progress made to comply with Table 4 in Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure since March 31, 2019 as it specifically relates to maintenance for road functional classifications which are in-scope on this project (effectiveness).

2. Assess road infrastructure maintenance program strategies, implementation plans and current performance against CoW 2018-19 Asset Management Plan (AMP) and common practice (economy & effectiveness).

3. Assess the design of governance, people and technology processes in place to achieve efficiency in operations throughout the road maintenance lifecycle (economy & efficiency).

Specific scope exclusions

Given the nature of the work and budgeted effort, the following elements are explicitly excluded from the scope of this internal audit:

- The effective design, implementation and operation of the Information and Technology (IT) environment and IT general controls;

- Local, Scenic Parkway and Alley road infrastructure assets are considered lower risk.

- Activities related to winter road clearing maintenance as a Value for Money/Performance Audit of purchased services related to winter road clearing was conducted in 2020.

Controls in place to identify, prioritize, plan and oversee the AMP roll out prior to March 31, 2019 as asset management practices covered in the 2019 Internal Audit of life cycle costing and asset planning methodology.

Appendix C: Basis of findings rating and report classification

Performance measurement classification

Performance Measures Fully Met	
Exceeded	>100% of performance measure
Attained	100% of performance measure
Performance Measure Partially Met	
Substantially Attained	90-99.99% of performance measure
Partially Attained	70-89.99% of performance measure
Somewhat Attained	50-69.99% of performance measure
Performance Measure Not Met	
Not Attained	<50% of performance measure
Performance Measure Not Assessed	
Not Assessed	Given project constraints no determination of the performance criteria viable under the project or data constraints.

Audit report classification

Report Classification	The internal audit identified one or more of the following:
Optimally Controlled	• Well-structured design effectively achieves fit-for purpose control objectives • Controls consistently applied and operating at optimum level of effectiveness.
Managed	• Sound design achieves control objectives. • No control design improvements identified. • Controls consistently applied. • Only minor instances of controls identified as not operating, which have mitigating back-up controls or the risk of loss is immaterial. • All previous significant audit action items have been closed.
Some Improvement Opportunity	• Control design improvements identified, however, the risk of loss is immaterial. • Isolated or "one-off" significant controls identified as not operating for which

(orange)	• sufficient mitigating back-up controls could not be identified. • Numerous instances of minor controls not operating for which sufficient mitigating back-up controls could not be identified. • Some previous significant audit action items have not been resolved on a timely basis.
Major Improvement Opportunity (dark orange)	• Design is not optimum and may put control objectives at risk. • Control design improvements identified to ensure that risk of material loss is minimized and functional objectives are met. • A number of significant controls identified as not operating for which sufficient mitigating backup controls could not be identified which may put control objectives at risk. • Losses have occurred as a result of control environment deficiencies. • Little action taken on previous significant audit findings to resolve the item on a timely basis.
Unacceptable Risk Exposure (red)	• Control design leaves the opportunity for loss, error or abuse. • Significant control design improvements identified to ensure that the risk of material loss is minimized and functional objectives are met. • An unacceptable number of controls (including a selection of both significant and minor) identified as not operating for which sufficient mitigating back-up controls could not be identified creating the opportunity for loss, error or abuse. • Material losses have occurred as a result of control environment deficiencies. • Instances of fraud or significant contravention of corporate policy detected. • No action taken on previous significant audit findings to resolve the item on a timely basis.

Finding ratings

Finding rating matrix	Low Impact	Medium Impact	High Impact
Highly likely • History of regular occurrence of the event. • The event is expected to occur in most circumstances.	**Moderate**	**Significant**	**Significant**
Likely • History of occasional occurrences of the event. • The event could occur at some time.	**Low**	**Moderate**	**Significant**
Unlikely • History of none or seldom occurrence of the event. • The event may occur only in exceptional circumstances.	**Low**	**Low**	**Moderate**

Impact	Impact Consideration

High	**Financial impact** likely to exceed $250,000 in terms of direct loss or opportunity cost.
	Internal Control: Significant control weaknesses, which would lead to financial or fraud loss.

	An issue that requires a significant amount of senior management/Board effort to manage such as:
	• Failure to meet key strategic objectives/major impact on strategy and objectives.
	• Loss of ability to sustain ongoing operations:
	   ○ Loss of key competitive advantage/opportunity
	   ○ Loss of supply of key process inputs
	• A major reputational sensitivity, e.g., market share, earnings per share, credibility with stakeholders and brand name/reputation building.

	Legal/regulatory: Large scale action, major breach of legislation with very significant financial or reputational consequences.
Medium	**Financial impact** likely to be between $75,000 to $250,000 in terms of direct loss or opportunity cost.
	Internal Control: Control weaknesses, which could result in potential loss resulting from inefficiencies, wastage, and cumbersome workflow procedures.
	An issue that requires some amount of senior management/Board effort to manage such as: • No material or moderate impact on strategy and objectives. • Disruption to normal operation with a limited effect on achievement of corporate strategy and objectives • Moderate reputational sensitivity.
	Legal/regulatory: Regulatory breach with material financial consequences including fines.
Low	**Financial impact** likely to be less than $75,000 in terms of direct loss or opportunity cost.
	Internal Control: Control weaknesses, which could result in potential insignificant loss resulting from workflow and operational inefficiencies.
	An issue that requires no or minimal amount of senior management/Board effort to manage such as: • Minimal impact on strategy • Disruption to normal operations with no effect on achievement of corporate strategy and objectives • Minimal reputational sensitivity.
	Legal/Regulatory: Regulatory breach with minimal consequences.

Appendix D: Limitations and responsibilities

Limitations inherent to the internal auditor's work

Internal control
Internal control systems, no matter how well designed and operated, are affected by inherent limitations. These include the possibility of poor judgment in decision-making, human error, control processes being deliberately circumvented by employees and others, management overriding controls and the occurrence of unforeseeable circumstances.

Future periods
Our assessment of controls is for the period specified only. Historic evaluation of effectiveness is not relevant to future periods due to the risk that:

- the design of controls may become inadequate because of changes in operating environment, law, regulation or other; or

- the degree of compliance with policies and procedures may deteriorate.

Responsibilities of management and internal auditors
It is management's responsibility to develop and maintain sound systems of risk management, internal control and governance and for the prevention and detection of irregularities and fraud. Internal audit work should not be seen as a substitute for management's responsibilities for the design and operation of these systems.

We endeavour to plan our work so that we have a reasonable expectation of detecting significant control weaknesses, and if detected, we shall carry out additional work directed towards identification of consequent fraud or other irregularities. However, internal audit procedures alone, even when carried out with due professional care, do not guarantee that fraud will be detected.

Accordingly, our examinations as internal auditors should not be relied upon solely to disclose fraud, defalcations or other irregularities which may exist.