

Urban Catalyst: Halifax's Waterfront Transit Hub

by

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Dalhousie University is located in Mi'kmaq'i,
the ancestral and unceded territory of the Mi'kmaq.
We are all Treaty people.

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For you, Justin.

Reminding me always that the path may not be straight, may not be clear, may not be easy and we may even have to make up the rules ourselves, but it is, however, beautiful, exciting and a wonder to behold and share.

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Abstract

Transportation systems are the central nervous systems of cities and afford transit the opportunity to impact and energize cities. Harnessing architecture's role in infrastructure design, my thesis explores the design of a waterfront transit hub in Halifax as an urban catalyst. Constructivism as a design strategy is employed to contend with the shifting of scales and test design moves. Understanding the complex urban fabric of Halifax reveal the significance of a hub as a point of intersection.

Positioning a multi-modal hub on the edge - of change, of the water, of systems, of the land- influence the facets of design for a multi-modal hub. Catering to the movement and rest of this building typology, across scales, allow for urban contextual integration. The transit hub can re-energize Halifax's downtown and intends to act as an urban catalyst, with many happy relationships with accidental functions.

Acknowledgements

This architectural pursuit would not have been so fruitful without the support of people in my life, keeping me in motion on a path, to whom I wish to acknowledge.

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Most importantly, thank-you Justin.

Chapter 1: A Personal Experience of Transit

My Experience of Halifax

Halifax is undergoing significant population growth, leading to a rapid urbanization and densification of the city. As the cityscape evolves and transforms, the necessity for efficient mobility becomes increasingly paramount. Unfortunately, the existing transportation systems often operate in isolation, causing friction rather than cohesion in the overall urban experience for both residents and visitors. Recognizing the vital role that transit systems play and the potential that their nodes of intersection have in creating dynamic and transformative experiences is exciting and brings to question how a transit hub can re-energize Halifax's downtown.

Having been a resident of Halifax for the past 12 years, I have actively engaged with the city's diverse transportation modes. My experiences range from the perspective of using a personal vehicle – an integral part of the city's infrastructure – to navigating the streets on a bicycle, utilizing buses for transit, and employing a combination of bike and ferry. More recently, I have embraced emerging trends in micro-mobility and vehicle sharing.

Through these varied interactions with transportation systems, I have gained a profound understanding not only of each independent mode of transportation but also of their interconnectedness within the urban fabric. Observing the city from different vantage points has allowed me to recognize the opportunities for architecture to provide integration and constructive interaction amid transit infrastructure. In Halifax's dynamic urban environment, my intention is to



Figure 1: Epistemic object model exploring rigidity of systems and nodal junctions

explore the design of a transit hub that acts as a node that weaves these disparate modes into a more efficient and mindful approach to urban mobility, effectively contributing to a seamless transportation experience for all that can be explored and celebrated at nodes - of architecture.

A Transit Hub on the Peninsula

A Paradigm Shift

Given Halifax's rapid expansion, deliberate recentering of the downtown is essential. Establishing a transit hub as the center of downtown facilitates convenient access through a single node while affording the potential to stimulate development. Leveraging the high volume of people interacting with this building type offers a front door for the city's inhabitants and visitors, and represents a significant departure from Halifax's previous strategies.

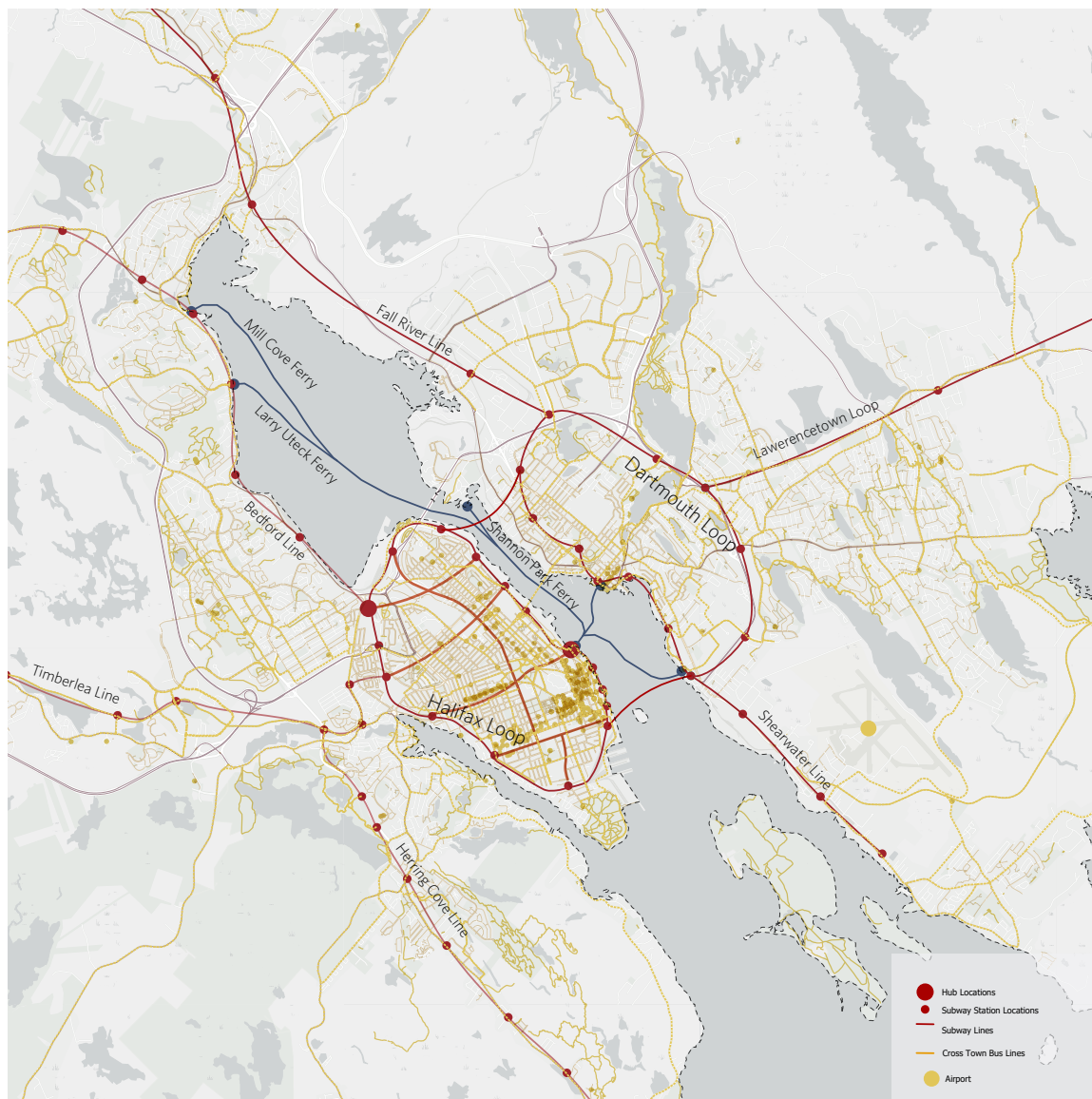


Figure 2: 1:50 000 Proposed regional system map with a complete Dartmouth and Halifax loop, extending to municipal neighborhoods, cross peninsula bus routes and connecting ferry lines.

The Vision

The envisioned transit hub in downtown Halifax epitomizes this concept, poised to instigate change within the city. By harnessing the influential power of architecture alongside the benefits of efficient urban mobility and prioritized transit, this convergence within a single edifice can fundamentally alter the pulse of the street, the neighborhood, and the city at large.

Global Precedent



Figure 3: Grand Central Station in New York City, (Rinhardt 1940)

Transit stations have a rich history of connecting people to places. In the late 1800s, train stations around the world served as thresholds into the city and, as such, architects prioritized designing these buildings as grand entrances to the cities themselves. As our modern world becomes more connected, transit stations worldwide have evolved. The transit hub typology now centralizes activity and encompasses the design of interconnected systems. Looking to buildings globally, this thesis finds influence from multiple case studies to inform major themes of spatial qualities, system integration, movement and urban cataclysm.

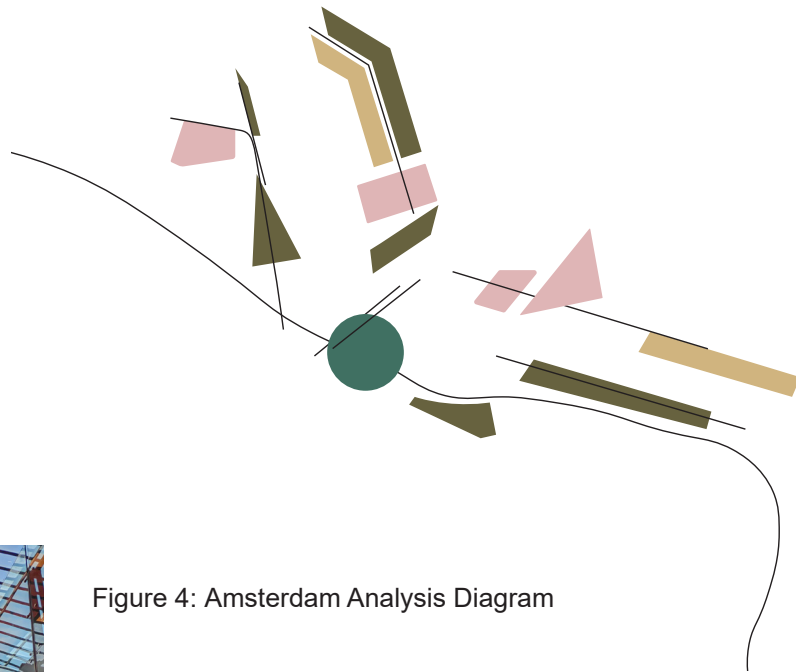


Figure 4: Amsterdam Analysis Diagram

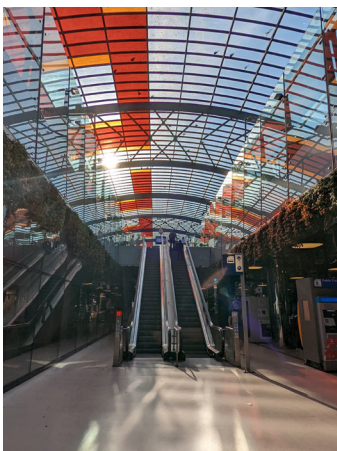


Figure 5: Amsterdam Hub Arrival

Amsterdam Central Station – System Integration

Amsterdam's Central Station serves as a pivotal point of reference for the themes explored in this thesis. Within this bustling transportation hub, a diverse array of actors converge - including trains, buses, ferries, cars, bicycles, pedestrians, trams, and subways. Despite this complexity, the station effectively manages development and growth



Figure 6: Amsterdam Hub
Magic

within existing constraints while paying homage to its rich cultural and physical heritage.

Noteworthy additions to the station include a raised bus platform, an underground car tunnel, and a ferry platform. These elements are intricately woven into the station's layout, seamlessly connecting bike and pedestrian paths along the most convenient routes. This station benefits from its flat topography, simplifying navigation and accessibility for travelers. Of particular interest are the interior conditions of the station. The transition from the below-ground train platform to the main concourse, the convergence of transportation modes and people, as well as the threshold between water and land exemplify conditions explored within this thesis.

Milan Central Station – Urban Catalyst

Milano Centrale, the busiest train station in Milan, is situated near its second busiest station, Milano Porta Garibaldi. The area between these two stations, known as the Porta Nuova district, showcases innovative solutions to urban growth challenges and serves as a hub for avant-garde architecture, design, and environmental conservation efforts. This district is undergoing one of the largest urban redevelopment projects in Europe, symbolizing the catalytic opportunities presented by the proximity of major transit nodes within the city.

TWA Flight Center, Eero Saarinen – Movement

The TWA Flight Center demonstrates a unique blend of stasis and dynamism tailored to the demands of a bustling airport. Despite its smaller scale, the design effectively delineates spaces for rest and movement. This clarity in



Figure 7: TWA Flight Center
(Stoller 1962)

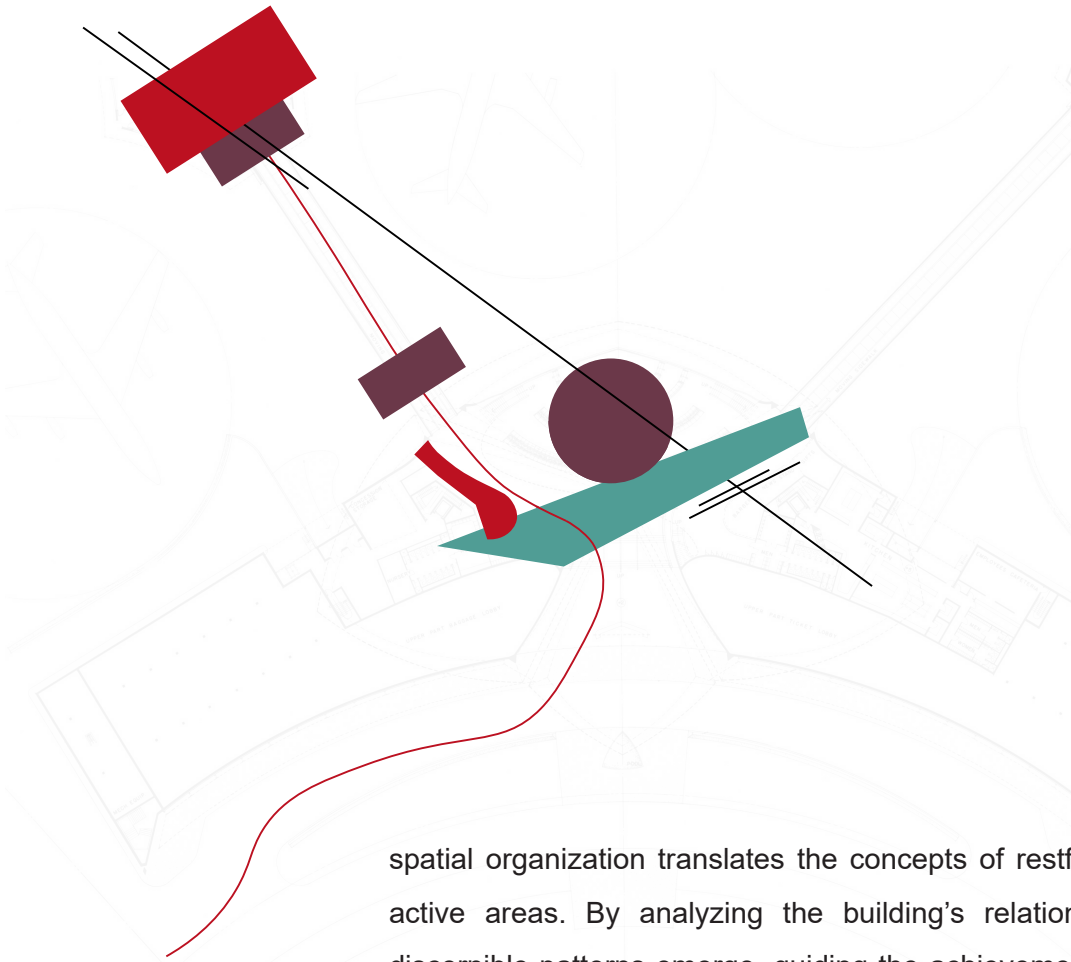


Figure 8: TWA Analysis Diagram

spatial organization translates the concepts of restful and active areas. By analyzing the building's relationships, discernible patterns emerge, guiding the achievement of a harmonious spatial balance.

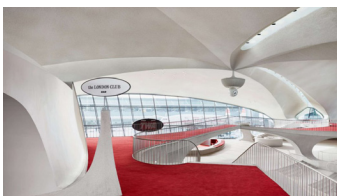


Figure 9: TWA Interior Circulation (Mitchell n.d.)

Color and form play pivotal roles in shaping the Flight Center, conveying an invigorating sense of movement. Through strategic implementation, these design elements communicate the excitement inherent in air travel, enhancing the overall experience of passengers and visitors alike.

Maxxi Museum, Zaha Hadid – Spatial Qualities

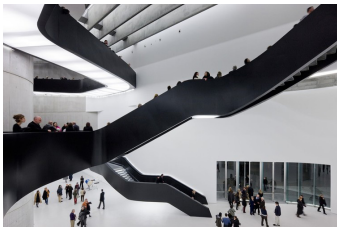


Figure 10: Maxxi Museum Atrium (Baan 2019)

The spatial and circulation systems of the Maxxi Museum emphasize modernist forms inspired by suprematist artists, resulting in a dynamic visual language. This design approach creatively utilizes materials, light, and structural articulation within circulation systems to convey movement

directionality. Contrasting curves and playful elements are integrated into the design, contributing to an engaging and stimulating spatial experience for visitors.

Urban Catalyst

Understanding Urban Dynamics

Buildings inherently possess the remarkable capacity to shape their surroundings. Their scale dictates a proportional opportunity to modulate and shift the rhythm of the urban fabric they inhabit. Henri Lefebvre's analysis of city dynamics describes urban spaces that weave together various elements to create transitions and imbrications across scales – from the intimate bedroom to the bustling streets (Lefebvre 2004, 88). A new residence alters a street's cadence while adding a café introduces fresh energy to a neighborhood. Likewise, a transit hub can invigorate redevelopment, fostering new uses and dynamics within a city.

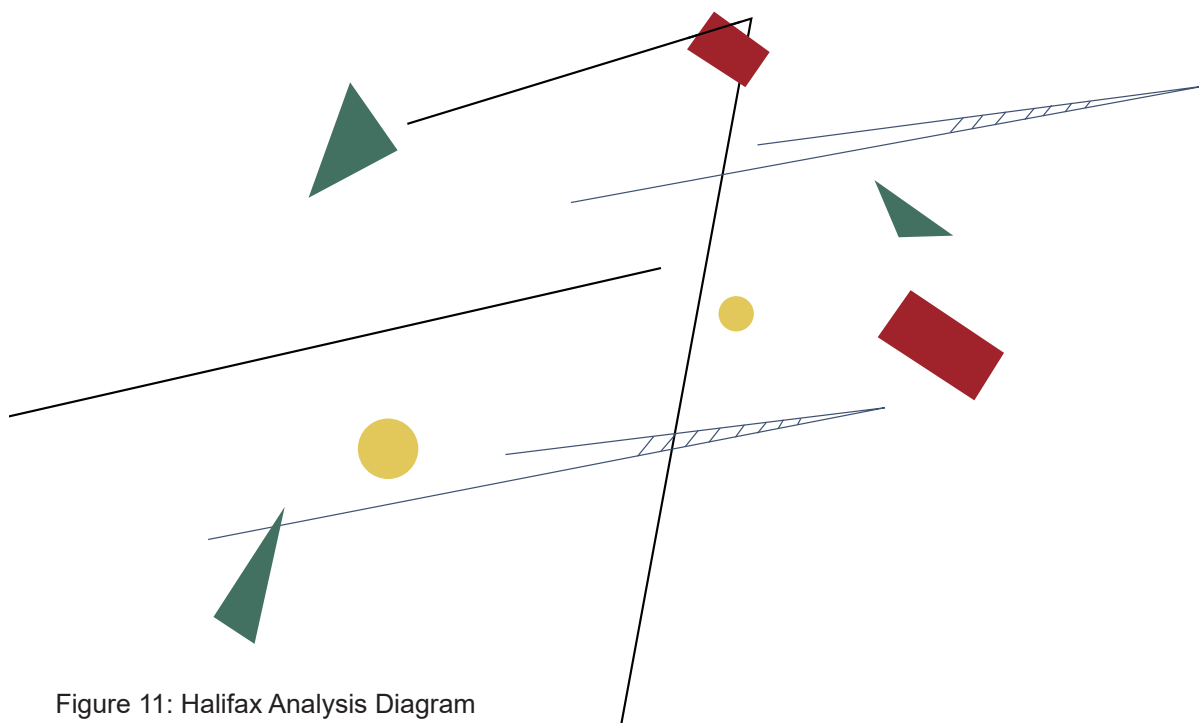


Figure 11: Halifax Analysis Diagram

Changing Patterns of Living, Working, and Moving

The idea of downtown has been rapidly shifting to focus on a place for housing. As this continued increase in housing stock dilutes the concept of downtown as a place to be and a place to go, a call to focus downtown areas as places to house specific large gathering program types help reinforce the identity of a downtown. To enable downtown to flourish and remain relevant, a transit hub is optimal for stimulating this idea and injecting people into the heart of downtown as efficiently as possible.

Transit Hubs as Urban Catalyst

Addressing Traffic Congestion

As population growth continues in Halifax, efficient urban mobility is paramount. As the growth accelerates, so does the number of vehicles on the road, leading to proven traffic congestion. Deploying efficient urban mobility strategies such as improved public transit, bike lanes, and pedestrian-friendly infrastructure works toward alleviating congestion, reducing travel times, and improving the overall quality of life in the city. However, critical to this planning are the system conversion points.

Supporting Economic Development

Efficient urban mobility transcends mere transportation logistics; it serves as a fundamental driver of urban prosperity but many barriers to infrastructure investment focus on the economic cost and not on the rich potential for economic growth. It facilitates the movement of people and goods, supports businesses, and attracts investment. By investing in infrastructure and transportation planning, Halifax can enhance its competitiveness and stimulate

economic development. Currently, \$1B of municipal investment is focused solely on highway infrastructure, with no budget allowance for Halifax's alternative transportation infrastructure, even the recently approved BRT scheme (Bousquet 2023).

Halifax's Neglectful Urban Planning

Halifax, according to Donovan (2018), resonates with dissonance due to its reliance on a car-centric infrastructure. This discordant approach, as highlighted by Lefebvre's (2006) distinction between everyday and extra-everyday rhythms, incurs environmental, social, and economic costs, disrupting the fluid movement and damaging the overall city experience. Urgent shifts are required to change the approach and prioritize alternative transportation modes for a sustainable and harmonious urban growth.

When examining current nodes within the city, it is evident that some nodes like the Alderney Ferry Terminal operate efficiently, seamlessly integrating various systems, creating a rhythmic intertwining in the daily life of its residents. In other instances, there are nodes that function sub-optimally, disrupting the natural cadence of the urban experience by considering only a fraction of the layered transportation systems. Furthermore, there are instances where nodes neglect the abundant opportunities to intricately weave together different systems, resulting in a disjointed urban experience. Without capturing the opportunities to coordinate convergence, the city risks perpetuating collisions and disappointments among its populace, disrupting the harmonious rhythms of urban living.

Halifax's Urban Catalyst

By functioning as a dynamic urban catalyst, the design of a central transit hub beckons inhabitants from far reaches to engage with the downtown, spurring the demand for complementary businesses, amenities, and residential spaces at its periphery. In its wake, underutilized structures find renewal and purpose, their proximity to the hub breathing new life into surrounding areas. This transformative development echoes Halifax's own experience with the Central Library's arrival in 2014, which ignited a revitalization of the Spring Garden Road streetscape and beyond.

Architecture in Infrastructure Design

Architecture plays a pivotal role in shaping the urban landscape in myriad ways. Steven Holl described architecture as being at the intersection of actual phenomena and the idea that drives it (Holl and Arc en rêve centre d'architecture 1996, 22), combining the idea of a building with its expression through the size, shape, and style contribute significantly to a city's visual identity. Tall skyscrapers, iconic landmarks, and distinctive structures define the skyline, creating a unique sense of place that attracts residents and visitors alike. This dynamic interplay of forces creates spaces that reflect the complex nature of urban life and can be broken down further into spatial, social, cultural and environmental qualities.

Buildings influence spatial arrangements, dictating the layout and organization of urban spaces. They define streetscapes, squares, and plazas, shaping the flow of pedestrian and vehicular traffic while crafting distinct urban experiences. The functional diversity of buildings, ranging from residential to commercial, industrial, and cultural, molds

the urban fabric with mixed-use developments integrating various functions within single buildings or neighborhoods, fostering walkability and vibrancy.

Beyond their utilitarian roles, buildings serve as vital hubs for social interaction and community engagement. Public facilities like libraries, museums, transportation hubs, and community centers act as focal points for cultural and educational activities. Commercial establishments such as cafes, restaurants, and shops foster socializing and commerce, nurturing a sense of belonging within the community and enhancing economic vitality.

Historic buildings and landmarks play a crucial role in preserving a city's cultural heritage. Reflecting unique architectural styles, traditions, and histories, these structures contribute to the city's identity and continuity. Preservation efforts safeguard their cultural significance, enriching the urban landscape and fostering a sense of connection to the past.

Environmental considerations are also paramount, as buildings impact energy consumption, greenhouse gas emissions, and urban heat island effects. Embracing sustainable building design and green infrastructure mitigates these impacts, promoting energy efficiency, reducing carbon footprints, and enhancing urban biodiversity.

In today's construction landscape, the integration of diverse programmatic responses – commerce, culture, and transit-oriented – enriches the design of an urban hub recentring the city of Halifax. Alive with movement and offering a gradient of spaces for rest and reflection, this hub encourages to evolve and shape the urban experience.

Redefining Urban Priorities [human centric design]

Recognizing the intricacies of human interaction, a notable shift towards prioritizing human experience over vehicular dominance is at the core of many contemporary urban initiatives. Jan Gehl's (1987, 47) critique of functionalism's urban planning approach highlights its narrow focus on physical infrastructure, neglecting the vital experiential elements that foster genuine connections between people and their urban surroundings. Considering this perspective, initiatives concerning civic infrastructure need to prioritize the human experience above all else. Rather than centering design around car parking logistics or disregarding alternative modes of transportation crucial for fostering a diverse urban community, emphasis on creating environments that resonate with and enhance the lived experiences of city dwellers allow a city's identity to be both unique and lasting.

Navigating Urban Life Through Efficient Routes and Sensory Landmarks

Efficient and welcoming movement is essential for fostering a well-connected and comprehensive city life. Enhancing individuals' understanding of the built environment and its place within the larger city context involves guiding people along paths between systems and through buildings to support their individual needs. Scaling buildings creates conditions for spatial parallax, offering unique and memorable spatial experiences as individuals navigate these paths (Holl and Arc en rêve centre d'architecture 1996, 22).

Strategically placed landmarks - by way of transit stops and stations - play a crucial role in navigating a city, contributing to its distinct identity and aiding in wayfinding (Lynch 1960, 78). Daily commuting experiences, marked by landmarks

and rhythmic transitions on the chosen routes, encompass elements felt underfoot on the skin, in the ears, and the eyes, contributing to a holistic understanding of the city's daily rhythm and the importance of well-defined routes in shaping it.

Rhythms

Environments provide opportunities to align spatial configuration with activity. Implementing this approach across various settings fosters a cohesive architectural understanding. Activities can typically be divided into states of movement and staying. The ongoing rhythm created by these activities influences how individuals experience their surroundings. The interplay between dynamism and stasis across various settings within urban landscapes forms the foundation for memorable user experiences, leaving a lasting impact as individuals navigate through them.

Spatial perception [sensory ambiance modulation]

The experience of space is a personal, individual experience. Factors that contribute to these include sensorial conditions – those of vision, temperature, sound, and air quality. Though many of these are heavily controlled in today's methods of construction, the modulation and varied conditions contribute to the overall experience of each person.

A space finds expression through the application of elements such as walls, ceilings, lighting, and pathways which guide the eye and spatially describe a sense of dynamism or stasis.

Dynamism refers to the perceived sense of movement or activity within a space. It encompasses the feeling of energy, flow, and change that occupants experience as

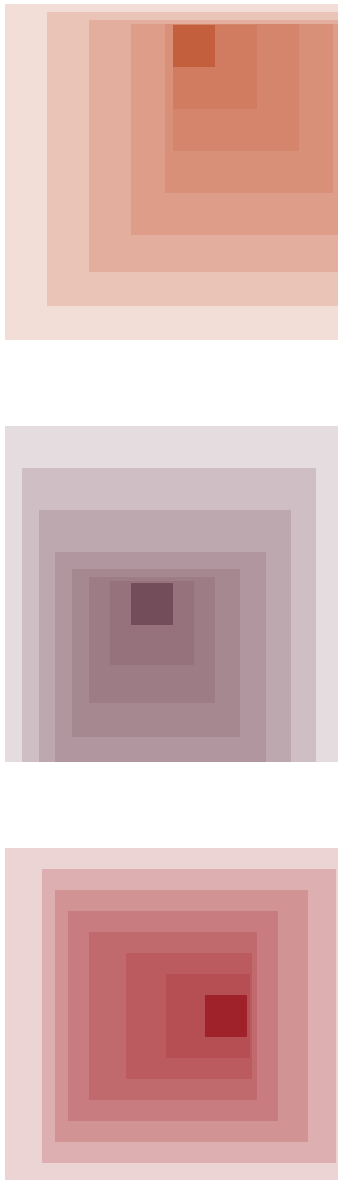


Figure 12: Movement Diagrams

they interact with architectural elements and environmental conditions. Elements such as lighting, pathways, and spatial arrangements can contribute to dynamism by guiding the eye and creating a sense of directionality or progression within the space. Dynamic spaces often evoke a sense of vitality, engagement, and exploration.

Stasis, on the other hand, denotes a sense of stillness, equilibrium, and stability within a space. It represents a state of rest or balance where there is minimal perceived movement or change. Spaces characterized by stasis often convey feelings of tranquility, serenity, and containment. Architectural elements and design features that contribute to stasis typically prioritize symmetry, harmony, and proportion, creating a sense of order and repose for occupants. Stasis can foster contemplation, relaxation, and a sense of security within a space.

Parallax [urban spatial dynamics]

Steven Holl's exploration of overlapping perspectives and spatial parallax aligns with the sensory experiences in daily commuting rhythms, emphasizing the dynamic nature of urban spaces (Holl and Arc en rêve centre d'architecture 1996, 22).

Holl (2000, 26) described parallax as the result of shifting perspectives caused by changes in the arrangement of surfaces defining space, contingent upon the viewer's position. As people navigate a building through concourses and circulation systems, the modification of planes which define these spaces begin to open opportunities to view the building's context in shifted perspectives. Framing specific views and affording commuters glimpses of the urban fabric within which they are moving enhances the urban

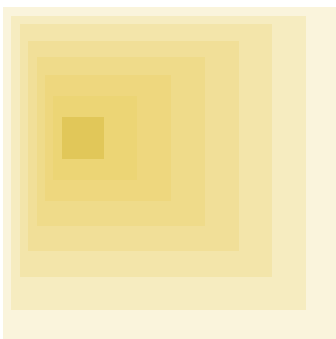


Figure 13: Movement Diagram

experience in individual ways from the inside out and vice versa.

Light as movement

The conditions of light as it interacts with space is perpetually in motion, contributing to the perception of spaces. The curiosity of what exists beyond layers of planes or around corners of surfaces intrigues the process of movement. Guidance through the building is aided with harnessing the power of light and of darkness in contrast. Aligning the qualities of light with the movement within a space helps guide users and construct a shared perception of the space.

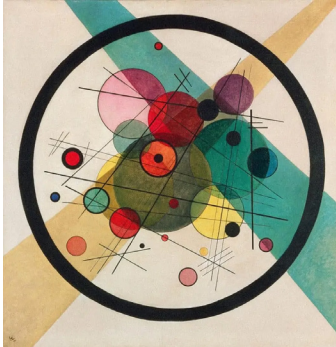


Figure 14: Circles in a Circle (Kandinsky 1923a)

Suprematism as Design Strategy

Abstract art, notation, and composition serve as my primary modes of exploration, allowing me to study existing or proposed elements and understand their relationships. By assigning specific colors, lines, and symbols while removing context, I can examine interactions independently of scale and context. Later, superimposing these findings back into the overall context, contributes to layered design decisions and shaping ideas from analysis through concept to implementation.

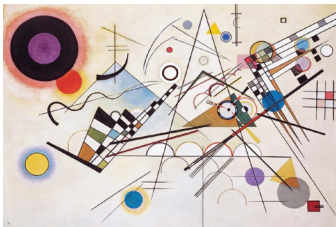


Figure 15: Composition VIII (Kandinsky 1923b)



Figure 16: Supremus № 56 (Malevich 1916)

The motivation behind this method lies in its versatility—the ability to seamlessly translate between hand-drawn and digital forms while comprehending relationships across different scales. Notably, suprematist artists such as Nikolai Seutin, Kasimir Malevich, Vassily Kandinsky, El Lissitzky, and Alexander Rodchenko have driven this stylistic approach.

Assumptions and Opportunities

As this thesis focuses primarily on the architectural opportunity and relevance in the intersection of multiple systems of transit, the following assumptions have been made that extend beyond the scope of this thesis but have been considered to aid in situating the architecture in a not-too-distant future.

Systems Design

Reconfiguring segments of Halifax's current transit systems to converge within this central hub aims to modernize the overall system to better suit contemporary needs and perspectives. Certain municipal initiatives are part of the conversation as illustrated below.

Integrated Mobility Plan, 2017

The Integrated Mobility Plan (IMP) guides investment in active transportation, transit, transportation demand management, goods movement, and the roadway network in Halifax.

The vision of the IMP is to create connected, healthy, affordable, and sustainable travel options. To do that, the plan focuses on: prioritizing the movement of people over vehicles; improving accessibility; creating links between people and communities; strengthening the relationship between transportation and land use decisions; and rethinking and redesigning our transportation system and communities. (Halifax Regional Municipality 2017)

All elements of the integrated mobility plan are being incorporated, with a strong focus on the implementation of complete street theory.

Bus Rapid Transit Strategy, 2020

The Rapid Transit Strategy includes a network of four Bus Rapid Transit (BRT) lines and three new ferry routes, which will promote the creation of more compact and walkable communities and increase mobility options alternative to private vehicles. (Halifax Regional Municipality 2020)



Figure 17: Integrated Mobility Plan (Halifax Regional Municipality 2017)

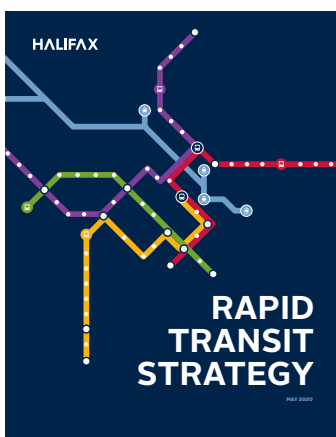


Figure 18: Rapid Transit Strategy (Halifax Regional Municipality 2020)

All elements of the BRT plan are being incorporated, with the only modification to relocate the waterfront ferry terminal into this central hub. Current proposals for the Mill Cove ferry terminal include propositions for modifying the current ferry terminal.

Cogswell District, 2019

This design includes elements which this thesis builds upon, with some elements being modified by this project.

The Cogswell District project will convert 16 acres of road infrastructure into a mixed-use neighborhood, extending the entrance of the downtown northwards and reuniting communities separated by the interchange lands. The urban street grid will be reinstated and will create development blocks capable of supporting new residential and commercial environments for 2,500 people. High quality dedicated cycling lanes, multi-use trails, new parks and open spaces, a reimagined transit hub, and a significant central urban square will transform this traffic-centric area into a livable pedestrian friendly area for people to live, work, and play. (Halifax Regional Municipality 2019)



Figure 19: Cogswell District Plan (Halifax Regional Municipality 2019)

The elements which remain include all elements north of Proctor Street - the north roundabout, the active transit greenway along Barrington Street, the pocket parks, etc. The elements which are being modified by this project include the “reimagined transit hub”, the denoted building lots B, C and D.

Fare System

Sustainable transportation initiatives play a crucial role in addressing environmental concerns and promoting equity in urban environments. Reliable transportation is essential for social equity, ensuring that all residents, regardless of income or location, have access to vital services, education, and employment opportunities. Of course, a system of transit requires fare payment and transportation agencies, like Metrolinx in Ontario (“Ontario’s One Fare Program”, n.d.), have been implementing fare capping principles. These principles allow free ridership after a certain number of rides within a given period. For instance, Burlington Transit offers free rides to passengers who take more than 40 trips in a month using the Presto fare card provided by Metrolinx. This approach ensures equitable access to transportation without prioritizing monthly pass affordability over individual rides. Additionally, locating payment terminals on board the various transportation vehicles eliminates in-terminal barriers, contributing to a smoother experience for all users. It’s worth noting that similar systems, such as PRESTO, operate effectively in other Canadian provinces.

Chapter 2: The Experience of Travel

Gaining access to the things we want and need requires us to move. This requirement involves a multitude of variables to help efficiently and effectively travel about; travel times, methods, access and affordability, most important in these acts of travel are points at which things change. Understanding this importance conveys the relevance to designing them to be beautiful, efficiently navigable, and easily understood, ultimately contributing to an overall positive transit experience. In the density of the urban fabric, every individual must contend with their own knowledge, emotions and understanding of paths and landmarks that work together in aiding travel.

It is architecture's role to celebrate and enhance the necessary experiences regarding travel and movement. At the human scale, sensual elements have great effects on this; direction of light, the sounds of buses braking, water sloshing, crowds moving, the aromas of cafes, the texture of the ground underfoot and the spatial qualities all help communicate movement and direction.

Urban Interactions

Examining the convergence of transportation modes with the goal of anchoring the downtown area prompts to consider the very definition of 'downtown.' If housing – given its current crisis – becomes the sole focus of downtown development, it will lead to an evening out of programmatic distribution. However, by dispersing programmatic spaces throughout the wider city, we contribute to a truly diverse urban landscape. Architects can leverage city thresholds,

particularly through transit stations, to enrich the overall fabric of the city while maintaining relevance to an active downtown.

Prioritizing Transit

As cities densify and evolve, transportation trends emerge to improve urban mobility. Trains historically shaped settlement centers, while cars led to stopover towns. Now, amidst climate concerns and the impact of individual vehicles, a shift toward multi-modal public transit is imminent. Cities like San Francisco, New York, and Oulu prioritize bus-only streets and biking infrastructure. As this trend continues, integrated systems become crucial.

Horrible Transit Hubs

Encountering a transit hub that leaves a lasting impression of confusion, anxiety, and overstimulation often results from multiple factors. These include navigation challenges, unclear signage, inadequate wayfinding, limited path options, environmental discomfort (such as exclusively outdoor waiting areas, undersized platforms, and poor ventilation), and interactions with the public (such as long waits, inefficient routes, unsafe conditions, and lack of security measures). Such negative experiences significantly impact the usability of the transportation systems it connects, potentially deterring people from fully engaging with the richness of the city.



Figure 20: Collage of Horrible Transit hub, denoting confusion and chaos.

Beautiful Transit Hubs

Encountering a beautifully designed transit hub results from a combination of often overlooked factors: architectural aesthetics, experiential elements, and convenience. These elements significantly contribute to a positive urban

experience. When thoughtfully aligned with the flow of people, visually appealing design and the use of quality materials create an easily navigable space that seamlessly guides and connects travelers. Efficient traffic patterns and passenger comfort further enhance the hub's appeal. Adequate space for unloading from various modes of transport, well-planned circulation, and modern conveniences (such as comfortable seating, clean facilities, and accessible amenities) all contribute to an overall positive experience. Transit hubs serve as meeting points for diverse travelers, offering both a collective and individual experience. Some find joy in the bustling movement of people, fostering a sense of connection with society. People-watching opportunities and services that make waiting enjoyable add to this positive engagement.

Our job as architects is to design spaces where human experiences can flourish – a long goodbye, a joyous reunion, an exciting gathering to begin a group journey – a transit hub offers these experiences time and time again.

Urban Movement

Movement with Landmarks

Navigating a city between landmarks offers unique opportunities to enrich urban experiences and deepen connection between people and their surroundings. Lefebvre's examination of squares and districts underscores the significance of landmarks, emphasizing the diverse nature of urban spaces (Lefebvre 2004). Scaling this critical quality from the city level down to both site and building scales, spatial organization using landmarks helps users engage and navigate complex and active spaces.

Lynch's emphasis on spatial qualities that enhance the image of paths (Lynch 1960, 54) adds depth to commuters' sensory experiences, shaping their perception of the city's daily rhythm. As individuals transition between various modes of transportation, diverse sensory environments emerge, catering to their needs for efficient transfer. These spaces should be thoughtfully designed to accommodate both rest and movement, thereby fostering harmonious urban connectivity.

Urban Spaces for Collective Interaction

Jenny Donovan introduces the social landscape as a stage for diverse collective activities. Cities facilitate shared experiences that contribute to the emotional capital of their inhabitants (Donovan 2018, 43). Donovan's emphasis on designing spaces that acknowledge and celebrate these varied patterns of community interaction underscores the importance of orchestrating diversity in the social fabric. By creating a city center that offers a gradient of collective spaces, the social landscape extends into this central building, leaving emotional traces with those who interact with it.

Integrated Urban Narratives

In line with Lefebvre's insights, formalizing spaces for interaction can be likened to composing a melodic narrative within the urban environment. Strategically placing areas of stasis, such as cafes and seating zones, seamlessly integrates people into the city's fabric. These elements serve as essential components for more meaningful engagement with the urban environment. Additionally, introducing food markets at key junctures of daily movement not only meets

practical needs but also enhances the allure of interacting with the surrounding architecture.

Spaces tailored for occasional seekers—whether city dwellers, visitors, or tourists—encompass extra-everyday spaces in the form of cultural landmarks, such as museums, aquariums, and performance halls. These landmarks add layers of utility that enrich the vibrancy of city life. Centralizing and interconnecting these attractions fosters a bustling city center teeming with the energy of diverse activities and people—a testament to the vitality of urban living.

Echoing Donovan’s perspective on the social landscape, cities serve as orchestrators of varied yet collective activities. Events and engagements unfold, enriching the social fabric and contributing to the emotional capital of all city dwellers. The significance lies in crafting spaces that not only recognize but also celebrate the diverse patterns of community interaction, thereby elevating the collective urban experience (Donovan 2018).

Significance of Hubs

Hubs serve as pivotal points of intersection for both users and systems. The magic of these interactions lies in their abundance and serendipity. Systematic route timing, synchronized with people’s daily schedules, creates moments of stasis that allow individuals to absorb and understand the building and its context. The diverse needs of users mirror the various requirements of transportation systems, ensuring efficient and effective operation.

Transitioning between modes necessitates a series of well-planned decisions to aid people’s movement through the hub itself. Clear pathways, notable landmarks, and effective

wayfinding conditions all contribute to the experience of everyone. The convergence of multiple systems empowers people to choose their preferred combination of travel, with the hub operating as the central nexus of information required for engaging with transportation systems.

For those who relish the hustle and bustle of city life, the hub offers strategically placed areas to sit and observe their preferred system or set of interactions. These rest zones correspond not only with views of systems in motion but also with the unloading of travelers. From a distance, observers can appreciate the arrival process, observe methods of movement, and witness the convergence of streams of people throughout the day.

Hubs as Points of Intersection

Journeying between landmarks within a city creates natural points of interaction, as Lefebvre suggests. These choreographed moments of synchronized movement unfold in spaces that become meeting points. Amid apparent disorder, underlying currents and order emerge through rhythms—whether accidental or determined encounters (Lefebvre 2004, 88). Paired seamlessly with areas of stasis, these environments allow individuals to engage with random encounters, unfamiliar faces, and the pulse of daily commuting. Scaling this understanding of collision points from the city scale to the human scale ensures that each person experiences moments that contribute to positive engagement with fellow city dwellers and the urban fabric itself.

Cadence, Movement, and Rest

In the design of a transit hub, the concepts of cadence and movement permeate every decision. Part of this design involves incorporating moments of rest within the overall rhythm, extending to the overall configuration of program and circulation distribution. Color and directionality are applied using gradients and varying intensities of color, which can subtly imply directionality and alignment with specific systems while color cues guide travelers intuitively, helping them navigate the hub. The design of architectural elements like ramps and stairs play a crucial role in communicating feelings of ascension and descension that contribute to the overall flow and ease of movement.

Ineffective hubs

An ineffective hub often emerges from a patchwork evolution—a gradual accumulation of layers added to the original system station. Unfortunately, this approach perpetuates the hierarchy of systems based on historical usage, resulting in wayfinding challenges. Travelers encounter a multitude of signs created at various times, lacking consistent symbology. The frustration and anxiety of navigating such hubs are palpable. Architecturally, transitioning from what feels like a grand hall into a confusing corridor extending to other modes of transportation leaves travelers bewildered and overwhelmed.

Effective hubs

When designing an effective hub comprehensively, careful consideration is given to the requirements of each system. This includes aspects such as waiting times, route patterns, intermodal connections, and appropriate berthing space.

By clearly defining the routes between different modes of transportation, the overall design language incorporates pivotal decision points that serve as nodes within the hub. Addressing these nodes within the building not only reduces stress but also enhances the overall comfort and efficiency of movement through the hub.

Chapter 3: A Transportation History of Halifax's Peninsula

Cultural History of Halifax

Halifax's Cultural Layers

The city's trajectory, shaped by its deep history and strategic harbor, continues to converge within the embrace of its diverse communities, fostering a collective memory of resilience and adaptation.

Halifax, rooted in Mi'kmaq history spanning over 13,000 years, shares a profound connection with its Chebucto namesake, "Kjipuktuk" or "Great Harbor." This name reflects its enduring importance to the people throughout time, serving as a sanctuary for the Mi'kmaq Clans, providing refuge, a place to beach canoes, and an entry point for hunting and fishing. The Mi'kmaq adapted their land use to seasonal changes, with coastal habitation for summer fishing and inland living for winter hunting, often relying on boats for travel (McDonald 2017). The harbor's unique shape endowed strategic advantages for protecting resources and inhabitants, discouraging entry as historical accounts tell of Mi'kmaq resistance, causing ships to vanish between the 1500s and 1600s.

As the roots of Mi'kmaq history collided with European contact in 1749, the convergence of cultures brought about a transformative period for Kjipuktuk. This formal contact ushered a period of tension and conflict, introducing diseases and turmoil to the Mi'kmaq, burying Kjipuktuk's shores in layers of erased history. Cornwallis' settlement, in response to the Utrecht agreement and England's expansion, established Halifax with a fortified wall and a

formal city grid, named after Cornwallis' friend, the Earl of Halifax.

Halifax's harbor played a pivotal role in both immigration and military history. Pier 2 at the foot of Cogswell Street operated as a major immigration point for the country. This area experienced a change in use during World War 1, when it operated as a major departure point for Canadian soldiers and a vital convoy assembly location. The wartime Explosion in 1917 reshaped Halifax, impacting development and transportation, creating a collision point between war and urban evolution. During World War II, Pier 2 again transformed into a military hub, focusing on soldier deployment and was transferred into military ownership. To accommodate ongoing immigration and the city's growing capacity, Pier 21 emerged as a new immigration point.

Urban renewal in the 1960s and 1970s erased heritage architecture and cleared slums for projects like the Cogswell interchange and lower-income housing infrastructure. The 1990s saw Halifax amalgamate with neighboring communities to form the Halifax Regional Municipality, facilitating inter community services, including transportation layers.

Halifax's Culture and Character

Arts and Culture

Halifax has a rich tradition of valuing music, art, and theater since its founding. These cultural expressions play integral roles in community life, social gatherings, and civic pride. Notable performing arts elements include Neptune Theatre, Shakespeare by the Sea, Eastern Front Theatre, and the Theatre Arts Guild.

Multicultural Diversity

Halifax's multiculturalism thrives due to a continued influx of immigrants from various countries. Celtic and Gaelic traditions continue to shape the city's cultural identity. Additionally, the historic African Nova Scotian community has significantly contributed to Halifax's cultural fabric. Recent waves of immigration have brought Greek, Lebanese, and other cultural influences, creating a dynamic and inclusive urban environment.

Design Influences

To ensure that the hub aligns with Halifax's identity, several design elements reflect the city's culture. Proximity to water, alignment with city circulation, and capturing ocean views and sounds are crucial for integrating the building seamlessly into the city's fabric.

Halifax's Transportation

Halifax, a city rich in both cultural and maritime history, boasts a tapestry of transportation systems that have formed and evolved routes through the city over centuries. From the enduring legacy of North America's oldest seawater ferry, operational since 1752, to the introduction of trains in the 18th century, Halifax has been a key player in the continental network. As modes of travel diversified, streetcars clattered through the downtown area, echoing a bygone era, and cars reshaped the urban landscape through the mid 1900s. The introduction of electric buses, cycling infrastructure, and the adoption of recent proposals for Bus Rapid Transit underscore Halifax's efforts to adapt its transportation systems to contemporary needs.

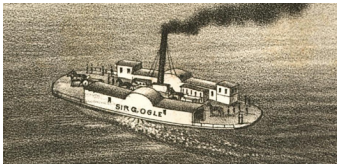


Figure 21: Halifax's Steam Ferry - Sir Charles Ogle (Ruger 1879)



Figure 22: Current Ferry Fleet Vessel (Hollingsworth 2023)



Figure 23: Approved New Ferry Fleet Vessel (Kilby n.d.)

Ferry

Linking the core of Dartmouth to the vibrant heart of Halifax, the seawater ferry stands as North America's oldest. Originally commissioned by Edward Cornwallis to transport goods across the harbour, the ferry's formal service commenced in 1752. An 1816 iteration of the ferry ingeniously utilized horses walking in circles to propel the boat until the subsequent introduction of steamboats.

Before the Angus L. Macdonald Bridge was erected in 1955, the ferry stood as the sole effective means of traversing the harbour. The post-war surge in population heightened demand, leading to the establishment of a two-ferry system in 1970. Presently, the ferry system maintains a diesel fuelled two-vessel fleet, yet faces challenges stemming from population growth and a lack of integration with other transportation systems.

As the city experiences these mounting population pressures and grapples with the environmental consequences of fossil fuel-driven transport, there is a heightened focus on modernizing the ferry fleet. Proposals include expanding services to encompass Bedford, Shannon Park, and Larry Uteck, thus alleviating strain on the existing system and shifting the fleet to electric vessels. While this new fleet presents an opportunity to address current challenges, it necessitates a fresh approach to accommodate the evolving needs of a growing city.

Train

In 1858, the advent of trains in Halifax ushered in a new era, providing crucial inland access for transporting both goods and people to the city and beyond. This strategic expansion

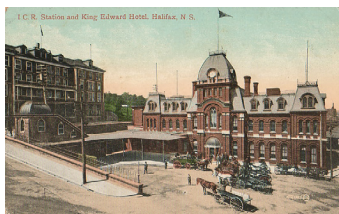


Figure 24: Intercolonial Railway's North Street Station (Ells 1915)



Figure 25: SS Andania and other vessels docked Pier 2 (MacAskill 1928)



Figure 26: Streetcar Birney 162 (Stephens 1949)

across Nova Scotia solidified Halifax's pivotal role in the burgeoning train network. The original line extended to Richmond Yards in the North end until 1877, culminating in the later construction of the North Street Station at the foot of North Street. The catastrophic harbour explosion of 1917 inflicted substantial damage on the North Street Station and was only repaired in a temporary fashion with intentions to move to the south end terminal under construction. With Pier 2 transitioning from an immigration hub into military control, the decommissioning and removal of rail lines along the peninsula's eastern edge ensued, leaving scant traces of their existence today.

The completion of the south end terminal was accompanied by the creation of train lines carving through the western edge of the peninsula. Since this pivotal shift in infrastructure, minimal modifications have been made to the infrastructure and buildings themselves.

Despite numerous proposals advocating for a commuter train system, several reasons, including substantial upfront and operating costs, have led to repeated denials (Draus 2019). The most recent plea urged the city to contemplate light rail commuter trains, prompting the government's response of deferral at present, with the possibility of reconsideration in the future (Draus 2019).

Streetcar

In 1866, the inaugural set of street rails was laid, marking the commencement of a transportation era where horse-drawn cars traversed these tracks. This network extended extensively through the heart of the downtown area, offering a vital public transportation service. Notably, one distinctive aspect of this system was the familiar sound of horses'

hooves clapping along the streets of Halifax. The integration with contemporaneous systems included connections to trains via the North Street Train Station, ferries docking at the foot of Duke Street, and the bustling commercial shipping dock situated at the base of what is now Cogswell Street.

This mode of transportation persisted until 1896 when the Halifax Electric Company introduced the electric streetcar service. These trolley streetcars continued to operate along the existing street tracks until the advent of diesel buses in 1969. This transition marked a significant shift in the city's transportation landscape, as the era of clattering hooves was supplanted by the hum of electric streetcars and, subsequently, the 'efficiency' of diesel-powered buses (Wyatt and Corley 2016).

Buses



Figure 27: Bus Fleet (Burns 1945)

The integration of electric buses into the city's transportation landscape unfolded gradually through the early 1900s, initiated by private ventures navigating the urban expanse and beyond. However, the advent of diesel buses in the 1960s dealt a blow to the viability of maintaining and sustaining the fleet of electric buses. Since the complete transition in 1970, the diesel bus has assumed the pivotal role of powering inner-city public transportation.



Figure 28: Beaver Bank Transit Bus (Slater n.d.)

In response to the escalating population growth, a Bus Rapid Transit (BRT) system has been both proposed and greenlit. This is accompanied by additions to the ferry network and a transition of the fleet of buses back to electric power.

Recent reports from Halifax's 2023 budgets, however, unveil a stark reality – the province has earmarked no funds for the BRT system. Instead, a substantial allocation

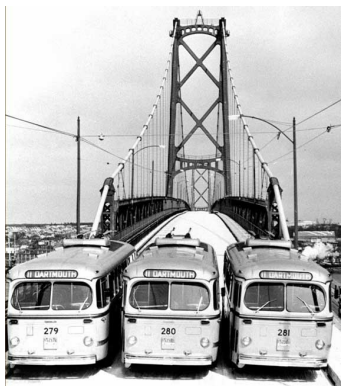


Figure 29: Opening of MacDonald Bridge (Halifax Harbor Bridges 1955)



Figure 30: Barrington Street (Notman & Son 1915)

of \$1 billion has been directed towards highway projects (Bousquet 2023). This budgetary decision underscores a current emphasis on highway infrastructure over a rapid transit system, signaling potential challenges for the city's public transportation evolution.

Cars

In the early 1900s, cars made their debut, initially catering to the elite. However, as automobiles gained popularity as the primary mode of transportation, regulations and laws for road infrastructure were implemented. Streets across the city were meticulously laid with bricks to accommodate the burgeoning use of cars, providing an avenue for increased travel and independent movement within urban areas.

The mid-1950s witnessed a swift and widespread adoption of personal vehicles in post-war Halifax. This surge in car ownership prompted substantial investments in infrastructure, including the construction of the Angus L. Macdonald Bridge in 1955, which reshaped the city's landscape. With the global embrace of cars as the preferred means of transport, urbanization efforts in the 1960s and 1970s strongly advocated for robust independent vehicle infrastructure.

Halifax experienced elements of this trend in tandem with downtown urban renewal initiatives, notably the Cogswell Interchange. Initially conceived as part of the "Harbour Drive" plan, the interchange faced considerable opposition from the public and the NSAA, leading to the Harbour Drive's underperformance and subsequent abandonment. The prolonged existence of the interchange initiated a multi-decade process to dismantle it, paving the way for a more people-centric infrastructure.

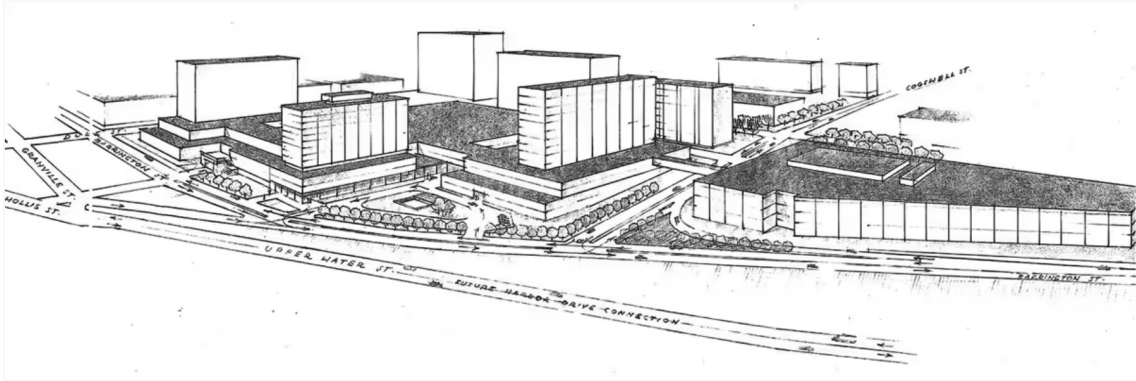


Figure 31: Harbor Drive Proposal at Cogswell Street (A. D. Margison and Associates 1967)

The ongoing Cogswell Exchange project, initiated after extensive public engagements and deliberations since 2012, is now in progress. Demolition and reconstruction of road infrastructure are well underway, and the approved plan includes a newly named Cogswell District and a compact hub nestled amidst parkland at the base of Granville (Montague 2021).

Despite support for proposals enhancing the overall transportation system, the province's budget reveals a persistent, albeit detrimental, commitment to infrastructure favoring independent vehicle use. Notably, the province's continued emphasis on electric car adoption, as opposed to investing in public transit, is counterproductive to sustainability efforts (Bousquet 2023). A more sustainable approach forward involves prioritizing and investing in public transit, an essential step that demands proactive support from the provincial government.



Figure 32: Multi-use trail along Barrington Street

Cycling

The cycling infrastructure in the city represents one of the more recent systems to be implemented. Officially introduced in 1999, the system has experienced swift adoption and ongoing investment. While some challenges persist, with fragmented and unsafe segments for cyclists,



Figure 33: Bike lane along Bell Road

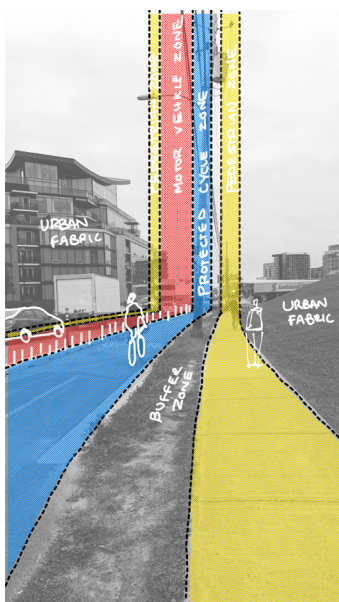


Figure 34: Analysis of infrastructure Distribution, Cogswell Street

the acknowledgment of cycling as a growing mode of transportation has ensured its integration into the city's fabric. This mode of travel not only serves numerous city dwellers but also paves the way for other forms of micro-mobility such as scooters, e-bikes, and skateboards, to seamlessly interact with the urban environment. The commitment to fostering cycling as a viable means of transportation reflects a forward-looking approach to urban mobility.

Current Scenario

In its current state, Halifax exhibits a complex tapestry of transportation systems that cater to various modes of travel. A fusion of bike and bus transportation envisioned through the Integrated Mobility Plan begin to suggest the city's acknowledgement to seamless mobility, allowing bikers to effortlessly board buses equipped with front-mounted bike racks. This integrated approach lays the foundation for a multi-layered interchange system within the city, fostering a dynamic and transformative urban experience. Ongoing investments strategically channel into both biking and busing infrastructures, featuring gradients of progress such as divided and protected bike lanes, priority bus lanes, and substantial commitments to the Bus Rapid Transit Strategy.

Despite these progressive steps, the city grapples with challenges stemming from its predominant car-centric focus, both in terms of investment and priority. The existing systems often diverge, lacking meaningful overlap or connection, hindering the realization of a seamless, multi-use experience that integrates the fastest and most efficient modes of transportation. Individuals naturally gravitate towards transportation modes that align with their specific needs, underscoring the urgency for a more

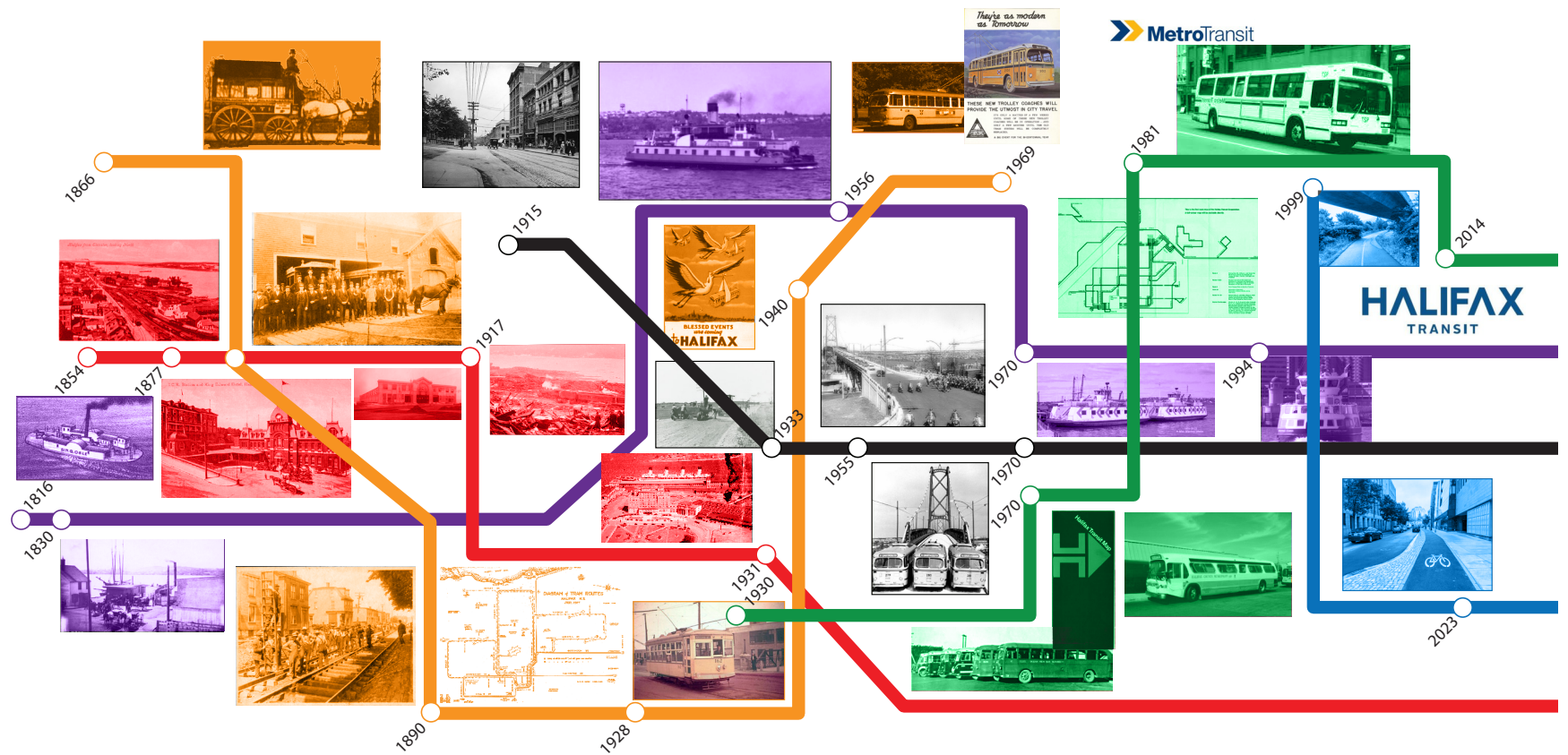


Figure 35: Historical Timeline system map of Halifax

interconnected approach. The city's current transportation strategy, characterized by individual system investments that align with current usage patterns, falls short of fostering sustainable and agile growth for the future.

Recognizing the need for convergence, creating opportunities for overlap and interaction becomes imperative. This not only enhances transportation efficiency but also fosters connections among people and with the city itself. A transformative shift towards a more integrated and user-centric urban environment requires an understanding of where these systems can intersect. This insight opens the door for architectural integration with transportation networks, envisioning locations such as a ferry terminal seamlessly connected with a bus station, a train station featuring strategically positioned bus stops, and designated park-and-ride areas strategically placed throughout the city. This collaborative and convergent approach signifies a bold step towards a more sustainable, efficient, and user-centric urban landscape.

From Where People Come

[Extra] Everyday Travellers

The pulsating beat of a city reverberates through the diverse experiences of its inhabitants, each segment resonating with its own distinct rhythms, that of the everyday and that of the extra-everyday. Understanding how the five focused systems of travel impact various scales informs the need for connectivity.

City Commuters

For the people who inhabit city streets everyday, daily life unfolds in a pattern of habits and rituals that weave through

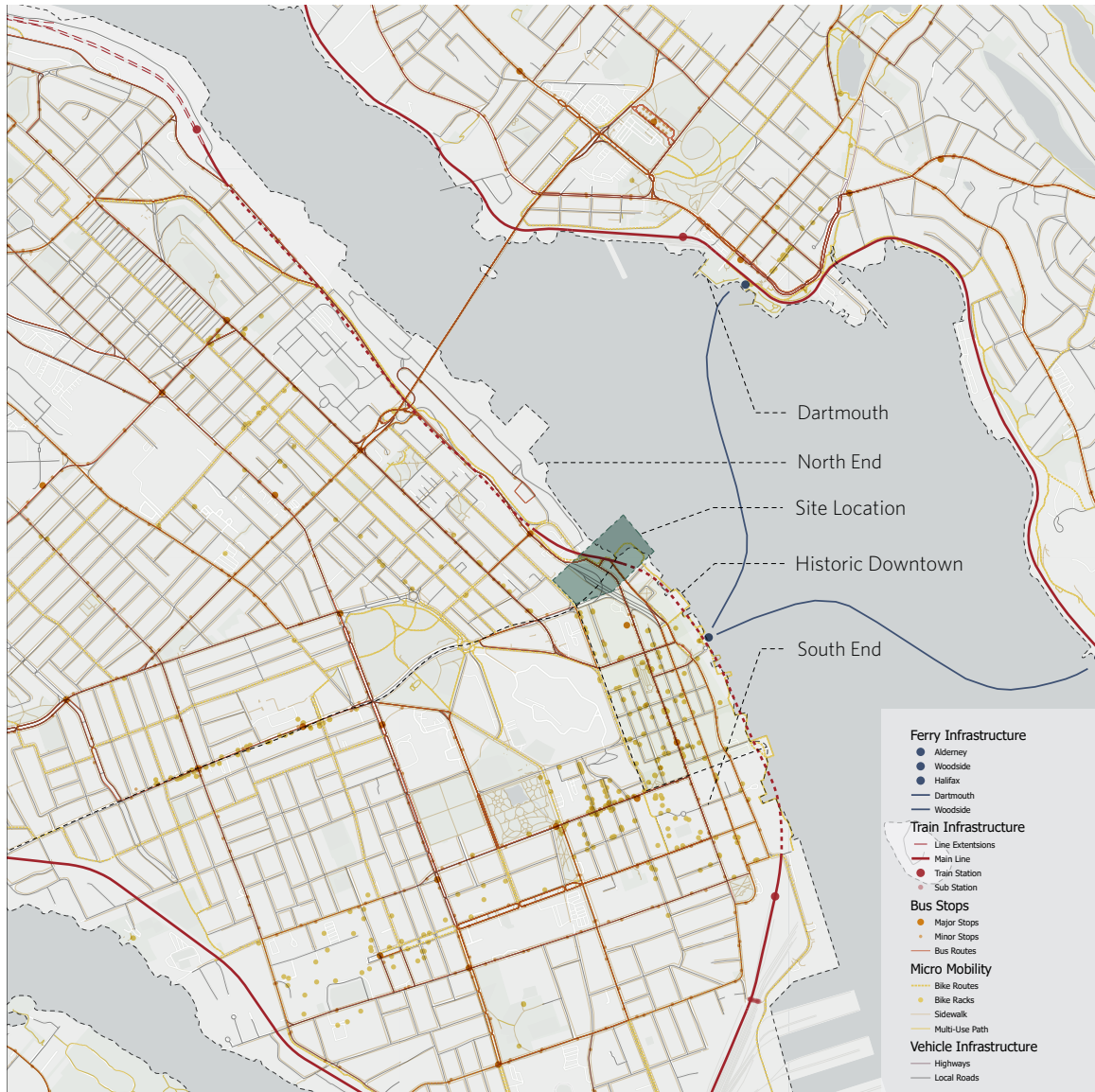


Figure 36: 1:15 000 Peninsula Map

the urban fabric, establishing a collective pulse. Whether it's the daily commute from neighborhoods like Bedford, Dartmouth, Eastern Passage or Herring Cove, residential routines, or recreational pursuits, each person contributes to the city's rhythm, guided by their individual cadences. As Lefebvre aptly acknowledges, amidst the shared activities, the experience remains uniquely personal, with everyone navigating the urban landscape in their own way (Lefebvre 2006, 192).

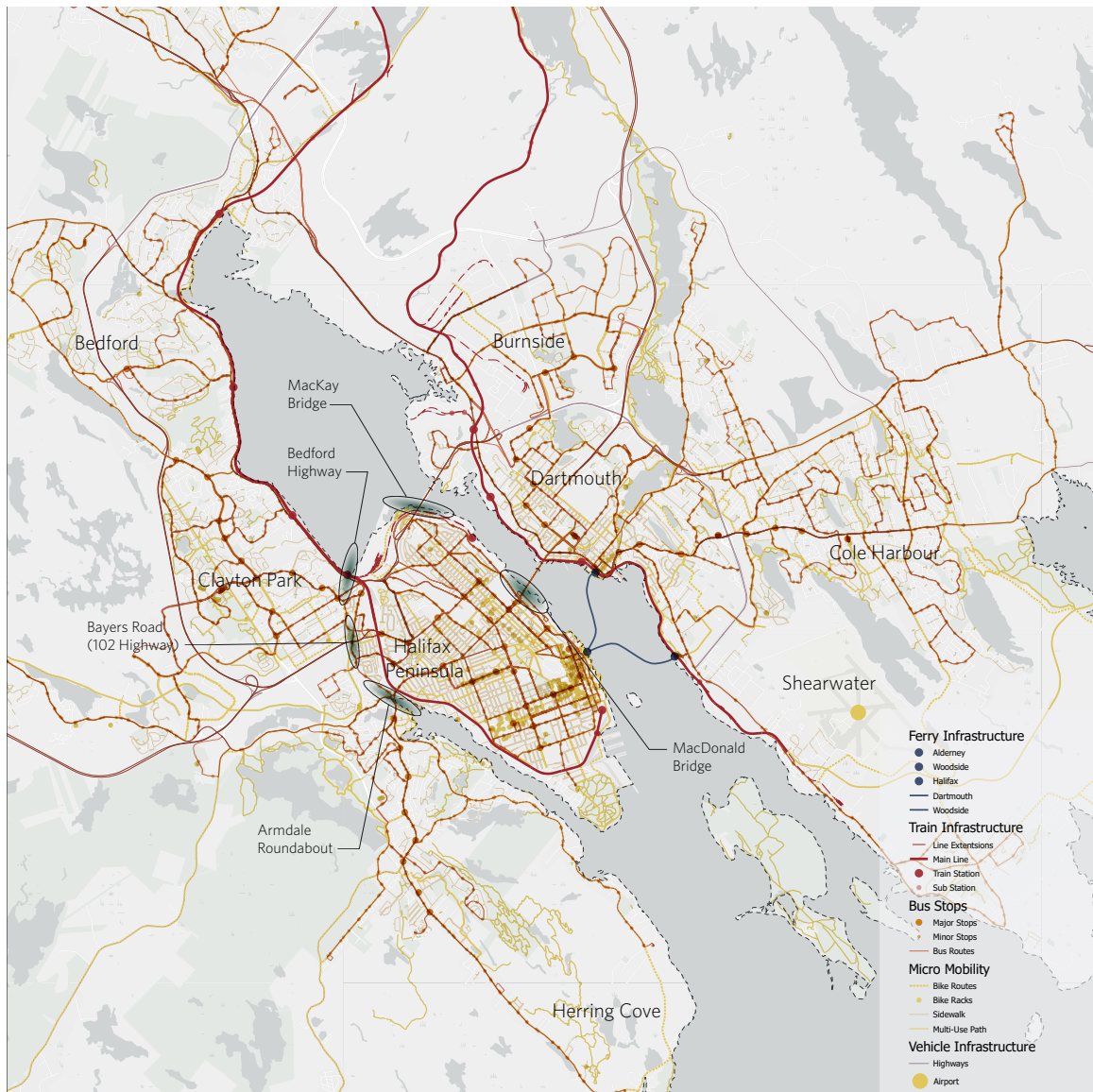


Figure 37: 1:50 000 District

Regional Reach

Occasional encounters with the city introduce a different tempo, as residents from outside the daily routine infuse their own rhythms into the urban fabric. Interactions between the city and provincial visitors from neighboring towns like Truro, Windsor or from the Eastern or South Shore seeking leisure, essential services, or familial connections, add depth to the city's vibrancy, enriching its pulse with differing beats. While they may not possess the same level of familiarity as

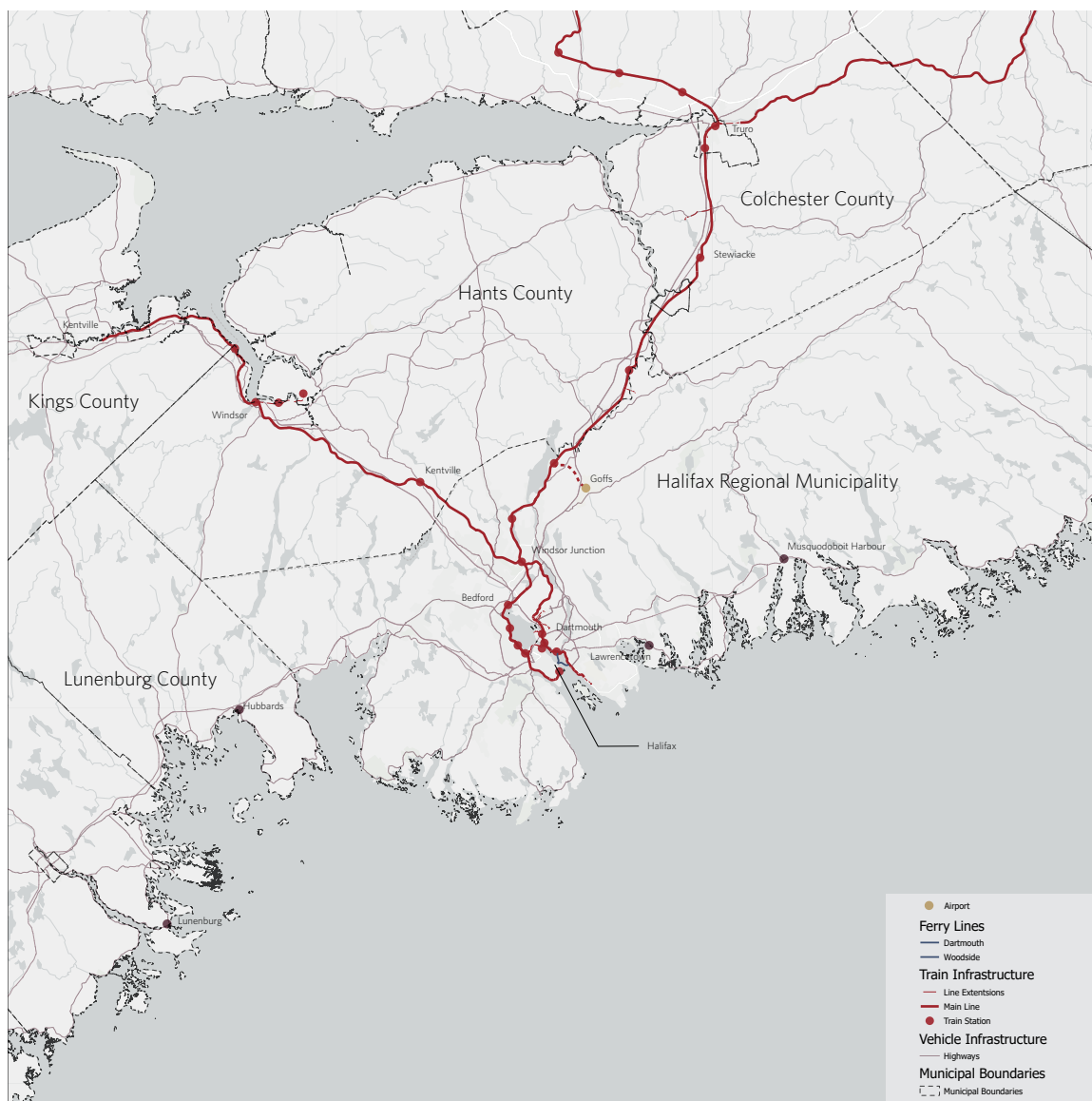


Figure 38: 1:500 000 Provincial Map

daily commuters, their presence contributes to the dynamic movements of urban life.

Provincial Patterns

Extra-everyday travellers that are vacationers offer another dimension to the city's rhythm, arriving via different gateways such as the airport or cruise terminals. Their interaction with the city often begins at its threshold, as they navigate through transit systems and embark on their urban exploration. These visitors, with their fresh perspective and

eager curiosity, imprint their own rhythms upon the city’s cultural landscape, contributing further diverse experiences.

In the harmonious interplay between the rhythms of the everyday and the extra-everyday, the city reveals itself as a living, breathing entity, pulsating with the myriad cadences of human experience.

Halifax’s Awkward Geography

Halifax’s Existing Makeup

As Canada experiences ongoing urbanization, the city’s population, according to the 2021 census, stands at 435,000, with the daily movement of this growing populace becoming more complex. The reported growth rate surpasses initial projections, necessitating innovative solutions to address how people traverse the evolving urban landscape while maintaining the delicate balance of daily life.

Presently, movement within the city typically takes around an hour, with a notable 20% of individuals commuting within a commendable 15-minute period, contributing to the flow of the city. While these statistics compare favorably to other metropolitan areas, the combination of a rising population, increased downtown employment, and limited opportunities for infrastructure expansion foreshadow potential worsening congestion and commuting times, disrupting established rhythms of the city.

The 2021 census indicates that the primary mode of transportation remains the independent motor vehicle (car, truck, or van), followed by public transit, with cycling representing a minor presence. As the city evolves, thoughtful and integrated transportation planning becomes imperative to accommodate the changing needs of its residents and

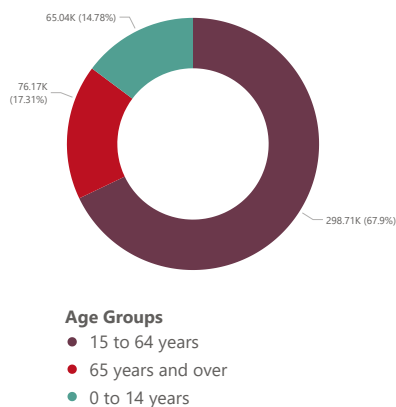


Figure 39: HRM Population (Statistics Canada 2021)

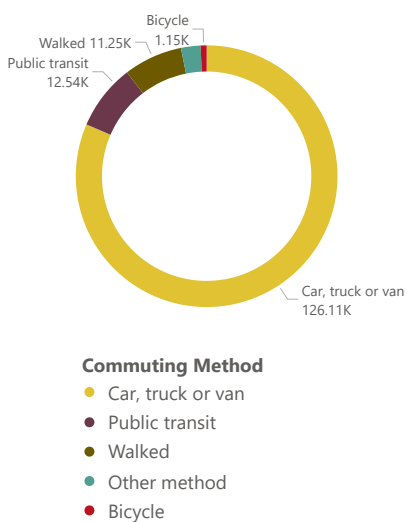


Figure 40: Commuting Method (Statistics Canada 2021)

sustain a thriving urban environment, harmonizing with the collective memory and rhythms of daily life.

Bottlenecking

Most notably, the Peninsula experiences bottlenecking in its transportation modes with the primary focus on road infrastructure. As independent vehicles and buses rely on this, having five arterial connections that serve the whole peninsula result in severe bottlenecking when any streams are disrupted. In recent times, the gridlock experiences have increased with rising demand of these systems and at times result in many hours backed up.

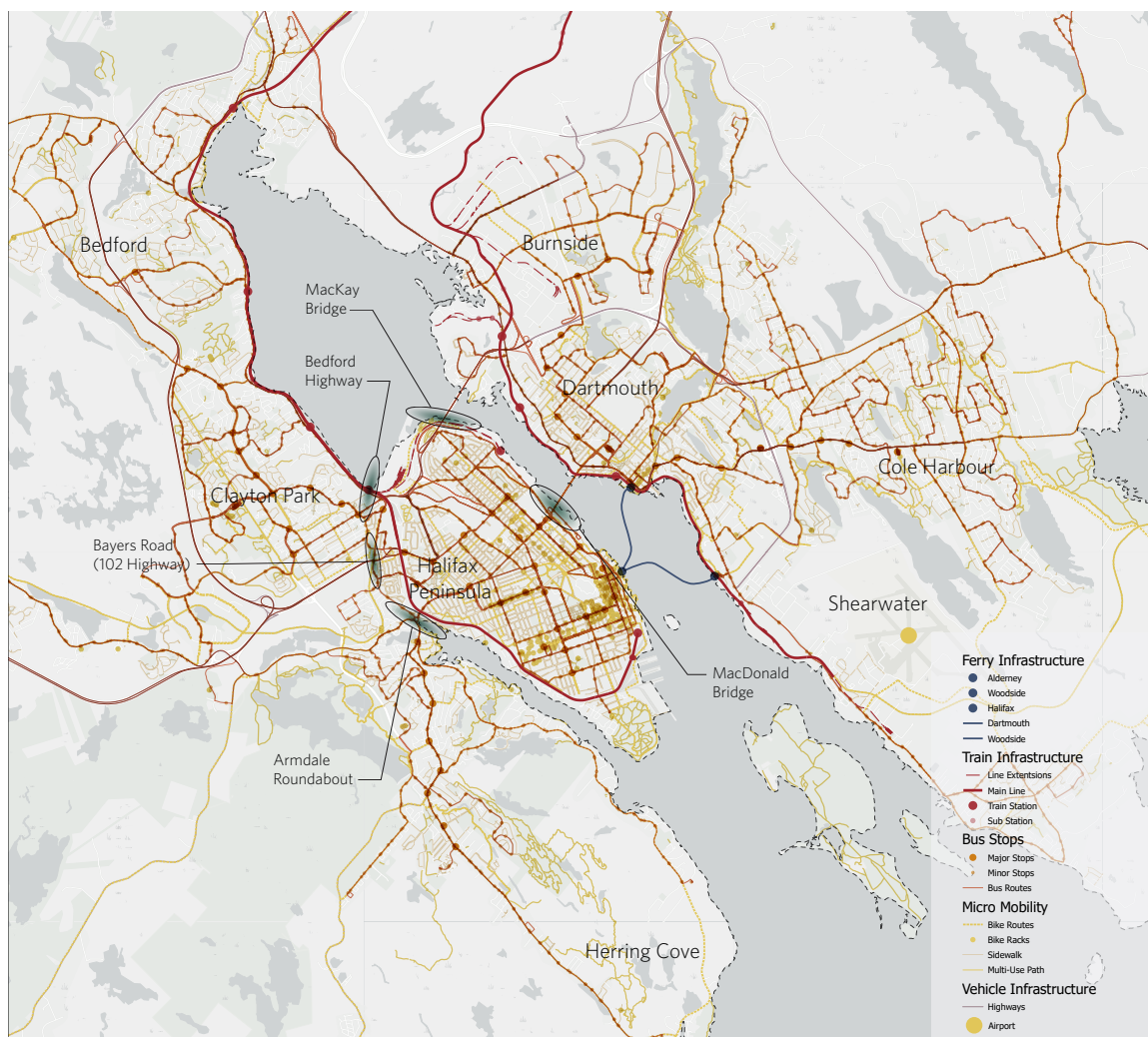


Figure 41: 1:50 000 Regional Map – Bottleneck

Personal anecdote: One of these very scenarios happened to me recently. I live at North and Gottingen and work at Prince and Brunswick, which is normally a 5-minute drive, a 10-minute bike ride or a 30-minute walk. As I was running behind for work, using a carshare vehicle afforded me the quickest mode to get to arrive for my meeting on time. As a resident of the peninsula, I tend to know routes that circumvent traffic jams. On one of my routes, I encountered backed up traffic on every road, locking me into the traffic grid that I had to endure for 35 minutes without any indication of the cause of such a backup in traffic.

It turned out that multiple things had happened at once, first the Cogswell exchange was rerouted to a single lane, choking the main artery feeding Barrington. Second issue was that an accident had occurred on the MacKay bridge, forcing even more traffic through the MacDonald, Barrington corridor. This disruption caused some of my colleagues to turn around and drive home after spending 45 minutes stuck in traffic. It even resulted in some meetings being cancelled on many ends (client, consultants, and our team) simply due to this disruption in traffic.

Looking toward the city's future growth, urban planning has zoned areas adjacent to independent vehicular transportation, notably the Circumferential Highway. This zoning strategy reflects a significant reliance on individual vehicles, raising questions about the city's ability to compose an integrated and sustainable transportation gradient that resonates with the rhythms of daily life.

Chapter 4: A Hub on the Edge

Edge of Change

Located at the foot of Cogswell Street, at the edge of the historic downtown, the edge of military land and abutting the water's edge, the chosen site contains a multitude of complex layers but is rife with opportunity for rapid action. Given that the Cogswell District is underway, the temporary and evolving nature of this site opens the door for a reimagination of such an important buffer between water and land, north and south, dynamism and stasis.

Of course, there are plenty of existing elements that must be addressed and contended with to make room for a hub of this scale to be realized. Such elements as the water's edge, transportation systems, the land, the urban fabric and surrounding buildings. Incorporating the conflicting elements serves as a proof of concept in reenergizing the downtown. Other options that may offer a simpler negotiation of systems or land use, denies the beauty of connecting travellers within the heart of dense urban fabric at the edge of change.

An Immediate Need for a Catalyst.

Current pressures on the peninsula reduce the window of opportunity for such a pivotal change to occur within the downtown.

- Major funding goes toward the infrastructure for cars, with significantly less financing for transit.
- Increased collisions, fragmented systems of transport intertwine and collide making each system inefficient.
- Available land on the peninsula is consumed, with no room to expand, leading to an increase in density. This density requires more people to use the systems of transportation in the city. With no large available swaths of land available for development, converging

transportation systems is tricky to achieve on the peninsula, especially within the downtown.

The city has been growing faster than it can handle. This is causing many issues in the city with houselessness, and increased people living in the limits of the city, increasing the momentum of people moving about to get where they need to get.



Figure 42: 1:5000 System Map

The Water's Edge

The site strategy deployed for the purposes of this thesis are encompassing transit system modifications while incorporating current pursuits from the municipality and the ever-changing waterfront edge.

Historic Waterfront

The existing historic waterfront currently fades out at the historic properties just south of the site. Though there is grade access through the Purdy's Wharf building composition, it is not pedestrian friendly. This waterfront acts as the fringe to the urban fabrics. Abutting the north edge of the site, the military dockyard holds what was once Pier 2. Extending the historic waterfront into the site connects the hub to this existing infrastructure. As this waterfront makes up much of the cultural image of Halifax as a city, it is critical to connect directly.

The System's Edge

Trains

The current network of trains omits a connection from the north end dockyards, including the CN Intermodal Terminal, to the South End Terminal. Reinstating the previously removed extension of tracks beneath Barrington Street leaves only the portion along the historic waterfront unconnected. To resolve this, dropping the train below grade at the edge of the military land, beneath the new Barrington roundabout and toward the water to run the length of the historic waterfront along a new seawall. As this area of the waterfront is highly vulnerable to both storm surging and the rise of the ocean, there is already a call to elevate the current waterfront level in this area to protect it. Implementing a

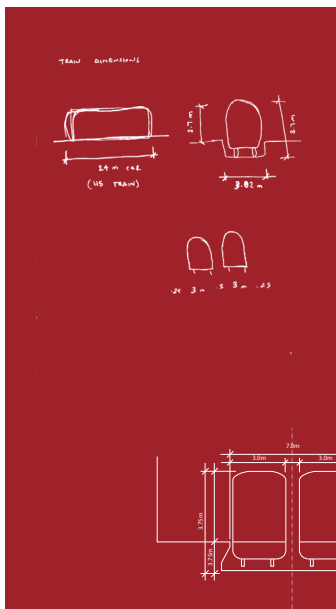


Figure 43: Train Parameter Sketches

seawall that contains both an underground train line and provides access for other infrastructure services (such as electrical, sewer, etc.) opens the opportunity to correctly future proof and protect the historic waterfront. The intention of this continuous loop track around the peninsula is to eventually shift this network to a subway line in these areas by sistering to the CN lines.

Viewing this train network as a subway line opens the opportunity for substations that connect underserved areas of the city and present an efficient approach to urban connectivity. Looking at this network from a municipal level, opportunities to eventually shift the BRT extensions to a subway line become available and connect suburban areas to the urban center while mitigating the traffic congestion.

The train platform will be below the concourse level with a holding area running the length of the tracks but direct visibility from above.



Figure 44: 1:5000 Train System Map

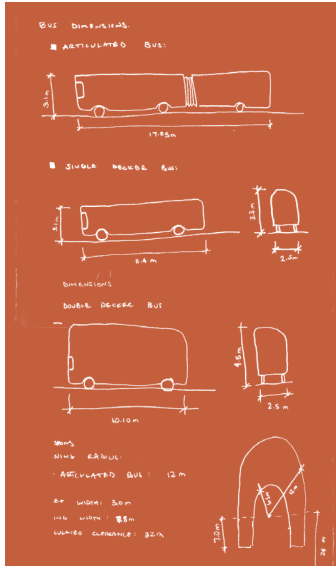


Figure 45: Bus Parameter Sketches

Buses

The current bus system sees approximately 30 bus routes that interact with the current open air Scotia Square station. Most of these routes engage with the Barrington North and South and with Cogswell Street to access Gottingen.

The design of this system within the site will see the southbound buses exit the roundabout and come across the newly created Poplar Street (which is intended to be a local road, so congestion along this road is minimal) and turn into the bus platform level in the hub. Continued southbound routes will exit the hub and descend into the center of Barrington and merge into the southbound lane into the existing fabric.

Northbound routes coming up Barrington Street will enter the hub via the central bus ramp and enter directly into the bus platform. All northbound routes will exit the hub toward

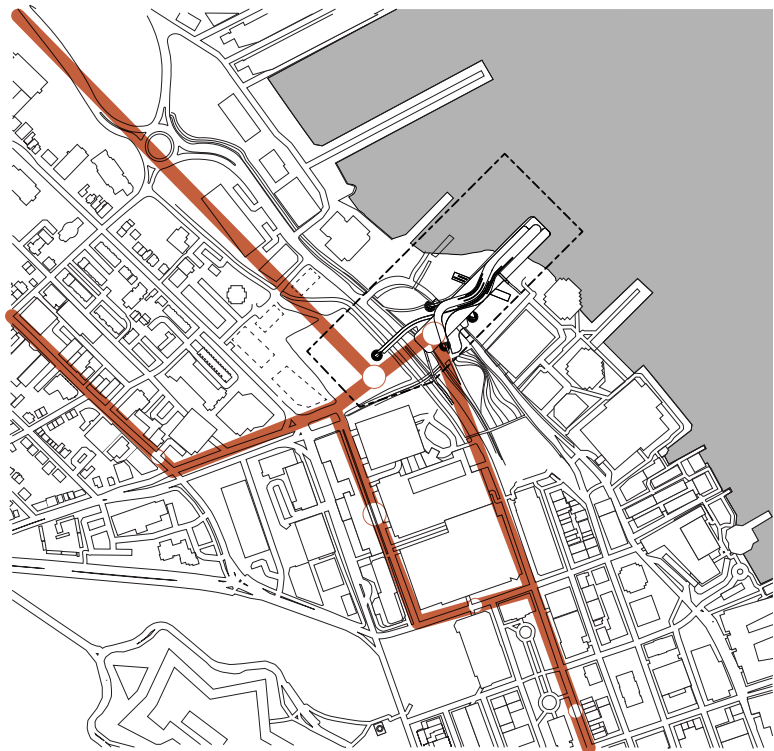


Figure 46: 1:5000 Bus System Map

Poplar Street with routes needing to access Barrington North turning right and moving toward the roundabout and those accessing Gottingen turning left and merging into Cogswell.

The bus platform will be located to the west of Barrington and connect into the hub via a gangway that crosses Barrington.

Ferry

The two current running ferries are side loaded and dock at the Ferry Terminal located along the boardwalk. There has been much discussion around the capacity of this facility not meeting the approved BRT network additions and proposals have focused only on adding one ferry to this facility and not the future proofing for the three approved routes. This allows the design of the ferry terminal within the hub to dock the existing Dartmouth ferries along the water's edge at the southern points of the dock. The approved front loading catamaran ferries will dock toward the north edge and will

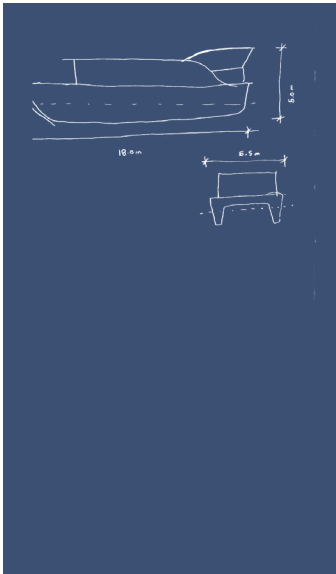


Figure 47: Ferry Parameter Sketches



Figure 48: 1:5000 Ferry System Map

serve Mill Cove, Larry U-Teck and Shannon Park. This direct loading into the ferry holding area will occur at the new elevation of the boardwalk.

Cruise Ships

Much of the cruise ship activity currently docks at Pier 21. Given that many of these are international and large in scale, incorporating them into this hub is not feasible, but connection to the boardwalk does open opportunity to use the underutilized Purdy's Wharf for smaller cruise docking. The security concerns would, much like the other systems, be handled on board the cruise ships.

Independent Cars

The current independent vehicle system across the site is undergoing much change with the ongoing construction and preparation of the Cogswell District. As this is a more efficient use, much of the design proposal is being incorporated into this design with slight modifications for the bus segregation and for the drop off points into the building.

The Upper Water Street connector will be tunneled within the hub, with visibility from the concourse. The drop off points will offer areas for both car sharing (Communauto, etc.) and ride sharing (taxi, Uber, and Lyft, etc.). These drop off points are collocated with limited below ground parking access. Additional drop off points are located along the Barrington Street entry, and this will have capacity for cab stands, Lyft and Uber stand and allow for passenger drop off at this entrance point. Currently the Cogswell Street extension has been demolished, and it is proposed that an underground tunnel be constructed that crosses the harbour and emerges on the Dartmouth side, with flow into

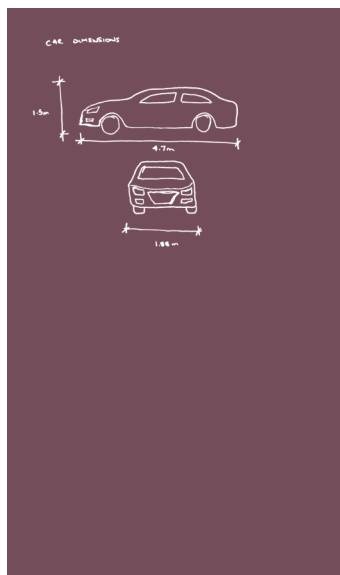


Figure 49: Car Parameter Sketches



Figure 50: 1:5000 Car System Map

Oceanview Drive, ultimately connecting between the two ferry terminals and alleviating capacity on the bridges.

Micro-mobility

Much of the micro-mobility systems intertwine or lack definition in terms of how and where they share or converge. As the city seeks to define these, the consideration for micro-mobility being delivered through multi-use systems is crucial. With increased pressures on larger transportation systems, the usage of micro-mobility increases as the density increases. Ensuring that these systems, with their independent needs – speed, connectivity, intersections, safety – are designed for itself first, and then intersections second will ensure the increased usability of each form of mobility.

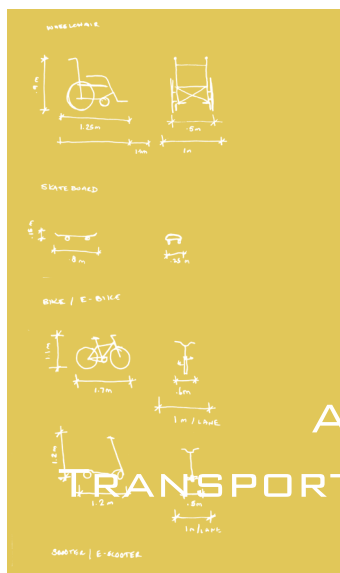


Figure 51: Active Transportation Parameter Sketches

Bicycles

The municipality has defined a biking system that has seen recent investment and focus on a continuous system of routes that cater to cyclists. Though many of these routes are fragmented and maintain a car first approach, this signifies efforts to promote other forms of transportation. At the fringes of the site, cyclists enter via a multi-use path, shared with other forms of micro-mobility. To the south, the Hollis Street bike lanes form part of the cycling routes the city has invested in. As it stands, these two routes do not connect well, and cyclists are forced to negotiate with drivers without the presence of bike lanes, or with pedestrians on the sidewalks.

Scooters

As the newest addition to the city's forms of micromobility, where and how scooters navigate through the city has been



Figure 52: 1:5000 Active Transportation System Map



Figure 53: 1:5000 Sketch model study, exploring the systems engaging with the edge of the site.

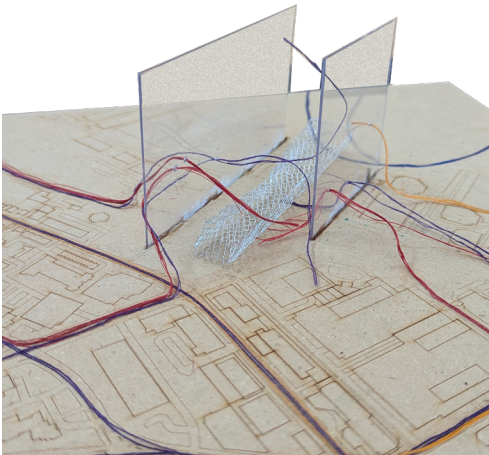


Figure 54: System edge model north perspective

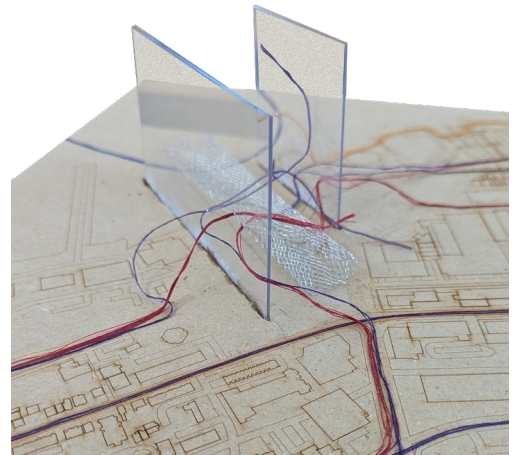


Figure 55: System edge model South perspective

a point of contention amongst those using, and those who do not use. Much like the bicycles, the constraints to the bicycle lanes results in fragmented intersections with pedestrians and vehicle drivers in many areas.

Pedestrian

In addition to the waterfront paths, there is an existing elevated pedway that wraps from Scotia Square, across to Granville Square and across and through Purdy's Wharf. This pedestrian walk currently enters the site and provides opportunity to layer in this pedestrian experience. To the north, an active transportation path is designed as part of the Cogswell District with intentions to carry this through the hub and lift it into the concourse.

Airport

The main airport for Halifax is located roughly 35km from the site location. Currently the public transit route from the airport to downtown is exclusive to the express airport bus line that has five stops but utilizes the constrained road network and bridges. To connect this airport into the overall system, a shuttle to the train line, just west to Grand Lake where a station can be added to train passengers directly into the city, avoiding the use of road infrastructure.

Alternatively, the Shearwater Airport, in Shearwater, could be transitioned into a passenger terminal that, when the road tunnel to Dartmouth exists, can provide quick access to downtown.

Helipad

Finally, a consideration for a Helipad has been undertaken and provided on the rooftop by the ferry for the possibility of passenger helicopters to land and unload in the terminal.

This too could connect to either airport for the fastest connections between the terminals.



Figure 56: Scope Sketch

The Land's Edge

The contours of the site limits range from sea level to 20m elevation at Brunswick. The variation of this elevation is undergoing much change as we speak. The water's edge has been reconfigured over time to where it is today. Much of the edge is covered currently by the casino, but much like the topography of the land, the edge is in a time where reconfiguration is most feasible. Given that the site is downtown, the idea of topography in this urban context is defined more by the urban fabric – streets and building levels – than it is by natural contours.

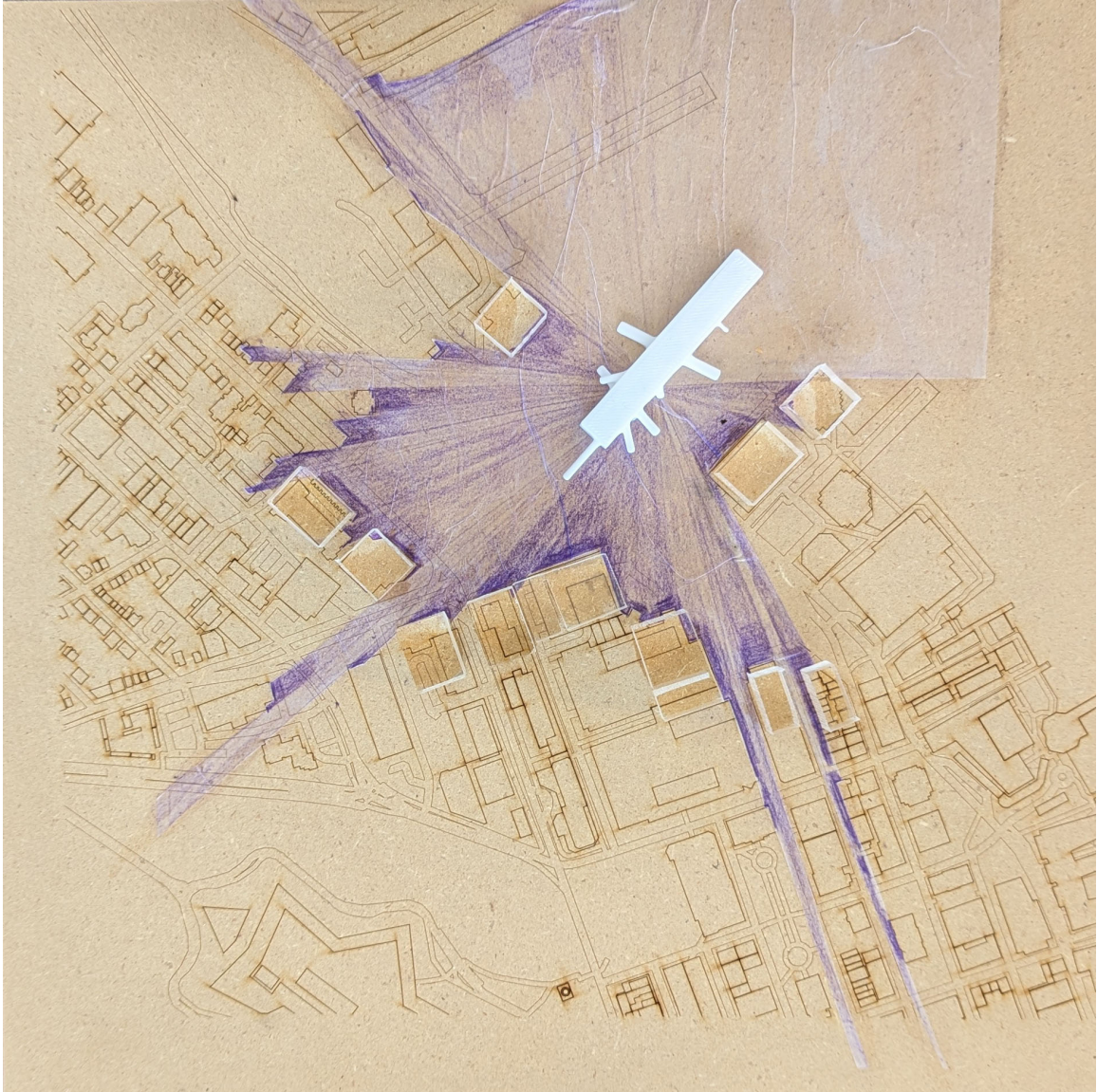


Figure 57: 1:5000 Sketch model study, exploring the urban fabric interacting within the scope of the site.

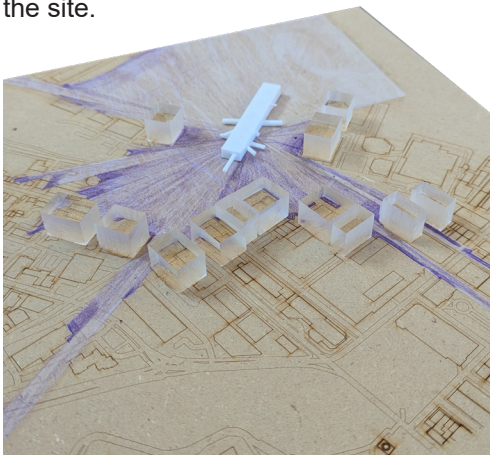


Figure 58: Scope model north perspective

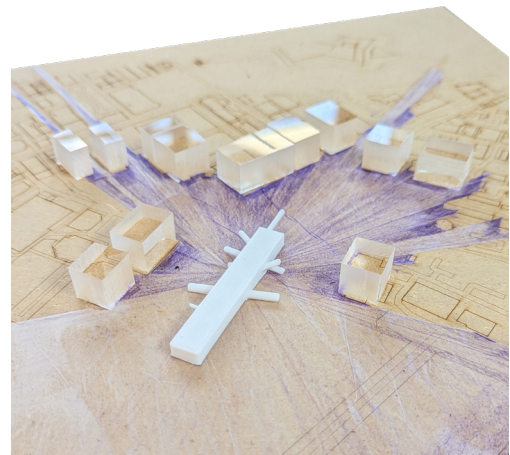


Figure 59: Scope model south perspective

Recently the municipality has described conversations regarding the ownership of the land that houses the port, in which a nod toward lack of space for housing is a component of those conversations (Gorman 2024) .

Availability of Land

The peninsula is water locked and lacks the ability to expand as is. Enriching the downtown on this site offers many opportunities.

With such a significant connection to the water, placing the hub along the water's edge is critical to the success of the hub. Placing this at the apex of the north and south end opens the opportunity to catalyze the surrounding areas into more robust development in the future.

With the adoption of the Cogswell district, and the remoulding of the land, the opportunity to pull the city toward the center is available.

The Building's Edge

Replacing an Inward-Looking Casino

The current casino sits on prime real estate at the buffer between the end of military land and beginning of historic downtown. A casino is an inherently inward program type which denies the site to utilize such an opportune placement of mixed programming that provides a more extroverted, cohesive connection with the city.

Casino NS

The current Casino NS Halifax is located over the edge of the water and has been in discussions to relocate (Luck 2021). Its current building is now 25 years old and in need of work. With increasing maintenance costs and dropping

revenue from patrons, the Casino has been searching for a new location out of the downtown area. With the program of a casino being internally focused, preserving this land solely for a casino goes against many of the density ideas the HRM is pursuing.

Casino Parking

Just Southwest of the casino and connected via pedestrian walk is the Casino Parking Lot. This 7-level structure butts against and forms the urban wall edge that carries down Lower Water Street.

Water Treatment Plant

As a central node in the water treatment, this building is set to remain as is, in place at the edge of the site. Relocating this building would be unnecessary.

Brunswick Place

This building is proposed to be removed to allow for the bus terminal to be located as a node of the hub and connection to the north end fabric.

Hotel Halifax

This Hotel is connected to the site through the pedestrian walk and has entrances at the same elevation as Barrington Street that will continue to weave into this street network.

Purdy's Wharf

Two iconic waterfront buildings that border the waterfront side of the site are set to remain, despite their current use and vacancy rates.

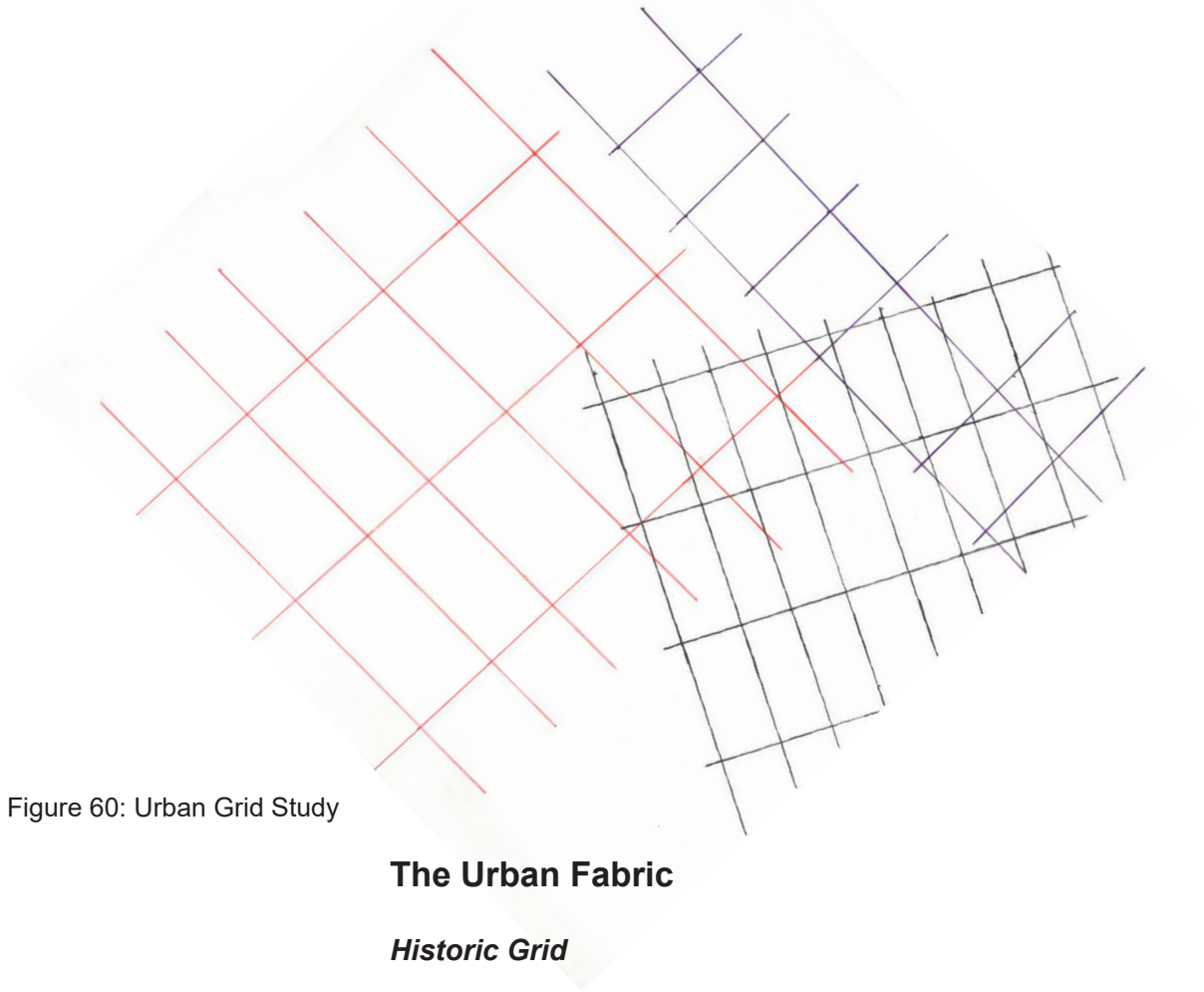


Figure 60: Urban Grid Study

The Urban Fabric

Historic Grid

The historic grid of the original Halifax is very present and regimented in the downtown core. These proportions face the water and stretch north to south.

North End Grid

The north end grid contains similar proportions, but at a larger block scale. This allows for smaller components of the grid to be used or omitted when necessary. This grid, like the historic downtown grid, is parallel to the water's edge.

His Majesty's Canadian Dockyard

Stretching from the shipyard in the Northend to the immediate north of the selected site is His Majesty's Canadian Dockyard. This is an important, though vast - swath of water's edge that



Figure 61: 1:5000 Sketch model study, exploring the alignment of circulation with the urban grid.

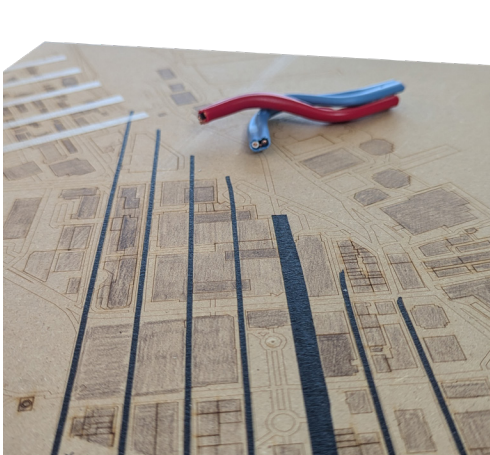


Figure 62: Urban grid model north perspective

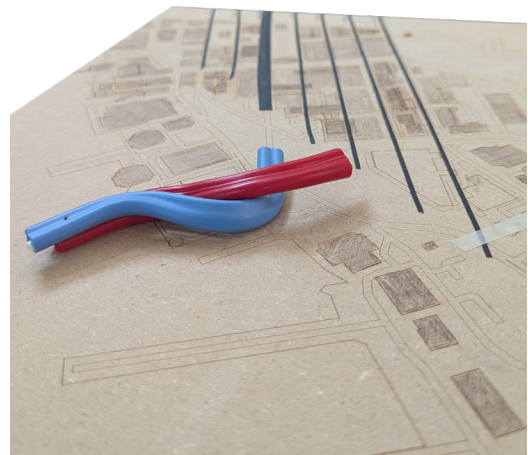


Figure 63: Urban grid model south perspective



Figure 64: 1:5000
Circulation Sketch model
study, intertwined



Figure 65: 1:5000
Circulation Sketch model
study, aligned



Figure 66: 1:5000
Circulation Sketch
model study, aligned
intertwinement

serves for the Canadian military and has acted as the oldest Canadian defence establishments since the late 1700's ("Port History" n.d.). The dockyard hosts the headquarters of Maritime Forces Atlantic, berths for Canadian and foreign warships and formation supply facility, among others. This presence also limits water usage to civilian vessels at the edge of the chosen site.

Granville Mall

The final segment of Granville Street, transitioned into an outdoor mall, faces directly into the site and is extended into the hub to provide direct connection for pedestrians and commerce into the site.

Scotia Square

As one of the largest downtown mall establishments since the 1970's, scotia square mall lines Barrington Street and hosts the current bus infrastructure that acts as a central node within the transportation network.

Cogswell Interchange

The newly demolished Cogswell exchange has left indelible marks on the image of downtown Halifax. This mid-century initiative demonstrated the dominance of the car in what the idea of downtown was in the 1960's. As this was executed through the clearing of what were identified as slums, the concrete layered routes severed the north end and downtown quite concretely. The bus terminal form is the nod to this now erased component of the site's history.

Chapter 5: Hub Design - Arrival, Transfer, and Enjoyment of Place

As a work of transit engineering, the building accommodates three functions. It provides an arrival point in downtown Halifax. It enables convenient transfers, both within one mode of transit and intermodally. And finally, it provides space for passengers to wait between arrivals and departures and attends to their comfort. As a work of architecture, it makes the travel experience great, both for the commuter, jaded and oblivious and for the visitor, excited and overwhelmed. The highest success is people coming not to travel but to enjoy the travelers joy vicariously and the beautiful building directly.

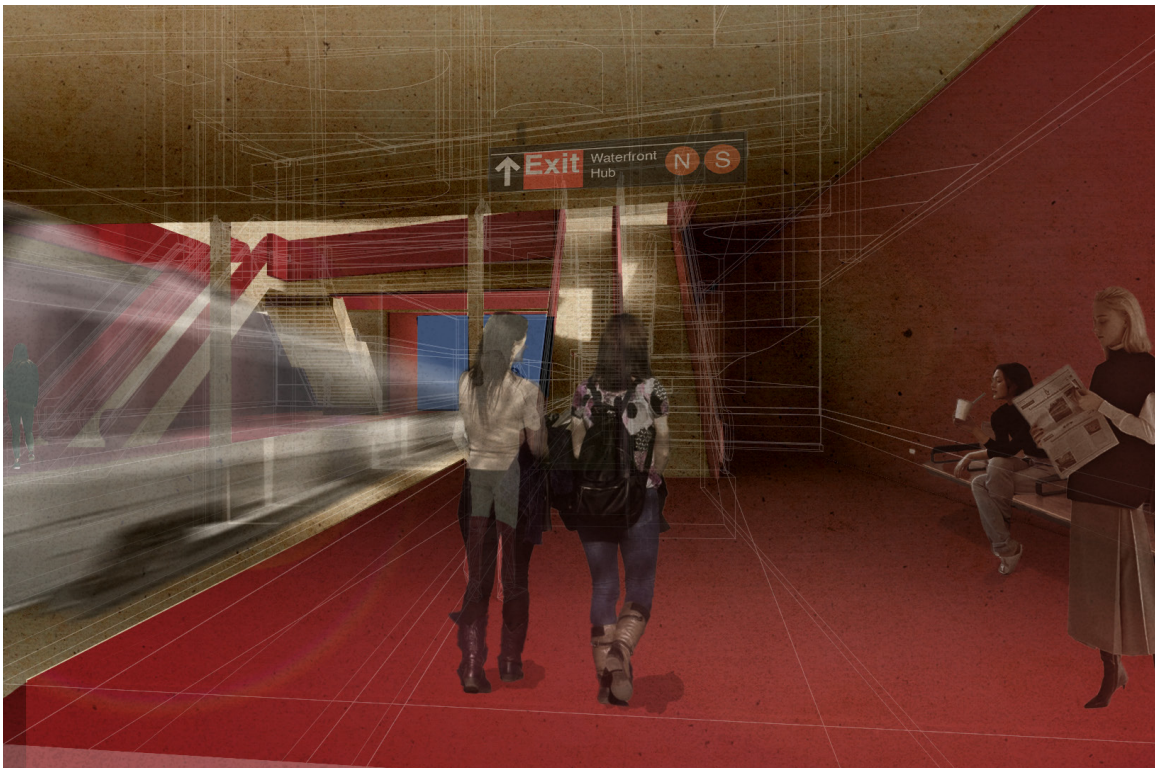


Figure 67: Train Platform Arrival Collage

Arrival

From Railway

The rail line running north to south enters the building below grade level. This entry point allows travellers to disembark along the linear length of the platform under covered roof into the train platform. The prominent features of this level are intended to draw travellers to the circulation in the center of the platform. Ascending from these two points brings people into the central atrium and offers a choice point and direct views to the city's edge toward the bus platform or the waters edge via the ferry bays. This ascension into a light filled, active atrium allows travellers to engage in the scale of the hub from its center.

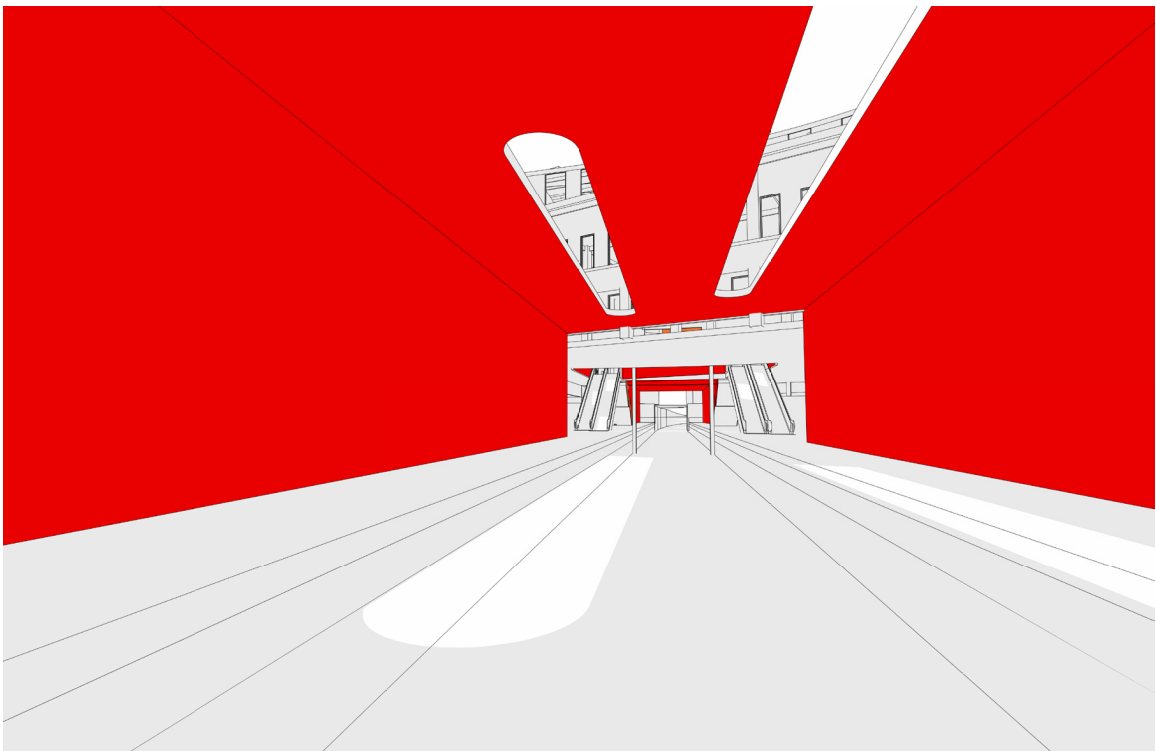


Figure 68: Train Arrival Perspective

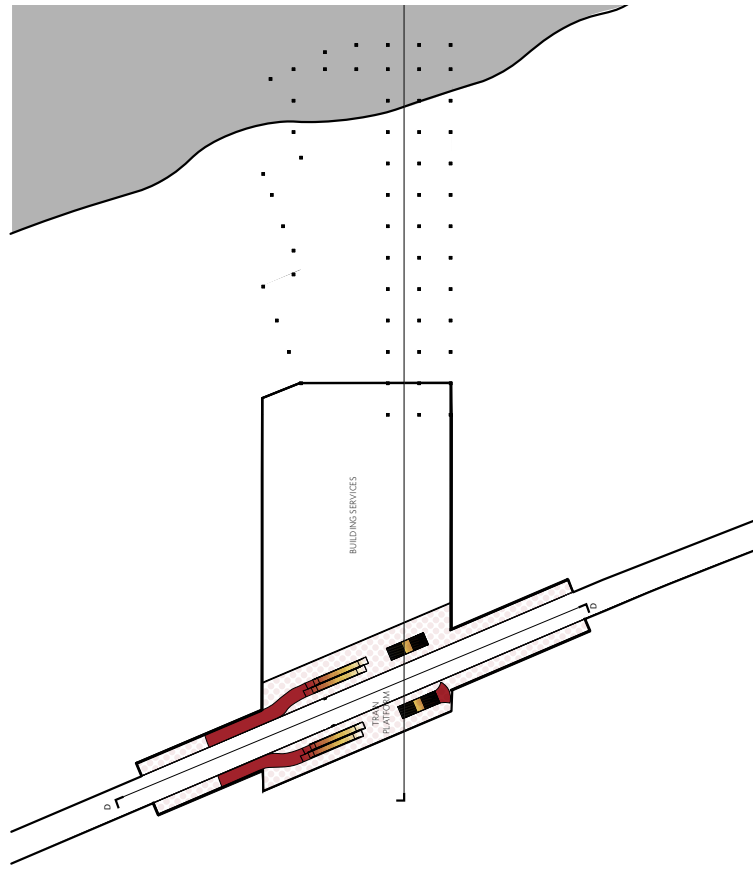


Figure 69: Level -1 Floor Plan

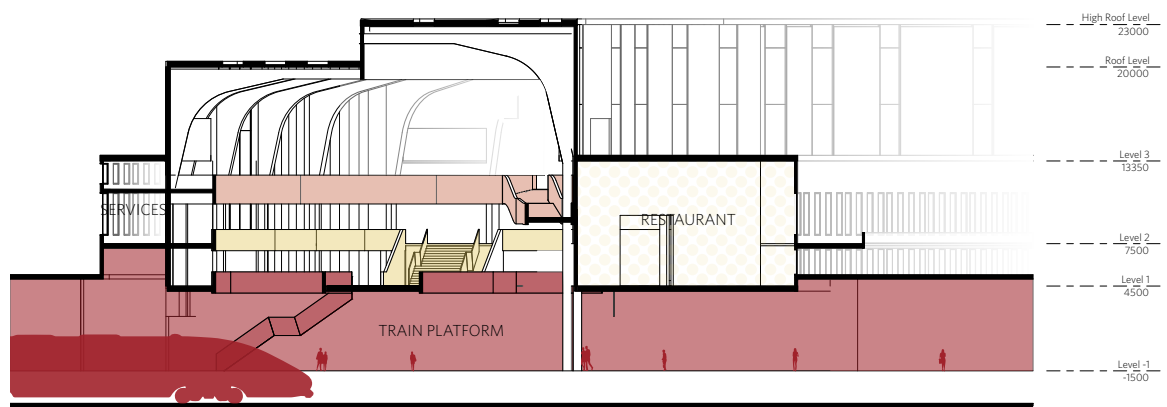


Figure 70: Cross Section D:D | Train Platform

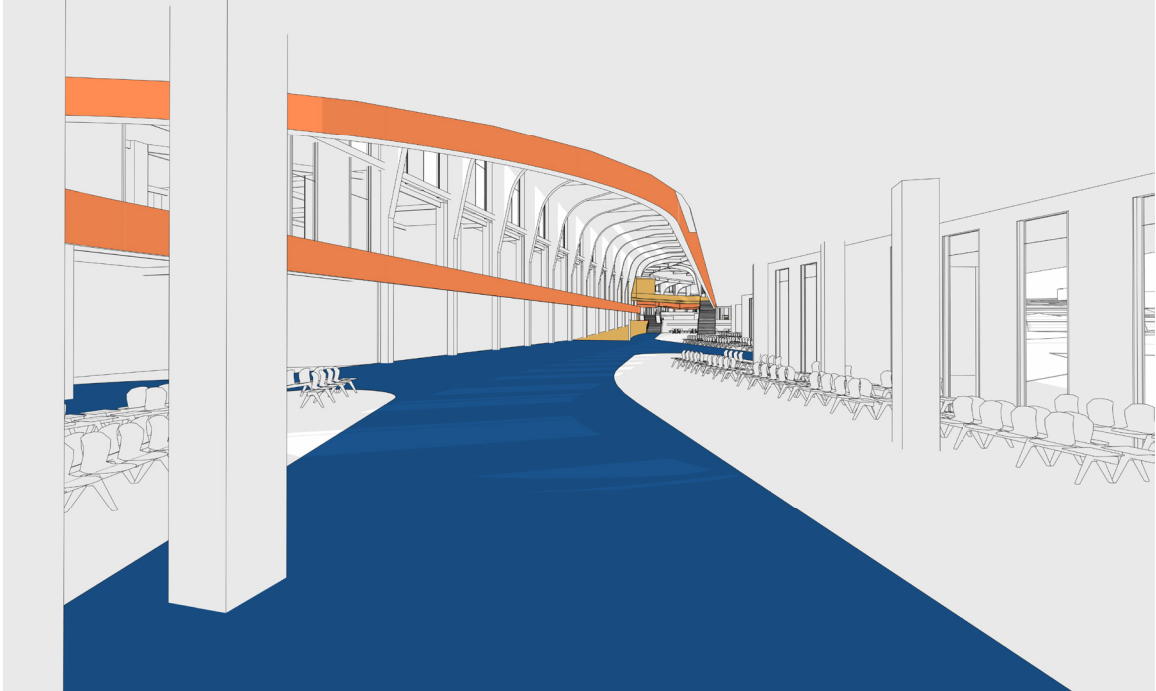


Figure 71: Ferry Arrival Perspective

From Ferry

Arriving via any of the five ferries engages one of the ferry bays along the waters edge. Approaching the building, the view allows travellers to understand the movement of the building in its reach out into the water. Once docked, disembarking onto one of the floating ramps brings ferry travellers toward the doors of the ferry bay tucked beneath the second-floor roof deck. Once inside the ferry bays, the concourses volume moves travellers toward the center of the building and toward the city.

From Cruise Ship

Docking along Purdy's Wharf, cruise ship vacationers enter the hub from the waterfront to the south. Entering the building just above the train brings travellers into the ferry bay and into the concourse itself

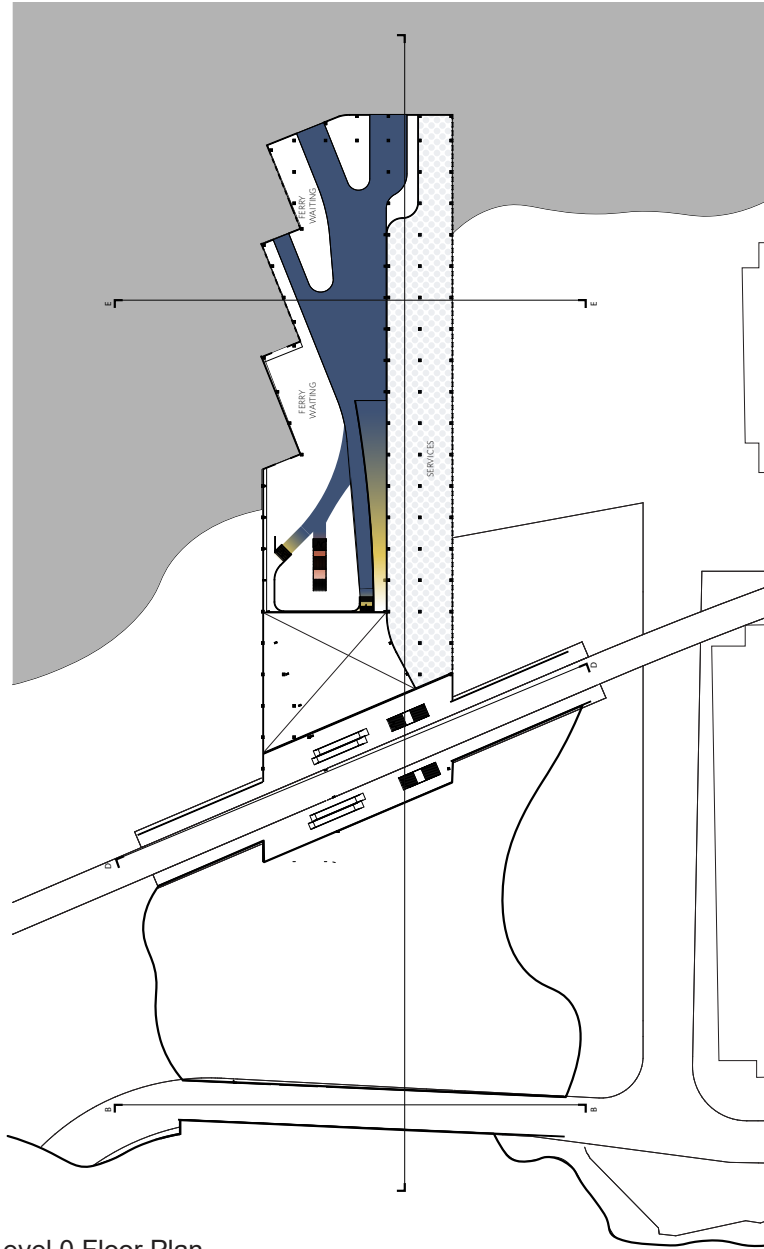


Figure 72: Level 0 Floor Plan

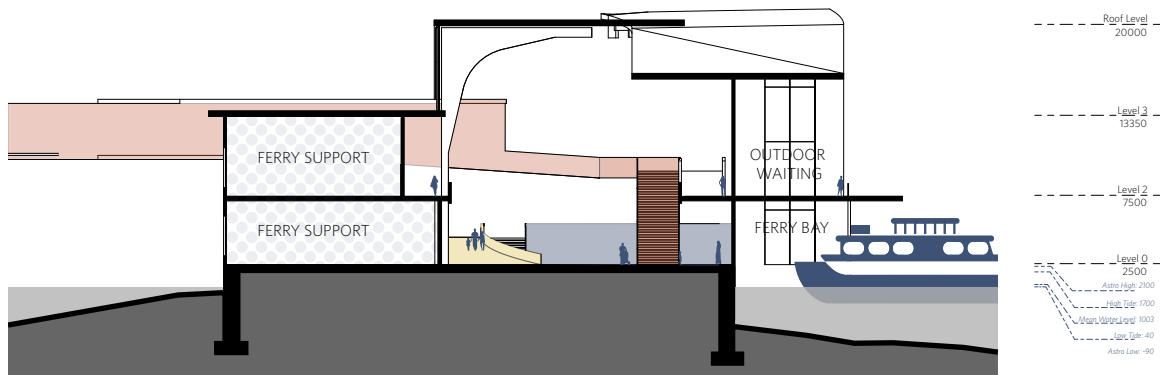


Figure 73: Cross Section E:E | Ferry Bays

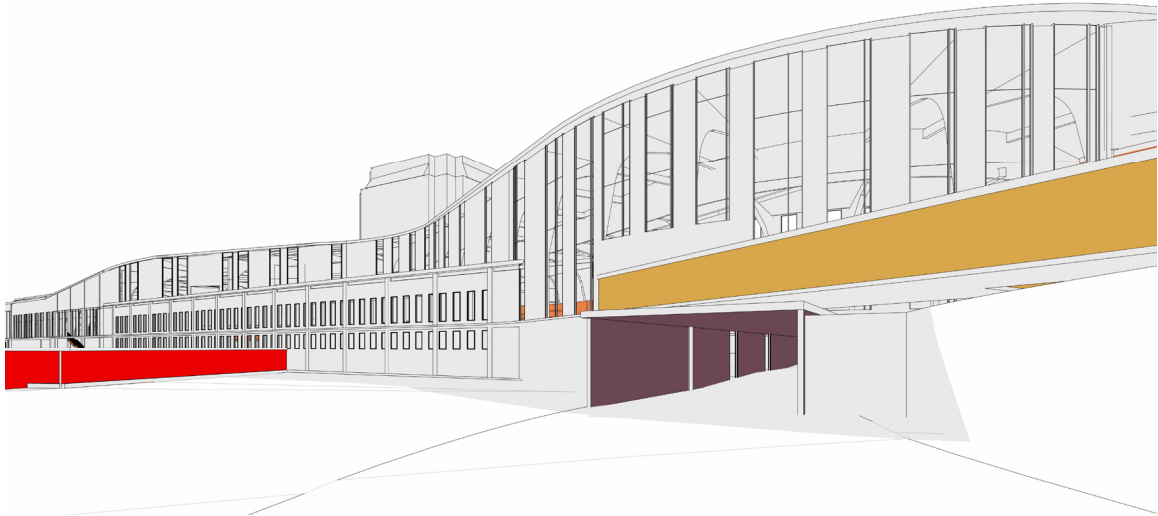


Figure 74: Lower Water Street Tunnel Perspective

From Cab/Uber/Drop-off

As the vehicular roads are designed in the Cogswell district, both Barrington Street and Upper water street interact directly with the building and provide weather protected areas for drop off from Uber, cabs or various drop off vehicles into the hub. The drop off along Barrington Street pulls toward the building and allows people to disembark from vehicles and enter the hub through the plaza and into the hub’s concourse. Drop offs from Upper Water Street pull off from the tunnel and allow travellers to enter the building at Level 0 and directly into the central atrium.

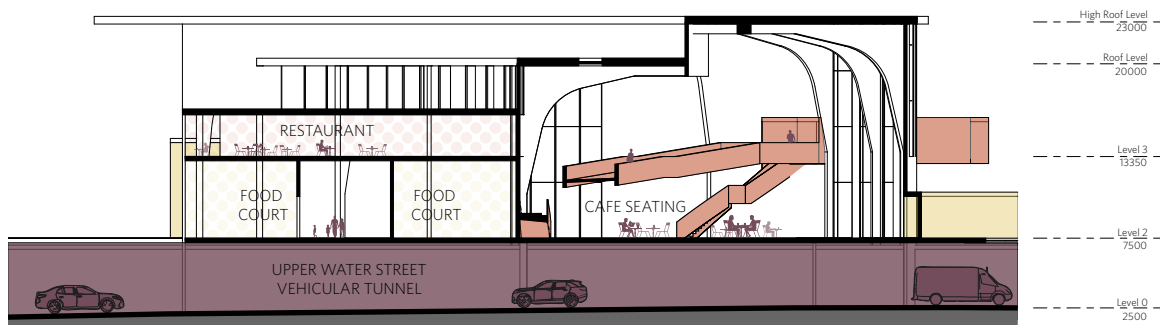


Figure 75: Cross Section C:C | Car Tunnel

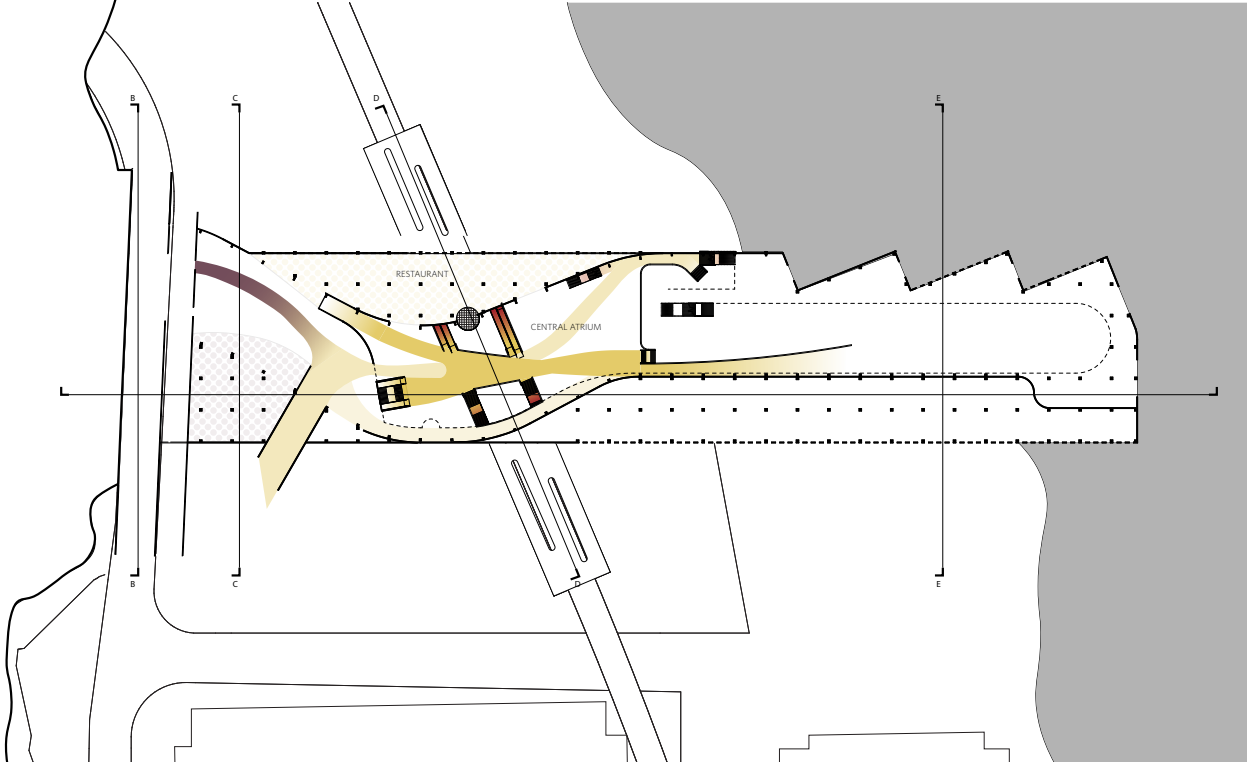


Figure 76: Level 1 Floor Plan

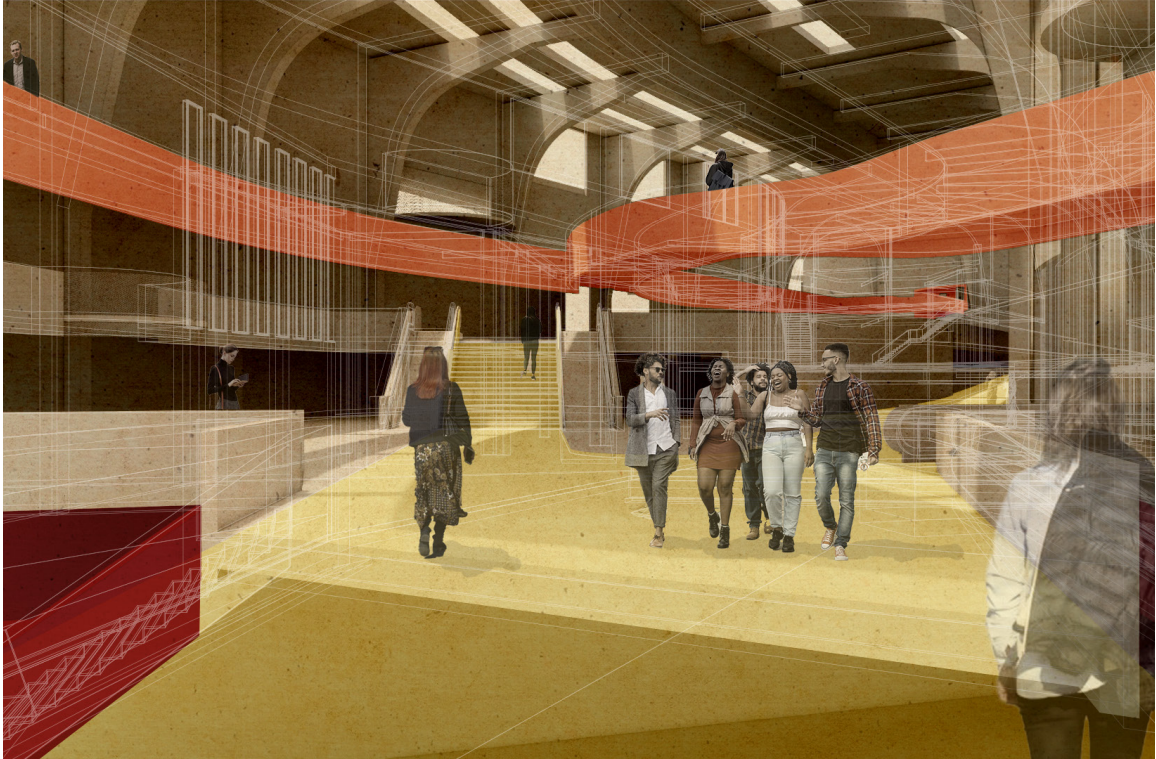


Figure 77: Atrium Collage

From Paths and Sidewalks.

With many interface points with the city, entrance by foot is addressed in a similar manner. The vestibule and canopy areas reach out from the building and gesture toward various city points. The procession toward the building sees an application of color to these entry points to clearly communicate these as nodal points. Entering through various threshold conditions – revolving doors, sliding doors, swing doors – pedestrians access the central concourse of the hub at various levels. Facing the north end, directly aligned with Barrington Street, pointed toward Granville Street mall and toward the waterfront boardwalk, each entry point directs toward the city and act as beacons from the city, toward the hub itself.

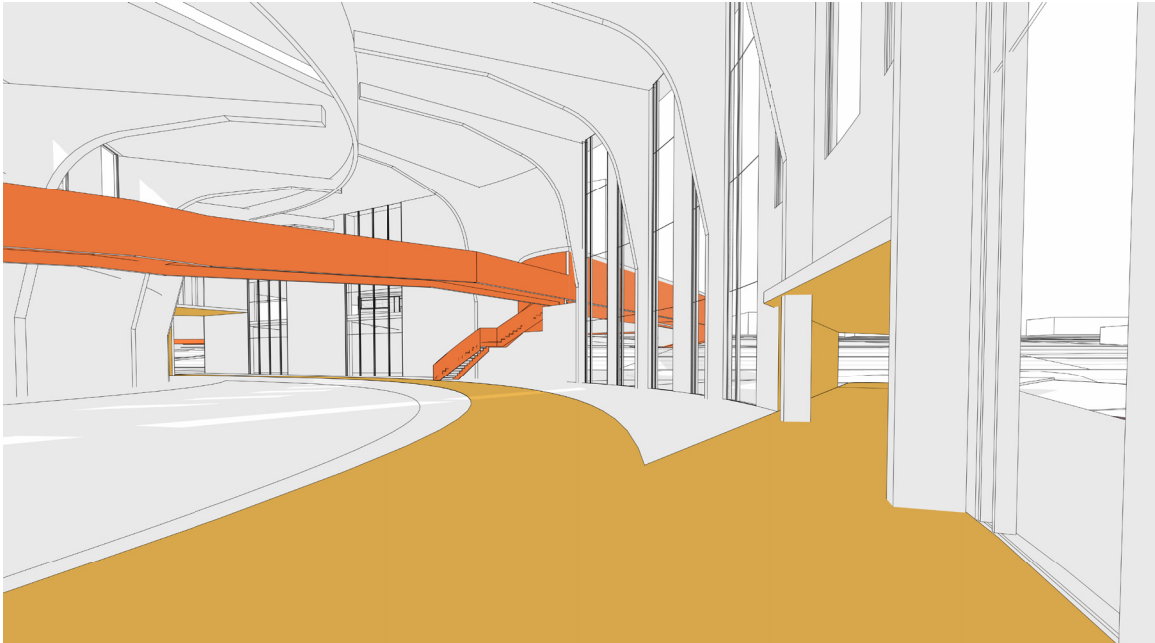


Figure 78: Atrium Perspective

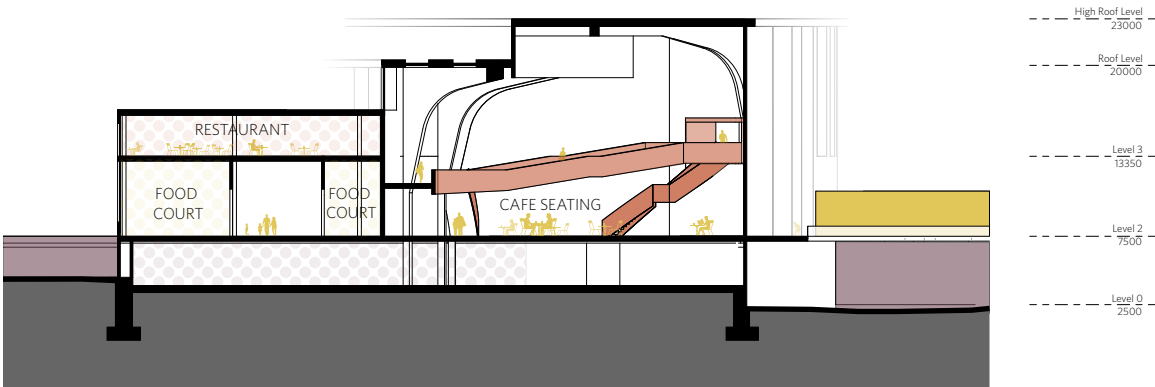


Figure 79: Cross Section B:B | Barrington Street Atrium

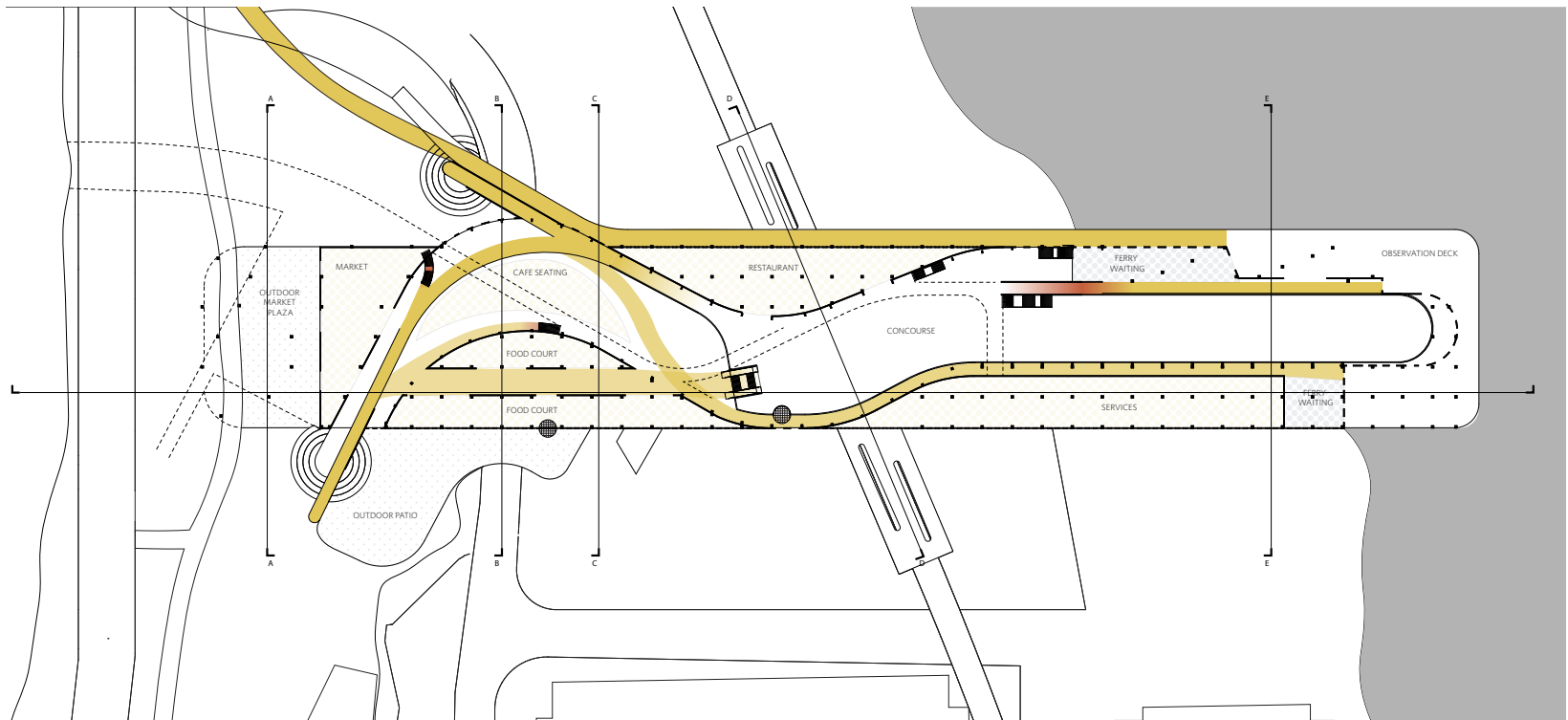


Figure 80: Level 2 Floor Plan

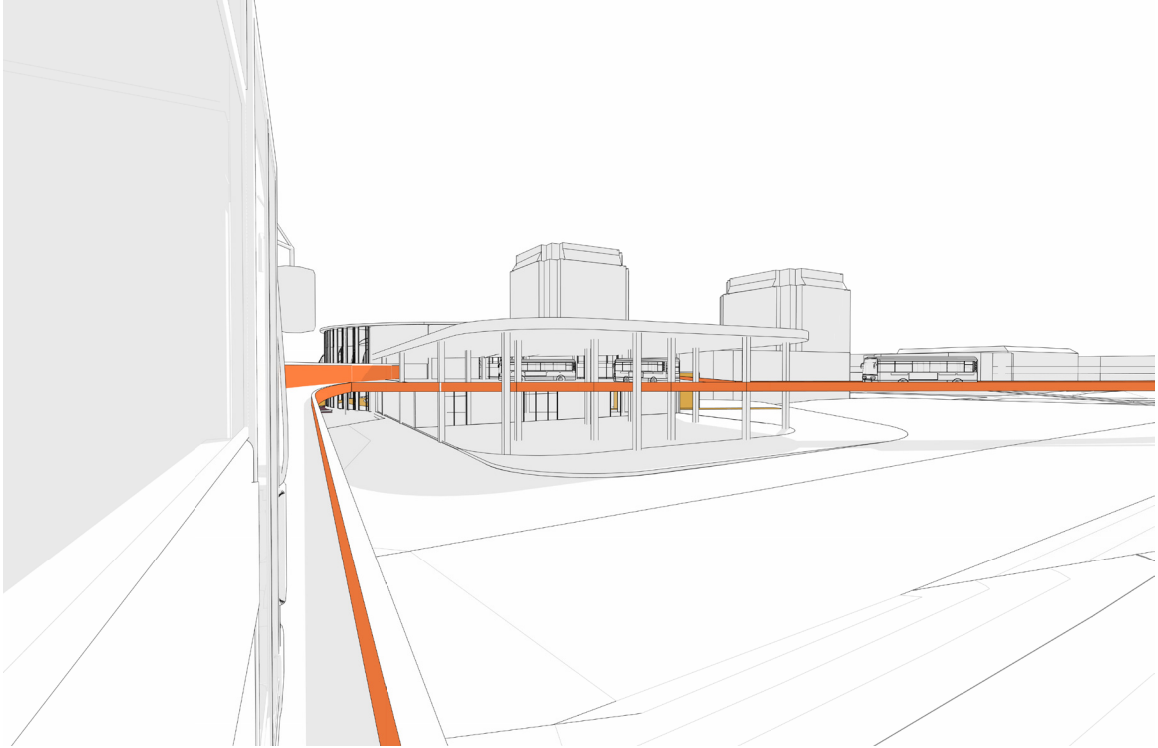


Figure 81: Bus Arrival Perspective

From Bus

High frequency city buses, express buses, and regional buses all congregate with the hub at various points. At the Brunswick adjacent lot, buses enter the site from the newly built roundabout of the Cogswell District. Once in this bus only space, the various routes disperse to reach their travellers in their various bays. Located out in the “lot”, express buses and regional buses rest in their corresponding bays for travellers to disembark and enter the building’s bridge that brings travellers into the hub. High frequency city buses come across the bus bridge, alongside the enclosed

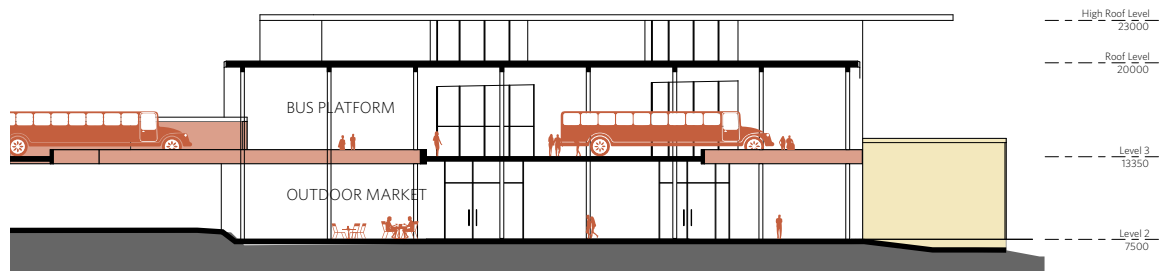


Figure 82: Cross Section A:A | Bus Platform

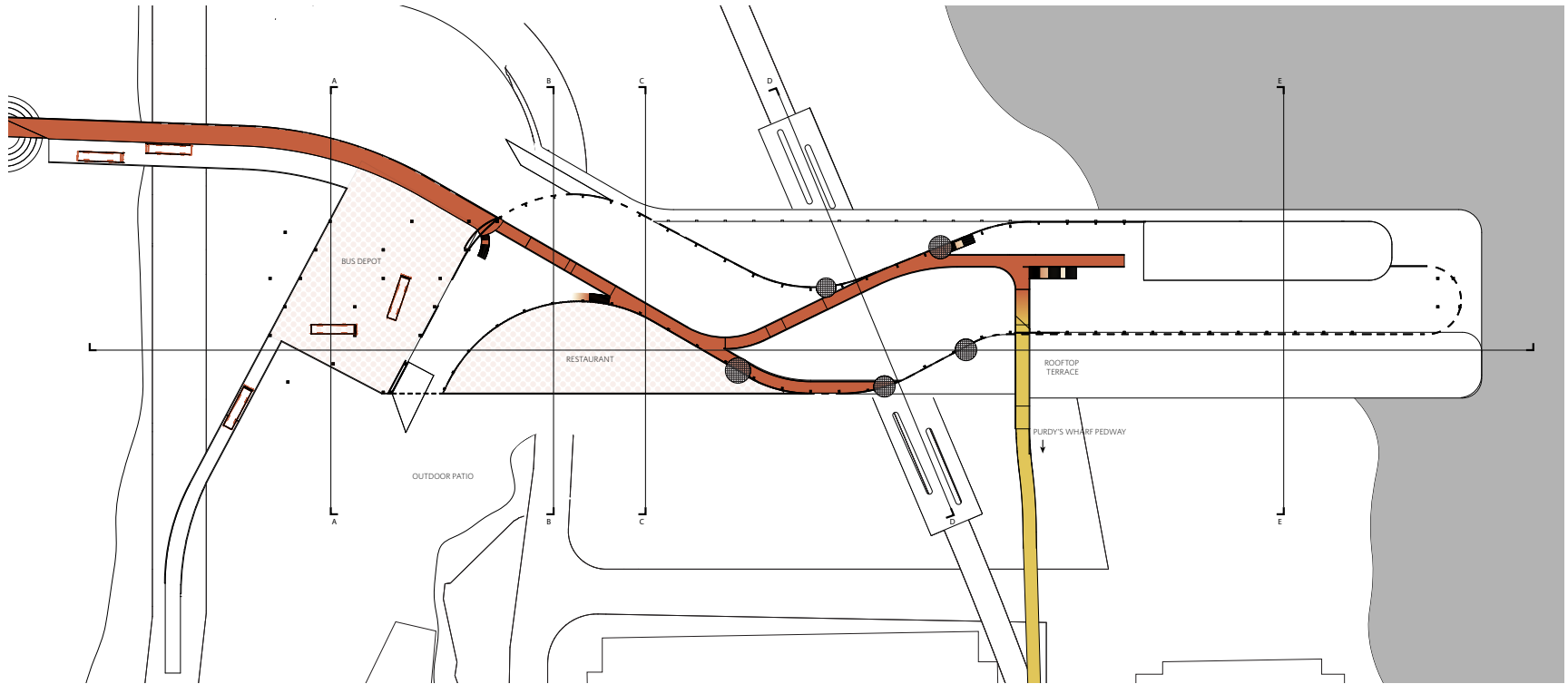


Figure 83: Level 3 Floor Plan

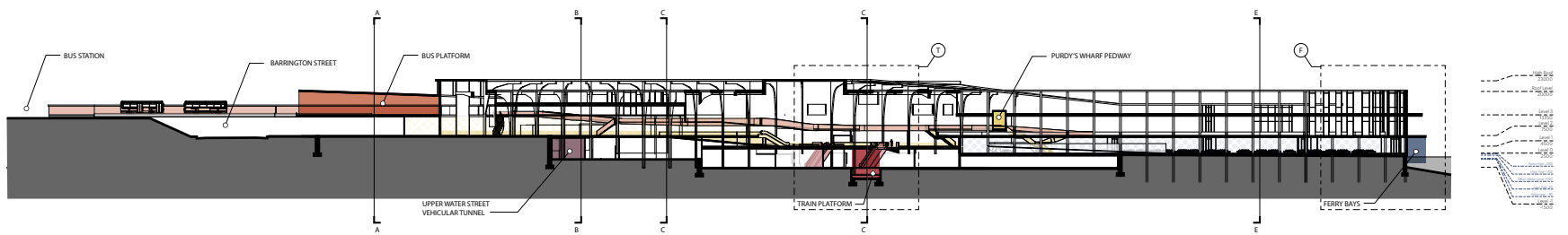


Figure 84: Longitudinal Section

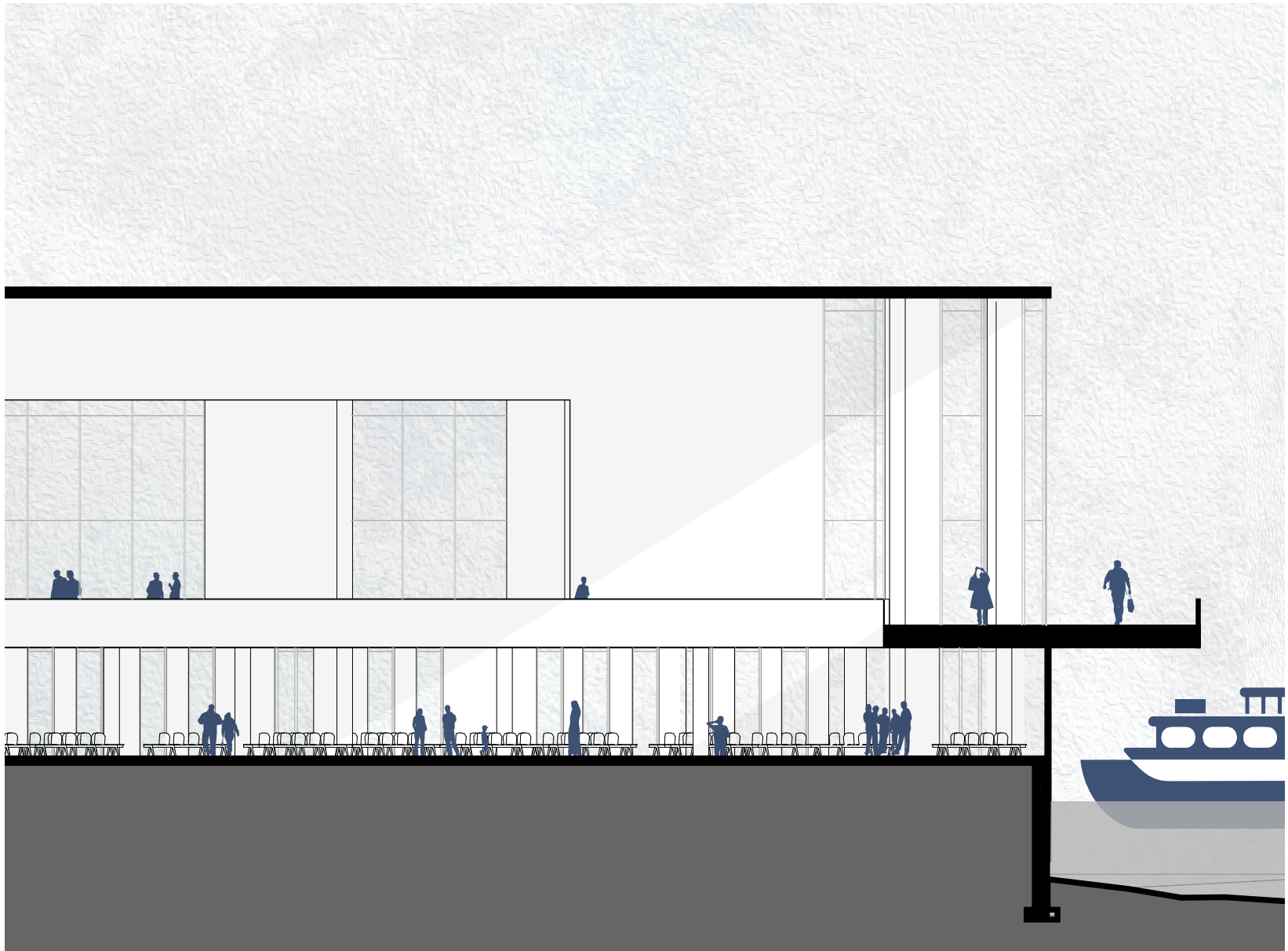


Figure 85: Ferry Bay Enlargement

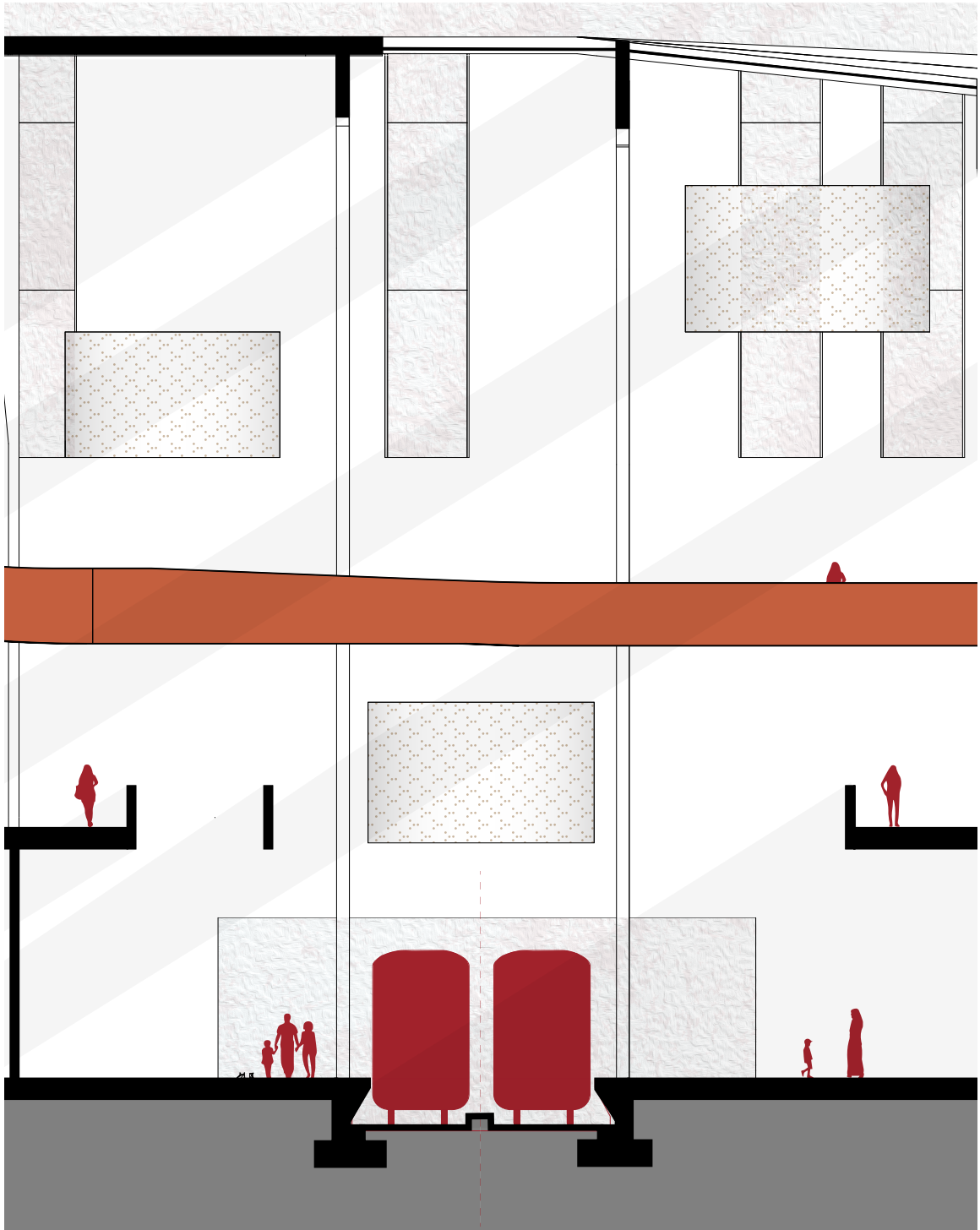


Figure 86: Train Atrium Enlargement

pedestrian bridge to the elevated bus platform at the edge of the city. Windows peer directly down into the bustling concourse and travellers enter via the elevated path that snakes into the concourse or descend down toward the Barrington Street entrance.

From Helicopter

Landing atop the concourse, helicopter travellers descend into the concourse and into the central circulation.

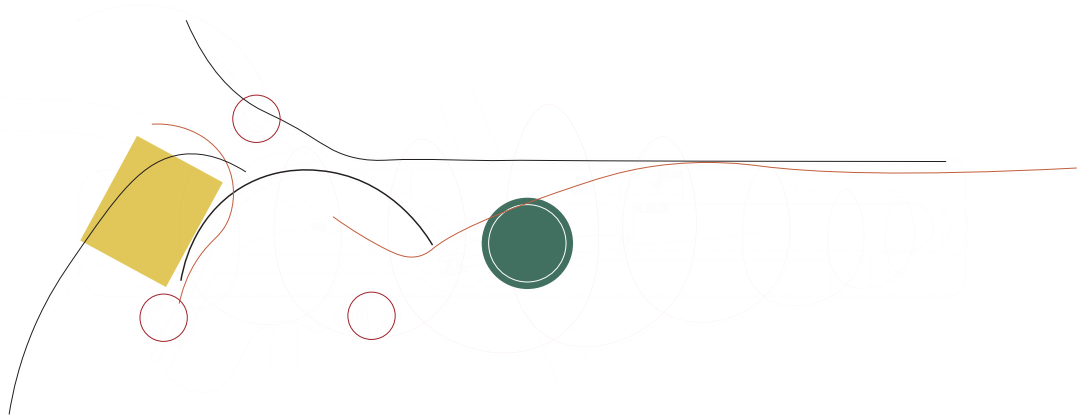


Figure 87: Floor Plan Analysis Diagram

Intermodal Transfers: The Concourse

The circulation works to connect travellers through the building and to each of the programmatic spaces abutting the concourse. Following cues from the urban fabric, alignment of this circulation to the grids, while weaving the atrium spaces brings a sense of movement and legibility to the system of commuters within the building. Transfers within a mode don't require full engagement with the concourse but each waiting area is directly within sight of the concourse.

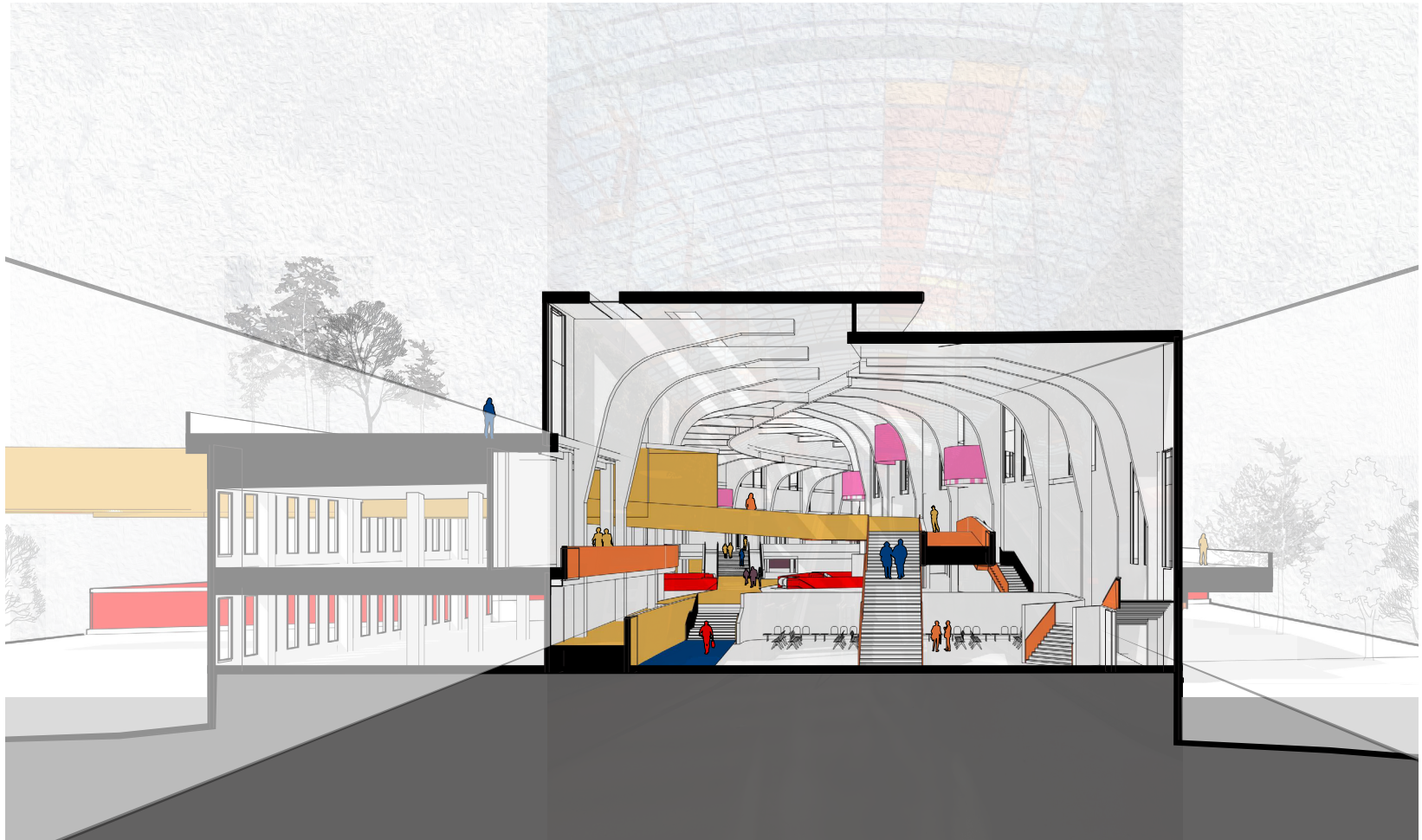


Figure 88: Concourse perspective section

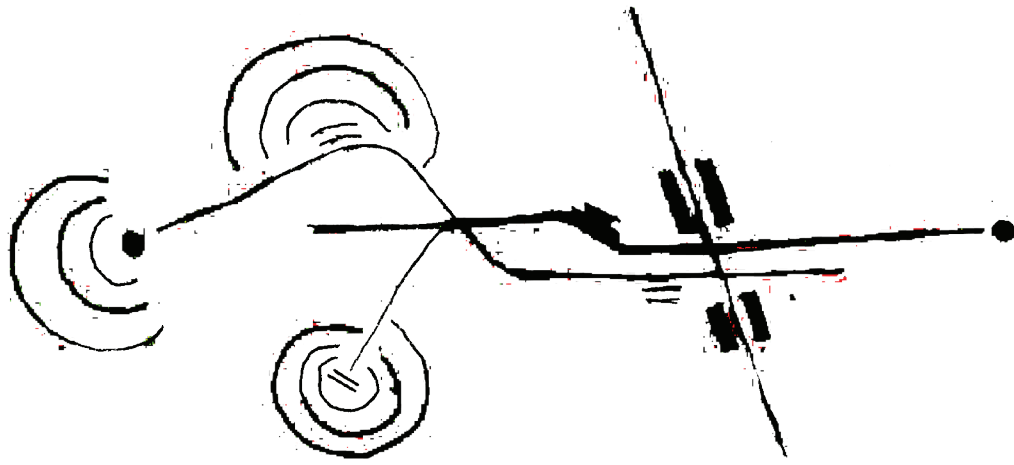


Figure 89: Concept Sketch: Circulation and catalyst moments

Wayfinding

Excellent wayfinding allows you to see where you need to go, with a minimum of signs and is stress free to navigate. The main concourse is designed to provide a clear view from one end of the 300-meter building to the other. The overall curvature of the concourse help navigate between the various system nodes and programmatic spaces along the concourse with excitement. Areas of rest and observation are scattered along the concourse to enhance the legibility of the overall building interior.

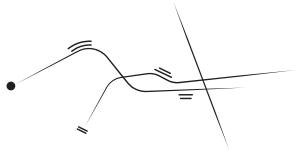


Figure 90: System Diagram

No Great Detours

Part of what makes the hub stress free is that whenever you look into the long lengthwise atrium, you can locate bathrooms, information desks, and waiting areas, which are clearly visible and in the same place on every floor. Using color and light to help identify the systems to which travellers are moving enhance the overall understanding of the building.

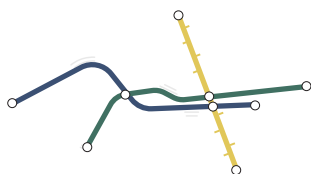


Figure 91: Circulation Diagram

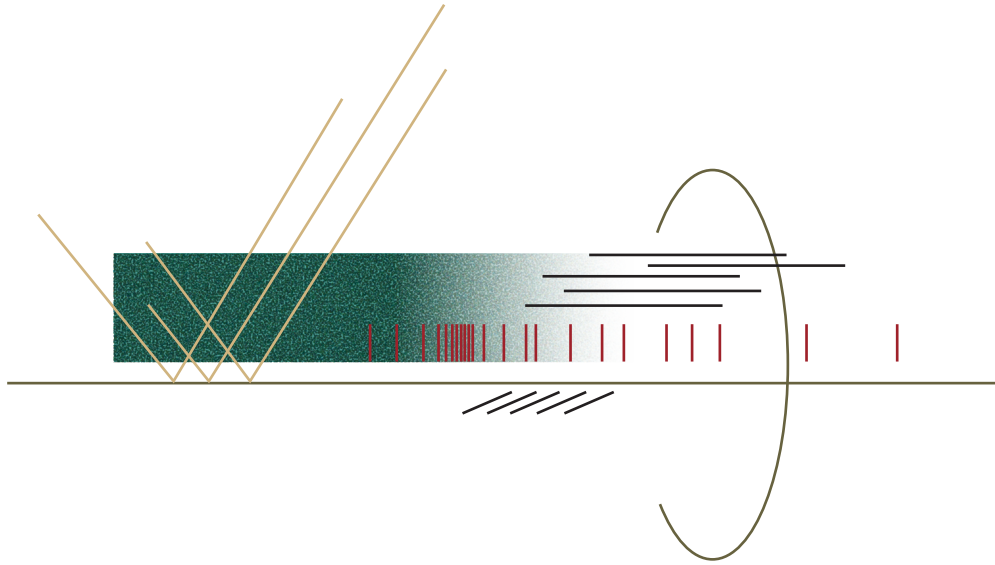


Figure 92: Wayfinding Diagram: Sight, Sound, Touch, Spatial

Interesting Experience

The act of navigating the concourse is inherently interesting simply in the understanding of the structure and the layers of circulation that activate the central concourse. Enhancing the overall experience, there are alternative circulation paths, program areas and observation nodes that intrigue and capture the imagination of people moving through the building. Along the concourse, the placement and alignment of windows delivers the city through various vantage points that begin to shift and change as you move along, delivering an experience of parallax.

Pedestrian Gateway to the City

There are five main doors out to the city. From each threshold, you can observe and identify parts of the city from well within the building, allowing time to decide whether it is the appropriate threshold for you. These view corridors are pivotal to the alignment of internal spaces and the overall concourse itself.

Barrington North and South

Barrington North Gateway faces the North End of the peninsula and engages with the multi-use paths and future development areas available. Barrington South Gateway is positioned of present the historic downtown immediately in the threshold, offering the hustle and bustle of the downtown to travellers and commuters.

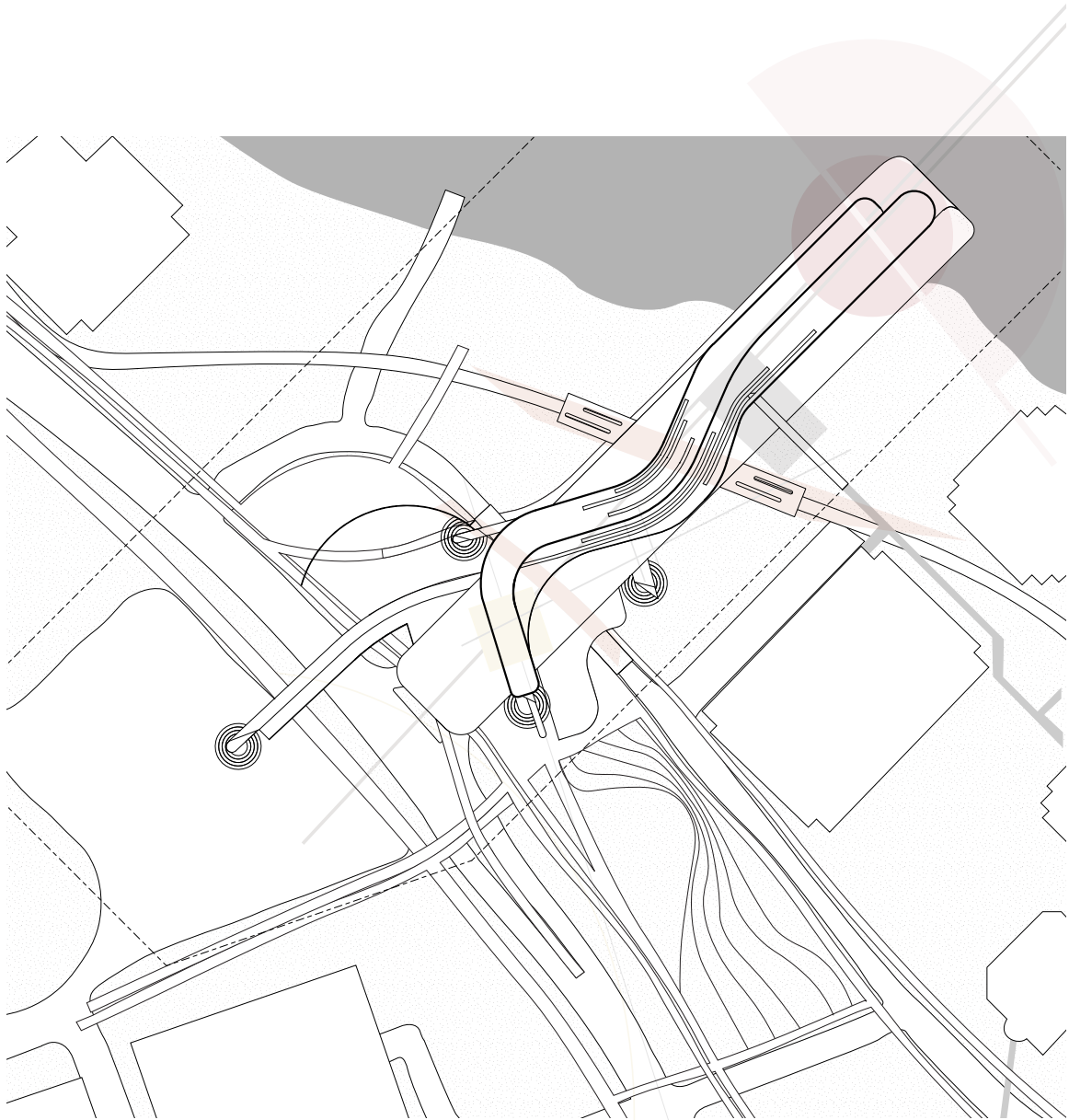


Figure 93: Site Plan: Urban Interface

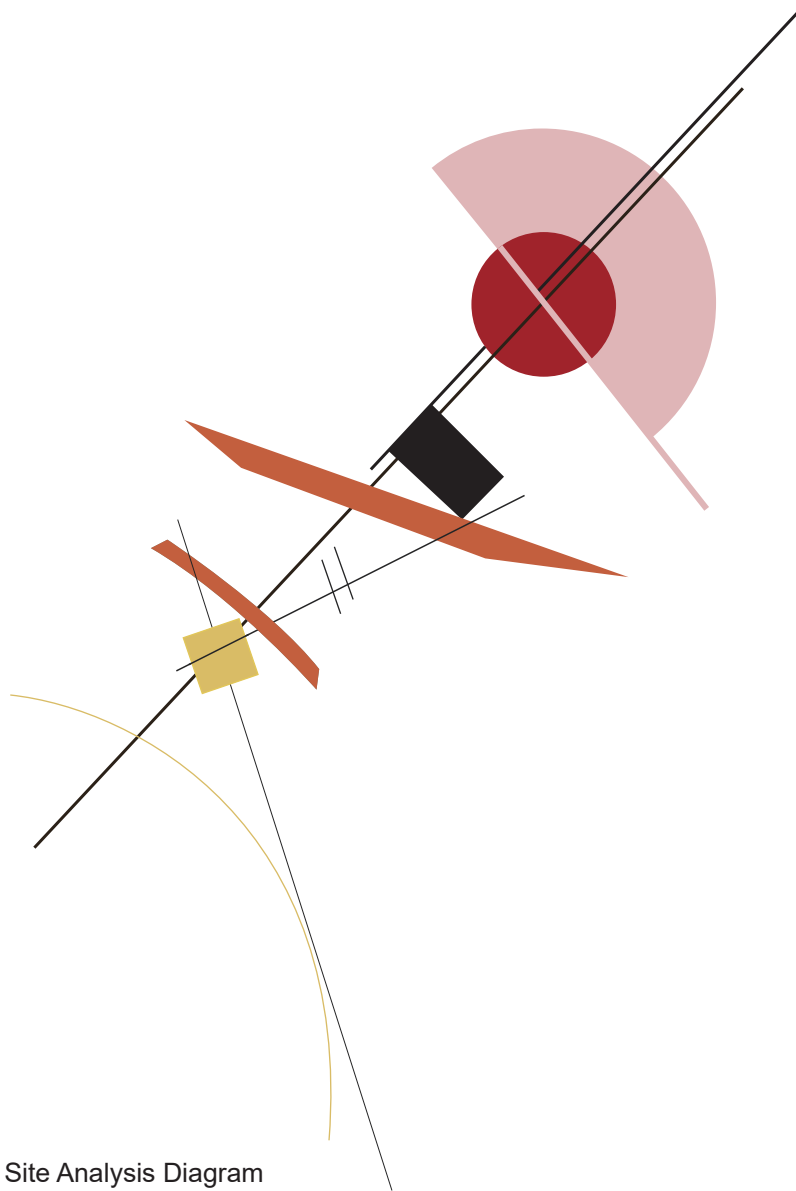


Figure 94: Site Analysis Diagram

Granville Mall

The end of Granville Street, now a pedestrian mall, is clearly visible and engages with the hub as an extension of the city.

Barrington Plaza

The main plaza extends the activity of the building out into the fabric directly. The porosity of the building ensures that multiple access points are offered to the plaza to extend the use out into the public. Aligning certain internal program with these external areas adds depth to the use of spaces.

Waiting and Watching

Sitting

Central

Sense of occasion is offered to those who wish to engage directly with the highest activity zones. Pods that extend into the atrium spaces allow those observers to roost and enjoy the busy-ness of these intersections. Accessing the pods is provided from the adjacent program areas and not directly from the concourse itself.

Peripheral

For those who wish for less stimulated observation points, view and access to each mode of travel is offered at the peripheral in program areas of rest, or in the form of holding areas for each mode. Additional to these, various rooftop, outdoor areas offer space to sit and observe at the peripheral.

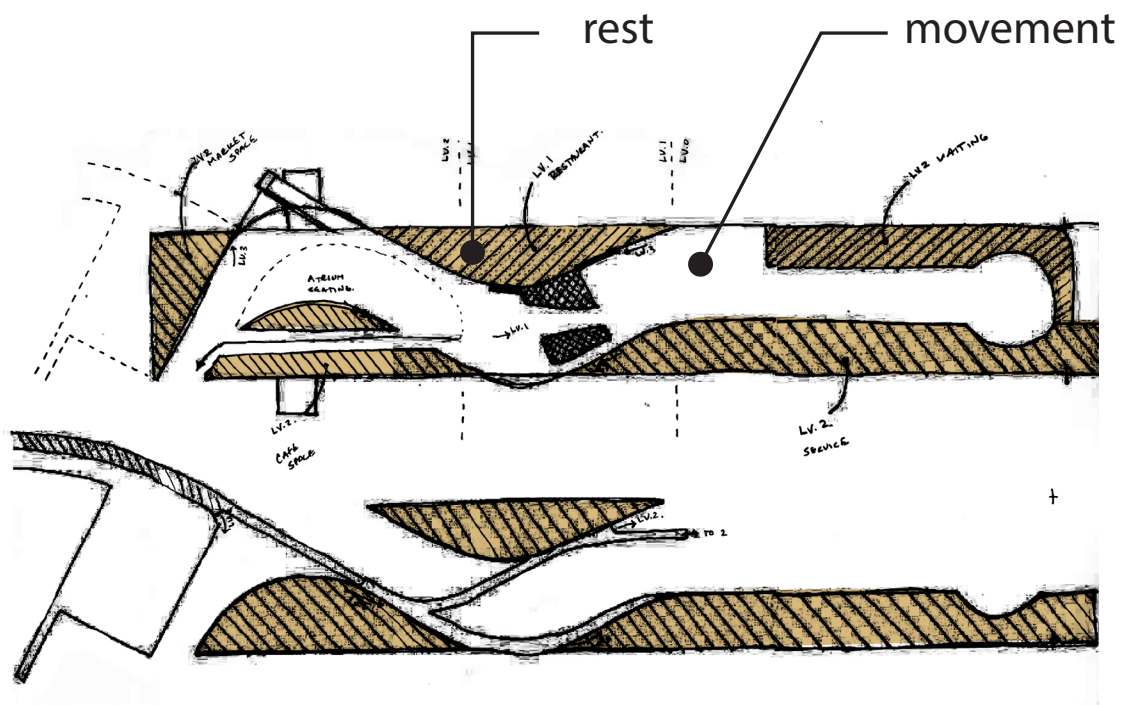


Figure 95: Concept Sketch: Program Distribution

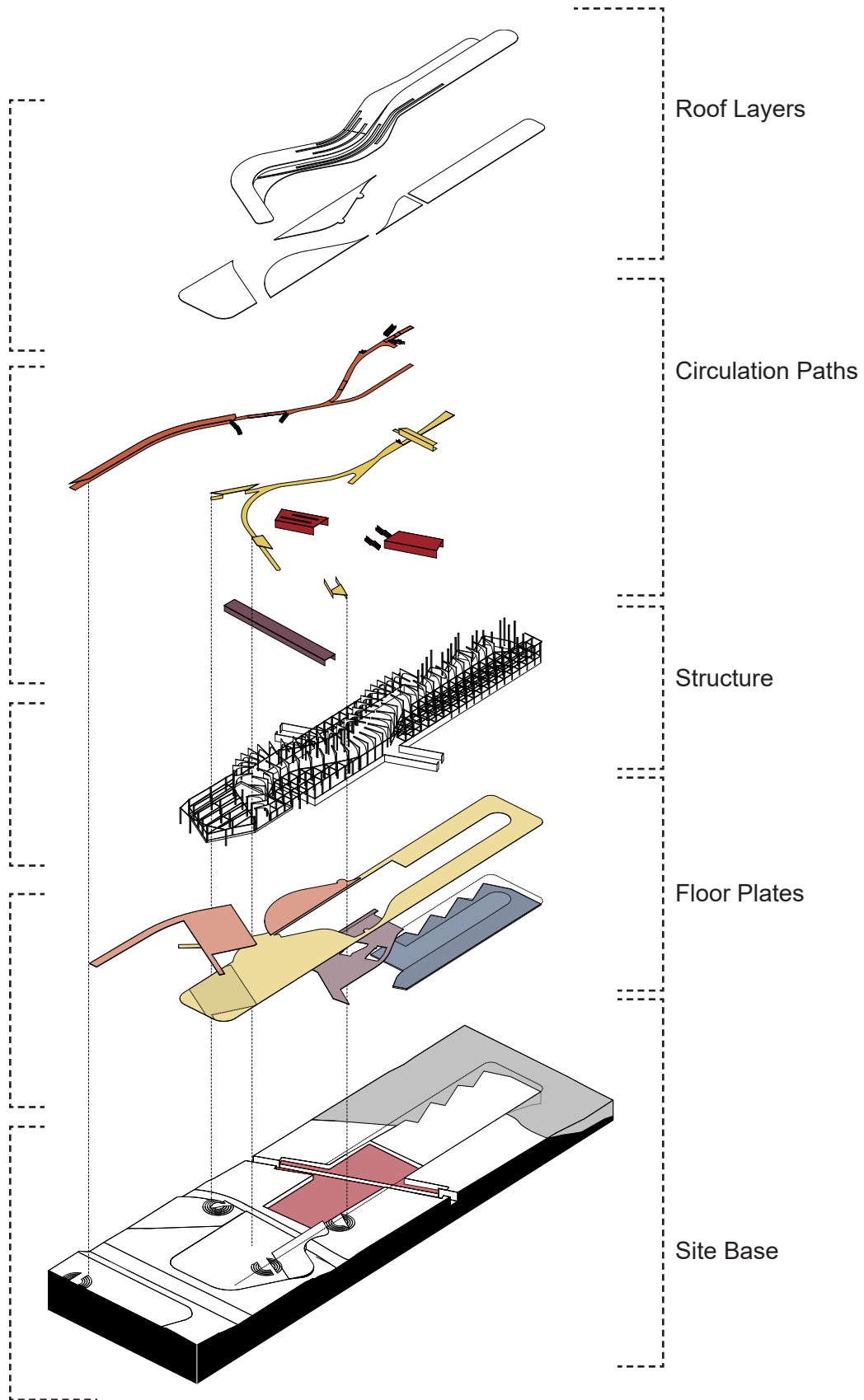


Figure 96: Exploded building axonometric drawing

Café

Located on Level 2, in the central concourse abutting Barrington, the café and open seating allow travellers access to various quick eats and drinks for their travels or their wait.

Food Court

The food court on level 2 allows multiple paths of circulation to flow through, while being easily accessed from the main central circulation. With access to the south facing patio space, vendors of various sizes can be housed in this area to capitalize on the many users of the hub.

Market

Offering space for commerce along Barrington at the head of the hub, allows access to outdoor market plaza for vendors to use the space both internally and externally as they see fit. This flexibility allows farmers and local vendors to offer their goods to the community without the need for their own retail space while being adjacent to the many moving people of the hub.

Building Services

Every building requires service space, but with the additional introduction of five transportation systems, the need for increased service space is required.

Traveler Services

Information desks and areas are visible at three of the major atrium spaces and are immediately adjacent to the main concourse for ease of use. Many of these spaces are intended to help those who do not understand the

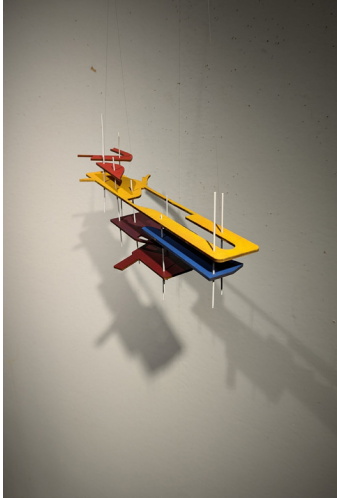


Figure 97: Floor plate model, water view

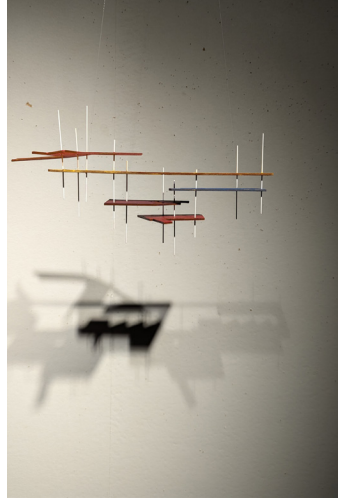


Figure 98: Floor plate model, south elevation

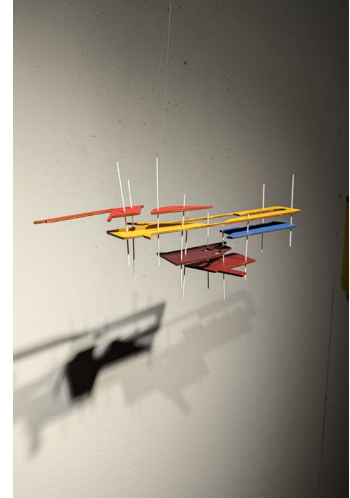


Figure 99: Floor plate model, land view

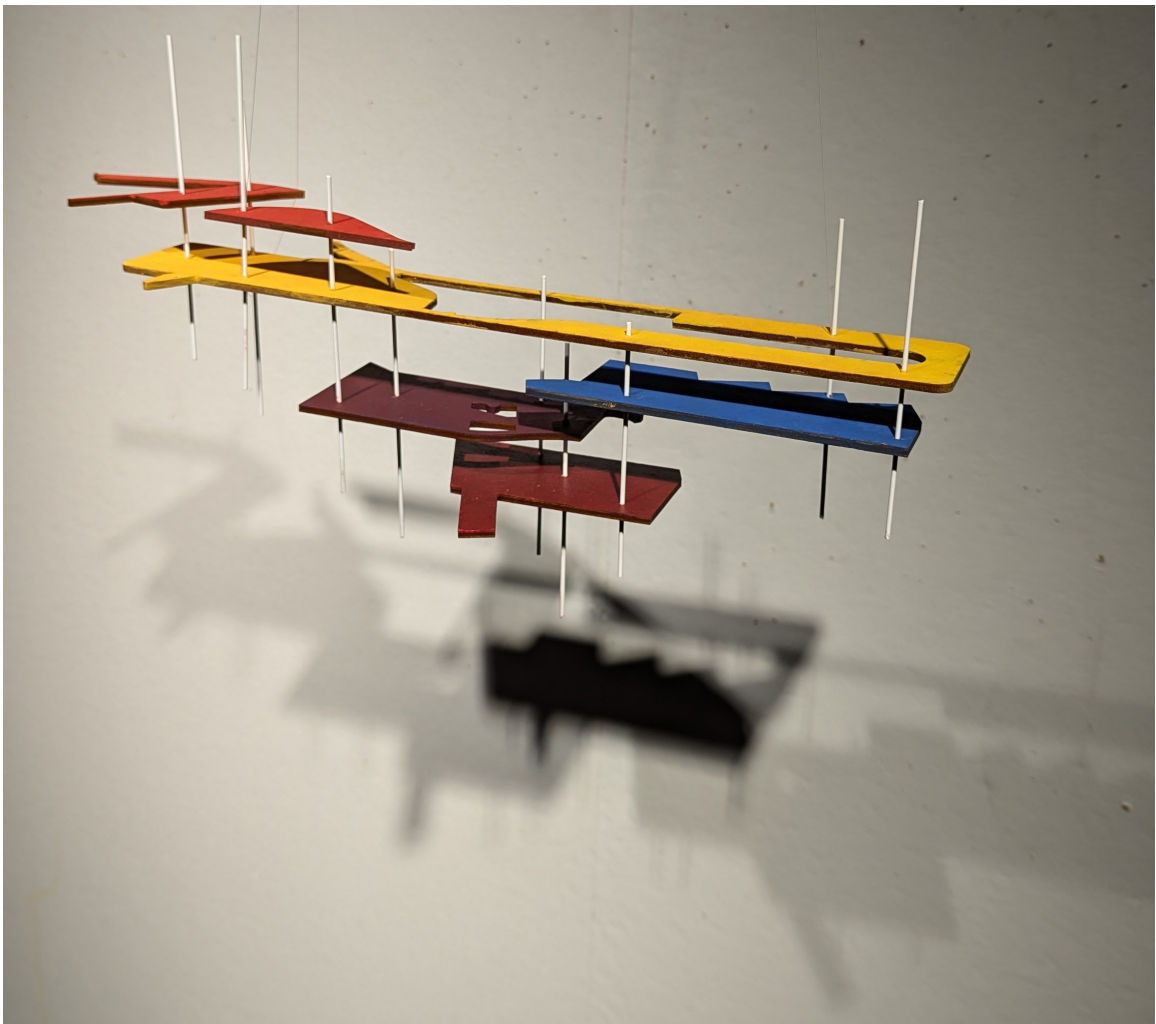


Figure 100: Floor plate model showing cascading interaction of floors across the site

transportation systems or navigate the city and its immediate surroundings without assistance.

Bathrooms

Directly adjacent to the concourse, and stacked accordingly, the washroom areas are presented to travellers in both a consistent and clear manner. Open to the circulation, these universal washroom designs allow travellers to be safe and have access to private facilities as they need during their time in the hub.

Staff Areas for Operators of Systems

Space for each operating transportation system is afforded their own departmental style service space abutting the concourse. Located near their specific system, with views directly to them, allow the staff to be in private spaces but also provide means to view their work from offices and staff rooms as required. The entrance points into these service spaces are intended to be much quieter and more reserved in expression than other access points in the building, to not confuse the public.

Operators of Building

Those who run the overall hub also require service space, much of which is also contained in the buttressing service space toward the ferry end of the concourse. Housing these spaces that have views to the full atrium allow the operators to have vision into the building while also being privately pulled away from the main circulation.

Mechanical Space

The many needs of mechanical servicing are offered in two locations, intended to be concealed from the public, and

within the form itself. In the very basement of the building, accessed via the train platform, building service space is allocated for storage, maintenance and mechanical needs. For systems requiring rooftop mounting and fresh air, the Level 3 penthouse space above the restaurant allows the expression of a restful, compressed restaurant and the provision of an isolated mechanical penthouse to not disrupt the overall formal expression of the building.

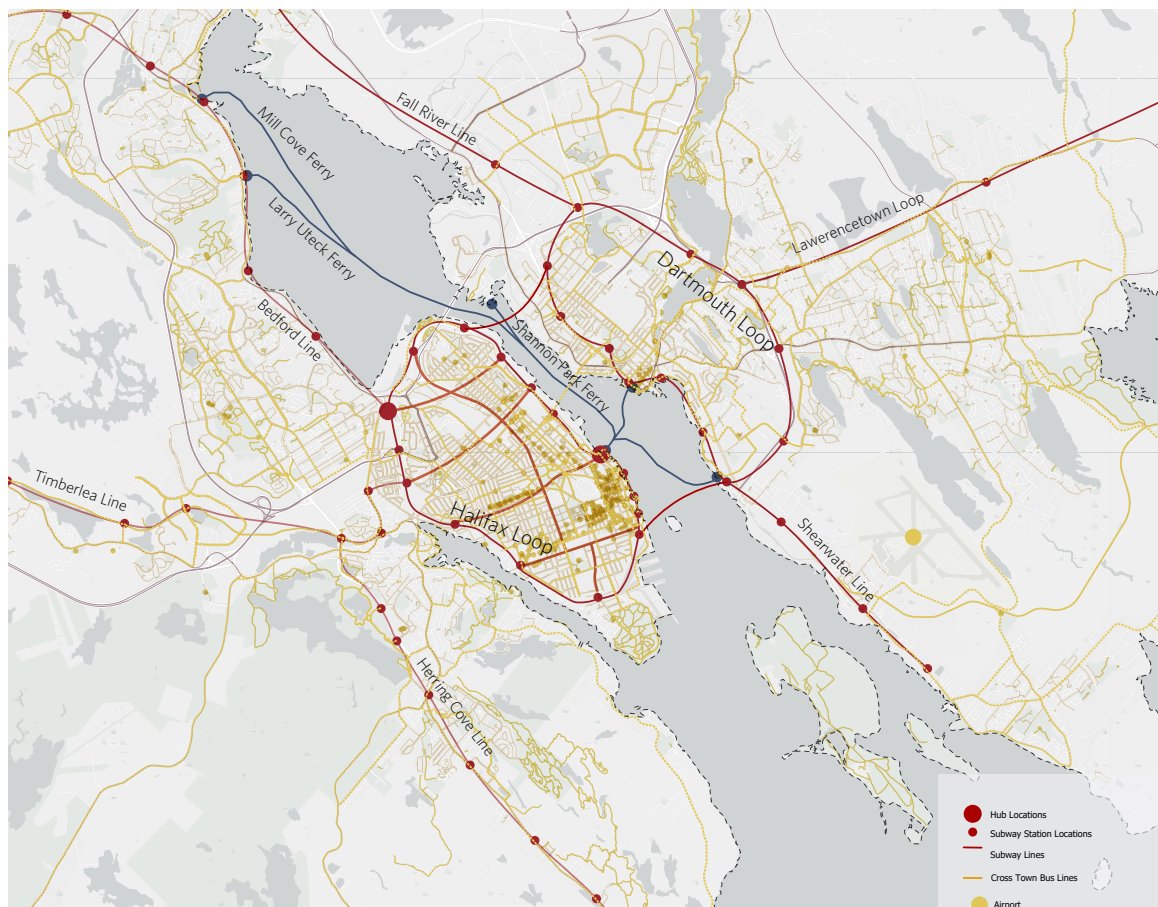


Figure 101: 1:50 000 Regional Proposed System Map

Chapter 6: Conclusion

The transit hub plays an essential role in cities today, offering the privilege and wonder of influencing the lives of all urban dwellers. As architects, we have the opportunity to shape the experiences of everyone who uses transportation systems, presenting and impacting the city in ways that leave a lasting impression. By harnessing the power and intrigue of architecture, we can make significant urban moves, influencing not only the people and their spatial experiences but also extending our impact to the immediate and broader urban context. This catalytic ability enables a transit hub to re-energize downtown areas amidst a rapidly evolving environment.

The pursuit of this thesis was to investigate the convergence of systems and spaces with diverse users, both internally and externally. Recognizing that the scope and scale of such a building require a multitude of designers to fully capture the opportunities presented, the exploration of urban reverberations was undertaken in an exploratory manner. Addressing the urban context in ways that weave the city and building together ensures that the hub itself can impact its surroundings from many vantage points.

Such a pursuit is not only feasible but necessary at this critical juncture in the growth of Halifax as a metropolitan center. With careful planning and innovative design, the design of a transit hub can re-energize the city and enhance the lives of its residents, embodying the potential for a brighter, more connected future.



Figure 102: Thesis Defense Layout: Main Pinup Wall



Figure 103: Thesis Defense Layout: Sketch Models

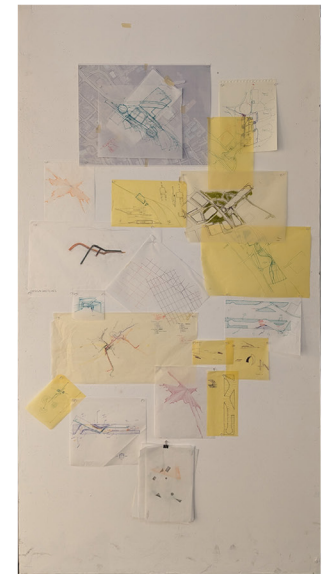


Figure 104: Thesis Defense Layout: Side Pinup Wall, Sketches

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