For Information Only

Asset Management Status Report

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Resolution

For Information Only

Relationship to the Strategic Plan / Health Impact Assessment

This report is directly linked to the Asset Management and Service Excellence pillar of the Strategic Plan 2019-2027.

Report Summary

This report outlines asset management planning, progress and the performance of asset classes.

Financial Implications

There are no financial implications associated with this report.

Signed By

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Asset Management Status Report

1. Background

The City is responsible for the maintenance and operation of a wide variety of infrastructure assets. These infrastructure assets are critical for the delivery of service levels expected by the residents of the City of Greater Sudbury.

In 2017, City Council approved an Enterprise Asset Management Policy aimed at ensuring its municipal infrastructure systems are supported by plans and financing decisions that demonstrate effective service support and appropriate regard for managing lifecycle costs.

The City, like most Canadian municipalities, must overcome multiple challenges in managing assets including aging infrastructure; expectations of higher levels of service with minimal financial impact; increasingly demanding and complicated legislation with environmental requirements; and mitigation of the increased risk involved with the execution of service delivery. Greater Sudbury by comparison is a vast geographical area, sparsely populated (outside of some relatively small urban areas) and experiences significant climate shifts with the changing seasons. Consequently, the City is moving to implement a focused and calculated approach to address these challenges through the development of detailed asset management plans.

On December 13, 2017 the province approved *O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure* under the *Infrastructure for Jobs and Prosperities Act, 2015*. The City has been working to develop departmental asset management plans for all of its infrastructure assets that comply with legislation. This includes describing the asset's expected performance level (that is, its "service level") based on technical data. This information is required to comply with *O. Reg. 588/17*, and must be based on data from at most the two calendar years prior to 2021 or 2023, the legislated Phase 1 and 2 completion deadlines.

The purpose of this report, further to the Asset Management Strategy presented to Council in April 2018, is to present the state of the City's Asset Management Program. It describes the major steps and milestones to develop and implement the City's Asset Management Plan in accordance with the provincial regulation *O. Reg. 588/17*.

A State of the Infrastructure Report (SOIR) will be prepared at least once per term of Council as outlined in the Enterprise Asset Management Policy. The SOIR will provide comprehensive information regarding the major asset classes managed by the City. To complement the SOIR, staff will prepare asset status reports annually to discuss asset management planning activities and progress. The asset status reports will also include

information on the performance of asset classes. This is the first asset status report to be provided to Council prior to the annual budget.

The performance of an asset is largely predicated on its condition. Infrastructure condition reporting involves both technical data and professional judgment. For example an asset, according to its technical data, may be deemed to be reliable for only a limited period. But our professional judgment suggests it could remain in service longer. If we keep the asset in service beyond its expected lifecycle, we also accept the increased risk of asset failure or emergency repairs.

The asset condition information in this report reflects our best available data and professional judgment. Work continues to refine data collection activities and manage the evolution of our asset management program.

2. Evolution of Asset Management Plans

The corporation must perform key steps during the development of its asset management plans.

2.1. Level of Service

A service level is a direction or requirement for a particular service area against which performance may be measured. For assets, technical data like performance specifications inform service levels. The assumption when reviewing asset condition against performance specifications is that there is a sufficient, appropriate maintenance program in place to support the asset's performance.

Periodic condition assessments help determine whether the combination of actual utilization levels and maintenance activities align with the specifications. A series of data collection processes and data storage requirements support the condition assessments. For Greater Sudbury, these processes need to be refined because in some examples, there is insufficient data. This leads to greater reliance on professional judgment informed by repair histories, expenditure reviews and other point-in-time assessments that do not provide as much assurance as reliable condition data.

2.2. Failure Prediction

Failure prediction is performed to assess the potential for an asset to deliver an expected level of service over time. Current and historical condition and performance data is analyzed to determine the current position of an asset within its life-cycle. This information informs a judgment about how much remaining service life is available.

2.3. Risk Management and Assessment

Risk management is a major component of asset life-cycle management. The City's risk management goals involve identifying, understanding and managing the potential for infrastructure assets to meet planned service objectives. Adopting best practices for

managing and maintaining assets increases the potential for achieving planned service objectives.

Risk assessment helps prioritize and optimize capital spending and decision making. The corporation evaluates both the Probability of Failure (PoF) and the Consequence of Failure (CoF) when prioritizing capital budget choices. This helps clarify and build a shared understanding about the risk associated with a decision to not engage in a project.

The PoF is an estimate of how likely an asset is to not meet its service expectations. The CoF is an estimate of the effect on outcomes if an asset actually fails. The consequences of failure could range from a service interruption to a catastrophic result depending on asset class. Where these assessments indicate an unacceptably high risk, a capital project is deemed to be relatively higher priority as the cost of the project is often less than the element of risk or consequence.

Overall, the probability and consequences of failure allow the corporation to focus on assets that have the greatest impact on service delivery.

2.4. Asset Life-Cycle Planning and Optimization

The majority of the City's assets have life-cycles that span several decades. As a result, infrastructure decisions arguably have a more substantial effect on the community's sustainability than year-to-year operational decisions.

For that reason, capital investments need to examine the entire life-cycle cost associated with the decision to make the investment. Life-cycle management supports decision making that will optimize capital planning by considering costs of planning, design, construction, acquisition, commissioning, operation, maintenance and rehabilitation, decommissioning and disposal costs. Reducing or disposing of assets the City does not require to meet its current or future operational needs is one of the City's asset management guiding principles.

2.5. Financial Strategy

In accordance with the province's legislation, at a minimum the City will be planning for life-cycle activities that maintain existing or achieve proposed levels of service for a 10-year period. Planning will include the estimated annual capital and operating costs for each year of a 10-year plan. This will include life-cycle maintenance and repair activities, as well as forecast to accommodate potential increases in service demand.

As part of each budget cycle, these asset level of service and life-cycle considerations will be taken into account when recommending the priority capital investments that will make their way into the capital budget. Council retains the ultimate authority to decide which investments are made.

3. City of Greater Sudbury Asset Value

The corporation has a historical capital investment of $2.83B (2018) invested into infrastructure assets that is detailed in Chart No. 1. The chart has been developed with capital investment history contained within the City's Tangible Capital Asset Database.
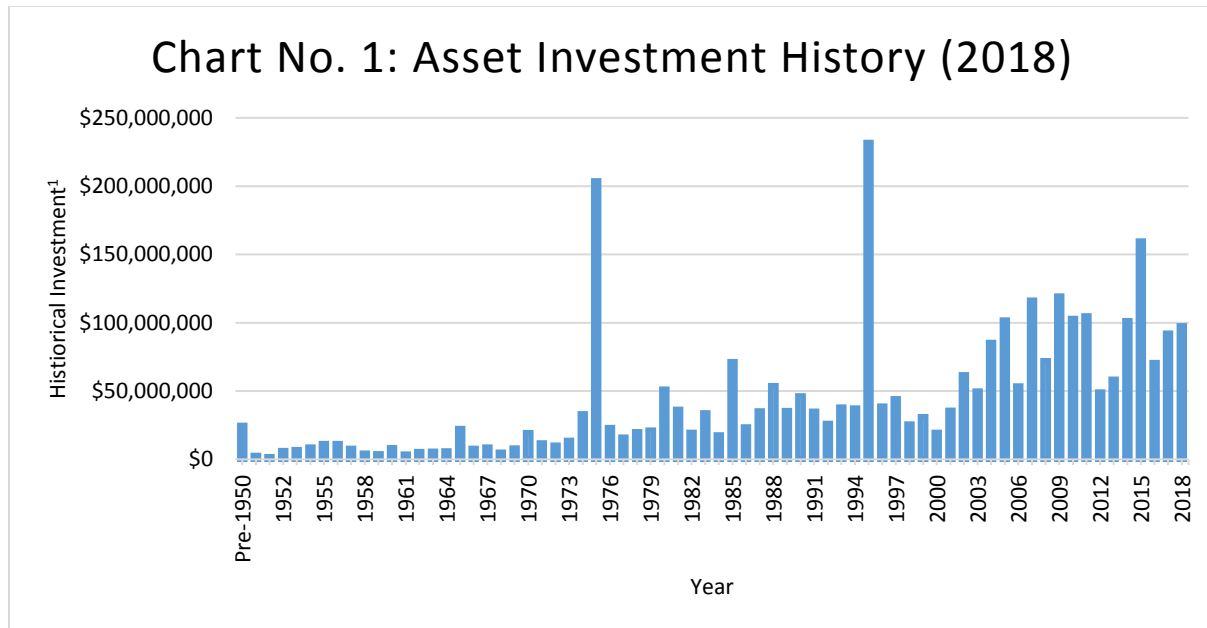

Chart No. 1: Asset Investment History (2018)

Chart No. 1 Note:
> [1] The value of $2.83B (2018) is the historical investment into infrastructure assets by the City of Greater Sudbury. Previous asset management planning by KPMG has indicated further investment of $3.14B over ten years was required.

This historical investment of $2.83B (2018) invested into infrastructure assets spans across a large portfolio that translates into $10.1B of replacement costs. This replacement value has increased significantly from the value of $7.2B presented by KPMG in December 2016. The three primary reasons for the increased replacement costs is the addition of the Greater Sudbury Housing Corporation to the City portfolio, the significant data collection that has been completed across the organization during asset management planning and the clarity and understanding that the City now has from data collection and analysis.

Replacement values of infrastructure assets are presented in the following Chart No. 2; the values are presented in millions.
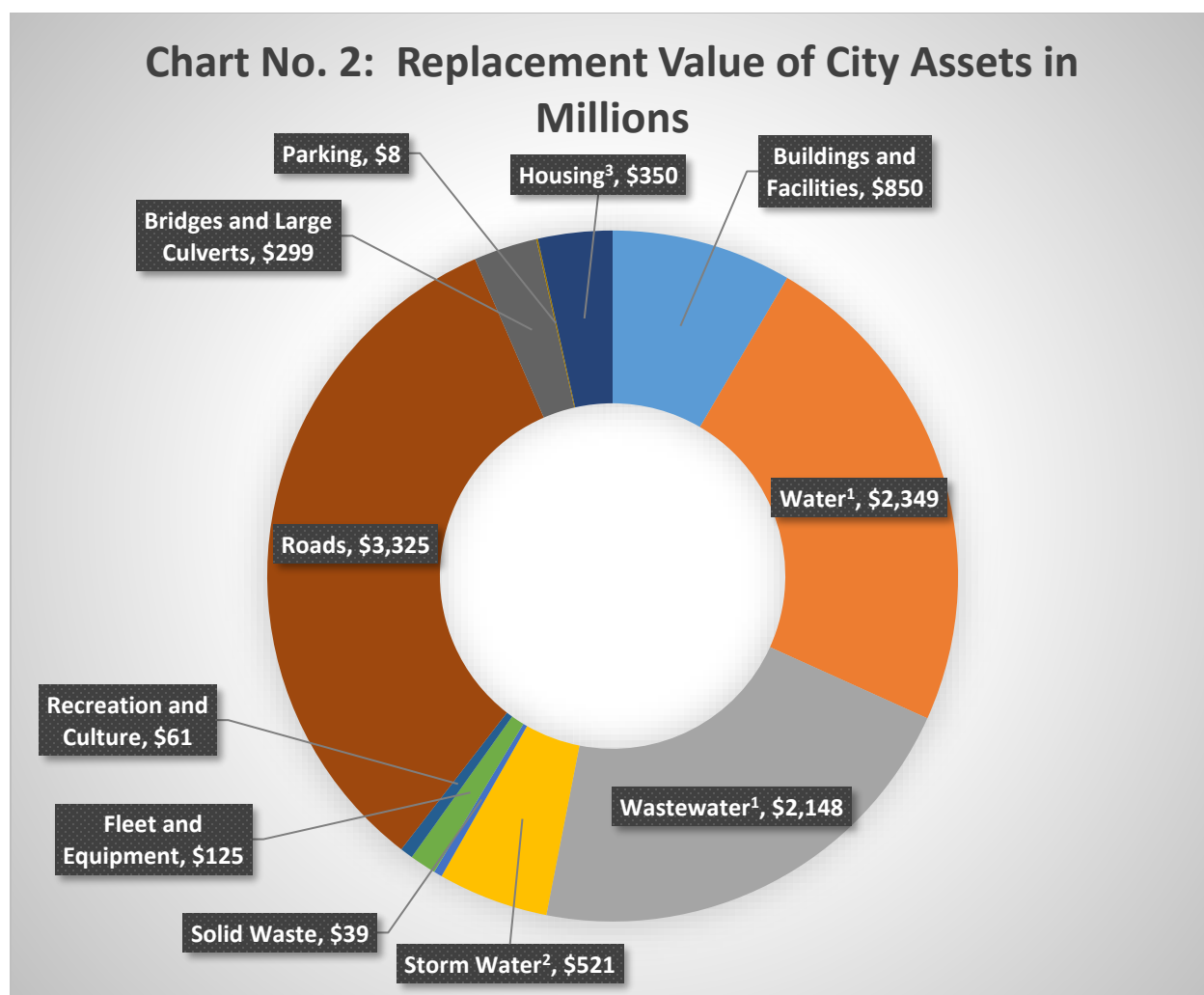
Chart No. 2: Replacement Value of City Assets in Millions

- Parking, $8
- Housing[3], $350
- Buildings and Facilities, $850
- Bridges and Large Culverts, $299
- Water[1], $2,349
- Roads, $3,325
- Recreation and Culture, $61
- Fleet and Equipment, $125
- Wastewater[1], $2,148
- Solid Waste, $39
- Storm Water[2], $521

Chart No. 2 Notes:

[1.] The replacement value reported in 2016 was the historical construction costs inflated to 2015 dollars. The current replacement values are driven by data collected and analyzed during the development of the asset management plan.

[2.] The replacement value reported in 2016 was the historical construction costs of storm water drains and ponds. The historical costs were inflated to 2015 dollars. The current replacement values are from data collected and analyzed during the development of the asset management plan. This includes the storm water linear pipe network, ditches, catch basins, manholes, etc.

[3.] New addition to the City asset portfolio.

The additional Water and Wastewater replacement cost has previously been presented to Council in April of 2017 and the additional Storm Water Management replacement cost was previously presented to Council in June of 2018.

4. City of Greater Sudbury Asset Portfolio

The following questions have been identified to provide details of infrastructure and its performance.

4.1. What infrastructure assets does the City own?

Buildings and Facilities

Buildings and facilities are utilized to deliver services across the City. The City owns and operates over 400 buildings. Buildings managed by various City departments include arenas, pools, ski chalets field houses, libraries, museums, community centers, municipal offices, depots, garages, long-term care facilities, fire and paramedic halls, etc.

The Greater Sudbury Housing Corporation owns a portfolio of 1,848 social housing rental units that provide accommodation to approximately 4,300 community members.

Water

The City's water supply consists of six water supply systems. Assets that deliver water treatment and distribution within these six water systems include linear water mains, system and control valves, valve chambers, hydrants, service connections, meter stations, water meters, pump houses, distribution facilities, storage facilities, treatment facilities and well facilities.

Wastewater

The City's wastewater collection consists of thirteen wastewater collection systems. Assets that collect and treat wastewater within the thirteen wastewater systems include the rock tunnel, linear gravity and forcemain sanitary sewer, lateral connections, control valves, drop shafts, maintenance holes, lift stations, collection facilities and treatment facilities.

Storm Water

The storm water management inventory consists of assets that include linear gravity storm water mains, ditches, manholes, catch basins, discharges, inlets, ponds and oil and grit separators.

Solid Waste

The solid waste inventory consists of assets including landfills, solid waste management facility, transfer stations and scales, monitoring wells, landfill access roads, storm water ponds, leachate management systems and ponds and a landfill gas management system.

Fleet and Equipment

The City owned fleet consists of heavy, medium and light duty licensed vehicles and various machinery and equipment assets.

A wide variety of services are delivered by the corporate fleet from snow plowing to waste disposal and excavation to arena ice resurfacing.

The transit fleet consists of buses that provide conventional public transportation. The fleet consists of accessible forty foot buses that operate on defined transit routes.

The Fire inventory of assets is primarily vehicles and equipment. These include fire trucks, hoses, compressors, bunker gear, jaws-of-life, marine rescue boat and a Hazmat Trailer.

Much like Fire, the Paramedic inventory of assets is also primarily vehicles and equipment. These include ambulance, power load stretchers, power stair chairs, defibrillators, narcotic security cabinets, vending lockers, laryngoscopes, off-road vehicles and trailers including a Special Operations Unit Trailer.

Parks and Recreation

Leisure and Parks Services maintain over 300 outdoor sport playing surfaces, 1,400 hectares of parkland and 177 km of trails. Outdoor sports playing surfaces include playgrounds, soccer and baseball fields, basketball courts, tennis and pickleball courts, skating paths and outdoor rinks, ski hills, BMX and skate parks and splash pads.

Roads, Bridges and Large Culverts and Parking

The City of Greater Sudbury's road network spans 3535 km and is prioritized into five road classifications; namely primary arterial, secondary arterial, tertiary arterial, collector and local. The road classifications have been developed to include for operating conditions that incorporate the concept of Complete Streets.

The bridge and large culvert inventory consists of a total of 182 structures, 94 of the structures are considered bridges and 88 are considered to be large culverts. For the purposes of inspection and reporting, bridges and large culverts are characterized as any structure with a span greater than 3 meters

The parking inventory includes municipal parking lots, parking meters, parking ticket systems and parking payment machines.

4.2. What is the condition of the City's infrastructure assets?

Infrastructure asset information is discussed below. Additional asset conditions details are provided in Appendix A.

4.2.1. Buildings and Facilities

Briefly, asset information for Buildings and Facilities can be summarized as follows. The Asset Level of Service (ALoS) is the condition and performance expectation for a given asset in order to produce desired levels of service. For scorecard definition on the evaluation of the quality of financial estimate, please refer to Appendix B.

Table No. 1: Buildings and Facilities Asset Information		
	Current Status	**Notes**
Asset Level of Service definitions Phase 2 – Existing ALoS (2023) Phase 3 – Target ALoS (2024)	**10%** Complete	• Preliminary ALoS Framework prepared • Additional data collection is required to validate the ALoS framework
Data Standards	**60%** Complete	• BCA submissions are to be completed using industry standards to ensure consistency • BCA's will establish PoF • CoF to be developed
Data availability	**10%** complete	• Data collection for buildings & facilities is underway
Financial Estimate To Maintain Level of Service	**$32,500,000**	• Annual expenditure requirement • Provided by KPMG Long-Term Financial Plan April 2017
Quality of Financial Estimate	**D**	• Quality will improve with additional dataset.

The 2020 Capital Budget includes funds for software that will assist in managing building condition assessment data. The tool will aid with legislative compliance to ensure that the City's data is current (within 2 years). An early example is Greater Sudbury Housing Corporation which has successfully incorporated its unit inventory into a capital planning tool.

A Facility Condition Index (FCI) is assigned for all buildings and facilities that have a BCA. The FCI is a percentage calculated as: the deferred capital need divided by the facility replacement cost in current dollars (2018). For the Buildings that have had a BCA completed in 2018, the FCI is detailed in Appendix A.

4.2.2. Water and Wastewater

Briefly, asset information for Water and Wastewater can be summarized as follows:

Table No. 2: Water and Wastewater Asset Information		
	Current Status	**Notes**
Asset Level of Service definitions Phase 1 – Existing ALoS (2021) Phase 3 – Target ALoS (2024)	**70%** Complete	• Phase 1 existing asset level of service definitions are complete for linear assets • Phase 1 existing asset level of service definitions in development for plants & facilities • Phase 3 target asset level of service definitions require additional data collection and analysis
Data Standards	**75%** Complete	• Recommendations from the Asset Management Plan Water and Wastewater include identification of additional data and performance measure reporting • CoF is established; however data for PoF to be improved for plants and linear assets • The current CCTV inspection program follows the Pipeline Assessment Certification Program (PCAP) • The CCTV program will bolster the PoF • BCA submissions are to be completed using industry standards • Process engineering equipment will require a customized format within BCAs
Data availability	**75%** complete	• Assets are known and documented • Data collection for water and wastewater assets are ongoing
Financial Estimate To Maintain Level of Service	**$110,000,000**	• Annual expenditure requirement until 2021; $90,000,000 from 2022 - 2026
Quality of Financial Estimate	**B – Linear Pipe** **D – Plants &** **Facilities**	• Quality will improve with additional datasets • Facility BCA and condition assessments have not yet been incorporated

The asset condition framework for water and wastewater linear infrastructure is based on asset life expectancy and asset age for the development of the Asset Management Plan Water and Wastewater; asset conditions are available in Appendix A. However, a more detailed analysis is required to refine the available data to reflect existing conditions.

4.2.3. Storm Water

Briefly, asset information for storm water management can be summarized as follows:

Table No. 3: Storm Water Management Asset Information		
	Current Status	**Notes**
Asset Level of Service definitions Phase 1 – Existing ALoS (2021) Phase 3 – Target ALoS (2024)	**65%** Complete	• Phase 1 existing asset level of service definitions complete • Phase 3 target asset level of service definitions require additional data collection and analysis
Data Standards	**75%** Complete	• CoF is well established; however data for PoF to be improved • The storm water asset management plan recommends additional data collection techniques such as CCTV camera inspection of linear pipe • Presently initiating a CCTV inspection program that will follow the Pipeline Assessment Certification Program (PCAP) • The CCTV program will bolster the PoF
Data availability	**75%** complete	• Assets are known and documented • Data collection for storm water assets is ongoing
Financial Estimate To Maintain Level of Service	**$9,559,000**	• 30-Year Annual expenditure requirement
Quality of Financial Estimate	**C**	• Quality will improve with additional datasets and level of service targets • Based on local experiences and unique to Greater Sudbury area; for example acidic soils.

The City's storm water management system (STM) is relatively new with the majority of asset installation in the decades following 1960's and 70's.

The STM system consists of approximately 540 km of linear gravity main; consisting of a majority 43% concrete pipe with an estimated useful life between 90 and 120 years. Further data collection is required as the material type and condition of 133 km of gravity mains are unknown.

4.2.4. Solid Waste

Within the first and second quarter of 2020, the City intends to develop a condition framework to accurately reflect solid waste assets. Developing this framework will involve a review of the solid waste asset inventory, identifying data collection

requirements, developing performance measures for asset level of service and determining the current level of service provided by specific assets.

4.2.5. Fleet and Equipment

Briefly, information for fleet, fire, paramedic and transit assets can be summarized as follows:

Table No. 4: Fleet, Fire, Paramedic and Transit Asset Information		
	Current Status	**Notes**
Asset Level of Service definitions Phase 2 – Existing ALoS (2023) Phase 3 – Target ALoS (2024)	**25%** Complete	• Phase 2 existing asset level of service definitions have been prepare for Fleet Services and Transit Services. Paramedic Services ALoS framework is in draft.
Data Standards	**80%** Complete	• Data is driven by asset age and collection of mileage or engine run-time hours
Data availability	**75%** Complete	• Assets are known and documented • Data collection is ongoing
Financial Estimate To Maintain Level of Service	**$6,600,000**	• Annual expenditure requirement • Value reflects Fleet and Transit Assets only
Quality of Financial Estimate	**B**	• Reliable inventory and age data; minimal assumptions for Fleet and Transit

All licensed vehicle assets have mileage collected. Mileage is collected by automatic vehicle locators, during servicing and at City owned and operated fill stations. The mileage collected can be used to expand upon age-based condition. Condition is determined using a weighted age-based and mileage condition grade and applied to licensed fleet assets in order to determine the state of the asset and its replacement schedule.

Engine run time hours are collected for various Machinery and Equipment, primarily heavy equipment and MTs. Machinery and Equipment Heavy includes Loaders and Graders while the MTs includes Sidewalk Plows and various MT Tractors.

4.2.6. Parks and Recreation

Within the first and second quarter of 2020, the City intends to develop a condition framework to accurately reflect parks and recreation assets. Currently, the parks and recreation asset inventory has been under review and data collection requirements have been identified. Additional performance measures for asset level of service are forthcoming.

The asset condition details provided in Appendix A, are age-based with the exception of the regional parks, community parks, neighbourhood parks, playgrounds and tot lots. These assets are visually inspected by City staff on a rotating basis.

4.2.7. Roads, Bridges and Large Culverts and Parking

Briefly, asset information for roads, bridges and large culverts and parking can be summarized as follows:

Table No. 5: Roads, Bridges and Large Culverts and Parking Asset Information		
	Current Status	**Notes**
Asset Level of Service definitions Phase 1 – Existing ALoS (2021) Phase 3 – Target ALoS (2024)	**5%** Complete	• Phase 1 existing asset level of service for roads, bridges and large culverts developed within first quarter 2020. • Asset level of service definitions have been prepared for Parking
Data Standards	**70%** Complete	• PoF is established through condition data; however data for CoF to be improved • Pavement Condition Index (PCI) • Gravel Roads visual inspection • Bridge Condition Index (BCI) Under Review: • Potential for Safety Improvement • Congestion Index
Data availability	**65%** complete	• Assets are known and documented • 2019 PCI data collection complete. PCI data must be processed and imported into Pavement Management System. • Biennial Bridge and Large Culvert Structural Inspection complete • Gravel Roads visual inspection to begin in June 2020.
Continued on Next Page.		

	Current Status	Notes
Financial Estimate To Maintain Level of Service	**$169,800,000 For Roads $4,887,000 for Bridges and Large Culverts**	• Annual expenditure requirement • Provided by KPMG in Long-Term Financial Plan April 2017 • Bridge and large culvert value provided with 2018 Bridge and Large Culvert Structural Inspection
Quality of Financial Estimate	**D – Roads B – Bridges**	• Quality will improve with additional datasets • With the 2019 PCI dataset, preparation will be made to improve the ongoing reporting by incorporating condition

The City's Pavement Condition Index (PCI) is a composite index calculated from structural cracking, non-structural cracking, rutting and roughness. Available network PCI scores are provided in Appendix A.

Structures are made up of various components that deteriorate at different rates. Therefore, the biennial bridge inspection program follows the Ontario Structure Inspection Manual (OSIM) guidelines that visually evaluate each component of the structure and classify component condition. The individual component condition scores are compiled into a Bridge Condition Index (BCI). A summary of the 2018 Bridge & Large Culvert Structural Inspection Report is provided in Appendix A.

4.3. How are the City's assets performing?

The City's Tangible Capital Asset Database can perform straight-line asset depreciation which demonstrates, where the City's assets are in their **theoretical** useful lives. Straight-line depreciation is a conservative approach to allocating an asset's useful life over time. Many of the City's major assets have a more rapid depreciation curve. For illustrative purposes, the percentage of straight-line theoretical useful life consumption (conservative) compared to historical investment is detailed in Chart No. 3.

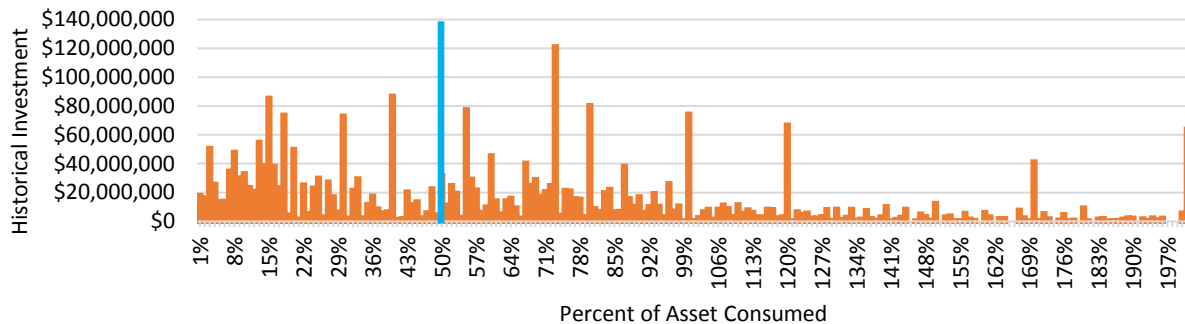# Chart No. 3: Asset Investment (2018) by Percent (%) Consumed

Chart No. 3 displays the amount of **theoretical** useful life that has been consumed in all asset classes. The blue line represents 50% of asset life consumed. The chart demonstrates that 57% of the City's infrastructure investment has consumed greater than half its theoretical useful life. Meanwhile, 20% of infrastructure investment is beyond its theoretical useful life.

Through the development of levels of service and maintenance plans, the City is afforded the opportunity to address asset consumption. For example, light duty fleet vehicles have a short theoretical useful life. Therefore, the level of service can be to maintain the light duty vehicle fleet to an average condition that coincides with a more reasonable service life and accrued mileage. Maintenance plans will be developed to aid in extending the life of assets whenever possible.

5. Milestones and Next Steps

The following Table No. 8 outlines the upcoming legislative dates and the current status of various departmental asset management plans.

Table No. 6: Legislated Milestones and Current Status				
AM Plan	**Division**	**Legislated Completion Date Phase 1 and 2**	**Current Status**	**Expected Completion for Council Approval**
Phase 1 - Core Infrastructure				
W/WW Linear AM Plan	Infrastructure and Capital Planning Services	July 1, 2021	Phase 1 Complete	Complete
W/WW Plants and Facilities AM Plan	Infrastructure and Capital Planning Services	July 1, 2021	• Building Condition Assessments to begin with standing offer in Third Quarter 2019	First Quarter 2021
Roads AM Plan	Infrastructure and Capital Planning Services	July 1, 2021	• LoS framework under development. • Pavement condition data is being collected in 2019	First Quarter 2021
Bridges/Large Culvert AM Plan	Infrastructure and Capital Planning Services	July 1, 2021	• LoS framework under development with 2018 Bridge and Large Culvert Structural Data	First Quarter 2021
STM AM Plan	Infrastructure and Capital Planning Services	July 1, 2021	• Phase 1 90% complete; submission expected in Q4.	Third Quarter 2020
Phase 2 - All other Infrastructure				
Fleet AM Plan	Assets and Fleet Services	July 1, 2023	• LoS defined • Risk Framework under development	First Quarter 2022
Transit AM Plan	Transit Services	July 1, 2023	• LoS defined • Risk Framework under development	First Quarter 2022
Parking AM Plan	Security and By-Law Services	July 1, 2023	• LoS framework under development	First Quarter 2022
Parks (Recreation) AM Plan	Leisure Services	July 1, 2023	• Data review, LoS framework under development	First Quarter 2022
Paramedic Services AM Plan	Paramedic Services	July 1, 2023	• Data review, LoS framework under development	Third Quarter 2022
Fire Services AM Plan	Fire Services	July 1, 2023	• Review existing data	Third Quarter 2022

AM Plan	Division	Legislated Completion Date Phase 1 and 2	Current Status	Expected Completion for Council Approval
Table 6: Legislated Milestones and Current Status				
Phase 2 - All other Infrastructure				
Buildings and Facilities AM Plan	Assets and Fleet Services Leisure Services	July 1, 2023	• Standardized facility condition scope complete • Data collection is underway	Fourth Quarter 2022
Long-Term Care AM Plan (Pioneer Manor)	Long-Term Care Services	July 1, 2023	• Building Condition Assessment in fourth quarter 2019	Fourth Quarter 2022
Greater Sudbury Housing Corporation AM Plan	Housing Services	July 1, 2023	• Data collection and review	Fourth Quarter 2022
Solid Waste (Landfill) AM Plan	Environmental Services	July 1, 2023	• Review existing data	Fourth Quarter 2022
Phase 3 - All Infrastructure				
All assets in Corporate Asset Management Plan	All departments listed above	July 1, 2024	• To begin following the completion of Phase 1 for core infrastructure assets. • To begin following the completion of Phase 2 for all other infrastructure assets.	First Quarter 2024

Per legislation, the City will perform an annual review of asset management progress following the implementation of the Phase 3 asset management plan. The review will monitor asset management planning implementation and progress. The reviews will be completed annually for July 1st.

Regulation also states that asset management policy and plan updates are to be prepared every 5 years. To ensure internal and external transparency, policies and plans have or will be posted to the City's website and shared with ministries or any persons as requested.

6. Conclusion

This report provides information on the current state of asset management and the steps staff will be taking to implement an enterprise wide approach to evolving the asset management planning.

The timeline for development and implementation of the City's asset management program has been outlined by the Province under the Ontario Regulation 588/17. The success of the City's asset management program relies on the collaboration of 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.

Asset management will continue to provide the City with a framework for consistent, calculated, reliable and transparent decision making. Staff will update Council regularly on the status of the City's asset management planning.

7. Legislative References

1. 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.

2. Infrastructure for Jobs and Prosperity Act, 2015. (Online: https://www.ontario.ca/laws/statute/15i15). Queen's Printer for Ontario 2015.

3. Ontario Regulation 588/17. (Online: https://www.ontario.ca/laws/regulation/r17588). Queen's Printer for Ontario 2018.

8. Appendix A: Condition Assessments

The following Table A1, provides a description of the conditions that are assigned to infrastructure assets within this Appendix A.

Table A1: Condition Scores Explained

Rating	Description	Buildings FCI	W/M and SAN Life Consumed	Fleet Light and Medium Mileage	Fleet Light and Medium Life Consumed	Fleet Heavy Duty Mileage	Fleet Heavy Duty Life Consumed	Ambulance and Firetruck Mileage	Ambulance and Firetruck Life Consumed	GOVA Bus Mileage	GOVA Bus Life Consumed	Parks/Parking Life Consumed	Roads PCI	Bridges BCI
Very Good	Well maintained, new or recently rehabilitated	0 to 5%	0 to 30%	0 to 40,000	0 to 50%	0 to 40,000	0 to 50%	75,000 to 0	0 to 20%	240,000 to 0	0 to 20%	0 to 20%	>85	≥70
Good	Acceptable, generally in mid stage of expected service life	5 to 10%	30 to 50%	40,001 to 100,000	51 to 100%	40,001 to 100,000	51 to 100%	75,001 to 150,000	21 to 40%	240,001 to 480,000	21 to 40%	21 to 40%	56 - 85	≥70
Fair	Signs of deterioration, requires attention, some deficiencies	10 to 30%	50 to 75%	100,001 to 150,000	101 to 125%	100,001 to 150,000	101 to 125%	150,001 to 200,000	41 to 60%	480,001 to 720,000	41 to 60%	41 to 60%	41 - 55	60 - 70
Poor	Approaching end of life, condition below standard, exhibits deterioration	30 to 50%	75 to 95%	150,001 to 200,000	126 to 150%	150,001 to 225,000	126 to 150%	200,001 to 250,000	61 to 80%	720,001 to 960,000	61 to 80%	61 to 80%	26 - 40	≤60
Very Poor	Near or beyond service life, widespread deterioration	>50%	>95%	>200,001	>151%	>225,001	>151%	>250,001	>81%	>960,001	>81%	>81%	<25	-

Buildings and Facilities:

A Facility Condition Index (FCI) is assigned to all buildings and facilities that have a BCA. The FCI is calculated as: the deferred capital need divided by the facility replacement cost in current dollars (2018). For the Buildings that have had a BCA completed in 2018, the mean Facility Condition Index is 10.7; this is detailed in Table No. A2.

Table No. A2: Facility Condition Index (FCI)		
Facility Type	**BCA Quantity**	**Mean FCI**
Arena	12	7.8%
Community Centre	4	4.1%
Fire Halls and EMS [1,2]	24	40.6%
Lionel E. Lalonde	1	4.1%
Playground Fieldhouse	9	11.4%
Pool	5	6.2%
Public Works	1 (Naughton)	37.6%
Ski Hill	6	16.7%
Total =	62	10.7%

Table No. A2 Notes:

[1.] The Fire Hall and EMS FCI indicates that the deferred capital needs of the Fire and Paramedic Service facilities on average are approaching half of the facility replacement costs. The Beaver Lake, Vermillion, Falconbridge, Skead, Coniston and Wahnapitae facilities have an FCI indicating deferred capital need for these facilities are as high as the facilities replacement cost.

[2.] Fire Hall 25 – Red Deer Lake was demolished in 2019.

The GSHC uses a software tool as a data repository to track the condition of its buildings and to project future capital work. The data repository analyzes condition data at a property, building and component level. The data identifies the actions required to maintain a state of good repair (SoGR). SoGR is the condition than an asset is able to operate at a full level of performance. The facility condition index of the housing inventory is provided in Table No. A3.

| Table No. A3: Facility Condition Index (FCI) Housing					
Property Type	**No. of Buildings**	**No. of Units**	**Percentage of Units**	**Current FCI (Site)**	**Current FCI (Building)**
High Rise Apartment	6	766	41%	125%	16%
Low Rise Apartment	25	294	16%	72%	11%
Townhouse	8	547	30%	39%	9%
Single / Duplex / Semi	241	241	13%	---	15%

Water and Wastewater

The asset condition framework for water and wastewater linear infrastructure is based on asset life expectancy and asset age for the development of the Asset Management Plan Water and Wastewater. However, a more detailed analysis is required to refine the available data to reflect existing conditions. The condition of watermain by consumption is provided in Chart No. A1.
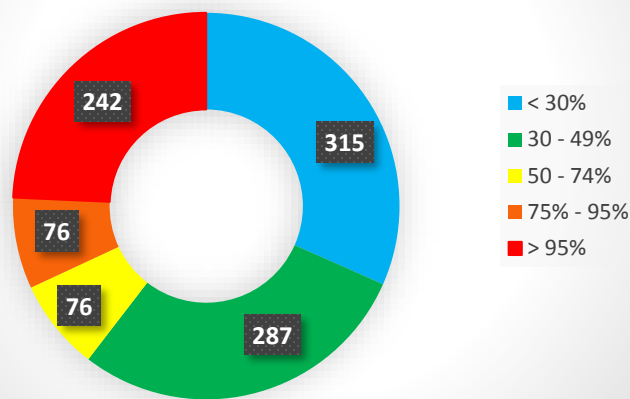
The condition of sanitary sewer main by consumption is provided in Chart No. A2.
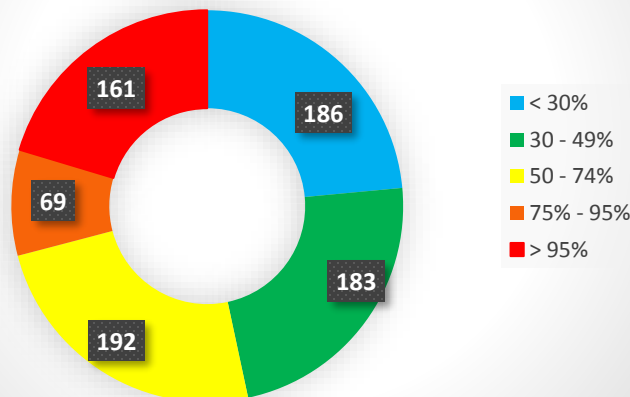
Storm Water Management

A Weibull Continuous Probability Distribution is used to analyze reliability, asset service life and model asset failure. To consider the premature failure of assets due to improper installation, severe soil and environmental conditions and assets that function beyond their estimated useful lives, the Weibull failure rate and reliability functions were analyzed to develop condition driven investment profiles. The investment profiles are featured below in Chart No. A3 and A4.
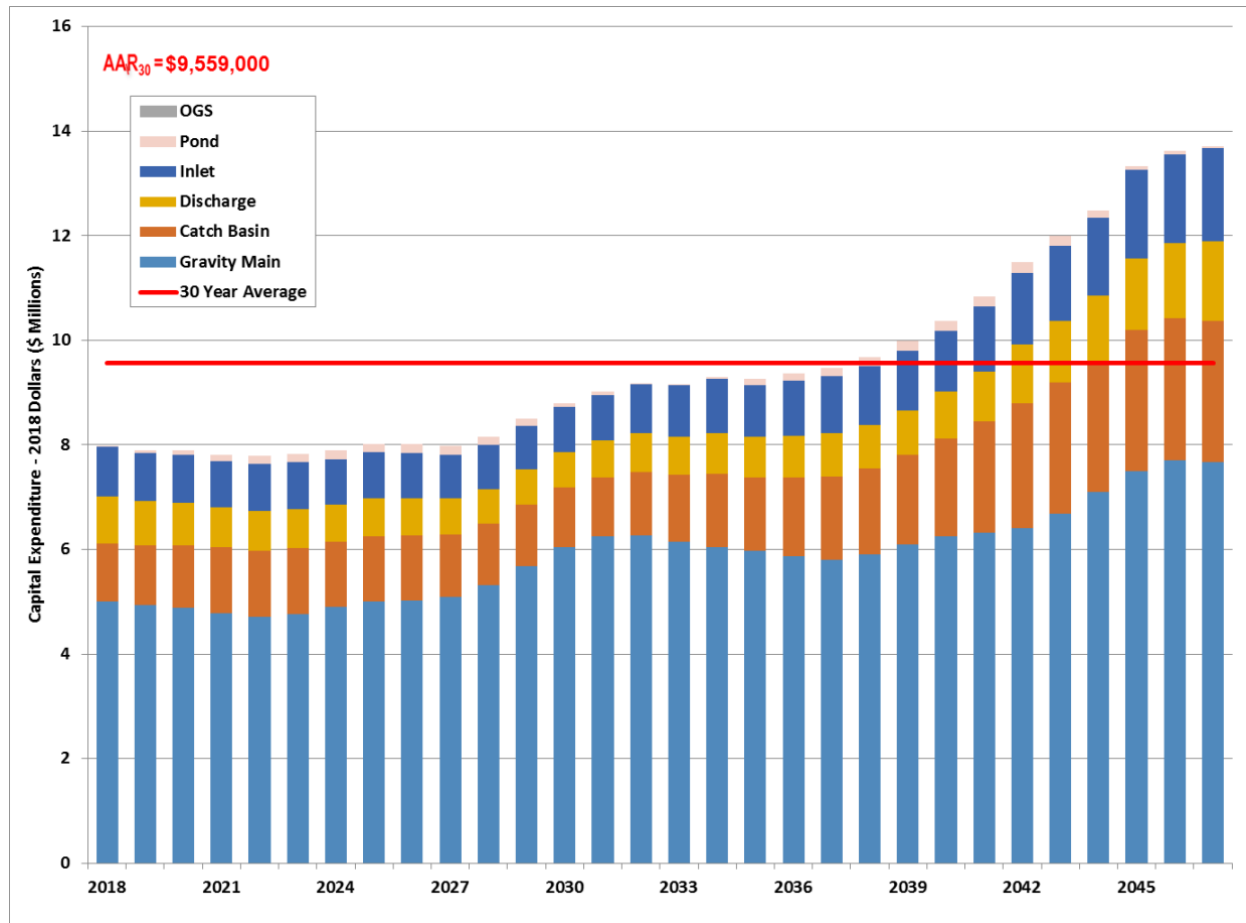
Chart No. A3: 30 Year Investment Profile for Storm Water Assets (Optimistic Scenario)
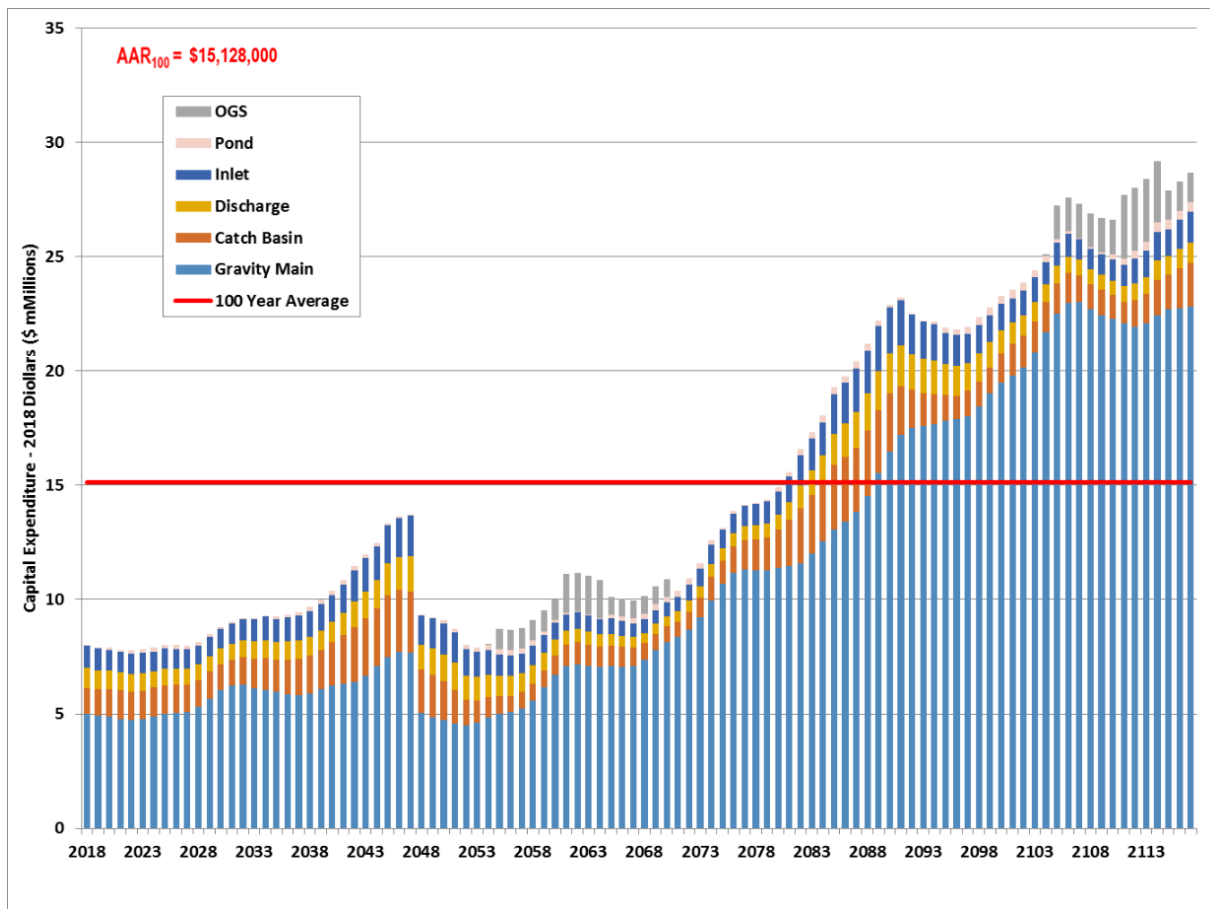
Chart No. A4: 100 Year Investment Profile for Storm Water Assets (Optimistic Scenario)

The 30 and 100 year investment profiles indicate that, although the STM system is relatively new, capital investment and additional maintenance programs are required to ensure the STM system continues to serve the community.

One of the maintenance program recommendations is to address data gaps with CCTV condition assessment inspections to establish a baseline condition, and collect attribute and inventory information, like material. This was initiated in 2019.

Fleet and Equipment

The condition of the City's licensed fleet, machinery and equipment assets are summarized in Table No. A4.

Table No. A4: Fleet, Fire, Paramedic and Transit Asset Condition		
Service Area	**Asset Type**	**Average Condition**
Fleet	Vehicles - Heavy Duty	56 - Fair
	Vehicles - Medium Duty	48 - Fair
	Vehicles - Light Duty	55 - Fair
	Machinery and Equipment Heavy	43 - Fair
	Machinery and Equipment MTs	46 - Fair
Fire	Fire Truck	40 - Fair
Paramedic	Ambulance	45 – Fair
	Conveyance Equipment*	66 – Good
	Defibrillator*	41 - Fair
	Operating Equipment*	62 – Good
Transit	Transit Bus	42 – Fair

* Does not have mileage or engine runtime collected and incorporated into the condition score; age-based condition only.

Parks and Recreation

The condition of the City's parks and recreation assets are summarized in Table No. A5. The conditions provided are age-based with the exception of the regional parks, community parks, neighbourhood parks, playgrounds and tot lots. These assets are visually inspected by City staff on a rotating basis; where 1 is poor, 2 is satisfactory and 3 is good. Going forward, data collection projects for recreational and cultural assets will build upon the baseline conditions below.

Table No. A5: Parks and Recreation Asset Condition		
Service Area	**Asset Type**	**Condition**
Rec Space	Splash Park (ie. DJ Hancock Splash Park, Memorial Splash Park)	83 – Very Good
	Trails (ie. Junction Creek Trail, Bell Park Trail and Boardwalk)	58 – Fair
Parks	Regional Parks, Community Parks, Neighbourhood Parks, Playgrounds and Tot Lots (ie. Bell Park and Delki Dozzi)	2.1 - Satisfactory

Roads, Bridges and Large Culverts and Parking

The City's Pavement Condition Index (PCI) is a composite index calculated from structural cracking, non-structural cracking, rutting and roughness. The network PCI is summarized as follows:

Table No. A6: Network Pavement Condition Index	
Asset Type	**Average PCI**
Arterial Roads	58
Collector Roads	49
Local Roads	46

The average PCI values are based on 2015 data which has been projected forward and includes any completed rehabilitation work. A data collection project for pavement condition is currently underway.

Structures are made up of various components that deteriorate at different rates. Therefore, the biennial bridge inspection program follows the Ontario Structure Inspection Manual (OSIM) guidelines that visually evaluate each component of the structure and classify component condition. The individual component condition scores are compiled into a Bridge Condition Index (BCI). A summary of the 2018 Bridge & Large Culvert Structural Inspection Report is provided in Table No. A7.

Table No. A7: Bridge Condition Index		
Asset Type	**BCI ≥70**	**BCI ≤70**
Vehicle Bridge	53	20
Vehicle Culvert	65	22
Pedestrian Bridge	17	4
Pedestrian Culvert	0	1

The age-based condition grades of the City's parking assets can be found in Table No. A8.

Table No. A8: Parking Asset Age-Based Condition		
Service Area	**Asset Type**	**Average Age-Based Condition**
Parking	Parking Lots	47 – Fair
	Operating Equipment	67 - Good

9. Appendix B: Data Quality Rating

The data rating used to determine the quality of the financial estimates are demonstrated in Table No. B1.

Table No. B1: Quality of Asset Datasets	
Data Quality Rating	**Description**
A	• No Assumptions with condition and age data • Reliable data inventory and source • Examples: Closed Circuit Television Inspection, Building Condition Assessment, Pavement Condition Assessment, Bridge Condition Assessment, Structural Report
B	• Dataset contains less than 10% assumptions • Moderately reliable data inventory and source • Example: aging condition data or studies
C	• Data contains greater than 10% assumptions • Moderately reliable data inventory and source • Example: aging condition data or studies
D	• Data from unreliable or out of date documents • Many assumptions of condition, age and replacement values • Example: purchasing records, condition data or studies older than 5 years
E	• Moderately reliable data for age or value, but not both • Only 1 moderately reliable data source
F	• No data available