

Parks and Recreation Asset Management Plan



Version No. 1

2023

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1. Executive Summary

1.1. Purpose

Asset management is the systematic and coordinated activities and practices of an organization to deliver on its service objectives optimally and sustainably through cost-effective lifecycle management of assets.

The Parks and Recreation Asset Management Plan provides details of the parks and recreation portfolio including the actions required to provide the current level of service while outlining the associated risks of asset ownership. The plan defines the current services provided, how the services are provided and what funds are required to maintain the services over a 20-year planning period.

1.2. Asset Management Strategy

The lifecycle intervention strategies for parks and recreation discussed within this report include best practice activities. Best practices for the management of parks and recreation assets are applied with intervention decisions to strive for the lowest lifecycle cost. These best practices include:

- Parks and recreation Inspections of grounds, activity structures as well as courts and playing fields.
- Document issues identified from asset users
- Adhere to the manufacturers scheduled maintenance
- Retain certified asset users when applicable and provide additional training to address proper use and maintenance for each asset.
- Monitor the condition of the assets annually

1.3. Failure Prediction and Risk Management

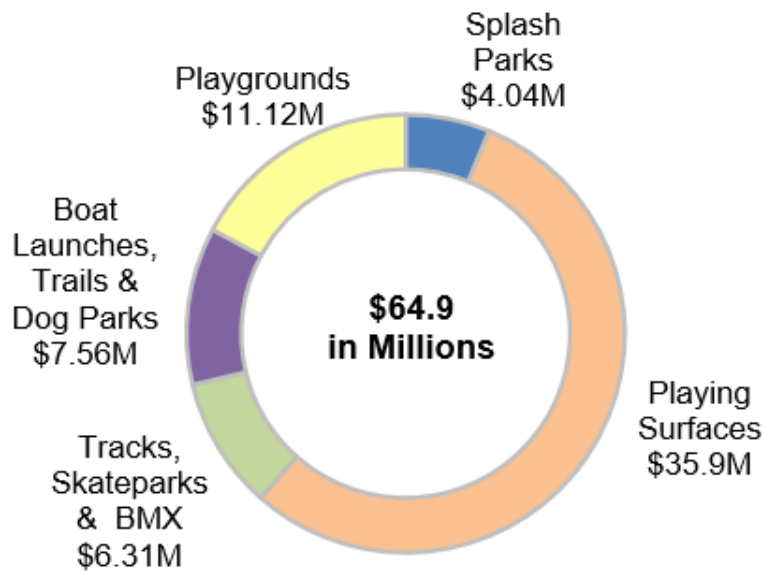
A risk framework was developed and implemented, and each individual asset is assigned a risk score based on a calculated probability and consequence of failure.

The probability of failure is an estimate of the likelihood of an asset is to not meet its service expectations. The consequence of failure is an estimate of the effect on outcomes if an asset fails. Under the parks and recreation portfolio infrastructure assets are prioritized for renewal or replacement with the output of the risk assessment. The parameters of the risk assessment are discussed in further detail within the plan.

1.4. State of the Infrastructure

The scope of the plan encompasses the parks, playground and all outdoor recreation spaces owned and operated by the City of Greater Sudbury. All building and building elements, equipment, and furnishings required to operate the buildings are captured under the Building and Facilities Asset Management Plan. The fleet and equipment required to maintain and operate the parks and recreation spaces are captured within the Fleet and Equipment Asset Management Plan. The replacement value of Greater Sudbury's parks and recreation infrastructure is summarized in Figure 1 below.

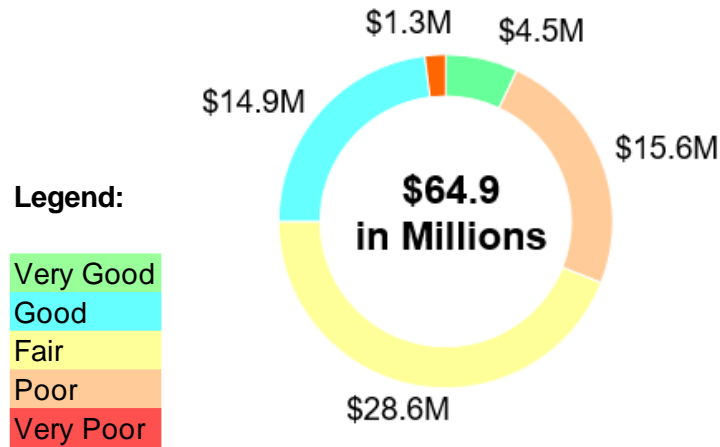
Figure 1: Replacement Value Distribution of Parks and Recreation Infrastructure



The parks and recreation assets have a replacement value of **\$64,900,000**.

The data analyzed to develop the plan is integrated from the City's tangible capital asset database and data spreadsheets. The details behind the development of condition and inspection frameworks are attached in Appendix A. Figure 2 outlines the replacement value and condition of the parks and recreation inventory.

Figure 2: Condition and Valuation of the Parks and Recreation Inventory in Millions



1.5. Level of Service

The City’s objective is to deliver services to the community. Levels of service (LoS) are used to define the extent that the City is currently delivering services and the extent that the City will aim to deliver services to the community. They provide a direction for a particular service area against which performance can be measured. Levels of service are imperative to establish reasonable expectations while taking into consideration the risks associated with service delivery and the affordability of delivering a service. Following the approval by Council of the Parks and Recreation Asset Management Plan, staff will work towards defining level of service targets for Council review, consideration, and approval.

1.6 Long-Term Need

Figure 6 details the 20-year average annual reinvestment requirement (AAR₂₀) by asset class. The AAR₂₀ represents the estimated annual amount of capital the City requires to reinvest in the parks and recreation inventory. Investment was analyzed on a 20-year period to capture the theoretical useful life of parks and recreation assets. The 20-year annual average reinvestment requirement for all parks and recreation assets is \$2,777,621.

1.7 Future Demand

The City’s parks and recreation assets are monitored for future demand requirements. The most significant future demand driver for parks and recreation are population demographics as well as climate change. The City has implemented preventative measures in anticipation of the demand drivers and are outlined in Section 8 of this plan.

1.8 Climate Change

In September 2020, Council approved the Community Energy Emissions Plan (CEEP) that is the long-term plan to reduce carbon emissions and pollution in Greater Sudbury. The City is beginning to monitor the effects of climate change on its infrastructure assets and the effects of climate change are discussed in further detail in section 9 of this plan.

1.9 Next Steps

Table 1 identifies the next steps identified during the development of the asset management plan.

Table 1: Next Steps		
Section	Category	Action Item
State of the Infrastructure	Inventory	<ul style="list-style-type: none">• Monitor and refine the parks and recreation asset inventory to reduce the quantity of data assumptions• Implement a digital solution to track, monitor and analyze parks and recreation data
Level of Service	Asset Level of Service	<ul style="list-style-type: none">• Develop target service levels for Council review
Asset Management Strategy	Lifecycle Management Plan	<ul style="list-style-type: none">• Review and refine strategies as necessary
Failure Prediction Risk Management	Risk Assessment and Exposure	<ul style="list-style-type: none">• Monitor and refine the deterioration model for Parks and Recreation assets as necessary
Long-Term Needs	Funding Sources	<ul style="list-style-type: none">• Develop a sustainability strategy to achieve target levels of service for Council review, discussion, and approval.• Determine funding source for infrastructure need.

2. Introduction

The City of Greater Sudbury parks and recreation assets are essential contributors to the quality of life to all residents. Each asset provides meaningful opportunities for social engagement and physical activity to residents, tourists, individual groups, young and old, and people of all abilities.

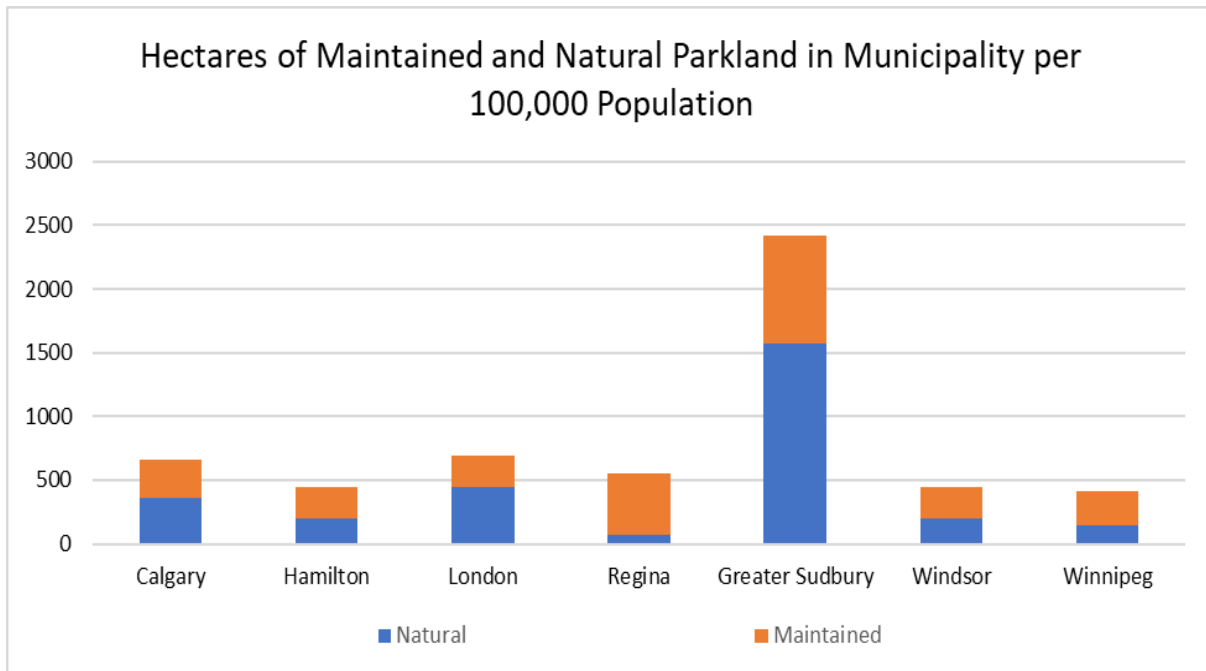
Individuals, households, and entire communities all benefit greatly from the assets that make up the parks and recreation portfolio, such as: physical benefits (health and wellness, social benefits, environmental benefits (from protection of open spaces), as well as the economic benefits made possible through the attraction of sport tourism and new residents due to the high quality of life that parks and recreation provide.

Over the years, the Canadian Parks and Recreation Association and Province of Ontario have produced summary documents of research findings that highlight the benefits of providing parks, recreation, and culture services. With these details, and this asset management plan, the City of Greater Sudbury will be able to report on the assets within parks and recreation to ensure that they can continue to meet the needs of residents. The asset management plan will help identify areas of infrastructure that are aging and in need of strategic renewal.

Greater Sudbury was formed on January 1, 2001, as recommended by the Report to the Minister of Municipal Affairs and Housing on Local Government Reform for Sudbury (November 1999). The amalgamation of the former Regional Municipality of Sudbury and several unincorporated townships marked the beginning of the evolution of the City of Greater Sudbury. Greater Sudbury is unique due to its large geographic area; the largest municipality by area in the Province of Ontario.

The City of Greater Sudbury park system spans over 2400 hectares (5930 acres) and contains extensive infrastructure that ranges significantly in terms of type and value. Primarily, the park systems are categorized as either maintained parkland or natural parkland. Maintained parkland includes hectares where the municipality is responsible for the direct cost to maintain the space and ensure the space is safe and available for public use. Natural parkland includes forests, meadows, storm water management buffer areas above the waterline, available for public use. Figure 3 identifies the quantity of maintained and natural parkland in municipalities reported to Municipal Benchmarking Canada (MBNCan), per 100,000 population.

Figure 3: Hectares of Maintained and Natural Parkland in Municipality per 100,000 Population



It is clear from Figure 3 that the City of Greater Sudbury is far above the median compared to other municipalities across Canada that report to MBNCan, for both natural and maintained parkland.

3. Asset Management Strategy

Best practices for the management of parks and recreation assets are applied with intervention decisions to strive for the lowest lifecycle cost. In addition, condition data is collected and involved in maintaining level of service contemplations and in the asset lifecycle intervention strategies for parks and recreation.

3.1 Maintain or Adjust Level of Service

Departments manage the parks and recreation assets to maintain the existing levels of service.

Best practices include but are not limited to:

- Continue to collect and report on performance measures currently tracked, while developing collection and reporting strategies for newly identified performance measures
- Perform annual inspection and certification as per legislation.

Following the approval by Council of the Parks and Recreation Asset Management Plan, staff will work towards defining level of service target for Council review, consideration, and approval. The process of reviewing and setting target levels of service will involve Council and

Department Leads to introduce the appropriate targets that can be sustained financially through capital infrastructure spending. To set targets, Council will be provided with the risks associated with the target options.

Future versions of the Parks and Recreation Asset Management plan will include the target levels of service as defined by Council at the appropriate time. The targets will include an explanation of why the targets are suitable for Greater Sudbury by explaining the associated risks and funding strategies to achieve the targets over time.

3.2 Lifecycle Management Plan

Best practices for the management of parks and recreational assets are applied with intervention decisions to strive for the lowest lifecycle cost. These best practices include:

- Asset inspection program protocols
- Document issues identified by users
- Adhere to manufacturers scheduled maintenance
- Retain certified asset users when applicable and provide additional training to address proper use and maintenance for each asset;
- Monitor the condition of assets annually;
- Regular maintenance activities are standard procedure across the parks and recreation portfolio. They are required to meet legislated requirements, approved service levels, and to optimize asset lifecycles. Non infrastructure solutions are considered in all stages of the planning process to identify opportunities to optimize asset lifecycles and reduce asset related service delivery costs through optimizing asset use, monitoring asset condition, and assessing asset specific risk to service.

4. State of the Infrastructure

4.1. Asset Data Inventory

The services provided through parks and recreational assets includes the maintenance of all municipal parks, playgrounds, beaches, tot lots, splash pads, trails, ski hills, sporting fields and courts enjoyed by community members across the City of Greater Sudbury. This inventory is stored within excel spreadsheets and the tangible capital asset database.

A detailed asset inventory is one of the vital components in understanding what assets the City owns to develop and implement an asset management plan that provides vision, strategy, and disciplined approach to achieve sustainable, efficient, and resilient assets.

Achieving a complete inventory can be a time-sensitive and costly effort, but one that can provide invaluable to future operational needs. An inventory that is up to date can feed many other initiatives. With a complete data set, it is easier to frame the structure of future condition

assessments and define capital replacement needs. Concise asset inventories are also used to establish preventative maintenance programs. Table 2 outlines a complete asset inventory of parks and recreation assets within the City of Greater Sudbury.

Service Area	Asset Type	Quantity
Parks and Recreation	Basketball Court (Full Court Equivalent)	36
	BMX Track	1
	Boat Launches	15
	Bocce Court	3
	Laurentian Track	1
	Outdoor Rink	57
	Dog Parks	3
	Playgrounds (tot lots)	181
	Skate Parks	9
	Soccer/Football Field	43
	Softball/Baseball Diamond	45
	Splash Park	17
	Tennis Court	40
	Pickleball Court	10
Trails*	41	
Volleyball Court	4	
Grand Total		506

*Total of maintained trails (km) = 179.9

4.2 Estimated Asset Value

The value of the parks and recreation infrastructure is determined through a combination of site reviews and assessments, appraisals, and estimating.

A Summary of the City’s parks and recreation value is provided in table 3.

Service Area	Asset Type	Replacement Cost
Parks and Recreation	Basketball Court	\$3,120,000
	BMX Track	\$160,000
	Boat Launches	\$390,000
	Bocce Court	\$30,000
	Laurentian Track	\$5,050,000
	Outdoor Rink	\$5,090,000
	Dog Parks	\$120,000

Playgrounds & Tot Lots	\$11,120,000
Skate Parks	\$1,100,000
Soccer/Football Field	\$7,320,000
Softball/Baseball Diamond	\$16,080,000
Splash Park	\$4,040,000
Tennis Court	\$4,140,000
Trails	\$7,040,000
Volleyball Court	\$100,000
Grand Total:	\$64,900,000

The estimated replacement value of the City’s parks and recreation assets is **\$64.9M**. This value represents 0.62% of the replacement value of the City’s total asset inventory.

4.3 Asset Useful Life and Asset Condition

As part of the parks and recreation data repository, annual inspection checklists will be routinely updated as a means of reporting on the condition of assets. By adhering to these inspections, the City can confidently report on conditions, regulatory compliance, and identify changes such as advanced deterioration that will impact the remaining useful life of the asset inventory.

Inspection checklists are produced based on the actual on-site condition of the parks and recreation assets, using professional judgement and industry standards. The visual inspection checklist can identify any physical defects, the general state of repair, quantities, potential hazards, and required reactive maintenance. The checklists inform the requirements for investment into lifecycle intervention.

The main purpose of the on-site inspection is to provide the City of Greater Sudbury with a condition survey of all assets and to create a replacement schedule for key components.

In addition to capital planning, Greater Sudbury’s parks and recreation section implements a series of routine activities to perform planned maintenance intervention of parks and recreation assets. In general, maintenance management uses an asset maintenance program consisting of these protocols:

- Regular scheduled preventative maintenance as per manufacturer recommendations and best practices. Greater Sudbury has adopted and adheres to preventative maintenance schedules with planned interventions. The maintenance work order system also allows City staff to be made aware of upcoming maintenance duties so that staff resourcing can be utilized efficiently and to ensure that assets are being inspected and maintained on a timely basis.
- Maintenance work orders are prioritized to ensure that critical assets are dealt with prior to less critical assets to minimize the impact on service delivery and to prevent further depreciation due to neglect.

- Visual inspections and documentation of conditions.
- Legislated and safety inspections and certifications.
- Discussions with the asset users, operators, and stakeholders regarding the performance of an asset.

4.4 Current Asset Condition

Condition ratings have been implemented to provide a benchmark to compare an asset's condition at a current or projected point in time. Condition ratings are based on the on visual inspections and the remaining useful life of assets and have been assigned to all parks and recreation assets within the City's inventory.

The average condition of the City's parks and recreational assets are provided in table 4 below.

Service Area	Asset Type	Mean Condition
Parks & Recreation	Basketball Courts	Fair
	BMX Tracks	Fair
	Boat Launches	Fair
	Bocce Courts	Fair
	Laurentian Track	Fair
	Outdoor Rinks	Fair
	Dog Parks	Good
	Playgrounds	Fair
	Skate Parks	Good
	Soccer/Football Fields	Fair
	Softball/Baseball Diamonds	Fair
	Splash Parks	Very Good
	Tennis Courts	Fair
	Trails	Fair
Volleyball Courts	Fair	

5. Levels of Service

Further development of the Parks and Recreation Asset Management Plan will provide opportunities for Council to review alternatives to the current levels of service. These future alternatives will be evaluated considering various levels of acceptable condition, risk, and financial alternatives.

The review of target levels of service will provide insight to establishing the criticality of assets and the long-term financial stability of the diverse options and impacts of proceeding with or deferring capital expenditures.

Consultation with staff, review of current activities and review of financial data have all been used in the preparation of the level of service framework. The current levels of service are described below.

5.1 Community: Levels of service are high level qualitative descriptions which indicate what the City currently strives to achieve through community, stakeholder, and individual expectations. Community levels of service for parks and recreation can be described as follows:

- Providing activities, parks, and facilities that are close to one's home
- Extending and connecting the system of trails and bike paths (and providing marked signage)
- Promote and advertise activities and assets (including online mapping of trails)
- Continue to provide a broad and evolving range of recreational services. For example, community gardens, splash parks, skate parks and pickleball courts.
- Maintain an acceptable level of cleanliness and maintenance of parks and recreation for summer playground programs, trail maintenance, sport, and tourism.
- Provide a safe and secure environments that are efficient and cost effective
- Compliance with legislative, regulatory, and code standards to meet service programming needs; for example, the *Accessibility for Ontarians with Disabilities Act*
- Appropriate training of staff, to ensure customer service and regulatory requirements are appropriately implemented (e.g., accessibility requirements)
- Appropriate parking is provided

5.2 Strategic: Qualitative and quantitative measures that describe what is being provided to the community. Examples of how this can be defined can include reliability, legislative compliance, quantity, quality, and safety. The strategic levels of service indicated below support the community levels of service.

Greater Sudbury recognizes the importance of monitoring service delivery through key performance indicators (KPI). Additionally, the City participates in the annual Municipal Benchmarking Canada (MBNCan) data call. Certain KPI's that are monitored may be measured against the aggregate or individual performance of other municipalities that report to MBNCan.

- Parks and recreation General:
 - o Plan for the opportunity to provide enhancements to accessibility standards per City of Greater Sudbury 2017-2021 Multi-Year Accessibility Plan and the Accessibility for Ontarians with Disabilities Act, 2005.

- Develop a connection between parks and recreation infrastructure and the Community Energy and Emissions Plan (CEEP) for design opportunities to achieve sustainability features that align with CEEP goals.

The CEEP is a long-term plan to reduce carbon emissions and pollution in Greater Sudbury. It responds to City Council's Climate Emergency declaration in May 2019, which includes a commitment to achieve net-zero emissions by 2050. That means reducing greenhouse gas emissions (GHG) caused by human activity to as close to zero as possible and removing remaining emissions from the atmosphere, by working towards set goals. The following goal is affiliated with parks and recreation green assets such as parkland and urban forests:

- Goal 18: Increase the reforestation effort of the Regreening Program. Primary action: increase the resources available to the Regreening Program for its reforestation efforts through operating budget assignment and coordination with businesses, institutions, and community groups. Greater Sudbury's Regreening Program is a renowned success. Increasing its capacity will help sequester more carbon and engage the community in environmental protection and restoration efforts.

- Develop a connection between parks and recreation and look for opportunities to design new assets or refurbish existing assets through the elements of Crime Prevention Through Environmental Design Principles (CPTED)

- Ball diamonds:

- Recommended provision level from Parks, Open Space & Leisure Master Plan: one baseball diamond for every 80 active participants
- Current provision level: one baseball diamond for every 68.5 participants
- Number of premier diamonds per 100,000 population
 - City of Greater Sudbury: 1.62
 - MBNCan Average: 2.67

- Outdoor basketball courts:

- Recommended provision level: one full court or equivalent court per 750 youth ages 10 to 19 years with 1.0km service radius considerations
- Current provision levels: one court per 567.4 youth ages 10 to 19 years (17,590 youth ages 10 to 19)

- Outdoor rinks:
 - Recommended provision level: distribution-based provision target of one outdoor rink within a 1.0 km radius of all urban residential areas
 - Current provision level: one outdoor rink per 2,884.5 persons
 - Number of outdoor manmade ice rinks per 100,000 population:
 - City of Greater Sudbury: 34.70
 - MBNCanada Average: 11.9

- Playground (structures):
 - Recommended provision level: distribution-based provision target of one play structure within an 800-metre radius of every urban residential neighborhood, without crossing a major arterial road or physical barrier.
 - Current provision level: no notable gaps in playground distribution within the urban portions of the City's settlement areas.
 - Number of playground sites per 100,000 population:
 - City of Greater Sudbury: 117.28
 - MBNCanada Average: 73.03

- Soccer fields:
 - Recommended provision level: one soccer field (unlit equivalent) for every 65 active participants.
 - Current provision level: one field for every 53.1 participants (4942 active participants during 2016 season)
 - Number of premier sports fields per 100,000 population
 - City of Greater Sudbury: 1.62
 - MBNCanada Average: 3.96

- Splash pads:
 - Recommended provision level: distribution-based provision target of one splash pad within a 1.5 km radius of all urban residential areas
 - Current provision level: one splash pad per 11,538 persons
 - Number of splash pads per 100,000 population

- City of Greater Sudbury: 8.64
 - MBNCanada Average: 4.75
- Tennis courts:
 - Recommended provision level: one court per 5,000 persons with 1.0 km service radius considerations
 - Current provision level: one court per 3047.7 persons
 - Number of operational tennis courts per 100,000 population:
 - City of Greater Sudbury: 34.67
 - MBNCanada Average: 17.89
- Parkland: The City of Greater Sudbury park system spans over 2400 hectares (5930 acres) and contains extensive infrastructure that ranges significantly in terms of type and value. A tiered park classification system has been developed to provide direction in park development and function. The classifications that have been prepared by the City's Green Space Advisory Panel (GSAP) follows. Included are standards that were adopted by City Council as part of the park classification system.
 - Active parkland
 - A neighborhood park is developed to meet the recreational needs of its immediate neighborhood. These parks should be located within 800 m (10 minutes walking) without crossing major barriers, with a minimum of 0.25 hectares per 1000 residents.
 - A community park is developed to provide the space and supportive facilities needed for active recreation. These parks should serve community and settlement areas, should be within 1600 m (20 minutes walking) without crossing major barriers, with a minimum of 1.5 hectares per 1000 residents.
 - A regional park is developed to be a focal point for the City with a minimum of 2.25 hectares per 1000 residents.
 - Open space
 - A linear park is a connector for people and/or wildlife. These parks should be within 800 m (10 minutes walking) without crossing major barriers.
 - A natural park protects a natural area while meeting residents' needs for passive recreation. These parks should be within 800 m (10 minutes

walking) without crossing major barriers and should be greater than 2 hectares where possible.

- A special purpose park (cultural/historical) protects sites with historic, scientific, cultural, social, or spiritual importance; or to serve a special, specific purpose.

To guide the future development of the parks system the City will use the following active parkland targets: *(the following is stated within the City of Greater Sudbury Official Plan Section 7.2.1 Active Park Provision Targets dated May 2019)*

- *neighborhood parks – 1.0 hectares per 1,000 residents*
- *community parks – 1.25 hectares per 1,000 residents*
- *regional parks – 1.75 hectares per 1,000 residents*
- *total active parkland – 4.0 hectares per 1,000 residents.”*

Although the City of Greater Sudbury Official Plan section 7.2.1 outlines the recommended provision levels as described above, the current provision levels are as follows:

- neighborhood parks – 2.3 hectares per 1,000 residents
- community parks – 1.3 hectares per 1,000 residents
- regional parks – 3.6 hectares per 1,000 residents
- total active parkland – 7.3 hectares per 1,000 residents

This equates to a 3.3 hectares per 1,000 resident's surplus of maintained active parkland.

When measuring the City of Greater Sudbury's maintained parkland per 100,000 population to that of the MBNCanada Average the results in hectares are 866.87 and 320.55, respectively. Therefore, the City of Greater Sudbury is above the MBNCanada average by 546.32 hectares.

5.3 Asset (Technical) Level of Service and Key Performance Indicators (KPI)

An asset level of service is a quantitative measure that defines the performance expectations for a given asset to produce the desired levels of service. These services are measured and can include asset conditions, responsiveness, expenditure, and asset value.

Levels of service can be evaluated by measures that consider customer complaints, customer surveys, community engagement, technical data, or discussions with municipal staff familiar with service operations.

The key performance indicators currently included in the asset levels of service are indicated below.

- Asset data collection and Inspections completed on an annual basis
- Asset condition breakdown
 - o % of assets in poor or very poor condition = 25%
 - o % of assets in fair condition = 44%
 - o % of assets in good or very good condition = 31%

The existing asset levels of service are provided in the following Table 5, which are based on the current condition of an asset that is providing the existing service levels to users.

Table 5: Current Asset Level of Service		
Service Area	Asset Type	Current ALoS
Parks & Recreation	Basketball Court	51%
	BMX Track	50%
	Boat Launches	50%
	Bocce Court	50%
	Laurentian Track	50%
	Outdoor Rink	51%
	Dog Parks	70%
	Playgrounds	53%
	Skate Parks	70%
	Soccer/Football Field	50%
	Softball/Baseball Diamond	50%
	Splash Park	90%
	Tennis Court	57%
	Trails	50%
Volleyball Court	50%	

6. Failure Prediction and Risk Management

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

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

framework that analyzes the PoF and CoF of parks and recreation infrastructure has been developed and implemented.

6.1 Probability of Failure (PoF)

The probability of failure is an estimate of the likelihood of an asset is to not meet its service expectations. The PoF for parks and recreation has been derived from asset condition. Table 6 demonstrates the rationale to determine the PoF of parks and recreation assets.

Table 6: Probability of Failure (PoF) Parks and Recreation			
Asset Condition translates to → Likelihood and PoF			
Condition		Likelihood	PoF
F (Very Poor)	Less than 20	Almost Certain: 80% of Greater	P5
D (Poor)	20 - 39	Likely: 60 – 79%	P4
C (Fair)	40 - 59	Possible: 40 – 59%	P3
B (Good)	60 - 79	Unlikely: 20 – 39%	P2
A (Very Good)	80 - 100	Rare: Less than 20%	P1

6.2 Consequence of Failure (CoF)

The consequence of failure is an estimate of the effect on outcomes if an asset fails. The consequences of failure could range from a service interruption to a catastrophic result depending on the asset criticality.

An example of this could be the City’s green assets such as green space and parks. The City of Greater Sudbury’s vast inventories of green assets help transform an urban neighborhood into an inviting, exciting place to live, work and play. The consequences of such assets failing could temporarily reduce recreation space or recreational opportunities. Overgrowth and lack of maintenance on these and similar green assets could reduce the desire for residents to spend time in outdoor recreational areas. If green assets are not maintained, especially in the first few years, the vegetation is likely to fail.

Urban heat islands happen when tightly packed buildings and paved surfaces that make up cities amplify and trap heat far more effectively than natural ecosystems and rural areas, which are often shaded by trees and vegetation and cooled by evaporating moisture. Failing vegetation diminishes the urban heat island reduction that occurs when urban area replaces manufactured land cover with trees, green roofs and other green infrastructure that cool the area by shading.

6.3 Risk Assessment and Exposure

The probability and consequences of failure allow the corporation to focus on assets that have the greatest impact on service delivery. The following formula demonstrates the PoF and CoF are multiplied to determine risk exposure.

$$\text{Risk Exposure} = \text{Probability of Failure} \times \text{Consequence of Failure}$$

The risk exposure for all the City's parks and recreation infrastructure is monitored and implemented for prioritizing projects related to reactive maintenance duties and Greater Sudbury's annual capital budget. For further details on the Risk Exposure framework, please refer to Appendix A.

6.4 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 lifecycle. This information informs a judgment about how much remaining service life is available. For this asset management plan, the remaining life of Parks and Recreation assets have been determined by condition.

6.5 Risk Response

The City's operating departments have risk response built-in to daily operations. Risk response includes contingency plans and mitigation strategies that have been developed with the experience of delivering levels of service to the community.

Over time the risk associated with any given asset will change but there are also ways to reduce the risk associated with an asset. Adding redundancy, monitoring, providing routine and preventive maintenance, developing a spare parts inventory, replacing an asset early and requiring specialized training are all ways overall risk can be reduced. Some of these approaches reduce the likelihood of failure of a given asset and some of these approaches reduce the consequence of failure of a given asset. Reducing either of these components reduces the risk associated with the asset.

Examples of risk response planning to reduce the disruption of service delivery includes:

- Risk can be reduced by having redundant assets. Redundancy involves the use of duplicate assets in critical areas to provide a backup in the event of failure, as well as to allow for operational flexibility during day-to-day operations. If an asset fails, there is another asset that can operate in its place without causing downtime. The City's playgrounds are a good example of redundancy with the number of strategically placed playgrounds, should one fail, another nearby site can be used in the interim.
- Routine and preventative maintenance will reduce the likelihood of failure of assets. Regular scheduled maintenance is being used on most assets based on a calendar year or use of the asset. Some examples of this type of maintenance would be the annual inspection per Ontario Regulation 126/16, s. 18 (2). Preventative maintenance is conducted to maintain the current operating condition and to help prevent unexpected failure. This type of maintenance requires monitoring and an awareness of asset condition. Wherever possible, departments try to perform routine maintenance on all assets and focus on preventative maintenance on the moderate to higher risk assets.
- Spare parts are a great approach to help minimize the risk of consequences of failure by minimizing the downtime of an asset that has failed and needs repair. The City of Greater Sudbury strives to keep an inventory of common and often used parts for maintenance and refurbishment.

- Monitoring assets through regular condition assessment or visual inspections ensure that the assets are functioning properly and can help to identify early signs of deterioration and the potential for failures. The City effectively monitors the asset inventory through the annual inspection checklists.

7. Long-Term Needs

The capital need detailed below is based on lifecycle modeling of Greater Sudbury's parks and recreation inventory. For this asset management plan, the lifecycle analysis represents the capital investment needed to rehabilitate and replace assets; the cost of operational maintenance is not included. Operational maintenance costs will be included in future updates to the asset management plan as part of full lifecycle cost analysis.

Detailed below is a 20-year average annual reinvestment requirement (AAR_{20}) which is the mean annual capital investment required over a 20-year period. The AAR_{20} is useful for defining the required rate of funding to maintain service levels based on the investment profile. It is recognized that spending will vary from year to year, however this value provides a benchmark upon which to measure whether parks and recreation assets are being renewed at a rate that is financially sustainable. With the average annual reinvestment requirement value, the City may either benchmark infrastructure investment against the metric while monitoring the variability year to year or contribute to reserves in years where the annual investment is short of the average annual reinvestment requirement value.

It is anticipated that a significant quantity of infrastructure investment need will be captured in an expenditure backlog. The risk-based lifecycle model discussed in Section 6 has been projected to determine upcoming investment requirements of parks and recreation assets.

Figure 4 below provides the 20-year average capital reinvestment need for parks and recreation assets to maintain the parks and recreation inventory at the existing condition. This represents the estimated amount of capital the City is required to reinvest in the parks and recreation inventory to maintain a FAIR level of service condition. The 20-year annual average reinvestment requirement in this scenario (AAR_{20}) for parks and recreation assets is \$2,777,621.

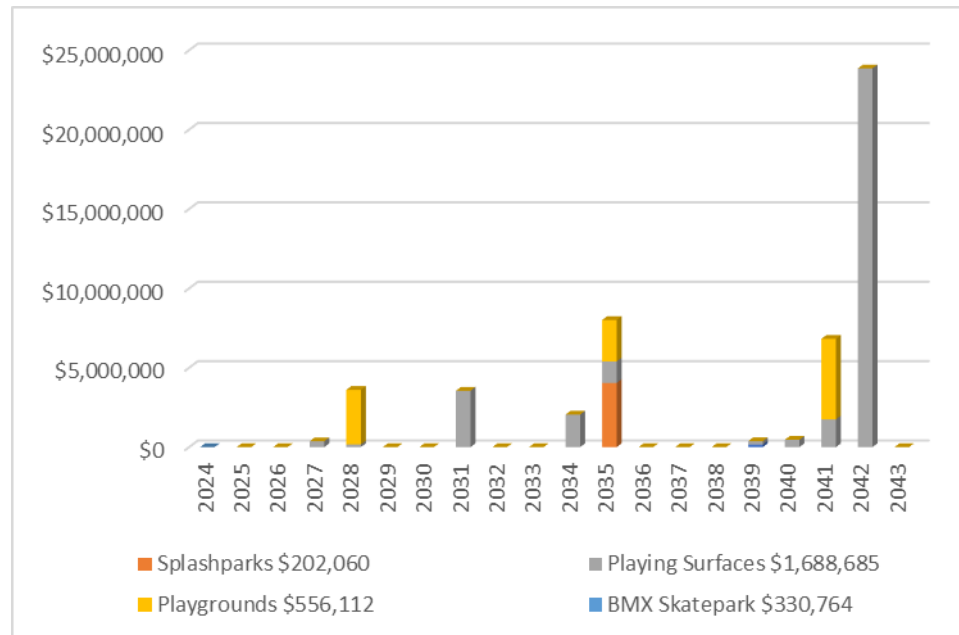
20-Year Capital Need Assumptions

The long-term needs for parks and recreation are based on the following assumptions:

- Parks and recreation assets are being refurbished and/or replaced with elements that are in similar function;
- 20-year average annual reinvestment requirement does not consider service expansion or reduction;
- High risk projects as defined within Section 6 Failure Prediction and Risk Management is immediate need in the year 2023;

- Calculated in 2022 Canadian dollars where actual costs vary with currency fluctuations.

Figure 4: Annual Reinvestment of the Parks and Recreation Inventory in Millions



7.1 Infrastructure Reinvestment Financing Strategy

State of good repair (SoGR) is the condition that an asset can operate at a full level of performance. To maintain the City’s infrastructure assets in a state of good repair, capital work is financed through tax supported capital reserve and utility rate supported capital reserve. The Parks and Recreation Asset Management Plan in conjunction with the annual capital budget proposes and prioritizes the City’s infrastructure investment requirements according to their respective financing sources.

The 20-year average annual reinvestment requirement is compared to historical expenditure from a period of 5 years to demonstrate the financial risk associated with asset ownership known as a funding gap. The funding gap is the unfunded capital value of infrastructure renewal needs that require attention as of the current year. It is important to note that additional expenditure from the operating budget helps to further reduce the funding gap. Maintenance expenditure can contribute to extending the actual service life of infrastructure. Table 7 demonstrates the parks and recreation funding gap.

Asset Class	5 Yr. Expenditure (Mean)	AAR ₂₀	Funding Gap
Parks and Recreation	\$2,345,089	\$2,777,621	\$432,532

7.2 Sustainability Strategy

The existing level of service for parks and recreation detailed in Section 5 Levels of Service drive the reinvestment forecasts in the asset management plan. Levels of service are based on

regulation, standards, and Council approved service levels. Following the asset management roadmap, Council will be provided with the opportunity to determine level of service targets to manage infrastructure within the City’s capacity to renew and maintain assets and accept the associated risk.

7.3 Next Steps

Ensuing Council approval of the Parks and Recreation Asset Management Plan, target level of service options will be prepared for Council review, discussion, and approval. The target level of service framework may require additional key performance indicators and will be the main driver of the sustainability strategy. When target level of service is reviewed, Council will have the option to select service levels that lead to either a reduction or an increase of assets that are in-service and require financing.

Table 8 identifies the next steps that emerged during the development of the asset management plan.

Table 8: Next Steps		
Section	Category	Action Item
State of the Infrastructure	Inventory	<ul style="list-style-type: none"> • Monitor and refine the parks and recreation asset inventory to reduce the quantity of data assumptions • Continue to implement the digital solution to track, monitor and analyze parks infrastructure • Continue to conduct condition assessments at appropriate intervals
Level of Service	Asset Level of Service	<ul style="list-style-type: none"> • Develop target service levels for Council review
Asset Management Strategy	Lifecycle Management Plan	<ul style="list-style-type: none"> • Review and refine strategies as necessary
Failure Prediction Risk Management	Risk Assessment and Exposure	<ul style="list-style-type: none"> • Monitor and refine the deterioration model for parks and recreation assets as necessary
Long-Term Needs	Funding Sources	<ul style="list-style-type: none"> • Develop a sustainability strategy to achieve target levels of service for Council review, discussion, and approval. • Determine funding source for infrastructure need.

8. Future Demand

8.1 Demand Drivers

Drivers affecting demand include parameters such as population, legislation, demographics, seasonal factors, technological advancement, economic, environmental awareness, and Council directed service revisions.

8.2 Demand Forecasts and Impact on Assets

The present position and projections for demand drivers that may impact future service delivery and use of assets were identified and documented in Table 9. The present position and projection statistics are from the City of Greater Sudbury Outlook for Growth to 2046 that was developed in March 2018.

8.3 Demand Management Plan

The City will regulate the demand on assets through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand. Opportunities identified for demand management are provided in Table 9. Further opportunities will be developed in future versions of the asset management plan.

Demand Driver	Present Position	Projection	Impact on Services	Demand Management Plan
Population	City of Greater Sudbury Population: 166,130	Population (2046): • Low: 165,090 • Mid-Range: 172,990 (Ref. Scenario) • High: 181,290	The City's population is anticipated to remain constant. This will minimize the impact on parks and recreation assets.	The City will continue to monitor population. Should the population deviate from the expected constant, the data will be analyzed to formulate an appropriate plan.
Legislation	Parks and recreation guidelines are evolving to meet and exceed legislation and provide accessibility to all residents.	Additional legislative requirements are anticipated. For example, implementation and enforcement for an accessible Ontario by 2025.	Replacement cost of parks and recreation assets are expected to increase with evolving legislation.	The replacement value of parks and recreation is monitored to reflect legislation and compliance, latest technology, and limited number of suppliers.
Demographic	Households: 69,152	Households (2046): • Low: 72,890 • Mid-Range: 75,250 (Ref. Scenario) • High: 77,590	The anticipated increase in households and population will be monitored against the services provided by parks and recreation assets.	The City has an expansive geographic area of 3,228 km ² that is serviced by the City of Sudbury parks and recreation. With an increase in an older population, the City will monitor the services provided to the area.

Environmental Awareness	Through legislation and the City's own actions, the City has demonstrated that it recognizes the need for environmental and climate protection.	In recent years, environmental awareness has received more attention. This is expected to continue. Environmental awareness is anticipated to result in additional legislative requirements and stricter best practices.	New parks and recreational assets are being developed to produce a lower carbon footprint. Replacement cost of assets are expected to increase as environmental awareness increases.	The replacement value of parks and recreation is monitored annually to reflect market demand resulting from legislation, latest technology, and limited number of suppliers. A policy may be generated to include the installment of energy efficient elements that make up parks and recreation assets.
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9. Climate Change

In September 2020, Council approved the Community Energy Emissions Plan (CEEP) that is the long-term plan to reduce carbon emissions and pollution in Greater Sudbury. The CEEP is a response to the City of Greater Sudbury Council's Climate Emergency declaration in May 2019. The CEEP outlines 18 goals that need to be met to attain the City's target of becoming a net-zero GHG emission community by 2050. For further information with respect to the Community Energy Emissions Plan, please visit: <https://www.greatersudbury.ca/live/environment-and-sustainability1/net-zero-2050/>.

Global climate models for the Greater Sudbury geographic area are available through various online resources, namely:

- [Climatedata.ca](https://climatedata.ca/), undertaken with the support of Environment and Climate Change Canada;
- [Climateatlas.ca](https://climateatlas.ca/), undertaken with the support of Environment and Climate Change Canada, Public Health Agency of Canada, and Health Canada.

The City is beginning to monitor the effects of climate change on its infrastructure assets. The data provided in the websites identify that there will be an increase in precipitation and an overall increase in mean temperature for the municipality. The increase in mean temperature within the area will result in a decrease of freeze-thaw days, additional summer days, more extremely hot days, and additional tropical nights.

The following Table 10 provides the results of several Global Climate Models for the City of Greater Sudbury geographic area with high and low carbon emission scenarios and the anticipated impact on parks and recreation assets. It is important to note that the anticipated impact is of climate change on infrastructure, not the potential impact of infrastructure contribution to climate change.

Variable	Current Mean	RCP	2021 - 2050	2051 - 2080	Anticipated Impact
			Mean	Mean	
Precipitation (mm)	848	High 8.5 Low 4.5	904 890	938 924	The increase in precipitation may require additional maintenance due to damage to outdoor courts caused by insufficient drainage. Drainage will be monitored and upgraded as required.
Mean Temperature	4.3°C	High 8.5 Low 4.5	6.5°C 6.3°C	8.8°C 7.3°C	No specific impact.
Tropical Nights (+20°C)	1	High 8.5 Low 4.5	5 4	17 7	No specific impact.
Very Cold Days (-30°C)	5	High 8.5 Low 4.5	1 2	0 1	Stress on urban forest and plants.
Very Hot Days (+30°C)	6	High 8.5 Low 4.5	18 16	39 24	Stress on urban forests, and grass playing fields.
Frost-Free Season (days)	137	High 8.5 Low 4.5	163 157	184 168	The decrease in frost days will allow for a longer construction season and allowing for ease of maintenance routines.
Freeze Thaw Cycles	68	High 8.5 Low 4.5	64.2 65.4	61.5 64.3	The decrease in freeze-thaw cycles may ease pressure on the foundations of outdoor playing courts such as asphalt basketball courts.
Mild Winter Days (-5°C)	120.1	High 8.5 Low 4.5	103.6 104.5	84.2 96.6	The decrease in mild winter days will allow for more opportunities to provide maintenance routines.
Summer Days (+25°C)	42.9	High 8.5 Low 4.5	68.9 65.2	93.8 77.4	Potential for an increase in risk of brush fires.
Winter Days (-15°C)	58.4	High 8.5 Low 4.5	42 43.9	24.8 35.3	The services provided by Parks and Recreation can be extended throughout the year and other services may be shortened with less Winter Days, such as outdoor ice rinks.

10. Improvement Opportunity

The City will take the following steps towards sustainability:

- Update and implement the Parks, Open Space, and Leisure Master Plan to develop a strategy for the management and delivery of services at municipal parks;
- Maintain full compliance with legislation;
- Increase the emphasis on consistent initiative-taking maintenance and lower the volume of reactive maintenance;
- Environmentally sustainable initiatives;

- Monitor asset lifecycles for scheduled replacements;
- Monitor scheduling of equipment as it relates to operating department service level needs;
- Monitor Parks and Recreation usage and optimize assets via utilization;
- Advance technologies and maintain in house expertise;
- Look for opportunity to improve training and departmental workforce depth.
- Council will be provided with the opportunity to adjust the level of service provided to the community.

Appendix A

Table 1: Consequences of Failure (CoF) for Parks and Recreation		
CoF Categories	CoF Parameters	Weighting
Sustainable Service Delivery	Ensures that current service needs, and those services are delivered in a socially, economically, and environmentally responsible manner. Does not compromise the ability of future generations to meet their own needs. Communities build and maintain infrastructure to provide services that support our quality of life, protect our health and safety, and promote social, economic, and environmental well-being.	20%
Strategic, Legislation and Environmental	Assets acquired, maintained, and disposed of strategically and in line with the City's strategic goals while following all legislation set forth by Federal, Provincial and Municipal bodies. Asset Management decisions are made in line with the environmental impacts	20%
Social Repercussions	When an asset fails, there may be minor or major impacts or inconveniences to the community. Social consequences can relate to safety, public health, service outages, or the public's ability to use or enjoy a park and recreation asset. Inconveniences may appear insignificant, but to members of the community, the inconvenience may be extremely important and may affect how they feel about the asset class in general. More consequential social costs include impacts related to public health and safety.	20%
Economic and Financial Losses	A framework for the clear value of infrastructure planning and maintenance, while adjusting economic factors. Decision-making and investment planning best practices transform complex and technical material into non-technical principles and guidelines for decision making and facilitate the realization of adequate funding over the life cycle of the infrastructure. Examples include protocols for determining costs and benefits associated with desired levels of service; and strategic benchmarks, indicators or reference points for investment policy and planning decisions.	20%
Redundancy and Mitigation	Redundancy involves the use of duplicate assets in critical areas to provide a backup in the event of failure, as well as to allow for operational flexibility during day-to-day operations. If an asset fails, there is another asset that can operate in its place without causing downtime.	20%