



Green Line Bow River LRT Bridge

Information Session

April 20, 2021

In the spirit of reconciliation, we acknowledge that we live, work and play on the traditional territories of the Blackfoot Confederacy (Siksika, Kainai, Piikani), the Tsuut'ina, Stoney Nakoda (Chiniki, Bearspaw & Wesley First Nations), the Métis Nation (Region 3), and all people who make their homes in the Treaty 7 region of Southern Alberta.



How to participate

Questions and comments can be posted in the chat box of the Microsoft Teams live event

- Questions will be read by the moderator and answered by our presenters following the presentation
- No names will be used when questions or comments are read out during the session



IMPROVING USER EXPERIENCE

Translation

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Closed Captioning

To turn on live captions and subtitles, select **Captions/Subtitles On**  **in your video controls**

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<https://engage.calgary.ca/greenline/green-line-session-instructions>



Agenda

- 1) Bridge planning guidance**
- 2) Alignment**
- 3) Bridge Architectural form**
 - 1) What we heard through engagement
 - 2) Bridge form evaluation and selection
- 4) Multi-use pathway design**
- 5) Bridge connections and promenade**
- 6) Next steps**



Green Line project update

Long term vision

A city shaping transit service that **improves mobility** in communities in north and southeast Calgary, **connecting people and places**, and **enhancing the quality of life in the city**.

Once built out, the entire Green Line will:

- Serve Calgarians in 27+ communities
- Support over 220,000 to 240,000 trips per day
- Provide a future airport connection
- Support future Transit Oriented Development (TOD) in 10 stations areas
- Consist of 46 km of track
- Include 28 stations

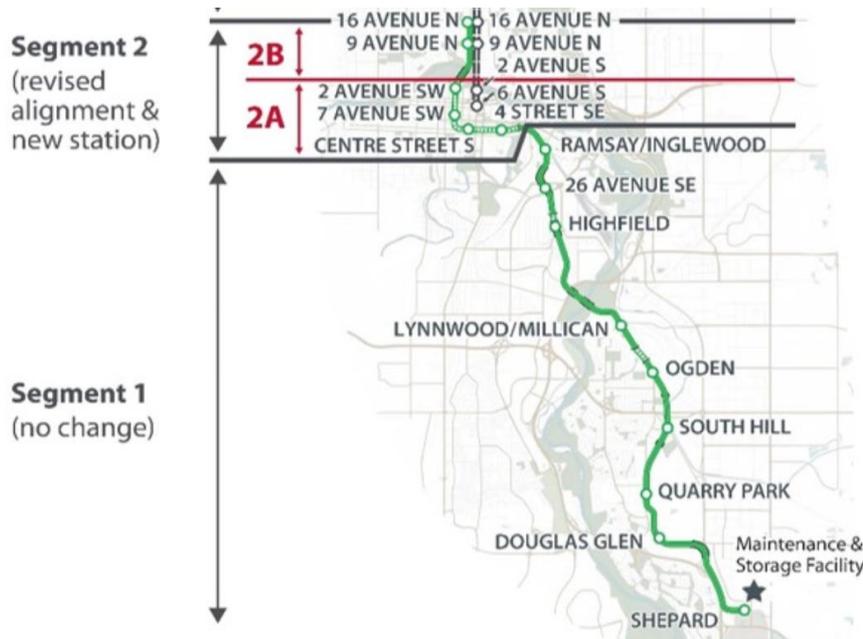




Updated Stage 1 alignment

Stage 1 is funded

Approval of stage 1 was a pivotal first step in achieving the vision of Green Line promised for Calgarians.



- **20,000** jobs
- **10,000** hours per day
- **Connects** communities



- **Enabling works / utility relocation program**
 - **Segment 1:** 14 enabling works projects completed in 2020, including over 300 utility relocations
 - **Segment 2:** Construction management firm has been selected through procurement process for utility relocation program; Enabling works construction is scheduled to begin this year.
- **Segment 2 functional planning** 
 - Segment 2A (Downtown & Beltline area)
 - Planning in Crescent Heights: Centre Street North Streetscape Masterplan and Crescent Heights Mobility Study
 - North Central Bus Rapid Transit (BRT) Study
 - North Central Mobility Study
 - Bow River LRT bridge
 - Centre Street South Public Realm Improvements



Green Line functional planning and delivery model



Segment 2 – Public engagement

Early 2020: Engagement for segment 2A (downtown/Beltline)

2020

2021

October

November–December

January–February

March–onwards



Inform

- Keep Calgarians up-to-date on Green Line planning initiatives through online events and electronic updates
- Host an online open house for projects impacting downtown in late-October
- Ensure previous public input informs our technical planning this fall

Explore

- Present ideas and considerations that will inform functional planning
- Gather input from Calgarians through online engagement

Evaluate

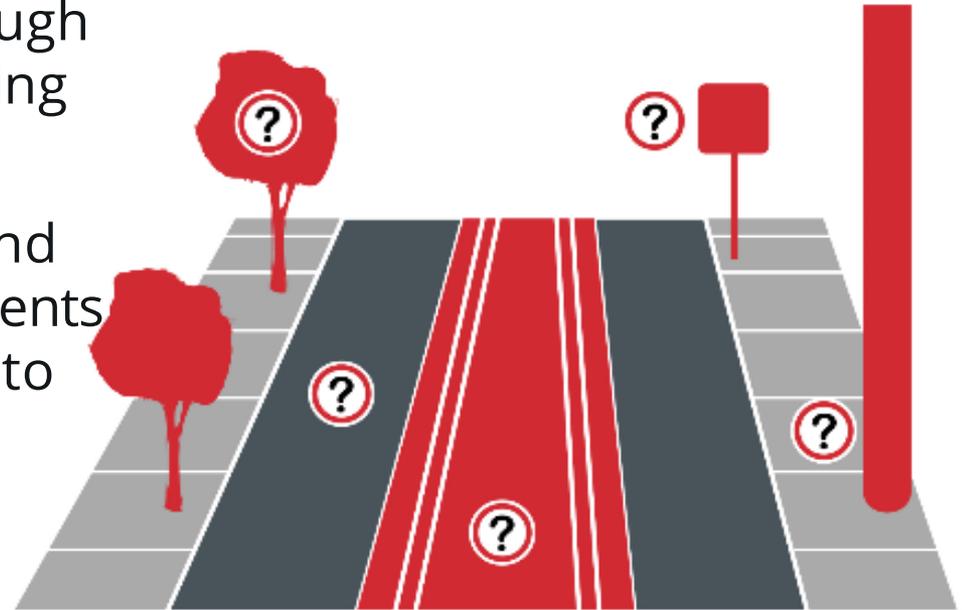
- Share what we've heard and how it informed proposed concepts
- Gather input to help us evaluate proposed concepts
- Host virtual engagement through online workshops and The City's Engage Portal

Reveal

- Share what we've heard and how it informed functional planning
- Develop and share final recommendations with Calgarians

Segment 2 - Functional planning

- In segment 2 we are moving through a process called functional planning
- This is where we better understand the unique engineering requirements and any specific issues that need to be addressed to develop more detailed plans for the project
- The functional plan will be completed by spring 2021 and will set the stage for procurement in fall 2021





DBF

Design-Build-Finance

- The City will be using a design-build-finance (DBF) delivery model, **which means that the detailed design process is completed by the contractor**



Planning the Bow River Bridge



Bow River LRT bridge timeline



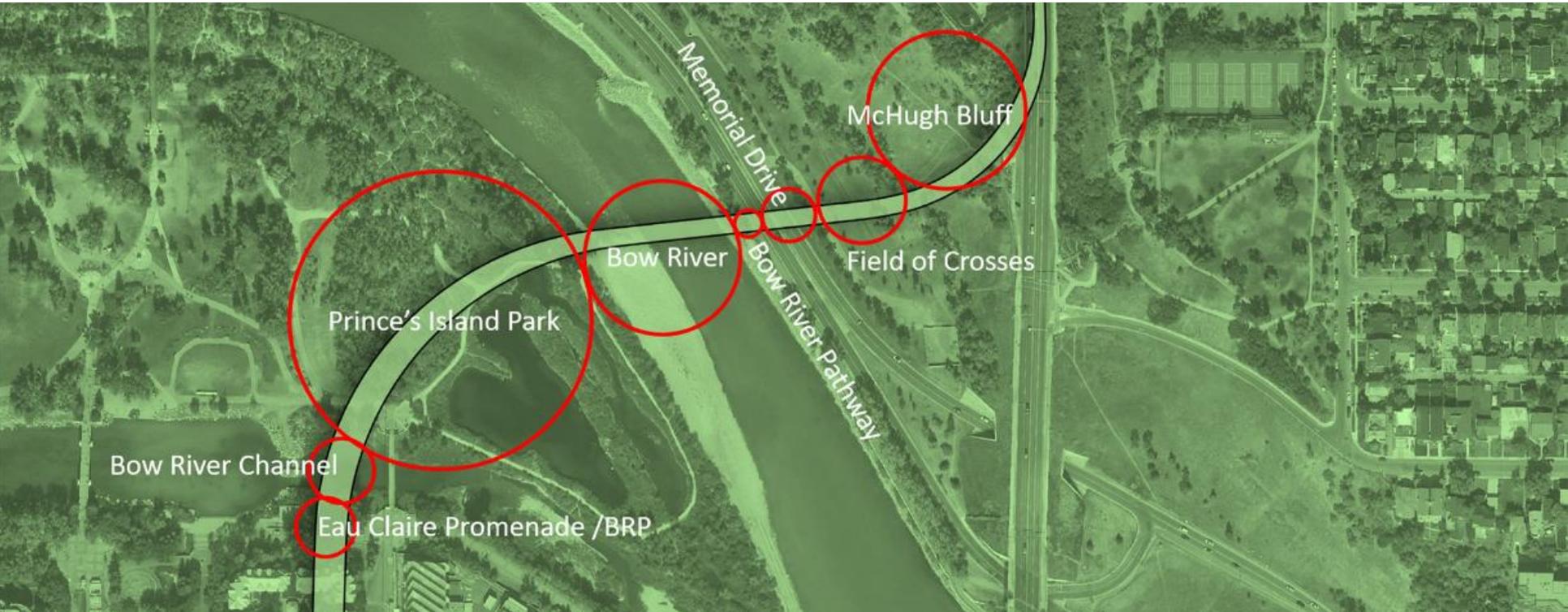


Planning & Design Objectives

- Minimize impacts to views
- Incorporate thoughtful bridge architecture
- Maintain the experience of the Bow River pathway system & Prince's Island Park
- Integrate LRT infrastructure with public realm
- Support continued vibrancy of cultural, social & community activities in the area



Bow River bridge Alignment





Bow River Bridge Planning Guidance

Local Context



Prince's Island Bridge – Jaipur Bridge



Centre Street Bridge



Peace Bridge

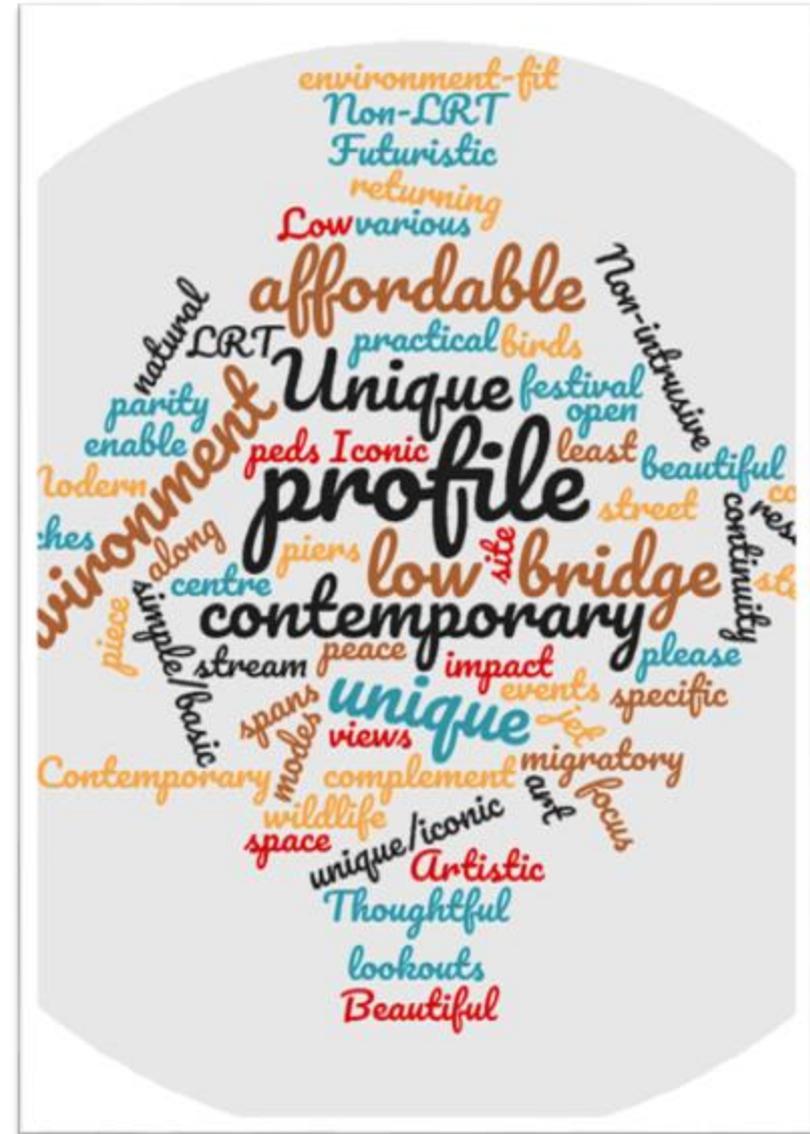


George C. King Bridge



Stakeholder Sentiment

- visually appealing
- low-profile bridge that fits well into the environment
- supports multiple types of users - walk and wheel alike
- integrates people and places into the surrounding area
- focal point for views
- gathering place that builds a fantastic urban environment in Calgary's downtown

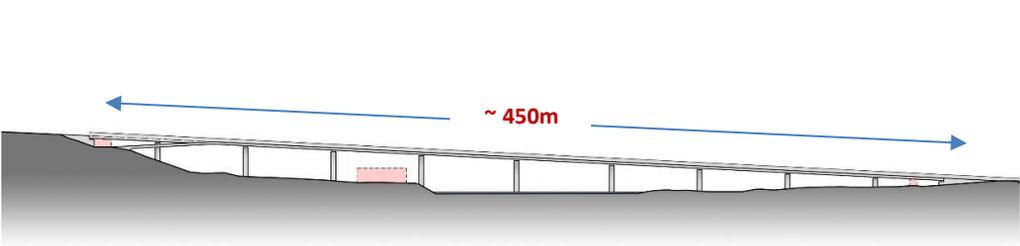




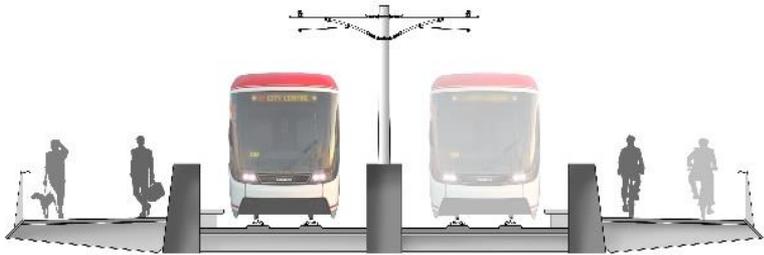
Bridge Form and Multi-Use Pathway

Bow River bridge

General architectural form



Multi-span viaduct



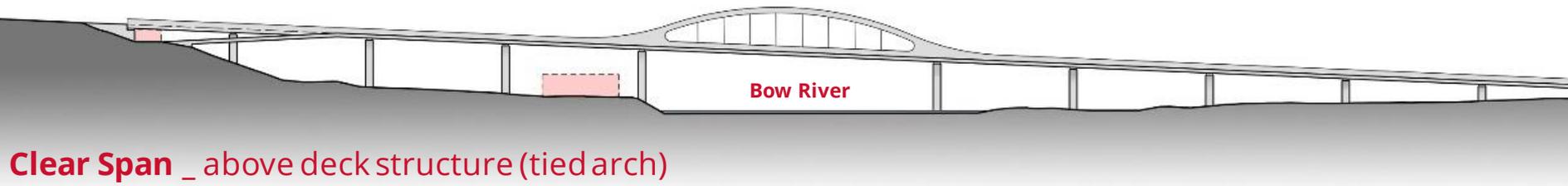
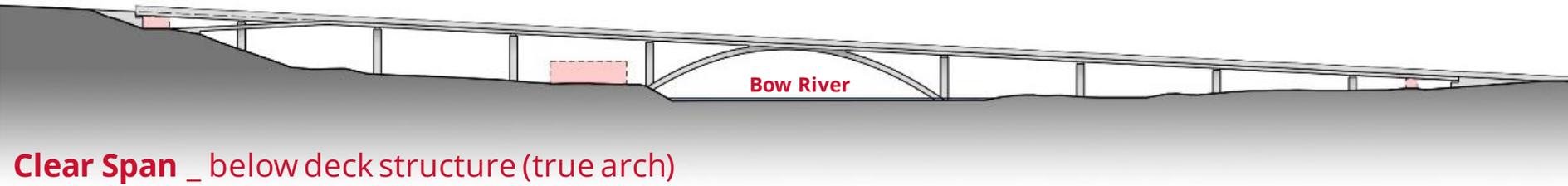
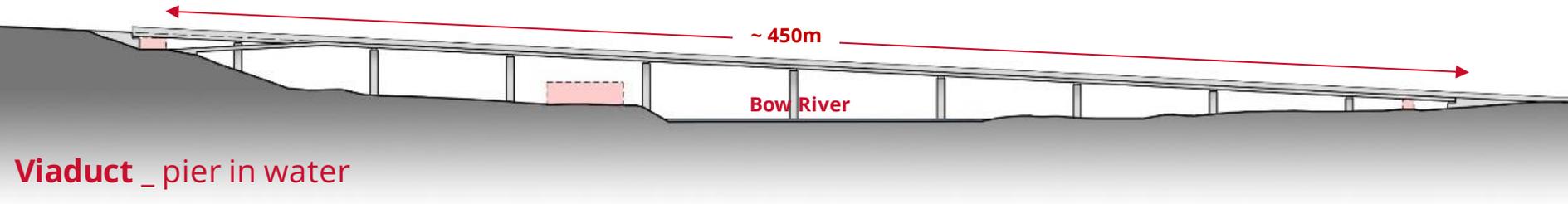
Multi-use pathway & LRT (2 paths)





Bow River Bridge

Architectural Form (Bow River Span)





Main Span Types

Bridge over Bow River





What we heard through engagement (surveys and workshops)

Community input on four questions

1. How will we know if the new Bow River LRT bridge is a success for the city and Calgarians?
2. Based on a comparison of the features, tell us which bridge form you think is best for Calgary and why?
3. Which bridge form best complements the surrounding area and why?
4. Tell us your ideas for ensuring that the multi-use pathways on the bridge provide a safe and enjoyable experience for all users

How will we know the bridge is a success?

- Provides a **safe and efficient LRT experience** that meets City needs for generations to come
- Fully **integrated into the City's sustainable transportation network**
- **Strengthens connections** between communities and the Centre City
- Provides **new opportunities for active transportation**
- Encourages the **safe movement of pedestrian and wheels** for recreation and commuting
- **Protects the natural environment** and Prince's Island Park
- Provides a **sense of pride for Calgarians**; a gathering place loved and used by all
- A bridge that is **visually pleasing from all perspectives** - from surrounding communities and complementing the City's other bridges



Preference for below deck structure

Top themes and # comments	Quotes
Design – general comments: low-profile view, positive architectural addition, aesthetically pleasing (36 comments)	Cleaner design, and it avoids a pier in mid channel on the Bow (which is less disruptive to aquatic life and safer for river users).
Views – maintaining views, highlighting the skyline, unobstructed river view, views from above and below the bridge (30 comments)	I prefer the Bridge River Span Below Deck as it doesn't interrupt the river flow , is cleaner looking and doesn't obstruct views from the train.
Impact on water flow: environmental and aesthetic considerations (24 comments)	Bridge river span below deck. This does not interfere with the Bow River yet is sleeker than the bridge with the above deck span. It is more environmentally acceptable than the pillar bridge which has a pillar in the river.



Illustrative only, for discussion



Preference for above deck structure

<p>Design – general comments (19 comments)</p>	<p>Design is more interesting with the arches rather than a flat design. Nice contrast to the other bridges across the river in that area i.e., 10 Street and Centre Street.</p>
<p>Positive feedback – general comments (11 comments)</p>	<p>More instantly recognizable and potentially iconic.</p>
<p>Iconic design: landmark, gateway, sense of place, destination, statement piece (8 comments)</p>	<p>Having architecturally attractive design will help define how modern Calgary is. Similar to how attractive the peace bridge is.</p>



Illustrative only, for discussion



Viaduct - comments

Integrate into context:
complement existing built
environment/architecture;
subtle design **(2
comments)**

Because the design fits in with the natural
environment around it. The structure does not
compete with nature, it fits in with nature's flow.

Views: maintaining views **(2
comments)**

This option is minimalistic and will detract the least
from the view too and from Prince's Island.





Multi-use pathway top themes

Thinking about how you might use the multi-use pathways, please tell us your ideas for ensuring that the pathways provide a safe and enjoyable experience for all users.

Physical separation between transportation modes	Physically separated, dedicated and well- marked lanes for people walking and wheeling to avoid conflict; desire for separation between active modes and transit lanes
Safety	Well lit, security cameras
	Non-slip surface, proper width, gentle grade
Wider pathways	Generous width for pathways (e.g., 4 metres) to accommodate many active modes
	Incorporate elements for pleasant experience for active modes, e.g., plants, viewing bays, benches



Bridge Form Evaluation and Selection



Bridge form evaluation criteria

- Framework developed to evaluate and compare bridge forms for further planning and design in RCD
- Framework criteria include (no particular order):
 - Environment
 - Connects people and places
 - Improves mobility
 - Cost and value (capital and operating)
 - Constructability and risk (including safety)
 - Urban and regional development



Bow River Bridge

Architectural Form (Bow River Span)

Evaluation Theme	Viaduct	True Arch	Tied Arch
			
Improving Mobility	-	-	-
Connecting People and Places	-	-	-
Urban and Regional Development	-	-	-
Environmental	X	-	-
Risk and Constructability	X	-	-
Cost and Value	-	-	-

Selected forms to carry forward into next phase of design

Bow River bridge Main channel span



Multi-span viaduct (pier in river)



Above deck arch (tied arch)



Below deck arch (true arch)

Bridge form recommendation

- **Below deck structure** will be carried forward into the next stage of planning and design



Illustrative only, for discussion

Bridge form recommendation

- **Above deck structure** will be carried forward into the next stage of planning and design



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Bridge Multi-use Pathway

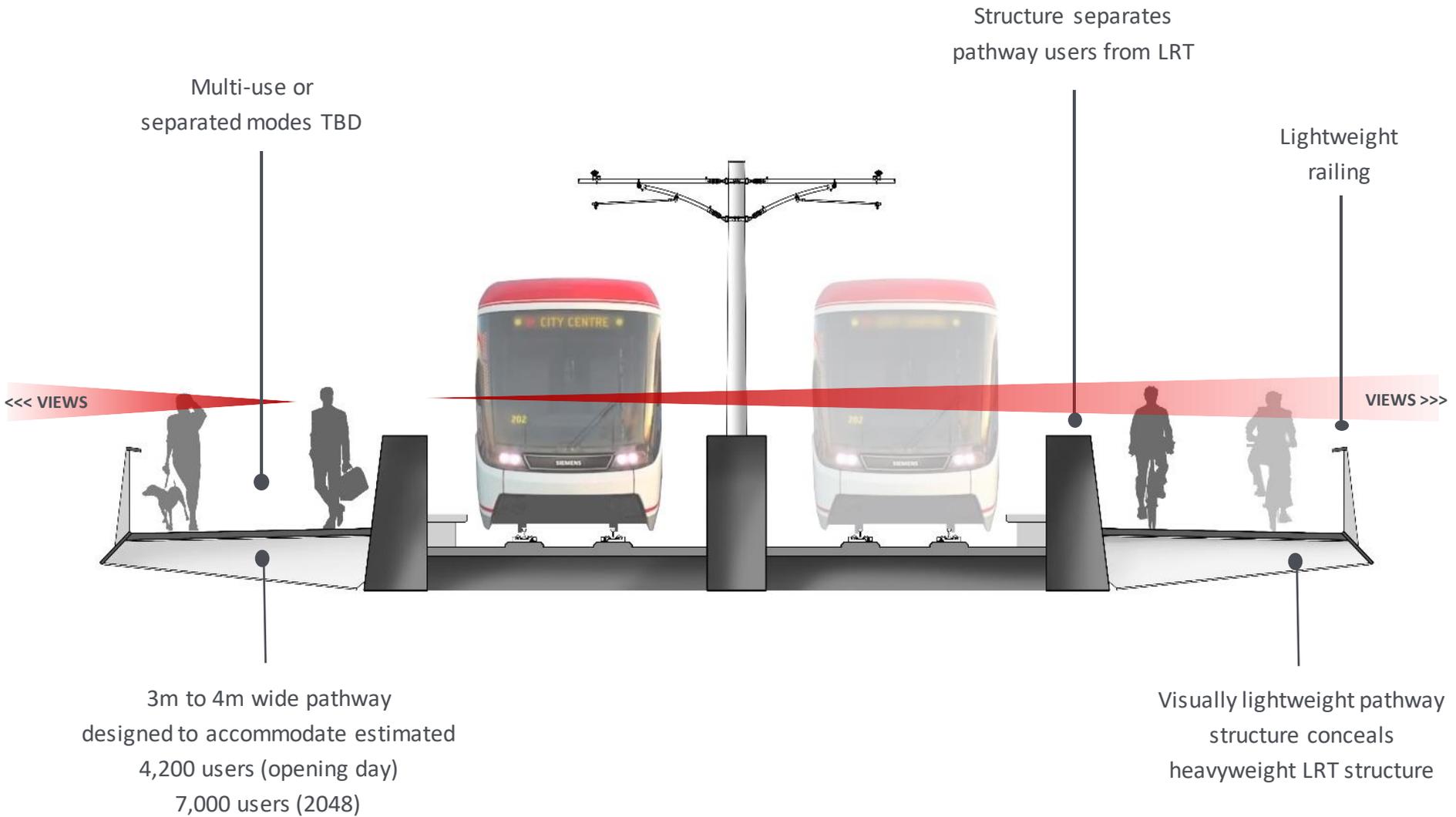
Bridge multi-use pathway

3 - 4 metre MUP is planned on each side of the LRT





Bow River bridge Multi-use pathway design





Bow River bridge

Multi-use pathways (experience)



View west to Rockies and sunset



View over Prince's Island Park Lagoon



View over Field of Crosses



View to Centre Street Bridge

Bridge Environmental & Permitting



Environmental Permitting and Approvals*

Federal

Fisheries Act

Canadian
Navigable Waters
Act

Migratory Birds
Convention Act

Species at Risk Act

Provincial

Water Act

Public Lands Act

Historical
Resources Act

Alberta Wildlife Act

Municipal

Biophysical Impact
Assessment

Tree Protection
Plans

Restoration Plans

Other City
Guidelines &
Requirements



General Permitting Approach

- Initial field surveys and reporting has been completed to support alignment discussions
- Anticipate regulatory submissions to Government of Alberta and Government of Canada to be completed by selected contractor as part of detailed design





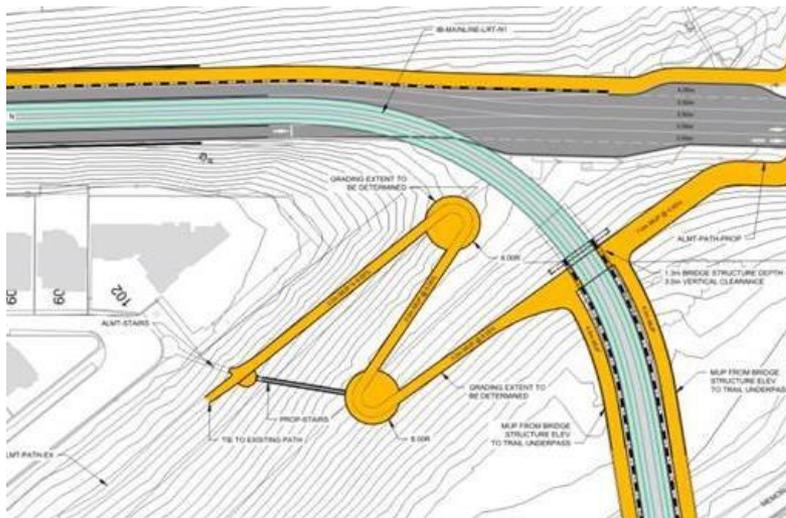
Biophysical Impact Assessments (BIA) (Municipal)

- BIA reports reviewed by City of Calgary Parks
- BIA Objectives:
 - Describing the existing biophysical conditions (vegetation, wildlife, fish habitat, etc.)
 - Identify potential effects of project on environment
 - Provide mitigation recommendations for construction and guidance for restoration planning
- Green Line Segment 2 BIA to be completed in two parts:
 - Preliminary BIA: underway to inform tender package
 - Final BIA: to be completed with detailed design

Bridge Landings & Pathway Connections

Bow River Bridge

Multi-Use Pathway Connections



North (Crescent Heights)
Pathway Connection



South (Eau Claire Landing)
Pathway Connection

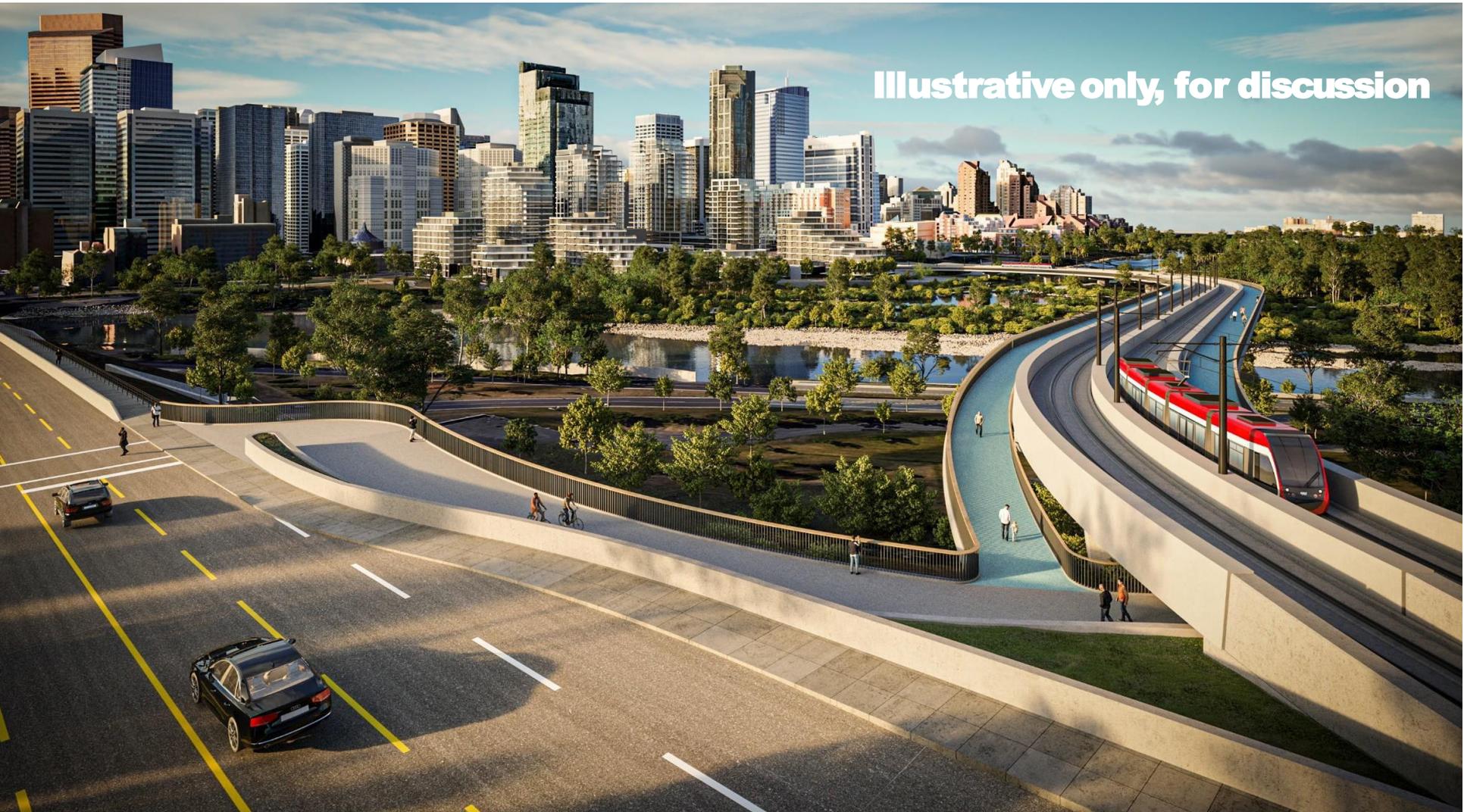
North Landing Crescent Heights connection

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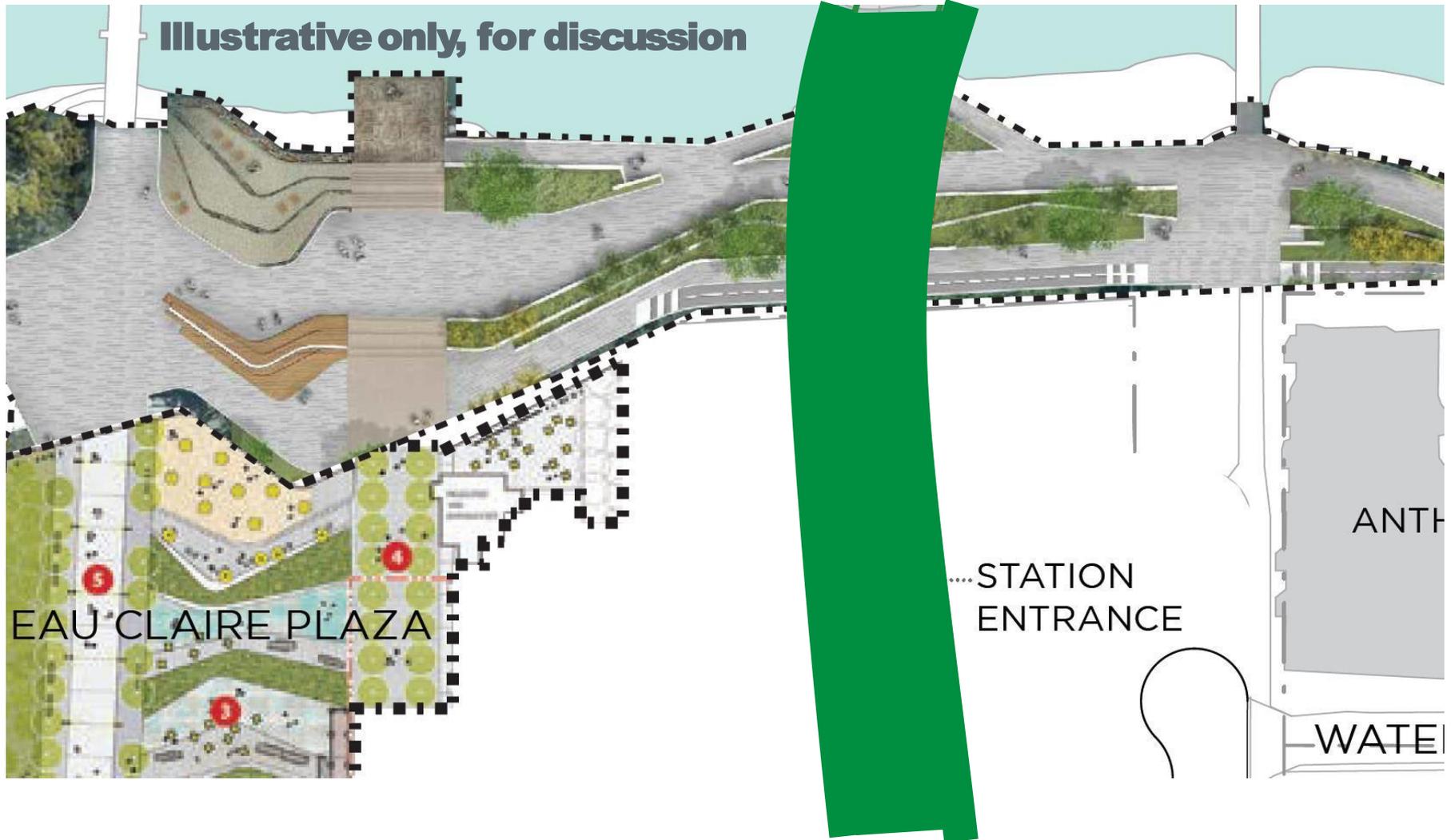
North Landing Crescent Heights connection

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Eau Claire Landing

Various Public Realm Improvement Projects



Eau Claire Landing Various Solutions Explored



Lower pathway elevation



Shift portal north into island



Pathway 'up and over' portal

Selected Solution



Shift 2 Avenue Station south

Eau Claire Landing

Proposed “Up and Over” Solution

Design goals:

- 1) Provide a strong east/west river pathway experience
- 2) Accommodate all modes (walk, wheel), abilities and anticipated volumes (~10,000 daily)
- 3) Connect 2 Avenue station & Bow Bridge pathway with Promenade, Eau Claire Plaza and Prince’s Island Park
- 4) Provide adequate rest areas along the route
- 5) Make the area a destination, not a detour

Eau Claire Landing Proof of Concept Design



Oblique View

Eau Claire Landing Proof of Concept Design



Illustrative only, for discussion

Primary Accessible & Wheeling Routes

Eau Claire Landing Proof of Concept Design



Primary Pedestrian Routes

Eau Claire Landing Proof of Concept Design



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Formal & informal gathering places

Eau Claire Landing Proof of Concept Design



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View from Lagoon Beach to East



Eau Claire Landing Proof of Concept Design

Illustrative only, for discussion



View from existing 2 Street bridge to south

Eau Claire Landing Proof of Concept Design

Illustrative only, for discussion



View from 2 Street to north



Eau Claire Landing Proof of Concept Design

Illustrative only, for discussion



View from 2 Avenue Station Entrance – Facing NW



Eau Claire Landing Proof of Concept Design

Illustrative only, for discussion



From portal roof to staircases, overlook, Prince's Island Park and new Bow Bridge



Eau Claire Landing Proof of Concept Design

Illustrative only, for discussion



Low oblique view of overlook, bridge pathway, promenade, beach

Next Steps

- Bow River Bridge Plan report to Green Line Committee
- Initiate reference concept design
 - Advance engineering and design of bridge form and span options (above and below deck arches)
 - Advance pathway design (widths, modal separation, user experience, connections)
 - Establish technical, urban design and visual performance requirements for bridge
 - Confirm procurement and construction timelines
- Continue communication with the public and stakeholders. Additional opportunities for engagement to be explored



Questions & Answers



The End

Thanks for attending

April 20, 2021

