The Parallel and the Perpendicular: Reconnecting Calgarians to the Bow River

by

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CONTENTS

ABSTRACT

The rapid population growth in Calgary since the oil drilling boom of the 1970s has led to a diversification of Calgarians in terms of ethnicity. socio-economic status, and age. Without any unifying public spaces, the city has become fragmented into polarized pockets of young and old, wealthy and poor, and ethnic background. This thesis seeks to reconnect the fractured populations of the Calgary to the core of the city, as well as to each other.

The Bow River bisects Calgary, physically linking a number of communities along its banks. Like the downtown core, the Bow River is a symbol of Calgarian identity. A number of design interventions along the parallel and perpendicular axes of the Bow River waterfront are proposed to resolve issues of public access and connectivity between the central core and outer communities of the city. A focus on the addition of both interactive public programming and public permeability to the existing waterfront will aid Calgary in achieving social unity.

ACKNOWLEDGEMENTS

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To all of my friends (both inside and outside of studio) for their support, camaraderie, and countless good memories.

To my family who provide me with the inspiration, love and support that I need to overcome any obstacle.

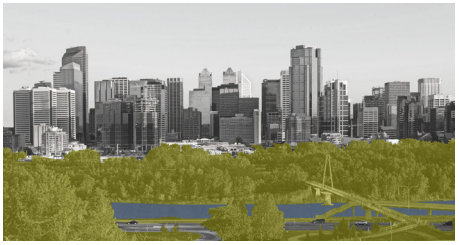
Thank you.

CHAPTER 1: INTRODUCTION

A City Divided: The Fragmentation of Calgary

Calgary Suburbs, photograph by Sam Chrsysanthou (Getty Images 2014)

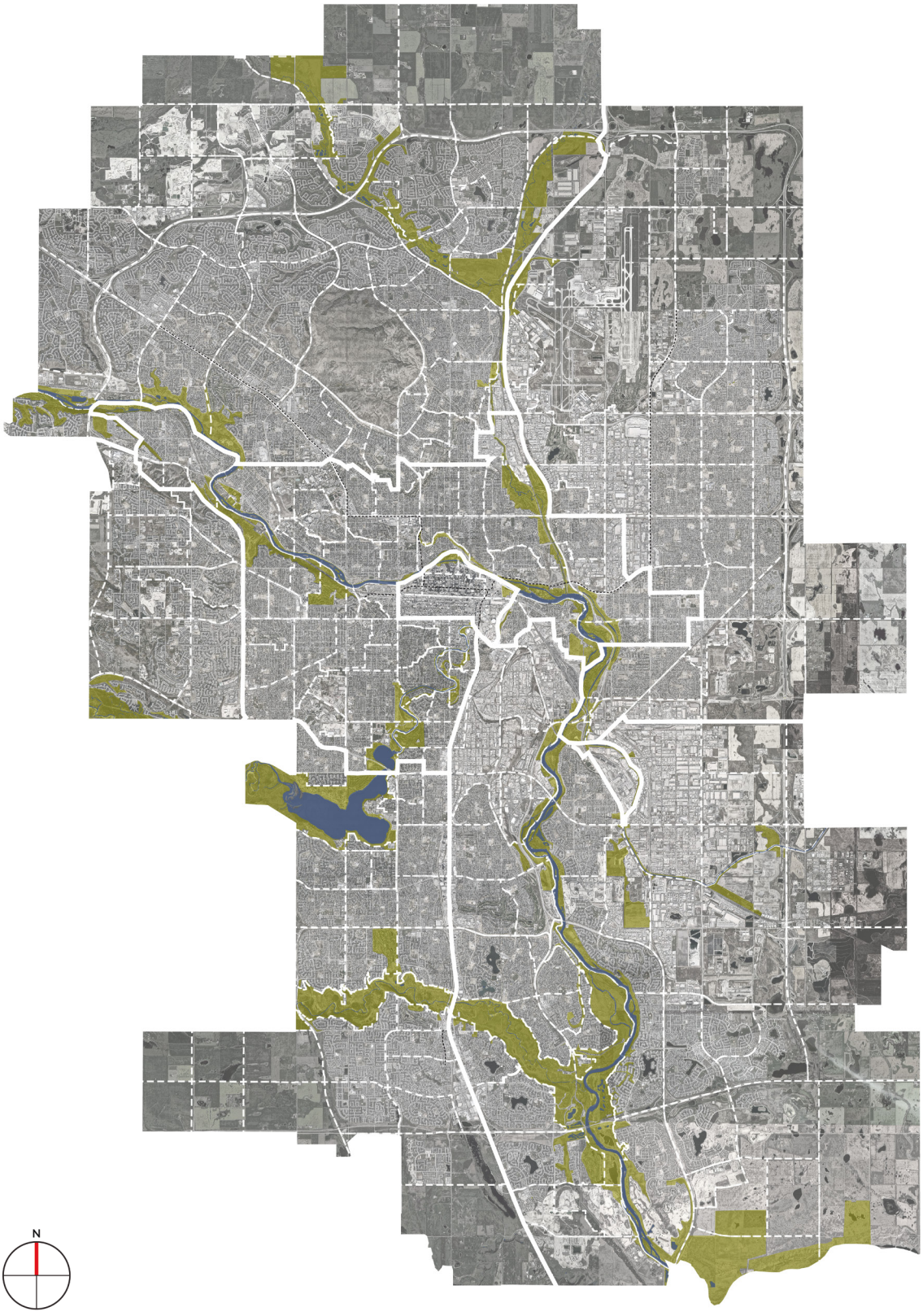
Neighbourhood of Beltline in Calgary, Alberta, Canada (Qyd/Wikimedia 2004)



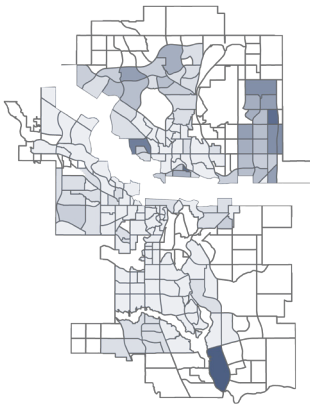
Calgary, Alberta Skyline from Crescent Road at Dusk, photograph by Chuck Szmurlo (Wikimedia 2007)

Rapid global development has caused a large influx of highly transient and diverse people into the city of Calgary. As the city continues to expand, both the physical and social structures of the city have begun to fragment and polarize. A majority of the population has withdrawn from the core of the city and into increasingly homogenous sectors of the suburban realm. This shift of population has led to the development of three clear urban forms: the downtown core, the inner city, and the quadrant suburbs.

> This is the ongoing dilemma for downtown Calgary: there are bigger draws in the suburbs - schools, shopping centers, malls, parks - than the downtown core itself. Yet all traffic corridors funnel into the downtown, the LRT lines fan out from the core and the center is visible from the far reaches of the city. A little wedding cake of tiers and towers, dense and intense, clearly the physical heart of the city. (White 2012, 42)

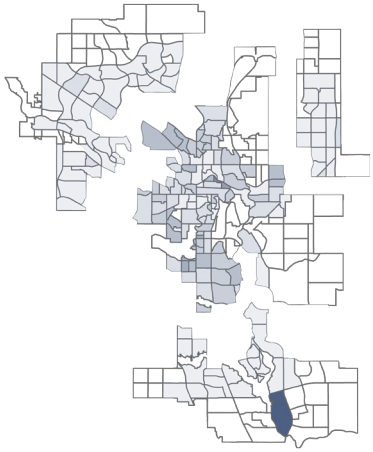


City of Calgary - Physical Fragments (Google Maps 2015)



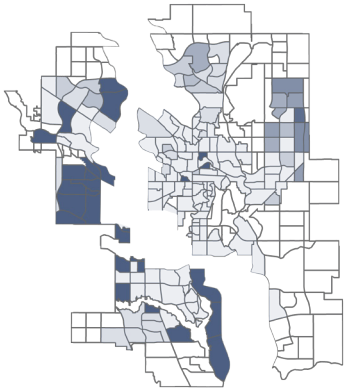
Higher Lower

Percentage of Residents with Ethnic Minority Heritage



Older Younger

Average Resident Age



Higher Lower

Average Resident Wealth

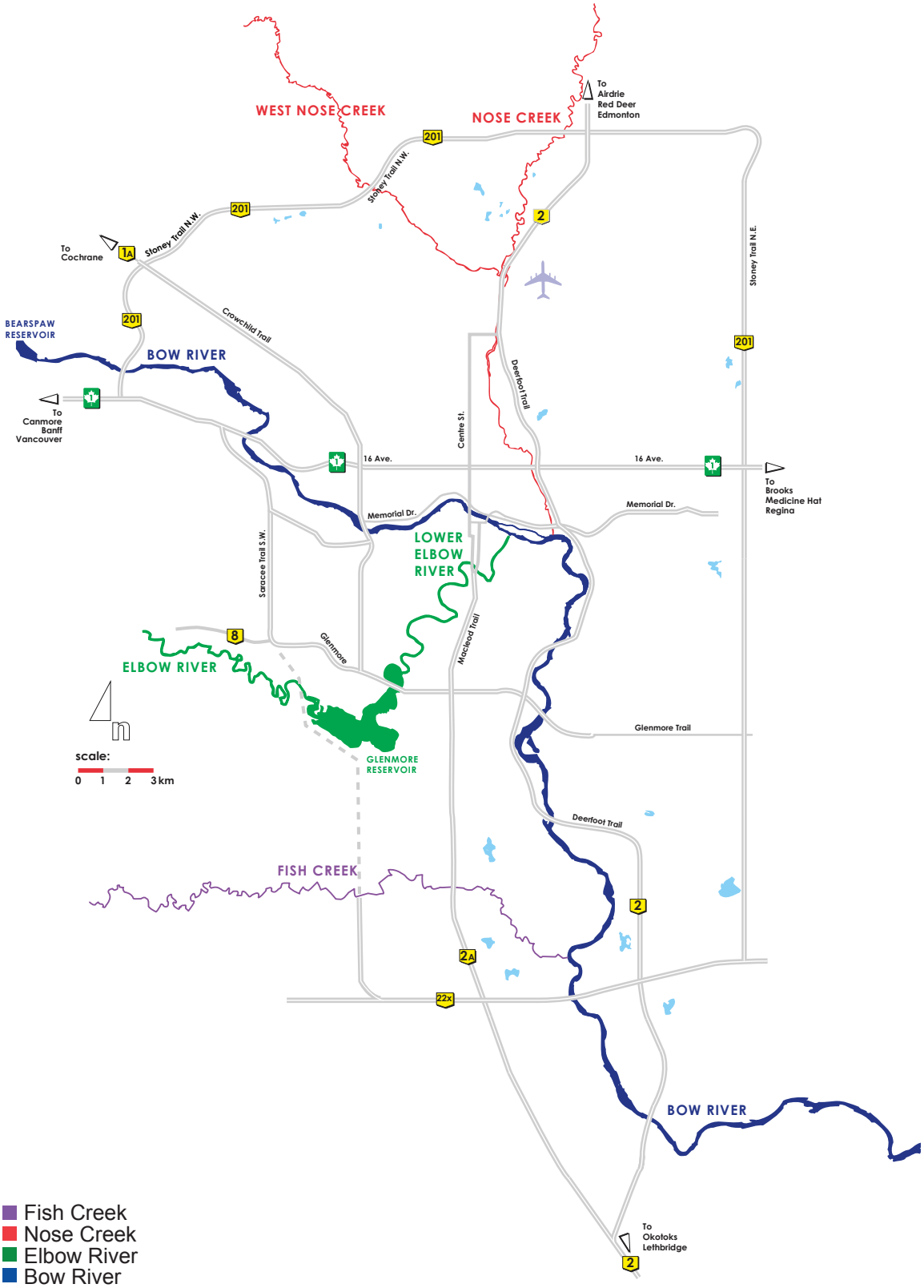
Data from The City of Calgary 2015

In addition to the obvious physical fragmentation of the city, Statistics Canada data collected in 2011 indicates that the social structure of the city is becoming more polarized - developing pockets of poverty and wealth, young and old, and ethnicity.

Calgary Mayor Naheed Nenshi, and the City of Calgary have recognized the need to reconnect Calgarians with their city, and with each other through the use of public space (Nenshi 2012). Like many other cities of the postmodern era, Calgary is faced with a dilemma of what the urban form of contemporary public spaces are, and what function they perform in the overall image of the city. (Marshall 2001, 3)

The most effective way to bring the fractured pieces of the city back into the unified whole is through the development of inclusive public spaces. These spaces must address the needs and desires of an increasingly diverse society in terms of age, cultural background and socio-economic standing. Both passive and active interaction between Calgarians in this new public realm could be the panacea to the continuing polarization of the city.

> But the public realm, as it is also called, also occupies a unique place in society: it is the sphere where we encounter the proverbial ‘other’ and where we must realm to ‘other’ behaviour, other ideas and other preferences. The public realm is ‘the sphere of social relations going beyond our own circle of friendships, and of family and professional relations. The idea of the public realm is bound up with the ideas of expanding ones mental horizons, of experimentation, adventure, discovery, surprise. (Hajer 2001, 13)



Fish Creek
Nose Creek
Elbow River
Bow River

Calgary Hydrologic Systems
(Bow River Basin Council 2010)

Thesis Question

How can increased public connectivity and public programming along the Bow River be used to reconnect the fractured populations of Calgary to the symbolic heart of the city?

This thesis proposes to use the existing river-valley systems as the new public realm for Calgarians. There are four major river-valley systems within Calgary: Fish Creek, Nose Creek, the Elbow River and the Bow River.

Each of these systems are already well integrated into Calgarian life - they provide drinking water, irrigation for crops, hydroelectric power, and numerous recreational activities year round. The river-valleys and Calgary identity have always been intertwined beginning with the founding of the city at the confluence of the Elbow and Bow Rivers. Most importantly, the river-valleys are present throughout the entire city. Whether you live in the suburbs of the South-West or the downtown core, Calgarians have a constant awareness of the river systems.

At the core of the city, the Bow River wraps around downtown, creating the iconic image of a dense city core rising up from the lush river-valley. The Bow River-valley is an essential part of the heart of Calgary, it provides a much needed counterpoint to the density and intensity of the core. This thesis will focus on creating a number of public spaces that can be replicated along the banks of the rivers throughout Calgary. This thesis will be developing these new

Calgary skyline from Crescent Road at dusk, photograph by Chuck Szmurlo (Wikimedia 2007)

> From the ground, in the downtown area, there are still views of the bleached grass on the escarpments of the Bow River. No matter how windy and gritty and grey is the downtown, there is a visual reminder that there is a steep slope winding along by the river. This is important. It keeps our attention from being too inward: it gives us a context for the intensity of the downtown core. It is a relief valve. (White 2012, 137)

public spaces within the context of the Downtown West-End and Eau Claire neighbourhoods. Despite the long-standing tie between the city and the river-valley, Calgary is like many other cities - overtime it has grown apart from the banks of its rivers. The Calgary river-valley has served industrial, commercial, public and residential purposes. This thesis seeks to reconnect the public to the Bow River by reinforcing connections in the parallel and perpendicular axes. The proposals aim to further develop the river-valley as the site for inclusive public spaces. Places where all Calgarians can gather, recreate, and most importantly, interact.

CHAPTER 2: THEORY

Urban Waterfronts

> The human fascination with water has long been a subject of reflection and speculation, both at the philosophical level and in architecture, landscape, and urban theory. The idea of urban waterfronts as places of pleasure is extremely widespread and seems rooted in more than some rational conception of amenity. (Dovey 2005, 23)

The urban waterfront has played a number of different roles in cities throughout time. They have contributed to the symbolic, iconic, physical organization, and economic development of the urban form world-wide.

Symbolically, waterfronts have an iconic role in defining the identity of a city. They can be seen as a unique edge condition - a sinuous, natural system colliding with the hard, constructed edges of a city. Waterfronts can be understood as the boundary between one world, land, and another, water (Fischer et al. 2004, 63). Therefore, the transition zones between city and water are endowed with experiential wealth that can be used to construct urban identity. This unique setting has been used to define a sense of place, and aid cities in resisting the “this could be anywhere” syndrome (Marshall 2001, 180).

The geographic and topographic features of an urban water system are tied to the organization of the city on its banks. Water systems adjacent to cities not only contribute to the transportation systems, but also became a spatial system that is a part of the

geographic fabric of a urban space (Calgary River-Valleys 2012, 5).

> Nearly all of our cities and urban cultural spaces grew up on riverbanks and their development and the possibility of their inhabitants also tell a story of their relationship with the water; trade, transport, and industry flourished because of the navigability of these rivers and their significance as transport routes. (Prominski et al. 2012, 5)

Most waterfronts across the globe have a history of industrial use. Each waterfront has been used for economic gain, whether this is through the trade of goods, tourism, or other water-based industries.

H. Meyer has developed a timeline of waterfront development, and divided this timeline into four distinct phases:

I. Pre-Modern Times

The phase refers to the time before most cities engaged in large-scale construction at the water's edge. Typically set before the 19th century.

II. Early Modern Times

In the 19th century, many waterfronts are industrialized to take advantage of the water-base economies of trade, and the further utilize the water as a transportation system.

III. Modernism

Set in the 20th century, there is a de-industrialization of the waterfront. Many cities focus on the waterfront as a place for renewal and beautification.

IV. Post-Modernism

This is the phase that city planners and architects are faced with today.

At the turn of the century, many waterfronts were no longer the industrial and transportation hub of the past. Cities began to focus on waterfronts as the next site of urban renewal and change. With the removal of the industrial and transportation barriers that closed off the water's edge for centuries, many waterfronts attracted public interest. There was a shift in conceiving the waterfront as a place of industry to a place of leisure and recreation.

> Riverside city lands previously devoted to heavy industry and shipping were being converted to housing, open space, and parks. Concrete bulkheads and embankments were being removed and replaced with restored wetlands, marshes, and beaches. Warehouses, highway overpasses, and other structures that were formerly crowded at the waterline were being torn down or set back to allow greater public access. Urban rivers, formerly open sewers of our cities, were increasingly needed to support waterfowl, fisheries, and canoeing. (Kibel 2007, 1)

The renewal of urban waterfronts in North America began in Baltimore (1965) and Boston (1959). As more cities began to redevelop their urban water bodies, waterfronts became their own specific form of urban design. Typically, waterfront renewal focuses on transforming a water body that was 'cut-off' from the city by industry and transportation into a waterline with 'green edges' (Castonguay and Evenden 2012, 3). They became spaces that were accessible to the public for recreation.

Waterfront development during the modernist phase were focused on public spaces: parks, walkways, trails, marinas, and other community recreation areas. Slowly, cities were turning back to their waterfronts, and using the water's edge to improve the quality of urban life through leisure and recreation (Prominski et al. 2012, 9).

Today, modernist ideals are still being upheld - waterfronts remain a place for public enjoyment. However, now cities desire a waterfront that is multifunctional. Cities want a waterfront that can be a place to work, a place to live, and a place to play (Fischer et al. 2004, 11). The public wants more than a beautiful place to recreate, they want an experience and intensity of activity. This would include public facilities that cater to: lifestyle shopping, family entertainment, sports, museums, art galleries, and science centers (Marshall 2001, 80).

Waterfronts of today have the potential for inclusive public space. The desire to be close to the water is a human-wide phenomenon.

> ...the rivers are many different things to many different people, repositories of a vast and varied range of hopes and expectations and uses. But where they come together - where their future lies - is as a center of community life. It is precisely their potential to meet so many different human needs - from the recreational to the aesthetic to the commercial - that gives the rivers their transcendent power. They are, very clearly, a "place" ; a multi-faceted but nonetheless cohesive gathering point for a community and its idea of itself. (Riverlife Task Force 2001, 4)

Central to the creation of inclusive, public waterfronts is public access and public permeability. All waterfront

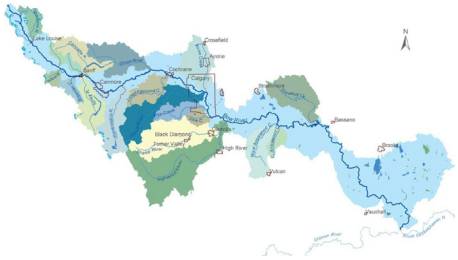
buildings should be designed for public permeability with open views to the water. Connections to the waterfront should focus on both public access, and link the form and structure of the city to the water's edge (Fischer et al. 2004, 63).

Post-industrial waterfront design is faced with a number of challenges including: providing for a broader set of social needs, managing the intersection of public and private domains, and reconciling local scale with a global context.

As mentioned previously, waterfronts are becoming increasingly multifunctional, and focused on inclusive spaces for the diverse populations in our cities. Designers need to create spaces that can be used by a variety of users for a variety of uses. Layered experiences and mixed developments are key to a successful waterfront.

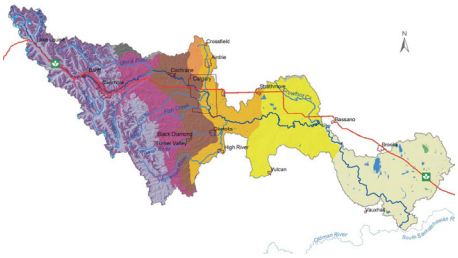
Waterfronts are a place to live as well as to play. There are a number of issues when dealing with residential spaces along a primarily public place. The opposition of private and public can create tensions between groups of users - especially when public desire for access and permeability conflicts with an individual desire for privacy and security (Breen and Rigby 1996, 153). Semi-public spaces and functions can be used as a transition zone between the private and public zones. Additionally, commercial spaces that serve both residents and the public can be used to reduce tensions in addition to providing extra amenities.

Finally, for every successful waterfront story, there are a number of unsuccessful, scaled down, or cancelled waterfront projects. Many of these suffered from the same issue. Too often, these projects were aimed only at a global economy and the tourist user (Malone 1996, 263). These projects do not relate to the local context - as a result the local markets and users can not support them.



Map of Bow River Tributaries
(Bow River Basin Council 2010)

- Bow River
- Pipestone River
- Redearth Creek
- Cascade River
- Ghost River
- Kananaskis River
- Elbow River
- Sheep River
- Highwood River
- Fish Creek



Map of Bow River Ecological Zones
(Bow River Basin Council 2010)

- Alpine
- Sub-Alpine
- Montane
- Upper Foothills
- Lower Foothills
- Foothills Parkland
- Central Parkland
- Foothills Fescue
- Northern Fescue
- Mixed Grass
- Dry Mixed Grass

Calgary's Bow River-Valley

> We think of Calgary's rivers as "natural" environments within our rapidly growing city. The Bow and Elbow are the cornerstones of Calgary's aesthetic, recreational and natural capital assets, and our rivers and river valleys have long had a high priority in the local civic agenda. The value of water in a dry land has played a fundamental role in Calgary's history and continues to affect development patterns." (Conaty 2004, 1)

The Bow River begins in the Rocky Mountains, at the glacier fed Bow Lake. It then flows through the Albertan foothills, where it bisects Calgary. The river winds out into the prairies where it eventually becomes a part of the South Saskatchewan River. Within Calgary, the Bow River creates a wide, shallow floodplain - an ideal geological condition that led to the founding of the city.

The geographical setting of Calgary can be understood in terms of east and west - a division denoted by Center Street. Eastern Calgary is flat, a stretches out into the Albertan prairies, while western Calgary sits at the start of the foothills. Downtown Calgary is located at one of the lowest points in the city, at the base of a valley formed by the Bow and Elbow Rivers. Steep escarpments form a boundary

Map of Bow River Land-Use
(Bow River Basin Council 2010)

- Rock
- Sub-Alpine
- Cropland
- Other Lands
- Forage
- Grassland

around downtown - and are often left as open parks due to the unstable condition of the escarpments (White 2012, 36).

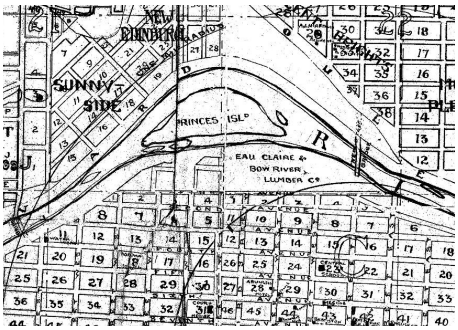
The Bow Riverfront has undergone a series of uses and development since the founding of the city. Returning to the phases of waterfront development proposed by H. Meyer we can define four distinct trends: Pre-Modern, Early Modern, Modernism, and Post-Modernism.

I. Pre-Modern

Calgary, 1884 (Calgary Public Library Archives 2015)

The confluence of the Elbow and Bow River was a meeting place for the indigenous populations long before the establishment of the North-West Mounted Police post in 1875. In 1884, the Canadian Pacific Railroad used the large, flat area of the Bow River Valley as a place for a new town - just to the west of the original Mounted Police Post (City Planning Department 1966, 15). It is during this time that the city grid was laid out - an organization system that is still present in the downtown today.

II. Early Modern



Calgary, 1907 (Calgary Public Library Archives 2015)

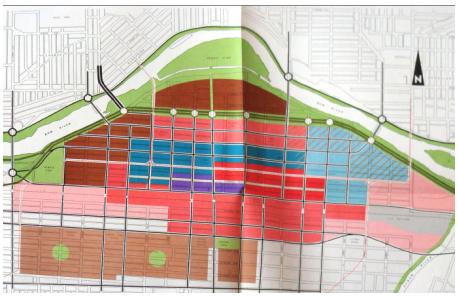
Unlike many other Canadian rivers, the Bow River was never used as a major transportation route; it was far too shallow, meandering, and variable for commercial transport (Armstrong, Evenden, and Nelles 2009, 66). As a result, Calgary relied heavily on the CPR as a means of transporting goods. The Canadian Pacific Railway continued to contribute to the growth and development of Calgary, its tracks

running parallel to the Bow River, and the city of Calgary occupying the banks between them.

From the late 1890s until 1944 the Bow River was an industrial river. The area that is now known as Eau Claire was home to the Eau Claire and Bow River Lumber Company (Conaty 2004, 92). A large wood mill and accompanying industrial buildings and workers houses crowded the south banks of the Bow River.

III. Modernism

Bow Riverbanks, 1955 (Calgary Public Library Archives 2015)



Calgary 1966 Masterplan (City Planning Department 1966)

The industrial era of the Eau Claire riverfront only lasted from 1886 until 1944, after which point it became a center for deindustrialization (Armstrong, Evenden, and Nelles 2009, 110). With the mill dismantled the area of Eau Claire became home to a number of light industrial businesses, parking and vacant lots. Eau Claire remained an eyesore along the banks of the Bow until the 1960s, when the public began to shift their views on the value of the river-valley. Most importantly, the 1960s represented a transition from the river-valley being held by primarily private to public ownership (Armstrong, Evenden, and Nelles 2009, 388).

In 1966, the City of Calgary released their downtown vision plan, entitled *The Future of Downtown Calgary 1966*. In addition to providing solutions to Calgary's traffic woes, the plan focused on the beautification of the Bow River-valley, and the development of a number of recreation spaces along the riverbanks.

> The Riverbank Development: although mentioned last, is by no means the least important of the major proposals. Together with the headland bluff, the riverbanks should be an attractive backdrop to Downtown, a recreational area for the use of Downtown and city-wide residents, and an attraction to visitors and a feature that, above all else, is unique to Calgary. (City Planning Department 1966, 2)

The area of Eau Claire transitioned from commercial to high-density residential zoning in an effort to bring Calgarians back into the downtown core.

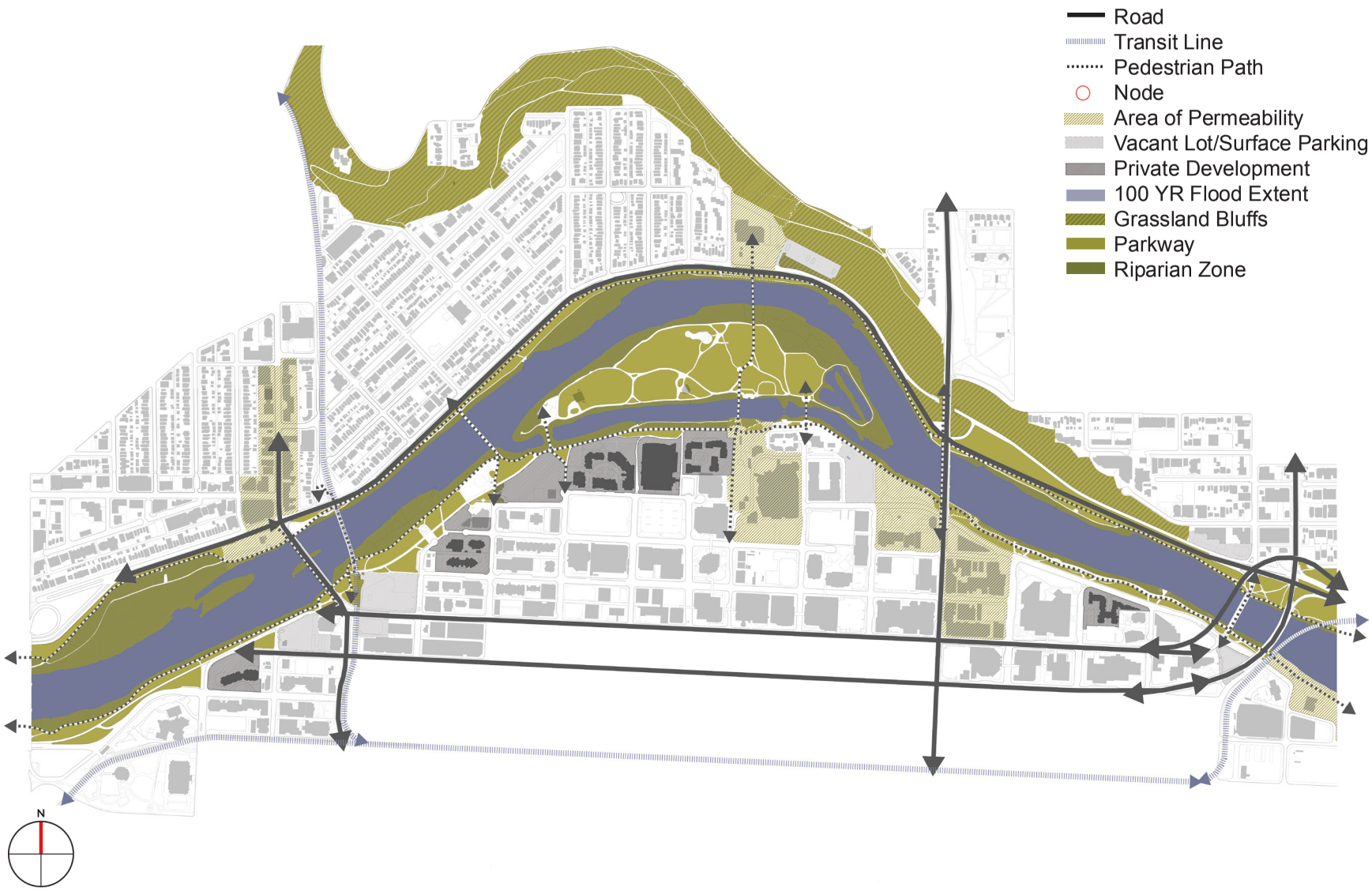
Calatrava Peace Bridge, photograph by Gavin Young (Calgary Herald 2012)

Calgary East-End Riverwalk (Calgary Municipal Land Corporation 2015)

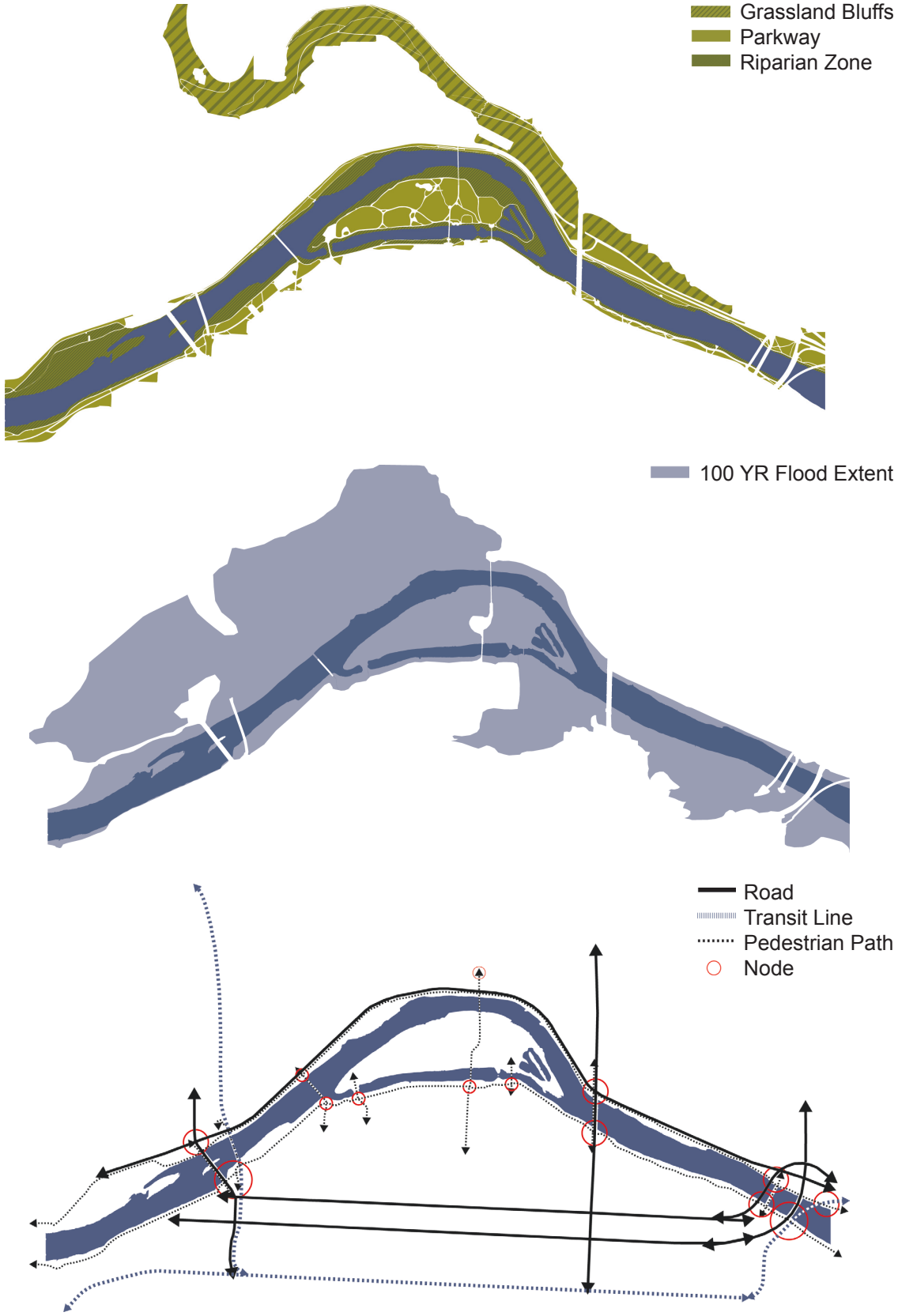
Eau Claire Redevelopment (Perkins + Will, 2015)

IV. Post-Modernism

By the 1970s the parkway and green belt of Calgary's river-valleys had become entrenched in municipal planning (Armstrong, Evenden, and Nelles 2009, 314). Today there are over 700 kilometers of pathways, and numerous recreational spaces along the banks of Calgary's river (Conaty 2004, 115). Current riverside developments are looking to provide more than beautiful green spaces. These developments are focused on creating an iconic presence in the river-valley, mixed-use facilities, and intensifying the activities that already happen in the Bow River-valley. Some of these developments include new pedestrian bridges (the Calatrava Peace Bridge and RFR's St. Patrick's Bridge), as well as an entirely new masterplan for Calgary's East Village and East Riverwalk. Finally, a number of existing riverside facilities are being replaced, as in the case of the Eau Claire Market Redevelopment.



Calgary's Downtown Bow River-valley Today



Calgary's Downtown Bow River-valley: Ecology, 100 Year Flood, Transportation

CHAPTER 3: METHODS

The Importance of Connectivity

A successful waterfront design must focus on the importance of connectivity. Waterfronts must foster a connection between the city as well as the public to the water's edge.

A good waterfront is able to connect the neighbourhoods along its banks. Old relationships between urban areas can be restored, or new relationships can be established. Strong connections between different districts of the city will create a more unified city. In Calgary, the city is undeniably related to the rivers that bisect its urban form. Like many waterfronts, Calgary's south bank of the Bow River is adjacent to the physical and symbolic heart of the city.

In order to foster relationships between different neighbourhoods of the city, a waterfront must first be accessible to the public. Even where the waterfront runs along a private development, the public should have a connection to the water's edge (Riverlife Task Force 2001, 15). Pedestrian accessibility is key. Connectors should link the city core with other inner-city communities along the river-valley (Marshall 2001, 48). Calgary is not a city known for its walkability. However, the downtown plans enforced during the 1960s have ensured that the river-valleys have been developed with the pedestrian in mind. Kilometres of bicycle and pedestrian trails, as well as a number of pedestrian bridges keep both sides of

the river-valley connected. This thesis will continue to build upon these ideals, and improve them where necessary to ensure that public pedestrian access to the water's edge is maintained.

In order to achieve better public connectivity and access to the river-valley system, this thesis proposes interventions at three distinct sites within the downtown Bow River-valley. Each site represents a different condition preventing public connectivity to the river's edge. The interventions will contribute to improving the public space of the river-valley on a local, regional and civic scale.

At a civic scale, the interventions can be used to reinforce the entire Bow River-valley as a system of public green spaces. The interventions are meant to both improve and tie into the existing pedestrian and cyclist pathway networks.

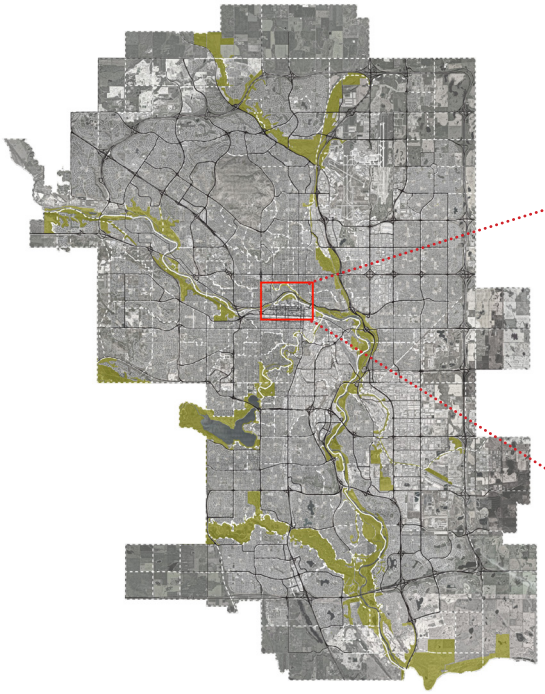
Within the regional scale, each intervention will step the existing green space back into the city - expanding the green belt between the built environment and the riparian zone. Regional cyclist and pedestrian pathways will be improved with more parallel and perpendicular linkages.

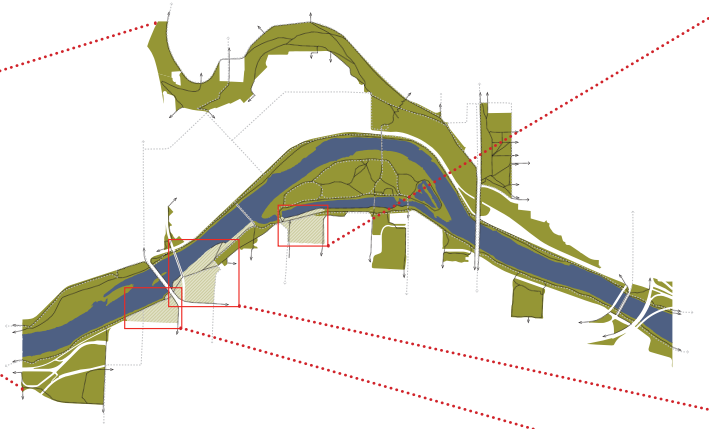
The local scale is addressed by focusing on the unique physical and social conditions present at each site. The physical conditions will dictate the form of the interventions, while the social conditions will inform the public program added. Each intervention is meant to reflect the local identity while reflecting a cohesive regional and civic system.

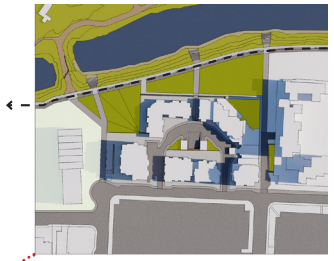
CIVIC SCALE

REGIONAL SCALE

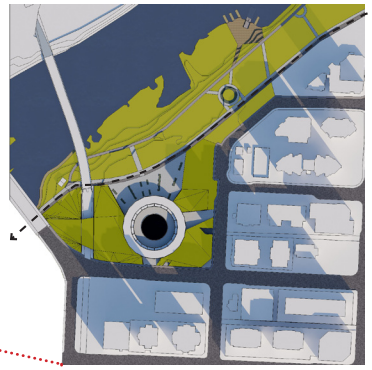
LOCAL SCALE







SITE 3



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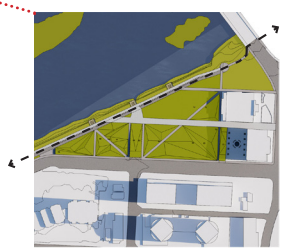
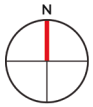


SITE 1



Pedestrian Path

Cyclist Path

Scale of Interventions

Site 1 (From Parking to Park) represents a number of downtown sites that encompass either vacant or surface parking lots next to the Bow River. The design response involves moving the parking underground to allow the park system to expand back into the fabric of the city.

Site 2 (From Indistinct Entry to Gateway to the City) identifies a unique site along the Bow River, at the confluence of a number of pedestrian, transit and vehicular access routes. This site is currently underdeveloped and used as a public parking lot. The proposal is the creation of an “anchor” building containing a farmer’s and arts market, recreation equipment rental facility and a number of rentable public spaces.

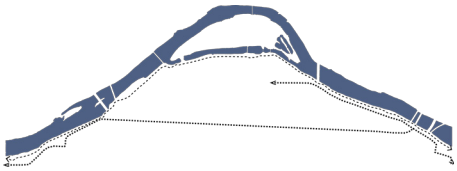
Site 3A (From Weak Link to Transit Stop and Trailhead) focuses on increasing access for the public from areas outside of the downtown. By adjusting transit routes, and bike lanes to extend into the river-valley system, the public will have a more direct mode of transportation from their homes to the river.

Site 3B (From Private Precinct to Public Promenade) is a design response to a number of private condominium complexes within the Eau Claire community. These complexes have privatized the land between the city and the river. To reduce tensions between residents and visiting users, the proposal introduces commercial programming on the main floor of the residential complexes.

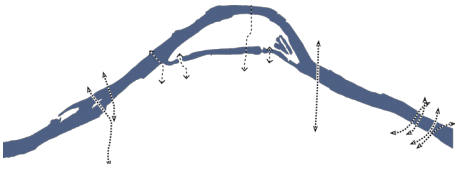
The Parallel and Perpendicular Axes

Waterfront connectivity can be thought of in terms of two key axes: the parallel and the perpendicular. These axes refer to the waterfront's relationship to the city and the water's edge. Parallel connections run alongside the river. Perpendicular connections start at the water's edge and extend back into the city. A successful waterfront will use both axes in order to connect its city and public to the waterline.

Parallel Connectivity



Parallel Connections



Perpendicular Connections

As mentioned above, parallel connectors run alongside the river. The parallel axes function is to provide a representation of each landscape it passes through, to reconnect different communities, and to provide a wide variety of programs/uses within the river-valley.

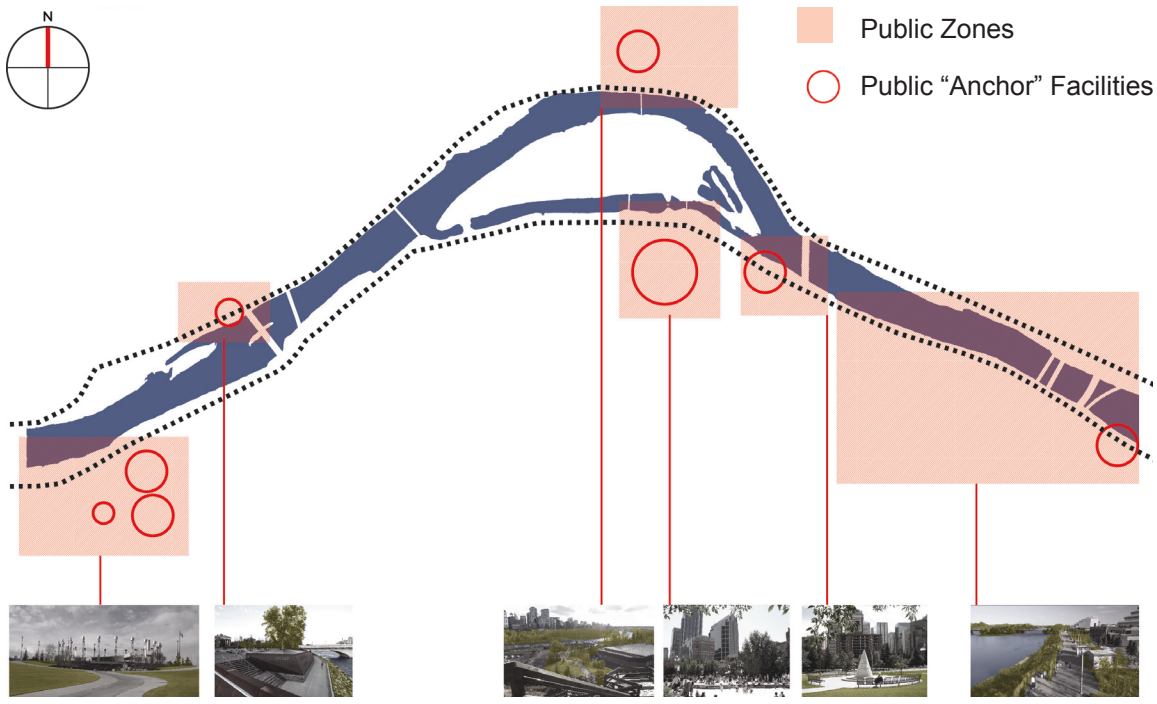
The Bow River passes through many different landscapes: geographical and social. The parallel axis provides an opportunity to capitalize on these unique conditions, while retaining the identity of the local context.

Boston's Emerald Necklace (Emerald Necklace Conservatory 2014)

> A river park system becomes a collection of many individual - and remarkable - public landscapes. Boston's Emerald Necklace offers a useful analogy. That city's Public Garden, or Commonwealth Avenue Mall, or Franklin Park are each treasured for their special character while always understood as parts of a larger, integrated, open-space system - the overall Necklace. (Riverlife Task Force 2001, 37)

In order to accurately represent each stretch of the Bow River, interventions must take into account what

the adjacent communities need from their river-valley. Generally, these needs and desires manifest into a public facility, or, anchor point. Each anchor point is connected via a number of pedestrian,vehicular and cyclist routes. Starting west to east: Shaw Millennium Park, Calgary Mewata Armory, Poppy Plaza, Prince's Island Park, the Calgary Curling Club, Eau Claire Market, Sien Lok Park, the East-End Riverwalk and concluding with Fort Calgary.



Parallel Connectors and Anchor Points

To bring the public into the river-valley system, a number of different needs and desires must be addressed. The goal is for a multitude of inclusive public spaces. As such, the interventions developed must provide multiple reasons to visit and enjoy the riverfront.

The parallel axis plays a key role in facilitating the interaction between these diverse activities. Along pedestrian routes, interaction, and an array of interchanges between different programs and users can enhance the urban complexity as well as create an inclusive space (Marshall 2001, 44).

Perpendicular Connectivity

> Perpendicular connections bring people to the waterfront. Sidewalks, public streets, pathways, and promenades provide safe and engaging passages and reinforce the riverfronts as public realm. (Riverlife Task Force 2001, 31)

The perpendicular axis should function as a direct connector between a community and it's waterfront. Perpendicular connectors can take the form of public walkways, trails and streets. However, a strong perpendicular connection should be applied to more than outdoor spaces - buildings should also be designed to draw people from the city and onto the waterfront. The most effective way to achieve a strong perpendicular axis is to avoid simplifying the waterfront to a thin line, and to provide a progression of experiences from city to water.

> One tends to think of land/water relationship in terms of opposites, or of the edge between the two. Metaphysically this edge is razor thin. In terms of city-building, the opposite is true. Places

> like Amsterdam or Sydney make this quite evident with their complex land and water weave. Even when geography offers less variation, the broader the zone of overlap between land and water the more successfully a city captures the benefits of its water assets. (Marshall 2001, 178)

The ‘thin line’ phenomenon refers to the development of a waterfront that involves the construction of a dense, tall line of buildings right at the water’s edge. This disproportional development results in disproportional land values. While the land right at the waterline is desirable, the blocks just behind are of reduced value (Marshall 2001, 178). In these cases, the connection between the city and water can only extend to the single, dense block - as opposed to extending the connection deeper into the city.

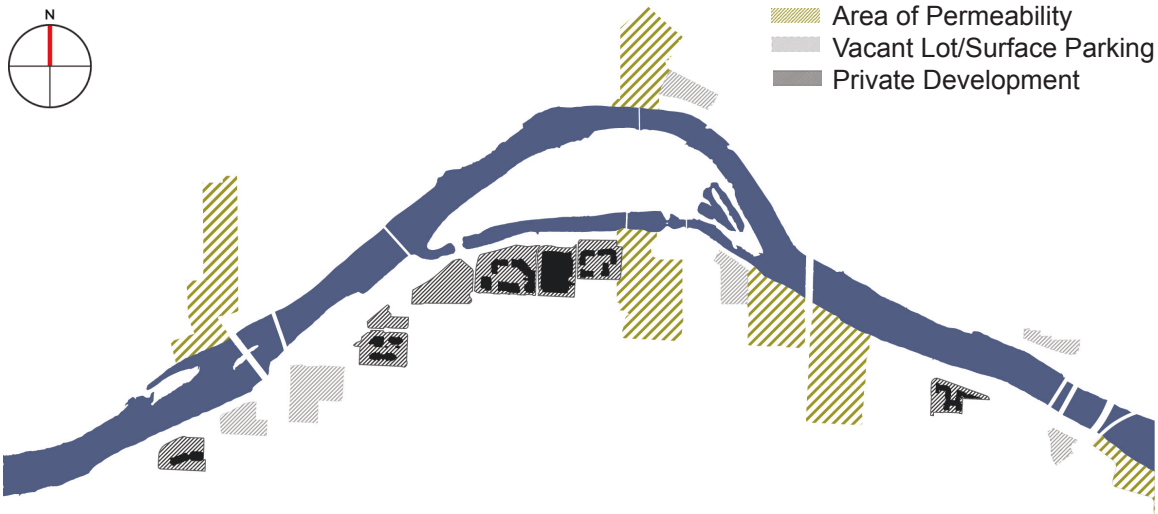
In addition to building developments, many cities have allowed their connection to the water’s edge to be severed by major transportation routes. This is true for the Bow River. Along the north bank of the Bow, Memorial Drive acts as a barrier between many mixed-use and residential communities and the water.

The south river bank suffers more from tall, dense, residential complexes that separate the city core from the waterfront. In order to increase the perpendicular connectivity, many of the proposed interventions were designed to increase the number of walkways, trails, and promenades to move the public from Calgary’s core through the residential Eau Claire, and to the water’s edge.

Existing City-Water
Perpendicular Connection

Strong perpendicular axes encompass more than public walkways and trails. To truly extend a city to the waterfront a mix of programs and urban uses need to entice users to the water's edge (Fischer et al. 2004, 48). Along perpendicular connectors it is important to develop a progression of experiences through a system of public programs and spaces. The proposed interventions were designed as a continuum of activities, meant to transition the public from the density of the city and into the recreational openness of the Bow River-valley.

Waterfront amenity should not be experienced only at the waterline (Fischer et al. 2004, 54). The built environment should allow public accessibility and extend the waterfront programs. This thesis examines some of the private residential complexes along Eau Claire. Type 2 proposed to transform these residential complexes from gated communities to developments that embrace both city and water without compromising public access to the Bow River.



Calgary Downtown Bow River-valley: Public Permeability

Precedents

Pittsburgh Riverfront

> Strengthening the waterfront's distinctive identity, opening it up to the whole community, and celebrating its many uses does more than bring people back to the water; it brings life back to the city - and transforms a region's image." (Riverlife Task Force 2001, 4)

Artist's Rendering of Three Rivers Park (Riverlife Task Force 2001)

Pedestrian/Cyclist Infrastructure (Riverlife Task Force 2001)

Parking to Pedestrian Path (Riverlife Task Force 2001)

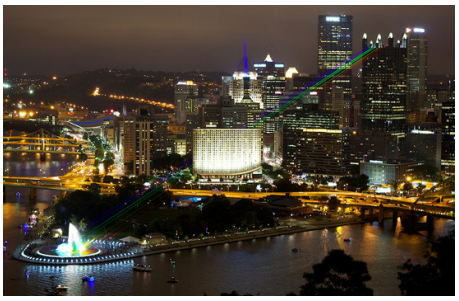
Pittsburgh's Riverfront Redevelopment is used as a precedent for the thesis due to a number of key factors: Pittsburgh, like Calgary is situated at the confluence of multiple rivers (the Allegheny, the Mononahela, and the Ohio), the downtown core is connected to the rest of the city via a number of bridges (again similar to Calgary), and it represents a post-modern attempt to redevelop a waterfront after deindustrialization.

The Riverlife Task Force has been involved with reinventing the Three River's image since 1999, and are proposing a 2020 completion date, attempting the redevelopment through segmented implementation. For the purpose of this thesis, I will be focusing on the design of Three Rivers Park. In order to understand how Three Rivers Park increased public accessibility and connectivity, I examined how the Riverlife Task Force developed both the parallel and perpendicular axes.

Parallel Axes

Connection between the parks that already exist along the waterline via trails, bridges, public program and open green spaces.

Utilization of the Boston Emerald Necklace analogy where important landmarks, public space and iconic architecture are the pearls or anchor points to the parallel system.

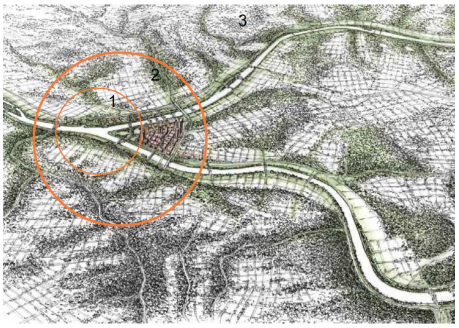


Connection between City and Water (Riverlife Task Force 2001)

Inclusion of mixed developments in order to appeal to a broad array of people as well as to bring both residents and tourists to the riverfront.

Envisioning the previously industrial river-line as a green-line through the city.

Promoting ideals of environment, economy and community.



Reconnecting in Scales (Riverlife Task Force 2001)

Perpendicular Axes

> As important as the shoreline's connection with the water will be the park's connection with the land and neighborhoods that surround it. Recognizing the value derived from being neighbors to this magnificent public space, landowners adjacent to Three Rivers Park will abide by design guidelines developed specifically for these adjoining lands. (Riverlife Task Force 2001, 5)

Strong Perpendicular Connections (Riverlife Task Force 2001)

Increased accessibility through the development of regional, pedestrian and water-based routes and nodes. Development of a design that responds to the local, adjacent and regional context.

Softening of the river's edge from concrete into natural beaches, riparian zones and beaches.

Reconnecting the existing major parks to the waterfront parks.

Developing strong perpendicular connectors from historical neighbourhoods to the rivers.

Business and institutions along the river edges respond to their river edges as a front yard instead of a backyard.

Calgary East-End Riverwalk

> Designed as both a journey and a destination, Riverwalk is a key connector and commuter route for pedestrians and cyclists. At the same time, with its outdoor art installations, lighting, outdoor furniture and extensive landscaping, it's a sought-after recreational destination - a place where Calgarians can reconnect with the river and literally dip their toes into the Bow. (Calgary Municipal Land Corporation 2015)

Bird's Eye View of Riverwalk (Calgary Municipal Land Corporation 2015)

Riverwalk Material Palette (Calgary Municipal Land Corporation 2015)

In order to create a cohesive and unified public system along the Bow River, the recently completed Jack and Jean Leslie Riverwalk (Stage 1) became an important design precedent. The East End Riverwalk, as it is also known, has become a popular destination for Calgarians along the Bow River, and is a phase of the redevelopment of Calgary's East Village neighbourhood. Previously a number of vacant lots - the East Village has been envisioned as a vibrant pedestrian focused neighbourhood including a number of residential, commercial and important public buildings (the Central Public Library, and the National Music Centre).

By utilizing a similar material palette and formal language to the East End Riverwalk, the Bow River-valley can be understood as a complete and cohesive system.

Parallel Axes

The Riverwalk was envisioned as an important

Pedestrian Connectors (Calgary Municipal Land Corporation 2015)

Restored Riverbank (Calgary Municipal Land Corporation 2015)

commuter route for both pedestrians and cyclists. In addition to the importation transportation role, the Riverwalk is also a destination with a number of unique art installations, outdoor furniture and a public plaza.

Envisioned as an important parallel axes by which to reconnect the previously divided neighbourhoods of Chinatown, the East Village, Inglewood, and Stampede Park.

Perpendicular Axes

Restoration of the riverbank back into a healthy and beautiful riparian environment.

The river-valley amenities are extended back into the city core by focusing on a streetscape that focuses on the scale of the pedestrian through the use of wider sidewalks, paving materials, vegetation, traffic interventions and greater pedestrian and transit access.

CHAPTER 4: DESIGN

Site 1
Similar Conditions
Key Plan

Site 1: From Parking to Park

Existing Conditions

Challenges/Issues to be resolved:

1. The edge between the parkway and the riparian zone has not been addressed, consequently there is no strong connection to the water's edge. Currently the separation is mediated by a small chain-link fence.

2. There is a single path for both pedestrians and cyclists this could lead to potential collisions between the slower moving pedestrians and the fast-moving cyclists.

3. Bow Trail SW cuts the river-valley park system into a number of small, uninhabitable pedestrian "islands" between the Louise and 14th ST bridges.

4. The combined vacant lot and parking lot creates a visual eyesore, and physical barrier between the residential downtown West-End neighbourhoods and the Bow River.

Opportunities

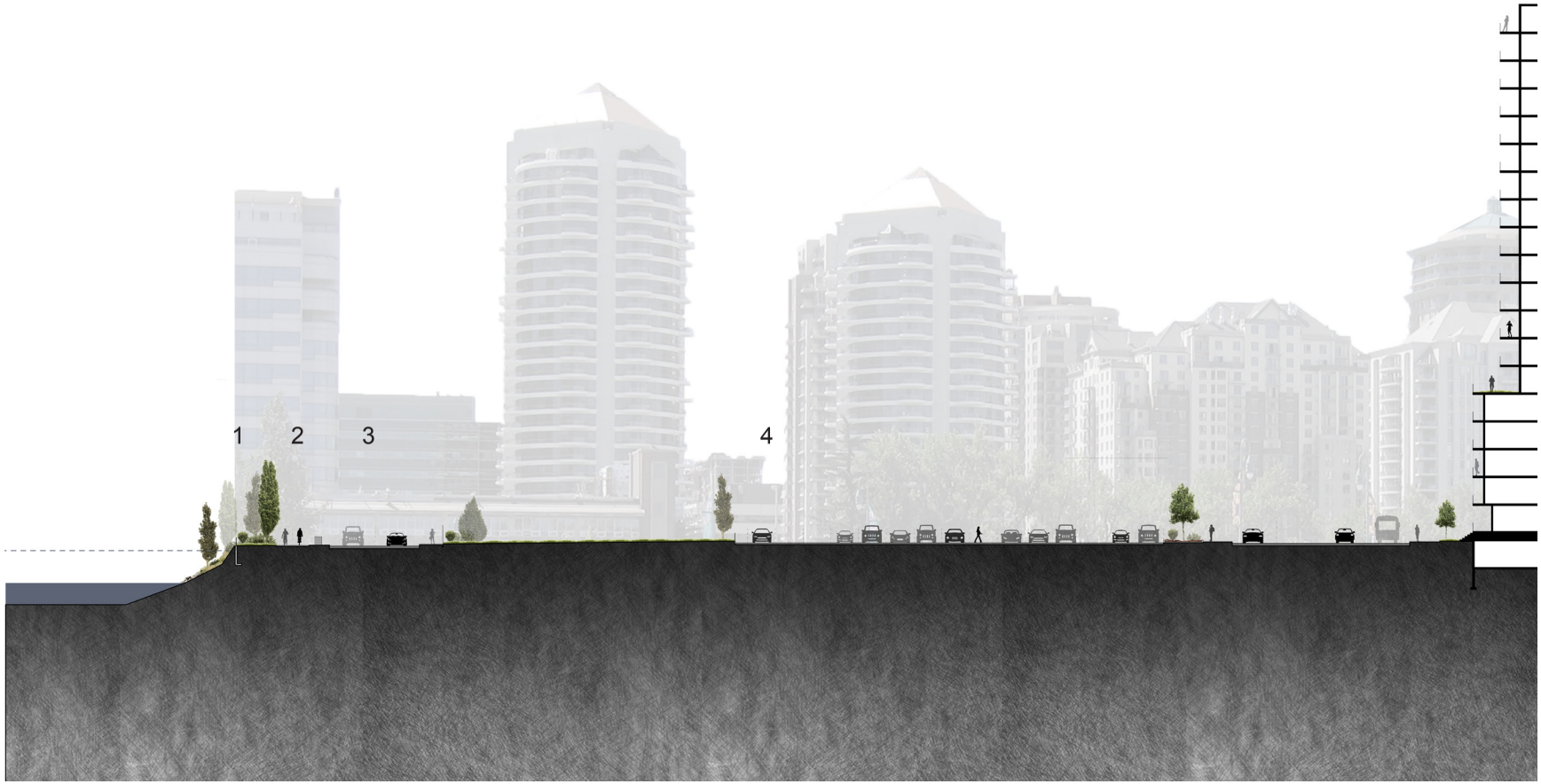
The river-bank is high at this point in the river-valley system, and provides great views across the river. The multiple vantage points provide a visual connection to monuments further down the river.

The neighbourhoods nearby have a number of

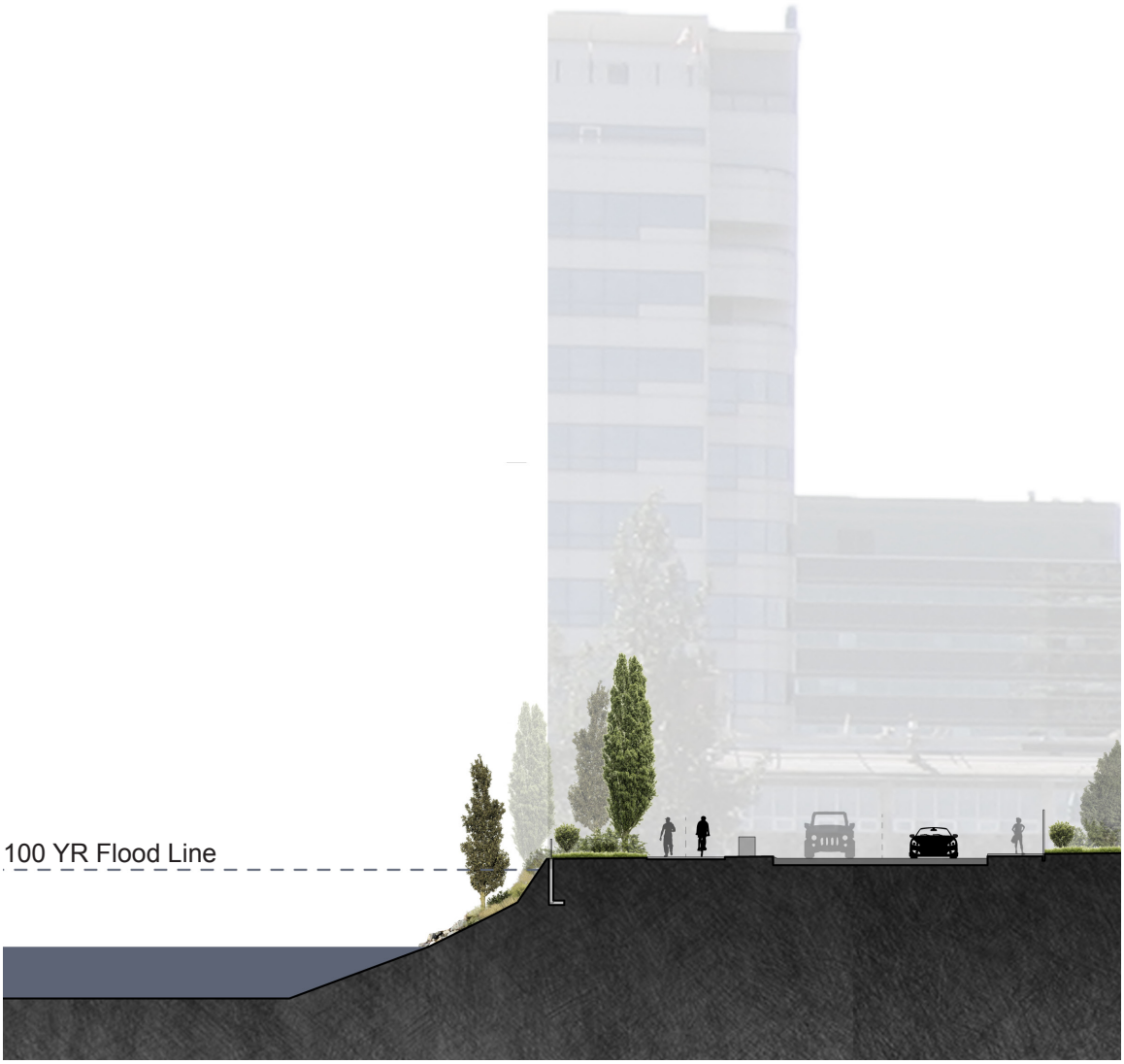
mixed-use developments, bringing in a variety of users.

Retaining walls along the river-banks, and other necessary infrastructure such as water management and lighting are already in place.

Existing Conditions



Site 1: Existing Conditions



Site 1: Existing Conditions at the River's Edge

Site 1: Existing Conditions: Vacant/Parking Lot

0 5 10 20m

Site 1: Existing Conditions: West-End Residential Zone

Proposed Conditions

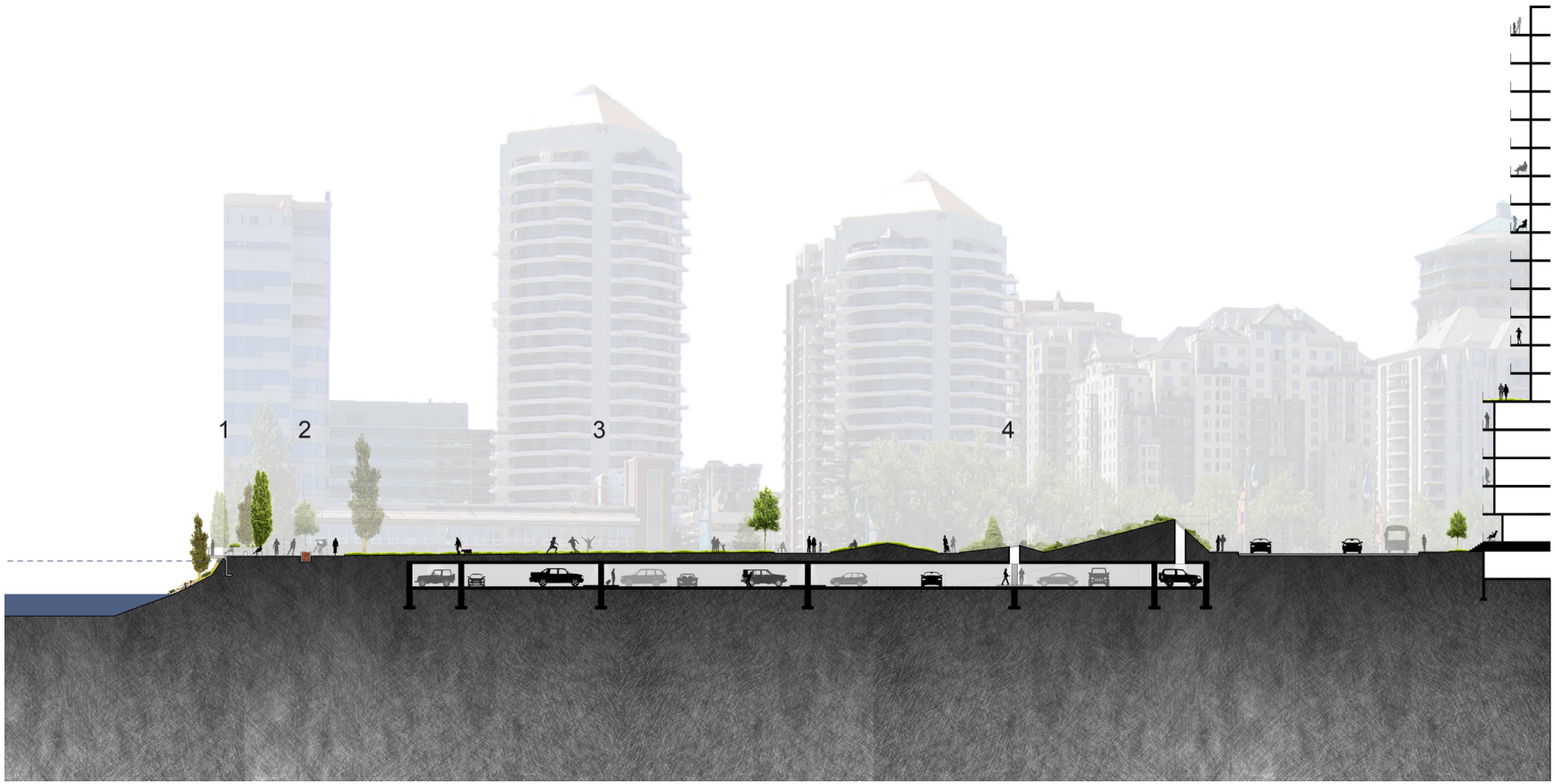
1. Responding to the local physical conditions of the river-bank, the river's edge is addressed by overlook points at the top of the steep river-bank. This intervention addresses the edge between the steep riparian zone and the parkway by visually connecting both sides of the Bow river bank. Users will also be visually connected to landmarks further down the river.

2. Civic transportation routes have been adjusted so that there are separate walking and cycling paths. A larger path with seating is created at the edge of the riparian zone. The pedestrians and cyclists are separated to prevent accidents.

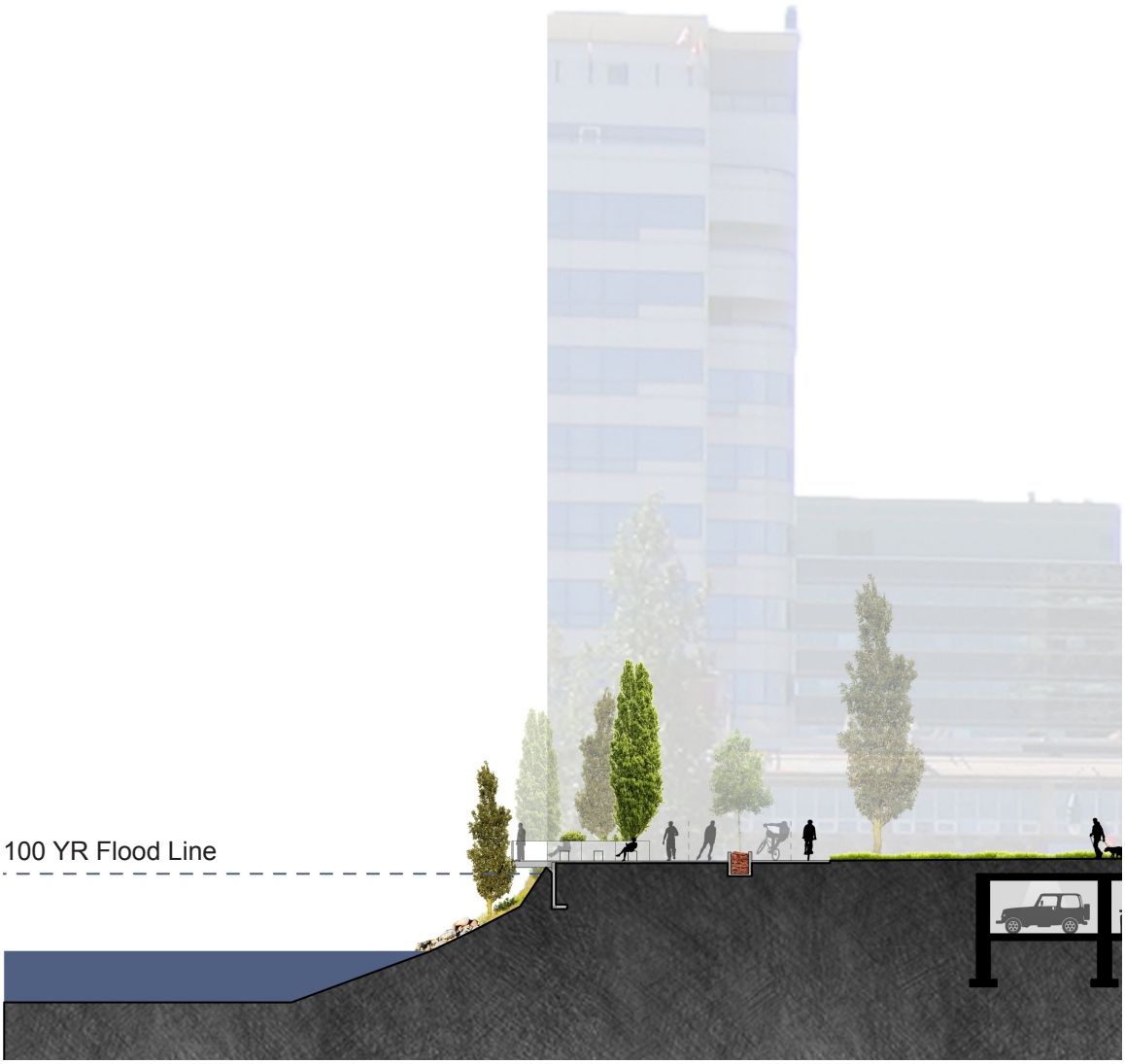
3. Recreation Fields have been created for activities such as picnics, impromptu sports activities, and relaxation. The surface parking has been relocated underground to allow for an uninterrupted green space at grade.

4. Gardens and sound berms have been created at the border between the park and 5th Avenue SW to reduce traffic noise. By beautifying these berms with gardens, the residents in the nearby high-rises are afforded a better view and 'front yard'.

5. A series of outdoor plazas along the back of the existing Avatamsaka Buddhist Monastery and Catholic School Board Center provide a gathering place for both visitors and employees to enjoy throughout the day.



Site 1: Proposed Conditions



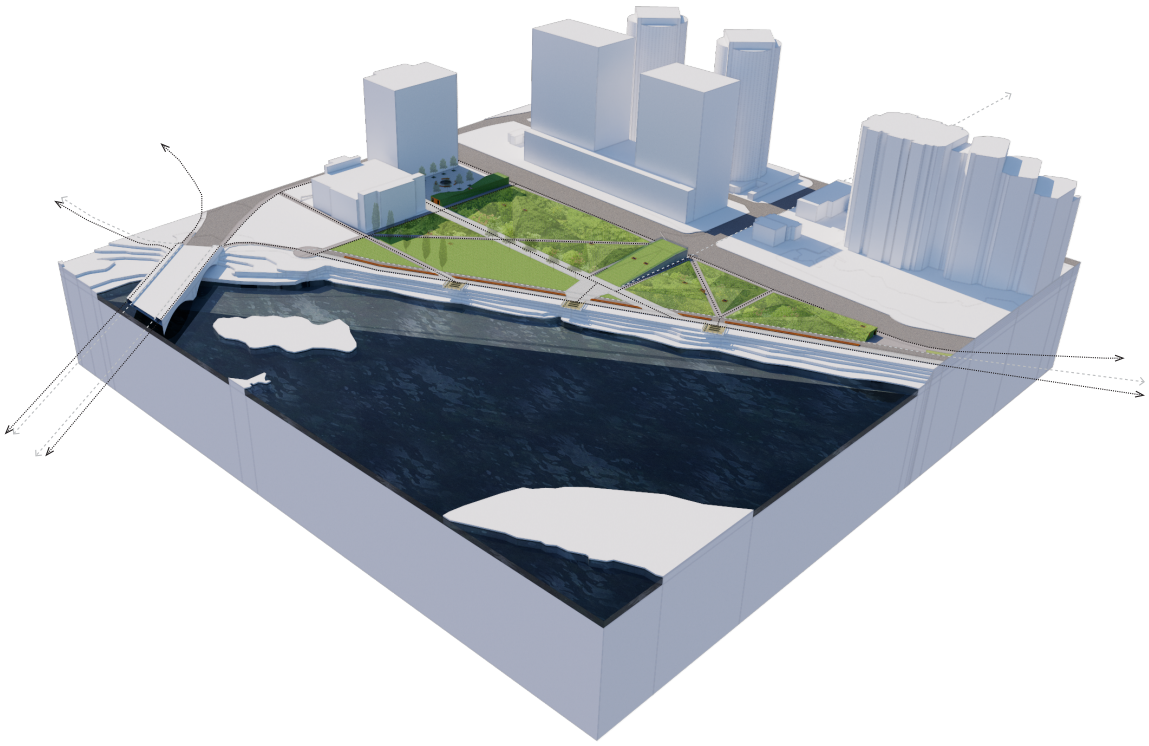
Site 1: Proposed Conditions at the River's Edge

Site 1: Proposed Conditions: Park

0 5 10 20m

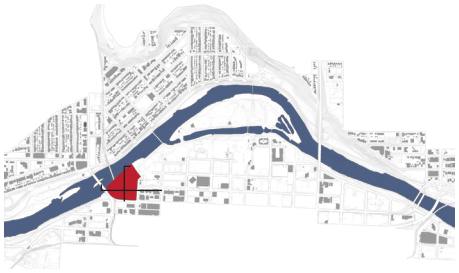
Site 1: Proposed Conditions: West-End Residential Zone 0 5 10 20m

Pedestrian Path
Cyclist Path



Proposed Conditions

Site 2: From Indistinct Entry to Gateway to the City



Site 2
Key Plan

Existing Conditions

Challenges/Issues to be resolved

1. The edge between the parkway and the riparian zone is not addressed.

2. A surface parking lot at grade creates a physical barrier and visual eyesore at the important pedestrian/vehicular/transit entrance from Kensington to Downtown.

3. There is no formal entry nor transition from the downtown into the river-valley system.

4. The section of river-valley from the Louise Bridge to Prince's Island Park lacks identity and program.

Opportunities

1. This is a unique site with transit, pedestrian, and vehicular bridges coming together at one point.

2. This site can be seen as the entrance point to downtown from north Calgary.

3. Kensington, a well-loved and popular inner-city neighbourhood is just across the riverbank. It contains a number of boutique shops, pubs, and restaurants.

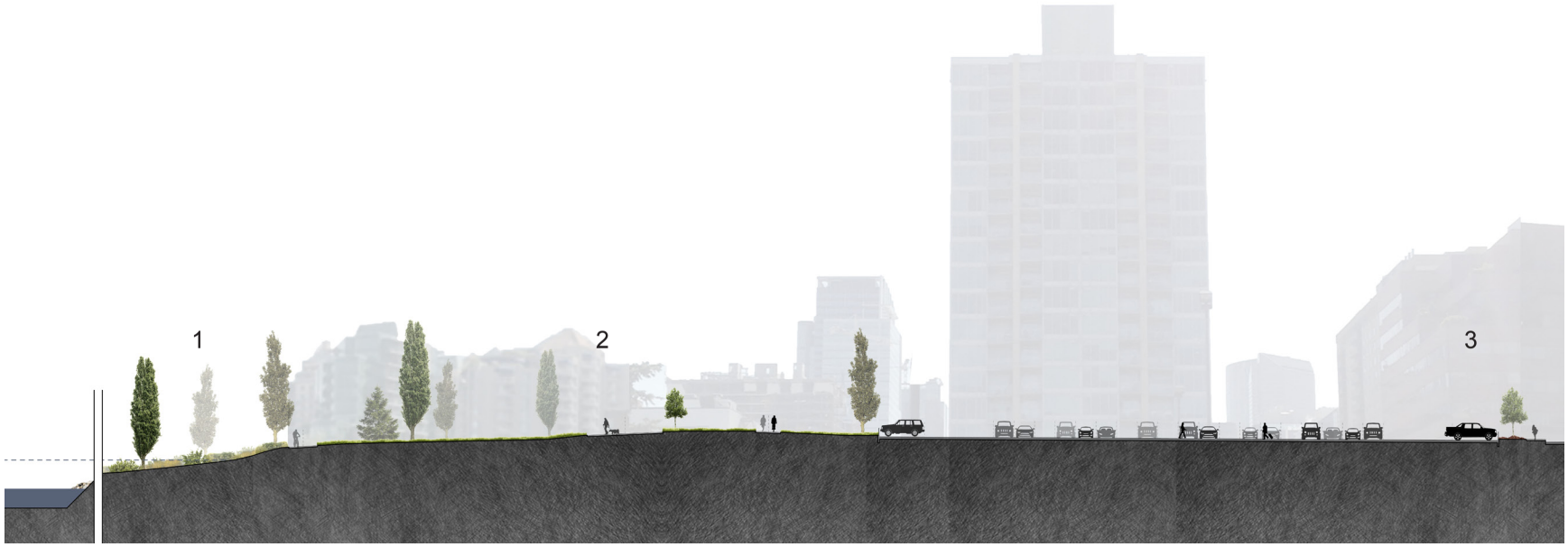
4. Due to the change in the shallows of the river after the 2013 flood, the water near the Louise Bridge has

become a popular river surfing spot.

5. Further east in Eau Claire Park, there is an existing boat launch, maintained by the City of Calgary.

6. West-End and Eau Claire are high-density residential zones, so there are already a number of different users that can make use of the area on a day-to-day basis.

Existing Conditions

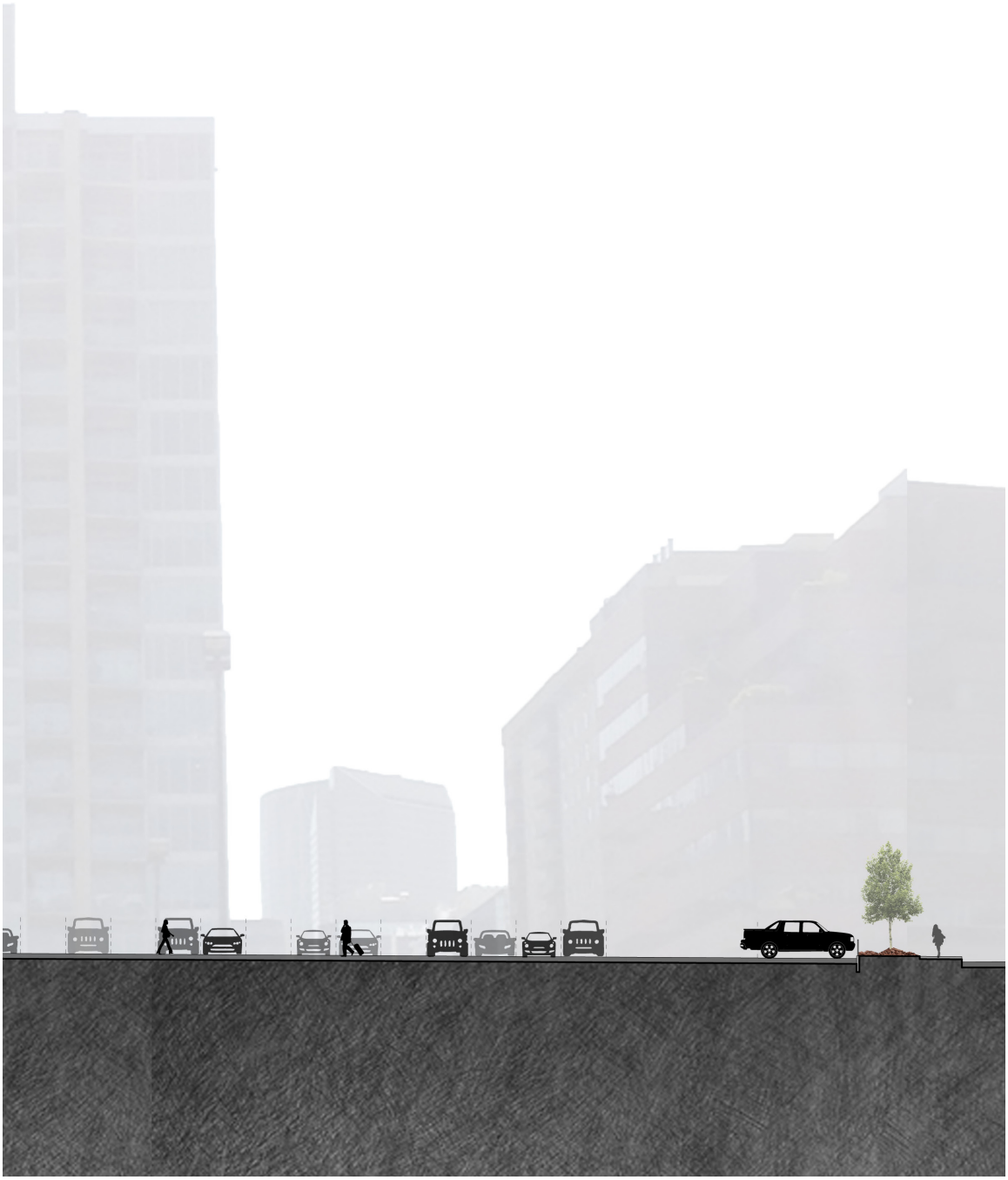


Site 2: Existing Conditions

Site 2: Existing Conditions at the River's Edge

Site 2: Existing Conditions: Parkway

0 5 10 20m



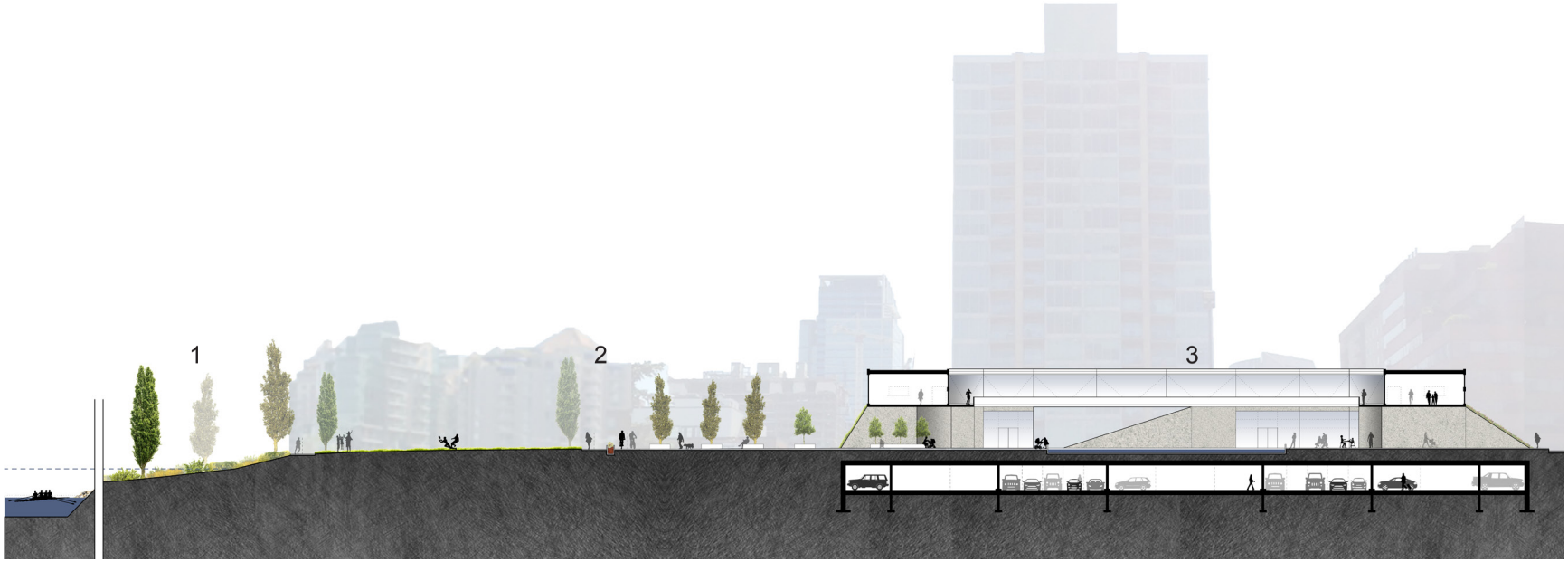
Site 2: Existing Conditions: Parking Lot

Proposed Conditions

1. Responding to local physical and social conditions, a floating platform/boardwalk has been added between the Louise and LRT bridges - this provides the users an opportunity to directly interact with the water. The river-surfers that already frequent the area can use both the platform and adjacent changing facilities. A series of docks have been added next to the existing boat launch for canoe, rafting, and fishing enthusiasts.

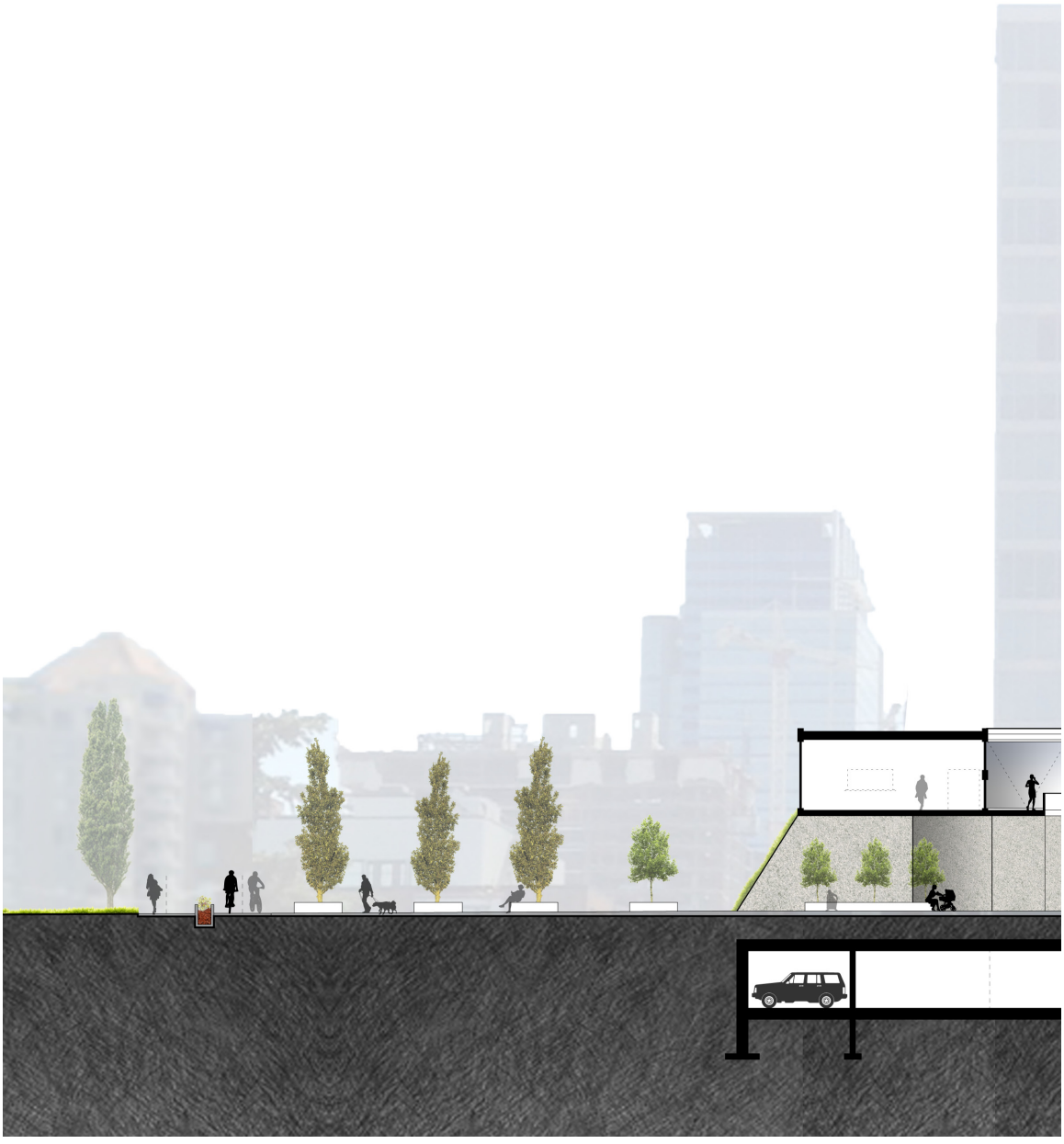
2. As a part of the regional scheme to bring the green space back into the city, the landscape has been modified both the expand the green belt and to reduce the noise from 4th Avenue SW. These berms can become relaxation spots in the summer, and sledding hills in the winter. The surface parking has been relocated underground.

3. The anchor building gives a visual identity to this section of the Bow River, while relating to a number of architectural icons nearby (The Calatrava Peace Bridge, and Norman Foster's Bow Building). On the ground level is a large public plaza. During the summer this plaza can host a number of different events as well as serve as an extended outdoor market and patio space for the businesses below. During the winter, the plaza freeze over and can be used for skating and Christmas markets.



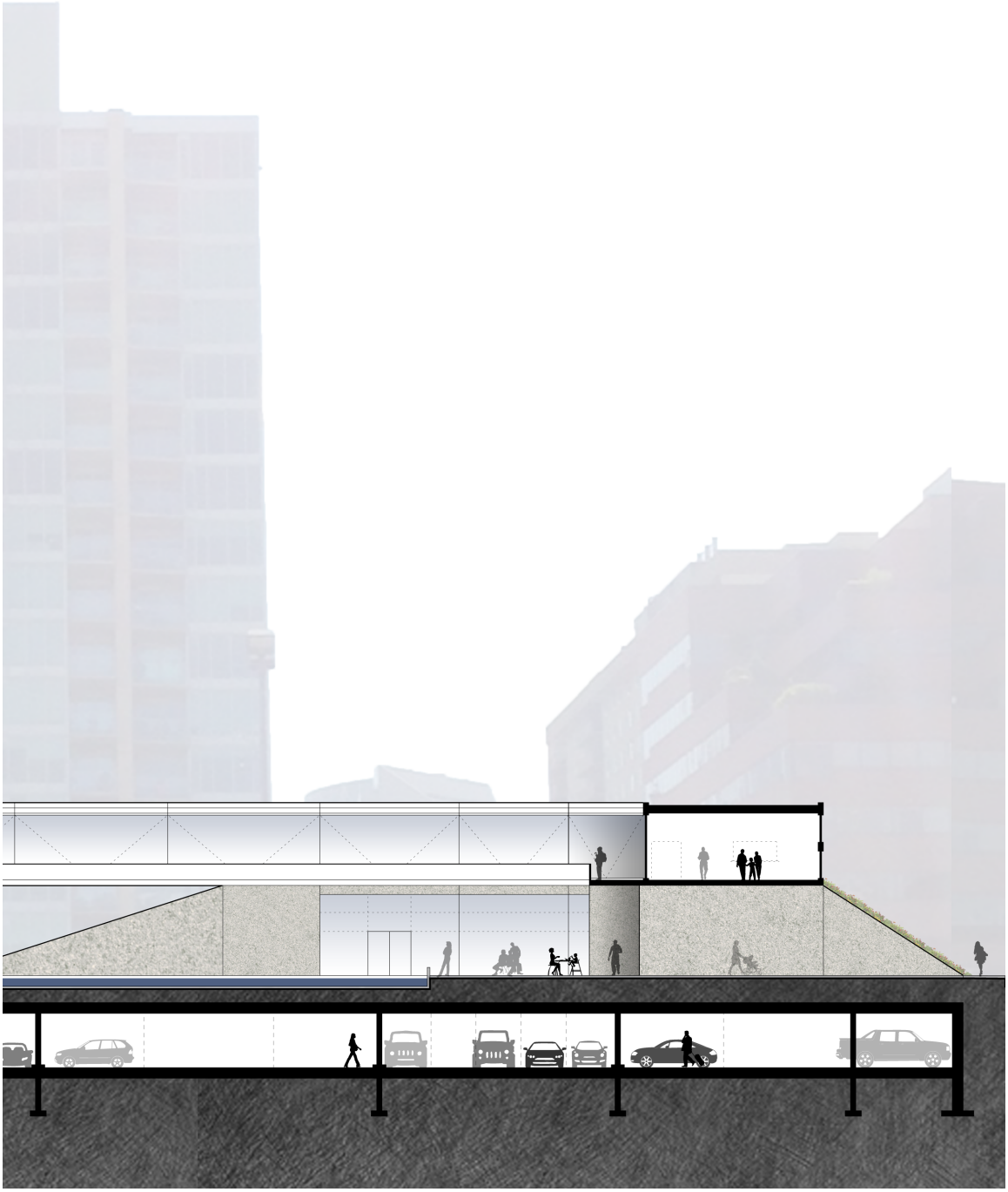
Site 2: Proposed Conditions

Site 2: Existing Conditions at the River's Edge



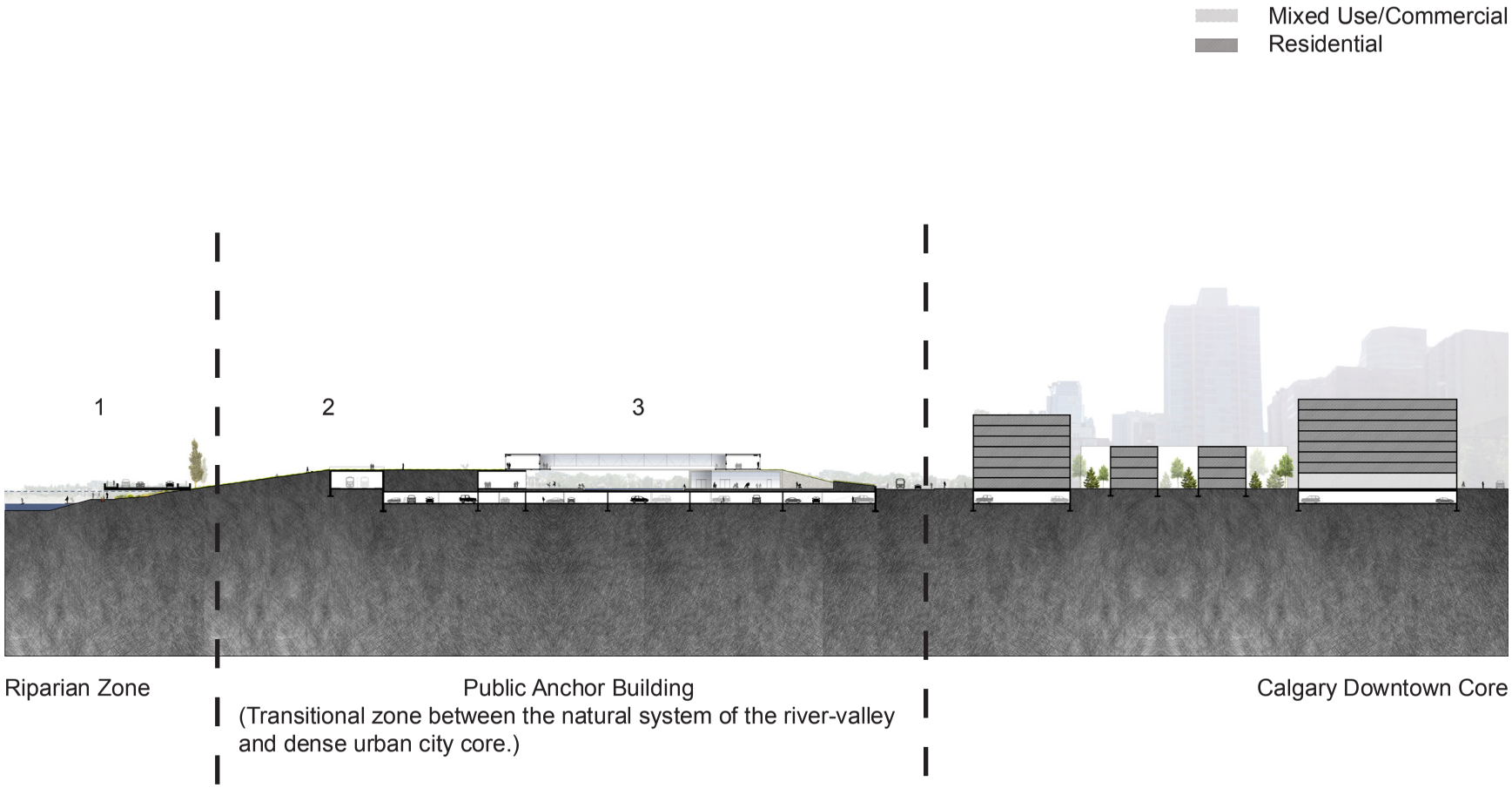
Site 2: Existing Conditions: Extension of Public Plaza

0 5 10 20m



Site 2: Existing Conditions: Anchor Building Entry

0 5 10 20m



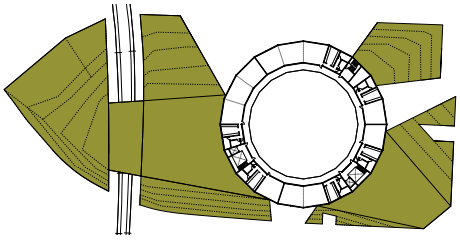
Site 2: Proposed Conditions at the Urban Scale

0 10 20 40m

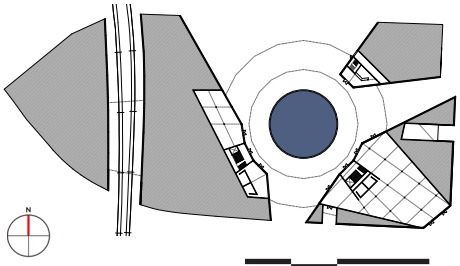
Public Anchor Building

Program

An urban art's and farmer's market is a replacement for the facilities being removed by the redevelopment of Eau Claire. Markets are a universal form/program shared by most cultures around the globe, in addition to being an activity enjoyed by both young and old. They also represent an opportunity for the numerous cultures and social groups within Calgary a chance to display their heritage through food and art at the core of the city. In the winter, market activities are done inside - but could move outside in the form of a Christmas market during December. In the summer, the market could expand into the open central plaza and into the adjacent riverbank park.



First Floor



Ground Floor

A recreation equipment rental shop is located next to the existing river-valley path systems and can provide users with items ranging from bicycles to canoes in order to enhance the activities occurring along the waterfront. The equipment stock would be seasonal, providing watercraft during the summer and skates during the winter in order to adjust to the seasonal weather patterns.

With the removal of Eau Claire market, the communities in downtown will lose a number of community spaces. As such, the upper portion of the building is devoted to rentable community space. These spaces have a number of movable partitions to adjust the size of the rentable rooms in order to accommodate a range of activities. The rentable

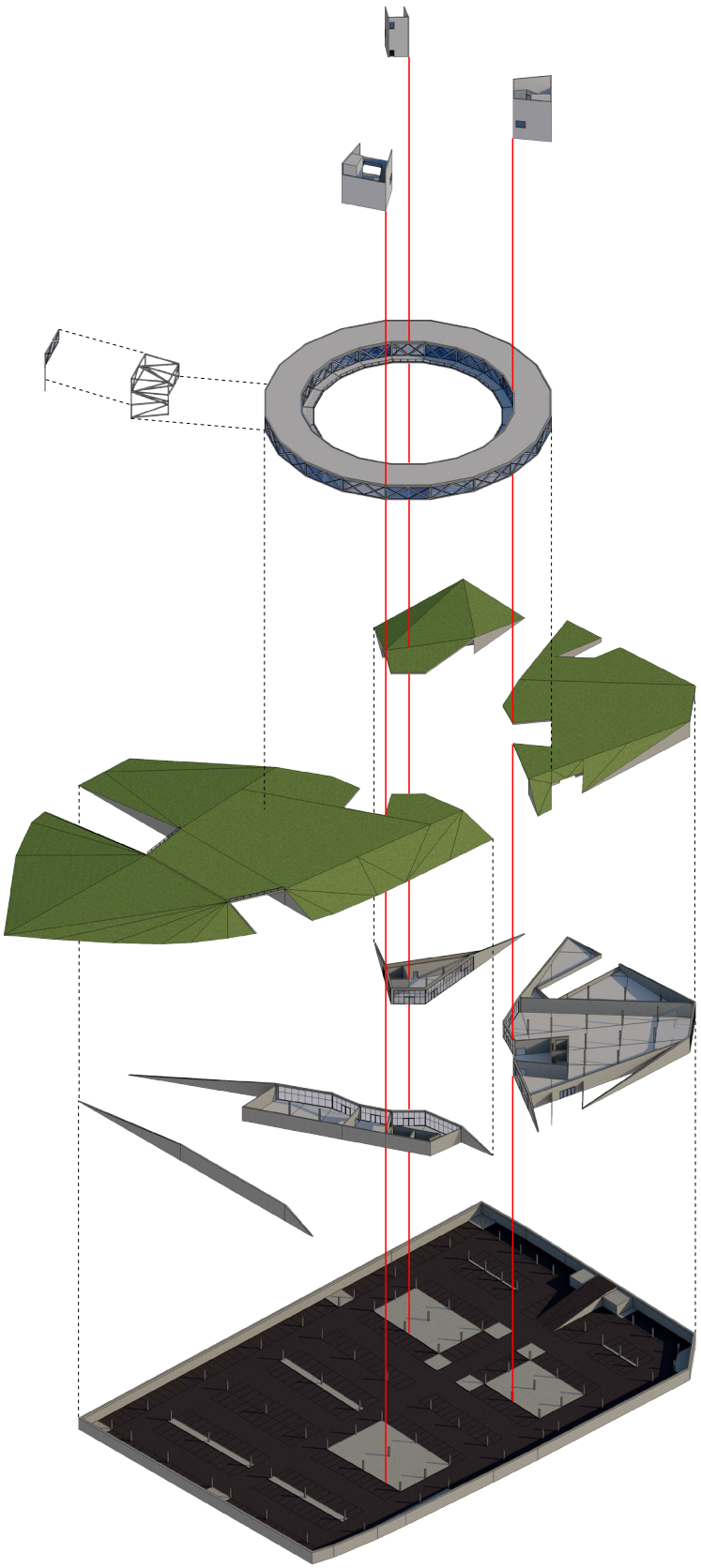
space could provide a place for any number of cultural or social groups at the heart of the city which do not currently have dedicated space elsewhere in Calgary.

The surface parking has been moved underground and expanded in order to accommodate larger numbers of users.

Form and Structure

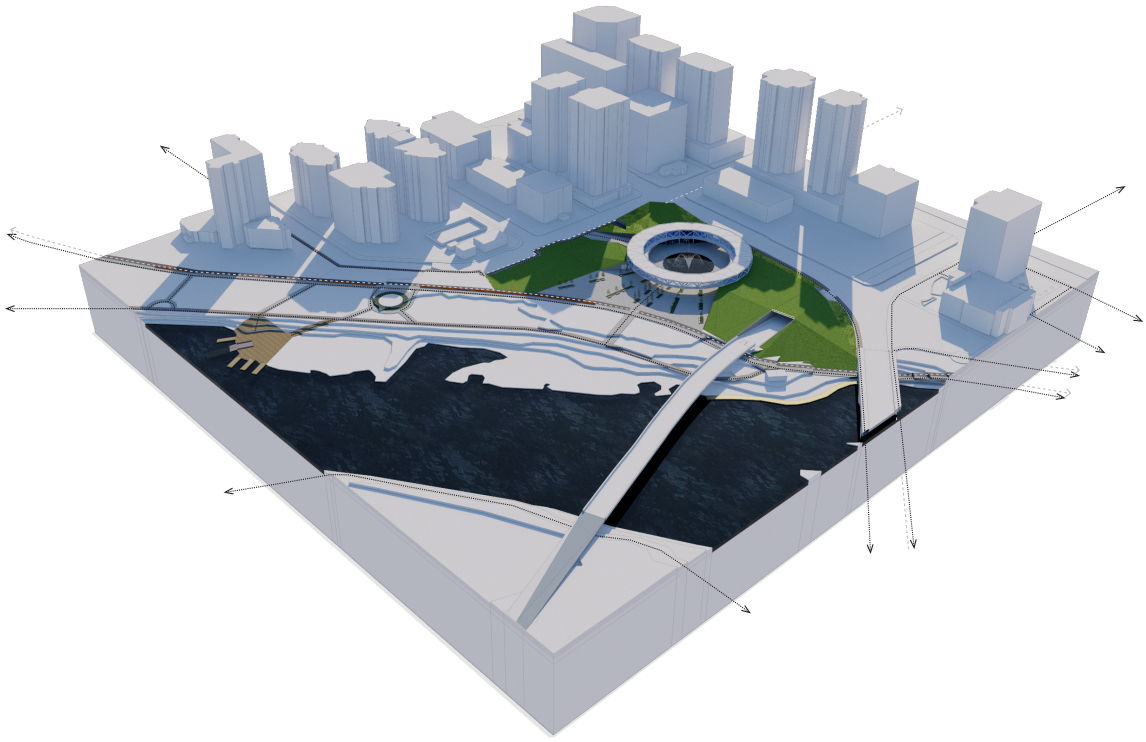
At grade, the landscape has be shaped into a number of earth berms to assist in sound attenuation and to extend nature back into the built environment of the city. The markets and recreation rental facilities are located under the berms and consist primarily of heavy concrete structure and glass. Increased glazing at the entries into the buildings increase visible permeability, and keep the spaces light despite being located under the landscape.

The upper building is in the form of a circle to symbolical represent the goal of social unity within the downtown core. Structurally, this upper building is separate from the berms except for the circulation cores which link all floors. The structure is comprised of a self-supporting steel truss system. To emphasis the structural system, the facade is comprised of tesselated glass panels. This pattern also ties the design to existing Calgary landmarks: the Bow Building and the Calatrava Peace Bridge.

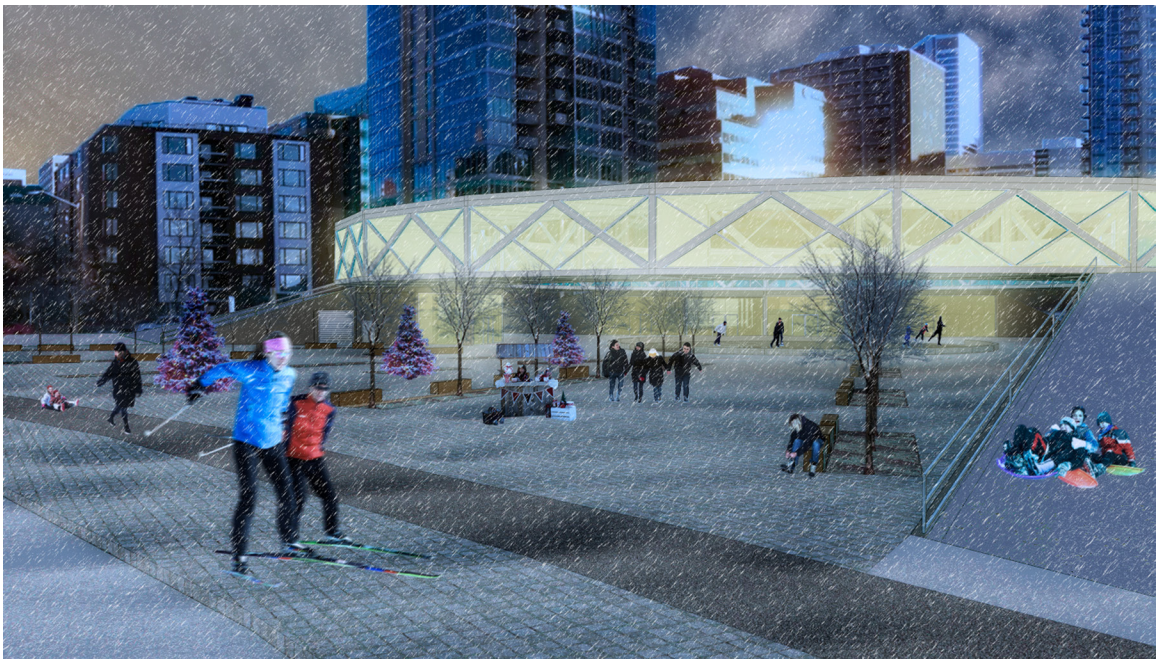


Exploded Axonometric

Pedestrian Path
Cyclist Path

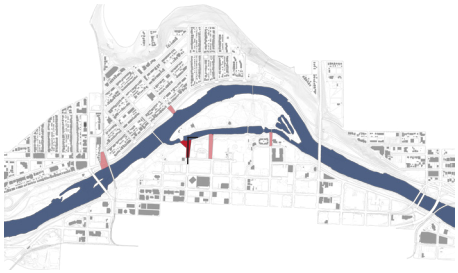


Proposed Conditions



Proposed Conditions: Seasonal Use

Site 3A: From Weak Link to Transit Stop and Trailhead



Site 3B
Similar Conditions

Key Plan

Existing Conditions

Challenges/Issues to be resolved:

1. The edge between the riparian zone and the parkway is not formally addressed.

2. The pedestrians and cyclists have to share a path.

3. The entrance into the river-valley from the city is not acknowledged.

4. The existing public transit and bike lane systems do not extend as far north as the river-valley system.

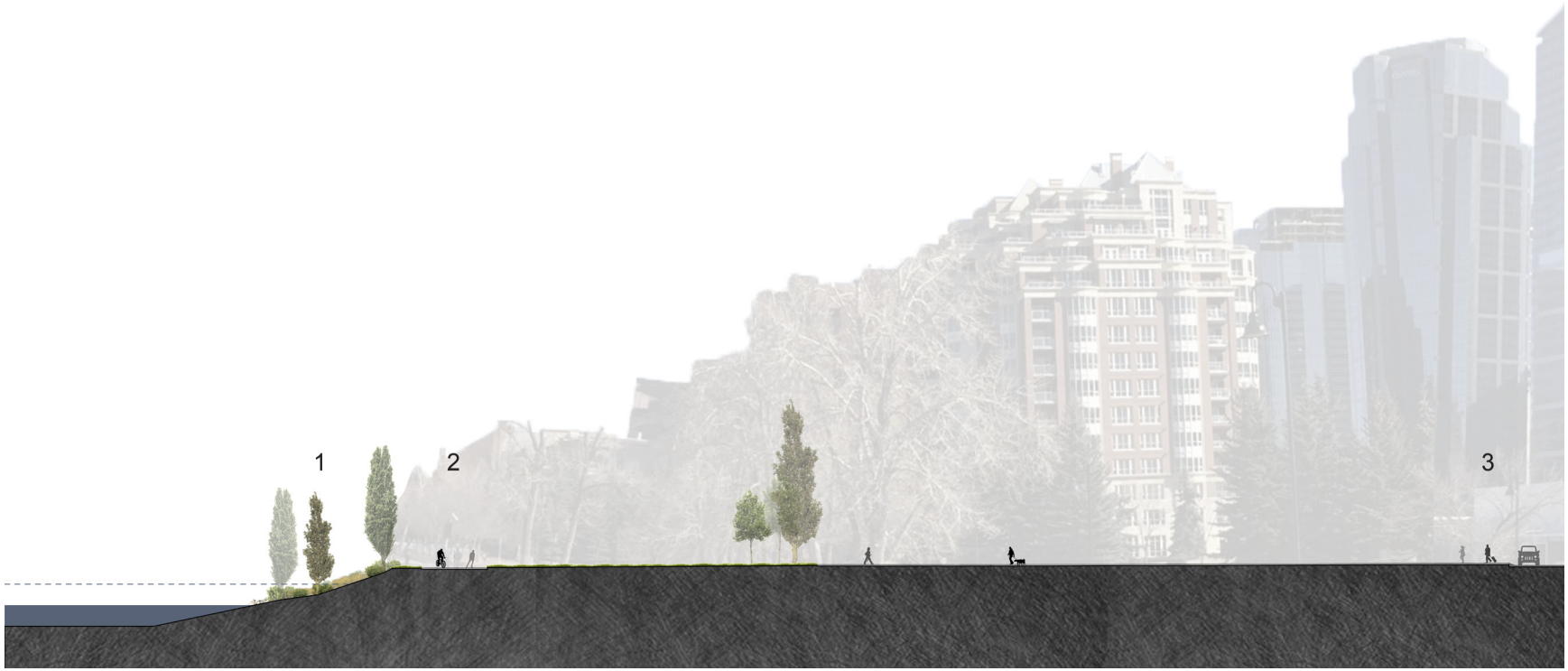
Opportunities:

1. Bike lanes exist further south in the city core on 4th, 5th, and 8th Avenues.

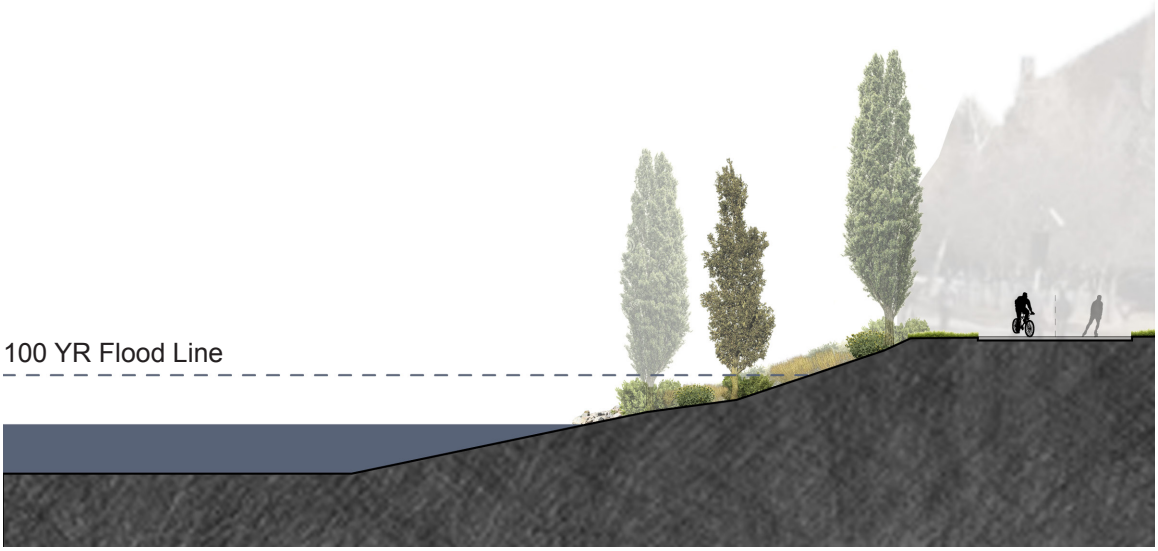
2. Transit lines 1, 9, and 419 already exist a few blocks south of the area of intervention. These particular lines act as connectors between the city core and the north and south suburbs.

3. A number of land bridge's connect Prince's Island to the south Bow River bank, and act as entrances to the park.

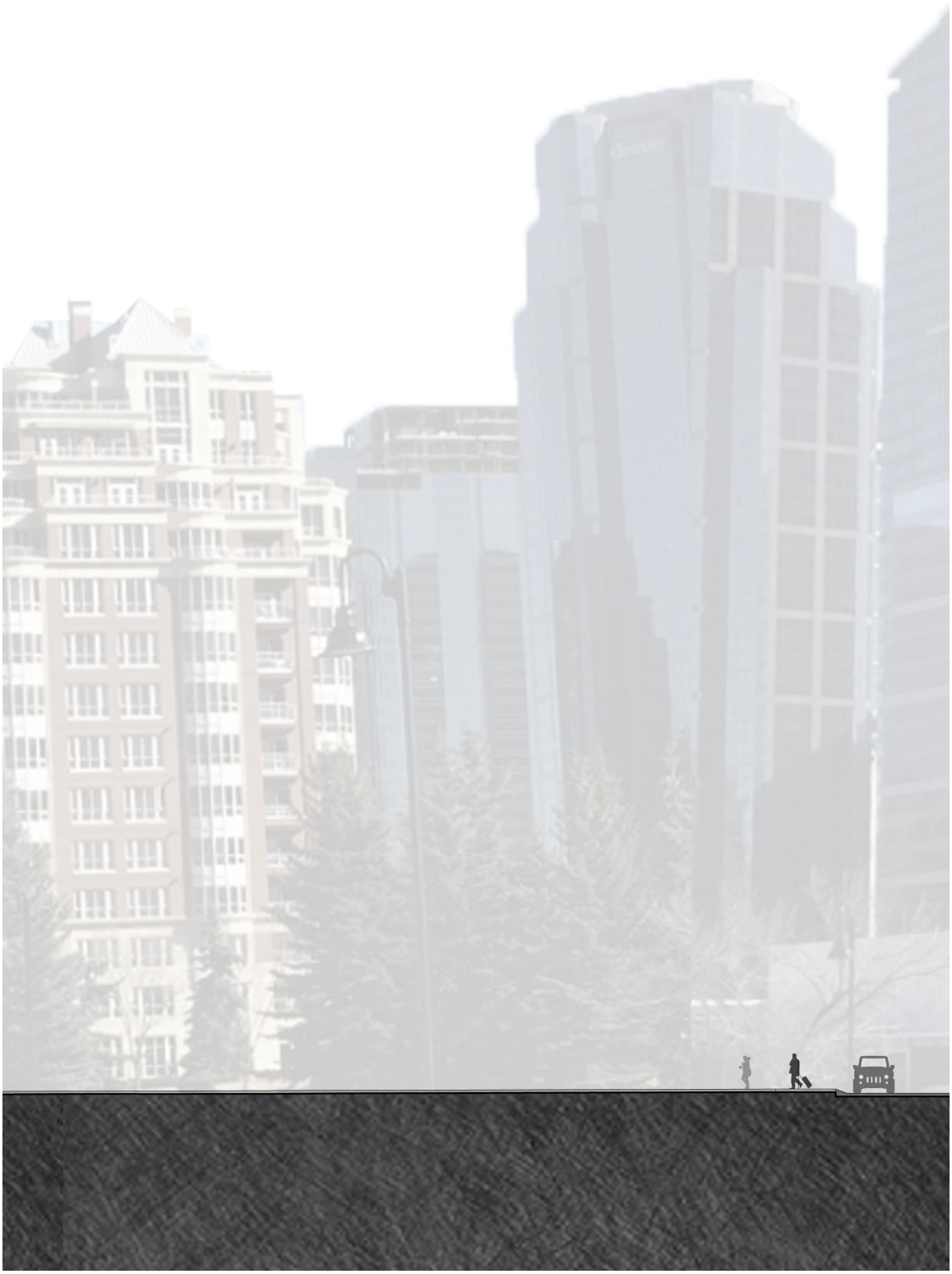
Existing Conditions



Site 3A: Existing Conditions



Site 3A: Existing Conditions at the River's Edge



Site 3A: Existing Conditions: Public Walkway

0 5 10 20m

Proposed Conditions

1. As an extension to the interventions proposed at Site 3A, a boardwalk has been placed at the banks of the lagoon between Eau Claire and Prince's Island. During the summer the boardwalk is a convenient place to sit and enjoy the water, while in the winter it allows for easy access from the bank to the ice. The riparian zone is addressed with seating and a series of flood markers that can double as lighting in the evening.

2. Building upon the existing civic pedestrian network, separate walking and cyclist pathways have been implemented to avoid collisions. To tie into regional cyclist lanes along 6th St SW, additional cyclist infrastructure such as bike racks and bicycle repair stations have been added.

3. A true entrance to the river-valley has been created with a transportation node. This node is responding to existing bike lanes and bus routes - bringing both further north along 6th St SW in order to connect to the river-valley system. The node is comprised of a new bus shelter and bicycle storage racks. A series of informational boards can outline the regional river-valley trail system and local landmarks.

Site 3A: Proposed Conditions

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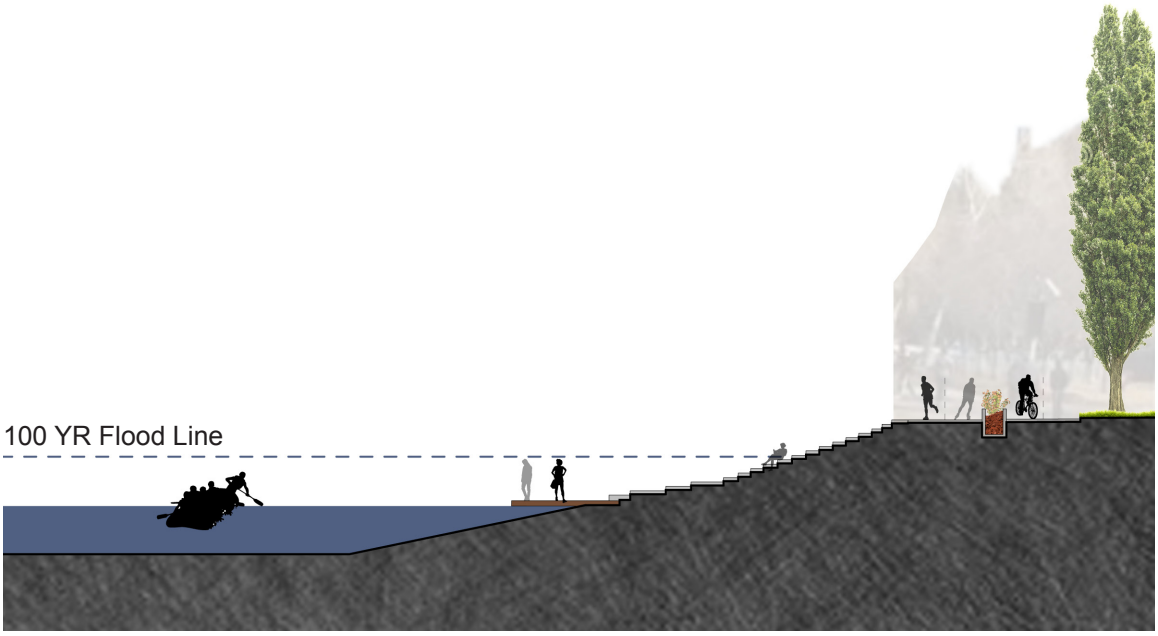

Site 3A: Proposed Conditions at the River's Edge

Site 3A: Proposed Conditions: Transportation Node

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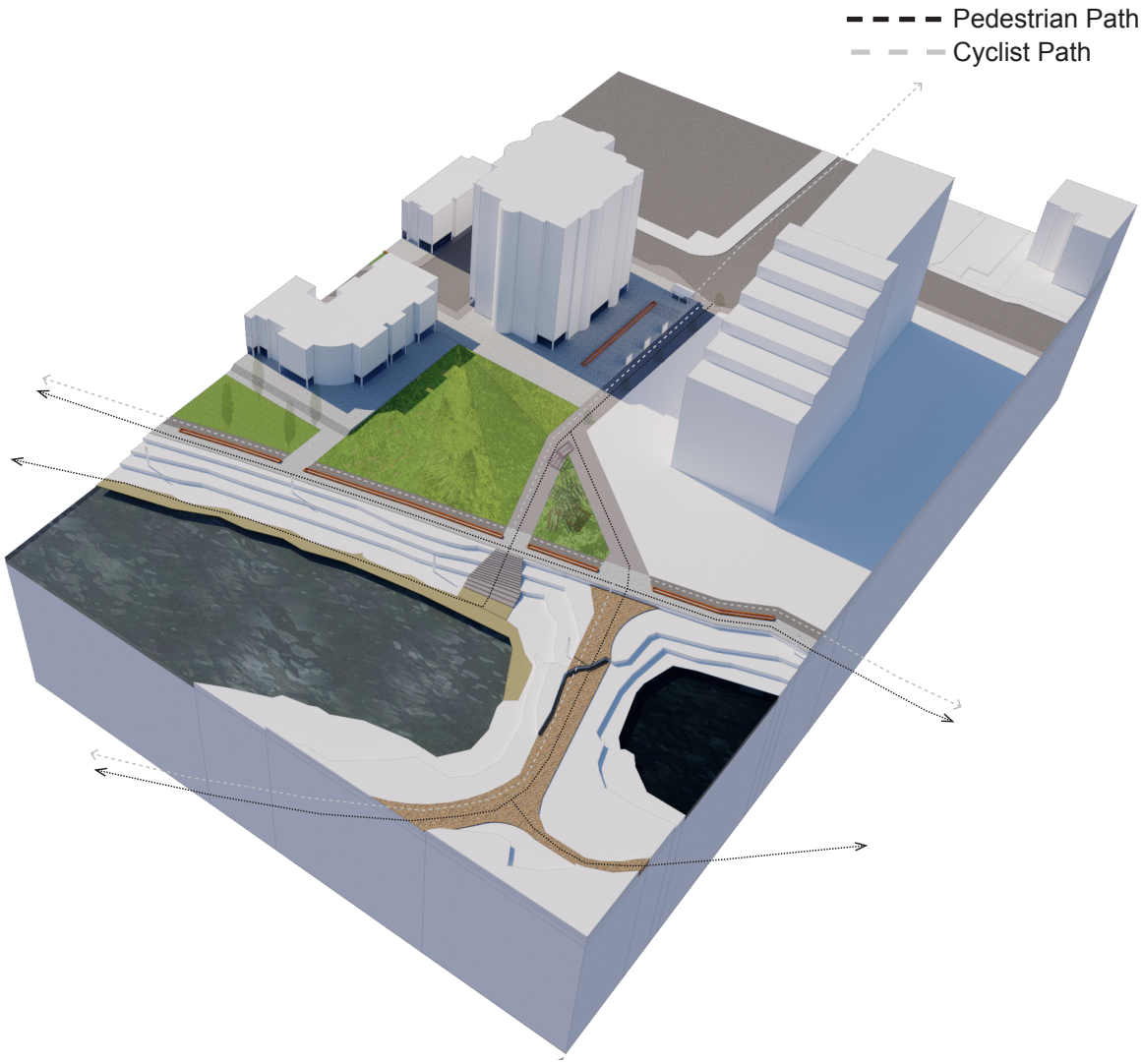


Proposed Conditions

Site 3B: From Private Precinct to Public Promenade

Site 3B
Similar Conditions

Key Plan

Existing Conditions

Challenges/Issues to be resolved:

1. The edge between the parkway and the riparian zone is not adequately addressed, therefore there is a weak perpendicular connection between the city and water.

2. Cyclists and pedestrians share the same river-walk path - this could led to potential collisions.

3. The residential complexes have apartments at grade. These apartments have exterior fenced porches - creating tension between the public green space and the private porch area.

4. The private development creates a large physical and visual barrier between the city and the river-valley. These developments are either enclosed courtyard or podium and tower forms. They act like gated communities separating the city from the Bow River.

5. A private courtyard prevents the public from travelling from the city to the river-valley system.

Opportunities

1. The stretch of pathways between Eau Claire and Prince's Island has already been beautified while maintaining the natural banks of the river. This parkway is very wide and can accommodate many

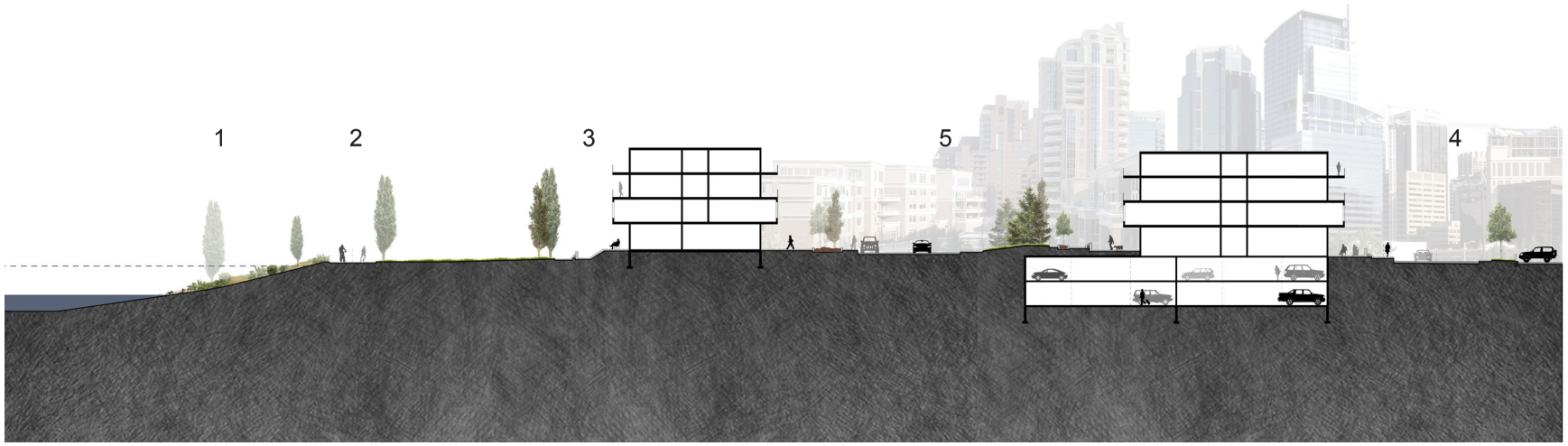
different activities.

2. The lagoon is already well used for skating in the winter and wading in the summer.

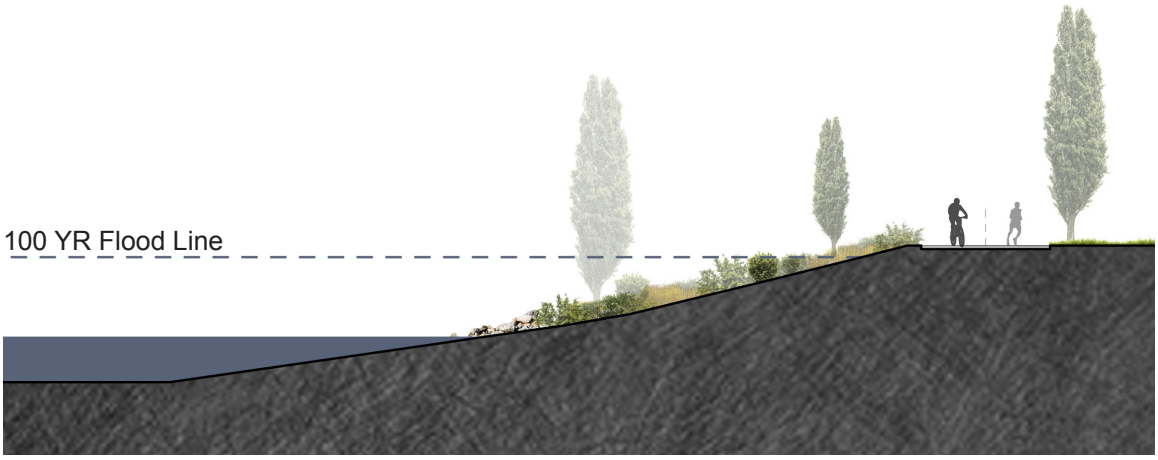
3. To the north, Prince's Island offers a number of beautiful vistas.

4. Eau Claire is primarily a residential neighbourhood, so there are already a number of different users that can make use of the are on a day-to-day basis.

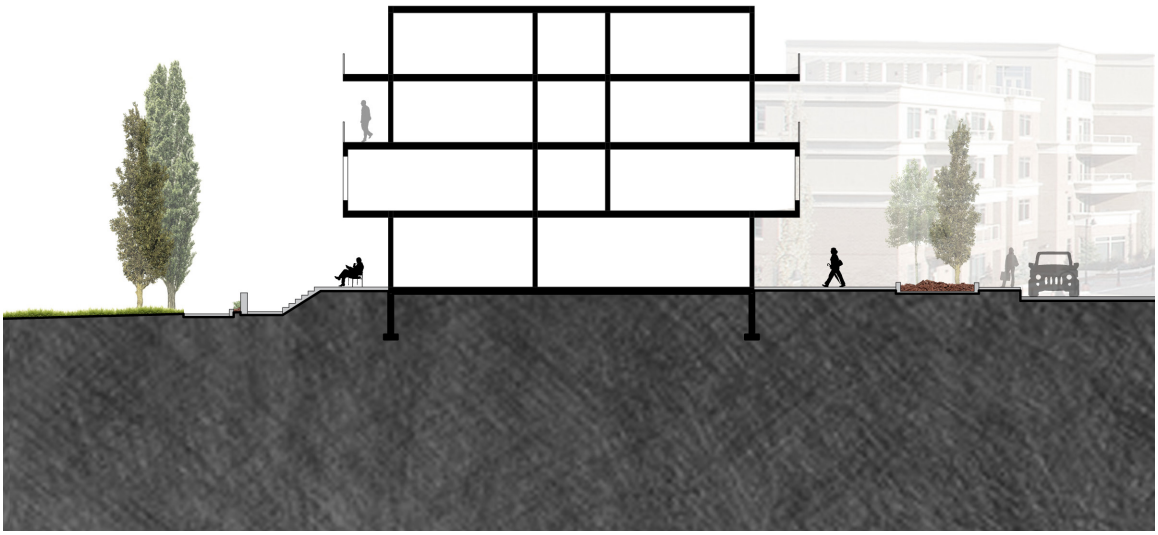
Existing Conditions



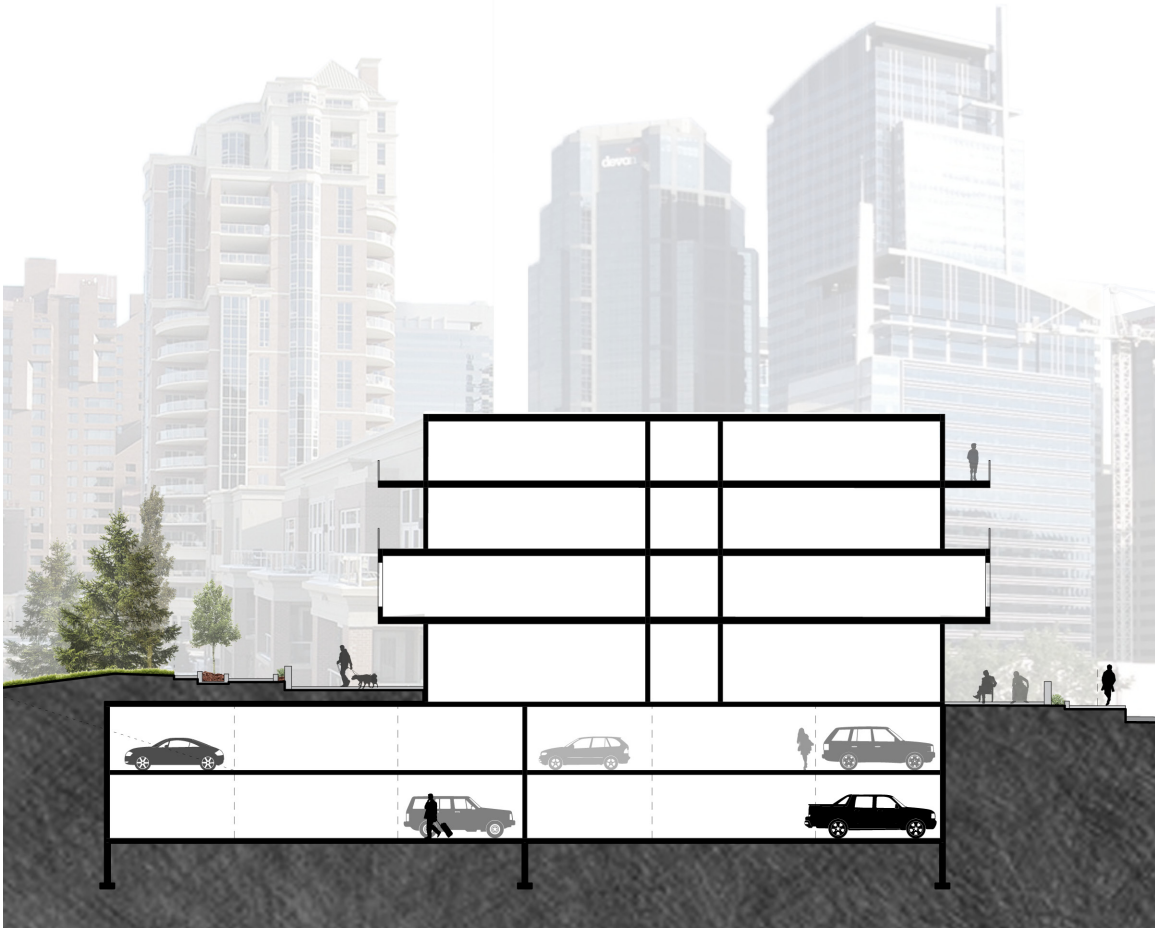
Site 3B: Existing Conditions



Site 3B: Existing Conditions at the River's Edge



Site 3B: Existing Conditions: Private Complex - River Side 0 5 10 20m



Site 3B: Existing Conditions: Private Complex - City Side 0 5 10 20m

Proposed Conditions

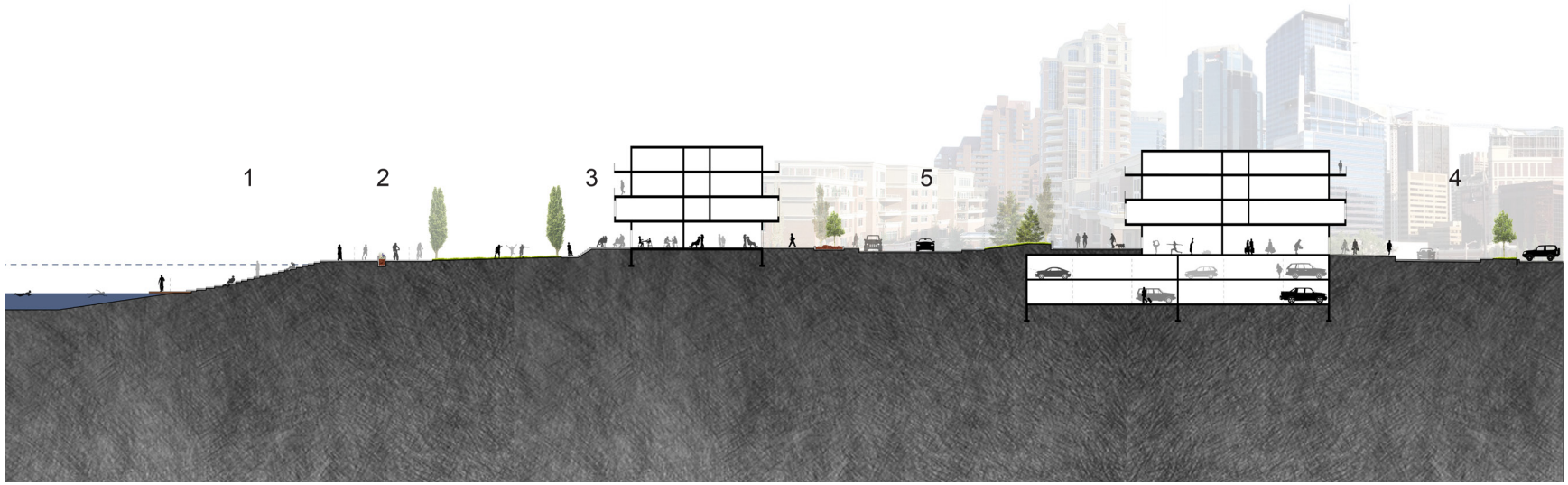
1. At the local scale, a boardwalk has been placed at the banks of the Prince's Island lagoon. During the summer the boardwalk becomes a convenient place to sit and enjoy the water, while in the winter it allows for easy access from the bank to the ice. The riparian zone is addressed with seating and a series of flood markers that also provide lighting in the evening.

2. To improve the existing pedestrian pathways, separate cyclist and pedestrian paths have been implemented to avoid collisions. There are a number of different walking paths to allow for a multitude of experiences along the river-valley. These new paths connect to a number of existing regional pedestrian networks. The new pathways include: a wide public promenade near the patio spaces, the existing river-walk along the parkway, a series of natural paths through the riparian zone, and the boardwalk at the river's edge.

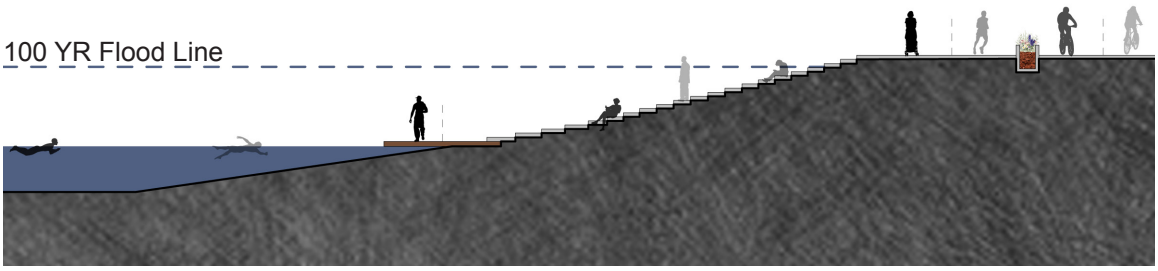
3. The creation of public patio spaces open the existing residential buildings to the waterfront, and increase the variety of programs within the river-valley. The courtyard in the middle of the complex becomes semi-public space, which can be open during the day and closed off in the evening for security.

4. The private apartments at grade have been removed and replaced with commercial functions that will serve both residents and the public. By

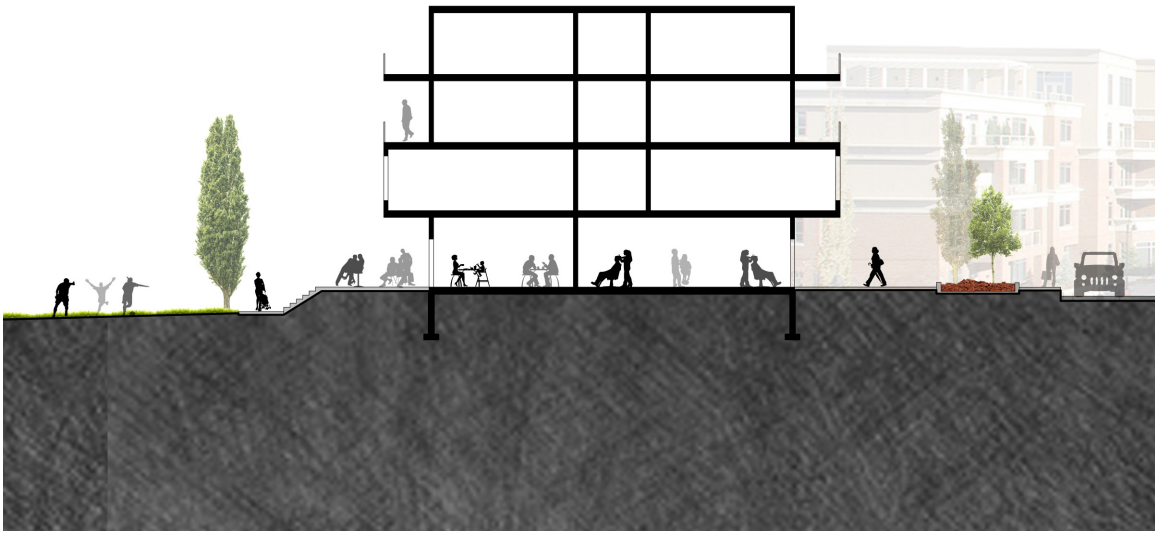
having commercial space at grade there is increased public permeability from the city to the river-valley.



Site 3B: Proposed Conditions



Site 3B: Proposed Conditions at the River's Edge



Site 3B: Proposed Conditions: Commercial - River Side

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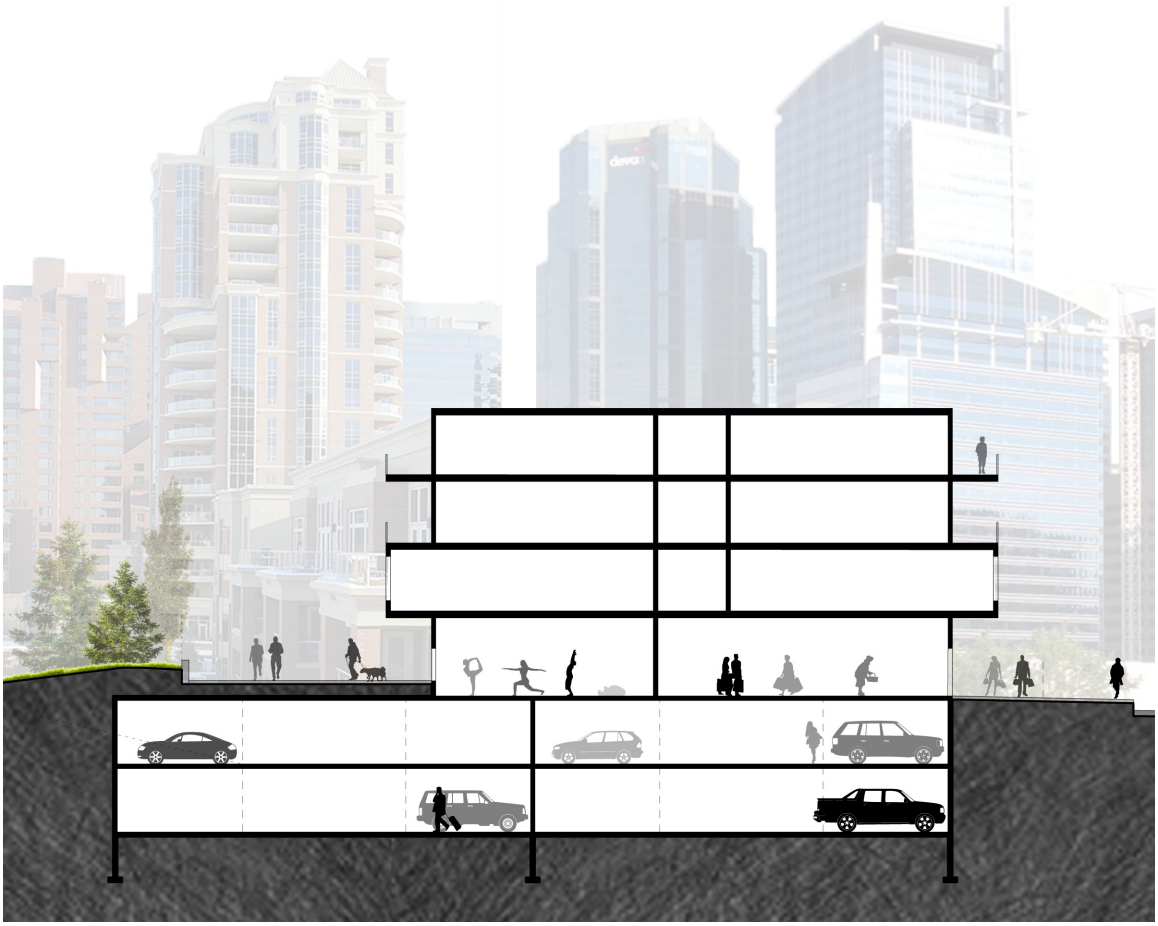

Site 3B: Proposed Conditions: Commercial - City Side

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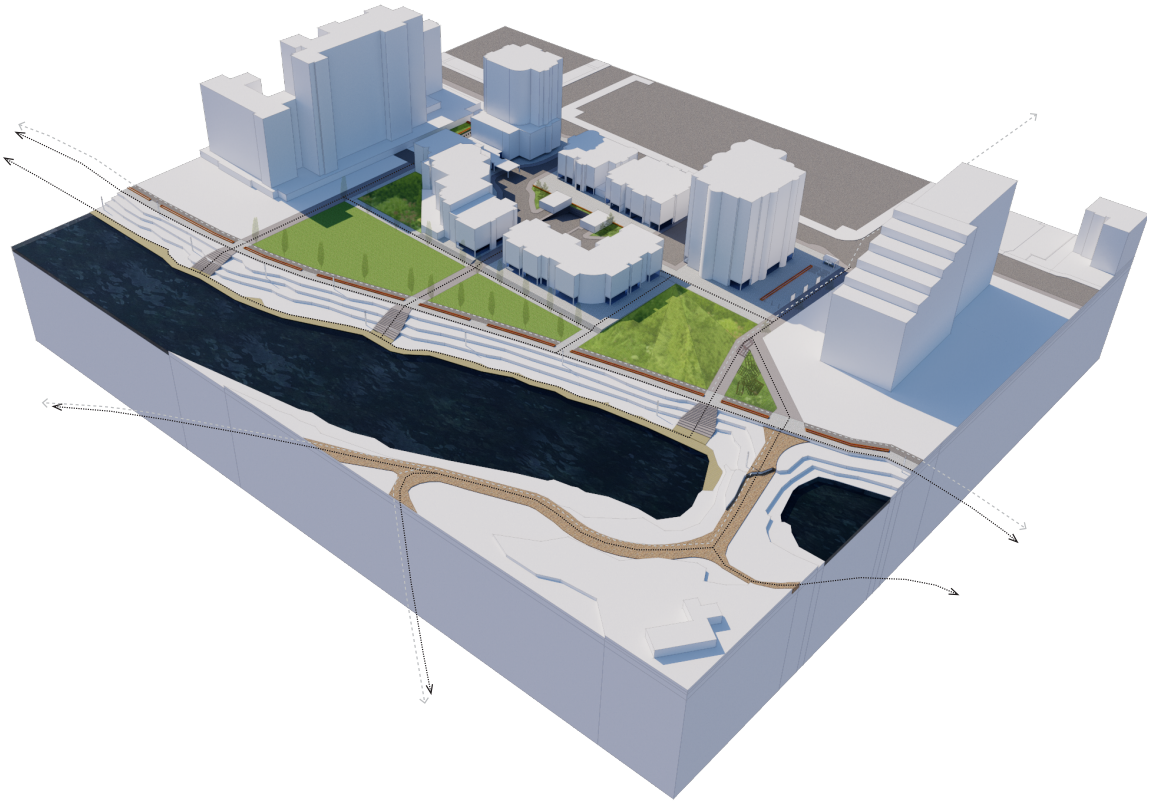
Pedestrian Path
Cyclist Path



Proposed Conditions

CHAPTER 5: CONCLUSION

Calgary is becoming more fractured and polarized with urban growth. In order to combat the increasing social fragmentation Calgary needs a common and inclusive public space to reunite Calgarians with the city and each other.

The thesis question was how can increased public connectivity and public programming along the Bow River be used to reconnect the fractured populations of Calgary to the symbolic heart of the city? In order to resolve the issues of public connectivity, the design responses also needed to develop architectural interventions that can positively impact a local, a regional and a civic scale simultaneously. In addition to determining how pluralistic design and interactive programming can play a role in public spaces and how they may be employed in order to achieve greater social unity. Finally, the design process questioned role of perpendicular and parallel connections in improving the relationship between the city and its waterfront.

In its existing state, the Bow River-valley contains a number of undesirable conditions along the downtown waterfront:

1. Vacant or surface parking lots.

2. Empty or undeveloped public anchor points.

3. The existing cyclist and transit networks do not extend into the river-valley system.

4. Private residential complexes that create a barrier between the city and the river.

In order to address the areas of public disconnection with the waterfront, this thesis proposed a series of design interventions including:

1. Moving surface parking lots underground, and extending the public parkway back into the city.

2. Enforcing the river-valley as an important public space network by adding a number of public anchor buildings that respond to local, regional, and civic user needs.

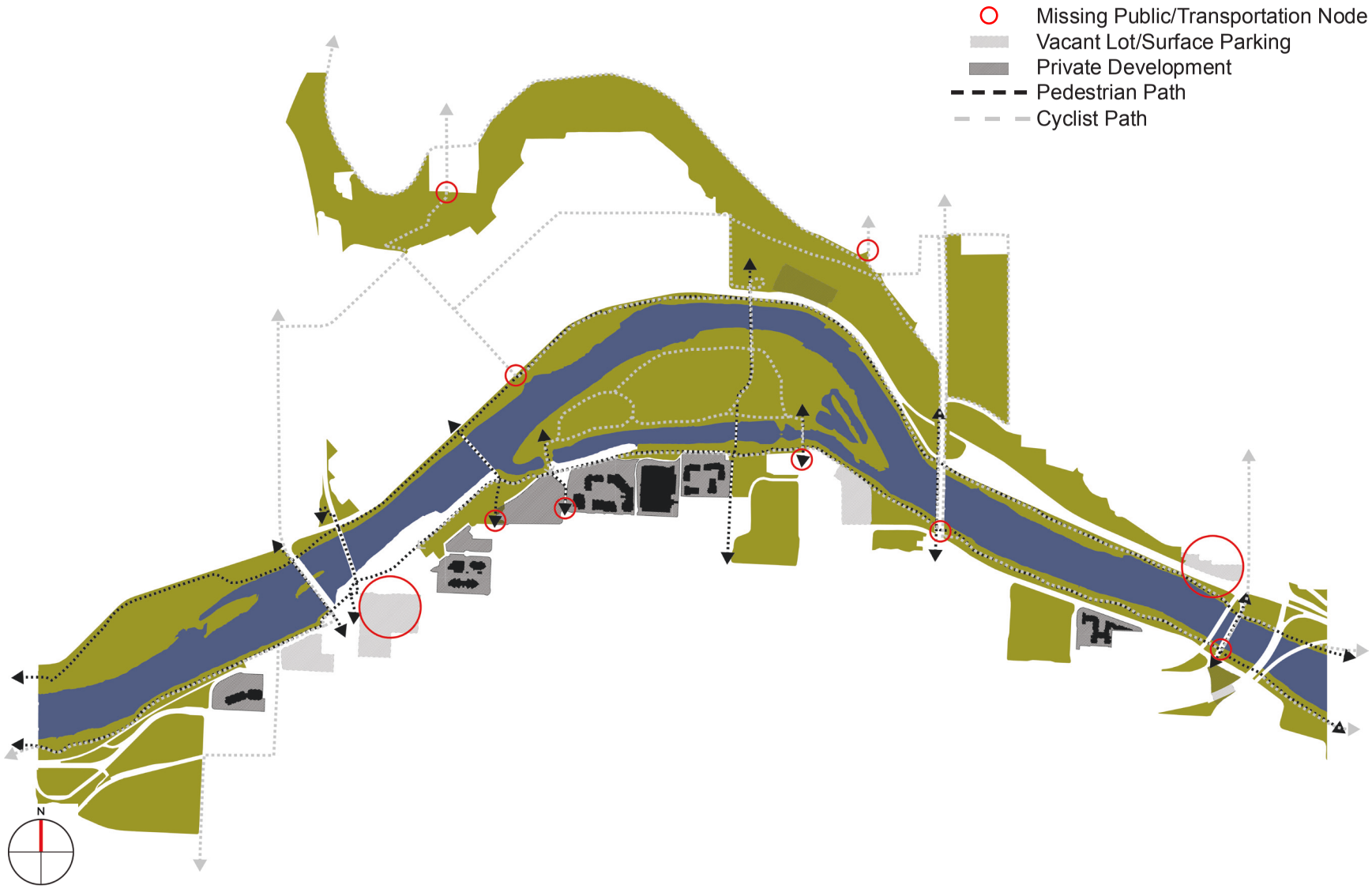
3. Extending the existing cyclist lanes and transit routes further north in order to connect them to the river-valley. Where these routes transition from the city to the river-valley a transportation node is created.

4. Removing residential apartments at grade along the Bow Riverfront. The privatized units are replaced with commercial and semi-public spaces which can serve both residents and visitors.

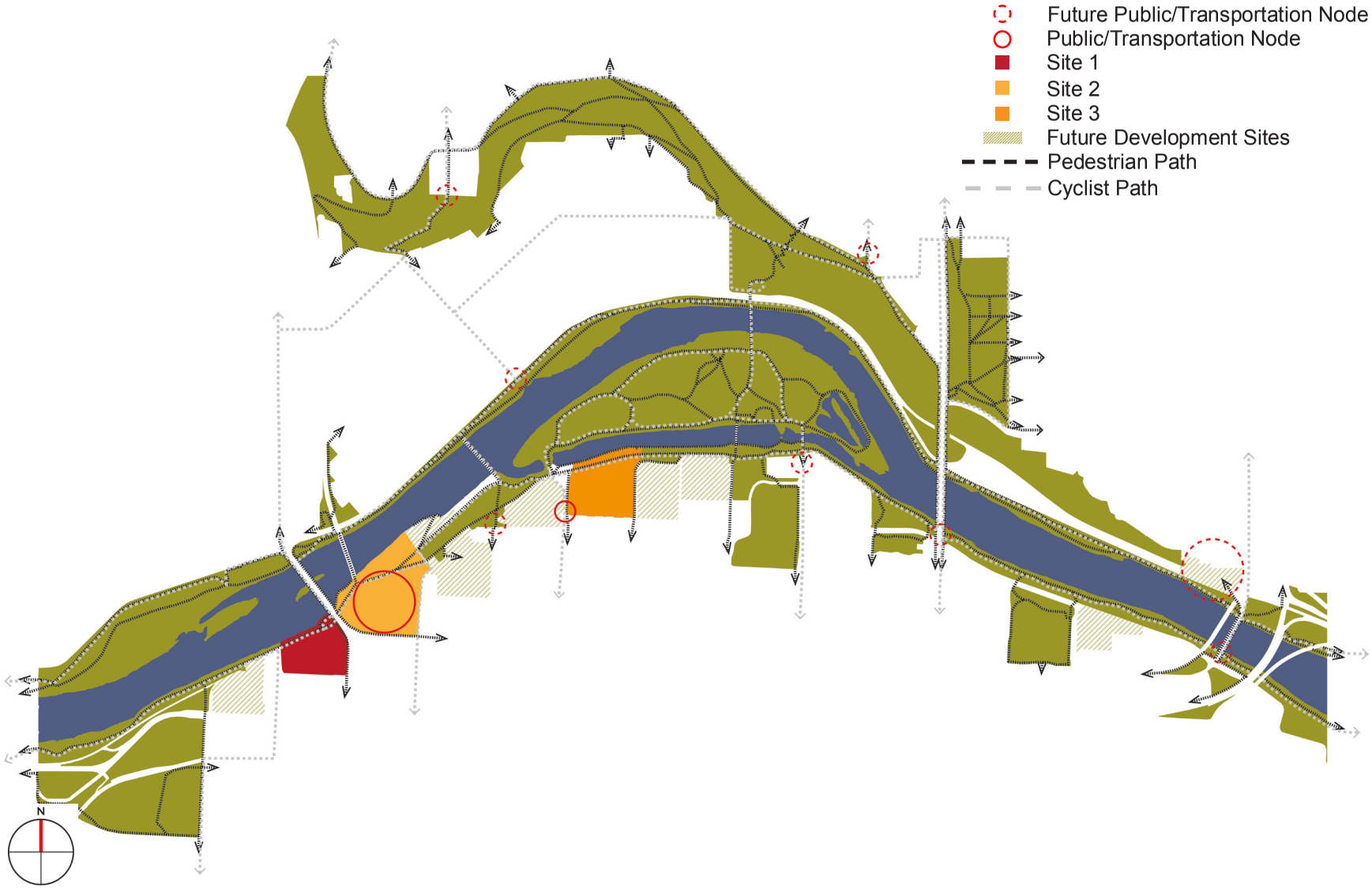
While each intervention is responding to unique local conditions, the development of transportation nodes along existing cyclist and transit routes, expansion of the public green belt back into the city and the development of regional public anchor buildings could be employed throughout the entire river-valley network.

This thesis has touched on using the social and physical conditions of the urban river as a way of developing a design; however, to apply this process within the real world would require an intense amount of community involvement, political will, funding, and coordination and implementation of each river-side development. Each of these important factors play a role in how each project takes shape, and is ultimately received by local, regional, and civic users.

Waterfronts represent a unique opportunity for architects and urban designs to create local, regional, and civic public spaces. Throughout North America, cities have been turning to their urban water bodies as the future for recreational, residential, and commercial development. I have proposed that Calgary's river-valley may be the opportunity to create social unity through the development of public spaces; however, each urban waterfront is unique and could play a variety of roles for its host city.



Existing Bow River-Valley Conditions



Post Design Bow River-Valley and Future Developments

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