

# **City in Motion: Anchoring Vancouver's Active Transit Network**

by

Josh Schmidt

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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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## **Abstract**

This thesis examines Vancouver's transportation networks and their impact on city-building to inform the design of an active mobility trailhead at the False Creek Flats. The proposal argues the social benefits of intersecting sustainable transit systems with public space to create accessible, healthy and pleasurable places for people to participate in vibrant city life. Through analysis of urban planning principles, theories, and precedents, this thesis seeks new ways to experience moving through the city by testing a series of architectural interventions that reconnect Pacific Central Station and Thornton Park to Vancouver's urban fabric.

## Abbreviations

AT	Active Transportation
BCER	British Columbia Electric Railway
CPR	Canadian Pacific Railway
EoT	End of Trip Facilities
HSR	High Speed Rail
LRT	Light Rapid Transit (SkyTrain)
TOD	Transit Oriented Development

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## Chapter 1: Introduction

To be able to move about easily and confidently, to be able to linger in cities and residential areas, to be able to take pleasure in spaces, buildings, and city life, and to be able to meet and get together with other people – informally or in more organized fashion – these are fundamental to good cities and good building projects today, as in the past. (Gehl 2011, 51)



Photograph of a cyclist happily looking back at his car after choosing to cycle to school.

The decision we make to walk, ride or roll through the city over taking a private automobile results in a myriad of health, environmental and financial benefits. The Government of BC states that Active Transportation (AT) combats obesity, reduces CO<sub>2</sub> emissions and saves both travel time and money (City of Vancouver 2019).

Indeed, Vancouverites seem to be listening, as they are choosing the bike more often, accounting for 10% of modal share in 2018 compared to 5% during the pre-cycle lane era in 2008 (City of Vancouver 2019).

This could be attributed to the city's commitment to building active lane infrastructure. In 2017, Vancouver garnered global attention when a press release from Eco Counter announced the Burrard Bridge cycle lane clocked an average of 3,100 cyclists per day – the highest tally in North America (CBC 2019).

However, not everyone is on board with the idea of AT, even after the quantifiable success of cycle lanes is considered. Despite numbers climbing year over year towards the city's goal of reaching 2/3 of all daily trips made by AT, 46% of commuters preferred the private car in 2019 (Translink 2020).

Still, the momentum of the city's successful implementation of active lanes resulted in a city-wide adoption of AT considerations to be required for new developments. Some of these include public bike share modules, secured indoor bike/mobility device storage at grade, and accessible showers and lockers (City of Vancouver 2017).

Despite supporting these mandates and advocating for an AT-prioritized city, this thesis takes into account the months of rain and arguably hilly terrain that Vancouver endures, which make electric and hybrid vehicles legitimate urban transit options. This is emphasized given the availability of car share programs that offer zero or low-carbon emitting vehicles - ideal for weekend trips or Costco runs.

Instead, the thesis seeks to answer the question: how can architectural interventions enhance the user experience of active transportation to remove its associated stigma and increase participation?

The structure of this exploration begins with analyzing the context and history of Vancouver's transportation networks in Chapter 2. It will then look to the future at a proposal for a new High Speed Rail (HSR) line, before investigating theories from Jan Gehl and Kevin Lynch in Chapter 3 on successful public space and how it's perceived while in motion.

Chapter 4 will evaluate existing Scandinavian-designed train stations that have been selected for their consideration of cycling culture. The precedents serve to help build design criteria that will be applied to designing the Pacific Central Trailhead Masterplan, proposed in Chapter 5.

## Chapter 2: Context

### Transit Networks as a Foundation for Cities

Rivers and canals, the world's earliest transportation networks, were responsible for the development and growth of some of the oldest cities. The intersection of waterway with road provided the movement of people and goods between places of commerce, spurring exchange of knowledge, culture and ideas. These social connections strengthened river-based communities such as the ancient Egyptian civilizations along the Nile and Mesopotamia along the Euphrates and Tigris.

The medieval city street networks which followed demonstrated the evolution of urban transportation and its importance to urban vitality. Select streets converged to form the urban square, an outdoor plaza enclosed by continuous walls of buildings where pedestrians were invited to gather, discuss, share and participate (Lynch 1981, 443). The

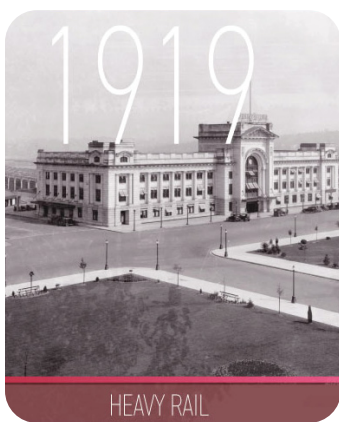


Piazza del Campo in Siena, considered by scholars the symbol of Tuscan public life. Established as a market place before the 13th century, its program now includes The Palio di Siena horse race and the finish of Strade Bianche, an annual road cycling race. (Manoy 2021)



scale of the square was important, with its organization and dimension principles still followed in today's city planning; urban designer and architect Jan Gehl references the design of one example, the Piazza del Campo in Siena, as being "ideally arranged to function as a meeting place and public living room for its citizens, both then and now" (Gehl 2011, 41).

### **Vancouver's Transit-led Boom**

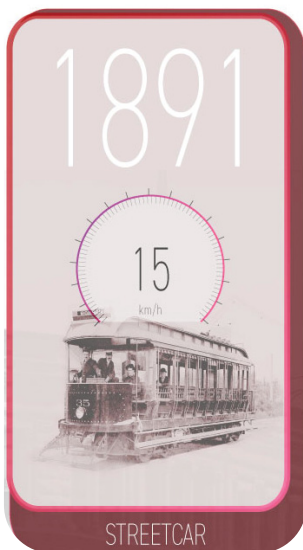


Canadian National, now known as Pacific Central Station, served as Canada's Western Terminus for passenger rail. Throughout much of the early 20th century the site was a symbol of new beginnings and bright futures. The station opening in 1919 introduced Vancouver to the East and quickly inspired an influx of travelers – many of whom became residents.

The waterway, street and square eventually became connected to a broader land network – heavy rail – which changed the way people in cities lived, worked and socialized. For some cities, heavy rail was the catalyst for immense, nearly-instantaneous growth, as what happened in Vancouver near the end of the 19th century. When it was announced that the Canadian Pacific Railroad would locate its western terminus at "Vancouver" in 1885, sawmills and logging camps had been in operation for about 20 years, and spanned "little more than one block" (Macdonald 1992, 22). Once the railroad entered the city, population rose from a few hundred pre-1885 to over 10,000 by the end of 1889 (Macdonald 1992, 22).

The rail network spread throughout Vancouver's then-city center, Gastown, tracking the water's edge in all directions. Soon construction of brick and mortar buildings followed in the form of schools, churches, sawmills, and hotels, which transitioned into wooden walk-up apartments and houses in the West End toward Stanley Park.

As the city expanded, so did the notion of the aforementioned town square, or public gathering space. For this unique city, the preferred public spaces ventured outside traditional plaza footprints and towards beaches and parks that would



Construction of the electric streetcar network in 1891 let passengers travel easily from Waterfront Station in Gastown and Pacific Central Station in False Creek Flats to Vancouver’s expanding neighbourhoods.

become distinguishing features of the city’s downtown core. Throughout the first decades of the 1900s, these public spaces became connected by the electric streetcar system, an amenity which differentiated Vancouver from other cities of the time. This catalyzed land development, as the quickly expanding transportation system would outbuild housing construction, so that where the British Columbia Electric Railway (BCER) would “lay down a track ... development seemed sure to follow” (Hayes 2018).

### Electric Streetcar That Planned the City

In 1891, North America’s first intercity electric railway was rapidly expanding from downtown’s Cordova Street into the West End and over False Creek (Macdonald 1992, 26). This directly resulted in expansion of Vancouver’s residential neighbourhoods that were developing in the downtown core into the wooded suburbs, while simultaneously weaving

#### PUBLIC SPACES CONNECTED

- OUTDOOR GATHERING SPACES
- HISTORIC PUBLIC BUILDINGS
- EXPO '86 PUBLIC BUILDINGS



Malkin Bowl performance space at Stanley Park in 1934, connected by streetcar (Vancouver Board of Parks and Recreation n.d.)



Map of Vancouver’s Streetcar grid circa 1950. (Base map from Nicholson Road Maps n.d.)



BC started replacing the BCER with buses during the 1950s, citing a cheaper alternative to laying rail. The first winter of heavy snow had the province second-guessing the choice, as the first trolley buses continuously got stuck. (Hayes 2018)

access to the recreational spaces that were growing in popularity at the time. In the elite West End, Stanley Park and English Bay Bathhouse were among favourite social spaces, with a 1909 survey revealing out of 33,000 visitors in one week, 1,100 explored the park by horse and buggy; 600 by bicycle; 400 on saddled horse; 400 by automobile and 30,500 by foot. However, since most people did not live within walking distance, presumably the majority of the remaining 30,500 pedestrians arrived to the park by streetcar (Macdonald 1992, 32).

Throughout the following six decades, the lines would extend across Burrard Inlet into North Vancouver, and east into the Fraser Valley, opening land to settlement and allowing farmers to commute to Vancouver daily to sell dairy and fresh produce. Eventually 29,000 km of tracks spread over the Greater Vancouver and New Westminster regions.

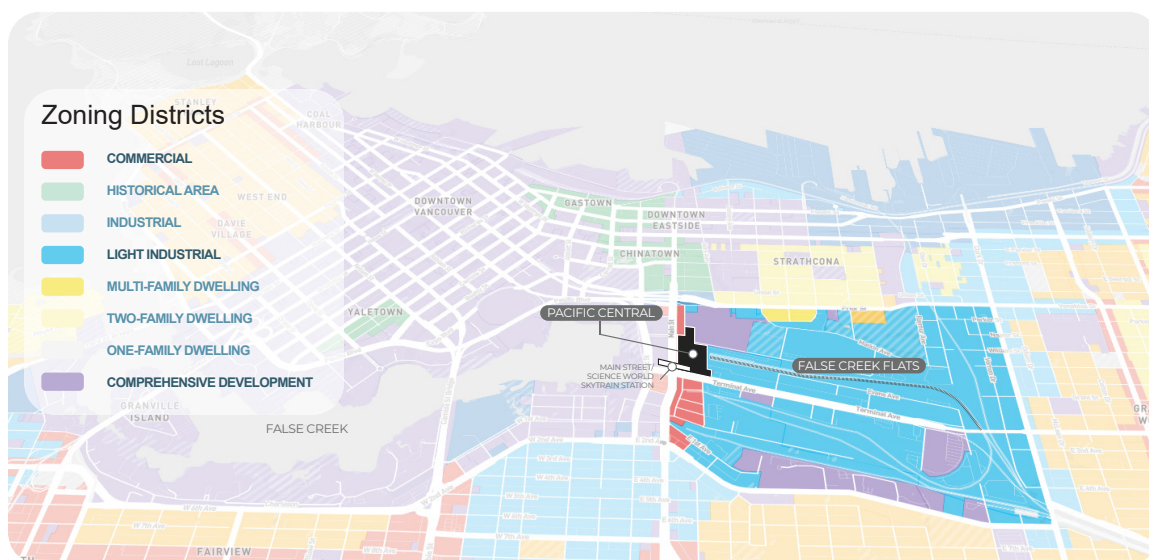
The lines also promoted separating work from living quarters, allowing those with jobs downtown working in sawmills and shingle mills to own their house on less expensive land in the city's first suburbs, Mount Pleasant and Fairview. As a result, more developable land became accessible for the growing population to enjoy public space, such as Robson Park and Athletic Park (Macdonald 1992, 44).

To support the advancing infrastructure, more BCER stops and downtown stations would be added that linked urban lines with urban lines, drawing more people into the city for social events. Soon the first Vancouver Hotel opened, joined by the Vancouver Opera House in 1891 as some of the city's first indoor gathering spaces. Two and a half decades later, one of the final structures built to directly serve the C.P.R. was Pacific Central Station, or as it was known



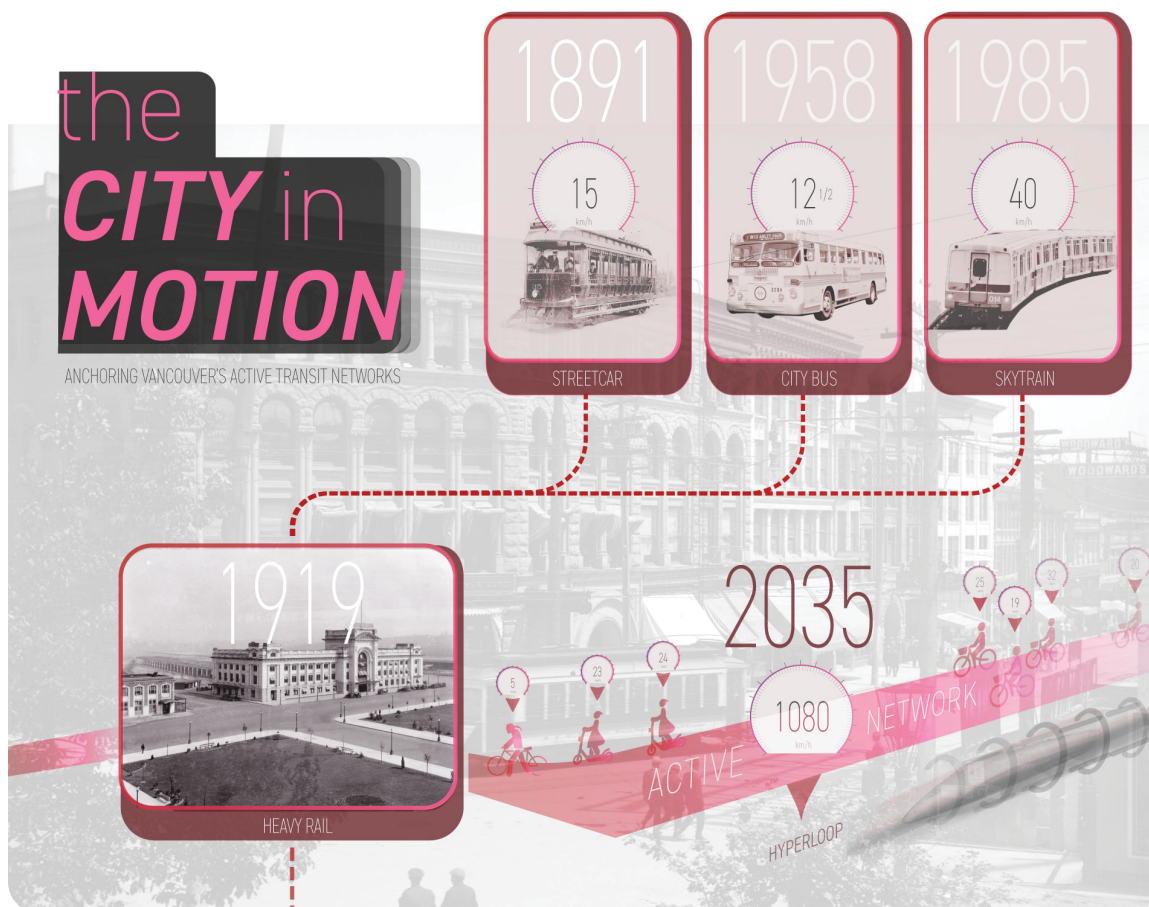
Sustainable electric transit moved people faster in 1985, when the first SkyTrain passenger car arrived at the elevated Main Street/Science World Station, overlooking Thornton Park and Pacific Central Station.

on opening day in 1917, Canadian National. It welcomed travelers from across the country at the infilled False Creek Flats and connected them to Gastown via modern streetcar, jitney or horse and buggy. Over the next 100 years, Pacific Central Station and its adjacent Thornton Park would nestle unassumingly against the backdrop of the North Shore mountains as the unofficial Gateway to the City. From its prominent position near the entrance of transportation-themed Expo '86 and the first rapid transit SkyTrain Station, the site would quietly witness the evolution of Vancouver's social, economic and political growth. Throughout the latter half of the 20th century, Pacific Central Station and Thornton Park were grounds for protests, markets and festivals, while also observing the rise of the private auto in city-planning as well as the subsequent historical roadblock when plans for a freeway were successfully protested against. The outcome protected the station from being divorced from downtown Vancouver by way of an eight lane freeway along the water's edge.



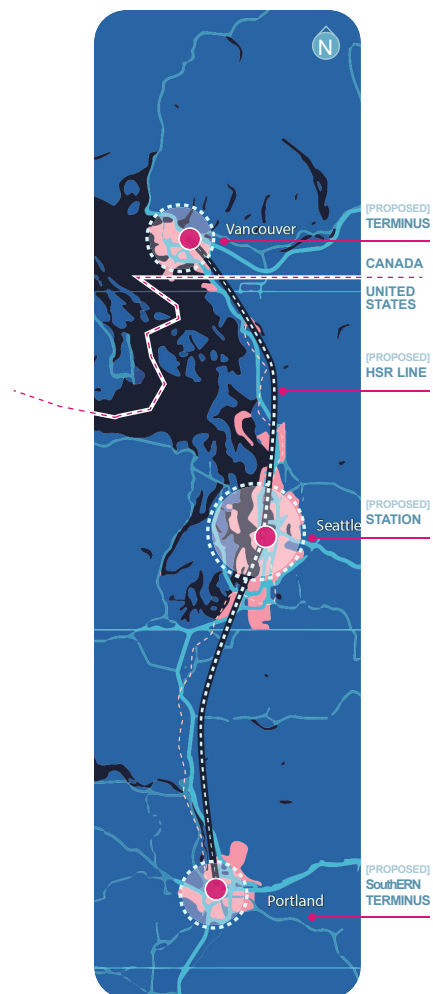
False Creek Flats is primarily I-2 light industrial. Its western edge permits some commercial in the FC-2 zone, where Pacific Central Station is located. However, a lack of mixed uses has left the neighbourhood struggling in recent years to see pedestrian activity. (Base map from Nicholson Road Maps n.d.)

In recent years, the station has played a peripheral role as the civic backdrop to Vancouver's now-completed False Creek Seawall, which links downtown beaches with multi-use trails. Today the station functions as a multimodal transit hub, but sees far less activity than in its heyday. Besides lack of demand for heavy rail travel, the site's industrial land use to the east, an interruption of active lanes, combined with car-centric urban planning, have contributed to the site's dwindling activity.



Vancouver's public transit network has historically intersected the city's active lane network to varying degrees. The inconsistent approach has discouraged some commuters from combining multiple modes; however, reinforcing AT integration with the future HSR system at Pacific Central Station would prevent increased strain on the city's public transit infrastructure.

## Future Sustainable Transit Networks



The Cascadia Corridor includes major coastal urban centers: Vancouver, British Columbia, Seattle, Washington, and Portland, Oregon.

A proposed high-speed, low-carbon train line will follow over 500 km of existing heavy rail passenger tracks, connecting travelers between cities in under one hour. (base map from Google maps n.d.a)

Reduced demand for heavy rail may have left Pacific Central Station as a relic of Vancouver's development history, but it also created room for alternative forms of passenger transportation. However, over the past decades, the private automobile has dominated the space for transit culture in most North American cities. In Vancouver, the city attempted to combat this over decades by implementing sustainable alternatives to freeways with networks such as SkyTrain, active lanes, and Bus Rapid Transit lines in addition to standard bus routes. These have proven successful, another condition unique to Vancouver; today, public transit runs at capacity as an increasing number of riders from outside the city choose public transit over the private car for their daily commute into the city. The Main Street/Science World station alone saw 15,080 daily boardings in 2018, up 5.6% from the year before (Translink 2019). Of particular note, history has shown that a benefit of increased ridership spurs housing and office space development around stations.

### *A High Speed Shift in Intercity Travel*

A forthcoming shift in Vancouver's interurban transit might exacerbate the local transit system-passenger imbalance, but increase opportunity and diversity of social mixing – a vital component of healthy city life (Gehl 2010, 63).

In a 2019 High Speed Rail (HSR) feasibility study released by the province of British Columbia along with the states of Washington, and Oregon, research determined viability for implementing an advanced passenger transport system that connects three major Cascadian cities: Vancouver, Seattle and Portland.

The proposal concluded that the fast new system would be successful in connecting the growing tech centers in the Cascadian Innovation Corridor, reducing congestion on roads, jet fuel consumption in the sky, and overall journey time (Washington State Department of Transportation 2019). The system could follow models implemented in high-density urban centers like Hong Kong, where the controversial but rapid Vibrant Express connects the city to mainland China in under 25 minutes (Barrow 2018).

The new HSR would replace existing heavy rail passenger service between Vancouver, BC and Seattle, WA, implying potential to overtake a percentage of private automobile commuter modal share and majority of direct intra-regional air travel. The study finds the new system's low carbon impacts and high-speed efficiency would provide "frequent trains running at speeds as high as 250 miles per hour (400 km/h) that could reduce travel time between the major cities to less than an hour" (Washington State Department of Transportation 2019).

### ***Methodology and Strategies for the Pacific Central Revival***



Two women disembark a bike-friendly HSR car in Copenhagen, DK (VisitDenmark n.d.)

Design consideration of the new stations and the public realms they intersect is limited in the study. It presents general location proposals for major train stations and suggests the northern terminus to be located at Pacific Central Station in Vancouver.

This thesis seeks to continue the design investigation where Washington State Department of Transportation left off, from an architectural perspective. The following chapters will explore the intersection of the proposed HSR line at Vancouver's existing Pacific Central Station and the

potential social and environmental benefits it will provide the Vancouver region. Responding to the transit hub's inherent benefit of guaranteeing movement of people in large quantities, the thesis tests architectural interventions that reflect the social ethic unique to Vancouver to improve the experience of arriving at Pacific Central Trailhead.

To achieve this, an analysis of existing site conditions and future developments proposed in the Flats, including a new hospital campus at the site's north boundary, will help drive program design. It will then evaluate successful TOD projects in Europe to inform design criteria for a new pedestrian-oriented transit hub. The criteria will be applied to test urban planning principles and theories established by Gehl, Lynch and Beasley to support design decisions for the site's transformation into Pacific Central Trailhead.

### **Overview and Hypothesis**

Since transit infrastructure became more than a planning strategy to develop Vancouver via the CPR (and the subsequent BCER), this thesis investigates how the proposed HSR transportation system might impact the city's next phase of growth and development. It will do this by exploring architectural interventions at the new network's terminus station to test the following three predictions:

1. High Speed train lines will replace heavy rail for passenger travel, affecting how, why and when we depart one city and arrive in another. This proposes an opportunity to reconsider the role of the station as a key social node in the city networks.
2. The pattern of successful social gathering points emerging near transit nodes presents a chance to reclaim



public space at Pacific Central Station and Thornton Park. Considering multi-functional spaces in the site's masterplan will allow program to evolve and respond to the needs of future adjacent developments at False Creek.

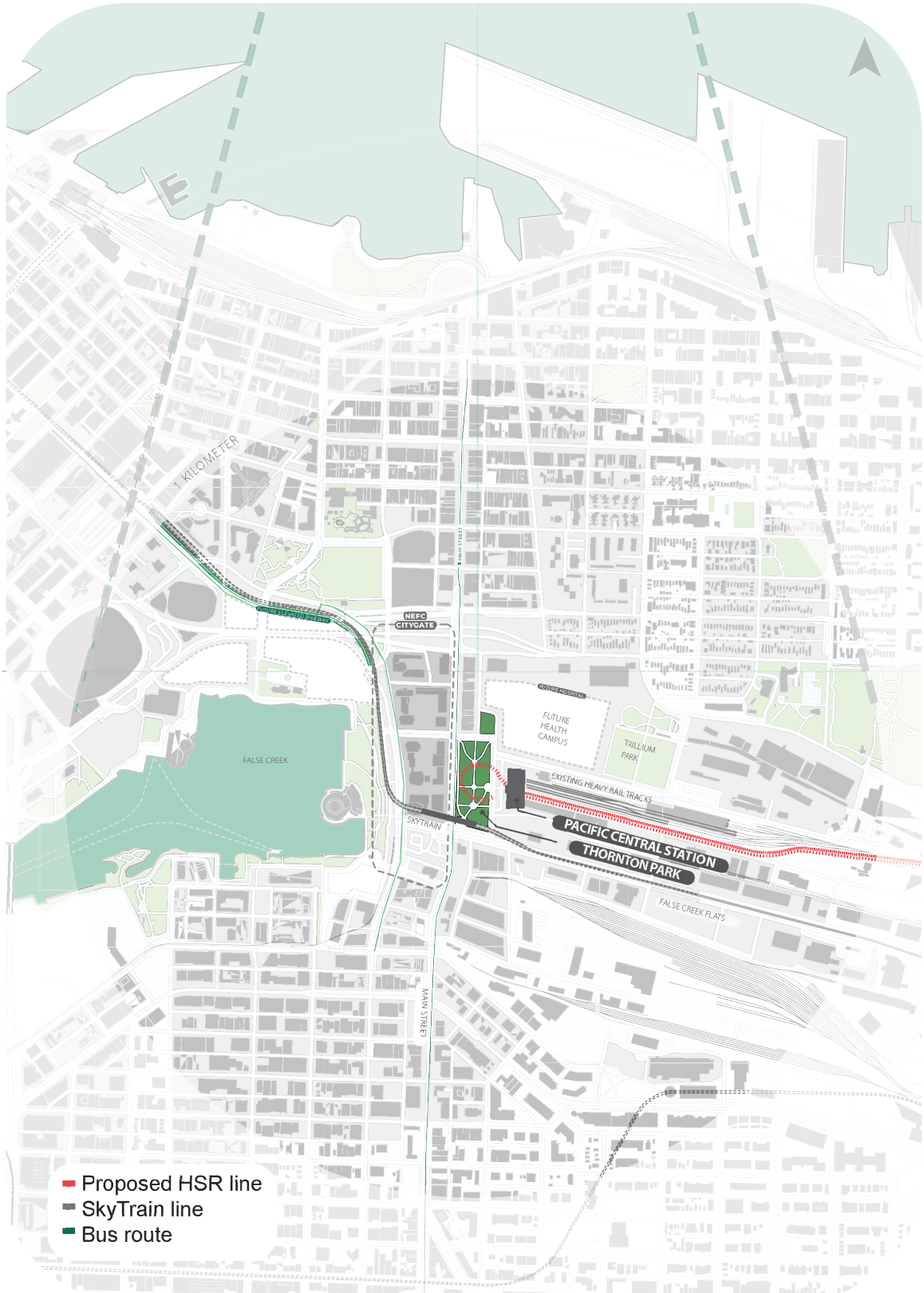
3. Drawing on Vancouver's historical dependency on transit systems to generate pedestrian flows to public space, there is an opportunity to integrate the city's developing active transit network with the new station. Successful design will contribute to British Columbia's commitment to "doubling the percentage of trips taken using active transportation by 2030" (Translink 2020). It will also address concern for reliable, sustainable, affordable, connected and safe access to the new networks from work and home – also known as the Last Mile Problem.

### **Thesis Question**

How can architectural interventions reconnect Pacific Central Station and Thornton Park to Vancouver's urban fabric while encouraging the use of active transportation?



Photograph of Pacific Central Station taken at Thornton Park, Vancouver, 2019



Map depicting existing and proposed transit routes converging at Pacific Central Station, and future development sites. (Base map from Google Earth n.d.)

## **Chapter 3: Theoretical Principles for Design**

### **Active Transit and its Benefits to Public Space**

Active transportation, defined as “all human-powered forms of travel, such as walking, cycling, in-line skating, skateboarding, and skiing that can be combined with other modes, such as public transit” (PlanH n.d.), requires ideal outdoor conditions – such as a sunny day – to be fully appreciated. While some adventurers prefer a workout on a muddy mountain bike trail, 19% of Vancouverites specifically choose AT for daily commutes to work or community activities (British Columbia. Ministry of Transportation and Infrastructure 2020).

Among the benefits of AT is the fulfillment of social interaction. Gehl states this will occur where the conditions are good, such as during decent weather, and at high-quality gathering spaces (Gehl 2011, 12).

### **The Need for Social Contact**

Jan Gehl evaluates the success of public space not by the quantity of people who pass through, but the quantity who are engaged. He defines engaged people as those who slow down, pause, and participate in activities. His observations conclude the increased quality of public space positively correlates to the number of activity participants.

Gehl then divides these activities into necessary, optional and social, with social being the emergent activities that result from the former. Optional activities depend on good weather and quality public space, whereas necessary

activities will happen regardless, like public transit or grocery shopping (Gehl 2011, 12).

The types of social interaction that happen during these activities vary. Gehl divides them into direct and non-direct, direct being verbal interaction – the active conversation that happens during emergent social activities. Indirect is passive contact, which is seeing and hearing other people to gather information about what’s happening in society around us (Gehl 2010, 23).

Indirect interaction occurs most frequently in public space, though it should be noted it occurs in varying degrees. In order to increase the opportunity for both types, public space must be designed to slow people down, and invite users to participate in the environment. This can be achieved with providing visual stimulus – Gehl states humans need 1000 stimuli/hour, equal to 1 every 4 metres – and by organizing space to foster the reduced velocity of pedestrians and active mobility users. To maximize the conviviality of space,



direct

Direct social interaction involves the conversations between people at the same relative speed, such as while sitting or walking/cycling side by side.



indirect

Indirect social interaction is non-verbal. It involves the action of scanning and using olfactory senses while moving at speeds under 15 km/h.



diminishing

As user speeds increase, as does the differential between the rider and others. At speeds over 25 km/h, interaction opportunities diminish.

a variety of low speeds should be welcomed, layered with areas designed for pause (Gehl 2011, 47).

The social interaction most likely to occur while riding a bike or mobility device is indirect. However, this happens most at speeds below 15km/h (Gehl 2011, 13). Faster speeds and opportunities diminish, as the speed differential between other cyclists and pedestrians increases, causing less ability to fully engage with surroundings. Therefore, it could be determined designing AT paths for indirect social interaction (at speeds under 15km/h) creates an ideal framework for engaging with public space.



Depiction of two cyclists engaging with a person sitting via eye contact. The indirect social interaction depicted is the type that occurs most frequently in public space; it is a starting point that can lead to other forms of contact.

## Legibility of the City

However, speeds above 15km/h possess qualities that can complement the more relaxed AT velocity. Appleyard and Lynch conducted observational studies of moving along the American highway in their publication *A View from the Road* (1965). They used their analyses to generate representations to describe the viewer's perception of their journey in motion with respect to their orientation within a landscape. Their representations examine how a path at highway speeds dictates a hierarchy of elements that garner attention. The frequently noticed included the shape and orientation of the roads ahead, large, distant landmarks, and quality of light. Recognized as having a less memorable significance were smaller objects such as signs, lampposts, as well as traffic and hills (Appleyard, Lynch, and Myer 1965, 23).

Among the frequently perceived identifiers was the apparent motion of large objects as they pass overhead or to the side – which, depending on size and speed at which they appear, illicit differing degrees of significance. For example, the authors state when an object (in this case, a large, hypothetical one) appears in a viewer's field of vision abruptly, it will certainly be noticed, but would create an unpleasant and jarring experience. Other times, seemingly random ascents or descents, or a view interrupted without apparent reason, caused irritation in the driver (Appleyard, Lynch, and Myer 1965, 24).

This example summarizes the unique concept experienced while in motion: the overlap of self-motion combined with the motion of objects becoming larger as one approaches, alters the viewer's *perception* of speed. When these encounters are intentionally arranged to consider the tempo

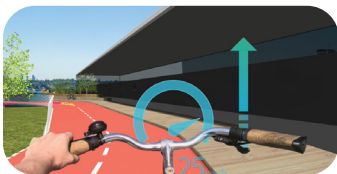
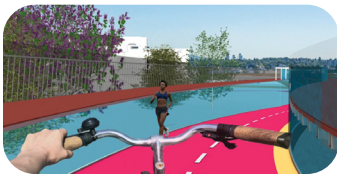
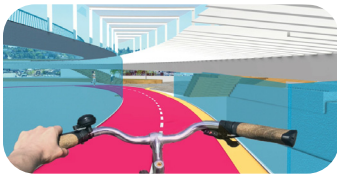
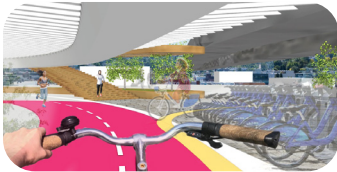


Photo representation of a driver approaching an overpass. The structure draws the driver's attention, creating a memory of time and place. Read from bottom to top. (Appleyard, Lynch, and Myer 1965, 32)

of the user, then moments of increased speeds could provide a pleasurable experience that creates a memory of time and place. Moving at faster speeds also draws the user's attention to expanded views, allowing one to notice distant landscape and buildings.

Furthermore, the view from the path while in motion and the view of the path from an observer's perspective suggests the notion of paths as moving works of art. The performers are the riders moving along a stage designed to create a visual rhythm and story. The story becomes nuanced with intentional 'interruptions' wherein the rider is prompted to slow down and take notice of their environment.

It should be noted that there is a difference in physical scale between the path and its user versus the highway and driver in relation to the built environment and natural landscape. The difference could be balanced by acknowledging the relative change in velocity. Where a vehicle on a fast highway may be exposed to more variation of a city's identity from the expanded view, such as the quantity and forms of buildings, a user on an e-scooter would see through a reduced field of vision. At slower speeds AT users would likely recognize details of closer buildings – such as variations in the building entrances and signage. Further, active mobility users are more exposed to the elements than are vehicle drivers, causing increased engagement with their immediate environment.



Modern interpretation of Lynch and Appleyard's theory of characteristics of moving through space; read from bottom to top of arriving at the Eastern SkyTrain entrance platform and bike share station.

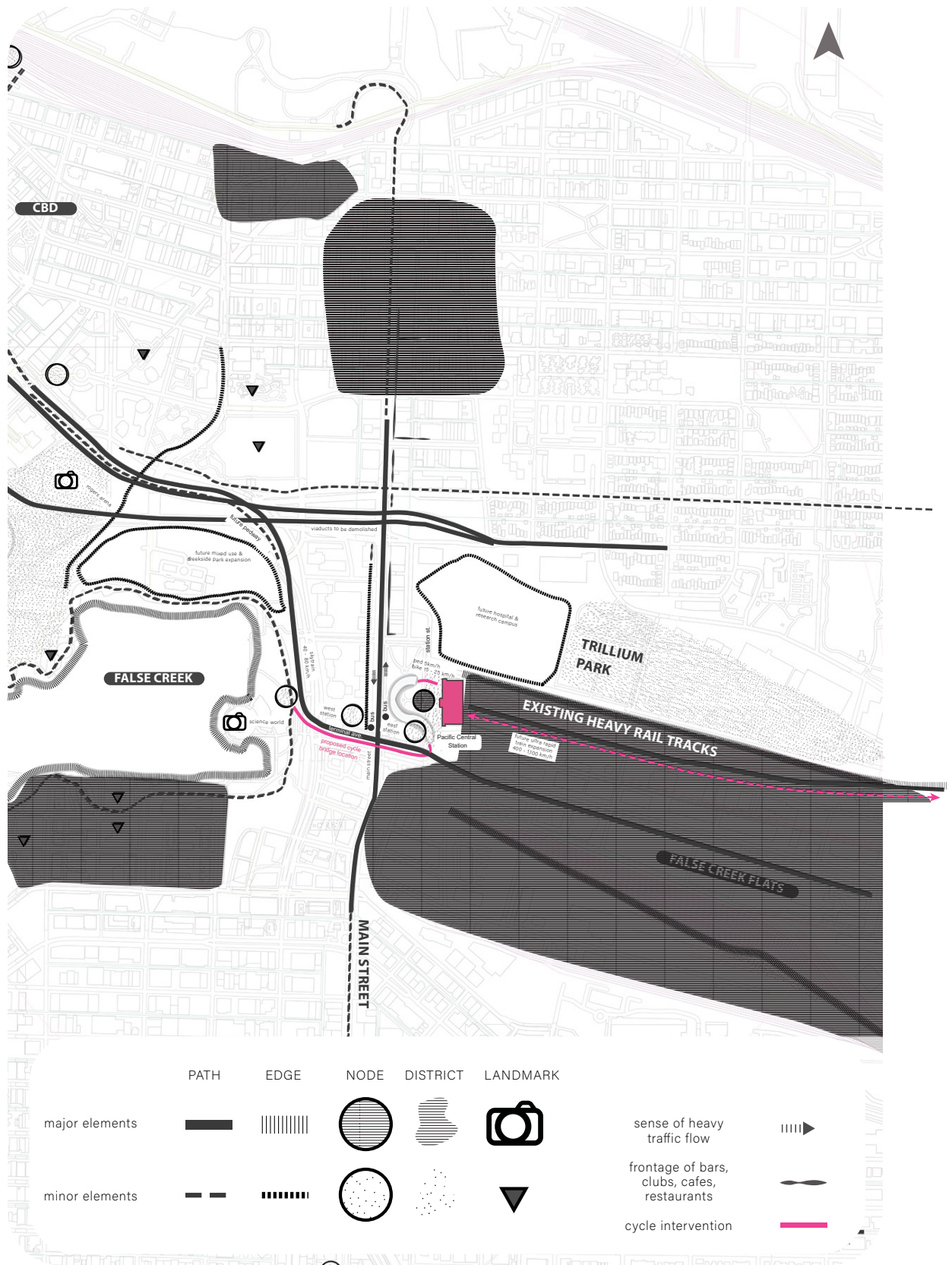
## Chapter 4: Situating

Pacific Central Station and Thornton Park are ideally situated at the intersection of the existing Main Street Skytrain Station, the proposed HSR terminus, and the future St. Paul's hospital campus. The following Legibility Map shows the form of the False Creek Flats, inspired by mapping exercises in Lynch's *The Image of the City* (1960). The illustration conveys how Pacific Central has also become bounded by highways, creating isolated and unpleasant active transportation conditions. These are further exemplified in the Cycling Network Map that depicts the site's lack of AT access.

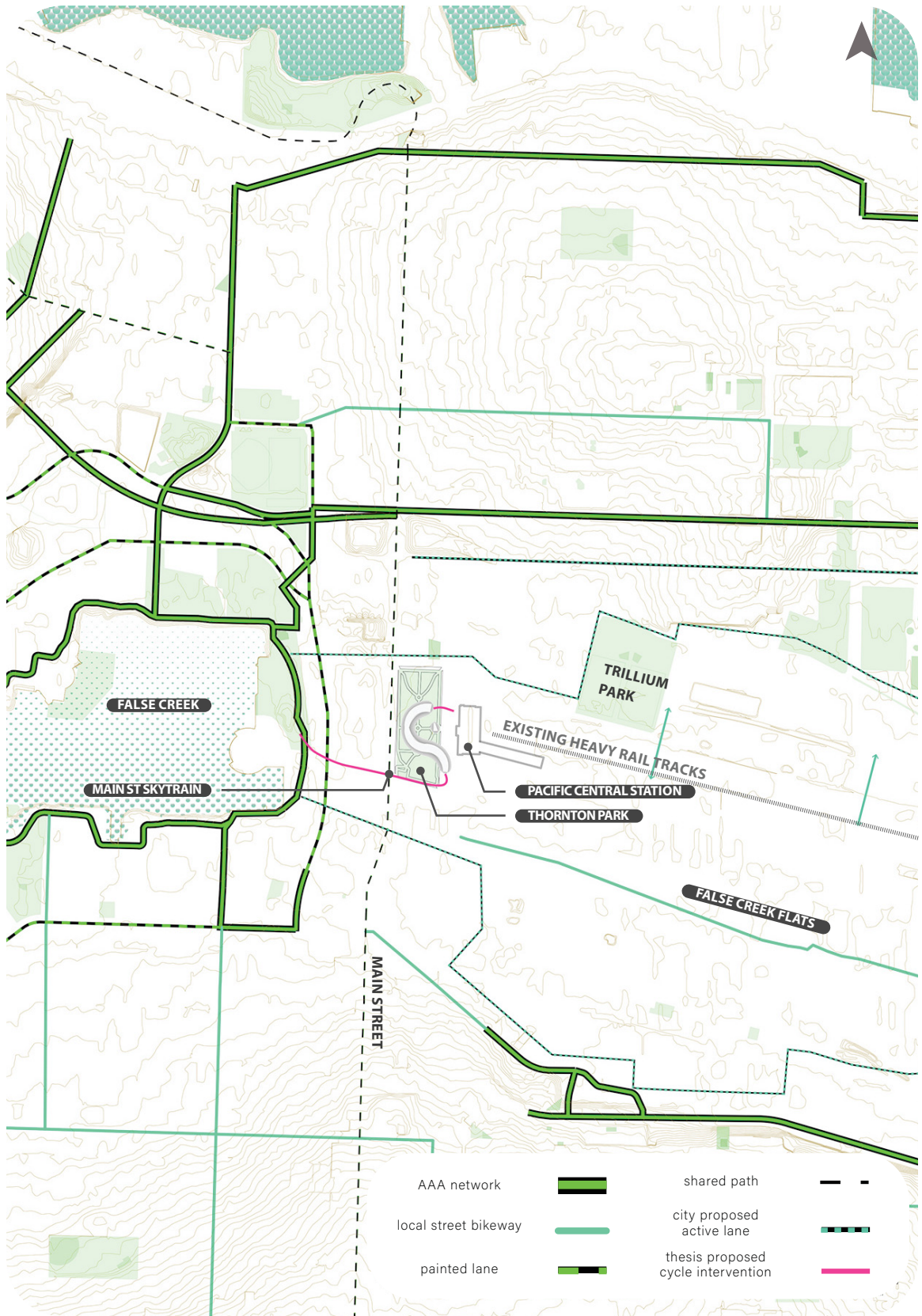


Aerial photograph of Pacific Central Station facing east, Vancouver, 2012 (Henn 2012)





Legibility Map of Vancouver's paths, edges, nodes, districts and landmarks translated into the Visual Form style depicted in Kevin Lynch's *Image of the City*. (Base map from Google Earth n.d.)

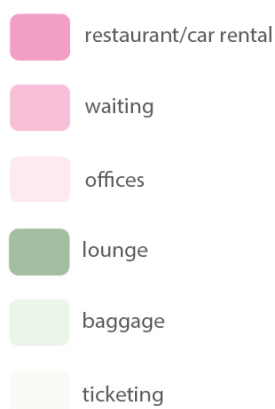


Vancouver Active Lane Network, showing lack of connectivity to Pacific Central Station and Thornton Park (Base map from City of Vancouver 2021)

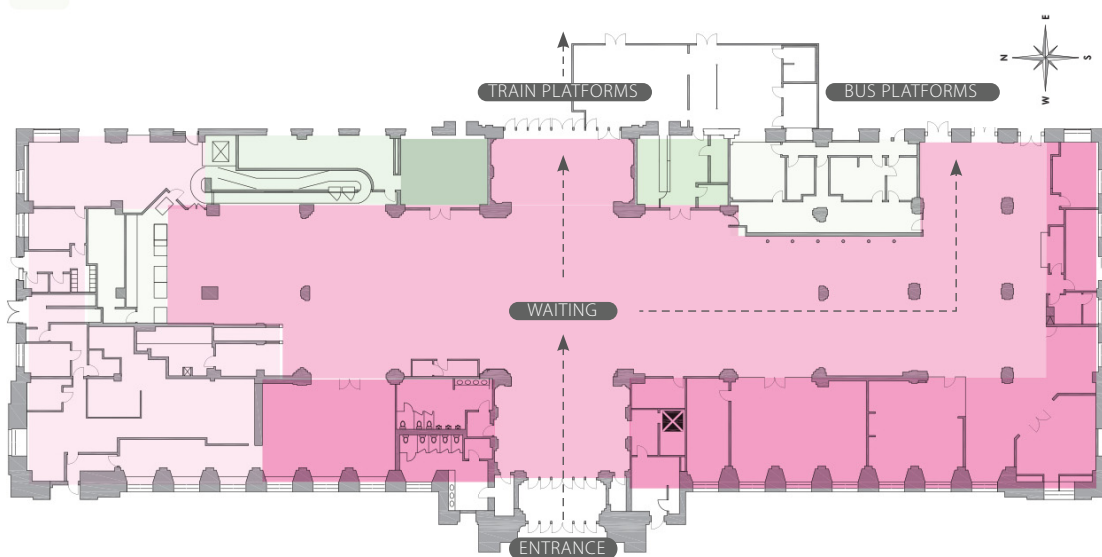
## Pacific Central Station

As of 2021, the existing Pacific Central heavy rail terminus station serves two routes: AmTrak to Portland via Seattle in the south, and VIA Rail to Halifax via Toronto to the east.

The site is separated from the existing network of bike lanes, but is within proximity of the False Creek multiuse path to the west and Trilium Park to the east. The existing station is four storeys, with the top three being private offices. The ground floor plan includes amenities such as fast food restaurants, car rental service and a cafe. Due to declining demand for heavy rail, the station has become occupied mostly by office tenants, with little public access for experiencing the station.



The architecture of the building is important to its history as a catalyst of Vancouver's population growth. The Statement of Significance for the station describes character-defining elements such as its symmetry, axial plan, use of light-coloured sandstone, deeply modeled Beaux-Arts tripartite facade, monumental arch, and neon 'Pacific Central' sign (Canada's Historic Places n.d.).



The ground floor of Pacific Central, the only publicly accessible part of the building, includes a waiting atrium. The new HSR station would not require a waiting room due to the frequency of the trains.

Pacific Central is considered a transport hub due to four nearby supporting modes, including:

- two bidirectional bus stops along Main Street at Terminal Avenue and one bus depot at the south elevation that serves long distance routes south to Seattle and east to Calgary
- an elevated SkyTrain station which spans Main Street along the south boundary of the site serving downtown to the west and East Vancouver
- heavy rail service (AmTrak, Via Rail)
- one Mobi bike share point

The site is transient, although there is little program within 100 m to invite passengers to stay and linger. Furthermore, while Thornton Park is maintained, lack of structures or program prevent vibrant activity. Busy highways at the west and south contribute to a general feeling of being unsafe for families, while the two fast food purveyors limit diversity of social mixing.



Map depicting transit hub modes within 800m of Pacific Central Station. (Base map from Google Earth n.d.)

## Bike Culture Scene

The Metro Vancouver Region has experienced a surge in active lane construction, with network length extending from 1,700 km in 2009 to over 4,595 km in 2019 (Translink 2020). Though this nearly matches Denmark's total network length of 4,770 km, the total trips Danes took to work or school totaled 44% in 2019 (VisitDenmark n.d.). In Metro Vancouver, they totaled just 2.3% in the same year (Translink 2020).

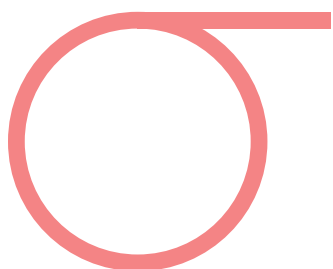
While there are reasons beyond the design of active lanes to hypothesize the success of bike culture in Scandinavian countries, this thesis will investigate the potential of architecture in affecting people's participation in AT.



Photograph depicting the deserted nature of Thornton Park, looking at Science World between buildings.

## Bike Culture to Inform Spatial Design

The following section will suggest criteria for evaluating precedents selected for their prioritization of cyclists and pedestrians. The criteria are adapted for the bicycle from Jan Gehl's planning principles in *Cities for People* (2011), using design considerations by NACTO and City of Vancouver. The rubric will score the following guidelines out of five:



20m radius for 30km/h



10m radius for 20km/h



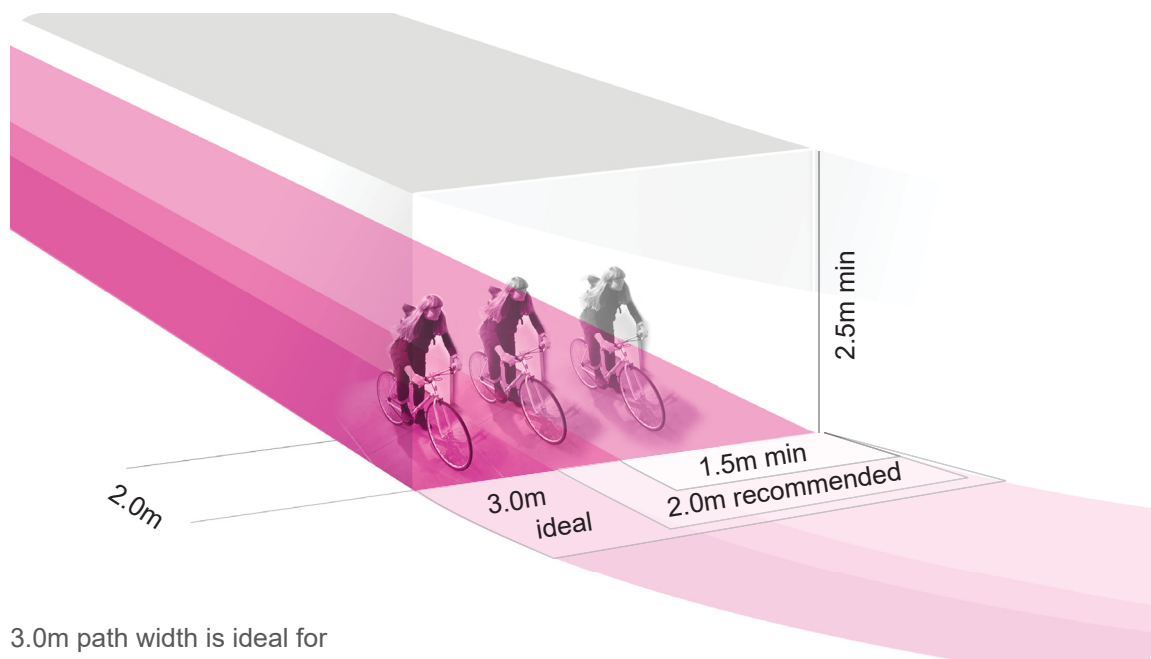
8% slope (1:12) is maximum for stretches under 150m.



4% slope (1:25) or less is ideal.

- **inviting** physical planning which encourages other cyclists and pedestrians to see and hear one another within active-mode public space
- **delightful** moments and spaces which punctuate the path, designed to ignite the senses along the journey to, through, and from a transit hub
- **exclusive** bike path design to entice new users, separated from the street with its own character and identity, emphasizing its unique position as both infrastructure and programmed public space
- **accessible** design between program to allow all spaces to be efficiently reached by bicycle, with consideration for the human-cyclist scale for both interior and exterior areas
- **connected** nodes to link to each other, nature, active program and to an extended transit network
- **comfortable** scale, slope, turning radius, proportions and surface texture of paths for cyclists to enjoy a smooth ride without excessive inclines or obstructions

These principles are used to evaluate five successful real-world projects that have been designed by architects to improve city life for the active transit user.



3.0m path width is ideal for conversation cycling, so that a third cyclist can overtake the pair. Unidirectional is preferred to maintain consistent traffic flow if the lanes are part of main arteries.

While there is no one global standard for cyclist requirements, averaging Canadian dimensions with international leaders like Copenhagen's standards is a method adopted here. (City of Copenhagen: The Technical and Environmental Administration 2017)

## Scandinavian Designed Precedents

This section will use the aforementioned criteria to evaluate five projects: Nørreport Station (Copenhagen), Superkilen, Nørreport District (Copenhagen), Cycle Serpent, Nørreport District (Copenhagen), Utrecht Central Station (Utrecht), and Denmark Pavilion (Shanghai). Inspiration from these will appear throughout the design proposal in Chapter 5.

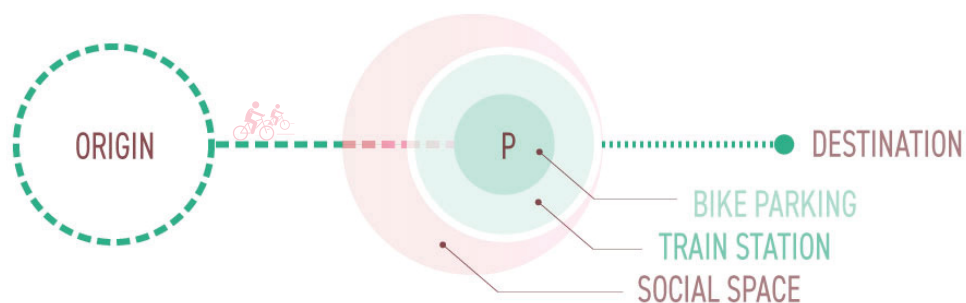


Diagram depicting the spatial consideration of Scandinavian train stations. A continuous cycle path leads through intermediate space consisting of a 'social zone' before entering typically utility-oriented space such as parking and train platforms.



Aerial view of Denmark's busiest train station, renovated in 2015. The station sees over 250,000 passengers daily, with 2,500 bike parking spots sunken 40cm into the pavement to preserve pedestrian sight lines along the linear plaza. (Cobe n.d.)

### ***Nørreport Station, Copenhagen***

Inviting	<input checked="" type="checkbox"/>	Designed by COBE Architects and Gottlieb Paludan Architects, the renovated station (2015) delights in its engagement of public space to create a linear plaza, oriented to the needs of the cyclist (i.e., parking). Pavilions provide pedestrian access to the underground platforms, as well as services such as restrooms, a travel kiosk, and newsstands. According to IDEA:CC, Nørreport Station shall be docked
Delightful	<input checked="" type="checkbox"/>	
Exclusive	<input checked="" type="checkbox"/>	
Accessible	<input checked="" type="checkbox"/>	
Connected	<input checked="" type="checkbox"/>	
Comfortable	<input checked="" type="checkbox"/>	



one point each for: Delight, for lacking an engaging path identifier; Exclusive, as pedestrians are favoured in the plaza circulation; and Comfortable, as it misses a potential opportunity to separate pedestrians from cyclists.



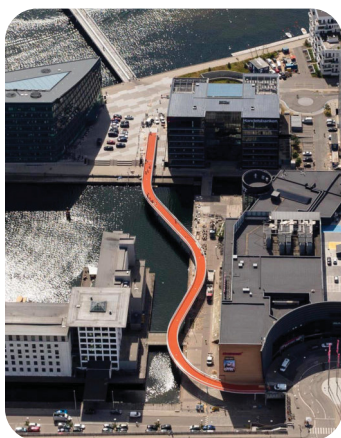
Diagram by BIG to identify three zones based on program (left). The red square was a source of controversy among residents. (Steiner 2013, 42)

- Inviting
- Delightful
- Exclusive
- Accessible
- Connected
- Comfortable

**Superkilen, Nørrebro District, Copenhagen**

Superkilen Park excels in the Connected category, despite not being linked to a major transit hub. This is due to its complex inception from rigorous public consult, reaching out to community members who don't always participate to create an intentionally inclusive design. BIG and Topotek 1's vision of connecting cultures to the neighbourhood

through consultation and through involving nature are celebrated with carefully chosen colours. While a commonly criticized project, the design delivers on public embrace and the activity it beholds. The delightful aspect comes from exploring a lateral park in three dimensions, by including paved “hills” that can be enjoyed riding over, or as places to sit and take in the bright dose of landscape.



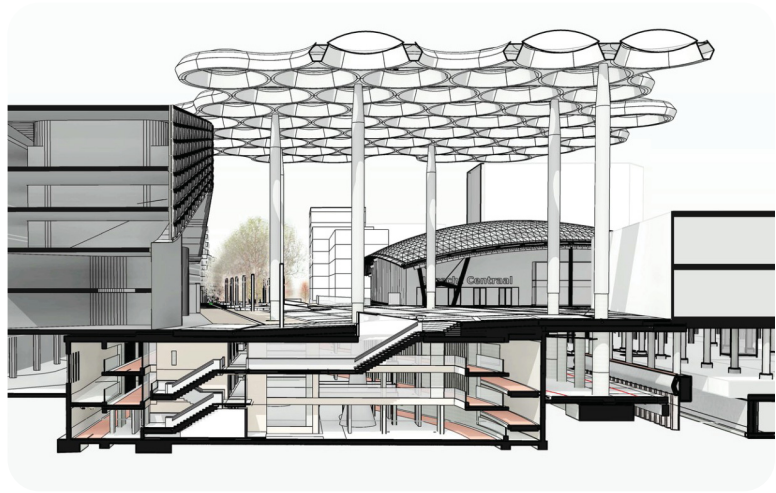
Aerial view of Cycle Serpent (Dissing+Weitling Architecture 2014)

### ***Cycle Serpent, Nørreport District, Copenhagen***

Dissing+Weitling designed an elevated cycle path that allows riders to bypass the very active waterfront, as pedestrian-cyclist collisions were at one point common. The design solves a problem through elevation, exclusivity and identity. The curves create an exciting experience that glides over water, but the project loses just one point for connection, as it does not connect to a transit hub. It does, however, connect to another cycling bridge, Bryggebroen, as well as to nature via water. It is 4.6m wide and bidirectional, which surpasses NACTO 2014 guidelines of 3.7m for bidirectional paths. The spine stands out with its gentle ascent to accumulate enough length to gradually rise 7m above the harbour.

Inviting	<input checked="" type="checkbox"/>
Delightful	<input checked="" type="checkbox"/>
Exclusive	<input checked="" type="checkbox"/>
Accessible	<input checked="" type="checkbox"/>
Connected	<input type="checkbox"/>
Comfortable	<input checked="" type="checkbox"/>

This project would receive full points if it considered conversation cycling, as the path width could have potentially grown in some areas. It is delightful, but may have been improved by adding width to incorporate an area for pause to enjoy the view.

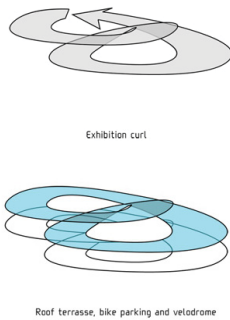


Parking becomes part of the fun at Utrecht Central Station. Three levels of easy-to-navigate bicycle parking are connected to an inviting public plaza above that functions as a gathering place in front of a shopping center. (ector hoogstad architects n.d.)

**Utrecht Central Station, Utrecht**

ector hoogstad architects designed the world’s largest bicycle storage as of 2014. The Utrecht Central Station renovation was a response to the growing number of cyclists connecting via train, as there were abandoned bikes piling around the station like a dump. The project succeeds in connection, as its continuous parkade loop turns parking into an experience. One point is docked for lacking a discernible connection to nature, but the project excels in comfort for high quality materials and for efficiency without foregoing experience; the cyclists can always orient themselves due to interesting intentional interior views of railway platforms and the 25 meter high outdoor canopy.

- Inviting
- Delightful
- Exclusive
- Accessible
- Connected
- Comfortable

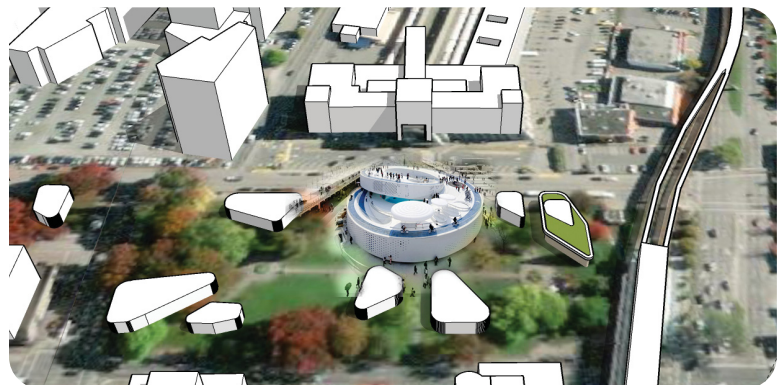


Diagrams depicting process of the knot and the final structure (BIG n.d.)

**Denmark Pavilion, Shanghai**

BIG combined velodrome-like circulation with a public art display, and incorporated program such as a bar to be accessed by both cyclists and pedestrians. While this project serves as a pavilion and considers less of the surrounding context, the unique interpretation of Danish bike culture makes this project stand out. The continuous loop makes this a highly delightful and inviting example of a bike-oriented facility.

- Inviting
- Delightful
- Exclusive
- Accessible
- Connected
- Comfortable



The pavilion is repositioned at Thornton Park to test proportion and scale required for a cyclist-oriented gathering space.

## Chapter 5: Application of Design Principles

### Intent of Today's Transit Hub

"The rejection of monofunctional areas is a prerequisite for the integration of various types of people and activities" (Gehl 2010, 107).

### *Pacific Central Trailhead*

The new transit station at the Pacific Central Trailhead aspires to be:

- an efficient and experiential portal between Cascadian urban centers
- an interchange to mix people and multifunctional activities that represents the diversity of Vancouver and fosters spontaneous encounters
- a democratic public space that provides user agency and sense of belonging
- an iconic gateway to the city that reflects the social and environmental ethos of Vancouver

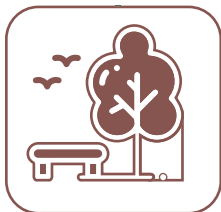
### *Goals and Strategies*

The following design principles have been developed after analyzing the aforementioned Scandinavian designs for AT-oriented public spaces. These spaces favour pedestrians and cyclists, noting that many European cities recognize the efficiencies of trains, cycling and walking over car use. Not just sustainable and affordable, public infrastructure as public space provides opportunities for social interaction and engagement with different communities. These activities

add value to the city by creating an incidental gathering place for residents and tourists to engage with each other and their environments.



**Integrated:** The site should consider its context, user groups, history and its future to optimize a calendar of program. The calendar should be designed to attract the diverse residents of the city by providing inclusive, comfortable and welcoming spaces.



**Sustainable:** Site design should incorporate structures conceived of renewable materials, or materials with low embodied energy such as steel over concrete. Considerations of existing buildings should be made to reduce energy wasted in demolition. Green space should be a priority to increase quality of life in urban centers.



**Experiential:** The efficiency of a transit hub is important to accept tens of thousands of daily boardings. However, the Pacific Central Trailhead ethos is to reflect the recreational character of the city. Experiential design should incorporate program and pleasure into the circulation of the masterplan to provide unique and playful encounters at the city's new portal.



**Scalable:** Transit stations, especially in Vancouver, have experienced rapid growth since SkyTrain's inaugural Expo Line in 1985. The Canada Line, adapted for the 2010 Olympics, began construction of an extension in 2021 in preparation of the new Broadway Subway. The design should consider the ability to expand, especially as the HSR stimulates development and economic growth along the entire corridor.



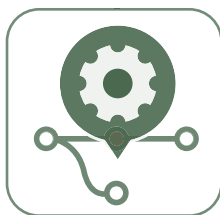
**Social:** Site design should involve pathways and public plazas, and high quality outdoor spaces programmed with activities that promote social interaction. Programmed spaces should appeal to a variety of user types, including age, ethnicity, gender and abilities. They should also be appropriate to the site's immediate context, including new developments and existing buildings.

These principles are applied to the following:

### ***Design Guidelines***

The principles should be applied in a manner sensitive to the site, with consideration of the pedestrian and cyclist a priority.

The following guidelines are interpreted from research from Kevin Lynch as explained in *Image of the City*, where studies of most memorable components are classified as landmark, district, node, path, and edge (Lynch 1960, 46). This design thesis builds on the concept of classification and applies them to scales smaller than the city, but of equal importance in terms of activity. The condensing of activity to a self-contained site requires an adjustment in scale of focus; therefore, the guidelines have been divided into a more specific set of four strategies/considerations:



**Program:** Program beyond station or interchange; place to represent culture and diversity of the city, ethos. The program should be represented using architectural devices; they define an identity for each zone within the masterplan. The architecture should reference the historical context of place and/or provide a function that responds to characteristics unique to Vancouver.



**Path:** An elevated spine should connect the main spaces, providing a hierarchy of circulation that directs users through major zones in an intentional, pragmatic and comfortable manner. The path at its foremost intent must be connected, at both ends of origin and destination, or guide to clear nodes that offer junction points to other existing paths. Movement should be encouraged at places of less interest, and moments of pause should be offered throughout. The design must be ADA compliant and invite users of limited mobility on the main route, as opposed to offering alternative accessible points.



**Park:** The existing Thornton Park must be considered with sensitivity to old growth trees. Extending boundaries of parks to integrate with landscaping and buildings (e.g., green walls, green roofs, and accessible garden terraces) is encouraged. A lighting strategy should be incorporated to make the park feel safe and inviting to use at any time of day or year. Lastly, the park should be accessible to users of all ages and abilities.



**Landmark:** The neoclassical style of Pacific Central Station is considered to be in generally good repair. Interventions to it would need to follow the *Standards and Guidelines for the Conservation of Historic Places in Canada* (2010), particularly in keeping with the recommended guidelines for altering roofs and exterior walls for program expansion. Because the station's west elevation has been restored, no irreversible penetrations should be considered in the design of the building addition. Furthermore, the new addition should be distinguishable from the original building, yet be expressed in a subordinate character.



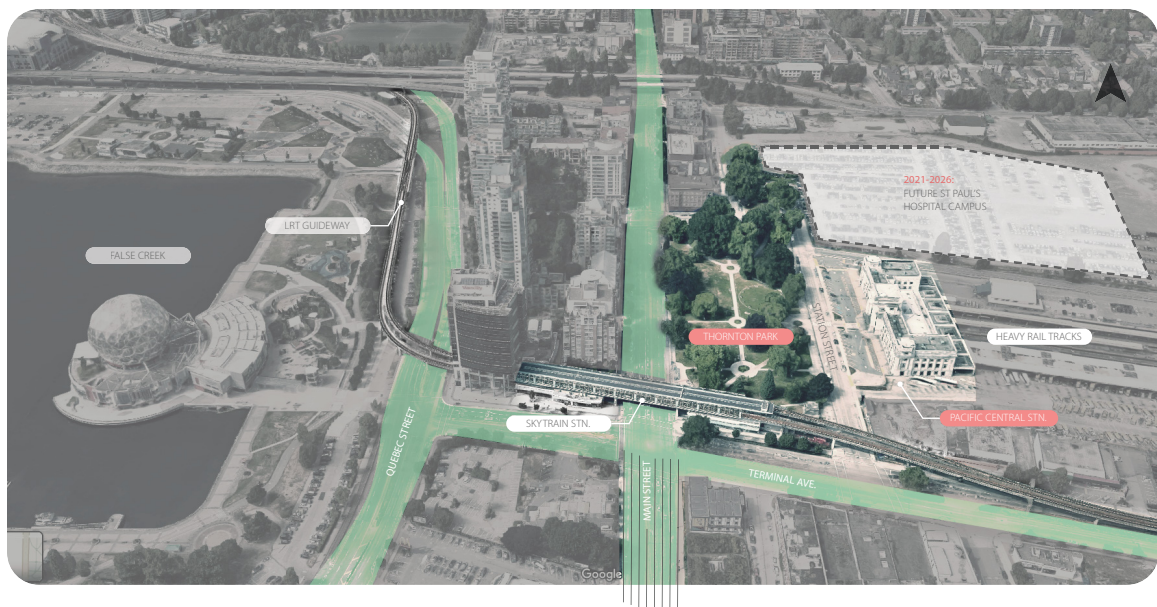
## Principles into Strategy

The following four diagrams describe the existing conditions at Pacific Central Station and adjacent Thornton Park and suggest three strategies inspired by the previous precedents for its revitalization.

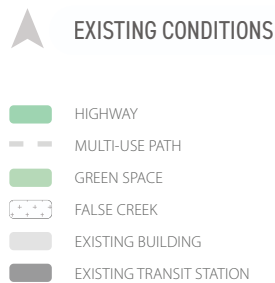
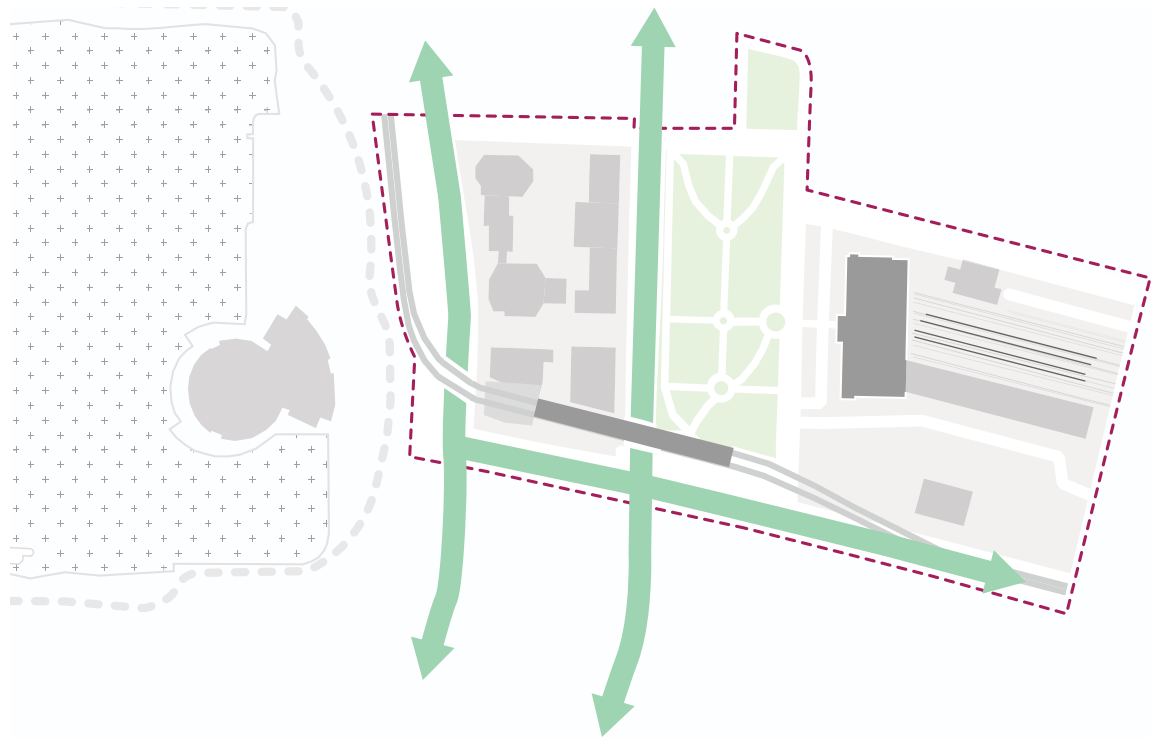
### *Existing Conditions*

The existing conditions at Pacific Central show an isolated and desolate park and dwindling heavy rail station; three eight-lane highways intersect to create physical barriers to pedestrian access between the site and the waterfront.

The Main Street Skytrain Station responds to automobile traffic with a raised platform that straddles the intersection. There are no connections to public or private space at level two; all users are required to directly descend to ground level. Some views of the park are offered while users wait at the boarding platform.



Aerial view of Pacific Central and Thornton Park, looking north. Highways (in green) restrict pedestrian access to the station and park. (Base image from Google Maps n.d.b.)

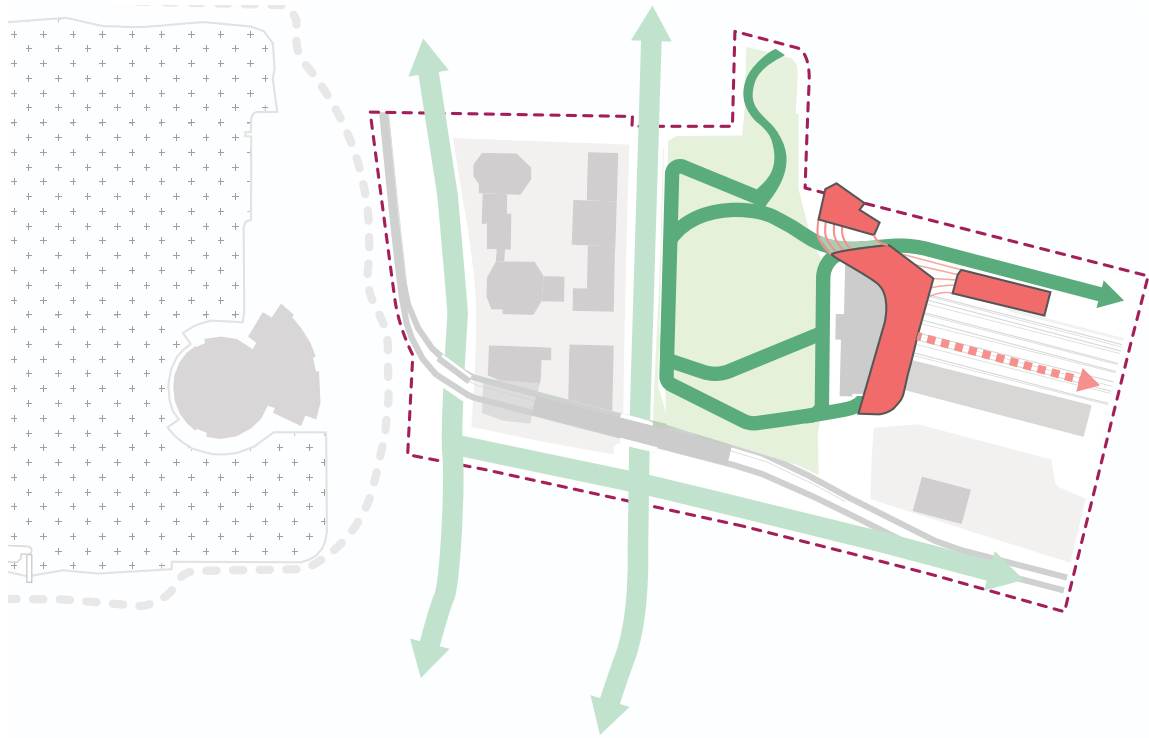









Plan diagram of Pacific Central and Thornton Park showing existing conditions with respect to buildings, roads, and paths.

### ***Adaptive Reuse***

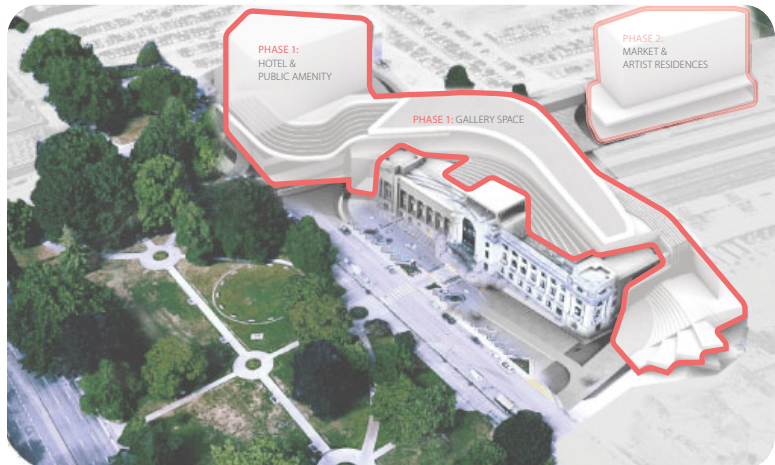
The first strategy considers opening the station fully to public amenity, allowing visitors to celebrate the site's nuanced history. Furthermore, layering multiple uses within the existing and proposed buildings will draw a mix of users in addition to the commuter demographic.

To make room for new program, the design proposes a 'soft' adaptive reuse of Pacific Central that includes constructing a hybrid steel-framed addition that gently rests atop the masonry station. The addition adheres to the *Canadian Register of Historic Places* (2010) by imposing minimal intervention upon the existing building and leaving the restored facade unpenetrated.



-  ADAPTIVE REUSE
-  NEW AT MAIN PATHS
-  MULTI-USE PATH
-  GREEN SPACE
-  FALSE CREEK
-  EXISTING TRANSIT STATION
-  PROPOSED BUILDINGS

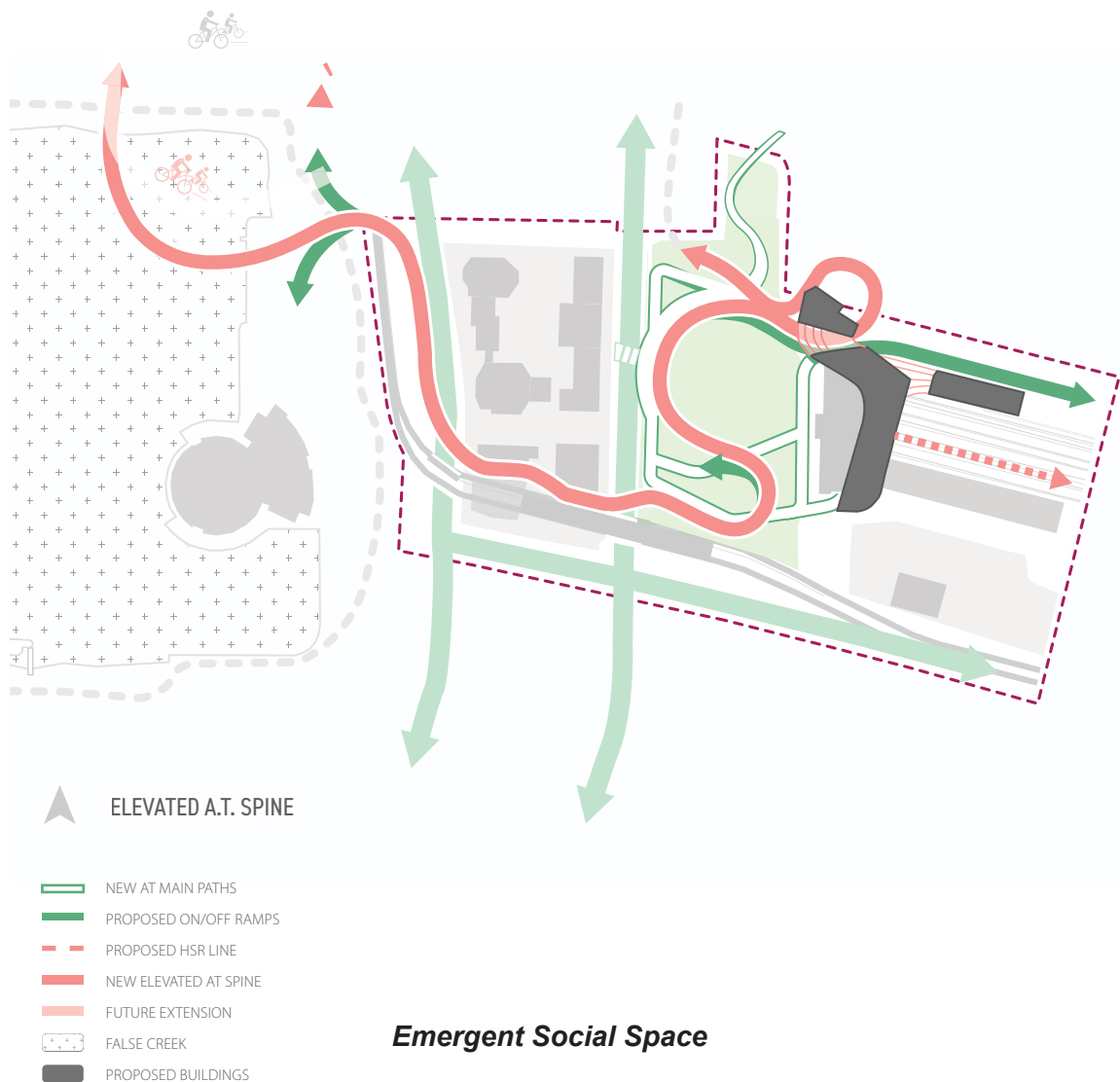
Plan diagram of Pacific Central and Thornton Park, showing proposed buildings and paths at ground level as a strategy to draw a mix of people.



Aerial view of Pacific Central and Thornton Park, showing proposed buildings and an addition to the station's roof (Base image from Google Maps n.d.b.)

### ***Elevated Spine***

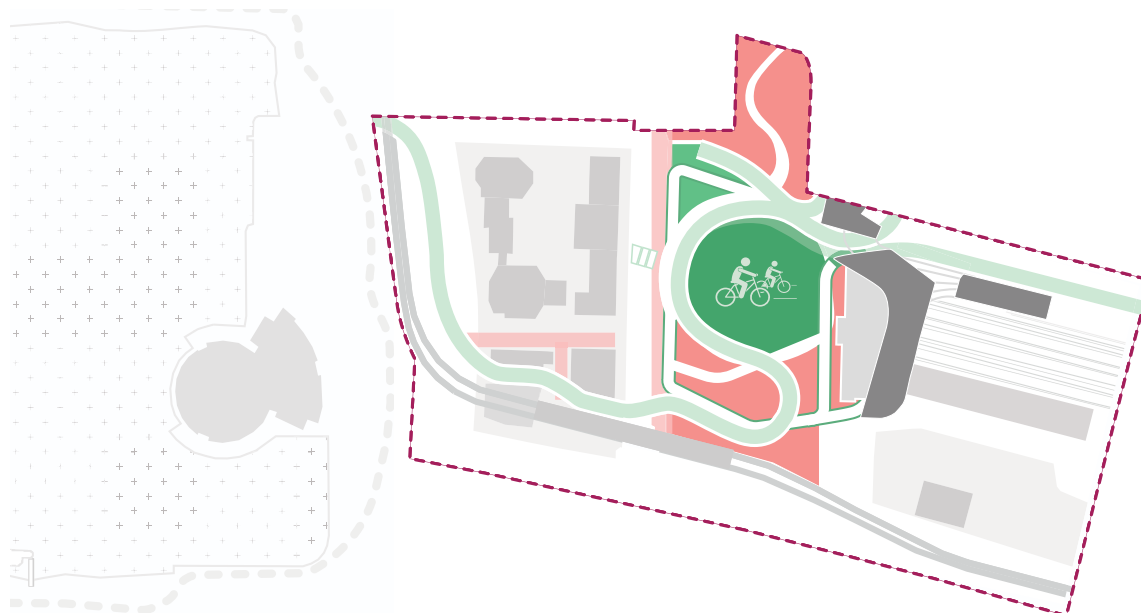
The second strategy proposes the new and existing buildings be accessed by an elevated active transportation spine, acting as a channel that draws locals through the park from False Creek, and tourists from the station to the city. A future extension to the west will physically connect to the water and offer an experience of gliding over False Creek.



Plan diagram showing an elevated path design for the exclusive use of pedestrians and active transportation users.

### ***Emergent Social Space***

The spine, oriented on axis with the existing heavy rail tracks, adheres to universal standards for slope and turning radii to rise gently over busy highways and compress between buildings adjacent to the raised SkyTrain station.



▲ EMERGENT SOCIAL SPACE

- NEW AT MAIN PATHS
- EMERGENT PRIMARY SPACE (1)
- EMERGENT SECONDARY SPACES (2)
- NEW ELEVATED AT SPINE
- FALSE CREEK
- PROPOSED BUILDINGS

Plan diagram of the emergent space created as the elevated path tracks through Thornton Park.

This geometry naturally creates emergent space with new edges, anchoring locations for possible activities within Thornton Park. To determine potential program for the three zones, the design considers the relationship to their adjacencies, which offers clues as to the types of user groups the site may attract.

The following drawing proposes a diagram of activity intersections that reflect the social culture of Vancouver. The chart is guided by theory from Jan Gehl's *Quality of Physical Environment* as determining factors for time spent in public space.

The activities begin to be arranged along the spine within the thresholds to form social zones. These are classified with overarching sections, from east to west:

### **1. False Creek Waterfront**

This zone is made up of 3 subzones, based on their relationship to its context: FC Seawall Connect, Science Steps and Garden Gallery. These would be explored in a future study.

### **2. Thornton Park**

Thornton Park comprises the three subregions that will be tested in the following drawings. They include the Active Culture Park (ACP) as the southern social space that borders the Skytrain station, the Spectacle Oval as the central and dominant event space, and Sensory Wellness Garden to the north bordering the future St. Paul's Hospital.

### **3. Pacific Central Station**

St Paul's Plaza and the Market at the Flats are proposed as a second phase and could be explored in a future study. Following testing of the three subregions within Thornton Park, this thesis will study how Pacific Central station's renovation will intersect with the proposed elevated A.T. spine.







Type of Activity	Quality of physical Environment	
	POOR	GOOD
Necessary Activities		
Optional Activities		
Social Activities resultant		

Diagram showing the increase in frequency that people meet and spend time in public space when exterior physical conditions are good (Gehl 2011, 11)

# SOCIAL INTERSECTIONS AT THE TRAILHEAD

## 4 TYPES

OF SOCIAL ACTIVITY  
BASED ON GEHL'S  
PRINCIPLES

Recreational,  
often involving  
2+ persons,  
directly driven by  
social interaction  
more than the  
activity itself



### optional 1

Recreational,  
driven by  
personal interest;  
to observe vs.  
participate



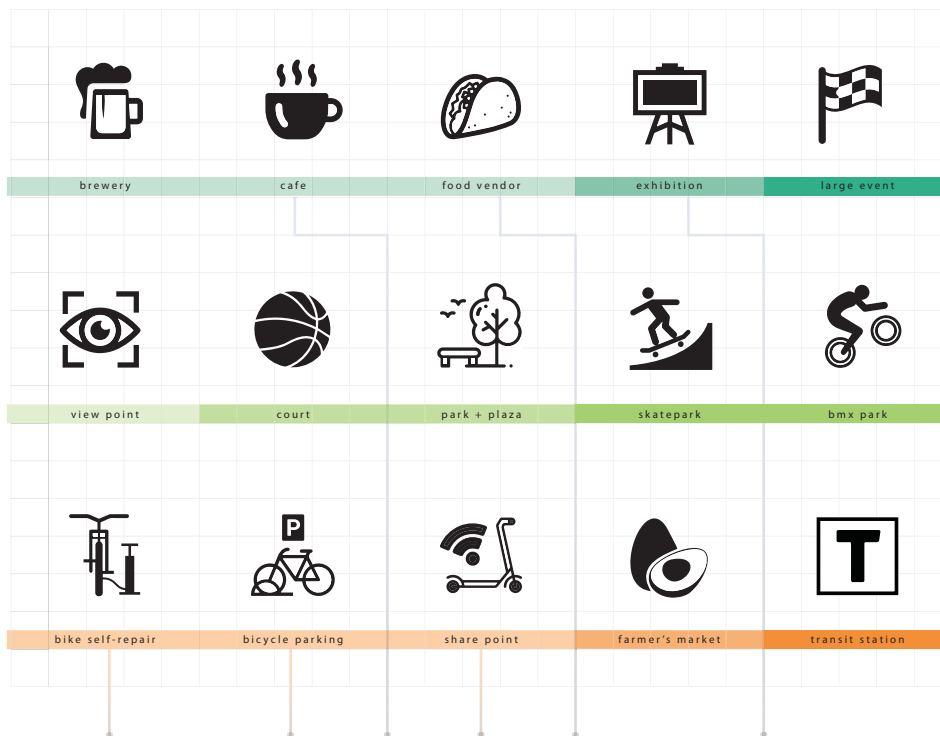
### optional 2

Functional, in-  
volving pedestri-  
an-oriented  
transportation



### necessary

when we reject mono-functional spaces, we create an opportunity to layer attractors that encourage a mixture of people to slow down and stay. when we integrate easy, enjoyable and universal access, we create circulation that adds legibility of these spaces. if these are designed with social interaction in mind, public space can become successful, playing a key role in the growth of communities.



### supporting



first aid



group cycle meet



tourist info



bike cafe



EoT facilities



charging station



repair service

Iconography: Menu of social intersection icons to identify key activity spaces within the Trailhead.

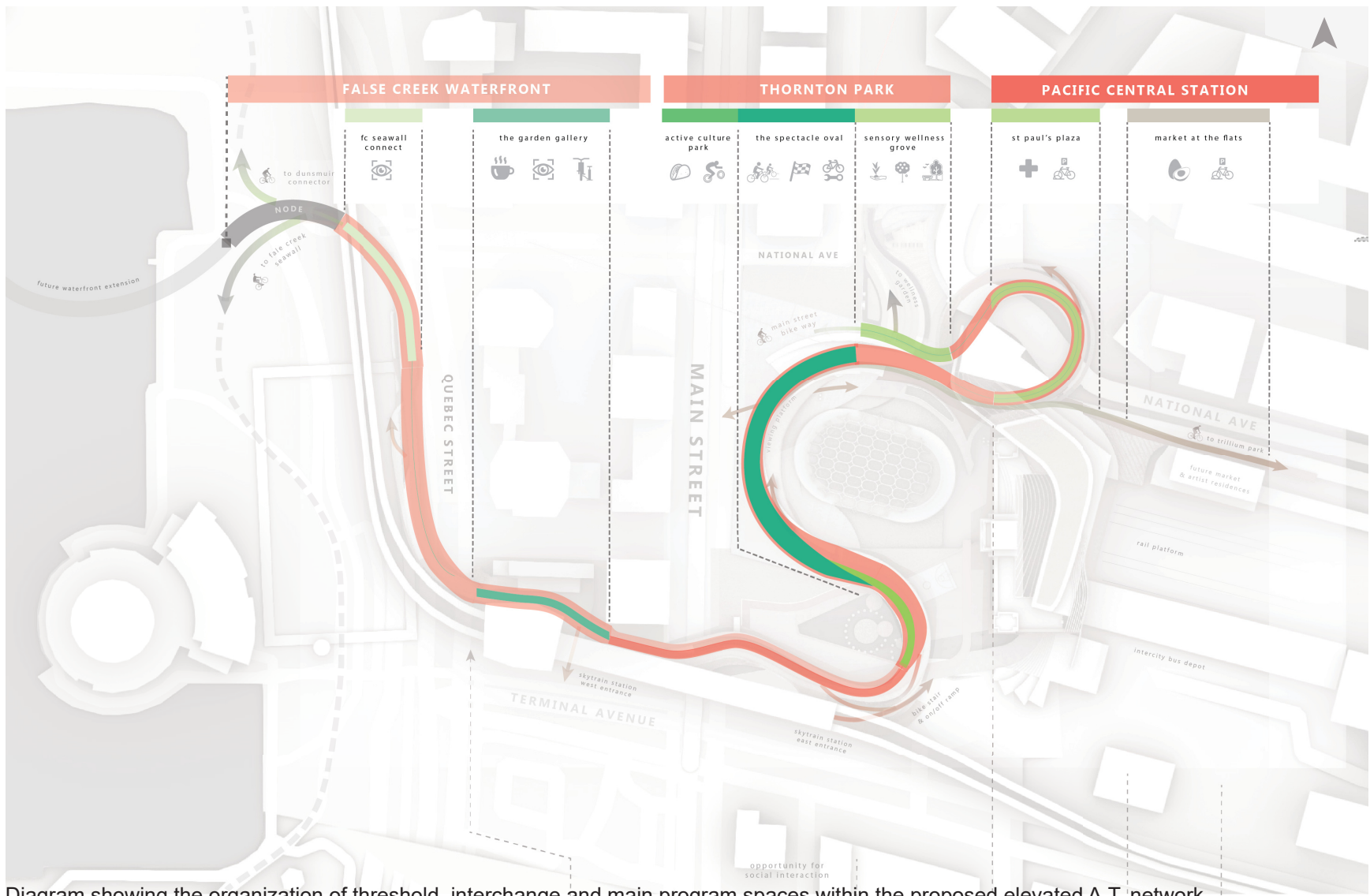


Diagram showing the organization of threshold, interchange and main program spaces within the proposed elevated A.T. network.



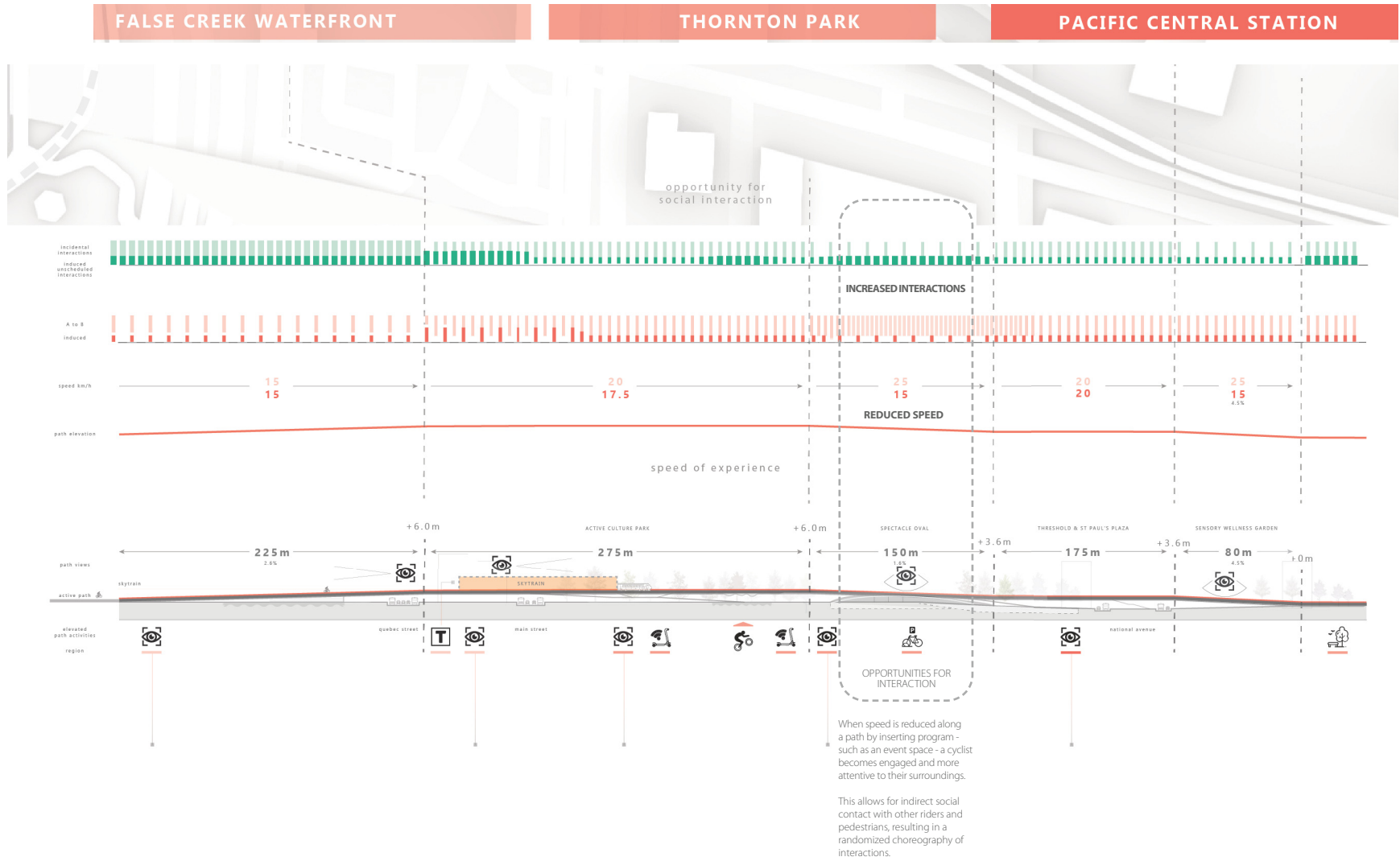
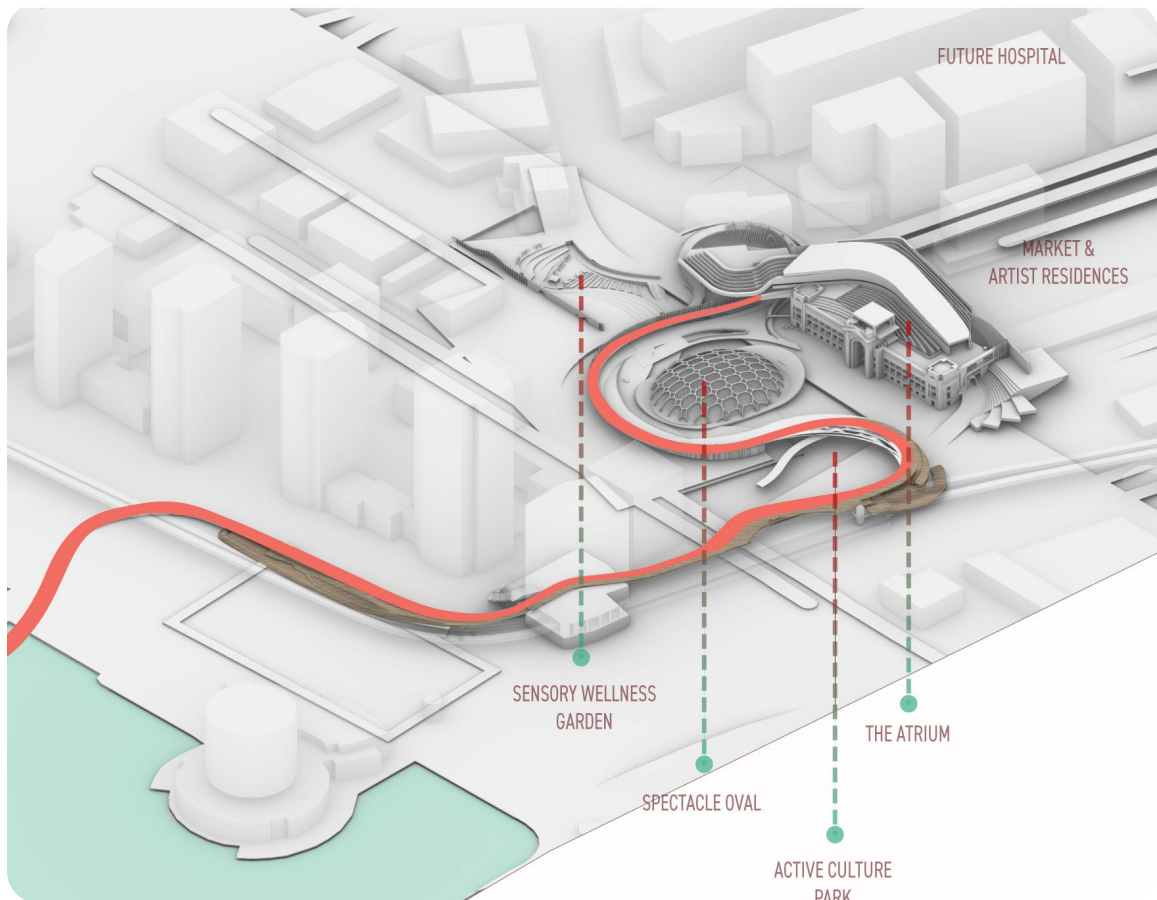


Diagram and unrolled A.T. spine section showing the relationship between a reduction in speed and an increase in opportunities for social interaction.

This graph demonstrates the movement along the spine from east to west and the inverse relationship between increasing speed and decreasing opportunities for social interaction. A user will encounter a higher frequency of social contact in areas where user speed is controlled by a combination of spatial geometry and the integration of program, resulting in a rhythmic gradient of motion and event. The interplay between speed and sensory stimuli creates a melodic experience, unique to each user.

Four primary social zones emerge from the geometry of the spine and the park's surrounding context. Devices are associated with each space as identifiers, each functioning



Isometric view looking northeast, showing the elevated spine within its context. The diagram suggests programming for the emergent social spaces and for the station's adaptive reuse.



The four zones at the Pacific Central Trailhead are designed with consideration of its users: The Adventurers reflect the ACP design, The Spectators reflect the SO, The Patient reflects the SWG and The Traveller reflects The Atrium.

to encourage people to slow down to participate in the activities or simply observe the view. The southern park concentrates on themes of street culture marked by the pump track, while the central lawn focuses on spectator sport and performance, marked by a semi-permanent canopy and velodrome.

As riders cycle through the trees along the elevated spine, the journey becomes an experience of its own. The weaving path guides users up and down through the landscape at Thornton Park, at times gently touching the ground, where the guardrail blends into a distinctive wooden façade. These continuous elements become the porous edges which invite people into the space, while also defining the park's zones.

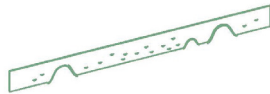
The long section indicates what happens in these zones, each using the original 1917 Neoclassical façade of Pacific Central Station as the backdrop to orient the user and remind the city of how it was built by way of the railroad.

In the active culture park, the Skytrain's 4.9 million annual boardings help bring diverse groups to the site throughout the day and night (Translink 2020). With the ACP's constant rotation of food trucks, street performers and art installations, a new experience awaits commuters every day. The group that drives this experience is therefore called The Adventurers. Furthermore, the brightly coloured amateur pump track signifies inclusivity, while the adventurers speeding through it are stage performers in constant motion for the inhabitants below.

The remaining three zones at the Pacific Central Trailhead are also designed with consideration of its users, including The Spectators, The Patient, and The Traveller which reflect the SO, SWG and Atrium respectively.

### ***Architectural Elements: Device as Identity***

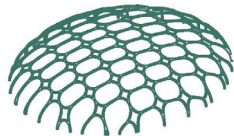
Devices are used to define the three main zones in the new Thornton Park and generate a design language that visually reflects the rhythm and movement in the revitalized Pacific Central Station and Thornton Park. The elements describe the space in which they exist by way of function, homage, or historic reference.



Waterwall

#### ***Waterwall***

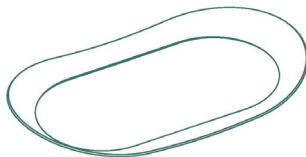
The Waterwall, located at the Sensory Wellness Garden, acts as a spatial and auditory boundary between the bustling highway of Main Street and the garden's zen-like environment. The use of water references False Creek and the original shoreline which lay beneath the railyards before 1915. The sound of falling water engages users' senses and transports them to a new zone at Pacific Central – one that can be identified as slow-paced, calm, meandering, and tranquil.



Canopy

#### ***Canopy***

The Canopy is a steel dome with large openings that provide views of the events inside. Covering the Spectacle Oval's great lawn, the canopy is a device that represents gathering. Its design pays homage to Bruno Freschi's Expo 86 relic building Science World, a geodesic dome that originally functioned as the Expo Preview Centre (Macdonald 1992, 82). The open air design allows for multiple types of events, with lighting and audio wired through the steel structure.



Velodrome

#### ***Velodrome***

The Velodrome reinforces the Spectacle Oval's program as a place for – well – spectating. It is an element that references Vancouver's sport culture and adoption of bike

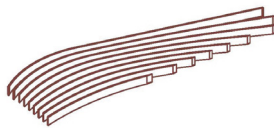
culture. While track cycling is considered a niche sport, the track itself is representative of British Columbia vernacular; yellow cedar was used to build this and original tracks in Vancouver at China Creek, and was a common construction material of sawmills in False Creek. The concept of a track-like structure is symbolic of competition and racing, recalling events such as the Molson Indy, the motorized bathtub races of 1967 (Macdonald 1992, 54) and Dragon Boat racing.

### ***Amateur Pump Track***

The Pump Track is a display of motion, a public stage located in the threshold between the races at the Spectacle Oval and the street life of the Active Culture Park. Raised 5m as part of the elevated spine, the vertical wooden slats act as a marker and a backdrop for the food-truck and pop-up eatery zone. People of all experience levels can take joy in heart-racing drops on their bike, e-scooter or skateboard. The interactive element evokes excitement for the user traveling northbound as the speed foreshadows the Spectacle Oval's sport-themed program.



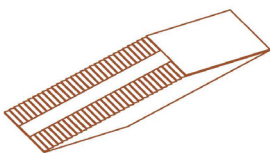
Amateur Pump Track



Louvres

### ***Louvres***

The Louvres filter light into the atrium at Pacific Central Station. The design language carries throughout the building as a wayfinding device for the Immersive Gallery throughout the atrium. The curved glu-lam beams, inspired by the concrete blades of Zaha Hadid's Maxxi Museum, provide the added function of indicating time of day by their shadows cast on walls and floors. To reference the heavy rail lines of the original CPR, the louvres are spaced approximately 1.5m apart, their gentle curves reminiscent of the tracks that once built Vancouver.



Bike Stair



SENSORY WELLNESS GARDEN



THE SPECTACLE OVAL

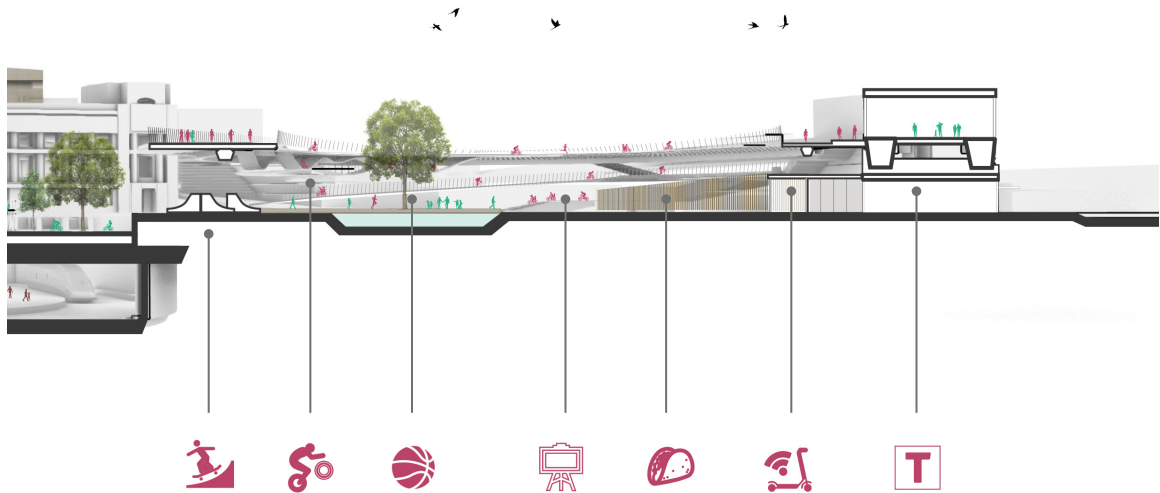


THE ATRIUM



ACTIVE CULTURE PARK

Long section cutting north-south through Thornton Park's three proposed outdoor zones and the proposed subgrade HSR station.



Section cut along the north-south axis focusing on the ACP. For the full context section, see p.49.

## Active Culture Park

Area: 2,650 m<sup>2</sup>

Who it's for: families with older kids, smaller groups, commuters, foodies, arts community, skateboarders

Average Speed: 0-15 km/h

The Active Culture Park sits at the prominent corner of Main Street and Terminal Avenue. The auto-centric intersection is covered by the elevated SkyTrain station, which sees over 15,000 boardings per weekday (TransLink 2019) and is grounded by two bus stops connecting to the 3, 8, 19, 22, N19 and N8. Commuters are the most commonly observed site visitors at this boundary, and tend not to stay for periods longer than typical waiting times for public transit.

The Active Culture Park is divided into two zones: Street Life with food vendors, seating and wooden material throughout, and the Chill Zone with harder surfaces like concrete half pipes, hillouts, basketball nets and a Clubhouse with EoT facilities.

### ***Threshold Experience***

Upon transitioning from the raised Skytrain LRT station, the user becomes prepared to experience the Active Culture Park. This is established through the path segment's eastern orientation, offering the user a dominant view of the historic Pacific Central Station – formally introducing the building as the site's primary transportation anchor.

The path then weaves widely to encircle the convivial food festival below, where food cart patrons laugh and enticing aromas linger. The chatter begins to mingle with the scraping of skateboard trucks on half pipes and youthful cheers from the elevated amateur pump track.

The colourful wooden backdrop of the approaching pump track defines both the northern boundary of the Active Culture Park and edge of the threshold between it and the Spectacle Oval. The Clubhouse is a lounge space for AT users and a self-repair shop that completes the threshold between main attractor spaces. The wood and glass structure that protrudes above the raised path marks the space with a totemic lightwell, while the accessory building below offers a place to rest from the non-stop action.



Plan view of the ACP, showing striped hillouts for unprescribed play, basketball court and plenty of green space to spread out and relax. The central pond anchors the park with its optimal views of the action above and below.





FOOD & COFFEE CART



THE POND



LEVEL 2  
ELEVATED SPINE



AMATEUR PUMP  
TRACK



FOOD CART

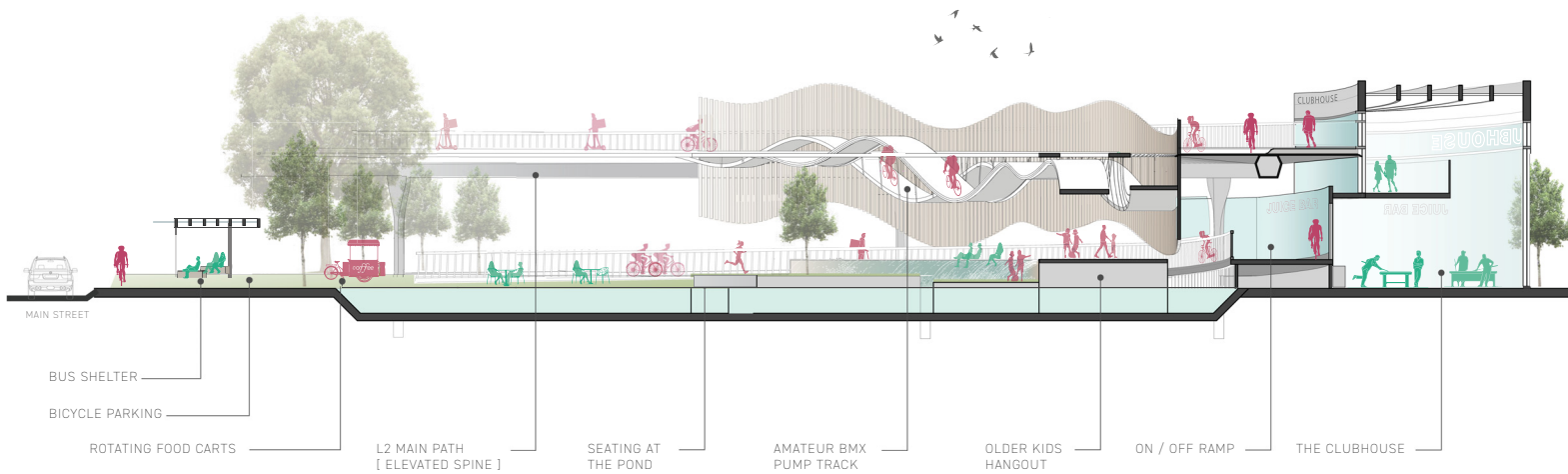


SOCIAL RIDE

## ACTIVE CULTURE PARK

PERSPECTIVE RENDER SHOWING  
SOCIAL ENGAGEMENT BETWEEN RIDERS,  
VENDORS AND STREET PERFORMERS

Perspective render showing social engagement between riders, vendors, and street performers at the ACP.



MAIN STREET

BUS SHELTER

BICYCLE PARKING

ROTATING FOOD CARTS

L2 MAIN PATH  
[ ELEVATED SPINE ]

SEATING AT  
THE POND

AMATEUR BMX  
PUMP TRACK

OLDER KIDS  
HANGOUT

ON / OFF RAMP

THE CLUBHOUSE



PARK YOUR E-BIKE & GRAB A SNACK AT THE FOOD CARTS WHILE WAITING FOR THE RAPID BUS



MEET FRIENDS FOR A SOCIAL RIDE, FILL A FLAT, RELAX AT THE POND & PEOPLE WATCH WITH A COFFEE

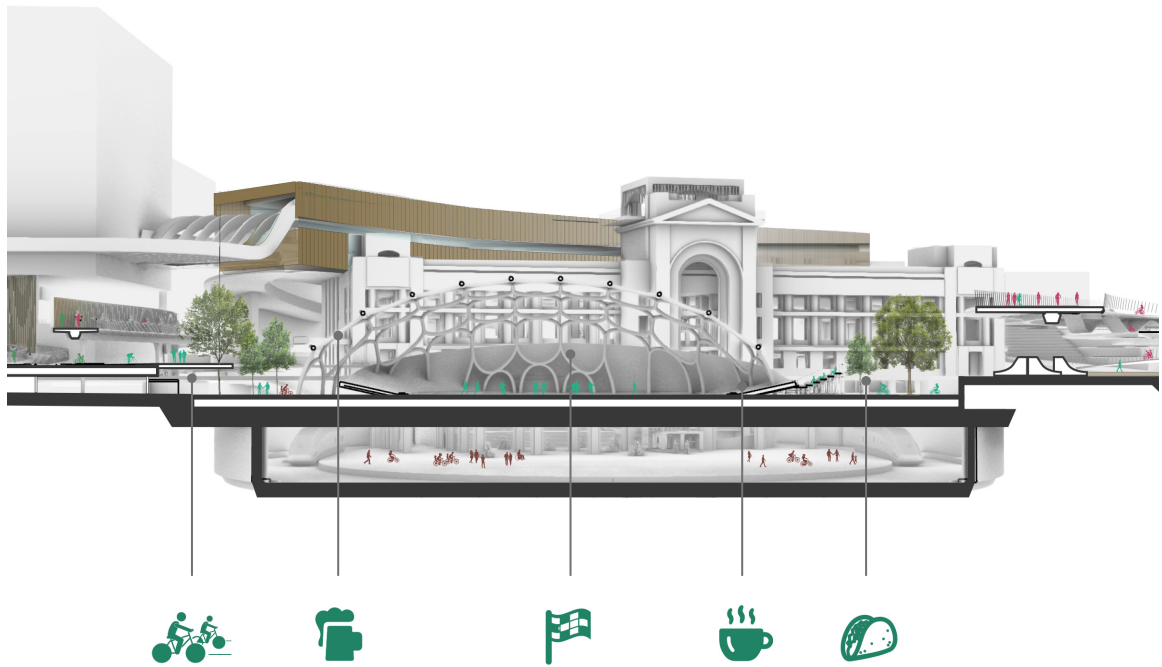


PLAY INDOOR GAMES, RECHARGE, & REFRESH AT THE CLUBHOUSE

## SECTION CC

THRESHOLD: SPECTACLE OVAL & ACTIVE CULTURE PARK

Section showing the threshold space between the SO and ACP.



Section cut along the north-south axis focusing on the SO. For the full context section, see p.49.

## Spectacle Oval

Area: 6,830 m<sup>2</sup>

Who it's for: Small to large groups of all ages, spectators, athletes, enthusiasts

Average Speed: 0-15 km/h

The Spectacle Oval (SO) is a transformable event space that makes use of indoor and terraced outdoor areas to support the Great Lawn activities. The largest zone of the park, the lawn is connected to the Olympic Village Neighbourhood Energy Unit (NEU) with a separate backup generator to accommodate many types and sizes of events. The following drawings depict what happens during different times of day and different seasons as users travel along the elevated spine and at the ground level.



LEVEL 2  
ELEVATED SPINE



OFF RAMP TO  
GROUND LEVEL



L2 SPECTATOR  
PLATFORM



INDOOR / OUTDOOR  
EVENT SPACE



MAIN EVENT  
OVAL

## SPECTACLE OVAL

RENDER ALONG ELEVATED SPINE  
FROM A CYCLIST'S PERSPECTIVE  
DURING AN AUTUMN BMX COMPETITION

Rendering showing elevated spine from a cyclist's perspective during an autumn BMX competition.



LEVEL 2  
ELEVATED SPINE



OFF RAMP TO  
GROUND LEVEL



L2 SPECTATOR  
PLATFORM



SOCIAL RIDE



INDOOR EVENT  
SPACE

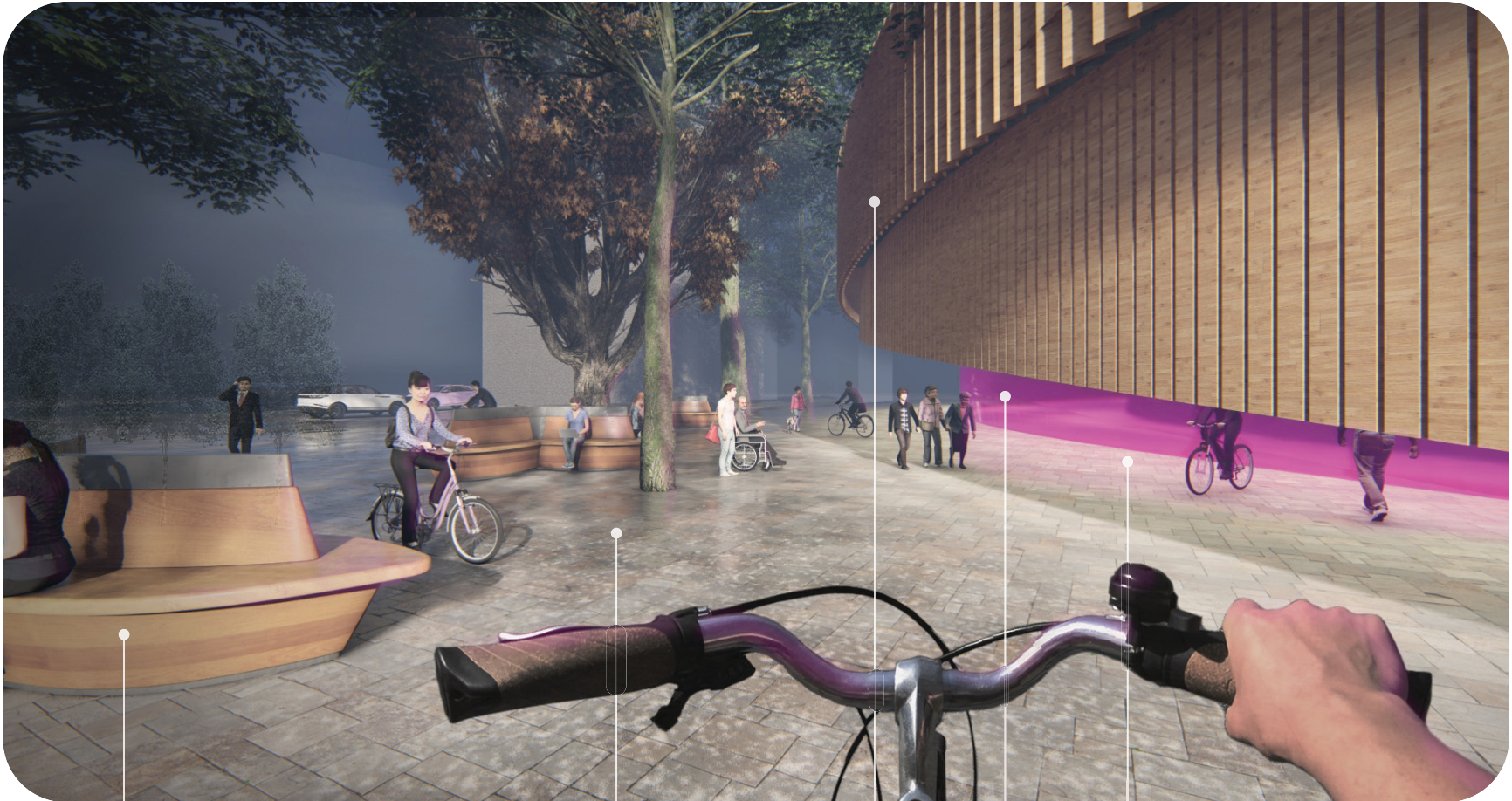


MAIN EVENT  
OVAL

## SPECTACLE OVAL

RENDER FROM A CYCLIST'S  
PERSPECTIVE; HEADED NORTH  
ALONG ELEVATED SPINE AT DUSK

Rendering showing elevated spine from a cyclist's perspective at dusk.



PLAZA SEATING



ENTRANCE PLAZA



LEVEL 2  
ELEVATED SPINE



INDOOR / OUTDOOR  
EVENT SPACE

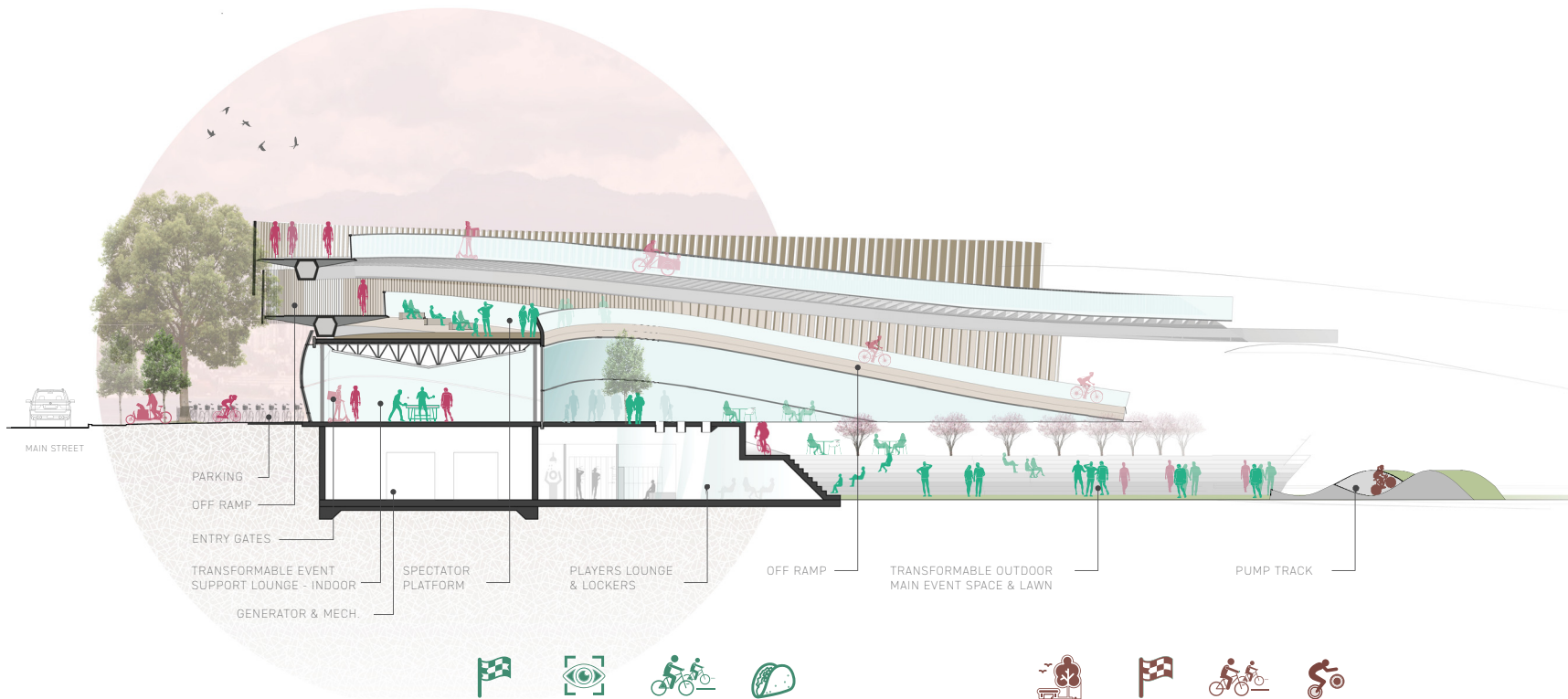


MAIN EVENT  
TICKET GATES

## SPECTACLE OVAL

RENDER AT GROUND LEVEL FROM A  
CYCLIST'S PERSPECTIVE DURING AN  
EVENING LASER LIGHT PERFORMANCE

Rendering showing elevated spine from a cyclist's perspective at dusk.



MAIN STREET  
 PARKING  
 OFF RAMP  
 ENTRY GATES  
 TRANSFORMABLE EVENT SUPPORT LOUNGE - INDOOR  
 GENERATOR & MECH.  
 SPECTATOR PLATFORM  
 PLAYERS LOUNGE & LOCKERS  
 OFF RAMP  
 TRANSFORMABLE OUTDOOR MAIN EVENT SPACE & LAWN  
 PUMP TRACK



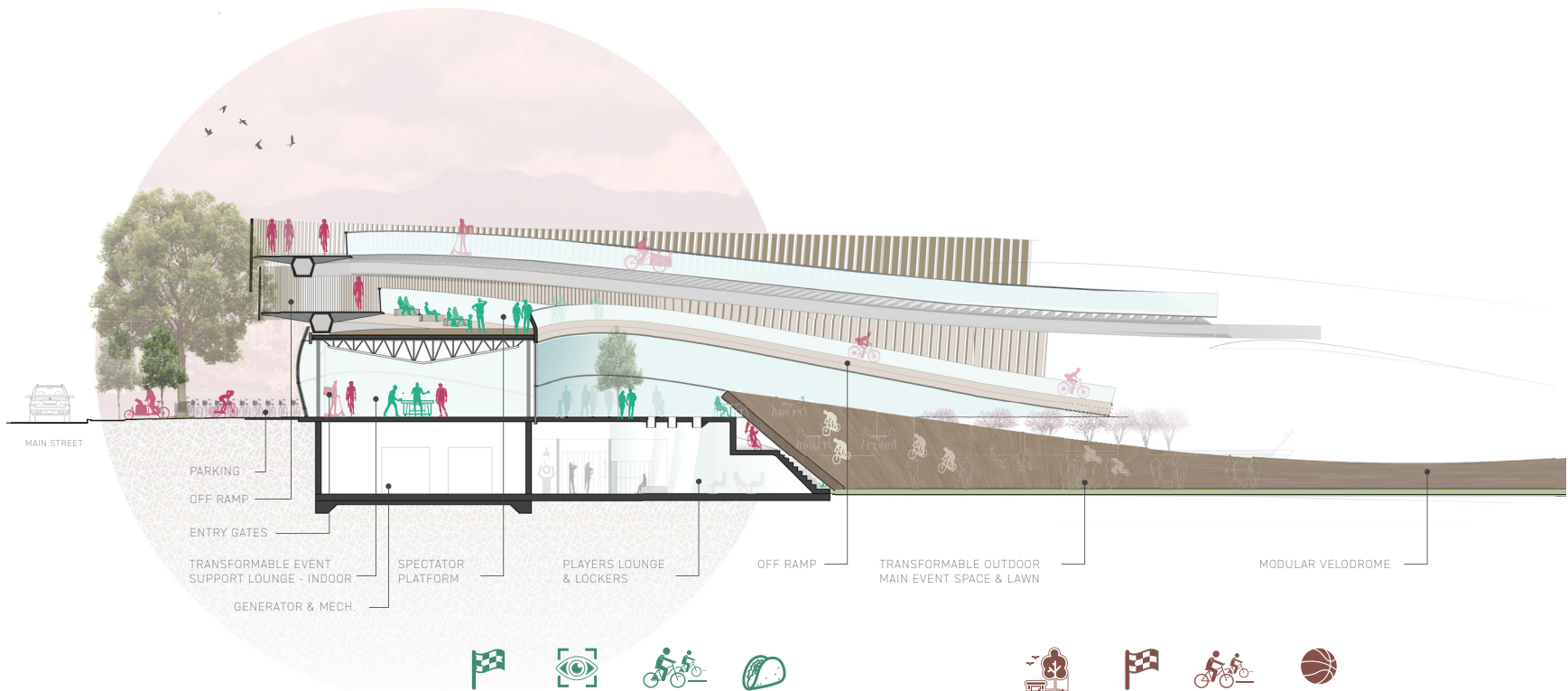
OBSERVE A LIVE PERFORMANCE, MINGLE  
 AT THE EVENT LOUNGE, CHEER FOR  
 YOUR FAVOURITE TRACK CYCLIST

LOUNGE ON THE GREAT LAWN,  
 PRACTICE ON THE AMATEUR PUMP  
 TRACK OR PLAY BOCCIE WITH FRIENDS

## SECTION DDa

MAIN EVENT SPACE:  
 SPECTACLE OVAL

Section showing the main event space when the program is non-specific at the Great Lawn



OBSERVE A LIVE PERFORMANCE, MINGLE AT THE EVENT LOUNGE, CHEER FOR YOUR FAVOURITE TRACK CYCLIST



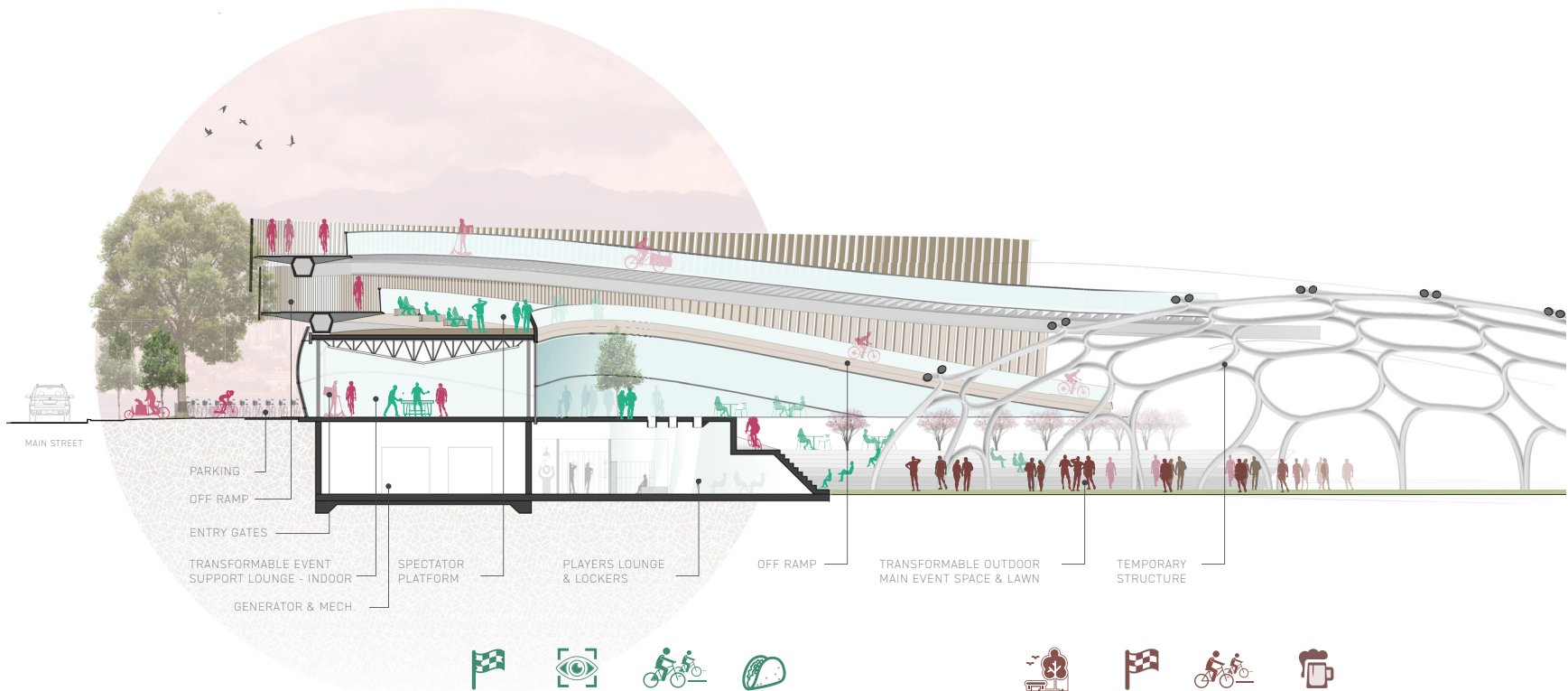
COMPETE IN A RACE, CHEER FOR A PARTICIPANT OR HANGOUT ON THE TRACK AFTER THE EVENT

## SECTION DD<sub>b</sub>

MAIN EVENT SPACE:  
SPECTACLE OVAL

Section showing the main event space when the modular velodrome is constructed for track cycling.





MAIN STREET  
 PARKING  
 OFF RAMP  
 ENTRY GATES  
 TRANSFORMABLE EVENT SUPPORT LOUNGE - INDOOR  
 SPECTATOR PLATFORM  
 GENERATOR & MECH.  
 PLAYERS LOUNGE & LOCKERS  
 OFF RAMP  
 TRANSFORMABLE OUTDOOR MAIN EVENT SPACE & LAWN  
 TEMPORARY STRUCTURE



OBSERVE A LIVE PERFORMANCE, MINGLE AT THE EVENT LOUNGE, CHEER FOR YOUR FAVOURITE TRACK CYCLIST

TASTE A HAZY IPA AT THE BEER FESTIVAL, MOSH AT THE OUTDOOR CONCERT, EXPERIENCE A LIGHT SHOW

## SECTION DDc

MAIN EVENT SPACE:  
 SPECTACLE OVAL

Section showing the main event space when the temporary steel structure is constructed for an outdoor event.



INDOOR /  
OUTDOOR GAMES



INDOOR EVENT  
SPACE



L2 SPECTATOR  
PLATFORM



GROUND LEVEL  
SPECTATOR



SOCIAL RIDE



MODEL BOAT  
RACE

## SPECTACLE OVAL

RENDER FROM A CYCLIST'S  
PERSPECTIVE; MODEL BOAT  
RACE DURING SPRING AT DUSK

Rendering from a cyclist's perspective during a model boat racing at dusk.



Section cut along the north-south axis focusing on the SWG. For the full context section, see p.49.

## Sensory Wellness Garden

Area: 2,400 m<sup>2</sup>

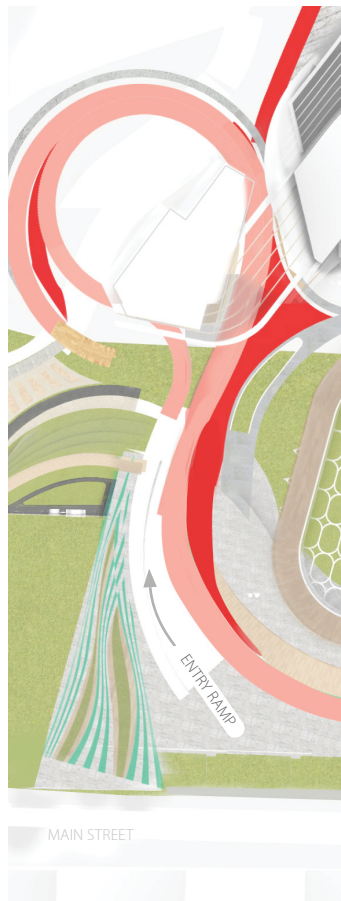
Who it's for: Hospital patients, family, solo or small groups, picnickers

Average Speed: 0-15 km/h

The Sensory Wellness Garden (SWG) is nestled adjacent to the new St Paul's Hospital. A medicinal garden is filled with shrubs and plants commonly known to promote healing: *Aloe arborescens* (aloe), *Ocimum basilicum* (Holy Basil, Tulsi), *Echinacea purpurea* (echinacea), *Passiflora incarnata* (Passionflower), *Menthe pulegium* (Peppermint), *Achillea millefolium* (Common Yarrow), *Callistemon citrinus* (Bottlebush plant), *Adiantum capillus-veneris* (Gingko baloba/maidenhair tree).

The Wellness Garden incorporates native grasses, shrubs, flowers and trees throughout the landscape to attract wildlife. Logs, trees and rocks serve as a home for various species that were once displaced when the False Creek flats were infilled to construct the original train station and tracks.

It is bounded by a waterwall inspired by Gerald D. Hines waterwall in Houston, TX. It serves as a noise barrier to busy Main Street to the west, and directs the sound of calming water into the park. It also acts as a threshold for visitors to walk through, under two extruded metal curved canopies – one at 1.5m for children to enter and follow a stone path to the picnic terraces and stream.



Plan view of threshold between the SWG and SO showing the entrance ramp from ground level down to P1 to bike parking, daycare, yoga, and connections to station level, S1.

### ***Threshold Experience***

While the Spectacle Oval directs the user's gaze outward, emphasizing direct social interaction and sensory stimulation, the transition into Wellness Park implores the user to look inward. Program inspires self care, introspection and spirituality.

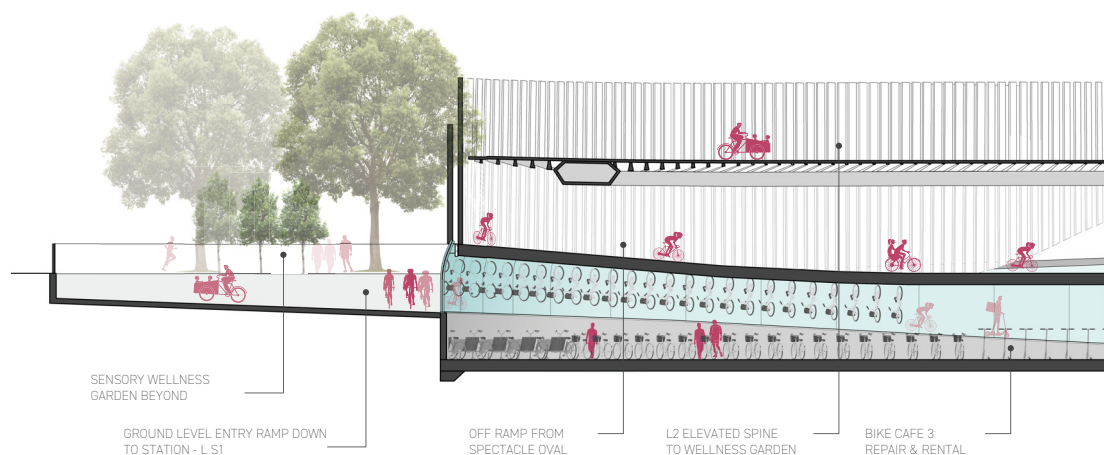
Another Bike Café, The Bike Doctor, marks the second threshold space by punctuating the convergence of the Oval with the ground-level entry ramp. As the ramp slopes down to Level P1, the user can see through the glazed walls to view the elongated repair area. A bike-thru coffee concession punctures the Spectator platform directly above, acting as a subtle totem for entry, threshold and convergence.

Passing by the Bike Café, the threshold continues in an east-west axis on three levels: The entry to Level P1 flows with the slope of the terraced lawn, along which the program gradient maintains the group and social dynamic of the Oval with spaces for yoga, stretch and dance. These spaces

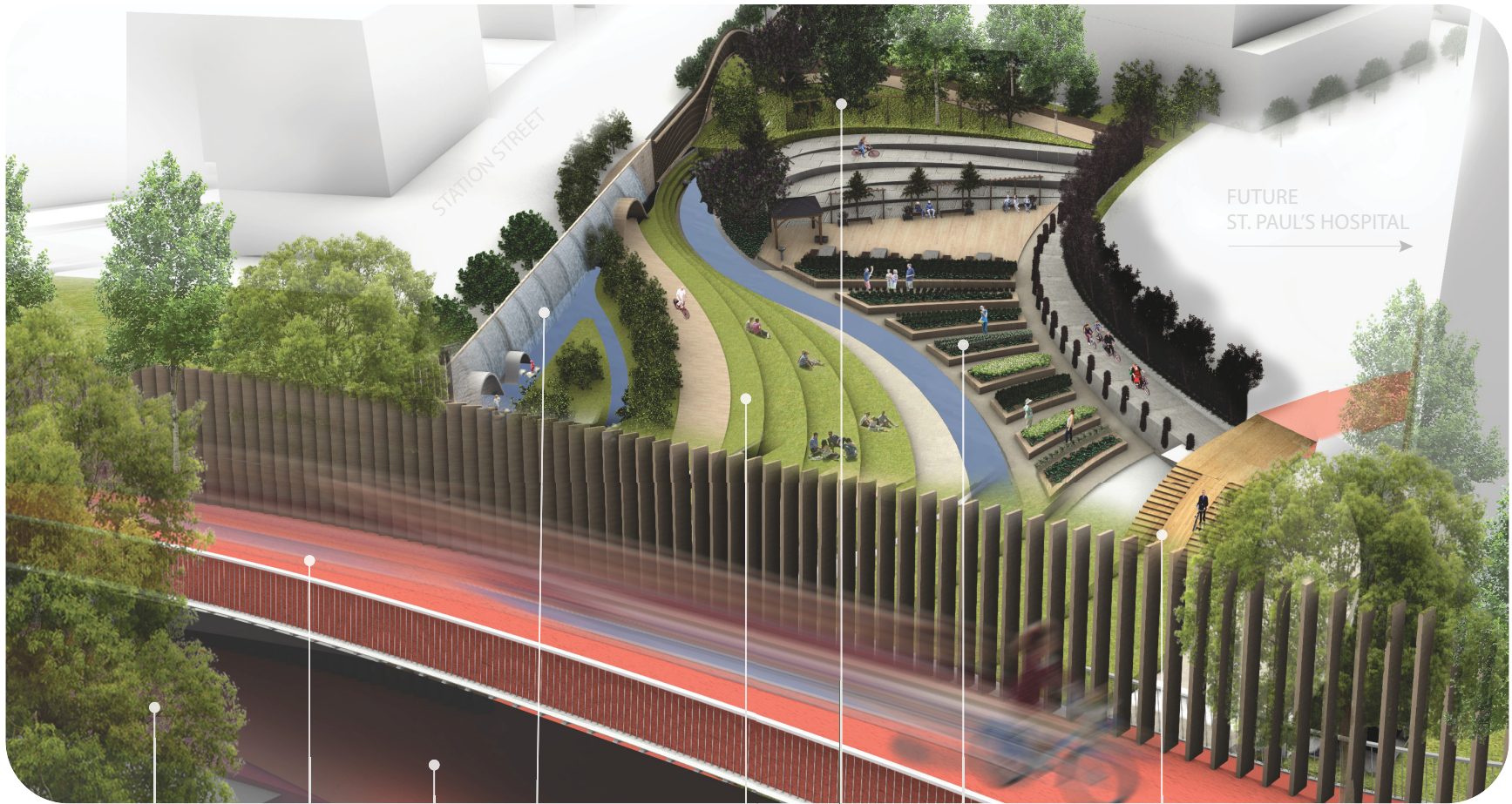
overlook the storm water stream, with a visual connection to the childcare center directly across at the base of the hotel structure.

Above the daycare at Level 1, a fitness center accessible to all transit-pass carrying members as well as hotel guests further asserts the user gradation from large scale Spectator to active participant. The center overlooks the terraced lawn below and the water wall at the edge of the Wellness Garden beyond. Existing large growth trees buffer the wall and provide a backdrop to define the boundary between garden and street.

Continuing north, the SWG integrates into the landscape with organic curved terraces that orient the user's views inward. Morning and afternoon sun filters through the fruit trees and medicinal gardens to transport the user out of the urban center and into a zen garden that engages all the senses.



Section looking north along the threshold between the SWG and SO. As users ride up or down the ramp, views of the elongated Bike Doctor repair shop animate the experience.



BIKE CAFE



L2 ELEVATED SPINE



YOGA STUDIO



WATER WALL



PICNIC TERRACES



ORCHARD



U-PICK MEDICINAL GARDEN



BIKE STAIR

## SENSORY WELLNESS GARDEN

AERIAL RENDER FROM HOTEL  
LOOKING NORTH AT THRESHOLD  
BETWEEN S.W GARDEN AND S.O.

Aerial rendering from the hotel looking north at the threshold between SWG and SO.



DOG PLAY



WATER WALL SOUTH PORTAL



WATER WALL KIDS ENTRANCE



VIEW SEATING



WATER WALL NORTH PORTAL

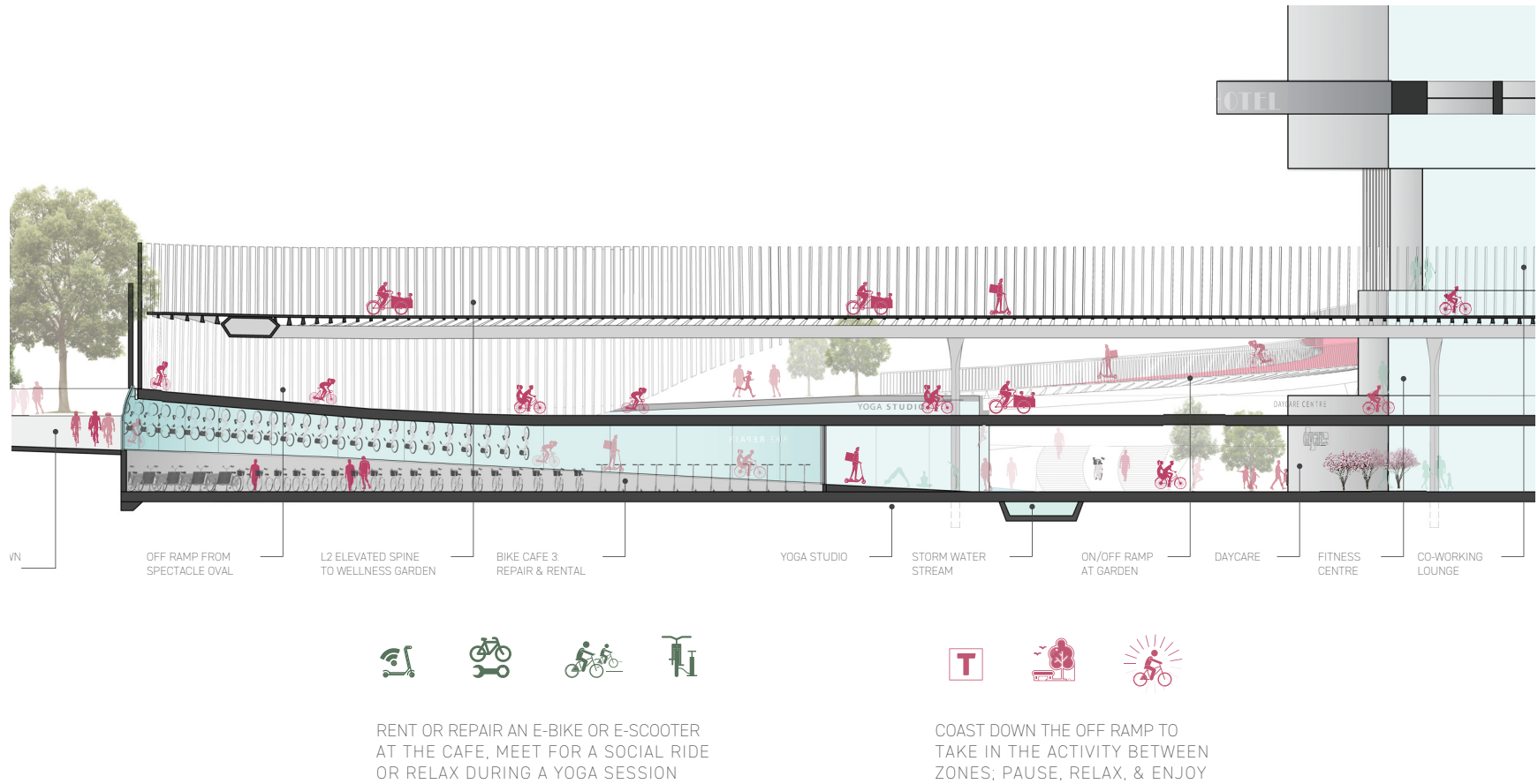


ORCHARD

## SENSORY WELLNESS GARDEN

VIEW FROM CYCLIST'S PERSPECTIVE HEADING NORTH ALONG THE TRANQUIL WATER WALL

View from the cyclist's perspective looking north along the tranquil waterwall.



Section through the threshold space between the SO and SWG.



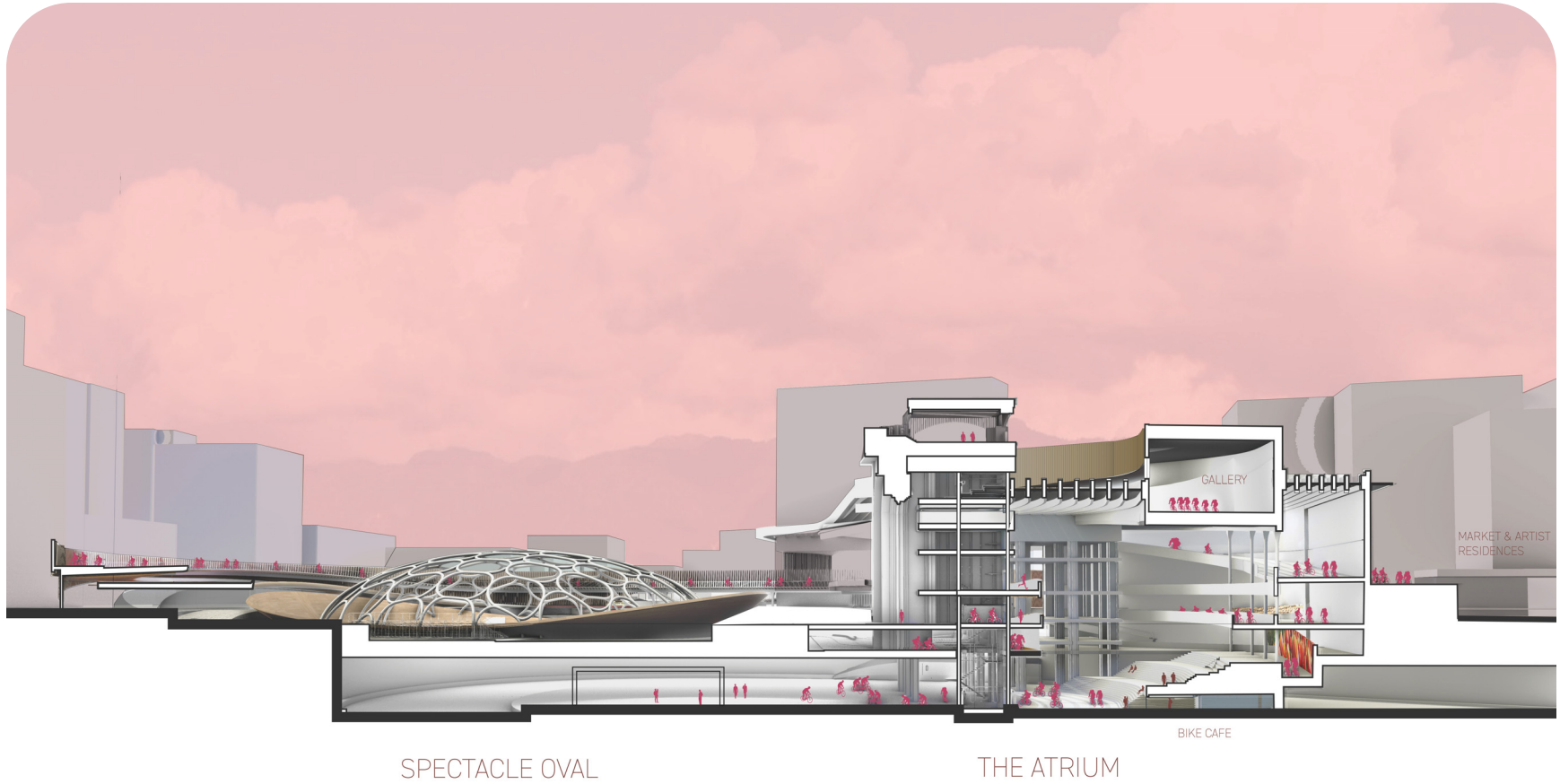


Perspective render of The Atrium looking south at The Portal Bike Cafe and Active Experience Ramp.

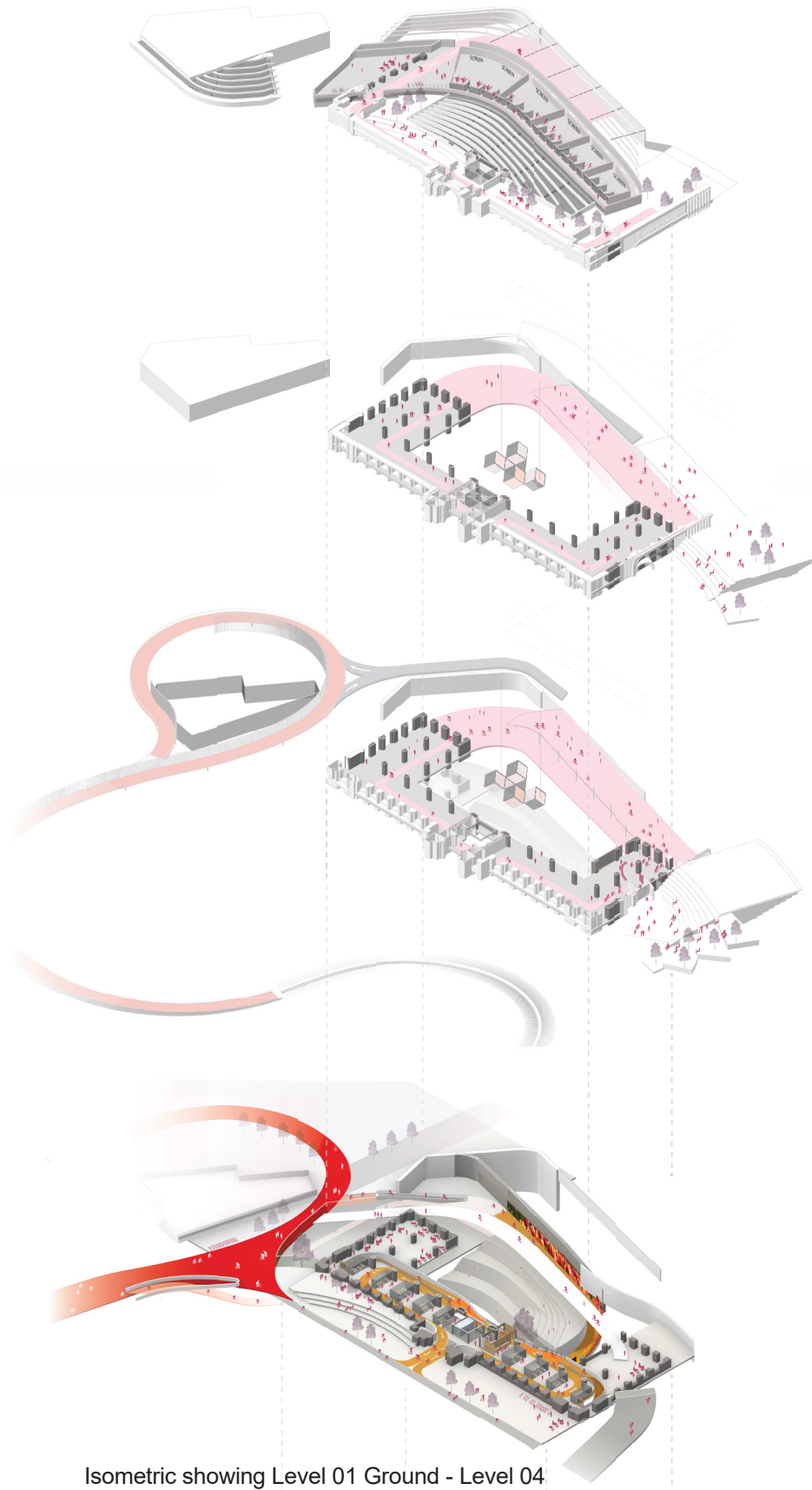
## The Atrium

The Atrium is the origin of the tourist's journey, and the transition space for the local embarking on their trip. It is where all types of people interface, using all forms of AT. The space is covered with iconic louvers inspired by the Maxxi Museum, filtering light into a garden-like atrium.

The gathering stair is theatre seating to watch the waves of travelers parking and retrieving their bikes at P1 and the ground level above. The fifth Bike Cafe, The Portal, invites users to rent a cargo bike if they arrived without an active mobility device. They can load luggage and continue their journey right from the gate along the Active Experience Ramp.



Short section cutting east-west through Pacific Central Station, showing the proposed HSR boarding area and gathering stair at the light-filled Atrium.

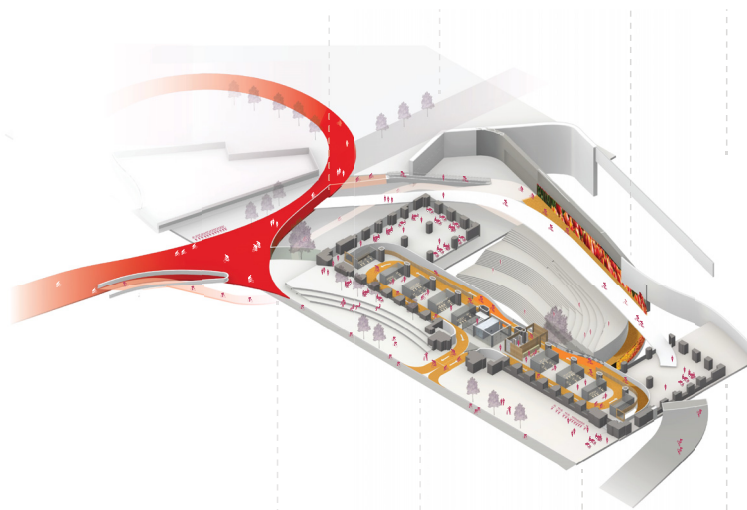


L 04, showing circulation and program of the Digital Immersive Gallery Level.

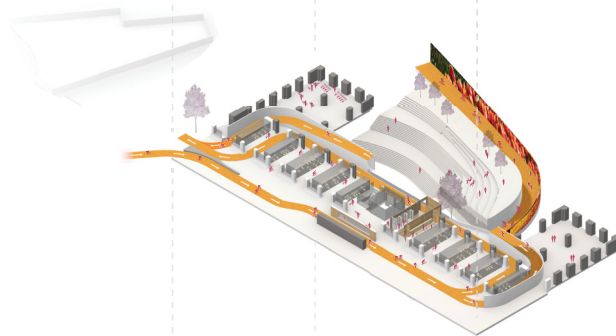
L 03, showing circulation, experience ramp, and outdoor viewing terraces.

L 02, showing A.T. access to the gallery experience the elevated A.T. spine.

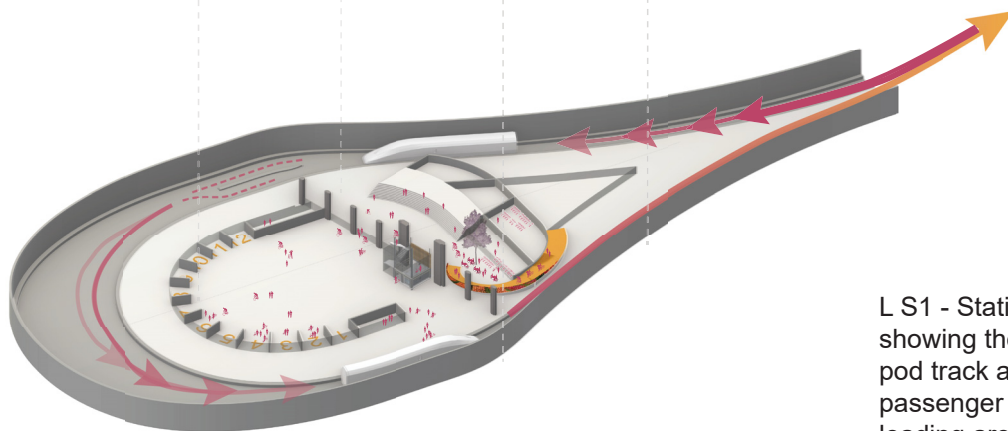
L 01 Ground, showing the relationship between the Red Plaza and the station's primary access and circulation.



L 01 Ground, as seen on the previous page.

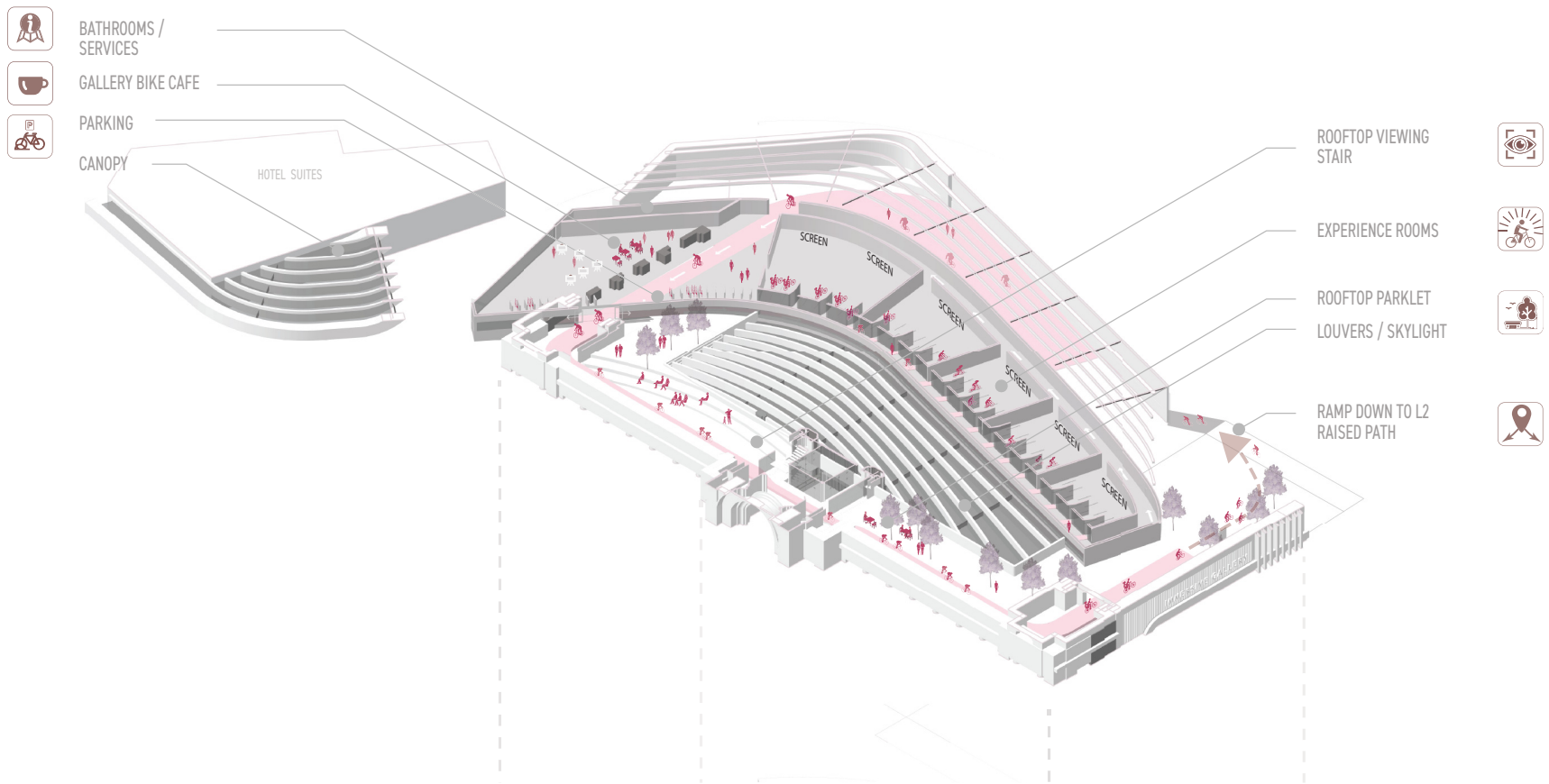


L P1, showing bicycle parking/ circulation and the Atrium gathering stair.



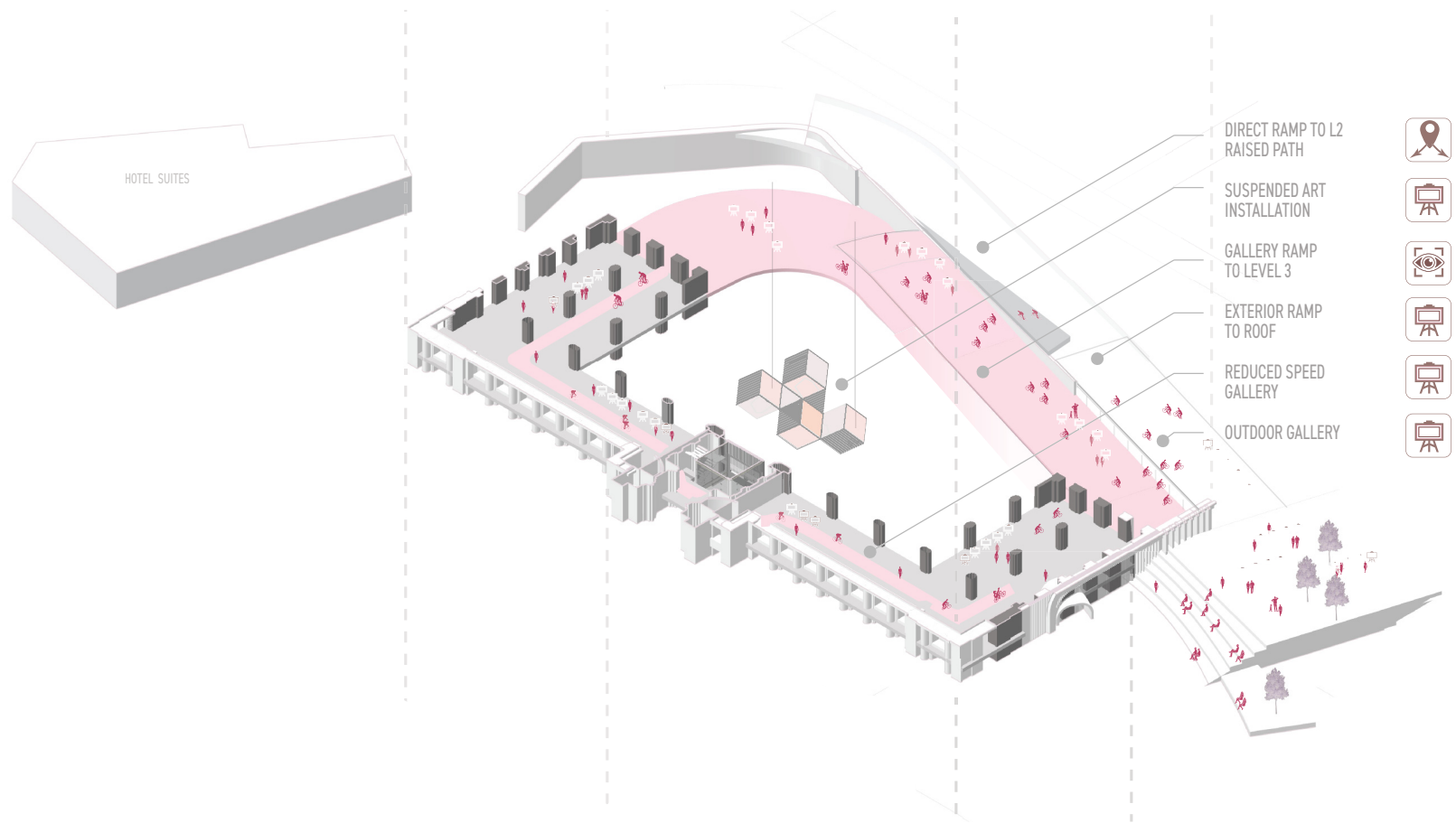
L S1 - Station, showing the HSR pod track and the passenger access / loading area.

Isometric showing Level S1 - Level 01 Ground.

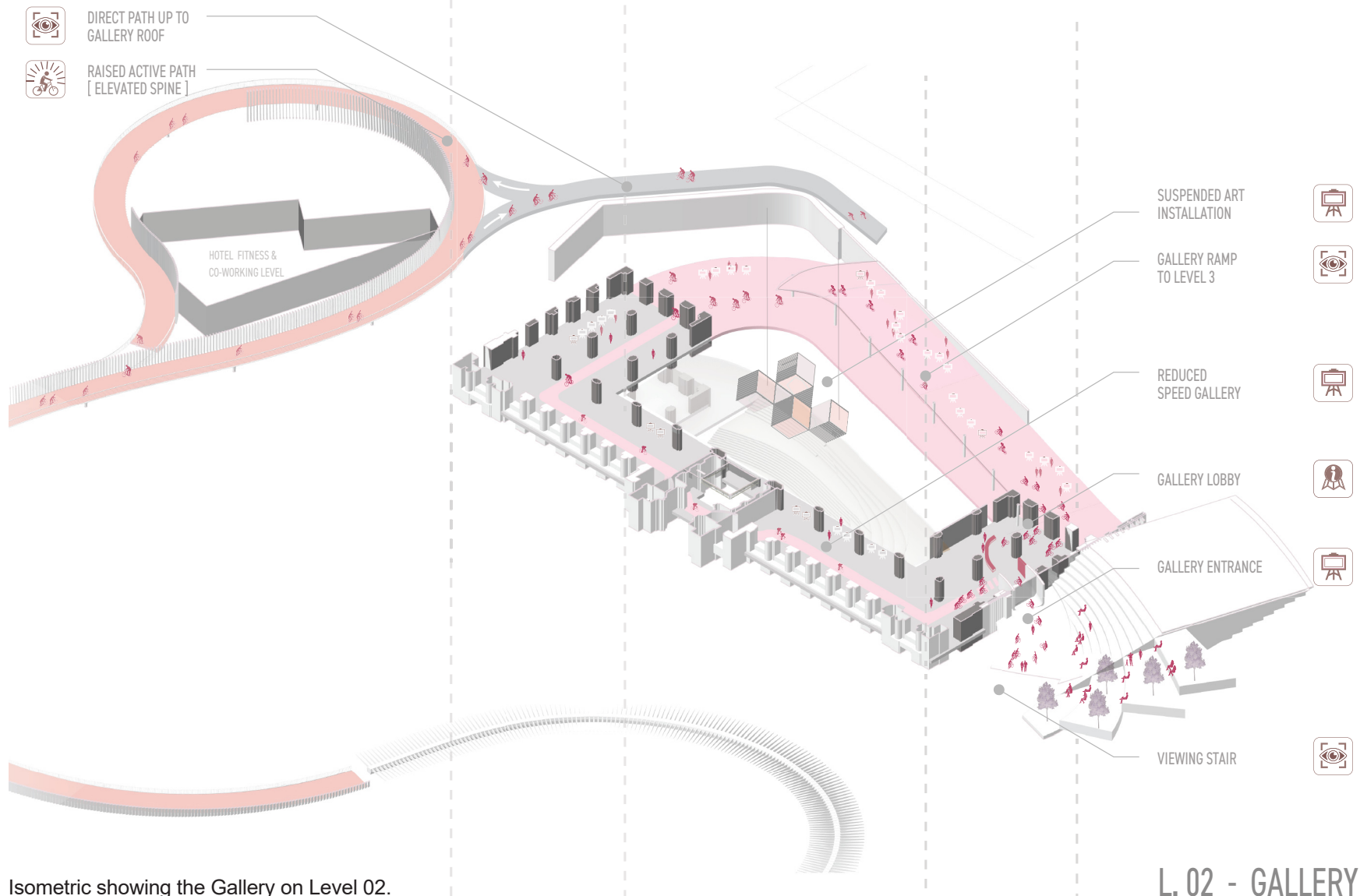


Isometric showing the Immersive Digital Gallery on Level 04.

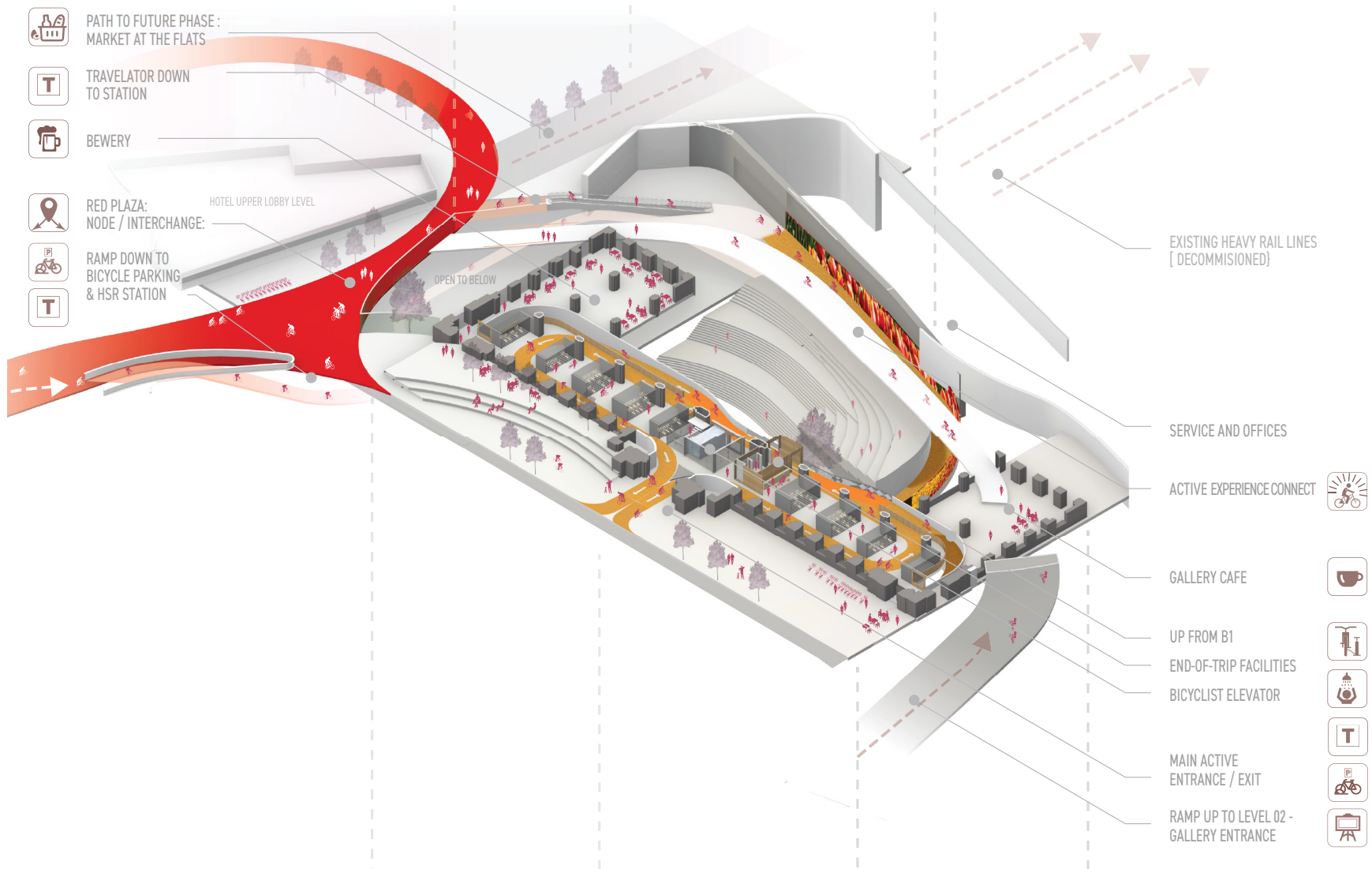
L. 04 -  
IMMERSIVE  
DIGITAL GALLERY



Isometric showing the Gallery on Level 03.

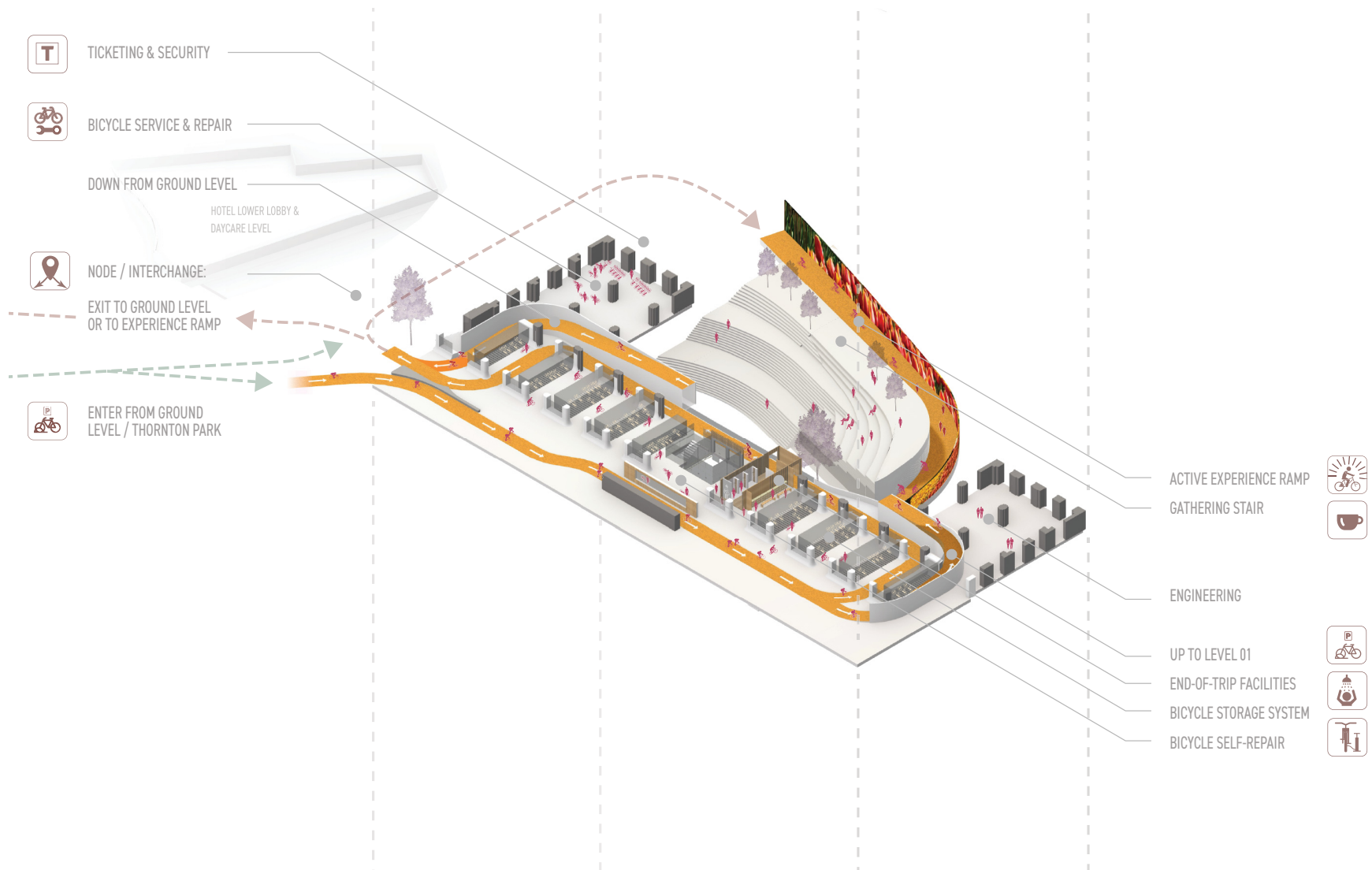


Isometric showing the Gallery on Level 02.

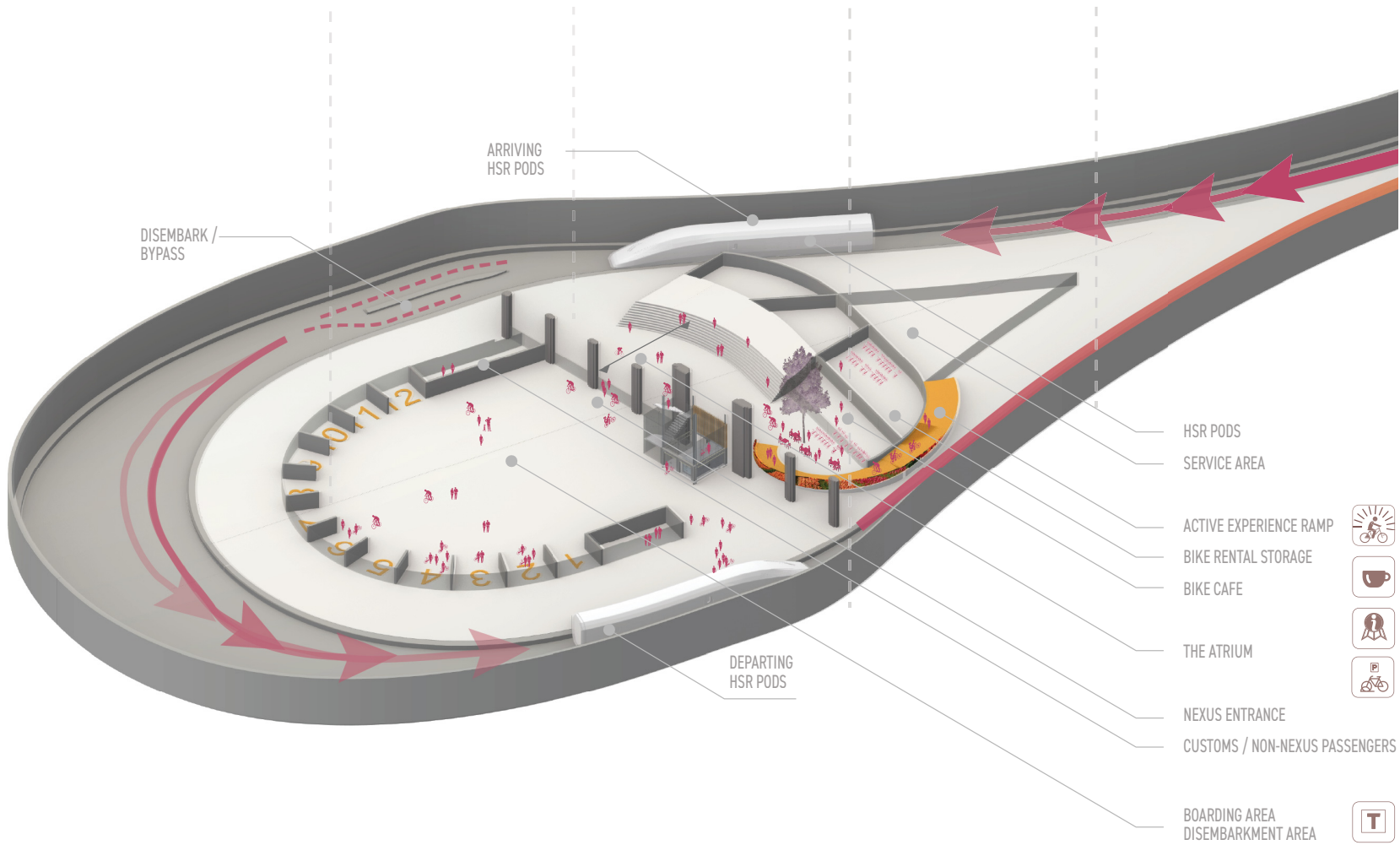


Isometric showing Level 01 - Ground.



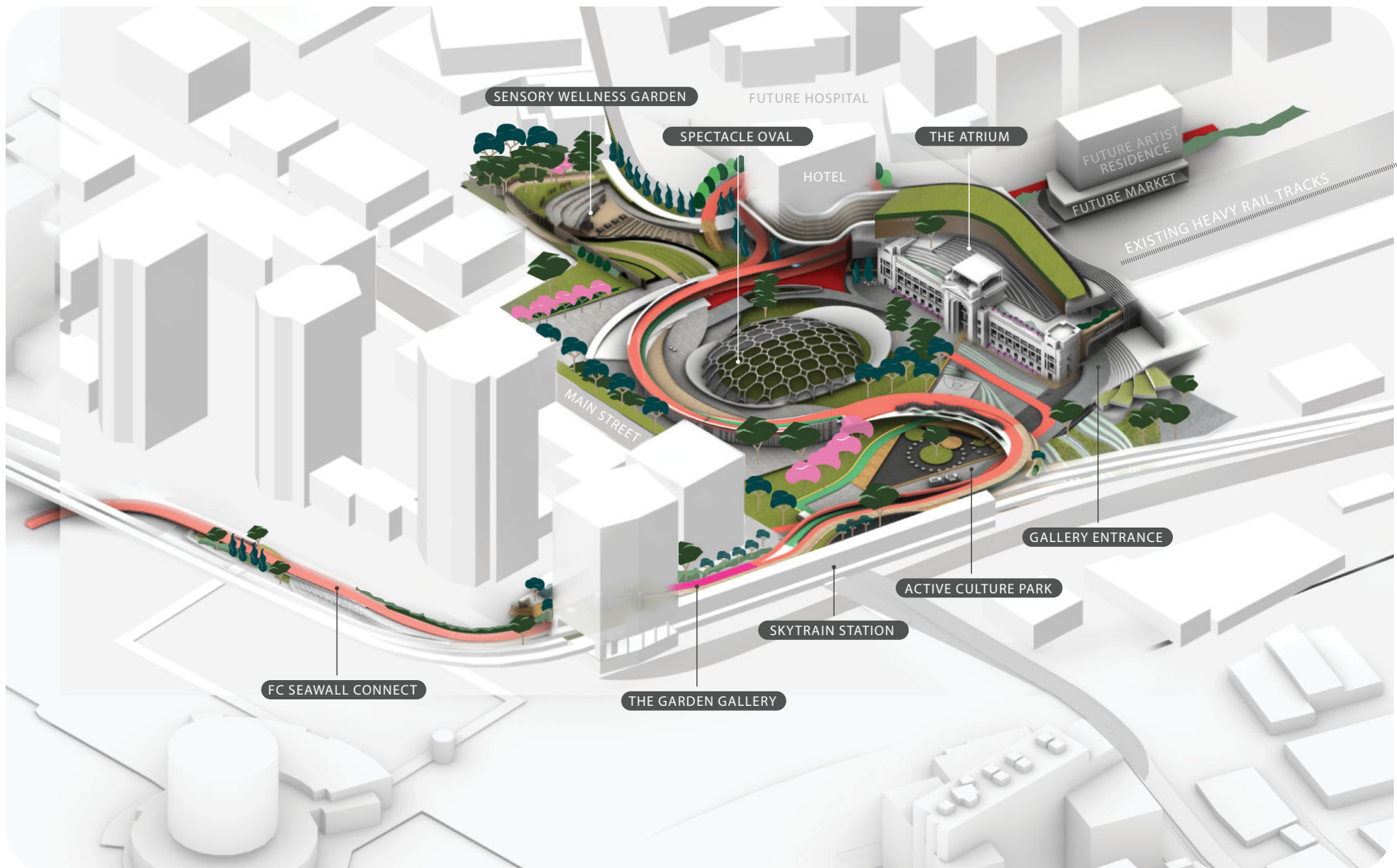


Isometric showing the bike parking circulation on Level P1.

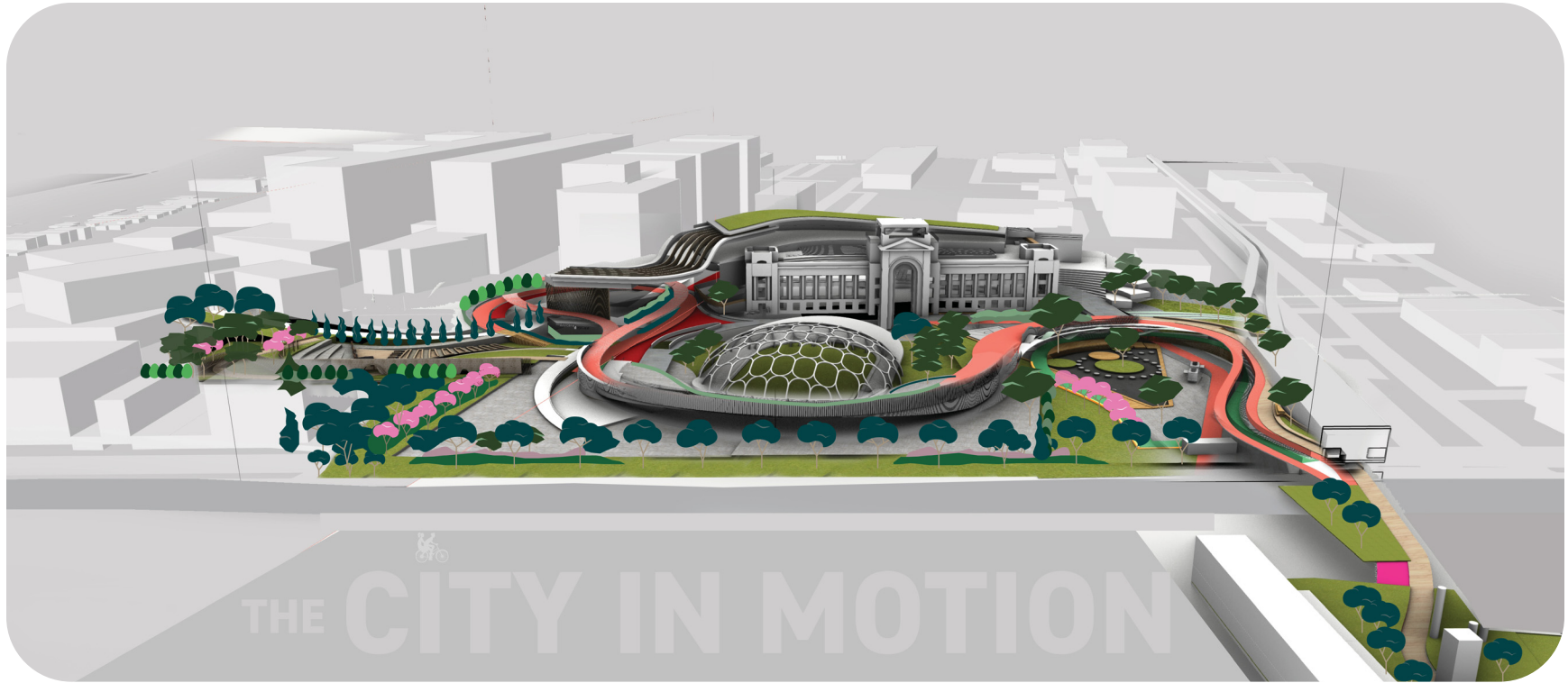


Isometric showing the station circulation on Level S1.

## L. S1 - HSR STATION



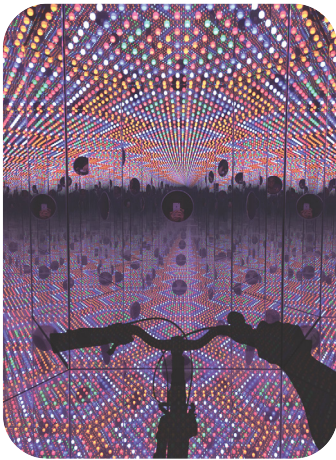
Isometric render of site in its future context.



Isometric render of site in its future context looking east.

## Chapter 6: Conclusion

This thesis explored theories involving the intersection of active lanes (the Main Street Loop - dubbed the Baguette by adoring fans) and the intermediate spaces around transit stations (the Pacific Central Trailhead) as potential gathering places. Through examination of Vancouver's past and present transportation networks and how they connect the city's existing public spaces at nodes, this thesis identified Pacific Central Station for the proposed HSR terminus as an optimal site to test these theories.



Interpretation of an immersive experience that takes place on Level 04 of the station, inspired by Yayoi Kusama's *Infinity Rooms* installations. (base image from Seattle Art Museum n.d.)

By exploiting the opportunity to guide passengers of the proposed HSR line through a series of multifunctional gathering areas along an accessible path, the elevated experience of walking, cycling and rolling through Vancouver's new Gateway invites people to engage, whether as participants or observers. The interwoven spaces at different levels offer users a variety of view points, while on/off ramps provide user agency to interact with the space how they choose - a short time, long, while sitting or at walking, jogging or cycling speeds. Threshold spaces give chapter breaks to the trailhead's rhythm where users can enter, exit or pull over and pause to fix a flat, sip a coffee, or rebalance at a yoga class.

The elevated spine of the Main Street Loop's design becomes a performance stage with the intent to keep people engaged longer, encouraging them to slow down and enjoy - whether it's to watch a track cycling race, make a taco stopover, or check out the exhibition. Occasionally the path offers a detour to speed UP - at the high adrenaline elevated pump track.

Veiled by the colourful architectural elements is an intent not all users would consciously notice, but from which all will reap reward: the opportunities for social interaction baked into the trailhead's architecture. At the heart of the experience is the choice to fulfill the human need for social interaction at the modulation of the user. Indirectly, users can make eye contact as other riders pass by and hear cheers and excited screams from the Spectacle Oval. Directly, users can choose to meet friends to watch an event, or prepare for a trail ride that connects to the seawall and on to Stanley Park. Spontaneous encounters with strangers increase in likelihood too - with the proposed HSR line's annual ridership expected to reach nearly one million between Seattle and Vancouver residents by 2040 (Washington State Department of Transportation 2019).

This thesis explored design interventions based on Jan Gehl's experience. His writings have a direct, key message: the primary tool of measuring the success of public space is people: how many, how long, and how often - and that the quality of the spaces is directly associated with the metric. Therefore, this project combines many ingredients to create something for everyone. It aims to recognize the culture of Vancouver through its diversity, history, social ethos and sustainable values to achieve success.

### ***The Future of Sustainable Transit***

As the train that built the city becomes replaced with new high speed systems, the transit station takes on a different role on the urban stage. When iconic London St Pancras Station experienced refurbishment to accommodate a new high speed train terminal in 2007, a programmatic overhaul reflected the the shift in passenger culture. A shopping centre

now takes advantage of its 36 million annual passengers, while the hotel which sat decommissioned since 1935 is again active, with upper levels rented as exclusive Airbnb suites.

While hotels and retail serve as popular and effective program for established high speed transit nodes worldwide, there is a unique opportunity to reconsider the terminal when the network is brand new to the city. For passengers on the West Coast, a station can respond to the interests and needs of the region through architecture.

This thesis touched on Phase 2 of the revitalization plan involving the Market at the Flats and its adjacent artist residences. The project could be explored further by designing their integration with the neighbourhood and finding out what benefits they might bring as they intersect expanding AT networks.

However, this thesis established the fundamental framework in Phase 1 for future stations along the proposed HSR route. It determined community-based programming is essential for future station architecture, and that defining an anchor within a transportation hub offers identity for a city's active transit network. The intersection of these proves everyday excitement can be found in just a commute – the evolution of which Vancouver can, along with other cities, eagerly look towards from behind the handlebars.

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