Report

PLUS 15 - NETWORK STUDY

September 2019

Prepared for:
The City of Calgary

Plus 15 Network Study

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Executive Summary

ES1 Study Purpose & Objectives

The Plus 15 network in The City of Calgary (The City) was first proposed in the 1960's by an architect named Harold Hanen, who envisioned that the system would develop organically as The City's downtown developed. As such, there was never a firmly designed system wide Plus 15 network plan to identify specific bridge locations or where tie-ins needed to occur. The first Plus 15 structure became operational in the early 1970's and connected the Westin Hotel and Calgary Place. Since then, the network has expanded to include eighty-seven structures covering over 16 km of bridges and public easements through private and public buildings and is one of North America's most extensive pedestrian skywalk systems.

The objective of the network study was to create a network plan that improves the current Plus 15 network and develop ways to expand and enhance the network. The plan addresses 5 main issues:

- Linkages: Gaps and missing links were identified in the existing network and several criteria were identified to aid in the selection of future links. Missing links and future links were prioritized through stakeholder engagement and technical review.
- Wayfinding: Wayfinding has a direct public impact and value, helping to shape the identity of private and public spaces and improving orientation to create a positive user experience. The plan provides recommendations to improve the Plus 15 network information, architectural integration, and use of new technologies.
- Accessibility: Some links were built in the 1970s and 1980s and don't meet current accessibility standards. An accessibility review was conducted for the Plus 15 bridges to identify critical issues and possible mitigations.
- Placemaking: Placemaking helps generate economic opportunities, creates a welcoming environment for pedestrians and draws more tourists. Several types of placemaking were explored on the Plus 15 bridges and in the connecting buildings.
- Hours of Operation: The Plus 15 policy states that the system shall be operational 24 hours, however many building owners lock their buildings and close their sections of the system after business hours, creating a discontinuous system.

ES2 Network Linkages & Boundary

ES2.1 Network Linkages

Although the existing Plus 15 network is robust, there are still opportunities to enhance the network in terms of the geographic footprint and internal connectivity. The existing network was reviewed to identify missing links, including:

- Internal Links: connections within the network that reduce overall travel distances or provide missing links to key attractions, trip generators, and transit.
- External Links: connections that expand the size of the network by connecting to key trip generators located at the periphery of the existing network.

The preliminary assessment of missing links is provided below.

Link(s) I: The west side of the network has limited north-south connections resulting in a long, circuitous route west of 5 Street SW. Providing link(s) in this area could drastically reduce travel distances within the system. There are several different options to connect the network in this area.

Links II & III: These links aim to provide a connection across 1 Street SW. Currently the most southerly crossing of 1 Street SW is north of 6 Avenue SW leaving a four-block gap in connectivity. These links would also improve overall connectivity as there are very limited existing links south of 6 Avenue between 1 Street SW and Macleod Trail (four blocks).

Link IV: As noted above, there are no north-south links between 1 Street SW and Macleod Trail (four blocks). This link would reduce north-south travel distances and would also connect the Telus Convention Centre with trip generators to the north, including existing and future hotels.

Links V, VI, & VII: There is currently poor connectivity in northeast corner of the network. These links aim to connect the network east of Macleod Trail with the rest of the system. There are some old and/or outdoor links within sections F and E that would need to be upgraded in order to be considered useful links in the overall system. Similarly, the existing sections adjacent to Link G would require upgrading.

Link VIII: This link would provide east-west connectivity in close proximity to the future Green Line LRT station at 2 Avenue SW. It would also provide a connection to expand the system north into the future Eau Claire mixed-use development and beyond.

Link IX: This link would expand the network to the northwest if future development proceeds north of 2 Avenue SW. The area is currently at-grade parking lots, but high-rise developments have been considered in the area in the past.

Link X: This link would connect any future Eau Claire development with the rest of the Plus 15 network and the 2 Avenue Green Line station. This link is dependant on the provision of Link VIII discussed above.

Link XI: Link XI would connect a future Eau Claire development with the high-rise residential developments north of Riverfront Avenue SW and east of 2 Street SW. These residential developments are new and the design is not conducive to the inclusion of a Plus 15 network.

Link XII: There is an existing at-grade parking lot at this location. If the lot is developed in the future, a connection to the network should be a consideration. Due to the visual implications of blocking the view of the Chinese Culture Centre, the link should be provided east-west.

Link XIII: The Canadian Pacific Railway represents a barrier for pedestrians travelling between the downtown and areas to the south. There are currently two Plus 15 crossings of the track at 3 Street SW and 1 Street SE. Not only are there no Plus 15 crossings west of 3 Street SW, there are no at-grade

crossings between 4 Street SW and 8 Street SW, resulting in limited north-south pedestrian connectivity. A connection at this location would provide an additional connection between downtown and the beltline.

Links XIV & XV: The current eastern boundary of the Plus 15 network is 3 Street SE. With the development of the East Village, there is an influx of high-rise residential developments that could potentially be connected to the network. Link XV would also provide a connection to the Central Library. However, the building is now complete and the design is not conducive to a Plus 15 connection.

Link XVI & XVII: These links would provide a pedestrian connection between the 4 Street SE Green Line LRT station and the rest of the Plus 15 network. This link would better connect the west side of the downtown with the Green Line, reducing the need for passengers coming from / going to the south to transfer to the Red or Blue Line. Link XVI would also better connect the network with the developments in/surrounding the Stampede grounds and future entertainment district.

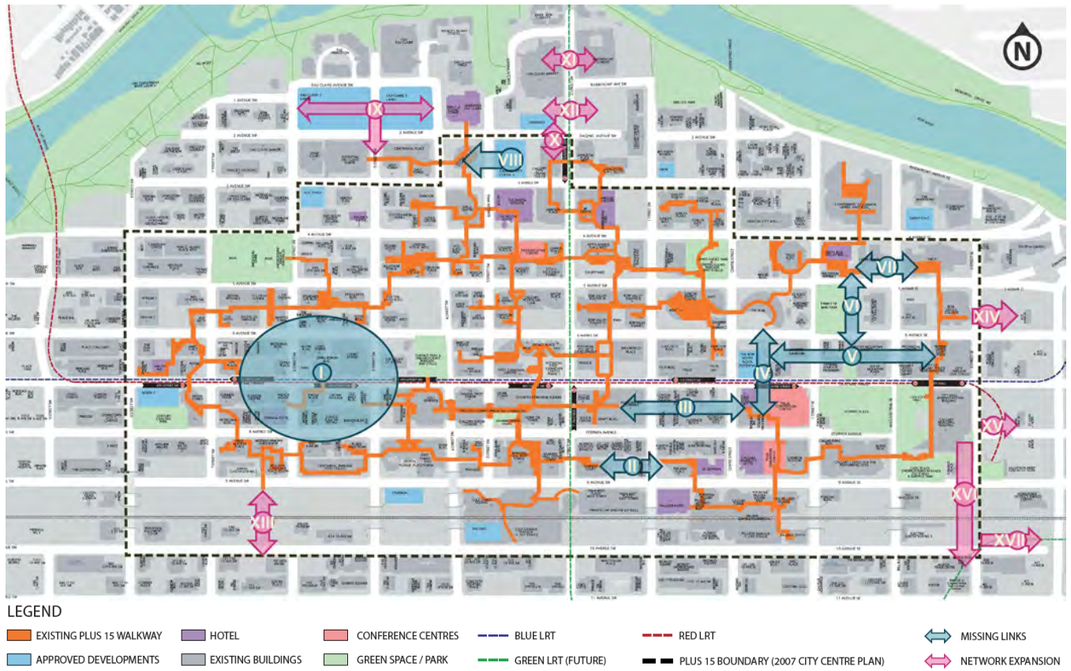


Figure ES-1:Preliminary Identification of Missing Links

The missing links identified went through a preliminary screening exercise to determine which links should be carried forward for further consideration. During this process the following links were removed from consideration:

Link XIII: Plus 15 crossings of the CP railway tracks present several challenges related to safety, horizontal and vertical clearances, gas emissions, and property rights/negotiations. Given these challenges, Link XIII was removed as it doesn't currently provide connections to any of the key amenities identified in Section 3.1. Link XVI was kept as a consideration as it would provide an important connection to the future Green Line Station. It should be noted that only Plus 15 overpasses bridges are being considered as a part of this study. Consideration could be given to providing an underpass for either Link XIII or XVI in the future depending on neighboring development plans.

Links XIV & XV: Plus 15 connections between the downtown and East Village / Central Library was a common theme during public consultation. However, given the high volume of residential development and limited office development in the East Village, The City does not feel the East Village area is conducive to a Plus 15 network. For this reason, Links XIV and XV were removed from consideration.

The remaining links were reviewed to assess which links should be considered higher priority. In order to prioritize the links, an evaluation matrix was developed which considered several different evaluation criteria. The evaluation criteria were selected based on the feedback received from the public and stakeholders during the initial engagement events, as well as input provided by The City of Calgary. The criteria include a mix of attributes that can be evaluated quantitatively and/or qualitatively:

The weighting of each evaluation criterion was developed based on feedback from both the public and internal stakeholders in the phase 2 and 3 engagement events. The recommended evaluation criteria and weightings is provided in **Table ES-1**.

Each of the missing links were scored based on the evaluation criteria to establish an overall priority for the link. Each link is assigned a score from 1 – 3, with 3 being the highest (best) rating and 1 being the lowest (worst) rating. The scores are then multiplied by the weighting and each criterion is added to produce the final score for each option.

A visual summary of the evaluation is provided in the evaluation matrix in **Table ES-2**. In addition to the overall ranking, the table also identifies the links as high, medium, and low priority to help group the links. Links that scored very low on the evaluation matrix are low priority links that are not recommended at this point. The high and medium priority links are illustrated in ***Figure ES-2***.

Table ES-1: Missing Link Evaluation Criteria

Evaluation Criteria	Weighting
Feasibility Lack of constraints related to heritage buildings, building design, owner support	20%
Cost Cost of construction	10%
Travel Time/Distance Reduction How well the link reduces travel distances within the system	15%
Connections to Transit Proximity to existing/future LRT stations and transit hubs	15%
Demand Existing pedestrian volumes, existing and future land and building development, lack of alternate options	15%
Current Policies and Council Direction Meets approved area land use plans, CP railway crossings	5%
Street Level Integration Avoiding competition with street-level shops; vitality, street security, traffic/walking delay, street classification and function	10%
Aesthetics Limits impact on visual corridors, public spaces, and visual identity	10%

An explanation of how each criterion was assessed is provided below:

Feasibility: Assesses how practical the link would be to construct. This includes considerations such as the length of the link, number of properties impacted, building design/configuration, owner support, and presence of heritage buildings. It is undesirable to interfere with the design/aesthetics of heritage buildings and in some cases building alteration is prohibited.

Example: Link X is a short crossing connecting a future development with a new development that has been designed to accommodate a future Plus 15 connection, so it received a score of 3. Conversely, Link III is long, passes through numerous properties, and the design of these buildings is not conducive to a Plus 15 connection, so it received a score of 1.

Cost: Cost considers the costs associated with construction of the link. Factors influencing the cost will include the length of the link, the number/length of bridge structures, the amount of internal building retrofit, and other constructability considerations.

Example: Link V already exists but is need of repair, so the cost scored a 3. Link I on the other hand would require at least two bridge structures and significant internal building retrofit, so it received a score of 1.

Travel Time/Distance Reduction: This criterion assesses how effective the link is at reducing the travel distance for users within the Plus 15 network. Links that can significantly reduce travel distances within the Plus 15 network are given a higher rating.

Example: Link II would provide a missing link at 1 Street SW, substantially reducing travel distances in the area (score of 3) whereas Link IX is a short extension to the existing network (score of 1).

Connections to Transit: Providing a climate-controlled connection between transit and trip generators is a key benefit of the Plus 15 network and was confirmed as such during the public engagement. This criterion scores how useful the link is at improving connections to transit.

Example: Link I would make use of an existing bridge structure over the LRT track and provide a connection to the 6 Street SW LRT station, so it received a score of 3. Link VII is a considerable distance from the LRT and provides minimal bus connectivity so received a score of 1.

Demand: This criterion assesses how well used the link is expected to be. Pedestrian volume counts were used with consideration for network connections and building size to predict pedestrian volumes.

Example: Links II and III would connect several high-rise towers with the busy CORE shopping area (score of 3) whereas Link XI would connect one building to the network at a low volume location (score of 1).

Current Policies and Council Direction: This category considered if any links were in support of or contradicting any City policies. Consistency with previous Plus 15 boundaries, such as those in the 2007 City Centre Plan, was also a major consideration.

Example: All links are within both the 1984 and 2007 Plus 15 Boundaries except for Links IX and X, which were in the 1984 plan, but not 2007 and Links XI, XII, and XVII which were not in either.

Street Level Integration: Considers how detrimental the link might be to street level vibrancy and prosperity. Considerations include the amount of ground level retail, streetscaping, and pedestrian / vehicle volumes.

Example: Link IV does not compete with a high value on-street pedestrian corridor and there is minimal ground level retail (score of 3). Link III runs in proximity and parallel to Stephen Avenue, which is a high value pedestrian corridor with significant street level retail (score of 1).

Aesthetics: Assesses if Plus 15 bridge structures would obstruct the view of important landmark or landscape views along the corridor. The visual identity of the adjacent buildings was also considered to see if Plus 15 structures would conflict with the aesthetics / character of the buildings.

Example: Link I does not impede any key visual corridors (score of 3) whereas Link III would create a visual obstruction of the Calgary Tower and impact the façade of The Bay building (score of 1).

Table ES-2: Missing Link Prioritization

Evaluation Criteria	Weight	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XVI & XVII
Feasibility	20%	○	◒	○	◒	●	◒	○	●	◒	●	○	◒	○
*Cost	10%	○	◒	○	◒	●	◒	◒	◒	○	●	○	●	○
Travel Time/Distance Reduction	15%	●	●	●	●	●	◒	◒	◒	○	○	○	○	○
Connections to Transit	15%	●	○	◒	●	◒	○	○	◒	○	●	○	◒	●
Demand	15%	◒	●	●	●	◒	◒	○	○	○	◒	○	◒	○
Current Policies & Council Direction	5%	●	●	○	●	●	●	◒	●	○	◒	○	○	○
Street Level Integration	10%	●	●	○	●	◒	●	◒	◒	○	○	○	○	●
Aesthetics	10%	●	●	○	●	●	●	●	◒	◒	◒	○	○	●
Overall Priority		High	High	Low	High	High	Medium	Low	Medium	Low	Medium	Low	Medium	Low

*Note *: lower cost items have a higher rating while higher cost items have lower rating*

● Best Meets Criteria (score of 3) ◒ Meets Criteria (score of 2) ○ Least Meets Criteria (score of 1)

The ranking list gives a rough idea as to which links should be prioritized first. However, there may be opportunities to implement lower ranked links prior to higher ranked links, such as in conjunction with adjacent building developments. These opportunities could provide cost effective and timely expansion of the network. Some specific considerations include links VIII, X & XII. Although these are listed as medium priority, implementation should be considered when redevelopment of the lots take place regardless of the implementation of higher priority links.

In addition, two of the high priority links, link V and link II, have been identified as important by The City's senior management team:

- As per a 2017 mandate, negotiations are underway with developers to construct a new Plus 15 connection from The Edison to Bankers Court (link II).
- As per a 2018 mandate, repairs to re-open the link from Andrew Davison to Old Central Library are planned for 2019. This work includes the repair of 2 plus 15 bridges as well as a possible connection through the old Central Library to the stairwell of the LRT platform (link V).

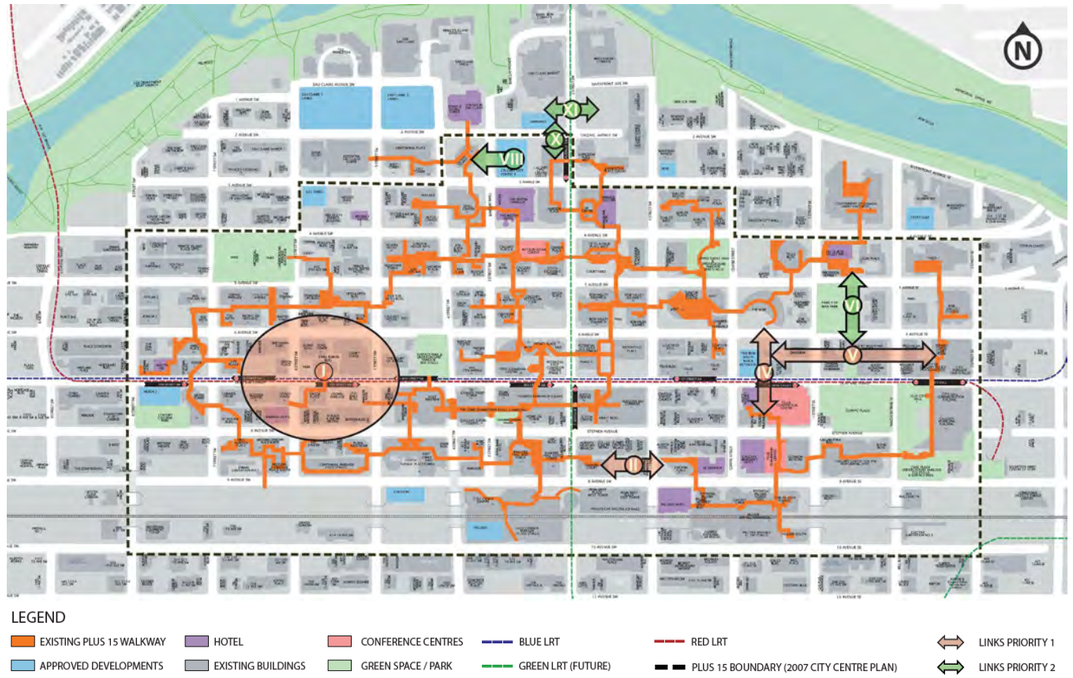


Figure ES-2: Prioritization of Missing Links

ES3.2 Proposed Boundary

The Plus 15 area was originally identified in the 1984 Policy with the boundary extending on the west side to 14 Street SW. Additionally, the area was divided into two sections:

- Area A which contained most of the highly developed portions of downtown with an already established Plus 15 network.
- Area B which contained the less developed portion of downtown and lacked any Plus 15 bridges.

A revised boundary was proposed as part of the 2007 Centre City Plan which is the boundary currently shown on the Plus 15 maps. The key attribute for the Plus 15 boundary is that it identifies lands in the Centre City which are eligible to receive a bonus density incentive for providing Plus15 bridges associated with new development. Additionally, the Plus15 boundary requires contributions to the Plus 15 fund for new development above the base density in a land use district.

The Plus 15 boundaries from the 1984 Policy and the 2007 Centre City Plan extend beyond the downtown core into parts of other centre city communities such as Eau Claire and Chinatown. These communities have Area Redevelopment Plans (ARPs) and are governed by direct control districts (DCs). Some DCs

in Eau Claire and Chinatown require contributions to the Plus 15 fund and require or provide options to build Plus 15 bridges. Each direct control district is specific to the particulars of each site and has resulted from negotiations between the Development Authority and original landowners.

As part of this study, changes to the currently used Plus 15 boundary which was set in the 2007 Centre City Plan have been discussed with key stakeholders. These changes were considered in order to incorporate:

- The future location of Greenline LRT station at the corner of 2 Street SW and 2 Avenue SW
- Future redevelopment of the Eau Claire area which includes the Harvard development and Calgary City Centre II
- Links that have been built outside of the boundary

A revised boundary is illustrated in ***Figure ES-3***.

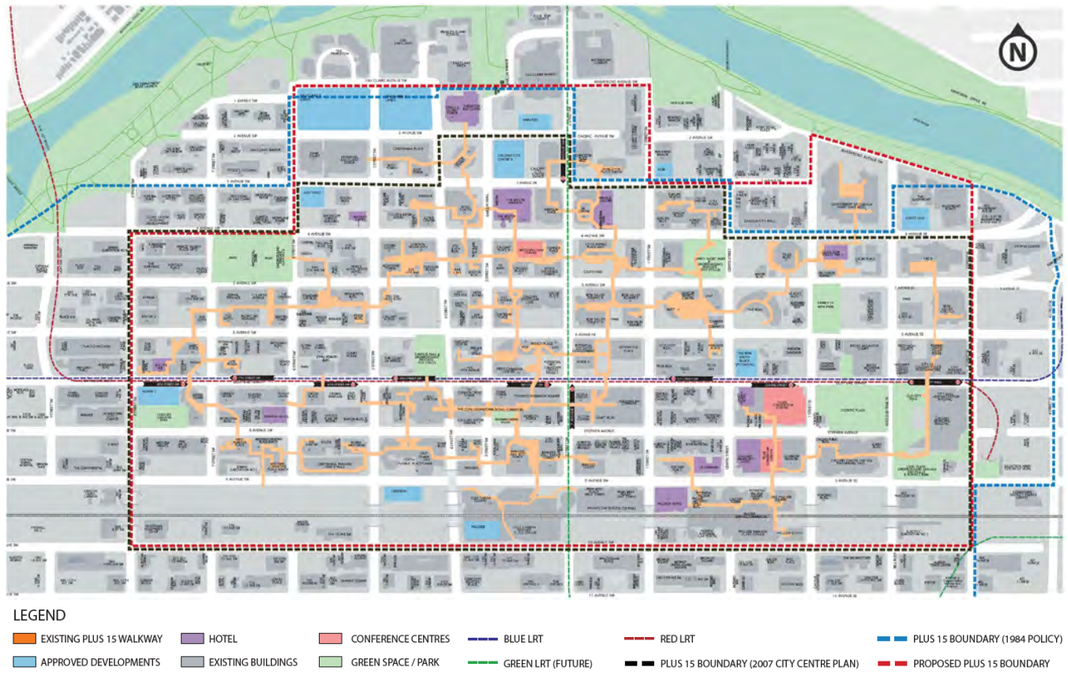


Figure ES-3: Plus 15 Revised Boundary

ES3 Hours of Operations

The current hours of operation vary throughout the network. This creates confusion for users as they may be unaware of the operational hours for a link they are considering using. This uncertainty could result in the person avoiding the Plus 15 network for that trip and potentially future trips in the Plus 15 as well. It is recommended that the unified operating hours be 6:00am to 9:00pm on weekdays. During the weekend, pedestrian volumes are significantly lower within the network. For this reason, reduced operating hours of 9:00am to 7:00pm are recommended for weekends and statutory holidays. Providing unified operating hours would not prevent individual developments from being open earlier, or later, than these core hours, but it would ensure the entire network is accessible during that time.

Providing unified operating hours for the Plus 15 network is desirable from a user's perspective as it provides a simple, cohesive, and reliable means of conveying when the network is available for use. With this information, users can feel confident that they can get to and from their destination within a particular time frame. This confidence may encourage more users to use the Plus 15 network as a part of their commute.

The highest pedestrian volumes on a weekday were generally observed during lunchtime (11:30am - 1:30pm). A smaller peak was also observed during in the early mornings (7:00am - 9:00am). Pedestrian volumes in the afternoon is relatively constant and tapers off significantly into the evening hours past 5:30pm. Pedestrian volumes during nighttime are negligible due to the closure of Plus 15 links. Although pedestrian volumes drop significantly after 8:00pm, it is suggested that the unified hours extend to 9:00pm. The rationale for this is that many of the downtown shopping establishments, including the CORE Shopping Centre, are open until 8:00pm on some evenings. Keeping the Plus 15 network open until 9:00pm would provide time for people to depart the shopping areas and reach their vehicle, transit stop, or home which may be located a few blocks away. The 9:00pm closing time would also provide connections for people destined to the numerous restaurants and other event centres located within the centre city.

The unified operating hours discussed above could be implemented for a trail period (recommended to be at least one year) to assess and mitigate any safety or operational concerns. The unified hours could be evaluated and adjusted if required at the end of the trial.

ES4 Wayfinding

The Plus 15 signage and wayfinding program was developed during the 1980's for a much smaller system. As a result of expansion and modernization of the city as well as degradation of the brand and misapplication of the sign program, we can see that the Plus 15 program is not as effective as it was and could be. The concept of city wayfinding through interior spaces and buildings is a challenge. Defining the system through brand and a consistent application of the sign program allows users to navigate with confidence and security, knowing that they are on the right path. The Plus 15 was developed as a method of convenience for downtown users but is now a major artery of pedestrian travel and commerce. Effectively supporting this method of travel is vital to ensuring the Plus 15 retains relevance in the future.

The following outlines recommendations on improving the Plus 15 network of signage and wayfinding. This is based on the observations made as well as public feedback from questionnaires. Input from City representatives also factored into the recommendations. These recommendations outline methods by which the system can be modernized and improved to convey a sense of place, while giving users confidence in the efficiency and safety of using the system. The wayfinding recommendations include:

- Defining the system through brand and a consistent application of the sign program to allow users to navigate with confidence and security, knowing that they are on the right path.
- Increasing the size of street level signs and considering options for illumination to improve legibility.
- The maps located along the route in the round stands would be more helpful if the macro level information was simplified and an enlarged insert was added that showed more detail of what was located within the immediate vicinity of each specific map stand.
- Refining the map to be more schematic and easier to read at a glance, with fonts and colours that visually connect to the logo and other brand assets. The addition of a directory that incorporates a grid location system to allow readers to look up specific buildings on the map.
- Developing a holistic approach to wayfinding design and placement to ensure continuity of the user experience and understanding throughout the entire Plus 15 network, including the buildings that connect to the Plus 15.
- Developing an app in addition to the static maps. The app features should include GPS enabled, open and closed links in real time, routing options, building names and attractions, and access doors at street level.

ES5 Accessibility

Level Playing Field evaluated the bridges that are part of the Plus 15 network based on the universal design principles of equitable use, flexibility in use, simple/intuitive design, consideration of perceptible information, tolerance for error, physical effort needed for use, and the size and space in the network for ease of use. In addition to the consideration of the Universal Design Principles, Level Playing Field's Audit of the accessibility throughout the Plus 15 network considered:

- emergency exits,
- point of access at each end,
- lighting and shadows,
- flooring, handrails and
- accessories such a seating, ramps and stairs, signage, and ease from building access.

The accessibility review considered the approach and entrance to the link, the entire length of the link, and the exit after the link. The findings of each link's evaluation were documented with detailed notes and photographs that are included in the network accessibility review report, along with recommendations for improvements. Most of the existing links have been audited and have been identified as having critical or moderate accessibility issues along with links that show strong consideration for universal accessibility.

Overall, five critical accessibility issues were noted repeatedly throughout the Plus 15 Network:

- Warning signage should be high visibility to alert all, regardless of age or ability, of the impending danger and to ensure they do not make contact with the sign.
- Emergency infrastructure lacks universal usability.
- Infrastructure such as handrails are often implemented incorrectly and universal design standard heights and form should be considered.
- Many links lack contrast, cast shadows, and have inconsistent tiling, which can create problems for visually impaired users of the network.
- Methods for wayfinding are inconsistently used and often do not indicate where the user is located.

In addition, the review noted that the existing wayfinding and signage made progression through the network difficult and that several routes had stairs without any corresponding ramp accesses. Sun glare and drastic changes in lighting levels were also noted, along with limited contrast between wall and floor colors, which may impact the visually impaired. The use of carpet was noted as having high rolling resistance for wheelchair users and muted sound reflectance for individuals using cane detection. Of note was the lack of emergency egress (accessible street access or emergency lifts), which limits access to and egress from the link for emergency responders or in case of evacuation.

Several locations were also identified that had strong considerations for accessibility. These included links that balanced strong aesthetics with intuitive design, including gradual and navigable inclines, sun glare and shadow mitigation measures such as glass tinting, low resistance rolling surfaces with enough texture to prevent slipping, good lighting and mitigated protrusions.

Recommendations to improve accessibility and wayfinding within the existing Plus 15 Network, are summarized below:

- Retrofitting power door operators to links that have been listed as lacking them.
- Universally accessible emergency infrastructure and policy so that all users of the Plus 15 Network can evacuate in an emergency scenario.
- Wayfinding measures such as "you are here" maps need to be updated to have correct waymarking to make navigating the Plus 15 network for all users, regardless of age and ability.
- Lighting is considered the most important factor in building for visually impaired persons. Add variable lighting control and window shades to eliminate glare and shadow casting.
- Mitigating protrusions with continuous path railings that block protrusions like columns from the path of travel and additionally help guide the visually impaired.
- Safety measures like updating the tactile walking surface indicators (TWSIs) on stairs and adding friction strips.

- More direct access to the link from the street level itself would also facilitate inclusive and universally designed spaces for all people regardless of age and ability.
- A map, smart phone application, or pedestal map that indicates where one can access the Plus 15 Network from the ground level.

For the long-term strategy and construction of future links, recommendations include:

- Using better materials and making links more consistent with one another.
- Future links must use flooring materials that provide a low rolling resistance and are easier for cane detection (ie: restricting the use of carpeting).
- Materials used on the sides of the link must be a contrasting colour to assist in wayfinding and to help the visually impaired navigate through links.
- Protrusions must always be mitigated, for instance, with a railing.
- Turns to be at 90 degrees wherever possible to help wayfinding and cane detection. With this, convex mirrors placed at strategic locations to assist those with hearing loss in avoiding collisions with other users at corners.
- Straight paths wherever possible.
- Wherever possible, the width of corridors is to be designed to accommodate 2 persons with guide dogs or sighted-guides to pass each other unimpeded (4 persons abreast).

ES6 Placemaking

'Placemaking' is a transformative approach to the shaping of our collective public realm. Facilitating creative patterns of activities and connections, it is the creation of quality public spaces that contribute to people's health, happiness, and well-being; and involves the planning, design, management and programming of public spaces. It strengthens the connection between people and the places they share, is adaptable to a diversity of people and uses, and is rooted in community-based participation.

A walkthrough survey of the existing experience through the network was undertaken as part of the initial system reivew. From a holistic perspective, the experience of walking through the network was divided between moments of contextual interest and clarity of where one was in the system, particularly through the Arts district by the Arts Commons and the Glenbow Museum, through the Calgary Municipal Building and towards Bow Valley College, and the remainder of the network which was a repetition of circulation walkways through the commercial core connected by food courts.

As a pedestrian dedicated network, the system is successful from an infrastructural perspective as it is physically connected to many of the buildings downtown and is unique by virtue of its visibility between buildings. Challenges become more apparent when a person is trying to gain access into the network from the street, when the connections from transit stops are not well established physically and visually, and when obstacles are encountered on the network for people with mobility needs, preventing use of the Plus 15 to get to their destinations. However, a major challenge to the use of the Plus 15 as a public space become apparent as people are not encouraged to sit and linger.

Of the eighty-seven bridges, fifteen bridges were identified as being good candidates, as detailed in ***Figure ES-4***, and include:

A Telus Convention Centre
B Civic Plaza Parkade
C Bow Valley College
D The Bow
E Sun Life Plaza
F Bow Valley Square
G Devon Tower
H 640 5 Ave SW
I 605 5 Ave SW
J Chevron Plaza
K Shell Centre
L Metropolitan Conference Centre
M 333 5 Ave SW
N Barclay Centre
O Bankers Hall

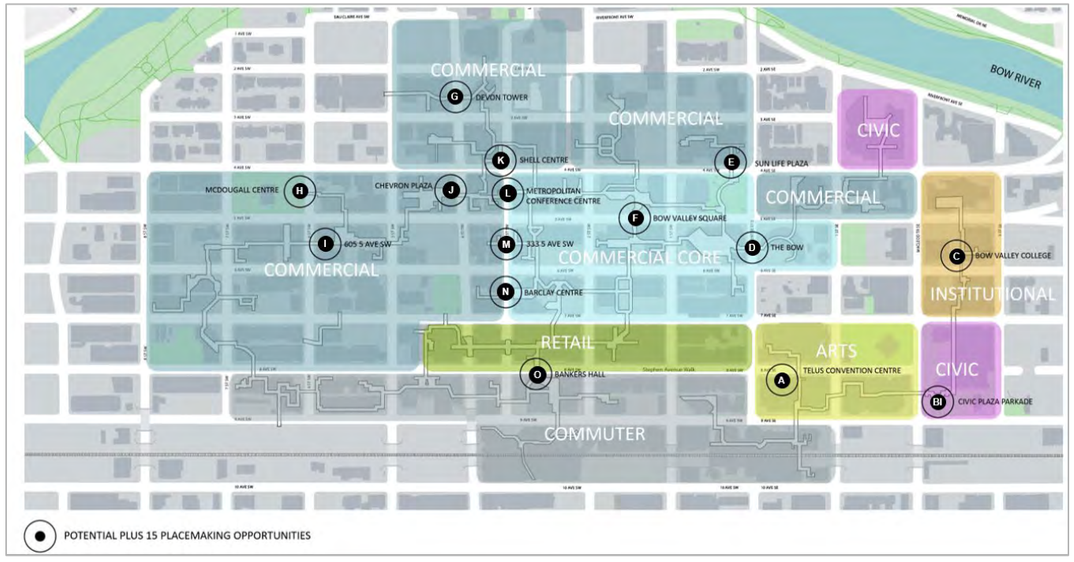


Figure ES-4: Plus 15 Placemaking Opportunities

The bridges identified as good candidates for placemaking were selected for a variety of factors. Some of these include the physical location of the links, as well as access to pedestrian-oriented streets and heavily footed traffic areas. Others were selected for their adjacency and connection to programs and services. There were also bridges selected for their inherent physical character and potential to be animated for public interest.

Of the fifteen bridge candidates, five locations are recommended as pilot projects for different types of placemaking:

- providing access to green space at Chevron Plaza (location J);
- improving connection to the street at Calgary Place 2 (location L);
- allowing for interruptions at the Telus Convention Centre (location A);
- creating destinations at McDougal Centre (location H); and
- activating with programming at Civic Plaza Parkade (location B).

However, the Plus 15 walkways are classified as a temporary structure and are challenged by restrictions set under the current City of Calgary Regulation Bulletin RB06-033 as well as the City of Calgary Access Design Standards. The implementation of a pilot placemaking program will allow for the testing of ideas presented in this network plan. From short to long term projects, pilot projects are the means towards long term change.

ES7 Engagement Process

Public participation was a critical component of the Plus 15 Network Plan. The findings from engagement in this project provided key inputs into the process for developing a Plus 15 Network Plan and Policy that is informed by the desires and priorities of the public.

Multiple touch points for public input and information sharing were built into the project through three project engagement phases:

Phase 1 – Capturing Issues & Opportunities

Phase 1 informed the community and key stakeholders about the project and its scope. Public engagement focused on establishing a broad understanding of the issues and opportunities within the Plus 15 network. Input was collected on current use, services and improvements might encourage people to use them more often, and overall network improvements.

Phase 2 – Targeted Stakeholder Discussion

Building on the input collected around the issues and opportunities for the network, Phase 2 targeted stakeholders including building owners and building managers about potential options to connect missing links, the overall network boundary, hours of operations, and the opportunity for placemaking.

Phase 3 – Collecting Input on Potential Improvement

In Phase 3, input was collected about the preferred network implements options that were developed using public engagement and technical analysis. This phase focused on refining the network plan recommendations and identifying the amenities and options for wayfinding that are most important for users.

Over three engagement phases, citizens and stakeholders participated in in-person and online engagement activities consisting of online surveys, in-person pop-up booths hosted during peak traffic hours in the Plus 15 network, and targeted stakeholder meetings.

Pop-up engagement sessions hosted in the Plus 15s handed out post cards promoting the online survey during busy lunch time hours in the network. Users were encouraged to share their knowledge and understand of the network in order to improve it. The City also promoted the engagement through social media including Twitter and Facebook.

Project and engagement information was available to the public and stakeholders throughout the process via the City's engagement portal on a project specific at: www.engage.calgary.ca/Plus15. The project website provides ongoing project updates and links to the project website along with What We Heard reports and engagement materials. An email distribution list and signup posted on the project website provided project updates

ES8 Recommendations

The study provides recommendations on five main issues: linkages, the boundary, hours of operation, wayfinding, accessibility, and placemaking. The recommendations were selected through a process that included:

- consideration for City policies and approved documents;
- feedback received from the public and stakeholders;
- technical team review and evaluation; and,
- harmonization with other ongoing projects and studies.

Table ES-3 highlights recommendations from the network study and categorizes the items as short, medium or long term as well as the level of effort required. There are 18 recommended items outlined below, with the majority requiring low to moderate efforts. The recommended items can be incorporated in The City's budget plan as deemed necessary. Some recommendations may become easier or more difficult to implement depending on other projects at The City, negotiations with developers and building owners, and key stakeholder input.

A summary of the recommendations including the high and medium priority links, the proposed boundary and the 5 pilot placemaking opportunities are illustrated in **Figure ES-5**.

Table ES-3: Plus 15 Network Study Recommendations

Level of Effort	Low	Moderate	High
Short Term Improvements (< 5 years)			
Unified operating hours are to be 6:00am to 9:00pm on weekdays.		X	
Reduced operating hours of 9:00am to 7:00pm for weekends and statutory holidays.		X	
Completing repairs on Link E and opening it to connect Andrew Davison to Old Central Library	X		
Refining the map to be more schematic and easier to read at a glance, with fonts and colours that visually connect to the logo and other brand assets	X		
The addition of a directory to the maps that incorporates a grid location system to allow readers to look up specific buildings on the map.	X		
Retrofitting power door operators to links that have been listed as lacking them.		X	
Adding variable lighting control and window shades to eliminate glare and shadow casting.	X		
A pilot placemaking program at 5 selected links		X	
Negotiating with building owners and building Link B as an east west link that connects The Edison to Bankers Court.			X
Developing an app in addition to the static maps.	X		
Convex mirrors placed at strategic locations to assist those with hearing loss in avoiding collisions with other users at corners.	X		
Medium Term Improvements (5 – 10 years)			
Extending the Plus 15 boundary to the north to include Riverfront Avenue.			X
Negotiating with building owners and building Link D as a north south link connecting The Bow and the Telus Convention Centre.			X
Developing a holistic approach to wayfinding design and placement to ensure continuity of the user experience and understanding throughout the entire Plus 15 network, including the buildings that connect to the Plus 15.		X	
Providing continuous path railings that block protrusions (like columns) and help guide the visually impaired.		X	
Changing policies to allow for occupancy in the Plus 15 bridges for better placemaking activation and programming.			X
Long Term Improvements (> 10 years)			
Negotiating with building owners and building Link A as a north south link connecting to Encore Place.			X
Retrofitting links to be accessible by adding ramps, escalators, and/or elevators.			X

For new Plus 15 bridges, the following guidelines should be considered:

- Designing any new Plus 15 bridge with careful considerations of its visual impact on historical resources, cultural landscape, and view corridors as identified in the Centre City Plan.
- Depending on the site context, the visual impact of the bridge may be offset by sensitive and creative design which provides visual appeal and adds to the character, space enclosure and attractiveness of the streetscape and/or place.
- Encouraging building new Plus 15-level open spaces/plazas of high quality only at appropriate locations and retrofitting existing open spaces for greener, more active, and better connected public spaces, as a means to address the general lack of open space in the dense centre city area.
- Bridges should have a minimum unobstructed interior width of 4.5m.
- Allowing major street-level pedestrian corridors and the Plus 15 network to work together as an integrated pedestrian system by providing well-treated interface or transition zone at the street-level entries
- Using flooring materials that provide a low rolling resistance and are easier for cane detection (ie: restricting the use of carpeting).
- Materials used on the sides of the bridge should be a contrasting colour to assist in wayfinding and to help the visually impaired navigate through links.
- Protrusions must always be mitigated, for instance, with a railing.
- Turns to be at 90 degrees wherever possible to help wayfinding and cane detection. With this, convex mirrors placed at strategic locations to assist those with hearing loss in avoiding collisions with other users at corners.

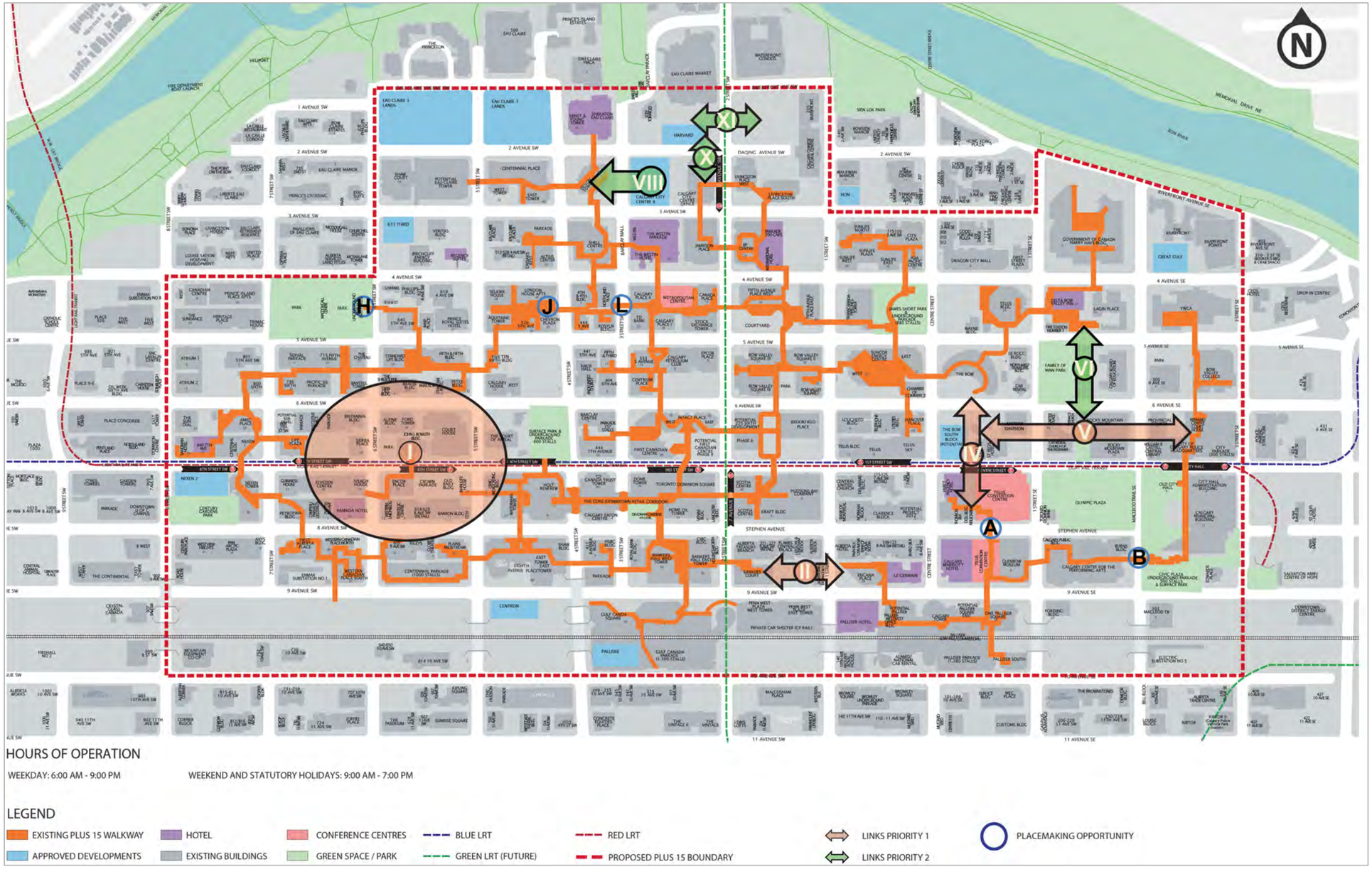


Figure ES-5: Network Plan Recommendations

SECTION 1

Introduction

1.1. Background

The Plus 15 network in The City of Calgary (The City) was first proposed in the 1960's by an architect named Harold Hanen, who envisioned that the system would develop organically as The City's downtown developed. As such, there was never a firmly designed system wide Plus 15 network plan to identify specific bridge locations or where tie-ins needed to occur. The first Plus 15 structure became operational in the early 1970's and connected the Westin Hotel and Calgary Place. Since then, the network has expanded to include eighty-seven structures covering over 16 km of bridges and public easements through private and public buildings and is one of North America's most extensive pedestrian skywalk systems.

The existing system extends from 2 Avenue (Eau Claire) in the north to 10 Avenue SW (Beltline) in the south and from Macleod Trail SE in the east to 8 Street SW in the west. City counts from 2011 and 2012 indicate that the busiest bridges on the system connect Energy Plaza, Centrum Place, and Calgary Place II and carry between 19,000 and 22,000 people every work weekday in the winter season. It's also obvious from the counts that the winter season represents the peak season as counts conducted in January are approximately double those conducted in July.

The Plus 15 network was initially envisioned as a comprehensive pedestrian network in the downtown that would remove pedestrians from the streets; whereas now, the emphasis is on integrating the two levels of pedestrian space and creating a cohesive network that provides links in the optimal locations.

1.2. Study Purpose & Objectives

The objective of the network study was to create a network plan that improves the current Plus 15 network and develop ways to expand and enhance the network. The plan addresses 5 main issues:

- Linkages: Gaps and missing links were identified in the existing network and several criteria were identified to aid in the selection of future links. Missing links and future links were prioritized through stakeholder engagement and technical review.
- Wayfinding: Wayfinding has a direct public impact and value, helping to shape the identity of private and public spaces and improving orientation to create a positive user experience. The plan provides recommendations to improve the Plus 15 network information, architectural integration, and use of new technologies.
- Accessibility: Some links were built in the 1970s and 1980s and don't meet current accessibility standards. An accessibility review was conducted for the Plus 15 bridges to identify critical issues and possible mitigations.
- Placemaking: Placemaking helps generate economic opportunities, creates a welcoming environment for pedestrians and draws more tourists. Several types of placemaking were explored on the Plus 15 bridges and in the connecting buildings.
- Hours of Operation: The Plus 15 policy states that the system shall be operational 24 hours, however many building owners lock their buildings and close their sections of the system after business hours, creating a discontinuous system.

1.3. Study Process

Phase 1: Project Initiation & Existing Conditions Assessment

Phase 1 informed the public and key stakeholders of the project objectives, scope and context. Public engagement was carried out to establish values and a future vision for the Plus 15 network, prior to investigating any improvement options. On the technical side, data regarding existing conditions was collected and reviewed, including pedestrian volumes,

Phase 2: Plus 15 Network Analysis

During Phase 2, the feedback from Phase 1 was reviewed and synthesized, and preliminary improvement options were developed that met the public feedback and project objectives. Preliminary improvement options on missing links, hours of operation, boundary, wayfinding, and placemaking were prepared and presented to the public and stakeholders for feedback.

Phase 3: Plus 15 Network Plan & Recommendations

Evaluation criteria was developed based on the public and stakeholder priorities identified in the engagement phases and City of Calgary feedback. The missing links were then evaluated with consideration for both the technical and public engagement findings, and a prioritized list of links was selected and refined. The network plan was prepared including maps, analysis details, prioritization process, and recommendations.

Phase 4: Present Final Design Concept

In the final phase, study findings and recommendations were documented for City approval and to become part of the Plus 15 Policy Update project.

SECTION 2

Plus 15 Network Existing Assessment

2.1. Mobility in Downtown Calgary

Calgary's centre city is a vibrant and lively area hosting countless amenities, including shops, businesses, restaurants and food services, residences, offices, parks, institutions and tourist attractions. As detailed in ***Table 2-1***, over the course of a year, almost 7 million people visit the centre city. Approximately 8,500 people reside within downtown, and the area employs almost 98,000 individuals and hosts 2,600 businesses. As such, the design of a safe and efficient transportation network throughout the centre city is imperative to accommodating the trips generated and providing an effective means of travel for all ages and abilities.

Table 2-1: Characteristics of Downtown Calgary

	Number	Source
Residents in Downtown Commercial Core	8,464	City of Calgary, 2018 Census
Visitors to the Downtown Core	6,983,700	Tourism Calgary, 2017 Annual Report
Businesses in the Downtown Core	2,574	City of Calgary, 2018 BIA Tax Rates
Commercial Office Buildings in the Downtown Core	172	Avison Young, 2018 Office Market Report Q3
Square Feet of Commercial Office Space	46,213,583 square feet	Avison Young, 2018 Office Market Report Q3
Jobs in the Downtown Commercial Core	97,895	City of Calgary, 2016
Tourist Attractions in and around the Downtown Core	10 major attractions 200 + art galleries, parks, public art, historical buildings, & shopping malls	Tourism Calgary, 2018

In addition to the extensive network of roadways, pathways, sidewalks, bike lanes, and transit infrastructure throughout downtown Calgary, the Plus 15 skywalk system plays a key role in moving people and providing a safe and reliable means of travel through the centre city. But the network is more than just a means of travel. In addition to its role in the transportation network, the Plus 15 network is a unique feature of the city unlike any other throughout the country. It characterizes mobility in the centre city as being pedestrian-oriented, while offering attractive vistas and diverse placemaking opportunities as part of the City's public realm.

The nature of transportation in Calgary has grown and evolved significantly over the last few decades as a focus on active and sustainable transportation modes has been emphasized. Improved infrastructure has increased the feasibility of walking, cycling and transit use for daily trips rather than solely for recreation or as a secondary alternative to driving, which has in turn decreased the proportion of vehicular trips. Other contributing factors have also influenced the shift away from vehicular travel, including increased traffic and parking congestion, and high vehicle operating costs.

Figure 2-1 illustrates the significant increase in walking trips downtown from approximately 31,000 in 1996 to almost 69,000 by 2018 (+123%). Similarly, cycling trips (+252%) and trips by transit (+91%) have also seen substantial increases over the last 22 years in the downtown central business district alone. These trends reflect a noteworthy transition away from auto use and towards more sustainable transportation options.

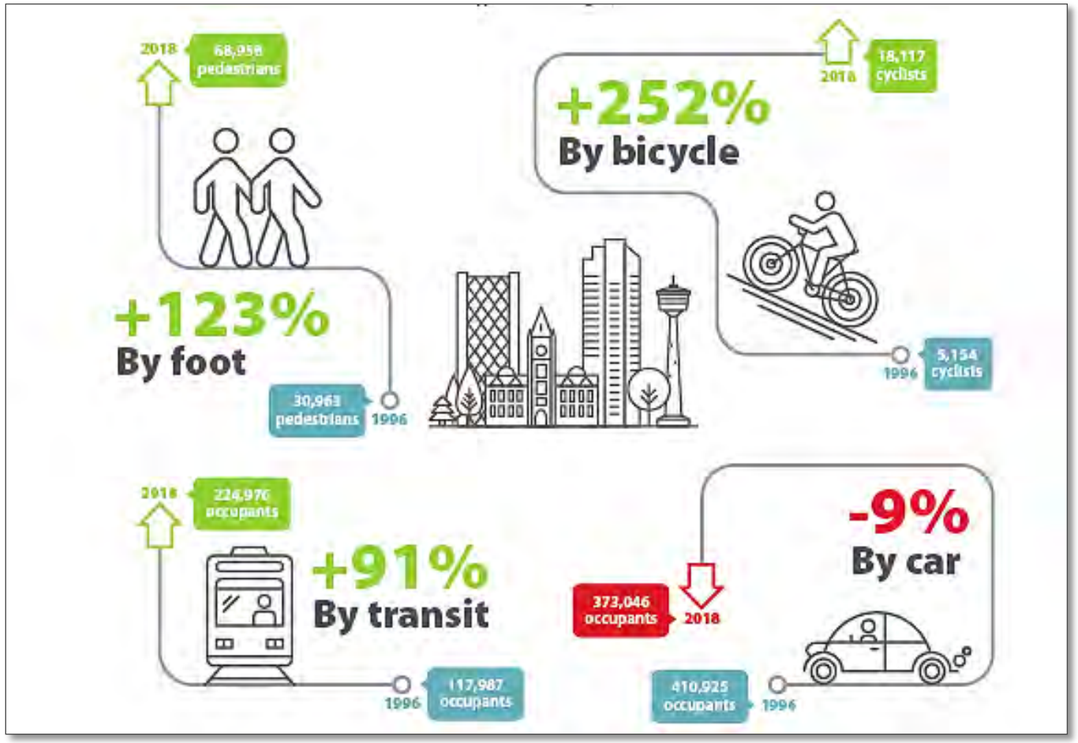


Figure 2-1: Mobility in Downtown Calgary – Changes from 1996 to 2018

The Plus 15 network is one of the key pieces of infrastructure that encourages active transportation in the centre city. Through its ease of use, connectivity to major destinations, safety benefits, and the protection the system offers from inclement weather, the Plus 15 network provides an attractive means of travel, promoting walking as a viable mode of transportation for daily trips.

2.2. About the Existing Plus 15 Network

The Plus 15 network was mostly built between the 1960s and the 1980s so that by 1984, the network consisted of 37 bridges and 8 km of walkways. Since then, the network has expanded to include eighty-seven structures covering over 16 km of bridges and public easements through private and public buildings.

2.2.1. Users of the Plus 15 Network

The Plus 15 network is utilized by a wide variety of users, including providing mobility/access for children, seniors, and people with disabilities in all seasons. Some new uses for the Plus 15 are as a major cultural/tourism asset and healthy, active design asset. These users differ in their travel patterns, familiarity with the Plus 15 network and mobility needs. Five major user groups were identified in the study:

1. Weekday-Users – Connected Workplace

These users work in a building connected to the Plus 15 during the weekday. They are the most likely user group to access LRT stations and parking facilities through the Plus 15. Additionally, they are also most likely to use the network to access amenities during lunchtime. They are intimately familiar with a section of the Plus 15 due to daily use. Occasionally, they may use the Plus 15 to access other buildings for meetings, shopping, etc.

2. Weekday-Users – Workplace Not Connected

These users work in a building not connected to the Plus 15 during the weekday. They are somewhat likely to utilize the Plus 15 to access parking facilities or amenities within the network during lunchtime. They are familiar with a section of the Plus 15 based on repeat use starting from an access point close to their workplace. Occasionally, they may use the Plus 15 to access other buildings for meetings, shopping, etc.

3. Local Resident Visiting Downtown Area

These users are residents who work elsewhere and visit downtown. Their visits could occur any day of the week either during the day or the evening. They have a high-level understanding of the Plus 15 terminology and system based on occasional visits. Their point of access to the Plus 15 is most likely near a public parking location. There are also users that are downtown residents and use the network to reach work and other destinations in the centre city.

4. Tourist Visiting Downtown Area

These users are non-residents who visit downtown. Their visits could occur any day of the week either during the day or the evening. Unlike other users, they have no familiarity with the Plus 15 terminology and system.

5. The Mobility Challenged

These users are a subset of the aforementioned user groups. They are categorized by a common desire for an easier, user-friendly access around downtown compared to navigating on the street level. Their travel patterns and familiarity with the Plus 15 network are varied. At all the various times of use, these users may be further categorized into one of the four aforementioned user groups.

2.2.2. Guiding Documents and Principles

1984 Plus 15 Policy

The current development of the Plus 15 bridges is guided by the Council approved 1984 Plus 15 Policy. The Policy identifies the network as composed of the following elements:

- bridges, which are located outside of the property lines of a building/site over a right of way, other than a lane;
- walkways, which are located within the property lines of a building/site
- links which are located outside of property lines of a building/site over a lane;
- stairs, escalators, and elevators connection grade and the Plus 15 levels;
- associated open and enclosed public spaces at the Plus 15 level; and
- signage.

The Policy states that the development of a Plus 15 bridge can occur through one of two ways:

1. Initiated by developers and either meet the Land Use Bylaw requirements or utilize bonus clauses on an opportunity basis.
2. Initiated by Administration and funded from the Plus 15 financial contributions which is required of downtown developers or other civic funds.

At the time, the principal objective of the Plus 15 network was to serve the various land uses in the downtown which was to be achieved by providing access between major transportation nodes, providing access between major destinations, and extending the network by connecting portion of the network that are already complete.

2007 Centre City Plan

The 2007 Centre City Plan focuses on a new vision for making the centre city a livable, thriving and caring place. The Plan addresses overall urban structure, neighborhood planning, special area policies, open spaces, movement and access systems, urban design, vitality, and community building. The Plus 15

network in the Centre City Plan, illustrated in **Figure 2-2**, is addressed under access and movement with specific guidelines that include:

- continuing to develop and maintain the system,
- ensuring key links and bridges are provided through the development approval process to improve the overall community of the network;
- ensuring the sensitive and creative design of new and retrofit Plus 15 bridges;
- recognizing that the Plus 15 bridges can negatively impact the pedestrian realm below them; and
- enhancing all components of the Plus 15 network to improve the attractiveness and usability of the network.

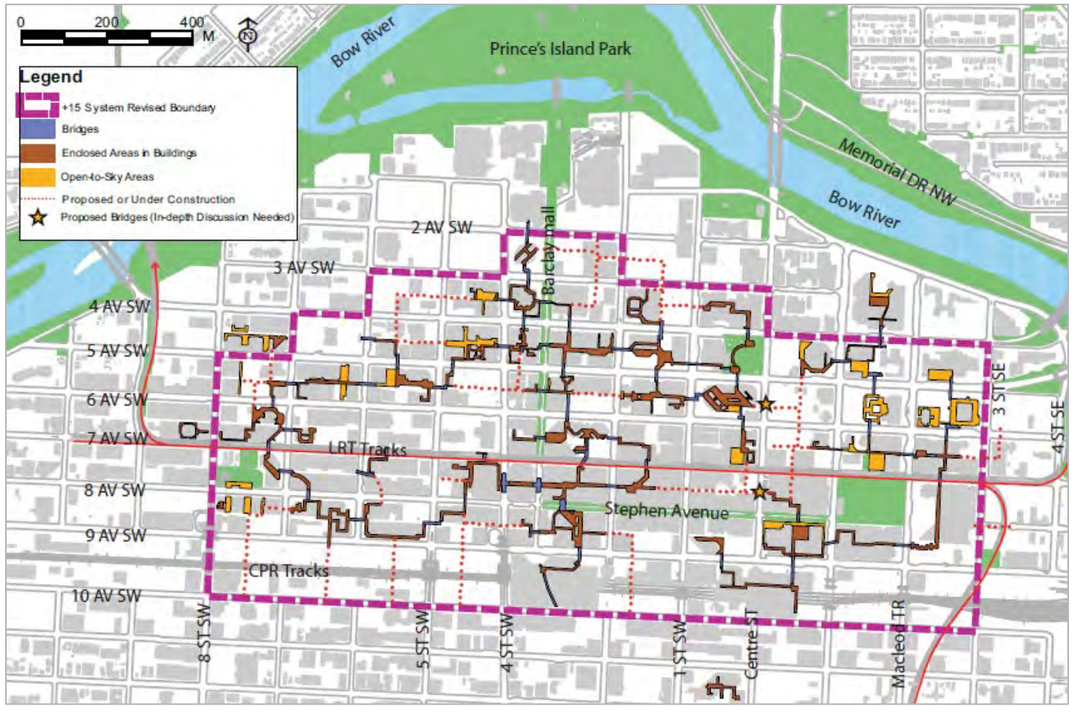


Figure 2-2: Plus 15 Network in the Centre City Plan

One of the key ideas from the Centre City Plan is a potential CPR corridor development which would consist of a system of Plus 30 public parks and places that bridge the tracks and are connected along the corridor. Underpasses would also be enhanced and become more pedestrian focused through redevelopment and improvement projects. The CPR corridor may be feasible through a new bonus system

Plus 15 Skywalk System Urban Design Strategy Draft Report

A draft report was prepared in 2012 focusing on the urban design of the Plus 15 network. While the report remains as a draft and was not reviewed by Council, it contains valuable information for the intent and continued use of the network. The draft report's overall goal is to offer strategies, guidelines and actions to sustain the success of the Plus 15 network as a major public accessible amenity in the centre city and to continue developing it into high quality, inter-connected, and animated urban public spaces enjoyable by all.

The seven objectives identified in the draft report to achieve the overall goal include:

- complimenting the centre city public realm;
- enhancing pedestrian movement;
- animating the network;
- improving quality consistency throughout the network;
- incorporating sustainable design and operational practices;
- facilitating system expansion; and
- strategizing the implementation.

The report highlights key strategies to improve the network and include but not limited to:

- Designing any new Plus 15 bridge with careful considerations of its visual impact on historical resources, cultural landscape, and view corridors as identified in the Centre City Plan.
- Depending on the site context, the visual impact of the bridge may be offset by sensitive and creative design which provides visual appeal and adds to the character, space enclosure and attractiveness of the streetscape and/or place.
- Encouraging building new Plus 15-level open spaces/plazas of high quality only at appropriate locations and retrofitting existing open spaces for greener, more active, and better connected public spaces, as a means to address the general lack of open space in the dense centre city area.
- The minimum width of the bridges can only be increased up to 6m as described in Plus 15 Policy in locations where high pedestrian volume is anticipated. The creation of stopping zones in these bridges for seating, public art, view and orientation on the edge of the bridges may be encouraged at the discretion of the Development Authority.
- Allowing major street-level pedestrian corridors and the Plus 15 network to work together as an integrated pedestrian system by providing well-treated interface or transition zone at the street-level entries, as illustrated in **Figure 2-3**.

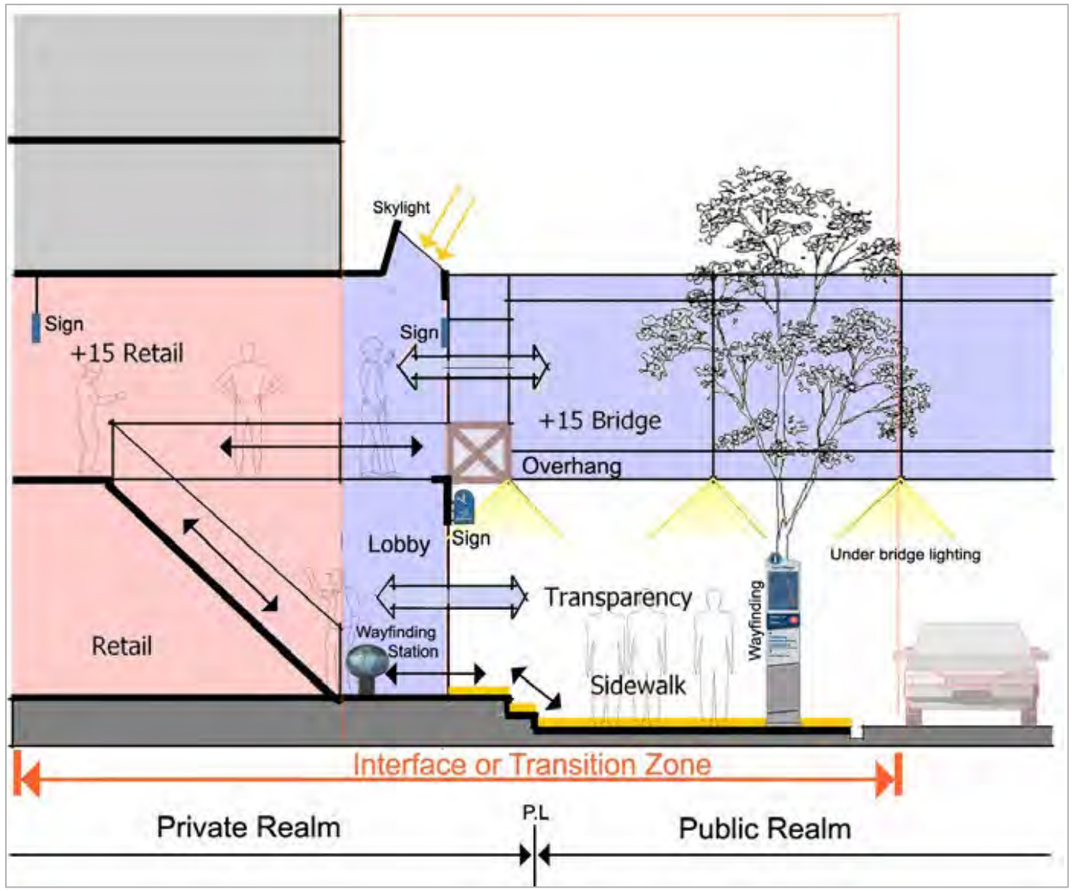


Figure 2-3: Interface or Transition Zone at Street Level Entries

The draft report also provides an enhancement plan with key actions and recommendations for the Plus 15 network by district focusing on improvements to the bridges, interior passageways, street-level entries, signs, open passageways, and future links.

2.2.3. Feedback from Plus 15 Users

Public participation was a critical component of the Plus 15 Network Study. The findings from public engagement carried out for the project were used to drive key decisions and help develop strategies and designs that were informed by the desires and priorities of the public.

A component of the public engagement carried out included feedback collected through a questionnaire online that ran from March 15 to April 5, 2018 and received 2,329 individual responses. The questionnaire helped gain insight into when and why people use the Plus 15 Network, what they enjoy about the network, as well as what aspects need improvement.

As detailed in **Figure 2-4**, the questionnaire asked people how often people use the network in good weather conditions, poor weather conditions, and during evenings/weekends to provide insight into when and why people are choosing to use Plus 15 network throughout the Centre City.

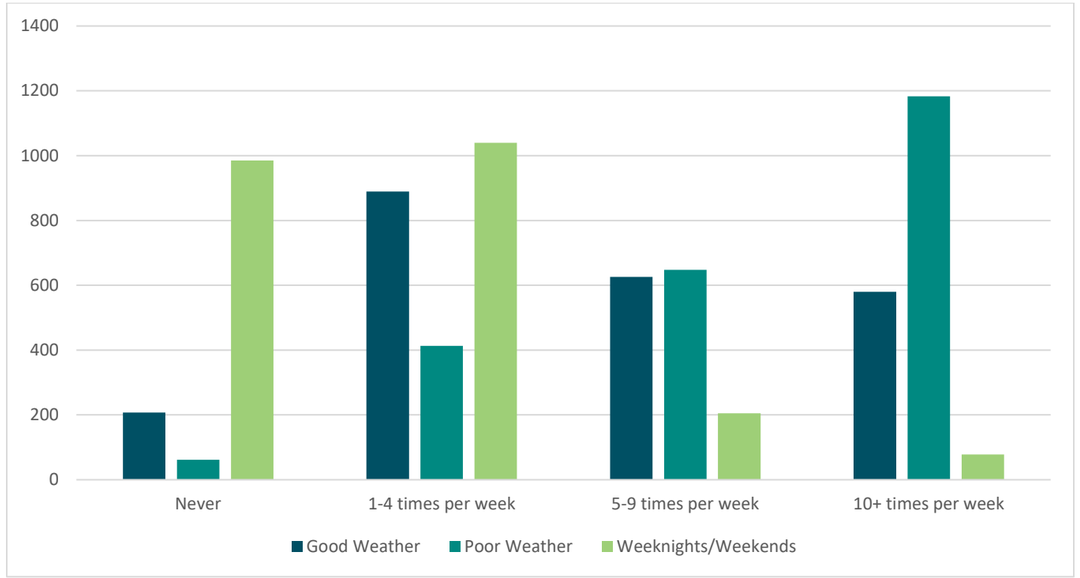


Figure 2-4: User Frequency of the Plus 15 Network

The questionnaire found that people are much more likely to use the Plus 15 network in poor weather conditions than in good weather conditions. In good weather conditions, the most common answer around frequency of use of the Plus 15 network was 1-4 times per week, at 39% of responses. During poor weather, over 51% of respondents noted that they use the network more than 10 times per week, which shows that weather is a strong determinant in the frequency that people choose to utilize the Plus 15 network. Overall, the questionnaire shows that weather plays a significant factor in how often people choose to utilize the Plus 15 network. For example, there was about twice the amount of responses for using the network more than 10 times per week in poor weather versus in good weather.

Respondents also indicated use of the Plus 15 network much more during the day than in the evenings and weekends, as 43% of respondents identified that they never use the network on evenings and

weekends. Inconsistent hours of operation may be a barrier to use of the Plus 15 network, which naturally diminishes access to and utilization of the network during evenings and weekends.

Figure 2-5 shows the public's responses to whether the Plus 15 network was preferred over use of sidewalks and/or streets. Weather was again highlighted as a significant factor in how strongly people favour use of the Plus 15 network, with the highest proportion of responses (38%) noting that preference for Plus 15 or sidewalks/streets "depends on the weather".

For those that chose to answer either "yes" or "no" to specify a clear preference for or against the Plus 15 network, 34% of respondents indicated a preference for the Plus 15 network and only 3% indicated a preference to use the street.

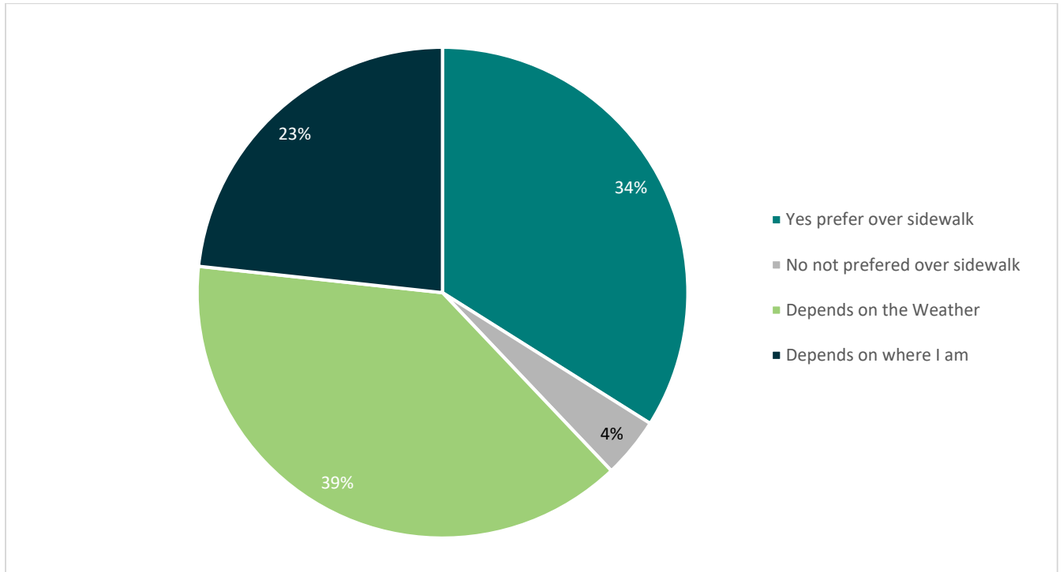


Figure 2-5: Use of the Plus 15 Network vs on Street Sidewalk

As shown in **Figure 2-6**, beyond avoiding poor weather, the main reasons that people use the Plus 15 network are because it provides relatively direct routes, makes crossing streets easier, provides access to shopping and restaurants, and also the accessibility to offices and places of work.

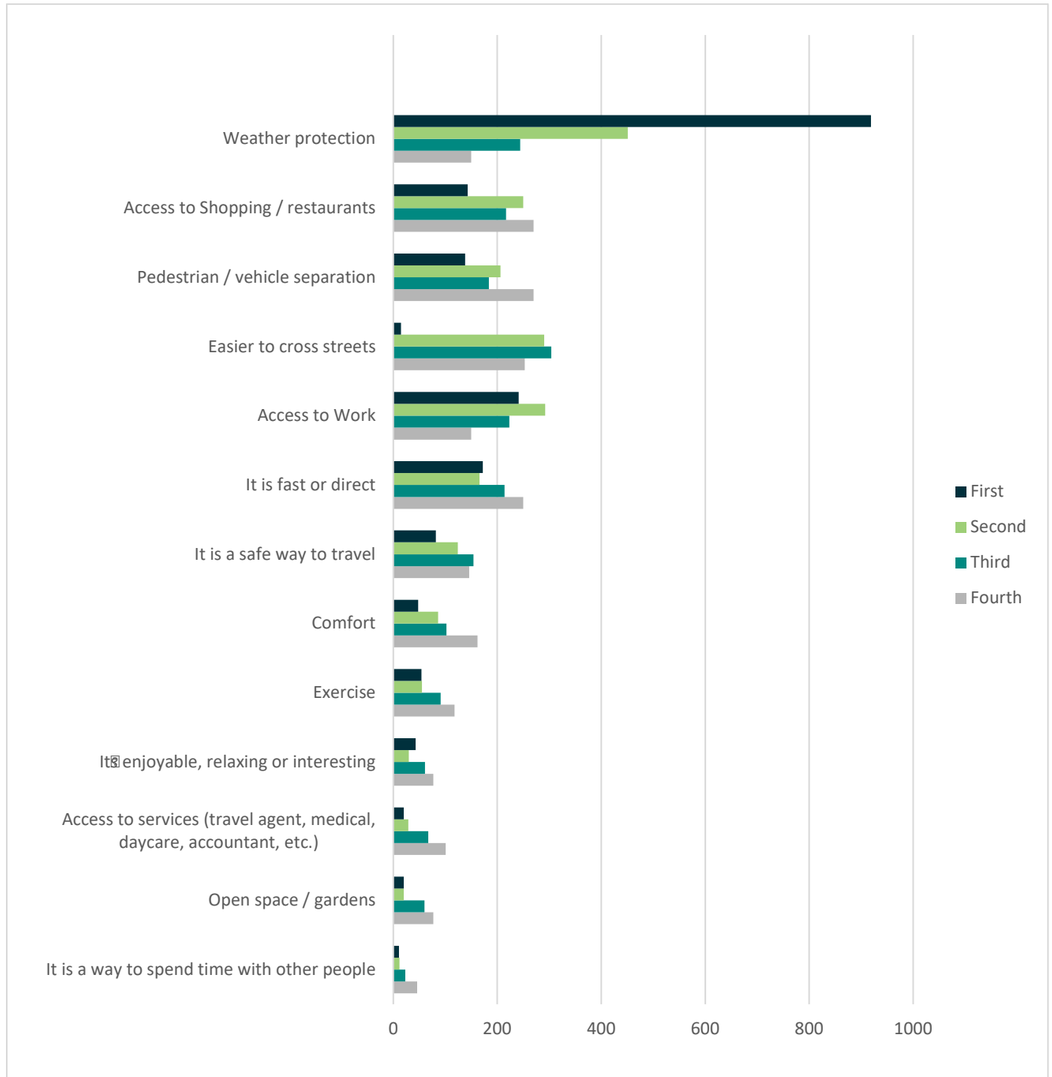


Figure 2-6: Primary Reasons for Using the Plus 15 Network

2.3. Pedestrian Volumes

The project team conducted short-term counts to assess pedestrian volumes within the Plus 15 network. The counts were conducted on the Plus 15 walkways between buildings and counted pedestrians entering the walkway from both entrances. Most counts were 9-hour counts conducted on several weekdays in January and February 2018. These counts encompassed both the morning and afternoon peak periods and represent conditions typical of a weekday in winter, where volumes are expected to be the highest compared to other seasons.

Additionally, 24-hour counts were conducted at several locations during weekdays in April 2018. These counts were used to fill gaps identified in the previous counts and provide information on temporal distributions. An illustration showing the location of pedestrian counts between January to April 2018 is provided in **Appendix A**.

2.3.1. Spatial Distribution

The observed pedestrian volumes were used to estimate peak daily pedestrian volumes across the entire Plus 15 network, including walkway segments contained within buildings. A heat map showing the differences in peak daily pedestrian volumes on the Plus 15 network is provided in **Figure 2-8**.

Several spatial trends were identified in the pedestrian volumes:

- The highest pedestrian volumes (>20,000/day) are found at The Core Downtown Retail Corridor. This corridor consists of west-east links just north of 7 Avenue SW from 2 Street SW to 4 Street SW. The walkway linking the corridor towards Bankers Hall West Tower also exhibits similarly high volumes.
- High pedestrian volumes (10,001-20,000/day) are found on the walkways adjacent to The Core Downtown Retail Corridor. These consists of north-south links north of Toronto Dominion Square and North of Scotia Centre through to 5 Avenue SW, as well as the walkway through the Bow Building.
- Moderate pedestrian volumes (5,001-10,000/day) are found on the walkways leading into the periphery of the Plus 15 network. Examples include the west-east link from Amec Place to Canada Place and the links adjacent to Centrium Place.
- Low pedestrian volumes (<5,001/day) are found on walkways on the periphery of the Plus 15 network as well as isolated walkways with limited connectivity. Examples include an isolated walkway through Encor Place and links connecting between Encana Place and Bow Valley College.

2.3.2. Temporal Distribution

Comparison of multiple pedestrian counts conducted at the same location were used to determine temporal trends. Generally, pedestrian volumes were higher in February 2018 than January 2011. This increase may be attributed to inclement weather in February, the addition of new links to the network, and an increase in office buildings.

Pedestrian volumes during the morning, lunchtime and afternoon peaks were determined using 9-hour counts conducted over an eleven-hour span in February 2018. **Figure 2-7** illustrates the variation in in the total pedestrian volumes on all counted locations over the course of a weekday in February 2018. Counts were not conducted in the off-peak hours from 9:30-10:30 and 14:00-15:00 which accounts for the gaps illustrated in the graph below.

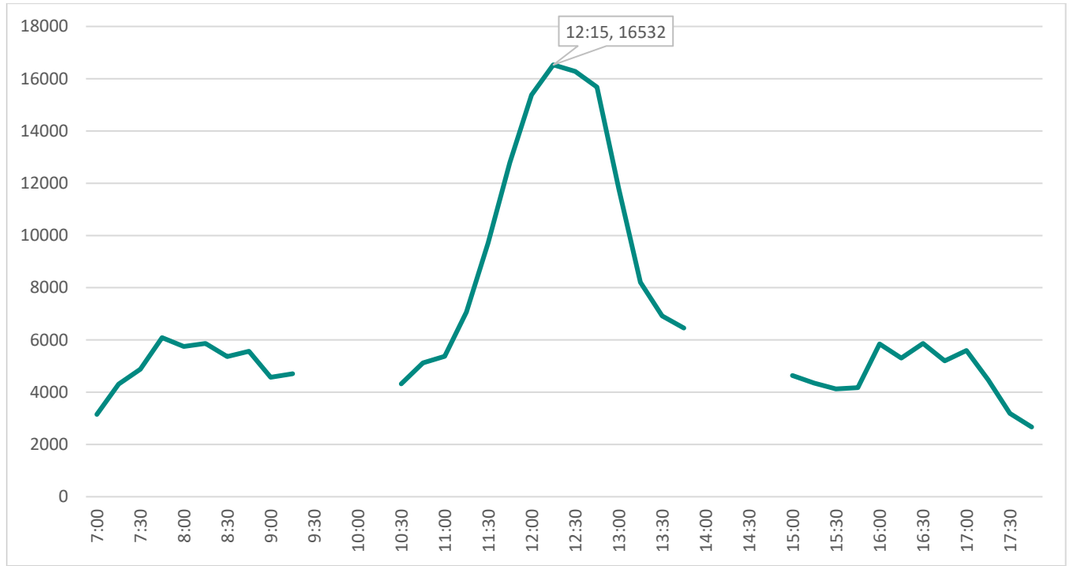


Figure 2-7: Peak Pedestrian Volumes on the Plus 15 Network (February 2018)

Overall, the highest pedestrian volumes on the weekday were observed during lunchtime (11:45-13:15). Pedestrian volumes during the early morning (7:00-9:30) and late afternoon (15:00-18:00) are similar and significantly lower than those observed during lunchtime. The trend slightly varies on some bridges, especially those close to the entertainment district where peaks occur in the evening.

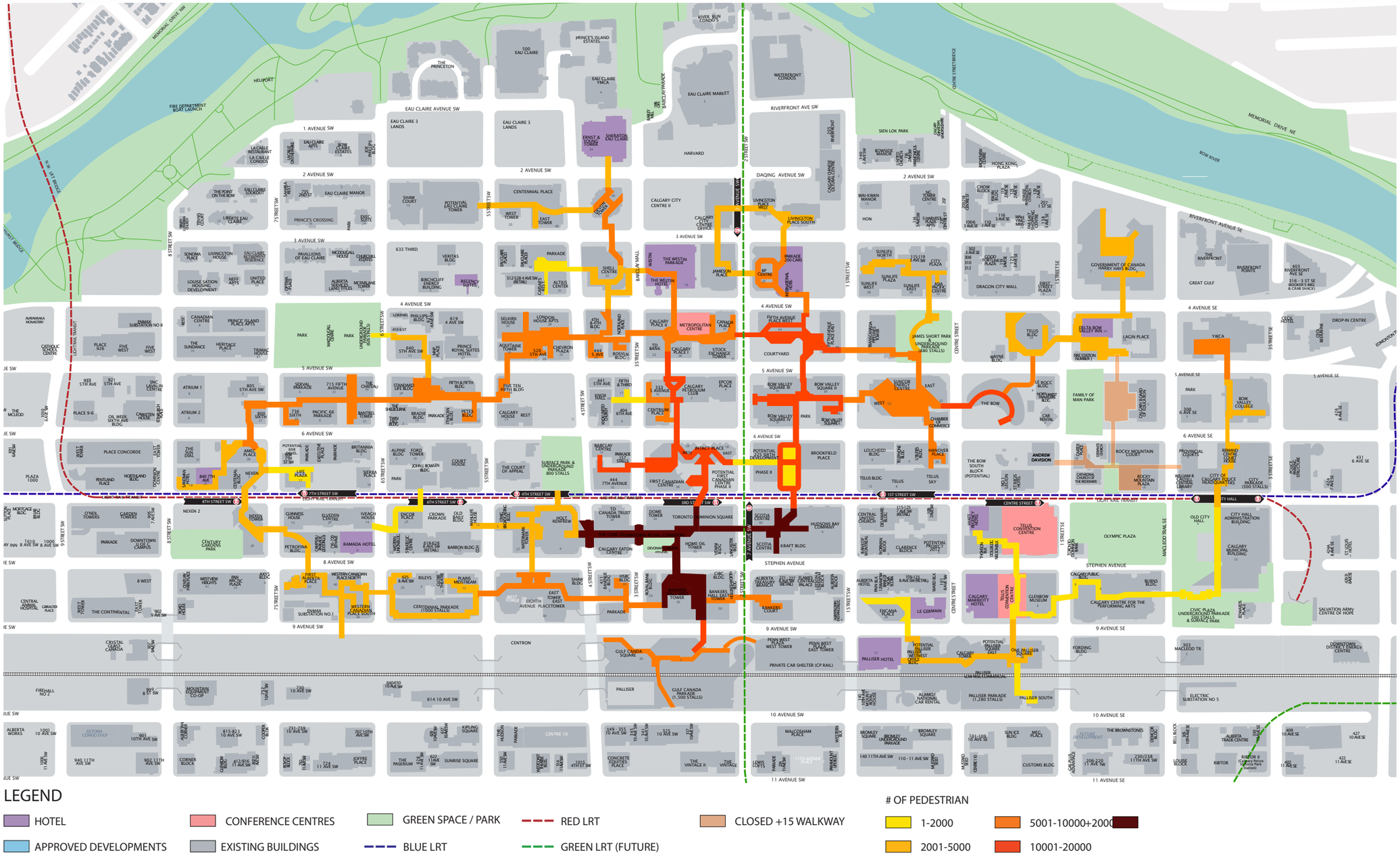


Figure 2-8: Plus 15 Pedestrian Heat Map

2.4. Bridge Assessment

The project team conducted physical assessments of 78 bridges on the Plus 15 network to determine their interior widths, which is defined as the width of the path of travel available to pedestrians. An additional 14 bridges were identified using the City of Calgary Asset System but were not assessed due to closure or being outside of the study boundary. An inventory of bridges on the Plus 15 network is provided in **Appendix A**.

The width of the Plus 15 bridges has resulted from negotiations between the Development Authority and applicants. Width requirements are also noted in CR20 (8.23.5) of the Land Use Bylaw, Section 5.2 of the Plus 15 Policy and the Access Design Standards.

The distribution of Plus 15 bridges according to their interior widths is provided in **Figure 2-9**.

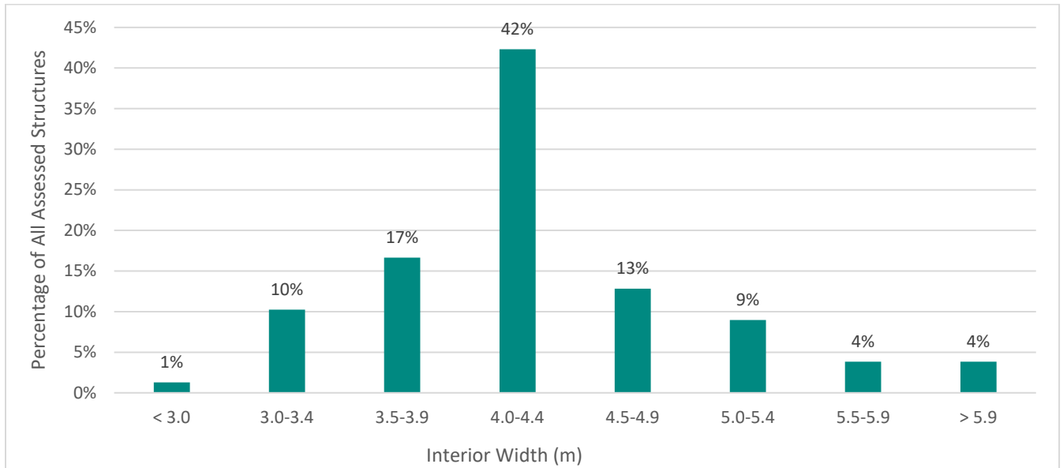


Figure 2-9: Interior Widths of Plus 15 Bridges

The average interior width of all assessed bridges is 4.46m. The narrowest interior width measured is 2.5m (Rosyln Building) while the widest interior width measured is 11.2m (The Core). The majority of bridges (71%, 55 bridges) have an interior width less than 4.5m. Five (5) of these bridges have obstructions such as planters or handrails in their respective path of travel.

Seventeen (17) of the assessed bridges have an unobstructed interior width of 4.5m as required by the City of Calgary Access Design Standards (2014). The unobstructed interior width is defined as a barrier-free path of travel void of obstructions such as planters and handrails. An additional six (6) bridges provide a minimum overall interior width of 4.5m that is obstructed by planters or handrails, which reduces the unobstructed interior width to less than 4.5m.

Bridge widths and their respective pedestrian volumes were compared to identify trends. **Figure 2-10** provides a breakdown of pedestrian volumes for various bridge widths.

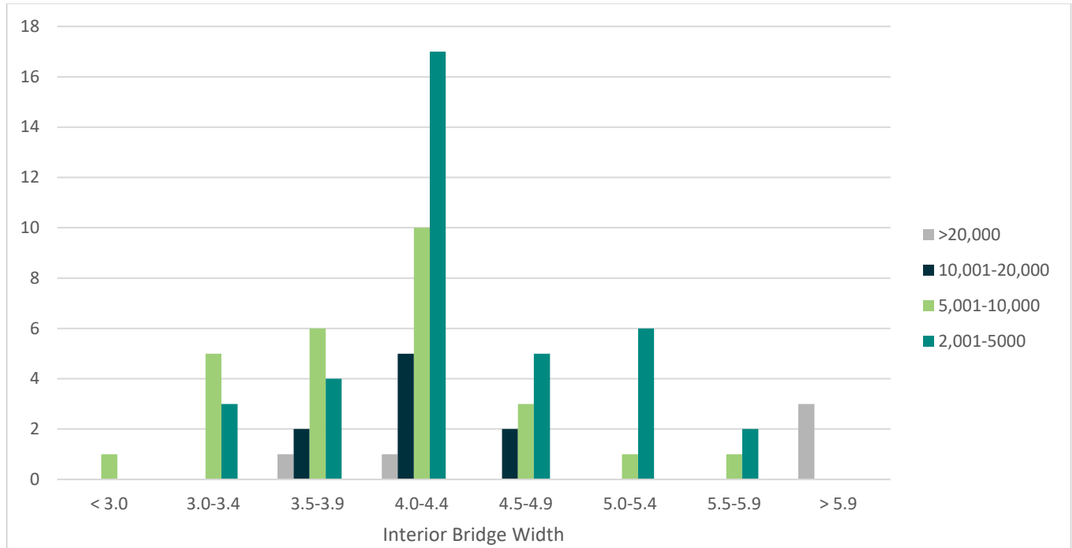


Figure 2-10: Bridge Widths and Pedestrian Volumes

Several trends in bridge widths were identified in relation to pedestrian volumes:

- Bridges as narrow as 3.8m were able to accommodate over 20,000 pedestrians a day. However, most bridges that accomodated high pedestrian volumes had widths between 10-11.2m.
- Several bridges between 3.7-4.5m wide were able to accommodate up to 20,000 pedestrians a day.
- Bridges between 5-5.9m wide accomodated only moderate to low pedestrian volumes (<10,000/day).

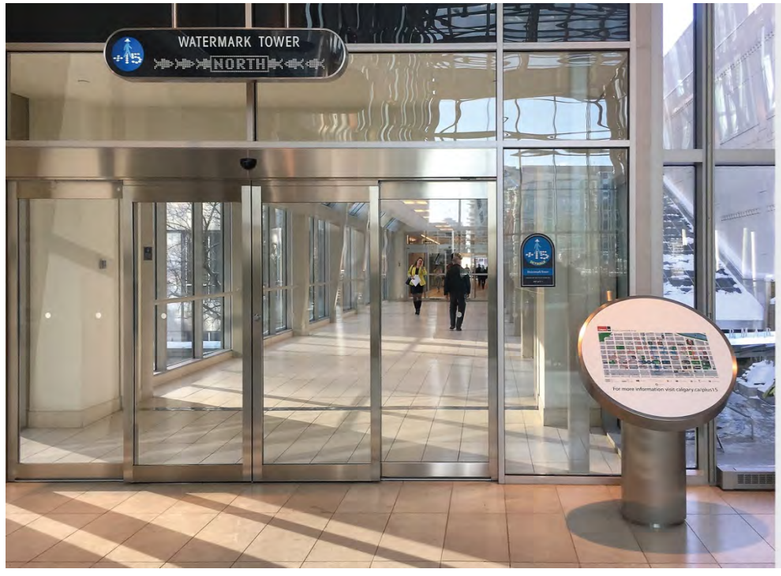
2.5. Wayfinding & Signage

This section deals with the assessment of the Plus 15 wayfinding and signage program. To properly asses the system, a detailed photographic study, observations of users interacting with the system and a physical review of the system was conducted. From this data, a series of observations were developed that reflect the common issues that were found. A more detailed set of observations can be found in **Appendix B**.

This section focuses on key areas that were found to be ineffective and have a negative impact on user experience with the system. For a wayfinding and signage program to be considered successful, it must achieve the following key objectives:

2.5.1. Deliver a Clear & Consistent Message

In signage programs, where brevity is key, consistent nomenclature is vitally important. In observing the existing Plus 15 program, several critical areas of communication are presented in an inconsistent manner, starting with the brand itself. In an audit of existing signage and messaging, the identity was presented in no less than 11 different ways throughout. “+15”, “PLUS 15”, “+15 Walkway”, and “+15 SKYWALK” are just four of the ways being used to describe the system. Third parties are also not using the correct brand and present information about the Plus 15 program as they chose, using terms such as “Plus15 Network” and “+15 Connection”, or creating their own iterations of the logo itself.



Example showing multiple brand treatments at a single location. The lack of blue Plus 15 logo on map table, combined with the red Calgary logo, makes it challenging for viewers to quickly comprehend that all these sign components relate to the same program.

There are also examples of situations where conflicting messages are presented. Where an “Emergency Exit Only” sign appears on a door next to Plus 15 “Push” sign. Or a “No Trespassing” sign appears on a door next to a Plus 15 sign. Users need to feel confident that the route they are on is part of the proper Plus 15 network.

Perhaps the most unexpected message being communicated about the Plus 15 through its overall signage program is how low key it is. Where once Calgary proudly promoted having one of the largest connected skywalk networks in the world, the Plus 15 is surprisingly subdued and discreet.

2.5.2. Properly Leverage the Benefits of Brand Consistency

A brand is often described as a shortcut to a decision. What that means is that all the elements that help make up a brand – the logo, colour palette, fonts, nomenclature – build up in the viewer’s mind so that they “read” the brand faster than they would the written word.

It is obvious through examination that the Plus 15 brand and its brand elements have gone through modifications since its inception as examples of various iterations remain in use. Two versions of the main logo are still in circulation – “+15 Walkway” and “+15 SKYWALK” – each with different colours. This, in addition to the fact the newest Plus 15 maps and website pages exclude the use of a logo, weaken the benefits of brand awareness and consistency.

There is also inconsistency in font use through all the various sign types with at least four different sans serif fonts set in both all-caps and upper-and-lower case used. The reader is forced to work harder to understand which signs refer to the Plus 15 program instead of being able to instantly recognize a Plus 15 sign in the visual din of the environment.

A more subjective observation about the Plus 15 brand is that its design is starting to reveal its age. When it was first introduced it looked modern, but now feels low-tech with its use of the dot matrix graphics. It also doesn’t represent inclusivity as it

Examples of inconsistent logo, colour, and nomenclature use.

Example showing use of different fonts, colours, and cases to describe the same information.

doesn't incorporate gender neutrality, cultural diversity, or people with mobility challenges. The iconic pictogram with the cowboy hat may not represent the current ideals of the modern Calgarian. The system also employs a motif for denoting the cardinal directions. Most surveyed did not realize what the image was and that it related to various landmarks in the city. The use of 'North' etc. can be misleading, as this refers to the direction of travel and not the quadrant of the city that you are located in. It's a component of the brand and system that is not working as effectively as it could.

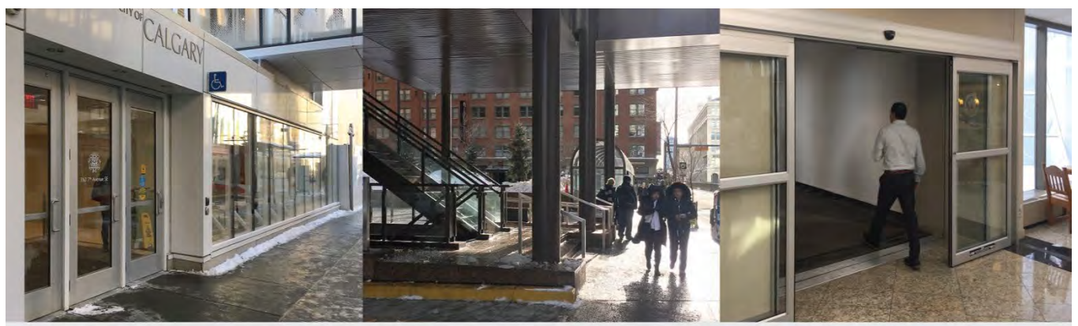
2.5.3. Successfully Communicate to All User Groups

The name of the program is understood by frequent users and long-time residents of the city (although the actual meaning of +15 is being lost over time). For those new to the city however, the term "Plus 15" by itself doesn't convey the program's intent. The loss of the distribution of a printed brochure for visitors and tourists has reduced the opportunities to increase awareness and understanding to new users. In addition, design elements such as the original graphics that accompany the compass directions have no meaning to new users and become superfluous.

A key element of communication missing from the overall program is information for the mobility challenged. Street level signs indicate stair access only. Entry points that require the use of building elevators do not include accessibility information, including hours of operation.

2.5.4. Display Information in A Consistent Pattern

People by nature look for patterns and repetition to help take in the information stimulus that surround them. Crafting a program to this expectation helps users navigate with greater ease and confidence. The current system of sign locations for the Plus 15 program is at its most successful at the interior entry and exit points of the bridges. There are signs positioned in a reasonably consistent pattern of locations with a common array of messaging at each location. Some locations, however, are out of date and need to be brought up to standard.



Example of inconsistent signage use. Many street level access points the the Plus 15 have no signage, including Calgary City Hall. Some interior connection points also lack signage.

It is at its weakest at both the street level and in the interior spaces that span the gaps between the bridges. In its current state, there appears to be no systematic plan to address signage at entry locations or signs that help navigate the spaces between points. There are doors that lead to direct access to the Plus 15 that have no signage and other doors that do have signage but are locked.

There are numerous street level access locations that do not have any Plus 15 identification signage. A good wayfinding program eliminates user anxiety by anticipating critical decision points and providing key information to keep the user moving on course with ease. Currently there are large gaps in the Plus 15 routes where additional signage would help achieve this and improve the overall user experience.

2.5.5. Present Information in a Scale & Look Appropriate for its Environment

From traffic signals to retail signs, cities are cluttered with visual noise and distractions. Designing a wayfinding program that considers this and works during all hours of operation takes this into account.

As Calgary's downtown has evolved, the Plus 15 exterior signage component has become lost and too discreet to be easily spotted. The blue background now blends into the sky and the glass buildings. Their scale and text size are only visible from up close. The non-illuminated signs get lost in the shadows of bridges. As a key driver for the use of the Plus 15 is to get in from the cold, it would seem highly beneficial if street level signs identifying entry points were better designed to stand out in the dark winter months.

Example of street level sign that is both underscale and hidden in shadow.

2.5.6. Present Information When it is Best Needed

The key to effective wayfinding is to avoid overloading the reader with information and to break it into parts and present it as needed or when it most helpful. The above-door signs located at the entrances to the bridges are useful in identifying the next building or landmark across the bridge but could be more helpful if they included a bit more information about the route ahead.

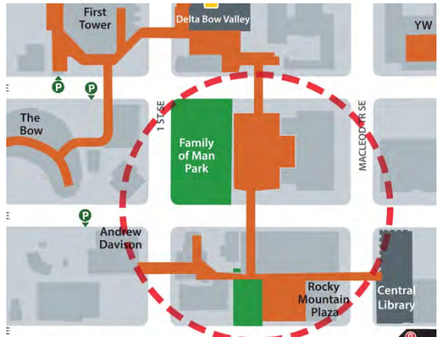
There are also signs at the bottoms of outdoor stairs that indicate a Plus 15 access point, but the hours of operation are only presented at the door at the top, only after the user has ascended the full flight of stairs to potentially encounter a locked door.

The maps located along the route in the round stands would be more helpful if the macro level information was simplified and an enlarged insert was added that showed more detail of what was located within the immediate vicinity of each specific map stand.

Hours of operation are noted at all doorways, but no information is provided for the user to find the closest exit should they reach doors that are locked and can't continue along their planned route.

It was also noted that some of the signs were not illuminated. Due to the design of the wayfinding sign, when the signs are not lit, the information is difficult to read and impacts user's ability to locate and read the information.

2.5.7. Maps Should Be Easy to Use



Sections of the Plus 15 that are closed are still shown as open on the current map.

The Plus 15 map is one of the most critical tools in communicating the usefulness of the network. Maps should be designed with the end user's needs in mind. A map like this has many different user needs, but mainly it is about easily seeing how to get from A to B.

At first glance, the current map looks to be broken into coloured routes. Only after reading the legend is it understood that the colours represent hours of access, a point that emphasizes another level of complexity to an already complicated map. A considerable amount of destinations are excluded from the map including buildings identities on the main signage program. The absence of a list of locations with corresponding grid and coordinates prevents users from finding easily finding destinations.

The added layer of information regarding "connected buildings" is confusing as identified buildings are not always connected to the Plus 15 route. It seems unnecessary to include this information as the map implies that all buildings along the shown routes are connected buildings.

Text on the map is hard to read at its current size. Also, the map does not indicate locations in the network that are not wheelchair accessible.

Maps, when positioned in the round map stations, do not properly orient to the users' viewpoint thus causing readers to mentally overlay the map to what they see around them.

Most importantly, the current map is out of date and includes sections that are no longer open. The original system included a digital screen that allowed the map content to be updated via a software, but because of the infrastructure required and costs, this system has been temporarily set aside and replaced by static printed maps. This has resulted in a loss of flexibility when new links are added.

2.5.8. Works in Concert with Current & Future Technology

Physical signs will always play an essential role in navigation, but technology can take the user experience and usefulness to another level, providing layers of information not feasible for a static sign.

The current third party-developed Plus 15 app only scratches the surface for an added layer of helpfulness to the existing signage. Since the app was not developed by the City, there is no control over the accuracy of the content as well as the ability to cross market information to potential users. Users may expect that the City is managing this asset and be disappointed if the information is not accurate.

2.6. Approved Developments

Several development permit applications have recently been approved by The City of Calgary for developments proposed for construction within the centre city. These new developments will either connect to the Plus 15 network directly or otherwise be located adjacent to existing connections within the Plus 15 network area. As such, these sites will impact the Plus 15 network in many ways, including expansion of the network through potential new connections in the future, additional traffic generated by the developments using existing links, and potential changes to Plus 15 traffic routing patterns.

Based on data obtained from The City of Calgary, ***Table 2-2*** summarizes notable future developments expected within the centre city, as well as corresponding land uses associated with each development.

With significant new development proposed in the centre city, a number of impacts to the Plus 15 network can be expected. As the land uses proposed for the new developments vary notably, significant land use interactions between complementary uses can be expected. For instance, trips from new residential and office uses to retail areas, other offices, supermarkets and restaurants can be anticipated. Given the ease of travel and pedestrian network connectivity, (both outdoor via sidewalks and indoor through the Plus 15 network), coupled with the inconvenience of motor vehicle use and parking for short trips within the centre city, a notable proportion of new development trips are expected to be walking trips. The proximity of the Plus 15 network to the proposed new developments makes it an ideal option for the site generated traffic associated with the developments to travel within the centre city.

In addition to increased area trips from new traffic drawn into the centre city by the new developments, a notable proportion of site generated traffic associated with these developments may also be existing traffic that already travels within the centre city. These existing area trips may be altered with the development of new origin and destination points associated with the proposed new developments. As such, the existing traffic patterns can be expected to change, with some Plus 15 links significantly increasing in daily volumes, while traffic on others may reduce. In addition, the demand for new links and expansion of the Plus 15 network may also arise with the introduction of these proposed new developments.

Similar impacts are also expected with major changes to the transportation infrastructure in the centre city. This includes any new roadway connections into and out of downtown, the development of new parkades, improvements to the existing bicycle and pathway network (including expansion of the network and new connections into and out of downtown), as well as transit system improvements, particularly with the future Greenline LRT and any changes to bus routing and BRT services.

Table 2-2: Potential Future Developments Within Downtown

Building	Expected Land Uses	Development Permit Details
Nexen 2	Office, Retail	DP2015-5341: 22 storey: retail ground floor and offices (37,000m^2)
633 Third	Office, Retail, Residential	DP2015-5345: 46 storey: retail, offices (36,844m^2), and residential (227 units)
Eau Claire B Lands	Retail, Residential, Child Care Services, Restaurant, Supermarket, Hotel	DP2014-2250: residential mixed use with hotel, commercial, supermarket, restaurant over 7 buildings
Harvard	Retail, Residential, Restaurant, Supermarket, Hotel, Cinema	DP2016-3165: Part 1-A and Part 1-B, and Part 2, 2 Ave SW and 2 Street SW building
City Centre II	Office, Retail, Restaurant, Hotel, Fitness Centre, Outdoor Café	D2015-5218: 2 Ave 2 Street SW, outdoor café, restaurants small and med, fitness centre, hotel, office, retail, 33 storey tower
Centron	Office, Retail	DP2013-1092: office, retail, consumer service. 14 storey: office with at-grade commercial
Palliser	Office, Retail	DP2014-0144: office, retail, business, 33 storey
Great Gulf	Retail, Residential	DP2015-1356: 443 dwelling units with retail podium
5 Avenue / 5 Street SW	Restaurant, Hotel, Outdoor Café	DP2015-3586: 28 storey tower, hotel, restaurant, outdoor café
Hon	Residential, Hotel, Retail	DP2018-3107: 3 towers with retail at grade, 524 dwelling units, hotel with 150 units.

2.7. Transportation Network Impacts Without the Plus 15 network

As mentioned, the Plus 15 Network moves thousands of individuals on each link daily. Without the network, several potential impacts to the centre city's transportation system and businesses could be observed, as follows:

- Significant increases in street-level pedestrian traffic volumes along several downtown streets and crossings would be observed. This would result in decreased levels of service for pedestrians due to the limited capacity offered by the existing sidewalk network. The current sidewalk widths and pedestrian crossing times at signals may be insufficient to accommodate the additional pedestrian traffic, resulting in delays, congestion and unsafe movements (ie: jaywalking, crossing at signals during "don't walk" phases, etc.)
- Corresponding increases in transportation network congestion and traffic delays (for all modes) may occur, as significantly more road users compete for green time at signalized intersections and limited network capacity. In particular, the presence of substantially higher pedestrian volumes at crossings (especially unsignalized crossings) where motorists must yield right-of-way to pedestrians could result in network gridlock if crossing pedestrians consistently interrupt vehicular and cyclist traffic flow. Consequential effects could include increased driver aggression and unsafe maneuvers with motorists not yielding to pedestrians.
- Motor vehicle traffic and parking congestion may increase with increased auto mode share, as a proportion of individuals who would normally use the Plus 15 Network may instead make vehicular trips, particularly during inclement weather conditions. This would also have detrimental impacts on the environment due to a decrease in sustainable travel mode share.
- With higher pedestrian volumes on street, increases in the exposure and conflict risks with motor vehicle and cyclist traffic may be observed.
- Negative impacts to businesses located adjacent to the Plus 15 walkways may result due to a decrease in pass-by trips from foot traffic in front of the commercial businesses and services.
- Reduced safety and accessibility for individuals with limited mobility may result, including wheelchair users and individuals with visual impairments. This may be amplified during winter months when outdoor sidewalk systems and crossings may be covered in slush, ice and snow.

As such, the Plus 15 network serves many unique purposes, including providing users with safe and reliable route choices throughout the centre city. Several negative impacts ranging from safety and accessibility concerns, to issues with delays, congestion and sustainability may result without the system in place.

SECTION 3

Network Linkage Improvements

3.1. Stakeholder Feedback

The first step in identifying new links to improve the network was to meet with stakeholders and the public. The objectives of the initial phase 1 engagement sessions were to:

- Inform stakeholders and the public of the project, including the purpose, scope and objectives;
- Discuss existing stakeholder and public concerns and their desired improvements; and,
- Identify the evaluation criteria that are most important to stakeholders and the public, that could be incorporated into an evaluation matrix to be used in selecting the recommended links.

Discussing the project with stakeholders and the public *prior* to the development of any link options was crucial for two reasons:

1. The project team was able to develop options with a more complete understanding of citizen and stakeholder needs.
2. Citizens and stakeholders felt engaged in the process, which is not always the case when preliminary options are developed prior to the first engagement event.

To aid in the assessment of missing links, the public was asked in December 2018 about what amenities are most desirable to reach by the Plus 15 network. Over 500 people provided online input when asked about the amentias that are most desirable to connect to via a Plus 15 bridge. A summary of the responses is provided in **Figure 3-1**.

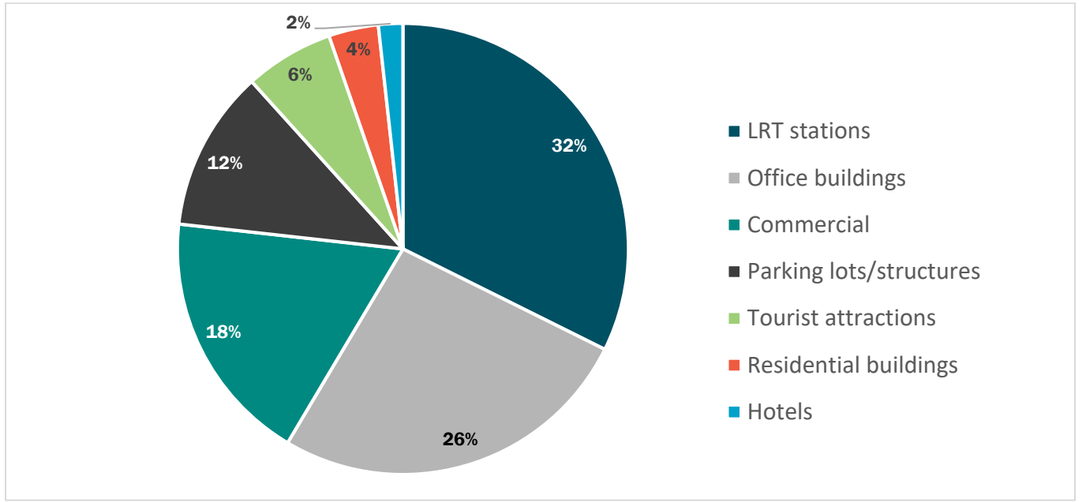


Figure 3-1: Public Responses (December 2018) – Desired Plus 15 Amenity Connections

Another question asked the public about where they would like to see new links and was designed with open-ended responses. The questions received a wide range of feedback (over 2000 responses), with some people citing specific locations, others noting general areas, and others looking for connections to specific buildings or landmarks as illustrated in **Figure 3-2** and **Figure 3-3**and In terms of buildings, more connections to City Hall were most desired, while the area that people think is most in need of new connections is Eau Claire

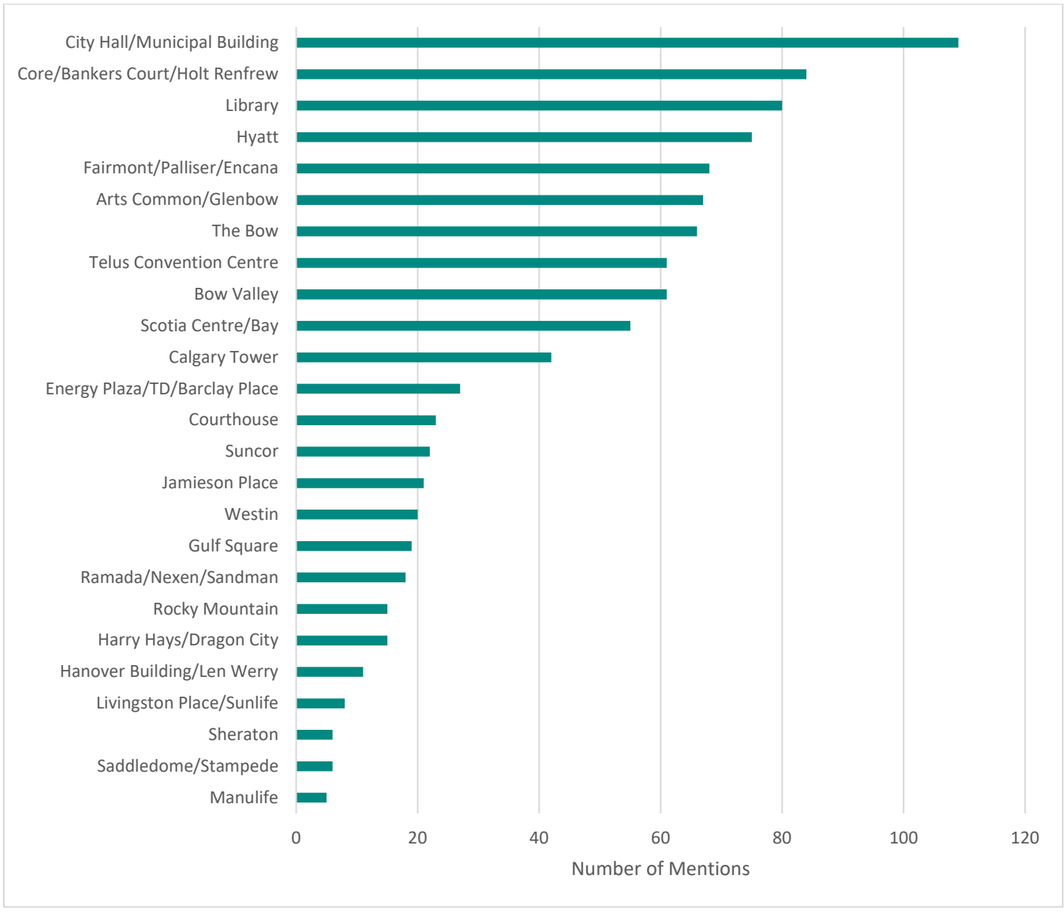


Figure 3-2: Public Responses (May 2018) - Desired Buildings to Link to Plus 15

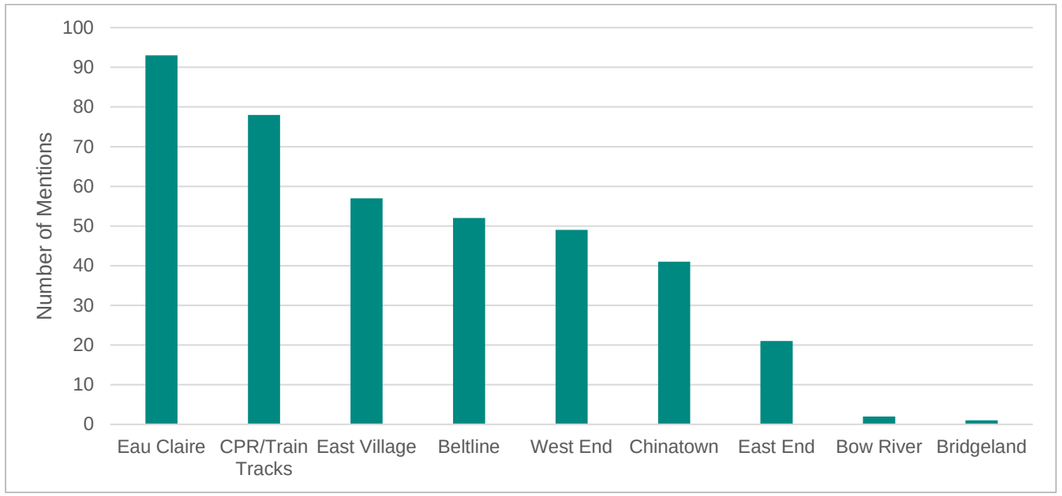


Figure 3-3: Public Responses (May 2018) - Desired Areas to Link to Plus 15

3.2. Missing Links

Although the existing Plus 15 network is robust, there are still opportunities to enhance the network in terms of the geographic footprint and internal connectivity. The existing network was reviewed to identify missing links, including:

- Internal Links: connections within the network that reduce overall travel distances or provide missing links to key attractions, trip generators, and transit.
- External Links: connections that expand the size of the network by connecting to key trip generators located at the periphery of the existing network.

The preliminary assessment of missing links is provided below and illustrated in **Figure 3-4**.

3.2.1. Missing Internal Links

Link(s) I: The west side of the network has limited north-south connections resulting in a long, circuitous route west of 5 Street SW. Providing link(s) in this area could drastically reduce travel distances within the system. There are several different options to connect the network in this area.

Links II & III: These links aim to provide a connection across 1 Street SW. Currently the most southerly crossing of 1 Street SW is north of 6 Avenue SW leaving a four-block gap in connectivity. These links would also improve overall connectivity as there are very limited existing links south of 6 Avenue between 1 Street SW and Macleod Trail (four blocks).

Link IV: As noted above, there are no north-south links between 1 Street SW and Macleod Trail (four blocks). This link would reduce north-south travel distances and would also connect the Telus Convention Centre with trip generators to the north, including existing and future hotels.

Links V, VI, & VII: There is currently poor connectivity in northeast corner of the network. These links aim to connect the network east of Macleod Trail with the rest of the system. There are some old and/or outdoor links within sections F and E that would need to be upgraded in order to be considered useful links in the overall system. Similarly, the existing sections adjacent to Link G would require upgrading.

Link VIII: This link would provide east-west connectivity in close proximity to the future Green Line LRT station at 2 Avenue SW. It would also provide a connection to expand the system north into the future Eau Claire mixed-use development and beyond.

3.2.2. Missing External Links

Link IX: This link would expand the network to the northwest if future development proceeds north of 2 Avenue SW. The area is currently at-grade parking lots, but high-rise developments have been considered in the area in the past.

Link X: This link would connect any future Eau Claire development with the rest of the Plus 15 network and the 2 Avenue Green Line station. This link is dependant on the provision of Link VIII discussed above.

Link XI: Link XI would connect a future Eau Claire development with the high-rise residential developments north of Riverfront Avenue SW and east of 2 Street SW. These residential developments are new and the design is not conducive to the inclusion of a Plus 15 network.

Link XII: There is an existing at-grade parking lot at this location. If the lot is developed in the future, a connection to the network should be a consideration. Due to the visual implications of blocking the view of the Chinese Culture Centre, the link should be provided east-west.

Link XIII: The Canadian Pacific Railway represents a barrier for pedestrians travelling between the downtown and areas to the south. There are currently two Plus 15 crossings of the track at 3 Street SW and 1 Street SE. Not only are there no Plus 15 crossings west of 3 Street SW, there are no at-grade crossings between 4 Street SW and 8 Street SW, resulting in limited north-south pedestrian connectivity. A connection at this location would provide an additional connection between downtown and the beltline.

Links XIV & XV: The current eastern boundary of the Plus 15 network is 3 Street SE. With the development of the East Village, there is an influx of high-rise residential developments that could potentially be connected to the network. Link XV would also provide a connection to the Central Library. However, the building is now complete and the design is not conducive to a Plus 15 connection.

Link XVI & XVII: These links would provide a pedestrian connection between the 4 Street SE Green Line LRT station and the rest of the Plus 15 network. This link would better connect the west side of the downtown with the Green Line, reducing the need for passengers coming from / going to the south to transfer to the Red or Blue Line. Link XVI would also better connect the network with the developments in/surrounding the Stampede grounds and future entertainment district.

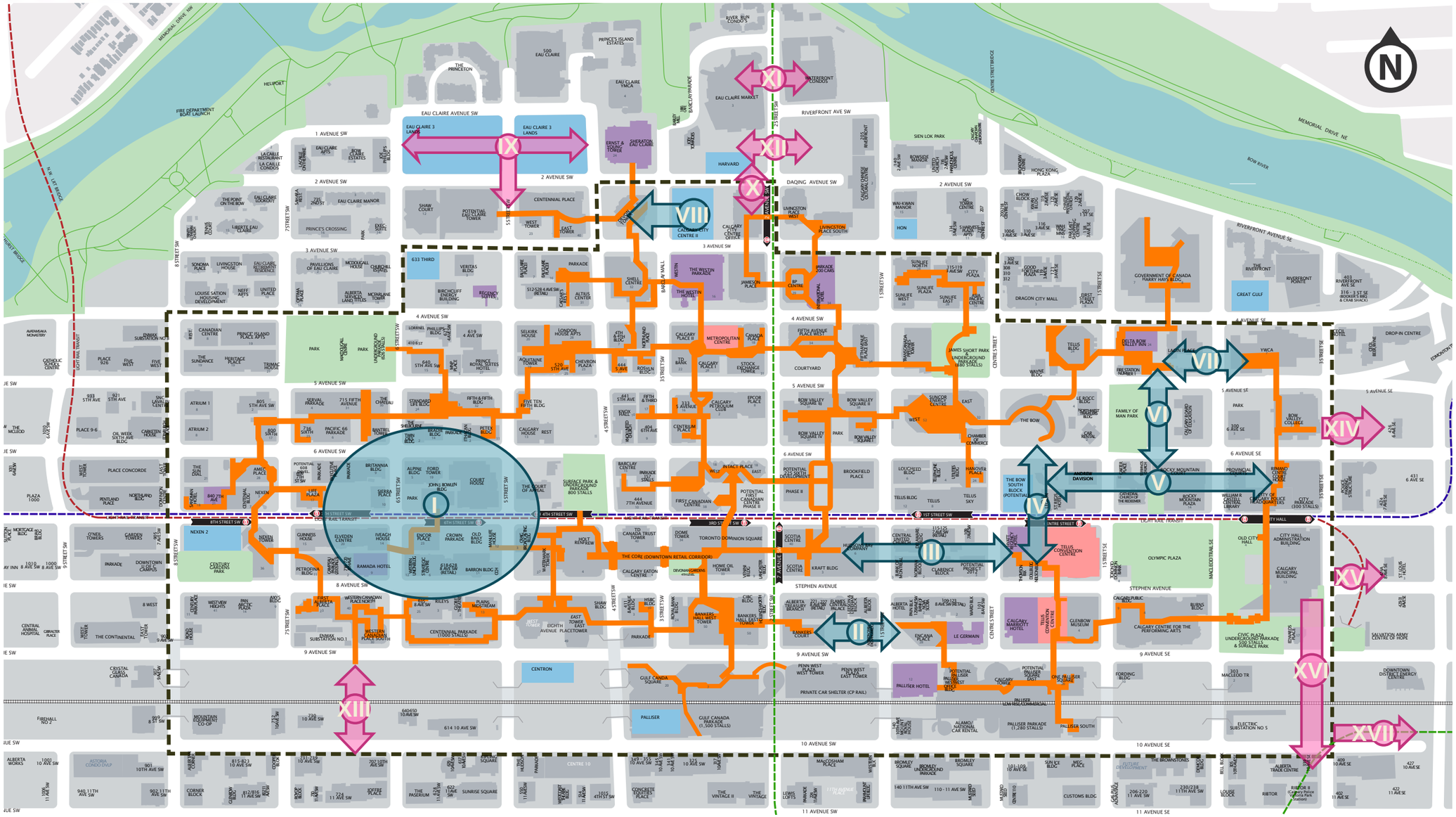


Figure 3-4: Preliminary Identification of Missing Links

3.3. Preliminary Screening

The missing links identified above went through a preliminary screening exercise to determine which links should be carried forward for further consideration. During this process the following links were removed from consideration:

Link XIII: Plus 15 crossings of the CP railway tracks present several challenges related to safety, horizontal and vertical clearances, gas emissions, and property rights/negotiations. Given these challenges, Link XIII was removed as it doesn't currently provide connections to any of the key amenities identified in Section 3.1. Link XVI was kept as a consideration as it would provide an important connection to the future Green Line Station. It should be noted that only Plus 15 overpasses bridges are being considered as a part of this study. Consideration could be given to providing an underpass for either Link XIII or XVI in the future depending on neighboring development plans.

Links XIV & XV: Plus 15 connections between the downtown and East Village / Central Library was a common theme during public consultation. However, given the high volume of residential development and limited office development in the East Village, The City does not feel the East Village area is conducive to a Plus 15 network. For this reason, Links XIV and XV were removed from consideration.

3.4. Evaluation Criteria & Link Prioritization

The missing links were reviewed to assess which links should be considered higher priority. In order to prioritize the links, an evaluation matrix was developed which considered several different evaluation criteria. The evaluation criteria were selected based on the feedback received from the public and stakeholders during the initial engagement events, as well as input provided by The City of Calgary. The criteria include a mix of attributes that can be evaluated quantitatively and/or qualitatively:

- Quantitative: Criteria which can be measured (e.g. cost).
- Qualitative: Criteria which can be observed or described, but not measured (e.g. aesthetics).

The weighting of each evaluation criterion was developed based on feedback from both the public and internal stakeholders in the phase 2 and 3 engagement events. The recommended evaluation criteria and weightings is provided in **Table 3-1**.

Each of the missing links were scored based on the evaluation criteria to establish an overall priority for the link. Each link is assigned a score from 1 – 3, with 3 being the highest (best) rating and 1 being the lowest (worst) rating. The scores are then multiplied by the weighting and each criterion is added to produce the final score for each option.

Table 3-1: Missing Link Evaluation Criteria

Evaluation Criteria	Weighting
Feasibility Lack of constraints related to heritage buildings, building design, owner support	20%
Cost Cost of construction	10%
Travel Time/Distance Reduction How well the link reduces travel distances within the system	15%
Connections to Transit Proximity to existing/future LRT stations and transit hubs	15%
Demand Existing pedestrian volumes, existing and future land and building development, lack of alternate options	15%
Current Policies and Council Direction Meets approved area land use plans, CP railway crossings	5%
Street Level Integration Avoiding competition with street-level shops; vitality, street security, traffic/walking delay, street classification and function	10%
Aesthetics Limits impact on visual corridors, public spaces, and visual identity	10%

A visual summary of the evaluation is provided in the evaluation matrix in **Table 3-2**. In addition to the overall ranking, the table also identifies the links as high, medium, and low priority to help group the links. These priorities are also illustrated in ***Figure 3-5***. Links that scored very low on the evaluation matrix are low priority links that are not recommended at this point.

An explanation of how each criterion was assessed is provided below:

Table 3-2: Missing Links Prioritization

Evaluation Criteria	Weight	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XVI & XVII
Feasibility	20%	○	◒	○	◒	●	◒	○	●	◒	●	○	◒	○
***Cost**	10%	○	◒	○	◒	●	◒	◒	◒	○	●	○	●	○
Travel Time/Distance Reduction	15%	●	●	●	●	●	◒	◒	◒	○	○	○	○	○
Connections to Transit	15%	●	○	◒	●	◒	○	○	◒	○	●	○	◒	●
Demand	15%	◒	●	●	●	◒	◒	○	○	○	◒	○	◒	○
Current Policies & Council Direction	5%	●	●	○	●	●	●	◒	●	○	◒	○	○	○
Street Level Integration	10%	●	●	○	●	◒	●	◒	◒	○	○	○	○	●
Aesthetics	10%	●	●	○	●	●	●	●	◒	◒	◒	○	○	●
Overall Priority		**High**	**High**	**Low**	**High**	**High**	**Medium**	**Low**	**Medium**	**Low**	**Medium**	**Low**	**Medium**	**Low**

Note *: lower cost items have a higher rating while higher cost items have lower rating

● Best Meets Criteria (score of 3) ◒ Meets Criteria (score of 2) ○ Least Meets Criteria (score of 1)

Feasibility: Assesses how practical the link would be to construct. This includes considerations such as the length of the link, number of properties impacted, building design/configuration, owner support, and presence of heritage buildings. It is undesirable to interfere with the design/aesthetics of heritage buildings and in some cases building alteration is prohibited.

Example: Link X is a short crossing connecting a future development with a new development that has been designed to accommodate a future Plus 15 connection, so it received a score of 3. Conversely, Link III is long, passes through numerous properties, and the design of these buildings is not conducive to a Plus 15 connection, so it received a score of 1.

Cost: Cost considers the costs associated with construction of the link. Factors influencing the cost will include the length of the link, the number/length of bridge structures, the amount of internal building retrofit, and other constructability considerations.

Example: Link V already exists but is need of repair, so the cost scored a 3. Link I on the other hand would require at least two bridge structures and significant internal building retrofit, so it received a score of 1.

Travel Time/Distance Reduction: This criterion assesses how effective the link is at reducing the travel distance for users within the Plus 15 network. Links that can significantly reduce travel distances within the Plus 15 network are given a higher rating.

Example: Link II would provide a missing link at 1 Street SW, substantially reducing travel distances in the area (score of 3) whereas Link IX is a short extension to the existing network (score of 1).

Connections to Transit: Providing a climate-controlled connection between transit and trip generators is a key benefit of the Plus 15 network and was confirmed as such during the public engagement. This criterion scores how useful the link is at improving connections to transit.

Example: Link I would make use of an existing bridge structure over the LRT track and provide a connection to the 6 Street SW LRT station, so it received a score of 3. Link VII is a considerable distance from the LRT and provides minimal bus connectivity so received a score of 1.

Demand: This criterion assesses how well used the link is expected to be. Pedestrian volume counts were used with consideration for network connections and building size to predict pedestrian volumes.

Example: Links II and III would connect several high-rise towers with the busy CORE shopping area (score of 3) whereas Link XI would connect one building to the network at a low volume location (score of 1).

Current Policies and Council Direction: This category considered if any links were in support of or contradicting any City policies. Consistency with previous Plus 15 boundaries, such as those in the 2007 City Centre Plan, was also a major consideration.

Example: All links are within both the 1984 and 2007 Plus 15 Boundaries except for Links IX and X, which were in the 1984 plan, but not 2007 and Links XI, XII, and XVII which were not in either.

Street Level Integration: Considers how detrimental the link might be to street level vibrancy and prosperity. Considerations include the amount of ground level retail, streetscaping, and pedestrian / vehicle volumes.

Example: Link IV does not compete with a high value on-street pedestrian corridor and there is minimal ground level retail (score of 3). Link III runs in proximity and parallel to Stephen Avenue, which is a high value pedestrian corridor with significant street level retail (score of 1).

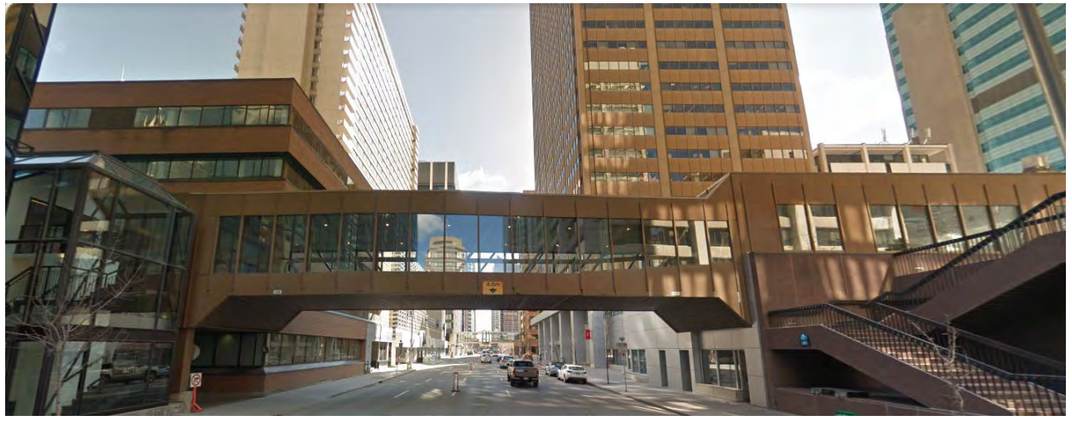
Aesthetics: Assesses if Plus 15 bridge structures would obstruct the view of important landmark or landscape views along the corridor. The visual identity of the adjacent buildings was also considered to see if Plus 15 structures would conflict with the aesthetics / character of the buildings.

Example: Link I does not impede any key visual corridors (score of 3) whereas Link III would create a visual obstruction of the Calgary Tower and impact the façade of The Bay building (score of 1).

The ranking list gives a rough idea as to which links should be prioritized first. However, there may be opportunities to implement lower ranked links prior to higher ranked links, such as in conjunction with adjacent building developments. These opportunities could provide cost effective and timely expansion of the network. Some specific considerations include links VIII, X & XII. Although these are listed as medium priority, implementation should be considered when redevelopment of the lots take place regardless of the implementation of higher priority links.

In addition, two of the high priority links, link V and link II, have been identified as important by The City's senior management team:

- As per a 2017 mandate, negotiations are underway with developers to construct a new Plus 15 connection from The Edison to Bankers Court (link II).
- As per a 2018 mandate, repairs to re-open the link from Andrew Davison to Old Central Library are planned for 2019. This work includes the repair of 2 plus 15 bridges as well as a possible connection through the old Central Library to the stairwell of the LRT platform (link V).



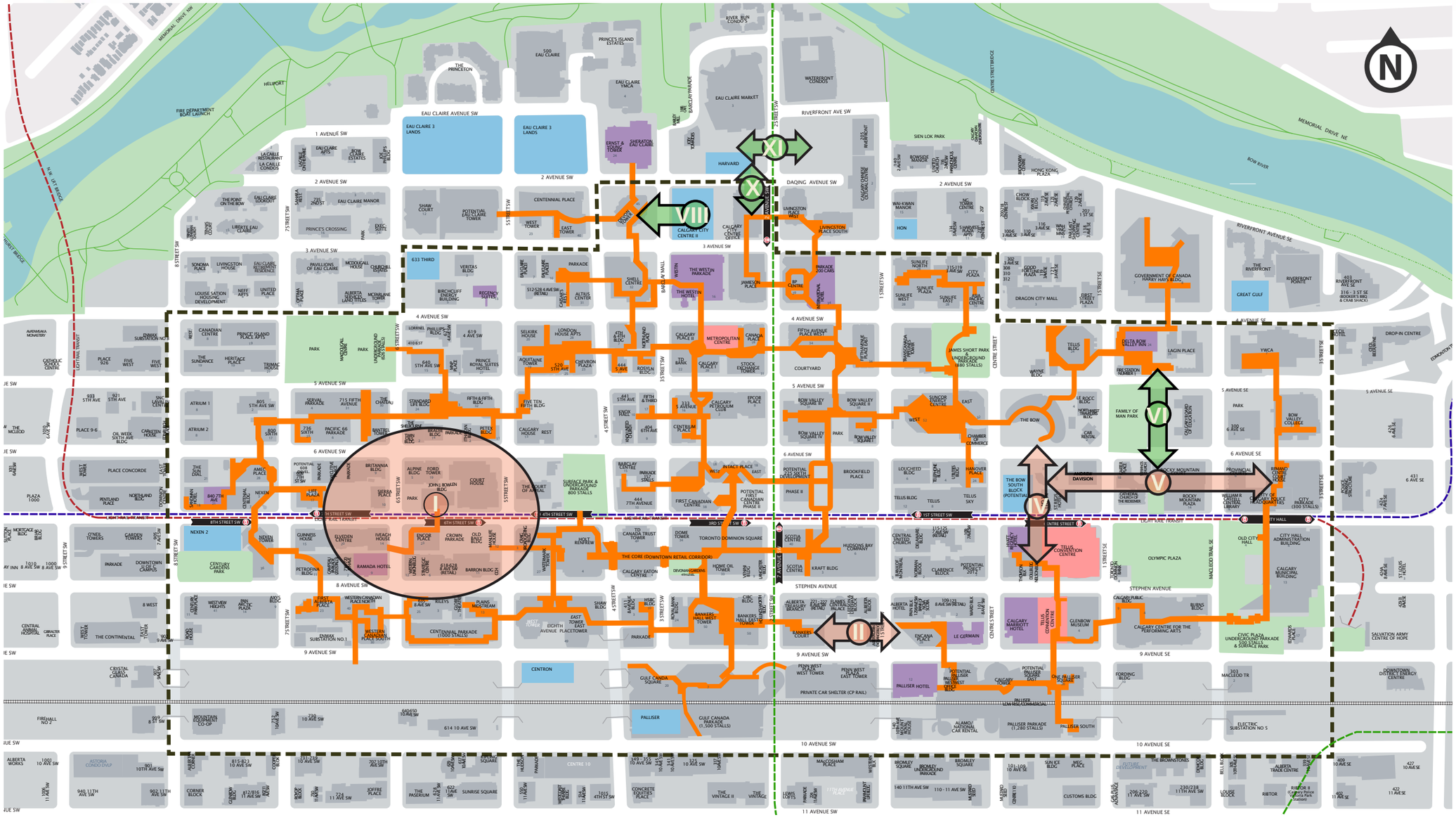


Figure 3-5: Prioritization of Missing Links

3.5. Plus 15 Boundary Changes

The Plus 15 area was originally identified in the 1984 Policy with the boundary extending on the west side to 14 Street SW as shown in **Figure 3-6**. Additionally, the area was divided into two sections:

- Area A which contained most of the highly developed portions of downtown with an already established Plus 15 network.
- Area B which contained the less developed portion of downtown and lacked any Plus 15 bridges.

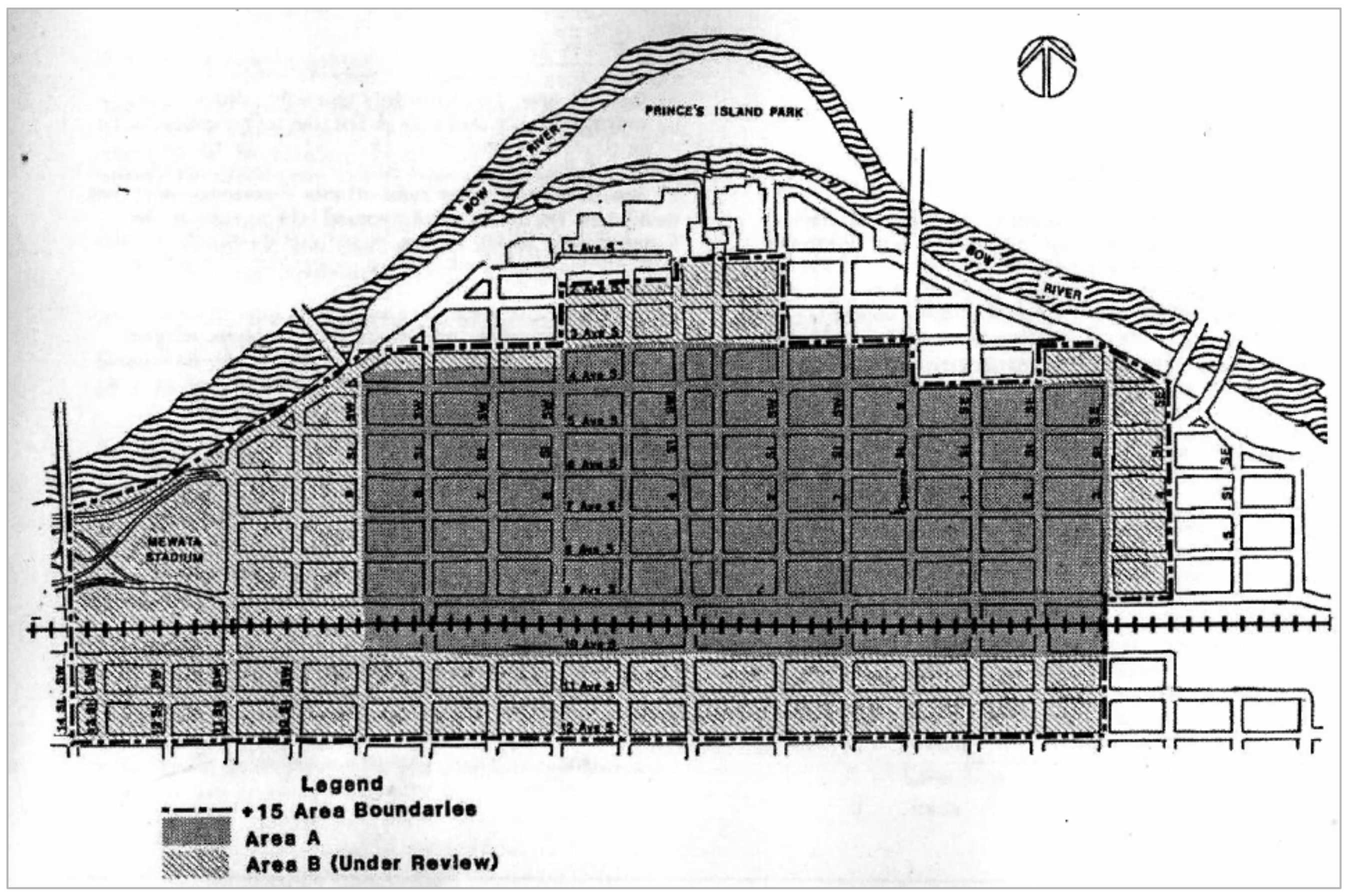


Figure 3-6: Plus 15 Area as per the 1984 Policy

A revised boundary was proposed as part of the 2007 Centre City Plan which is the boundary currently shown on the Plus 15 maps. The key attribute for the Plus 15 boundary is that it identifies lands in the Centre City which are eligible to receive a bonus density incentive for providing Plus15 bridges associated with new development. Additionally, the Plus15 boundary requires contributions to the Plus 15 fund for new development above the base density in a land use district.

Density bonusing is used as a land use tool in areas of the Centre City to gain public benefits and amenities in exchange for additional development density.

Land parcels in the centre city that are zoned CR20 generally have a base density of 3.0 Floor Area Ratio (FAR) for residential and office use. If these parcels elect to build above 3.0 FAR, one bonus density incentive is a mandatory contribution to the Plus 15 fund. Building a Plus 15 bridge is an optional bonus density incentive for office and residential uses if the building has a minimum of 11 FAR. The building of a Plus 15 bridge provides an additional 1.0 FAR for each Plus 15 bridge up to a maximum of 2.0 FAR.

When CR20 was put together, the focus was on encouraging more residential in the centre city, which is why the bonus earning items are geared to office rather than residential by:

- Providing minimum required bonus density earning items for both office and residential above 3.0 FAR
- Allowing residential a further 12.0 FAR to get to a total of 15.0 (with other incentives above 15.0 to get to 20.0)
- Requiring office to provide more bonus density earning items to get to 20.0 FAR.

The Plus 15 boundaries from the 1984 Policy and the 2007 Centre City Plan extend beyond the downtown core into parts of other centre city communities such as Eau Claire and Chinatown. These communities have Area Redevelopment Plans (ARPs) and are governed by direct control districts (DCs). Some DCs in Eau Claire and Chinatown require contributions to the Plus 15 fund and require or provide options to build Plus 15 bridges. Each direct control district is specific to the particulars of each site and has resulted from negotiations between the Development Authority and original landowners.

As part of this study, changes to the currently used Plus 15 boundary which was set in the 2007 Centre City Plan have been discussed with key stakeholders. These changes were considered in order to incorporate:

- The future location of Greenline LRT station at the corner of 2 Street SW and 2 Avenue SW
- Future redevelopment of the Eau Claire area which includes the Harvard development and Calgary City Centre II
- Links that have been built outside of the boundary

A revised boundary is illustrated in ***Figure 3-7***.

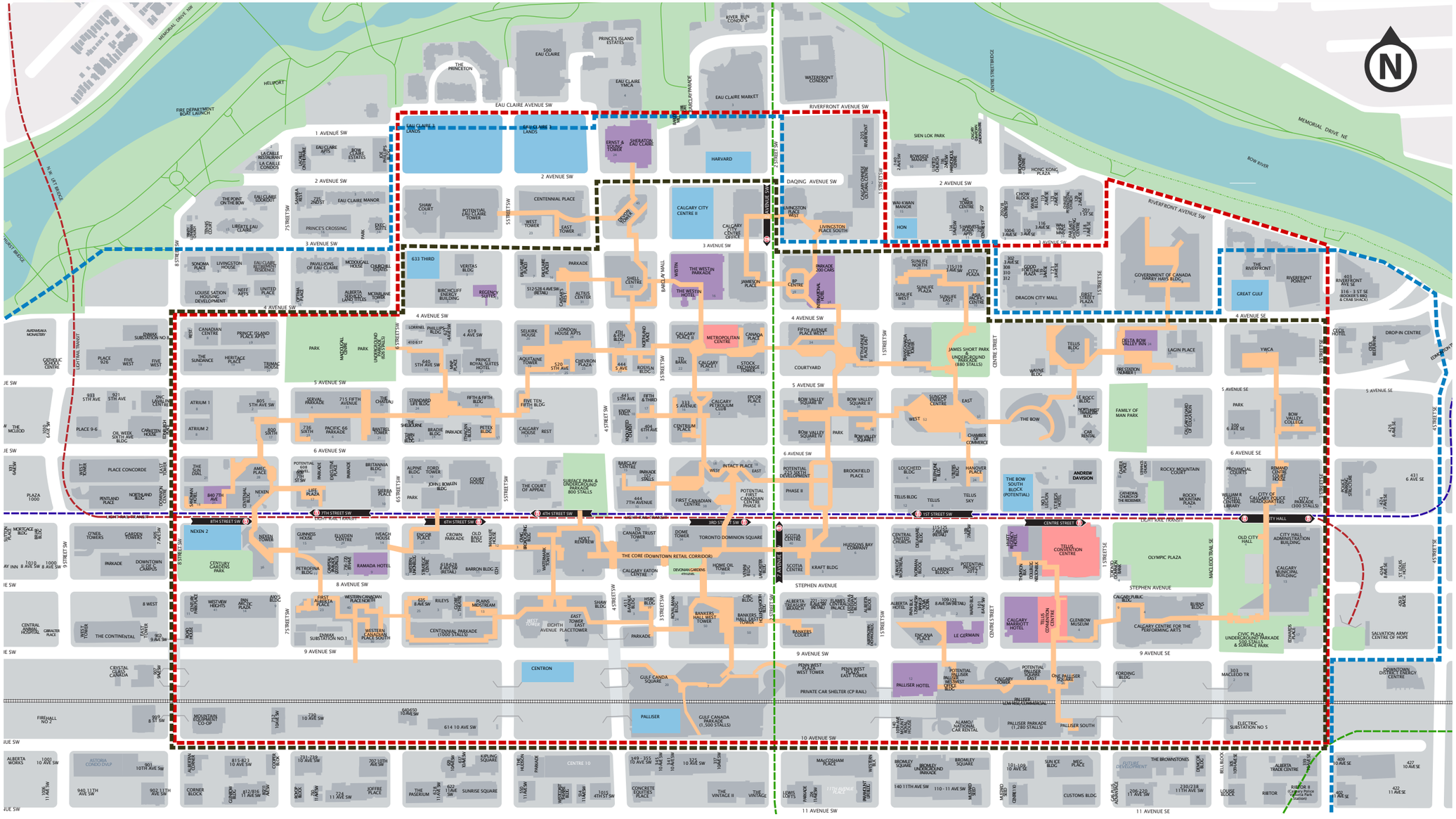


Figure 3-7: Plus 15 Revised Boundary

3.6. Hours of Operation

The current hours of operation vary throughout the network. This creates confusion for users as they may be unaware of the operational hours for a link they are considering using. This uncertainty could result in the person avoiding the Plus 15 network for that trip and potentially future trips in the Plus 15 as well.

Providing unified operating hours for the Plus 15 network is desirable from a user's perspective as it provides a simple, cohesive, and reliable means of conveying when the network is available for use. With this information, users can feel confident that they can get to and from their destination within a particular time frame. This confidence may encourage more users to use the Plus 15 network as a part of their commute.

Consideration was given to what the most appropriate operating hours would be. The pedestrian traffic counts were reviewed to determine when the Plus 15 network is most utilized, and a summary is provided in **Figure 3-8**.

Variations in pedestrian volumes over the course of a typical weekday were determined using counts conducted in April 2018. **Figure 3-8** illustrates the variation in pedestrian volumes over the course of a typical weekday.

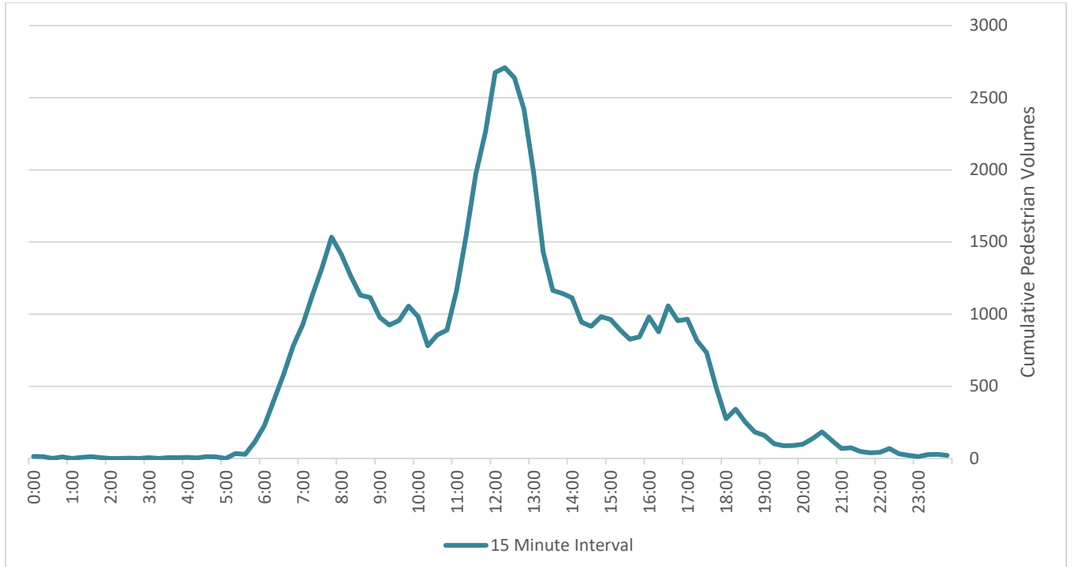


Figure 3-8: 24 hour Weekday Pedestrian Volumes on the Plus 15 Network (April 2018)

The highest pedestrian volumes on a weekday were generally observed during lunchtime (11:30-13:30). A smaller peak was also observed during in the early mornings (7:00-9:00). Pedestrian volumes in the afternoon are relatively constant and taper off significantly into the evening hours past 17:30. Pedestrian volumes during nighttime are negligible due to the closure of Plus 15 links.

This review indicated a clear jump in pedestrian traffic commencing at around 6:00am and a clear drop in volumes after 8:00pm. Although pedestrian volumes drop significantly after 8:00pm, it is suggested that the unified hours extend to 9:00pm. The rationale for this is that many of the downtown shopping establishments, including the CORE Shopping Centre, are open until 8:00pm on some evenings. Keeping the Plus 15 network open until 9:00pm would provide time for people to depart the shopping areas and reach their vehicle or transit stop which may be located a few blocks away. The 9:00pm closing time would also provide connections for people destined to the numerous restaurants and other event centres located within the centre city.

During consultation with building owners, they expressed a concern with keeping the Plus 15 network open later than the evening office rush as they considered evenings to be higher risk from a security standpoint due to lower pedestrian volumes. However, for the reasons listed above and feedback received from the public and The City, it is recommended that the unified operating hours be 6:00am to 9:00pm on weekdays

During the weekend, pedestrian volumes are significantly lower within the network. For this reason, reduced operating hours of 9:00am to 7:00pm are recommended for weekends and statutory holidays.

Providing unified operating hours would not prevent individual developments from being open earlier, or later, then these core hours, but it would ensure the entire network is accessible during that time.

The unified operating hours discussed above could be implemented for a trial period (recommended to be at least one year) to assess and mitigate any safety or operational concerns. The unified hours could be evaluated and adjusted if required at the end of the trial.

SECTION 4

Wayfinding Improvements

4.1. Clarity & Consistency of Brand Message

The key to a strong brand is to first identify your communication goals and aspirations. This helps to ensure all brand related decisions are working in harmony to express those goals. A program such as the Plus 15 might have communication goals to convey a feeling of being safe, easy, convenient, inclusive, helpful, and engaging. The current Plus 15 brand does not represent the modern Calgary and Calgarian. Through time the brand has eroded and has become ineffective at conveying the idea of the Plus 15 network in a consistent and meaningful way. It is recommended that the Plus 15 undergo a detailed audit of the current brand and that further work be done to create a stronger and more effective brand.

Brand assets such as the logo, colours, nomenclature and iconography would be measured against these goals to rate their effectiveness in meeting them and adjusted accordingly. While the City is in the midst of absorbing its brand assets under the main City of Calgary brand program, it is recommended that the Plus 15 maintain a more distinct, consumer-minded brand. This provides more latitude to create a specific set of brand standards and elements that can be used by the City and third-party members while maintaining the requisite consistency needed for a simple, clear and effective brand.

Calgary Plus15

Calgary Transit

Shifting the Plus 15 brand to a sub-section of the Calgary brand is not recommended as it becomes difficult to quickly distinguish from other Calgary service identities.

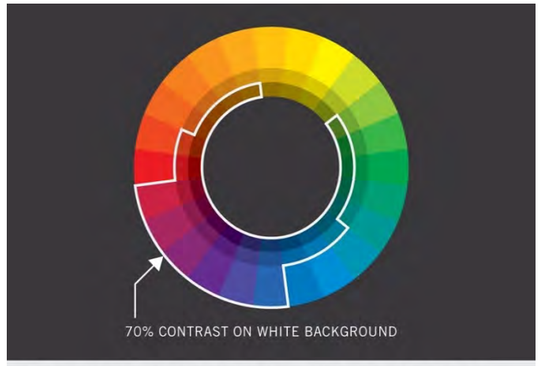
The Plus 15 brand can still visually connect to the City of Calgary brand, but it needs to be able to be immediately distinguishable from other Calgary service identities at signage viewing distances. Ideally, a viewer should be able to see and recognize a logo shape without having to fully read text.

Appropriate logo, font, and colour testing should be done to ensure the program is refined to be easily recognizable in all environments and appealing to the intended audience.

Consideration should also factor in legibility at all current and future uses – from large format outdoor signs to the screen icon on a phone app – as well as production methods for both physical and digital applications.

Signage location standards should be created to ensure existing and future developments incorporate signage to a set standard placement and design. In addition, guidelines should be developed to allow third party users such as the Building Owners and Operation Managers Association to follow set standards for Plus 15 representation on their building's signage and directories to ensure consistency.

Communication requirements for accessibility issues should also be built into the brand standards.



For optimal visibility, signage colours should have a minimum 70% contrast against a white background.

Graphics should be recognizable from distances that may cause visual distortion and blurring.

The development of a third party brand usage guide will help achieve consistent brand nomenclature.

Program needs to be updated to include iconography and information for wheelchair accessibility.

4.1.1. Maps

The map is a key piece of the brand message. It must be easy to use, helpful, and convenient. It is recommended that the map be refined to be more schematic and easier to read at a glance, with fonts and colours that visually connect to the logo and other brand assets. The addition of a directory that incorporates a grid location system to allow readers to look up specific buildings on the map. This would also allow fewer landmarks to be noted on the map, each at a more legible scale.

If the maps in the tables remain non-digital, it is recommended that an enlarged detail map be added to each location that highlights the amenities in short distance from each specific map table.

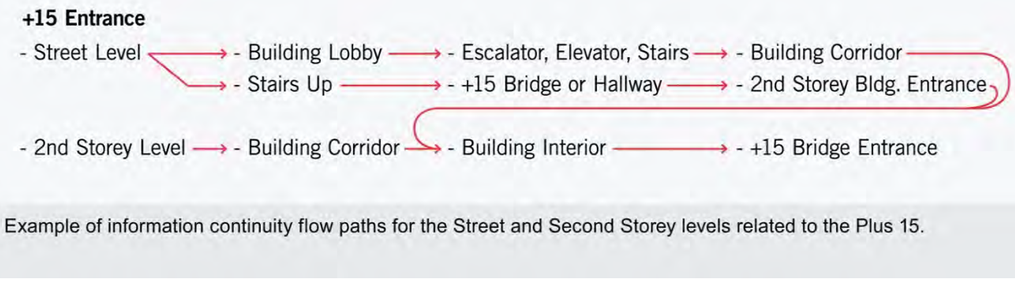
These maps also need to be oriented to match North at their location and reader's position. Building Names should be included as well as landmarks. Insert maps would also help users as they can focus in on the details of the immediate area providing better navigation and orientation. The overall system may benefit from identifying quadrants of the city (i.e. the North East area could be a different colour than the South West). This colouring scheme could then be applied to the wayfinding signs providing a quick guide to users about where they are.

Example map (PATH in Toronto) that shows simplified route lines and street grid, and incorporates a directory with location coordinates which helps readers who are not already familiar with the location of the building they are seeking. Map also demonstrates a simple yet effective compass system.

4.2. Awareness / Visibility

It is recommended that a holistic approach to wayfinding design and placement be developed to ensure continuity of the user experience and understanding throughout the entire Plus 15 network, including the buildings that connect to the Plus 15. It is important to use the brand to clearly identify entrances to the system as well as the route itself and be clearly distinguishable from its various surroundings.

The presentation of information should be simple, yet distinct, and include wheelchair accessible route information, and all points of entry and exit. It is recommended that the entire system be reviewed, and a detailed audit of the existing infrastructure be documented. Once complete, all the gaps between street level and through the system can be identified and properly designed.



Example of information continuity flow paths for the Street and Second Storey levels related to the Plus 15.

Example of interior directional signs recommended to be incorporated into the areas between Plus 15 connectors.

Having identified weak spots in the continuity flow, recommendations for additional signage would be developed to reside at street level entrances, the through-ways on the second level that connect to the bridges, and on the bridges themselves. The goal would be to enhance visibility to the network and add a level of vitality and energy to the Plus 15.

Example of monolith pillar signs used to identify entrances to PATH in Toronto.

Street level signs should be increased in size for improved legibility, and options for illumination considered.

Example massing of signage components at street entrance. Freestanding monolith signs stand off the sidewalk directing pedestrians to the nearest entrance and bridgeways are branded with dynamic graphics (colour for identification purposes only).

4.3. App Development

According to the recently conducted public survey, 64% of respondents identified an app as being a desirable addition to the Plus 15 program. Additionally, 73% stated that both the static signage and the app are important and that the app should not replace static signs as not everyone has a smartphone and shouldn't be required to rely on an app to navigate the network. According to the survey, the new app would require that its features surpass those found on Google or Apple maps relative to the Plus 15's specific information. Ranked in importance, the features it should include are:

1. GPS enabled and be able to track your location in real time,
2. Identify open and closed sections in real time,
3. Provide routing options,
4. Have an easy-to-use interface that shows building names and attractions, and allows the user to search for a specific destination, or look at curated lists of categories (restaurants, shops, etc.),
5. Identifies Plus 15 access doors at street level and road names.

Other features that would add convenience include the ability to pin a location (where one parked, for example), calculate approximate walking times, and offer pinch zoom and pan and reset. We recommend that the development of an app be reviewed for its appropriateness for use in the Plus 15 network as well as the ability to maintain the app. The app would have to be able to track your location in real time, have a simple-to-use interface that allows the user to search for a specific destination, or look at curated lists of categories (restaurants, shops, banks, etc.). The app would have to show you your route in advance and indicate which routes are open or closed in real time. The app would give notifications of closures and would always be up-to-date.

4.4. Summary

The Plus 15 signage and wayfinding program was developed during the 1980's for a much smaller system. As a result of expansion and modernization of the city as well as degradation of the brand and misapplication of the sign program, we can see that the Plus 15 program is not as effective as it was and could be. The concept of city wayfinding through interior spaces and buildings is a challenge. Defining the system through brand and a consistent application of the sign program allows users to navigate with confidence and security, knowing that they are on the right path. The Plus 15 was developed as a method of convenience for downtown users but is now a major artery of pedestrian travel and commerce. Effectively supporting this method of travel is vital to ensuring the plus 15 retains relevance in the future.

SECTION 5

Placemaking Opportunities

5.

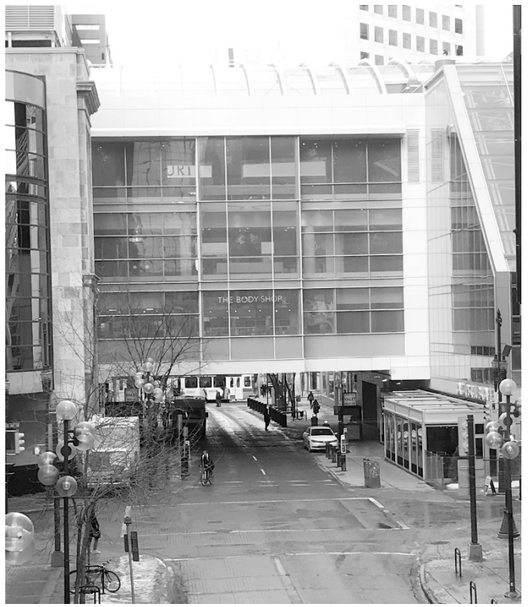
5.1. What is Placemaking

‘Placemaking’ is a transformative approach to the shaping of our collective public realm. Facilitating creative patterns of activities and connections, it is the creation of quality public spaces that contribute to people’s health, happiness, and well-being; and involves the planning, design, management and programming of public spaces. It strengthens the connection between people and the places they share, is adaptable to a diversity of people and uses, and is rooted in community-based participation. Some examples of placemaking include temporary events and uses, community driven events, performances, art, seating areas, and green space.

5.1.1. Placemaking & the City of Calgary Plus 15 Network

Since the network’s inception by Harold Hanen in the 1960s, the network has grown to over sixteen kilometres and eighty-seven bridges. Conceived incrementally as circulation between buildings, the network examined in the present day lacks intuition for how to navigate the system. The repetitious nature of the bridges themselves are often limited in character, further eroding one’s sense of orientation and place within the centre city.

From a placemaking perspective, the update of the 1984 Plus 15 Policy recognizes a fundamental cultural shift, by prioritizing the quality of the human experience beyond the efficient movement of pedestrians. The Plus 15 Network is an integral part of the transportation network for Downtown Calgary. Beyond its tag line as one of the most extensive pedestrian skywalk systems in North America, examining the network through a placemaking lens offers opportunity to reimagine the network as the most unique cultural experience of a pedestrian artery through Downtown Calgary.



5.1.2. Placemaking for Whom: Workers vs Tourists

The measure of success of the Plus 15 network is dichotomous depending on the type of user and their purpose in navigating the network. **Figure 5-1** illustrates this distinction between worker and tourist traffic routes within the Plus 15 network.

While the routes for workers are scattered consistently throughout the network, the routes for tourists can be distinguished by connections between hotels, landmarks and destinations. For the downtown worker, the distance of travel is typically bounded by radial destinations related to food and personal services available by foot travel during lunch and coffee breaks. The Plus 15 network is less about placemaking than it is about learned behaviours and the efficient movement between places of work and destinations available within a limited time frame.

For the tourist, foot travel is circuitous and while guided by a destination, the importance of context and place becomes an invaluable tool in providing a qualitative experience for visitors to our city. Improving the appeal of the network will require a re-examination of the targeted demographic for defining that success.

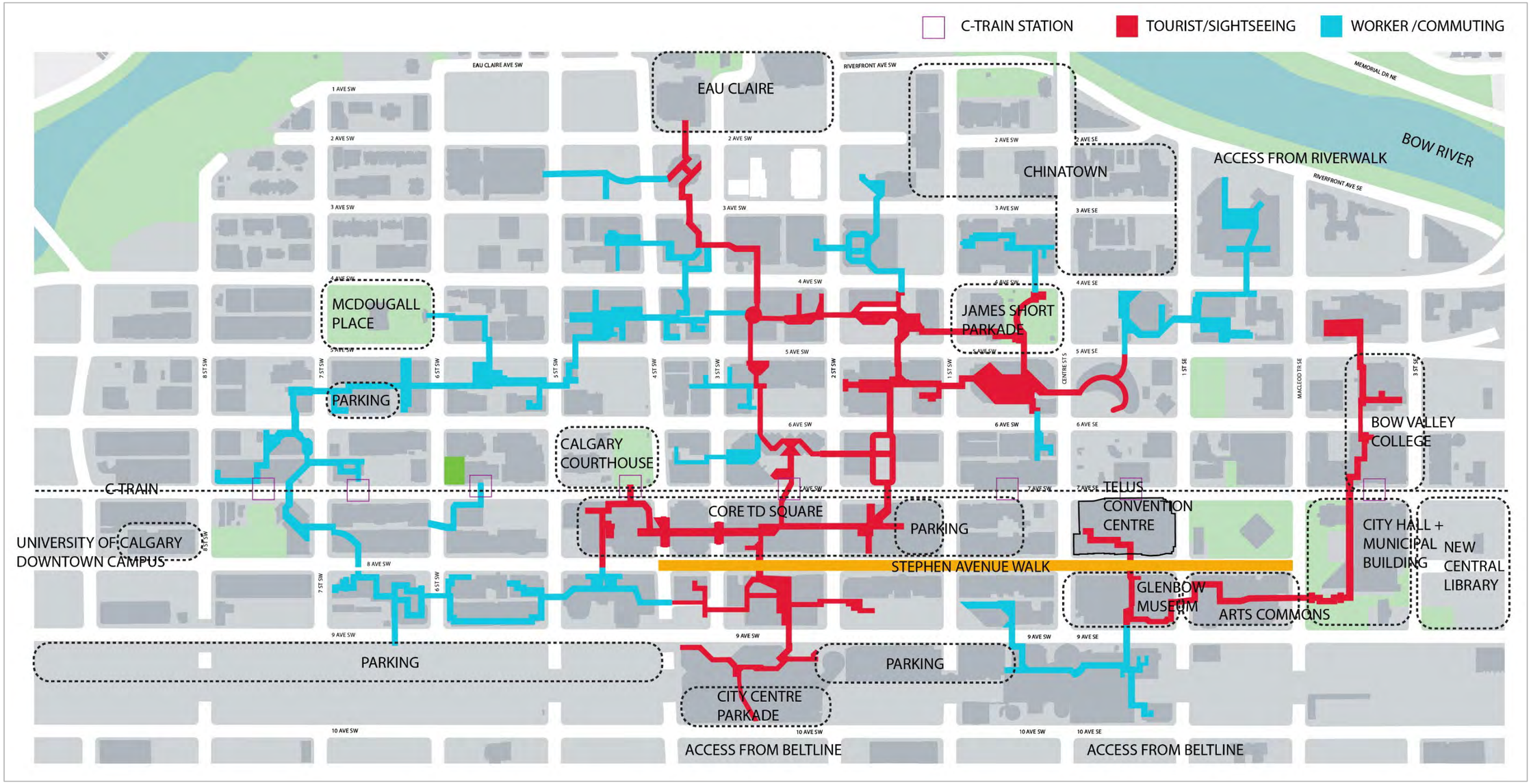


Figure 5-1: Placemaking for Whom: Workers vs Tourists

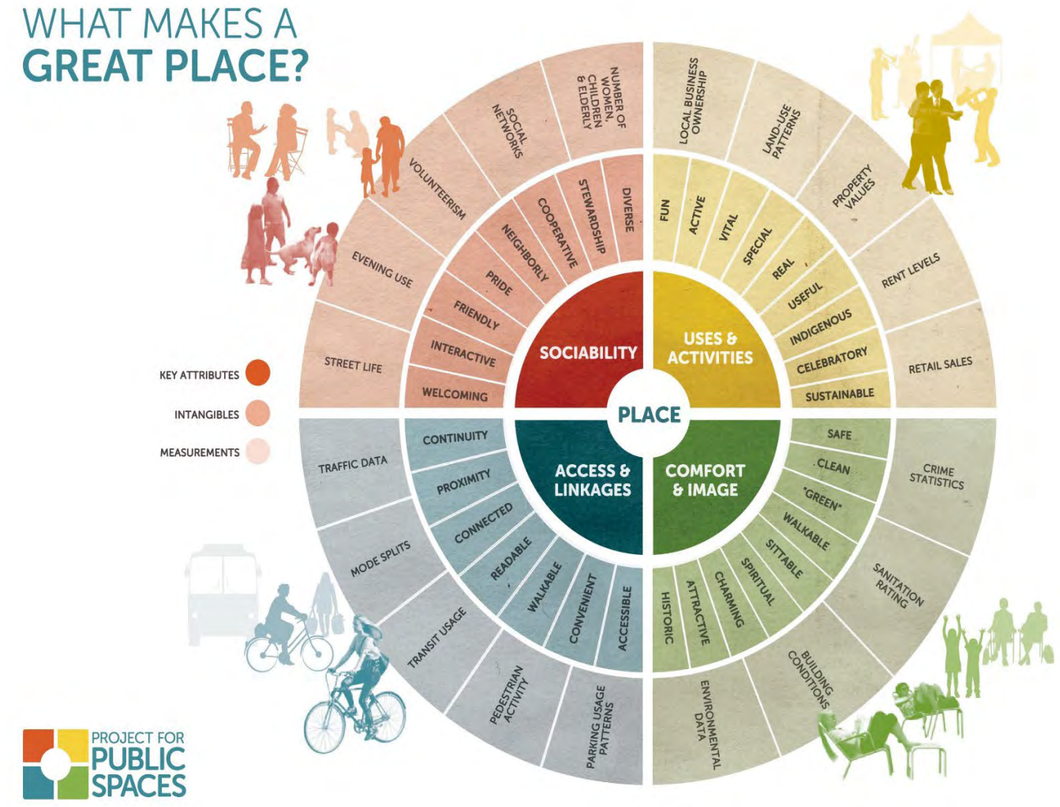


Figure 5-2: Public Spaces Place Diagram

5.2. Placemaking Evaluation Criteria

5.2.1. Protect for Public Spaces

In evaluating the existing Plus 15 network, the Project for Public Spaces (PPS) Place Diagram, shown as **Figure 5-2**, served as a means to establish the criteria in measuring the success of the network as public space. By asking the question "What Makes a Great Place?", the diagram evaluates public spaces through attribute categories of Sociability, Access and Linkages, Uses and Activities, and Comfort and Image.

Each attribute is evaluated under qualitative aspects by which to judge a space, and quantitative aspects which can be measured by statistics or research. While the exercise did not warrant a quantitative study, evaluating the Plus 15 network from a qualitative aspect provided an informative means for determining what would make the network successful from a placemaking perspective.

Attribute: Access and Linkages

Intangibles	Questions to Consider
Continuity Proximity Connected Readable Walkable Convenient Accessible	• Can you see the space from a distance? Is its interior visible from the outside? • Is there a good connection between the space and the adjacent buildings, or is it surrounded by blank walls? Do occupants of adjacent buildings use the space? • Can people easily walk to the place? • Do sidewalks lead to and from the adjacent areas? • Does the space function for people with special needs? • Can people use a variety of transportation options – bus, train, car, bicycle, etc. – to reach the place?

As a pedestrian dedicated network, the system is successful from an infrastructural perspective as it is physically connected to many of the buildings downtown and is unique by virtue of its visibility between buildings. Challenges become more apparent when a person is trying to gain access into the network from the street, when the connections from transit stops are not well established physically and visually, and when obstacles are encountered on the network for people with mobility needs, preventing use of the Plus 15 to get to their destinations.

Attribute: Comfort and Use

Intangibles	Questions to Consider
Safe Clean Green Walkable Sittable Spiritual Charming Attractive Historic	• Does the place make a good first impression? • Are there more women than men? • Are there enough places to sit? Are seats conveniently located? Do people have a choice of places to sit, either in the sun or shade? • Are spaces clean and free of litter? Who is responsible for maintenance? What do they do? When? • Does the area feel safe? Is there a security presence? If so, what do these people do? When are they on duty? • Are people taking pictures? Are there many photo opportunities available?

A major challenge to the use of the Plus 15 as a public space become apparent under the Comfort and Use category. While the network is safe, clean, and walkable, people are not encouraged to sit and linger. By extension, the network has a lack of seating choices.

Attribute: Uses and Activities

Intangibles	Questions to Consider
Fun Active Vital Special Real Useful Indigenous Celebratory Sustainable	• Are people using the space or is it empty? • Is it used by people of different ages? • Are people in groups? • How many different types of activities are occurring? • Which parts of the space are used and which are not? • Are there choices of things to do? • Is there a management presence, or can one identify if anyone oversees the space?

The Plus 15 network currently has a limited diversity of activities to foster its establishment as a public space. Beyond several pieces of public artwork in place throughout the network, the walkways could be improved to increase the stimuli of fun and engaging activities to encourage people to stop and stay a while.

Attribute: Sociability

Intangibles	Questions to Consider
Diverse Stewardship Cooperative Neighborly Pride Friendly Interactive Welcoming	• Is this a place where you would choose to meet your friends? Are others meeting friends here or running into them? • Are people in groups? Are they talking with one another? • Do people seem to know each other by face or by name? • Do people bring their friends and relatives to see the place or do they point to one of its features with pride? • Are people smiling? Do people make eye contact with each other? • Do people use the place regularly and by choice? • Do a mix of ages and ethnic groups generally reflect the community at large? • Do people tend of pick up litter when they see it?

The qualities considered under Sociability are tied to the connection one feels to a place and the attachment and belonging one has to a greater sense of community. While the Plus 15 network is a unique feature to Calgary and may instill a certain experience for those who navigate through, improvements to the network could ensure that the network fosters these types of social activities.

5.2.2. Plus 15 Network as a Qualitative Experience

A walkthrough survey of the existing experience through the network was undertaken as part of the initial evaluation. From a holistic perspective, the experience of walking through the network was divided between moments of contextual interest and clarity of where one was in the system, particularly through the Arts district by the Arts Commons and the Glenbow Museum, through the Calgary Municipal Building and towards Bow Valley College, and the remainder of the network which was a repetition of circulation walkways through the commercial core connected by food courts.

As shown in **Figure 5-3**, the observations of the qualitative experience were guided by both the PPS Places Diagram criteria alongside the evaluation of the Plus 15 network as a holistic experience of a pedestrian journey beyond its connection between two buildings. It was guided by several observations:

- Physical width and height of the Plus 15 bridges;
- The aesthetics of the connections between bridges and their relationships to the purposes of the buildings,
- The articulation of the bridges to adjacent landmarks and destinations;
- Physical and visual connections to the street;
- Whether places for seating or gathering were provided;

This observation strongly supports the need for the Plus 15 Network to be viewed holistically to consider the pedestrian experience. Moving forward, the questions surrounding the Plus 15 network should be framed around how we can fully develop and leverage this asset to provide a unique, urban experience while enhancing its connection as a complementary part of the pedestrian street fabric.

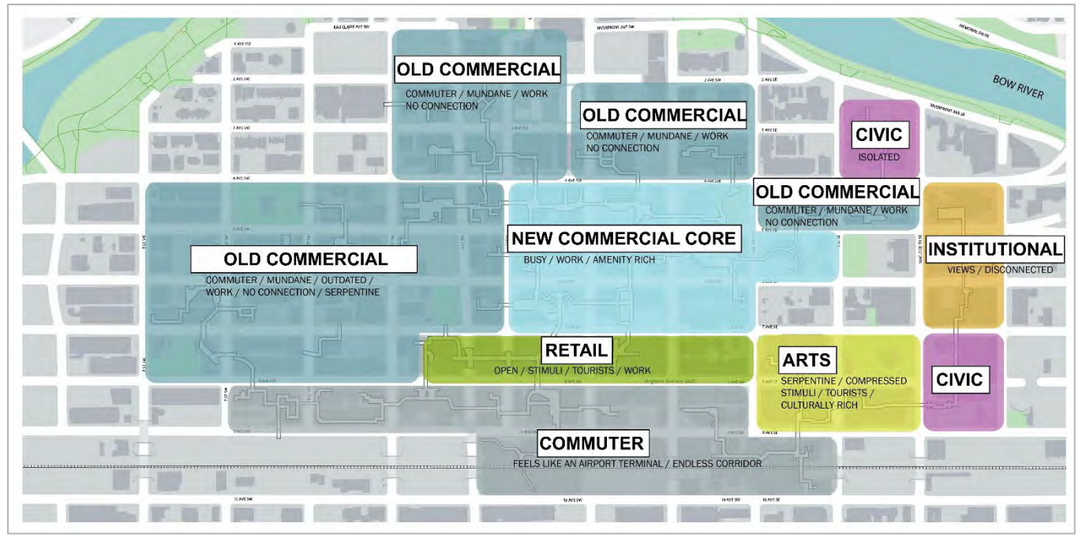


Figure 5-3: Placemaking Observations – Qualitative Experience

5.3. Existing Challenges to Placemaking Opportunities

Plus 15 walkways are classified as temporary structures and are challenged by restrictions set under the current City of Calgary Regulation Bulletin RB06-033 as well as the City of Calgary Access Design Standards.

5.3.1. City of Calgary Regulation Bulletin RB06-033

This regulation bulletin stipulates application of the building code to Plus 15 walkways.

Interpretation on Occupancy

The City of Calgary Regulation Bulletin RB06-033 states that no occupancy is allowed in walkways. Under the realm of placemaking as defined by the Project for Public Spaces, placemaking requires activities and use, lingering and congregation to achieve success. The guideline surrounding occupancy classification may need to be changed as some activities may trigger an interpretation surrounding occupancy. The following occupancy classifications in the 2014 Alberta Building Code would qualify for consideration of the types of placemaking activities:

- **Group A Assembly Occupancy** is whereby the use of the building by a gathering of persons for civic, political, travel, religious, social, educational, recreational or like purposes, or for the consumption of food or drink.
- **Group E Mercantile Occupancy** means the occupancy or use of the building or part thereof for the displaying or selling of retail goods, wares or merchandise.

Building Classification	Occupancy	Major Use
Group A2	Assembly occupancies not elsewhere classified in Group A	Art galleries, Auditoria, Bowling alleys, Churches and similar places of worship, Clubs non-residential, Community Halls, Courtrooms, Dance Halls, Daycare facilities, Exhibition halls, Gymnasia, Lecture halls, Libraries, Licensed Beverage establishments, Museums, Passenger stations and depots, Recreational piers, Restaurants, Schools and colleges non-residential, Undertaking premises
Group A4	Assembly occupancies in which occupants are gathered in the open air	Amusement park structures, Bleachers, Grandstands, Reviewing stands, Stadia
Group E	Mercantile occupancies	Department stores, Exhibition Halls, Markets, Shops, Stores, Supermarkets

Exiting

Exiting requirements from the Plus 15 requires exiting into adjacent buildings where such buildings are accessible 24 hours. Otherwise, an independent exit stair from the walkway to grade is required. In the event the placemaking activity requires an occupancy classification, the Alberta Building Code may trigger criteria on the exiting requirement. For example, under ABC 3.3.1.5 (1)(b), two means of egress are required for occupant loads over 60 persons. The interpretation of requirements will be highly subjective to the specific walkway under consideration.

Fire Separation

Under the bulletin, the delineation between the walkway and the building adjacent requires a 45-minute fire separation. If the placemaking activity requires an occupancy classification, the fire separation requirement may require to be increased. The interpretation of requirements will be highly subjective to the specific walkway under consideration.

Mechanical Requirements

Under the bulletin, an enclosed Plus 15 walkway must be ventilated with a fresh air flow of at least one air change per hour. Air change rates may need to be increased to sufficiently accommodate the activity being proposed. The interpretation of requirements will be highly subjective to the specific walkway under consideration.

5.3.2. City of Calgary Access Design Standards

Under existing regulations, the access design standards stipulate that a minimum unobstructed width for Plus 15 bridges, walkways and lane links shall be 4,500mm.

5.4. Selection Criteria

In identifying existing bridges and spaces within the network to serve as catalysts for placemaking, prioritization was given to bridges which had the greatest potential for addressing existing deficiencies identified from the public survey, such as the lack of seating, green space, and wayfinding. Preference was also given to bridges that:

- may benefit from an amplified visual and physical connection to the street,
- are adjacent to pedestrian priority streets,
- have inherently unique physical characteristics that offer opportunity for playful interpretations for placemaking, and
- are in locations with the potential to become location markers in anchoring the network.

Potential to Strengthen Connections to Green Space

Biophilia refers to the human desire to be with nature. Research has shown the wellbeing of the environment and of natural systems are intricately linked to the wellbeing of people. Natural landscapes support the wellbeing of people through stress relief, attentional recovery, enhanced physical activity, engagement with nature and relaxation, and greater social cohesion.

Potential to Strengthen Connections to the Street

Points of entry play crucial roles in connecting projects to the street and surrounding community - they are the built “first impressions” that one has into the network, and their design can create welcoming environments that draw people in. Enhancing the walkability of the street can increase physical activity through Crime Prevention Through Environmental Design (CPTED) principles.

Potential to Enhance Character as a Place for Animation

Studies have shown that visual art aids in improving mental wellbeing. Providing access to spaces for spontaneous, informal and creative enjoyment helps to build social cohesion and connectedness and contributes positively to individual and community wellbeing.

Potential as a Place of Destination

Participating in cultural, leisure and recreational activities can improve individual health and wellbeing. Destinations which are aimed at promoting educational, social and economic values creates social cohesion and social capital in the community.

Potential for Program Activation

Local business activity contributes to the social capital of a neighborhood. Allowing home-based businesses, supporting local talent, and encouraging local ownership is recognized as important in improving community cohesion.

Of the eighty-seven bridges, fifteen bridges were identified as being good candidates, as detailed in **Figure 5-4** and **Table 5-1**, with the selection process outlined in the sections that follow.

The bridges identified as good candidates for improvement include (bridge numbers were chosen arbitrarily but are consistent for the remainder of this section):

A Telus Convention Centre

B Civic Plaza Parkade

C Bow Valley College

D The Bow

E Sun Life Plaza

F Bow Valley Square

G Devon Tower

H 640 5 Ave SW

I 605 5 Ave SW

J Chevron Plaza

K Shell Centre

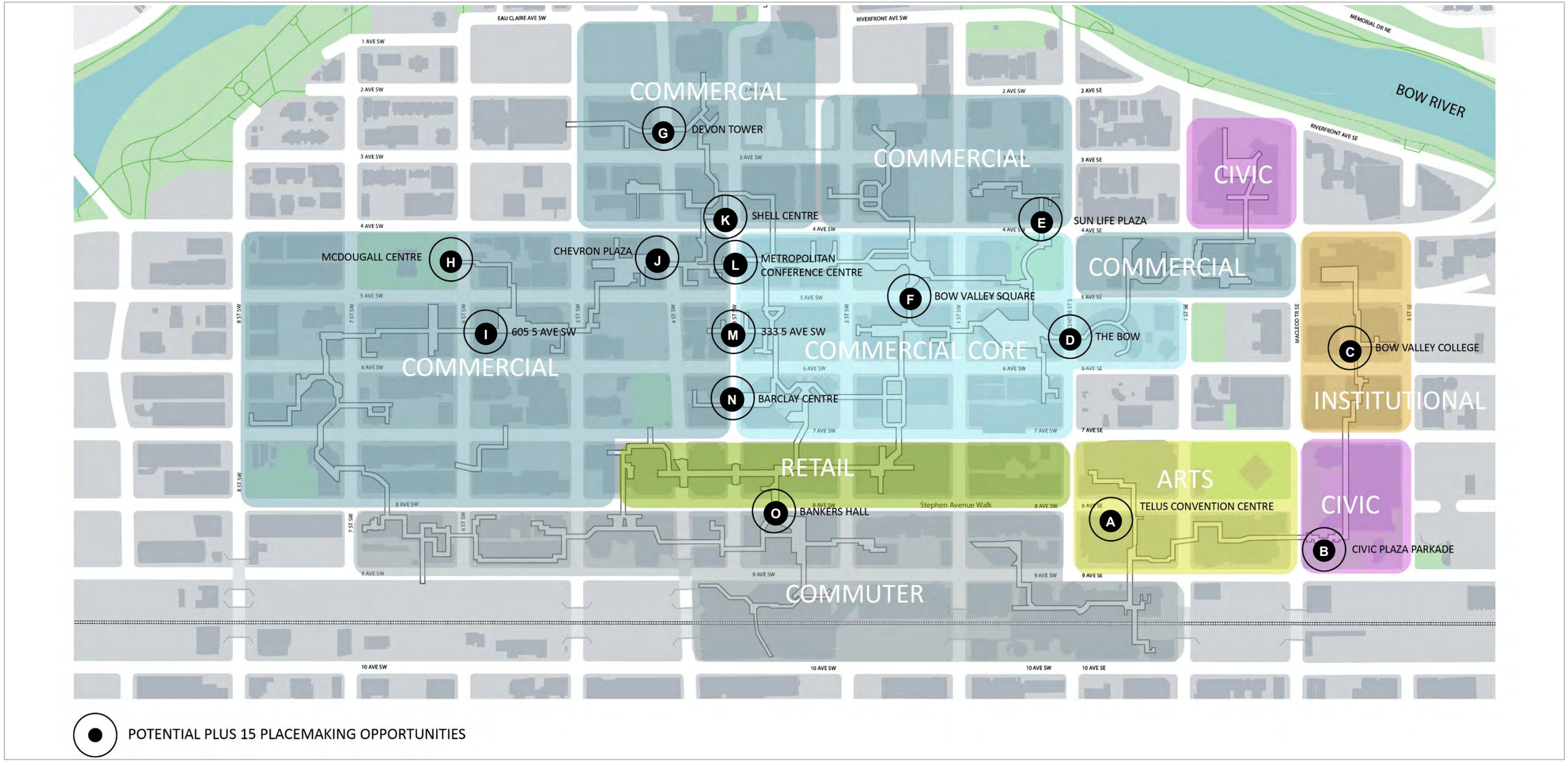
L Metropolitan Conference Centre

M 333 5 Ave SW

N Barclay Centre

O Bankers Hall

The bridges identified as good candidates for placemaking were selected for a variety of factors. Some of these include the physical location of the links, as well as access to pedestrian-oriented streets and heavily footed traffic areas. Others were selected for their adjacency and connection to programs and services. There were also bridges selected for their inherent physical character and potential to be animated for public interest.



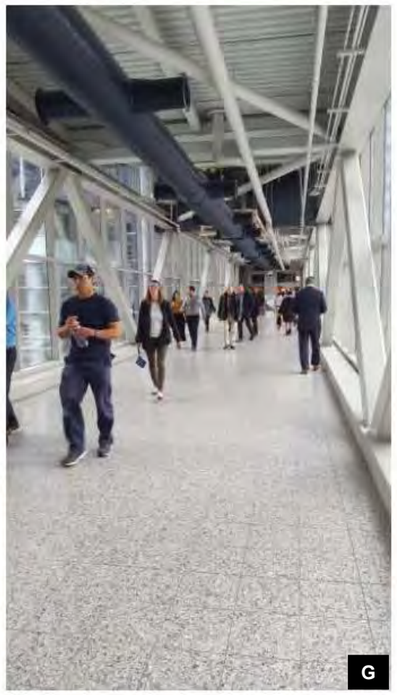
Note: # in circle refers to list above of bridges and matches Table 5-1

Figure 5-4: Plus 15 Placemaking Opportunities

Table 5-1: Qualitative Evaluation for Placemaking Opportunities

	PLUS 15 PLACEMAKING OPPORTUNITIES	PEDESTRIAN COUNTS (JAN 2011/FEB 2018)		POTENTIAL TO STRENGTHEN VISUAL/PHYSICAL CONNECTION FROM STREET LEVEL	CURRENT DEMOGRAPHIC	TARGETED DEMOGRAPHIC	TEMPORARY/PERMANENT INTERVENTION	TYPE OF PLACEMAKING OPPORTUNITY	EXAMPLE OF PLACEMAKING OPPORTUNITY	ORDER OF MAGNITUDE
A	Telus Convention Centre (1511)	1503 / Not available	↑	✓ Stephen Avenue	Tourists Downtown workers	Tourists General Public	Temporary into permanent	Improve Connection to Street Level Allow for Interruptions	Artist Intervention	$$
B	Civic Plaza Parkade	600 / Not available		✓	Commuters Downtown workers	General Public Tourists	Temporary into occasional		Makers Market / Farmers Market	$
C	Bow Valley College	N/A / 6563			Students	Students Tourists	Temporary - rotating installations	Activate Spaces with Programming	Artist Intervention	$
D	The Bow (1584)	N/A / 12206		✓	Downtown Workers	General Public Tourists	Temporary – rotating installations	Activate Space with Programming	Artist Intervention	$
E	Sun Life Plaza	1884 / 3409	↑		Downtown Workers	General Public	Permanent	Recreational Create Destinations	Bouldering Wall	$
F	Bow Valley Square (1532)	12370 / 16810	↑	✓	Downtown Workers	Downtown workers	Temporary	Activate Spaces with Programming	Busking	$
G	Devon Tower (1580)	6316 / 8157	↑	✓	Downtown Workers	Downtown Workers	Temporary into permanent	Access to Green Space	Green Space / Public Space	$
H	640 5 Avenue SW (1576)	861 / 2649	↑	✓	Downtown Workers	General Public Tourists	Temporary into permanent	Access to Green Space	Makers Market / Farmers Market / Arts Hub	$$
I	605 5 Avenue SW (1579)	9724 / 7178	↓		Downtown Workers	Downtown Workers	Temporary – rotating installation	Allow for Interruptions	Artist Intervention	$
J	Chevron Plaza (1530)	9665 / 8114	↓	✓	Residents Downtown Workers Commuters	General Public Downtown Workers	Permanent	Access to Green Space Activate with Programming	Community Garden	$$
K	Shell Centre	6316 / 8157	↑	✓ 3rd Street	Downtown Workers Tourists	Downtown Workers General Public	Permanent / Intensive Renovation Required	Improve Connection to Street Level	Public Space / Green Space	$$$
L	Metropolitan Conference Centre (1565)	7512 / N/A		✓ 3rd Street	Downtown Workers Tourists Commuters	Tourists General Public	Permanent / Intensive Renovation Required	Improve Connection to Street Level Create Destinations	Public Space / Green Space	$$$
M	333 5 Avenue SW (1551)	818		✓ 3rd Street	Downtown Workers Tourists Commuters	Tourists General Public	Permanent / Intensive Renovation Required	Improve Connection to Street Level Create Destinations	Public Space / Green Space	$$$
N	Barclay Centre (1577)	N/A		✓ 3rd Street	Downtown Workers Tourists Commuters	Tourists General Public	Permanent / Intensive Renovation Required	Improve Connection to Street Level Create Destinations	Public Space / Green Space	$$$
O	Bankers Hall (1510)	16294 / 11697	↓	✓ Stephen Avenue	Tourists Downtown Workers	Tourists Downtown Workers General Public	Temporary – rotating installations	Improve Connection to Street Level	Artist Intervention Busking	$

Selection Criteria: Potential as Green Space



A Telus Convention Centre - Public Plaza Adjacent to Plus 15: In a great location which connects Stephen Avenue with the Telus Convention Centre and Glenbow Museum, this Plus 15 walkway provides an existing physical connection down to street level via an exterior public space which is unprogrammed. The gate onto Stephen Avenue currently only allows for pedestrians to exit from the Plus 15 but does not allow the option to access the Plus 15 from the street level.

J Chevron Plaza: This plaza offers an excellent location as it offers a physical connection from the street. The plaza is also situated adjacent to the London House, a residential apartment building with a daycare accessible from the plaza, and to a commercial building on its neighboring edge.

L Calgary Place 2: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north / south in the centre city. It is one of the main bridges connecting the old and new commercial core.

G Devon Tower: Devon Tower is in a strictly commercial area of downtown south of Eau Claire. There is no green space within a walkable distance from the building, and the main and second floors of the building have not been considered as a public space for workers to gather for lunch and breaks. The Plus 15 walkway between Devon Tower and Centennial Plaza is wide and generous, with great access to daylight.

N First Canadian Centre / Barclay Centre Parkade: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north / south in the centre city. It is one of the main bridges connecting the old commercial core with the new commercial core. It is also located for access to the Barclay Centre Parkade.

Selection Criteria: Potential for Connection to Street

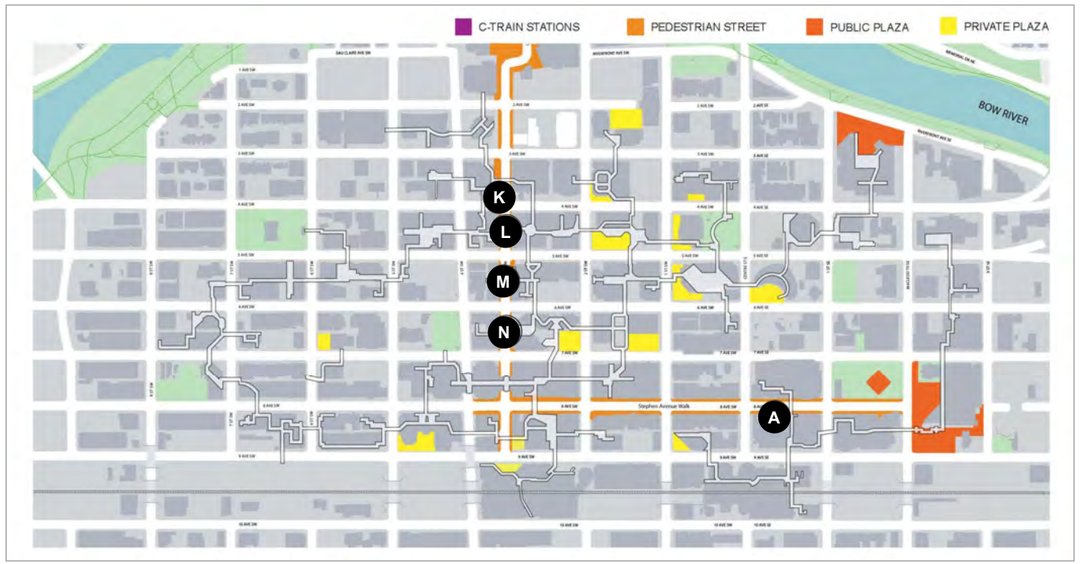
A Telus Convention Centre - Public Plaza Adjacent to Plus 15: This Plus 15 walkway is located off Stephen Avenue, a pedestrian street. In a great location which connects Stephen Avenue with the Telus Convention Centre and Glenbow Museum, this Plus 15 walkway provides an existing physical connection down to street level via an exterior public space which is unprogrammed. The gate onto Stephen Avenue currently only allows for pedestrians to exit only from the Plus 15 but does not allow the option to access the Plus 15 from the street level.

K Shell Centre / Northland Place: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north/south in the centre city, with great south and south eastern exposure. The bridge and connecting path is unique as it snakes around the corner of the building and provides great visual and physical connection from the street. The bridge is also located adjacent to Eau Claire.

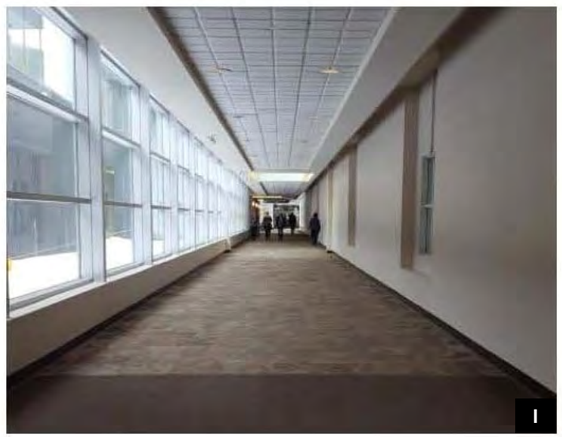
L Calgary Place 2: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north south in the centre city. It is one of the main bridges connecting the old commercial core with the new commercial core.

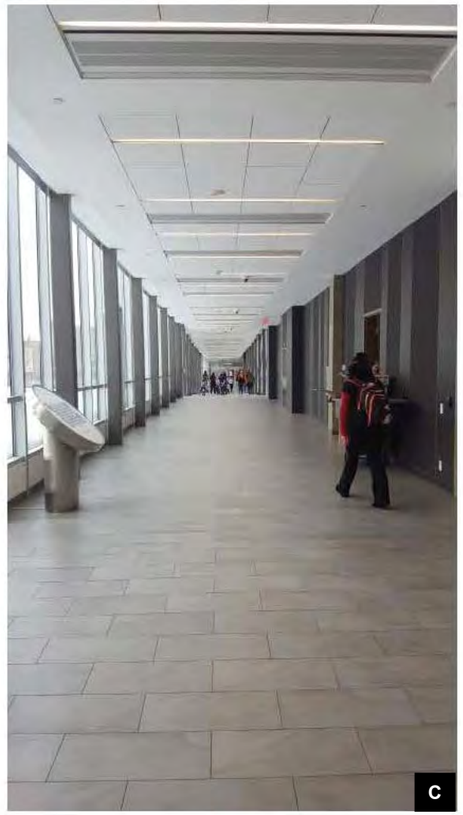
M Centrium Place / 404 6 Ave SW: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north south in the centre city. It is one of the main bridges connecting the old commercial core with the new commercial core.

N First Canadian Centre / Barclay Centre Parkade: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north/south in the centre city. It is one of the main bridges connecting the old commercial core with the new commercial core. It is also located for access to the Barclay Centre Parkade.



Selection Criteria: Potential for Animation





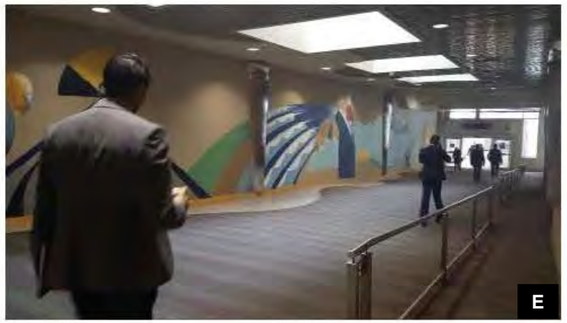
A Telus Convention Centre: This Plus 15 walkway is located off Stephen Avenue, a pedestrian street. In a great location which connects Stephen Avenue with the Telus Convention Centre and Glenbow Museum, this Plus 15 walkway provides an existing physical connection down to street level via an exterior public space which is unprogrammed. The gate onto Stephen Avenue currently only allows for pedestrians to exit only from the Plus 15 but does not allow the option to access the Plus 15 from the street level. The bridge itself has an interesting character.

C Bow Valley College: This Plus 15 walkway is immediately adjacent to Bow Valley College and has a unique lookout back to Downtown Calgary.

E James Short Park / Asia Pacific Centre: This Plus 15 walkway leading to the bridge and James Short Park and Parkade is generous in width. Its sloping nature offers an interesting opportunity for animation and placemaking.

I 605 5 Ave SW: This Plus 15 walkway connects much of the old commercial core and offers an interesting opportunity for animation and placemaking to break up the space.

Selection Criteria: Potential as a Destination



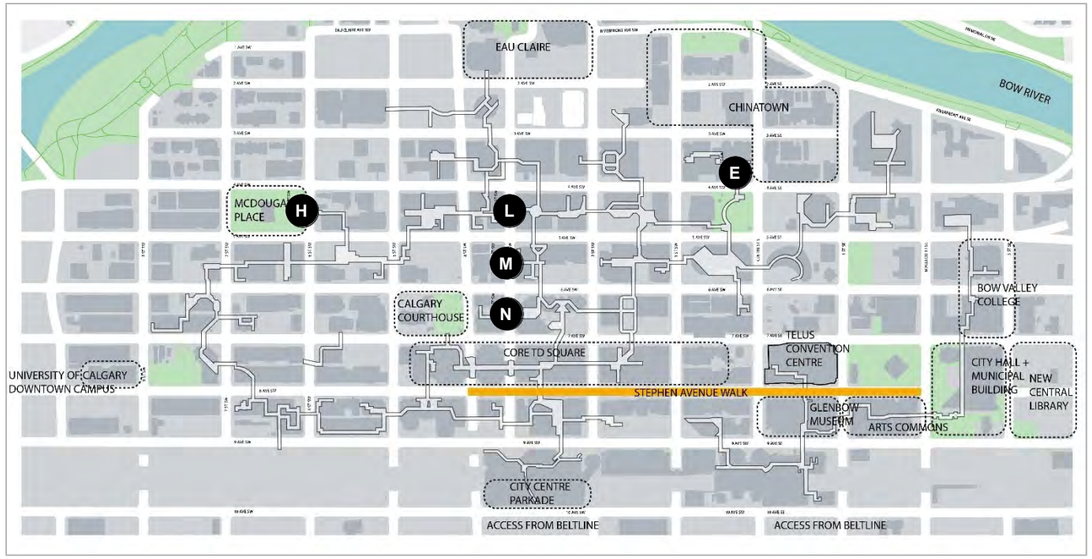
E James Short Park / Asia Pacific Centre: This Plus 15 walkway leading to the bridge and James Short Park and Parkade is generous in width. Its sloping nature offers an interesting opportunity for animation and placemaking.

L Calgary Place 2: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north/ south in the centre city. It is located as one of the main bridges connecting the old commercial core with the new commercial core.

M Centrium Place / 404 6 Ave SW: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north / south in the centre city. It is located as one of the main bridges connecting the old commercial core with the new commercial core.

N First Canadian Centre / Barclay Centre Parkade: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north south in the centre city. It is located as one of the main bridges connecting the old commercial core with the new commercial core. It is also located for access to the Barclay Centre Parkade.

H McDougall Centre Parkade: This space within the McDougall Centre Parkade provides a physical and visual connection to McDougall Centre. It is the anchoring point of the network from the residential area into downtown.



Selection Criteria: Potential for Program Activation

B Civic Plaza Walkway: This Plus 15 walkway is connected to the Calgary Municipal Building and the Arts Commons, with immediate access to a public plaza off 9th Avenue, with heavy traffic. The walkway has an interesting physical character and generous height.

F Sunlife Plaza: This Plus 15 bridge has heavy traffic and the nooks created between columns are great spots for busking.

L Calgary Place 2: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north / south in the centre city. It is one of the main bridges connecting the old commercial core with the new commercial core.

M Centrium Place / 404 6 Ave SW: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north / south in the centre city. It is one of the main bridges connecting the old commercial core with the new commercial core.

N First Canadian Centre / Barclay Centre Parkade: This Plus 15 bridge is located on 3rd Street, the main pedestrian priority street running north / south in the centre city. It is one of the main bridges connecting the old commercial core with the new commercial core. It is also located for access to the Barclay Centre Parkade.

5.5. Types of Placemaking

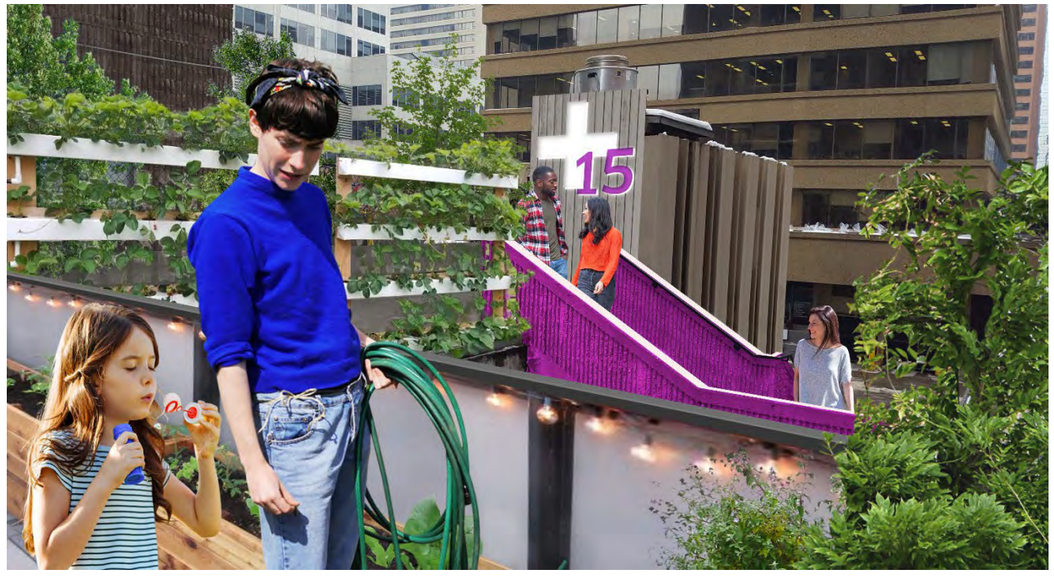
The types of placemaking opportunities identified for the Plus 15 network stem from observations and findings from the 2018 Public Survey. They seek to improve the legibility of the system and optimize the transformation of the pedestrian transportation network into a unique landscape of activated public space.

Access to Green Space

Studies have shown the more access people have to green space, the healthier they are. Green spaces can be gardens, parks, urban forests and open spaces that have an abundance of trees, flowers, water, and other natural elements. They improve mental health, reduce stress, improve mindfulness and creativity, and build social capital. The provision of green space or an urban garden that can be easily accessed within or adjacent to the Plus 15 allows for a place for relaxation and reconnection.

CHEVRON PLAZA

SITE DIAGRAM

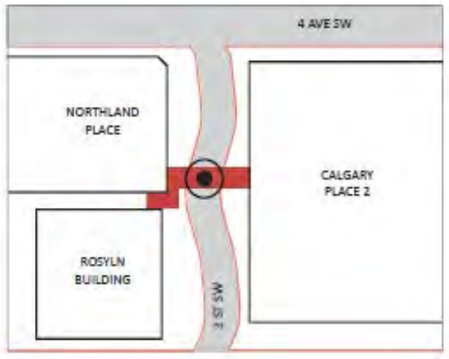


Conceptual Only (Location J)

Improve Connection to the Street

Part of the negative perceptions surrounding the existing Plus 15 network system stem from the idea that the network may take away from pedestrian life on the street. By improving the visual and physical connection of the Plus 15 bridges to the street, the Plus 15 network system can be better integrated as part of the pedestrian street fabric. It will also improve the legibility of the network for access and wayfinding. Treatment and graphic identification of the underside of Plus 15 bridges can also be an effective means of identifying the network from the street level.

CALGARY PLACE 2

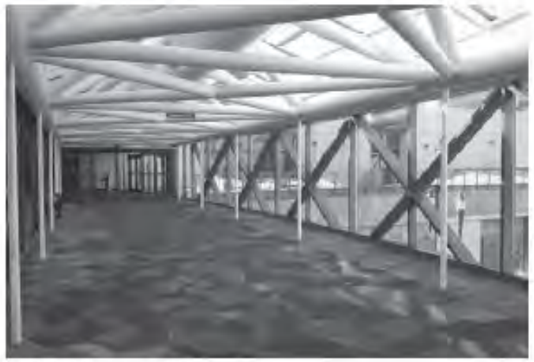


SITE DIAGRAM

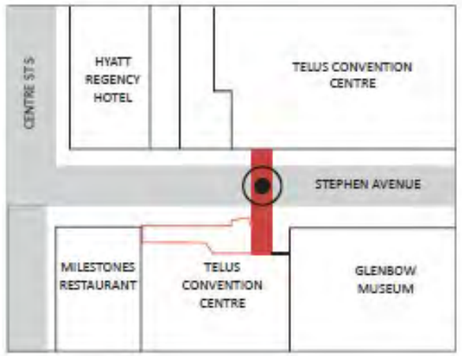
Conceptual Only (Location L)

Allow for Interruptions

Playful animation can be a great way to introduce placemaking in the Plus 15 network while accommodating a variety of seating options, access to places for retreat and rejuvenation, and the promotion of active living.



TELUS CONVENTION CENTRE



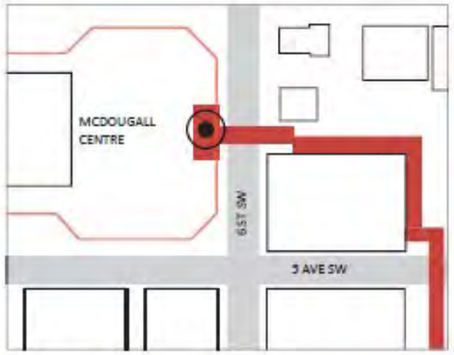
SITE DIAGRAM

Conceptual Only (Location A)

Create Destinations

Cultural, social, fun and active destinations on the Plus 15 bridges can provide a truly unique experience, a greater sense of place, pride and attachment of the network for the general public, tourists, and workers alike.

MCDOUGALL CENTRE



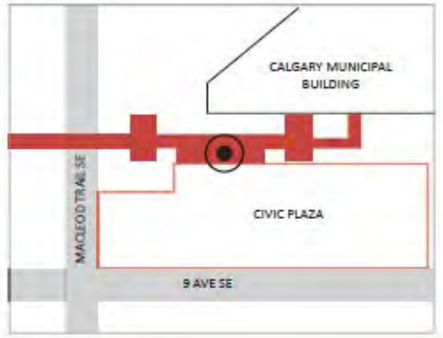
SITE DIAGRAM

Conceptual Only (Location H)

Activate with Programming

Programmed activities and opportunities to participate give people a reason to come and return to a place time and time again. Activating the Plus 15 bridges with a variety of activities can encourage a more engaging experience than is currently offered. It can also be an opportunity to activate the Plus 15 network on evenings and weekends.

CIVIC PLAZA PARKADE
- adjacency to public plaza
- adjacency to major destination
- accessible from street level



SITE DIAGRAM

Conceptual Only (Location B)

5.6. Placemaking in the Plus 15 Next Steps

Interpretation on Placemaking and Occupancy

Of all the types of placemaking opportunities proposed, it is worthwhile to note that only the fifth category of ‘Activate with Programming’ involves discussion surrounding occupation and is suggestive of the importance of a critical mass to the vitality of place and placemaking. In the search of placemaking within the context of the Plus 15 network, priority should be given to the importance of animation and sensorial engagement in reinforcing the experience of being present within the network and the provision of contextual play to the city it is running through.

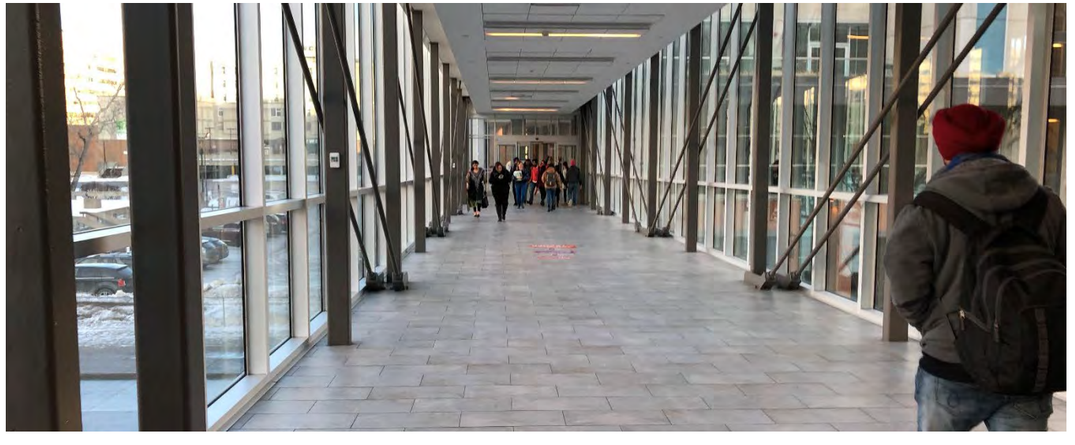
In similar fashion, the creation of a destination does not necessitate permanent occupation; it is a place that people will make a special trip to go visit. Its only desire is to be memorable and worth the journey.

A Holistic Approach Through the use of Super-graphics with Space and & Architecture

There is a general consensus that pedestrians using the Plus 15 network are confused as to the continuity of the system between the bridges and the extents the network will carry them to their destination. Through a holistic approach to wayfinding and placemaking, the network can greatly benefit from a stronger graphic and architectural identity and presence in setting its legibility apart. Super-graphics are large-scale printed or applied decorative art in bold colors, typically in geometric or typographic designs, that are applied over walls, floors and ceilings to create the illusion of altered space. The application of super-graphics into the Plus 15 network can be one means of improving legibility and visual interest of the system.

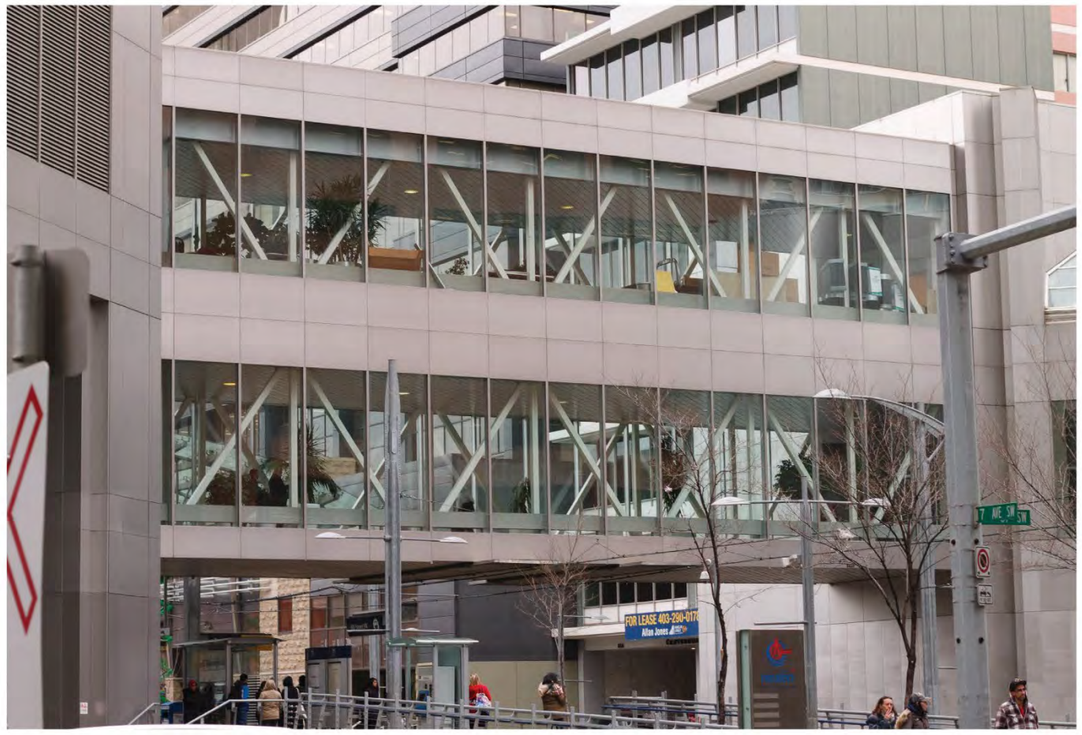
Pilot Placemaking Study

The implementation of a pilot placemaking program will allow for the testing of ideas presented in this placemaking study. From short to long term projects, pilot projects are the means towards long term change. They serve as a platform for citizen engagement and a means for people to be involved in the process of changing the city towards their need and desires.



SECTION 6

Accessibility



As part of this study, Level Playing Field was retained to carry out a network accessibility review of the Plus 15 network. The review was carried out in October 2018 and identified critical and moderate accessibility issues within the Plus 15 network links, along with recommendations for improvements and future considerations. A summary of the review's findings is included in the following section, and the full report has been included as **Appendix C**.

In the report, Level Playing Field indicates that as of 2006, persons with disabilities represented approximately 11% of the 18 and older demographic within Calgary, which translates to approximately 143,900 persons with disabilities who likely require the use of community facilities. This increases by 1.3% per year (Signposts II Report, 2009). Considering that persons with a disability in Calgary are a sizeable and growing demographic, measures must be taken to make Calgary's built environment universally accessible.

6.1. Review Methodology

Level Playing Field evaluated the bridges that are part of the Plus 15 network based on the universal design principles of equitable use, flexibility in use, simple/intuitive design, consideration of perceptible information, tolerance for error, physical effort needed for use, and the size and space in the network for ease of use. In addition to the consideration of the Universal Design Principles, Level Playing Field's Audit of the accessibility throughout the Plus 15 network considered:

- emergency exits,
- point of access at each end,
- lighting and shadows,
- flooring, handrails and
- accessories such a seating, ramps and stairs, signage, and ease from building access.

The accessibility review considered the approach and entrance to the link, the entire length of the link, and the exit after the link. The findings of each link's evaluation were documented with detailed notes and photographs that are included in the network accessibility review report, along with recommendations for improvements. All links have been audited and the links that will be discussed in this section are examples of links that have been identified as having critical or moderate accessibility issues along with links that show strong consideration for universal accessibility.

6.1.1. Links with Critical Accessibility Issues

A review of each Plus 15 link was undertaken to identify critical accessibility issues. A sample of the results of the evaluation are summarized in **Table 6-1**. Detailed evaluation notes, photographs and recommendations are provided in the Level Playing Field report included as Appendix C.

Table 6-1: Links with Critical Accessibility Issues

Link #	Link Description	Critical Accessibility Issues
1	Metropolitan Conference Centre (Calgary Place) to Westin link	This Plus 15 link can only be accessed by stairs, making it inaccessible to mobility impaired users.
2	Westin to Shell Centre link	Obstructive construction causing entrance issues, and no power door operator available. Exit leads to two steep staircases which are not accessible by wheelchair.
3	James Short Parkade to TransCanada Tower link	Broken power door operator and high physical effort required to open door. (It was noted that, many users have had difficulty with this door for a long period of time.)
4	Holt Renfrew to 4th Street C-Train Platform link:	No power door operator making the link hard to access. No elevator to get from Plus 15 level to train platform.
5	Holt Renfrew to Watermark Tower link	No power door operator, making the link difficult to access.
6	Delta Bow Valley to Harry Hays Building link	No power door operator, making the link difficult to access. Ramp leading up to the door could cause a user in a wheelchair to roll back when opening the door to access the Delta Bow Valley.
7	Family Man Park to Rocky Mountain Plaza link	Not accessible due to being boarded up, and decommissioned.
8	Bow Valley College to YWCA link	Inaccessible by wheelchair, link has a wheelchair ramp that leads to sets of stairs.
9	Petro Fina to 801 7th Avenue SW (Nexen) link	Wheelchair ramp which leads to a door without a power door operator. Platform size is too small for adequate maneuverability in a mobility device, powered or otherwise.
10	Encore Place to Calgary Court Centre link	Link is difficult to access from outside due to construction and the inside is very dark with no power door operator. Construction notification must be made apparent and at both ends of the link.

6.1.2. Links with Moderate Accessibility Issues

The review also identified moderate accessibility issues observed within the Plus 15 links. A sample of the results of the evaluation are summarized in ***Table 6-2***. Detailed evaluation notes, photographs and recommendations are provided in the Level Playing Field report included as Appendix C.

Table 6-2: Links with Moderate Accessibility Issues

Link #	Link Description	Moderate Accessibility Issues
11	5th Avenue 5th Street link	Steep ramps with carpeting create a high resistance rolling surface. Support columns protrude out and cast long shadows across the walking surface which can be problematic to those with visual impairments.
12	333 5th Avenue to Metropolitan Conference Centre link	Poor indication of pathway ending to become a staircase, no contrast between wall and pathway combined with protruding support columns and glare create multiple hazards for visually impaired users.
13	Bow Valley Square to Fifth Avenue Place link	Large protrusions in the hallway are not well mitigated and cast shadows which can be problematic to those who may be visually impaired. Hallway also uses white for columns and the pathway which creates poor wayfinding.
14	James Short Parkade to Sun Life Plaza link	Deficient size and space for approach and use, inadequate turning radius from the entrance to the wheelchair ramp. Concerns with crowding at this location.
15	James Short Parkade link	Use of differing materials is problematic. Tile alternating with carpet makes navigating this link more difficult for a wheelchair user, and a person using cane detection for wayfinding.
16	Fifth Avenue Place to International Hotel link	Inadequate size and space for approach and use, inadequate turning radius for a user operating a mobility scooter or a power chair. Manual chair users require greater landing areas, such as a runout to stop after a slope.
17	Palliser Centre to Calgary Tower links	Complicated and lacks wayfinding. The links to get to the Calgary Tower though the Palliser South building are indicated as Plus 15 but are actually on the Plus 30 level. This can lead to users becoming confused when following a Plus 15 map.
18	Bankers Hall to Gulf Canada Square link	Stairs are lacking warning/tactile strips which can present a slipping hazard which is hazardous to visually impaired users.
19	Gulf Canada Square to City Centre Parkade	Link is difficult to see and appears to be only accessible by stairs. Elevator access would be better utilized with signage indicating the elevator as a means to accessing City Centre Parkade for those who find it difficult to use the stairs.
20	Eight Avenue Place to Royal Bank Building	Non-intuitive design choices leading to risk of possible accidents, planters are obstructing path to stairs, stairs have no warning strips to indicate the end of the path, and the wheelchair ramp railings are too high for those using the ramp.
21	TD core to First Canadian Centre link	Poor design for rolling resistance with extreme cross slope and carpeted flooring.
22	City Hall to Bow Valley College Building	Inadequately indicated accessible ramp, standard indications would make the design more intuitive.
23	Bow Valley College links	Can become difficult to navigate when students are passing through links, a separation of the hallway or direction arrows could help these areas become friendlier to use.
24	Arts Commons to Municipal Building link	High effort carpeting for those using a wheelchair and lack of size and space for easy use in parts of the hallway.
25	Centennial Parkade area	Alternating between tile and carpet impacts usability. Statues in the middle of the hallway along with wall protrusions create an area with risk for potential accidents.
26	Western Canadian Place to Petro Fina (First Alberta Place)	Steep incline/decline leading into an automatic door, this can be a hazard to wheelchair users.
27	Petro Fina to 801 7 Avenue link	This Plus 15 exit is notably darker than the Plus 15 link with inadequate indication between the end of the pathway and a staircase.
28	801 7 Avenue link	Minimal contrast between walkway and walls. Large plants are also placed along the walkway, which could create an environment that is difficult for those who are vision impaired to navigate this area. Planters also create hallway congestion as they subtly direct people to all enter and exit through one set of doors.

Link #	Link Description	Moderate Accessibility Issues
29	Amec Place to Nexen link	A short but steep carpeted ramp with no railings is present and creates an atmosphere where a wheelchair user would need to exert great physical effort to use this Plus 15 link.
30	724 6 Avenue link	This Plus 15 link has a very slippery material with unmarked stairs, which creates a falling hazard to those using this passageway. Highly suspect area for those with vision impairment.
31	707 7 Avenue to Encore Place link	The gradual incline and carpet in this link create an environment where above average physical effort is needed to use the link on the incline. There are unmitigated protrusions in the link, which could impede cane detection.

6.1.3. Overall Findings

These five critical accessibility issues were noted repeatedly throughout the Plus 15 Network:

- Warning signage should be high visibility to alert all, regardless of age or ability, of the impending danger and to ensure they do not make contact with the sign.
- Emergency infrastructure lacks universal usability.
- Infrastructure such as handrails are often implemented incorrectly; universal design standard heights and form should be considered.
- Many links lack contrast, cast shadows, and have inconsistent tiling, which can create problems for visually impaired users of the network.
- Methods for wayfinding are inconsistently used and often do not indicate where the user is located.

In addition, the review noted that the existing wayfinding and signage made progression through the network difficult and that several routes had stairs without any corresponding ramp accesses. Sun glare and drastic changes in lighting levels were also noted, along with limited contrast between wall and floor colors, which may impact the visually impaired. The use of carpet was noted as having high rolling resistance for wheelchair users and muted sound reflectance for individuals using cane detection. Of note was the lack of emergency egress (accessible street access or emergency lifts), which limits access to and egress from the link for emergency responders or in case of evacuation.

Several locations were also identified that had strong considerations for accessibility. These included links that balanced strong aesthetics with intuitive design, including gradual and navigable inclines, sun glare and shadow mitigation measures such as glass tinting, low resistance rolling surfaces with enough texture to prevent slipping, good lighting and mitigated protrusions.

6.2. Recommended Improvements

In the short term, the report notes the importance of addressing the critical accessibility issues that have been outlined. In the near-term, it is also important that the moderate issues are addressed accordingly. The report makes recommendations to improve accessibility and wayfinding within the Plus 15 Network, as summarized below:

- Retrofitting power door operators to links that have been listed as lacking them.
- Universally accessible emergency infrastructure and policy so that all users of the Plus 15 Network can evacuate in an emergency scenario.
- Wayfinding measures such as “you are here” maps need to be updated to have correct waymarking to make navigating the Plus 15 network for all users, regardless of age and ability.
- Lighting is considered the most important factor in building for visually impaired persons. Add variable lighting control and window shades to eliminate glare and shadow casting.
- Mitigating protrusions with continuous path railings that block protrusions like columns from the path of travel and additionally help guide the visually impaired.
- Safety measures like updating the tactile walking surface indicators (TWSIs) on stairs and adding frictions strips.
- From this evaluation we feel that more direct access to the link from the street level itself would also facilitate inclusive and universally designed spaces for all people regardless of age and ability.
- A map, smart phone application, or pedestal map that indicates where one can access the Plus 15 Network from the ground level.

For the long-term strategy and construction of future links, recommendations include:

- Using better materials and making links more consistent with one another.
- Future links must use flooring materials that provide a low rolling resistance and are easier for cane detection (ie: restricting the use of carpeting).
- Materials used on the sides of the link must be a contrasting colour to assist in wayfinding and to help the visually impaired navigate through links.
- Protrusions must always be mitigated, for instance, with a railing.
- Turns to be at 90 degrees wherever possible to help wayfinding and cane detection. With this, convex mirrors placed at strategic locations to assist those with hearing loss in avoiding collisions with other users at corners.
- Straight paths wherever possible.
- Wherever possible, the width of corridors is to be designed to accommodate 2 persons with guide dogs or sighted-guides to pass each other unimpeded (4 persons abreast)

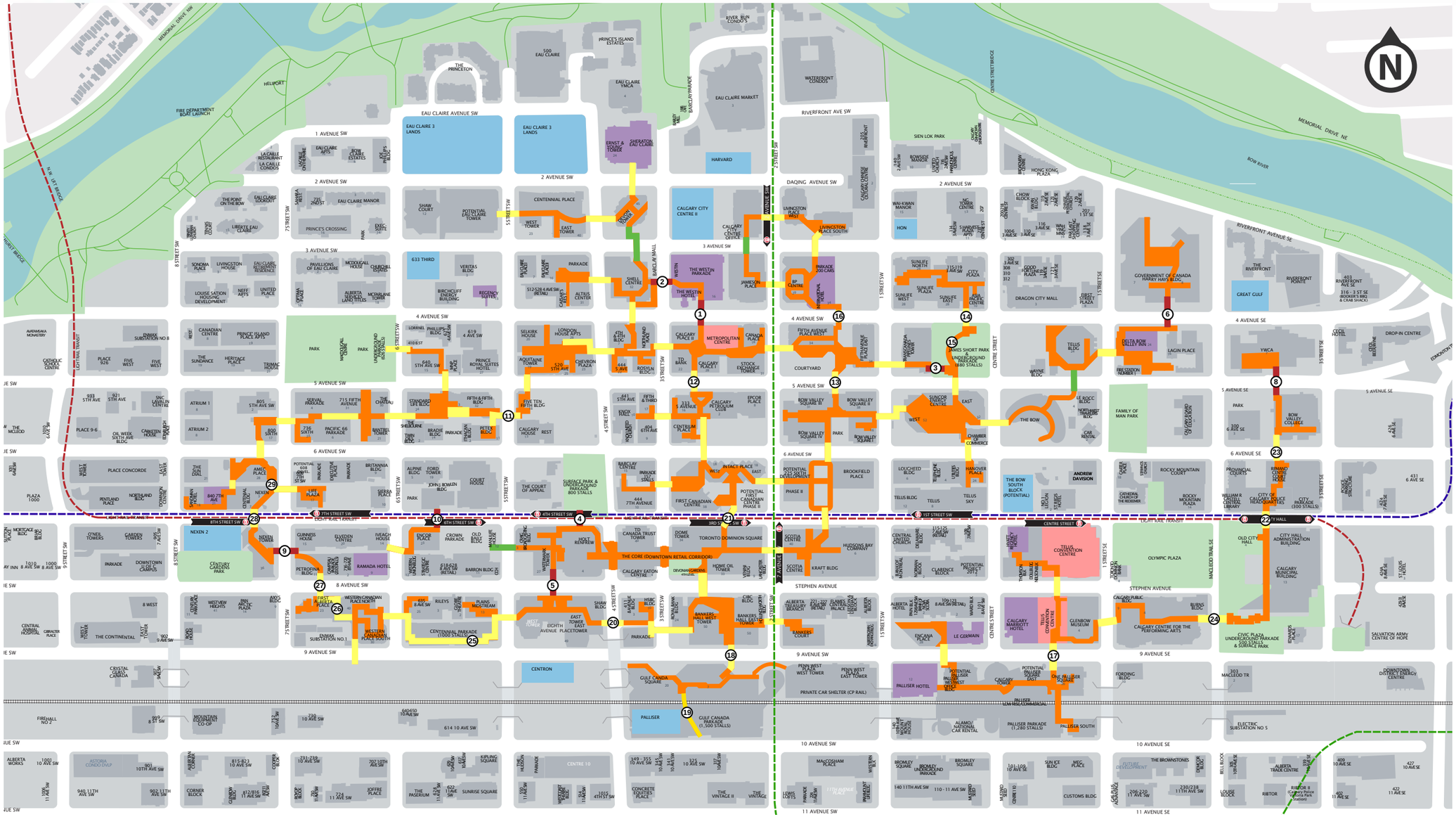


Figure 6-1: Accessibility of Plus 15 Links

SECTION 7

Engagement Summary

7.1. Overall Engagement Process

Public participation is a critical component of the Plus 15 Network Plan. The findings from engagement in this project provide key inputs into the process for developing a Plus 15 Network Plan and Policy that is informed by the desires and priorities of the public.

Multiple touch points for public input and information sharing were built into the project through three project engagement phases:

Phase 1 – Capturing Issues & Opportunities

Phase 1 informed the community and key stakeholders about the project and its scope. Public engagement focused on establishing a broad understanding of the issues and opportunities within the Plus 15 network. Input was collected on current use, services and improvements might encourage people to use them more often, and overall network improvements.

Phase 2 – Targeted Stakeholder Discussion

Building on the input collected around the issues and opportunities for the network, Phase 2 targeted stakeholders including building owners and building managers about potential options to connect missing links, the overall network boundary, hours of operations, and the opportunity for placemaking.

Phase 3 – Collecting Input on Potential Improvement

In Phase 3, input was collected about the preferred network implements options that were developed using public engagement and technical analysis. This phase focused on refining the network plan recommendations and identifying the amenities and options for wayfinding that are most important for users.

Over three engagement phases, citizens and stakeholders participated in in-person and online engagement activities consisting of online surveys, in-person pop-up booths hosted during peak traffic hours in the Plus 15 network, and targeted stakeholder meetings.

Pop-up engagement sessions hosted in the Plus 15s handed out post cards promoting the online survey during busy lunch time hours in the network. Users were encouraged to share their knowledge and understand of the network in order to improve it. The City also promoted the engagement through social media including Twitter and Facebook.

Project and engagement information was available to the public and stakeholders throughout the process via the City's engagement portal on a project specific at: www.engage.calgary.ca/Plus15. The project website provides ongoing project updates and links to the project website along with What We Heard reports and engagement materials. An email distribution list and signup posted on the project website provided project updates. More detailed information on the engagement process is provided in **Appendix D**.

7.2. Phase 1 Engagement

Phase 1 was about introducing the project to Plus 15 users, directly affected stakeholders and Calgarians to help identify issues and opportunities for the overall network, including collecting input to understand how the bridges are currently used, what services or improvements might encourage people to use them more often, and how they could be improved overall.

In-person engagement activities included pop-ups in the Plus 15 network on March 21, 2018. The public questionnaire was hosted online and ran from March 15 to April 5, 2018. It received 2,329 individual responses. The survey was promoted online, through social media, and through pop-ups in the Plus 15 network on March 21, which gave away nearly 800 flyers promoting the survey to members of the public using the Plus 15 network.

7.2.1. Issues & Opportunities Questions

The questionnaire gives insight into when and why people use the Plus 15 Network, what they enjoy about the network, as well as what aspects need improvement. We asked the following questions online:

1. How many times a week do you typically use the Plus 15 network in good weather conditions?
2. How many times a week to you typically use the Plus 15 network in poor weather conditions (cold/wet/snow)?
3. Thinking about your typical week, how many times do you use the Plus 15 network on weeknights (after 6 pm) and/or weekends?
4. In order of importance, what are the five main reasons you use the Plus 15 network?
5. Do you prefer using the Plus 15 network instead of using sidewalks and/or streets?
6. How do you typically access the Plus 15 network?
7. When you are on the street and trying to find a way into the Plus 15 network, what do you look for?
8. Please tell us what you don't like about using the Plus 15 network (if anything).
9. On a scale of 1 to 5, how easy is it to find your way through the Plus 15 network?
10. Do you ever look at the maps in the Plus 15 network?
11. Is it easier to find your way through the Plus 15 network when you can see the buildings or streets outside?
12. Please tell us how easy or difficult it is to understand the signs for the Plus 15 network.
13. How often do you typically use any of the open areas, seating space or outdoor gardens in the Plus 15 network?

14. In your experience are there are parts of the downtown that are missing Plus 15 bridge connections? Please indicate the street and avenue where you think an additional Plus 15 bridge connection would be valuable.
15. What types of changes do you suggest for the Plus 15 network?
16. What types of activities in the Plus 15 network would encourage you to use the Plus 15 on weeknights and weekends?

7.2.2. Summary of Phase 1 Key Findings

Reasons for Using the Network

Beyond avoiding poor weather, the main reasons that people use the Plus 15 network is because it provides relatively direct routes, makes crossing streets easier, provides shopping/restaurants, and provides access to offices/places of work. Similarly, many survey respondents (53%) noted that they access the network through office buildings, highlighting that a significant portion of the network connections and destinations are downtown office towers.

Users of the Plus 15 network also make use of the amenity spaces throughout the network, with over 40% of survey respondents noting that they use seating areas, gardens, and open spaces once a week or more. An additional 20% of respondents use these spaces once a month or more, indicating that public space within the network is valued and well utilized.

Navigation & Wayfinding

In terms of wayfinding and navigating the Plus 15 network, many people responding to the survey (53%) noted that they find the network “somewhat easy” to navigate. However, over 80% of those who find the network easy to navigate also noted that they use the network five times or more per week in poor weather, showing that there is a lot of familiarity with the network from the survey respondents. Of the survey respondents, 25% noted that it is “somewhat difficult” or “very difficult” to navigate the network.

Although the majority of survey respondents do not seem to have significant issues navigating the Plus 15 network and are regular users of the network, over three-quarters of people indicated that they use network maps at least sometimes, which shows that even frequent users of the network require wayfinding assistance at times, but also that wayfinding and directional elements are well used in the network. Survey results show that most people find wayfinding elements satisfactory, but few (19% of respondents) find that they are “very easy to use”.

Updates to the Network

Less than 1% of survey respondents noted that no changes to the network are required. The top two desire upgrades that people have for the Plus 15 network is for increased connectivity to more destinations, as well as consistent and longer operating hours – both of which were heard throughout the survey as current issues with the system. Respondents also noted that dead ends are an issue, which effects connectivity to destinations.

There is also strong desire to see an app to help with navigation and wayfinding through the network. Improved signage was also noted as the fifth most desired improvement. Additionally, clear access points and clearer directions scored highly on the list of desired improvements. These numbers, combined with the amount of people indicating that they use signage to navigate the network and the “satisfactory” assessment of current signage, shows a need to improve wayfinding elements throughout the network.

7.3. Phase 2 Engagement

Phase 2 engagement focused on engaging directly affected stakeholders to discuss and better understand their views and preferences about potential enhancements to the network, the overall network boundary, and hours of operation.

The stakeholder sessions took place during the fall of 2018 and facilitated discussions informed stakeholders about the project and guided discussion to collect feedback on key topics for the network.

7.3.1. Targeted Stakeholder Questions

Discussion questions at the stakeholder meeting focused on key topics that relate to the network plan. We asked the following questions:

Missing Links

- What amenities are most desirable for you to reach by Plus 15 bridge?
- Which of these missing links are most important to you? Which are feasible / desirable?
- Are there any additional links you would like considered?
- Are there locations where the suggested boundary is larger or smaller than necessary?
- Do you feel the proposed unified opening hours are appropriate?

7.3.2. Summary of Phase 2 Key Findings

The following notes summarize the themes and topics discussed during stakeholder engagement sessions for the Plus 15 Network Plan and Policy Update.

Dead Ends

In both the missing links and hours of operation topics, dead ends came up as an item that needs to be avoided in the Plus 15 network. Dead ends are seen to compromise both the functionality and safety of the network. This is seen to be a result of both inconsistent hours of operation and missing links in the network. Inconsistent hours of operation can create dead ends when part of the Plus 15 is open and other parts are closed. As dead ending as a result of inconsistent hours of operation often happens at night, this can create significant safety concerns for Plus 15 users.

Consistent Hours of Operation

There was strong agreement that consistent hours of operation would be a good thing for the Plus 15 network. Unified hours are seen to mitigate maintenance and security costs as well as improve the user experience for those navigating the network. As the network is largely used to connect businesses, many felt that closing the network shortly after regular business hours makes sense while others noted that keeping the network open until 9pm was more appropriate for businesses in the area. Similarly, having the network open during the weekend did not make sense to many. There were, however, some that felt keeping the network open later and during the weekend would be better for retail that is connected to the network.

Connecting to Access Points

A recurring theme throughout the stakeholder sessions was the need to better connect the Plus 15 network to access points. During these sessions, and throughout the engagement process, it has been noted that it often isn't easy to know where to, or how to, access the Plus 15s. Improved connection points were most commonly noted to include the C-Train and parking facilities. Several comments were also made about planning to integrate the network with future Green Line stops.

Placemaking

Overall, there was not significant support for placemaking activities within the Plus 15s. Some noted that there are events within the Plus 15s currently, and that they are sufficient in terms of placemaking. There was also strong sentiment that anything that encourages people to linger and spend more time within the network is often problematic as it leads to loitering and to homeless peoples occupying the network. Another reoccurring concern with any placemaking activities or furniture is blocking pedestrian movement in the network. The Plus 15s get crowded during peak hours, and constraining the pedestrian zones are seen to be problematic to the functionality of the system. Similarly, there were also some comments that the main purpose of the Plus 15 is to move people around, not to create places for people to spend significant amounts of time in.

7.4. Phase 3 Engagement

Building on input already collected early in the project and options developed through the technical analysis, the project team used Phase 3 to focus on questions that refine the final aspects of the plan. Phase 3 engagement specifically focused on the preferences for the wayfinding app and future planning considerations related to the Plus 15s.

In-person pop-up sessions were held in the Plus 15 network during peak traffic hours on:

- December 17, 2018 – Bankers Hall (11am – 1 pm)
- January 9, 2019 – City Hall Atrium (10 am-5 pm)
- January 10, 2019 – The CORE (10 am-8 pm)
- January 16, 2019 – Bankers Hall (11 am- 1 pm)

An online survey ran from December 3, 2018 – January 19, 2019 on the project engagement page. It received 666 individual responses. The survey was promoted online, through social media, and through pop-ups in the Plus 15 network.

7.4.1. Potential Improvement Questions

We asked the following questions online:

- What amenities are most desirable for you to reach by Plus 15 bridge?
- In order of importance, what are the five main criteria that are important to you in determining when a new Plus 15 bridge link should be built?
- Would you prefer having a wayfinding app for the Plus 15 network instead of the existing signs with static maps?
- If a wayfinding app were to be developed, what components/elements would you like it to include?
- If a wayfinding app were to be developed, are there any other components/elements would you like it to include?

7.4.2. Summary of Phase 3 Key Findings

Amenity Access

Based on survey responses, the most desirable amenities to reach by the Plus 15 network are LRT stations (32%), office buildings (26%) and commercial (18%). Survey results show that together, these three amenities are by far the most desirable, accounted for 76% of the question responses.

Only some respondents noted parking lots and structures (12%) as a desirable amenity to reach. Respondents cited the lowest ranked amenities to reach by the Plus 15 network as residential (4%) and hotel (2%).

Criteria for New Plus 15 Bridges

When asked to rank the criteria for determining when a new Plus 15 bridge should be built, survey respondents ranked connection to LRT stations, travel time, and demand as the three most important. According to the survey, cost is ranked moderately as a criterion followed by street level integration and feasibility. Of all the criteria, aesthetics and current policy and council direction were ranked as the least important.

Wayfinding App

When asked if a wayfinding app was preferred instead of static maps for navigating the Plus 15 network, survey respondents generally said yes (64%). However, over a third of survey respondents said no (22%) or chose 'other' (14%). Most of the comments collected under 'other' noted a strong importance to have both a wayfinding app and static maps, that a wayfinding app should not be a total replacement for static

maps. Additional comments encouraged integration with existing wayfinding / map applications. A few comments also noted that not all users have access to a smart phone or tablet which adds a barrier to use.

Survey respondents noted that if a wayfinding app is developed, the most important elements / components to include:

- GPS location with information like building names, road names, and attractions
- Hours of operation for the Plus 15 Network and access points showing 'now open' / 'now closed'
- Route options and travel times with the suggestion to compare the Plus 15 to outside streets
- Amenities like public washrooms, water stations, nursing areas, elevators, parking, seating areas, and public art
- Locations of transit connections, street access points, and universal access

7.5. Incorporating Stakeholder Input

Input received from the public, external stakeholders, and internal City groups were used throughout the network study at various stages including the identification of key issues to address in the existing network, selection of missing link locations, unifying the hours of operation, and wayfinding recommendations. ***Table 7-1*** illustrates how some of that feedback was directly used throughout the study.

Table 7-1: Incorporating Stakeholder Input into the Network Study

Input Received	How Input was Incorporated
Phase 1	
Increased connectivity to more destinations.	Missing and future links were identified to connect the network to more destinations.
Consistent and longer operating hours.	Unified hours of operations are recommended to be from 6am – 9pm on weekdays.
Connections to landmarks: City Hall, Bankers Hall, Library & Hyatt.	Preliminary links were selected that connect to those destinations including links: V, XIV, XV, III, II.
The network is confusing with not enough signs for those less familiar with the network.	The branding and signage was reviewed with recommendations to improve the map layout and signage to help users navigate the network.
Phase 2	
harmonizing hours of operation to minimize operational costs.	Unified hours of operations are recommended to be from 6am – 9pm on weekdays
Integrating the network with future Green Line stops.	Preliminary and prioritized links were selected to connect to future Green Line stations.
Extending the Plus 15 network to the new Central Library and the East Village.	Preliminary links were selected that connect to those destinations including links: XIV, XV, XVI, XVII.
Phase 3	
Highest ranked criteria for determining when a new Plus 15 bridge should be built are connection to LRT stations, travel time, and demand.	The evaluation criteria to prioritize links includes connections to LRT, decreasing travel time and demand. Those criteria were weighted more than other criteria based on the feedback received.
An app to help with navigation and wayfinding through the network.	An App is recommended to improve wayfinding in the Plus 15 network.
The most desirable amenities to reach by the Plus 15 network are LRT stations.	The evaluation criteria to prioritize links includes connections to LRT. In addition, links were chosen initially that connect to existing and future LRT stations.

SECTION 8

Recommendations

The objective of the network study was to create a network plan that improves the current Plus 15 network and develop ways to expand and enhance the network. The plan addressed 5 main issues:

- Linkages & Boundary: Gaps and missing links were identified in the existing network and several criteria were identified to aid in the selection of future links. Missing links and future links were prioritized through stakeholder engagement and technical review.
- Wayfinding: Wayfinding has a direct public impact and value, helping to shape the identity of private and public spaces and improving orientation to create a positive user experience. The plan provided recommendations to improve the Plus 15 network information, architectural integration, and use of new technologies.
- Accessibility: Some links were built in the 1970s and 1980s and don't meet current accessibility standards. An accessibility review was conducted for the plus 15 bridges to identify critical issues and possible mitigations.
- Placemaking: Placemaking helps generate economic opportunities, creates a welcoming environment for pedestrians and draws more tourists. Several types of placemaking were explored on the plus 15 bridges and in the connecting buildings.
- Hours of Operation: The Plus 15 policy states that the system shall be operational 24 hours, however many building owners lock their buildings and close their sections of the system after business hours, which creates a discontinuous system.

The study recommendations for the 5 main issues were selected through a process that included:

- consideration for City policies and approved documents;
- feedback received from the public and stakeholders;
- technical team review and evaluation; and,
- harmonization with other ongoing projects and studies.

Figure 8-1 illustrates the process undertaken for selecting the network plan recommendations to be carried forward.

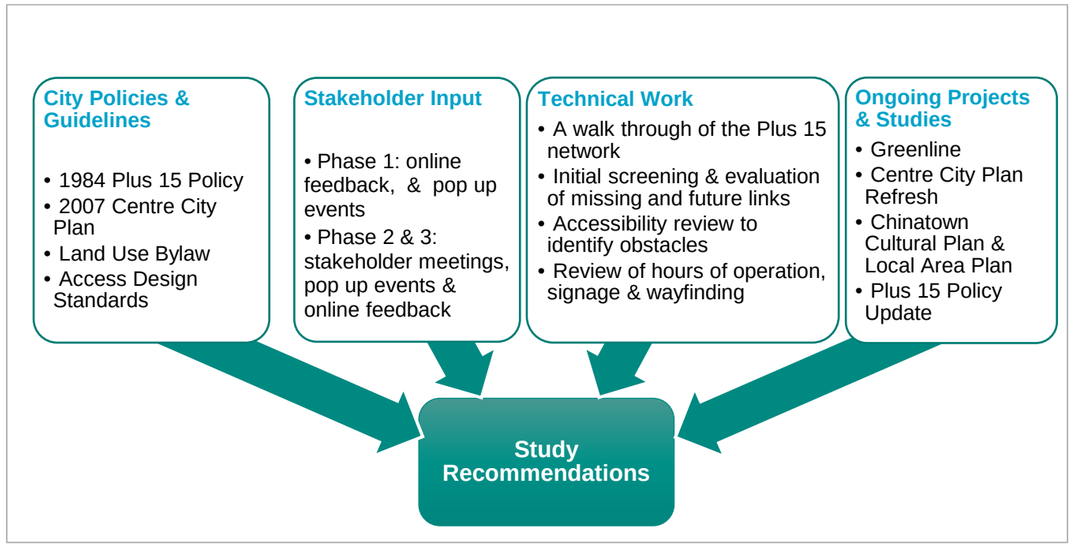


Figure 8-1: Network Plan Recommendations Process

A summary of the recommendations for each of the main issues is outlined below.

Linkages

Although the existing Plus 15 network is robust, there are still opportunities to enhance the network in terms of the geographic footprint and internal connectivity. The existing network was reviewed to identify seventeen internal and external missing links. The missing links were reviewed to assess which links should be considered higher priority. In order to prioritize the links, an evaluation matrix was developed which considered several different evaluation criteria. Based on the evaluation, the following four links were identified as high priority:

- Link(s) I: The west side of the network has limited north-south connections resulting in a long, circuitous route west of 5 Street SW. Providing link(s) in this area could drastically reduce travel distances within the system. There are several different options to connect the network in this area but a north south link connecting to Encore Place would be preferred.
- Links II: This link aims to provide a connection across 1 Street SW by connecting The Edison to Bankers Court. Currently the most southerly crossing of 1 Street SW is north of 6 Avenue SW leaving a four-block gap in connectivity. This link would also improve north-south connectivity as there are no existing north-south links between 1 Street SW and Macleod Trail (four blocks).
- Link IV: As noted above, there are no north-south links between 1 Street SW and Macleod Trail (four blocks). This link provides a connection from The Bow to the Telus Convention Centre and would

reduce north-south travel distances and would also connect the Telus Convention Centre with trip generators to the north, including existing and future hotels.

- Links V: There is currently poor connectivity in northeast corner of the network. This is an existing link which needs repair and connects Andrew Davison to Old Central Library. This link aims to connect the network east of Macleod Trail with the rest of the system.

Boundary

The currently used Plus 15 boundary was set in the 2007 Centre City Plan. It is recommended to extend that north boundary edge to Riverfront Avenue in order to incorporate:

- The future location of Greenline LRT station at the corner of 2 Street SW and 2 Avenue SW
- Future redevelopment of the Eau Claire area which includes the Harvard development and Calgary City Centre II
- Links that have been built outside of the boundary

Wayfinding

The Plus 15 signage and wayfinding program was developed during the 1980's for a much smaller system. As a result of expansion and modernization of the city as well as degradation of the brand and misapplication of the sign program, the Plus 15 signage is not as effective as it was and could be. The concept of city wayfinding through interior spaces and buildings is a challenge.

The following outlines recommendations on improving the Plus 15 network of signage and wayfinding. This is based on the observations made as well as public feedback from questionnaires. Input from City representatives also factored into the recommendations. These recommendations outline methods by which the system can be modernized and improved to convey a sense of place, while giving users confidence in the efficiency and safety of using the system. The wayfinding recommendations include:

- Defining the system through brand and a consistent application of the sign program to allow users to navigate with confidence and security, knowing that they are on the right path.
- Increasing the size of street level signs and considering options for illumination to improve legibility.
- The maps located along the route in the round stands would be more helpful if the macro level information was simplified and an enlarged insert was added that showed more detail of what was located within the immediate vicinity of each specific map stand.
- Refining the map to be more schematic and easier to read at a glance, with fonts and colours that visually connect to the logo and other brand assets. The addition of a directory that incorporates a grid location system to allow readers to look up specific buildings on the map.
- Developing a holistic approach to wayfinding design and placement to ensure continuity of the user experience and understanding throughout the entire Plus 15 network, including the buildings that connect to the Plus 15.
- Developing an app in addition to the static maps. The app features should include GPS enabled, open and closed links in real time, routing options, building names and attractions, and access doors at street level.

Accessibility

Several short-term recommendations to improve accessibility and wayfinding within the Plus 15 Network, as summarized below:

- Retrofitting power door operators to links that have been listed as lacking them.
- Universally accessible emergency infrastructure and policy so that all users of the Plus 15 Network can evacuate in an emergency scenario.
- Lighting is considered the most important factor in building for visually impaired persons. Add variable lighting control and window shades to eliminate glare and shadow casting.
- Mitigating protrusions with continuous path railings that block protrusions like columns from the path of travel and additionally help guide the visually impaired.
- Safety measures like updating the tactile walking surface indicators on stairs and adding frictions strips.

For the long-term strategy and construction of future links, recommendations include:

- Using better materials and making links more consistent with one another.
- Future links must use flooring materials that provide a low rolling resistance and are easier for cane detection (ie: restricting the use of carpeting).
- Materials used on the sides of the link must be a contrasting colour to assist in wayfinding and to help the visually impaired navigate through links.
- Protrusions must always be mitigated, for instance, with a railing.
- Turns to be at 90 degrees wherever possible to help wayfinding and cane detection. With this, convex mirrors placed at strategic locations to assist those with hearing loss in avoiding collisions with other users at corners.
- Straight paths wherever possible.
- Wherever possible, the widths of corridors should be designed to accommodate 2 persons with guide dogs or sighted-guides to pass each other unimpeded (4 persons abreast). The current policy states a bridge width of 4.5m; however, it is recommended that the 4.5m width be clear of obstacles and objects.

Placemaking

There are five locations which are recommended as pilot projects for different types of placemaking:

- providing access to green space at Chevron Plaza (location J);
- improving connection to the street at Calgary Place 2 (location L);
- allowing for interruptions at the Telus Convention Centre (location A);
- creating destinations at McDougal Centre (location H); and
- activating with programming at Civic Plaza Parkade (location B).

However, the Plus 15 walkways are classified as a temporary structure and are challenged by restrictions set under the current City of Calgary Regulation Bulletin RB06-033 as well as the City of Calgary Access Design Standards. The implementation of a pilot placemaking program will allow for the testing of ideas presented in this network plan. From short to long term projects, pilot projects are the means towards long term change.

Hours of Operation

It is recommended that the unified operating hours be 6:00am to 9:00pm on weekdays. Based on the data collected, there is a clear jump in pedestrian traffic commencing at around 6:00am and a clear drop in volumes after 8:00pm. Although pedestrian volumes drop significantly after 8:00pm, it is suggested that the unified hours extend to 9:00pm. The rationale for this is that many of the downtown shopping establishments, including the CORE Shopping Centre, are open until 8:00pm on some evenings. Keeping the Plus 15 network open until 9:00pm would provide time for people to depart the shopping areas and reach their vehicle or transit stop which may be located a few blocks away. The 9:00pm closing time would also provide connections for people destined to the numerous restaurants and other event centres located within the centre city.

During the weekend, pedestrian volumes are significantly lower within the network. For this reason, reduced operating hours of 9:00am to 7:00pm are recommended for weekends and statutory holidays.

Summary of Recommendations

Table 8-1 highlights recommendations from the network study and categorizes the items as short, medium or long term as well as the level of effort required. There are 18 recommended items outlined below, with the majority requiring low to moderate efforts. The recommended items can be incorporated in The City's budget plan as deemed necessary. Some recommendations may become easier or more difficult to implement depending on other projects at The City, negotiations with developers and building owners, and key stakeholder input.

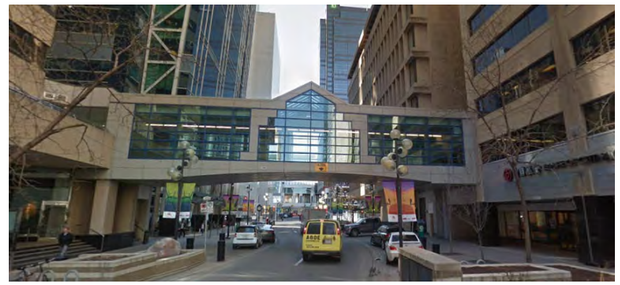
A summary of the recommendations including the high and medium priority links, the proposed boundary and the 5 pilot placemaking opportunities are illustrated in **Figure 8-2**.

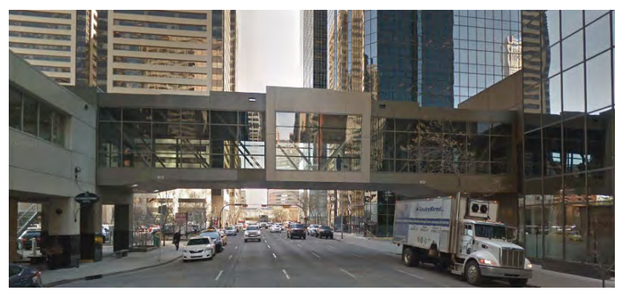
For new Plus 15 bridges, the following guidelines should be considered:

- Designing any new Plus 15 bridge with careful considerations of its visual impact on historical resources, cultural landscape, and view corridors as identified in the Centre City Plan.
- Depending on the site context, the visual impact of the bridge may be offset by sensitive and creative design which provides visual appeal and adds to the character, space enclosure and attractiveness of the streetscape and/or place.
- Encouraging building new Plus 15-level open spaces/plazas of high quality only at appropriate locations and retrofitting existing open spaces for greener, more active, and better connected public spaces, as a means to address the general lack of open space in the dense centre city area.
- Bridges should have a minimum unobstructed interior width of 4.5m.
- Allowing major street-level pedestrian corridors and the Plus 15 network to work together as an integrated pedestrian system by providing well-treated interface or transition zone at the street-level entries
- Using flooring materials that provide a low rolling resistance and are easier for cane detection (ie: restricting the use of carpeting).
- Materials used on the sides of the bridge should be a contrasting colour to assist in wayfinding and to help the visually impaired navigate through links.
- Protrusions must always be mitigated, for instance, with a railing.
- Turns to be at 90 degrees wherever possible to help wayfinding and cane detection. With this, convex mirrors placed at strategic locations to assist those with hearing loss in avoiding collisions with other users at corners.

Table 8-1: Plus 15 Network Study Recommendations

Level of Effort	Low	Moderate	High
Short Term Improvements (< 5 years)			
Unified operating hours are to be 6:00am to 9:00pm on weekdays.		X	
Reduced operating hours of 9:00am to 7:00pm for weekends and statutory holidays.		X	
Completing repairs on Link V and opening it to connect Andrew Davison to Old Central Library	X		
Refining the map to be more schematic and easier to read at a glance, with fonts and colours that visually connect to the logo and other brand assets	X		
The addition of a directory to the maps that incorporates a grid location system to allow readers to look up specific buildings on the map.	X		
Retrofitting power door operators to links that have been listed as lacking them.		X	
Adding variable lighting control and window shades to eliminate glare and shadow casting.	X		
A pilot placemaking program at 5 selected links		X	
Negotiating with building owners and building Link II as an east west link that connects The Edison to Bankers Court.			X
Developing an app in addition to the static maps.	X		
Convex mirrors placed at strategic locations to assist those with hearing loss in avoiding collisions with other users at corners.	X		
Medium Term Improvements (5 – 10 years)			
Extending the Plus 15 boundary to the north to include Riverfront Avenue.			X
Negotiating with building owners and building Link IV as a north south link connecting The Bow and the Telus Convention Centre.			X
Developing a holistic approach to wayfinding design and placement to ensure continuity of the user experience and understanding throughout the entire Plus 15 network, including the buildings that connect to the Plus 15.		X	
Providing continuous path railings that block protrusions (like columns) and help guide the visually impaired.		X	
Changing policies to allow for occupancy in the Plus 15 bridges for better placemaking activation and programming.			X
Long Term Improvements (> 10 years)			
Negotiating with building owners and building Link I as a north south link connecting to Encore Place.			X
Retrofitting links to be accessible by adding ramps, accelerators, and/or elevators.			X





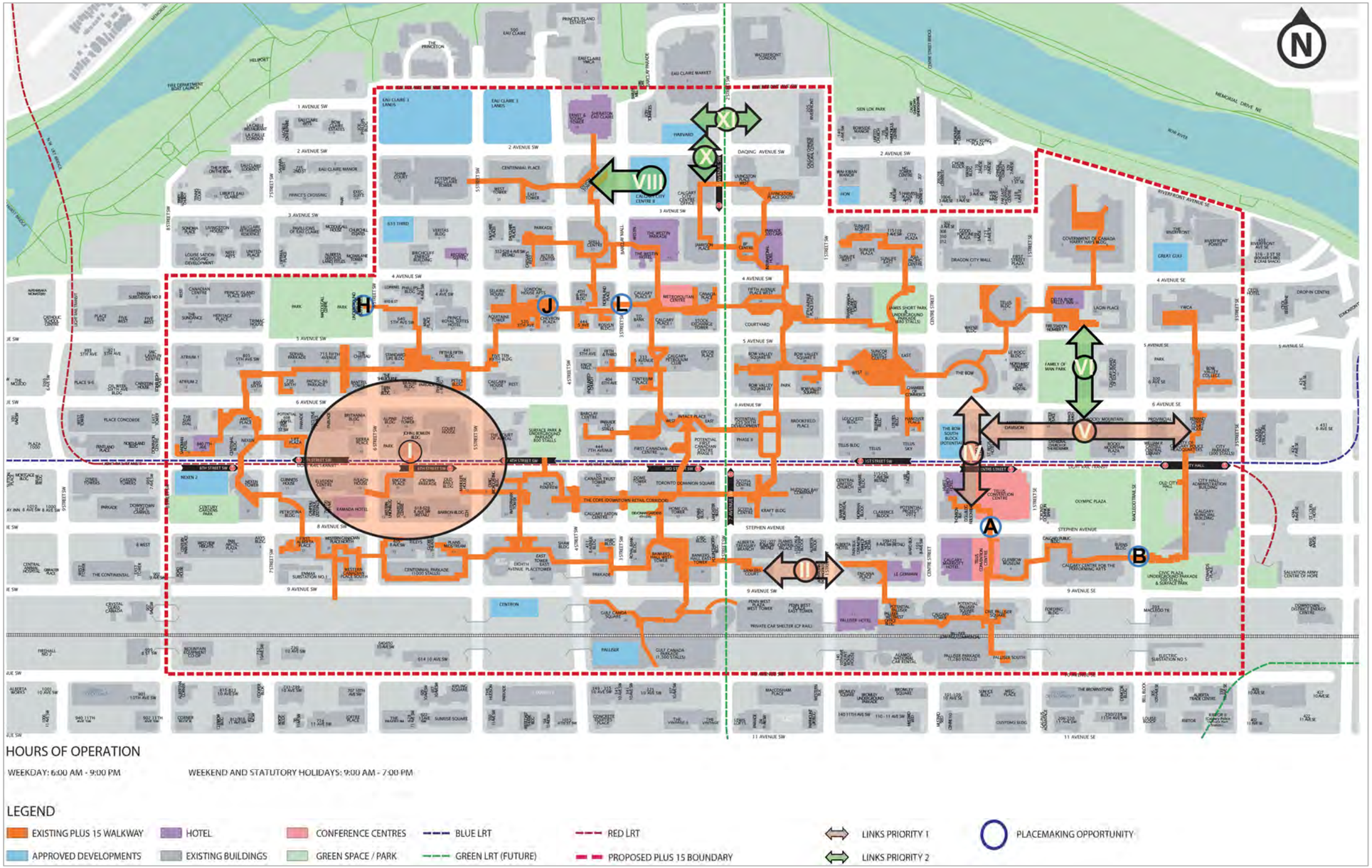


Figure 8-2: Network Plan Recommendations