

PROPOSED MEGA PARK LIFE CYCLE COST ANALYSIS

2022



**CITY OF
PRINCE GEORGE**

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Introduction

The Community Foundation and Prince George Rotary is proposing to build a Mega Park near the corner of 22nd Ave and Ospika Blvd. The proposed park would include six **major park features** and several **other park amenities**. A conceptual view of the proposed park features were presented to Council on March 14, 2022. The following are the major features proposed (more details can be found in Appendix A):

1. Junior Adventure Park (18 months – 5 years)
2. Youth Adventure Park (5 years - 12 years+)
3. Spray Park
4. Accessible Playground
5. Competition caliber Pump Track
6. Senior Friendly Outdoor Fitness Station

The Community Foundation's plan is to raise enough funds to build these six features and donate them to the City who would own and maintain them for the rest of their service lives and eventually replace. Although donated assets are a gift to the City and the community, knowing how much the cost of owning these new assets for their whole life and beyond is required in order to make the right decision going forward.

This is why Council has requested a life cycle cost (LCC) analysis for this proposed park which would be considered a Community Park service class. There are many **other park amenities** that would be found in a park of this caliber and would need to be installed and paid for by the community through tax dollars or grants if available. These amenities include (see Appendix B for details):

- | | |
|----------------------------|----------------------------|
| ▪ Washroom with Changeroom | ▪ Fencing |
| ▪ Picnic Shelter & Tables | ▪ Drinking Water Fountains |
| ▪ Benches | ▪ Paved Walkways |
| ▪ Trees | ▪ Trail Lighting |
| ▪ Turf | ▪ Trash Containers |
| ▪ Irrigation | ▪ Signage |

During a recent public consultation survey, it was apparent that the first four major park features were of interest to the majority of the survey respondents. The pump track and senior friendly outdoor fitness station were the least voted for, however, all six major features are included in the LCC analysis.

Methodology

A MS Excel based life cycle costing (LCC) tool was used to analyze the following factors to determine the whole life cost of ownership of an asset:

- | | |
|---------------------------------|-------------------------------|
| ▪ Estimated Service Life (ESL); | ▪ Annual Operating Costs; |
| ▪ Initial Capital Cost; | ▪ Cyclical Maintenance Costs; |
| ▪ Future Capital Renewal Costs; | ▪ End of Life Costs. |

Estimated Service Lives (ESL's) are based on a combination of a variety of data sources including Cityworks, the City's Tangible Capital Asset reporting, BC Guide to Useful Lives, IPWEA Useful Life Book for Parks Assets, Powerplan, BUILDER SMS, and professional judgment from Parks staff.

Preliminary initial capital costs for the six major features were provided by Community Foundations and used to calculate future capital renewal costs plus a 5% annual inflation. The initial capital costs for these major features are not included in the analysis as it is assumed that Community Foundations will be paying for these six major features and donating them to the City. Renewal costs from recent previous projects and tenders were used to

calculate the initial capital cost and the future capital renewal costs for the other Parks amenities that would be required for the proposed Mega Park.

Asset Management met with Parks staff to determine operations & maintenance (O&M) costs and activities based on the Parks Maintenance schedule for a Service Level A: Community Park. Duchess Park and Lheidli T'enneh Memorial Park (LTMP) were used as a baseline for the O&M data for the proposed Mega Park. The proposed site area was used to estimate the amount of other park amenities that would be envisioned for a park of this caliber. These amenities would need to be considered in the detailed design if Council directs the project to move ahead.

The list of assumptions used for the LCC analysis:

- Annual inflation set to 5%. Interest on investments were excluded from the real rate of return calculation because there is currently no dedicated reserve available for a park, where its dollars would be invested to earn interest over time. The LTMP spray park opened in 2001 and cost \$160k. Community Foundations is estimating approx. \$405k for a similar spray park in 2022 dollars. This is approx. a 5% annual inflation between 2001 and 2022 proving that the estimated annual inflation is an acceptable number to use for this analysis.
- Although it is likely that there would be booking revenues for some of the park features, the revenue income was excluded from the LCC analysis.
- Preliminary cost estimates for the six major park features were provided by Community Foundation in March 2022. These preliminary cost estimates were used to calculate the eventual renewal of the assets.
- The LCC analysis is based on 50 years of ownership, although realistically the features in this park would continue to be replaced as long as there is demand for this type of service.
 - Six major park features will be paid for by Community Foundation and donated.
 - End of Life Costs (demolition and disposal) are included in the future capital renewal costs, rather than separately.
 - Assuming the park amenities would be closed during the winter with the exception of the surrounding walkway that could be plowed of snow. This cost was included in the LCC analysis.

Project Budget & Schedule

Budget/Estimates Pricing

Description	Amount
Design / Consulting	250,000
Spray park	300,000
Junior adventure park	135,000
Teen adventure park with tower	235,000
Senior fitness stations	75,000
PumpTrack	250,000
All accessible playground	1,100,000
Contingency & Escalation	500,000
Total	2,845,000

Note: the budget above does not include land prep, utilities/amenities (water/sewer/lighting)

Life Cycle Cost Analysis Results & Financial Considerations

Each of the six major features has its own LCC analysis, along with the washroom and other park amenities, totaling eight individual LCC's that form Appendix C. Table 1 is a summary of all eight of the LCC analyses:

Table 1: Summary of Total Life Cycle Cost of Ownership

Total Life Cycle Costs over 50 years of Ownership:	
Initial Capital Cost	\$3,975,305
Annual Operating Costs Over 50 yrs	\$10,508,392
Cyclical Maintenance Costs Over 50 yrs	\$12,156,576
Capital Renewal Costs Over 50 yrs	\$41,635,395
Total Life Cycle Cost (LCC)	\$68,275,668
LCC/Year	\$1,365,513

The total cost of ownership for a park like the proposed Mega Park over a 50-year time period is over \$68M. This includes a total of \$22.6M of operating and maintenance costs and \$41.6M in capital renewals over that same 50 years. In reality, the park will provide service to the community long after 50 years, but for this analysis, the 50th and final year's costs were not included because it is assumed that at year 50, the assets would not be renewed. This can be seen in the life cycle graphs in Appendix C.

In addition to these features and amenities, new small equipment would need to be purchased to maintain the park including, a push mower, weed eater, pressure washer, backpack blower and backpack sprayer, totaling approx. \$4.5k. This small equipment typically lasts between 5 to 10 years. These were not included in the LCC analyses, but are still considerations when adding a new large park to the City's park inventory.

The cost for operations and maintenance for the proposed Mega Park totals approx. \$107k per year, plus inflation, and is included in Table 1. A park of this caliber with its expensive amenities should be staffed 5 days per week, similar to LTMP. The additional staff required was not included in Table 1's O&M costs, but could be upwards of \$150k per year in addition to the labour that has been included in the analysis.

This site is currently being used by the Utilities Division to store gravel material. There will be an additional upfront cost that City will have to pay to remove this material. Preliminary cost for this work is \$50k - \$80k depending on whether the berm requires removal. This cost was not included in Table 1.

Re-investing in our existing infrastructure assets should always be a first consideration rather than adding to the parks asset inventory. Except for the pump track, the services the proposed Mega Park would provide are the same services already available in the City's existing parks, like Duchess Park and LTMP.

Other Considerations

During the investigation phase of this analysis, discussions about the City of Prince George's standards for park amenities were noted. For example, vandalism occurs frequently on wood structures and therefore, playground equipment installations have been made of composite or metal materials rather than wood. This standard also reduces injuries from wood splinters. Comparing to our fellow municipalities is a resource we often use. The City of Parksville has a Community Park that includes an accessible playground and spray park that is made of non-wood material.

In the City's experience there should be no natural turf amongst the playground equipment as it will not survive the foot traffic. Artificial turf is an option, however, at Duchess Park where it is used in the playground area, it can be very slippery in the rain, soak up the heat in the sun, and wasps are prone to nest. It was also vandalized (peeled up and ripped apart).

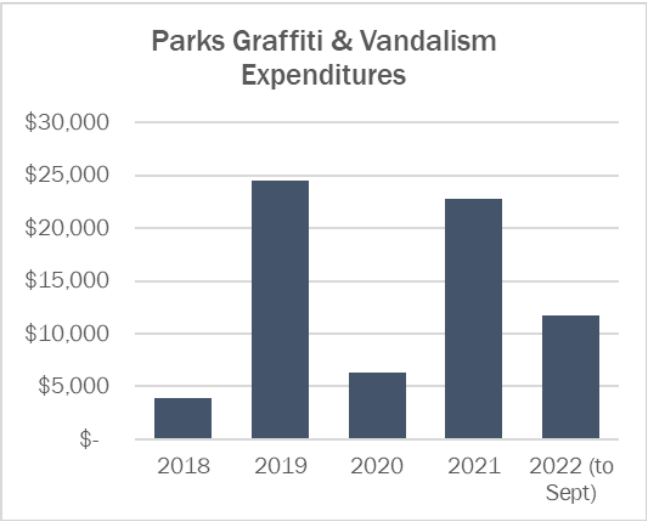
The park should consider a free-standing shade structure over at least one of the playground areas. This is becoming common practice as our climate gets hotter.



There are concerns about installing a pump track that is paved. Existing amenities like the Blackburn All Wheels Park experience graffiti. Graffiti is difficult to remove from pavement.

Graffiti and vandalism are a reality, but with thorough design and staffing considerations, these incidences can be reduced. Over the last 5 years the Parks Division has spent \$70k on repairing parks amenities after they've been vandalised.

Fencing will also help deter unwanted activities and provide safety to the park users and the park equipment. It is proposed that the park would be secured entirely by a fence as seen in the fence description on page 6.



Summary & Conclusion

It is important to know what resources would be required into the future before taking on a new asset, especially one as large and expensive as the proposed Mega Park. The preliminary estimate for the total whole life cost of the Mega Park is approx. \$68M over a 50-year period. This includes \$107k, plus inflation, for O&M over and above the current Parks budget. Based on experience with vandalism, it is recommended that a park of this caliber be staffed 5 days per week, adding an additional \$150k to the \$107k O&M estimate.

Initial upfront costs are reduced because the Community Foundation is proposing to build and donate the six major features, but there is still an estimated \$3.9M initial cost that the City would need to pay for. This number can change depending on detailed design if Council choses to continue with this project. And ongoing future renewals/replacements are estimated to be almost \$42M over a 50-year time period. Ideally there would need to be a reserve set up that would collect approx. \$1.37M annually in order to pay for the operations, maintenance, and eventual replacement of the assets in the proposed Mega park.

Most of the services this proposed park would provide are already available at other parks within the City and should be a consideration before moving forward.

Appendix A – Six Major Park Features Proposed

Junior Adventure Park



(Children ages 18 months – 5 years)

Natural, physical and imagination play for the younger set, including; play houses, log pyramids & climbers, and swings. This is similar to the playing area at Duchess and Lheidli T'enneh Memorial Park (LTMP).

Youth Adventure Park



(Youth ages 5 years - 12 years+)

Includes; big logs, boulders, climbing nets, ziplines, and tower slides. This playground is similar to Duchess Park.

Spray Park



The spray park is similar to the one found at LTMP. This proposed spray park is assumed to have a recycled water system to meet today's water conservation best practices.

Accessible Playground



This playground is similar to the all accessible playground at Duchess Park.

Pump Track (Beginner & Advanced)



Two paved pump tracks, one for beginners and one for advanced, that could host competitions. Assuming natural turf is included within the track. Based on the preliminary site plan, the track area is approx. 90' x 160' (27m x 49m). Assuming 60% of the feature is asphalt totaling approx. 793m²

Senior Outdoor Fitness Station



This feature is similar to the Act Now BC Seniors Community Park next to Masich Place Stadium and includes equipment similar to those found around the fitness track at the newly constructed Ron Brent Park.

Appendix B – Other Park Amenities

Picnic Shelter & Picnic Tables



According to the preliminary park layout provided by Community Foundations, the proposed shelter is 4,606ft² or 428m². Based on Shane Lake picnic shelter and Paddle Wheel Park picnic shelter, there is one picnic table per 19m² of shelter space. Therefore approx. 22 picnic tables could be installed under the proposed shelter. The City's standard for picnic tables is concrete. The shelter would be made of metal as there have been a number of occurrences with vandalized wooden structure, specifically fires.

Washroom



Washroom with changeroom and equipment storage area. The newly replaced washroom at Carrie Jane Gray Park was used as a comparable.

Paved Parking Lot & Access Road



As per Community Foundations preliminary site plan, 100 stalls are proposed measuring 3,078m² (38m x 81m). The paved access road would be approx. 318m long.

Trees



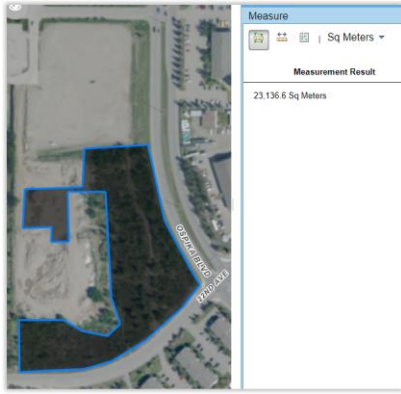
One tree for every 400m² of park is the average based on Duchess Park and Bravery Park. This equates to approx. 58 trees (23,140m² green area divided by 400m²)

Benches



On average, there are 8 benches per park playing area based on LTMP playing areas. Therefore, approx. 8 benches x 6 primary park playing features = 48 benches total. The benches will be made of composite material and comes with a concrete pad as per City standard.

Landscaping & Turf



Based on Parks staff experience, retaining all of the bush between the proposed park and Ospika/22nd will reduce the visibility to the playing areas, leading to the risk of vandalism, homeless shelters and criminal activity. Therefore, the total turf area is estimated to be 23,140m² as seen in the shaded area above. The site would need to be grubbed, shaped, top dressed, graded, seeded, fertilized and dragged. The natural area will be selectively cleared to retain some of the area's bush and naturally occurring trees to provide a buffer between the park, Ospika Blvd, and 22nd Ave.

Fencing



Based on the preliminary plan provided by Community Foundations, the fenced area would consist of approx. 515m of 8' galvanized steel 2" mesh and associated framework. Also, a minimum of 3 accessible man gates and 2 vehicular rolling gates would be required. The fencing costs included in the life cycle analysis do not reflect a black vinyl coated chain link fence. This would be substantially more expensive. The location is based on the plan to selectively clear the natural area along Ospika and 22nd leaving some shrubs and trees to maintain a buffer while ensuring visual site lines to the park and maintaining the existing trail.

Irrigation



The entire turf area may not require an underground sprinkler system, but for this analysis, it is assumed a sprinkler system would be installed for the turf area of 23,140m².

Drinking Water Fountains



A total of four fountains are proposed for this kind of park, including the underground water piping.

Asphalt Walkways & Lighting



Approx. 500m of 3m wide paved walkway surrounding the six proposed features is estimated. With approx. 14 lights (36m spacing based on Bravery Park). Lighting will be required along the access road and around the perimeter of the parking lot estimating an additional 14 lights. A total of approx. 28 lights would be required. This does not include the necessary lighting within the six proposed features.

Trash Containers



Based on the trash containers per area at Duchess Park (1 trash container per 1,800m² of park area) and the approx. area of the proposed Mega Park at 36,500m², the total number of bear resistant trash containers is 20.

Signage



An estimate of approx. 20 signs of various types would be installed throughout the park.

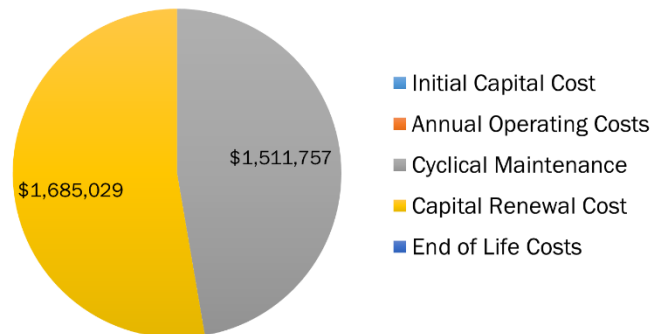
Appendix C – Life Cycle Cost Details by Feature

Junior Adventure Park (Age 18 Months – 5 Years)



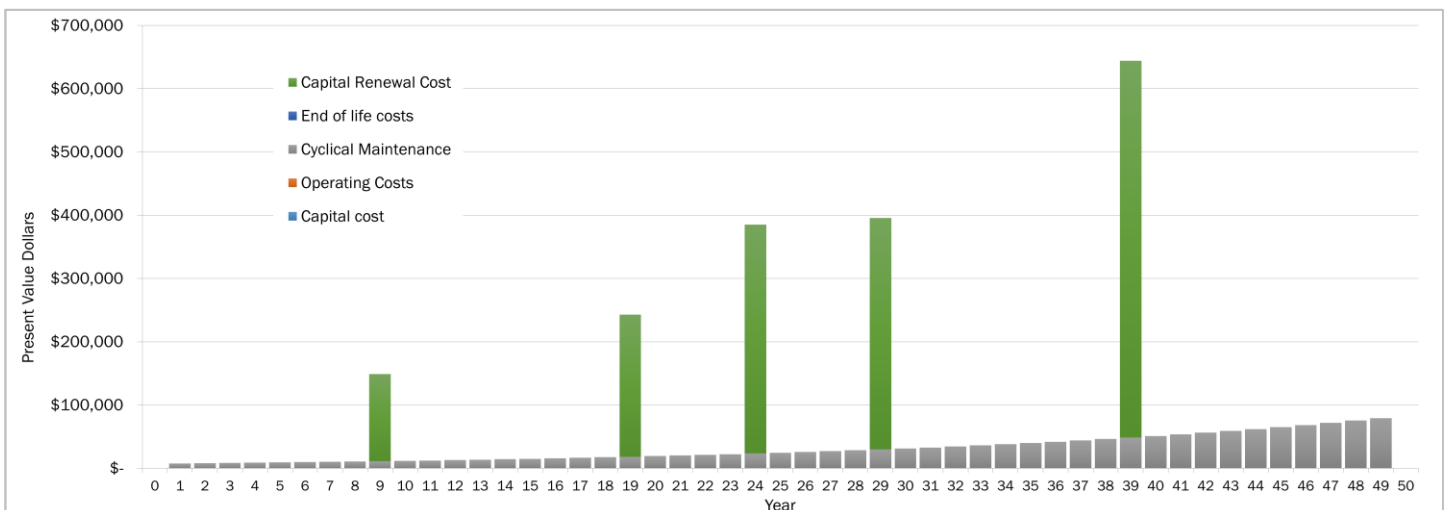
Total Life Cycle Costing (50 years):	
Initial Capital Cost	Donated
Annual Operating Costs	-
Cyclical Maintenance Costs	\$1,511,757
Capital Renewal Costs	\$1,685,029
Total Life Cycle Cost (LCC)	\$3,196,786
LCC/Year	\$63,936

Total Life Cycle Costs by Spending Category



Notes: The Life Cycle Cost (LCC) assumes this feature was donated at no cost to the City. All of these costs are a total over a 50-year timeframe. Duchess Park and LTMP were used to derive operating and maintenance costs. The operating costs have been applied to the 'Other Park Amenities' LCC as these types of costs are usually for the park as a whole.

The preliminary plan for the playing features for this adventure park revolve around natural wood, however the City no longer installs playground equipment made of wood due to ongoing vandalism including fires. It has been standard for the City to replace all wooden playground equipment as they come up for renewal, with metal and composite materials.

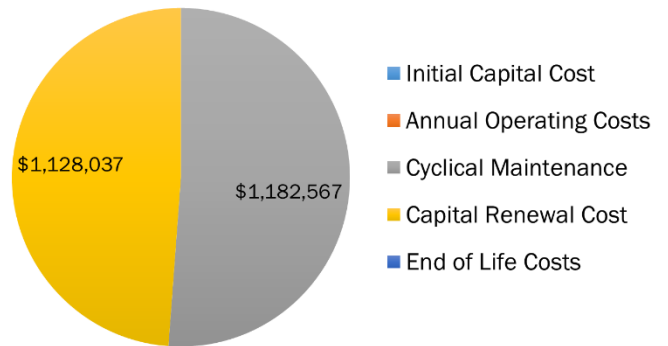


Youth Adventure Park (Age 5 – 12 Years +)

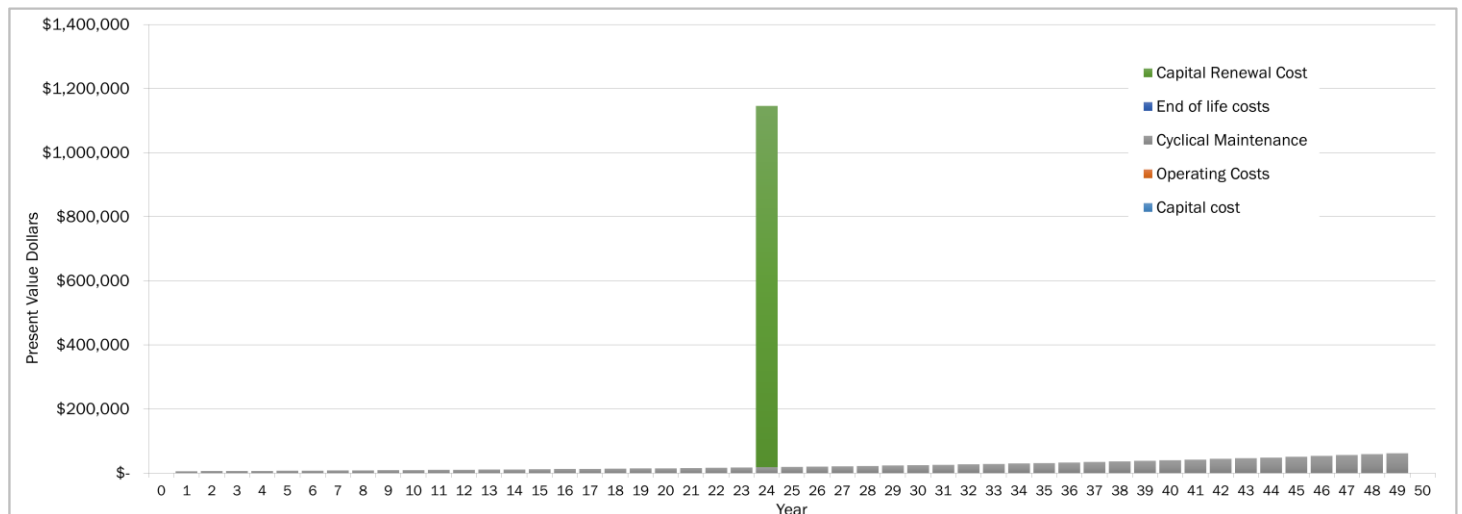


Total Life Cycle Costing (50 years):	
Initial Capital Cost	Donated
Annual Operating Costs	-
Cyclical Maintenance Costs	\$1,182,567
Capital Renewal Costs	\$1,128,037
Total Life Cycle Cost (LCC)	\$2,310,605
LCC/Year	\$46,212

Total Life Cycle Costs by Spending Category



Notes: Same comment as the Junior Adventure Park regarding the use of wooden playground features. City standard for playground equipment is metal and composite. The operating costs have been applied to the 'Other Park Amenities' LCC as these types of costs are usually for the park as a whole.

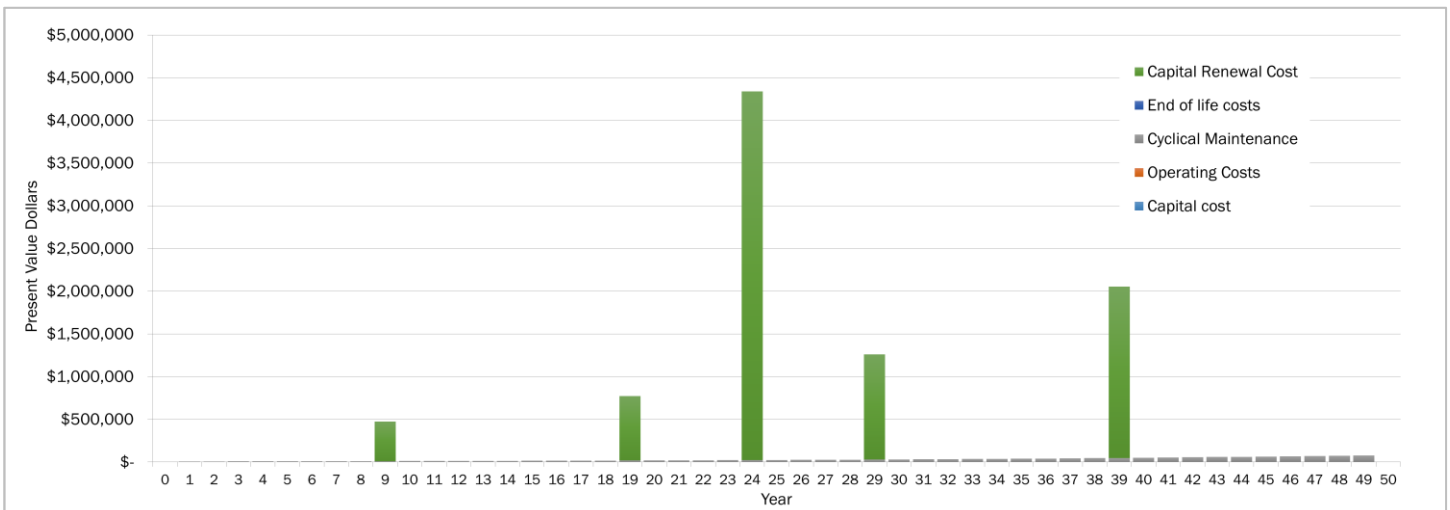
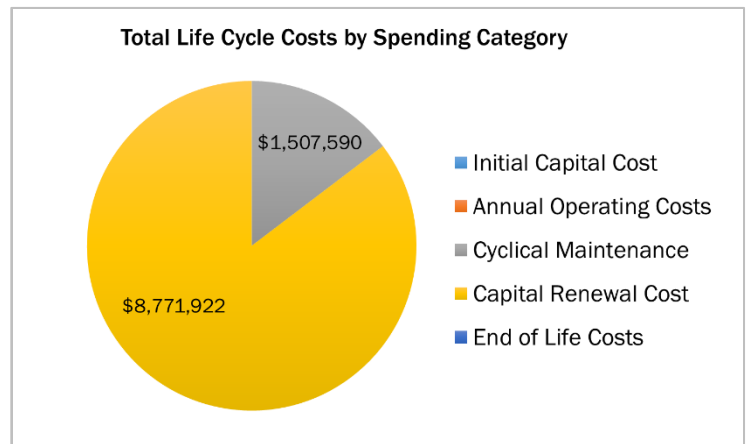


All Accessible Playground



Total Life Cycle Costing (50 years):	
Initial Capital Cost	Donated
Annual Operating Costs	-
Cyclical Maintenance Costs	\$1,507,590
Capital Renewal Costs	\$8,771,922
Total Life Cycle Cost (LCC)	\$10,279,512
LCC/Year	\$205,590

Notes: The existing Duchess Park all accessible playground was used as a reference for annual maintenance costs. The operating costs have been applied to the 'Other Park Amenities' LCC as these types of costs are usually for the park as a whole.



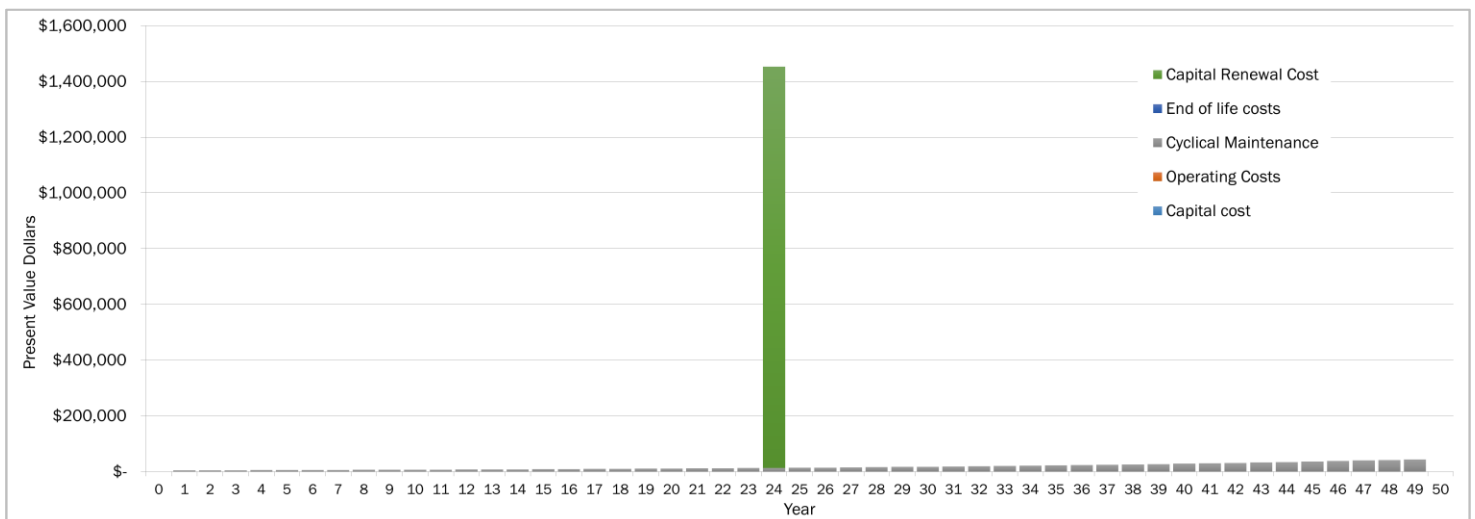
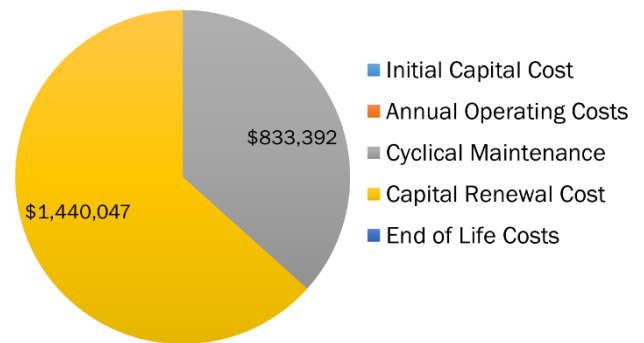
Spray Park



Total Life Cycle Costing (50 years):	
Initial Capital Cost	Donated
Annual Operating Costs	-
Cyclical Maintenance Costs	\$833,392
Capital Renewal Costs	\$1,440,047
Total Life Cycle Cost (LCC)	\$2,273,439
LCC/Year	\$45,469

Notes: The operations and maintenance costs at the LTMP spray park (seen on the right) were used to estimate the costs for the proposed spray park. The operating costs have been applied to the 'Other Park Amenities' LCC as these types of costs are usually for the park as a whole.

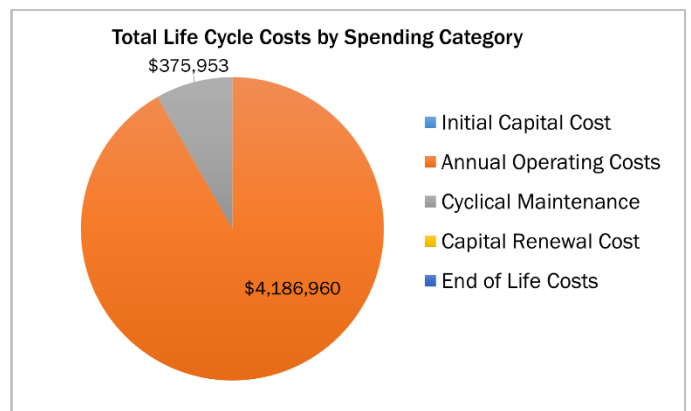
Total Life Cycle Costs by Spending Category



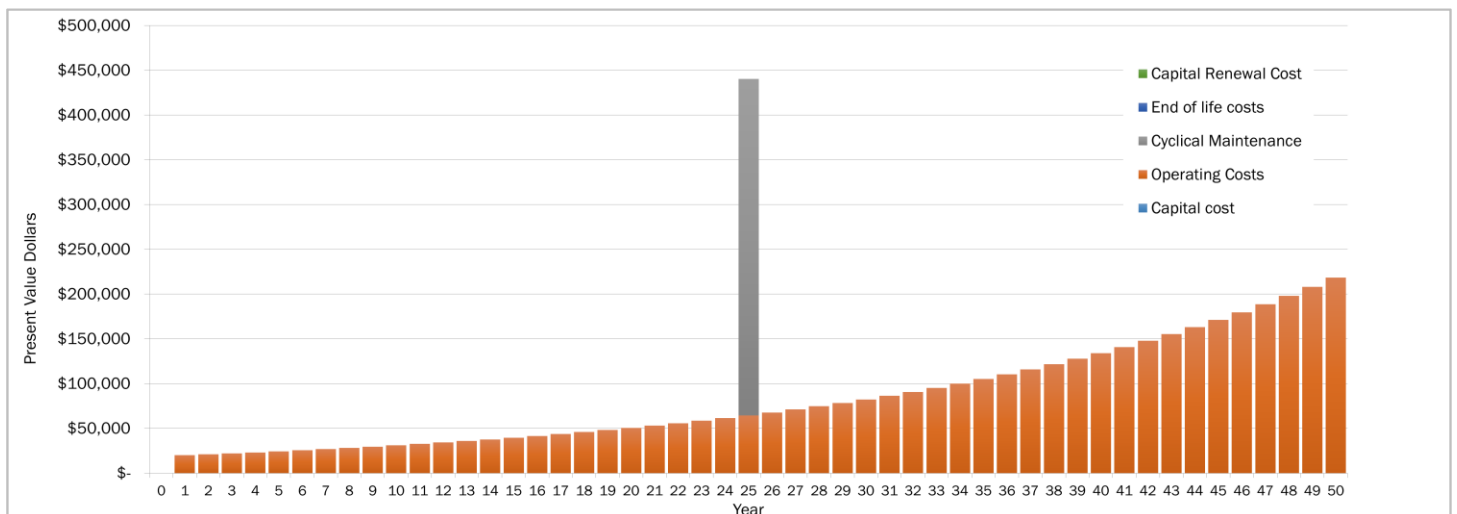
Competition Caliber Pump Track (Beginner & Advanced)



Total Life Cycle Costing (50 years):	
Initial Capital Cost	Donated
Annual Operating Costs	\$4,186,960
Cyclical Maintenance Costs	\$375,953
Capital Renewal Costs	\$0
Total Life Cycle Cost (LCC)	\$4,562,913
LCC/Year	\$91,258



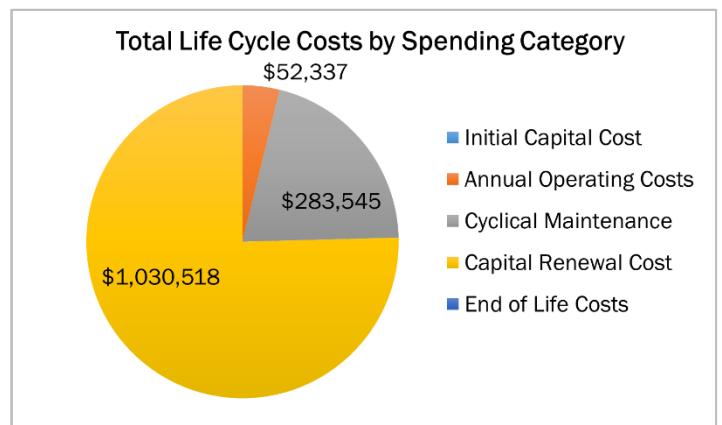
Notes: The estimated service life for the track is 65 years at which time a full reconstruction would be required. The ESL for the asphalt surface of the pump track is 25 years and would need to be replaced at that time (shown as Cyclical Maintenance in these graphs). It is anticipated that there will be maintenance required due to graffiti on the asphalt track, but without any similar City owned assets to compare to, this unknown cost was excluded from the analysis. The City does not currently own a pump track and therefore, operations costs are based on the City of Powell River's pump track annual budget of \$20k.



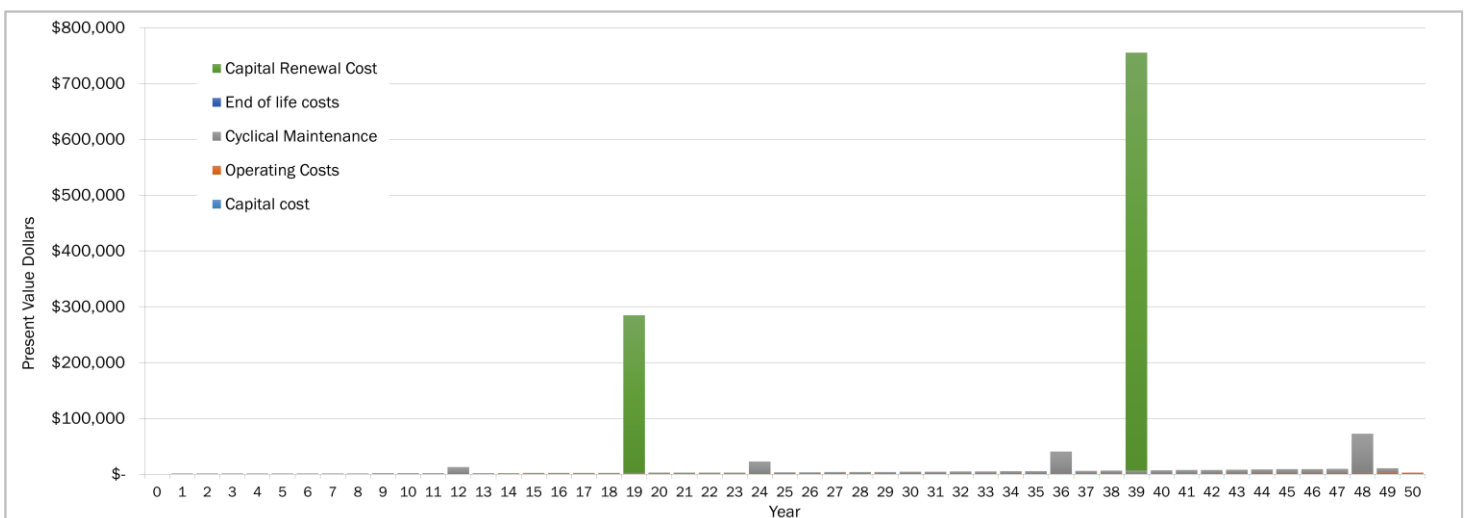
Senior's Fitness Equipment



Total Life Cycle Costing (50 years):	
Initial Capital Cost	Donated
Annual Operating Costs	\$52,337
Cyclical Maintenance Costs	\$283,545
Capital Renewal Costs	\$1,030,518
Total Life Cycle Cost (LCC)	\$1,366,400
LCC/Year	\$27,328



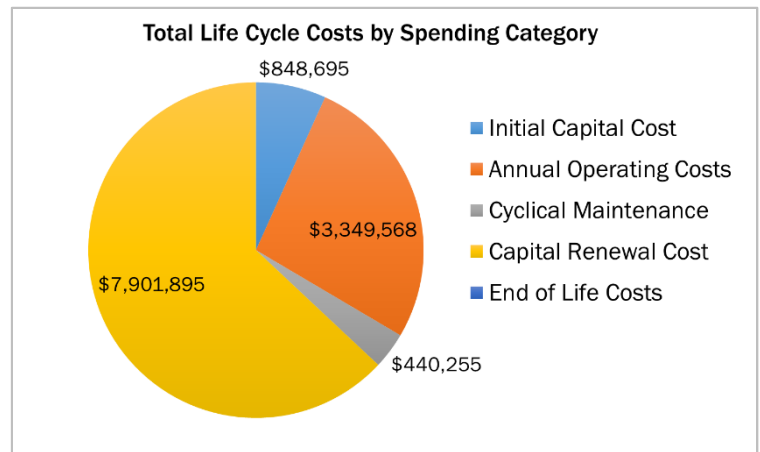
Notes: Similar to the outdoor seniors fitness facility next to Masich Place Stadium. Maintenance costs include renewal of the concrete support structures which the City has recently had to do for the Masich seniors facility which is now 12 years old. Estimated service life (ESL) for fitness equipment is 20 years.



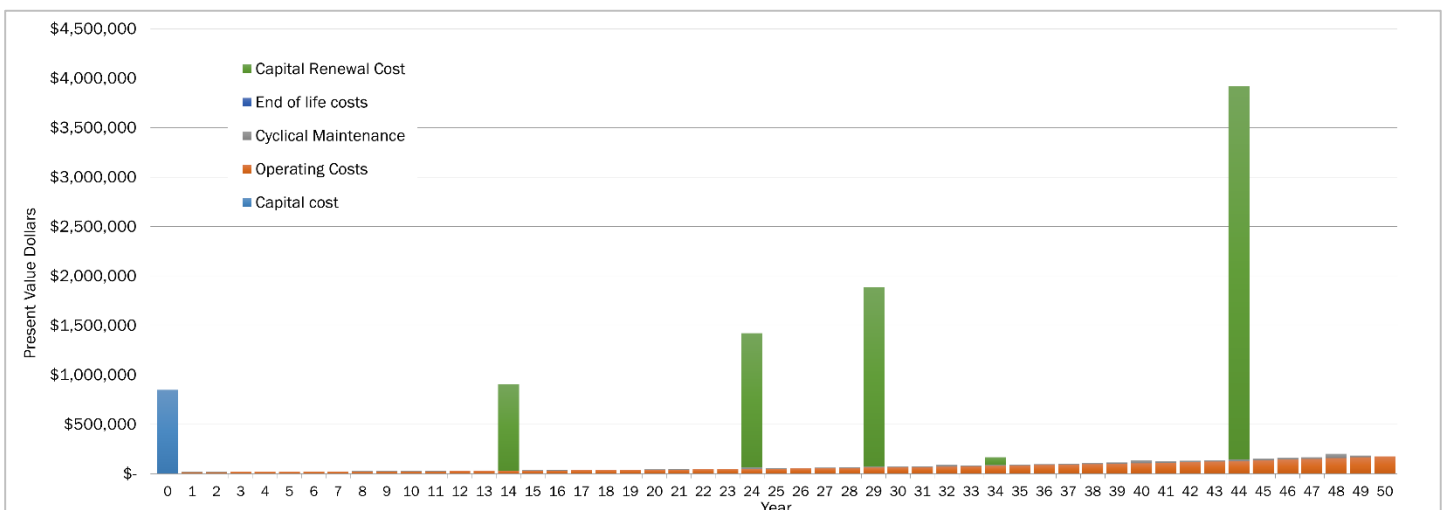
Washroom



Total Life Cycle Costing (50 years):	
Initial Capital Cost	\$848,695
Annual Operating Costs	\$3,349,568
Cyclical Maintenance Costs	\$440,255
Capital Renewal Costs	\$7,901,895
Total Life Cycle Cost (LCC)	\$12,540,413
LCC/Year	\$250,808



Notes: This proposed washroom includes changerooms and an equipment storage area and is similar to the one that was recently built at Carry Jane Gray Park which cost \$750k. The estimated upfront cost for the City to build a washroom facility like this at the proposed Mega Park is \$850k in 2023 dollars, including underground service connections. Various building components will need to be renewed at various times as they each have their own ESL's, for example, the HVAC system lasts approx. 25 years. Various renewal costs are represented below in green.

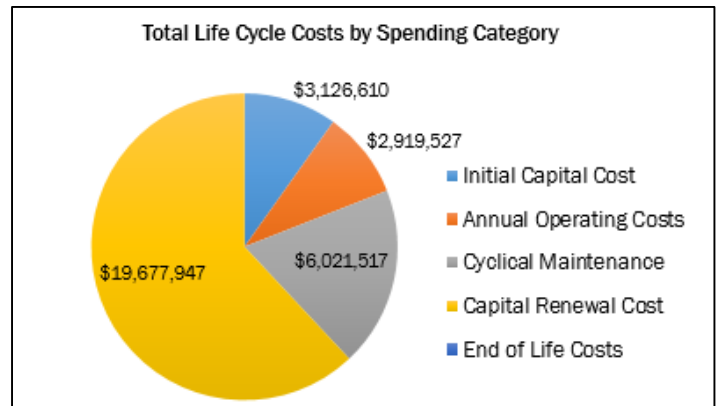


Other Park Amenities

No.	Component	Component ESL
1	Trees	40
2	Irrigation	25
3	Landscaping & Turf	80
4	Drinking Water Fountains	15
5	Trash Containers (Bear resistant)	15
6	Benches (Composite)	15
7	Picnic Tables (Concrete)	20
8	Picnic Shelter (428m ² proposed)	25
9	Paved Walkways	25
10	Lighting	20
11	Paved Parking Lot and Access Rd	20
12	Fencing	20
13	Man Gates	20
14	Vehicle Roller Gates	20
15	Signs	10

These Estimated Service Lives (ESL) were derived from a variety of sources including, Cityworks, the City's Tangible Capital Asset reporting, BC Guide to Useful Lives, IPWEA Useful Life Book for Parks Assets, Powerplan, BUILDER SMS, and professional judgment from Parks staff. The LCC tool uses these ESL's to determine when the component needs to be renewed, adding them together over a 50 year term for a total of \$19.7M in capital renewal costs for these 'other park amenities'. For example, a bench would need to be renewed every 15 years over the course of the 50-year term that was chosen for this analysis.

Total Life Cycle Costing (50 years):	
Initial Capital Cost	\$3,126,610
Annual Operating Costs	\$2,919,527
Cyclical Maintenance Costs	\$6,021,517
Capital Renewal Costs	\$19,677,947
Total Life Cycle Cost (LCC)	\$31,745,602
LCC/Year	\$634,912



Notes: The City would need to fund approx. \$3.1M to install the above noted amenities that would be required for a park of this caliber. The operating and maintenance costs were derived from historical costs for comparable parks, like Duchess and LTMP. The proposed Mega Park would be classed as a Service Level A park.

