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Performance Audit of the  
Infrastructure Capital  
Planning Division

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November 27, 2023

Final Report

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## OBJECTIVE

To assess the extent of regard for value-for-money within the Infrastructure Capital Planning Division.

## BACKGROUND

The Infrastructure Capital Planning Division employs 23 full-time staff and several part-time staff who are responsible for long-range master planning, asset management and capital budgets for roads, transportation, bridges, storm water, linear water distribution, linear wastewater collection, storm-water and wastewater treatment facilities and management of traffic signals and road safety. Staff also provide business improvement and technology innovation support, review development approval applications, road occupancy & oversize load permitting, and administer utility locate services. Financial results for the Division are shown below in Table 1.

Revenues and Expenses \$(000s)	2019		2020		2021		2022		2023
	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget
Grants	40	32	40	44	40	55	40	40	134
User Fees	105	98	108	73	112	80	104	74	121
Capital Contribution	294	218	207	162	225	145	114	68	40
<b>Total Revenues</b>	<b>439</b>	<b>348</b>	<b>356</b>	<b>279</b>	<b>377</b>	<b>280</b>	<b>258</b>	<b>182</b>	<b>295</b>
Salaries & Benefits	3,350	2,358	3,407	2,498	3,516	2,501	3,579	2,749	3,645
Materials and Other	104	88	153	51	67	77	221	182	363
Purchased Services	274	209	638	240	650	210	654	318	952
Cap Contributions	309	276	284	340	284	269	284	302	70
Internal Recoveries	2,445	3,384	2,625	3,247	2,704	3,422	2,705	3,212	2,778
<b>Total Expenses</b>	<b>6,482</b>	<b>6,315</b>	<b>7,108</b>	<b>6,376</b>	<b>7,298</b>	<b>6,479</b>	<b>7,443</b>	<b>6,763</b>	<b>7,808</b>
<b>Net Expenses</b>	<b>6,043</b>	<b>5,967</b>	<b>6,752</b>	<b>6,097</b>	<b>6,921</b>	<b>6,199</b>	<b>7,185</b>	<b>6,581</b>	<b>7,513</b>

## METHODOLOGY & SCOPE

This audit included staff interviews, site visits, analysis of policies, processes and reports as well as tests of controls for the period January 1, 2019 to June 30, 2023.

## EXECUTIVE SUMMARY

While a number of significant accomplishments were identified in this audit, the capital requirements for the City's paved roads were not adequately supported by funding levels recommended in previous annual budgets. The proposed capital budgets for 2025 to 2027 recognize the need to align the capital budgeting process for the City's paved roads with the City's enterprise asset management policy. If approved, these capital budgets will respond to the continued deterioration of these assets.

## AUDIT STANDARDS

We conducted our audit in accordance with Generally Accepted Government Auditing Standards which require that we adequately plan audits; properly supervise staff; obtain sufficient, appropriate evidence to provide a reasonable basis for audit findings and conclusions; and document audits. For further information regarding this report, please contact Ron Foster at the City of Greater Sudbury at 705-674-4455 extension 4402 or via email at [ron.foster@greatersudbury.ca](mailto:ron.foster@greatersudbury.ca).

## OBSERVATIONS AND ACTION PLANS

### A. Long-Range Master Planning

The ICP Division is responsible for long-range master planning for roads and transportation, bridges, storm-water, linear water distribution, linear wastewater collection, as well as stormwater and wastewater treatment facilities. These master plans are required to support the City's Official Plan and the Corporate Strategic Plan.

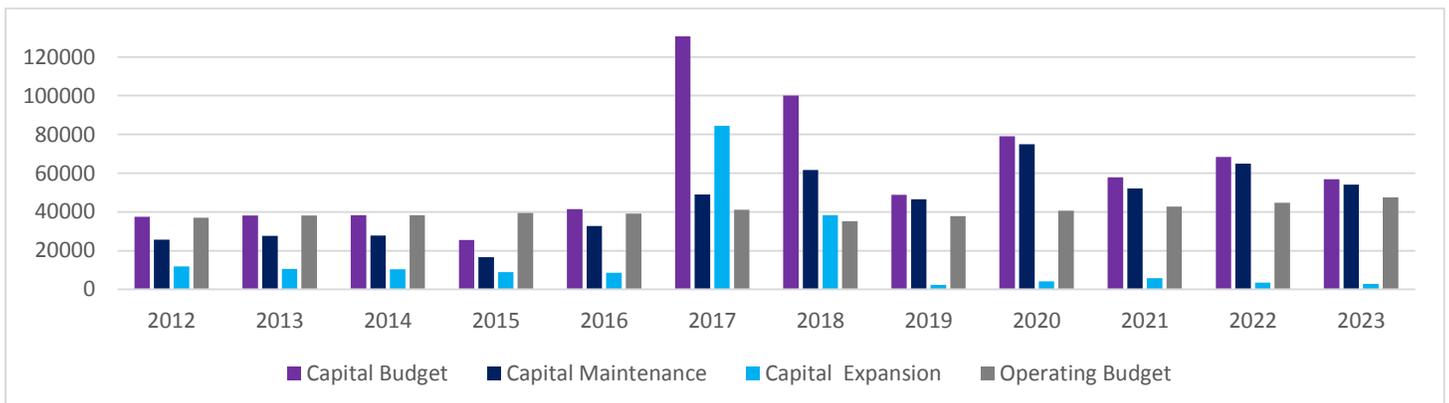
Updates to the asset management plans for the water and wastewater portfolios are nearing completion and a contract has recently been awarded for an update of the master plan for this portfolio.

The Transportation Master Plan is scheduled to be updated in 2026. To support the management of storm-water, staff completed a Sustainability Funding Study in 2021 as well as Subwatershed Studies and Stormwater Master Plans for Junction Creek and Capreol in 2019 as well as Ramsey Lake in 2022.

A long-term plan for roads and related infrastructure was prepared with the assistance of KPMG in 2012 to identify the financial requirements to sustain this infrastructure, but the findings were not incorporated into subsequent capital or operating budgets.

The Enterprise Long-Term Financial Plan, which was approved by Council in April 2017 as a basis for budgeting and financial planning decisions for all of the City's assets for the next 10 years, suggested that 39% of the annual capital budget be allocated to roads. Figure 1 below indicated that the actual capital funding directed to capital maintenance on roads averaged 40.5% since 2017 but was only 32% in 2022 and 33% in 2023 as the City responded to other competing needs and risks in order to meet other asset management plan objectives.

**Figure 1 - Capital for Roads, Structures and Related Infrastructure (\$000s)**

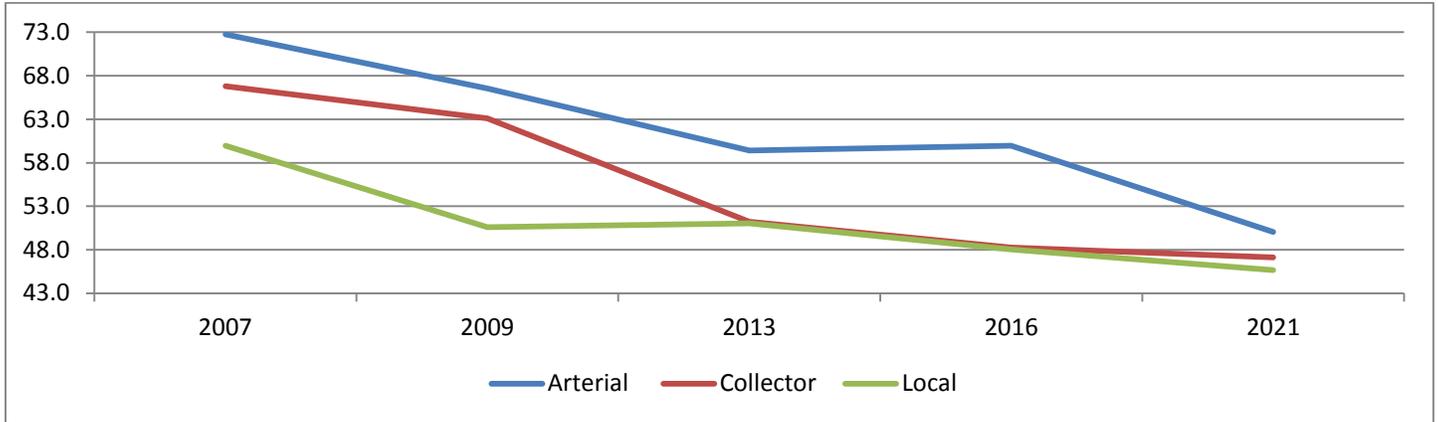


*\*Spending levels were higher in 2017 for the Maley Road extension and in 2018 for the MR-35 expansion.*

Since our audit of summer road maintenance processes in 2019, staff have taken appropriate steps to align the capital program for the City's structures with the City's enterprise asset management program. In addition, capital programs for roads have been focused on projects with the highest rate of return and coordinated with the asset management program for linear water and wastewater assets.

While funding for roads in the proposed capital budget for 2024 continues to be modest, the funding proposed for 2025 to 2027 increases significantly to an average of \$65.6 million per year. If approved, these capital budgets will respond to the deteriorating condition of the City's paved roads that is shown below in Figure 2.

**Figure 2 - Condition of Paved Roads in the City (Out of 100)**



### **Recommendations**

1. Update the enterprise long term financial plan in 2025 to align with the enterprise asset management program and enterprise risk management program for the City's paved roads.
2. Update the long term financial plan for water and wastewater in 2024 to recognize the significant inflationary pressure on capital projects in this portfolio.

### **Management Response and Action Plan**

*We Agree. A key component of Asset Management Planning is to ensure that there is a shared understanding and established Council Approved Service Level. Between the original 2012 KPMG study and today, staff have worked to create a greater understanding of the actual service levels achievable with available funding. Various business systems have been changed to create greater understanding of levels of efforts and costs to maintain assets, as well as to understand the condition of the assets. City staff have incorporated the use of new technologies such as City Works to automate work order management, and enhanced use of geo-spatial databases. Phase 2 of the Asset Management Plan, which is scheduled to be completed in 2025 will focus on presenting proposed service levels for roads and the required capital and maintenance funding to maintain agreed service levels. The results of the next phase of the Asset Management Plan will allow a continued increase in information through the Long Term Financial Planning exercise to allow Council to provide the necessary direction to staff through an approved Budget to continue to improve the road network as required.*

*Staff are in the process of procuring a consultant to update the water and wastewater long-term financial plan and it will be updated in 2024 for Council's consideration.*

### **B. Asset Management and Capital Budgeting Processes**

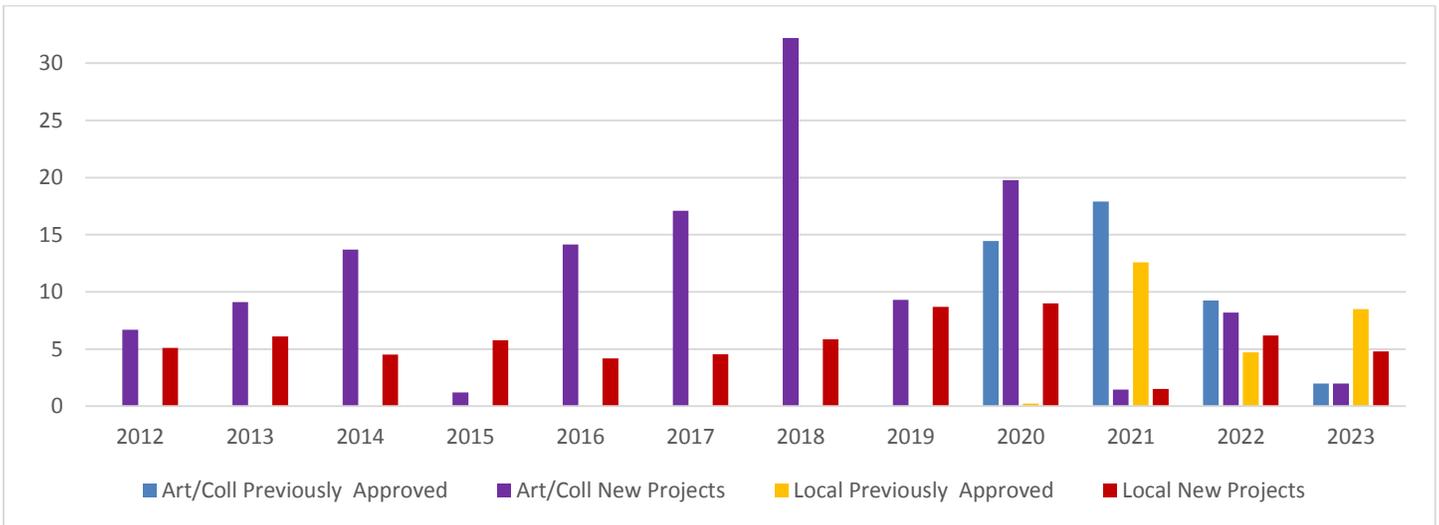
The ICP Division is responsible for asset management and capital budgets for roads, transportation, bridges, storm water, linear water distribution and wastewater collection, stormwater and wastewater treatment facilities.

The 2021 Enterprise Asset Management report indicated that there was a \$45 million funding gap between the required level of investment in the City's paved roads of \$80 million and actual average investment level of \$35 million. This audit determined that the capital budget for road maintenance projects has declined in recent years. As shown below, on average, less than \$10 million was approved in the last three years for new roads projects.

**Table 3 – New Road Maintenance Projects (\$Millions)**

Budget Year	Arterial/Collector	Local	Total
2021	\$1.5	\$1.5	\$3.0
2022	\$8.2	\$6.2	\$14.4
2023	\$2.0	\$4.8	\$6.8
3-Year Average	\$3.9	\$4.2	\$8.1

**Figure 3 - Road Maintenance Projects (\$Millions)**



Our analysis of the submission for arterial and collector roads in 2023 determined that combining \$15.2 million of projects for roads that have Pavement Condition Index (PCI) ratings > 60 with \$20.5 million of projects for roads that have PCI ratings < 40 reduced the project risk score to 11 out of 22 and the total project score to 27 out of 50. As shown in the table below, combining these projects into one submission in the capital budget resulted in just \$2 million of funding being approved in 2023.

**Table 4 – Risk Scores for Arterial/Collector Roads**

Arterial/Collector Roads	Risk Score	Project Score
Roads with PCI > 60	8	24
Roads with PCI < 40	14	30
Combined Roads Submission	11	27

We note, however, that the capital budgeting process for linear and vertical infrastructure has been revised for the 2024-2027 budget process. As a result, our recommendation below focuses on the capital budget submission process for the ICP Division.

**Recommendation**

Revise the ICP Division’s annual capital project submission process for the City’s paved roads to provide Council with current information on the condition of these assets as shown in Figure 2 of this report and differentiate projects that extend the useful lives of paved roads that are in fair condition from projects that address risks associated with roads that are in very poor or serious condition.

## Management Response and Action Plan

We will seek opportunities to submit projects with higher potential risk separately from the regular program submissions; however, asset management best practices would encourage making timely and appropriate investments throughout the asset lifecycle. It is more cost effective to maintain an asset in good condition than to replace a poor condition asset. It is understood that the lack of funding available for failed assets creates additional risk, however the Operating Services Divisions continue to provide maintenance interventions to ensure compliance with Provincial Regulations. Staff will continue to prioritize investments in accordance with Asset Management principles which dictate priorities for higher classification roadway, at earlier stages in the Life Cycle of the road. This will avoid the inevitable consequence of allowing further deterioration of fair and good assets should all available funding be spent on a limited number of failed assets

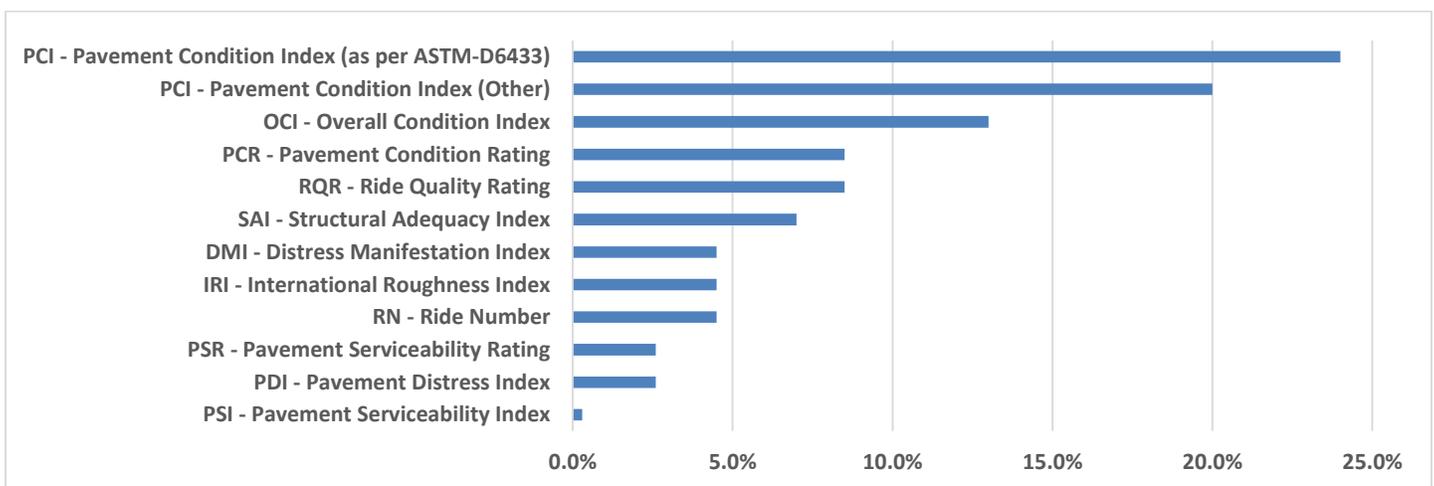
The capital submissions for the 2024-2027 Capital Budget were prioritized for risk and submitted. With the inclusion of the 1.5% Special Capital Levy all road classifications receive funding including local roads. A portion of the funding is allocated to address high risk areas, identified either through claims or excessive maintenance costs, to address localized areas. This strategy balances capital investment with operational maintenance costs, to ensure that overall road maintenance costs consider a holistic approach to asset management.

In regards to providing information on the condition of assets as shown in Figure 2, we will collaborate with staff who prepare the budget document and the annual Asset Management Status report to provide additional historic condition information. This information will also be highlighted in the Phase 2 Roads Asset Management Plan.

### C. Pavement Condition Index Information

In 2022, the Ontario Good Roads Association presented a case study on paved roads in Ontario at the Transportation Association of Canada Conference to advocate for harmonization of pavement condition evaluation methods. As shown below in Figure 4, the Pavement Condition Index which utilizes the American Society for Testing and Materials (ASTM) standard D6433 is the most commonly used method in Ontario.

**Figure 4 - Asphalt Pavement Condition Indices used in Ontario**



Like many other municipalities in Ontario, CGS staff presently use the ASTM-D6433 system to classify the condition of the City's paved roads. However, the current rating system that is used only contains 5 of the 7 rating ASTM rating categories. Combining several of these categories overstates the percentage of paved roads that fall into the "Good" category and understates the percentage of roads within the "Very Poor" category.

**Table 5 – Paved Road Condition**

<b>Paved Road Condition Rating</b>	<b>CGS Rating Index</b>	<b>CGS Road Profile 2019</b>	<b>CGS Road Profile 2021</b>	<b>ASTM Road Profile 2021</b>	<b>ASTM Rating Index</b>	<b>Paved Road Condition Rating</b>
Very Good	85-100	3	3	0	-	Very Good
Good	55-85	37	34	3	85-100	Good
Satisfactory	-	-	-	12	70-85	Satisfactory
Fair	40-55	33	29	22	55-70	Fair
Poor	25-40	24	29	29	40-55	Poor
Very Poor	0-25	3	5	29	25-40	Very Poor
Serious	-	-	-	5	10-25	Serious
Failed	-	-	-	0	0-10	Failed
Total		100%	100%	100%		

This audit also indicated that staff only report periodically to Council on the condition of the City’s roads rather than every two years following the completion of condition assessments.

**Recommendation**

Report every two years to Council on the condition of the City’s paved roads using the unmodified version of the ASTM Index to ensure the City follows better practices.

***Management Response and Action Plan***

*We agree. The annual Asset Management Status report provides Council the current condition of the City’s different asset classes, including roads. Staff will continue to collaborate on the preparation of this annual report and will update the condition data every two years. Further, while we have no objection to the ranges used in the ASTM Index for the qualitative descriptions of the condition of the road it is our recommendation that the qualitative descriptions and associated Pavement Condition Index (PCI) ranges used be a decision of Council and any changes be completed as part of defining the desired level of service for the City’s roads during the development of Phase 2 of the Roads and Transportation Asset Management Plan.*

**D. Significant Accomplishments**

Value-for-money audits include an assessment of effectiveness relative to program goals. During our audit, we identified the following significant accomplishments:

1. The Transportation Master Plan was completed in 2016.
2. A Sustainability Funding Study for Storm-water was completed in 2021.
3. Asset management plans were completed for core infrastructure assets in 2021.
4. The capital planning and budget processes for structures and culverts has been integrated with the asset management and risk management processes.
5. Mobile district metering and the pilot programs for leak detection have been implemented to gather additional condition assessment data;
6. Supported the implementation of several business improvement/innovation projects within Linear Infrastructure Services, Engineering Services, Infrastructure Capital Planning and Water/Wastewater Treatment and Compliance.
7. Implementation of the red light camera program.

**Table 6 – Summary of Significant Risks**

Risk	Total No. of Risks	Risks (Before Controls)			Residual Risks (After Controls)		
		High (15 to 25)	Med (9 to 14.99)	Low (1 to 8.99)	High (15 to 25)	Med (9 to 14.99)	Low (1 to 8.99)
Reputation (R)	1	1	0	0	0	0	1
Operational (O)	7	7	0	0	0	5	2
Financial (F)	7	7	0	0	0	5	2
Legal (L)	1	1	0	0	0	0	1
<b>TOTAL</b>	<b>16</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>6</b>

**Table 7 – Significant Risks**

Type of Risk	Description of Risk	Risk Before Controls	Residual Risk*
F1/O1	Long-term planning processes for infrastructure may not align with the vision and goals of the City's corporate strategic plan.	25	12
F2/O2	Planning and budgeting processes may not align with long-range master plans for roads and transportation, bridges and stormwater.	25	12
F3/O3	Planning processes may not align with the Enterprise Asset Management program.	25	12
F4/O4	Planning processes may not align with the Enterprise Risk Management program.	25	12
F5/O5	Planning processes may not be delivered with due regard for effectiveness.	25	12
F6/O6	Planning processes may not be delivered with due regard for efficiency.	20	8
F7/O7	Planning processes may not be delivered with due regard for economy.	20	8
L1/R1	Legal and regulatory obligations may not be managed effectively.	20	8

*\*Note that it is not cost-effective to eliminate all residual risks.*

**Appendix 1 – Risk Assessment Criteria**

<b>Impact</b>	<b>Services</b>	<b>Technology</b>	<b>People</b>	<b>Strategic</b>	<b>Legal/Reputational</b>	<b>Financial</b>
<b>Very Minor (1)</b>	<ul style="list-style-type: none"> <li>• Less than 90% of service objectives achieved.</li> </ul>	<ul style="list-style-type: none"> <li>• Minor disruptions of secondary systems or data loss or corruption.</li> </ul>	<ul style="list-style-type: none"> <li>• Minor reportable employee injury.</li> <li>• Increase in number of union grievances.</li> </ul>	<ul style="list-style-type: none"> <li>• Minor instances of actions that are at odds with strategic priorities.</li> </ul>	<ul style="list-style-type: none"> <li>• Small amount of negative media coverage or complaints to City.</li> <li>• Non-lasting damage or no reputational damage</li> <li>• Theft or Fraud under \$1,000.</li> </ul>	<ul style="list-style-type: none"> <li>• Uninsured loss, cost overruns or fines &lt; \$10K</li> <li>• Insured loss &lt; \$100K</li> <li>• Loss of replaceable asset.</li> </ul>
<b>Minor (2)</b>	<ul style="list-style-type: none"> <li>• Less than 75% of service objectives achieved.</li> <li>• Unable to perform non-essential service.</li> </ul>	<ul style="list-style-type: none"> <li>• Disruptions of systems or data loss or corruption</li> <li>• Disclosure of non-confidential but embarrassing information.</li> </ul>	<ul style="list-style-type: none"> <li>• Reportable employee injury.</li> <li>• Loss of key staff but able to recruit competent replacements</li> <li>• Significant increase (&gt;10%) in number of union grievances.</li> </ul>	<ul style="list-style-type: none"> <li>• Instances of actions at odds with strategic priorities.</li> </ul>	<ul style="list-style-type: none"> <li>• Complaints elevated to the Director level.</li> <li>• Short-term repairable damage to City's reputation</li> <li>• Public outcry for discipline of employee.</li> <li>• Moderate amount of negative media coverage</li> <li>• Theft or Fraud of \$1,000 to \$10,000.</li> </ul>	<ul style="list-style-type: none"> <li>• Uninsured loss, cost overruns or fines of \$10K to \$100K</li> <li>• Insured loss &lt; \$100K - \$1M</li> <li>• Inefficient processes</li> <li>• City's actions result in reduced economic development.</li> </ul>
<b>Moderate (3)</b>	<ul style="list-style-type: none"> <li>• Less than 60% of service objectives achieved.</li> <li>• Unable to perform essential service but alternatives exist.</li> </ul>	<ul style="list-style-type: none"> <li>• Disruptions of significant systems or data loss or corruption</li> <li>• Recoverable loss from important system.</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple employee injuries or long-term disability from one incident.</li> <li>• Inability to retain or attract competent staff.</li> <li>• Increase in stress leave, sick leave or WCB claims.</li> <li>• Work-to-rule union disagreement or short-term strike.</li> </ul>	<ul style="list-style-type: none"> <li>• Numerous actions are at odds with strategic priorities.</li> </ul>	<ul style="list-style-type: none"> <li>• Public/media outcry for removal of management</li> <li>• Long-term damage to City's reputation</li> <li>• Citizen satisfaction survey indicates unacceptable performance.</li> <li>• Complaints elevated to Council level.</li> <li>• Results inconsistent with commitments made to citizens</li> <li>• Theft or Fraud under \$100,000.</li> </ul>	<ul style="list-style-type: none"> <li>• Uninsured loss, cost overruns or fines of &gt;\$100K to \$1M</li> <li>• Insured loss &gt;\$1M to \$10M</li> <li>• Having to delay payments to contractors/suppliers.</li> <li>• City's actions results in lost revenue for significant number of City businesses.</li> </ul>

Impact	Services	Technology	People	Strategic	Legal/Reputational	Financial
<b>Major (4)</b>	<ul style="list-style-type: none"> <li>• Less than 45% of service objectives achieved.</li> <li>• Unable to perform an essential service where no alternative exists.</li> </ul>	<ul style="list-style-type: none"> <li>• Unrecoverable loss or corruption of data from important system</li> <li>• External exposure of important information</li> <li>• Unavailability of significant systems</li> </ul>	<ul style="list-style-type: none"> <li>• Serious injury of one or more employees</li> <li>• Legal judgment against the City in workplace matter.</li> <li>• Turnover of key employees</li> <li>• Sustained strike of staff.</li> </ul>	<ul style="list-style-type: none"> <li>• Numerous actions are significantly at odds with the strategic priorities.</li> </ul>	<ul style="list-style-type: none"> <li>• Public/media outcry for change in CAO or Council</li> <li>• Public or senior officials charged or convicted</li> <li>• Legal judgment against the City in a workplace matter</li> <li>• Integrity breach resulting in decreased trust in City Council or Administration.</li> <li>• Theft or Fraud &gt;\$100,000</li> </ul>	<ul style="list-style-type: none"> <li>• Uninsured loss, cost overruns or fines of &gt;\$1M - \$10M</li> <li>• Insured loss of &gt;\$10M - \$100M</li> <li>• Unable to pay employees and contractors on time.</li> <li>• City's actions impair local economic conditions.</li> </ul>
<b>Extreme (5)</b>	<ul style="list-style-type: none"> <li>• Less than 30% of service objectives achieved.</li> <li>• Unable to perform several essential services where no alternatives exist.</li> </ul>	<ul style="list-style-type: none"> <li>• Unrecoverable loss or corruption of data from critical system</li> <li>• External exposure of confidential information</li> <li>• Unavailability of critical systems</li> </ul>	<ul style="list-style-type: none"> <li>• Death of an employee</li> <li>• Major legal judgment against the City in workplace matter.</li> <li>• Significant turnover of key employees with ELT</li> <li>• Sustained strike of staff supporting key services</li> </ul>	<ul style="list-style-type: none"> <li>• Many actions are significantly at odds with the strategic priorities.</li> </ul>	<ul style="list-style-type: none"> <li>• Public/media outcry for change in CAO or Council</li> <li>• Senior officials criminally charged or convicted</li> <li>• Severe legal judgment against the City in a workplace matter</li> <li>• Major integrity breach resulting in complete loss of trust in City Council or Administration.</li> <li>• Theft/Fraud &gt;\$1,000,000</li> </ul>	<ul style="list-style-type: none"> <li>• Uninsured loss, cost overruns or fines &gt;\$10M</li> <li>• Insured loss &gt; \$100M</li> <li>• File for bankruptcy</li> <li>• Failure to maintain financial capacity to support current demands.</li> <li>• City's actions significantly impair local economic conditions.</li> </ul>

Likelihood	Unlikely (1)	Possible (2)	Probable (3)	Likely (4)	Very Likely (5)
	Less than 20%	>20% but < 40%	>40% but < 60%	>60% but < 80%	80% or more
	Less frequent than every 10 years	May occur in the next 2 years	Will occur this year or next year at least once	May occur regularly this year	Will occur within months may reoccur often