

Building Better Parks: An Asset Management Plan for Parks



Parks

INTRODUCTION

The City of Saskatoon's (City) park assets are maintained by Community Services, Parks Division and Asset & Financial Management, Facilities and Fleet Management Division (Facilities Division). The inventory is comprised of a variety of asset sub-classes that include but are not limited to: pathways, irrigation systems, play structures, trees, shrubs, trash cans, benches, fencing, sport fields, tennis courts, lighting, signage, picnic sites, skateboard parks, gazebos, foot bridges, shade structures, pools, and water features. On August 15, 2016, a partial Building Better Parks, Asset Management Plan was presented to the Standing Policy Committee on Planning, Development & Community Services that was focused on pathways, irrigation systems, and play structures. The following Asset Management Plan includes updates on assets previously reported on, as well as a majority of the assets mentioned above. The structures in the parks, trees, shrubs, lighting, and signage will be included in future Asset Management Plans.

CURRENT INVENTORY

Park inventory is maintained within both the Parks and Facilities Divisions. The asset data has been compiled over time, through a variety of methods, with some assets being measured and recorded in the field while other data has been recorded using a combination of aerial photography and GIS technology. It is important to note that the park asset inventory represents a snapshot in time and that park development, park upgrades, and data refinement efforts will influence inventory over time.

The current replacement cost for park infrastructure is approximately \$230.9 million, as detailed in Table 1 and Table 2.

Table 1: Current Inventory Summary (in millions of \$)

Asset Group	Replacement Cost
Amenities*	11.7
Pathways	31.6
Parking Lots	8.9
Roadways	3.0
Fencing/Retaining Walls	7.9
Irrigation	34.5
Pools and Water Features	68.2
Play Structures	26.9
Sport Fields	38.2
Total	230.9

**Amenities: Benches, bleachers, garbage cans, bike racks and tables.*

Table 2: Detailed Parks Inventory Listing - 2016

Asset	Inventory	Replacement Cost Per Asset	Total Replacement Cost
Amenities			
Benches	1,788 each	\$3,500	\$6,258,000
Bleachers	36 each	\$7,000	\$252,000
Garbage Cans	1,519 each	\$2,100	\$3,189,900
Bike Racks	217 each	\$1,700	\$368,900
Tables	334 each	\$5,000	\$1,670,000
			\$11,738,800
Pathways			
Asphalt	222,033 sq. m.	\$90	\$19,982,970
Concrete	10,441 sq. m.	\$150	\$1,566,150
Crusher Dust/Shale	81,308 sq. m.	\$60	\$4,878,480
Pavers	24,838 sq. m.	\$210	\$5,215,980
			\$31,643,580
Parking Lots			
Gravel	56,876 sq. m.	\$50	\$2,843,800
Paved	30,400 sq. m.	\$200	\$6,080,000
			\$8,923,800
Roadways			
Gravel	22,053 sq. m.	\$50	\$1,102,650
Paved	9,473 sq. m.	\$200	\$1,894,600
			\$2,997,250
Fencing/Retaining Walls			
Bollards	67,000 each	\$60	\$4,020,000
Stone	4,246 lin.m.	\$550	\$2,335,300
Omega	140 lin.m.	\$175	\$24,500
Chainlink	14,157 lin.m.	\$105	\$1,486,485
			\$7,866,285
Irrigation	575 ha	\$60,000	\$34,500,000
			\$34,500,000
Pools and Water Features			
Paddling Pools	30 each	\$1,200,000	\$36,000,000
Spray Pads	19 each	\$600,000	\$11,400,000
Swimming Pools	4 each	\$5,190,937	\$20,763,748
			\$68,163,748
Play Structures			
Composite or Metal	180 each	\$130,000	\$23,400,000
Older Style Wooden	9 each	\$130,000	\$1,170,000
Destination Accessible	5 each	\$450,000	\$2,250,000
			\$26,820,000
Sport Fields/Courts			
Soccer/Football	107 each	\$120,000	\$12,840,000
Ball Diamonds - Baseball	24 each	\$150,000	\$3,600,000
Ball Diamonds - Softball	150 each	\$100,000	\$15,000,000
Basketball 1/2 court	19 each	\$40,000	\$760,000
Basketball full court	19 each	\$80,000	\$1,520,000
Tennis	45 each	\$100,000	\$4,500,000
			\$38,220,000
Total			\$230,873,463

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Amenities

The amenities category includes benches, tables, bleachers, garbage cans, bike racks and tables that are located within the City parks.

Pathways

Asphalt, concrete, crusher dust, paver and shale pathways located in park areas are included in this report. Any non-park pathways such as road right-of-way, buffers etc. are not included in this report.

The Meewasin Valley Authority (Meewasin) and the City share the responsibility to rehabilitate the Meewasin trail. The Meewasin trail system inventory is included in this report.

Parking Lots and Roadways

City's parks include a number of parking lots and roadways that provide access to park areas and are either gravel or paved. The inventory includes parking lots and roadways located within the park.

Fencing

The report covers a variety of fencing structures including bollards, stone walls, chain-link and omega (welded wire mesh).

Irrigation System

Irrigation assets include sprinklers, pipe, wiring, electronic field controllers, weather stations, central control computers, and valves. This report includes irrigation in parks but not irrigation in non-park open space such as streetscapes or the Woodlawn Cemetery.

Pools and Water Features

This category includes regular outdoor swimming pools, paddling pools, and spray pads. Indoor pools will be included in the City's Facility Asset Management Plan.

Play Structure

Metal, composite, old style wooden and the destination accessible play structures are included in this report. Replacement cost of all the play structures include the removal of the old structure, landscaping, and replacement of all components including the playground surface material under the play structures.

Sport Fields/Courts

The sport fields section of the report includes soccer and football fields, ball diamonds, tennis and basketball courts, along with goal posts, backstops, and benches.



PHYSICAL CONDITION OF PARK ASSETS

A comprehensive condition rating and inspection have yet to be completed on all of the park assets as the appropriate resources and systems are not currently in place for this. Therefore, in order to determine a representative condition assessment of the City's park assets as a whole, the condition of the park asset is determined in one of three ways:

- fixed asset useful life;
- actual condition assessments completed; or
- no formal condition assessment with condition being based on Division reviews of information available.

Useful life is the time the asset is expected to be usable for the purpose it was intended.

Table 3: Rating structure has been developed based on Administration's knowledge of the park assets and industry best practices.

Table 3: Rating Structure

Condition Description	Identifier
Very Good (VG)	New Condition or recently rehabilitated. No defects and little maintenance.
Good (G)	Normal maintenance costs, good overall condition.
Fair (F)	Asset requires some attention. Maintenance costs begin to rise.
Poor (P)	The asset is approaching end of service life; condition is below standard and a large portion of the asset exhibits significant deterioration. Risk of negative impact to service level increases.
Very Poor (VP)	Asset is beyond service life and requires major refurbishment, upgrade or replacement. Service level may be negatively impacted.

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Table 4 illustrates the condition of each asset based on the rating structure in Table 3. Table 4 is color coded with each color representing the method used to determine the condition of the asset. Based on the rating structure in Table 3, and the condition method as per Table 4, the majority of assets are in “fair” or “better” condition.

Table 4: Condition of Asset Groupings

Asset	Quantity	Condition Level				
		Very Good	Good	Fair	Poor	Very Poor
Amenities						
Benches	1,788 each	33%	0%	56%	9%	2%
Bleachers	36 each	0%	30%	55%	10%	5%
Garbage Cans	1,519 each	27%	0%	47%	25%	1%
Bike Racks	217 each	65%	0%	28%	7%	0%
Tables	334 each	19%	0%	40%	34%	7%
Pathways						
Asphalt	222,033 sq. m.	37%	18%	8%	16%	21%
Concrete	10,441 sq. m.	9%	48%	1%	8%	34%
Crusher Dust/Shale	81,308 sq. m.	32%	23%	39%	1%	5%
Pavers	24,838 sq. m.	12%	42%	3%	2%	41%
Parking Lots						
Gravel	56,876 sq. m.	14%	17%	6%	8%	55%
Paved	30,400 sq. m.	0%	3%	5%	0%	92%
Roadways						
Gravel	22,053 sq. m.	0%	0%	0%	0%	100%
Paved	9,473 sq. m.	0%	0%	0%	0%	100%
Fencing						
Bollards	67,000 each	38%	0%	57%	4%	1%
Stone	4,246 lin.m.	0%	15%	40%	25%	20%
Chainlink	14,157 lin.m.	6%	17%	26%	15%	36%
Omega	140 lin.m.	15%	20%	35%	15%	15%
Irrigation/Drainage						
Irrigation/Drainage	575 ha	10%	17%	13%	9%	51%
Pools and Water Features						
Paddling Pools	30 each	10%	14%	37%	33%	6%
Spray Pads	19 each	30%	30%	15%	15%	10%
Swimming Pools	4 each	25%	25%	25%	25%	0%
Play Structures						
Composite or Metal	180 each	22%	37%	23%	14%	4%
Older Style Wooden	9 each	0%	0%	0%	44%	55%
Destination Accessible	5 each	20%	40%	40%	0%	0%
Sport Fields/Courts						
Soccer/Football	107 each	7%	28%	40%	15%	10%
Ball Diamonds	174 each	5%	25%	55%	10%	5%
Tennis (outdoor)	45 each	5%	55%	20%	15%	5%
Basketball 1/2 court	19 each	5%	10%	35%	25%	25%
Basketball full court	19 each	5%	10%	35%	25%	25%

Actual condition assessments completed.

Formal Condition Assessment has not been completed. This is an estimate provided by the Divisions upon reviewing of information available.

Condition determined based on age.

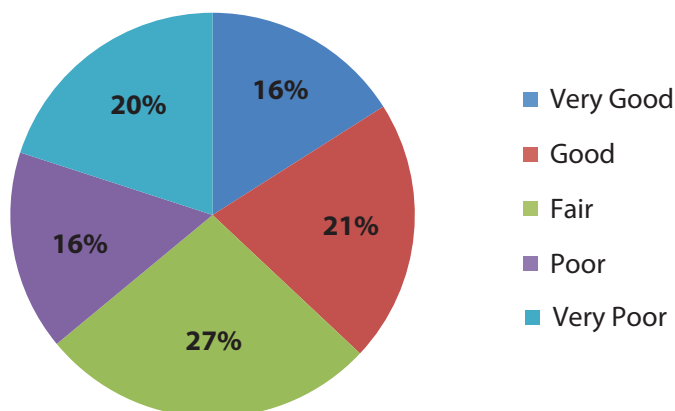
Table 5: Asset Category by Condition Rating

Asset Grouping	Very Good	Good	Fair	Poor	Very Poor
Amenities	30%	1%	50%	17%	2%
Pathways	31%	24%	12%	11%	22%
Parking Lots	4%	8%	5%	3%	80%
Roadways	0%	0%	0%	0%	100%
Fencing	21%	8%	46%	12%	13%
Irrigation/Drainage	10%	17%	13%	9%	51%
Pools and Pool Features	18%	20%	30%	28%	5%
Play Structures	13%	36%	25%	14%	12%
Sportsfield	6%	29%	45%	13%	8%

While various rating systems have been utilized in order to get a representative view of the condition of park assets, it is important to note that while physical condition assessments have been completed on some assets, it has not been completed for all; therefore, other information available or age has been used to determine condition. Using age to determine condition has its limitations, for example, although 100% of City asphalt roadways within parks have been identified as very poor condition as they are past their useful life, many may still be in usable or fair condition. In order to determine a more accurate rating system, physical review, inspection and ratings of all individual asset will be performed for park assets in the near future.

The chart below illustrates the % of total assets based on replacement value that falls under each condition rating. Overall, the majority of park assets, or 64%, are rated fair or above condition with 16% being close to the end of their life and 20% identified as being past their useful life.

% of Total Asset Replacement Cost in each Category



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Although 64% of park assets are in fair or better condition, this is largely due to the fact that a substantial amount of park space has been developed over the past 10 years as Saskatoon experienced significant growth. This means assets are in good or very good condition as they are relatively new, however, moving forward the City has very little funding dedicated towards the rehabilitation and replacement of parks assets, approximately \$960,000 per year. As this growth of park infrastructure continues, it will be important to ensure that appropriate amounts of operating funding are applied to the various park assets so that expected asset life cycles and desired asset conditions can be achieved and sustained.

EXPENDITURE LEVELS

The level of service for each type of asset is defined; however, as the level of service increases for the asset, so does the cost of maintaining the asset. In order to be able to compare the level of investment for all assets corporate-wide, five levels of expenditures are identified below. It should be noted that expenditure levels are not condition assessments but lead to a change in the asset condition over time. “A” represents the highest level of expenditure and “F” represents no expenditure.

Table 6: Expenditure Levels

Expenditure Level	Asset Condition	Description
A	Getting Better Quickly	Sufficient expenditures to keep assets in the desired condition and to increase asset condition/value quickly over time.
B	Getting Better	Sufficient expenditures to keep assets in the desired condition and to increase asset condition/value slowly over time.
C	Maintain Assets in current condition	Sufficient expenditures to keep asset in constant condition over time.
D	Getting Worse	Insufficient expenditures to maintain asset condition. Over time asset condition will deteriorate.
F	Getting Worse Quickly	No expenditures. Asset condition/value decreased rapidly.

The two decisions to be made in order to proceed with an asset management plan are:

1. What is the desired condition level?
2. How fast would City Council like to reach the desired condition level (expenditure level)?

Table 7 aligns the desired condition and expenditure level. The required funding to “B” or “C” expenditure level is averaged at \$10.8 million annually. It is important to note that this is the funding required if all assets were currently in the desired condition.

Table 7: Current Condition, Desired Condition, and Expenditure Level

Asset	Actual Physical Condition	Physical Condition Desired	Desired Expenditure Level	Required Annual Funding (to meet Expenditure Level)
Amenities	30% Very Good 1% Good 50% Fair 17% Poor 2% Very Poor	Fair	C	700,000
Pathways	31% Very Good 24% Good 12% Fair 11% Poor 22% Very Poor	Fair	C	1,500,000
Parking Lots	4% Very Good 8% Good 5% Fair 3% Poor 80% Very Poor	Fair	B	500,000
Roadways	100% Very Poor	Fair	B	200,000
Fencing	21% Very Good 8% Good 46% Fair 12% Poor 13% Very Poor	Fair	C	300,000
Irrigation/Drainage	10% Very Good 17% Good 13% Fair 9% Poor 51% Very Poor	Fair	B	1,700,000
Pools and Water Features	18% Very Good 20% Good 30% Fair 27% Poor 5% Very Poor	Fair	B	1,900,000
Play Structures	13% Very Good 36% Good 25% Fair 14% Poor 12% Very Poor	Fair	C	1,700,000
Sport Fields/Courts	6% Very Good 29% Good 44% Fair 13% Poor 8% Very Poor	Fair	C	2,300,000
Total Funding Required				10,800,000
Less: Funding Available				5,000,000
Funding Gap				5,800,000

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The required annual funding was estimated based on the estimated replacement value divided by the estimated life of each asset. As condition assessments and life cycle cost models were not available for each individual asset at this time, useful life and replacement value was utilized. For example, if the City owns a play structure that costs \$150,000 to be replaced and is estimated to last 15 years, the plan indicates that \$10,000 should be put away each year for preventative maintenance and eventual replacement. It is important to note that the calculated funding would be utilized for preventative maintenance and capital replacement in an effort to extend the useful life as long as possible and achieve the lowest possible life cycle costs. If funding is phased in, the Administration will continue to develop actual condition assessments and life cycle cost models which will refine the funding model.

Upon reviewing the ongoing operating and capital investments and the impact of these funding sources on the condition of the assets, a potential funding strategy has been developed identifying a shortfall of approximately \$5.8 million annually.

PRESERVATION PROGRAMS

The funding to provide preventative maintenance to all assets mentioned in this report is available through various operating accounts in Facilities and Parks Division operating budgets. Shortfalls in operational budgets have a direct impact on the condition of the asset and its life span.

Service levels within the Parks and Facilities Division continue to be defined and presented to City Council. As new information becomes available, it will be presented.

Amenities

The amenities within parks are the responsibility of Facilities Division. They undergo annual inspections which are used to develop a prioritized maintenance schedule. Repairs can include everything from replacing parts, or the base of the amenity being reconstructed, to a complete replacement. Replacement becomes necessary when the amenity reaches the end of its useful life, or in the event of vandalism, which destroys the whole unit. In addition, through annual inspections, needed repairs are brought to the attention of the Administration when City staff report damage to an amenity seen while working in a park or a member of the public reports concerns.

Pathways

Park pathways are inspected by supervisory staff on an annual basis or when poor condition is reported by the public. Repair and Maintenance of these pathways is prioritized and funded through Parks operating budgets.

Parking Lots and Roadways

The city parks include a number of parking lots and roadways that are either gravel or paved. Paved parking lots and roadways are inspected routinely and then repaired with operating funding or upgraded out of a capital reserve. Facilities' and Parks' operating budgets are currently not funded adequately to support required maintenance and renewal of paved and gravel parking lots and roadways. Repairs to the roadways and parking lots tend to be reactive when the asset has deteriorated to very poor condition. A recent increase in the Capital Reserve, however, will begin to help upgrade the parking lots. This will start to reduce the maintenance expenditures over time.

Fencing

A variety of fencing structures including bollards, chain link, stone wall, and omega (welded wire mesh) serve to guide access into and within park areas. Wooden bollards line the outside of many of parks to prevent unauthorized entry and damage to the park surfaces; decorative bollards are used in specialized areas like River Landing to provide lighting on pathways; large metal bollards are used to stop vehicles from damaging infrastructure at the end of roadways. Stone walls are built for many reasons ranging from a utilitarian purpose such as retaining walls to an architectural improvement in the design of entrances to village squares throughout the City. Capital and operating budgets within Parks and Facilities Divisions support the maintenance and replacement associated with fencing structures.

Irrigation Systems and Drainage

Irrigation and drainage systems ensure the intended function and useful life of park infrastructure is achieved by maintaining adequate levels of moisture within park areas. The Parks Division provides maintenance to park irrigation systems that includes the annual blow out of the system prior to the winter season and charging the system with water in the spring in combination with operational system checks that are performed to ensure the system is applying water as efficiently as possible. Deficiencies including broken heads, valves, wiring, and pipe are repaired as identified and allow continued distribution of irrigation water throughout the growing season. These maintenance costs are funded through the Parks Division's operating budget.

Poor drainage impacts the lifecycle and function of all the park assets both hard and soft. Freeze/thaw cycles associated with poor drainage will damage hard and green infrastructure as well as compromising the functional aspect that the park infrastructure is to provide. Many of the City parks are experiencing drainage problems which have appeared over time, compromising the function and service level of the park area. These areas also represent an elevated maintenance cost due to additional labor associated with maintaining soft, wet, areas where water accumulates on a regular basis. These saturated conditions often also damage other adjacent park and private (residential) infrastructure such as asphalt pathways, lighting systems, basements as well as contributing to tree, shrub, and turf mortality. The root causes of these issues are many including; high water tables in newly developed areas, development processes that limit the opportunities to ensure adequate grades to support adequate drainage, as well as the lack of a drainage bylaw that prohibits or limits the use of park space as an area where residential storm and sump water can be directed. The Parks Division recently completed a high level inventory of all parks with regard to drainage and problem areas were categorized and potential solutions/remediation completed. If an asset management strategy is implemented, drainage issues will be dealt with at the same time as asset rehabilitation in order to ensure repairs or renewed assets reach their full life cycle capacity.

Pools and Water Features

Maintenance to pools and water features by the Facilities Division includes annual winterization/water blowouts which is crucial to maintaining the condition of the assets. Other annual maintenance includes caulking expansion/control joints and slurry coats to asphalt spray pads. Currently, maintenance on pools is performed on an as needed basis but ideally applying sealer to concrete surfaces would be beneficial long-term to slow down the damage due to freeze thaw cycles. Phased replacement of the older pools are presented to

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Council when it is no longer feasible and economic to continue to maintain and operate the existing facilities. Paddling and spray pads are planned for upgrades/repairs based on priority needs and prior condition assessment audits.

Play Structure

Preventative maintenance of play structures is included in the Parks and Facilities operating budgets. This includes playground equipment certifications, labour for inspections of the structures, replacement materials for the components that are worn out or unsafe, cleaning of broken glass, pumping water after spring melts or rain events, sharps checks, sand/woodchip replenishment, sweeping, raking, and rototilling of sand.

In 2016/2017, funding of \$1.1 million was used to replace 11 play structures which were in very poor condition. This project was funded jointly by the Federal Canada 150 Infrastructure program, donor contribution, and the City of Saskatoon.

Sport Fields/Courts

The infrastructure for the recreation component of City owned parks are maintained by the Facilities Division while the ground surface maintenance is the responsibility of the Parks Division. The amenities for recreation activities include soccer nets, football goal posts, tennis nets, surfacing and perimeter fencing, ballfield backstops, home run fencing, and benches, basketball nets and asphalt courts, and bleachers. There are also larger complexes where multiple events are hosted, Gordie Howe Sports Complex being one example.

Sport fields ground surface conditions are maintained to support intended recreational use through the application of Parks Division service levels such as mowing, fertilizing and watering. Above basic service levels on Class 1, 2, and 3 fields are funded by user groups and provide a higher level of service to support an increased level of competitive play.

Green Assets

Green assets are not considered in this version of the Parks Asset Management Plan.

Preservation and maintenance of green assets such as trees, horticultural plantings, and grass and turf natural and naturalized areas are a fundamental part of the service the Parks Divisions provides, however the application of traditional asset management principles to living green infrastructure does not always provide an accurate representation for the asset condition and future life cycle requirement.

The City Administration is currently undergoing a process of inventorying and valuing municipal-owned and/or maintained natural assets¹ in Saskatoon. The Natural Capital Asset (NCA) valuation will link financial values to the various benefits that green infrastructure provides to the community. For example, a value will be determined for green infrastructure assets such as trees, natural pathways, wetlands, riparian areas, community gardens, ecologically significant areas, grassy areas and others. The goals of the NCA valuation initiative are to: better understand the economic value of natural assets and green infrastructure, identify how and where green infrastructure options can act as viable, effective and affordable alternatives to build ("grey") infrastructure, identify any potential risks and funding requirements for green spaces, and provide the City with the ability

¹ *Natural capital assets refers to features of the natural environment that provide a benefit to the community. These benefits include geology, biology, soil, air, water, ecosystems, recreation, health and others.*

to better manage the maintenance of its green infrastructure, engage in life-cycle asset management, strategize future development and infrastructure upgrades, and implement a triple bottom line approach to municipal planning and operations.

As this data is gathered and analyzed, it may be added to future Parks Asset Management Plans.



POTENTIAL PLAN TO ADDRESS THE FUNDING GAP

Park asset replacements and maintenance are funded through a variety of operating and capital sources. Renewal and rehabilitation is prioritized each budget year. The Parks Infrastructure Reserve of \$960,000 adjusted annually for CPI, provides annual funding to upgrade, enhance, and repair parks throughout the City. This includes irrigation system replacement, drainage systems, lighting, furniture, and play equipment. Meewasin Valley Authority is allocated \$250,000 towards pathway maintenance. There are a variety of operating accounts that also contribute to the rehabilitation or renewal of park assets (\$3.5 million).

Upon reviewing the current condition of assets to determine funding requirements, as well as reviewing the current funding sources available, it was identified (as shown in Table 4) that there is a funding shortfall of \$5.8 million annually to maintain the park assets to the desired condition level.

Table 8 illustrates a potential phased-in approach to funding a Park Asset Management Plan. This funding strategy would allow for a significant impact to the infrastructure with a property tax impact of .40 annually for 7 years.

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Table 8: Potential Funding Plan (in millions of \$)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Current Funding*	\$5.00	\$5.80	\$6.60	\$7.40	\$8.20	\$9.00	\$9.90	\$10.80
Required Funding	\$10.80	\$10.80	\$10.80	\$10.80	\$10.80	\$10.80	\$10.80	\$10.80
Funding Gap	\$5.80	\$5.00	\$4.20	\$3.40	\$2.60	\$1.80	\$0.90	\$0.00
Annual Phased In	\$0.80	\$0.80	\$0.80	\$0.80	\$0.80	\$0.90	\$0.90	\$0.00
Property Tax Impact	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.00%

*Current Funding includes: Parks capital reserve contribution, operating funds directly related to maintenance of assets plus funds allocated to MVA for pathway maintenance.

Strategies that Parks and Facilities will undertake to further develop its Asset Management Plan are as follows:

- Define requirements for data gathering on inventory, condition, and environment to better define useful life.
- Collaborate with IT Division to identify and implement tools that can support improved data management and data based decision making.
- Apply continuous improvement tools to the asset management process to ensure efficiency and effectiveness.
- Work with the Green Infrastructure strategy team to leverage their expertise in the valuation of natural capital assets.

CLIMATE ADAPTION STRATEGY

To prepare for periods of extreme weather, the Parks Division has already implemented or is currently developing the following systems and plans related to the asset sub-classes in this report:

- Irrigation systems are installed for times of prolonged drought;
- Updating landscape design and construction specifications (i.e. slope, surface drainage) to mitigate the park impacts associated with prolonged wet weather conditions;
- As a result of storm water movement, durable pathway surfaces are being installed in areas with a low risk of erosion;
- Ensuring safe work practices for workers during extreme hot or cold;
- Design and construction specifications are being developed to ensure new park development considers all risk events, as well as a confirmation of minimum and maximum design standards to help moderate operating impacts; and
- Implement a green infrastructure plan as green infrastructure is a cost effective and resilient way to managing risks to a community brought on by extreme weather events and climate change. Parks and green spaces filter water, provide flood abatement, prevent heat islands, offer sound barriers, sequester carbon, prevent downstream flooding, absorb pollutants, and serve as buffer areas for extreme weather events such as plow winds.





City of
Saskatoon