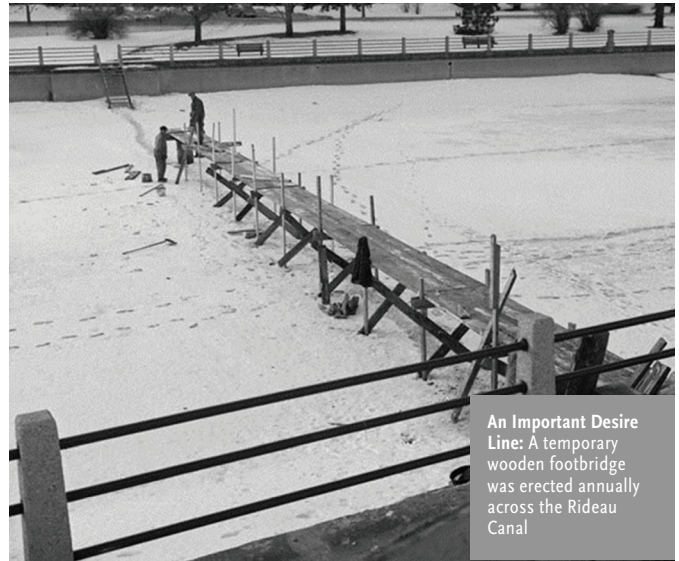




Rideau Canal Multi-Use Crossing



Project Summary



AS PART OF A BROADER STRATEGY TO CREATE A HEALTHIER, MORE VIBRANT, AND LIVABLE CAPITAL CITY FOR OTTAWA RESIDENTS AND ALL CANADIANS, THE CITY OF OTTAWA HAS EMBARKED ON AN AMBITIOUS EFFORT TO CHANGE TRAVEL BEHAVIOUR BY CREATING A WORLD-CLASS PEDESTRIAN AND CYCLING REALM.

While Ottawa boasts an extensive and well-used active transportation network, physical barriers to walking and cycling remain. Specifically, the two-kilometre stretch of the Rideau Canal between the Bank Street and Pretoria Bridges divides two important midtown Ottawa communities, and represents the longest linear barrier to active transportation in the urban area.

A bridge across the Rideau Canal in this location was proposed almost a century ago in the Holt Report (1915), which was a comprehensive plan for both Ottawa and Hull, led by Herbert Holt and drafted by architect Edward Bennett. Despite temporary efforts to service this important desire line including operation of a ferry (c. 1950) and provision of a temporary wooden footbridge (c. 1960), a permanent bridge at this location was never constructed. Challenges to building a bridge at this site included year-round canal operations and the availability of sufficient space to accommodate a bridge of appropriate size and scale for the Rideau Canal landscape, which is designated by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a World Heritage Site.

MMM Group Limited (MMM), DTAH, and the City of Ottawa initiated the process of planning a new multi-use bridge at this location to provide a much needed functional connection in support of the City's broader sustainability objectives. Specific planning services performed included project management, public engagement, transportation demand analysis, site selection, physical design, and an environmental impact assessment of social, cultural, and heritage features. The goal was to create a structure which would serve as a gathering place year-round, and represent a contemporary landmark in this important World Heritage setting.

With this extremely ambitious mandate, meaningful stakeholder engagement was critical to identify values and perspectives, and to resolve technical constraints. The consultation process kicked off with a visioning and design charrette that brought together technical experts, regulatory agencies, other interest groups, and members of the local community. This collaborative effort resulted in a shared vision for the project, and a series of design objectives that would guide the planning and design process throughout the study. The public

engagement strategy that followed included an interactive online blog fostering discussion and seeking real time public input, public open houses, consultation group meetings, and individual meetings with Parks Canada and the National Capital Commission (NCC) - the owners and caretakers of the canal and its heritage landscape. Given its high profile and national significance, the project was also presented on two occasions to the NCC's Advisory Committee on Planning, Design and Realty (ACPDR). This committee, comprising professionals from across the country, provided a national perspective that ensured the resulting plan for the bridge reflected best practices in Canadian planning and design.

The project garnered strong community interest and participation. While the recommended plan was ultimately supported by over 30 different community associations, schools, businesses, and interest groups, a number of community issues were identified through the public consultation process that required careful attention. For example, members of the local community were concerned that, by improving access to a nearby major events complex, a new bridge would generate a significant increase in neighbourhood traffic congestion as event patrons flooded the area in search of available on-street parking. To address this issue, the study team completed a comprehensive geo-spatial analysis that visually explained the potential impact at the neighbourhood level, and informed the selection of a preferred location for the bridge crossing.

To address concerns that the new bridge would significantly impact existing views of the canal landscape, renderings were prepared that clearly illustrated the bridge's impact and scale from the perspective of adjacent residents and users of the adjacent parkway system, which is designated as a Capital scenic entry route. Design refinements were made to ensure that the bridge location, form, and design emphasized visual lightness, was of an appropriate scale, integrated seamlessly into the world heritage landscape, and minimized impacts to adjacent residents.

The recommended plan seeks to create a popular gathering place, with a widened deck that encourages users to pause and enjoy the spectacular setting, and pier footings that are revealed in winter to create a place to rest and relax during the city's skating season and annual Winterlude festival.

Sustainable design elements were incorporated throughout, including a structural coating system that provides a durable finish, the use of sustainably harvested ipe wood in the bridge deck and handrails, and energy-efficient LED lighting to enhance public safety and to illuminate the bridge's architecture at night, reducing both energy consumption and light pollution.

This \$17.5M investment in sustainable transportation will foster healthy communities by encouraging an estimated shift of 2,500 trips every day from personal vehicles to active transportation modes.



A winter view from the Rideau Canal skateway depicts the piers of the bridge which double as seating

“This study stands as an outstanding example of our city staff and its consultants engaging in an open and responsive fashion with all members of the community.

The public meetings, the communications with community associations and local residents, and the willingness to listen to and respond to criticism and requests for clarification have been done admirably. As a result, I believe the ultimate recommendations of the report reflect the consensus of the community. A strong majority of immediate residents as well as many from outside the ward who have participated in the process have confirmed that a multi-use crossing of the Rideau Canal in the location identified, and with the design attributes recommended will make a very positive addition to the transportation linkages, and the economic and social life of both the immediate area and the city as a whole, with minimal negative impacts. A new bridge between Fifth Avenue and Clegg Street will play a key role in solving some of the significant congestion and mobility challenges facing the community.”

— Local Ward Councillor David Chernushenko

Explanation



The crossing will serve as a new landmark for the capital and will change the way people travel

Innovation & Contribution to the Profession

An innovative review of community demographic profiles and existing travel behaviour was completed, which enabled the project team to estimate the projected shift from auto trips to active trips that could be generated by providing this critical network link. This unique approach complements traditional user projections based on trip generation, helps to build a stronger case for investment in sustainable transportation, and can be applied to other active transportation planning projects across the country. This was particularly important for this project given its high-profile location and capital cost of \$17.5M.

Any new bridge represents an intervention into the Rideau Canal World Heritage landscape, potentially impacting this beautiful setting. Building support for the bridge therefore required extensive visualization including photo-simulation, artistic rendering and computer modelling. This allowed stakeholders to view bridge design concepts in the site context from a variety of perspectives, and resulted in consensus that the recommended design appropriately complements its setting.

In terms of its physical design, the bridge's location and form respond to unique site challenges including year-round canal operations, limited availability of landing space and extremely flat topography. While the curvilinear, v-frame structure is technically complex, the end result is appropriately simple, and visually light, and enhances its surrounding setting. Through iterative stakeholder engagement, the study team has confirmed that this complex structure can be economically constructed and maintained without impacting canal operations.



Method

This project followed a comprehensive five-step planning process with opportunities for meaningful public engagement through a variety of methods.

Needs Assessment

The case for a new bridge was developed through analysis of problems and opportunities. Our analysis concluded that the canal acts as a barrier to active transportation, there is limited opportunity to improve existing crossings, and a new bridge will change travel behaviour resulting in a shift of 2,500 trips per day from personal auto to active modes.

Visioning

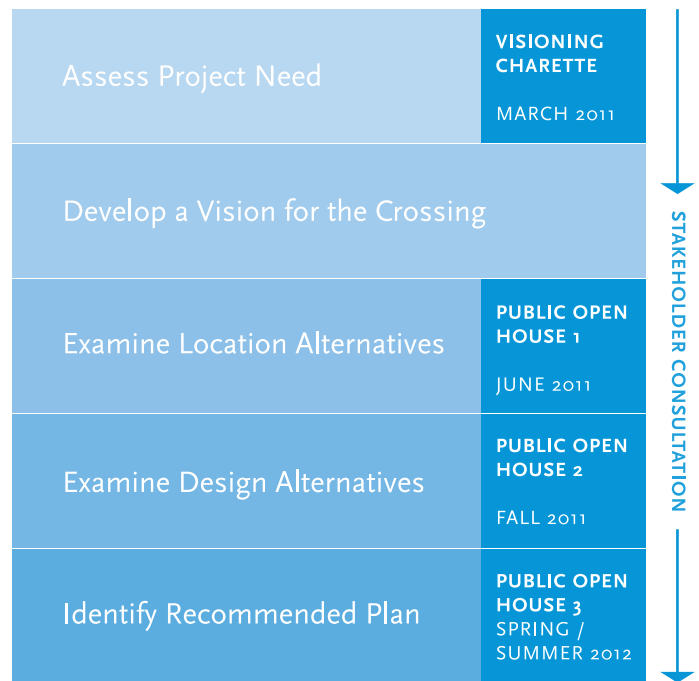
Our initial consultation event, the visioning and design charrette, resulted in a common vision and series of guiding principles for the project (outlined in the table on page 8).

Location Alternatives

Once guiding principles were established, we undertook a detailed process to generate and evaluate alternatives to find the optimal crossing and location. Through this process, we identified three potential locations based on site-specific opportunities and constraints. Evaluation criteria to assess these location alternatives were developed and refined through consultation with stakeholders and the public, and a representative family of design alternatives was created for each location to test the range of opportunities and constraints at each site. The subsequent evaluation resulted in the selection of a central location connecting Fifth Avenue to Clegg Street as the preferred spot for a new bridge. This location allows for safe connections to the existing pathway systems without requiring extensive ramping, provides a good connection to the existing street network, and minimizes the active trip lengths.

Design Alternatives

To determine the recommended bridge design, we consulted with the local community, the general public, Parks Canada, NCC staff, and the NCC's Advisory Committee on Planning, Design and Realty. This consultation resulted in a set of design objectives to guide the design process. Among other design objectives, the recommended plan needed to consider the number of piers in the Rideau Canal, provide navigation clearance for boat traffic, and avoid impacts to



resident views. Alternative east and west landing designs, deck alignments, and structural support arrangements were generated and assessed. Through extensive public consultation and evaluation of the advantages and disadvantages of each alternative concept, we arrived at our recommended plan.

The Recommended Plan

The recommended plan consists of a curvilinear structure that echos the organic geometries of the canal itself. Landings are carefully integrated into the existing landscapes to preserve and enhance the heritage qualities of the canal. The recommended design concept was then subjected to a rigorous structural design process which modelled and tested for pedestrian, thermal, and wind loading impacts, and aeroelastic stability. Finally, to ensure the bridge could be fabricated, transported and erected without significantly impacting canal operations, an implementation and construction staging plan was developed in consultation with City staff, the NCC, and Parks Canada. The recommended plan received overwhelming support at the final public open house in the fall 2012, and was subsequently approved by both Ottawa City Council and the NCC Board of Directors.

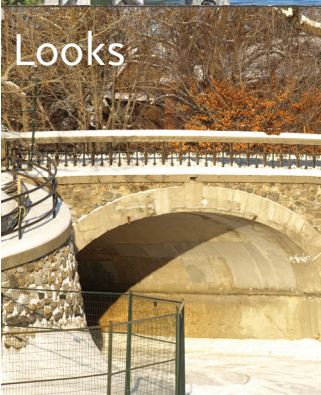
Clarity of Goals and Objectives

At the outset of the project, it was imperative to develop a collective vision for the project, as well as a set of principles to guide the evaluation of alternatives, which represented the opinions of the stakeholders and approval agencies involved. The guiding principles were grouped into five key themes, known as the five “Ls”, and were referenced frequently as the planning and design of the project progressed.

These guiding principles were used to reinforce the project need, identify and evaluate location alternatives, and test and refine design concepts. As evidenced by the extremely high level of agency and public support, we believe that the resulting recommend plan is an accurate reflection of the initial vision.

TOPIC

GUIDING PRINCIPLES



- Plan the crossing in a manner which improves connections between Old Ottawa East and the Glebe, and offers increased access to amenities and key destinations on both sides of the canal
- Plan the crossing to enhance east-west and north-south connectivity, by linking the crossing to the broader pedestrian and cycling networks
- Locate the crossing so that it reduces trip lengths (when compared to existing crossings), and thereby promotes sustainable transportation modes as more desirable ways to travel
- Situate the crossing in a location that minimizes and mitigates impacts to natural systems, including wildlife, vegetation, surface water, and other location-specific environmental features
- Situate the crossing in a location that maximizes design opportunities to integrate it with, and to make a positive visual contribution to, its surroundings
- Situate the crossing in a location that maximizes opportunities for place making, and provides a new vantage point for users to appreciate the canal
- Situate the crossing in a location that minimizes impacts to adjacent communities
- Implement innovative design to ensure the crossing is compatible with the canal's operation and maintenance, considering the canal's role as a skateway and a navigable waterway
- Design the crossing to be universally accessible, including to those in strollers and wheelchairs, with special consideration to how pedestrians and cyclists can safely access nearby pathways and cross adjacent driveways
- Design the crossing to ensure integration of landings with adjacent pathways and road networks, and the safe interaction of pedestrian, cyclist, and vehicular traffic
- Design the crossing to be respectful of the canal's important built heritage context, and protective of the canal's walls and bed
- Design landings with the goal of creating an enhanced sense of place, through increasing accessibility and safety, and promoting a variety of uses
- Design and construct the crossing in a manner that respects and draws on the local, capital and national heritage, while incorporating modern technology
- Design an iconic structure, which balances the design qualities of a landmark crossing with the responsible use of public funds
- Design the crossing so that its look and scale complement its setting
- Design the crossing with consideration to how it looks and functions in different environmental conditions, such as different seasons and times of day
- Design the crossing so that it does not detract from, but rather enhances, the national historic site and world heritage site designations
- Design the crossing so that it provides amenities to support opportunities for safe, enjoyable, and memorable experiences for different user groups, and enhances the opportunity for all Canadians to appreciate the unique setting of the Rideau Canal

Rideau Canal Multi-Use Crossing

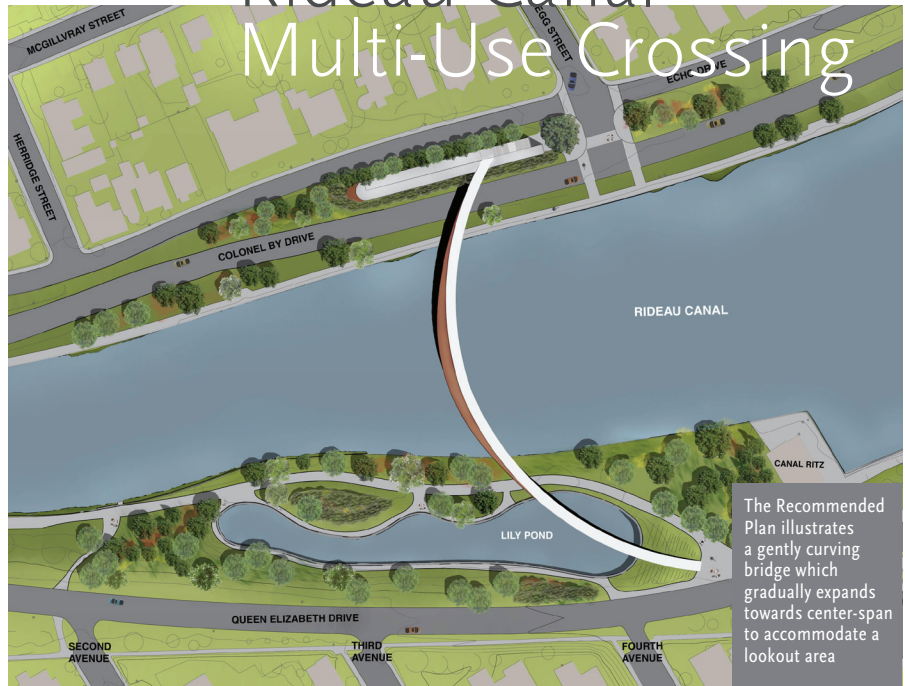
Implementation

Thorough consultation and design work was instrumental in delivering a project that was not only supported by the public and agencies, but is also implementable given the unique site constraints. These included working in a UNESCO designated World Heritage setting, minimizing impacts to summer and winter canal operations, identifying construction staging areas in the highly urbanized study area, and confirming a preferred method for transporting pre-fabricated bridge components to the site.

Another important element in the implementation of this project was the development of a comprehensive mitigation plan to avoid or minimize potential environmental impacts during construction and operation. The comprehensive study report which was prepared as part of this project incorporates the combined expertise of environmental planners, ecologists, and engineering professionals, and clearly identifies these commitments.

Overall Presentation

We recognized the importance of preparing materials that clearly communicated how the design evolved throughout the design process in response to stakeholder input. Throughout the project, our team incorporated comments received from the public into the final design of the bridge, and we traced the design evolution of the project to illustrate how initial design concepts were refined into a single recommended plan. The final recommended plan was also developed with the appropriate level of technical detail, which ensured that the project was implementable and supported by approving agencies.



Presentation materials were available for public review through the project website and in-person at a series of public open houses. At these events, large display boards captioned with bilingual descriptions were organized by key themes and strategically placed throughout the space. Prior to making content available to the public, all materials were reviewed by members of the project's consultation focus groups. This ensured that the messaging was clear and that the accompanying graphics helped the general public to understand sometimes complex design issues and concepts.

A variety of visualization techniques were implemented including photo-simulation, artistic rendering and computer modelling to clearly communicate the design concept as it evolved, and identify and address potential negative impacts.

The final project deliverable included a comprehensive study report which explains the planning and design process in plain language and is supported by both artistic renderings and technical drawings. The organization of the report was intended to reflect the chronology of the study process and is outlined as follows:

Chapter 1.0 – Introduction: Provides an overview of the project, environmental assessment process, and consultation approach.

Chapter 2.0 – Consultation: Summarizes consultation activities, stakeholder interests, and how they were addressed in the final plan.

Chapter 3.0 – Identified Problems and Opportunities: Presents the planning and policy context and rationale for the proposed crossing, as well as potential user projections.

Chapter 4.0 – Existing Conditions and Parameters: Describes the study area and features related to the natural environment, local community, cultural environment, and transportation environment. Technical constraints that influenced planning and design decisions are also discussed.

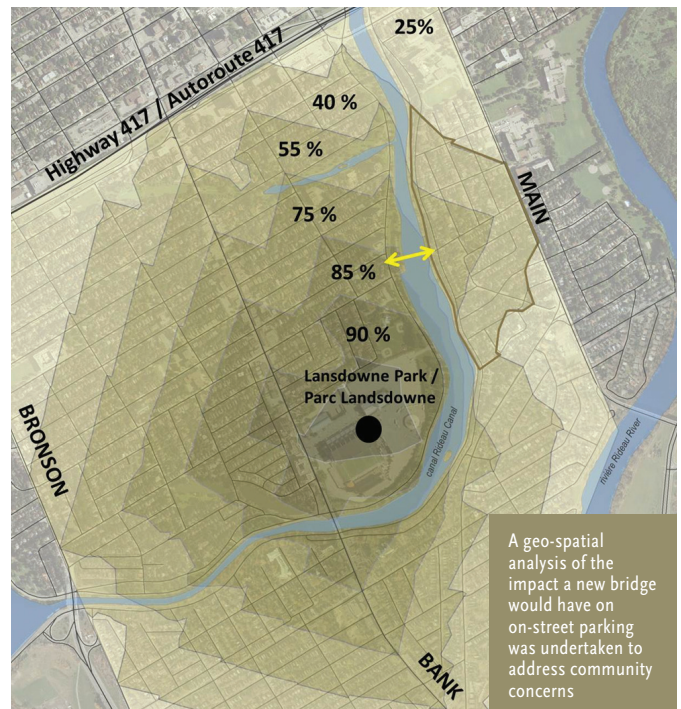
Chapter 5.0 – Evaluation of Alternatives: Describes the evaluation of alternative planning solutions, crossing types, crossing locations, and design alternatives.

Chapter 6.0 – Recommended Plan: Presents a detailed description of the plan and identifies mitigation measures to address potential environmental impacts.

Chapter 7.0 – Future Commitments: Outlines future consultation and approval requirements, and additional impact assessment studies that should be completed during the detailed design phase of this project.

Public Engagement

The sensitivity of the site and the scale of the undertaking garnered close attention by key stakeholders, (including the City of Ottawa, Parks Canada, and the National Capital Commission), as well as local community associations and the general public. The study process was carefully orchestrated to ensure optimum participation throughout all phases of the project and to engage directly affected stakeholders. Our consultation approach was designed to meet statutory requirements and capitalize on the local knowledge of the people who live and work in the study area. Our study team understood the importance of communicating through a variety of channels to maximize inclusive and accessible participation.



Early in the study, a project website and blog were established to encourage discussion on project issues and objectives, share information in real time and provide enhanced public access to the study team. The study team posted discussion questions, moderated discussion, and incorporated public input into the design as it developed.

Two consultation focus groups were established for the project: an Agency Consultation Group (ACG) and a Public Consultation Group (PCG). The ACG was composed of representatives from the City of Ottawa, Parks Canada, and the NCC. Its mandate was to provide our team with specialized expertise throughout all stages of the study. The PCG consisted of the community's local groups and associations. Members of the consultation focus groups met in advance of the project's three public open houses to provide design input and to review materials to be presented to the general public. The focus group process ensured that study materials were clear and effective.

Each public open house was organized as a drop-in style session, with a formal presentation by the study team, followed by a facilitated question and answer session. Bilingual materials were presented at each public open house and content was also made available on the website. These meetings allowed the general public an opportunity to review the plan as it developed, ask questions and provide input.

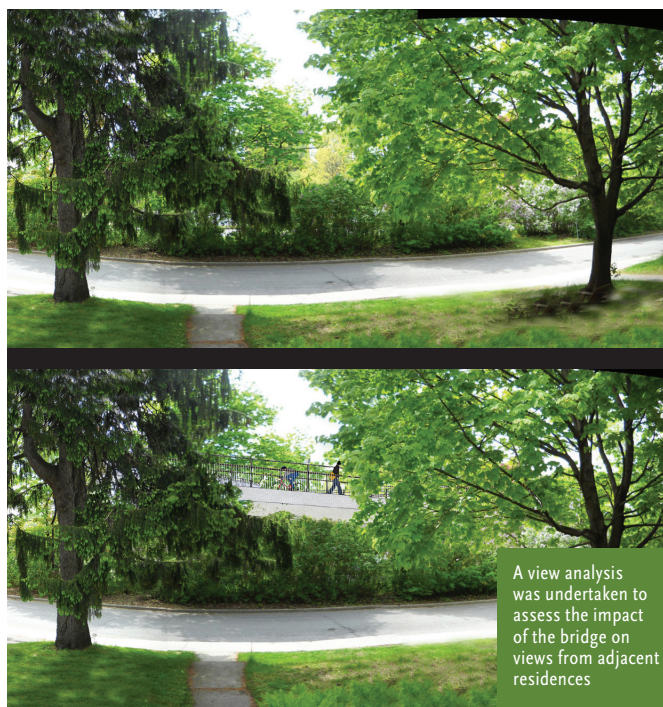
Regular meetings were held with Parks Canada and NCC staff throughout the project to ensure compliance of the recommended plan with design expectations, and policy and regulatory requirements. To obtain a national perspective, the study team presented to the NCC's Advisory Committee on Planning, Design and Realty (ACPDR) on two occasions. Finally, to address specific stakeholder interests and concerns, face-to-face site meetings were scheduled with residents and businesses in the area.

The scale and diversity of consultation techniques applied throughout this project resulted in a very high level of participation, with hundreds of comments submitted. A systematic review of all comments took place in order to identify and highlight common themes and to understand the key concerns raised by participants.

Sustainability

This project supports sustainable mobility by directly contributing to the creation of a world-class pedestrian and cycling realm in Canada's capital. The recommended plan will help the City of Ottawa reduce auto dependence by making active trips safer and more convenient. The benefits of investing in active transportation infrastructure include healthier populations, reduced auto emissions, and more vibrant local economies. By providing this link, it is projected that 2,500 vehicle trips per day will be converted to active trips.

In addition to promoting sustainable transportation, the recommended plan includes a number of sustainable design elements. It is proposed that a durable, sustainably-harvested, and climate appropriate species of wood be used in the construction of the bridge's handrail and other areas such as the deck of the lookout area and the bench seating provided along the bridge. Metal components of the bridge will be finished in high-quality paint and layered to provide a strong and durable finish, which will minimize maintenance of the bridge.



Energy conservation was also considered in the design of the bridge. For example, LED lighting was selected to provide an understated lighting scheme for the bridge which highlights the structure's architectural detail, and creates a safe crossing environment.

The protection of the natural environment was carefully considered in the placement and design of the bridge. For example, the plaza of the east landing of the bridge is centered on a mature oak tree, which was retained through careful planning and design, and creates a focal point in the setting. The ramp and stairs of the east landing are also integrated within the existing landscape to the greatest extent possible, by means of tree retention and landscaping using native species.

Finally, the design of the structure and landings endeavours to protect and enhance a heritage site of international importance. The gently curving structure is designed as an elegant line in space with a profile minimized to reduce visual impact on important views. The landings are fully integrated with existing landscapes to protect heritage assets while optimizing circulation and associated recreational opportunities.



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Project Documentation



 Ottawa

 MMM GROUP

 dtah

Recommended Plan: Views

Connectivity | Livability | Sustainability
Connectivité | Habitabilité | Viabilité



View towards south

Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale



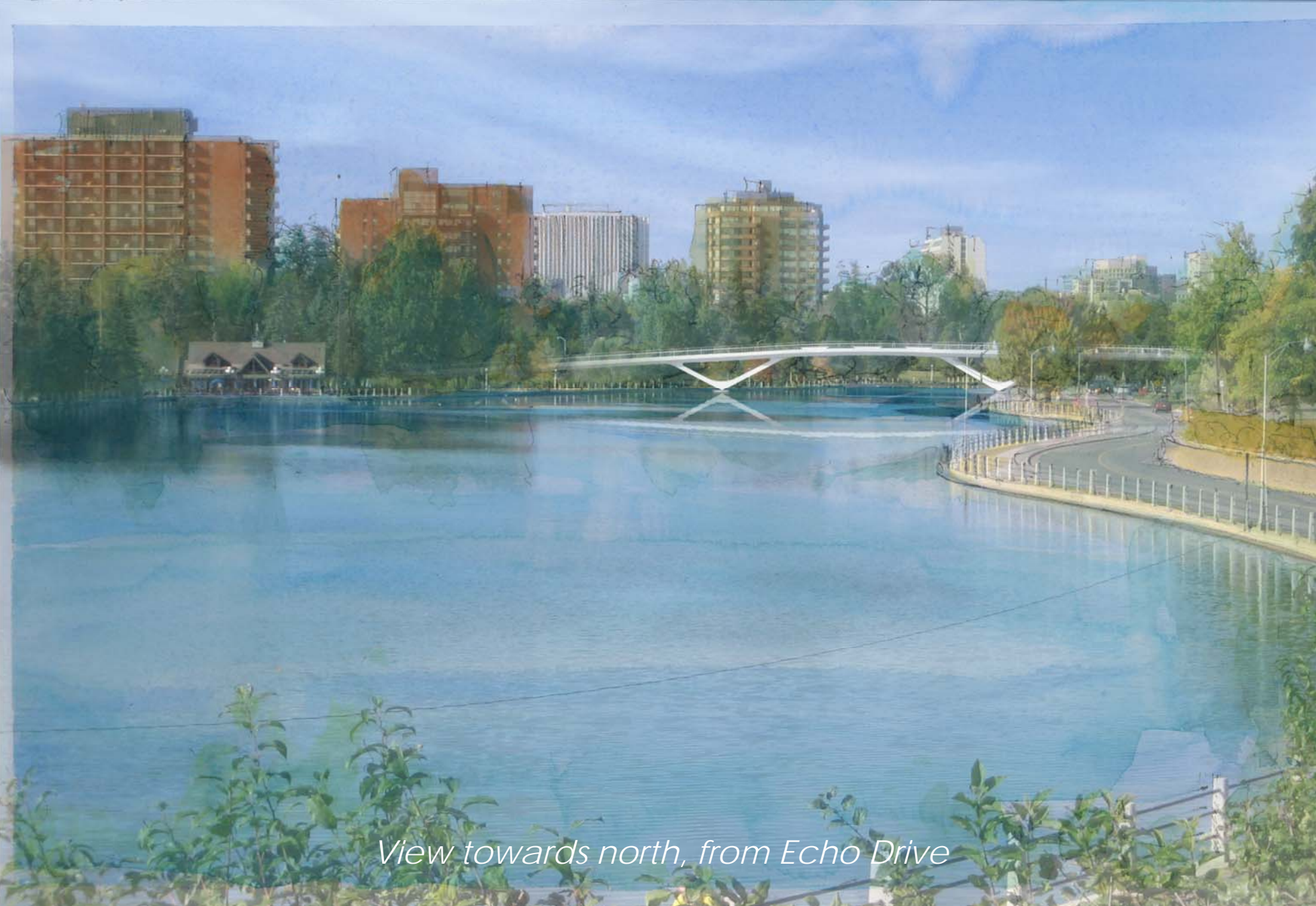
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Recommended Plan: Views

Connectivity | Livability | Sustainability
Connectivité | Habitabilité | Viabilité



View towards north, from Echo Drive

Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale



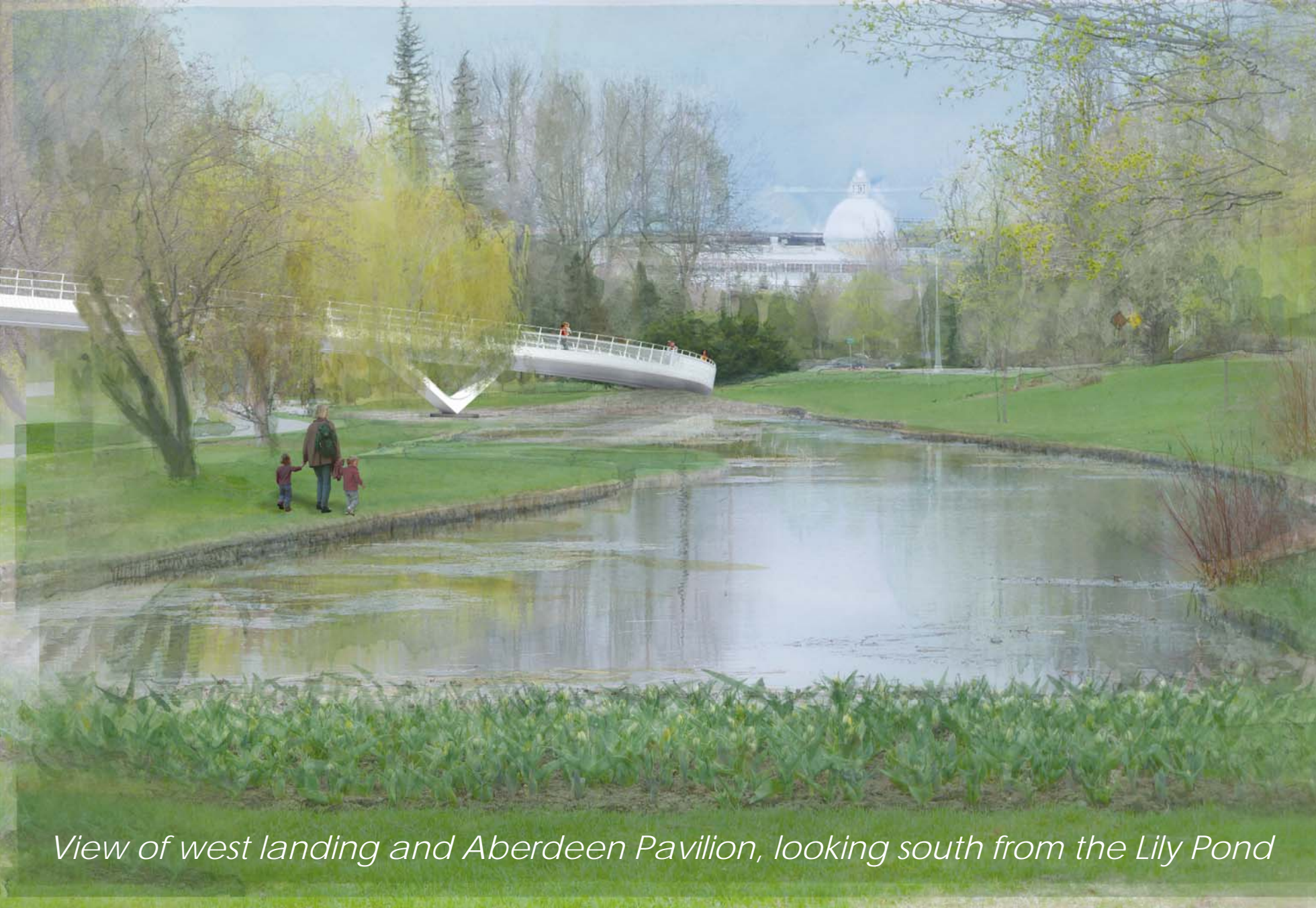
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DTAH

Recommended Plan: Views

Connectivity | Livability | Sustainability
Connectivité | Habitabilité | Viabilité



View of west landing and Aberdeen Pavilion, looking south from the Lily Pond

Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale

Ottawa

MRC

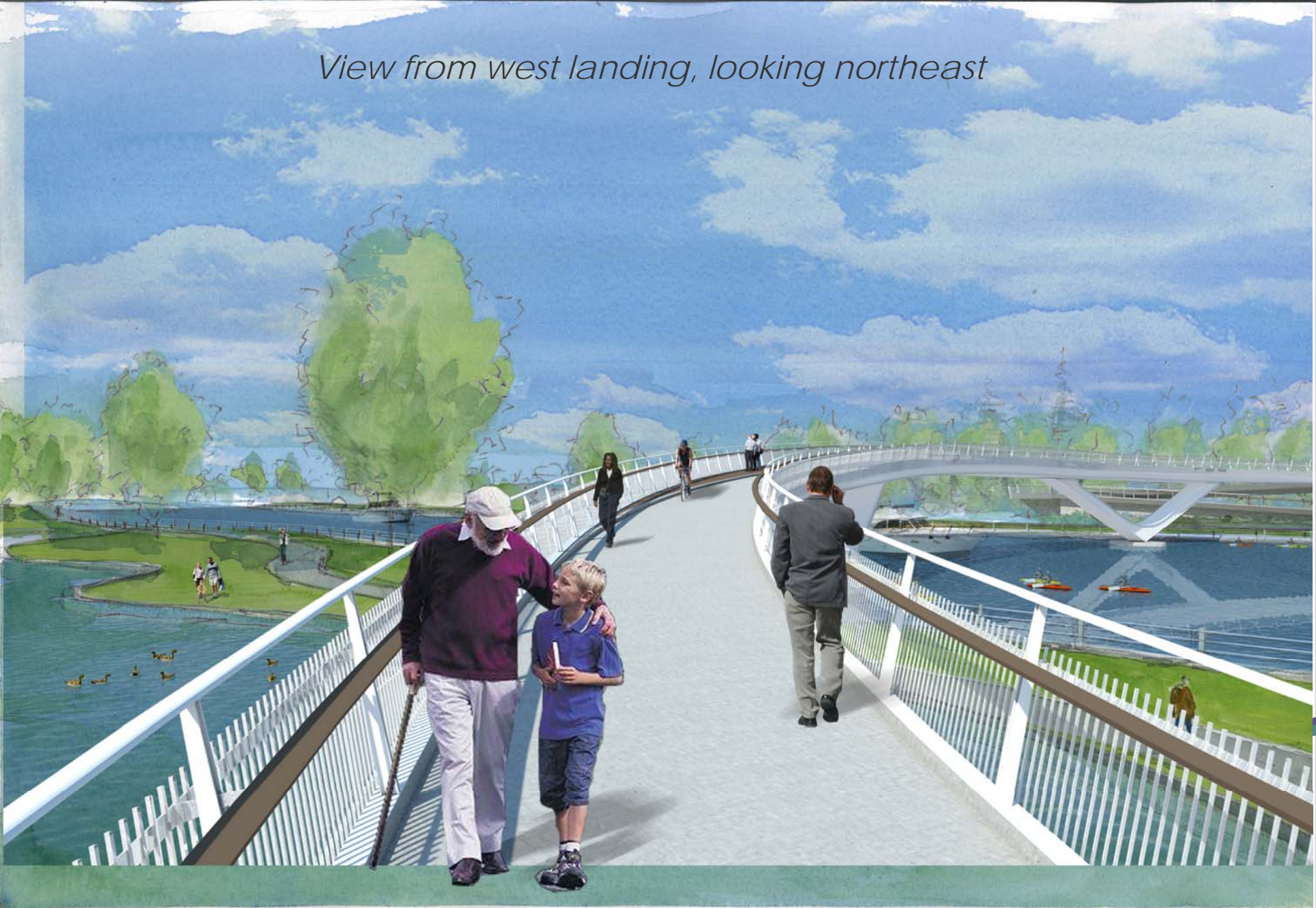
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Recommended Plan: Views

Connectivity | Livability | Sustainability
Connectivité | Habitabilité | Viabilité

View from west landing, looking northeast



Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale

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Recommended Plan: Views

Connectivity | Livability | Sustainability
Connectivité | Habitabilité | Viabilité

View towards the west, from the bridge



Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale



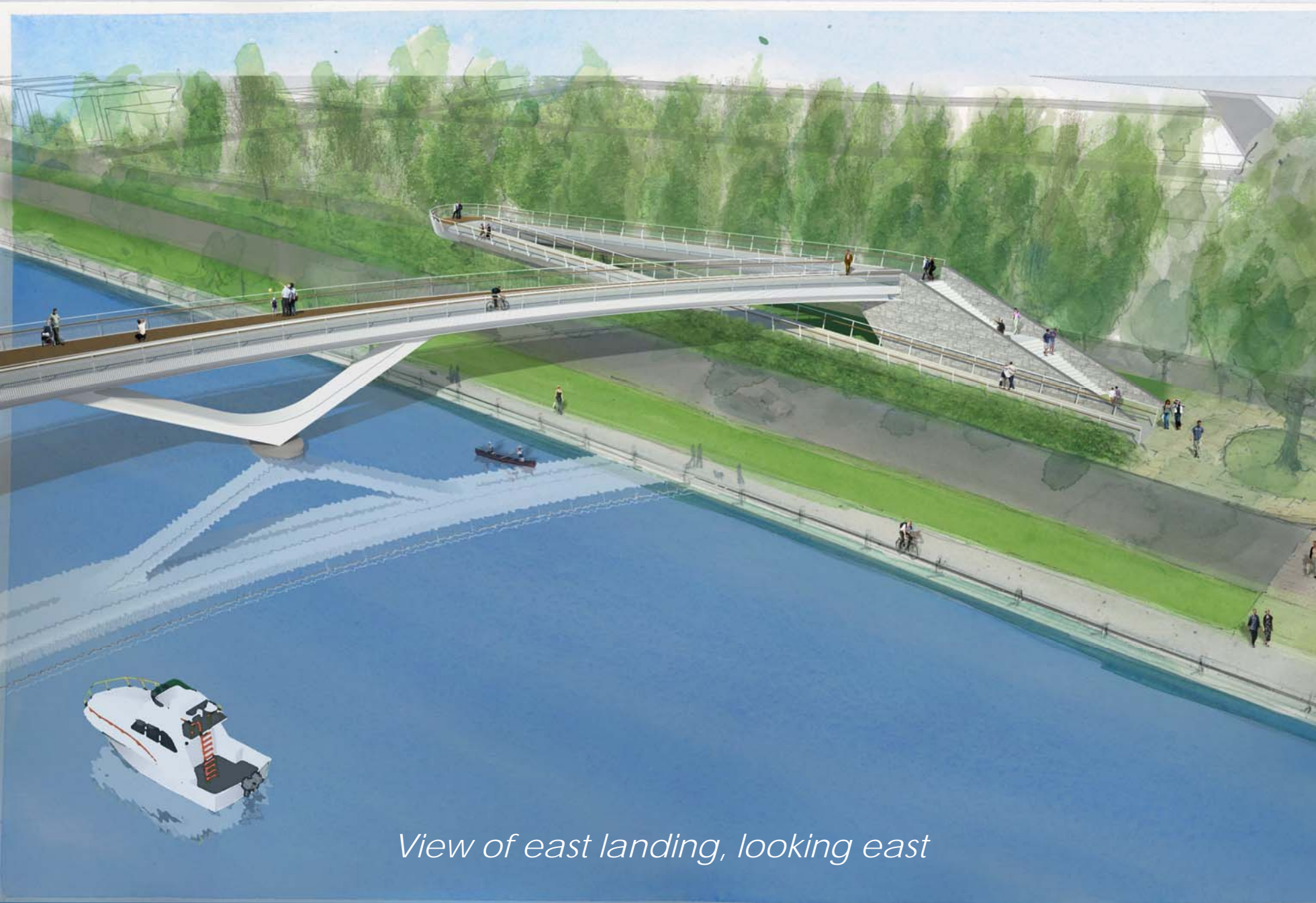
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Recommended Plan: Views

Connectivity | Livability | Sustainability
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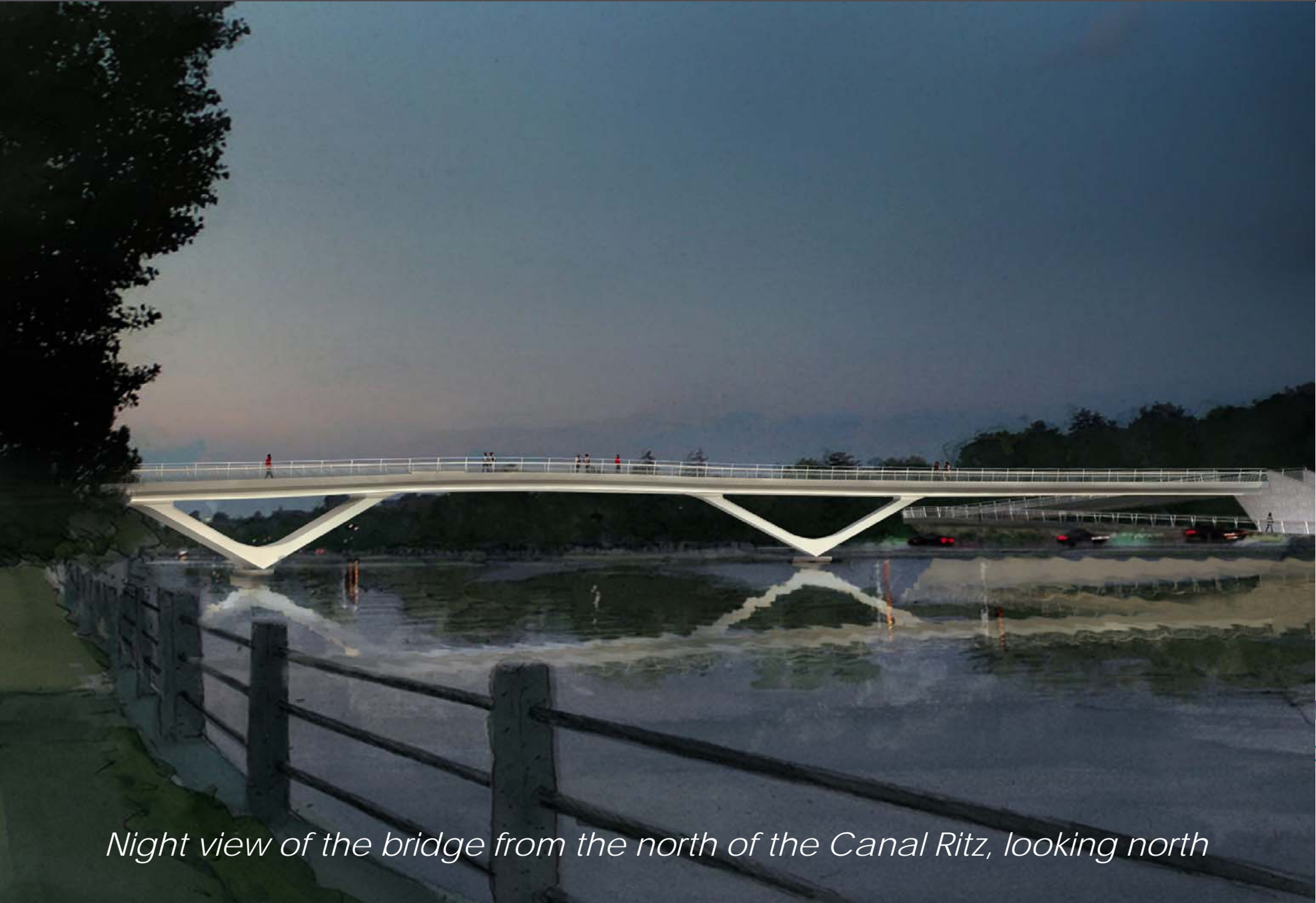


View of east landing, looking east

Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale

Recommended Plan: Views

Connectivity | Livability | Sustainability
Connectivité | Habitabilité | Viabilité



Night view of the bridge from the north of the Canal Ritz, looking north

Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale



DTAH

Recommended Plan: Views

Connectivity | Livability | Sustainability
Connectivité | Habitabilité | Viabilité



Winter view of the bridge from the Canal

Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale

Recommended Plan: Views

Connectivity | Livability | Sustainability
Connectivité | Habitabilité | Viabilité



Winter view of the bridge from the Canal, looking south

Rideau Canal Crossing | Environmental Assessment Study
Passerelle du Canal Rideau | Étude d'évaluation environnementale



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