



Bow River Bridge Plan | Green Line LRT

May 2021

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Executive summary

The new Bow River LRT bridge will provide the critical link to connect the Green Line LRT with Calgary's north central and southeast communities. The bridge will also provide new opportunities for those who walk and wheel, connecting Crescent Heights with Eau Claire, Chinatown and the Downtown Core.

In June 2020, City Council approved the updated plan for the Green Line LRT. This new plan outlined the vision for an LRT bridge that crosses Prince's Island Park and the Bow River. As part of Council's approval of the updated Green Line plan, Administration was directed to continue planning and engagement for the Bow River LRT bridge and to report back to the Green Line Committee with the Bow River LRT Bridge Plan in spring 2021.

As outlined in the Segment 2 Concept Report, the next stage of bridge planning was to focus on:

- Refining the bridge alignment and configuration
- Determining if the pathway is situated on the top deck, bottom deck, or on the side of the bridge
- Seeking public input on bridge architecture objectives
- Developing a preferred bridge architectural concept

This document presents the outcome of the Bow River bridge planning work and engagement completed to date and has been organized into four key sections.

1. **Planning guidance** – outlines the overarching principles, objectives, guiding documents and stakeholder & public input that has been used to advance the planning for the Bow Bridge.
2. **Bridge architecture** – describes the bridge alignment, general architectural form, approach for crossing the Bow River main channel and multi-use pathway arrangement.
3. **Multi-use pathway experiences and connections** – describes the design intent for the pathway, public feedback on potential features or amenities to be included in the detailed design, and conceptual renderings that show how the bridge and pathways will connect into the communities of Crescent Heights and Eau Claire.
4. **Next steps** – reviews the next steps required to advance the planning and design of the Bow River Bridge.

Planning guidance

This section summarizes the inputs that were used to develop the Bow River Bridge Plan. These include overarching design principles, planning and design objectives, guiding Council-approved documents, and stakeholder and public input received through the 2020 to 2021 engagement process.

Planning & design objectives

Six overarching planning and design objectives, outlined below, were established in spring 2020 and included in the Green Line concept report that City Council approved in June 2020. These objectives have guided the overall bridge planning process and will be used in the next stages of bridge planning and design.

- Provide continued functionality and experience of the river pathway and Prince's Island Park
- Minimize impacts to views
- Incorporate flexibility for thoughtful bridge architecture options
- Minimize environmental impacts
- Mitigate construction impact to users of Prince's Island Park and the surrounding area
- Consider strengthened connectivity for people who walk and bike

Design principles

Building on the six planning and design objectives, public and stakeholder engagement was used to develop design principles that will be used to further guide the planning and design of the Bow River LRT bridge.

- **Sustainable transportation choices** – the bridge will provide a safe, accessible and efficient transportation experience prioritizing LRT while accommodating pedestrians and other non-motorized wheel modes.
- **Protecting view corridors** – a low-profile bridge form will ensure that views along the river valley and skyline are maintained.
- **Protecting the environment** – the bridge form and its construction will respect and protect the natural environment along the Bow River and across Prince's Island during construction and future LRT operation.
- **Context sensitive form** – the bridge form will complement its unique location, including how it crosses the Bow River, the history and character of the Centre Street bridge, Prince's Island Park and the promenade, and surrounding landscapes.
- **Accessible and connected** – the new bridge will be safe and accessible to pedestrians and wheeled modes, providing a new connection for those travelling across the Bow River to get to where they live, work and play.

- **Community pride** – the new bridge will be a place for Calgarians to meet, to socialize and to celebrate their community.

Public and stakeholder input

Engagement on the new Bow River LRT bridge was held between October 2020 and April 2021 over two phases of engagement and one phase of information sharing. Throughout the project, we engaged with residents and Calgarians at-large, community associations, business improvement areas, local business owners, special interest groups and ward offices. Throughout all phases of engagement, we held 13 public and stakeholder sessions, four meetings of the stakeholder working group and two online surveys. In total, over 57,000 people were made aware of the project through our communications campaigns, we connected with over 1,004 participants through our engagement opportunities and received over 1,154 ideas and contributions across all phases.

Through engagement, citizens shared a variety of visions for the new Bow River LRT bridge, from distinctive to low-key, including:

- A desire for a bridge that incorporates convenient access points
- An interest in multimodal bridge that is safe and comfortable for people walking and wheeling
- Functional features including viewpoints and resting areas
- A desire for environmentally sensitive design that does not encroach on Prince's Island Park

We heard that a successful bridge is one that creates multi-use pathways that support active transportation and accessibility; considers the environment by reducing impact on river flows and that is complementary with the natural surroundings while maintaining Prince's Island Park for recreational use; and supports mode shift and increased ridership by encouraging more people to take transit, thereby helping to reduce traffic congestion.

The input received through public and stakeholder engagement was used to develop the design principles for the bridge and evaluate the Bow River main span form, and will be used in future stages of planning and design as details on the pathway experience and bridge urban design features are defined.

Bridge architectural concept

This section describes the design strategies that informed the planning of the Bow River bridge, the refined alignment, architecture concept, approach for crossing the Bow River main channel and multi-use pathways.

Design strategies

The design strategies that were used to guide the planning and design of the Bow River Bridge are as follows:

LRT operating requirements

- Accommodate LRT operating requirements in the bridge design.
- Maintain a low slope and gradual curves to support safe and efficient LRT operations.
- Accommodate the weight and vibrations of the LRT with an adequate thickness of bridge structure and piers.
- Ensure the bridge structure is designed to be above the 1 in 100-year flood elevation.
- Ensure the bridge design protects the adjacent LRT tunnel from 1 in 200-year flood events.

Walking and wheeling requirements

- Include a multi-use pathway on the bridge.
- Maintain a low slope to ensure the bridge is accessible for all pathway users.
- Ensure the pathway width accommodates a safe and comfortable space for walking and wheeling.

Prince's Island Park users

- Maximize the clearance between the park surface and bottom of the bridge deck to allow park users to comfortably pass under the bridge.
- Consider the experience of park users in the design and aesthetic of the bridge ceiling.

Views

- Blend the bridge design into the surrounding environment and do not significantly impact skyline views.
- Minimize impacts to views from nearby residential buildings through the design.
- Ensure the design does not significantly alter or impact the views from below from the Bow River, Prince's Island Park and adjacent pathways.

Pathway connections

- Connect the bridge to other walking and wheeling connections:
 - In the north, connect the pathway to the McHugh Bluff pathway and Centre Street North; and
 - In the south, connect the bridge pathway with the Eau Claire Promenade and Bow River pathway system
- Integrate the bridge landing into the new Eau Claire Promenade and Downtown Flood Protection Project, scheduled to begin construction this year.

Environmental impacts

- Consider the potential impacts to birds, wildlife and the natural environment.
- Minimize upstream river effects by minimizing how much bridge structure is placed into the floodplain, which is most affected by flooding.
- Design does not impact flood resiliency and the benefits of the downtown flood barrier project.

Local context

- Ensure the bridge complements and does not compete with the aesthetics of surrounding bridges, such as the historic Centre Street Bridge.
- Connect and integrate the bridge into adjacent communities, notably Chinatown, Eau Claire and Crescent Heights.

Bridge alignment

A conceptual alignment for the Bow River bridge was included in the Segment 2 Concept Plan presented to City Council in June 2020. This Plan acknowledged that alignment variants were still being explored and would be refined through the next phase of planning. Over the past year, planning for the bridge has advanced and the alignment has been refined, as described below. It should be noted that the alignment will continue to be refined as the detailed engineering design for the bridge is completed.

The Bow River bridge connects the 2 Avenue LRT Station and downtown underground tunnel with Centre Street N., where the LRT will operate on the surface of the roadway. The bridge alignment is approximately 450m long and crosses a variety of built and natural environment features. In the south, the bridge landing interfaces with the soon to be constructed Eau Claire Promenade before crossing over the Lagoon, Prince's Island Park and the Bow River main channel. In the north end, the bridge crosses over the regional pathway, Memorial Drive and the west tip of Field of Crosses before landing on McHugh Bluffs, where the LRT will connect into Centre Street N. The height of the bridge increases across the alignment, where it sets out from the underground station at 2 Street, rises from a low elevation over Prince's Island Park and lands at a higher elevation on McHugh Bluff. Collectively, the location of bridge landings, landscape features and topography have all influenced the planning for the refined bridge alignment.

Over the past year, the alignment for the bridge was refined based on the updated design for the 2 Avenue Station. As planning for this station progressed, its north end shifted approximately 10m to the west from its original location contemplated in the concept design, increasing the space between the LRT alignment and adjacent housing. As a result, the location for the south end of the bridge shifted to match the 2 Avenue Station, which influenced the ultimate shape and orientation of its alignment.



The bridge follows a diagonal path over Prince's Island Park and the Bow River to connect the 2 Avenue Station with Centre Street N. LRT operating requirements require the tracks to have gradual curves and run along gentle slopes to allow for the most efficient movement of the train. As such, the bridge alignment follows a gradual s-shape across the landscape, comprising of a general southern curve, a short straight section in the middle (crossing the Bow River), and another general curve to the north. The s-shape allowed the length of the bridge to be extended, which was needed to keep the bridge deck at a gentle slope, less than 5%, to satisfy both LRT operating and pathway accessibility requirements. As an added benefit, the s-shape allowed the alignment to be designed to generally follow the border between Prince's Island Park's parkland and constructed wetland. This provides an opportunity to minimize impacts to the constructed wetland and to positively reinforce the border between the park's distinct landscape environments.



Conceptual rendering depicting the s-shaped curve of the bridge alignment (main span architectural form shown is the above deck, tied-arch).

Bridge Form

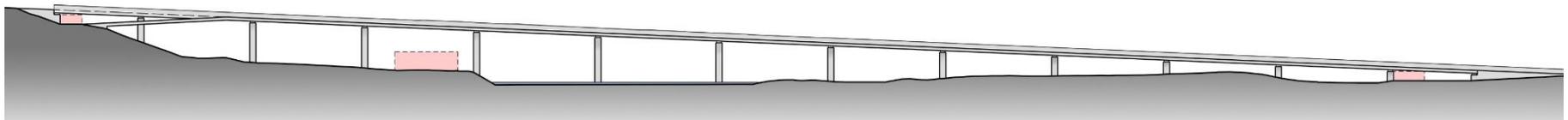
The Segment 2 Concept Plan presented to City Council in June 2020 acknowledged that the next phase of planning would establish the preferred architectural concept for the Bow River bridge, including the design for the multi-use pathway that will be incorporated into the bridge. This section describes the architectural concept including general form, span structural form, multi-use pathway arrangement and Bow River main span crossing design.

General form

At approximately 450m long, the Bow River bridge will be one of Calgary's longest bridges crossing the river valley. Given the length of this bridge, the structure will be a multi-span viaduct that uses a series of regularly spaced piers to carry the bridge deck from 2 Avenue Station to Centre Street N.

The bridge is intended to be a simple, low-profile form that best preserves the area's view corridors and respects the context of the surrounding natural and built environment. To accomplish this, the design strikes a balance between structural depth (thickness of bridge deck) and span arrangement (number of piers) to create an optimized arrangement.

A viaduct with longer spans was not recommended given there was neither an engineering requirement nor architectural justification to build longer spans over Prince's Island Park and the Bow River. This would have resulted in a bridge with a thicker or taller structure that is supported by larger piers and would not have been in scale with the surrounding area.



Drawing that illustrates viaduct's regularly spaced piers and the gentle sloping characteristic of the alignment.

Typical span design

The next stage in the bridge planning process established the typical span, or superstructure design. The superstructure is required to carry the weight of fully loaded inbound and outbound LRT trains and pathway users.

Calgary has adopted two typical superstructure designs for its existing LRT bridges - ride-over and ride-through structures, as illustrated in the images below. Both spans use long concrete or steel structural beams to support the deck that the LRT train runs along. The 4th Avenue LRT bridge utilizes the ride-over structure, where the bridge deck is placed on top of the beam so that the train runs over the top. The ride-through structure is used with the Sunnyside LRT bridge, where the bridge deck is fastened below the beam and the train runs between them. One of the fundamental differences between the ride-over and the ride-through types is the amount of clear space that remains available beneath the bridge, where the ride-through structure retains the greatest maximum headroom clearance.

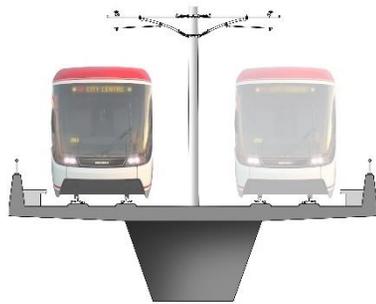
The south end of the Bow River bridge is very low in height, since the LRT is just emerging from the 2 Avenue Station. Because of this, it was important to select a bridge superstructure design that maximizes the headroom over Prince's Island Park to ensure park users can freely move around the park under the bridge. Within the south end of park, where the bridge height is lowest to the ground, it was determined that the ride-through structure would maintain a minimum 3m headroom clearance between ground level and bridge deck, while the ride-over structure would not provide this minimum clearance.

As a technical design requirement, the bridge should be designed to avoid placing any significant structural elements at a height that would be impacted by flood waters during a 1 in 100-year flood event. This is important to best protect the bridge and LRT system during flood events and to minimize how much floodwater the structure deflects upstream during flood events to avoid impacts to other infrastructure or communities. Through the evaluation, it was determined that the ride-through structure is best protected from 1 in 100-year flood events, whereas in the south end of Prince's Island Park, the ride-over structure would have been impacted by significant flood events.

Through this evaluation, it was concluded that the ride-through structure was preferred form since it performs best at minimizing impacts to Prince's Island Park users and would be most protected during significant flood events.



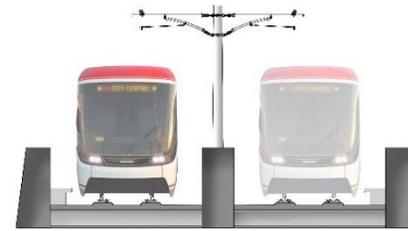
Ride Over Structure: 4th Avenue LRT Bridge



Reduced clearance
to ground below



Ride Through Structure: Sunnyside LRT Bridge



Maximum clearance
to ground below

Graphic illustrating typical span designs and their impact on headroom clearance.

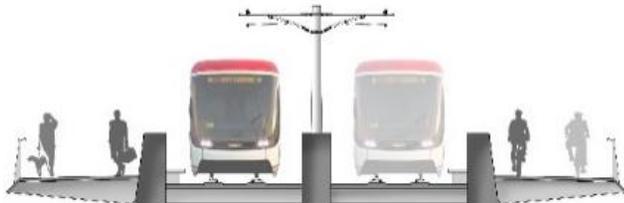
Multi-use pathway arrangement

As planning for the bridge form advanced, an evaluation was undertaken to determine the preferred approach for integrating a multi-use pathway into the bridge. Three pathway arrangements were considered which placed either one or two pathways on the main bridge deck (beside the LRT) or a single pathway suspended under the main bridge deck (under LRT). Graphics illustrating these three arrangements and their evaluation summary are shown below. The three arrangements were evaluated against important project considerations that included:

- Pathway connections: ability to connect the pathway with the Eau Claire Promenade, McHugh Bluff pathway and Centre Street N.
- Flood resiliency: does the pathway arrangement impact the bridge's 1 in 100-year flood level design
- Prince's Island Park headroom: does the pathway arrangement impact how users move around the park beneath the bridge
- Aesthetics: does the pathway arrangement compliment or impact the aesthetics of the bridge form
- Structural complexity and cost: does the pathway arrangement make the bridge structure more complicated and affect cost

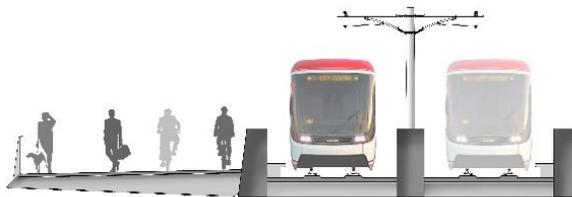
Two multi-use pathways on main bridge deck (beside LRT)

- ✓ Pathway connections
- ✓ Flood resiliency
- ✓ Prince's Island Park users
- ✓ Aesthetics
- ✓ Structural complexity and cost



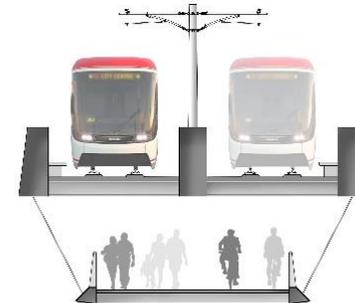
One multi-use pathway on main bridge deck (beside LRT)

- ✓ Pathway connections
- ✓ Flood resiliency
- ✓ Headroom for Prince's Island Park users
- ✗ Aesthetics
- ✗ Structural complexity and cost



One multi-use pathway hung beneath main bridge deck (under LRT)

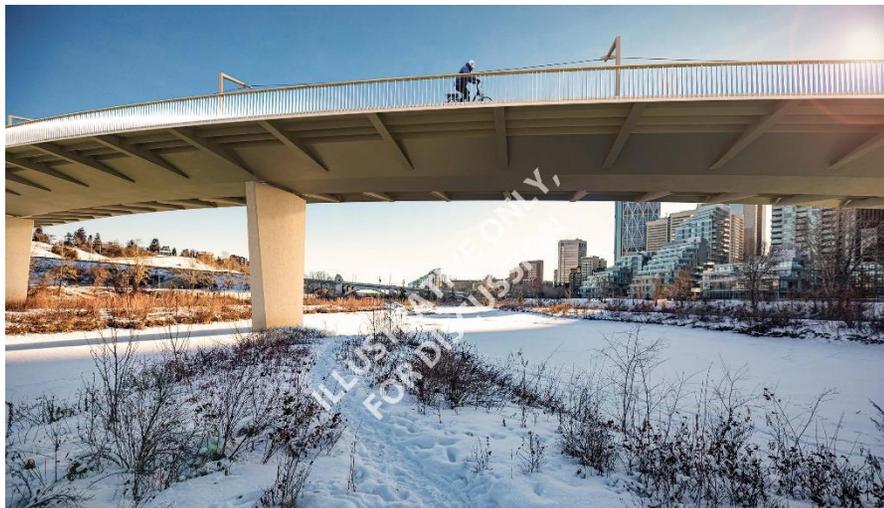
- ✗ Pathway connections
- ✗ Flood resiliency
- ✗ Headroom for Prince's Island Park users
- ✗ Aesthetic
- ✗ Structural complexity and cost



Through the evaluation, the pathway arrangement with multi-use pathways on either side of the main bridge deck, beside the LRT, was selected as the preferred architectural form. This arrangement retained ample clearance beneath the bridge, which would allow Prince's Island Park users to freely move beneath the bridge and protect the bridge structure during significant flood events.

From an aesthetic perspective, this arrangement performed the best. Placing the pathways on the outer deck together in conjunction with a more open handrail design (to be designed in futures stages) helps hide the bulkier structural beams and give the bridge a visually lighting and thinner appearance on both sides. Aesthetically, this will help the bridge better blend into the surrounding area and look less bulky than the other pathway arrangements considered. From a constructability and cost perspective, this arrangement allowed the weight of the LRT and structural beams, which are the heaviest elements, to be centered over the piers, which result in a lower cost and simple construction method.

Details on the pathway design, connections and user experience are described in the **multi-use pathway design and connections** chapter of this report.



Conceptual renderings that illustrate what the bridge might look like with multi-use pathways on the outer deck. Pathway configuration allows for a thinner outer deck and open railings that make the bridge appear thinner and lower profile, hiding the inner structural beams.

Bow River main span design

The 450m multi-span viaduct structure, with its regular spacing of piers, will successfully cross over all obstacles between Eau Claire and Centre Street N., such as Memorial Drive and the Lagoon, with the exception of the Bow River main channel. The width of the channel is too wide for the viaduct to cross without placing at least one pier in the river. Given this condition, the bridge planning process evaluated what was the preferred approach for crossing the river's main channel. The evaluation considered if the viaduct structure should continue with its regularly spaced span arrangement by placing a pier in the river, or if different architectural forms could be used to avoid placing a pier in the river.

Initially, a variety of architectural forms for crossing the main channel were explored and evaluated against the bridge planning and design objectives. Through this cursory review, two forms that best met the bridge planning & design objectives and design principles were selected as potential alternatives for crossing the main channel – true arch and tied arch structures. A multiple account evaluation, which considered public feedback, was used to evaluate the multi-span viaduct and alternate forms to determine which form or forms would be carried forward into the next stages of detailed planning and design.

The section below describes the three main span forms, the evaluation process and the preferred approach for crossing the Bow River main channel.

Multi-span viaduct



True arch (below deck structure)



Tied arch (below deck structure)



Conceptual renderings of the three Bow River main span crossing forms evaluated.

Multi-span viaduct

The multi-span viaduct option would continue the bridge's rhythm of regularly spaced spans and piers to provide a consistent appearance across the entire 450m long structure. This option would place a pier in the middle of the Bow River main channel to carry the structural load of the bridge deck. The viaduct option is characterized by the following key features:

A low-profile design that does not stand out in the skyline. The continuous nature of the bridge deck becomes the dominant visual characteristic of this form.

Continuous aesthetic and experience across the entire bridge. The experience for LRT riders and pathway users would be consistent from end-to-end, with no visual characteristics defining the main channel crossing. Pathway users would have clear views at the river span. Similarly, the features and views from the beneath the bridge would remain consistent across its full length.

Requires a pier in the river, which could restrict river flow and impact recreational use of the river. The placement of a pier in the river is not unprecedented on this stretch of the Bow River. However, pier placement would impact on water flow, particularly in times of flooding, river ecology and safety of river users.



Conceptual rendering of multi-span viaduct structure at the Bow River main span

True arch (below deck structure)

The true arch main span option breaks the rhythm of regularly spaced spans and piers by crossing the Bow River's main channel with a longer span that is supported by an arch below the bridge deck, avoiding placement of a pier in the river. The arch itself provides a recognizable form and visual relationship with Centre Street Bridge. The true arch is characterized by the following key features:

A low-profile design that does not stand out in the skyline. The below deck arch establishes a strong visual presence without rising above the bridge deck level. Similar to the viaduct, the horizontal deck line becomes a dominant visual characteristic of the Bow River bridge.

Continuous experience on the bridge and gateway experience on the Bow River. The true arch provides a continuous end-to-end journey experience for LRT riders and pathway users, with no visual characteristic announcing the main channel crossing to users. With the structure carried below the deck, pedestrians and LRT riders alike would have clear views at the river span. When experienced from below (e.g. Memorial Drive pathway, Bow River) the structure provides a clear gateway structure, particularly for river users passing beneath. Given the thickness of the arch, however, it may obscure views of the surrounding landscape and skyline from certain perspectives.

Clear span structure with reduced impacts on the river. The structure clears the Bow River, minimizing impacts to water flow and river ecology and would not impact river users.



Conceptual renderings of the true arch (below deck structure) at the Bow River main span.

Tied arch (above deck structure)

Similar to the true arch, this main span option breaks the bridge's rhythm of regularly spaced spans and piers by crossing the main channel with a longer span that is suspended from an arch above, avoiding a pier in the river. The arch shape borrows from the adjacent Centre Street Bridge, but its position above the deck creates a defining visual differentiation. The tied arch is characterized by the following key features:

A low-profile design over land with a character defining element over the river that adds visual interest to the skyline. The tied arch structure, rising above the bridge deck, presents a unique visual presence over the main channel through its arch ribs that will be visible from many viewpoints. The arch will contribute a new visual element to Calgary's skyline views, while minimizing its impact on views given its remoteness from adjacent residential areas.

A clear marker above the Bow River for viewers and bridge users. The above deck arch creates a defining marker for LRT riders and pathway users, announcing where the bridge crosses the main channel. Views from the bridge will not largely be impacted by the presence of the arch structure, rather the arch structure will frame views over the river. Views from beneath the bridge will not be affected, instead the bridge piers and above arch will frame the gateway experience for river users.

Clear span structure with minimal impacts on the river. The structure clears the Bow River, minimizing impacts to water flow and river ecology and would not impact river users.



Conceptual renderings of the tied arch (above deck structure) at the Bow River main span.

Evaluation and recommendation

Around 200 Calgarians provided input on their preferences and interests for the three Bow River main span forms. Given the low number of participants, the feedback received is not considered representative of the population but does indicate some general trends. Overall, participants expressed preference for a low-profile bridge that spans the Bow River with a quiet design. Maintaining views that respected the skyline and protecting the natural environment were both identified as important to participants. When it comes to views, the majority of respondents preferred a contextually appropriate bridge design that complements the existing built environment, highlights the natural environment, and maintains unobstructed views of the downtown skyline and river valley.

Calgarians who participated in the engagement felt that the viaduct option, with the pier in the river, was least acceptable due to its perceived impacts to the environment and safety of river recreational users. Only 10 participants expressed preference for the viaduct option since they felt it was a minimalistic structure that would least detract from views. The majority (130 responses) preferred the true arch (below deck) form because it avoids a pier in the river, retains a low-profile design and would not obstruct views from the LRT or pathway. 53 respondents preferred the tied arch (above deck) form because they felt it was a visually interesting and iconic architecture structure which would contrast well with the neighbouring Centre Street Bridge.

A multiple-account evaluation was undertaken to determine which form or forms would be carried forward into the next stages of detailed planning and design. The impacts and benefits of each main span option were evaluated against six themes to determine if there were any significant differentiators that would result in a form not being selected. The six evaluation themes were established during previous phases of the Green Line project and have been adopted by the project in many decision-making processes. A summary of the evaluation is outlined in the table on the following page.

Through the evaluation, it was determined that the multi-span viaduct option, with a pier in the river, had the highest potential environmental impact from construction, greatest construction and long-term safety risks and least stakeholder acceptance. Based on this evaluation, the viaduct option will no longer be considered for the Bow River main channel crossing.

The evaluation did not identify any significant differentiators between the true arch (below deck) and tied arch (above deck) forms. As such, both forms will be carried forward into the next stage of planning and design. This will allow the engineering design for both options to advance to a sufficient level that will better inform cost estimates and establish the most likely construction approaches, which will allow capital cost and construction risks to be more thoroughly evaluated.

Summary of the multiple-account evaluation undertaken to determine which main span form or forms would be carried forward into the next stages of detailed planning and design.

Theme	Evaluation summary
Mobility: Improves mobility and ridership benefits	Not a differentiating criteria. All options include the same facilities for LRT and the multi-use pathway.
Connectivity: Connecting people and places and strategic network connections	Not a differentiating criteria. All options provide the same capacity for LRT ridership and multi-use pathway connections.
Development: Urban and regional development	Not a differentiating criteria. There are no significant features of any option that would materially impact the urban or regional development opportunities created by the from the Green Line program.
Environmental: Unmitigable impacts from construction and operations	The multi-span viaduct option has the highest potential environmental impact. Construction of its pier in the river would have localized in-stream impacts during construction. There are no anticipated significant environmental impacts from construction of both the true arch (below deck) and tied arch (above deck) forms.
Cost and value: Capital, operating and maintenance costs	Not a differentiating criteria. Based on level of design, all three options are considered to have similar capital costs. Additional design work would be required to refine the cost estimates and establish if there is a significant differentiator between the structures. While operating and maintenance costs will vary for the different forms, the cost differences are not significant and not deemed a differentiator.
Risk and constructability: Significant construction, stakeholder or safety risks	The multi-span viaduct option has the highest construction risk with respect to potential flooding during construction (impacts in-stream pier construction) and schedule disruption, least stakeholder acceptance and greatest long-term safety risk for recreational river users. The true arch and tied arch have lower overall risk and constructability issues. Additional design work be required to further evaluate potential risk and constructability impacts or opportunities between the two arch options.

Multi-use pathway design & connections

Pathway design

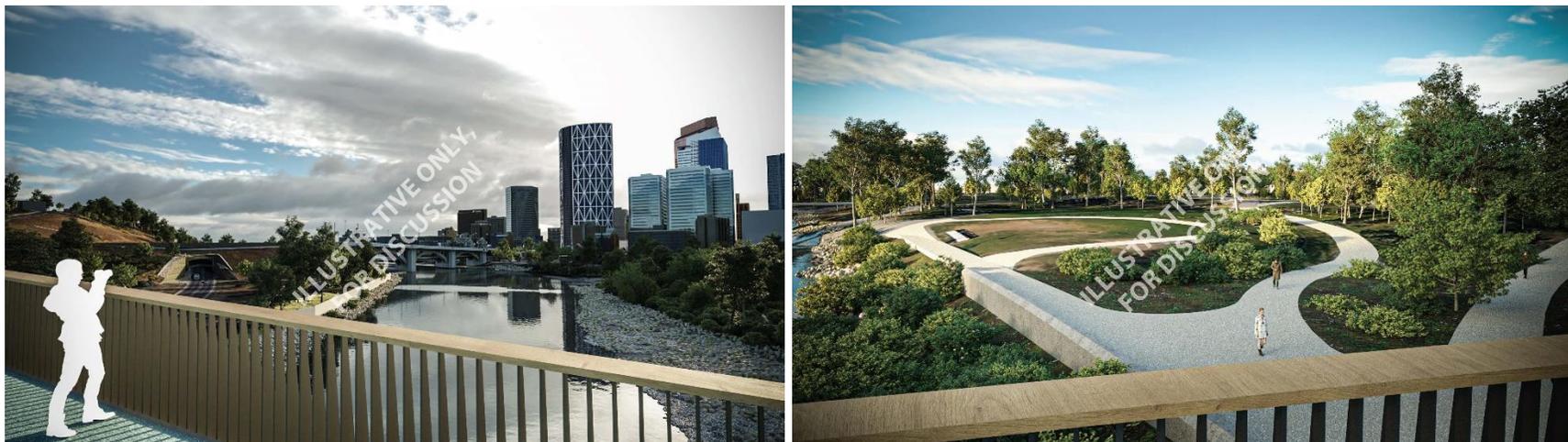
As described earlier, the new Bow River LRT bridge will include two multi-use pathways for walking and wheeling. The pathways will be located on each side of the LRT alignment and will be 3m to 4m wide. This width accommodates the anticipated volumes of pathway users, while also providing storage area for snow clearing. On Green Line opening day, the bridge is anticipated to carry an estimated 4,200 daily pathway users, and this number is anticipated to rise to 7,000 per day by 2046.

As part of the engagement process, renderings were shared to help the members of the public imagine how they might experience the pathways and enjoy the new views the bridge will provide. Citizens were asked what kinds of features or amenities they felt were important to be included in the design to provide a safe and comfortable user experience. To improve pathway safety, respondents expressed a desire for physical separation from the LRT, well-lit areas, CCTV surveillance, non-slip surface and painted lines to separate pedestrian and wheeled users. From a user comfort perspective, those engaged suggested that the pathways be wide enough to incorporate viewing areas and benches for resting. All feedback received on the pathway amenities will be considered in future stages of bridge planning and design when design requirements for urban design features are established.



Renderings of the new views the bridge will unlock (Left: view from east pathway of downtown, right: view from west pathway of Field of Crosses).

With respect to the pathway design, many expressed interest to use the two pathways to physically separate those walking and wheeling in order to avoid conflicts and improve user safety, while others felt it was important to retain flexibility for all modes to choose which side of the bridge they wish to travel on. Appreciating that the bridge will unlock new views of the city and the Bow River valley, some citizens felt that many pedestrians might only journey mid-way across the bridge to enjoy the views, and for this reason suggested an alternate mode split, where each pathway is divided to provide two-way pedestrian travel on the outside and one-way wheeling on the inside. At this stage in bridge planning, no decision will be made on the future operations of the pathway. This decision will be made in the future once the bridge design is developed and the width of pathway have been finalized.



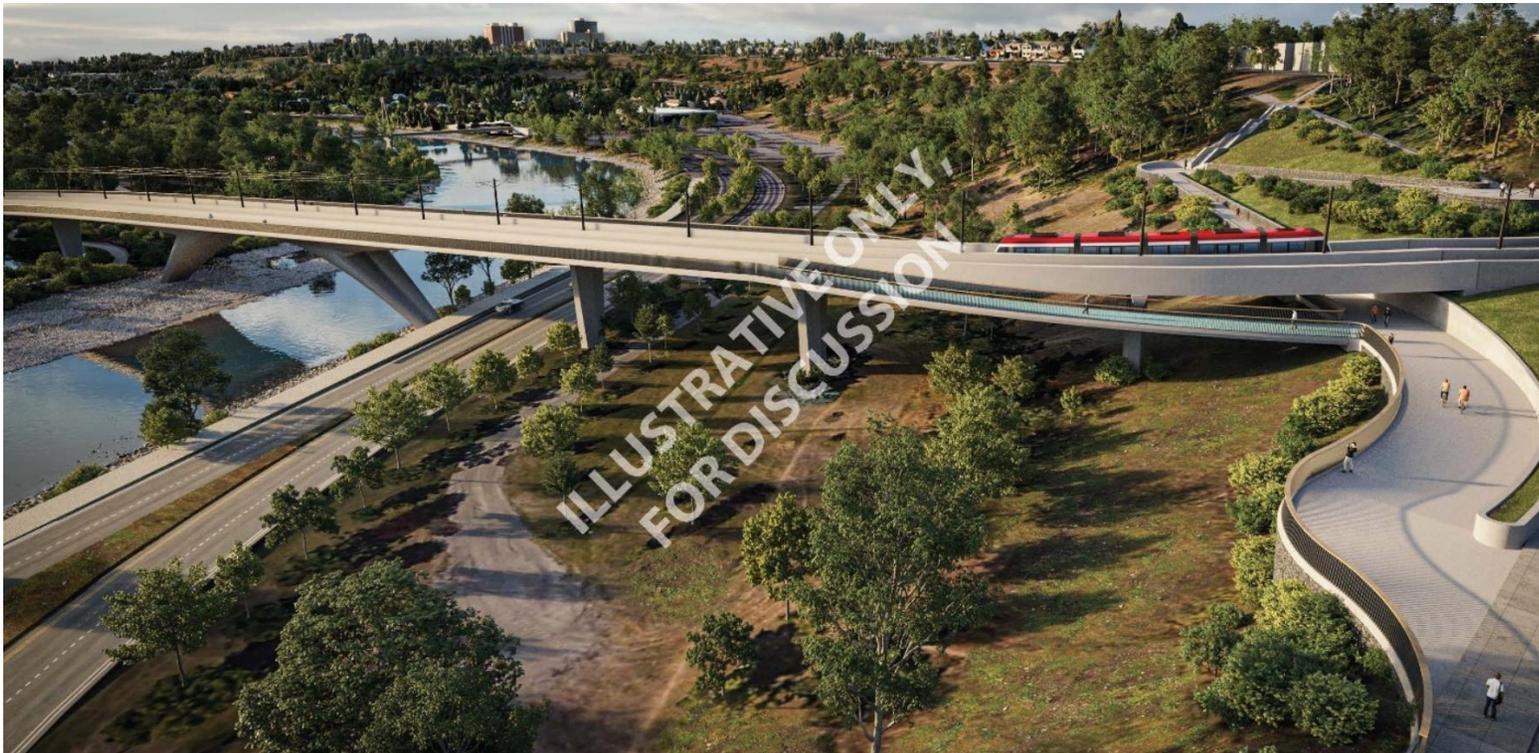
Renderings of the new views the bridge will unlock (Left: view from the east pathway of Centre Street Bridge, right: view from west pathway of Prince's Island Park lagoon).

Pathway connections

Through the bridge planning process, initial design concepts for the multi-use pathway connections into Crescent Heights and Eau Claire have been developed. Conceptual design for both pathway connections are described below.

Crescent Heights pathway connection

The new Bow River LRT bridge will land onto McHugh Bluffs in Crescent Heights. As illustrated in the conceptual rendering below, the bridge's pathways will connect with Centre Street N. and the east-west pedestrian crossing at Samis Road, as well as with the existing McHugh Bluffs pathway that connects with Crescent Road. The bridge landing design will require a section of the existing pathway to be re-configured. The detailed design of this pathway connection will be resolved in future stages of planning.



Conceptual rendering of the north pathway connection into the community of Crescent Heights.

Eau Claire pathway connection

ISC: Unrestricted

The new Bow River LRT bridge connects into the 2 Street SW LRT station, which will be constructed as an underground station within the Eau Claire Market redevelopment site. The location of the station requires the bridge to land directly onto the Eau Claire Promenade and Bow River pathway system. The promenade is a popular and well-used pathway system that is used by nearly 10,000 users a day, and which connects Calgarians and visitors to Prince's Island Park, Peace Bridge, RiverWalk, Eau Claire Plaza and the broader downtown core.

Given the importance of the promenade and the Green Line's planning and design objective to provide continued functionality and experience of the river pathway system, various options to maintain the pathway were explored. These options included shifting the 2 Street SW LRT station further south, shifting the LRT alignment and bridge landing north into Prince's Island Parks lagoon area, lowering the height of the promenade under the bridge or re-routing the promenade up-and-over the LRT alignment. The first three options were not technically feasible because they did not meet LRT operating requirements, impacted flood resiliency or were not aligned with pathway design guidelines. The up-and-over option was deemed technically feasible, and therefore a proof of concept design was developed to confirm if the option could meet pathway experience requirements and following objectives:

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

The proof of concept design demonstrated that up-and-over solution would achieve they key objectives and establish a new public plaza space for Calgarians and visitors to enjoy. Renderings of the proof concept design are shown on the following pages. These renderings integrate the existing design language of the Eau Claire Promenade up-and-over the LRT alignment. Additional work is required to refine this design once the detailed engineering for the bridge and underground station at 2 Street SW has been finalized.



Rendering of the proof of concept design to re-route the Eau Claire Promenade up-and-over the Green Line LRT alignment (birds-eye view of the future plaza area).



Rendering of the proof of concept design to re-route the Eau Claire Promenade up-and-over the Green Line LRT alignment (view facing east).



Rendering of the proof of concept design to re-route the Eau Claire Promenade up-and-over the Green Line LRT alignment (view facing north from the new 2 Avenue LRT station entrance).

Next steps

Additional work is required to advance the planning and design of the Bow River LRT bridge. Key next steps include:

- Advance next stage of engineering and design of the bridge and both main span options.
- Advance planning for the multi-use pathway to establish widths, modal separation and user experience features.
- Continue planning of the Eau Claire pathway connection, coordinating with The City's Eau Claire Promenade, Downtown Flood Protection and Eau Claire Plaza redevelopment projects.
- Establish the technical, urban design and visual performance requirements for the bridge components.
- Continuing to communicate with stakeholders and the public—additional opportunities for engagement with the public will be explored.



Conceptual rendering of Bow River LRT bridge, with below-deck main span form, viewed from the Eau Claire Promenade.