

Enterprise Asset Management Plan

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Report Summary

This report and presentation provides a recommendation regarding the Enterprise Asset Management Plan. The plan exceeds the requirements of Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure.

Resolution

THAT the City of Greater Sudbury approves the Enterprise Asset Management Plan (2021), as outlined in the report entitled “Enterprise Asset Management Plan”, from the General Manager of Corporate Services, presented at the Finance and Administration Committee meeting on August 17, 2021.

Relationship to the Strategic Plan, Health Impact Assessment and Community Energy & Emissions Plan (CEEP)

This report is directly linked to the goals as described in City Council’s 2019 – 2027 Strategic Plan. The emphasis is primarily on Goal 1: Asset Management and Service Excellence, however in accordance with the Enterprise Asset Management Policy the purpose of asset management planning is to make the best possible decisions about the acquisition, maintenance and disposition of assets in order to sustainably provide municipal services. In that broader sense, asset management plans support reliable service delivery and assist with virtually all strategic goals.

Financial Implications

There are no direct financial implications associated with this report. Indirectly, the guidance provided by this policy will inform asset investment and renewal decisions that will influence both capital and operating budgets.

1. Background

Asset management in the Province of Ontario has evolved, culminating in the passage of *O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure* under the *Infrastructure for Jobs and Prosperities*

Act, 2015. The Provincial Regulation was formally placed into effect on January 1, 2018 as a follow up to the the long-term infrastructure plan for Ontario entitled *Building Together (June 2011)*.

Greater Sudbury's first asset management plan was adopted in December 2016 to meet the initial asset management requirements of *Building Together*. The plan reflects an estimate of financial requirements associated with maintaining City assets in a state of good repair. Since 2017, the City has been working across all asset classes to refine these estimates and advance asset management planning.

On April 16, 2021, the Province of Ontario provided a one-year extension to the scheduled deadlines contained within *O. Reg. 588/17*. The first deadline was July 1, 2019 when municipalities were required to have finalized a strategic asset management policy. In 2018, City Council achieved the first requirement with the approval of the Enterprise Asset Management Policy aimed at ensuring municipal infrastructure systems are supported by plans and financing decisions that demonstrate effective service support and appropriate regard for managing lifecycle costs. The upcoming deadlines as mandated by *O. Reg. 588/17* and current status are discussed in Table 1.

Table 1: O. Reg. 588/17 Phase-in Schedule as of April 16, 2021		
New Deadline	Original Deadline	Requirement
July 1, 2019	July 1, 2019	Finalize a strategic asset management policy that promotes best practices and links asset management planning activities with budgeting, and other municipal planning activities.
July 1, 2022	July 1, 2021	Approve an asset management plan for core assets (roads, bridges and large culverts, water, wastewater and stormwater management systems) that identifies current levels of service and the cost of maintaining those levels of service.
July 1, 2024	July 1, 2023	Approve an asset management plan for all municipal infrastructure assets that identifies current levels of service and the cost of maintaining those levels of service.
July 1, 2025	July 1, 2024	Approve an asset management plan for all municipal infrastructure assets that builds upon the previous requirements. This includes identification of proposed levels of service, the activities required to meet proposed levels of service, and a strategy to fund these activities.

The attached Enterprise Asset Management Plan (2021) successfully exceeds the requirements of *O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure* both in terms of timing and scope. The attached is complete approximately one year in advance of the deadline and the scope is exceeded by including fleet and equipment and municipal parking in addition to core infrastructure. Staff are working on the next phase of planning for all remaining asset classes, the largest of which is vertical infrastructure (e.g buildings, facilities and housing stock).

2. Enterprise Asset Management Plan (2021): Core Infrastructure, Fleet and Equipment, and Municipal Parking

The Enterprise Asset Management Plan (2021) uses a risk-based approach to asset management planning. The plan integrates a number of individual plans by asset class including: water and wastewater, stormwater management, roads and transportation, bridges and large culverts, fleet and equipment, and municipal parking lots. Future versions of the plan will include buildings and facilities, housing, long-term care, parks and recreation, and solid waste.

The plan is focused on current levels of service and the existing condition of core infrastructure assets, fleet and equipment, and municipal parking.

A service level is a direction or requirement for a particular service area in which performance may be measured. Service levels have been defined within the three categories provided in Table 2. The levels of service discussion in this report focuses on the asset (technical) level of service.

Table 2: Levels of Service Definitions	
Category	Definition
Community	Qualitative descriptions that define the community, stakeholder and individual expectations.
↓	
Strategic	These include qualitative and quantitative measures that describe what is being provided to the community. Examples of how a strategic level of service can be defined include: reliability, legislative compliance, quantity, quality and safety.
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Asset (Technical)	An asset level of service is a quantitative measure that defines the performance expectations for a given asset in order to produce the desired levels of service. These services are measurable and can include asset condition, responsiveness, maintenance expenditure, and asset value.

The Enterprise Asset Management Plan (2021) provides current levels of service and conditions exclusively. The plan provides an existing snap shot of asset management and infrastructure; financing plans will be provided in future versions of the plan along with alternatives that may guide decisions in the future to make changes to assets to enhance or decrease levels of service in these classes.

Performance measurement is used to define the quantity, quality, and impact of services provided to the community. Performance measurement utilizes key performance indicators (KPI) to define, implement, and maintain current or target levels of service. The parameters to determine the condition of infrastructure is an example of a key performance indicator. Condition may be calculated as complex indices such as the Pavement Condition Index and Bridge Condition Index, or condition can be calculated by service life consumption and/or utilization.

Table 3 has been prepared with select KPIs and the associated current asset levels of service (ALoS). For a complete list of KPIs and ALoS, please refer to the individual asset management plans prepared by asset class. All of the following asset levels of service are taken from the appendices of the Enterprise Asset Management Plan (2021). The future asset management plan required for completion by July 1, 2025 will include target levels of service selected by Council and the financing plans to achieve the targets. Council will be engaged throughout the discussion to select service level targets.

Table 3: Asset Level of Service (ALoS)			
Asset Class	Key Performance Indicator	Existing ALoS	Discussion
Road and Transportation Network	Arterial Pavement Condition Index (PCI)	57 - Good	PCI data is collected every 2 to 3 years to ensure up-to-date analysis. Arterial roads connect major centres, communities, other arterials and facilitate long distance travel. Traffic movement is primary/major consideration.
	Collector Pavement Condition Index (PCI)	48 - Fair	Collector roads connect multiple neighbourhoods or neighbourhoods with arterial roads. Traffic movement and land access are of equal importance.
	Local Pavement Condition Index (PCI)	47 - Fair	Local roads connect properties within neighbourhoods. Land access is the primary function.
	Gravel Road Condition Index (GCI)	59 - Fair	The GCI was developed for implementation in 2020. Future work will include a more detailed review of gravel road maintenance, capital and financial requirements.
Bridges and Large Culverts	Bridge Condition Index - Bridges (BCI)	75 - Good	BCI data is collected every 2 years as part of the Legislated Structural Inspection Program.
	Bridge Condition Index - Large Culverts (BCI)	79 - Good	BCI data is collected every 2 years as part of the Legislated Structural Inspection Program.
Water Treatment and Distribution	Quantity of watermain breaks per year	72	Quantity of watermain breaks have been reduced from 98 /year as detailed in the W/WW AMP dated June 2018. The quantity of 72 in 2020 is the lowest quantity since 1998. The 5-year average of watermain breaks is 84.
	Cleaning and swabbing of small diameter water mains (% of network)	10%	Continue to clean and swab small diameter water mains annually.
	Volume of water treated and supplied (m³/year)	19,744,331	Volume of water treated and supplied from municipal water supply systems.
	Total available water treatment capacity (m³/year)	58,799,400	Maintain capacity to meet demand.
	Adverse Water Quality Incidents (AWQI/year)	27	Minimize Adverse Water Quality Incidents.
Wastewater Collection and Treatment	Flushing/cleaning program (% of network)	27%	Continue to perform flushing/cleaning program annually. The annual budget permits CCTV condition inspection, however the quantity of kilometers of the CCTV inspection program varies annually.
	Volume of wastewater treated (m³/year)	30,570,484	Volume of wastewater treated from municipal wastewater treatment plants.
	Total available wastewater treatment capacity (m³/year)	43,861,685	Maintain capacity to meet demand.
	Wastewater plant and lift station electricity consumption (kWh)	14,170,000	In 2020, wastewater plants and lift stations consumed an additional 295,600 m3 of natural gas.
	Quantity of sewage bypass events per year	12	Minimize bypass events. Additionally, in 2020 there were 36 incidents where a component of the system within a plant was operating over design capacity. However in these 36 situations, all wastewater went through every treatment step.
	Quantity of reported overflows per year	7	Minimize overflows.
Stormwater Management (STM)	Annual Culvert Cleaning (percentage of inventory)	4%	Council will be engaged to discuss an increase to the annual culvert cleaning frequency due to elevated quantities of winter sand use required in Northern Ontario.
	Annual Catch Basin and Maintenance Hole Cleaning (percentage of combined CB and MH inventory)	20%	Council will be engaged to discuss an increase to catch basin and maintenance hole cleaning frequency to greater than once per year due to the elevated sand use required in Northern Ontario. Increased catch basin cleaning will decrease the need for maintenance hole cleaning.
	Stormwater management facility legislative compliance (percentage of inventory)	100%	Standard Best Practices

Table 3: Asset Level of Service (ALoS)			
Asset Class	Key Performance Indicator	Existing ALoS	Discussion
Fleet and Equipment - Fleet Services	Heavy Duty Vehicle Condition	62 - Good	Replace heavy fleet between 12 - 15 years and prior to 300,000 km.
	Medium Duty Vehicle Condition	51 - Fair	Replace medium fleet by 10 years and prior to 250,000 km.
	Light Duty Vehicle Condition	53 - Fair	Replace light fleet by 10 years and prior to 250,000 km.
	Percentage of all fleet scheduled maintenance work order hours (Preventative)	52%	Maintain specified preventative maintenance schedules to allow asset to perform for duration of service life.
Fleet and Equipment - Paramedic Services	Ambulance Condition	71 - Good	Replace ambulances by 7 years.
	Paramedic Vehicle Condition	67 - Good	Replace paramedic vehicles by 7 years.
	Percentage of paramedic scheduled maintenance work order hours (Preventative)	80%	Maintain specified preventative maintenance schedules to allow asset to perform for duration of service life.
Fleet and Equipment - Fire Services	Fire Truck Condition	72 - Good	Rotate fire truck to reserve status by 15 years to meet Fire Underwriters Survey requirements.
	Fire Vehicle Condition	66 - Good	Replace vehicles by 10 years.
	Percentage of fire scheduled maintenance work order hours (Preventative)	67%	Maintain specified preventative maintenance schedules to allow asset to perform for duration of service life.
Fleet and Equipment - Transit Services	Bus Fleet Condition	45 - Fair	Replace transit bus by 15 years and prior to 1,200,000 km.
	Percentage of transit bus scheduled maintenance work order hours (Preventative)	38%	Maintain specified preventative maintenance schedules to allow asset to perform for duration of service life. Non-planned repair work order hours are elevated due to minor repairs resulting from daily driver reports.
Municipal Parking	Paved Parking Lot Condition	68 - Good	Inspect paved parking lots at appropriate intervals depending on existing condition to ensure data is up-to-date.

3. Level of Service Sensitivity Analysis

The Enterprise Asset Management Plan (2021) focuses on existing condition and the financial implications associated with owning and properly maintaining infrastructure assets. However, it is critical to recall that City Council has authority to review and select level of service targets for infrastructure assets within prescribed legislative requirements. Adjusting service levels has an effect on the corporation's financial implications.

To demonstrate the ability to manage the financial risks of ownership through the adjustment of service level targets, staff have prepared some examples of decisions that can be made for two asset classes, namely roads and fleet. The rationale for selecting roads and fleet for the example is that a path to sustainability for water and wastewater infrastructure need is addressed within the City of Greater Sudbury Water and Wastewater Long-Range Financial Plan that has been endorsed by Council. Also bridges, large culverts, and municipal parking capital needs are not currently being underfunded; in other words, at the existing asset level of service for bridges, large culverts, and municipal parking a capital funding gap does not exist.

The infrastructure that makes up the stormwater management network is relatively new and the City's stormwater asset management initiative is advancing projects aimed at collecting additional condition data for analysis. The data will be analyzed to determine if Greater Sudbury's investment into stormwater infrastructure is appropriate for lifecycle renewal and replacement interventions. At present day, the capital plan for stormwater infrastructure reflects a need to increase investment over time as the existing infrastructure ages.

The following discussion provides a few scenarios that are hypothetical scenarios presented to demonstrate that a target variable such as a level of service can be adjusted based upon input variables such as

investment or usage. **None of the following scenarios are to be interpreted as recommendations.** Current data is reviewed and extrapolated to demonstrate how Council will have the opportunity to review and select target levels of service for infrastructure assets. In time, staff will present a detailed analysis of target options.

3.1. Roads and Transportation Hypothetical Target Scenario: Projecting investment scenarios and the Pavement Condition Index

The hypothetical target scenario for roads and transportation analyzes various investment scenarios for the paved road network over a 10-year period.

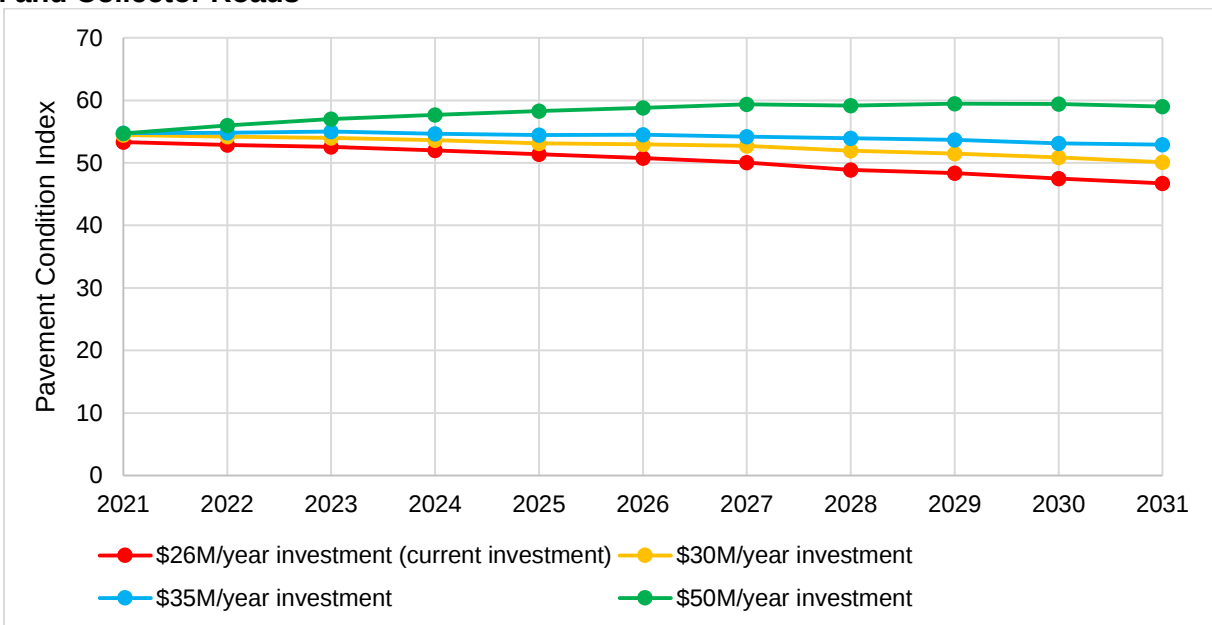
Arterial and Collector Roads

The current weighted PCI value for combined arterial and collector roads is 53 (Fair).

There are 4 annual investment scenarios that are projected in Figure 1; \$26M/yr, \$30M/yr, \$35M/yr and \$50M/yr over the course of 10-years for Arterial and Collector Roads. The average annual investment over the previous 5-year period is represented by the \$26M/year projection. Over the course of a 10-year period, if Greater Sudbury continues on the current investment trajectory the network PCI value for arterial and collector roads will decrease slightly to 47; however, the PCI remains in the Fair condition category.

Alternatively, the investment scenario of \$35M/year over the course of the 10-year period maintains the weighted PCI at the current value of 53 (Fair). Meanwhile an investment scenario of \$50M/year will increase the weighted PCI to 59; effectively moving the arterial and collector road network into the Good condition category.

Figure 1: Roads and Transportation Hypothetical Scenario – PCI and Investment Projections for Arterial and Collector Roads



Local Roads

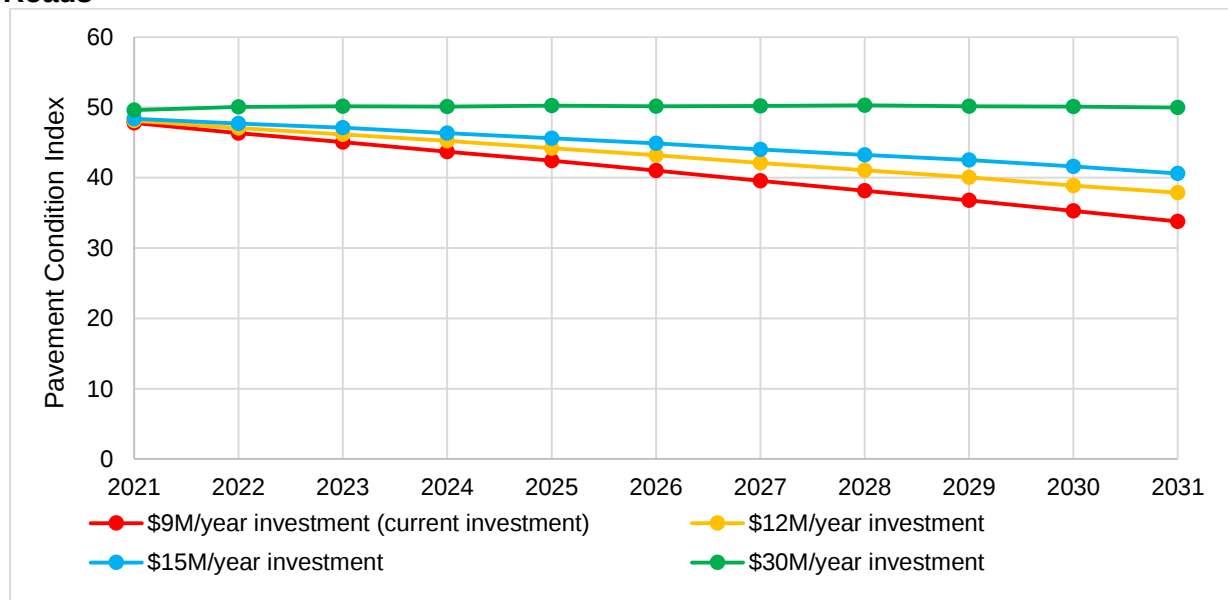
The current PCI value for local roads is 47 (Fair).

There are 4 annual investment scenarios that are projected in Figure 2; \$9M/yr, \$12M/yr, \$15M/yr and \$30M/yr over the course of 10-years for Local Roads. The average annual investment over the previous 5-year period is represented by the \$9M/year projection. Over the course of a 10-year period, if Greater Sudbury continues on the current investment trajectory the network PCI value for local roads will decrease to

34 (Poor). This decrease is significant because the PCI for local roads moves from the Fair condition category well into the Poor condition category.

Alternatively, the investment scenario of \$30M/year over the course of the 10-year period slightly increases the PCI value to 50 and maintains local roads in the Fair condition category. Meanwhile an investment of \$15M/year into local roads will see the PCI drop to the threshold of 41(Fair-Poor).

Figure 2: Roads and Transportation Hypothetical Scenario – PCI and Investment Projections for Local Roads



As asset management planning progresses, a risk framework will be developed for the Greater Sudbury road network. Financial models will then be prepared to target investment options for infrastructure with elevated risk levels. Detailed investment scenarios will be presented to Council to inform decisions regarding target road condition and associated service levels.

3.2. Fleet and Equipment Hypothetical Target Scenario: Alternatives to eliminate the funding gap and achieve requirements of the Community Energy and Emission Plan (CEEP)

There are a number of fleet examples that consider potential fleet level of service alternatives to financing the annual funding gap.

Greater Sudbury may consider adjusting the service life of fleet vehicles which will have a direct impact on the asset level of service determined by condition. Extending the service life of a vehicle identified as a low risk to the City appears to offer initial capital savings, however there is an expected increase in maintenance costs as the vehicle or equipment ages. Alternatively, decreasing the service life of a vehicle or equipment will require an increase in initial capital investment, however offer savings in maintenance as the asset ages, and savings in fuel as combustion engines become more efficient and/or are replaced with electric vehicles.

Furthermore, decreasing the service life of a vehicle will expedite the potential to achieve the CEEP Goal 9: Electrify 100% of transit and City fleet (vehicles) by 2035. It is expected that the costs associated with electrification of the Greater Sudbury Fleet will come down as the vehicle and charging technology become widely accepted. In 2021 the City introduced its first 4 electric vehicles to the fleet. The rate of fleet electrification for 2020 and prior years was zero.

Another example of a potential service level decision revolves around minimum usage. At present day when a vehicle has reached the end of its service life, a needs assessment is conducted prior to replacement. Assessments include usage, condition, mileage, and the potential for vehicle sharing through various departments. The threshold criteria to replace a vehicle may be adjusted to identify underutilized light duty

passenger vehicles. As of January 1, 2020, the City pays a mileage rate for work related travel of \$0.53/km. There may be scenarios where paying mileage to staff as opposed to supplying and maintaining a light duty vehicle will be the most cost effective staff transportation solution.

Another potential alternative is the contracting out of services. Examples of contracting out services could include maintenance contracts such as snow plowing and removal services, short term contracts and rental agreements, or at times, leasing a vehicle or a piece of equipment for a longer term.

These alternatives are simply examples of adjustments that can be made to capital investment and service levels that can assist in reducing the overall capital funding requirement for the City's asset base.

4. Future Asset Management Plans

The identification of existing and the development of target levels of service establish the foundation for the development of the City's asset management planning. Council will have the opportunity to define target levels of service as asset management planning evolves.

Provincial Regulation requires that Greater Sudbury not only identify target levels of service, but provide an explanation of why the targets are appropriate and why they are achievable. The City must demonstrate the ability to fund the targets by providing financial plans that will lead the path to sustainability. To effectively achieve this requirement, the upcoming target level of service conversations will focus not only on the finances available to fund service delivery, but also the risk associated with service delivery. In some cases, the risk of a declining asset condition may be acceptable. Key Performance Indicators (KPI) are already in place with baseline data for current levels of service in the attached Enterprise Asset Management Plan (2021). While identifying targets, additional KPIs may be developed. Additional KPIs are also being developed for the asset classes to be included in future asset management plans.

5. Conclusion

As demonstrated, Council has the authority to adjust the required infrastructure capital investment by adjusting an asset level of service that influences the service levels provided to the community.

The timeline for development and implementation of the City's asset management plans have been outlined by the Province under *Ontario Regulation 588/17*. The success of the City's asset management program relies on collaboration between all City departments. Staff within Corporate Services will work with individual departments to ensure the City meets and achieves the steps and milestones as outlined. Staff will also further engage Council with detailed analysis of level of service target options.

The attached Enterprise Asset Management Plan (2021) represents the next step in the City's asset management journey as envisioned in its Enterprise Asset Management Policy, while positioning Greater Sudbury to meet and exceed the requirements of *O. Reg. 588/17*.

Resources Cited

Ministry of Infrastructure Ontario (2011) Building Together – Guide for municipal asset management plans. (Online: <https://www.ontario.ca/page/building-together-guide-municipal-asset-management-plans>). Queen's Printer for Ontario, 2012.

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