

BEAUMARIS LAKE OPEN SPACE

Concept Design Report
January 2018



Executive Summary

The open spaces and amenities surrounding Beaumaris Lake are starting to show their age. Opened in 1979, these adjacent areas are almost 40 years old and need to be updated to deal with a host of safety and visual issues. Building upon the 2016 condition assessment of the stormwater management function of the lake, the current conceptual design project is meant to address these issues and to create a unified vision for any future repairs or modifications that are required, and to assist in the request for a Capital Budget Profile for 2019-2022.

The project consisted of three main phases, with each phase creating the foundation for the subsequent work in the project.

- Functional Program Assessment and Summary – the assessment of the open spaces and amenities identified six main areas of interest that needed to be addressed in the rehabilitation program:
 - East Park Area
 - West Park Area
 - Promenade Area
 - Docks and Viewpoints
 - Trails
 - Lighting
- Concept Option Development – using a series of community engagement techniques and opportunities, the project team gathered input from the neighbouring homes, surrounding communities, and other lake amenity users to inform the creation of a series of concept options, community values and an overall design vision for the lake's open spaces and amenities
- Preferred Concept Development – feedback received from the project stakeholders on each of the concept options was used to refine the concepts into a preferred design for each area, and along with the vision, will be used to create a detailed design and associated construction budget request as part of the next phase of the project

An extensive community engagement program was undertaken during every phase of the project to both inform stakeholders of the project context and progress, and to provide multiple opportunities for interested parties to provide input along the way. This included the creation of a community engagement committee consisting of local residents and community association representatives, "pop-up" events and graffiti boards at the lake during peak hours to receive feedback directly from lake users, and two online surveys. These community engagement events also helped to create a number of objectives and values for the overall rehabilitation of the Beaumaris Lake open space.

Resulting from the three phases of concept design, and the community engagement program, is this comprehensive detailed design report. In addition to providing a detailed overview of the three phases, this report provides a Class "D" (+/- 50%) cost estimate (outlining only the cost of construction, including contingency), and a 'Next Steps' guide for the continuation of the project.



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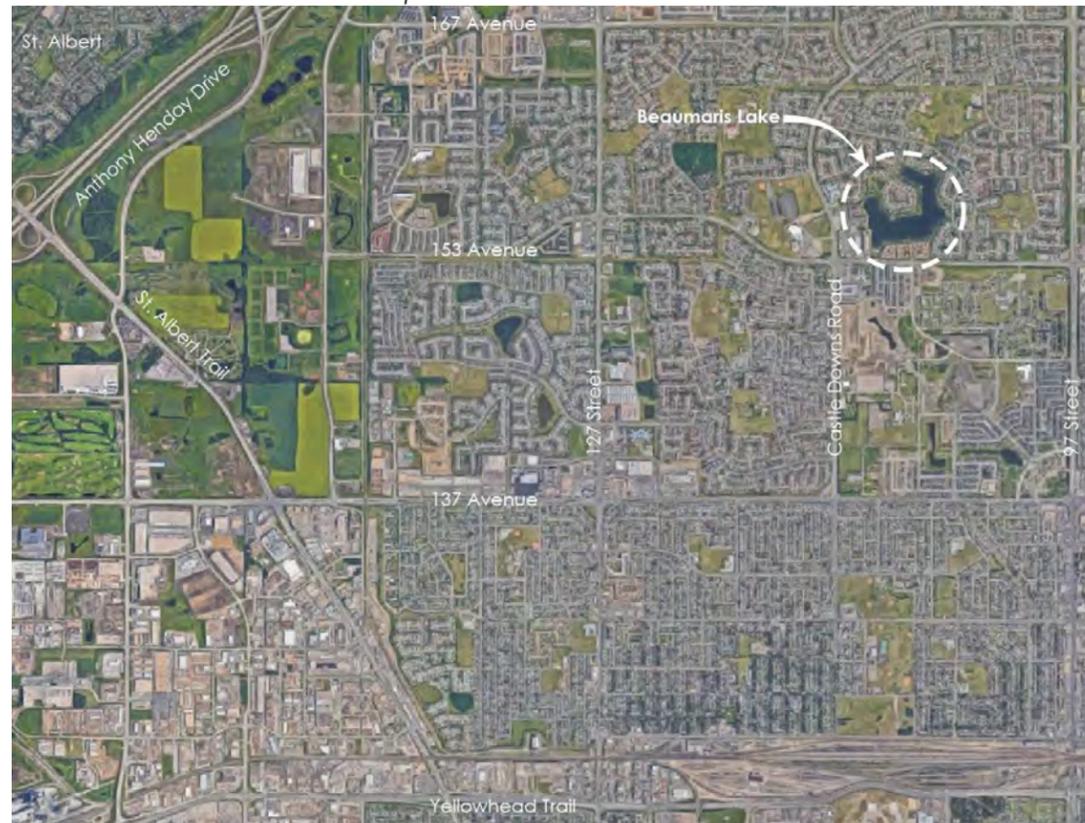
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Project Introduction

Lake History

Located in north Edmonton, Beaumaris Lake is the oldest and largest storm water lake in the City. Opened in 1979, Beaumaris Lake is a well-loved destination for residents and visitors, displaying a panorama of marsh plant life, mature trees, birds, and wildlife. With approximately 2.5km of trails around the lake, it is a popular location for running, walking, cycling, and other methods of active transportation. The lake also serves a functional purpose, playing a key role in a much larger drainage network spread across northwest Edmonton (refer to Storm Water Network graphic, this page). Beaumaris Lake serves as the final collection point for surface water runoff from a series of stormwater lakes stretching from 135 Street to 97 Street and from Anthony Henday Drive to 153 Avenue.

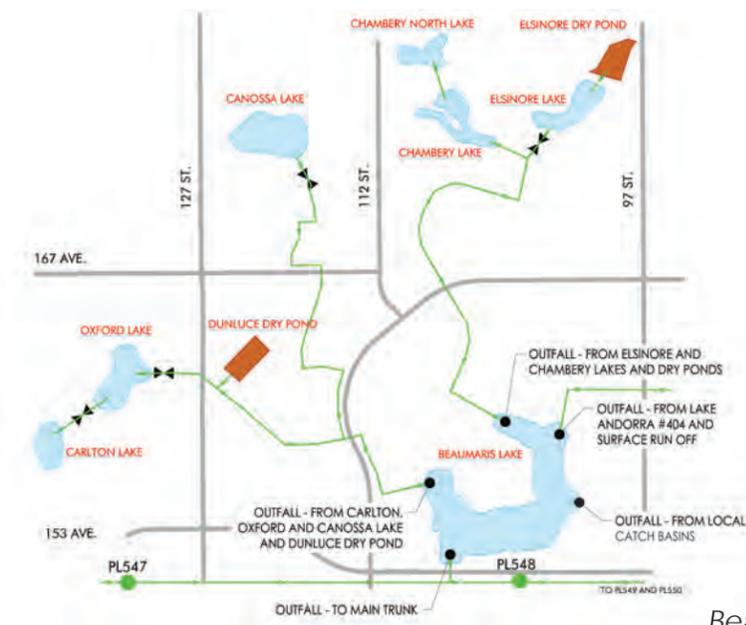
Beaumaris Lake Location Map



Due to its age and success as a community amenity, the open space is experiencing deterioration, causing aesthetic and safety issues. In 2016, the City of Edmonton completed a conditions assessment of Beaumaris Lake, which included the surrounding landscape, amenities and open space, and the lake itself. The lake was determined to be functioning well in terms of flood protection and water quality enhancement, however, the assessment identified a need for rehabilitation of the surrounding public realm.

Project Objectives

Utilizing the previous investigative reports completed by the City of Edmonton and by Stantec, this phase of the Beaumaris Lake Open Space Rehabilitation will develop a long-term vision and concept for the lake that will address the safety concerns and guide rehabilitation of the open space. This vision will also be supported by feedback from the community, gathered through the Public Engagement program carried out through the project. The concept will assist in preparing for a capital budget request for the 2019-2022 budget cycle.



Beaumaris Lake Storm Water Network

Key Stakeholders

Throughout the project, key internal and external stakeholders were consulted with, and had the opportunity to contribute to the development of the concept plans. The following is a list of the key internal and external stakeholders:

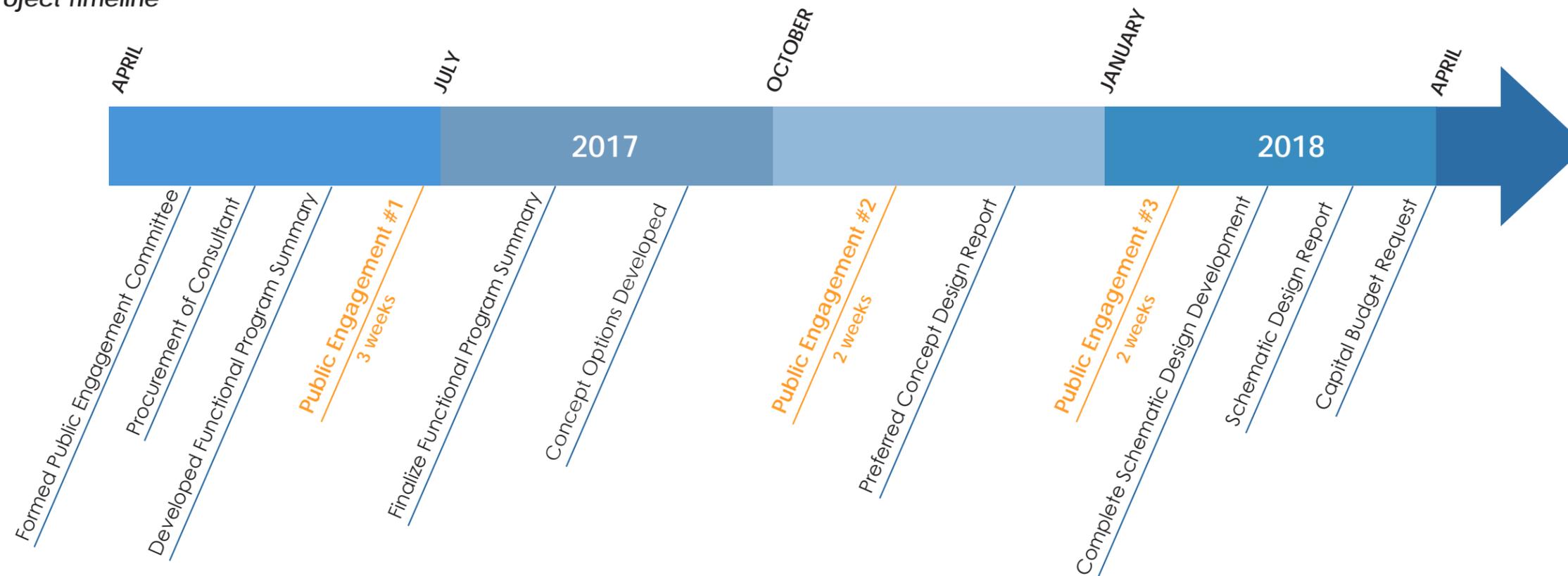
Internal

- Parks Operations
- Life Cycle Management, Asset Management Parks and Roadway

External

- EPCOR
- Friends of Beaumaris Lake
- Ward 3 City Councilor

Project Timeline



Existing Conditions, Assessment, and Recommendations

In spring 2017, the Stantec team, along with the City project team, completed a comprehensive site assessment. This assessment, along with the Conditions Assessment and Rehabilitation Plan completed in 2016, provided an overview of the existing conditions, and helped to identify the physical needs for the rehabilitation. The results of these two assessments are compiled in the following section, along with recommendations for the different areas of Beaumaris Lake.

Beaumaris Lake Key Plan and Public Access Points



Overall Site Analysis

Geotechnical and Subsurface Conditions

Our team reviewed the Phase II ESA for 15505 Castle Downs Road, provided by the City of Edmonton. Located northwest of the west park, this site formerly contained a diesel fuel underground storage tank and a pump island. The results of this indicated a presence of hydrocarbon impacted groundwater on this site. No other geotechnical or environmental studies were provided.

Recommendations: Geotechnical and Environmental investigations should be completed in Schematic Design.

Adjacent Land Uses

The north, east, and south edges of Beaumaris Lake is bordered by residential land uses, both single family and multi-family. The west edge is bordered by multi-family, as well as a commercial shopping area. The connection between the commercial shopping area and the lake is extremely poor. The west park is adjacent to the backside of the library, and, while it appears there is a small public access to the library on this side, it is not obvious that there is a major node and connection to the lake at this point.

Recommendations: Investigate ways to enhance connection between the west park and the commercial shopping area.

Access and Circulation

Beaumaris Lake can be accessed from numerous points around the site. All public access points are universally accessible, with the exception of the West Park, which contains only stairs. This impedes convenient access from the shopping centre for those with mobility issues, or strollers. There are also a number of varying types of

accesses to the lake from private properties. Many of the multi-family developments provide fixed structures accesses, commonly stairs, while private residences predominantly utilize gates and walk on the existing surface (ie. sod or mulch). There are plenty of trails provided, connecting the many access points, and few goat-trails were seen, indicating there are no trails missing.

Recommendations: Maintain all existing public access points.

Vegetation

The vegetation at Beaumaris Lake is predominantly naturalized and mature. There were some dead trees noticed on site that were marked for removal by the City. Some overgrown vegetation was seen, obstructing site lines and encroaching on the trails.

Recommendations: Replace dead plant material, and address vegetation that is obstructing site lines and encroaching on trails, through maintenance, or removing and replacing with alternate plant material.

Environmental Value

Beaumaris Lake provides a high environmental value for the neighbourhood, and for the City. Being a longstanding, naturalized area, the lake is home to many animals, and is used by many birds as a migratory and nesting area.

Recommendations: Mitigate the disruption to these natural areas as much as possible during rehabilitation construction.

East Park

The East Park at Beaumaris Lake provides access from the Beaumaris neighbourhood, and has incredible views looking west over the lake. As the amenities and landscape in the East Park are in relatively good condition (albeit outdated), the East Park was not reviewed in the conditions assessment. However, during the functional assessment, it was identified as a desired location for improvement, due to the strong feelings of safety and security issues. The dense vegetation close to the road impedes the views into the park, making it a desirable location for illicit activities.

Recommendations: Keeping the general trail alignment, provide a new concept design for the East Park allowing for clear views into the site.



West Park

The West Park is the major access point from the library and commercial businesses adjacent to the lake down to the promenade and lake trails. The conditions assessment identified the West Park as an area requiring short term attention. Currently, the stairs are almost completely barricaded due to deterioration, resulting in poor accessibility from the businesses. There are also no existing ramps in the West Park, forcing those with mobility challenges to access the promenade and trails from other locations. Due to age and construction practices at the time of installation, the paving stones should be replaced to address settlement issues, and for modernization. Furnishings in the West Park appear to have been replaced recently, and are generally in good condition.

Recommendations: The West Park should be redesigned to address infrastructure failure and accessibility issues.



Promenade

Along with the West Park, the Promenade serves as a key gathering hub for the Beaumaris Lake trails. While the conditions assessment identifies only the replacement of the guardrail as a short-term priority, functionality of the Promenade is closely tied to the West Park. The pavers and planter walls are showing their age with deterioration and differential settlement, and the current concrete barricade obstructs the views to the lake. Furnishings in the Promenade appear to have been replaced recently, and are generally in good condition.

Recommendations: Redesign of the Promenade should happen in conjunction with the West Park. Redesign should also include replacement of the guardrail to provide views through the rail, out to the lake.



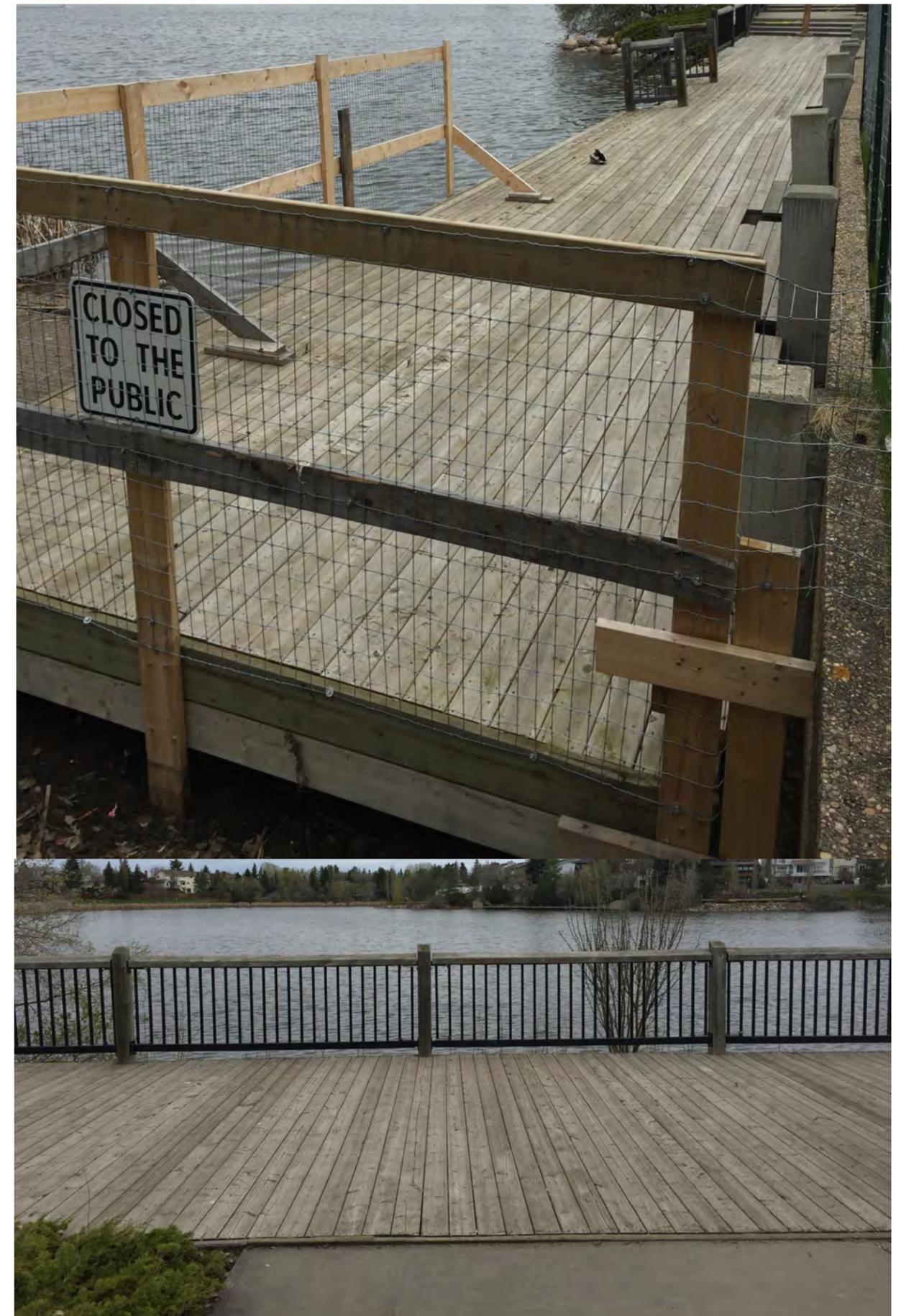
Docks and Viewpoints

There are a number of viewpoints and floating docks around the trails at Beaumaris Lake. The viewpoint platforms are constructed of timber and are in decent condition. The railings are a combination of aluminum and wood, and are also in decent condition. There is one standalone viewpoint with stairs and a gated-off access to the lake.



The lake trails currently include three floating docks and one raised viewdeck. Two of three floating docks are fenced off, prohibiting the public from accessing them. The raised viewdeck is accessible, and consists of an aluminum and wood railing, in the same style as the viewpoints. The viewdeck is supported by concrete piles. The docks are a well-loved feature of the lake, however direct contact with stormwater lakes is prohibited under Edmonton's Drainage Bylaw 16200.

Recommendations: All floating docks are to be removed and replaced with raised viewdecks. The standalone viewpoint with the gate should also be removed.



Trails

The trails around Beaumaris Lake demonstrate the variation of upgrades that have happened over the years. Most of the trails are concrete construction, and many have been widened to fulfill the role of a shared use path. There is evidence of grading and drainage issues at various locations around the lake, which result in areas of ice in the winter, and wet, muddy trails the rest of the year.

Furnishings around the trails also vary in their style and age, indicating replacements that have happened over the years as needed. A few memorial benches existing around the lake.

Recommendations: Remove all trails, and reconstruct with asphalt to a full 3.0m width. This will allow the grading and drainage issues to be addressed, and extend the life of the trails.



Lighting

Pedestrian lighting exists throughout the trails and amenity areas of Beaumaris Lake. Light fixtures appear to be in decent condition. Power infrastructure is showing signs of rust and age.

Recommendations: Review pedestrian lighting to determine acceptability of style, infrastructure, and lighting levels. Consider updating fixtures to LED.



Regulatory Requirements

During the concept phase, the design team completed a high level review of the a number of regulatory and policy documents, as well as planning documents pertaining to Beaumaris Lake. The following sections discuss the findings and the next steps with regards to ensuring a smooth process for the future phases of design and implementation.

Open Space

Both the Urban Parks Management Plan (UPMP) and *breathe*: Edmonton's Green Network Strategy (*breathe*) identify the importance of creating and maintaining Edmonton's open spaces. As a long-standing and well-loved open space, the values of both UPMP and *breathe* should be solidified and upheld when considering upgrades and rehabilitation to Beaumaris Lake.

Zoning and Bylaws

The zoning for Beaumaris Lake is AGU (Urban Reserve Zone), meaning it does not fall under the Parkland Bylaw (2202). As a Storm Water Management Facility, Beaumaris Lake is subject to the conditions of the Drainage Bylaw (18093), and any alterations around the lake must follow those conditions.

Environmental

During the concept phase, a high level bylaw requirement review was completed. Based on the findings from the bylaw review, knowledge of Beaumaris Lake, and previous projects at the lake, it has been determined that Beaumaris Lake is maintained by the City of Edmonton and EPCOR, and the Government of Alberta holds no jurisdiction. As such, Beaumaris Lake does not fall under the *Water Act*, and approval is not required from the Government of Alberta to carry out construction in and around Beaumaris Lake. During future stages of work, periodic nest sweeps will need to be completed, in accordance with the *Migratory Birds Convention Act, 1994*.

Procedures

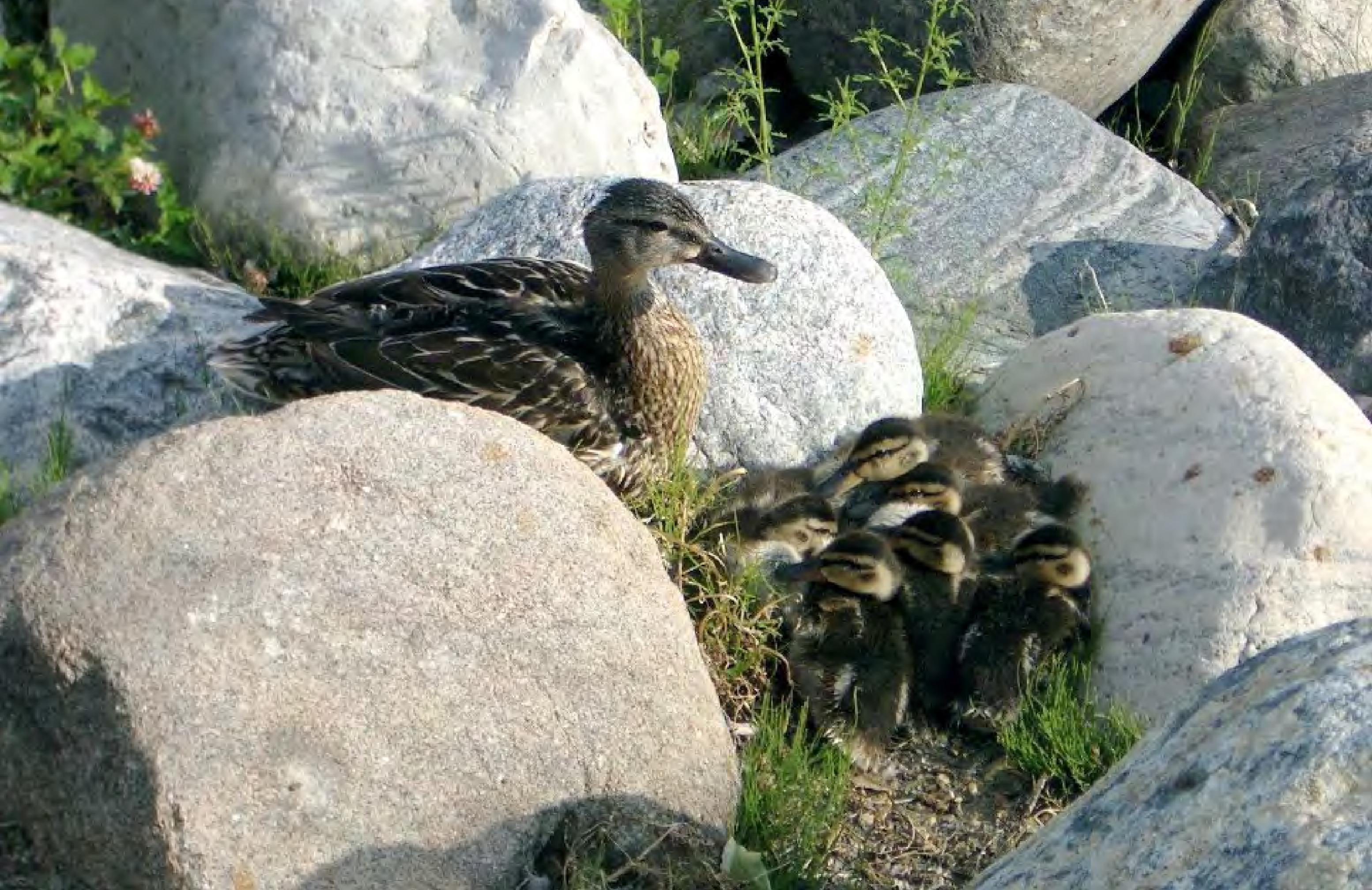
All design will be done to meet or exceed the Edmonton Design and Construction Standards (latest edition). A Development Permit application will need to be developed prior to any detailed design of the sites. The drawings will then need to be submitted through e-services for circulation and comments to all required departments.

Utilities

A desktop study in Concept Design showed the presence of five major drainage outfalls servicing Beaumaris Lake, as well as shallow power throughout the site. During Schematic to Detailed Design phases, further investigation and discussions will be required to coordinate with ATCO (gas), and EPCOR (water, drainage, and power), to confirm the locations of utilities in and around the project area. Hydrovac will be required to confirm depths and location of any utilities prior to obtaining the appropriate agreements to proceed with construction.

Beaumaris Lake Utilities Network





Public Engagement

In order to create a broadly accepted long-term vision for the landscape and community open spaces around the lake, a large-scale community engagement program was undertaken. A community engagement committee was formed to help guide the engagement activities for the project, consisting of a diverse group of Beaumaris Lake stakeholders. Members of the committee include:

- Residents of the multi-family housing buildings facing the lake
- Residents of the single-family homes surrounding the lake
- Local community association representatives

The committee met several times to provide local intel on best methods and locations for engagement with other stakeholders and community members. Their feedback shaped the community engagement approach that was used in the functional plan phase of the project. All communications to the public were also channeled to the committee members, with instructions for them to assist in raising awareness of the project and the need for community input into the process.

Project Awareness

An important piece of stakeholder feedback received by the team during the Beaumaris Lake condition assessment project in 2016 was that the zone of interest in the lake extends much farther than the homes within a block of the lake. Based on this information, the notification area for this project was expanded to a 2 KM radius from the central point in the lake, illustrated below in Figure 2. This notification area was used to ensure project awareness mailouts reached the appropriate zone of interest, enabling a greater quality of feedback. Project awareness messages were also sent to the five community leagues that surround Beaumaris, with direct notification was sent to the executives of the following associations, with instructions to forward on to their membership:

- Lorelei/Beaumaris Community League
- Baturyn Community League
- Caernarvon Community League
- Carlisle Community League
- Cumberland/Oxford Community League
- Griesbach Community League
- Castle Downs Recreation Society

The trails around Beaumaris Lake also have news-posts installed at strategic locations. Project awareness posters were placed on all the available news-posts around the lake, and included information on the project objectives and background, as well as the opportunity to participate via the online survey and engagement events.

Engagement Events

A number of opportunities were provided for stakeholders and community members. The project team conducted two phases of community engagement.

Community Engagement Phase 1

Community Engagement Phase 1 was conducted in June 2017, and was used to gather background information, such as demographics, amount of use, likes and dislikes of the lake, and general comments on the lake and open space. The project team held three Pop-Up Events, as well as created an online survey, to gather necessary information. Participants had the opportunity to provide feedback on the lake overall, as well as on specific zones, as shown on Figure X.

- Zone 1 West: covers the entire west side of the lake, including the West Park and Promenade, the walking trail that connects the lake's trails to Castle Downs Road, and the greenspace/south entrance near 153 Avenue that includes the boat launch area.
- Zone 2 North: is quite naturalized, with a heavily treed and rocky area near the entrance to Peggy Holmes Park, and numerous viewpoints along the trail.
- Zone 3 East: also quite naturalized and includes the East Park.
- Zone 4 South: Naturalized trail with viewpoints.

The results of Community Engagement Phase 1 were distilled into five specific themes, shown on the next page.



Beaumaris Lake Zone Map



Preservation and Enhancement of Existing Natural Setting:

The most prevalent theme in the comments provided by stakeholders was the desire for very little change to the current “feel” of the lake. Many noted that the existing naturalized state attracts a large amount of wildlife that normally would not be present in a large city like Edmonton, and that the presence of this fauna makes the lake feel more secluded and tranquil. Rather, they would like to see a greater emphasis on the maintenance and upkeep of what is already present. This included:

- Repair and updating of the West Park and Promenade area in Zone 1, especially the stairs leading to the upper plaza and onwards to the library. Many also expressed the need for a ramp in this area to improve access both to and from the businesses above the lake for people with mobility impairments, families with strollers/wagons, etc.,
- Repair/replacement of the barricade system along the promenade area to both improve the view of the lake and to improve the safety of the aging concrete slab wall system that has begun to fail,
- Overall upkeep/maintenance/smoothing of the trail system to make it safer and easier to walk, cycle, etc. upon. Several stakeholders also noted that widening of the trail where possible would be appreciated, as the volume of traffic often leads to conflicts,
- Pruning of vegetation around the lake, especially along the trails and particularly near corners, and removal of dead trees/branches. This included the thinning or removal of the undergrowth in several areas, which many felt was both blocking the view of the lake as well as providing a security risk in certain areas,

- Repair or replacement of the floating docks around the lake. Several of these structures have been damaged over the years and have been closed off from access, and many felt that they are an interesting and valuable part of the lake experience,
- Above all, any new designs must be created with a low maintenance perspective.





Improved Safety and Security

A frequent comment from stakeholders of the project was the increase in safety and security concerns at Beaumaris Lake over the past several years. Many pointed to issues with drug related activities around the lake, particularly at Peggy Holmes Park and the adjacent areas by the lake, near the East Park, and at the viewpoints on the south section. Several felt that a stronger police presence in these areas, better lighting, and thinned out vegetation would potentially reduce these issues. Numerous female stakeholders also expressed concern with the level of vegetation near the trails, as it provides hiding places for would-be assailants, especially at/near blind corners.



Additional Seating and Resting Areas

Many stakeholders noted that while the lake is beautiful in its current layout, there are few areas to sit and take in the view around the lake. The strategic addition of more benches and a few picnic tables around the lake were felt to be welcome parts of an improved set of amenities, as long as they include additional garbage receptacles. Areas noted for more seating areas included:

- Within the grassed area of the promenade by the lake,
- Along the south edge of the trail in the middle of Zone 2 near the Castle Keep Neighbourhood,
- Near the lake in Zone 4, particularly the area near the transition to Zone 3.



Inclusion of Interpretive Signage

Numerous comments were received that while the lake is very popular in its current state, the addition of interpretive signage around the lake would enhance the experience even further. Suggested topics for signage include:

- Images and information on frequently seen wildlife in the area, especially the resident ducks, geese, pelicans, songbirds, and raptors,
- Images and information on the vegetation around the lake, including its importance as a natural habitat for the previously mentioned wildlife,
- Information on the history of the Beaumaris area, both pre- and post-development,
- Circuit training (exercise) suggestions at select locations around the lake to make a walk/run around the lake part of a larger exercise regimen.



Desire for Drinking Fountains and Washroom Facilities

The addition of washrooms and drinking fountains at select locations around the lake was quite divisive. While many felt that the addition of these amenities would be beneficial, others felt that they would not be well maintained or would be abused, which would lead to an overall worse experience at the lake.

Community Engagement Phase 2

Using the input received from Community Engagement Phase 1, the team created a series of conceptual designs for four main areas around the lake:

- The West Park – the upper plaza area located on the west side of the lake, between the Promenade and the Edmonton Public Library branch.
- The Promenade – the wide concrete and paving stone area that runs along the west side of the lake parallel to the upper housing and commercial areas.
- The East Park – the small park area on the most eastern part of the lake, near 106 Street.
- The Overall Lake Concept – conceptual design direction for the remainder of the lake, including trails and floating docks.

These conceptual design options were communicated to the public at two in-person community engagement events, as well as through online survey. Respondents (both in-person and online) were presented with an initial display focused on project context (overall goals, previous feedback, project timeline, etc.) followed by a more detailed display that contained a series of concepts based on the four main areas around the lake. In conjunction with these static displays, attendees at the in-person events were also able to view each of the design concepts in virtual reality (VR) through a series of individual VR headsets. In-person event attendees were reminded to complete the associated online survey hosted on the City of Edmonton's website. This survey gave respondents the opportunity to provide feedback on the concepts for the East Park, West Park, Promenade, and the overall lake concepts.

Results from the survey respondents were reviewed and translated by the Project team, and the following results were observed:

East Park

Responses from the community engagement indicated that Option 1 was the preferred concept for the East Park rehabilitation. Respondents noted the preference to have the open grass space separated from the upper plaza area, and expressed that the wavy walls were more visually appealing.

West Park

The feedback from the three concept options from the West Park were divided, identifying different components from each of the options as preferred components. Preference was given to the soft, winding pathways, with the desire for the inclusion of a direct route as well. There was equal interest in the water feature versus the interactive art feature, with hesitation towards the maintenance required for a water feature. There was strong support for the open lawn area, as well as the upper plaza, to support seating opportunities, and provide options for gathering spaces.

Promenade

The concept for the Promenade was largely favoured by a high percentage of the respondents. The increased seating options, replacement of the railing, and planted edge were elements that appealed to the public in the rehabilitation of the Promenade. Concern was expressed over the boardwalk, and the maintenance of the material chosen. This should be further reviewed in the next stages of the project.

Overall Lake Concept

The proposed enhancements to the overall lake trail were well received by the respondents. The inclusion of wayfinding, fitness circuit, and interpretive signage were viewed as a good addition to the trail system, as well as the addition of seating opportunities. The removal of the floating docks has been a sensitive issue however, most respondents understand the safety risk of them, and agree the raised viewdecks provide a safer alternative. Many respondents also expressed concern on the levels of activity on the trails, and the width of the trails, and the conflicts that can happen.

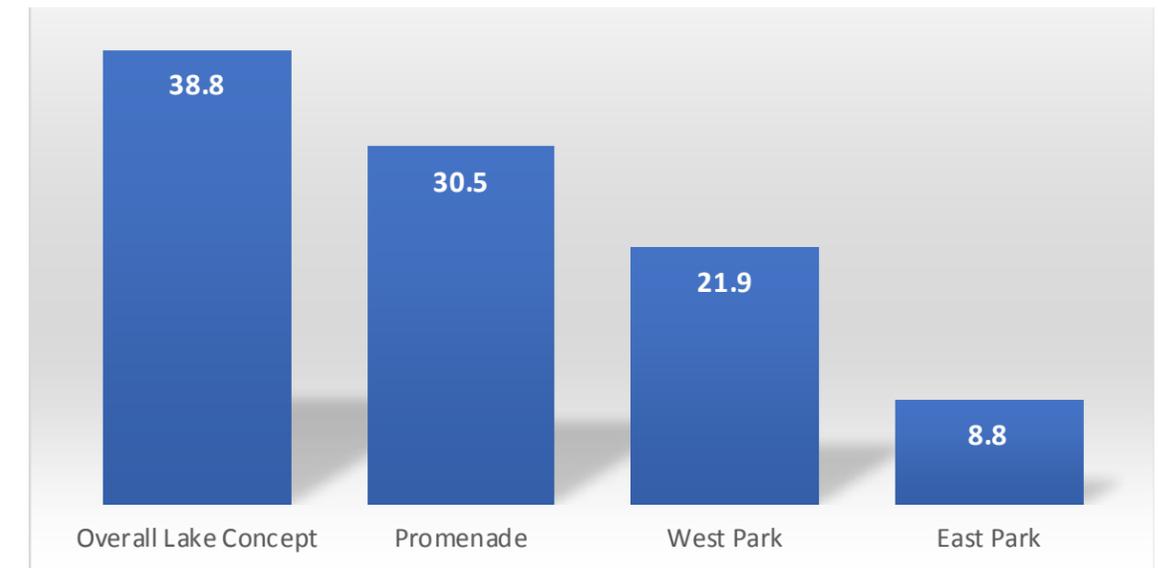
General Feedback

A number of common themes emerged from the respondent feedback:

- **Benches:** Clear preference was made by the public for wood or wood-like seating material. Comments were also made to provide benches with backs, as well as arm rests.
- **Waste:** With the addition of seat areas, including picnic tables, concern was raised over the number of waste receptacles around the lake and adjacent to seating and picnic areas.
- **Lighting:** The provision of lighting in all areas was frequently mentioned by the public to enhance the feeling of safety around the lake and in the park areas.
- **Maintenance:** As the currently state of infrastructure at Beaumaris Lake exhibits a lack of care and maintenance over the years, respondents are concerned about a continuation of this treatment after the rehabilitation.
- **Elements of play:** Many comments addressed the desire for opportunities for play for children visiting Beaumaris Lake.

Priorities

During the community engagement, the public was asked to allocate a budget amount to the four areas (East Park, West Park, Promenade, and Overall Lake Concept), in the order of their prioritization. The following graph represents the average level of priority as seen through the eyes of the community.



Design Rationale

Following Community Engagement Phase 1, the project team used the themes established to develop a Vision Statement, Project Values, and Project Objectives. These are used to guide the design process and to measure what success looks like for Beaumaris Lake.

Vision Statement:

“To provide a high quality, natural environment that supports healthy living by offering opportunities for: tranquility and rest, wildlife and stormwater management education, community gathering, and physical activity.”

Project Values:

- Preservation and enhancement of mature landscape and theme
- Peacefulness and tranquility
- Safety and security
- Community gathering
- Education, wildlife preservation, and connecting children to nature
- Exercise and physical activity

Project Objectives:

- Improve user experience at the lake
- Improve views of the lake
- Retain and enhance existing landscape
- Improve trails and seating network
- Provide connections between the lake and the library
- Create gathering places
- Provide education on rain garden and innovative stormwater management
- Provide support signage for exercise loop



Preferred Concept Options

East Park

Throughout the concept design process, it was heard that the East Park had wonderful views of Beaumaris Lake. Concern was expressed on the sightlines into the park, prompting the City Project Team to add the redevelopment of the East Park to the scope of the project. Two concept options were developed and presented to the community. Based on the feedback from the community engagement sessions, **Concept Option 1** was the preferred option for the East Park. The community was interested in discouraging gathering close to the road, concentrating it on the lower level, adjacent to the shared use path. Views from the road will remain unobstructed, and lighting levels will be reviewed to increase visibility into the park.

Both original concept options can be seen in Appendix C.

Rendering of East Park



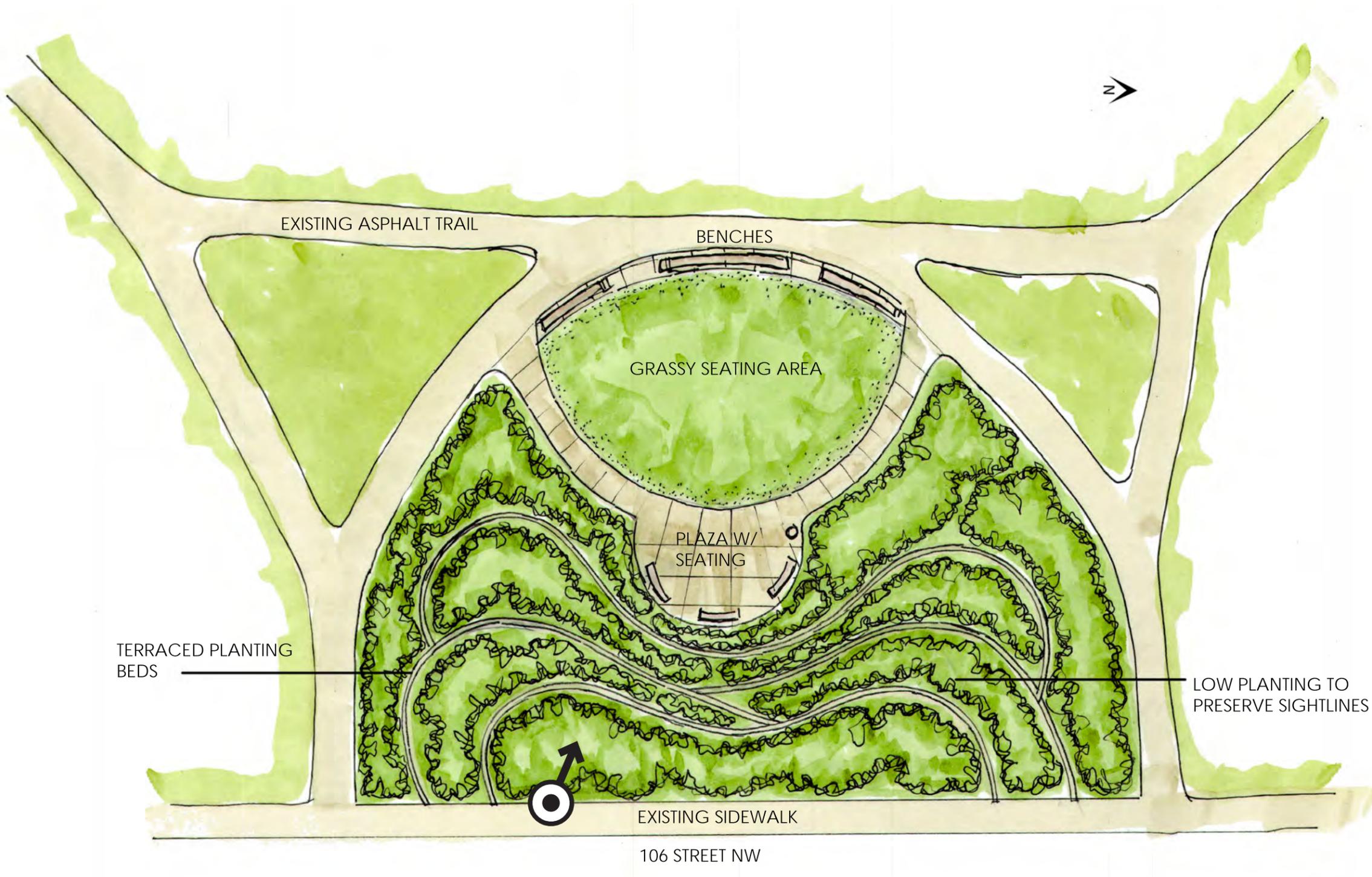
Terraced Walls and Planting Precedent Images



Grassy Seating Area Precedent Image

Bench Seating Precedent Images





 Location of Rendering Viewpoint



West Park

The West Park is a key connection from the Beaumaris Lake trail to the commercial shopping area. Currently, the stairs are predominantly fenced off due to the failing infrastructure, allowing access only at certain locations. Along with the disrepair of the West Park, it was heard that the large expanse of hard surface contrasts with the rest of the open space. The visitors and residents highly value the natural feel of the lake, and expressed the desire to have the West Park reflect this. Three concept options were developed for the West Park, and presented to the public, which can be seen in Appendix C.

Results from the community engagement sessions for the West Park indicated a preferred option that included elements from all of the options presented. The final concept option includes the soft, winding path needed to ensure universal accessibility, as well as a more direct route, with a wide staircase. Space is identified in the upper plaza for an interactive art or water feature, and plenty of seating areas are available in the upper, mid, and lower plazas. The upper and mid plazas both have adjacent open lawn areas, and interpretive rain gardens are included to showcase the importance of natural stormwater management.

Rendering of West Park



Rain Garden Stormwater Education Zone Precedent Image



Interactive Water / Art Feature Precedent Image

Low Maintenance Plantings Precedent Image



ACCESS TO LIBRARY / PARKING



STAIRS FOR ALTERNATE ROUTE

UPPER PLAZA W/ WATER FEATURE

3m ACCESSIBLE SHARED USE PATH

GRASSY SEATING AREA

LOW PLANTING TO PRESERVE SIGHTLINES

STORMWATER EDUCATION PIECE

MID PLAZA W/ SEATING AREA

GRASSY SEATING AREA

ACCESS TO PROMENADE



Location of Rendering Viewpoint



Promenade

The Promenade at Beaumaris Lake is a wonderful way to view the lake. Running almost the entire west side of the lake, the Promenade plays a key connection to the lake from the commercial area, as well as the residential developments north and south of the commercial area. The existing Promenade provides plenty of space, however, seating opportunities are extremely limited. The existing barrier wall also obstructs views to the lake from those seated on the Promenade.

The Concept Design for the Promenade looks to balance the users in the Promenade area. The structural wall will be cut back to allow for trailing planting, creating a softer edge around the lake front. The solid, concrete barrier wall will be removed, and replaced with a decorative aluminum railing to match the rest of the lake, and allow views through. The boardwalk material represents the traditional use of wood decking along waterfront promenade, while the concrete provides durable surfacing for a multitude of uses. Due to the high volume of people using the promenade, it could be recommended that cyclists are to dismount through the main promenade area, to avoid conflict with the various users.

Rendering of Promenade



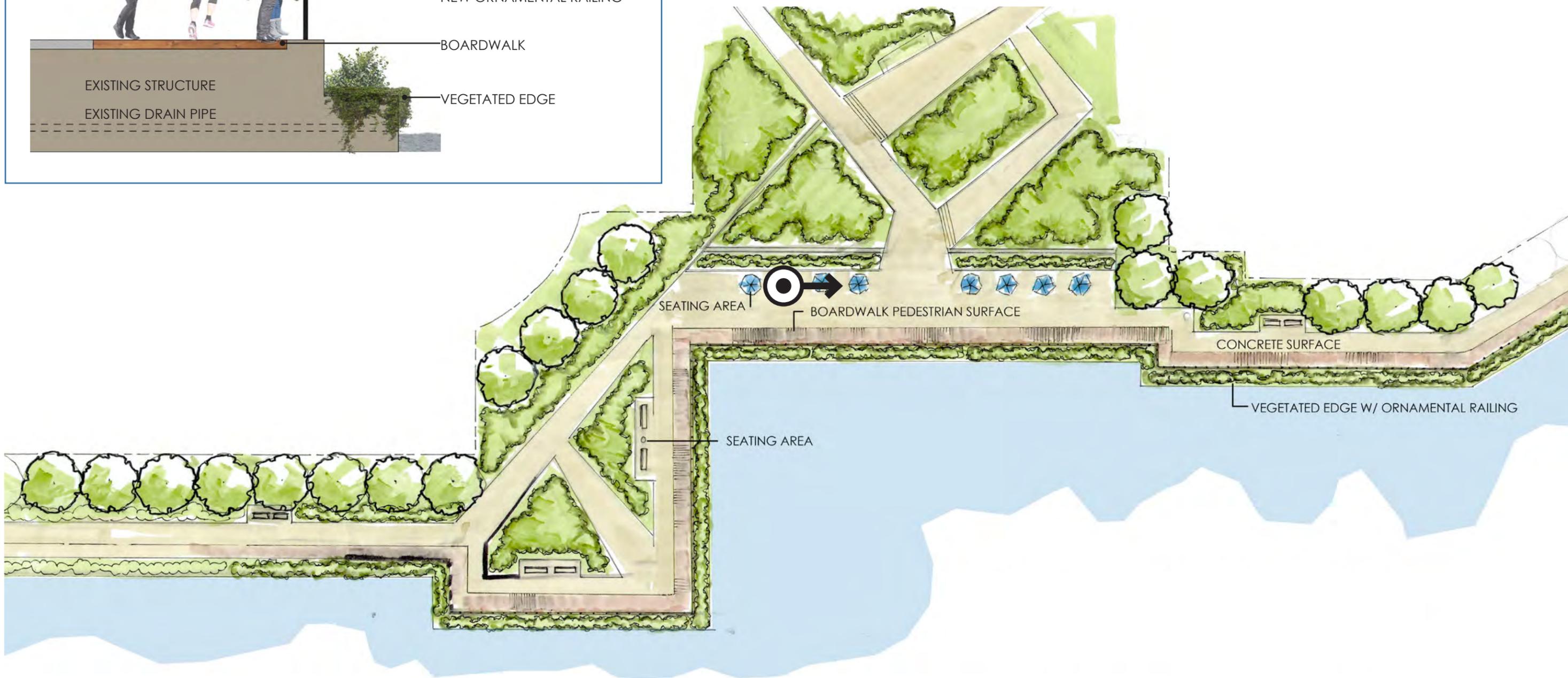
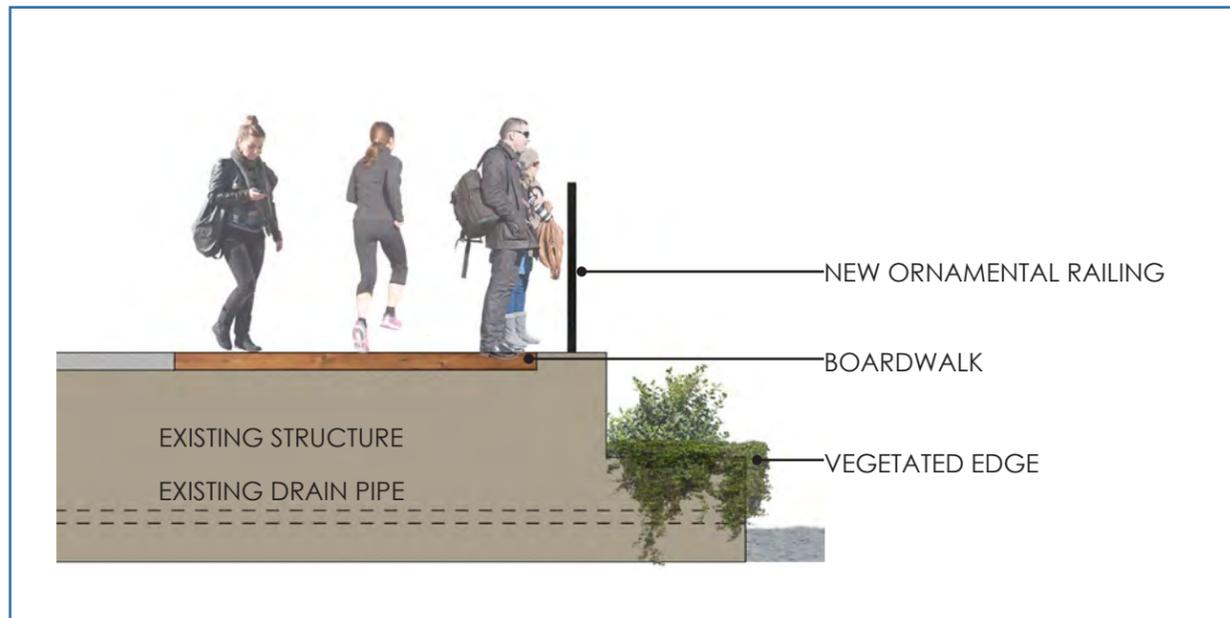
Seating and Walls Precedent Images



Boardwalk Precedent Image

Trailing Plant Material Precedent Images





 Location of Rendering Viewpoint



Overall Lake Concept

Upgrades to the overall lake include: design and installation of wayfinding, fitness, and interpretive signage, replacement of the floating docks with raised viewdecks, installation of additional seating opportunities and waste receptacles, and addressing trail safety concerns with grading, drainage, and width issues.

Existing Raised Viewdeck



Dock Replacement Precedent Images





BEAUMARIS LAKE FITNESS CIRCUIT

-  2.5km FITNESS TRAIL
-  FITNESS STATIONS
-  ADD SEATING AND / OR PICNIC TABLES





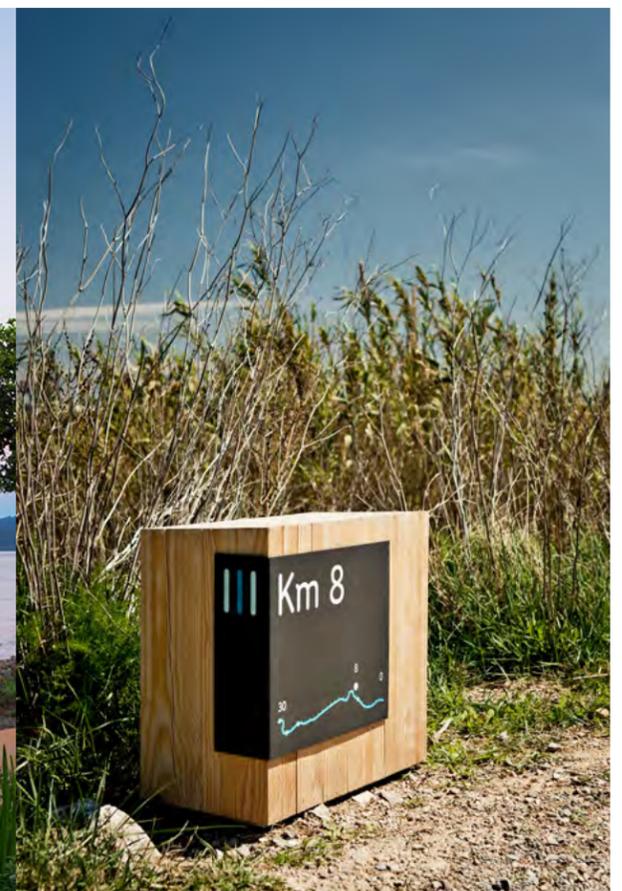
10-Minute Outdoor HIIT Workout

- 1 Park Bench**
 1 min jog, 30 sec sprint
 20 single leg step ups
 20 squat jumps
 20 tricep dips
- 2 Railing**
 1 min jog, 30 sec sprint
 20 incline push-ups
 30 plié squat jumps
 10 incline lever pull-ups
- 3 Park Bench**
 1 min jog, 30 sec sprint
 10 decline push-ups
 20 power knee steps
 10 burpees

Fitness Trail Signage Precedent Images



Interpretive Signage Precedent Images



Trail Wayfinding Signage Precedent Images



Risks and Mitigation

Risk Type	Risk	Mitigation	Impact to Project (Low/Medium/High)
Ownership / Maintenance	There are various below and above ground elements and utilities on the site.	Ensure ownership of site elements and utilities is clear, and there are defined maintenance expectations.	Low
Budget Approval	Budget for full rehabilitation may not be approved.	Develop a phasing plan that will outline the priorities for construction.	Low
City of Edmonton Internal Department Approval	Design elements may require higher standard of maintenance and care.	Identify potentially challenging items and initiate conversations with specific departments in order to gain acceptance prior to drawing circulation. Establish maintenance budgets to meet the needs of the site.	Low
Cost Control	Staying on approved construction budget.	Frequent recurring meetings to review cost, and make changes, if necessary.	High
Schedule Control	Staying on construction schedule.	Frequent recurring meetings to review schedule, and make changes, if necessary.	Medium
Unknown Site Conditions	Unforeseen factors that could arise when beginning construction (unstable geotechnical conditions, contaminated soils, extraneous utilities, etc.)	Soils testing and associated geotechnical reporting, and comprehensive site surveying and data collection to be completed prior to preliminary design.	Medium to High
Community Approval	Community members may approach City Councillors, City Administration, or the media with concerns regarding project.	Ensure clear communication strategies are in place for community members to know who to talk to, and provide consistent updates and explanations on decisions made.	Low
Environmental Impacts	Impacts to water quality, migratory birds, native plant species, and wildlife.	Ensure proper environmental approvals are in place. Conduct regular site visits to ensure contractors are following proper environmental impact mitigation strategies.	Medium
Public Access and Safety	Impacts to site access and public safety during construction.	Ensure clear signage, appropriate access accommodation, and proper safety procedures are in place, and maintained by contractor. Conduct regular site visits to review.	Medium

Cost Estimate

Based on best knowledge of current industry pricing, the following is a Class 'D' (+/- 50%) estimate of the construction for all the work in the scope of this project. The estimate includes work as recommended in the Conditions Assessment and Rehabilitation Plan, completed in 2016, as well as work identified throughout this project. The cost estimate does not include design fees, site survey, geotechnical investigation, utility locate fees, environmental review, permits, design contingency, project administration, or escalation.

East Park

The cost estimate for the East Park includes: removal of existing hard surfaces and soft landscaping, site earthworks and grading, construction of all hard surfaces, retaining walls, soft landscaping and plant material, installation of site furnishings, and upgrading of lighting.

West Park

The cost estimate for the East Park includes: removal of existing hard surfaces and soft landscaping, site earthworks and grading, construction of all hard surfaces, stairs, retaining walls, soft landscaping and plant material, installation of site furnishings, water / art feature, interpretive signage, and upgrading of lighting.

Promenade

The cost estimate for the Promenade includes: removal of existing hard surfaces and soft landscaping, site earthworks and grading, modification of the lake wall, construction of all hard surfaces, boardwalks, retaining walls, soft landscaping and plant material, railing, installation of site furnishings, interpretive signage, and upgrading of lighting.

Raised Viewdecks

The cost estimate for the Docks includes: removal of existing floating docks, including adjacent access walks and stairs, and construction of new, raised viewdecks, including access walks and stairs, railings, and structural piles.

Overall Lake Upgrades

The cost estimate for the overall lake upgrades includes: removal of all asphalt and concrete trails, construction of new 3.0m wide asphalt trails, installation of furnishings and interpretive signage, and upgrading of lighting.

Class 'D' Cost Estimate

EAST PARK (Approx. 6-8 month construction)*	\$410,722.50
Removals	\$20,750
General Earthworks	\$24,200
Hard Surfaces (Concrete)	\$26,400
Retaining Walls	\$37,800
Soft Landscaping (Sod and Planting)	\$153,000
Site Furnishings	\$25,000
Lighting	\$70,000
Construction Contingency (15%)	\$53,572.50

WEST PARK (Approx. 6-8 month construction)*	\$1,046,636.25
Removals	\$59,525
General Earthworks	\$57,900
Hard Surfaces (Concrete and Stairs)**	\$134,400
Retaining Walls	\$15,750
Soft Landscaping (Sod and Planting)	\$372,000
Site Furnishings	\$25,000
Lighting	\$70,000
Art / Water Feature	\$150,000
Interpretive Signage	\$12,500
Sub-Drain for Stormwater Education Zones	\$15,000
Construction Contingency (15%)	\$134,561.25

*Approximate construction times do not include lead time for products and material procurement. Construction time contingency is +/- 50%.

** Items identified in the 2016 Conditions Assessment and Rehabilitation Plan Report as needing short-term attention.

PROMENADE (Approx. 12-16 month construction)*	\$1,571,705
Removals	\$91,900
General Earthworks	\$80,000
Wall Modification	\$250,000
Hard Surfaces (Concrete and Boardwalk)	\$295,800
Retaining Walls	\$53,550
Soft Landscaping (Sod and Planting)	\$342,000
Site Furnishings (Including Railing)**	\$90,950
Lighting	\$150,000
Interpretive Signage	\$12,500
Construction Contingency (15%)	\$205,005

RAISED VIEWDECKS (Approx. 2-3 month construction)*	\$506,000
Removals**	\$40,000
New Docks**	\$400,000
Construction Contingency (15%)	\$66,000

OVERALL LAKE (Approx. 18 month construction)*	\$1,480,625
Removals	\$187,500
General Earthworks	\$65,000
Hard Surfaces (Asphalt)	\$600,000
Site Furnishings	\$70,000
Lighting	\$300,000
Interpretive Signage	\$25,000
Landscape Restoration	\$40,000
Construction Contingency (15%)	\$193,125

TOTAL PROJECT COST (+/- 50%)	\$5,015,688.75
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Percent for Art Program (1% of Qualifying Construction Costs): ~\$50,000

Next Steps

Future Design Phases

Following Concept Design, the project will move into Schematic Design. As part of Schematic Design, the following services should be engaged:

- Public Consultation - continued communication to community residents and stakeholders
- Geotechnical Investigation - all sites, including underwater for raised dock design.
- Civil Engineering - underground utility coordination and site grading.
- Structural Engineering - promenade wall modifications and raised dock design.
- Electrical Engineering - design and coordination with EPCOR Power for upgraded lighting.
- Water Engineering - review of water run-off for rain gardens, and coordination for potential water feature.
- Environmental Services - nest sweeps, and review of environmental risks and mitigations.
- Landscape Architecture - schematic and detailed design of all site amenities, including plazas, trails, furnishings, plant material, vertical structures, and coordination with all previously listed disciplines.
- Review of Infrastructure Life Expectancy

Estimated duration of Schematic Design is 4-6 months.

Following Schematic Design, the project will move into Detailed Design and preparation of construction documents. This phase is estimated to take 6-8 months, including a tender phase of 6-8 weeks. Coordination with Edmonton Arts Council can take place during the Detailed Design phase.

Construction Considerations

As Beaumaris Lake is very well used, and well loved by the surrounding residents, consideration to communication and public access and safety should be given during the future phases. Regular updates on project status and changes in site conditions should be communicated to the public through the Community Stakeholder group, and through media publications.

During construction, it is important to maintain site access, and provide safe alternatives for the public to circulate through the site. Clear signage posted on site, as well as circulated communication, will help to keep everyone up to date.



**BEAUMARIS LAKE CONDITION
ASSESSMENT AND
REHABILITATION PLAN**

Summary Report



Prepared for:
The City of Edmonton
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Project No. 110117043

November 22, 2016

Revision	Description	Author	Quality Check	Independent Review
0		CV, NC	HA	KJ
1		CV, NC	HA	



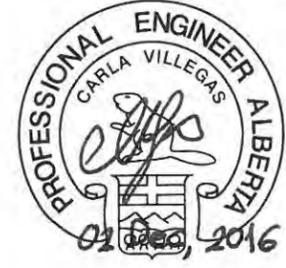
Sign-off Sheet

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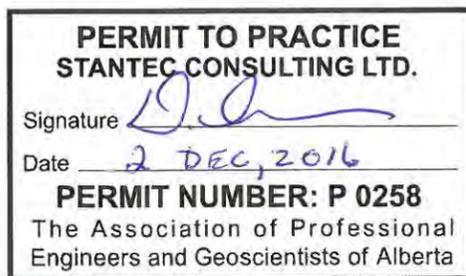
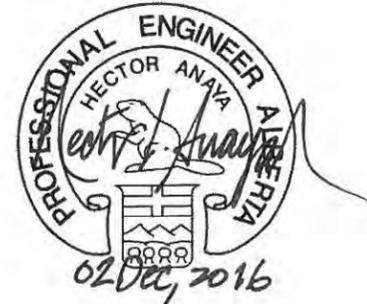


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APPENDICES ARE NOT INCLUDED

1.0 INTRODUCTION

The City of Edmonton (the City) Drainage Services owns and operates the Sanitary and the Land Drainage Utility. The proper and effective functioning of these systems at a reasonable cost is one of the key strategic directions for Drainage Services – “Ensuring sustainable infrastructure through proactive, optimized and integrated asset management approach”. Currently there are over 200 stormwater management facilities (SWMFs) in the City that includes Wet Ponds, Constructed Wetlands, and Dry Ponds. Community Services and Transportation Services also own and/or maintain some of the assets around these facilities. The “One City” approach is an important part of ensuring that these facilities are maintained and that infrastructure planning is in place. Drainage Services has recently formed two Working Groups, with representation from each department, to further this initiative. One working group is focused on short term immediate needs, and the other is focused on the condition assessment and medium and long term planning.

The purpose of this study is to develop a condition assessment framework for assessing all SWMFs in the City of Edmonton to ensure sustainable infrastructure through proactive asset management. A condition assessment of Beaumaris Lake was completed as benchmark for the framework developed. Based on the condition assessment findings, a rehabilitation plan was also developed for Beaumaris Lake.

The general condition assessment process for each SWMF was proposed to proceed in the following order:

1. Preliminary Assessment
2. Category-level Assessment
3. Component-level (or Detailed) Assessment

For each of the three levels of assessment, Stantec created a spreadsheet tool to evaluate the input variables and provide risk-based prioritizations using the methodology developed in conjunction with SMA Consulting and City Staff during a Workshop session conducted in January 2016.

1.1 PROJECT SCOPE

The objectives for this project were two-fold. First, there was a need to develop an overall condition assessment program for the entire inventory of SWMFs. Secondly, there was a need to assess the condition of Beaumaris Lake and determine what actions are to be taken to address the results of the assessment. Specifically to Beaumaris Lake, there have been multiple issues that have affected functionality and safety of the facility. Certain ongoing maintenance and repairs

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Introduction
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are not sustainable, and a permanent solution is required. The assessment carried out for the lake include a risk-based prioritization approach for maintenance, repairs and upgrades needed to restore their physical and functional condition as originally intended.

1.2 PROJECT METHODOLOGY

In order to meet the goals and objectives of the project, the following are the main activities that were undertaken:

- Data Collection and Review
- Condition Assessment Framework Development
- Risk-Based Prioritization Tool Development
- Beaumaris Lake Condition Assessment
- Investigation and Testing
- Asset Value Analysis
- Maintenance, Rehabilitation, and Replacement Plan (MR&R)
- Public Engagement and Consultation Session
- Implementation Plan Development
- Condition Assessment Expansion Process
- Documentation Process

1.3 REPORT ORGANIZATION

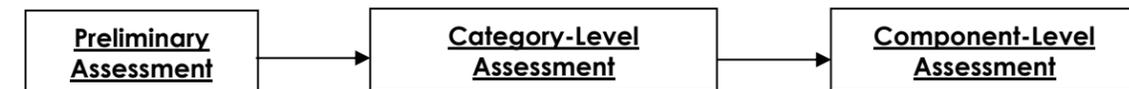
This report summarizes the outcomes of entire undertaking during the execution of the project. **Section 2** presents the condition assessment framework, which includes assets and components classification, preliminary assessment, condition rating, category level assessment, component level assessment, risk-based prioritization and expansion process. **Section 3** summarizes the assessment findings and proposed plans of Beaumaris Lake. **Section 4** presents the outcomes of the public engagement session held with Beaumaris Lake's adjacent community.

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Condition Assessment Framework
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2.0 CONDITION ASSESSMENT FRAMEWORK

The condition assessment framework includes three levels of assessment as shown in the following diagram and described in the subsequent sections.



2.1 PRELIMINARY ASSESSMENT

Stantec in conjunction with City of Edmonton has developed a spreadsheet tool that allows using available data to rank the facilities based on the level of service and complexity. The tool does not require the collection of any field information, which makes it primarily a desktop assessment using data available from facility design studies or other existing sources. The tool was developed to use the City's existing asset management or GIS database of Storm Lake assets. The City provided example outputs from their database system in MS Excel and these were used as inputs for this tool. **Appendix A** presents details of this tool.

Key performance parameters (e.g. age, inlets, outlets, active volume, tributary area, NWL, 100-year rain event) are combined with user-defined weightings to produce an overall score for each facility. The scores are ranked from high to low and the top ranked facilities are considered to be those with the highest risk factors and top priority for further investigation.

2.2 CATEGORY AND COMPONENT LEVEL ASSESSMENT

After preliminary assessment the next steps are the category and component level assessment. The SWMF's assets or components are grouped in categories to facilitate the condition assessment. The hierarchy provides a framework for segmenting the components into appropriate categories. Category-Level assessment involves assigning a composite condition rating to each of the 12 categories and then carry-out the risk-based prioritization analysis. Category-level assessments can be conducted by City operations and maintenance staff using the questionnaire provided in **Appendix A**. Component-Level assessment involves assigning condition rating to each SWMF's components. Therefore, it is recommended that this detailed assessment (Component-Level) should be conducted by a consultant or specialist.

2.2.1 Asset Hierarchy

An asset hierarchy was developed by first grouping all infrastructure components commonly found in SWMFs into the following 12 categories based on their function (see **Table 2-1**).

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Condition Assessment Framework
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Table 2-1 Asset Category Components

Asset Category	Components
Pretreatment	Oil/Grit Separator
Inlet Conveyance	Flow Splitter, Grate, Maintenance Access (Manhole), Orifice Plate, Overland Flow Route, Piping, Screen, Weir
Inlet Structure	Energy Dissipator, Grate, Headwall, Screen, Stilling Basin
Sediment Forebay	Available Volume, Rip-Rap, Sediment Dry-out zone, Trash Racks
Storage Pool	Active Storage Depth, Available Volume, Bed/Liner, Benching Berm, Floating Island, Flood Wall, Fountain, Low-flow Channel Parapet Wall, Permanent Pool Water Depth, Rip-Rap, Vegetation, Weeping Tile
Outlet Structure	Controls, Comms, Level Sensor, Hickenbottom, Maintenance Drain Orifice Plate, Pipe, Reverse Slope Pipe, RTC Gate, Valves
Outlet Conveyance	Emergency Spillway, End wall, Flow Splitter, Headwall, Maintenance Access, Pipe, Receiving Watercourse, Screen
Landscaping and Community Amenities	Benches, Bollards, Bird Nester, Bridges, Curbing, Decks, Fire Fixtures, Grass, Light Fixtures, Parapet Wall, Pavers/Paving Stone, Planters, Plaques, Playgrounds, Promenades, Railings, Rain Garden, Retaining Walls, Shrubs, Sidewalks, Stairs, Tables, Timber Decking & Platforms/Boardwalks, Trees, Vegetation, Viewpoints, Walkways/Trails, Waste Receptacles
Maintenance Access	Access Road, Boat Launch, Laydown Area/Material Drying, Other Maintenance Access
Security	Fences, Gates, Locks, Railings, Signage
Other Structures	Drains, Embankment, Flooding Protection Walls, Grading, Rip-Rap, Side Slopes, Structural Retaining Walls, Other Retaining Walls, Vegetation
Water Quality	Available Volume, Vegetation

2.2.2 Field Inspection & Condition Rating

Once a SWMF has been selected for further investigation, a field inspection is needed to complete a detailed assessment of the physical and functional conditions of the asset categories and/or components. Not all components of a SWMF must be assessed in order to assign a risk score. As a minimum, "Key" components (see **Table 2-2**) must be scored to get meaningful results in the tool. Those key components were identified by City staff, SMA and Stantec during the workshops held for development of the Risk Prioritization Tool (see **Appendix A**).

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

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Table 2-2: Asset Groups and Key Components

Asset group	Key Components (in order)
Inlet Conveyance	(1) Piping (2) Orifice Plate (3) Screen (4) Grate (5) Maintenance Access (Manhole)
Inlet Structure	(1) Energy Dissipator (2) Headwall (3) Stilling Basin
Landscaping and Community Amenities	(1) Walkways/Trails (2) Railings
Maintenance Access	(1) Boat Launch (2) Access Road (3) Other Maintenance Access
Other Structures	(1) Structural Retaining Walls (2) Other Retaining Walls (3) Embankment (4) Side Slopes (5) Vegetation (6) Rip-Rap
Outlet Conveyance	(1) Screen (2) Pipe (3) Emergency Spillway (4) Maintenance Access
Outlet Structure	(1) Orifice Plate (2) Pipe (3) Controls, Comms, Level Sensor (4) RTC Gate
Pretreatment	(1) Oil/grit Separator
Security	(1) Gates (2) Fences (3) Locks (4) Signage
Sediment Forebay	(1) Available Volume
Storage Pool	(1) Bed/Liner (2) Rip-Rap (3) Available Volume (4) Low-flow Channel (5) Active Storage Depth
Water Quality	(1) Available Volume (2) Vegetation

If recent information is not available, investigation and testing maybe required including but not limited to site visit, bathymetric survey, geotechnical investigation of liners, slope subsidence, retaining walls movement assessment, water quality monitoring, underwater inspection, and CCTV in inlets and outlets.

The components in each asset category are rated based on their physical and/or functional condition, if applicable, using information gathered during the site visit, investigation and testing and review of existing information including design reports, construction plans, recorded modifications and upgrades, operations and maintenance, hydraulic models, and current design standards.

The physical condition deals mainly with structural integrity of the asset or component. A scale of 1 to 5 is used, where a rating of 1 is set as a very good and a rating of 5 is determined as very poor (see **Table 2-3**).

The functional condition is related to the service provided by the asset or component. A scale of 1 to 5 was used, where a rating of 1 is set as a very good and a rating of 5 is determined as very poor (see **Table 2-4**).

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Condition Assessment Framework
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Table 2-3 Physical Condition Scale

Scale	Description
1 Very good	The asset is physically sound and is performing its function as originally intended. Asset is new or recently rehabilitated. Only normal routine maintenance required to keep the asset operational.
2 Good	The asset is physically sound and is performing its function as originally intended. Asset is within mid-stage of its expected life. Minor maintenance work or operational actions required to keep the element operational.
3 Moderate	The asset is showing signs of deterioration and is performing at a lower level than originally intended. Asset has been used for a long time and is within the later stage of its expected life. Significant ongoing maintenance and/or operational actions required to keep element operational.
4 Poor	The asset is showing signs of deterioration and is performing at a lower level than originally intended. A major portion of the asset is physically deficient. Required maintenance costs significantly exceed acceptable standards and norms. Asset is approaching the end of its expected life.
5 Very poor	The asset is physically unsound and/or not performing as originally intended. Asset has high probability of failure. Maintenance costs are unacceptable and rehabilitation is not cost effective. Replacement / major refurbishment is required.

Table 2-4 Functional Condition Scale

Scale	Description
1 Very good	The asset meets all program/service delivery needs in a fully efficient & effective manner
2 Good	The asset meets program/service delivery needs in an acceptable manner
3 Moderate	The asset meets most program/service delivery needs and some inefficiencies & ineffectiveness present
4 Poor	The asset has limited ability to meet program/service delivery needs
5 Very poor	The asset does not meet program/service delivery needs

Once all the components are assessed a condition rating is assigned to each component, a risk-based prioritization tool is used to convert the condition assessment ratings into a risk score.

2.3 RISK-BASED PRIORITIZATION

The Risk-based Prioritization tool is used to convert the condition assessment ratings into a risk score. The Risk-based Prioritization tool developed by City of Edmonton Staff, Stantec and SMA during the workshop sessions. The tool combines three elements as follows:

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

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- 1) A Failure Mode and Effect Analysis (FMEA) which identifies the SWMFs' components that are the most critical to its operation;
- 2) Potential impacts which are divided into multiple consequence types, such as "Property Damage" or "Public Safety." These consequences were evaluated to determine their relative importance using the Analytic Hierarchy Process during the workshop; and
- 3) "Multipliers", which operate at a facility level and would increase or decrease the severity of individual types of impacts for specific locations.

Two levels of assessment were incorporated in the risk-based prioritization tool: 1) "Category-Level Assessment" which is a preliminary level assessment using ratings for asset categories only, and 2) "Component-Level Assessment" which is a detailed level assessment using physical and functional condition ratings for each component. It is expected that category-level assessments would be conducted first and any facilities which receive poor scores would be flagged for follow-up using a component-level assessment.

The "Category-Level Assessment" could be conducted by the City's operations and maintenance staff and a questionnaire was developed for this purpose. The "Component-Level Assessment", which requires a detailed engineering condition assessment is recommended to be conducted by a specialized personnel or consultant (see **Appendix A**).

2.4 EXPANSION PROCESS

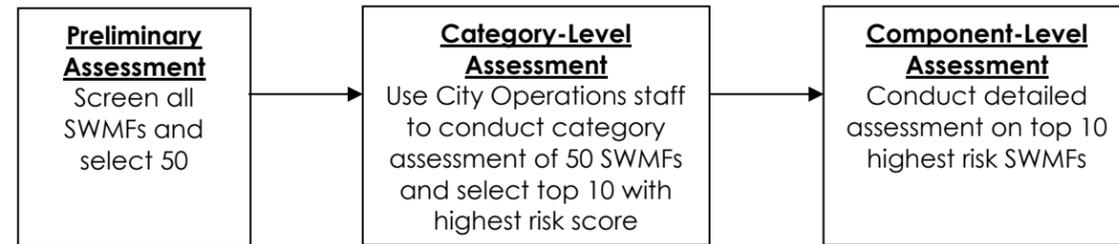
In discussions with City staff, it is Stantec's understanding that all SWMFs in the City will eventually be assessed for physical and functional condition and a risk rating will be assigned. This section addresses how the methodologies described earlier could be implemented for the entire inventory of SWMFs currently owned and operated by the City.

A preliminary assessment of the entire City inventory of SWMFs is recommended to prioritize the 50 facilities in need of field inspection and condition rating. It is anticipated that the City conduct a periodic analysis (perhaps on an annual basis) between the results of the screening tool and the results of any Component-level and Category-level assessments conducted. If correlations can be made between the screening-level parameters and the results of the category or component level assessments, the City can modify the screening parameter weightings (which are adjustable in the spreadsheet) to better predict in future which SWMFs should be prioritized for further assessment.

After the preliminary assessment of SWMFs, a representative sample of approximately 50 facilities should be selected for Category-level assessments by City operations and maintenance staff using the questionnaire provided in **Appendix A**. Based on the results of those assessments, approximately 10 facilities should proceed to Component-level assessment as shown in the following diagram.

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Condition Assessment Framework
November 22, 2016



BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Beaumaris Lake Condition Assessment
November 22, 2016

3.0 BEAUMARIS LAKE CONDITION ASSESSMENT

The Beaumaris Lake was selected as a benchmark to develop a condition assessment program due to its complexity and age. The Beaumaris Lake is one of the oldest and one of the largest facilities constructed in the City. The normal water level area of the lake is 13.8 ha and the approximate lake perimeter is 2.5 km. Aside from typical stormwater management facility components, Beaumaris Lake has numerous significant aesthetic or landscaping ornamental features, such as promenade, decks, viewpoints, walkways, and structural retaining walls.

3.1 REVIEW OF THE EXISTING INFORMATION AND SITE VISIT

The documents listed in **Appendix B** were provided by the City of Edmonton. Given the complexity of the facility the review existing information was conducted by dividing the information in 5 disciplines: structural, hydraulic, landscape, water quality and geotechnical. A visual condition assessment of the existing structures in and around the Beaumaris Lake SWMF was also undertaken by Stantec and City of Edmonton staff on November 5, 2015. **Appendix C** presents the finding of the review and site visit.

3.2 INVESTIGATIONS AND TESTING

A Bathymetric Survey was conducted as part of this project using a remote controlled SONAR equipped boat. The results of the survey are presented on **Figure 3-1**. The measured depths suggest only slight variations from the design elevations provided on the record drawings (for more information please see **Appendix C**).

During the site review of the existing assets the following observations were made: signs of buckled and displaced decks; movement in concrete paver relative to adjacent structures; blocked weeping holes behind retaining walls; deformed retaining walls; depressed ground in multiple areas; cracked concrete trails; slope movements; deterioration of concrete guard rails and rusted steel and other areas experiencing distress such as along the walking trails, guardrails, stairwells, slabs, etc. A geotechnical investigation was beyond the scope of this project, therefore, it is recommended to conduct those assessments in the future as shown on **Appendix E** and **F**.

3.3 CONDITION RATING AND RISK SCORE

Based on the information reviewed, site visit and investigations, a condition rating was assigned to the components. For some of the assets located below water and underground, the condition assessment was not included in the current study scope and ratings were not assigned. Water quality and enhancement efficiency was also not included since there was not enough information to conduct an efficiency assessment. Once the condition rating was assigned to key components, the risk based prioritization tool was applied to convert the rating

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Beaumaris Lake Condition Assessment
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to risk scores by asset category. **Table 3-1** summarizes condition rating and risk scores for Beaumaris Lake assigned during Stantec assessment, including condition ratings provided by the City staff for components such as headwall, piping, boat launching, active storage depth and available volume. Only components with rating are shown in the table.

Most of the deficiencies identified were related to components in the category of landscape and community amenities such as displaced decks; movement in concrete paver; deformed retaining walls; cracked concrete trails; slope movements; deterioration of concrete and rusted steel in guardrails and stairwells. Other deficiencies identified were the absence of structures associated to the functionality of storm water management facility such as oil/grit separator; emergency spillway; inland route; and sediment dry out zone, which were not required at the time the lake was constructed. Further detail about structural, landscaping, hydraulic, water quality and geotechnical deficiencies is presented in **Appendices D and E**.

\\ed1001-c200\shared_projects\110170431\resources\16\06m27d Bathymetric Survey\Bathymetric Survey.mxd
2016/07/14 By: noody



Stantec

10160 - 112 Street
Edmonton AB
www.stantec.com

Legend

Bathymetric Surface
(m)



Client/Project
City of Edmonton
Beaumaris Lake
Condition Assessment and
Rehabilitation Plan

Figure No.
3-1

Title
Underwater Surface of
Beaumaris Lake from
Bathymetric Survey

Beaumaris Lake Condition Assessment
November 22, 2016

Table 3-1 Condition Rating and Risk Score

Asset Category	Component	Physical Rating	Functional Rating	Operations Risk Score	Safety Risk Score	Overall Risk
Pretreatment	Oil/Grit Separator (key component)	N/A	5	3.6	-	3.6
Inlet Structure	Headwall (key component)	2	2	2.7	-	2.7
Inlet Conveyance	Maintenance Access (Manhole) (key component)	NVAL	1	6.0	7.9	13.9
	Overland Flow Route	NVAL	3			
Outlet Structure	Piping (key component)	2	2	21.9	33.5	55.4
	Controls, Comms, Level Sensor (key component)	NVAL	4			
Outlet Conveyance	Pipe (key component)	2	2	15.9	17.3	33.2
	Emergency Spillway (key component)	NVAL	5			
Storage Pool	Pipe (key component)	2	2	17.6	7.4	25
	Active Storage Depth (key component)	3	4			
	Available Volume (key component)	NVAL	3			
	Benching	NVAL	1			
	Flood Wall	NVAL	5			
Landscaping and Community Amenities	Permanent Pool Water Depth	NVAL	2	0.7	24.8	25.5
	Benches	2	1			
	Bollards	3	3			
	Deck 1	5	5			
	Deck 10	5	5			
	Deck 10A	5	5			
	Deck 11	5	5			
	Deck 12B	5	5			
	Deck 3	5	5			
	Grass	3	2			
	Lake Side Retaining Walls (10' Exposure)	2	2			
	Lake Side Retaining Walls (4' Exposure) Property line	5	4			
	Lake Side Retaining Walls (7'-6" Exposure)	2	2			
	Pavers - West Plaza	5	5			
	Planters	2	2			
	Precast Benches - West Plaza	5	5			
	Promenade - Structural slab	2	2			
	Promenade Guardrail (Railings key component)	5	3			
	Promenade Planter Structures	2	2			
	Shrubs	2	2			
	Special interest areas (SW entrance by mall)	5	5			
	Stair Structures	5	5			
	Stairs - West Plaza	5	5			
	Trees	2	2			
	Viewpoint 1	2	2			
	Walkways / Trails (key component)	3	3			
	Waste Receptacles	3	3			
Other Structures	Drain - West Plaza	4	5	-	-	-
	Flooding Protection Walls	2	5			
	Grading	3	2			
Sediment Forebay	Available Volume (key component)	3	2	0.9	-	0.9
	Sediment Dry-out Zone	NVAL	5			
Maintenance Access	Boat Launch (key component)	2	2	4.0	6.8	10.8
Water Quality	Available Volume (key component)	NVAL	2	1.0	2.0	3.0

NVAL: Information (e.g. geotechnical investigation, underwater inspection, water quality) was not available or significant to provide a condition rating

N/A: Not Applicable

Condition rating provided by Stantec
Condition rating provided by the City

3.4 ASSET VALUE AND LIFE EXPECTANCY

Based on the current condition of the Beaumaris Lake assets and anticipated service life, an opinion of probable cost was developed. Replacement costs are based on the 2016 estimates and asset value with 2% annual inflation applied to the estimated remaining life span of the asset.

The following definitions were applied to characterize the assets.

Design life: The period of time that an asset is designed to be productive given that appropriate operation, maintenance and preservation is undertaken.

Useful life: The period in years over which an asset, component, or subsystem provides adequate performance; a technical parameter that depends on design, construction quality, operations and maintenance practices, use, and environmental factors.

Replacement cost/value: Refers to the approximate cost of rebuilding an asset.

Estimated asset value: Estimated value of the asset at the current state.

Table 3-2 presents the list of structural assets based on the above stated definitions. Figure 2-1 shows the location of the assets. The rates and measurements used in asset value estimate are provided in Appendix E.

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Beaumaris Lake Condition Assessment
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Table 3-2 Asset Value and Life Expectancy

Component	Year Built	Years in service	Design Life	Estimated Useful Life (Years)	Estimated remaining useful life (Years)	Estimated Asset Cost/Value (\$2015)	Anticipated Date to Replace	Replacement Cost/Value
Inlet Structure 1	1978	38	50	50	12	\$450,000	2028	\$570,709
Inlet Structure 2	1978	38	50	50	12	\$450,000	2028	\$570,709
Inlet Structure 3	1978	38	50	50	12	\$450,000	2028	\$570,709
Inlet Structure 4	1978	38	50	50	12	\$450,000	2028	\$570,709
Inlet Structure 5	1978	38	50	50	12	\$450,000	2028	\$570,709
Outlet Structure	1978	38	50	50	12	\$470,000	2028	\$596,074
Lake Side Retaining Walls (4' Exposure)	1978	38	50	63	25	\$2,595,093	2041	\$4,257,525
Lake Side Retaining Walls (7'-6" Exposure)	1978	38	50	63	25	\$3,318,315	2041	\$5,444,047
Lake Side Retaining Walls (10' Exposure)	1978	38	50	63	25	\$1,067,913	2041	\$1,752,024
Deck 1	1991	25	40	25	0	\$448,188	2016	\$448,188
Deck 3	1991	25	40	40	15	\$918,563	2031	\$1,236,264
Deck 10	1991	25	40	40	15	\$643,438	2031	\$865,982
Deck 10A	1991	25	40	25	0	\$1,042,813	2016	\$1,042,813
Deck 11	1991	25	40	40	15	\$430,438	2031	\$579,312
Deck 12B	1991	25	40	25	0	\$781,000	2016	\$781,000
Viewpoint 1	1991	25	40	40	15	\$412,688	2031	\$555,423
Stair Structures	1991	25	40	40	15	\$46,047	2031	\$61,973
Promenade	1982	34	50	60	26	\$5,823,660	2042	\$9,745,418
Promenade Guardrail	1982	34	50	34	0	\$491,563	2016	\$491,563
Promenade Planter Structures	1982	34	50	60	26	\$28,932	2042	\$48,416
Flood Wall	1999	17	50	40	23	\$551,582	2039	\$869,789
West Plaza Pavers	1978	38	40	38	0	\$690,250	2016	\$690,250
West Plaza Stairs	1978	38	40	38	0	\$530,167	2016	\$530,167
West Plaza Benches / Walls	1978	38	40	50	12	\$259,875	2028	\$329,584
Sediment Basin	1978	38	>50	N/A	N/A	N/A	N/A	N/A
Storage Pool	1978	38	>50	N/A	N/A	N/A	N/A	N/A
Total						\$22,800,522		\$33,179,356

3.6

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

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Figure 3-2 Component Locations

3.5 MAINTENANCE, REHABILITATION AND REPLACEMENT PLAN (MR&R)

The proposed MR&R plan is divided into capital projects and maintenance projects. The capital projects are generally intended to add or increase the design life of the rehabilitated component and overall life of the facility by preventing damages to other components. The maintenance projects are generally intended to keep component or the facility function as originally intended including inspection and assessment activities. The horizons of the projects were clustered in three categories Short Term (0 to 3 years), Medium Term (4 to 10 years) and Long Term (10 to 20+ years).

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

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3.5.1 Maintenance Projects

The City of Edmonton currently carries out general maintenance and inspection of various components of the SWMFs. Stantec identified additional maintenance or inspection projects to be added to these established routines, as well as, conducting more comprehensive engineering condition assessments to review components to supplement the findings of in-house visual inspections of the existing infrastructure (see **Appendices E and F**).

3.5.1.1 Short Term Maintenance Projects

The short term maintenance projects include routine annual inspection tasks to ensure proper operation and maintenance of facility and safety checks of amenities for public usage at a total cost of approximately \$252,000 for 3 year period. In addition to these routine checks and maintenance activities, specific engineering inspections/studies are also included to be completed over next three years at an approximate cost of \$205,000. Those projects are listed as follows:

- Conduct underwater inspection of inlet and outlet structures and conveyance
- Conduct geotechnical investigation of bed liner
- Conduct geotechnical monitoring and/or investigation of slope subsidence
- Conduct sedimentation pond circulation study
- Revise water quality monitoring

As upgrades for various components are completed, the frequency and/or duration of routine check can be reduced in future.

3.5.1.2 Medium Term Maintenance Projects

The total cost of medium term maintenance projects is approximately \$653,000 for 7 year period. The total cost include tasks/activities that are to be completed by the City's Operation staff typically on an annual basis as well as engineering assessment by external consultant at a five year interval basis.

3.5.1.3 Long Term Maintenance Projects

The long term maintenance activities/projects total estimated cost is approximately \$891,000 for 10 year period. All of the activities for short, medium and long term are similar with respect to routine inspections.

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3.5.2 Capital Projects

Based on the condition assessment of the Beaumaris Lake asset components and anticipated remaining service life, a number of capital projects are proposed by Stantec in the short, medium and long term. The long term rehabilitation requirements are subject to on-going monitoring to determine exact implementation timing. **Table 3-3, Table 3-4 and Table 3-5** summarize the proposed capital projects.

3.5.2.1 Short Term Capital Projects

The opinion of probable cost for all of the short term projects is \$5.72 million (see **Table 3-3**). Based on the risk assessment, the outlet structure has the highest total rating. Although the total risk assessment scores for the landscaping and community amenities category is relatively low, it does have a significantly high safety risk score. The total immediate cost of rehabilitation of the landscaping and community amenities components is approximately \$5.51 million consisting of replacement of decks, guardrail, pavers, retaining wall blocks, stairs, and benches. For the landscaping and community upgrades, the cost is based on replacement/upgrade cost. Further assessment of alternatives for each component could be completed through a conceptual design process in consultation with the public. The option analysis could consider removal of unsafe decks versus upgrade and replacement of paved surfaces areas with grass or other surfaces. The remaining components can all be grouped in two projects. One project would be explorative nature consisting of installation of flow, level and turbidity monitors and development of O&M manual at an approximate cost of approximately \$138,000. A second project would consist of minor outlet pipe upgrade and construction of sediment dry out areas at cost of \$72,000. Further details on condition assessment of individual component are provided in **Appendix C**.

3.5.2.2 Medium Term Capital Projects

The capital projects that are recommended to be implemented in the medium term (4 to 10 years) are summarized in **Table 3-4**. The opinion of probable cost for implementation of all the medium term projects is \$2.46 million.

For the risk based prioritization for categories with medium term capital projects, the highest total score is 55.4, and 25.0 was for outlet structure and storage pool, respectively (there is not medium term projects allocated for outlet conveyance and Landscaping categories). Total medium term upgrade cost for these projects is approximately \$464,000. The remaining rehabilitation projects are related to sediment controls and performance of Beaumaris Lake in terms of TSS removal. Exact implementation requirement for these projects can be determined based on the findings of the proposed water quality monitoring program under the short term implementation plan and the overall City's regulatory compliance requirement under Total Loading Plan for the City's Approval to Operate with Alberta Environment.

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

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3.5.2.3 Long Term Capital Projects

The capital projects recommended to be implemented in the long term (10+ years) are summarized in **Table 3-5**. Under long term implementation virtually all of the remaining components are required to be upgraded due to end of useful life of components.

The opinion of probable cost of all the long term projects is approximately \$34 million. Approximately 75% (\$25.6 million) of these costs are for landscaping and community amenity components. These capital cost could be significantly reduced if alternate landscape and community amenities options are considered as many of these costs can be considered as reoccurring costs after 50 or 65 years. Alterations to existing landscaping features should be completed in consultations with the surrounding residents and may need to include considerations for sustainable funding mechanism.

Due to long term implementation requirement, each of the recommend projects will need to be reviewed at a regular interval (~5 years) and the indicated individual project timeline will need to be adjusted according field condition and/or system performance requirements. For these long term projects, physical condition assessment of below water structures and forebays and storage pool bathymetric survey should be completed in the early stages. Upgrades to below water components including dredging should be completed simultaneously as it could be completed more effectively by draining the permanent pool possibly during fall/winter time.

The physical inspection of underground components should also be completed in the early stages of long term implementation period.

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Table 3-3 Short Term Capital Projects (0 – 3 years)

Asset Category	Component	Description	Opinion of Probable Cost	Timeline
Inlet Structure		Install flow monitor on each inlet	\$50,000	2 years
		Install Turbidimeter on each inlet	\$50,000	2 years
Outlet Structure	Piping	Component Upgrade/Replacement	\$47,000	2 years
		Prepare O&M manual for the facility	\$8,000	2 years
		Install flow & level monitor on outlet, connect to SCADA	\$10,000	2 years
		Install Turbidimeter on outlet	\$10,000	2 years
Storage Pool		Upgrade Water Level Sensor	\$10,000	2 years
Landscaping and Community Amenities	Lake Side Retaining Walls (4' Exposure) Property line	Repair Allan Block Retaining Wall	\$15,000	1 year
	Deck 1	Replace Deck Structure	\$448,188	1 year
	Deck 10A	Replace Deck Structure	\$1,042,813	1 year
	Deck 12B	Replace Deck Structure	\$781,000	1 year
	Promenade Guardrail	Replace Guardrail	\$491,563	1 year
	Pavers - West Plaza	Replace Pavers	\$690,250	1 year
	Stairs - West Plaza	Replace Stairs	\$530,167	1 year
	Precast Benches - West Plaza	Repair Damaged Benches	\$7,500	1 year
	Special Interest Areas (SW entrance by mall)	Remove all failing infrastructure, redesign and replace all hardscape, new plantings and features	\$1,500,000	1 year
Sediment Forebay	Sediment Dry-out zone	Construct sediment dry-out areas	\$25,000	2 years
Total			\$5,716,481	

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Table 3-4 Medium Term Capital Projects (4 – 10 years)

Asset Category	Component	Description	Opinion of Probable Cost	Timeline
Pretreatment	Oil/Grit Separator	Add Pre-treatment structure (OGS) to each inlet	\$1,250,000	8 years
Inlet Structure	Screen	Add high flow diversion to avoid re-suspending sediment at each inlet	\$500,000	8 years
Outlet Structure	Outlet Structure	Component Upgrade/Replacement	\$58,750	8 years
	Outlet Structure	Provide Stoplog storage on-site	\$5,000	4 years
Storage Pool	Flood Wall	Raise top of Flood Walls above 100 year level	\$200,000	10 years
	Available Volume	Study the implications of 100 year WL on surrounding infrastructure and private property	\$200,000	10 years
Sediment Forebay	Available Volume	Conduct inlet and outlet sumps dredging	\$250,000	8 years
Total			\$2,463,750	

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Table 3-5 Long Term Capital Projects (11 – 20+ years)

Asset Category	Component	Description	Opinion of Probable Cost	Timeline
Inlet Structure	Stilling Basin	Replace Inlet Structures	\$2,853,545	12 years
Outlet Structure	Outlet Structure	Component Upgrade/Replacement	\$70,500	14 years
	Outlet Structure	Replace Outlet Structure	\$596,074	12 years
	Outlet Structure	Increase Outlet capacity	\$2,000,000	20 years
Outlet conveyance	Emergency spillway	Create Emergency Spillway	\$1,000,000	20 years
Storage Pool	Active Storage Depth	Raise surrounding infrastructure or add additional storage to prevent WL from rising and damaging surrounding infrastructure	\$1,000,000	20 years
Landscaping and Community Amenities	Lake Side Retaining Walls (4' Exposure) Property Line	Replace Retaining Wall	\$4,257,525	20 years
	Lake Side Retaining Walls (7'-6" Exposure)	Replace Retaining Wall	\$5,444,047	20 years
	Lake Side Retaining Walls (10' Exposure)	Replace Retaining Wall	\$1,752,024	20 years
	Deck 3	Replace Deck Structure	\$1,236,264	15 years
	Deck 10	Replace Deck Structure	\$865,982	15 years
	Deck 11	Replace Deck Structure	\$579,312	15 years
	Viewpoint 1	Replace View Point Structure	\$555,423	15 years
	Stair Structures	Replace Stair Structures	\$61,973	15 years
	Promenade - Structural slab	Replace Promenade Structure	\$9,745,418	25 years
	Promenade Planter Structures	Replace Planter Structures	\$48,416	25 years
	Benches	Replace Benches	\$329,584	12 years
	Walkways / Trails	Replace Trails	\$725,000	11 years
Other Structures	Flooding protection wall	Replace Flood Wall	\$869,789	20 years
Total			\$33,990,876	

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4.0 LOCAL RESIDENTS AWARENESS

The main focus of the public engagement program was mainly on project awareness (making the community aware of the overall SWMF assessment program and the use of Beaumaris Lake as the benchmark for the new assessment tool) and issues identification regarding the site (safety concerns, areas of high usage/importance, access issues, water levels/quality, etc.). The aim of the community engagement was also to manage stakeholder expectations regarding the timing of major upgrades at Beaumaris Lake and to showcase how the overall assessment program is being used to make solid budget and timing decisions for the entire SWMF system.

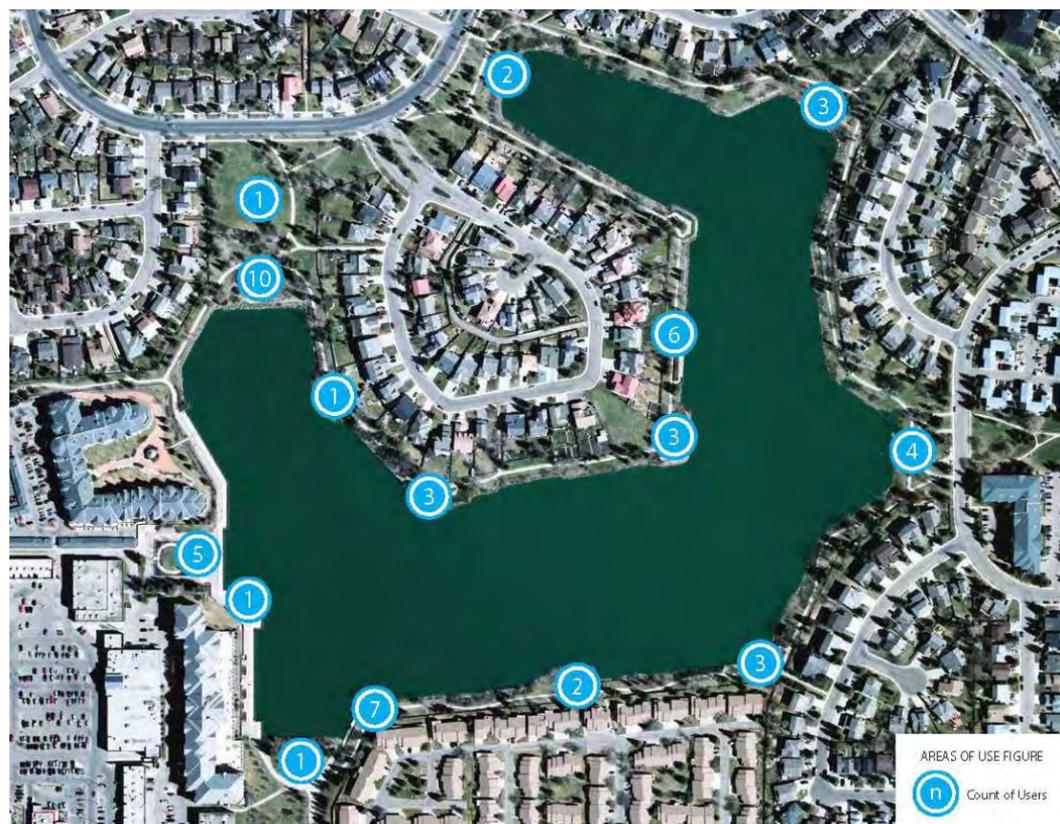


Figure 4-1 Areas of Use

A community information session was held on Wednesday, April 27, 2016 at the Castle Downs Park Pavilion from 4:30 to 7:30 PM. The event was hosted as an informal drop-in session within the prime availability timeslot at the end of the workday. Since the majority of the stakeholders identified for this phase of the project are homeowners, it was reasoned that this timeslot would be the ideal time of day for these residents to stop in on the commute home or on the way to evening activities. Attendees were presented with information regarding the need for the

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condition assessment program, the creation of the condition assessment tool and its elements, and the timelines for next steps in the project. This information was conveyed through a series of project display boards.

A total of 32 residents attended the session. The attendants were asked to provide feedback directly onto two large maps of Beaumaris Lake from two different perspectives: areas of use and areas of concern. Areas of the lake and amenities of regular use are presented in **Figure 4-1** indicating user count amongst the session attendants.

Areas of concern were identified by the attendants and linked to safety issues in stairways, walkways, and decks, as well as need for new/additional amenities, water quality, garbage accumulation, trees, and algae blooms. See **Appendix G** for more details.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the finding of the overall study, the conclusion and recommendations are discussed in the following sections.

5.1 CONCLUSIONS

The key conclusions of the overall project are as follows:

- Three levels of assessment for the City's SWMFs were developed: Preliminary Assessment, Category-level Assessment, and Component-level Assessment. A spreadsheet tool was developed to facilitate the evaluation of input variables and provide prioritizations using the methodology developed in conjunction with SMA Consulting in the workshop process.
- The Beaumaris Lake was selected as a benchmark to develop a condition assessment program due to its complexity and age. The facility has many non-essential components (from stormwater management functionality perspective) which are in significant need of repair due to physical condition and public safety hazards.
- The facility appears to be functioning well in terms of flood protections from stormwater management functional perspective. The physical condition assessments of components that are located below water and below ground were not completed as part of this study with exception of bathymetric survey and pipe CCTV inspection. Effectiveness of water quality enhancement was also not assessed due to the lack of appropriate information. In term of flood protection, the pond has almost 1:100 year 24 hour design event storage (2012 Standards) with the existing flood walls.
- The outlet structure, outlet conveyance, storage pool and landscaping and community amenities asset categories generate the highest overall risk score indicating higher priority for upgrade based on the risk assessment framework developed for the project. The landscaping and community amenity asset category generate second highest overall risk score, most of these points due to safety risk score due to poor condition of some of the components. These risk scores are based on incomplete assessment of the assets; when completed, it may alter priority of some rehabilitation projects.
- The main areas of concern identified during the public engagement session are related to safety issues in stairways, walkways, and decks, as well as need for new/additional amenities, water quality, garbage accumulation, trees, and algae blooms.

5.2 RECOMMENDATIONS

The recommendations of the assessment and rehabilitation plan are as follows:

- The City should conduct a periodic analysis (perhaps on an annual basis) between the results of the preliminary assessment tool and the results of any Component-level and Category-level assessments conducted. If correlations can be made between the screening-level parameters and the results of the category or component level assessments the City can modify the screening parameter weightings (which are adjustable in the spreadsheet) to better predict in future which SWMFs should be prioritized for further assessment.
- The short term rehabilitation capital projects should be implemented as follows:
 - Complete installation of flow monitors, level sensors, turbidity monitors and develop O&M manual for the lake. The monitoring data is required to complete assessment of some of the components. Total cost for this program is expected to be approximately \$138,000.
 - Implement the minor outlet pipe upgrade and construct sediment dry out areas at a total cost of approximately \$72,000.
 - Rehabilitation of components for landscape and community amenity asset category is required at a total cost of \$5.51 million dollars. It is recommended that as part of the conceptual design for these components, an optional analysis be completed in consultation with the public to see if the overall upgrade cost can be reduced.
- The medium term rehabilitation capital projects should be implemented as follows:
 - Implement outlet structure and storage pool upgrade at a total cost of approximately \$464,000.
 - Additional \$2.20 million upgrades related to sediment controls and the lake performance have been identified for implementation. Need for these projects will have to be confirmed based on the findings of the monitoring program and the City's overall regulatory compliance requirements under the City's Approval to Operate.
- The long term rehabilitation capital projects should be implemented as follows:
 - For the long term rehabilitation plan, a total of approximately \$34 million of projects need to be implemented between 2028 and 2042 based on the anticipated remaining useful life of various components. Of this total amount, approximately 75% or \$25.6 million projects are from landscape and community amenity category. It is recommended that option analysis be completed for these components in future in consultation with the community stakeholders to reduce or minimize future reoccurring rehabilitation needs along with sustainable funding mechanism.
- For maintenance projects, the following should be implemented in addition to the existing City maintenance activities:

BEAUMARIS LAKE CONDITION ASSESSMENT AND REHABILITATION PLAN

Conclusions and recommendations
November 22, 2016

- Implement the recommended engineering assessments by 2018 at a total cost of approximately \$205,000
- Allocate \$100,000 per year of additional funding to complete recommended safety inspections, assessment and minor repairs of all Beaumaris Lake components on an ongoing basis.



**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

Executive Summary

Beaumaris Lake is Edmonton's oldest, and largest, stormwater lake – and one of the very few that also serves as a community recreation destination. The facility is more than 40 years old, however, and requires a rehabilitation program due to several safety and aesthetic issues.

A large-scale community engagement program, led by the City of Edmonton (the City) and Stantec Consulting Ltd. (Stantec), has been underway since early 2017 to create a broadly accepted, long-term vision for the landscape and community open spaces around the lake. Residents and users of the amenities around the lake were engaged through a variety of means, including:

- A community engagement committee, consisting of area residents and representatives from several area agencies
- A targeted mailout to the residences and businesses in the study area
- A series of in-person engagement events at the lake and other local gathering places
- Several "graffiti boards" posted at the lake to receive input from the users directly
- An online survey to gather feedback on areas of interest and concern about the lake

The project team interacted with hundreds of users at the engagement events at the lake, and received a large volume of information on the challenges and opportunities that are present. Nearly 250 people from across the City participated in the in-depth online survey, and the results from all forms of engagement have been pooled to create a set of common project themes.

Participant feedback fell into five main themes, shown below in the order of the level of feedback received:

1. Status Quo – repair what needs repairing, but maintain existing "natural" feel of lake
2. Maintain and improve safety and security around Beaumaris Lake
3. Increase the number of sitting/resting areas available
4. Add interpretive signage to enhance the experience at the lake
5. Potential for addition of washrooms and drinking fountains



Beaumaris Lake
Open Space Rehabilitation
Functional Plan
Engagement Summary Report
October 25, 2017



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APPENDICES ARE NOT INCLUDED

BEAUMARIS LAKE OPEN SPACE REHABILITATION

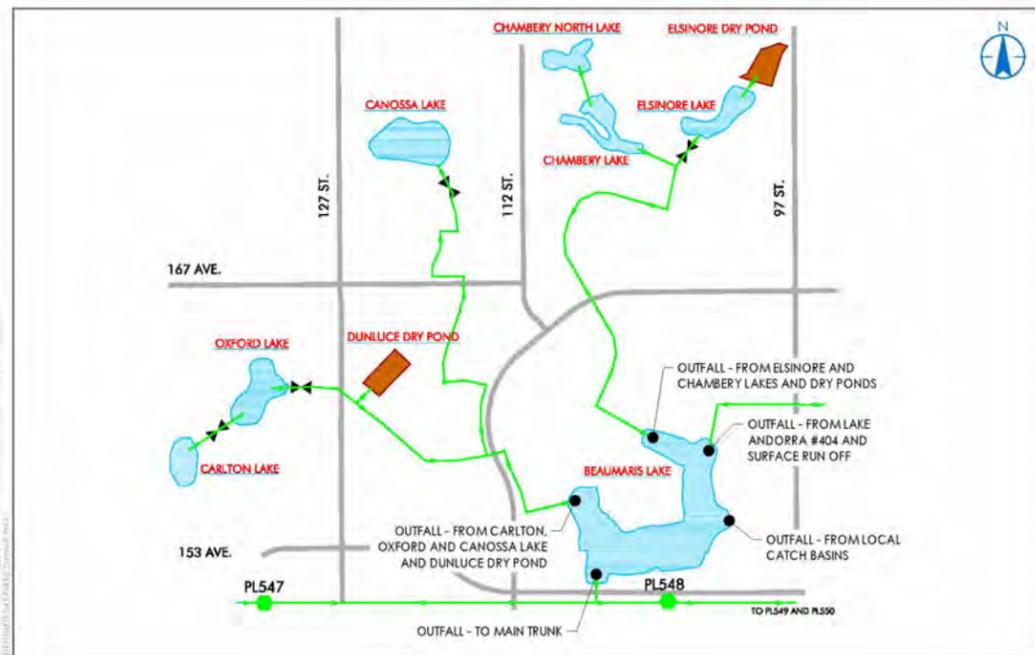
Project Background
October 24, 2017

1.0 PROJECT BACKGROUND

Beaumaris Lake is Edmonton's oldest, and largest, stormwater lake – and one of the very few that also serves as a community recreation destination. Over two kilometres of multi-use trail encircle the lake, along with numerous wildlife observation platforms, green spaces, and a broad promenade. However, since the facility was constructed over 40 years ago, several areas around the lake are in need of major rehabilitation.

The lake is part of a much larger drainage network spread across northwest Edmonton, serving as the final collection point for surface water runoff from a series of stormwater lakes stretching from 135th Street to 97th Street and from Anthony Henday Drive to 153rd Avenue.

Figure 1 - Northwest Edmonton Stormwater Lake Drainage Network



In order to create a broadly accepted long-term vision for the landscape and community open spaces around the lake, a large-scale community engagement program was undertaken by the City of Edmonton (the City) and Stantec Consulting Ltd. (Stantec). This engagement included several components, which are described in more detail below.

BEAUMARIS LAKE OPEN SPACE REHABILITATION

Project Background
October 24, 2017

1.1 COMMUNITY ENGAGEMENT COMMITTEE

To guide the engagement activities for this project, the City formed a community engagement committee consisting of a diverse group of Beaumaris Lake stakeholders. Members of the committee include:

- Residents of the multi-family housing buildings facing the lake
- Residents of the single-family homes surrounding the lake
- Local community association representatives

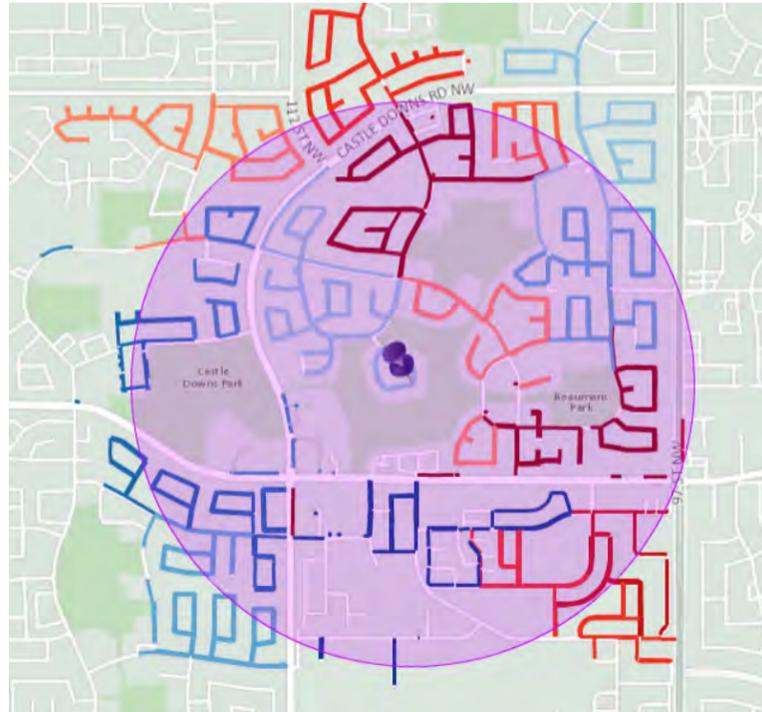
The committee met several times to provide local intel on best methods and locations for engagement with other stakeholders. Their feedback shaped the community engagement approach that was used in the functional plan phase of the project. All communications to the public were also channeled to the committee members, with instructions for them to assist in raising awareness of the project and the need for community input into the process.

1.2 PROJECT AWARENESS MAILOUT

An important piece of stakeholder feedback received by the team during the Beaumaris Lake condition assessment project in 2016 was that the zone of interest in the lake extends much farther than the homes within a block of the lake. Based on this information, the notification area for this project was expanded to a 2 KM radius from the central point in the lake, illustrated below in Figure 2. This mailout reached nearly 7000 households, including single family homes, apartments/condominiums, and businesses. An example of the mailout is included in Appendix A. Project awareness messages were also sent to the five community leagues that surround Beaumaris. Direct notification was sent to the executives of the following associations, with instructions to forward on to their membership:

- Lorelei/Beaumaris Community League
- Baturyn Community League
- Caernarvon Community League
- Carlisle Community League
- Cumberland/Oxford Community League
- Griesbach Community League
- Castle Downs Recreation Society

Figure 2 - Project Awareness Mailout Area



1.3 PROJECT AWARENESS POSTERS

As part of the community-based layout of the lake’s amenities, a series of news-posts have been incorporated into strategic locations at the intersections of pathways around the lake. Project awareness posters were placed on all the available news-posts around the lake, and included information on the project objectives and background, as well as the opportunity to participate via the online survey and engagement events.

1.4 POP-UP ENGAGEMENT EVENTS

A series of engagement events were hosted at the lake and other local community gathering places between June 17-26, 2017.

The schedule of the events was as follows:

Table 1 - Pop-up Engagement Event Details

Time	Locations
1:00 PM – 4:00 PM Saturday June 17 th	Engagement stations at west promenade, east entrance, and north Peggy Holmes Park
5:00 PM – 8:00 PM Wednesday June 21 st	
6:30 AM – 9:00 AM Friday June 23 rd	
5:30 PM – 7:30 PM Monday June 26 th	Castle Downs YMCA, Castle Downs Recreation Centre, and Castle Downs Library

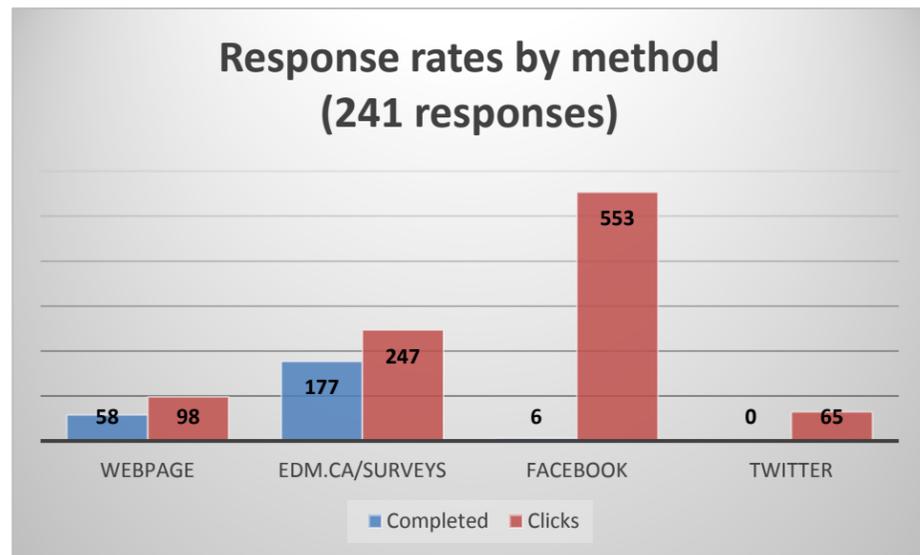
Each event followed a similar format. Project team members from the City and Stantec hosted a series of stations around the lake to interact with users as they were using the lake’s trail system. The locations were strategically chosen at major trail intersections/entrance points to maximize the number of interactions with stakeholders. The timings of the events were also strategic, as it allowed the team to interact with weekly/infrequent users (Saturday afternoon), frequent users and adjacent homeowners (Wednesday evening and Friday morning) and area residents who may not have heard about the events at the lake or were unable to attend (Monday evening).

All three stations consisted of one City and one Stantec staff member, who interacted with passing stakeholders and encouraged them to provide feedback on a mounted, waterproof “graffiti board.” Each board contained some information on the project background and objectives, areas for comment on opportunities and challenges with the current landscaping and amenities, and two idea rating areas to gauge the level of support for the level of development and the number of amenities at the lake in general. These boards were left in place after each event to allow other participants to both view the feedback from their fellows as well as leave their own input. Each station’s board was refreshed once it was filled, and a total of 18 boards (6 replacements for each of the three stations) were used over the two-week course of engagement at the lake. The raw comments and an example of the boards have been included in Appendix B.

2.0 ONLINE SURVEY

An online survey, hosted on the City's website, ran from June 16-30, 2017, and received 241 responses. The survey was designed to complement the in-person engagement efforts and to provide a separate opportunity for interested stakeholders to participate in the process. A breakdown of the response rates is included below in Figure 3.

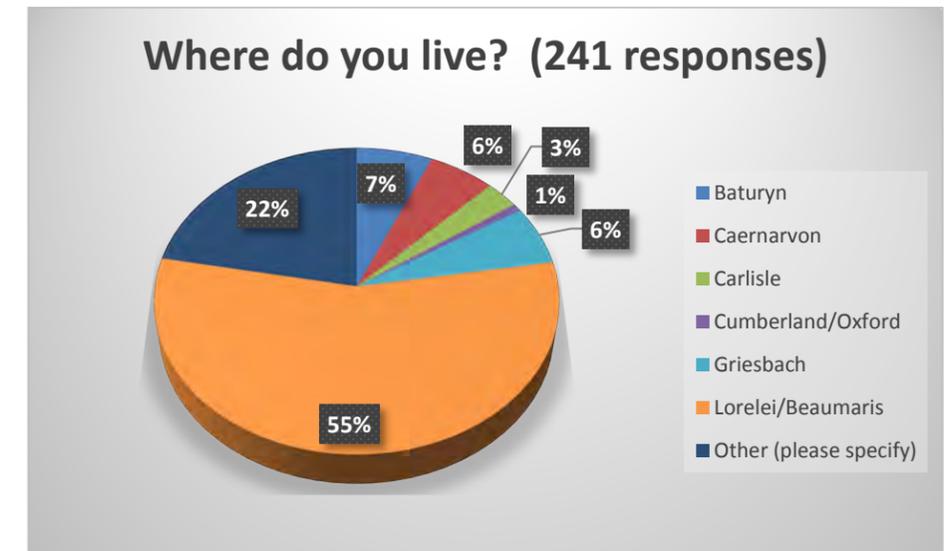
Figure 3 - Survey Responses and Exposure by Method



2.1 DEMOGRAPHIC QUESTIONS

From the outset of the project, there has been a basic understanding that the users of Beaumaris Lake likely are not limited to the residents of the homes closest to the lake. To confirm this, survey participants were asked a series of questions to determine where they live, how frequently they come to the lake, and what draws them to use the lake for recreation. The results are shown below in Figures 4-7.

Figure 4 - Residency of Survey Respondents



The "Other" category generated 54 additional responses, with the majority (15) from Dunluce. The remaining responses are mapped below in Figure 5, and range from adjacent neighbourhoods to south Edmonton and all the way to the Town of Devon. The other 25 areas noted consisted mainly of one or two responses each, with three from Lauderdale and four from Elsinore the only outliers. The red area denotes the Beaumaris neighbourhood, with highlighted areas indicating a neighbourhood listed by a respondent. The black area in the lower left indicates the Town of Devon.

Figure 5 - Other Response Locations Outside of Adjacent Areas

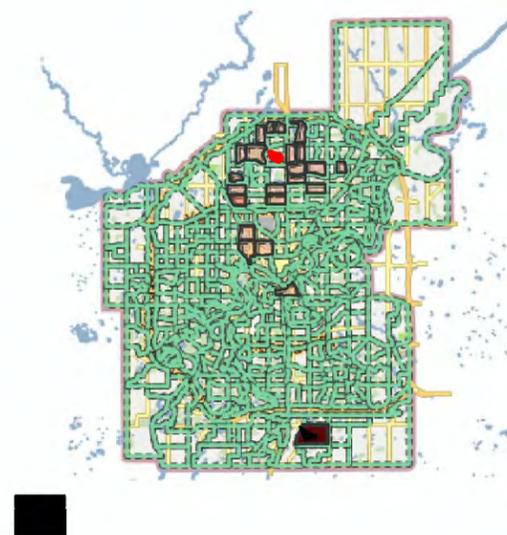


Figure 6 - Frequency of Beaumaris Lake Visits

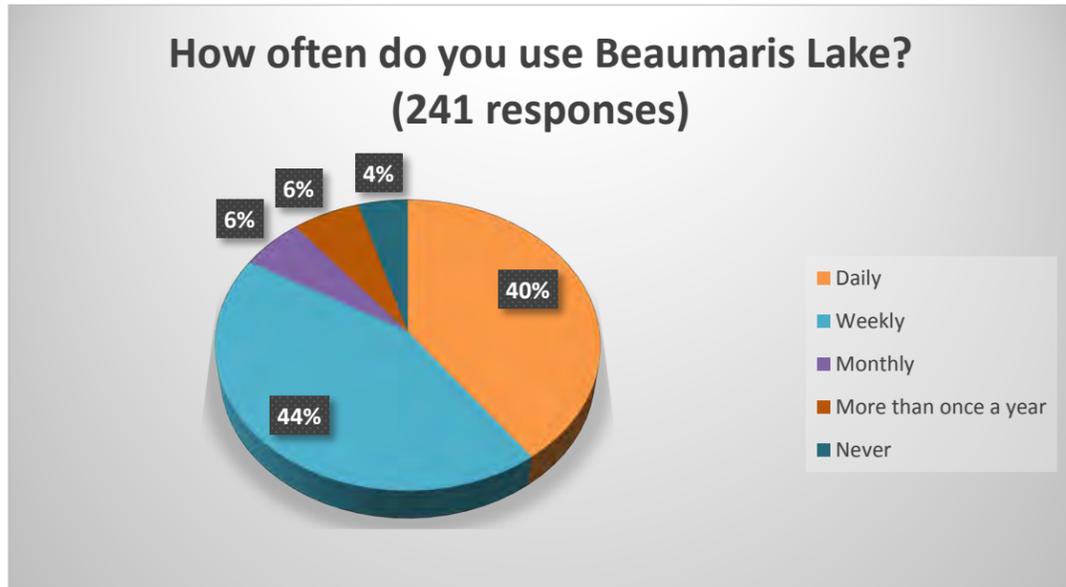
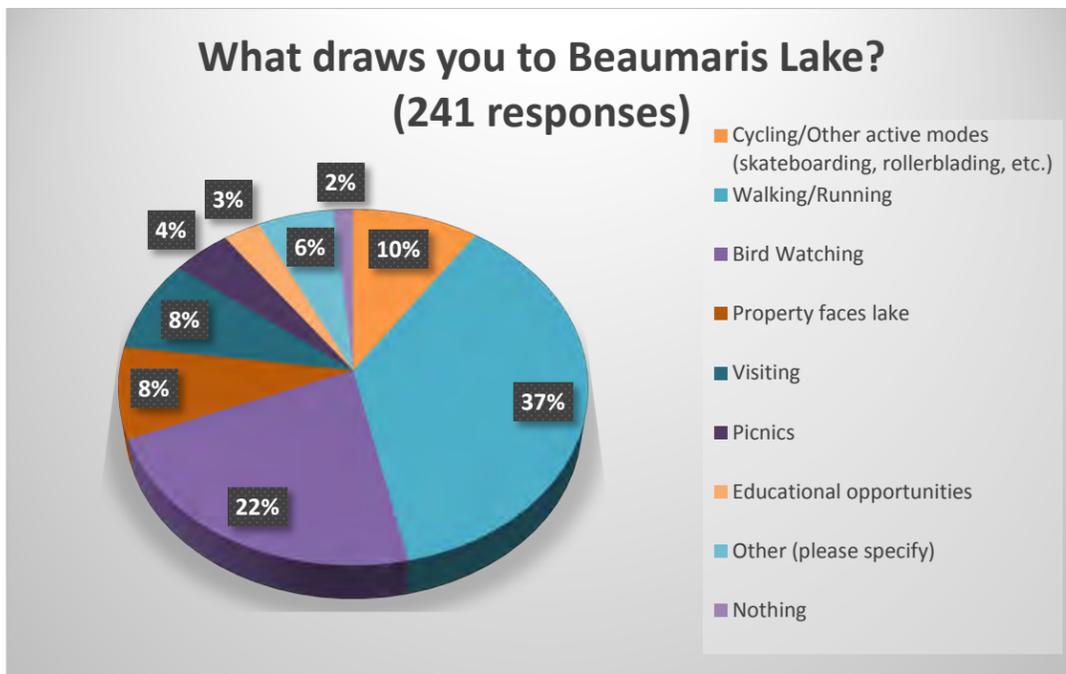


Figure 7 - Reasons for Visiting Beaumaris Lake



The "Other" category generated 34 responses included dog walking, connecting with nature and the tranquility of the area, and using it as a link between local residences and the businesses and other amenities in the Castle Downs area.

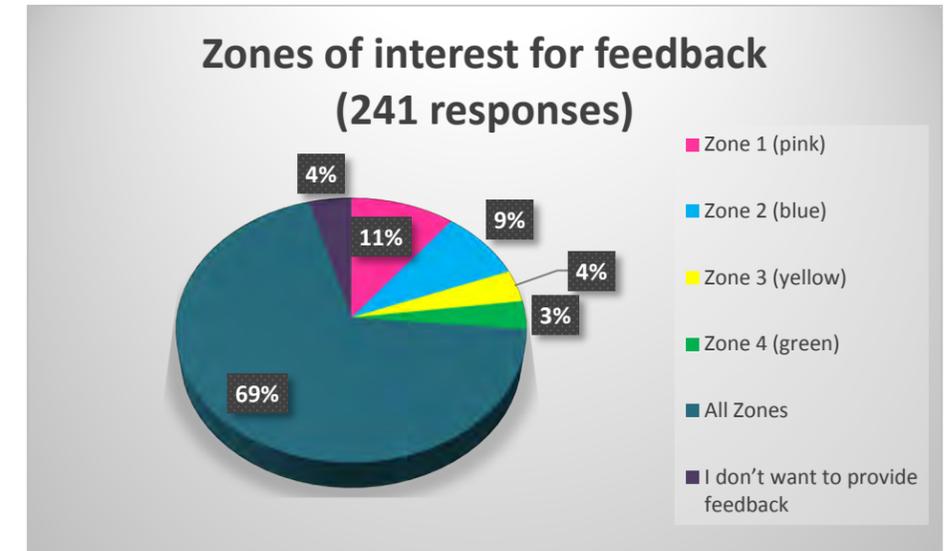
3.0 ZONE SPECIFIC FEEDBACK

Figure 8 - Beaumaris Lake Zone Reference Map



Participants in both the in-person and online components of the engagement program were asked to use the map shown in Figure 8 to provide input on specific areas of the lake as opposed to the entire lake. While the graffiti boards focused more on the general feel of the lake and the associated challenges and opportunities, the message of zonal input was communicated frequently during the pop-up events, and formed the basis for the following questions in the online survey.

Figure 9 - Selection of Zones for Input by Participants

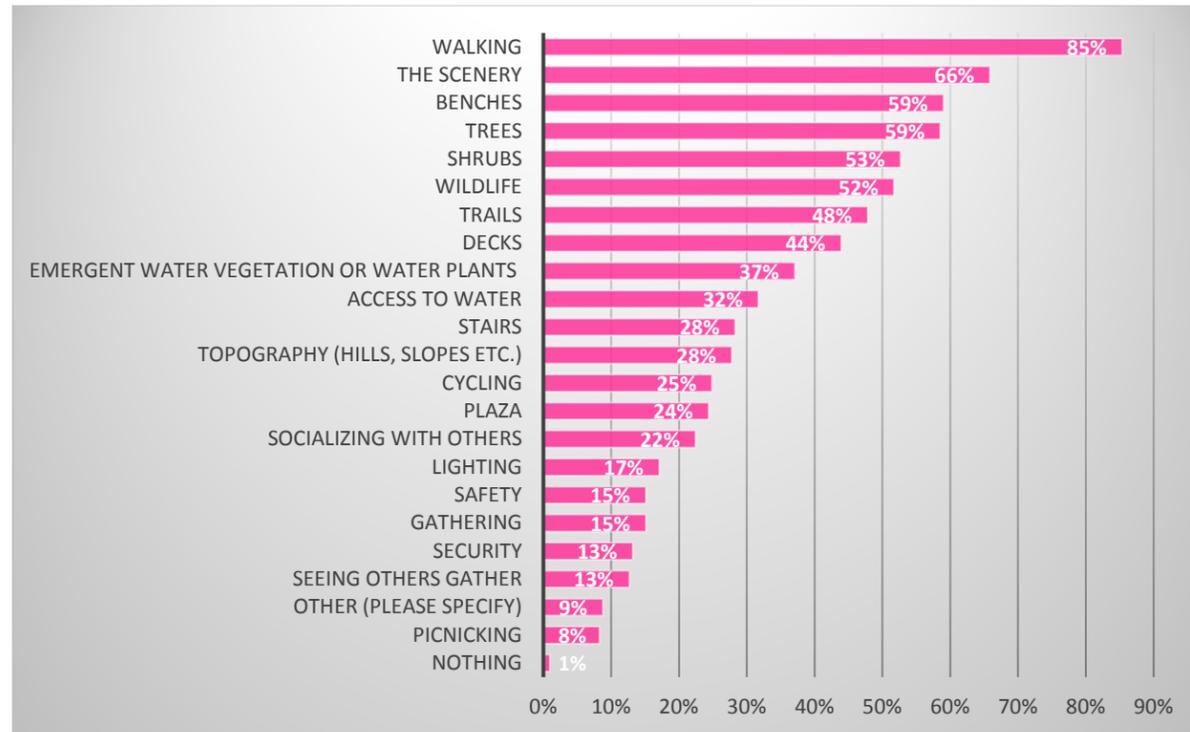


A large majority (nearly 70%) of respondents provided input on all four zones of the lake, with significantly lower levels providing input on individual sections. Note that the question was structured so that individuals could provide input on anywhere from zero to all four zones of the lake. This means that there may be respondents who provided input only on Zones 1 and 2, for instance, which would have counted towards the percentages for both zones.

Once respondents indicated which zones they would like to provide input on in the survey, a series of four identical questions on each zone were then presented. The following sections will illustrate the broader responses to these questions, and will be followed by a summary of the general comments received for each zone as well.

3.1 ZONE 1 - WEST

Figure 10 - Favourite Zone 1 Activities/Elements (205 responses)



Respondents were asked to select as many of the listed activities and amenities as they wished. Zone 1 covers the entire west side of the lake, including the raised plaza, the walking trail that connects the lake's trails to Castle Downs Road, and the greenspace/south entrance near 153 Avenue that includes the boat launch area. As shown in the graph above in Figure 10, respondents ranked the natural elements of the zone very highly, with walking the most highly ranked activity by far. Several noted that one of the nice features of the zone is the access to the businesses and the library branch directly from the trail system.

Figure 11 - Least Favourite Zone 1 Activities/Elements (205 responses)

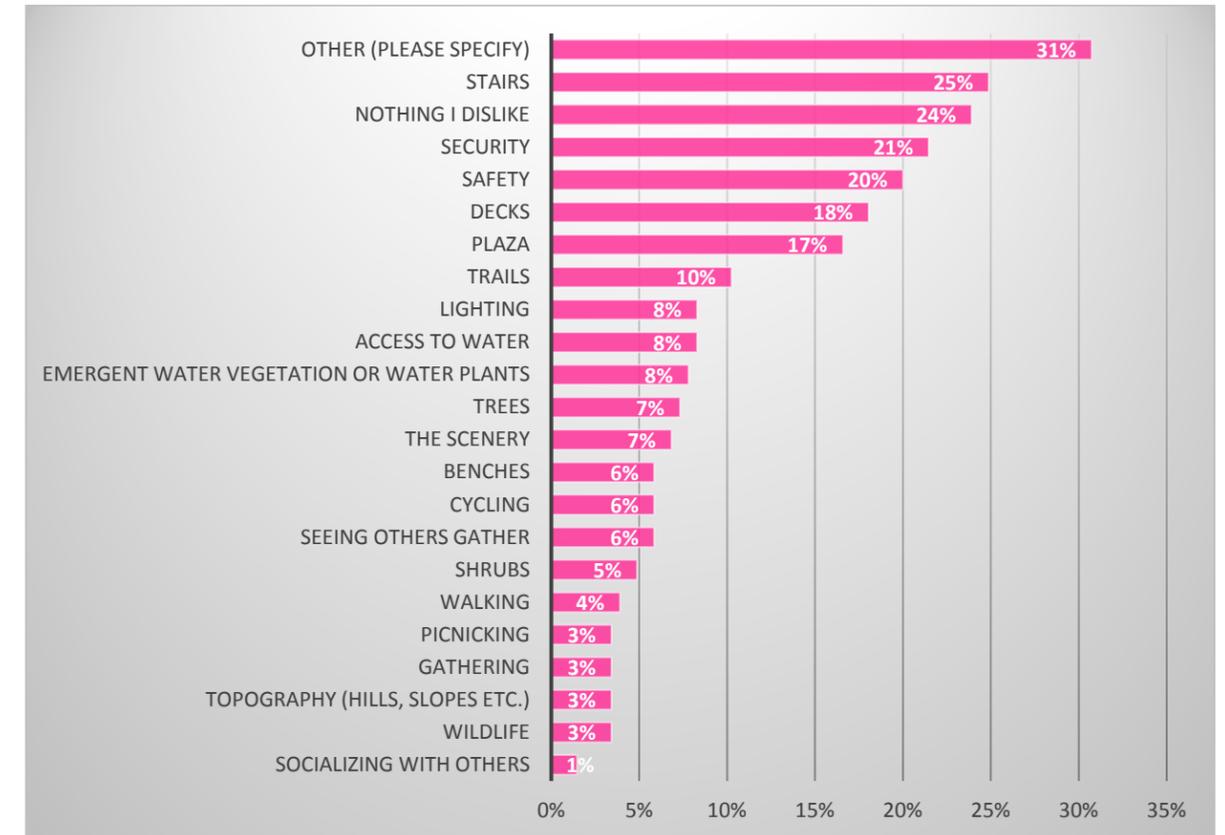
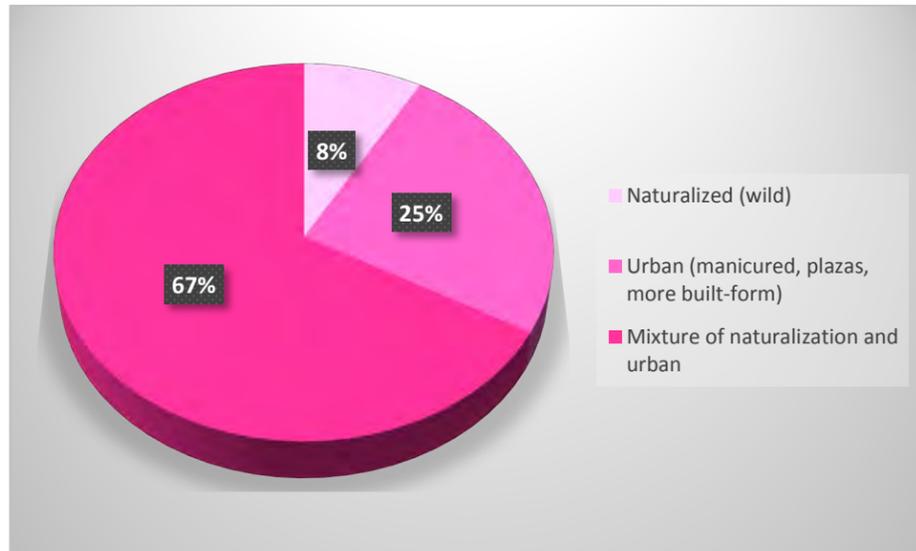


Figure 11 illustrates the least favourite activities and elements of Zone 1, which shows good correlation to the lowest ranked elements in the previous question. Several respondents noted that the area is in a state of disrepair, with the blocked off and broken stairs contributing to the poor access issues/tie in to the businesses above the lake. Others noted that the abundance of concrete in this area is a sharp contrast to the remainder of the lake, and efforts to "soften" this zone would be appreciated. The addition of more seating, either in the form of picnic tables or benches, in this zone were a positive as it would encourage more usage of the area.

**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

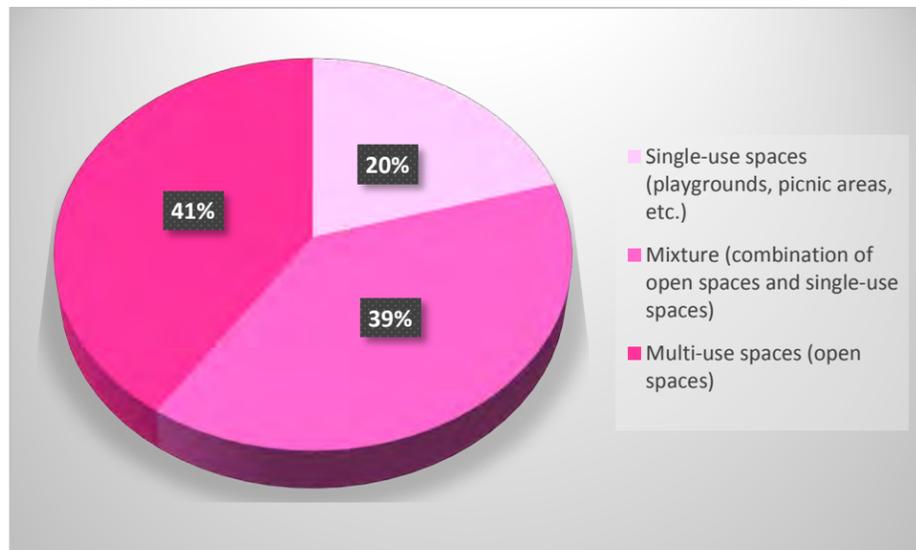
Zone Specific Feedback
October 24, 2017

Figure 12 - Zone 1 Preferred Level of Development (205 responses)



Respondents were informed through the text of this question that Zone 1 would be currently classified as a mixture of naturalization and urban landscaping, and over 2/3 felt that this status was acceptable. Interestingly, nearly a quarter of respondents felt that the area could potentially be even further urbanized, indicating a level of comfort with the fact that the west side of the lake can exist with a separate vision and development level.

Figure 13 - Zone 1 Preferred Types of Amenities (205 responses)



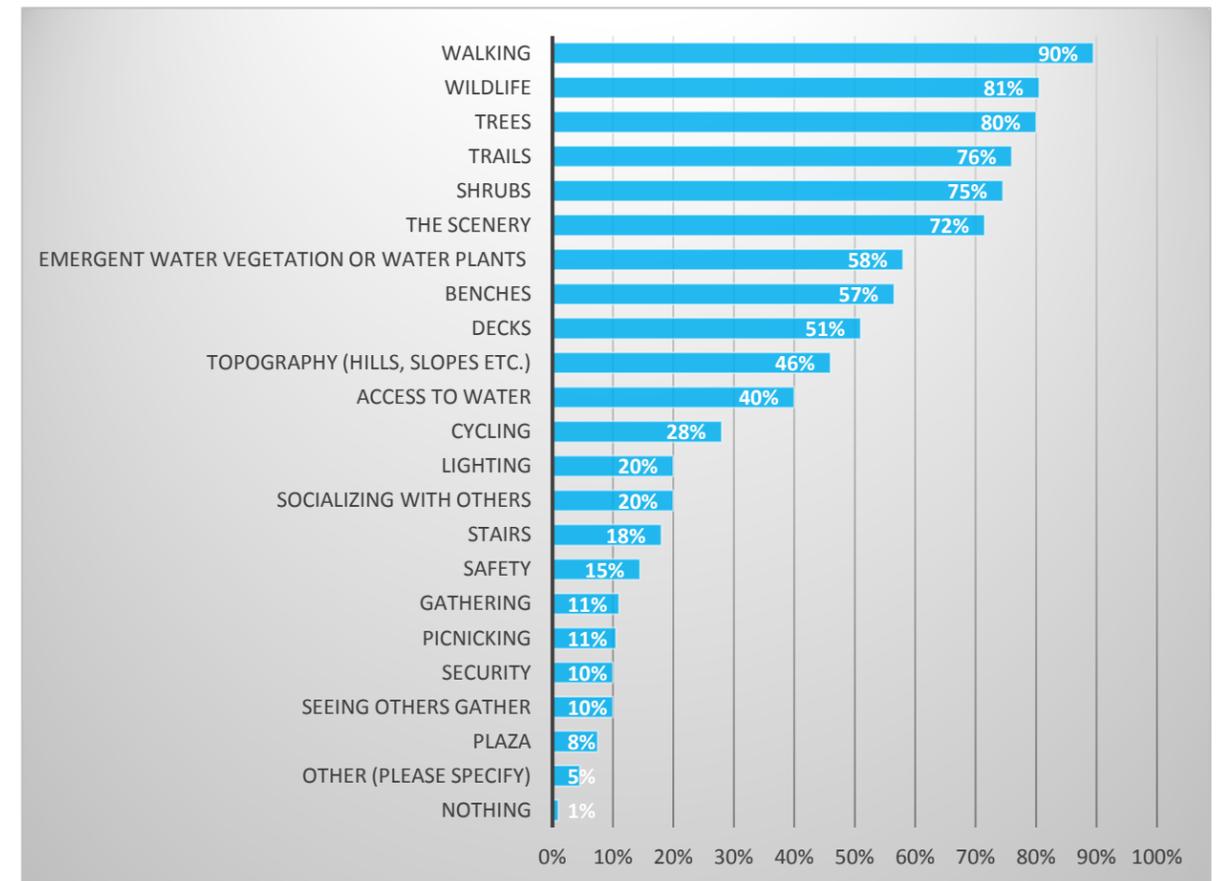
**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

Zone Specific Feedback
October 24, 2017

In a confirmation of the results from the previous question, a nearly even mix of respondents felt that the current state of Zone 1 as hosting mainly multi-use spaces could be balanced with the addition of a few single-use spaces. As noted previously, this could include more seating, a picnic area, and a stronger tie/access to the businesses near the lake.

3.2 ZONE 2 – NORTH

Figure 14 - Favourite Zone 2 Activities/Elements (200 responses)

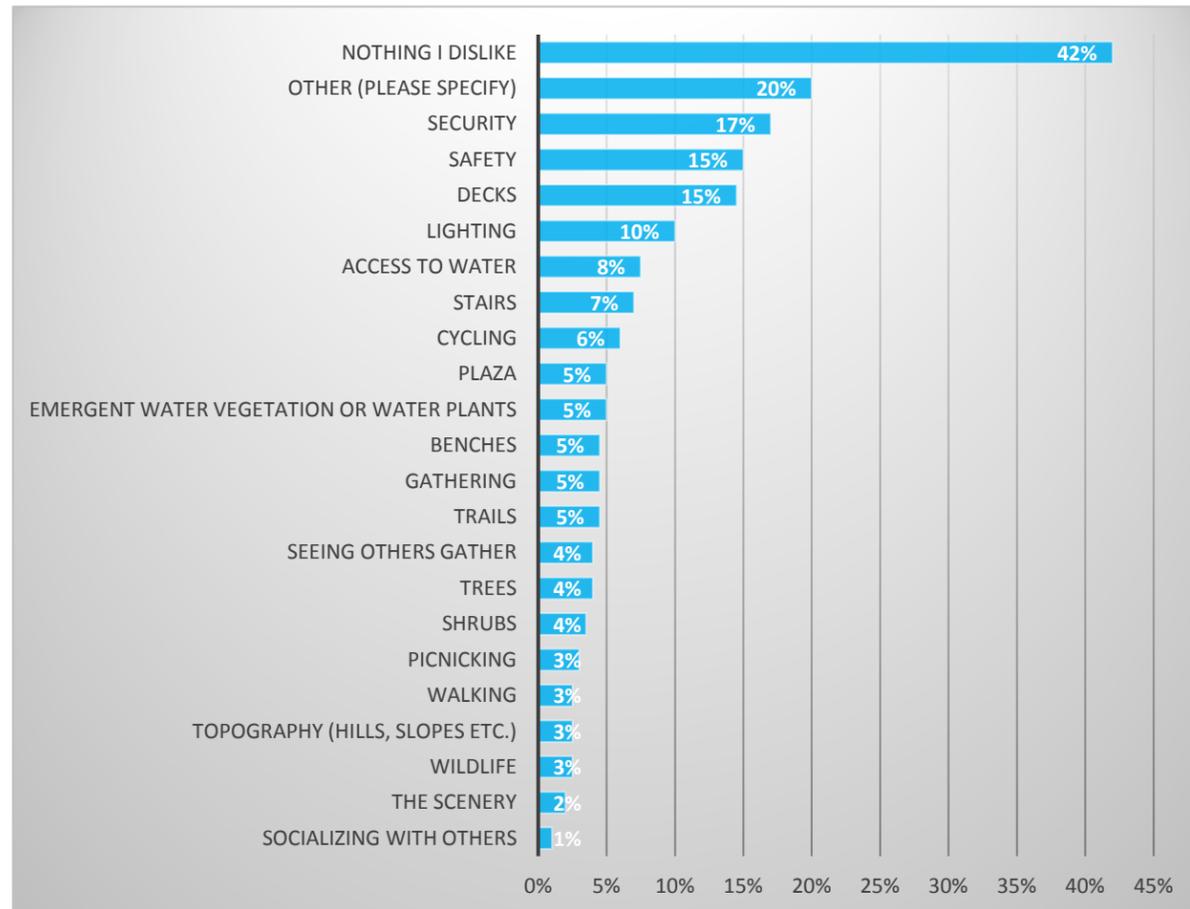


Responses for Zone 2 showed similar trends to Zone 1, with even stronger support for the natural elements existing in the zone. Zone 2 is quite naturalized, with the heavily treed and rocky area near the entrance to Peggy Holmes Park mentioned numerous times as a favourite area of the entire lake.

**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

Zone Specific Feedback
October 24, 2017

Figure 15 - Least Favourite Zone 2 Activities/Elements (200 responses)

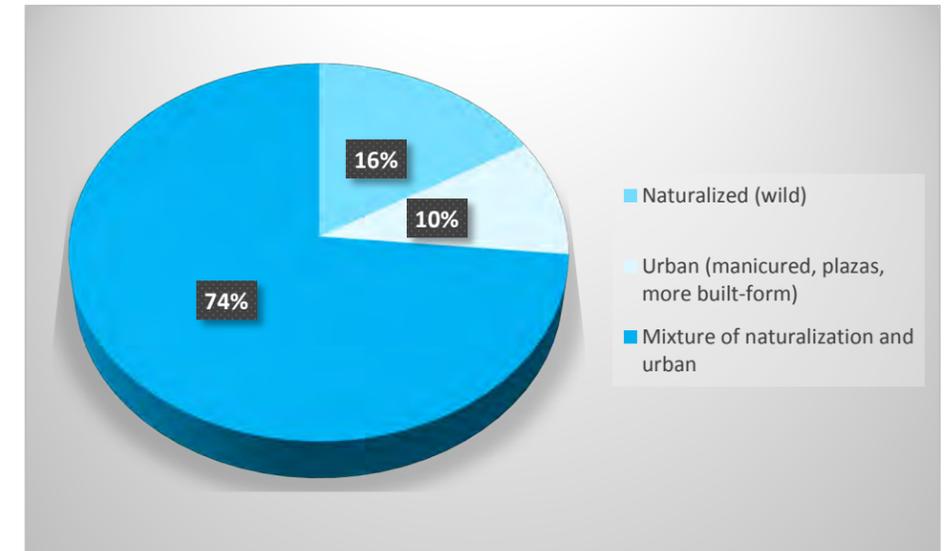


Many respondents noted throughout the survey, as well as at the in-person engagement events, that this zone contains some safety/security concerns – especially the area near and including Peggy Holmes Park. This area was consistently identified as a gathering place for drug-related activities and crime, with several suggestions that better lighting and a stronger police presence in the area would deter much of this undesirable activity.

**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

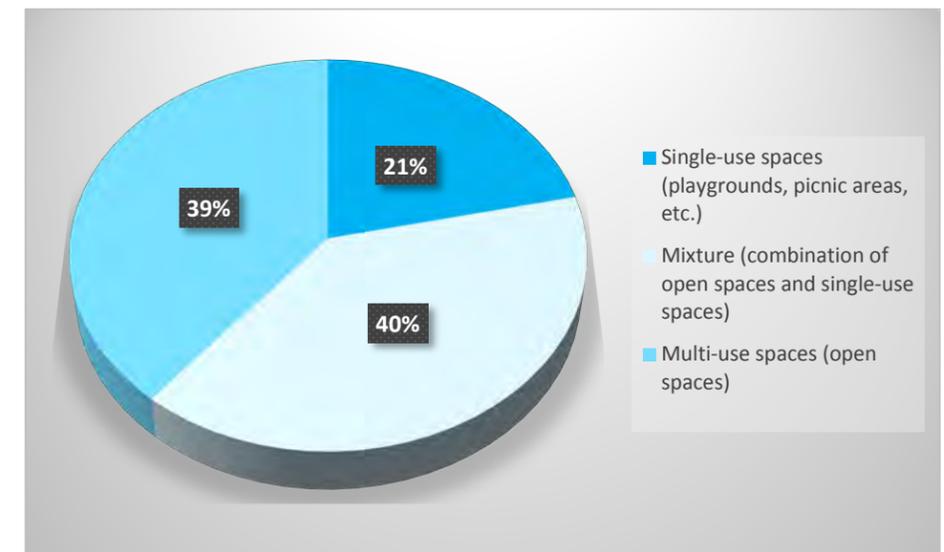
Zone Specific Feedback
October 24, 2017

Figure 16 - Zone 2 Preferred Level of Development (200 responses)



Zone 2 is currently classified as a mixture of naturalization and urban, although skewed towards naturalization. More than three-quarters of respondents felt that this was acceptable, with slightly more of the remainder feeling that the zone could be even further naturalized.

Figure 17 - Zone 2 Preferred Types of Amenities (200 responses)



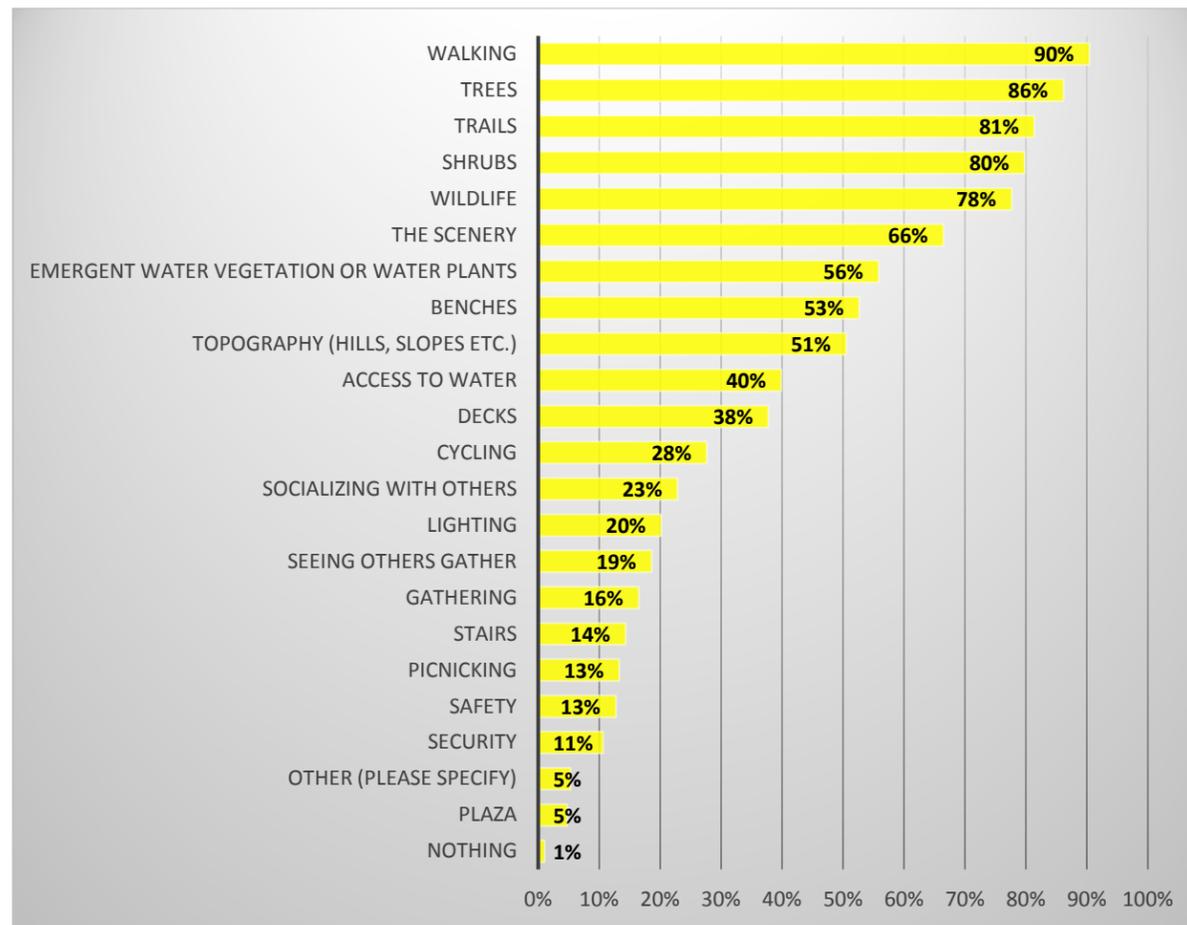
**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

Zone Specific Feedback
October 24, 2017

Zone 2 currently has few planned spaces other than Peggy Holmes Park and one of the waterfront viewing platforms, and many respondents felt that this was an acceptable level of development for the zone. While playgrounds were provided as an example of a single-use space, many felt that the addition of such an amenity to this zone would not be supported, with several noting that there were already several playgrounds in the area within walking distance of the lake.

3.3 ZONE 3 – EAST

Figure 18 - Favourite Zone 3 Activities/Elements (188 responses)

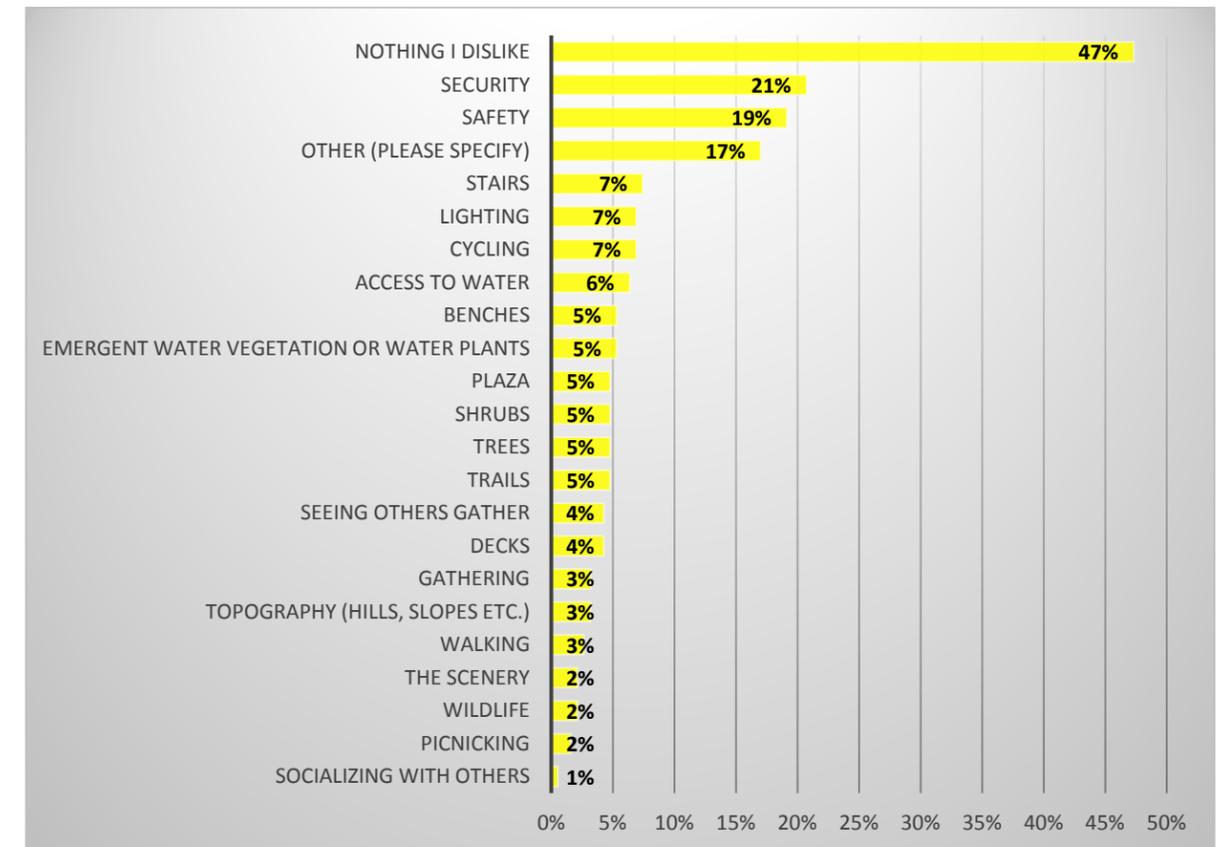


Much like Zone 2, respondents felt that the wild, naturalized charm of the east side of the lake was a one of the key reasons for its popularity, as evidenced by the high ratings for the natural elements for the zone.

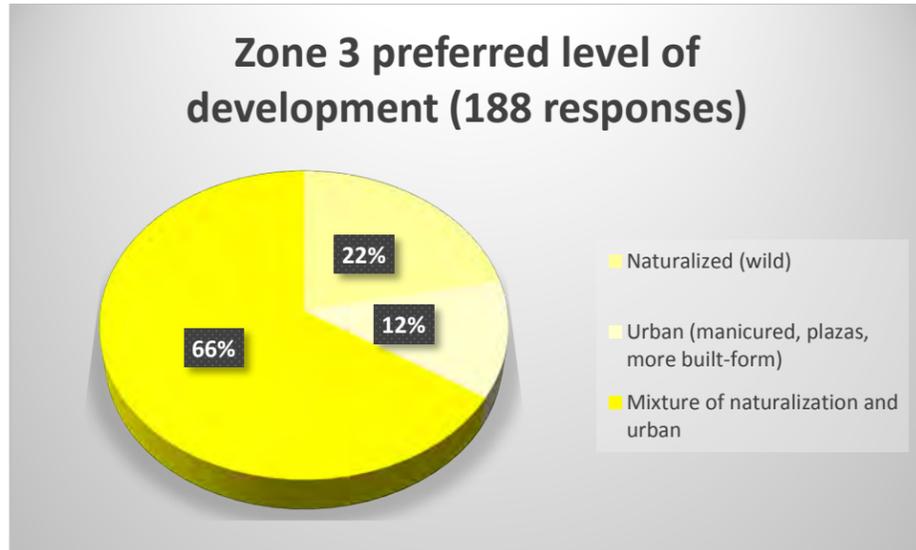
**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

Zone Specific Feedback
October 24, 2017

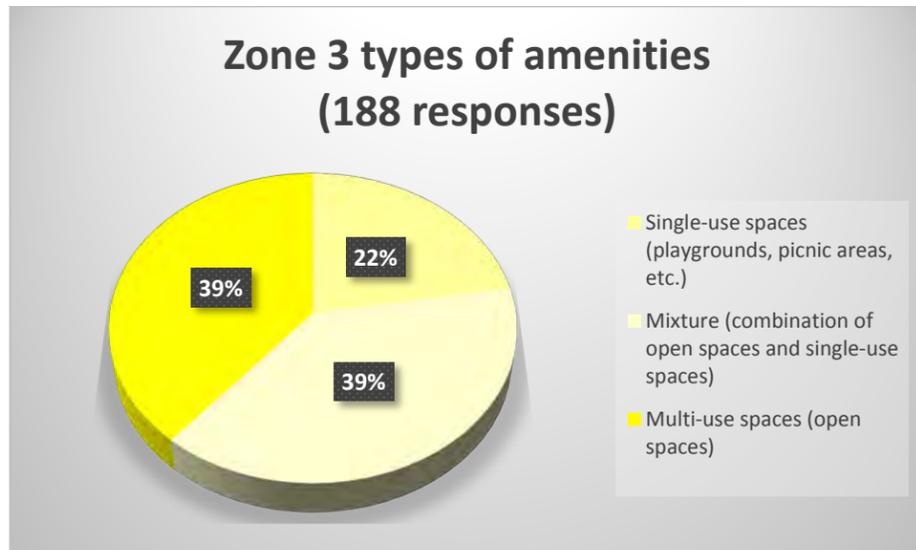
Figure 19 - Least Favourite Zone 3 Activities/Elements (188 responses)



Much like in Zone 2, safety and security were key concerns noted by respondents, especially in the greenspace/entrance on the east side of the lake near 106 Street. Impromptu parties and the presence of drug-related activities in the area made many feel unsafe, with several noting that the dense vegetation contributes to the issue.



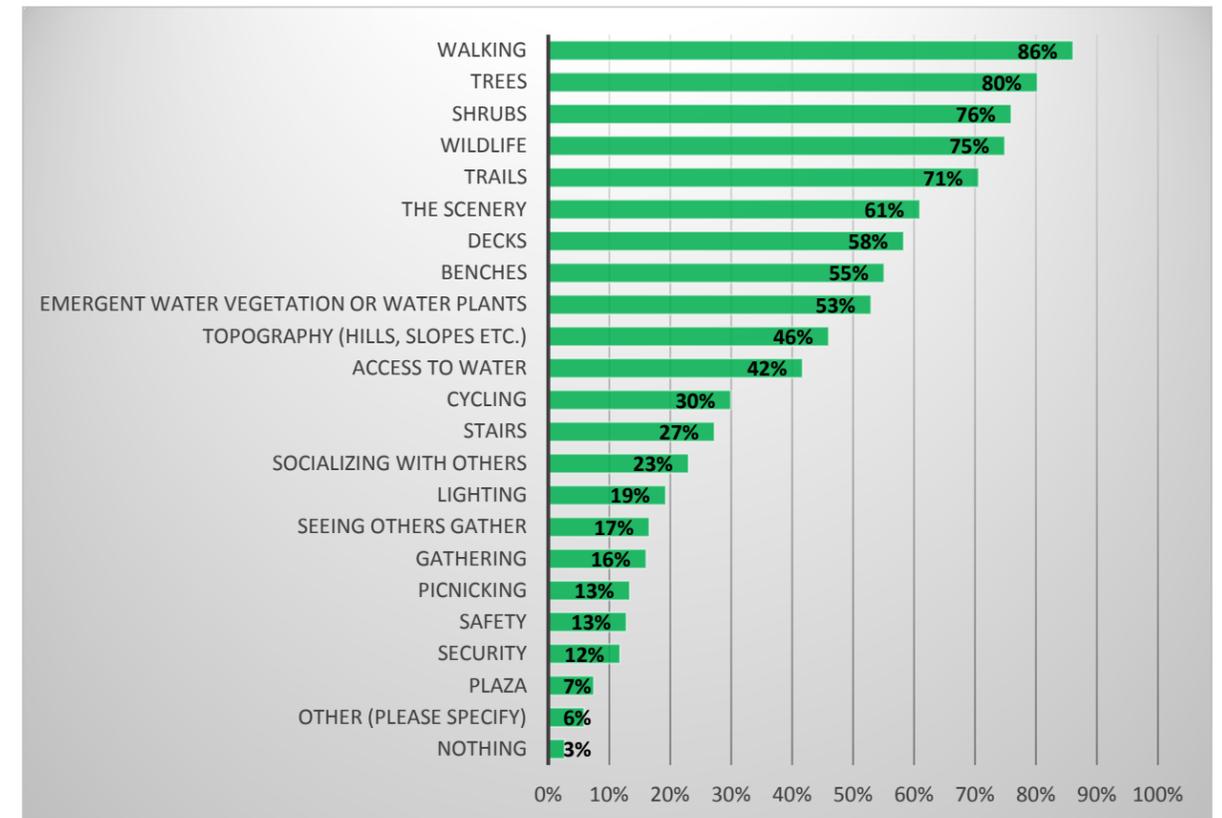
Zone 3 is currently a mixture of naturalization and urban development, and two-thirds of respondents felt that this was an appropriate level. However, nearly one-quarter of those surveyed felt that the area could be even further naturalized than its current state.



Respondents were evenly split on whether the zone should have more amenities included within it than currently are available or not. However, this zone had the highest response rate for the addition of more single-use spaces of the entire lake, likely due to the amount of available space in this zone for more amenities to be included.

3.4 ZONE 4 – SOUTH

Figure 20 - Favourite Zone 4 Activities/Elements (187 responses)

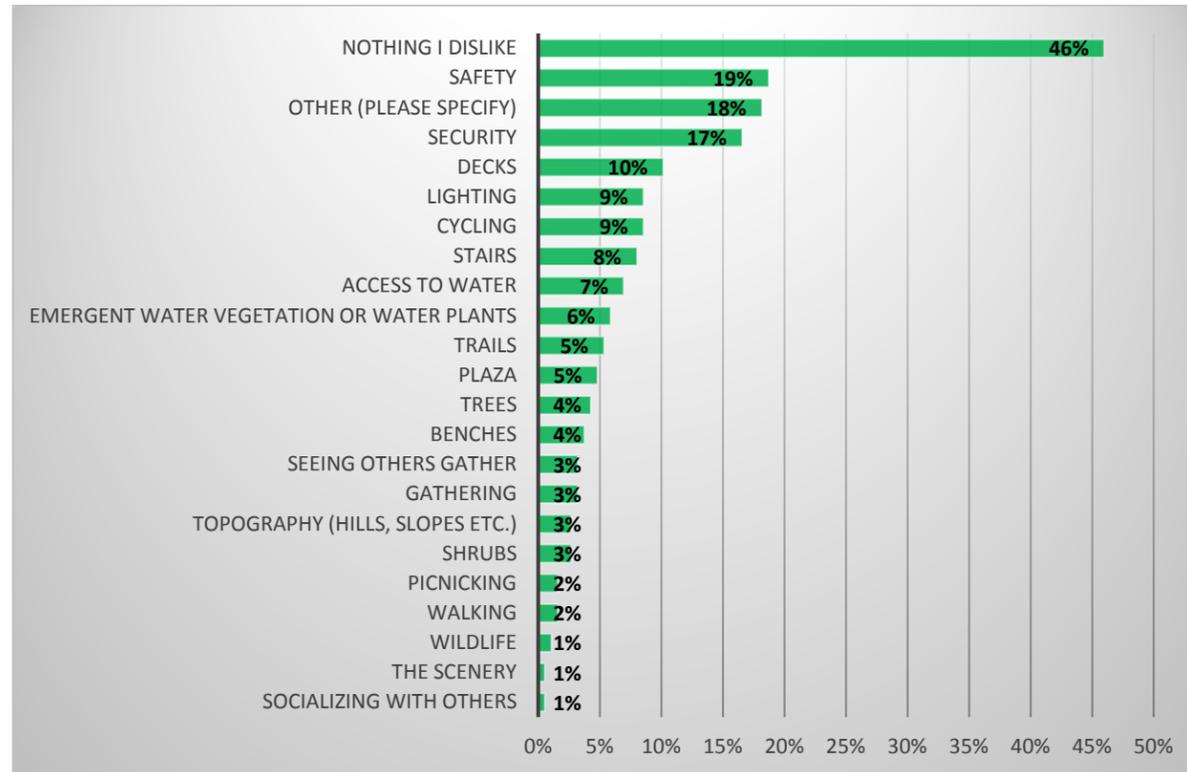


Much like the other sides of the lake, respondents noted the natural features on the south side as favourite reasons for visiting Beaumaris. Several respondents noted that the larger boardwalk/viewing area on the south side of the lake as being a reason for this strong support for the type and level of development in this zone.

**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

Zone Specific Feedback
October 24, 2017

Figure 21 - Least Favourite Zone 4 Activities/Elements (187 responses)

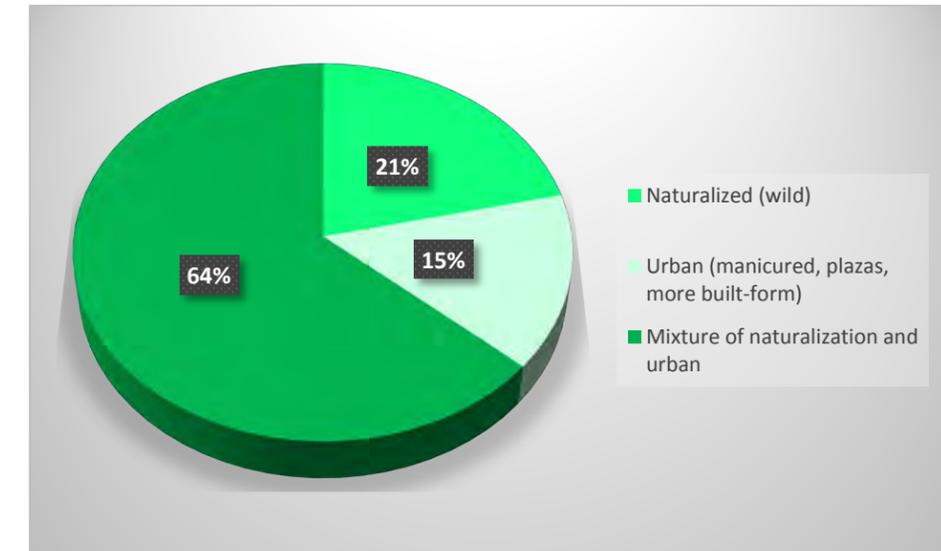


Safety and security again were the top of the list of least favourite elements, mainly due to the proximity to the parking area and access along 106 Street noted above in Zone 3. The other main safety issue noted was the drainage pattern towards the lake from the houses in this zone on the south side of the trail, which frequently results in mud alongside the pathway as well as ice buildup on the trail itself during the winter months. Respondents also noted that the aging trees along this zone contain numerous large dead branches, and some entirely dead trees, that are at risk of falling either onto the trail or onto homes.

**BEAUMARIS LAKE
OPEN SPACE REHABILITATION**

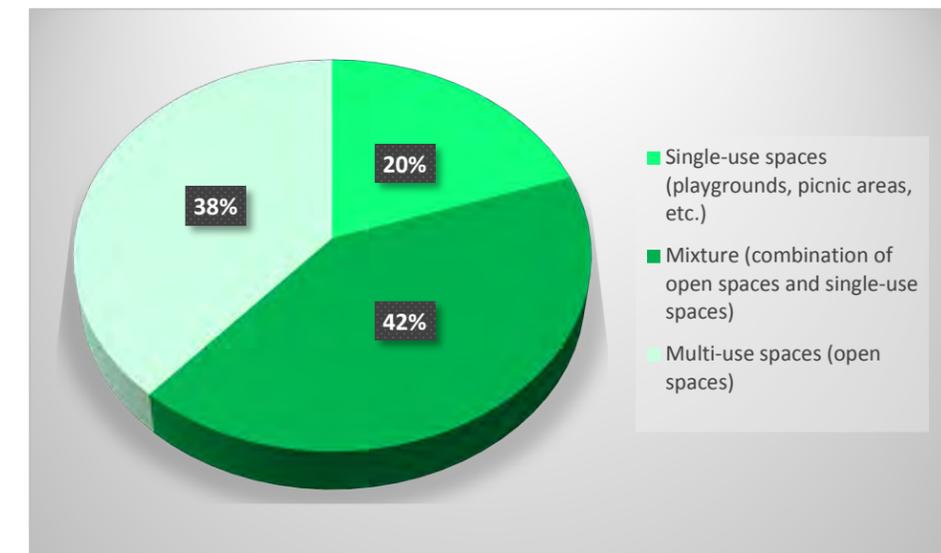
Zone Specific Feedback
October 24, 2017

Figure 22 - Zone 4 Preferred Level of Development (187 responses)



Just under two-thirds of respondents preferred the current level of mixed development, with strong support (over one-fifth) of respondents indicating that a higher level of naturalization in this zone would be acceptable.

Figure 23 - Zone 4 Preferred Types of Amenities (187 responses)



Much like Zone 3 previously, respondents felt that a few more single-use type spaces in Zone 4 would be acceptable. Based on comments from the survey and from individuals encountered during the pop-up events, many felt that picnic tables/areas would be an appropriate addition.

4.0 GENERAL THEMES

The engagement activities to support the functional plan phase of this project were very well received by area stakeholders, who provided very clear direction on several areas of interest to the project team. Taken collectively, the survey results and the comments provided on the project graffiti boards around the lake have generated a few clear themes that will help guide the next stages of the project.

4.1 STATUS QUO

The most prevalent theme in the comments provided by stakeholders was the desire that very little change in the current “feel” of the lake. Very many noted that the current, highly naturalized state of most of the lake attracts a large amount of wildlife that normally would not be present in a large city like Edmonton, and that the presence of this fauna makes the lake feel even more secluded and tranquil. A large majority of individuals encountered at the popup events and in the survey indicated a preference for no major changes in the current layout and landscaping of the lake and its surrounding areas. Rather, they would like to see a greater emphasis on the maintenance and upkeep of what is already present. This included:

- Repair and updating of the promenade area in Zone 1, especially the stairs leading to the upper plaza and onwards to the library. Many also expressed the need for a ramp in this area to improve access both to and from the businesses above the lake for people with mobility impairments, families with strollers/wagons, etc.
- Repair/replacement of the barricade system along the promenade area to both improve the view of the lake and to improve the safety of the aging concrete slab wall system that has begun to fail
- Overall upkeep/maintenance/smoothing of the trail system to make it safer and easier to walk, cycle, etc. upon. Several stakeholders also noted that widening of the trail where possible would be appreciated, as the volume of traffic often leads to conflicts
- Pruning of vegetation around the lake, especially along the trails and particularly near corners, and removal of dead trees/branches. This included the thinning or removal of the undergrowth in several areas, which many felt was both blocking the view of the lake as well as providing a security risk in certain areas
- Repair or replacement of the waterside decks around the lake. Several of these structures have been damaged over the years and have been closed off from access, and many felt that they are an interesting and valuable part of the lake experience
- Above all, any new designs must be created with a low maintenance perspective

4.2 SAFETY/SECURITY

A frequent refrain from stakeholders of the project was the decreased level of safety and security at Beaumaris Lake over the past several years. Many pointed to issues with drug related activities around the lake, particularly at Peggy Holmes Park and the adjacent areas by the lake, near the greenspace at 106 Street on the east, and at the boardwalks/decks on the south section. Several felt that a stronger police presence in these areas, better lighting, and thinned out vegetation would potentially reduce these issues. Numerous female stakeholders also expressed concern with the level of vegetation near the trails, as it provides hiding places for would-be assailants, especially at/near blind corners.

4.3 SITTING/RESTING AREAS

Many stakeholders noted that while the lake is beautiful in its current layout, there are few seating areas to sit and take in the view around the lake. The strategic addition of more benches and a few picnic tables around the lake were felt to be welcome parts of an improved set of amenities, as long as they include additional garbage receptacles. Areas noted for more seating areas included:

- Within the grassed area of the promenade by the lake
- Along the south edge of the trail in the middle of Zone 2 near the Castle Keep neighbourhood
- Near the lake in Zone 4, particularly the area near the transition to Zone 3

4.4 INTERPRETIVE SIGNAGE

Numerous comments were received that while the lake is very popular in its current state, the addition of interpretive signage around the lake would enhance the experience even further. Suggested topics for signage include:

- Images and information on frequently seen wildlife in the area, especially the resident ducks, geese, pelicans, songbirds, and raptors
- Images and information on the vegetation around the lake, including its importance as a natural habitat for the previously mentioned wildlife
- Information on the history of the Beaumaris area, both pre- and post-development
- Circuit training (exercise) suggestions at select locations around the lake to make a walk/run around the lake part of a larger exercise regimen

4.5 WASHROOMS/DRINKING FOUNTAINS

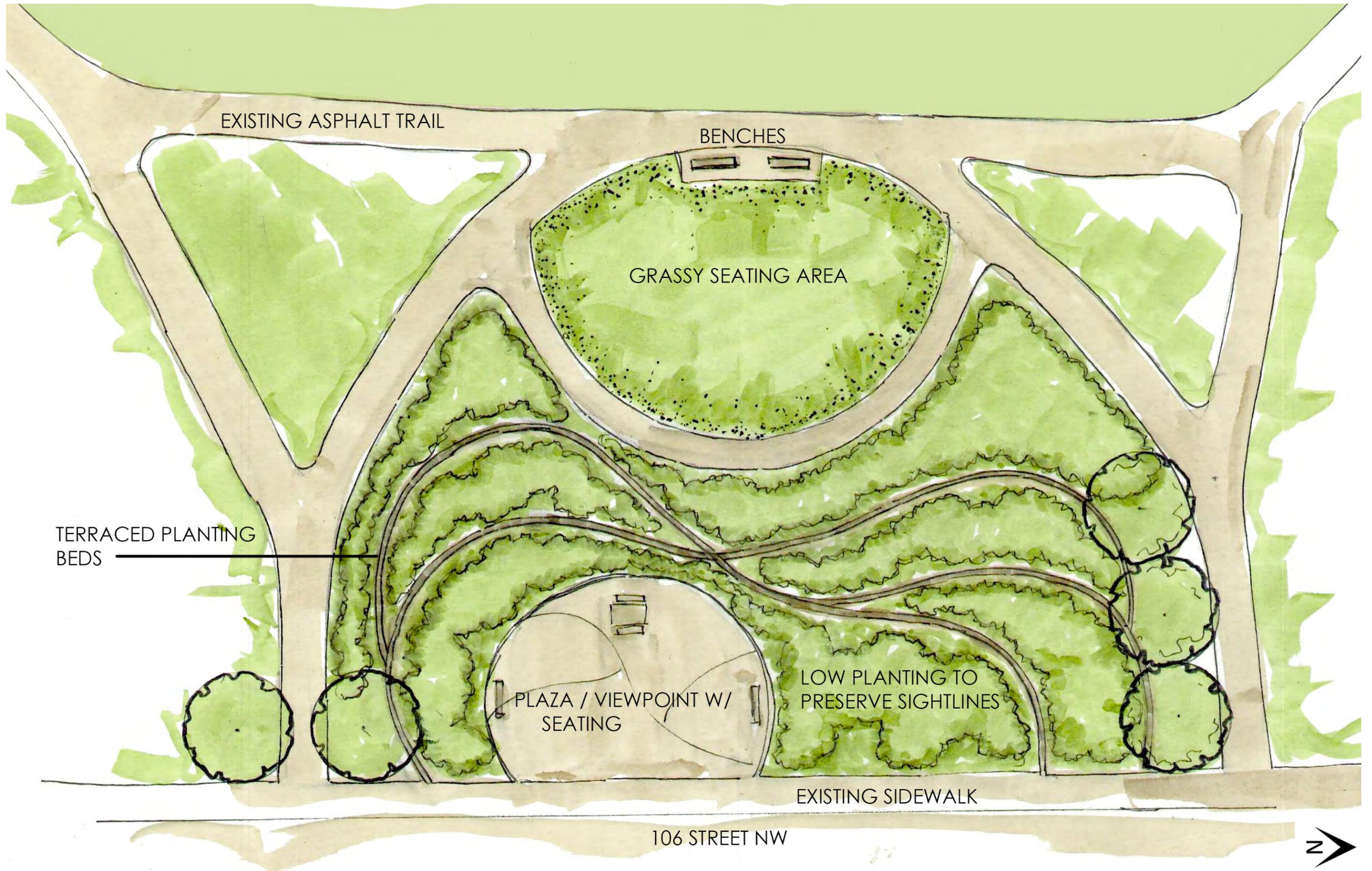
The addition of washrooms and drinking fountains at select locations around the lake was quite divisive. While many felt that the addition of these amenities would be beneficial, others felt that they would not be well maintained or would be abused, which would lead to an overall worse experience at the lake.



East Park

Concept Option 1 consists of two gathering places; a concrete surfaced plaza and an open lawn. The plaza contains bench seating, and is located adjacent to the existing sidewalk on 106 Street. Low, trailing plantings in tiered, wavy walls frame the plaza, and step down to an open lawn with additional seating areas. Option 1 positions the quiet, tranquil resting place at the upper level, easily accessible from the neighbourhood, while the active, open space is located on the lower level, adjacent to the shared use path. This space is ideal for outdoor activity, whether it's group classes, individual fitness, or a casual game of soccer or football.





EXISTING ASPHALT TRAIL

BENCHES

GRASSY SEATING AREA

TERRACED PLANTING BEDS

PLAZA / VIEWPOINT W/
SEATING

LOW PLANTING TO
PRESERVE SIGHTLINES

EXISTING SIDEWALK

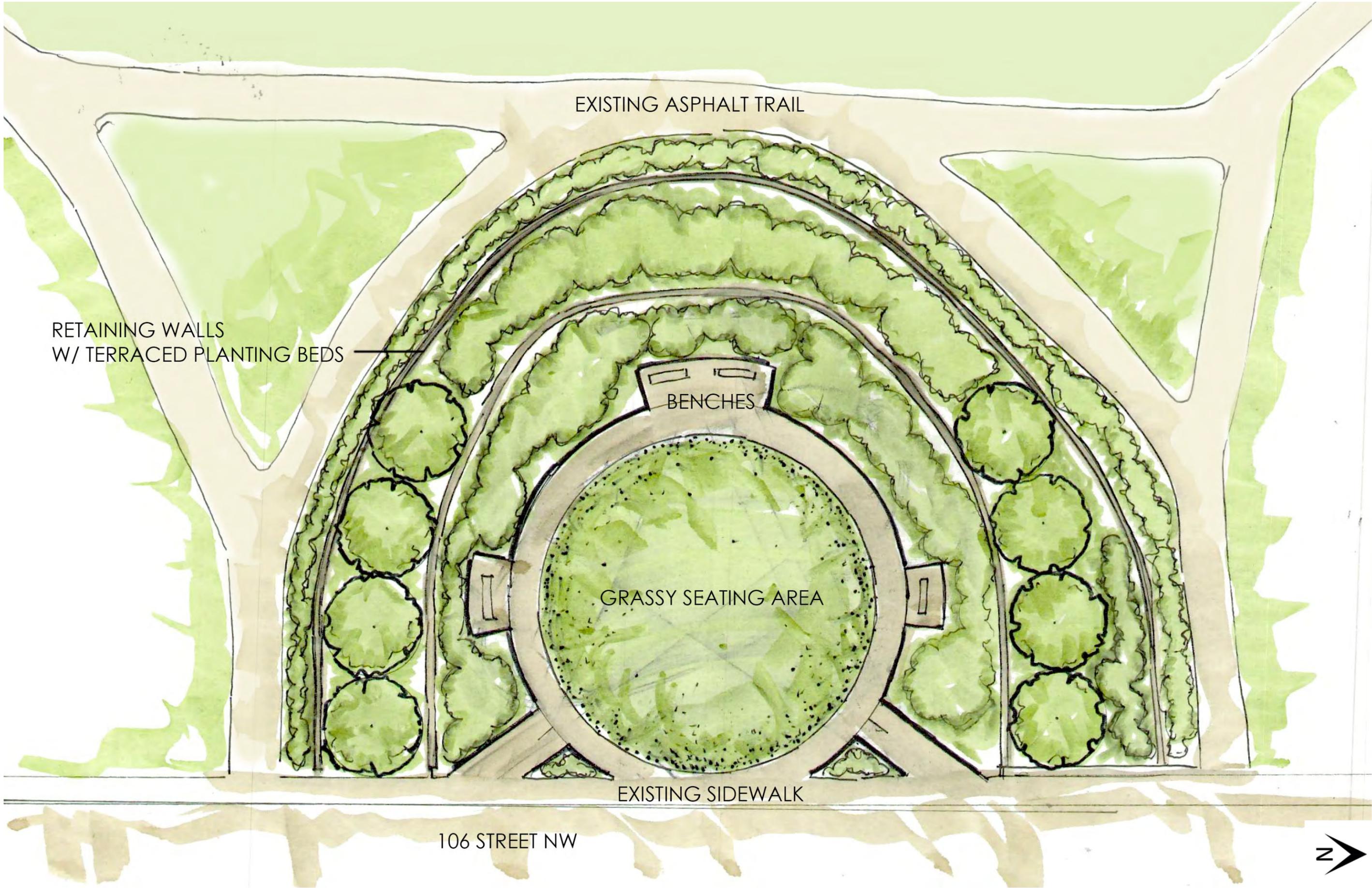
106 STREET NW



East Park

Concept Option 2 contains a large open lawn and seating area on the upper level, adjacent to 106 Street. Terraced walls with low, trailing plantings, encircle the plaza, and step down to the shared use path below. Option 2 concentrates the space at the upper level, combining the tranquil seating areas with the active open lawn.





EXISTING ASPHALT TRAIL

RETAINING WALLS
W/ TERRACED PLANTING BEDS

BENCHES

GRASSY SEATING AREA

EXISTING SIDEWALK

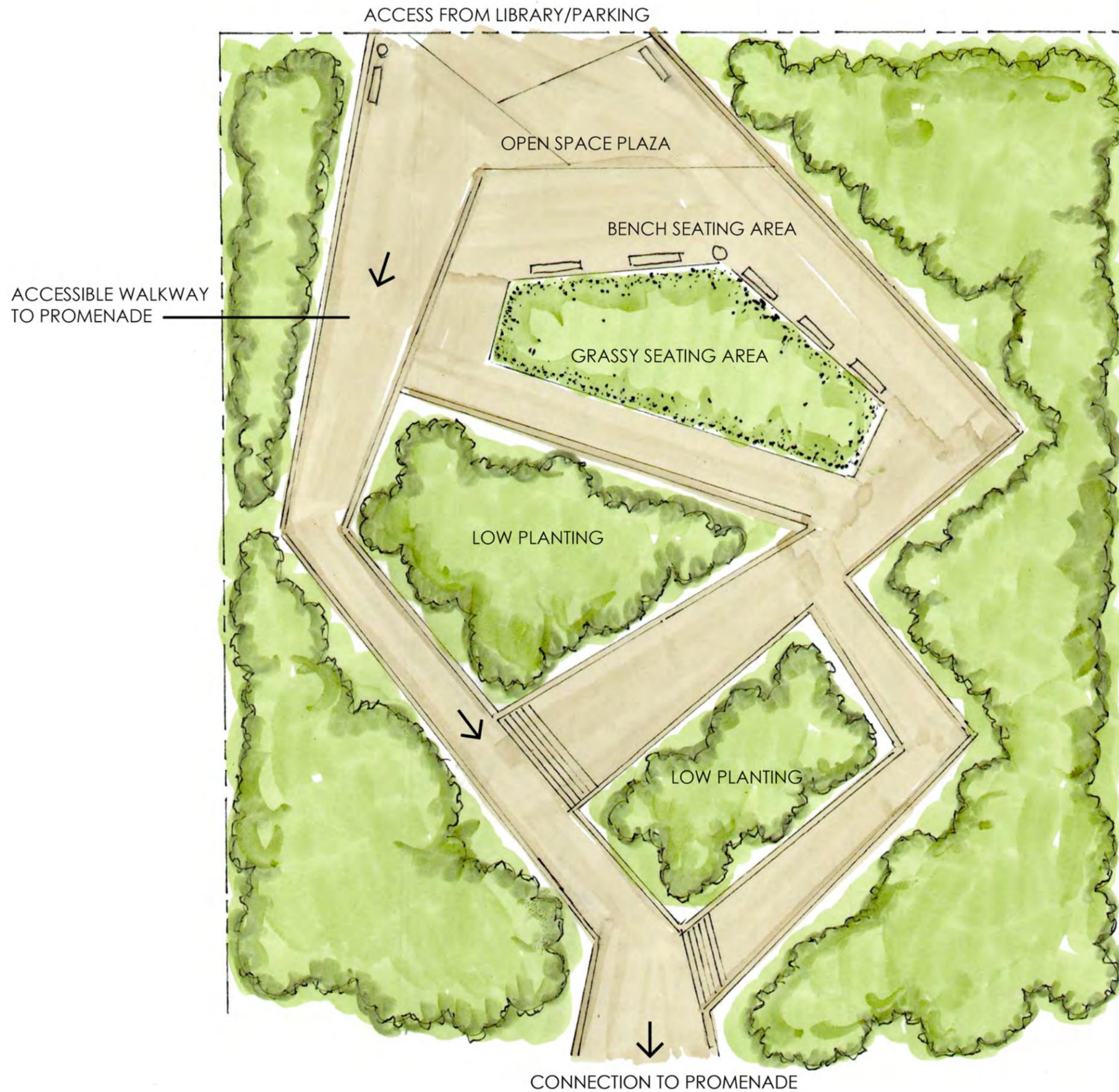
106 STREET NW



West Park

Concept Option 1 consists of a single, large upper plaza with ample seating, gathering space, and an open lawn area. A universally accessible walkway runs along the south side of the plaza, while additional walkways carve the park into smaller landscape areas with low plantings, surrounded by additional seating opportunities. The walkways come together at a single connection point to access the Promenade.





West Park

Concept Option 2 provides three plaza areas, and highlights the benefits of stormwater management. The large upper plaza provides clear connections to the commercial area, and contains ample seating, and a water feature for ambient noise as well as play. The gentle winding path is universally accessible, and leads to the mid plaza, and down to the lower plaza, which opens into the Promenade. Alongside the path is low planting, with two connected rain garden stormwater education zones. The mid and lower plazas both provide seating opportunities, and the mid plaza also contains interpretive signage for stormwater management.



ACCESS TO LIBRARY / PARKING



UPPER PLAZA
W/ WATER FEATURE

RAIN GARDEN
STORMWATER
EDUCATION ZONE

MID PLAZA W/
INTERPRETIVE
SIGNAGE

VEGETATION TO
RESEMBLE EXISTING
PLANTING

RAIN GARDEN
STORMWATER
EDUCATION ZONE

LOWER PLAZA -
ACCESS TO
PROMENADE

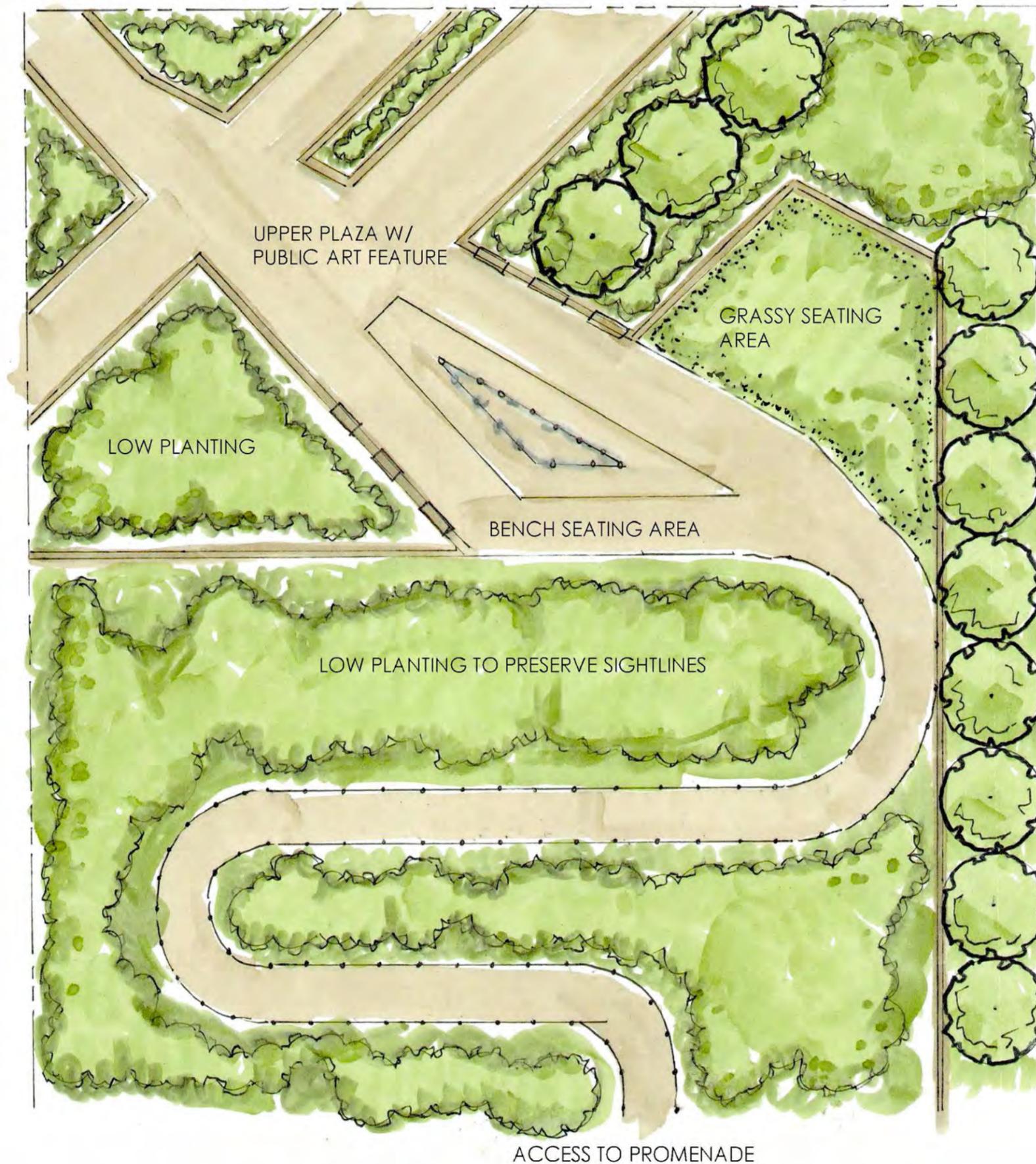


West Park

Concept Option 3 focuses on a large upper plaza, with opportunity for interactive public art. The plaza provides clear access to the commercial area, and plenty of space for gathering and resting, as well as an open lawn area for playing and passive activities. The northeast end of the plaza leads to a universally accessible path that winds through low plantings, and brings users to the Promenade.



ACCESS TO LIBRARY/PARKING



ACCESS TO PROMENADE



