

BEND IN THE BOW

Harvie Passage Facility Enhancement Plan

JUNE 2023





Harvie Passage Facility Enhancement Plan

Prepared for:

The City of Calgary

Prepared by:

O2 Planning & Design

Klohn Crippen Berger Engineering

Bunt & Associates Engineering Ltd.

June 2023

Table of Contents

1 INTRODUCTION	6	2.5.7 Lease Agreement	36
1.1 Site Considerations	7	2.6 Utility Review	37
1.1.1 Background	7	2.6.1 Shallow Utilities	37
1.1.2 Land Ownership + Management	8	2.6.2 Deep Utilities	38
1.1. Lease Agreement Implications	9	3 FACILITY ENHANCEMENT	39
1.2 Project Overview	10	3.1 Strategy + Recommendations	40
1.2.1 The Harvie Passage Task Force	10	3.1.1 Guiding Approach	40
1.3 Project Vision	11	3.1.2 Upgrades Overview	40
1.3.1 Project Mandate	11	3.2 Safety Programming	41
1.3.2 Core Values + Objectives	11	3.2.1 Design Recommendations	41
1.3.3 Key Observations	12	3.3 Vehicle Access + Parking	43
1.4 Project Process	13	3.3.1 Design Recommendations	43
1.4.1 Project Stages	13	3.4 Pedestrian + Cyclist Circulation	45
1.4.2 Decision Process + Influencing Factors	13	3.4.1 Design Recommendations	45
1.4.3 Task Force Input	14	3.5 Park Amenities	47
1.5 Relevant Plans + Studies	15	3.5.1 Signage Strategy Recommendations	47
2 SITE ASSESSMENT	16	3.5.2 Site Furnishing Recommendations	47
2.1 Park Uses + Amenities	17	3.5.3 Playground Recommendations	47
2.1.1 Existing Park Uses	17	3.6 Park Facilities Tied to Harvie Passage	49
2.1.2 Park Amenities	17	3.6.1 Washroom + Change Room	49
2.1.3 Harvie Passage	22	3.6.2 Boathouse + Vehicular Access	50
2.2 Vehicle Circulation	23	3.6.3 Event Pad Improvements	54
2.2.1 Parking	23	3.6.4 Bridge to Divide Island	55
2.2.2 Traffic Study	27	3.6.5 The Engineered Wave	57
2.3 Pedestrian + Cyclist Circulation	29	4 IMPLEMENTATION	60
2.3.1 Existing Circulation	29	4.1 Top Priority	61
2.3.2 Water's Edge + Divide Island Access	29	4.1.2 Core Principles of HPFEP	61
2.4 Environmental Considerations	31	4.1.3 Highest Priority Upgrades	61
2.4.1 Baseline Assessment	31	4.2 Road Map + Dependencies	62
2.4.2 Fish Habitat	33	4.2.1 Quick Wins	62
2.5 Technical Assessments	35	4.2.2 Short Term Recommendations	63
2.5.1 Introduction	35	4.2.3 Medium Term Recommendations	64
2.5.2 Previous Studies	35	4.2.4 Long Term Recommendations	65
2.5.3 Geotechnical	35	4.2.5 Cost Estimate Assumptions + Exclusions	66
2.5.4 Hydrogeological	36	4.3 Reference List	67
2.5.5 Hydrotechnical	36	4.2.1 Documents	67
2.5.6 Regulatory Compliance	36		

Executive Summary

The purpose of the Harvie Passage Facility Enhancement Plan is to develop a set of recommendations to guide the conceptual design and implementation strategy of park improvements, addressing increasing demands within both park and river spaces while considering long-term environmental and public safety concerns. The document provides a framework for the short, medium and long-term capital improvements and management recommendations for Pearce Estate Park, including Harvie Passage. The improvements outlined in this enhancement plan are anticipated to become a key component of the Bend in the Bow Redevelopment Plan, which is currently being updated.

PROJECT PROCESS

Recommendations for park improvements were developed through a consultation process involving the Harvie Passage Task Force over the course of nine (9) meetings. The Task Force included representatives from surrounding residential communities, relevant user groups, the City of Calgary, and the Province of Alberta. Along with feedback from the Task Force, the project's decision-making process was informed by consideration of existing policy, previous public feedback generated by the Bend in the Bow project, and technical assessments. This comprehensive process allowed for a series of park enhancement recommendations that align with the City's best practice policy, are fiscally responsible, and that support existing natural assets, infrastructure, recreational activities, and opportunities in the area.

THE PLAN

The Facility Enhancement Plan is divided into four (4) parts:

1. **Introduction** - This section presents an overview of the project's purpose, key site observations, project goals and objectives, decision-making process, land ownership boundaries, relevant plans, and parallel studies that influence this Plan.
2. **Site Assessment** - This section describes the existing condition of the park, circulation patterns, original design intent, and rationale for upgrades within both Harvie Passage and Divide Island.
3. **Facility Enhancement Recommendations** - High-level descriptions of capital improvement recommendations are outlined in this section, including new amenities and management strategies that aim to mitigate the challenges explored in the Site Assessment section
4. **Implementation** - Based on consultation with the Harvie Passage Task Force and the City project team, the Facility Enhancement Strategy proposes short, medium and long-term improvements.

SUMMARY OF RECOMMENDATIONS

The following provides a brief overview of the Facility Enhancement Plan recommendations:

1. Vehicular Access and Parking Improvements

- » Enhanced parking lot layout
- » Improved access for shuttle buses and food truck programming
- » Parking lot capacity signage

2. Pedestrian and Cyclist Circulation Improvements

- » Park pathway upgrades
- » Safer intersection design

3. Park Amenities

- » Wayfinding, interpretive and safety signage plan unification
- » Added seating and other supporting day use amenities
- » Playground upgrades

4. Proposed Features and Site Upgrades

- » A multi-use/Boat House Facility and controlled boat ramp access path scenarios
- » Washroom + change room upgrades
- » A modified surf wave
- » A potential bridge to Divide Island

STUDY AREA

The Study Area includes Pearce Estate Park, Divide Island, Municipal Reserve to the south of the park and the Harvie Passage low water channel.

Figure 1: Project Area and Site Context



1 INTRODUCTION

1.1 Site Considerations

1.1.1 BACKGROUND

Pearce Estate Park

Unique in its diversity of uses, Pearce Estate Park contains the Sam Livingston Fish Hatchery, the Bow Habitat Station, a 15-hectare reconstructed wetland, and outdoor spaces for both active and passive use. The park is complemented by the Harvie Passage whitewater channel. Harvie Passage provides improved safety and navigability around the Bow River weir, improved fish habitat, and recreational opportunities for a variety of river sports. Since the reconstruction of Harvie Passage in 2018, the low water channel has become the preeminent Canadian Whitewater course, drawing hundreds of visitors on hot summer days.

Pearce Estate Park and Harvie Passage are facing increasing usage demands, with visitor numbers pushing existing amenities past capacity. Safety is a key priority at Harvie Passage, ensuring that users are well-informed about how to use the facility and have the right equipment to do so. Conflicts between vehicles, high-speed and large numbers of bike commuters, and

pedestrians are also escalating in severity as visitor numbers continue to rise.

To manage these challenges, the City of Calgary (CoC) has hired O2 Planning & Design to facilitate the Harvie Passage Facility Enhancement Plan, working with key interested and affected parties to identify priorities and build a road map for the further studies, approvals, and funding necessary to conduct upgrades throughout the park.

The Harvie Passage Facility Enhancement Plan

On September 13, 2021, City Council created the Harvie Passage Task Force. This collective represented the multiple levels of government that manage the main greenspace within Pearce Estate Park and along the Bow River, as well as key user groups. The main objective of the Task Force was to advise on the development of this plan, ensuring a cohesive and well-informed vision of capital improvements and strategic directions is achieved.

Figure 2: Pearce Estate Park Grass Path



1.1.2 LAND OWNERSHIP + MANAGEMENT

Who Manages Pearce Estate Park?

Pearce Estate Park is shared between the City of Calgary (CoC) and the Government of Alberta (AB. Gov), (Figure 1). AB Gov. manages the river bed and shoreline, namely Harvie Passage, while the CoC owns the majority of Pearce Estate Park. The CoC leases the main portion of Pearce Estate Park to AB Gov. to operate both the Sam Livingston Fish Hatchery and Bow Habitat Station. An agreement with AB Gov. was recently renewed to govern monitoring wells for Bow Habitat Station for another 35 years. Due to the 2013 flood and reconstruction of Harvie Passage, certain areas of the Divide Island have been altered.

Who Manages Facility Operations?

At Pearce Estate Park, the CoC and AB Gov. share responsibility for facility operations at Pearce Estate Park, AB Gov. maintains both the Fish Hatchery and Trout Pond. Water Infrastructure and the Operations Branch of the Government of Alberta manage the barriers, signage, inspections and maintenance at Harvie Passage, while CoC manages emergency response. Other responsibilities are shared between CoC and AB Gov, including:

- » Naturalization projects throughout the park
- » Boardwalks and Adirondack chairs
- » Interpretive and wayfinding signage
- » Parking enforcement

The CoC maintains site furnishings such as seating BBQ stations, and waste and recycling bins.

What Approvals are Required for Improvements?

Careful coordination of future development or intensification of uses within the park will be required due to municipal, provincial and federal jurisdictions, existing lease agreements, and the interests of multiple user groups. Modifications within the Bow Riverbed and along the shore area would require Provincial as well as Federal government approvals, including but not limited to the Transport Canada Navigable Protection Act, Alberta Environment and Parks Code of Practice or Water Act, Public Lands Approval, and Fisheries + Oceans Canada Approval.

Figure 3: Land Ownership



1.1.3 LEASE AGREEMENT IMPLICATIONS

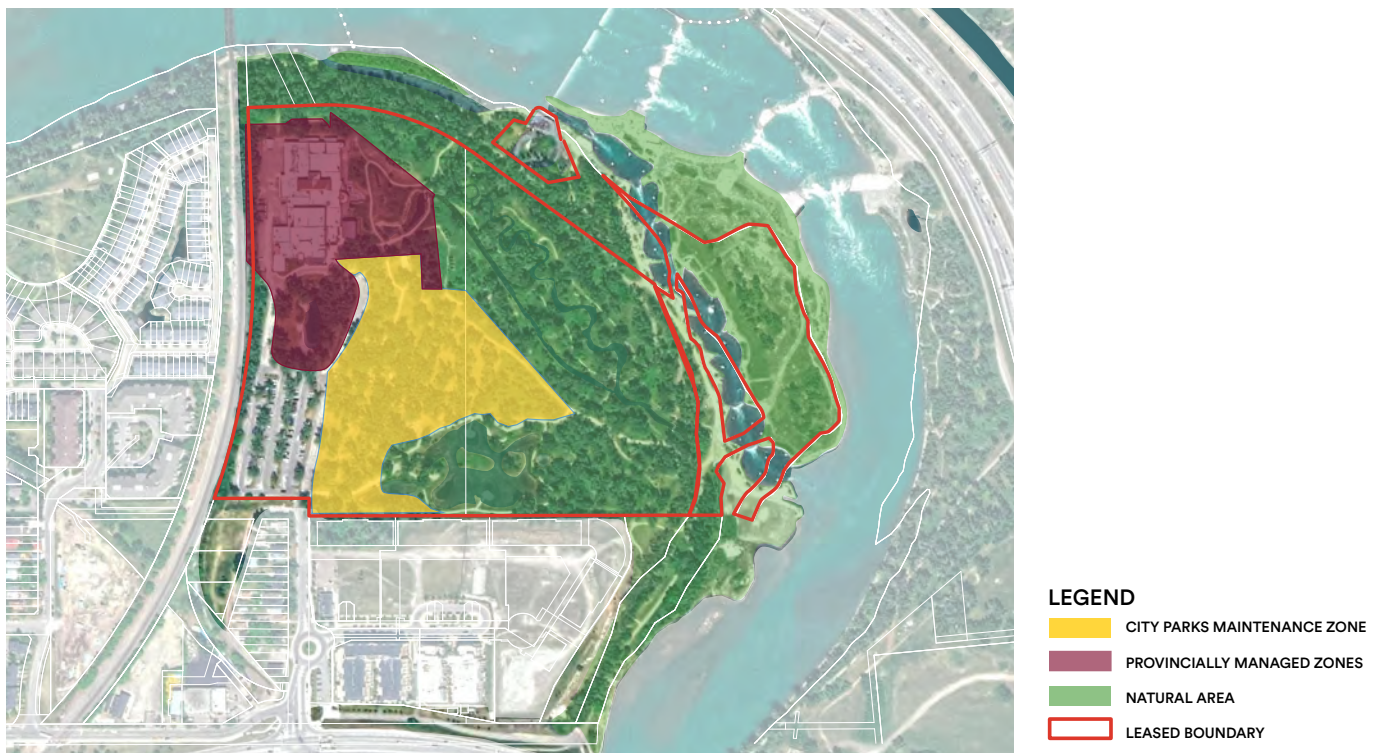
Provincial Involvement

In 1970 the Province entered into a lease agreement with The City for the development of the Sam Livingston Fish Hatchery. The Province is therefore a lease holder on the City property of Pearce Estate Park for the operations, maintenance and ownership of the fish hatchery facility, associated pools, ancillary buildings, ponds, lagoon, aquatic and wetland features. Throughout the park there is also a network of underground pipes connecting to numerous groundwater intake wells that collect water and feeds the water back to the hatchery which is essential for conducting hatchery operations.

The lease agreement includes obligations and responsibilities for both parties to use reasonable and best efforts to maintain the park so as not to contaminate the hatchery's groundwater supplies and not to undertake developments in the park that would disrupt, affect or impact the hatchery operations.

The consent or approval to undertake any development or for any matter relating to the use of the park must be provided in writing by both The City and the Province. Future development within the park's boundary is limited by the terms and conditions of the lease agreement.

Figure 4: Land Management Zones



1.2 Project Overview

1.2.1 THE HARVIE PASSAGE TASK FORCE

Once the Task Force Team had been established, an overview of site information relating to the legislation, regulations, policies, and operational structures that currently oversee Park maintenance was provided to the team. Acknowledging the complex structure of Municipal, Provincial, Federal, and non-government involvement in the site, O2 sought to ensure early on that each member of the Task Force was aware of each other's interests. The following agencies were represented on the Task Force:

City of Calgary

- » Climate & Environment
- » Parks and Open Space
- » Public Spaces Delivery
- » Recreation & Social Programs
- » Calgary Fire Department
- » Calgary Police Service
- » Community Strategies
- » Emergency Management & Community Safety
- » Partnership

Government of Alberta

- » Infrastructure
- » Community Planning

Key User Group Representatives

- » The Inglewood Community Association
- » The Calgary River Users' Alliance (CRUA)
- » Representatives from the Ward 9 office

After several Task Force sessions, a series of recommendations were compiled to address safety, access, and improvements for the Park. Each recommendation takes operational impacts, evolving community needs, and overall site character into account. Priority is based on the greatest benefit to the largest number of users, as well as how well each proposed enhancement fits into the broader conservation story of the Bend in the Bow Redevelopment Plan, a planning document that addresses ways to connect Pearce Estate Park with the Inglewood Wildlands and Bird Sanctuary.

Figure 5: Bow Habitat Station Picnic Area



Figure 6: Trout Pond Boardwalk



Figure 7: Pedestrian Bridge Nature Space View



1.3 Project Vision

1.3.1 PROJECT MANDATE

The Harvie Passage Facility Enhancement Plan “consider(s) safety, access, environmental and operational impacts, and community needs... [The Plan] outlines short, medium, and long-term actions and strategies that would improve the experience for all visitors of Harvie Passage, Pearce Estate Park and the adjacent Bow River Pathway.” (Harvie Passage Task Force Terms of Reference, CD2021-1533 Attach. 2, p.1)

1.3.2 CORE VALUES + OBJECTIVES

The project core values stem from the Bend in the Bow Redevelopment Plan Update and include nature, culture, and education as key drivers. The Harvie Passage Facility Enhancement Plan also includes recreation as a core value, with project objectives that seek to promote a safe, dynamic, and accessible amenity spaces for all users.

Figure 8: Bend in the Bow Original Core Values + HPFEP Added Core Value

BEND IN THE BOW CORE VALUES		HPFEP ADDITIONAL CORE VALUES	
NATURE OBJECTIVES <ul style="list-style-type: none"> Conserve and enhance environmental value for future generations; Protect and restore natural areas and habitats; Design spaces that respect wildlife and their habitats; Maintain the sense of wildness of existing natural areas; Protect and respect the river and its functions; and Increase the ecological value of the park and improve resiliency to flooding + environmental change. 	CULTURE OBJECTIVES <ul style="list-style-type: none"> Recognize Indigenous uses of the park; Celebrate early settlers who were conservationists and instrumental in the development of the city; Conserve and interpret the park's recognized heritage resources; and Restore or reveal traces of cultural landscapes and landmarks. 	EDUCATION OBJECTIVES <ul style="list-style-type: none"> Promote environmental literacy; Foster the continued delivery of formal and informal education programming by various organizations; Provide opportunities for experiential informal learning and enjoyment; Promote stewardship through planning, art and design, education, volunteer opportunities, and interpretation; and Encourage sustainable enjoyment by providing passive recreational experiences that build on the opportunities of the park (<i>note that while Bend in the Bow refers to passive recreation, active recreation aligns with the existing and future vision for Harvie Passage</i>) 	SAFETY OBJECTIVES <ul style="list-style-type: none"> Encourage safe river use Prioritize amenities that will promote safety at the river Consider a suite of programming tools, from education to signage, that will inform users about the Harvie Passage whitewater course
		RECREATION OBJECTIVES <ul style="list-style-type: none"> Celebrate adventure and accessibility in and along the Harvie Passage whitewater course; Provide a safe, active recreational environment for all users; Improve circulation and encourage greater ease of movement for multiple modes of activity; Collaborate with partners to deliver recreation 	

Figure 9: Regional Pathway Bike Commuter

1.3.3 KEY OBSERVATIONS

Key observations of the study area's existing conditions were gathered during site visits, meetings and work sessions with key interested and affected groups, and meetings with the Harvie Passage Task Force. These summary points are the fundamental drivers of the recommendations contained within The Facility Enhancement Plan.



A BELOVED PLACE TO RELAX AND RECREATE

Both passive and active uses are supported by the park and river's edge, areas well-used by locals and visitors alike.



PUBLIC SAFETY

Emergency incidents on the Bow River necessitate a more robust culture of safety education around Harvie Passage.



PARKING CHALLENGES

Parking during peak season is often overcrowded with informal parking spilling out into surrounding informal greenspace.



ACTIVE RESTORATION

Restoration areas can be found throughout the park along the river bank, the sides of nature trails and beside the Regional Pathway corridor.



EDUCATIONAL PROGRAMMING

Site features and interpretive signage provide valued nature education opportunities within the park.



A MIX OF SIGNAGE STYLES

The mix of directional, interpretive, regulatory, and water safety signage on site lacks hierarchy, with some signs containing out of date messaging and styles.



ISSUES WITH GARBAGE ACCUMULATION

Additional waste and recycling bins are needed to help manage ongoing challenges with litter during peak season use.



IN NEED OF FACILITY UPGRADES

There is increasing demand for improving supporting amenities such as washrooms, change rooms, and showers.



HUB FOR EVENTS & PROGRAMMING

Additional collaboration, spaces and pathway enhancements to accommodate events and cultural activations are greatly needed.



CONFLICTING PEDESTRIAN SPEEDS

Walking, cycling, and commuting with watercraft equipment all take place on busy pathways.



LACKS A FEELING OF COHESIVENESS

A lack of a clear pathway hierarchy combined with mismatched site furnishings creates a sense of fragmentation.



FUNCTIONS THROUGH PARTNERSHIPS

Multiple parties are involved with park operations, maintenance, and programming.

1.4 Project Process

1.4.1 PROJECT STAGES

The Harvie Passage Facility Enhancement Plan was undertaken in four stages. Interested and affected parties meetings with the Harvie Passage Task Force, CoC, and AB Gov. occurred throughout Stages 1 to 3.

- » **Stage 1: Site Analysis & Assessment** – included a parks amenities inventory, high-level transportation impact assessment, existing utilities overview, and hydraulic assessment.
- » **Stage 2: Interested + Affected Parties Input** – included individual meetings with The City, the Province and user groups such as the Calgary River Users Alliance (CRUA) along with a review of the latter's Component Plan + Adjustable Wave Project. The Task Force also met for eight sessions during the major milestones of this plan's development. Feedback informed the development of the concept options and improvement recommendations.
- » **Stage 3: Concept Development & Recommendations** – information from both site analysis and meetings with interested and affected parties were used to inform a series of concept scenarios that sought to improve existing site challenges and accommodate potential amenity additions.
- » **Stage 4: Harvie Passage Facility Enhancement Plan** – describes proposed capital improvements for Pearce Estate Park and Harvie Passage alongside a phased implementation strategy that explores the benefits, challenges and recommended next steps to concepts and direction raised by the Task Force. The Appendix includes a Traffic Accommodation Strategy Report.

1.4.2 DECISION PROCESS + INFLUENCING FACTORS

A combination of policy, program information, input from the Harvie Passage Task Force, previous public engagement feedback (2017 Bend in the Bow project), and technical requirements were considered when developing facility enhancement recommendations. This process helped to ensure that park enhancement recommendations remain fiscally responsible, align with best practices, and consider existing infrastructure and activities in the neighbourhood.

The influencing factors for the project align with the City's triple bottom line requirements, as follows:

- » **Social Factors** – ensures an inclusive park for a range of **passive-to-active recreational activities** that contribute to the **well-being and safety** of all visitors.
- » **Environmental Factors** – upholds the integrity of natural areas at Pearce Estate Park and Harvie Passage while strengthening environmental resiliency, through **mitigation and enhancements**.
- » **Economic Factors** – considers how recommendations in recreation, commercial activities, and amenities are **cost effective** and can facilitate **future investments to support city desirability**.
- » **Smart Growth** – provides a long-term vision for a **thriving park in the Established Area** with strong **multi-modal access**. The Task Force also demonstrates a successful process for **partnering** with community partners and the Province

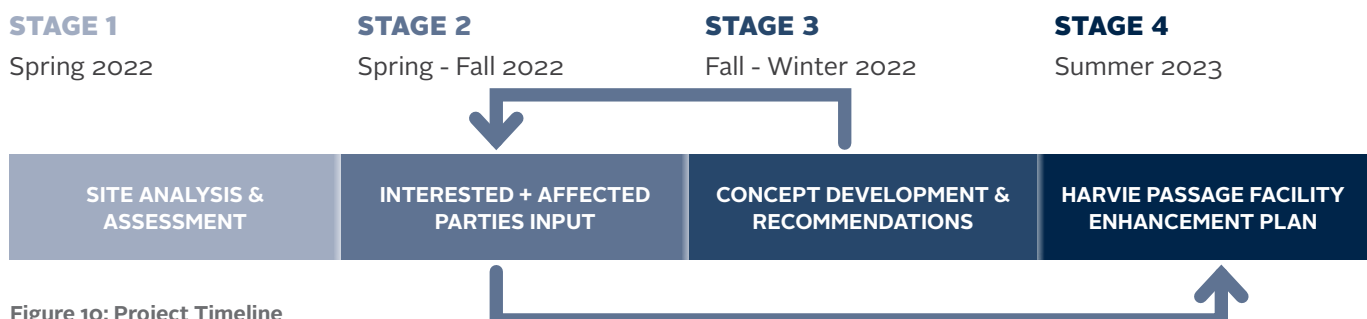


Figure 10: Project Timeline

1.4.3 TASK FORCE INPUT

The **Harvie Passage Task Force** met regularly to discuss issues related to the safe use and ongoing maintenance of the variety of spaces found within the study area. Meetings were structured and sequenced in a way to thoroughly understand both the context and internal identity of the site:

- » **Task Force Meeting #1, 2022.03.02** – Project team introduction, review of draft project plan milestones and deliverables, and discuss components of the facility enhancement plan.
- » **Task Force Meeting #2, 2022.03.31** – Project update and discuss inclusions of additional community representatives.
- » **Task Force Meeting #3, 2022.04.18** – Group site visit, walk through tour of Pearce Estate Park and Harvie Passage.
- » **Task Force Meeting #4, 2022.05.25** – Introduce community and City Engage representatives, summary of what we heard and discussion of key observations.
- » **Task Force Meeting #5, 2022.06.28** – Group workshop opportunities and constraints, topics include park access and circulation, park programming, water's edge and island.
- » **Task Force Meeting #6, 2022.08.30** – Project update summary of what we heard from workshop, summary of improvements, building massing and discuss final report's draft table of contents.
- » **Task Force Meeting #7, 2022.09.29** – Project update and presentation of traffic strategy review, implementation strategy review of short, medium and long term items.
- » **Task Force Meeting #8, 2022.12.15** – Review of first draft of Harvie Passage FEP, and a strategic discussion on framing implementation recommendations.
- » **Task Force Meeting #9, 2023.01.31** – In-person meeting at IBS, mostly open discussion on items such as Bend in the Bow and FEP, need for future public engagement, and discussion about short term priorities.

- » **Task Force Meeting #10, 2023.05.31** – In-person meeting at IBS, review of quick-wins and short term projects, Committee draft presentation, next steps for Bend in the Bow and public engagement.

KEY PARTICIPANTS MEETINGS

- » **Key Participants** Calgary River Users Alliance (CRUA) including paddling, surfing, and angling organizations, the Province of Alberta, and the Bow Habitat Station were consulted. These meetings focused on the day-to-day maintenance and programming needs within the park, as well as the long-term vision for the site.

EXTERNAL INPUTS

- » Internal City interested and affected groups were consulted as part of the Bend in the Bow Redevelopment Plan Update, which mainly focused on amenity improvements within Pearce Estate Park and The Corridor (the open space connecting Pearce Estate Park and Inglewood Bird Sanctuary).
- » **Public Input** collected during the 2017 Bend in the Bow consultation process was considered and assessed against recent considerations on safety, access, environmental impacts, and user experiences.



Figure 11: Decision-making Factors

1.5 Relevant Plans + Studies

Bend in the Bow Redevelopment Plan Update (2023)

The Bend in the Bow Redevelopment Plan (BITB) will address broader strategic connections between Pearce Estate Park, Inglewood Wildlands, and Bird Sanctuary. The Harvie Passage Facility Enhancement Plan will align with the BITB, but provide direction that is more site specific and addressing the unique context of Pearce Estate Park and Harvie Passage.

Calgary River Access Strategy (2017)

The Calgary River Access Strategy (RAS) was approved by Council in 2017. The document lists boat launches and walk-in hand launches throughout the City, as well as opportunities for site amenity improvements to address public safety, education, and economic development potential along Calgary's rivers. Its relevance applies in general to how boat access at Harvie Passage has been contemplated.

2013 Flood Damage Repairs / Harvie Passage Final Design Report (2017)

The Harvie Passage Final Design Report summarized the design approach, analyses, and recommendations for the final design of the Harvie Passage whitewater channel. It outlined the original design intent of improving safety and navigability, contributing to new recreational opportunities for boating, as well as providing improved fish passage and habitat.

Flood Damage Repairs Harvie Passage: Updated Biophysical Impact Assessment (2016)

The Biophysical Impact Assessment (BIA) for the rehabilitation of Harvie Passage provided updated environmental information following the 2013 flood and outlined changes to project construction. Factors include soils and terrain, heritage resources, hydrology and river morphology, navigation, water quality, vegetation, wildlife and wildlife habitat, and fish habitat.

CRUA Harvie Passage Whitewater Park Component (2021) & Adjustable Wave Project (2022)

CRUA produced documents that outline desired amenities such as a the boathouse and adjustable wave. The content was discussed during Task Force meetings and considered within this plan.

Figure 12: Conceptual plan of Pearce Estate Park + Surrounding Greenspace Connections from the Bend in the Bow Redevelopment Plan (2017)



2 SITE ASSESSMENT

2.1 Park Uses + Amenities

A wide variety of amenities, nature spaces, and high caliber programming has allowed for Pearce Estate Park to become an increasingly popular destination along the Bow River.

2.1.1 EXISTING PARK USES

Pearce Estate Park contains a series of reconstructed interpretive wetlands, ponds, streams, picnic sites, a playground, nature trails, the Sam Livingston Fish Hatchery, and the Bow Habitat Visitor Centre. The park sits adjacent to the highly successful Harvie Passage whitewater course. Current park uses include but are not limited to:

- » Marathons + half marathons
- » Whitewater canoe, kayak, Stand-up Paddleboard (SUP), and slalom events + freestyle competitions
- » Recreational canoe, kayak, rafting, or SUP use.
- » Family events (ie. weddings, birthdays, reunions)
- » Picnics + Festivals (ie. food truck, corporate events)
- » Mobile adventure playgrounds + child programming
- » Fitness boot camps
- » Biodiversity studies
- » Nature skills training

Rentable areas include sections of the main pathways, greenspace pockets, a stall area for food trucks, the parking lot, and various picnic sites. Figure 7 outlines booking attendees per month by area.

2.1.2 PARK AMENITIES

Park amenities are installed and monitored by the City of Calgary, Bow Habitat Station, the Government of Alberta, and Calgary Parks. Amenities found throughout the park support existing uses and include:

1. **Greenspace** - The 21-hectare greenspace is available for booking for large events and includes four picnic sites of varying sizes, which are available to book separately. The sites are protected by a healthy tree canopy. Both the greenspace and the picnic sites are well used throughout the summer. These spaces are also well utilized during shoulder seasons.
2. **Playground** - The existing playground was installed by Ducks Unlimited and is well used by park visitors. The playground is in moderate condition and consists of a stand-alone slide, one swing bay, and several small play features. Overall, the site offers reasonable play value but given the park's growth in visitors, the playground is relatively small and limited. It also does not include accessible components for children with disabilities and could be larger given the increasing usage demands of Pearce Estate Park.

Figure 13: Booking Attendees per Month (2018-2022)

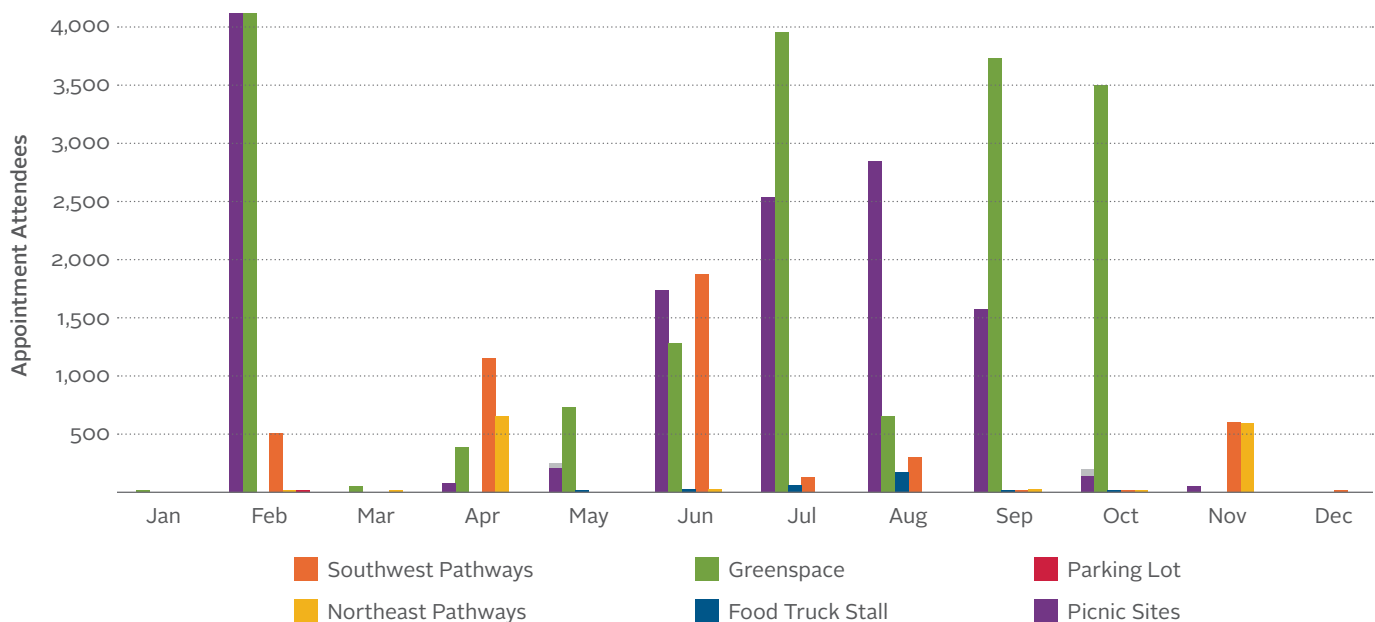


Figure 14: Existing Park Amenity Map



3. Washroom Facility - There is one seasonal building that serves both Pearce Estate Park and Harvie Passage. The current structure is not an efficient use of the space, often feeling dark, cramped, and unsafe. There is one seasonal drinking fountain located on the outside of the washroom building that supports all of Pearce Estate Park and Harvie Passage. The City brings in two seasonal port-a-potty units to better serve Harvie Passage. Currently, there are no change room stalls within the washroom building.

4. Water bodies - Pearce Estate Park offers a variety of ecological benefits with a series of reconstructed wetlands, a hatchery effluent stream, access to the Bow River, and several ponds. The water bodies throughout the park offer interpretive opportunities and are beneficial to a broad variety of visitors. Harvie Passage low water channel also enables recreational use through uses such as kayaking and canoeing.

5. Harvie Passage Access - There is one boat ramp located at Harvie Passage that is not open to the public. Currently, people using Harvie Passage are required to either float down the Bow River or walk across from the Pearce Estate Park parking area. Accessing Harvie Passage from the parking area causes pathway conflicts along pathways where people carrying their flotation devices cross high-speed bike routes. The Calgary River Access Strategy (2017) more thoroughly addresses river access via boat ramps and thus this topic was not identified as a key challenge to address in the Harvie Passage Facility Enhancement Plan.

6. Pathways - The Regional Pathway is paved and loops through Pearce Estate Park, a significant portion of which is part of the Great Trail of Canada. There are several other paved, gravel, and natural surface trails that offer a variety of experiences throughout the park, from enabling movement around the greenspace to loops that provide peaceful rest areas to contemplate nature.



GREENSPACE



PLAYGROUND



WASHROOM FACILITY



HARVIE PASSAGE LIMITED ACCESS BOAT RAMP



PATHWAYS



POND - WETLAND LOOKOUT



EPHEMERAL STREAM HABITAT



7. **Signage** - There are several styles of signage found throughout Pearce Estate Park with many different types of materials and styles employed, contributing to a fragmented Park identity. Several signs are in need of repair or replacement and new consolidated safety messaging is required, especially regarding river use hazards.

» **Wayfinding** - The majority of the wayfinding signs found throughout the Park belong to the Bow Habitat Station series, with directional pole and large freestanding panels of matching colour and material. Also scattered throughout the park are several wooden post markers with no signage panels. Perhaps part of a larger conceptual strategy for the Park's naturalized spaces, the purpose of these wood posts is now unclear and many have been covered by tall grasses or shrubby undergrowth.

» **Interpretive** - The major theme of fish, wetland, and river habitat conservation is the primary focus of the Park's interpretive signage. These signs have distinct characteristics based on the area they are located in, with simple corten steel panels along the river and more decorative interpretive panels beside the wetland lookouts. Although in fairly good condition, the dramatic difference in material application makes a harmonious reading of the full-site story challenging.



SIGNAGE VARIETIES



BIKE RACKS + WASTE MANAGEMENT



PICNIC SITE



STANDARD BENCH - MOST COMMON

» **Regulatory** - Many of these signs are scattered throughout the park. These signs are in good condition but messaging could be strengthened by consolidating information, especially for water safety messaging.

8. Site Furnishings

» **Bike Facilities** - Bike parking is a challenge at both Pearce Estate Park and Harvie Passage. There is only one bike rack located in the main greenspace that services Pearce Estate Park. There are several bike racks located along Harvie Passage although these are single racks and rarely available during peak times .

» **Waste + Recycling** - There are several waste and recycling bins located throughout the park. The number of bins have been increased recently along with waste pick-up frequency although litter continues to be a challenge at the park.

» **Benches** - Several types of benches are found throughout the park, with many featuring commemorative plaques that should be considered when replacement is necessary. Benches placed along the hatchery effluent stream in more hidden natural pockets are most in need of replacement.



CONTEMPORARY BENCH STYLE



STANDARD BENCH - MOST COMMON



TIERED BOULDER SEATING ALONG THE BOW RIVER

2.1.3 HARVIE PASSAGE

Within the Bow River and adjacent to Pearce Estate Park, Harvie Passage enables whitewater recreational activities. The water course was reopened in 2018 after an extensive post-flood rebuild. Since then, the facility has become one of Calgary's biggest attractions for canoing, kayaking, stand-up paddle boarding, surfing, rafting, drift boat use through passage, and casual tube floating.

Harvie Passage has two separate channels that serve a variety of skill levels. The right, low water channel, separates Pearce Estate Park from Divide Island and is classified as Class 2 whitewater, has pool-drop features on the top and bottom, and a meandering middle section. The left, high-water channel, is a more challenging route and is classified as high volume Class 3+ whitewater that is not recommended except for experienced, prepared, whitewater paddlers. Less experienced rafters and paddlers are also given the option to exit the river before the two channels and portage around the major whitewater features. It is important to note that large rafts and hard-bottomed boats are currently unable to portage the whitewater channel.

Although the course has been a tremendous success, The Calgary Fire Department responds to dozens of emergency calls throughout the summer relating to unsafe use incidents.

KEY CHALLENGES

1. Growth demands + user experience at Harvie Passage

- » The lack of amenities supporting Harvie Passage undermines the experience of visitors. Whitewater users, for example, are currently changing their clothing in the main Pearce Estate parking lot or within the forested area that borders Harvie Passage. There are also no storage opportunities to support ease of ongoing programming and promoting use of PFDs.

2. Safety of Use

- » Many unsafe practices currently take place on the river, including boating and swimming with no PFDs, compounded by an overall lack of organized safety education and/or enforcement.

3. Lack of seating options

- » Limited accessible seating prevents limited mobility spectators from enjoying whitewater events and programming that takes place along this popular stretch of the Bow River.

4. Limited bike lock-up infrastructure.

- » The single bike racks that are located along Harvie Passage are heavily used, cannot accommodate sufficient bikes and are seldom available during peak summer use times and there are no bike racks directly along the Regional Bike Pathway that bisects Pearce Estate Park and Harvie Passage, with only one bike rack located within the main greenspace of Pearce Estate Park.

5. Unclear Signage.

- » A lack of signage highlighting upcoming events and programs, particularly at the park entrances, is a detriment to current programming initiatives. Additionally, the multiple types of wayfinding at scattered locations contribute to a fragmented identity.

6. Waste accumulation throughout the park.

- » Garbage pick-up times and bin locations have been increased but are still insufficient, especially in windy areas adjacent to open water.

Figure 15: Harvie Passage Summertime Use



Image Credit: Lina Holroyd-Wolf

2.2 Vehicle Circulation

Overall, the road network can adequately accommodate traffic generated by Pearce Estate Park although parking challenges and associated traffic congestion continues to increase as visitor numbers continue to rise.

See Parking & Traffic Accommodation Strategy by Bunt & Associates, August 2022 for complete details.

2.2.1 PARKING

EXISTING PARKING SUMMARY

Pearce Estate Park has one large parking area that can accommodate 225 vehicles. There is an adjacent City owned parcel of land that is currently undeveloped and frequently used for informal spillover parking during peak season.

On street parking is available in the surrounding neighbourhoods and in parking lots that are associated with other parks in the area (Albert Park Radisson Heights Off Leash Park and the Inglewood Pump Track).

PARKING DEMAND

Bunt & Associates collected data in May and July 2022. Data could not be collected in June due to poor weather. Weekday parking demand, illustrated in Table 1, was primarily accommodated within the existing parking lot at Pearce Estate Park. On peak days, minor spillover into surrounding informal areas occurred.

The weekend parking demand, illustrated in Table 2, resulted in spillover parking on most warm weekends, with demand peaking between 3 pm and 4 pm.

KEY CHALLENGES

1. Significant spillover into informal areas and along road edges
2. Congestion is caused when parking lot is full and drivers loop back through the area or wait for an available spot
3. Limited space for drop-offs
4. Limited space for truck and trailer parking as well as for food trucks
5. Lack of pedestrian crossing signage in main parking areas.

LOCATION		SUPPLY	
Pearce Estate Park	Main Parking Lot	225 stalls	Marked
	City Land (Undeveloped)	32 stalls	Unmarked
Other	Public Lot (SoBow)	12 stalls	Marked
	Albert Park Radisson Heights Off-Leash Area	24 stalls	Unmarked
	Pump Park Lot	25 stalls	Unmarked

Figure 16: Spillover - Main Parking Lot East (Main) Drive Aisle



Figure 17: Spillover - Main Parking Lot South Drive Aisle



Figure 18: Spillover - Main Parking Lot West (North) Drive Aisle



Figure 19: Existing Parking Map



Table 1: Weekday Parking Demand

DATE	WEATHER	PEAK TIME	PEAK DEMAND			
			On-site	City Land	Other	Total
July 15, 2022 (Friday)	30°C (Sunny)	4:00 pm	163	-	-	163
July 27, 2022 (Wednesday)	29°C (Sunny)	5:00 pm	132	-	-	132
July 28, 2022 (Thursday)	29°C (Sunny)	7:00 pm	219	2	10	231
July 29, 2022 (Friday)	32°C (Sunny)	5:30 pm	215	-	8	223

Figure 20: Weekday Parking Demand

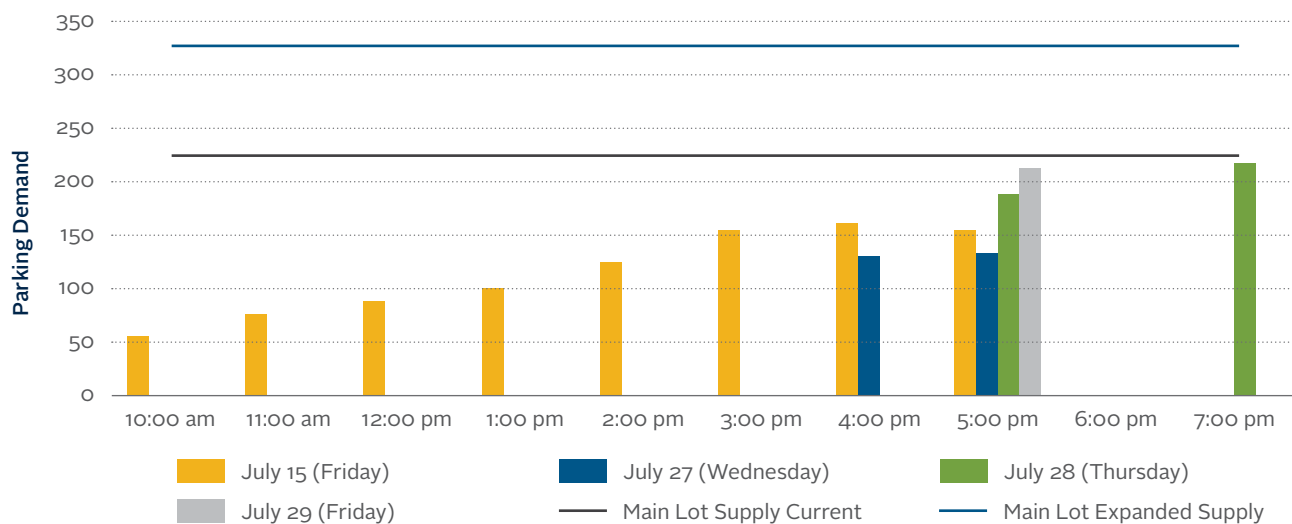


Figure 21: Observed Spillover (City Undeveloped Land)



Table 2: Weekend Parking Demand

DATE	WEATHER	PEAK TIME	PEAK DEMAND			
			On-site	City Land	Other	Total
May 22, 2022 (Sunday)	17°C (Partly Cloudy)	3:00 pm	176	-	-	176
May 23, 2022 (Monday)	19°C (Sunny)	3:00 pm	251	23	-	274
July 16, 2022 (Saturday)	28°C (Sunny)	4:00 pm	228	80	53	361
July 23, 2022 (Saturday)	25°C (Sunny)	4:00 pm	237	22	4	263
July 24, 2022 (Sunday)	27°C (Partly Cloudy)	3:00 pm	264	62	34	360
July 31, 2022 (Sunday)	31°C (Sunny)	6:00 pm	251	75	57	383

Figure 22: Weekend Parking Demand

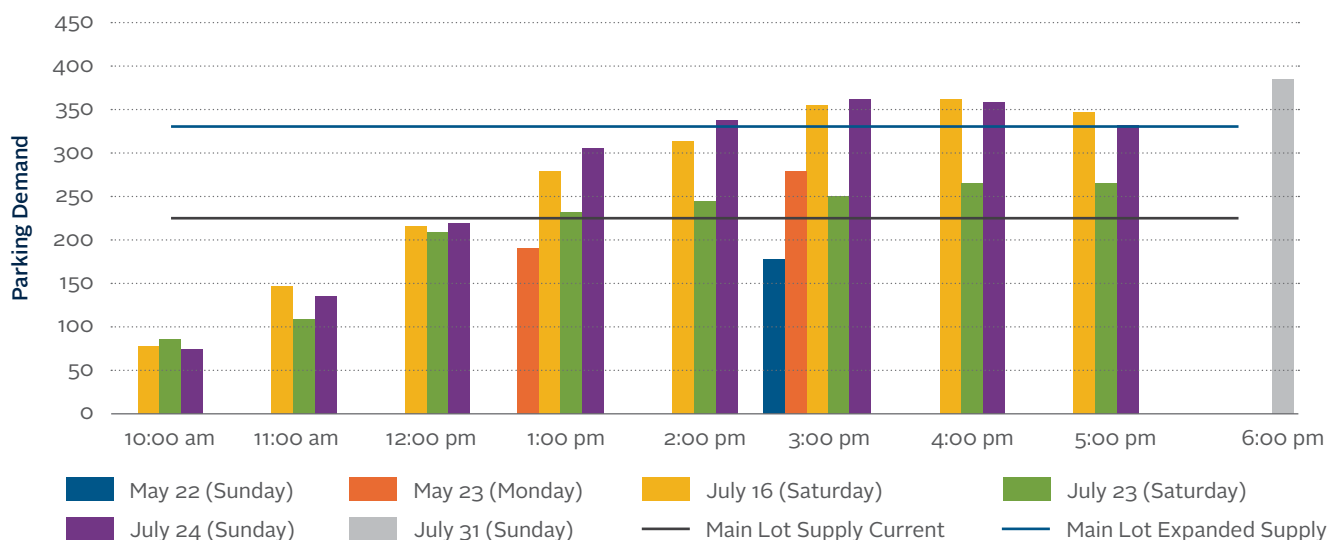
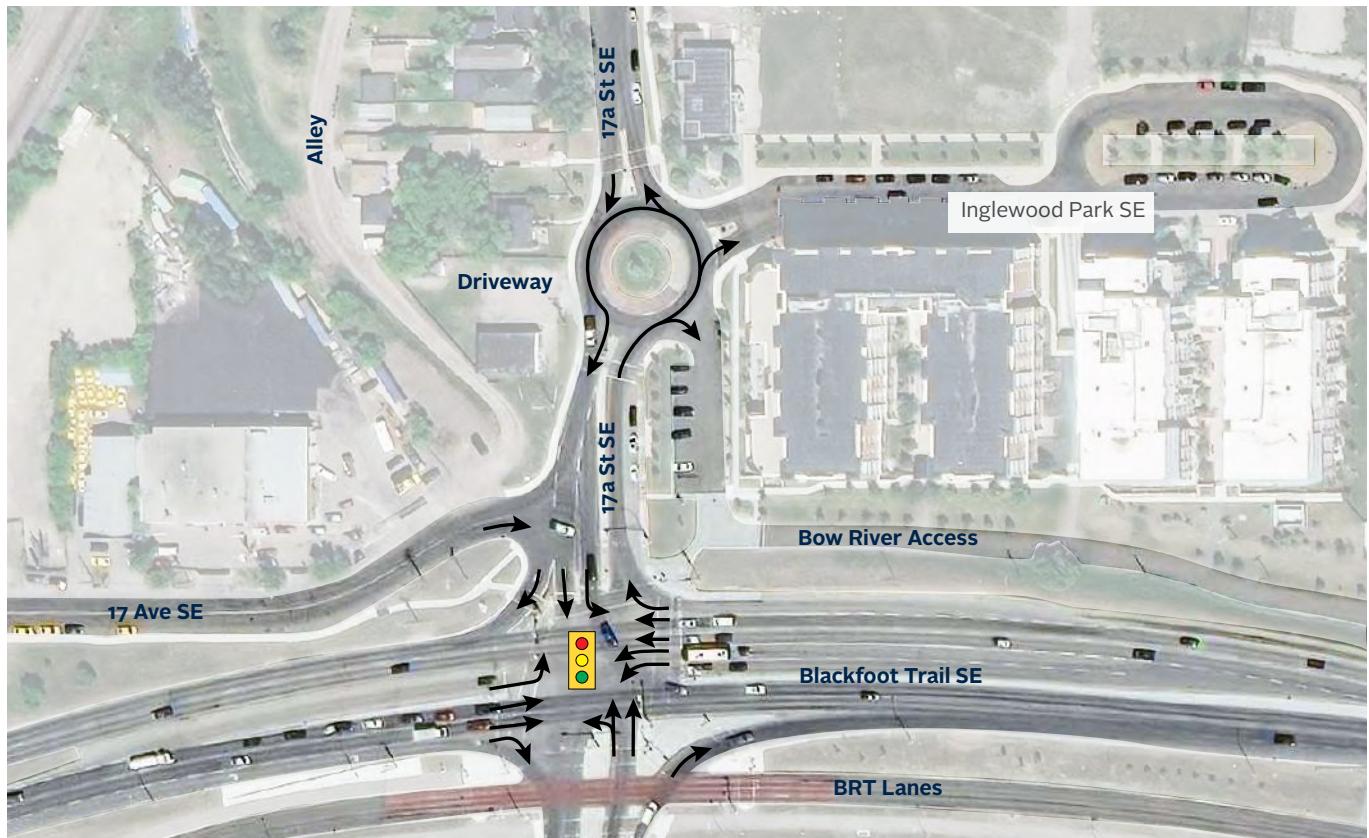


Figure 23: Observed Spillover (On Street - 17 Avenue SE)



2.2.2 TRAFFIC STUDY

Figure 24: Entrance Intersection Configurations



ACCESS AND CIRCULATION

Pearce Estate Park is accessed via the 17A Street and Inglewood Park SE single-lane roundabout which accommodates inbound access is from the 17A Street & Blackfoot Trail SE intersection.

Bunt & Associates completed a traffic study that compared intersection data collected throughout the summer of 2022 with historical intersection data. Weekday evening and weekend peak hour volumes on 17A Street (north of Blackfoot Trail SE) are compared in Table 3 and Figure 13.

The analysis shows that current weekday volumes on 17A Street SE were consistent with historical weekday data. July weekend volumes on 17A Street SE were 20% higher than weekday peak volumes. Summer weekend parking counts confirmed that overspill occurs frequently. Such overspill leads to higher traffic volumes as vehicles make multiple trips into the site looking for parking.

The highest anticipated circulating volume at the 17A Street and Inglewood Park SE roundabout is approximately 514 vehicles per hour, with a general rule-of-thumb stating that a single-lane roundabout can accommodate a volume of approximately 1,100 vehicles per hour. The intersection capacity analysis completed by Bunt & Associates confirmed that all legs of the roundabout will continue to operate acceptably for the foreseeable future. No major changes to the roundabout are required or warranted. There is no inbound queue spillback on 17A Street SE and Blackfoot Trail SE and infrequent outbound queue spillback was observed during late afternoons.

KEY CHALLENGES

1. Traffic congestion leading up to main parking area .
2. Lack of sense of arrival along 17A Street SE.
3. No direct public transit access

Table 3: Hourly Volumes (17A Street SE)

DATA	TIME PERIOD	DATE	HOURLY VOLUME		
			Southbound	Northbound	Total
Historical	Weekday PM	September 27, 2019 (Friday)	146	315	461
		October 5, 2017 (Thursday)	156	347	503
		June 30, 2015 (Tuesday)	196	345	541
		August 9, 2011 (Tuesday)	132	237	369
New	Weekday PM	July 22, 2022 (Friday)	164	260	424
		July 29, 2022 (Friday)	218	293	511
	Weekend Peak	July 30, 2022 (Saturday)	314	338	652
		July 31, 2022 (Sunday)	238	406	644

Figure 25: Hourly Volumes (17A Street SE Link)

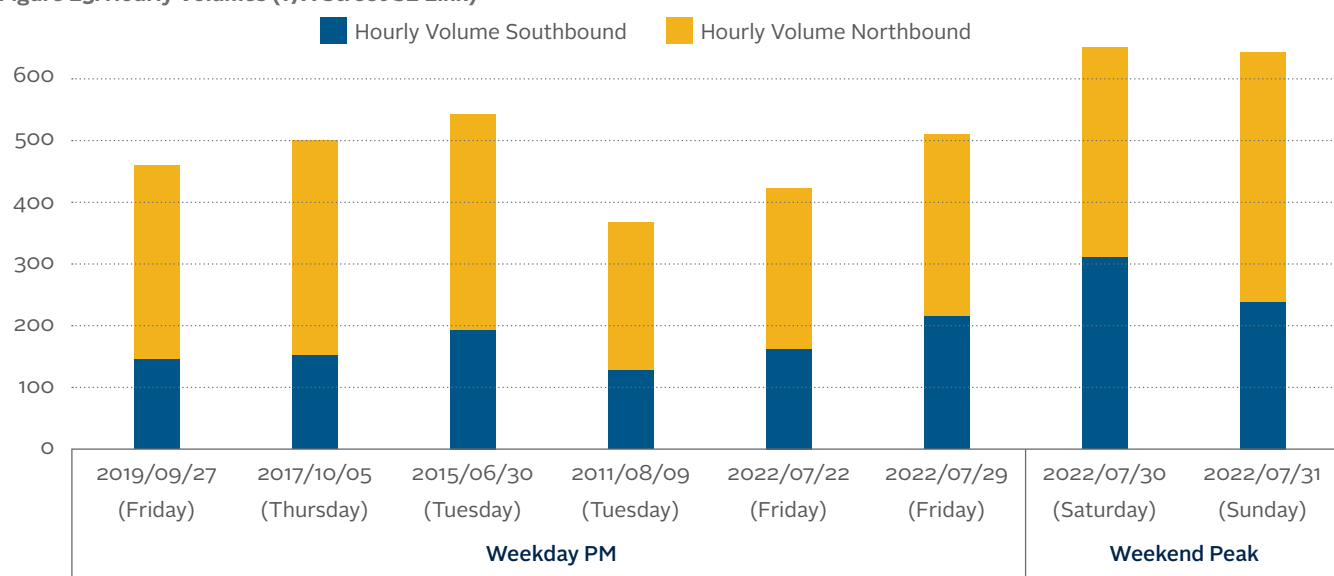


Figure 26: Main Entry Area - Observed Need of Shuttle + Maintenance Vehicle Parking



2.3 Pedestrian + Cyclist Circulation

Site paths accommodate a broad variety of uses, from high-speed commuting to young child programming. Frequent pinch points and blind spots need to be addressed.

2.3.1 EXISTING CIRCULATION

Pearce Estate Park is accessible from the main parking lot through Regional Pathway connections on the northeast and southwest of the park. There are a variety of paved, gravel, and natural pathways throughout the park.

KEY CHALLENGES

1. User Speeds

- » Major points of conflict between user speeds occur at pathway intersections along the regional pathway.

2. Programming Uses

- » Trails throughout the park support a variety of uses, including the main maintenance road gravel track, which is also used for young child programming and food truck events.

3. Lack of Unity

- » The west-to-east Bow River bike pathway connection is not prominent and the major entrance to this pathway, located at the main parking lot entrance, is poorly marked.

4. Vehicle Access Crossing Pedestrian Use Zones

- » Currently, there is only limited access for maintenance vehicles, food trucks, and emergency services through the park along one gated and controlled gravel track.

5. Unclear Intersections

- » There is no formal crosswalk from the parking lot to Pearce Estate Park. This creates hazards for people moving from their vehicles into the park and vice-versa.

2.3.2 WATER'S EDGE + DIVIDE ISLAND ACCESS

The Divide Island is currently only accessible by wading through water to reach the other side of Harvie Passage. Ideas for public access on the island via a bridge have

been discussed, with the topic of public safety at the forefront. The Divide Island is rehabilitated with bio-engineering techniques to mitigate erosion and improve fish and terrestrial habitat.

Whitewater safety training also takes place using both sides of the river, with the high water and low water channels used for rescue demonstrations. The challenges associated with balancing potential future access to the island with public safety and environmental remediation protection is a topic currently being discussed by key interested and affected parties.

KEY CHALLENGES

6. Proximity to High Water Channel Class 3+ Whitewater Drops

- » Concerns have been raised in regards to officially opening up the island to public access as currently it acts as a natural barrier to the High Water Channel Class 3+ Whitewater drops.

7. Habitat Restoration Efforts

- » Currently several large stretches of the island are undergoing active habitat restoration efforts, with positive but not full vegetation establishment yet achieved.

8. Cost

- » Adding an access bridge to the island would be one of the most costly facility enhancements within the study area, with the installation providing possibly the most limited benefit to the smallest number of users.

9. Flood Risk

- » Adding infrastructure within the flood zone comes with high probability of future repair complications and associated expenses.

Figure 27: Pedestrian and Cyclist Circulation



2.4 Environmental Considerations

Pearce Estate Park is an important bio-diverse ecological area and growing park use can place additional stress and degradation of habitats.

2.4.1 BASELINE ASSESSMENT

The following information was collected from the Updated Biophysical Impact Assessment (2016) completed by Klohn Crippen Berger (KCB). Pearce Estate Park is located within the northern limits of a major Natural Area System. The Natural Area System is defined as a group of sections of land with inherent diversity and a relationship of habitat types. Overall, the site has high waterfowl, bald eagle, and ungulate usage. The riverine habitat is significant as a migratory bird corridor and wildlife movement corridor as noted in Figure 18. Pearce Estate Park, along with the Inglewood Bird Sanctuary, is considered provincially significant habitats, primarily for songbird migration and over-wintering birds. Pearce Estate Park has a mixture of wetland, mixed native/non-native grassland, riverine tall shrub, balsam poplar forest, low shrub habitat types, as well as disturbed land.

Figure 28: Ecological Connectivity, The City of Calgary

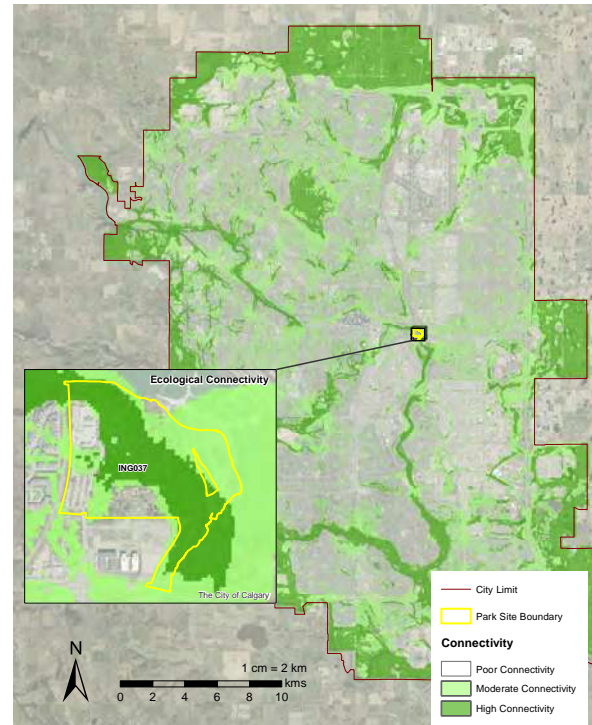


Table 4: Restricted Activity Periods and Environmental Risk for Construction Projects

ENVIRONMENTAL ELEMENT	COMPONENT	ACTIVITY	HABITAT	ENVIRONMENTAL RISK ASSOCIATED WITH CONSTRUCTION											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wildlife and Wildlife Habitat	Migratory Birds	Breeding	Riparian												
	Owls	Breeding	Riparian												
	Bats	Breeding	Riparian												
	Mammals	Breeding	Riparian												
	Amphibians	Breeding	Wetland												
	Snakes	Breeding	Riparian												
Fish and Fish Habitat	RNTR	Spawning	Riverine												
	MWHF	Spawning	Riverine												
	BNTR	Spawning	Riverine												

Low Risk (Green): Very limited or no environmentally sensitive, ecological activities during these times.

Medium (Yellow): Environmentally sensitive activities are expected but they can be effectively managed through pre-construction surveys, construction monitoring, and implementation of recommended mitigation measures.

High (Orange): Peak of environmentally sensitive activities. These are regulated activity periods and will require pre-construction surveys, setbacks if activity is confirmed, and construction monitoring. Given the level of activity, construction works can expect significant additional costs for environmental surveys and project delays even after application of mitigation measures.

Extreme (Red): These are regulated restricted activity periods and will require extensive biological surveys, professional justifications, and a mitigation plan to support proposed works during these time periods. Will also require direct consultation with regulatory agencies and approval application.

Recommended RAP's are based on ESRD Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta, restricted activity periods of Alberta rivers, and professional judgment.

Development at Pearce Estate Park may affect several environmental components depending on the location and timing of development, as identified in Table 4 by KCB.

VEGETATION ECOLOGY

Vegetation surveys were conducted in the area while completing a terrestrial biophysical impact assessment (TBIA) in 2007. The following distinct vegetation communities were noted at the park:

- » Balsam poplar/shrub
- » Balsam poplar/non-native grasses
- » Willow shrub
- » Wetland communities
- » Non-native grasslands

The TBIA did not find any unique plant communities or rare plant species; however, it is important to note that two-leaved waterweed was recorded in 1973 within the Inglewood Bird Sanctuary. Clammy hedge-hyssop and water mudwort were recorded in the constructed wetland in Pearce Estate Park and are likely introduced with initial macrophyte plantings. Cottonwoods are classified as sensitive by the Government of Alberta due to restricted distribution and are likely to occur in the riparian areas.

WILDLIFE ECOLOGY

The TBIA outlined four wildlife habitat areas that include:

- » Cavity nests and raptor perches
- » Song bird nesting and feeding
- » Waterfowl nesting and rearing
- » Grazing areas
- » Two porcupine dens
- » Beaver lodge

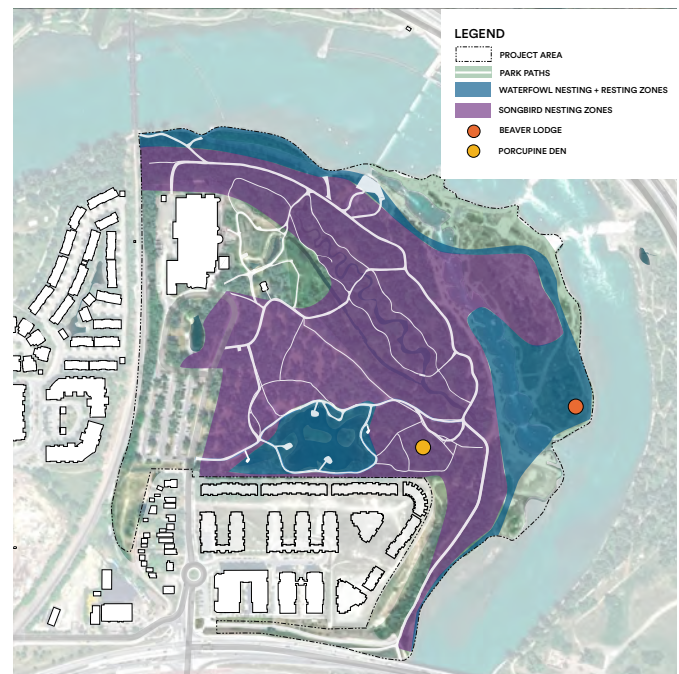
The Bow River is considered to be a major migratory flyway for birds and a significant wildlife movement corridor. Pearce Estate Park provides a key link between the Nose Creek corridor and the Inglewood to Deerfoot Major Natural Area System. Movement constrictions occur at the CPR crossing, Cushing Bridge, and recent residential developments.

Two bat species have been listed as 'Endangered' under federal Species at Risk Act (SARA); the little brown myotis and the northern myotis. Both bat species are possible at Pearce Estate Park, likely within the mature

Figure 29: Vegetative Communities



Figure 30: Wildlife Communities



trees. The peregrine falcon may also exist at the park; however, suitable nesting and foraging habitat does not exist at the park.

Species recorded within Pearce Estate Park ranked as potentially at risk or sensitive by AEP include:

- » **Sensitive:** Fifteen bird species (the great grey owl, pileated woodpecker, and Swainson's hawk have the potential to be affected by removing mature trees)
- » **May be at Risk:** Long tailed weasel (potential to be affected by disturbance to den sites and/or foraging areas) and the northern myotis
- » **At Risk:** Peregrine falcon (considered a transient occurrence)

2.4.2 FISH HABITAT

As outlined in the Updated Biophysical Impact Assessment (2016) conducted by Klohn Crippen Berger, the Bow River provides suitable cold water habitat for a variety of fish species including rainbow trout, brown trout, and Mountain whitefish. Generally, such habitat consists of shallow fast flowing riffles and runs, with a limited number of deep slow flowing pools. Based on previous surveys, the most abundant large fish that live along the Harvie Passage stretch of the Bow River are the Mountain whitefish.

One of the primary objectives for the redesign of the whitewater channel was the creation of additional fish habitat. Also known as “lunker bunkers”, sheltered fish nooks were created by including protected shady areas along the rock channels. These spaces were designed to avoid collecting loose material from the river as well as preventing limb entrapment by featuring minimal gaps between the rocks. This project is a testament to the success that can be found by merging habitat restoration efforts with the creation of new recreation opportunities along inner city rivers.

A major contributor to the broader site narrative of fish conservation within Pearce Estate Park is the Bow Habitat Station, a public environmental education facility located on site that is dedicated to fostering an appreciation for Alberta's biodiversity. It consists of the Discovery Centre, Sam Livingston Fish Hatchery, Kids Can Catch Trout Pond and a series of Interpretative Wetlands.

KEY CHALLENGES

1. Litter

- » Waste management continues to be an ongoing challenge throughout the site with concerns around the threat of litter migrating into wetland, stream, and river systems increasing as visitor numbers continue to rise.

2. Ongoing Restoration Efforts

- » Habitat restoration is a primary goal of ongoing site maintenance, although a lack of facilities contributes to many visitors trampling through restoration zones in an effort to surreptitiously go to the washroom or change outfits in treed areas.

3. Site Narrative

- » The story of conservation, especially for fish habitat, comes through only moderately via poorly coordinated existing site signage.

Figure 31: Wetland area



Figure 32: River Access



2.5 Technical Assessments

High-level technical assessments were completed in an effort to further understand existing site conditions and to provide the foundation for future considerations of larger facility upgrades.

2.5.1 INTRODUCTION

The assessment provided by Klohn Crippen Berger Ltd. (KCB) provided the geotechnical, hydrotechnical, and hydrogeological input to inform the Harvie Passage Facility Enhancement Plan scope of work. This report covered a technical analysis of existing site conditions, key challenges, and proposed design parameters based on these findings.

2.5.2 PREVIOUS STUDIES

Golder Associates Ltd. (GAL) conducted a site investigation for a preliminary groundwater study for the Calgary Weir Improvement Project (now called Harvie Passage). GAL's report entitled "Report on Preliminary Groundwater Study – Calgary Weir Improvement Project, submitted to the Calgary Weir Improvement Project Technical Committee, February 2005" (GAL 2005) was relied upon for the geotechnical and hydrogeology overview for this project.

2.5.3 GEOTECHNICAL

GAL's site investigation included: monitoring the eleven Sam Livingstone Fish Hatchery water supply groundwater wells; installing and monitoring nine groundwater monitoring wells in Pearce Estate Park and Headworks Park; and surveying of Bow River water levels. The soil stratigraphy encountered in the eight groundwater monitoring wells were logged. Six of the groundwater monitoring wells are located within Pearce Estate Park and are located along the south side of the park and near the cold water return channel. Two groundwater monitoring wells are located immediately east and north of the Sam Livingstone Fish Hatchery.

Boreholes were advanced to depths of 4 m to 13 m below ground. Bedrock was not encountered in any of the boreholes. Each borehole consisted of a relatively thin layer of organics overlying sandy gravel with pebbles and cobbles.

The surficial geology within Pearce Estate Park consists of a floodplain terrace of the Bow River, composed of sand and gravel with minor silt (ARC 1987). Locally, the fluvial channel gravels are sands overlain by silts which were deposited as overbank flooding of the Bow River (Moran 1986). Boreholes from the fish hatchery groundwater supply wells indicate that bedrock is approximately 12 m to 18 m below ground. The bedrock is the Paskapoo Formation and is composed of sandstone, siltstone, and mudstone. GAL (2005) stated that their surficial geology conditions observed within Pearce Estate Park were consistent with the regional surficial geology.

Numerous buildings are built within, and adjacent to, Pearce Estate Park. Some with below ground foundations and in the case of the washrooms in Pearce Estate Park, shallow or slab on grade foundations. Consequently, as long as a site specific geotechnical site investigation and foundation design is conducted for any future buildings (i.e. boathouse), there are no identified technical geotechnical challenges with incorporating new buildings in Pearce Estate Park based on available data.

2.5.4 HYDROGEOLOGICAL

GAL (2005) monitored groundwater and corresponding Bow River levels from June to October 2004 and concluded that groundwater within Pearce Estate Park is recharged by the Bow River immediately upstream of the Western Headworks Weir and then flows towards the southeast. Calculated hydraulic gradients ranged between 0.003 to 0.010. Groundwater levels varied with river level and were between 1.6 m and 4.9 m below ground over the monitoring period.

GAL (2005) estimated the transmissivity value for the fish hatchery wells as 3,200 m³/day which corresponds to very high hydraulic conductivity values for the aquifer under Pearce Estate Park ranging from 4.6×10^{-3} to 1.0×10^{-3} m/s (GAL 2005). Consequently, any deep excavations and/or building foundations will need to account for elevated groundwater levels very high hydraulic conductivities, and groundwater inflow.

2.5.5 HYDROTECHNICAL

Pearce Estate Park and Harvie Passage are located within the floodplain of the Bow River. The top of the right bank/pedestrian pathway along the right side of the Low Water Channel at Harvie Passage was set a minimum of 0.5 m above the 1:2 year flood event on the Bow River. Localized overbank flooding is expected in Pearce Estate Park at river floods greater than the 1:5 to 1:10 year flood events.

Alberta Environment and Protected Areas (AEPA) is currently updating the Bow River floodplain mapping. This information is not publicly available. Based on correspondence with The City of Calgary River Engineering (Ms. Sandra Davis, pers. comm.) the post-2013 floodplain mapping is not significantly different from the 2012 floodplain mapping.

City of Calgary Land Use Bylaw IP2007 states that permanent buildings must be located a minimum of 6 m from the edge of the floodway and located a minimum of 60 m from the edge of the Bow River (CoC 2022).

The location of any permanent buildings will need to fulfill these City of Calgary bylaws and due to the possibility of future flooding should locate electrical and mechanical systems above the estimated 1:100 year flood level. Due to the shallow groundwater table and

risk of river flooding within Pearce Estate Park, consideration should be given for new buildings to incorporate pile foundations with no inhabitable spaces below ground.

REFERENCES

- Alberta Research Council (ARC). 1987. Quaternary Geology, Southern Alberta. Natural Resources Division.
- The City of Calgary (CoC). 2022. Land Use Bylaw IP2007. Revised August 15, 2022.
- Golder Associates Ltd. (GAL). 2005. Report on Preliminary Groundwater Study – Calgary Weir Improvement Project. Submitted to: Technical Committee Calgary Weir Improvement Project. February 2005.
- Moran, S.R. 1986. Surface Materials of the Calgary Urban Area (NTS 82P/4).

2.5.6 REGULATORY COMPLIANCE

Both Pearce Estate Park and Harvie Passage are under the authority of several acts and bylaws. Any future interventions within the site must comply with the following:

FEDERAL

- » The Canadian Navigable Waters Act
- » Fisheries and Oceans Canada Mandates
- » The Canadian Environmental Protection Act

PROVINCE OF ALBERTA

- » The Water Act
- » The Fisheries (Alberta) Act
- » The Public Lands Act

MUNICIPAL

- » City of Calgary Land Use Bylaws
- » The City of Calgary Development Permit Process

2.5.7 LEASE AGREEMENT

The consent or approval to undertake any development or for any matter relating to the use of the park must be provided in writing by both The City and the Province. Future development within the park's boundary is limited by the terms and conditions of existing lease agreements.

2.6 Utility Review

A high-level review of both shallow and deep utility lines was conducted as part of the overall site analysis of Pearce Estate Park. This information will be important for ongoing discussions around the potential location of a boathouse facility.

2.6.1 SHALLOW UTILITIES

Figure 33: Site Plan Utilities - Shallow



2.6.2 DEEP UTILITIES

Figure 34: Site Plan Utilities - Deep



3 FACILITY ENHANCEMENT

3.1 Strategy + Recommendations

The Facility Enhancement Plan addresses ongoing maintenance, safety, access, amenities, and ecological considerations across the site through a series of phased recommendations.

3.1.1 GUIDING APPROACH

The following recommendations will improve park function by providing a clear focus for specific amenity, circulation, and programming upgrades. Safety and maintenance issues are addressed and were informed by meetings with the Harvie Passage Task Force.

3.1.2 UPGRADES OVERVIEW

SAFETY

Site safety is of paramount importance and has been threaded throughout the following recommendations for upgrades. Key safety upgrades under consideration include pedestrian pathway improvements, safety signage, emergency locator code signage, Personal Flotation Device (PFD) lending station(s) and emergency call boxes.

VEHICULAR ACCESS & PARKING

Traffic safety challenges were identified early on in the Task Force input process as a key issue to be resolved through future design interventions. Based on Bunt & Associates traffic study, several proposed tactics are presented to address congestion issues such as added parking stalls, lay-bys, and parking lot capacity signage.

PEDESTRIAN + CYCLIST CIRCULATION

To address recent and anticipated growth in pedestrian traffic on the pathways and increasing conflicts between users, a series of upgrades are proposed for the short, medium, and long term. The anticipated results will be safer circulation through the park and parking lot.

PARK AMENITIES

The Site Assessment identified fragmented and overlapping signage, end-of-life furniture such as benches, and an opportunity to reconsider the future of the existing playground. There are also known safety concerns around Personal Flotation Device (PFD) use at Harvie Passage. In general, the recommendations in the following pages aim to strategically upgrade amenities to meet evolving visitor needs within the park.

PARK FACILITIES

Several significant concepts were proposed during Task Force meetings to enhance the functionality of both Pearce Estate Park and Harvie Passage. Additional storage, a boathouse facility with vehicular access to the boat ramp, change rooms, upgrades to the existing washroom building, added infrastructure to host events, modifications for an engineered wave, and a new pedestrian bridge were all discussed. Final decisions on several of these items are dependent upon further study, engagement and regulatory approvals. In order to enable a constructive path forward, the report notes the benefits, challenges, and next steps required if the concepts are to be further pursued.

3.2 Safety Programming

Safety is a high priority for the Harvie Passage Facility Enhancement Plan. The following highlights programming options that can potentially be delivered by The City and further supported through community park stewardship.

3.2.1 DESIGN RECOMMENDATIONS

CONTEXT

There are opportunities to improve river safety for all users at Harvie Passage. In addition to the ones outlined below, there is also a recommendation for a PFD lending station, educational wayfinding signage, and trail design improvements that are referenced later in this chapter. The focus immediately below is on programming actions.

RECOMMENDATIONS

- ① Implement a digital strategy using website content and social media to educate users about how to use the different features of Harvie Passage safely including etiquette among users. The City is likely best placed to implement this action.
- ② Consider ways to best coordinate river education and enforcement initiatives shared among Calgary Police Services, Calgary Fire Department, and City Bylaw.
- ③ Identify staffing or volunteer opportunities to provide lifeguarding and park ambassador positions during peak-use days. The park ambassador could focus efforts on educating proper use of the facilities.
- ④ Explore the potential use of an emergency locator system on site using signs and/or phones and/or call boxes for users to easily be able to communicate one's location in the event of an emergency. Locator signage could be placed on both sides of the river, i.e. "Riverbank Left" and "Riverbank Right" of the Bow River.



Figure 35: City of Coquitlam emergency locator signs (accessed at [Tricitynews.ca](https://www.tricitynews.ca))



Figure 36: Parks Ambassador Program BC Parks Foundation (accessed at bcparksfoundation.ca)



Figure 37: Calgary Fire Rescue (accessed at calgary.ca)

3.3 Vehicle Access + Parking

The following set of recommendations will reduce traffic congestion, address informal parking issues, improve user group access, and maximize use of available space.

3.3.1 DESIGN RECOMMENDATIONS

CONTEXT

Particularly during the summer, the parking lot is challenged by overcapacity, traffic congestion and spillover parking. Based on a traffic and parking study, the following recommendations have been identified that will allow the site to better accommodate peak use.

RECOMMENDATIONS

- ① Add **signage** to improve circulation . See Section 3.4.1.
- ② **Expanded parking:** formalize a portion or all of the City-owned parcel to the south of the existing parking lot as additional parking stalls. Appropriate engagement should be undertaken with surrounding residents. Consideration should be given to controlling for seasonal use, minimizing negative impacts to adjacent properties, and any additional uses and features that could be incorporated into the space, such as landscaping.
- ③ Add a **parking aisle** on the south side of the existing lot where there is currently only a drive aisle.
- ④ Add **lay-bys for truck and trailer loading stalls** to facilitate drop off zone for whitewater users. The eastern lay-by can be considered food trucks programming use as well.
- ⑤ Add **lay-by for passenger vehicle loading stalls** to facilitate whitewater equipment drop-and-go zone. This tactic supports users to bring equipment closer and then park off-site during high volume weekends.
- ⑥ Options for a **Controlled Access Path** to the boat ramp and/or proposed boat house is under consideration. This direction is dependent upon further discussion and feasibility studies for the proposed boat house, but the existing service path could be used to service the proposed temporary storage, events, or be piloted in some configuration in the short term.

⑦ Calgary Transit should consider feasibility and value of adding a **new bus stop** at existing concrete pad and adjusting Route 101 to turn on to 19 Street SE and 17 Ave SE from 9 Ave SE. Calgary Transit should assess whether its fleet can turn around at the traffic circle to exit the site.

⑧ If the above strategies do not abate parking demand, consider the following steps in order of importance: (i) implement new permit or time limit parking restrictions (and consider reserving certain stalls if needed for programmers/stewards), (ii) consider angled parking on 17 Ave, (iii) provide car-share stall, (iv) encourage off-site parking at Inglewood Bicycle Pump Track lot, (v) consider time limit or reservation system at parking lot (vi) implement shuttle bus



Figure 38: Sample of Parking Capacity Signage, Nashville TN (accessed from signal-tech.com)



Figure 39: City-owned land south of existing parking lot

Figure 40: Vehicular Access - Recommendations



Figure 41: Conceptual Parking Layout from Pearce Estate Parking and Traffic Accommodation Strategy



3.4 Pedestrian + Cyclist Circulation

The following set of recommendations will relieve conflicts between different pedestrian speeds along pathways, thereby creating a safer and more comfortable experience for all.

3.4.1 DESIGN RECOMMENDATIONS

CONTEXT

On a busy day, the parking lot can be congested with vehicle traffic as well as large flows of pedestrians moving to and from Harvie Passage. Based on a site assessment of the park as well as a traffic and parking study, the following recommendations were identified to create a safer and more convenient flow between different modes of travel.

RECOMMENDATIONS

- ① The **new sidewalk by proposed lay-bys** helps to provide a continuous walkway from the park entrance to Bow Habitat Station.
- ② New **pedestrian crossings** to provide safer conditions at busy intersections.
- ③ Propose widening of **main east-to-west pathways** to facilitate portage routes and include painted markings on the ground for more intuitive wayfinding from the parking lot towards Harvie Passage.
- ④ **Painted pedestrian crossing to Kids Can Catch Trout Pond** to facilitate a safer crossing condition from Bow Habitat Station.
- ⑤ **Portage Crossings** painted on the asphalt surface at cross-traffic intersections along the Regional Pathway to reduce risk of collisions. If conflict issues continue, then consider alternative tactics such as slow down zones, speed reduction mini-traffic circles, and mini-speed bumps.
- ⑥ **Upgrade the Bow River Regional Pathway** to separate walking and cycling to accommodate increasing volume of users during the day-to-day and events, as well as access into the Park from the main river path. This action should better address the context of having a mix of slower speeds and users sharing space with high speed travelers on bike.

Figure 42: Short-term Pathway Improvements

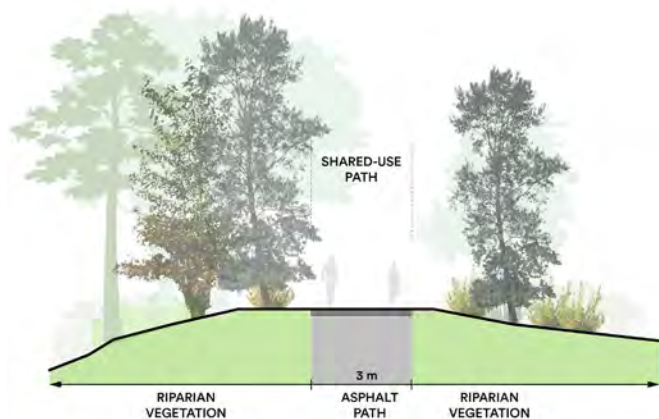


Figure 43: Medium-term Pathway Improvements Design A

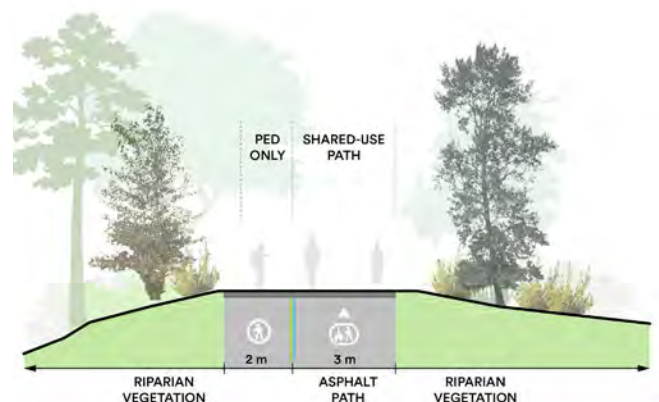


Figure 44: Medium Pathway Improvements Design B

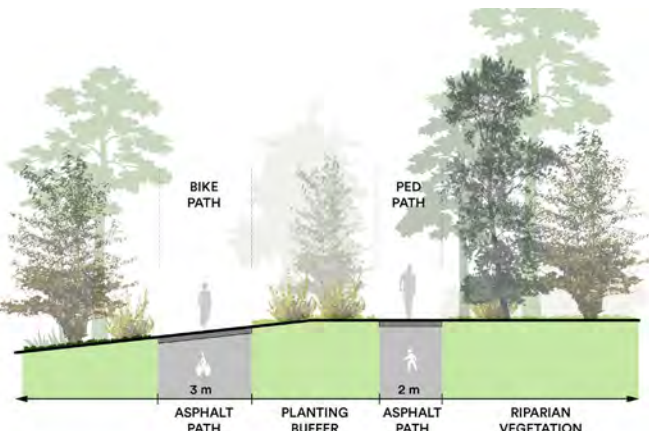


Figure 45: Pathway and Trails - Recommendations



3.5 Park Amenities

Updated amenities will promote improved wayfinding, circulation, a cohesive park identity, and safety. Additional park furnishings will support increasing park use and relieve pressures facing nature spaces within the park.

CONTEXT

Based on site assessment of the park, there are several investments into the existing and new supporting amenities that will enhance the experience of park users at Pearce Estate Park and Harvie Passage.

3.5.1 SIGNAGE STRATEGY RECOMMENDATIONS

- ① Undertake a **Pearce Estates/Harvie Passage Sign Plan** that consolidates redundant signs, integrates storytelling of the Bow Habitat, and develops a set of common brand identity guidelines through common colour palettes and styles. Focus should include but not be limited to water safety, wayfinding, and available activities..
- ② Enhance **entry signage** at major entry locations including from pathways. Consider placement of large seasonal planters to highlight visibility.
- ③ Add **Main Harvie Passage Entry Points** signage indicating portage crossings ahead and to yield to pedestrians carrying watercraft.
- ④ Add **Parking capacity signage** showing parking lot space availability to manage high-volume weekends and special events. This tactic would reduce congestion north of the traffic circle and parking lot by allowing drivers to turn around when lot is at capacity. Signage could also consider highlighting alternative parking locations, bike connections and nearby bus stops to encourage alternative access and parking options
- ⑤ Enhance **signage** around maintenance and emergency vehicle access path and Bow River Path entrance.

3.5.2 SITE FURNISHING RECOMMENDATIONS

- ⑥ Add bike racks adjacent to the Bow River Pathway and near access points to Harvie Passage.
- ⑦ Add additional recycling and garbage receptacles, especially next to stand-alone benches, close to upgraded programming zones, and at major park entrances. Enhanced positive messaging could also be included as part of the improved signage strategy.
- ⑧ Add additional **drinking water fountains** to site.
- ⑨ Restore paint on **large monitoring well structures**. Consider opportunity to add artistic or interpretative content to support park identity and reinforcing the story of fish conservation (not included on map).
- ⑩ Add **picnic tables and BBQ pits** to existing picnic area as well as additional seating near Harvie Passage. Ensure accessibility is accommodated through new furniture (not included on map).
- ⑪ Consider **PFD & Kayak Wheels Lending Stations**
- ⑫ Continue to utilize **portable toilets** near Harvie Passage during high use season and consider public site-use patterns to determine other locations for possible future additional portable toilets.

3.5.3 PLAYGROUND RECOMMENDATIONS

- ⑭ As a major destination park, the existing playground should be upgraded with new features and universally accessible components. The playground design is an opportunity to complement the adjacent wetland through its design.

Figure 46: Park Amenities Recommendations



3.6 Park Facilities Tied to Harvie Passage

Interested and affected parties have identified a set of facility upgrades that are intended to elevate Harvie Passage as a destination for whitewater users. The following section provides an overview of the concept, important considerations in their potential development, and recommended next steps

3.6.1 WASHROOM + CHANGE ROOM

CONTEXT

Harvie Passage users currently do not have a dedicated change room, which requires visitors to either change clothing at the small washroom north of the parking lot, changing at one's car, or changing somewhere within forested areas. To address this demand, short and long term recommendations provided below.

RECOMMENDATIONS

- ① Add new, **temporary universally accessible change stalls** installed at both the western park boundary and on parking lot island(s) as a short term solution.
- ② Upgrade existing washroom and incorporate change rooms within the washroom's design as a medium term solution. Temporary universally accessible pop up change rooms could still be utilized at key site locations.

KEY CHALLENGES

1. Change room needs to be located where it provides convenient access for user groups while minimizing impacts to site vegetation.
2. New infrastructure may be costly.
3. Existing washroom is in need of lifecycle replacement.

Figure 48: Pop-up Change Room Locations



Figure 49: Precedent for temporary universal change stall



Figure 50: Precedent for temporary universal change stall



3.6.2 BOAT HOUSE + VEHICULAR ACCESS

CONTEXT

Whitewater users groups have identified interest in developing a boat house that can accommodate storage, act as a community hub with potential for commercial food and equipment concession as well as hosting emergency services. A separate but related concept is to find a way to have public vehicle access to the existing boat ramp (which is currently reserved for emergency service use) as well as to the future boat house.

In order to assess both options and provide a structure to move forward, the following section provides an overview of scenarios, and assessment of advantages and disadvantages, and recommends next steps.

BUILDING ASSUMPTIONS

All the scenarios are generally made up of the same key elements: an approximate 60'x80' 2-storey building footprint and a controlled vehicular access path. What differs amongst the scenarios are the proposed locations on site, the level of investment required, and the amount of disturbance to existing vegetation.

BUILDING CONSTRAINTS

From a regulatory standpoint, all these locations fulfill the City bylaw to be 60m from the edge of Bow River, and a minimum 6m from the edge of the flood way, as well as the required setbacks from existing infrastructure like the monitoring wells.

In accordance with the City's Land Use Bylaw, Part 3, Division 3, new buildings or other new structures are not permitted within a floodway. Additional information and data on flooded areas and flood inundation maps are provided by the Alberta Government's floods portal map. A proposed boat house development will require regulatory applications and will be subject to the development permit and building permit processes.

VEHICULAR ACCESS

The level of disturbance and potential conflict between park users and vehicles is complicated by where the boathouse is located. Options for vehicular access can be considered along a spectrum of management.

- » **Most restricted case** is to limit vehicle access to emergency and park maintenance vehicles along the existing shared access road from the southeast corner of the parking lot to the boat ramp and river's edge.
- » **Regulated access 1:** a moderately more permissive stage is to allow a limited type of private vehicles access such as user group vans and food trucks by way of regulated gates with an efficient means of controlling access (ex. such as a digital code interface)
- » **Regulated access 2:** the stage above could also be further opened up to private vehicles under limited scheduled times to enable drop-offs.
- » **Open Access:** an option is formalize the path as an all-access shared roadway. While this option would provide the most convenience for enabling drop-offs and use of the boathouse, it would raise the potential for user conflicts.

RECOMMENDATIONS

- » Determine preferred Scenario explored on following page through reviews by key participants, including The City and the Province.
- » Once Scenario is determined, undertake Biophysical Impact Assessment and tree assessment and design of boathouse and pathway.
- » With support in principle, the boat house plan is to be pursued subject to all regulatory requirements.

Table 5: Multi-use Building / Boat House Amenity - Opportunities and Challenges

GENERAL BENEFITS OF A BOAT HOUSE & VEHICLE ACCESS

Item	Benefit
Aquatic Safety	<ul style="list-style-type: none"> » Providing space to enable certified instructors, coaches, swift water rescue and first aid based nearby can improve facility safety » Contributes to cultural norms for river safety
River Use and Interest for Recreation and Sport Users	<ul style="list-style-type: none"> » Enables ease of storage for equipment, programming hub for white water users » Enhances a node for gathering and the creation of a vibrant facility » Potential to support event hosting
Vehicle Access	<ul style="list-style-type: none"> » Convenient equipment and servicing drop off » Boat ramp access and drop off
Utilities/Servicing	<ul style="list-style-type: none"> » May enable the option for public washrooms, which would enhance comfort and experience for park users » Supports event hosting, programming and partnerships

GENERAL CHALLENGES & POTENTIAL MITIGATING ACTIONS

Item	Challenge	Mitigating Actions + Commentary
Managing Access	<ul style="list-style-type: none"> » Overuse/misuse of vehicle access » Vehicle conflict with pedestrians on path » Ensuring unobstructed access for emergency services 	<ul style="list-style-type: none"> » See commentary above on considerations for different levels of access. » Likely will require a successful partnership with whitewater user groups
Utilities/Servicing Boathouse	<ul style="list-style-type: none"> » Ensuring servicing is feasible based on context 	<ul style="list-style-type: none"> » Could require conveying sanitary up to the road through pump system (~\$500k). Septic tank requires maintenance. Septic field (not an option). Nature of soil/proximity to river. » Water servicing placed below frost line. Electrical to tie into existing network. » Avoid conflict with existing servicing on site
Flood Mitigation	<ul style="list-style-type: none"> » Boathouse would sit within the floodplain 	<ul style="list-style-type: none"> » Follow policies from the Land Use Bylaw's Flood Fringe category (locating mechanical/electrical above designated flood level). » Ensure Building is outside the flood way » Adopt flood resilient design to minimize risk of flooding from high groundwater.
Regulatory Approvals	<ul style="list-style-type: none"> » Will require multi-stage approvals. 	<ul style="list-style-type: none"> » Including but limited to City of Calgary's development approvals (e.g Land Use Bylaw), Government of Alberta Code of Practice, Public Lands Approval, and Building Codes and ensuring a 10m buffer from existing Government of Alberta Wells » As per the current property lease agreement, written consent or approval will be required from the Government of Alberta as the Lease Holder.

SCENARIO A. SOUTH ACCESS PATH

LEVEL OF INVESTMENT & COMPLEXITY



HIGHEST due to most environmental impacts, constraints with utility servicing.

CONSIDERATIONS

Minimal Environmental Impact	●	●	●
Ease of Programming	●	●	●
Ease of Servicing/Utilities	●	●	●
Inclusivity	●	●	●



ADVANTAGES

- » Most preferred by User Groups as it is in the most ideal and intuitive location for river use programming, due to proximity to event pad and boat launch
- » Moves vehicle access away from other park uses (eg playground)
- » Direct access path from parking lot to Harvie Passage
- » Setback lessens obstruction of wildlife movement

DISADVANTAGES

- » Removal of trees required for access path and building
- » Permanent disruption to Ducks Unlimited wetlands and Bow Habitat Station interpretive trails
- » Requires new servicing
- » Relatively close to future development

SCENARIO B. BUILDING ON MUNICIPAL RESERVE

LEVEL OF INVESTMENT & COMPLEXITY



HIGH due to most environmental impacts, constraints with utility servicing.

CONSIDERATIONS

Minimal Environmental Impact	●	●	●
Ease of Programming	●	●	●
Ease of Servicing/Utilities	●	●	●
Inclusivity	●	●	●



ADVANTAGES

- » Supported by User Groups and City (Recreation) due to proximity to Harvie Passage
- » Allows for loading and hiding staging behind the facility
- » Direct access path from parking lot to harvie passage
- » Moves vehicle access away from other park uses (eg playground)
- » Sited in area of tree clearing, less tree removal required for the building
- » Protected by existing berm

DISADVANTAGES

- » Removal of trees required for access path
- » Proximity to adjacent new development
- » Proximity to fish effluent/waste discharges to the end of the channel
- » Requires new servicing

SCENARIO C. CENTRAL ACCESS PATH

LEVEL OF INVESTMENT & COMPLEXITY



MEDIUM due to leveraging existing vehicle access path, but building located within a natural zone.

CONSIDERATIONS

Minimal Environmental Impact
Ease of Programming
Ease of Servicing/Utilities
Inclusivity



ADVANTAGES

- » Upgrade of existing pathway to asphalt
- » Proximity to event pad and boat launch
- » Painted wayfinding on asphalt path (bike lane, portage lane, and pedestrian lane)

DISADVANTAGES

- » Existing vehicle access path creates user conflict between vehicles and pedestrians
- » Requires relocation or barrier to playground to avoid children programming near vehicle access
- » Causes disruptions to the Ducks Unlimited Wetlands and Bow Habitat Station interpretive trails
- » Requires new servicing

SCENARIO D. REPLACED EXISTING WASHROOM

LEVEL OF INVESTMENT & COMPLEXITY



MEDIUM due to leveraging existing vehicle access path, but building located within a natural zone.

CONSIDERATIONS

Minimal Environmental Impact
Ease of Programming
Ease of Servicing/Utilities
Inclusivity



ADVANTAGES

- » Located away from the flood plain
- » Adapts existing building and utilizes existing servicing
- » Leads to starting point of Harvie Passage
- » Central location of building creates more diverse programming for different park uses
- » Preserves more trees to the south

DISADVANTAGES

- » Creates traffic congestion and confusion with having to share drive aisle with Bow Habitat Station programming
- » Less direct vehicle access to boat launch

3.6.3 EVENT PAD IMPROVEMENTS

CONTEXT

Events and festivals have been held on site, such as the kayaking slalom event at the Harvie Passage Open in 2022. As part of the site assessment, improvements were identified that could facilitate events at a dedicated space near the boat ramp on the southern edge of Harvie Passage. Given the existing use as a turn-around area and the opportunity to evaluate future events, the following recommendations are to consider the development of the event space as a future longer term action.

KEY CHALLENGES

1. Minimizing negative impacts to the natural environment next to the river with increased use.
2. Design challenges with increased use between vehicles circulation need and event-pad need.
3. The event pad area is Crown land under the jurisdiction of the Government of Alberta and is subject to the regulations governing river beds and river banks. Regulatory applications and approvals will be required for activities in this area.

RECOMMENDATIONS

- » Monitor events in the short term to determine if there are unmet needs from infrastructure and design enhancements.
- » Continue to place portable washrooms north of this site to support high use seasons and events.
- » Manage vehicle access to be consistent with ultimate plan for access path.
- » Maintain turn-around area for vehicles with trailers
- » Discourage food truck parking to be located at this site and instead be enabled at parking lot through traffic layout improvements.
- » Do not install lighting near the river.
- » Dependent on determination of need for improvement:
 - » Undertake further study including assessing earthwork and re-grading to address surface or ponding issues, and develop a maintenance plan for hosting events.
 - » Add seating such as log benches and consider ways to make space welcoming year-round.

Figure 51: Event Pad - Configuration for Non-events days



Figure 52: Event Pad - Potential configuration for typical event



3.6.4 BRIDGE TO DIVIDE ISLAND

CONTEXT

Divide Island is currently only accessible by wading across the Harvie Passage Whitewater channel. The shoreline adjacent to Harvie Passage is used by the Calgary Fire Department during whitewater training rescue exercises, although vegetative areas that are undergoing habitat restoration are at risk from greater pedestrian disturbance. A bridge to Divide Island was raised as an idea to increase and formalize access as an extension to Harvie Passage and Pearce Estate Park.

Figure 53: Proposed Divide Island Bridge



BENEFITS

Item	Benefit
Aquatic Safety	» Improved pedestrian access to the island would allow more locations for spotters and training
River Use and Interest	» Improved pedestrian access to the island expand footprint of park, and thereby providing another feature of the park » Bridge would provide appealing views of Harvie Passage

CHALLENGES & POTENTIAL MITIGATING ACTIONS

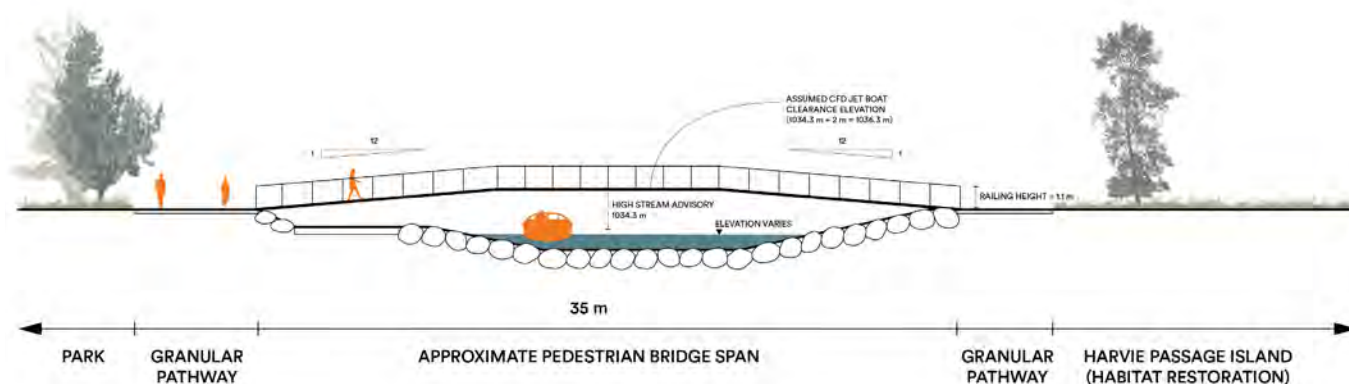
Item	Challenge	Mitigating Actions + Commentary
Aquatic Safety	» Dangerous use of bridge » Increased access to faster moving water	» Bridge could enable jumping into channel with shallow water depths. At the height required for the bridge to facilitate clearance for watercraft, jumping could be dangerous. There may not be a sufficient mitigating action to reduce this risk. » Access to the island would allow more users to reach the High Water Channel and there may not be a sufficient mitigating action to reduce this risk
Bylaw and Emergency Services	» Difficulties in access	» Since the island will not be accessible by vehicle, enforcement of inappropriate uses as well as injuries would be more difficult

Item	Challenge	Mitigating Actions + Commentary
Regulatory Approvals	» Approvals include but not limited to Canadian Navigable Waters Act, Government of Alberta Water Act, and Public Lands Approval.	» Precedents could be referenced to support effort
River Hydraulics/ Flooding	» Bridge resilience	» Bridge abutments are flooded somewhere between the 1:2 and 1:5 year flood. Bridge could trap debris and/or be damaged during larger flood events
Constructibility/Design	» Contextual constraints of bridge	» Bridge would need to span abutment (i.e no piers). Span to accommodate limited mobility access would be approximately 35m. Span would be approximately 22m if steps at the bridge abutment were incorporated.
Environmental	» Preservation considerations	» The island has been planted with native species (trees, shrubs, and cuttings) and has been purposefully planned to provide terrestrial habitat. The island was re-vegetated to provide wildlife habitat with limited human access.

NEXT STEPS

- » To not pursue bridge at the current time unless context changes. If decision changes in the future, the following should be considered:
 - » Consult with Government of Alberta (AB Gov.) on safety parameters permissible by the AB Gov.
 - » Based on discussion with AB Gov, draft concept options for bridge to assess feasibility to address island access, habitat preservation and user safety.
- » Frisbee Golf was raised as an idea but was ultimately not considered to be an appropriate use of this area given environmental sensitivities and the establishment of wildlife habitats.

Figure 54: High Level Concept for Bridge Section



3.6.5 THE ENGINEERED WAVE

CONTEXT

Engineered waves can be installed within the river, using submerged plates that mimic naturally forming waves. Whitewater user groups have identified an interest to install one of these systems within Harvie Passage. Two locations are considered: Drop 2 and Drop 6 (see map to the right), with future design to be coordinated with the new wave at the 10th Street bridge location, further upstream.

NEXT STEPS

- » Further explore an adjustable wave structure that can facilitate different levels of skills, allow passage for drift boaters and canoes, and not negatively affect fish passage.
- » Reach ultimate decision on location based on minimal impact on fish, site suitability, walking distance, viewing and access for safety, and sight-lines for other channel users.
- » Use existing concepts and research to develop a more detailed plan with budget.
- » Consider supporting features and learnings from 10th st. wave initiatives such as an area for warm up and cool down as well as racks for boards.

Figure 55: Wave from Bend Oregon (photo credit: surfanywhere.ca)



Figure 56: Drop 6 is a candidate location for the wave



BENEFITS

Item	Benefit
Economic	<ul style="list-style-type: none"> » CRUA suggests this could generate \$650,000 of new economic activity » Potential for partnership funding
River Use and Interest	<ul style="list-style-type: none"> » Adds an additional amenity that can draw users » Expands opportunities and interest in recreational river use » Provides an amenity for the wave using community at Harvie Passage which includes surfers, kayaks, body boarders, SUPers, and more.
Navigation	<ul style="list-style-type: none"> » Potential to improve navigability than existing recirculating hole

CHALLENGES & POTENTIAL MITIGATING ACTIONS

Item	Challenge	Mitigating Actions + Commentary
Whitewater Hydraulics	<ul style="list-style-type: none"> » Minimize negative impacts to existing configuration and access along channel 	<ul style="list-style-type: none"> » An adjustable wave at LWC Drop #6 may have less impact on whitewater hydraulics because of the structure configuration, but this should be confirmed by a more detailed plan. » The structure is intended to provide precise control of the whitewater hydraulics, and thereby have a minimal impact on the low flow exit because the structure upstream of the exit

Item	Challenge	Mitigating Actions + Commentary
Conflict & Experience	<ul style="list-style-type: none"> » Potential conflict between river users » Overcrowding » Inclusion 	<ul style="list-style-type: none"> » The range of features at Harvie Passage for different users could lower the risk of conflict and overcrowding capacity » The ability to set the wave different skills could allow more users to participate
Aquatic Safety	<ul style="list-style-type: none"> » Ensuring safety for users of the wave » Increase in emergency response needs 	<ul style="list-style-type: none"> » Existing precedents with no-to-limited safety issues elsewhere in North America can inform safe practices. » Adjustable wave can be operated to provide opportunities for all Low Water Channel (LWC) users. » The pool upstream of an adjustable wave at LWC Drop #6 is large with clear site lines which should provide more warning time for LWC users to wait until the wave is lowered and/or the river surfer to get out of the way. » Increased wave users may also have the potential to increase emergency notification and/or be first response to some degree (while not replacing need for operational capacity from Fire Dept. and EMS) » Opportunity to educate users on safe use of the river in general to increase safe practices (see Safety recommendations)
Fish Passage	<ul style="list-style-type: none"> » Avoid negative impact to fish movement 	<ul style="list-style-type: none"> » Fish passage would need to remain on both or one side of the structure, and confirmation would need to be established during design and approval that this solution is able to work effectively
Canoe and Boat Passage	<ul style="list-style-type: none"> » Avoid obstructing passage for other users 	<ul style="list-style-type: none"> » Feature design can be potentially easier for travel than existing recirculating hole
Regulatory Approval	<ul style="list-style-type: none"> » Approvals include but not limited to Canadian Navigable Waters Act, Alberta Environment and Parks Water Act, and Public Lands Approval. » Feasibility to construct feature 	<ul style="list-style-type: none"> » Precedents may support effort » Drawing from precedents internationally, notably the retrofitting of existing whitewater features » Drop#6 was built with large boulders with concrete to fill voids. An adjustable wave would need to be designed to ensure plate can be properly affixed to the structure » Detailed design would need to consider retrofitting Drop 2 & 6's boulders to affix plate properly, piping for inflatable blabber or hydraulic, and electrical servicing

Figure 57: Park Amenities - Overall Recommendations



4 IMPLEMENTATION

4.1 Top Priority

Based on the core values of the HPFEP and discussions during Task Force meetings, there are a set of elements that have been identified as the highest priority. These are outlined below.

4.1.1 CORE VALUES OF HPFEP

NATURE

CULTURE

EDUCATION

SAFETY

RECREATION

4.1.2 HIGHEST PRIORITY UPGRADES

SUPPORT SAFE RECREATIONAL USE OF SITE

1. A set of safety programming should be implemented that is some combination of: emergency locator code signage, emergency call boxes, lifeguard/ambassador presence on highest peak days.
2. PFD Lending Station

ROADMAP TO ENHANCING HARVIE PASSAGE

1. Change rooms and temporary universal change stalls
2. Determination for the boat house
3. Determination for vehicle access to boat ramp

ACCOMMODATE GROWTH PRESSURE

1. Implementation of parking lot improvements and potential expansion of additional parking stalls using City-owned land south of existing parking lot

NOT RECOMMENDED AT THIS TIME

1. Bridge to Divide Island (continue naturalization and preservation efforts on the island instead). Subject to change in the future.
2. Formalizing an event pad

4.2 Road Map + Dependencies

To facilitate a strategic approach to guide future decision making on achieving the highest priority items outlined in the last sub-section as well a number of tertiary actions that will nonetheless enhance park experiences at Pearce Estate Park and Harvie Passage, recommendations have been organized within an implementable time horizon. Taken together, these steps provide a common path forward for the future of Pearce Estate Parks.

4.2.1 QUICK WINS (12 - 18 MONTHS)

The following recommendations are intended to be quick-wins that can be implemented within a 12-18 month period.

Improvement	Action	Class 5 Cost Estimate
Sea Can Storage & PFD Lending Station	» Install sea can (sea can and PFD supplied by CRUA) near Harvie Passage, including delivery and install, site preparation (aggregate base), and basic fit-out (steel racks) including items for public education.	\$10,000 delivery, site preparation, basic fit-out
Change Stalls Near Parking Lot	» Install temporary universal change stall structures near parking lot » Develop internal City maintenance plan for change stalls	\$20,000 for 2 Units
Safety & Public Education	» Coordination meeting for 2023 summer season between Calgary Fire, Bylaws, and Calgary Police » Consider any additional funding or operational planning for Emergency Services that may be needed for long term management of site	N/A
Pathway Upgrades, Safe Crossings and Signage	» Add painted pedestrian crossings and safety signage at Portage Crossing, and emergency locator signage on both sides of river.	\$200,000
Parking Lot Improvements	» Initiate process for improvements and expansion including what level of engagement is appropriate for changes to city-owned lot.	\$250,000
Existing Washroom Upgrades	» Undertake conceptual redesign plan for upgraded washroom and initiate renovation works.	\$375,000 including design
Boathouse	» Finalize site location and develop concept plan (with massing, uses, and feasibility determined)	\$60,000 consulting fees

Quick Wins Class 5 Cost Estimate Total: \$915,000.00

4.2.2 SHORT TERM RECOMMENDATIONS (1-3 YEARS)

The following actions address immediate needs to improve safety, congestion, and enable future investment.

Capital Improvement	Action	Dependency	Class 5 Cost Estimate
Complete Parking Lot Improvements and Expansion	<ul style="list-style-type: none"> » Complete parking lot improvements such as added lay-bys and extra parking stalls. » Implement gravel parking lot expansion (including enhanced landscaping in remaining area of City-owned lot) » Investigate other recommended measures such as off-site parking and public transit improvements, test food truck hub areas. 	<ul style="list-style-type: none"> » Dependent on funding » Dependent on whether public engagement is undertaken on lot expansion 	\$94,000 for full parking expansion
Enhance Pedestrian + Cyclist Circulation	<ul style="list-style-type: none"> » Build new concrete sidewalks as part of parking lot improvements 	<ul style="list-style-type: none"> » Dependent on funding 	\$32,500
Upgrade Park Amenities	<ul style="list-style-type: none"> » Install basic electronic parking capacity signage with digital sensors at vehicle entrance » Install bike racks, seating, fire pits, garbage receptacles and other supportive amenities in high-use gathering locations » Undertake conceptual redesign plan for new destination playground » Create Pearce Estate/Harvie Passage signage strategy (consider interpretive opportunities) 	<ul style="list-style-type: none"> » Dependent on finalizing locations and funding 	\$131,000 total \$20,000 parking signage \$56,000 site amenities \$30,000 playground consulting fees \$25,000 signage consulting fees
Washroom + Change Room	<ul style="list-style-type: none"> » Additional Portable Toilets for high demand days 	<ul style="list-style-type: none"> » Dependent on funding 	Rental fees
Vehicle Access to Harvie Passage	<ul style="list-style-type: none"> » If interested, user groups to submit an application and Terms of Reference to City of Calgary to pilot limited access based on Scenario 3 (see Recommendations Chapter) 	<ul style="list-style-type: none"> » Dependent on finalizing locations and funding 	TBD
Events	<ul style="list-style-type: none"> » Internal City monitoring of events to assess whether improvements are needed and in what configurations 	<ul style="list-style-type: none"> » N/A 	N/A
Wave Modification	<ul style="list-style-type: none"> » Determine location and develop concept plan, detailed design, and submit application. » Develop internal City maintenance and operations plan 	<ul style="list-style-type: none"> » N/A 	\$20,000+ consulting fees for non-profit

Short Term Class 5 Cost Estimate Total: \$408,500.00

4.2.3 MEDIUM TERM RECOMMENDATIONS (3-5 YEARS)

Undertaking key moves to accommodate future growth + demand.

Section	Action	Dependency	Class 5 Estimate
Vehicular Access + Parking	» Implement other supported traffic and circulation improvements (bus stop, dedicated car share parking stalls + off-site parking plan)	» Dependent on engagement » Dependent on investigation of options	N/A
Pedestrian + Cyclist Circulation	» Upgrade Bow River Pathway to widen path, separate pedestrians and cyclists	» Dependent on environmental assessment of trail widening	\$200,000
Park Amenities	» Install signage based on Pearce Estate/Harvie Passage Signage Plan » Install new destination playground		\$97,000 signage \$750,000 playground
Washroom + Change Room	» Upgrade existing washrooms, including new change rooms and full interior renovation (assume using existing foundation, structure, utility lines)		\$375,000 renovation \$1 million new building
Boathouse	» Undertake concept plan for boathouse & access path upgrades » Complete detailed design and engineering based on concept plan and coordinate regulatory approvals » Build Boathouse (2-story occupiable building to National Building Code, including washrooms, HVAC system, etc), basic landscape, & access path upgrades	» Dependent on further study of feasibility, approvals of preferred location of boathouse and upgrades to path	\$2.2 million building construction, including consulting fees
Access Path	» Implement long-term approach to vehicle access management » Scenario A. South Access Path (Install informal gravel vehicle access route along south perimeter of site (provided wetland setbacks allow) » Scenario C. Central Access Path (use existing alignment)	» Potential dependency is learnings from pilot of Scenario C	\$450,000* Scenario A \$250,000* Scenario C * Excluding tree removal and servicing costs
Wave modification	» Implement adjustable wave modifications & supporting amenities (such as board racks and warm up areas), assume project management by non-profit river groupssuch as CRUA and/or Alberta Whitewater Association	» Dependent on concept, funding and approvals	\$350,000 non-profit construction

Medium Term Class 5 Cost Estimate Total: \$4,222,000 - \$5,047,000.00

4.2.4 LONG TERM RECOMMENDATIONS (5+ YEARS)

Ensuring Pearce Estate Park continues to reflect both original + evolving needs.

Section	Action	Dependency	Class 5 Cost Estimate
Vehicular Access + Parking	» Undertake traffic and parking validation assessment impacts within and beyond site after improvements, including transportation impact assessment	» Dependent on implementation of parking and traffic improvements	\$36,000 consulting fees
Pedestrian + Cyclist Circulation	» Monitor trail capacity and conflicts	» Dependent on trail upgrades	\$36,000 consulting fees
Washroom & Change Room	» Monitor washroom area demand through mapping of anonymous cellular data collection and site visit observation at peak usage.		\$5,000 consulting fees
Boathouse & Access Path	» Internal City monitoring of vehicle access management on upgraded access path	» Dependent on if boathouse is developed	N/A
Wave Modifications	» Work with Sam Livingston Hatchery to monitor fish habitat to ensure no negative impacts following wave modification	» Dependent on if wave modification is pursued further	N/A
Park Use	» Monitor and evaluate park-wide trends & utilization levels for a multi-year study from 2019 onwards » Including collection and mapping of anonymous cellular data from social media applications (ie. Strava app) » Including multiple smart AI sensors on peak days to provide multi-modal (cyclists, pedestrians) data on frequency and speed	» N/A	\$15,000 consulting fees for data analysis study

Long Term Class 5 Cost Estimate Total: \$92,000.00

4.2.5 CLASS 5 ESTIMATE ASSUMPTIONS + EXCLUSIONS

- » All items are for supply and install, unless otherwise noted.
- » The unit prices used in estimating the project construction cost were derived from: recent tenders and contracts for similar works; material costs obtained from suppliers (where applicable); and prices determined by elemental analyses. The unit prices are of a general nature and subject to confirmation with more detail and scope definition.
- » Class 5: -50% to +100%
- » Exclusions:
 - » Soft costs, permits, design and engineering consulting fees, contingency.
 - » Mobilization/demobilization, general conditions, incidental costs, erosion and sediment control.
 - » Landscape warranty and maintenance.
 - » Taxes (GST).
- » Assumptions:
 - » No restrictions from adjoining properties, stable soil conditions, average-quality finishes.
 - » No remediation of contaminated soils or groundwater.

CLASS 5 COST ESTIMATE TOTAL: \$5,637,500.00 - \$6,462,500.00

4.3 Reference List

4.3.1 DOCUMENTS

- » Bend in the Bow Plan Development Plan. City of Calgary. Current.
- » River Access Strategy. City of Calgary. 2017.
- » CRUA HP Components. CRUA.
- » Overview of Adjustable Wave Project. CRUA.
- » CRUA Bow River Recreation Economic Impact Assessment. CRUA.
- » Full Parking & Traffic Accomodation Strategy by Bunt & Assoicates, August 2022.

Figure 59: Short-term Recommendations



Figure 6o: Medium-term Recommendations



Figure 61: Long-term Recommendations

