

The Problem



Calgary's Plus 15 network—the world's largest indoor pedestrian walkway system—was built to offer Calgarians a convenient way to move through downtown (City of Calgary, 2021). From the outside, the architecture is striking. But you know the saying, "it's what's on the inside that counts"? In this case, the exterior may impress, but the inside tells a different story.

Unfortunately, the wayfinding system lacks clarity and accessibility, leaving many users frustrated, confused, and disoriented (City of Calgary, 2021). As a result, both newcomers and regular users often avoid the network altogether (City of Calgary, 2021). At the same time, many Calgarians aren't even aware the system exists, as its wayfinding tools fail to capture attention or communicate effectively (City of Calgary, 2021).

To address this, The City of Calgary hired Steer, a design and consulting firm, to modernize the Plus 15's

wayfinding signage and maps and improve accessibility. Yet, user testing revealed key issues across the signage and map prototypes: poor legibility, unclear orientational cues and directions, lack of tactile and audio support, and overwhelming, cluttered content. Users also disliked how the designs didn't reflect Calgary's identity. Despite this feedback, these concerns were not meaningfully addressed in the final wayfinding outputs.



These issues impact all users, but are especially problematic for visually impaired users who heavily rely on clear, well-designed signage and maps to navigate independently (CAS, 2019). On top of that, while digital tools like Google Maps may seem like a solution, they often misinterpret the Plus 15's elevated walkways, redirecting users the wrong way (Jones, 2020).

When all wayfinding tools fall short, how are people supposed to navigate The Plus 15?



The reality is—they can't. Without a clear, reliable, and accessible system in place, users are left confused, frustrated, or disengaged entirely. For those with visual impairments, these barriers are even more limiting, stripping away the independence that accessible design should support. The Plus 15's current wayfinding system fails to deliver on the most basic expectations: helping users locate

where they are, understand their surroundings, and move confidently through the space. Until these core issues are addressed, the system will continue to exclude everyone that it was designed to serve.

Audience



“More than 85,000 Calgarians are blind, deafblind, or have low vision” - (CINB, 2024).

Evidently, that’s a lot of people—many of whom rely on or could benefit from public infrastructure like the Plus 15 to navigate the city! The primary audience for this project is individuals with visual impairments—both Calgarians and visitors—whether they are new to or familiar with the Plus 15 network. This includes people with any level of vision loss, from partial impairment to complete blindness.

These users need signage and maps that are easy to notice, visually engaging, and accessible. This means high contrast, large and legible fonts, reduced visual clutter, and consistent placement. Maps should be zoomable or scalable and include alternatives like tactile or audio options. Most importantly, users need to be able to orient themselves confidently and independently. A more accessible Plus 15 network won’t just serve visually impaired users—it will also directly improve the experience for everyone else using it.

Goal



Develop an intuitive, visually engaging, and memorable wayfinding system for the Plus 15 that enables the diverse groups who use—or could benefit from—the network to navigate it with confidence, joy, and ease. The top priority is ensuring full accessibility for visually impaired users by improving clarity, increasing colour contrast, and exploring tactile and/or audio features.

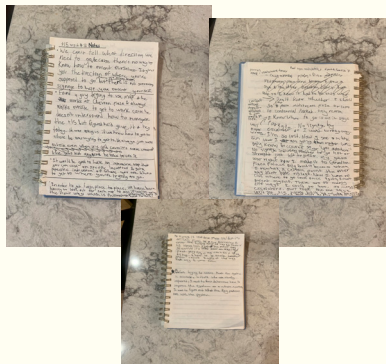
Design Process

Research

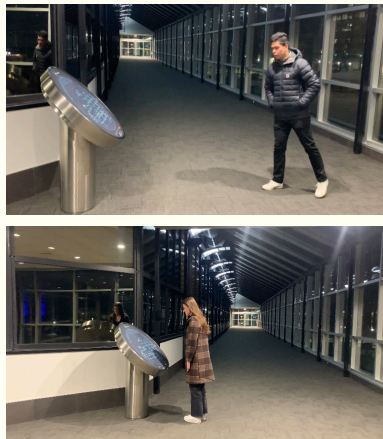
Before starting this project, I didn't even know what the Plus 15 was. However, once I began researching it, I quickly came across a wave of negativity online. This led me to question:

why do people dislike the Plus 15 so much? What's making it so difficult to navigate?

So, I went out and experienced it for myself. Over the course of four separate visits, I explored different parts of the Plus 15 and tried navigating solely using the existing maps and signage. I took handwritten think-aloud notes throughout to capture my real-time reactions, confusion, and moments of insight. This helped me later reflect on what the experience was actually like from the perspective of a new user.



Each time, I brought friends with me who also tried to get from point A to B using only the provided wayfinding tools. Some were very familiar with Calgary, others weren't. Some had used the Plus 15 before, and others hadn't. This gave me a broader range of perspectives and helped me see how the system affects a wide variety of users.



One day, I also ran a quick vision test with a friend who has better-than-20/20 eyesight, while I have fairly poor nearsightedness. I wanted to understand how readable the current static maps are for people with different types of vision. Legibility from a distance is crucial for all users, but especially important for visually

impaired users. Therefore, this quick test helped reveal how accessible (or inaccessible) the maps are in practice.

As demonstrated in the previous photographs, this is the point where we each could just start making out the content. To read it comfortably, we both had to move even closer. I had to stand about a foot away to see the text clearly, while my friend needed to be about five feet away. This confirmed that the maps need to have greater legibility from a distance, which was a valuable insight to later developing an effective solution to this problem.

One of the most memorable moments from my research was when a man approached us at a Plus 15 map, asking for directions to Chevron Plaza—his workplace. Even though it's directly connected to the network, he admitted he actively avoids it because he always ends up lost. The only reason he was using it that day was because it was freezing outside. This was a clear example of how the system's poor wayfinding pushes even regular users away, rather than pulling them in.

"I always walk outside, because it's more convenient"

- (Office Worker, Chevron Plaza)

Furthermore, between each site visit, I also conducted desk research to better understand accessibility standards, inclusive wayfinding, and how other cities have tackled similar navigation challenges. This gave me a stronger foundation for understanding what the Plus 15 system should be doing—and where it was falling short.

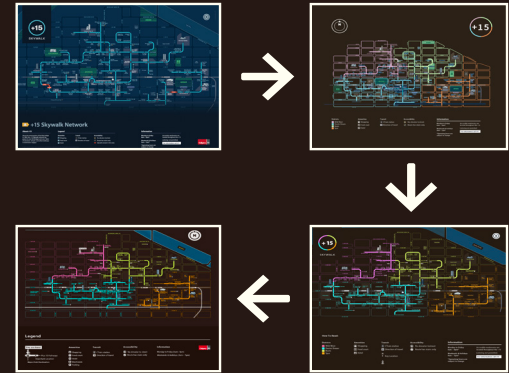
Synthesis

After gathering data from my Plus 15 site visits and desk research, I broke down my findings into organized lists and a comparison table to better understand what was and wasn't working in the current signage and mapping system. This process helped me clearly identify key strengths and weaknesses across both elements, which I could later draw from in developing a more meaningful and accessible solution.

Since Steers' new signage hasn't yet been installed in the Plus 15, I also compared the current signage to the new, upcoming signage designs. Analyzing both helped me pinpoint what each version does effectively, helping me discover attributes worth building upon for my own signage.

Concept Development

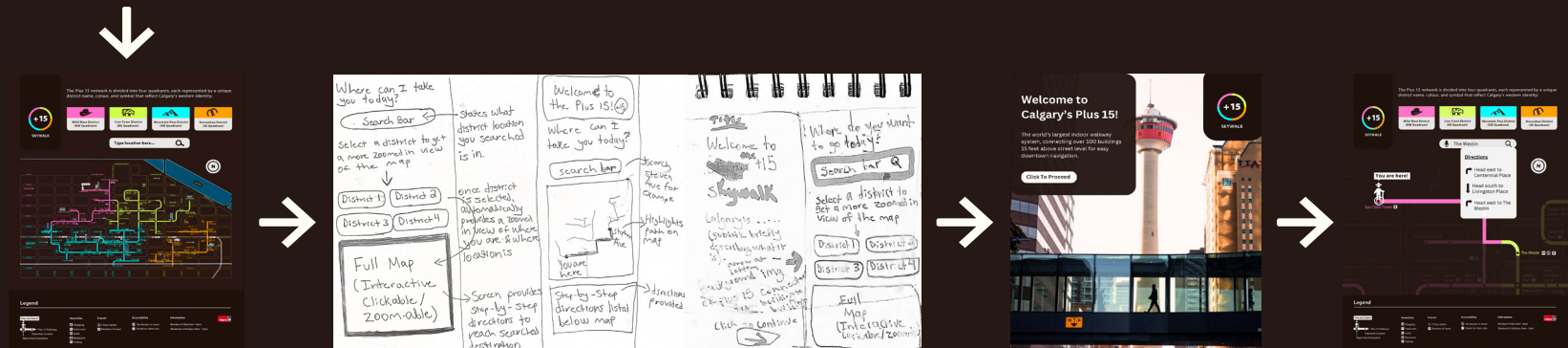
I started editing the existing Plus 15 map using a fully editable vector file created by Steer. This gave me complete control over the layout, text, colours, and visual elements, making it easier to focus on what needed to be improved without starting from scratch. Since the structure was already in place, I didn't begin with hand sketches. Instead, I went straight into refining the digital map—removing visual clutter, enlarging text for better readability, and dimming background elements to bring forward the most important information. I also added key amenities that were missing from the original map, such as parking and washroom locations. In the legend, I also clarified symbols that were previously unexplained—like the different types of circles along the Plus 15 pathways.



<p>Color Picker Alpha</p> <p>Contrast Ratio: 7.04:1</p> <p>Normal Text</p> <p>Large Text</p> <p>Graphical Objects and User Interface Components</p>	<p>Color Picker Alpha</p> <p>Contrast Ratio: 15.08:1</p> <p>Normal Text</p> <p>Large Text</p> <p>Graphical Objects and User Interface Components</p>	<p>Color Picker Alpha</p> <p>Contrast Ratio: 13.69:1</p> <p>Normal Text</p> <p>Large Text</p> <p>Graphical Objects and User Interface Components</p>	<p>Color Picker Alpha</p> <p>Contrast Ratio: 8.69:1</p> <p>Normal Text</p> <p>Large Text</p> <p>Graphical Objects and User Interface Components</p>
<p>Wild West District (NW Quadrant)</p>	<p>Cow Town District (NE Quadrant)</p>	<p>Mountain Pass District (SW Quadrant)</p>	<p>Horseshoe District (SE Quadrant)</p>

Trichromatic View	Anomalous Trichromacy	Dichromatic View	Monochromatic View
<p>Normal</p>	<p>Red-Weak/Protanomaly</p>	<p>Red-Blind/Protanopia</p>	<p>Blue Cone Monochromacy</p>
	<p>Green-Weak/Deuteranomaly</p>	<p>Green-Blind/Deuteranopia</p>	
	<p>Blue-Weak/Tritanomaly</p>	<p>Blue-Weak/Tritanopia</p>	

With a solid layout, I shifted my focus to visual identity. I carefully developed a colour palette that was vibrant, attention-grabbing, and fully accessible. Using tools like Coblis and WebAIM, I tested colour combinations to ensure strong contrast and distinguishability for users with colour blindness. I also created Calgary-inspired district symbols and playful names to bring personality and familiarity to the system. These visual choices were key to achieving clarity, accessibility, and engagement. With the map system established, I began sketching ideas for the kiosk interface—exploring whether it should open directly to the map or start with a welcome screen introducing the Plus 15. I tested different layouts for features like search and district navigation. Once I landed on a direction that felt intuitive, I digitized the design.



Furthermore, signage explorations focused on improving legibility and aligning visual language with the updated map system. With already digitized district colour, name, and symbol combinations in my map, this made it easier to go straight to digitizing potential signage designs, rather than taking the time to hand sketch.

Furthermore, my early signage explorations focused on improving legibility and ensuring the visual language aligned with the updated map system. Since the district colours, names, and symbols were already digitized in the map, I was able to move straight into designing potential signage digitally, rather than starting with hand sketches.



Prototype

Originally, I planned to build a fully interactive prototype where users could manually type in a location, hit

search, and watch an animated route appear with directions—similar to Google Maps. I spent a lot of time researching how to make this possible through coding, but due to technical limitations and time constraints, I had to pivot and find a more creative workaround.

I created a sequence of screenshots in Adobe Express, using timed animations to form a video that simulates how a real user would interact with a kiosk—reading information, typing a destination, tapping the search icon, and watching the screen zoom into the correct district, with a highlighted route and step-by-step directions appearing.

Each interaction was timed to reflect the natural pacing of a real user, allowing me to effectively communicate the layout, functionality, and user flow—even without a fully coded prototype. This approach let me demonstrate how a more accessible and engaging wayfinding system could work in practice.

Watch the prototype:

<https://drive.google.com/file/d/1a-361al7jLazPGuCAwUrYmSuLLiFrYfq/view?usp=sharing>

I designed three types of signage: *ceiling mounted signage* for mid hallway orientation, *gateway signage* above bridge doorways for navigating new building connections, and *cube signage* above large kiosks to navigate key four way junctions.

Gateway Signage for Building Connections

Calgary City Centre

- Jamieson Place (E)
← 1 min
- 240FOURTH (S)
→ 3 min
- The International (S)
↓ 5 min

Ceiling Mounted Mid Hallway Signage

Eau Claire Place II

- Altius Centre (E)
→ 1 min
- Shell Centre (N)
↑ 5 min
- 400 Third Ave (N)
↑ 6 min

Four Way Key Junction Cube Signage

TD Square

- Intact Place (N)
↑ 2 min
- Stephen Ave. Place (E)
→ 3 min
- Bankers Hall (S)
↓ 5 min
- Denovian Gardens (W)
← 4 min

User Testing

I conducted 10 user tests on my kiosk map prototype with visually impaired participants aged 20–60, including current and former Plus 15 workers and people unfamiliar with the system. Using a think-aloud method, I paused the prototype at key moments to hear participants' thoughts throughout the entire test, while observing how they navigated the interface at different stages.

All users successfully searched for and found the assigned location (The Westin), confirming the map's clarity and usability. They found the step-by-step directions easy to follow and appreciated features like the zoom-in tool for accessibility. Several also commented on the engaging, Calgary-themed design, which made the experience feel fun and approachable.

While feedback was largely positive, a few helpful suggestions came up: adding walking time, moving the search bar, ensuring directions don't overlap the animated route, and adding a clickable audio option on the home screen. These insights directly shaped my final design refinements.

Final kiosk map design with user feedback implementation: <https://drive.google.com/file/d/1Ae57mkL4xIJ78YgsQYZxmXF3On9AZrMn/view?usp=sharing>

I couldn't formally user test my signage



prototypes due to time constraints, but I planned to test them in the Plus 15 with visually impaired users to assess visibility at different distances. Since signage was a secondary support to the map, this wasn't a major setback. I still received informal feedback throughout the design process, which helped refine content, visual hierarchy, and overall clarity.

Implementation

With user feedback integrated into the signage and map designs, and with full support from the City of Calgary and Plus 15 business owners, the new wayfinding system is ready to launch—starting with the Mountain Pass District, which sees the highest foot traffic and features some of the most complex intersections in the network. From there, signage and kiosk updates can be expanded across the system in phases, guided by user feedback and traffic patterns.

All existing map kiosk pedestals will remain in place, as they are already well distributed across the network at key decision points for navigation. These kiosks used to be interactive

touchscreens and still have power outlets and cords, making this installation simpler and more affordable. Each of these kiosks will have accessible touchscreens with anti-glare glass to support legibility and reduce visual strain. This will help everyone receive optimized sight—especially aiding visually impaired users. These kiosks will look like the one in the image below and will function as demonstrated in my finalized map prototype (refer to user testing link).

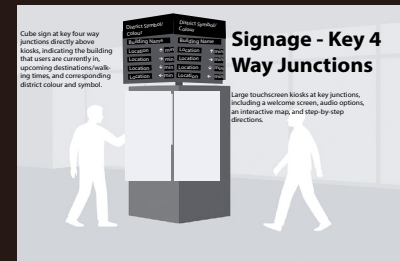


In spacious, high-traffic four-way junctions—where users often feel most disoriented—large freestanding kiosks will be placed at the center of the space where all four paths meet. These kiosks will use the same touchscreen interface as others in the network but will be scaled up to remain visible and accessible in busier areas.

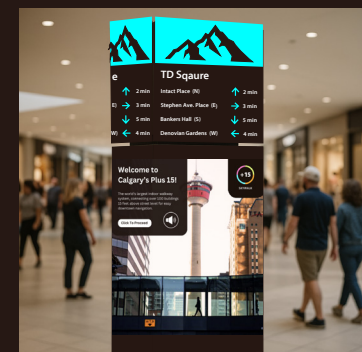
Above each kiosk, a suspended cube sign will be mounted about 7–8 ft high, with each face angled toward one

of the four approach directions. Each side will display directional arrows and labels aligned to the viewer's perspective. Made from durable, high-contrast vinyl, the signage will be easy to read from a distance.

For visually impaired users—my primary audience—having large, eye-catching, and clearly placed wayfinding tools in these key locations is essential. It supports independent navigation, reduces confusion, and makes the system more welcoming and inclusive.



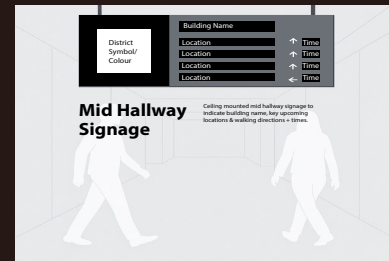
TD Square, located in the Mountain Pass District, is a prime example of a high-traffic, spacious junction where many people get lost due to poor wayfinding tools. Installing a kiosk with directional cube signage above it here would greatly improve visibility, clarity, and accessibility—making navigation easier for everyone.



Existing gateway signage at building connections is already well-placed across the network above the start and end of skywalk bridge doors. The current signage in the network will simply be updated with my design that achieves improved clarity, visual engagement, and accessibility.



Mid-hallway signage, currently missing from the system, is crucial for helping users navigate the Plus 15 network with ease—especially along longer stretches where it's easy to forget which turns to take, or when entering from side entrances where no gateway signage is present.



All signs will be vinyl printed and mounted on lightweight aluminum panels, allowing for easy replacement if updates or changes are needed. They will be sized for visibility, follow accessibility standards, and be mounted at consistent eye level. The use of bold visuals and district-specific cues will make navigation intuitive and seamless—especially when paired with the new map kiosks.

are blind can manually scan. To further support non-visual navigation, I would consider adding tactile buttons along the walls that users could press to have the signage information read aloud.

To assist with spatial orientation, I would also explore using different floor textures—such as tactile guiding strips—to help blind users navigate key decision points or follow consistent paths through the network. For the map, I would introduce bilingual options to better support Calgary's diverse population, ensuring information is accessible to a wider range of users.

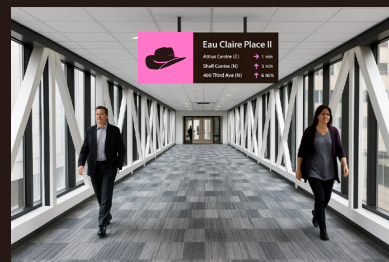


This signage will include all the same elements as the gateway signage but will be ceiling-mounted and double-sided for visibility from both directions. Adding these signs throughout the network will ensure users always know where they are and where to go next.

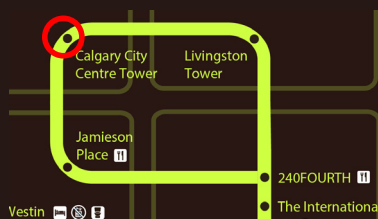
There are many manufacturers capable of producing and installing both the signage and kiosks, making this system highly feasible to implement. Because the materials are common and the construction straightforward, ongoing maintenance will be simple and cost-effective. Updates to routes or destinations on printed signage can be made easily by replacing the vinyl layer on the aluminum panels.

Additionally, I would update the current Plus 15 app design to align with my wayfinding system changes, finding ways to better integrate accessibility features (eg, high-contrast mode, screen reader compatibility, audio navigation, etc). This would allow users to access personalized, accessible directions on their phones—extending the impact of the kiosk maps beyond physical touchpoints.

Calgary City Centre, located in the Cow Town District, is an example of one of the many locations where gateway signage will be installed.



For digital kiosks, updates can be managed remotely through a central content management system, allowing for real-time changes to maps, directions, or alerts—ensuring the wayfinding experience remains current, accurate, and user-friendly over time.



Eau Claire Place II, located in the Wild West District, is an example of one of the many buildings with long walking stretches before any new gateway signage currently appears. Signage installation in areas like this will benefit users in orienting themselves in the network.

Future Developments

With more time, I would expand the signage system by exploring the addition of outdoor signage to help users transition more easily into the Plus 15 from street level. I would also continue developing more indoor signage, including wall-mounted signs with integrated Braille that users who

Finally, I would carry out my plan of conducting signage user testing in the Plus 15 to fine-tune text sizes, placement heights, and signage visibility for users with various visual impairments. These future developments would build on the strong foundation already in place, moving the system even closer to being fully clear and accessible for all.

Theoretical Grounding

Cognition

To make the Plus 15 easier to navigate, I leaned on core principles of cognition. I used **chunking** by dividing the system into four directional quadrants—Northwest, Northeast, Southwest, and Southeast. This breaks the network into smaller, more manageable pieces, reducing **cognitive information overload** and making it easier to process. I also applied **dual coding theory** by pairing each quadrant with a bold colour and a Calgary-themed symbol. This combination of visuals and text helps increase a users' **memory** of where they are and helps them find their way faster. I also designed with **processing fluency** in mind—keeping layouts clean, signage legible, and visual contrast strong—so users can absorb and act on information quickly without confusion.

Biases

Several cognitive biases also shaped my decisions. The use of consistent quadrant labels helps orient users through the **anchoring bias**, giving them a fixed mental reference point. I leaned into the **salience bias** by making the signage bold, high-contrast, and visually distinct. Steers' signage and map designs blend into the environment—it looks generic like it could exist in any city. In contrast, my redesign uses colours, symbols, and layouts that are visually unique and unmistakably Calgarian, making them easier to notice, remember, and act on. To avoid **choice overload**, I simplified what users see at any given moment with my map and signage designs, reducing unnecessary details and focusing only on navigation essentials. I also considered the **mere exposure effect**—by repeating icons, colours, and layout patterns across the system, users build familiarity and confidence over time. The **halo effect** plays a role too: by embedding Calgary's identity into the visuals, the system feels more approachable, local, and emotionally engaging. Finally, during user testing, I stayed mindful of the **observer expectancy effect**, keeping my behavior neutral so participants wouldn't feel pressured to respond a certain way.

Motivation

Motivation was also a key part of my design thinking. I wanted the system to feel intuitive and inviting, especially for users who may feel excluded or overwhelmed in public spaces like my target audience tends to experience. Calgary-inspired symbols and clear structure support **intrinsic motivation**, making the experience feel rewarding and personal. I also drew from **self-determination theory**, which emphasizes the importance of autonomy, competence, and relatedness. The quadrant system helps users feel in control of their navigation (autonomy), understand how the system works (competence), and feel connected to the space through culturally relevant design choices (relatedness). Together, these elements make the Plus 15 feel less like a confusing maze and more like a network built with users in mind.