



# 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

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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**.

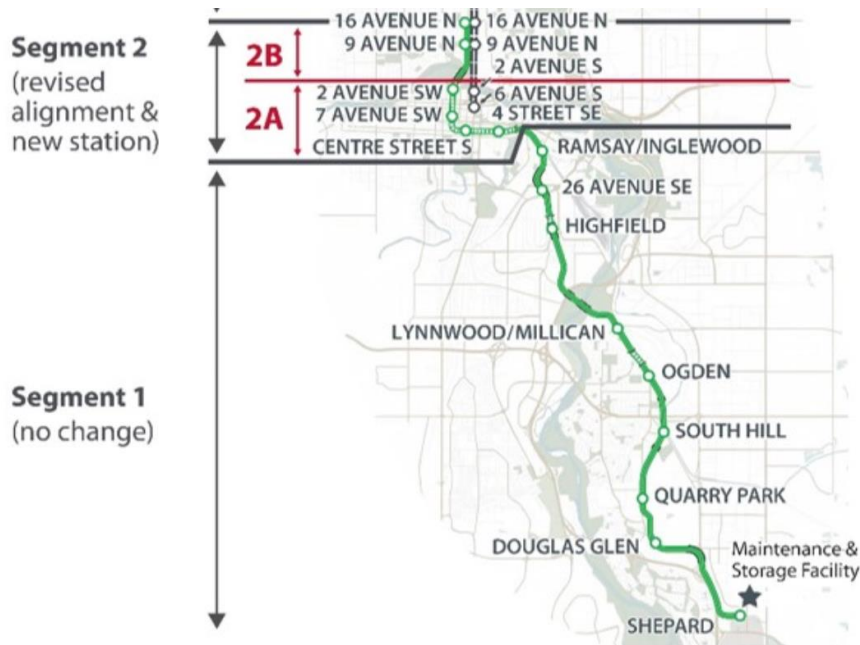
## Once built out, the entire Green Line will:

- 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**



**We are here**

- 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

October



### 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

November–December



### Explore

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

## 2021

January–February



### 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

March–onwards



### Reveal

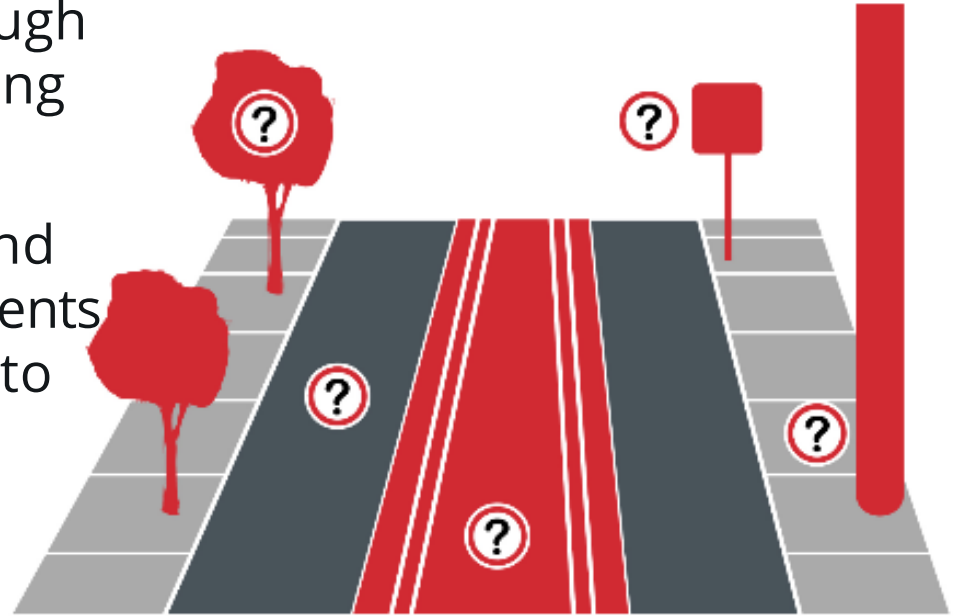
- Share what we've heard and how it informed functional planning
- Develop and share final recommendations with Calgarians

We are here



## 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



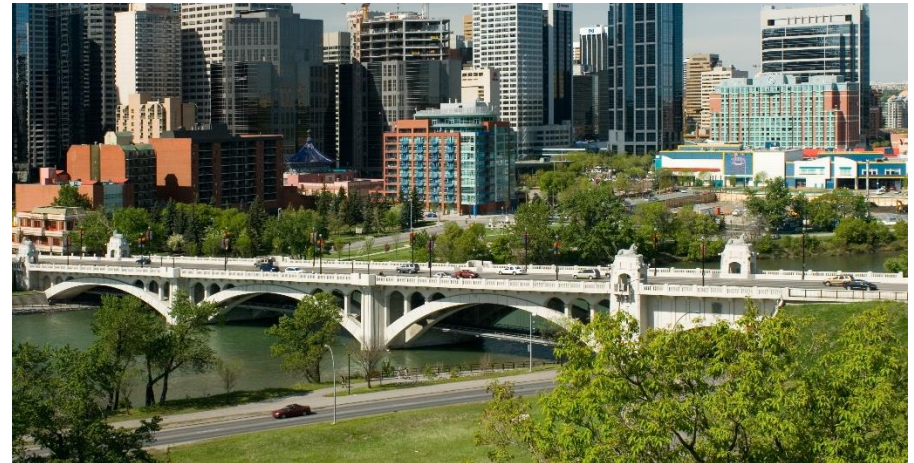


# Bow River Bridge Planning Guidance

## Local Context



Prince's Island Bridge – Jaipur Bridge



Centre Street Bridge



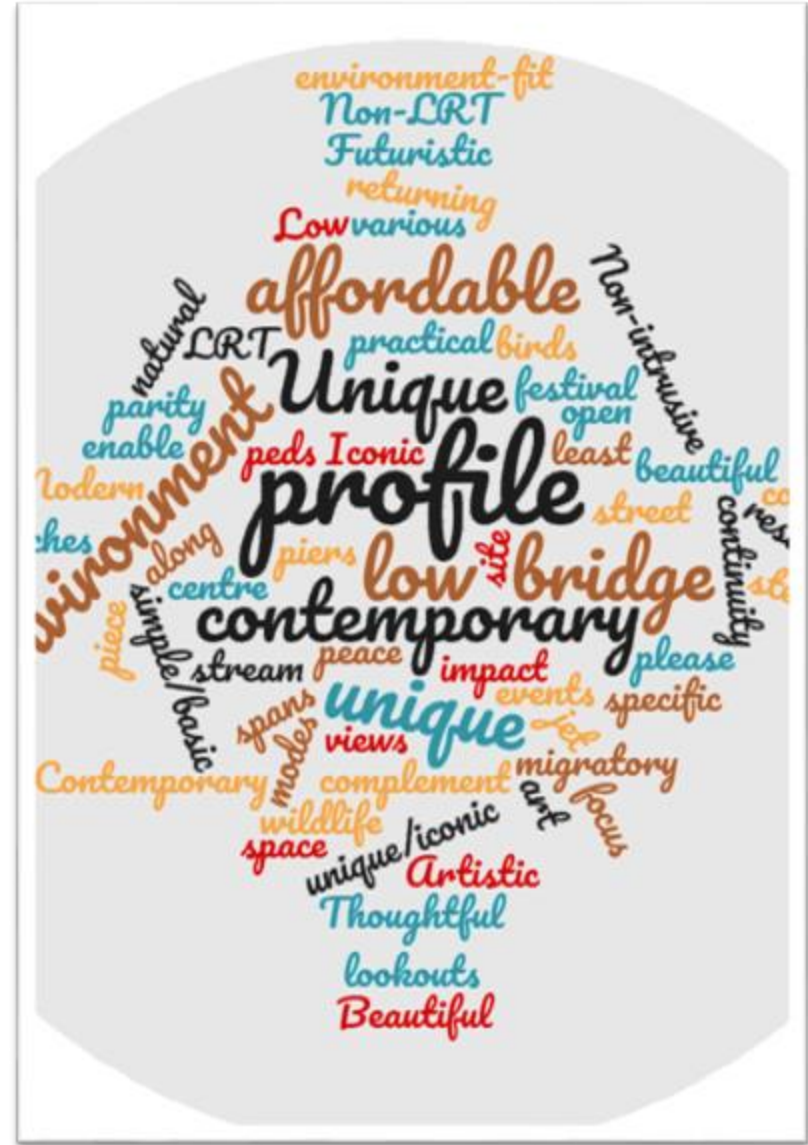
Peace Bridge



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



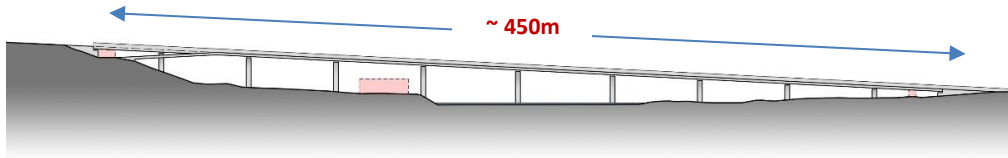


# Bridge Form and Multi-Use Pathway

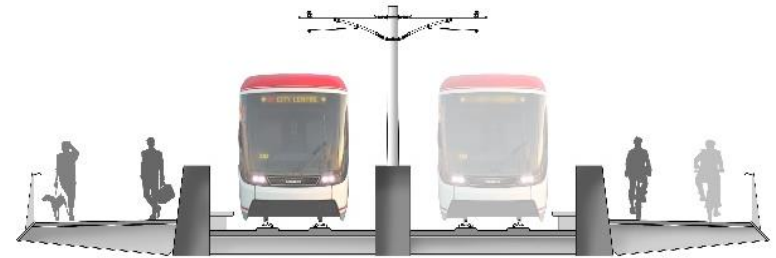


# Bow River bridge

## General architectural form



Multi-span viaduct

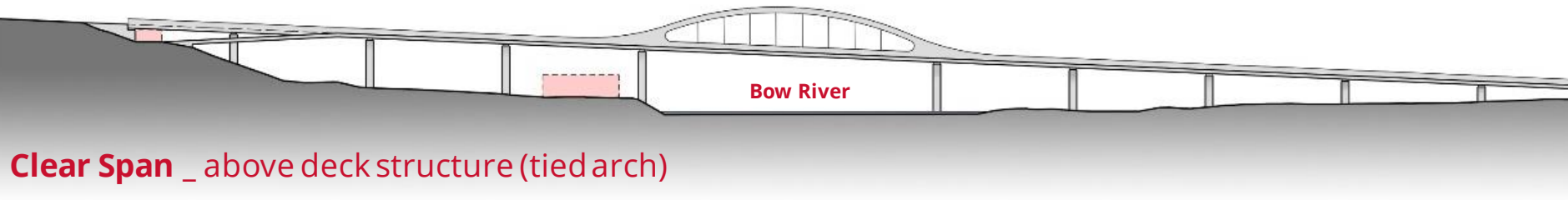
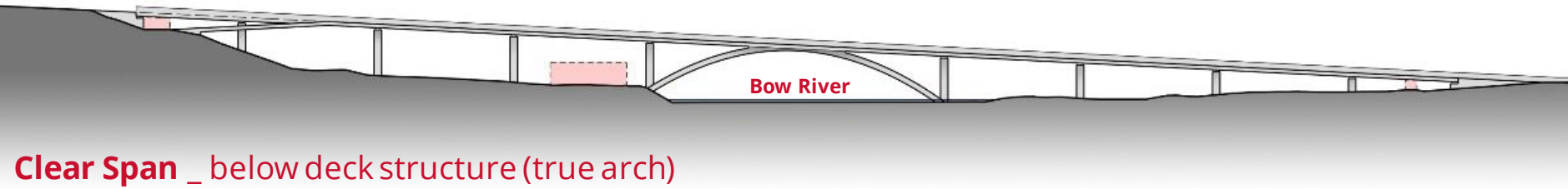
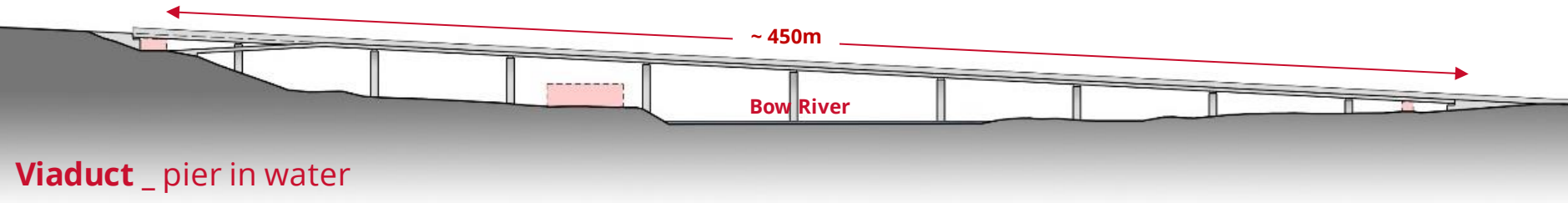


Multi-use pathway & LRT (2 paths)



# 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 <b>(36 comments)</b>	Cleaner design, and it <b>avoids a pier in mid channel on the Bow</b> (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 <b>(30 comments)</b>	I prefer the Bridge River Span Below Deck <b>as it doesn't interrupt the river flow</b> , is cleaner looking and doesn't obstruct views from the train.
Impact on water flow: environmental and aesthetic considerations <b>(24 comments)</b>	Bridge river span below deck. This <b>does not interfere with the Bow River</b> 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.





# Preference for above deck structure

Design – general comments <b>(19 comments)</b>	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.
Positive feedback – general comments <b>(11 comments)</b>	More instantly recognizable and potentially iconic.
Iconic design: landmark, gateway, sense of place, destination, statement piece <b>(8 comments)</b>	Having architecturally attractive design will help define how modern Calgary is. Similar to how attractive the peace bridge is.



**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



**Illustrative only, for discussion**





# 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

Multi-use or  
separated modes TBD

Structure separates  
pathway users from LRT

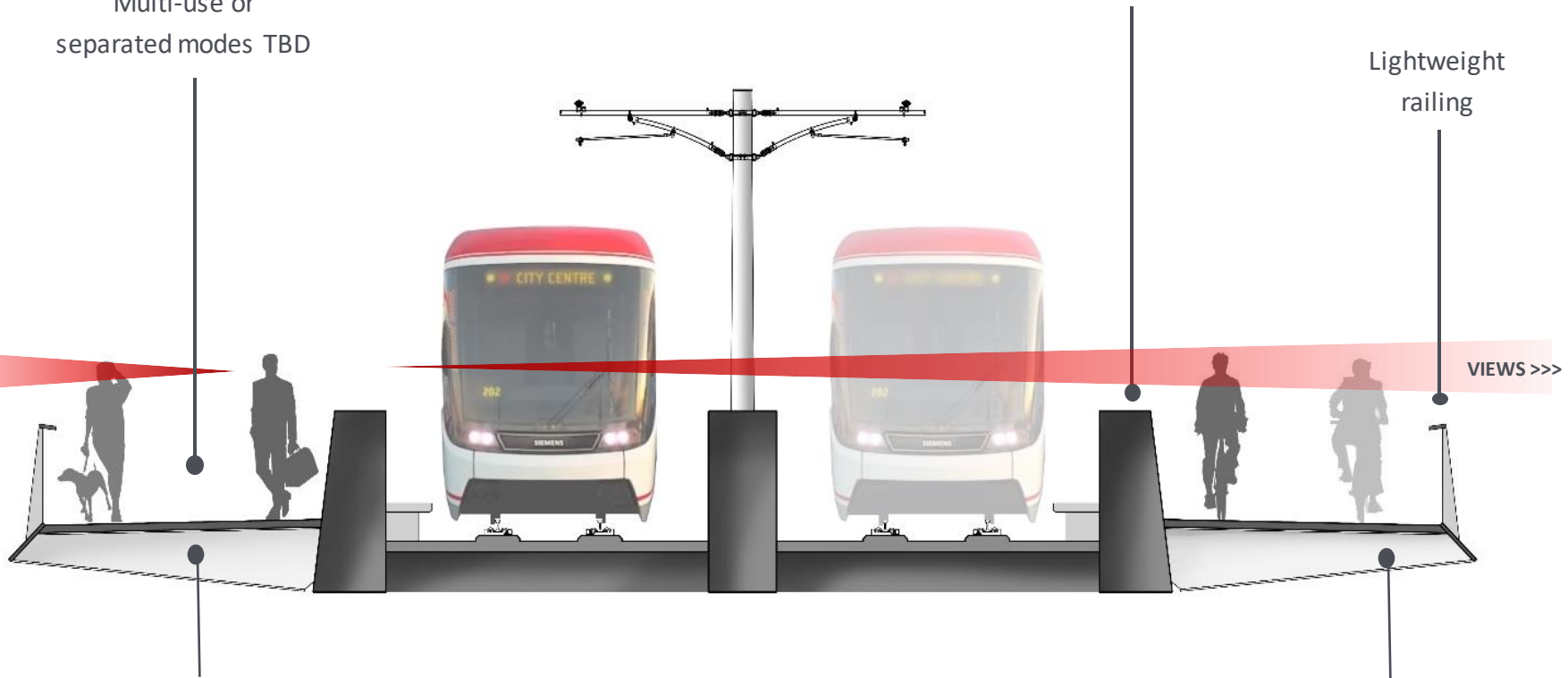
Lightweight  
railing

<<< VIEWS

VIEWS >>>

3m to 4m wide pathway  
designed to accommodate estimated  
4,200 users (opening day)  
7,000 users (2048)

Visually lightweight pathway  
structure conceals  
heavyweight LRT structure





# 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





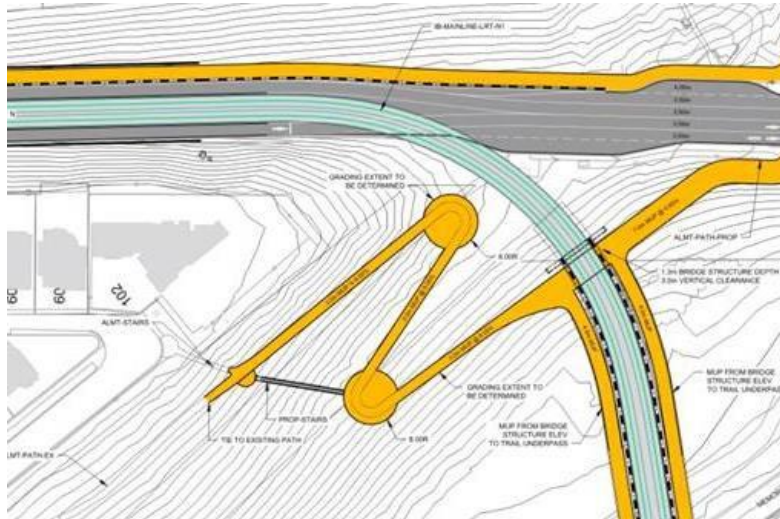
## Biophysical Impact Assessments (BIA) (Municipal)

- 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

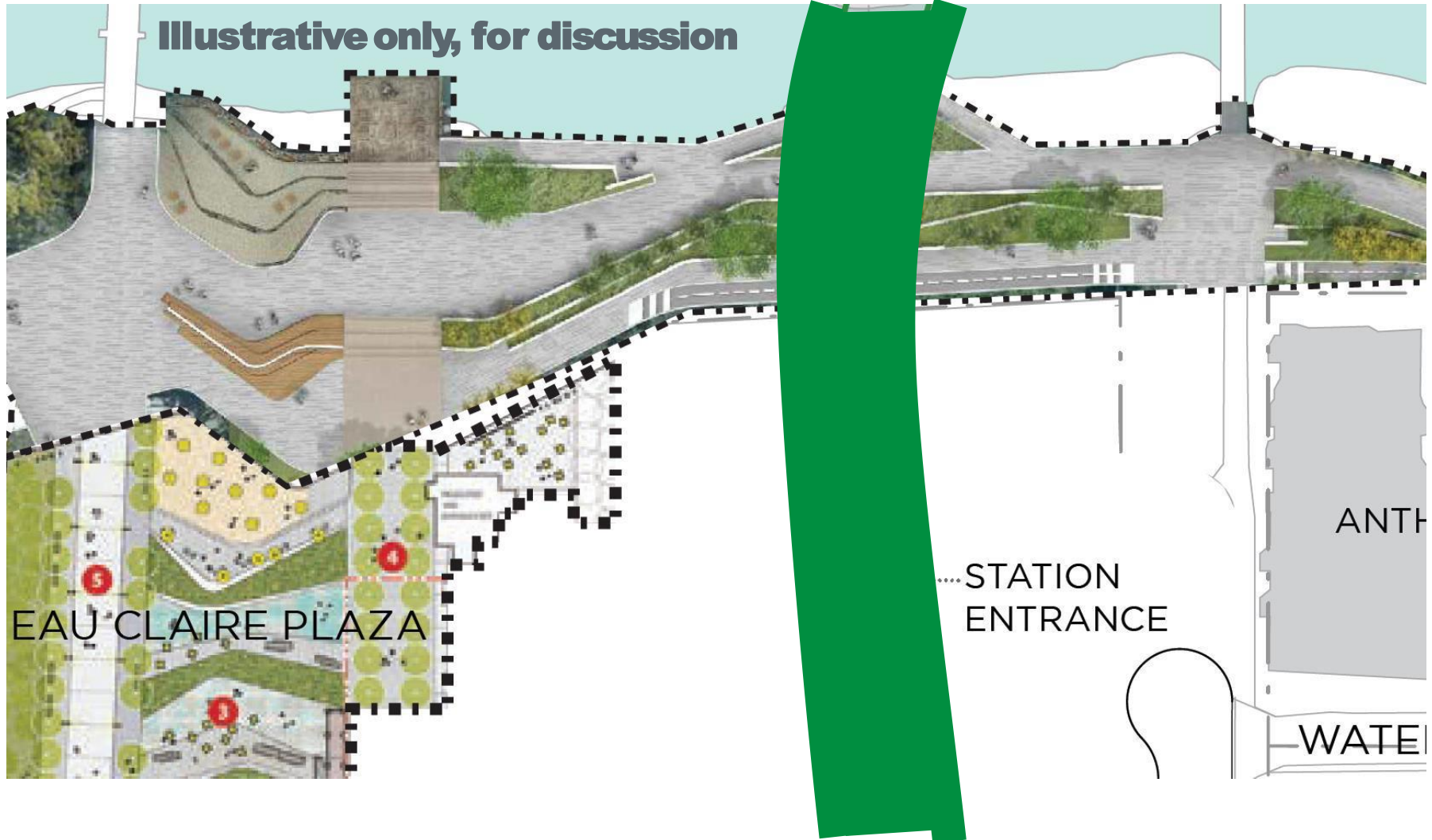
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# Eau Claire Landing

## Various Public Realm Improvement Projects



# Eau Claire Landing Various Solutions Explored



Lower pathway elevation

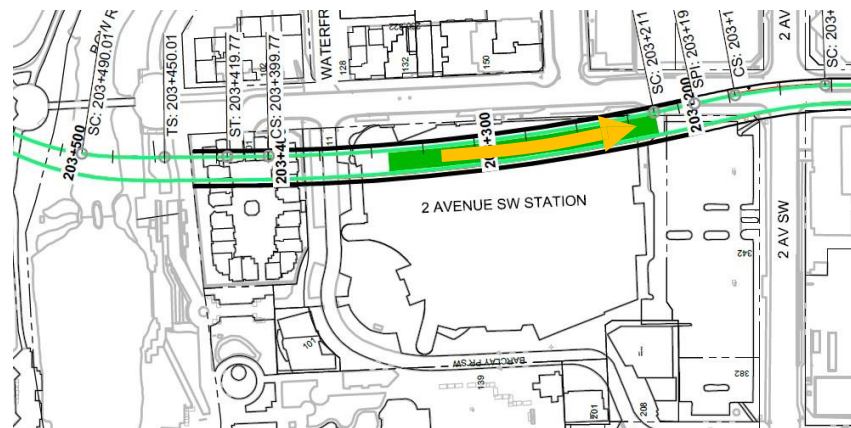


Shift portal north into island



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

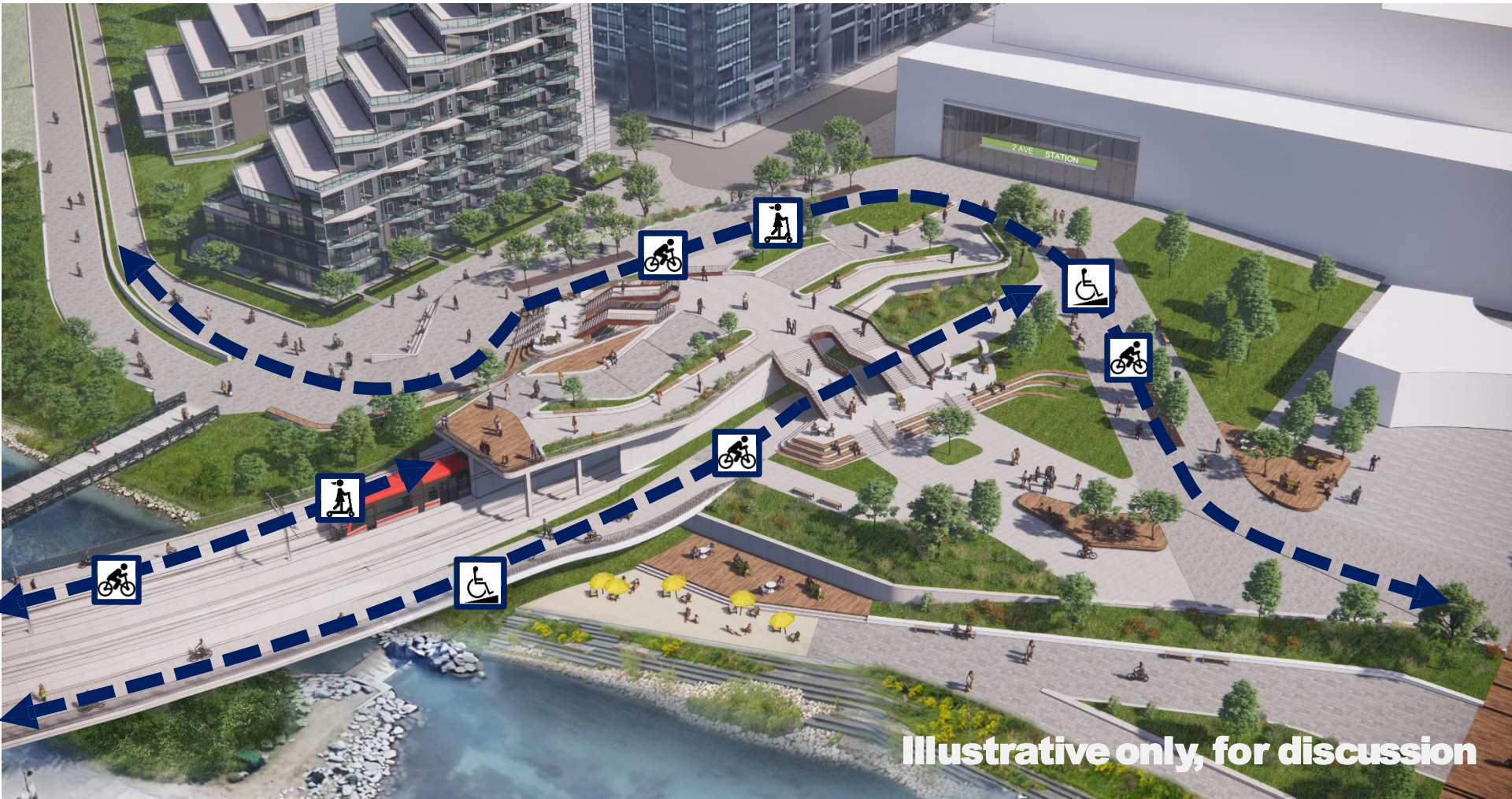


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Oblique View



# Eau Claire Landing Proof of Concept Design



Illustrative only, for discussion

Primary Accessible & Wheeling Routes



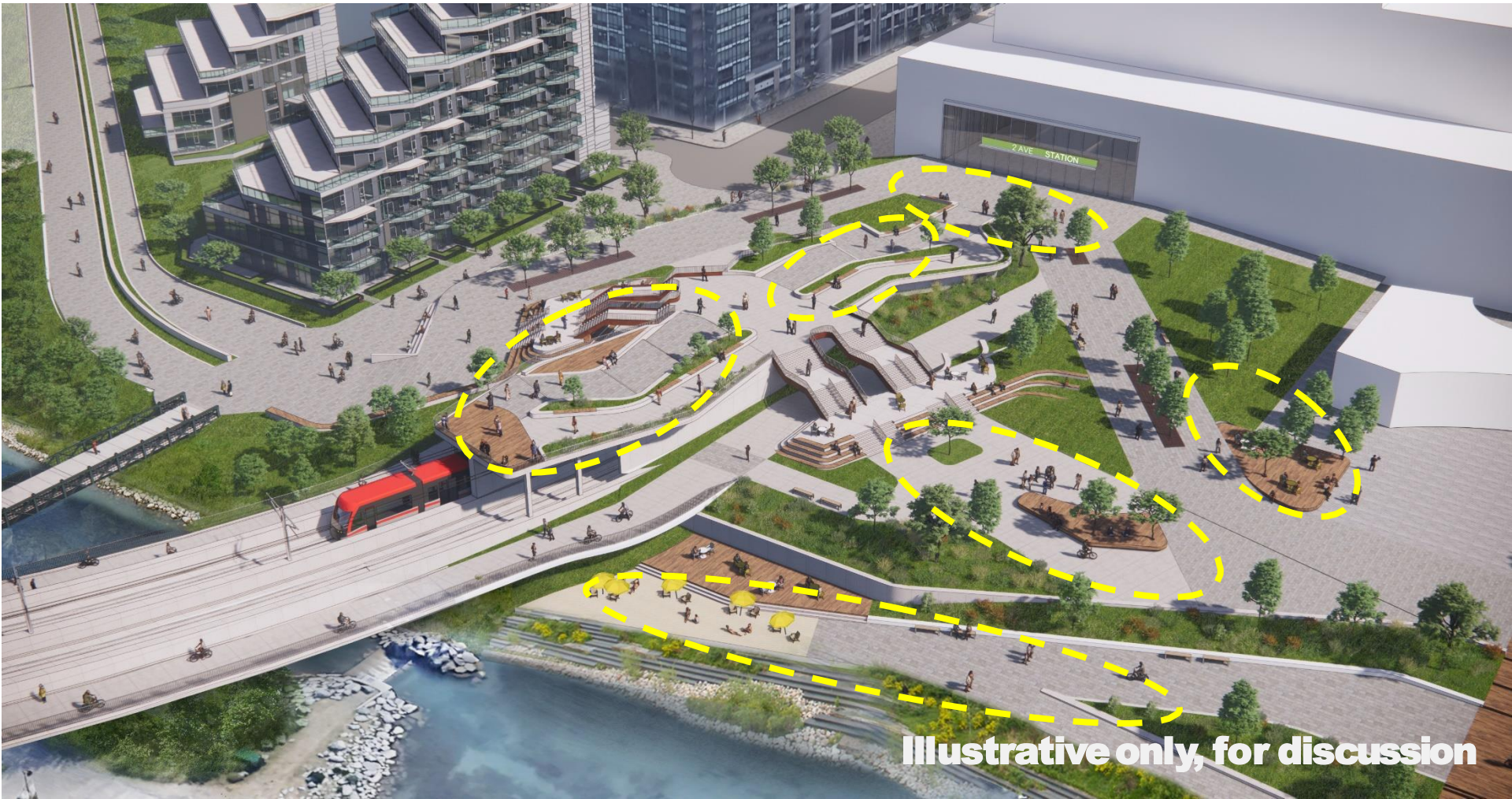
# Eau Claire Landing Proof of Concept Design



Primary Pedestrian Routes



# Eau Claire Landing Proof of Concept Design



Formal & informal gathering places



# Eau Claire Landing Proof of Concept Design



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

