Sense-Able Transit:
Bridging the Gap Between Human Ability Difference and the Built Environment Through GO Transit Gateways

by

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ACCESSIBILITY CLAUSE AND PERMISSION TO USE

abstract

Keywords

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human transit

Transportation has played a pivotal role in shaping cities while creating gateways within societies providing technological, economic, social and political growth. The Mimico GO station is one of many within the Greater Toronto and Hamilton Area providing its community with socio-economic opportunities through a series of accesses. A substantial number in population today require accessibility accommodations due to visible and invisible ability differences. Through critical analysis of disability studies, it is evident that the learnt environment greatly affects perceptions on the right to being and perceived as human. Therefore, the transformation of the mind and built environment combined sets a new framework for universal design. The framework investigates alternative technologies, adaptive reuse, sensorial enhancement, and spaces within the public realm that go beyond the minimum requirements. Focusing to capture moments of transition with detailed connection, ultimately delivering fluidity, adaptability, independence and pride to each individual user experience.

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AIM TO CAPTURE THESE MOMENTS OF LANDSCAPED STATION CONNECTIONS THAT SHAPE A CONTINUOUS MOVEMENT FROM ONE PLACE TO ANOTHER WHILE BEING FLUID, FLEXIBLE AND ADAPTABLE TO ALL TYPES OF HUMAN ABILITIES.

Introduction


EASTBO
TRAIN
EASTBO

Transportation in Canada has played an important role throughout social, economic, and political disciplines as it has been used as a method of travel as well as a means of connectivity through a journey from one city to another. The purpose of transportation in terms of connectivity is applied across a series of accesses through community identity known as gateways until a final destination has been reached. As modes of popular transportation have evolved in Canada, the railway system has remained a travel constant providing social and economic benefit for those settlements residing along the rail line. The Canadian railway system began in the 1700's as horse drawn carriage and slowly improved as new technologies came to light such as the 1820s inclined cable rail, first passenger train owned

by the Canadian Pacific Railway (CPR) company,[1] and on street tram cars. In 1836 the federal government of Canada realized the economic benefits of passenger rail travel and expanded all rail lines across the country addressing the growing consumer demand.

By the 1960's, the settlements occupying Southern Ontario were booming, creating a greater necessity for longer distance commuter traffic in and out of Downtown Toronto from suburban cities. To address these larger spanning boundaries of commuters throughout the Greater Toronto and Hamilton Area (GTHA), the Government of Ontario implemented a specialized railway service. In 1967, the first interregional commuter train made its way connecting suburbs to Toronto's Union Station, giving birth to the Government of Ontario Transit or GO Transit.[2] By the end of the two World Wars, there were many survivors that experienced life altering changes due to injuries obtained and dehumanization from the surrounding society.

The two World Wars brought upon a multitude of injuries that never faded away or fully healed leaving the lives of soldier's both physically and mentally tainted. Many community members of society and veteran spouses felt disgusted and uncomfortable due to the way veterans looked or acted in comparison to how they were known prior to the war. In order to address challenges normal people faced, North American governments implemented a rehabilitation program to repair broken soldiers. The program forced veterans to feel shameful allowing for the dehumanization and severe mistreatment towards those with disabilities to persist as the years followed.[3]

History has paved the path for prejudice and bias within psycho-social culture for anyone who seems different or abnormal in

1 James H. Marsh, "Railway History in Canada," in *The Canadian Encyclopedia*, historica Canada, article published March 25, 2009; last Edited July 09, 2021.

2 Metrolinx, *in Suits and Dresses and Even Hats, Customers Line up and Board the Original GO Trains*, n.d, https://blog.metrolinx.com/2019/03/20/travelling-back-in-time-the-remarkable-evolution-of-your-go-train/.

3 Julie Anderson, "Mutilation and Disfiguration," in *International Encyclopedia of the First World War, 2017, https://encyclopedia.1914-1918-online.net/article/mutilation_and_disfiguration.*

comparison to others. Some of the terms used to describe those with special circumstances due to permanent physical injuries, health issues, older age, and even cognitive development are handicapped, disabled, or lame. Accessibility by definition is, "the quality of being able to be reached or entered; the quality of being easy to obtain or use; the quality of being easily understood or appreciated." [4] By these definitions, there is a common theme that relates accessibility to the equal quality of life for every human being no matter their circumstances.

Advancing to GO and the 21st century, the demand for readily available public transit was higher than ever before connecting Toronto to the GTHA. GO Transit introduced five principles to achieve a better, more efficient means of travelling to work.[5] However, the principles and future plans of GO seem to only target a particular type of able-bodied individual continuing to lack the drive to address accessibility in a more thoughtful and inclusive way.

Ontario's public transit today serves over twenty-five major suburban cities but have proven to lack the desire or motivation to extend the reach to all types of users. How Can The Built Environment Address Needs Of Accessibility And Most Importantly Bring Freedom To All Walks Of Life Through A Series Of GO Transit Station Connections?

In order to create change in terms of accessibility, one must critically analyze discourse of disabilities within society through other disciplines such as The Prosthetic Impulse, The Critical Disability Theory, A Cyborg Manifesto, The Rick Hansen Foundation, and case studies of the built environment. The discourse and use of the term disability have been discussed through several theories surrounding

4 Oxford English Dictionary, "Accessibility," in *Oxford English Dictionary, https://www.oed.com/.*

5 GO Transit, n.d, *benefits of Taking GO,* https://www.gotransit.com/en/about-us/benefits-of-taking.

common theme where authors choose to represent the word in a positive tone, transforming into ABILITY.

The Prosthetic Impulse is based upon contributors' personal experience stories, shedding light on prosthetic technology to provide empowerment to voices of those with prosthetics and glorifying the technological beauty.

The Critical Disability Theory (CDT) criticizes the existing perception of disability by redefining its definition and purpose proving that people with disabilities deserve equal treatment as it is their human right.[6]

Donna Haraway's theory written in A Cyborg Manifesto creates a perspective on human abilities in response with technology providing a new definition of man and what it means to be human.[7]

Creating a space for "everyone, everywhere" is an awareness campaign organized by the Rick Hansen Foundation (RHF) aiming to bring forth knowledge, understanding and perspective to society on an inclusive environment for all.[8] The RHF calls upon designers to re-evaluate spaces to accommodate accessibility needs by seeking solutions beyond the minimum requirements from the Ontario Building Code (OBC) and the National Building Code (NBC).[9]

6 Melinda C. Hall, "Critical Disability Theory," in *The Stanford Encyclopedia of Philosophy,* Metaphysics Research Lab, Stanford University, 2019.

7 Rebecca Pohl, *a Mcat Analysis of Donna Haraway's A Cyborg Manifesto,* Mcat International Ltd, 2018.

8 Rick Hansen Foundation, *Rick Hansen Foundation Strategic Plan 2021 – 2023,* Rick Hansen Foundation, 2021.

9 Rick Hansen Foundation, *Points to Certification!,* Rick Hansen Foundation, 2020.

All the theories mentioned critique the way society has created a misconception of those who face barriers of the everyday life. Thus, proving a desire to eliminate all stigmatization or discrimination from politics, architecture and finally the world as a whole.

As a steppingstone to see change in the world, an analysis of existing GO Transit stations proves to be a pillar of many unaddressed issues in terms of accessibility within the built environment. The Mimico GO station is located in Etobicoke, Toronto, surrounded by single-family dwellings, nearby to the Humber Bay Park and the future home to several high-rise condominium developments. Through site analysis studies such as mapping, photography, visual and audio recordings, Mimico GO is an exemplary station without any available accessibility accommodations which does not comply with the OBC or NBC[10] further proving the need for re-evaluation of the station, its platforms, landscape, and surrounding connections while addressing accessibility issues by creating thoughtful design solution standards.

Through investigation of station improvement plans created by Metrolinx, a crown-agency owned by the Government of Ontario,[11] addition of elevators or mini accessible platforms are the main methods to address accessibility needs.[12] In which presents the question of How Many Types Of Ability Differences Do Elevators And Mini Platforms Completely Solve? The ability to address accessibility in

10 The City of Toronto, "PDF" (Toronto, 2021).

11 Metrolinx, "Metrolinx about Us," Metrolinx, 2022, https://www.metrolinx.com/en/aboutus/about_us_index.aspx.

12 Greater Toronto Transit Authority, and Government of Ontario Transit, rep. *GO Transit Annual Report - 2008-2009*, 2008, https://books.scholarsportal.info/en/read?id=/ebooks/ebooks4/ogdc4/2019-07-08/2/218110-2008-2009#page=3

different ways is possible through case studies such as the Yokohama International Passenger Terminal,[13] the Hazelwood School for Blind and Deaf,[14] the Ed Roberts Campus,[15] the Solomon R. Guggenheim Museum,[16] and the House of Disabled People's Organizations.[17] These case studies have set a precedent to reflect on the countless types of ableism that exist and to design spaces looking through a different lens such as the enhancement of other senses.

Based upon information collected from personal experience stories that speak about direct challenges Canadians face on a daily basis regarding the necessity for accessibility, renders the development of the matrix as the new founded guidelines as the foundation to the design proposal. These stories identify the types of abilities Canadians have as well as the barriers that impede on simple daily tasks, shedding light on the freedom able-bodied and able-minded people are privileged with. The matrix focuses on creating the best solutions through sensorial analysis to provide the top possible accommodations to the masses.

13 David Langdon, "AD Classics: Yokohama International Passenger Terminal / Foreign Office Architects (FOA)," web log, Arch Daily, n.d., https://www.archdaily.com/554132/ad-classics-yokohama-international-passenger-terminal-foreign-office-architects-foa.

14 Universal Design Case Studies, Hazelwood School, Institute for Human Centered Design, 2007, https://universaldesigncasestudies.org/education/primary/hazelwood-school.

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16 Adelyn Perez, "Ad Classics: Solomon R. Guggenheim Museum / Frank Lloyd Wright" (Arch Daily, 2010), https://www.archdaily.com/60392/ad-classics-solomon-r-guggenheim-museum-frank-lloyd-wright.

17 Valenzuela, Karen, "House of Disable People's Organization," Arch Daily, Cubo Arkitekter, FORCE4 Architects, 2014, https://www.archdaily.com/495736/house-of-disable-people-s-organization-cubo-force4?ad_source=search&ad_medium=projects_tab.

Transit today focuses on bringing people to their destination in a faster, easier way. Instead, transit should focus on the spectrum of abilities in society, taking a walk through another lens, and creating a space driven by SENSE-ABLE solutions. The SENSE-ABLE solutions have been inspired through a framework of study to find alternative means to resolve the issues at hand. The framework investigates alternative technologies, adaptive reuse, technological sensorial enhancement, and spaces within the public realm. These areas of focus aim to capture these moments of landscaped station connections that shape a continuous movement from one place to another while being fluid, flexible and adaptable to all types of human abilities.

Chapter One

Chapter One

Where It All Began

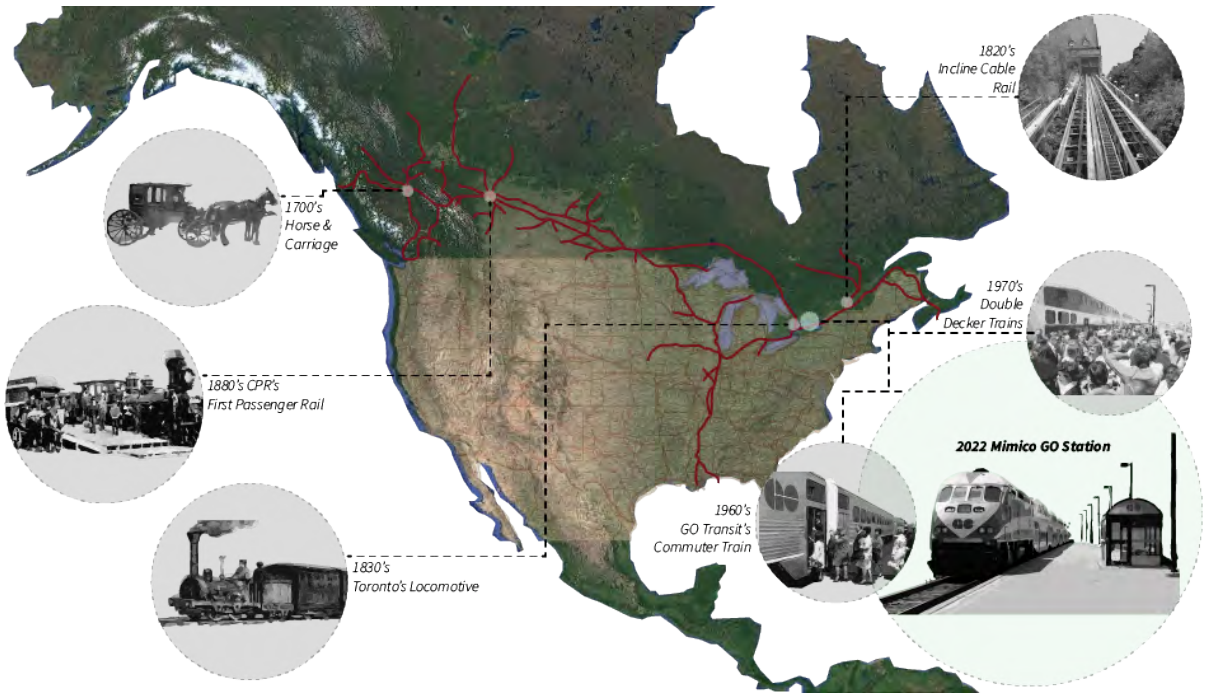


Figure 1.1: Transportation in North America

Throughout history, transportation has been a key component of adventure and embarking on a journey from one city to another. This idea of transportation connects a series of access points through cultural identity until a final destination has been reached. Although popular modes of transportation have evolved over time, the railway system has remained a travel constant acting as arteries through these gateways providing social and economic benefit to neighbouring communities. Canada has been no different with the constant evolution of transportation by means of commercial cargo and passenger rail.

1.1 History of Canadian Transportation Prior to the First World War

Within Canada, the first railway variation began as early as 1720 with horse drawn carriage to transport supplies that were much too large to carry and for construction efficiency. By the 1820s the system upgraded to an inclined cable rail to haul supplies and materials up a sizeable hill to build the Quebec Citadel. The utilization of railroad travel grew substantially until 1850 when the first official Canadian railway was constructed.

This rail line was built alongside the St. Lawrence River to St. Johns in what was considered Lower Canada and named the Champlain and Saint Lawrence Railroad, introducing the method of portage. Portage is a means of travel by land only to avoid barriers along the route such as bodies of water which speaks to human desire to remove barriers to access cities, towns, goods, and services. By the year of 1853, Toronto received the first built locomotive engine that connected Toronto to the North, Toronto to the West and Toronto with the United States of America (USA). [18]

At the end of the following year, southern Ontario was rich with several rail lines such as the Great Western Railway and Grand Trunk Railway (GTR) that spans across Sarnia to Toronto, Montreal as well as Portland, Maine.[19] These two railways eventually amalgamated years later in which would be widely used by public transit, paving the way to greater access for the future. As the advancement of technology continued, the need for travel of both goods and passengers became more apparent where Canada was a leading country in the industry.

From the beginning of the 1830's there was a demand for more localized travel which was addressed by the use of horse-drawn tram systems in both Toronto and Montreal. By 1861, Canada built

18 James H. Marsh, "Railway History in Canada," in *The Canadian Encyclopedia*, historica Canada, article published March 25, 2009; last Edited July 09, 2021.

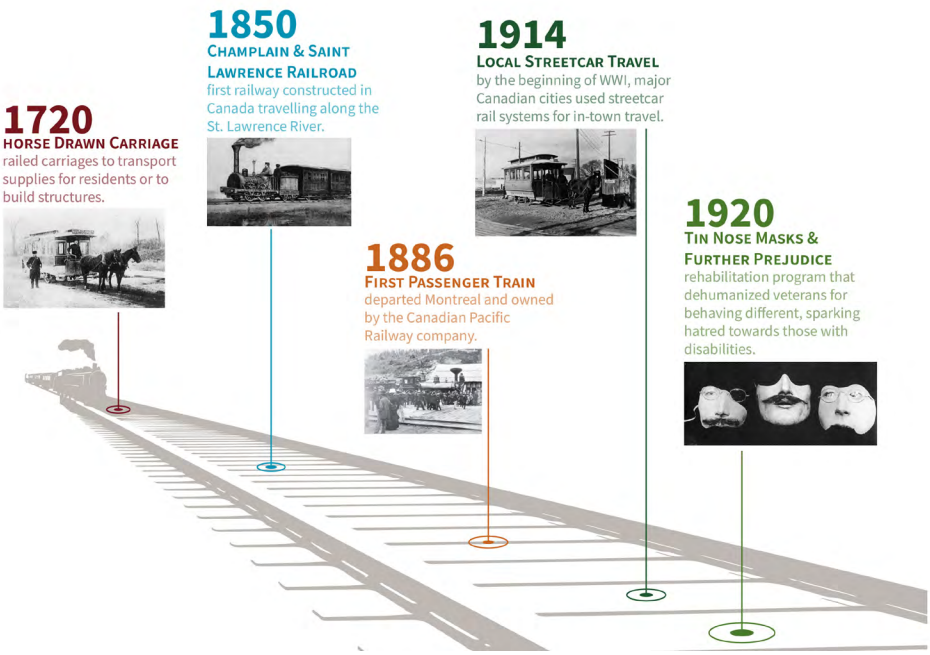
19 Karl M Ruppenthal, "Transportation," The Canadian Encyclopedia, 2007, https://www.thecanadianencyclopedia.ca/en/article/transportation.

one hundred and nine km of tracks with the use of three-hundred and sixty-one tram carts, that later transformed into a specialized passenger tram service in the year 1884. These were utilized to carry local passengers to and from the Toronto Industrial Exhibition [n]ow known as the Canadian National Exhibition (CNE), thus, piqued the interest of creating more lines of in-town transportation known as streetcars.[20]

Two years later in 1886, the first all passenger rail train departed Montreal on route to Port Moody, BC which was operated and owned by the Canadian Pacific Railway (CPR) company. The CPR company brought many economic benefits as many settlements of towns began to reside along the railway providing direct access to other cities and resources. The advancement of railways caught no-

20 Brian E Sullivan, "Streetcars," The Canadian Encyclopedia, 2015, https://www.thecanadianencyclopedia.ca/en/article/streetcars.

Figure 1.2: Transportation Timeline Part 1



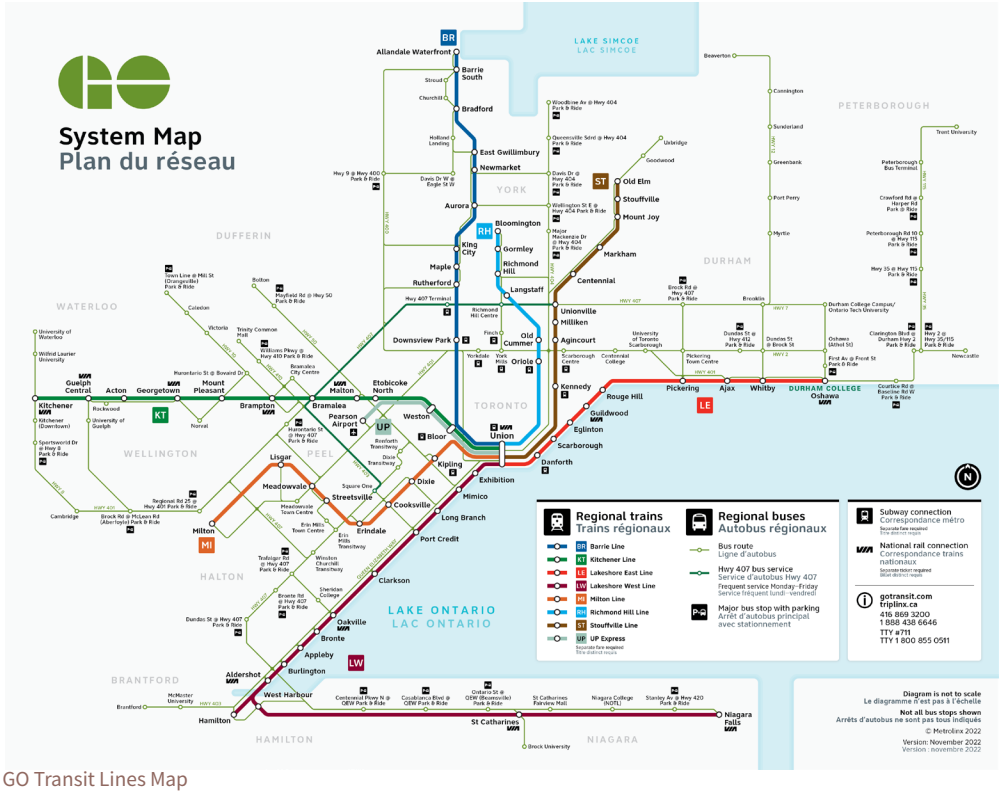


Figure 1.3: GO Transit Lines Map

tice by the federal government as it "contributed to general economic developments, and the indirect benefits for business and employment were significant."[1]

Another major milestone during the year 1886 when Canada introduced the first all electric streetcar system located in Windsor, Ontario. All main cities across the country followed suit shortly after with Toronto receiving the technological advancement by the end of 1892.[3] After years followed, technology continued to evolve and improve the operations of both streetcars and the railways.

The Government of Ontario Transit (GO Transit) is a method of public transportation owned by the Government of Ontario acting as gateways connecting municipal or regional buses to the railways in the Greater Toronto and Hamilton Area (GTHA). Then finally linking to Toronto's public transit called the Toronto Transit Commission (TTC).

1 James H. Marsh, "Railway History in Canada," in *The Canadian Encyclopedia*, historica Canada, article published March 25, 2009; last Edited July 09, 2021.

3 Julie Anderson, "Mutilation and Disfiguration," in International Encyclopedia of the First World War, 2017, https://encyclopedia.1914-1918-online.net/article/mutilation_and_disfiguration.

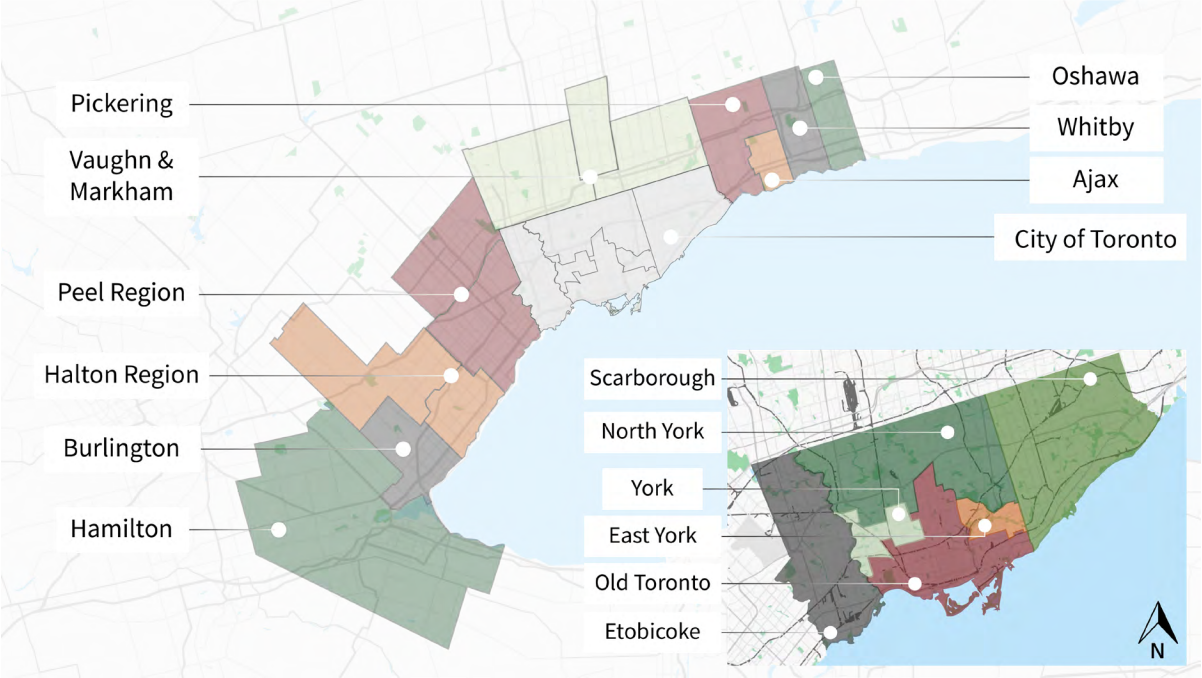


Figure 1.4: Toronto Suburban Boundaries

Throughout the mid 1900's, the city of Toronto expanded its boundaries by absorbing the neighbouring townships of Etobicoke, North York, and Scarborough. With the combination of these twelve suburban municipalities to the City of Toronto creating the municipality of Metropolitan Toronto, aiming to generate economic prosperity for all through public access to goods or services. [21]

By the beginning of World War One (WWI), Canada was well-rounded with forty-eight independent streetcar systems providing transportation means to residents and owned several federal railways. These federally owned railways eventually formed in the 1920's to create the Canadian National Railways (CN Rail) for transportation and distribution of consumer goods across Canada.[3] During the twentieth century, southern Ontario saw a significant leap in technological, social, and political changes to the railway systems.

3 Julie Anderson, "Mutilation and Disfiguration," in International Encyclopedia of the First World War, 2017, https://encyclopedia.1914-1918-online.net/article/mutilation_and_disfiguration.

21 Daniel Garcia, and James Bow, "GO Transit's Lakeshore Line," Transit Toronto, 2021, https://transittoronto.ca/regional/2101.shtml.

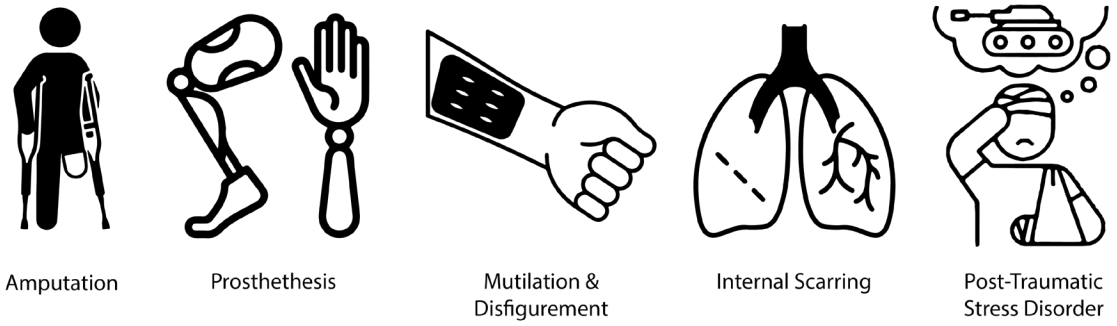


Figure 1.5: Veteran Injuries

1.2 Post-War Society and Progress of Public Transit

As WWI was coming to an end, North America experienced a multitude of permanent injuries that were unheard of in terms of previous war or battle wounds. These newly discovered injuries never faded away or fully healed which left the lives of soldier's both physically and mentally tainted. Within societies, many noticed extensive behavioural and physical changes to neighbourhood veterans that often caused repulsive reactions from fellow community members, including the federal government. Numerous types of injuries caused physical mutilation, disfiguration and cognitive impairment that suddenly altered the lives of countless war survivors such as: limb amputation due to shrapnel, explosions and shattered bones from machine guns, use of prosthetic devices due to amputation, lashed or mangled limbs, visible scars due to surgical repairs, and internally

scarred organs or third-degree burns due to poisonous gas.[22]

Many of the injuries and post-surgical scars on soldiers' bodies could be well hidden by clothing or prosthetic devices but among the hardest to conceal were permanent damages to the face. In order to blend into the accustomed norms of society, soldiers would endure extensive measures to reshape an ordinary aesthetic such as the use of tin noses. These tin noses were metal masks, moulded and hand painted to fit the client perfectly, but the masks were uncomfortable as clients had difficulty breathing or talking while wearing. As the methods to conceal disfigurement increased, criticism arose as to who the concealments were truly protecting, the disfigured servicemen or the public who wished not to see unsettling or mutilated people?" [5]

5 GO Transit, n.d, benefits of Taking GO, https://www.gotransit.com/en/about-us/benefits-of-taking.

22 Julie Anderson, "Mutilation and Disfiguration," in *International Encyclopedia of the First World War, 2017, https://encyclopedia.1914-1918-online.net/article/mutilation_and_disfiguration.*

Figure 1.6: Tin Noses

Unfortunately, the disgust, disrespect and mistreatment of veterans did not stop there as this attitude grew into a political manner especially throughout western society. A program was implemented through North American governments as a rehabilitation initiative requiring veterans to learn how to repair oneself to be able to re-enter society.[5] From the veterans perspective, one would not only feel shameful of the physical disfigurement, uncontrollable behaviour and constant reminder of war trauma but feel dehumanized by society for superficial reasoning of being different. The program brought upon prejudice and hatred towards anyone with less abilities than a typical person that paved a negative path for decades after the end of the world wars. Leading up to the 1960's, the expansion of growth outside the boundaries of the Municipality of Metropolitan Toronto was repeating at a grander scale. The expansion was reaching into the rural areas of Peel county, York county, Regions of Halton, and Durham. In which sparked a necessity to create a means of travel farther than the existing streetcar system to transport people to and from the boundaries of Toronto.[4]

In the year of 1967, the provincial government of Ontario released the first interregional commuter train as a three-year pilot program to address the rapid growth in neighbouring counties. The pilot program consisted of single-deck diesel coaches with an iconic logo that would remain constant into the twenty-first century. The first commuter train traveled from Oakville to Pickering along the GTR, commonly known as the Lakeshore West and East lines, carrying approximately two-and-a-half million passengers within the first year of service.[23,7]

4 Oxford English Dictionary, "Accessibility," in *Oxford English Dictionary*, https://www.oed.com/.

5 GO Transit, n.d, benefits of Taking GO, https://www.gotransit.com/en/about-us/benefits-of-taking.

7 Rebecca Pohl, a Mcat Analysis of Donna Haraway's A Cyborg Manifesto, Mcat International Ltd, 2018.

23 Metrolinx, *in Suits and Dresses and Even Hats, Customers Line up and Board the Original GO Trains*, n.d, https://blog.metrolinx.com/2019/03/20/travelling-back-in-time-the-remarkable-evolution-of-your-go-train/.

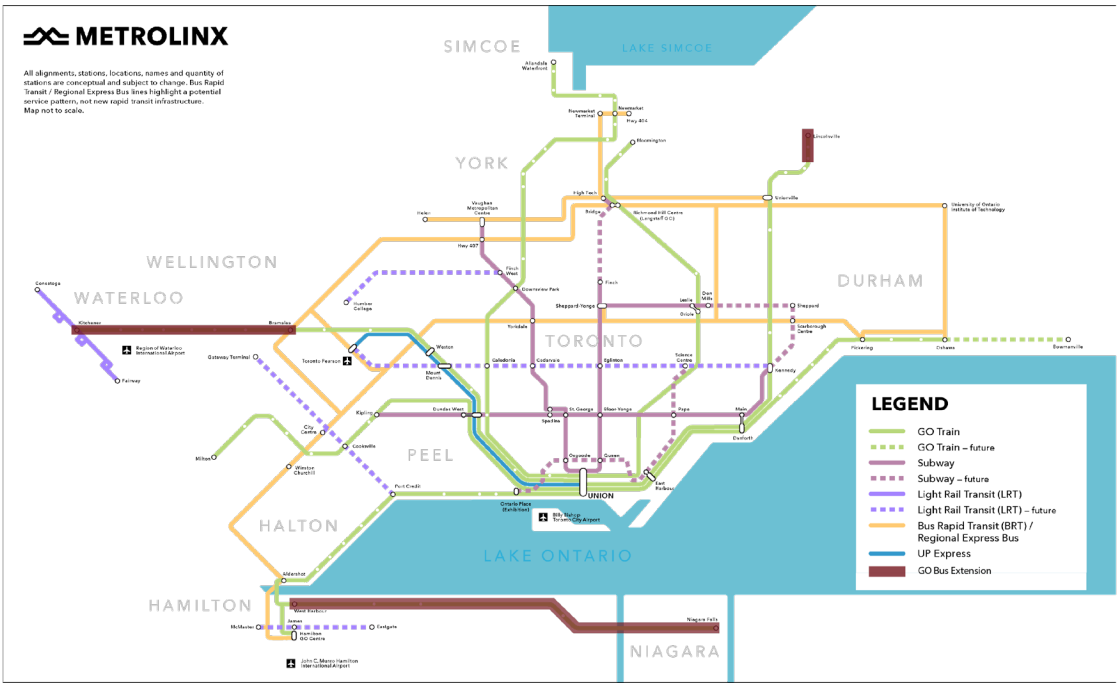


Figure 1.7: GO Rail Line Expansion Map & Timeline

1.3 Twenty-First Century GO Transit

GO Transit had undergone several rail line expansions over the decades with the Georgetown line in 1974, the Richmond Hill line in 1978, the Milton line in 1981, the Stouffville line in 1982, and the Lakeshore line into Oshawa in 1990.[24] During this time, another major technological advancement played a significant role to provide access by means of improved train coach design.

In collaboration with Hawker-Siddeley, a train manufacturing company, GO Transit introduced the first ever bi-level coach. This coach was named the Series One and built in the year of 1976 to then be put on display at the CNE to allow Ontarians to explore the interior spaces aboard. These Series One coaches were fully integrated

24 Get Toronto Moving Transportation Committee, "GO Transit History," web log, *Get Toronto Moving* (blog), 2016, https://web.archive.org/web/20161008170424/http:/www.gettorontomoving.ca/go-transit-history.html.

Figure 1.8: GO Principles

by the end of 1991 as GO transit slowly phased-out the utilization of single-level carts.[25]

Throughout the 1990s, there was an economic recession that put the financing and operations responsibility of GO Transit in jeopardy which in turn was resolved by the year 2001 as the provincial government took back responsibility.[4] By putting forth funding and future plans towards a better Ontario public transit system, GO Transit went through a rebranding phase during the twenty-first century, backing itself with other crown agencies to prioritize the new driving principles of the company. This sparked the merging and collaboration with Metrolinx, Bombardier, the federal, and municipal governments. The guiding principles were created to address the major issues of efficiency, profit, and political sustainability: save money

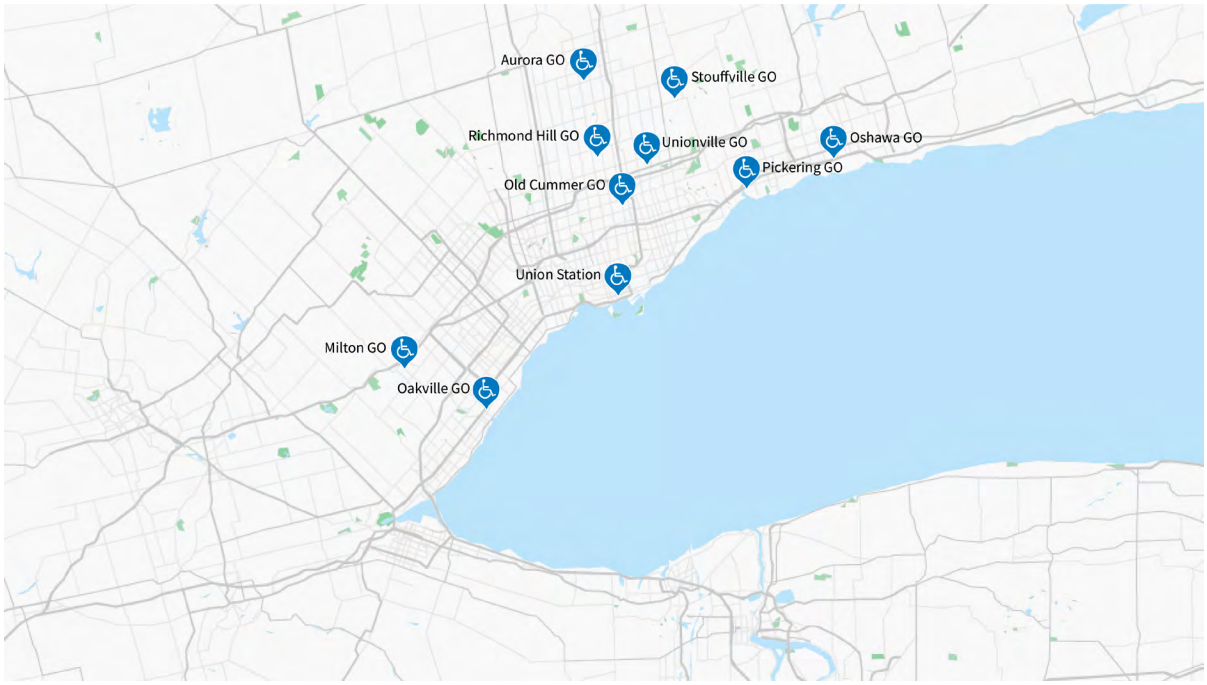
4 Oxford English Dictionary, "Accessibility," in *Oxford English Dictionary*, https://www.oed.com/.

25 Bombardier, "Our History," Bombardier, accessed 2022, https://bombardier.com/en/who-we-are/our-history.

and time, relax during your trip, catch up on work, grab a bite or a beverage, help the environment.[26] These principles are the foundation that GO Transit utilizes when tackling operations and expansion plans in collaboration with Metrolinx and Bombardier, especially in terms of profit or efficiency.

In the year of 2002, GO Transit collaborated with Bombardier, an independent company responsible for the operation and maintenance of GO Transit's fleet equipment as conductors, drivers, and manufacturers. Bombardier was a leading company in manufacturing rail fleet across North America and Europe as it brought the first accessibility coach for GO by the end of 2004.[6, 27] This step towards accessibility was one of GO's major milestones to becoming more inclusive after the 1995 station adaptation plan, converting ten stations

Figure 1.9: Ten Accessible Stations Map



6 Melinda C. Hall, "Critical Disability Theory," in The Stanford Encyclopedia of Philosophy, Metaphysics Research Lab, Stanford University, 2019.

26 GO Transit, n.d., *Benefits of Taking GO,* https://www.gotransit.com/en/about-us/benefits-of-taking.

27 Daniel Garcia, James Bow, and Edward Brain, "The Bi-Level Coaches (1977-?)," Transit Toronto, 2016, https://transittoronto.ca/regional/2507.shtml.

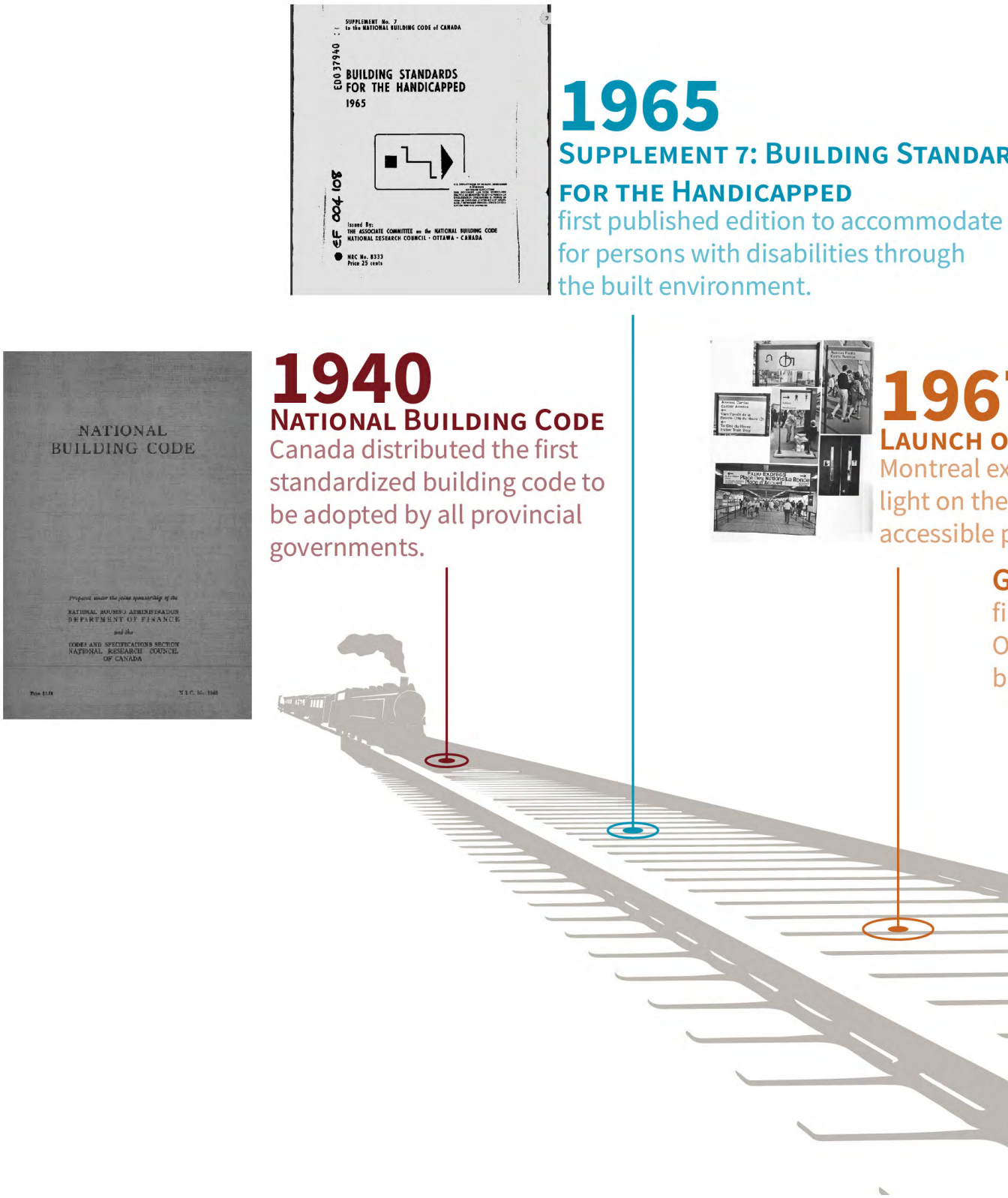


Figure 1.10: Accessibility Timeline

RDS

7

F Expo 67

hibition to shed
need for more
ublic spaces.

O Transit Commuter Train

rst interregional train backed by the
ntario government for farther travel
etween Toronto and suburban towns.

1995

10 Wheelchair Accessible Stations

conversion of Oakville, Milton, Aurora, Richmond Hill, Old Cummer, Stouffville, Unionville, Pickering, Oshawa and Union stations to accommodate for wheelchair users.

2004

First Accessibility Coach

in collaboration with Bombardier to run the first train that consisted of a wheelchair accessible coach.

to be wheelchair accessible: Oakville, Milton, aurora, Richmond Hill, Old Cummer, Stouffville, Unionville, Pickering, Oshawa, and Union.[28]

By the year of 2006, GO Transit was well underway to superior systems and made the move to merge with Metrolinx, a sector of the Government of Ontario to "improve the coordination and integration of all modes of transportation in the Greater Toronto and Hamilton Area." [29] Today, GO Transit and Metrolinx work in unison to create a well-connected public transit system while focusing on efficient travel, economic growth, and sustainable travel options. Through these areas of focus, GO Transit is able to offer commuting suburban-living individuals a feasible and sustainable transportation option into Downtown Toronto, delivering an ease of access to public transit. However, these intentions present a concern regarding the type of individuals the Government of Ontario prioritizes when addressing improvements, particularly of accessible and universal standards.

28 Metrolinx, "Now Arriving 2000s," web log, *GO 50 Years Going Strong (blog), Metrolinx, 2017, http://goingstrong.gotransit.com/en/2000.html#:~:text=On%20May%2014%2C%202009%2C%20GO,Transit%20Implementation%20Act%20was%20approved.*

29 Metrolinx, "Metrolinx about Us," Metrolinx, 2022, https://www.metrolinx.com/en/aboutus/about_us_index.aspx.

1.4 Accessibility Becoming a Standard in Canada

Throughout history there have been different terms used within society to describe those with special needs due to permanent physical injuries, health matters, aging, and cognitive development. The terms typically used to categorize these individuals in the past were handicapped, disabled, or challenged, all stemming from a position of judgement and prejudice towards those deemed abnormal to society.

Accessibility by definition is, "the quality of being able to be

reached or entered; the quality of being easy to obtain or use; the quality of being easily understood or appreciated." [30] By these definitions, there is a common theme that relates accessibility to the equal quality of life for every human being. The use of the term accessibility has evolved over time as it is commonly used in the belief of accommodating for those with disabilities. However, many of the existing Canadian accessibility standards neither resolve barriers nor provide society with full access to public benefits, especially through public transit and public spaces.

The origin of the term branches from the word access[31] which is based upon assimilation and can be used as a tool when integrated into society. Acknowledging the ability to take control over the perception of those with disabilities, invokes the responsibility to create change in the world through the political eyes of the built environment.

Beginning in the late 1930s, the Canadian federal government decided to create a standardized guide for building regulations and finally distributing Canada's first National Building Code (NBC) in 1941, drafted by the National Research Council (NRC), to be adopted by all as law.[32]

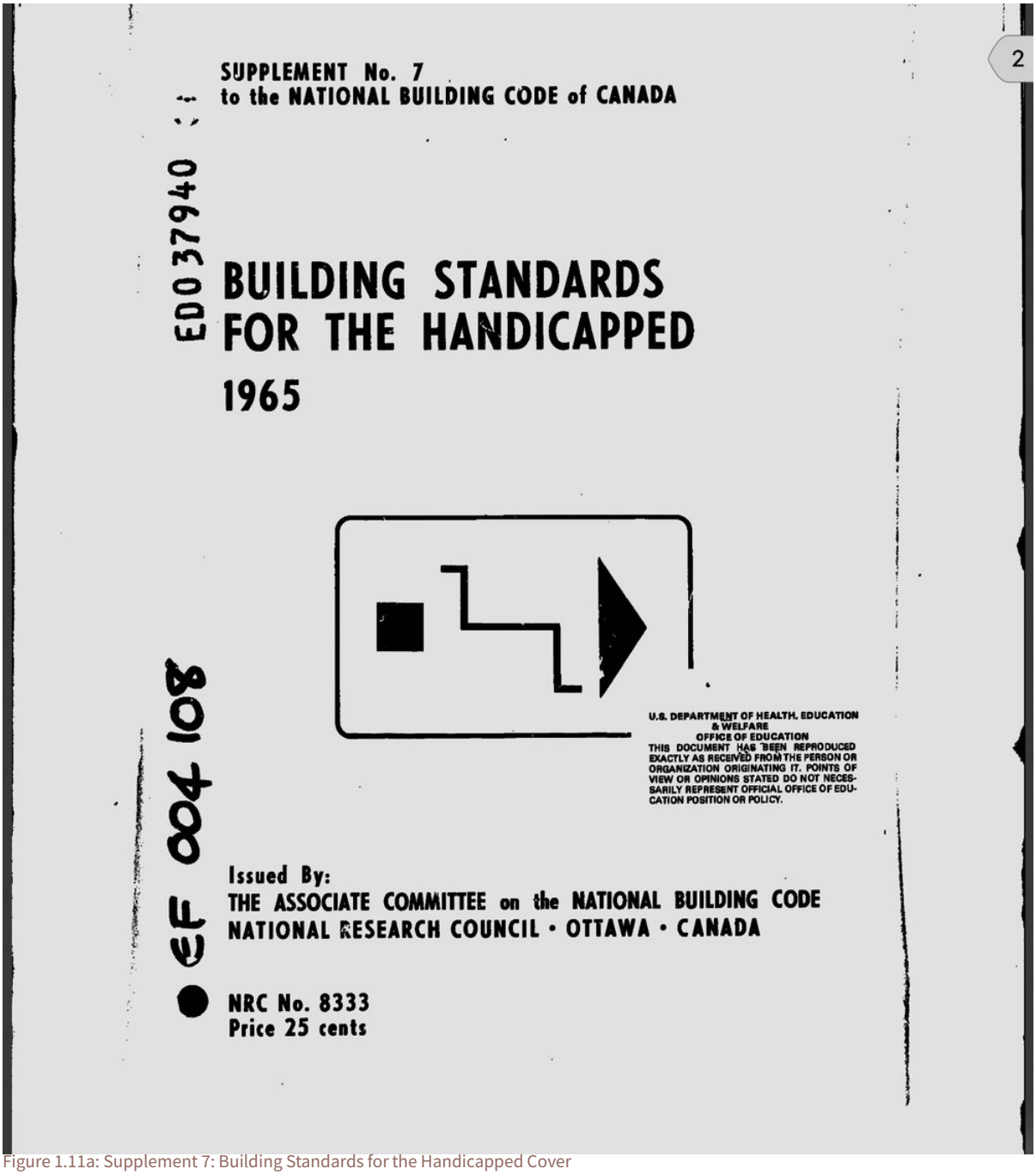
During the early 1960s, British architect Selwyn Goldsmith, who uses a wheelchair due to a disability, published a guidebook explaining how designers can create buildings with accessibility accommodations. This generated great interest across the nation resulting with the NRC publishing the first amendment to the code called Supplement 7: Building Standards for the Handicapped by the year 1965.[15]

30 Oxford English Dictionary, "Accessibility," in *Oxford English Dictionary, https://www.oed.com/.*

31 Douglas Harper, "Accessibility (n.)" (Online Etymology Dictionary, 2018), https://www.etymonline.com/word/accessibility#:~:text=accessible%20(adj.),upon%22%20(see%20accede).

15 Ed Roberts Campus, "Design," Universal Design Ed Roberts Campus, 2010, https://www.edrobertscampus.org/design/.

32 Stephanie Chipeur, "A Vision for Accessible Design at Expo 67," ed. Brian Sholis, *Front-Door Citizens (The Site Magazine), accessed 2022, https://www.thesitemagazine.com/read/front-door-citizens.*



SUPPLEMENT No. 7
to the NATIONAL BUILDING CODE of CANADA

ED037940

BUILDING STANDARDS FOR THE HANDICAPPED

1965

EF 004 108

Issued By:
THE ASSOCIATE COMMITTEE on the NATIONAL BUILDING CODE
NATIONAL RESEARCH COUNCIL • OTTAWA • CANADA

NRC No. 8333
Price 25 cents

Figure 1.11a: Supplement 7: Building Standards for the Handicapped Cover

15 Ed Roberts Campus, "Design," Universal Design Ed Roberts Campus, 2010, https://www.edrobertscampus.org/design/.

16 Adelyn Perez, "Ad Classics: Solomon R. Guggenheim Museum / Frank Lloyd Wright" (Arch Daily, 2010), https://www.archdaily.com/60392/ad-classics-solomon-r-guggenheim-museum-frank-lloyd-wright.

33 Government of Canada, "Canadian Corporation for the World Exhibition: General Report on the 1967 World Exhibition," vol. IV, 1969.

Through a survey study by the federal government, there were 533,000 people of the Canadian population that claimed to have either a severe or total disability that affected everyday life with regards to mobility, cognitive tasks, health concerns, etc.[33] Based upon the results, the federal government of Canada, the provincial government of Quebec and the city of Montreal joined together investing in the creation of Montreal's International and Universal Exposition known as Expo 67. The Expo was intended to incorporate and maximize accessibility features in compliance with the Supplement 7 amendment to prove that accessibility accommodations are easily implemented at the global scale. Some accommodations from the code supplement included elevators, ramps, wide doorways, wheelchair-accessible toilet stalls, lower water fountains, designated spaces in theatres and auditoriums focusing on values of social inclusion. Approximately a year before the Expo in 1966, representatives including advocates for persons with disabilities held a meeting to discuss the different challenges and issues persons with ability differences may face. The meeting concluded with the information that there should be accommodations for "the mentally and physically handicapped, the aged, disabled, infirm, as well as persons with audio and visual limitations." [15, 16] Further proving the extensive range of ability differences and the necessity to provide accommodations throughout the entirety of society.

As the dates grew closer to Expo's launch, enforcement of the strict budget and timeline caused members to create modified accessible solutions that received great disapproval such as on-site transportation. The fleet of trailer-trains called La Balade included a ramp to board, eight hook-up spots to secure wheelchairs and a hostess for private guided tours. Unfortunately, the fleet established a destructive perspective due to the isolation of persons with ability

Figure 1.11b: Pictures from Expo 67

differences from their accompanied guest and remainder of Expo visitors.[15]

In terms of successful features, the Expo worked in collaboration with Canadian graphic designer Paul Arthur to produce the signage used for the Expo. Arthur became the developer of the concept of wayfinding through his thoughtful, careful signage designs. He created the first known symbol that was representative of a person in a wheelchair which later became the first Canadian national symbol for accessibility and printed on the cover of the 1966 edition of Supplement [7.15, 34]

After the publication of the 1965 Building Standards Code with an updated version to Supplement 7, it took Canadian provinces a range between ten to fifteen years after publication for the regulations to be implemented as law.15 In accordance with the analysis from Stephanie Chipeur, most of Montreal remains inaccessible as of 2019 due to discrepancies, technicalities and contradictions within code regulations or overlap of by-laws.[15] These types of issues are relevant within Toronto as renovations to meet minimum code requirements of many existing buildings would be exceedingly costly and time consuming such as the addition of elevators.

It is evident that several worldly countries had begun to implement accessibility accommodations for those who hold disability status around the mid twentieth century. Yet, GO Transit did not begin to start considering accessibility in public spaces for a handful of stations until over thirty years later. Acknowledging the historic significance of accessibility as a necessity, why does GO Transit continuously create gaps in the timeline for accessibility change. After immense analysis of the historic background and record shown through chapter one, there is an obvious issue from the psychosocial

15 Ed Roberts Campus, "Design," Universal Design Ed Roberts Campus, 2010, https://www.edrobertscampus.org/design/.

34 Liat Ben-Moshe and Justin J.W. Powell, "Sign of Our Times? Revis(It)Ing the International Symbol of Access," *Disability &Amp; Society 22, no. 5 (n.d.): pp. 489-505, https://doi.org/10.1080/09687590701427602.*

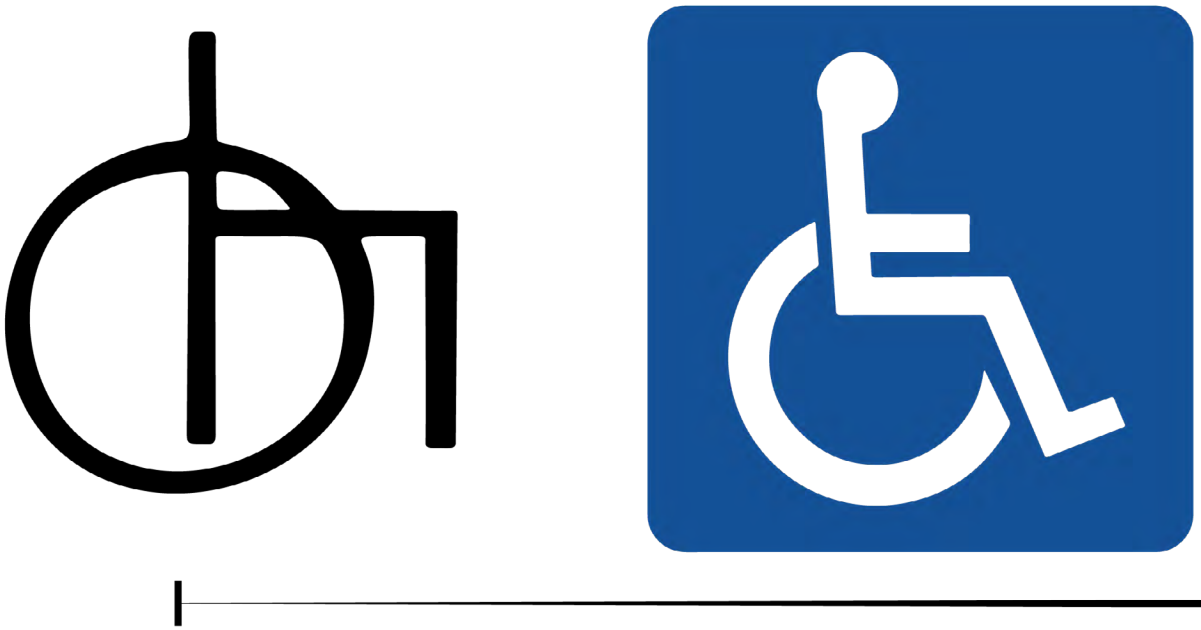


Figure 1.11c: Accessibility Logos Over Time

Modified
Dynamic
Symbol

characteristics of humans that require further study. These studies further prove that universal and accessible design through the built environment aid to eliminate barriers on all scales.

Chapter Two

Chapter 2

The Human Connection

Figure 2.1: Theories Main Themes

As the years past, the discourse and use of the term disability have been discussed through several theories surrounding a common theme where authors choose to represent the word in a positive tone, transforming into ABILITY. Within the world today, there are a substantial number of people who require additional assistance regardless of their abilities. Through analysis of theories and case studies, it is clearly evident that the learnt environment greatly affects human perspective. Therefore, the transformation of the mind and built environment combined sets a new framework to follow.

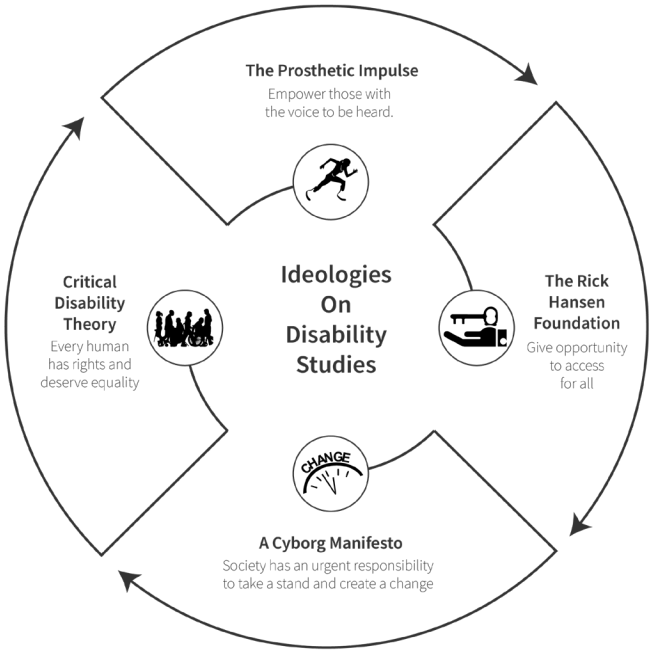


Figure 2.2: Disability Studies

2.1 Critiquing the Perfect Human Body

The Prosthetic Impulse is a theory based upon personal experiences of those with prosthetic devices glorifying the beauty of the technology, proving prosthetics are no different than natural limbs and enforcing equal treatment of all. The book was edited by Marquard Smith and Joanne Morra in which they challenge and critique the current definition of the prosthesis as a "replacement of a missing body part with an artificial one." [35] Smith and Morra explore the definition and historic background of the term with the realization that it is not simply "an encounter between individual and environment that is meant to aid contact between the two." [36] The editors' work to prove the meaning of the prosthetic impulse is more broad

35 Marquard Smith and Joanne Morra, eds., "The Prosthetic Impulse: From a Posthuman Present to a Biocultural Future," in *The Prosthetic Impulse: From a Posthuman Present to a Biocultural Future (Cambridge, MA: MIT, 2007).*

36 Joel Tannenbaum, "The Prosthetic Impulse: From a Posthuman Present to a Biocultural Future," *Information, Communication &Amp; Society 12, no. 5 (2009): pp. 756-758, https://doi.org/10.1080/13691180902866059.*

as it is both a cause and a symptom of a state between being fully human as well as fully inhuman. This belief stems from the innate human desire to alter or augment their bodies due to an anxiety of the inability to do the same tasks as everyone else. The other half branches from the opposite perspective of becoming too dependent on technology that causes one to lose themselves, and ultimately their right to freedom. These perspectives provide insight to how people with any form of aid device are seen as less capable and ultimately less human. The editors continue on focusing on redefining what it means to be human through personal stories from contributors. Thus, emphasizing ABILITY DIFFERENCE and contradicting the conventional body typology that society set in culture years prior.

One of the stories authored by Aimee Mullins, is a double amputee known for her famous glass legs. Mullins' story incorporates

Figure 2.3: Prosthetic Beauty

black and white photographs from a modelling shoot showing off her figure with emphasis on the beauty of her glass legs. In her essay, she shares her experiences of difficult encounters with culture and society, wanting to bring awareness to the many social challenges people with visible differences face.[37] Many of the stories prove that prosthetic devices have a much larger impact than the fundamental purpose, but the attitude of others causes the negative socio-cultural perception. The different messages aim to change how society, professionals, and politics portray the meaning of human as well as to correct negative correlations. Ultimately, empowering those with ABILITY DIFFERENCES with a voice to be heard.

Throughout the book, the editors work together to prove that humans need to escape the thought of humans becoming less human and focus on how humans can change the world in the present to create a world that better suits the needs for everyone.[19] Shown through the essays, there is a link between materiality with metaphorical meaning demonstrating that the combination brings to light the right to being human and being celebrated as human.

19 Karl M Ruppenthal, "Transportation," The Canadian Encyclopedia, 2007, https://www.thecanadianencyclopedia.ca/en/article/transportation.

37 Rob Harle, *Leonardo* 40, no. 3 (2007): 306–7, http://www.jstor.org/stable/20206427.

2.2 Accessibility to Society is a Human Right

The Critical Disability Theory (CDT) has been written by many philosophers, theorists, realists, and psychologists, critiquing the existing perception of disability. One of the many publications on CDT was written by Melinda Hall, exploring a psychosocial-political perspective.[38] While the Dianne Pothier and Richard Devlin investigate perspectives emphasizing the political aspects of liberalism.[39]

By definition, "Critical Disability Theory is rooted in a critique

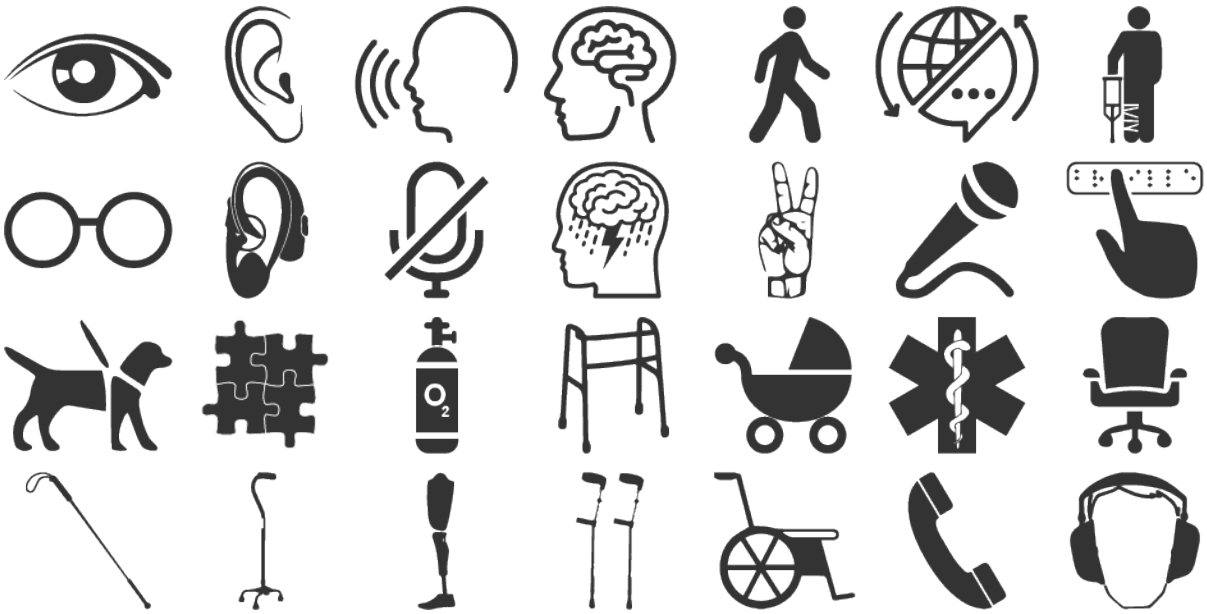
38 Melinda C. Hall, "Critical Disability Theory," in *The Stanford Encyclopedia of Philosophy,* Metaphysics Research Lab, Stanford University, 2019.

39 Dianne Pothier, and Richard F. Devlin, *Critical Disability Theory: Essays in Philosophy, Politics, Policy, and Law, UBC Press, 2006.*

of traditional discourses and assumptions of disability which serve to oppress persons with disabilities and infringe on their human rights. The theory is built upon the argument that disability is not fundamentally a question of medicine or health, nor is it just an issue of sensitivity and compassion." [40] Melinda Hall begins her analysis as a methodology studying the scrutinization of any impairment through social norms. Hall's analysis further studies the social conditioning towards stigmatized attributes among particular populations.[18] Thus, assessing a common theme through Ableism specifically exhibited through societal behaviour due to prejudice and bias. The ideology of ableism has been engraved in community cultures where success is based upon if one can do tasks without assistance, therefore speculating ultimate freedom and perfection correlate to physical capabilities. Through this perspective, ableism creates stereotypes deem-

40 Jennifer Gillies, "Critical Disability Theory," in *Encyclopedia of Quality of Life and Well-Being Research*, 1348–50, Springer, 2014, https://doi-org.librweb.laurentian.ca/10.1007/978-94-007-0753-5_619.

Figure 2.3: Abilities Diagram



ing any form of inability is unnatural and unhuman. Other terms that are used within this publication to emphasize the importance of equality for persons with disabilities as a human ʳight are anti-disability, normate, oppression, and discrimination. Furthermore, majority of the human population perceive disabilities as a non-human characteristic resulting in the isolation or separation from others and portrayed as a diminished state of being human.[18]

Throughout the world, countries take pride in themselves to promote values and principles in all aspects of the community. Canadians in particular have been immensely proud to claim ownership of the best country in the world based upon liberty, equality, and inclusion. Unfortunately, this belief is not confidently voiced by persons who constantly face marginalization and social exclusions from peers, society as well as the government. Pothier and Devlin explore themes of liberalism and dis-citizenship due to deep structural economic, social, political, legal, and cultural inequality towards persons with ability differences. Through a political lens, the concept of citizenship is critiqued as many associate the term with the ability to vote or possess a passport of a particular country. Except, this definition must work in partial with the capacity to "participate fully in all the institutions of society[,] not just those that fit the conventional definitions of the political, but also the social and cultural."[19] Therefore, people with a difference in abilities are often denied the conventional and fundamental purposes of citizenship, creating a status that includes zero allowances or advantages, a disabling citizenship for DIS-CITIZENS.19 The CDT explores the use of the term liberalism within society and its approach that is embedded with assumptions. These categorize persons with disabilities as a misfortune while glorifying able-bodied norms through privileged normalcy. Pothier and Devlin prove that society should reflect on the way the world

18 James H. Marsh, "Railway History in Canada," in The Canadian Encyclopedia, historica Canada, article published March 25, 2009; last Edited July 09, 2021.

19 Karl M Ruppenthal, "Transportation," The Canadian Encyclopedia, 2007, https://www.thecanadianencyclopedia.ca/en/article/transportation.

has skewed meanings to suit the needs of a politically stereotypical able-bodied person. The authors challenge these types of assumptions by framing the study through four themes: 1) language, definitions, and voice, 2) contextual politics and the politics of responsibility and accountability, 3) philosophical challenges, and 4) citizenship and dis-citizenship. Thus, providing other studies with a newfound thinking when applying accessibility accommodations within society.

Regardless of physical and cognitive ABILITIES, humans should be given the equal opportunity and rights deserved with one goal in mind, freedom. The central arguments made through the Critical Disability Theory surround the notion that disability is more than just issues of medicine, health, sensitivity, and compassion, where it demands solutions to "politics and power(lessness), power over, and power to."[19]

19 Karl M Ruppenthal, "Transportation," The Canadian Encyclopedia, 2007, https://www.thecanadianencyclopedia.ca/en/article/transportation.

2.3 Technology is an Extension of Our Ability

Donna Haraway's theory within A Cyborg Manifesto creates another perspective on human abilities in response with technology. Through exploration of various analyses of her manifesto, Haraway creates a new definition for a cyborg in which all humans use modern technology to extend both physical and cognitive capabilities simultaneously.[41]

The manifesto aims to provide a critical analysis and call to action to respond to issues of science, technology, and social-feminism in today's society. Donna Haraway creates a new definition for a cyborg as a creation by man in which a human must blend with modern day technology to extend one's capabilities. During the time of the publication, the world had begun blending with modern day

41 Rebecca Pohl, a *Mcat Analysis of Donna Haraway's A Cyborg Manifesto*, Mcat International Ltd, 2018.

Figure 2.5: Cyborg Manifesto

technology to improve capabilities and is now the norm. Haraway believes that all humans today have a dependency on technology whether it is small or large for typical daily activities, supporting that humans are versions or variations of cyborgs.[24] People in society today are constantly looking to improve themselves for the better both physically and cognitively, especially for those who are ageing or have underlying health issues as degradation is inevitable for all. Thus, everyone is equal in terms of inability or anti-ableism and there is a responsibility to one another to create an inclusive world by equipping everyone with equal opportunity.

A world and society that speaks to all inabilities and abilities is something that is thought of by a large sum of the human population with the desire for change. Ultimately, all humans will obtain a form of ability difference in which communities want to see society

24 Get Toronto Moving Transportation Committee, "GO Transit History," web log, Get Toronto Moving (blog), 2016, https://web.archive.org/web/20161008170424/http:/www.gettorontomoving.ca/go-transit-history.html.

and the political government address such changes through the built environment, specifically public spaces.

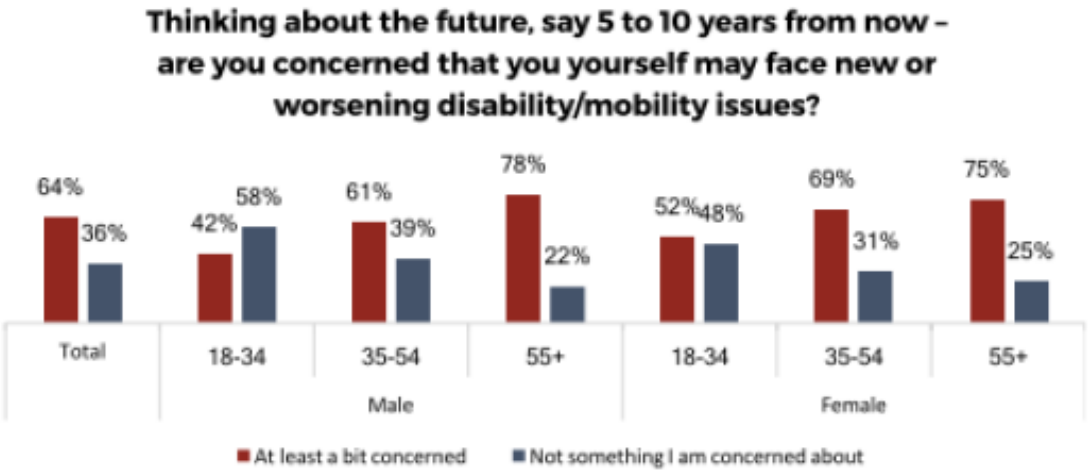
2.4 The Desire for a Global Standard

42 Angus Reid Institute, "Accessibility: A Source of Future Anxiety And A Significant Consideration For Canadian Consumers Today," Angus Reid Institute, 2019.

Through collaboration with the Angus Reid Institute (ARI) and Statistics Canada, there has been a vast desire for change in public buildings and spaces across Canada. In today's population, there is a growing trend of those with disabilities with correlation of age, creating a lengthy list of natural degradation of physical and cognitive abilities.[42]

When asked in a research survey in 2021 on issues that tend

Figure 2.6: 2019 Correlation Between Age and Disabilities



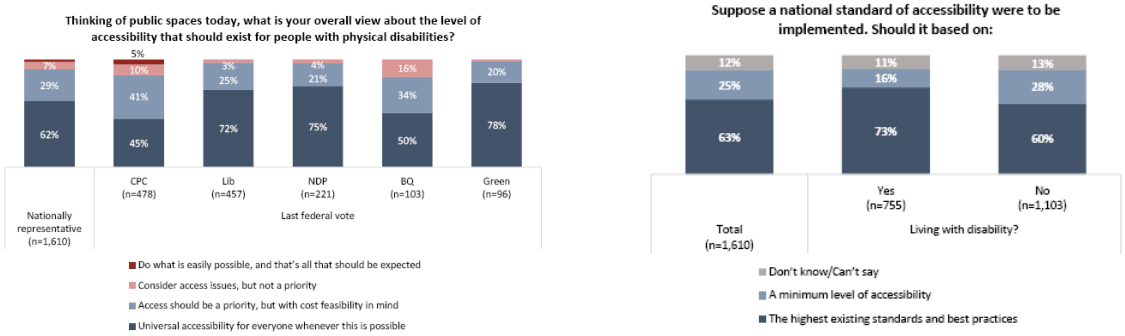
to be overlooked, many Canadians clearly indicate that taxpayer money should not be "spent on building new barriers to accessibility, with the majority of respondents (56%) preferring a priority on both environmental and accessibility concerns" along with "78% … believe there should be a national standard of accessibility."[43]

Another research survey was conducted to point out prioritization through developments in the city. With results of "51% say development within their community often reflects what developers want instead of the people living in the space would like to see" and that "new buildings should be accessible to people with disabilities (96%), as well that new buildings are beautiful (92%), energy efficient (90%) and family-friendly (89%)."[44]

43 Angus Reid Institute, "Platform Inaccessibility? Canadians living with disabilities say key issues are being overlooked in Election 44," Angus Reid Institute, 2021.

44 Angus Reid Institute, "Reshaping Communities: Discontent with community design drives a push for more inclusive architecture," Angus Reid Institute, 2022.

Figure 2.7: 2021 Prioritize Universal Design



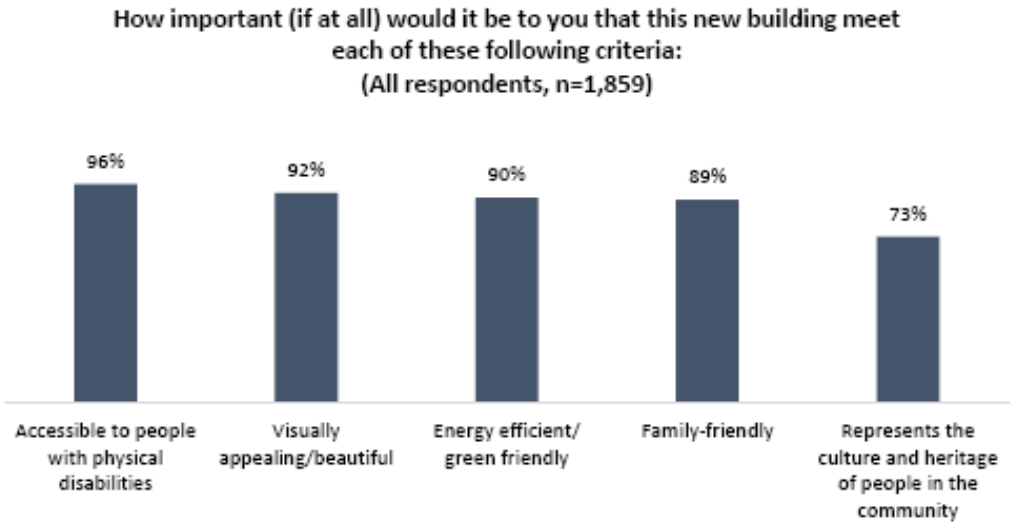


Figure 2.8: Importance of Accessibility

In 2019, Angus Reid conducted another survey that asked Canadians with any form of (dis)ability to categorize the challenges they face in public places according to inaccessibility. The most prominent challenge is no access to an elevator or there are too many stairs at 56%. The second most supported is a difficult to operate door at 45% and the third barrier of no ramps at 42%. The top three answers indicate a need for incorporating solutions that can be solved for at the architectural scale.[25] Proving that the people of Canada have expressed a necessity to have public buildings that incorporate and maximize ability accommodations.

According to these studies and surveys, there is a great need for change in the public realm, especially through public transit. Public transit should work towards capturing these connecting moments while being fluid, flexible and adaptable to all human needs. Through

25 Bombardier, "Our History," Bombardier, accessed 2022, https://bombardier.com/en/who-we-are/our-history.

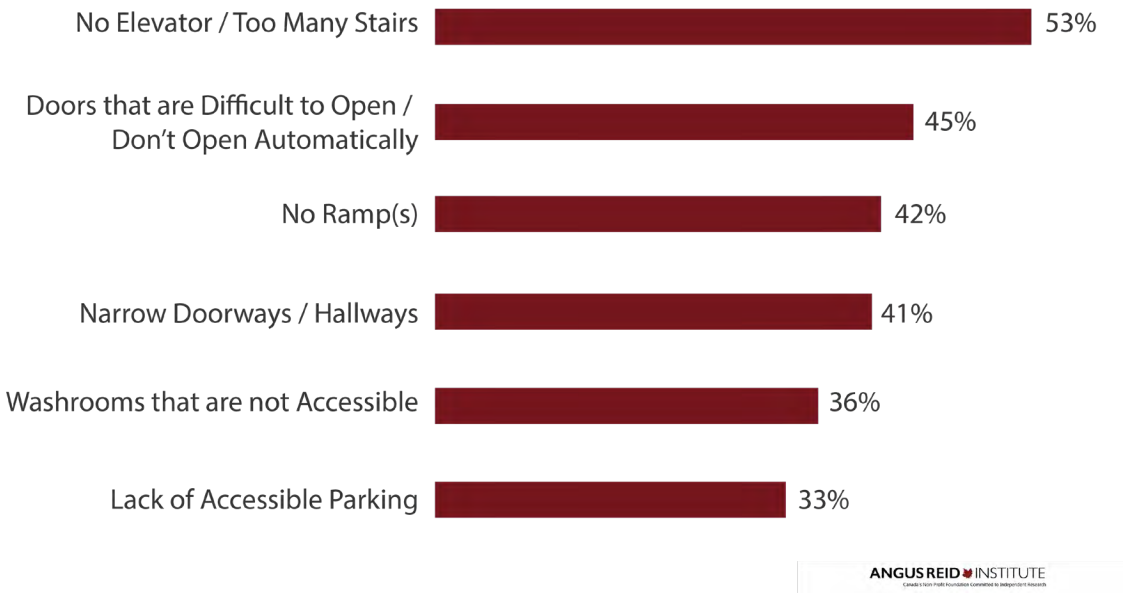


Figure 2.9: Typical Barriers

exploration of transit as a tool in which it can also be utilized as a responsibility to create public spaces for everyone.

2.5 The Minimum is Not Enough

Creating a space for "everyone, everywhere" is an awareness campaign within the Rick Hansen Foundation (RHF) aiming to bring forth knowledge, understanding and perspective to society on an inclusive environment.[45] The RHF calls upon communities to re-evaluate spaces to accommodate accessibility needs by seeking solutions beyond the minimum requirements from the Ontario Building Code

45 Rick Hansen Foundation, *Rick Hansen Foundation Strategic Plan 2021 – 2023,* Rick Hansen Foundation, 2021.

(OBC) and the National Building Code (NBC). [46]

46 Rick Hansen Foundation, *Points to Certification!,* Rick Hansen Foundation, 2020.

The RHF has created a new guide in terms of design for building owners and managers to reflect on to look for improvement. These guidelines are based upon the minimum requirements that can be found within the OBC and NBC with attentiveness to improve the current state of the requirements. The RHF challenges the many contradicting policies due to municipal by-laws and correct the exaggeration that deems accessibility accommodations as costly or time-consuming. Furthermore, with thoughtful design exploration at the beginning stages of projects these spaces and buildings will not cost any more than if the project met only the minimum requirements.

Many of these standards follow the foundation's key idea to remove all barriers for persons with (dis)abilities, based upon challenges of mobility specifically those who are confined to the use of a wheelchair such as proper heights. Although majority of the regulations work to solve mobility challenges, there are standards that address differences in vision and to correct an attitudinal barrier of separation. For example, clear indicators that are visually contrasting and tactile, designated zones for movement and resting, the use of automated technology, audible information, and emergency indicators, and to remain in the same area as others.[29] Similar to the philosophical and psychological theories on (dis)ability, RHF strives to eliminate all stigmatization or discrimination towards persons with disabilities. Therefore, by not only prioritizing ability difference but by leading through example when designing with accessibility in mind first.

29 Metrolinx, "Metrolinx about Us," Metrolinx, 2022, https://www.metrolinx.com/en/aboutus/about_us_index.aspx.

Figure 2.10: Rick Hansen Certification Points

The public realm is no exception to these ideologies, "imagine missing your train to work because there were no audio announcements. Or not understanding a historic speech because they didn't provide captions or an ASL or LSQ translator. Or not accompanying your child to their first day of school because your wheelchair couldn't make it up the front steps of the school. Unfortunately, for many Canadians, this is a reality. Every day, thousands of individuals encounter barriers because the built environment is not accessible for people with disabilities… When people are unable to contribute and fully participate in life, it affects us all."[47] These critiques transfer the direction to experience spaces differently while analyzing the built environment in a critical way through detailed site analysis. In

47 Rick Hansen Foundation, *Building a World for Everyone, Everywhere: Annual Report April 1, 2019 – March 31, 2020, Rick Hansen Foundation, 2020.*

order to design impartially, one must understand the challenges and barriers of personally and learn how these barriers are embedded through politics, society and especially architecture.

2.6 Accessibility in Mind in the Built Environment

Historic background and theories have shown a clear disadvantage towards persons with ability differences throughout society and culture. Yet, many of the disadvantages are experienced directly through physical means of the built environment that constantly reminds people of the difference in capabilities between one another. This constant reminder diminishes the confidence, freedom and enjoyability of a public space or activity for those who is not perceived as an independent individual. It also serves as a visible marker for those without ability difference to categorize other people in a discriminating way. However, there are several firms, companies and communities that have strived to design spaces with accessibility in mind first such as the Yokohama Passenger Terminal, Solomon R. Guggenheim Museum, Ed Roberts Campus in Berkley, the Hazelwood School in Glasgow, and the House of Disabled People's Organization. These are a few of the many case studies around the world that verify beautiful, thoughtful architecture is possible with focus on movement, fluidity, and connection between the built environment with its users.

The Osambashi Passenger Terminal is an international port located in Japan off the Port of Yokohama. The newly renovated terminal building utilizes the length of the port to design the interior with focus on the ease of movement through slowly sloping ramps on all levels. The building does not consist of any stairs which allows customers to move about freely and without difficulty especially when travelling with large luggage. This method of slopes eliminates

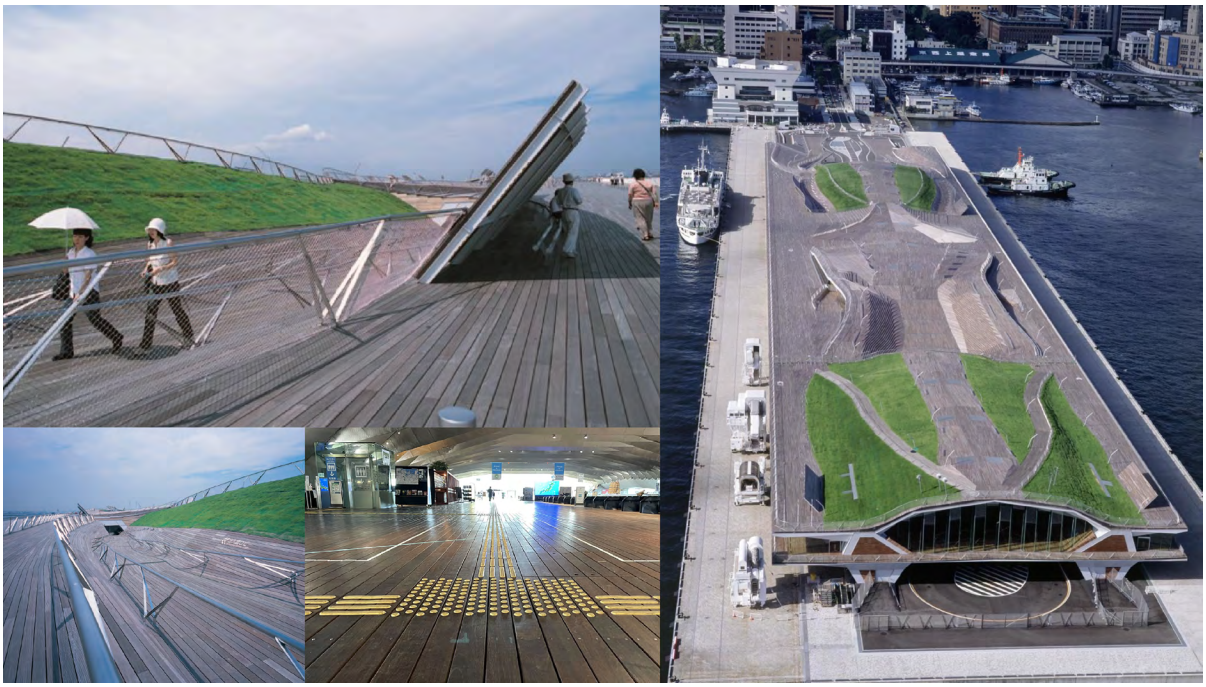


Figure 2.11: Yokohama Terminal

mobility barriers while creating a linear building form mimicking ocean waves. The main interior spaces and exterior rooftop are used as an extended public space connecting Akarenga Park with Yamashita Park.[48] The terminal is a primary example of creating a fluid public space for all.

48 David Langdon, "AD Classics: Yokohama International Passenger Terminal / Foreign Office Architects (FOA)," web log, Arch Daily, n.d., https://www.archdaily.com/554132/ad-classics-yokohama-international-passenger-terminal-foreign-office-architects-foa.

Figure 2.12: Solomon R. Guggenheim Museum

Figure 2.13: Ed Roberts Campus

Another case study that utilizes the building form to create ramps is the Solomon R. Guggenheim Museum but for the purpose of vertical circulation. The ramps throughout the building create a continuous gallery providing constant fluidity. The ramps indirectly eliminate mobility barriers, leading the users in an uninterrupted experience passing every piece of artwork on the way up and down.[49] Although the museum was not originally designed to serve accessibility accommodations, the experience of the users and how they use the space is a key aspect to universal design.

49 Adelyn Perez, "Ad Classics: Solomon R. Guggenheim Museum / Frank Lloyd Wright," ArchDaily, 2010, https://www.archdaily.com/60392/ad-classics-solomon-r-guggenheim-museum-frank-lloyd-wright.

Figure 2.13: Ed Roberts Campus

The Ed Roberts campus located in Berkley, California, adjacent to the Ashby subway station. The building is famous for the bright red ramp centralized in the building lobby. The building was commissioned by City Council, UC Berkeley, Center for Independent Living, World Institute on Disability, and community disability leaders to create a public plaza for persons with disabilities. The aim of the building was to ensure (dis)abled users feel comfortable, welcome, and confident to utilize the spaces. The bright red ramp in the center of the building draws attention upon entry to provide empowerment to people with ability differences and serve as a reminder that no one should be separate from society.[50]

50 Ed Roberts Campus, "Design," Universal Design Ed Roberts Campus, 2010, https://www.edrobertscampus.org/design/.

Figure 2.14: The Hazelwood School

In Glasgow, United Kingdom, the Hazelwood school was designed catering to students with auditory and visual ability differences. Many of the students use aid devices such as walking sticks, hearing aids, guide dogs, braille, and sign language to complete typical daily tasks. However, the school utilizes other senses to help enhance the experience and independence while moving throughout the building.[51] The use of touch is a sense in which many of the students will heavily rely on and is explored through tactile incorporations such as vents grates and textured walls to allow students the opportunity to move with confidence and freedom.

51 Universal Design Case Studies, Hazelwood School, Institute for Human Centered Design, 2007, https://universaldesigncase-studies.org/education/primary/hazelwood-school.

Figure 2.15: The House of Disabled People's Organization

The House of Disabled People's Organizations also known as Danske Handicaporganisationer was built in collaboration with the United Nations to serve as an exemplary study for inclusive design. The building is considered to be the most accessible office building and is situated in Taastrup, Denmark. There are many highly detailed and carefully designed spaces to incorporate sense enhancement solutions. Some of the solutions were designed to a specific user experience through sensorial technology such as the studs in the railings indicating floor levels, the use of T-coils in meeting spaces, and wayfinding through methods of signage, lighting, sound, and tactile floor tiles, thus, providing freedom and user safety.[52]

52 Valenzuela, Karen, "House of Disable People's Organization," ArchDaily, Cubo Arkitekter, FORCE4 Architects, 2014, https://www.archdaily.com/495736/house-of-disable-people-s-organization-cubo-force4?ad_source=search&ad_medium=projects_tab.

Above all, these carefully designed buildings are used as a precedent to set the foundation for future designers to learn from. Architecture can address accessibility needs first and most importantly that these elements serve a greater purpose of change. Ontario public transit today serves over 25 major suburban cities but have proven to lack the drive or motivation to extend the reach to all types of users. Through exploration of sensory site analysis, the identity of gaps within the public realm will arise speaking to accessibility solutions, ultimately, bringing freedom through moments of transitions at GO Transit stations.

Chapter Three

Chapter 3

Investigating the Gap

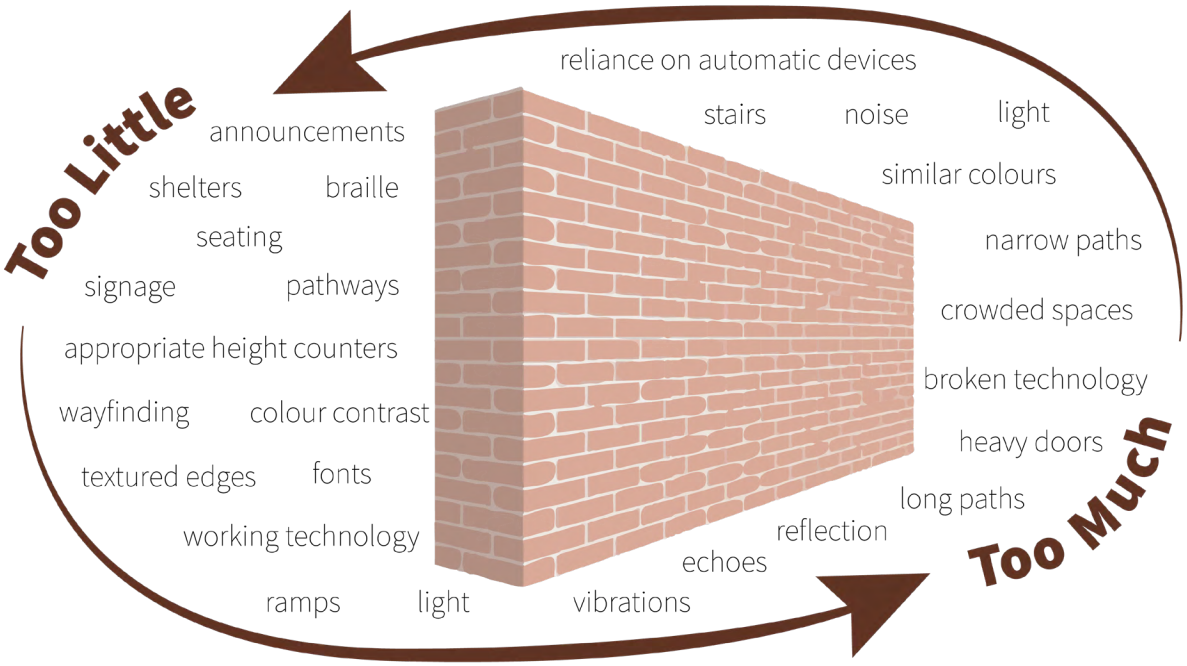


Figure 3.1: Barrier Analysis

In reflection from the many theories on disability studies, the entire GO Transit system can be analyzed, critiqued, and transformed into a new perspective by investigating the gaps throughout the system in an accessibility lens. Throughout public transit history, many able-bodied people face challenges while travelling such as the ability to board, maneuvering to and on the vehicle, proximity to the station, appropriate space for purchasing tickets, waiting areas, shelter, seating, etc. However, these obstacles are far worse to cope with when it comes to ability differences and are still evident throughout the entire GO Transit system today. Through investigation of barriers along the most utilized transit lines in Ontario, the exemplary station will present itself to address the existing conditions and experiences of passengers.

3.1 Barrier Investigation

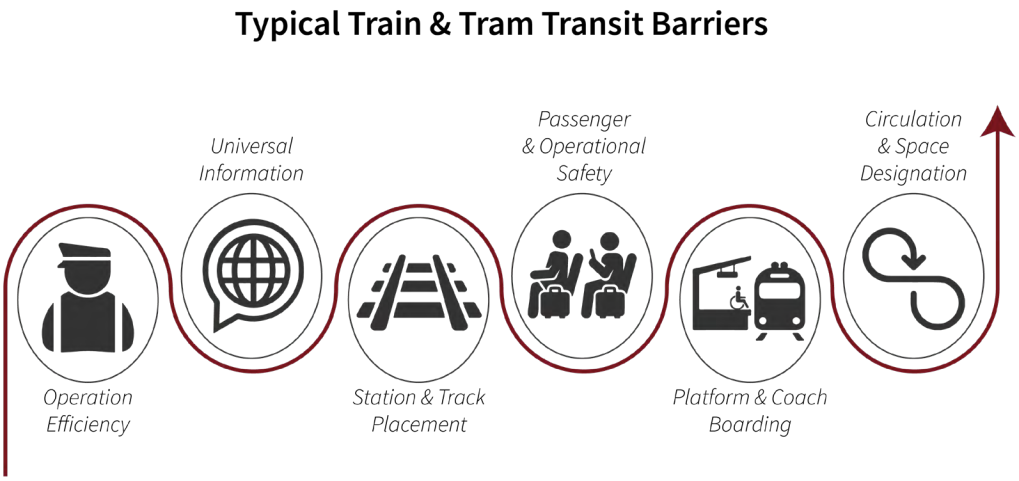


Figure 3.2: General Transit Barriers

Beginning with accessibility first, the GO stations along the Lakeshore West and East lines are analyzed in depth based upon the ability to address existing major barriers that block both visible and invisible ability differences. As previously mentioned through historic research, GO Transit implemented wheelchair accessibility to their stations as early as 1995 and to a single train coach in 2004. Since 2004, the stations have improved to allow wheelchair accessible shelters, platforms, ticket counter, and platform height in limited quantity at select stations along all lines. In depth research conducted by methods of site visits and mapping analysis, to create a consensus of information on a condensed scale. After collection of information of stations along the Lakeshore West line, it is evident the improvements to the stations and platform are great starting points. However, the methods used to eliminate barriers result in inefficiency,

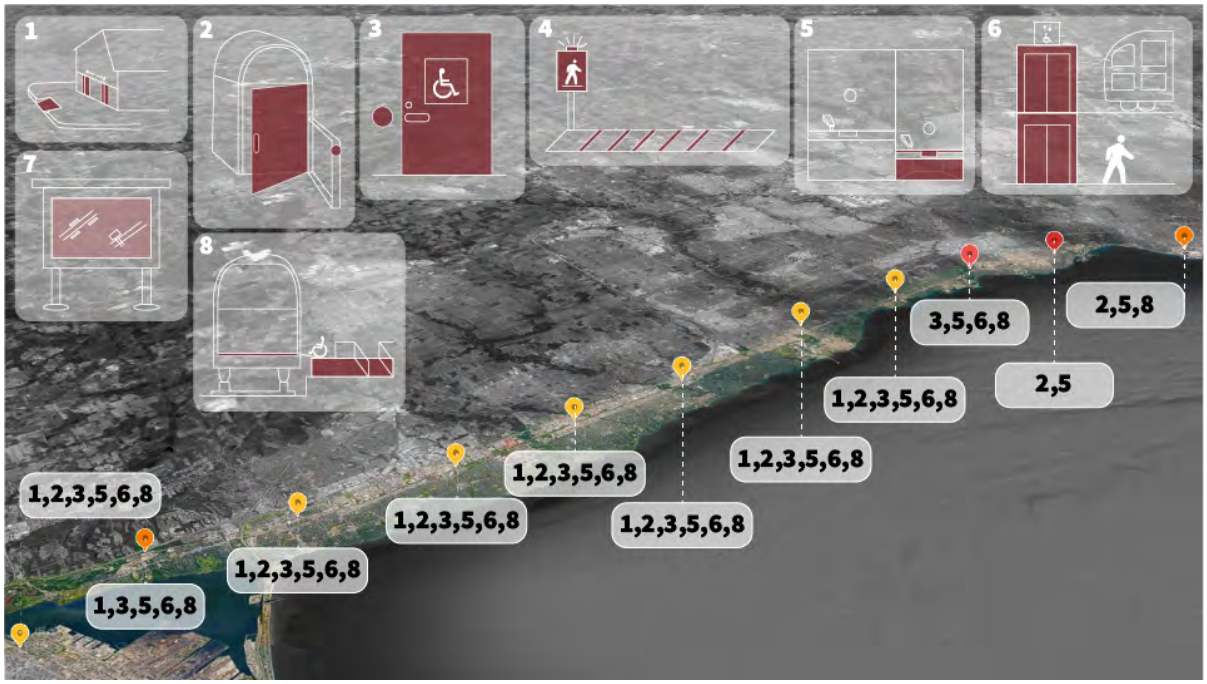


Figure 3.2: How GO Addresses Barriers Along Lakeshore West

segregation of users from the general public and an ideal of one size fits all. GO Transit and Metrolinx have begun to consider other solutions that promote safety of their passengers such as designated pathways, yet the company's accessibility solutions take a halt, turning the attention to prioritize efficient travel rather than solving the critical point of universal inclusion.

After meticulous consideration through detail-oriented research, the Mimico GO Station became apparent as an exemplary project to set the foundation for a new typology. Consequently, providing a site that includes two accessibility features of barrier free parking and an automatically powered door to the ticket booth set inside an inaccessible enclosed hallway. Further beyond the station building, the platforms can only be entered from a tunnel located north of the tracks while there are zero elevators, accessibility seating

Identity & Information								
Address	Station Name	Platforms	Platform Shelters	Bus Shelters	Shelters w/ Seating	Operable Elevators	Escalators	Station building w/ Staff
1199 Waterdown Road, Burlington	Aldershot GO	3	10	3	6	3	0	1
214 Cross Ave, Oakville	Oakville GO	4	12	6	8	4	0	1
1110 Southdown Rd, Mississauga	Clarkson GO	3	6	2	4	3	0	1
20 Brow Drive, Toronto	Long Branch GO	3	7	0	4	0	0	1
315 Royal York Rd., Toronto	Mimico GO	4	7	0	7	0	0	1

							N
Station Name	Station Entrances	Hours of Staff Operation	Shelters	Seating	Tunnels via Elevator	Bath
Aldershot GO	1	14	0	0	1	
Oakville GO	1	14	2	0	1	
Clarkson GO	1	14	2	0	2	
Long Branch GO	1	7	5	0	0	
Mimico GO	0	7	5	0	0	

Figure 3.4: In-Depth Station Analysis

	Number of:								
Parking lots	Parking Garages	Bicycle Parking Stations	Outdoor Benches	Waiting Room Benches	Layout Maps	Bathrooms	Mini Platforms	Pedestrian Walking Areas	Ramps in Station
2	0	2	10	1	0	1	2	0	0
4	1	4	17	2	0	2	3	3	0
4	1	6	15	1	0	1	2	2	0
1	0	1	5	2	0	2	2	0	0
1	0	0	4	2	0	1	0	0	0

umber of Accessible:						
hrooms	Tactile Information & Signage	Pedestrian Walking Paths	Designated Arrival Areas	Wayfinging Devices	Platforms via Elevator	Platforms via Road
1	0	0	2	0	3	1
2	0	3	3	0	3	1
1	0	2	3	0	2	0
2	0	0	1	0	0	0
0	0	0	0	0	0	0

or raised platform to board to accessibility coach. Therefore, the evidence proves the lack of attention to Mimico's architectural potential and GO Transit's disregard for customer safety, wellbeing, and negative socio-economical outcomes. The Mimico GO station, surrounding neighbourhood, and passengers of all abilities deserve to have equal opportunity to utilize public transit as a fluid connection on their journey.

The Mimico GO station is located in the heart of the Mimico Queensway (MQ) neighbourhood also known as a boundary within Etobicoke, a historically low-density suburban district of Toronto, Ontario. The MQ neighbourhood is rich with residential homes, public lakefront access, plentiful greenspaces, local vendors, and art establishments. The many local businesses are unique to MQ filled with years of history and experience helping to build the cultural identity of a proud family-oriented neighbourhood. Some of the most iconic businesses and institutions that are still present within the community opened as early as 1911 with the Mimico Connaught Masonic Temple [53] followed by Mimico Carnegie Library in 1915 [54], Mimico GO in 1967 [55], and Tom's Dairy Freeze [56] and Sanremo Bakery in 1969.[57] Thus, playing a pivotal role in shaping the community that exists today providing a sense of belonging when those who grew up within the community come back to visit.

Through several mapping strategies, the MQ boundary consists of large greenspaces within a 20-minute walk or bus ride in proximity to the furthest location from Mimico GO.[58] Due to the nature of the suburban built community, the number of public greenspaces

53 Michael Harrison, "History of the Town of Mimico: Mimico Masonic Temple (Connaught Hall) - 23 Superior Avenue," *History of the Town of Mimico (blog), November 8, 2012, http://mimico-history.blogspot.com/2012/11/mimico-masonic-temple-connaught-hall.html.*

54 "Carnegie Library - Mimico," Toronto Public Library, accessed March 5, 2023, https://www.torontopubliclibrary.ca/about-the-library/library-history/carnegie-mimico.jsp.

55 "Mimico GO Station," in *Wikipedia, July 13, 2022, https://en.wikipedia.org/w/index.php?title=Mimico_GO_Station&oldid=1098032730.*

56 Toms Dairy Freeze, "About Us," *Toms Dairy Freeze (blog), accessed March 5, 2023, https://tomsdairy-freeze.ca/toms-dairy-freeze/.*

57 "Home," Sanremo, accessed March 5, 2023, https://sanremo-bakery.com/.

58 "Mimico Neighborhood in Toronto," Walk Score, accessed March 5, 2023, https://www.walkscore.com/CA-ON/Toronto/Mimico.

Figure 3.5: Mimico Historic Landmarks

make the area very appealing for higher density residential buildings and an opportunity to bring businesses to lively main corridors along the pathway.

The largest and notable public park as seen in figure 3.6a is known as the Humber Bay Park which is split down the middle by the Humber Bay River then opening up to Lake Ontario and its water-front. The park and shorefronts are home to many wildlife, yacht clubs, and in more recent years, the high-density mixed used residen-tial condominiums to provide a large outdoor space for homeowners who do not own a private backyard or balcony. In accordance with the growth of community members in MQ, the need for a universally designed public transit hub is essential, especially for individuals commuting to and from downtown Toronto.

Figure 3.6a: Parks and Open Spaces

At the same scale, there are prominent business along Royal York Road, running North to South, as well as Lakeshore Boulevard, running South-West to North-East that emulate identity of local, unique, and family-oriented.

Alongside the local companies, are the existing mid-rise and high-rise residential developments mapped in the colour brown of figure 3.6b showing the trend of residential growth around well-developed landscapes.

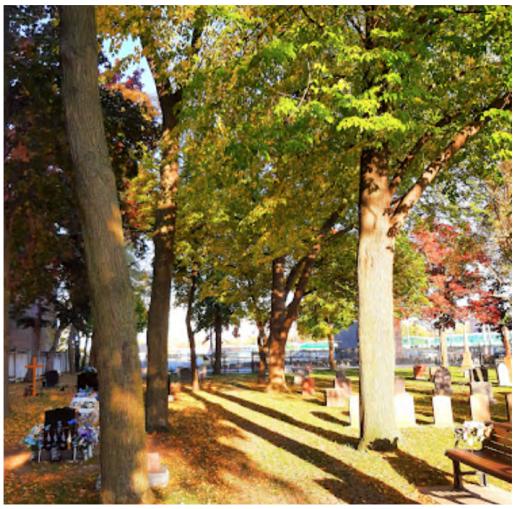
Figure 3.6b: Existing Local Businessess & Mid to High Density Residential

The main corridor, the Queensway, located at the North of the map spanning from left to right, acts as a divide between the historic, quaint neighbourhoods of Etobicoke and the modern, noisy city-scape of Etobicoke.

Figure 3.7: MQ Iconic Spots Today


Royal York
MEAT MARKET


FLORIDA
ROYAL GARDEN
ROYAL GARDEN




REVOLVER
PIZZA CO
the cote


309
309

However, this border has slowly began to dissipate as more families decide to move to suburban neighbourhoods and putting strain on building higher density units in quiet communities.

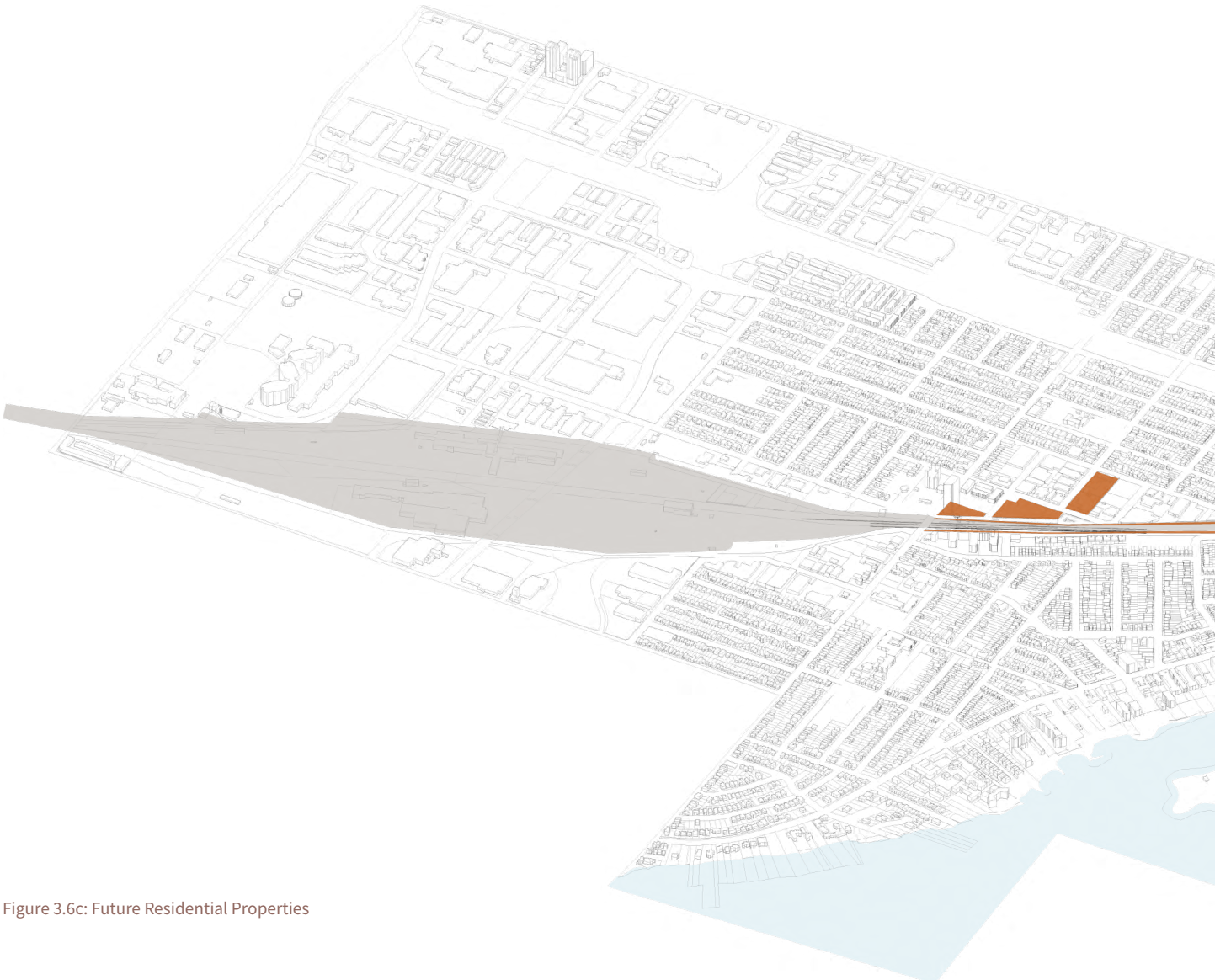
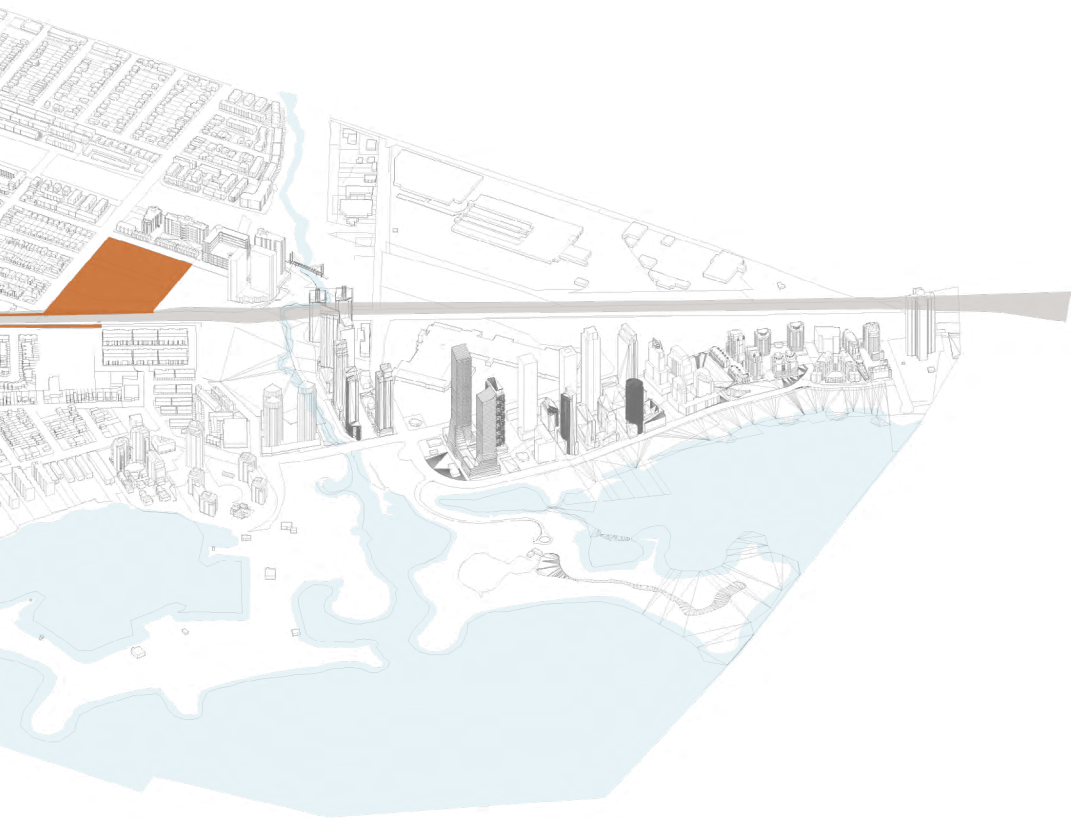


Figure 3.6c: Future Residential Properties

This transition is unmistakeably evident through the properties highlighted in figure 3.6c of the proposed Grand Central Mimico condominiums with a desire to connect the residents to the nearby public parks through a pedestrian only greenway.



These new developments have already launched construction as of 2021 and are well underway to creating an able-bodied modern vision to the community and station.[59]

59 "Grand Central Mimico," Vandyk Properties, accessed March 5, 2023, https://vandyk.com/properties/grand-central-mimico/.

In contrast to the community's excitement of the Vandyk mixed-use developments, there are many proposed barriers that will hinder the overall performance of the station, customer satisfaction, and accessibility experience as seen in figure 3.8. The existing renderings prove that accessibility accommodations will not be met to the fullest degree and that universal design was not thought of first. The proposed fully glazed enclosure for the station building and lack of clear signage contributes to visual, auditory, intellectual, and mental health barriers. In addition to the station building, the platforms seem to have no real improvements besides creating a second tunnel entrance and implementing elevators. Therefore, proving the barrier of continuity and ease of access through movement will persist once the proposed design becomes reality.

Figure 3.8: Grand Central Mimico Renderings

Looking at the larger scheme of transportation, there is an emphasis on movement, flow, and fluidity at all times. The MQ routes were designed in a grid connecting each street to a major bus route that operates along the important local landmarks allowing users a smooth transition to their destination.59 As the land use in MQ is leading towards more residential, the families within the neighbourhood will rely heavily on well-rounded public transit, thus, the need for reliable access to transit is essential.

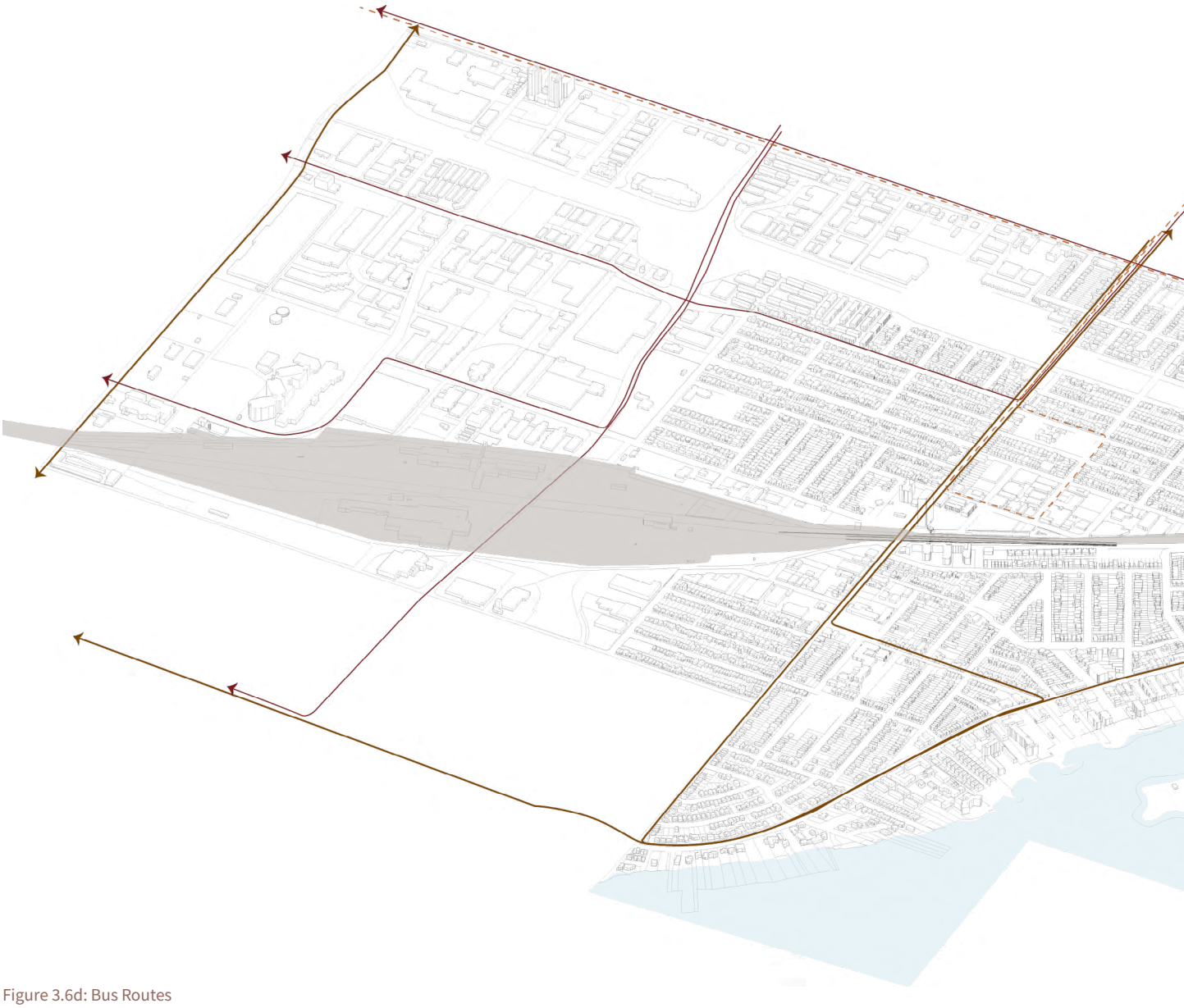
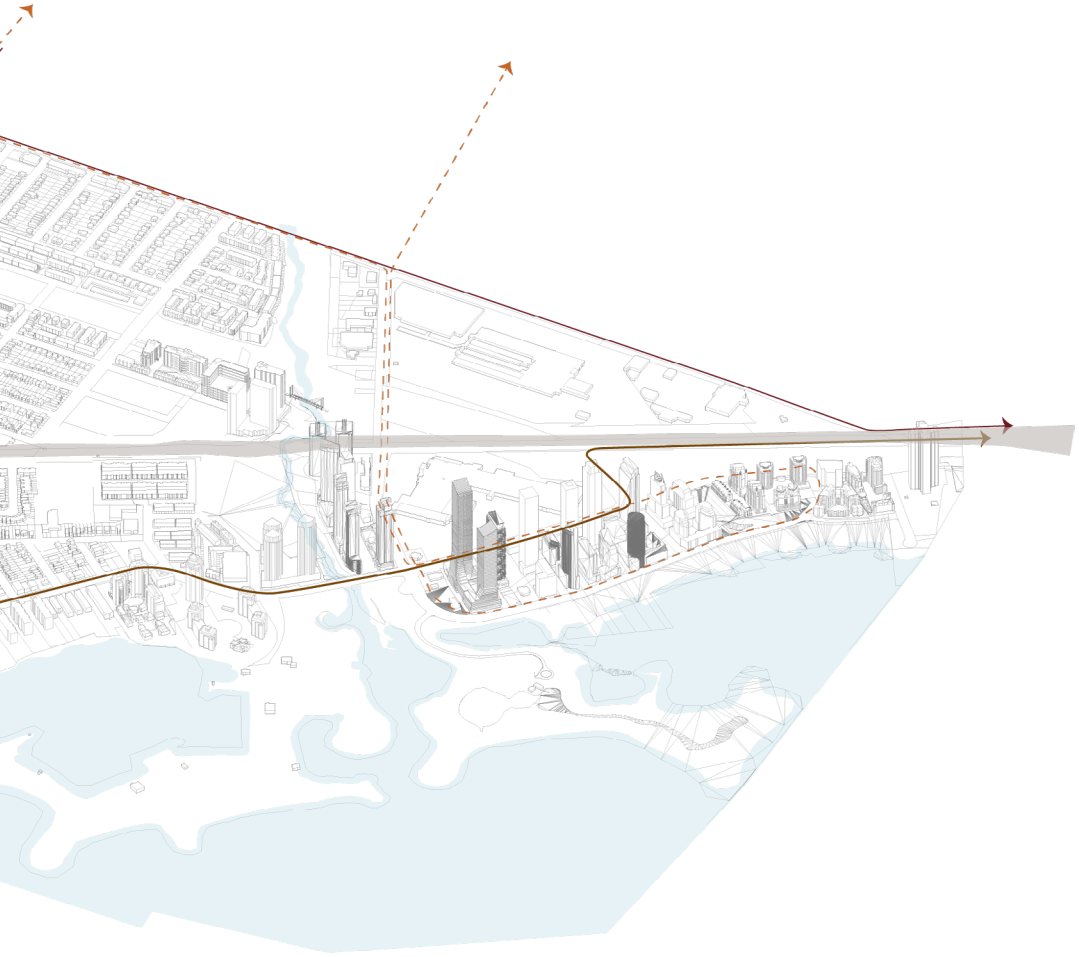


Figure 3.6d: Bus Routes



It is unmistakable that accessibility has not been a top priority for existing and future developments of Mimico GO and the surrounding neighbourhood. There is an obvious need to critically analyze the detailed existing conditions of Mimico GO to identify the essential architectural parameters to create a thoughtfully universal space.

3.2 A Walk Through a Different Lens

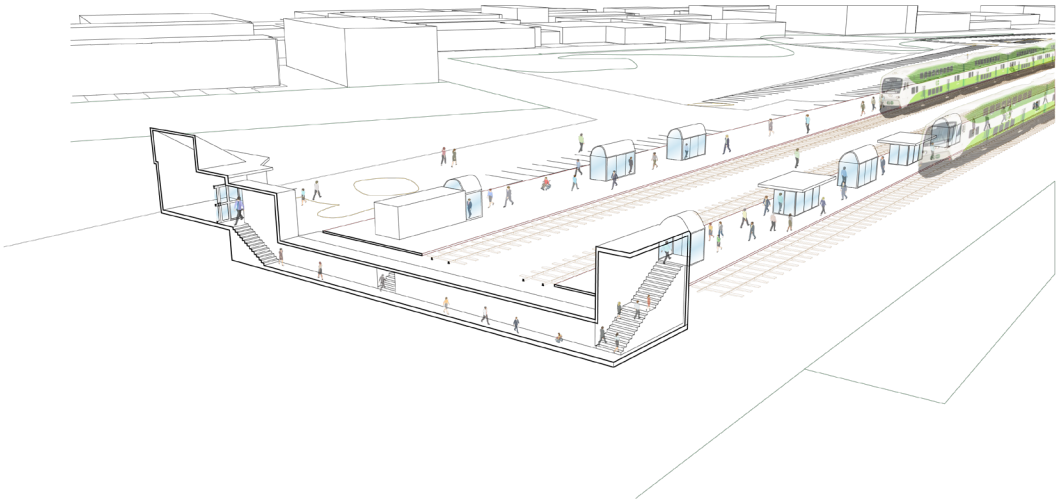


Figure 3.9: Typology

A typical GO station always consists of a minimum of six elements that are critical for operation: the train tracks, boarding platform, a transition path from the street to platform, a station to purchase tickets, a public washroom, and a parking lot with minimum required barrier-free spaces located near the station entrance. Two of the critical elements are permanent in which they cannot be relocated or demolished causing substantial barriers of scope of work to overcome. However, the remaining elements are left for interpretation that can contribute to eliminate any remaining barriers.

Mimico GO is one of the many stations that meet the minimum requirements for operation and safety in accordance with the OBC and NBC but do not follow the Toronto Accessibility Guidelines (TAG). The TAG set a new standard within Toronto and its districts to implement for all construction of buildings and public spaces to

secure Ontario's path to a barrier-free and accessible province by 2025.[60] The adopted standards dictate both interior and exterior spaces with a high degree of detail such as ramp slopes, pathways, surface finishes, glares, tactile systems, emergency communication devices, placement of controls, evacuation plans, audio-visual signals, and proper maintenance. The TAG are a step towards a universal future and assist to shape the way GO Transit and Metrolinx create transit plans through an accessibility lens.

There are thousands of different types of abilities that are present in today's society, but among the most common are visual, auditory and mobility. Through methods of audio tapes, video walkthrough and movement analysis, Mimico GO is shown through different perspectives of ability difference.

Figure 3.10: Auditory Perspective

60 City of Toronto, "City of Toronto Accessibility Design Guidelines" (City of Toronto, 2021), https://www.toronto.ca/wp-content/uploads/2021/08/8ee5-Revised-TADG.pdf.

The audio file in figure 3.10 provides a perspective to a passenger with little to no eyesight, proving the difficulties to determine bearing. For example, determination of location along the platform and how close to the edge one stands, which direction will the train come from, what destination will the train travel to, what train coach will stop nearby, where will the doors be located, etc. Further supporting the need for accessibility accommodations in terms of safety.

In many instances, especially with older age, there are combined disabilities where a person may experience challenges that pertain to more than one type of barrier simultaneously. In figure 3.11, the visual lens provides a perspective on hearing loss with limited vision. Further proving that accessibility accommodations enhance customer satisfaction and a major contributor to customer safety, especially alongside train and vehicular traffic.

Figure 3.11a: Visual Lens

Figure 3.11b: Typical Challenges at Mimico

Mimico GO is one of the first stations built along the Lakeshore West line and one of the only stations that have not undergone any major renovation for proper maintenance or accommodating accessibility standards. There are many obvious hazards and barriers that exist at Mimico GO such as little to no seating, miniscule waiting area within the station, light posts located too close to doorways and no designated pedestrian pathways. While other absent elements that further prove GO Transit's neglect in terms of accessible safety are: mobility accessible platforms, clear with colour contrasting signage, supportive seating, automatic-powered doors, bathrooms, fountains, edge textures for the platform and stairs, wide circulation spaces and raised accessibility platform. For every passenger departing from or arriving to Mimico GO must always consider these archi-

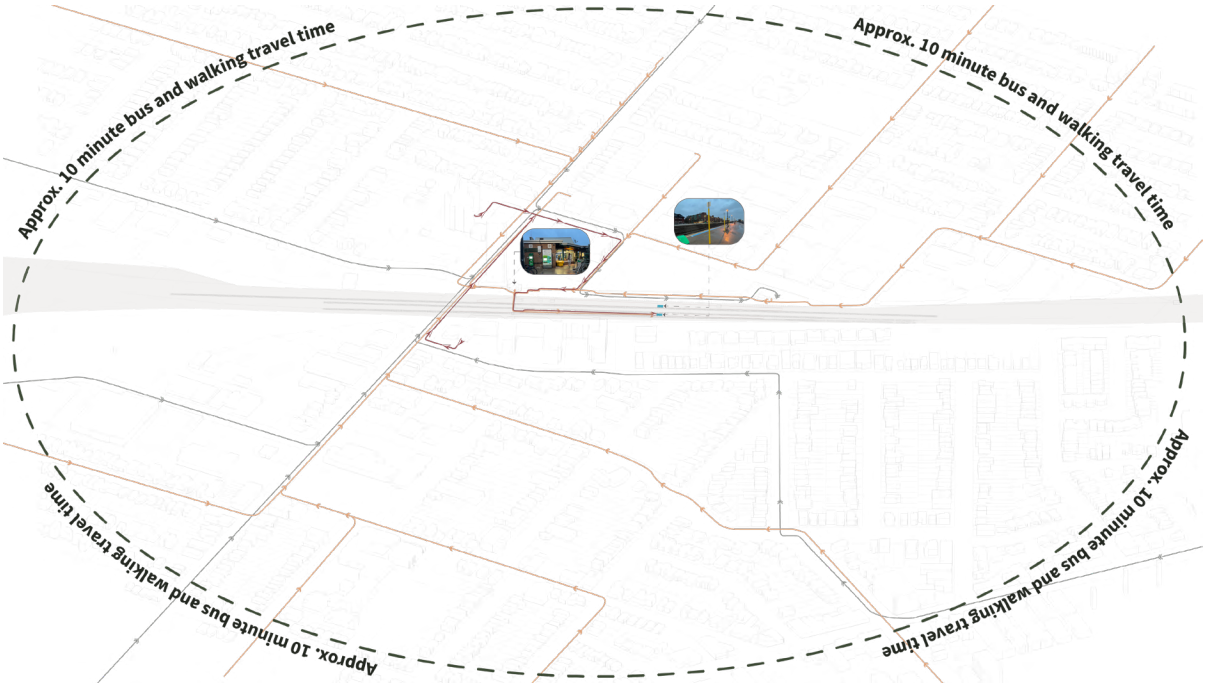


Figure 3.12a: Travel Time

tectural barriers along their pathway both within and outside the property of the station.

Considering a 10-minute travel distance from the entrance of the station, figure 3.12 represents the radius for an average able-bodied person, travelling at an average pace. Majority of GO transit users arrive to their closest station by car while the latter of passengers arrive by local transit or bicycles. However, every passenger must arrive to the station property at one of two entrances, the set of stairs perpendicular to Royal York Road or the free parking section located in the east corner of the parking lot. For the majority, passengers must walk from the east-most corner to the station at approximately 2.5 minutes. Upon arrival to the station building, a ticket is paid for to continue down into the tunnel to travel upstairs and down the long platform to arrive at the designated accessibility area at an additional

Figure 3.12b: Travel Time Within Mimico Property

2 minutes. This addition of 4.5 minutes of travel time for an able-bodied passenger to have the most direct route into Toronto's Union Station is unnecessarily long. Thus, proves those with disabilities, especially whose disability pertains to mobility differences, would be absurdly lengthy affecting time, efficiency, financial factors, planning and coordination.

This barrier of path of travel in relation to time is critical to efficiency, operation, satisfaction, and safety. Furthermore, the existing conditions of the station make it impossible for Mimico GO's direct neighbours to use. This is due to the minimal effort implemented in creating accessible accommodations for the occupants of the two senior assistive living residences as shown in figure 3.12c.

Figure 3.12c: Neighbouring Senior Assistive Living Units

Apart from the prolonged walking distance and lack of elevators or ramps, there are other elements that contribute to barriers for passengers suffering from old age. Some of the elements are the exposure to excessive or inadequate lighting conditions, areas for rest and shelter, indirect pathways, wide circulation spaces and quick access to bathrooms. One of the most problematic barriers on the property for seniors are the set of stairs in the most direct path to the station and platform in which users would have to walk around the block to reach the accessible entrance.

Fortunately, GO Transit and Metrolinx have created a proposal to address some of the challenges their customers, especially the seniors, would face when arriving to the property. As shown in figure 3.13, there is an addition of a south entrance and two elevators per platform. As effective as these solutions are, elevators are not the

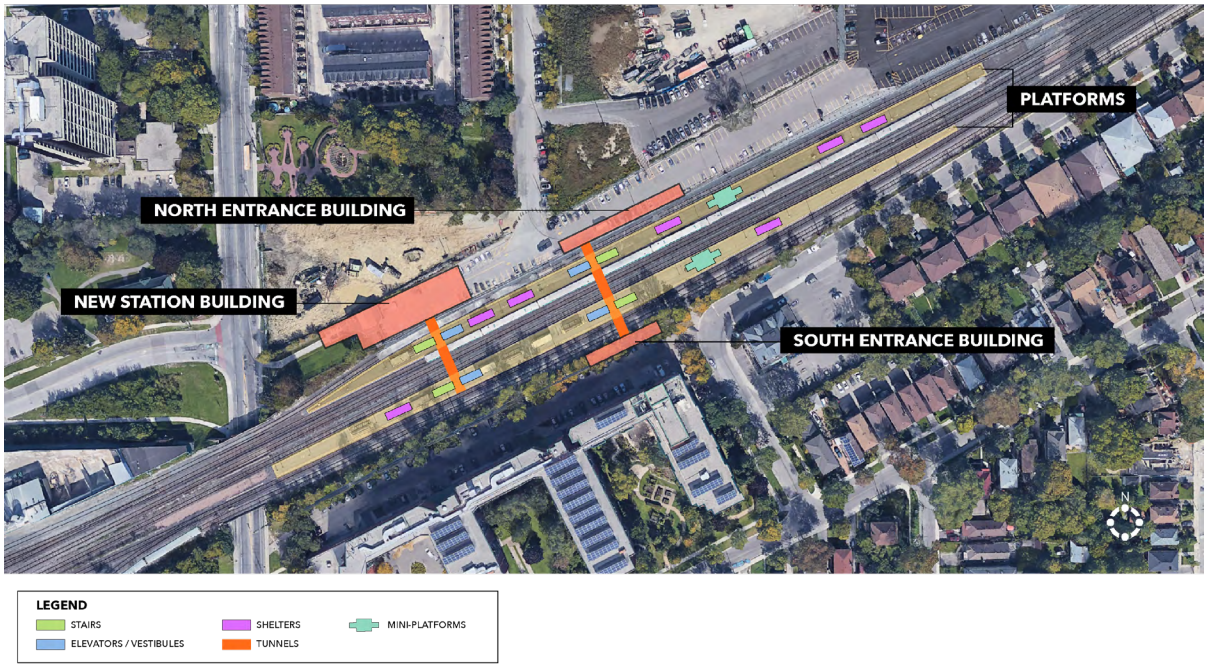


Figure 3.13: Mimico's Current Proposal Addressing Accessibility

only accessibility solution and tend to be unreliable. Consequently, there are many barriers left unresolved such as the Royal York stair entrance, accessibility accommodations from station to tunnel and further connection to local buses or businesses.

3.3 An Elevator is Not the Only Solution

GO Transit and Metrolinx are first and foremost a company for the public, to give the public access to a well-rounded transit system. However, the existing transit station elements only allow for specific types of people to obtain full access at a limited number of stations, being an able-bodied or wheelchair and similar aid device using customer. Thus, the typical addition of elevators, automatically powered doors, and segregated accessibility boarding platforms contribute to the numerous barriers rather than providing a solution.

In several cases, ability differences can be invisible to the people around such as colour-blindness, epilepsy, autism spectrum, mental health spectrum, and the use of unconventional aid devices as shown in figure 3.14. Unfortunately, many of these ability differences that exist receive prejudice or scrutiny that cause people to treat them differently and without compassion. Yet the definition of accessibility, not just through architecture, applies to all human beings regardless of their physical, mental, visual, auditorial or intellectual capabilities. Each ability difference shows a reduction in ability of a particular action that is then compensated by the human brain and body through enhancement of a different sensory response.

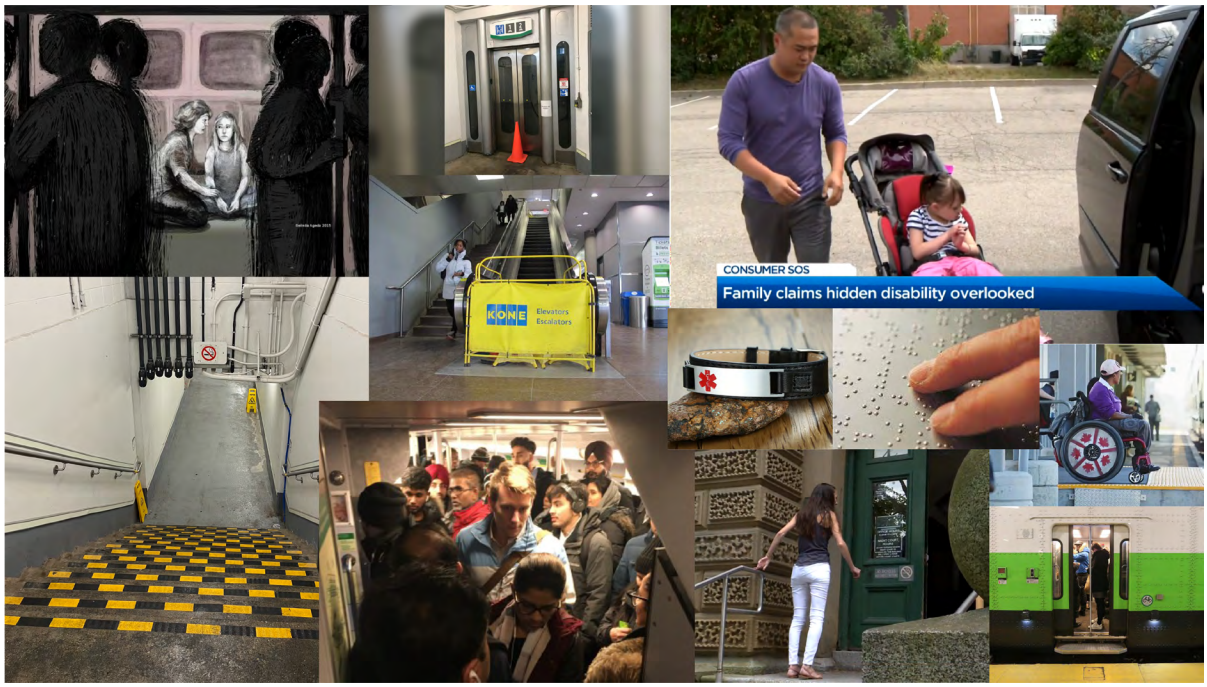


Figure 3.14: More than Just Physical Barriers

The Abilities Matrix (AMX), shown in figure 3.15, began as a spreadsheet with a list of different types of ability differences both general and specific located in the leftmost column. The top row represents the possible and viable solutions to be implemented at Mimico GO in accordance with accessibility guidelines from the RHF and the TAG. The row below is labelled with sense enhancement to categorize a single sense or action that the solution most activates. With many differences in abilities comes a multitude of possible solutions, where results may overlap with another to create a space with well-integrated accommodations with zero separation and providing a new norm.

Abilities

Solution Type	Braille	Sound Wayfinding	Lighting Atmosphere	Light Wayfinding	Colour Wayfinding	Contrasting Colour	Sign Size	Font Size	Sign Wayfinding	Textured Wayfinding	Room Signage	Motion Sensored Openings	Platform Height	Success Vibrations	Sign Language	T-Coil Capability	Announcement	Railings
Sense Enhancement	Touch	Hear	Mental Health	Visual	Visual	Visual	Visual	Visual	Intellectual	Touch	Intellectual	Mobility	Mobility	Hear	Visual	Hear	Hear	Mobility
Ability Type																		
Wheelchair Confinement			○						○			●	●					
Crutches			○						○			●	●					○
Cane			○						○			●	●					○
Walker			○						○			●	●					
Stroller			○						○			●	●					
1on1 Personal Assistant			○						●		●	●	●				●	○
Guide Dog			○		○				○	○	○	●	●	○			●	○
Old Age			○	●	●	●	●	●	●	●	●	●	●				●	●
Hearing Aid Or Impairment			○	●	●	●			●	●	●				●	●	○	
Deafness			○	●	●	●			●	●	●				●			
Hearing Sensitivity			○	●	●	●			●	●	●			●				
Light Sensitivity			●		●	●			●	●	●	●	●				●	●
Glasses	●	●	○			●	●	●		●		●	●				●	●
Visual Stigmatism	●	●	○			●	●	●		●		●	●				●	●
Visual Impairment	●	●	○			●	●	●		●		●	●				●	●
Blindness	●	●	○							●		●	●				●	●
Deaf-Blindness	●									●		●	●					●
Peripheral Blindness	●	●	○			●	●	●		●		●	●				●	●
Colour Blindness			○			●												
Prostheses			○						○			●	●					○
Anxiety Spectrum			○	●	○				●	●	●	●	●	●				○
Mental Health Illness			○	●	○				●	●	●	●	●	●				○
Post Traumatic Disorder			○	●	○				●	●	●	●	●	●				○
Trauma Induced			○	●	○				●	●	●	●	●	●				○
Autism Spectrum			○	●	○				●	●	●	●	●	●				○
Learning Difference			○	●	○				●	●	●	●	●	●				○
Asthma									●		●	●	●					●
Oxygen Tank									●		●	●	●					●
Stroke									●		●		○					○
Translator									●		●						●	
Speech Impediment									●		●						●	
Tourette Syndrome			○	●	○				●	●	●	●	●	●				○
Temporary Physical Injury			○						○			●	●					○
Paraplegia			○						○			●	●					
Cerebral Palsy			○						○			●	●					○
Orthopedic Impairment			○						○			●	●					○
Spina Bifida			○						○			●	●					
Chronic Neurological Conditions			○						○			●	●					○
Physical Chronic Illness			○						○			●	●					○
Short Stature Disorder			○						○			●	●					○
Muscular Dystrophy			○						○			●	●					○
Multiple Sclerosis			○						○			●	●					

Legend	
○	Partially Solves
●	Fully Solves
∴	In Combination

Figure 3.15: Abilities Matrix

Matrix

Shadow Enhancement	Ramps	Elevator	Escalator	Automatic Openings	Easy-to-Open Levers	Foot Levers	Foot Control Buttons	Supportive Seating	Waiting Area	Wide Circulation	Designated Pathways	Emergency Posts	Indoor Shelters	Colour Palette	Sound Suppression	Safety Textures	Language	Vendor Stations	Art Gallery
Mental Health	Mobility	Mobility	Mobility	Mobility	Mobility	Mobility	Mobility	Mobility	Mobility	Mental Health	Mobility	Safety	Safety	Visual	Hear	Touch	Cultural	Cultural	Cultural
	●	●		●	○		●	○	●	●	○	○	○			○			
	●	●	○	●	○		○	●	●	●	○	○	○			○			
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	○	○	○	●	●	●	●	○	●	●	○	○				○			
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	●	●		●	●		●	●	○	●	●	○	○	●		●	●		
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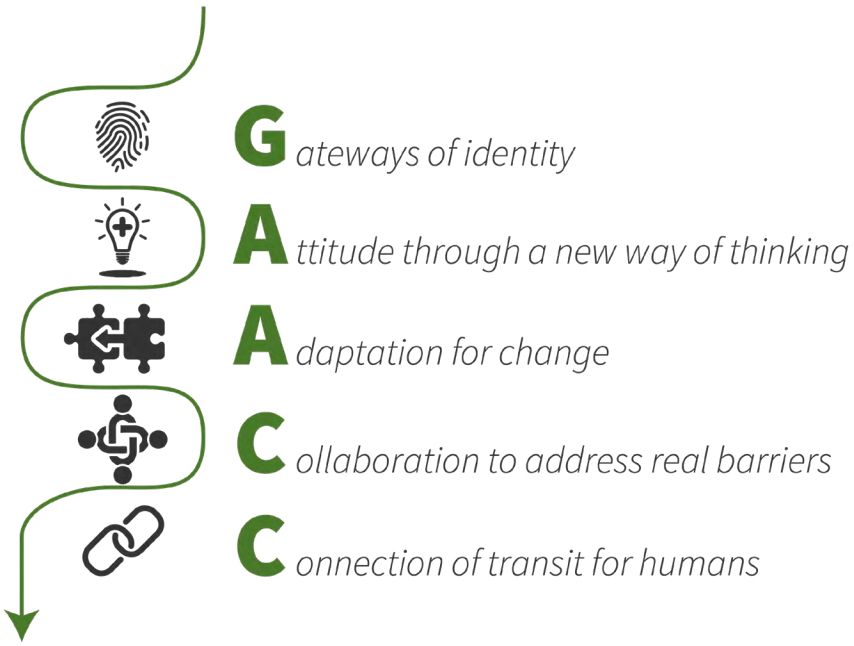


Figure 3.16: GAACC

3.4 Beginning with Accessibility First

After completion of the AMX, there are many different technologies, details, innovations, and landscapes that exist within the built environment that address an atmosphere of sensory enhancement or adaptation. The possible architectural solutions will aim to provide the following principles GAACC as shown in figure 3.16: gateways of identity, a new attitude through way of thinking, adaptation for change, collaboration to address real barriers, and connection of trains for humans.

Humans perceive the world through culture and history of architecture by obtaining information across interactions. These interactions are learnt through the built environment and the way ar-

Figure 3.17a: Another Way to Solve the Issue

chitectural tradition has deemed elements as standard. However, the traditional sense may not be the only solution such as the elevator.

In figure 3.17a, the researched solutions explore other programs and functions of a space or object, optimizing its potential to create another solution type to a different barrier. The two top images are physical art installations placed in a Washington, DC abandoned subway station to showcase work done by local artists, allowing customers to interact using their senses.

Mimico GO incorporates heavy, long spanning platforms that cannot be moved showcasing a singular purpose of a space to wait for a train. However, the train station and platform have potential to be used as a tool at a larger scale of a urbanscape. As shown in figure 3.17b, the Highline, the Yokohama Passenger Terminal, and bridge plazas throughout Europe prove that long spanning urban landscapes thrive around the world, providing public spaces to gather within society.

Figure 3.17b: Transit as a Tool

Technology is forever evolving and improving throughout the world, providing more technologically advanced solutions to aid devices and other sensory innovations. The bottom row of precedents in figure 3.17c show a deaf dancer utilizing the vibrations of music bass to dance to the beat of the song while the blue signage indicates the use of T-coils embedded into the space to enhance sound for hearing aids. Thus, attesting to innovative methods that work efficiently and effectively to increase sensory experiences for the transference of information.

Figure 3.17c: Innovation as a Method

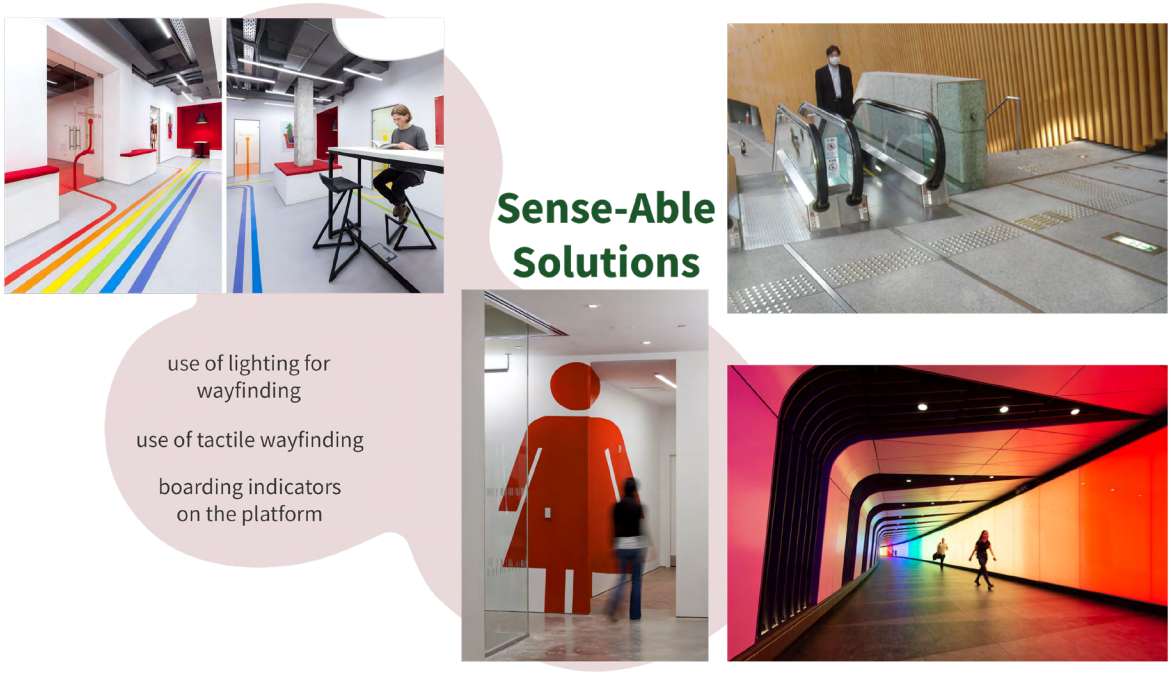


Figure 3.17d: Overlapping Solutions

The ability to navigate through a space is a challenge people face regardless of their ability difference. The examples shown in figure 3.17c provide visual and tactile solutions for navigation through public spaces using colours, signage, pathways, lighting, and textures.

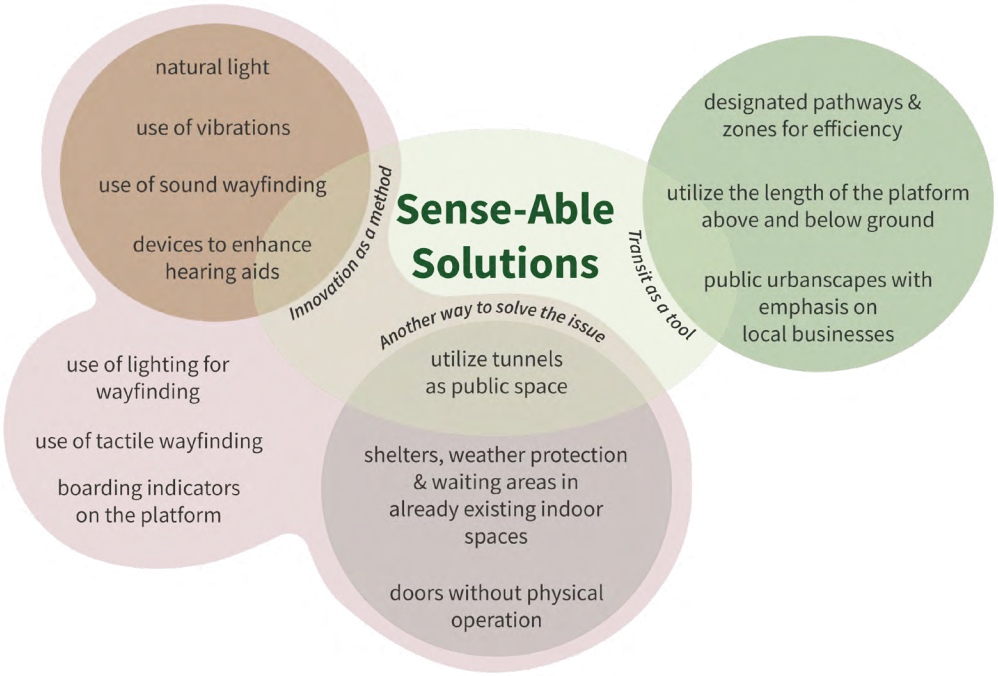


Figure 3.18: Sense-Able Solutions

The AMX working together with detailed precedents speak to the methodology used to design the best suited solutions to the barriers that respond to the masses. Therefore, each integrated solution that incorporates universal accommodations through thoughtful architecture brings long-term benefits to GO Transit and Metrolinx. The efficiency of operation would be affected in a positive way while all users will feel the sense of belonging and inclusion within the societal public realm.

Chapter Four

Chapter 4

Sense-Able Solutions

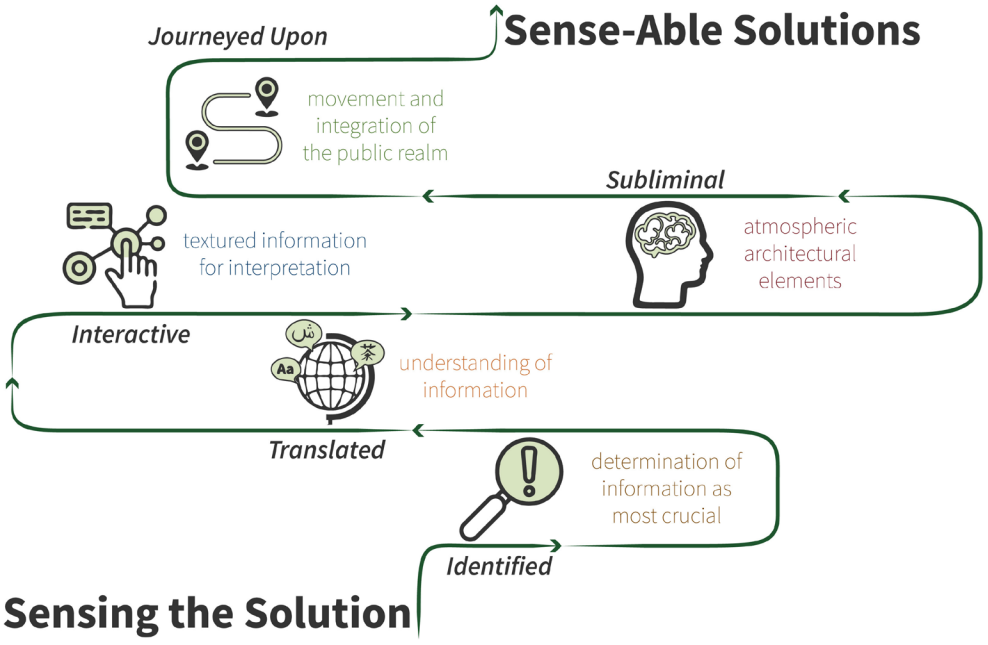


Figure 4.1: Design Approach

Through a direct relationship between thoughtful design and accessibility accommodations by means of the AMX, the design of the proposed Mimico GO station consists of specified details that work together as a whole. These specified architectural details work in conjunction with one another to provide the best approach with regards to enhancing the sensorial experience of its users. Thus, enriching the overall experience within and around the station for customers with a wide variety of ability differences.

4.1 The Community Landscape

Figure 4.2: Windsor Street Entrance

Windsor Street Entrance (North) & Bus Loop

As shown in several site studies, the MQ neighbourhood puts emphasis on family-oriented businesses, community involvement, safety, and care. The design of the station property located at ground floor level on both the north and south side of the tracks extends out into the neighbourhoods. This is to provide a safe environment that is easily accessible as well as designated pathways from the station boundary to major local greenspaces, trails, bus stops and pedestrian footpaths.

The landscape is carefully integrated into the existing conditions of the neighbourhoods to match the level of intimacy according to site specific conditions. The north side of the tracks will be lined with future high-rise condominium units which in turn includes an increase in population, noise pollution, pedestrian traffic, vehicular traffic, and the opportunity for new shops or businesses. This active condition requires space for designated pathways directing both pedestrians and vehicles, space to rest, interact, and for vegetation to moderate sound. These solutions work together to easily direct users who are unfamiliar with the area, allow spaces for users to rest, relax and enjoy the outdoors while ultimately providing safety throughout the entirety of the site.

Figure 4.3: Blue Goose Entrance

Meanwhile the south side of the tracks requires a softer approach as the area is populated by single-family, low-rise residences with a less active population. This entrance consists of a single, smaller passenger drop-off area and a considerable amount of vegetation in comparison to the north entrance at Windsor Street. The vegetation acts as a natural sound buffer to diffuse excessive noise pollution due to ongoing activities on the north side of the tracks as well as passing trains. The design of the softscape provides more

Blue Goose Entrance (South)

privacy for the residents of neighbouring houses as there will be increased pedestrian traffic due to the new entrances into the station. Since the train tracks at the ground level completely cut off the most direct path to travel from north to south and vise-versa, the community landscape continues underground delivering a pedestrian-only passageway to effortlessly cross the tracks. Thus, shortening the travel distance from the existing vehicle and pedestrian underpass located on Royal York Road beneath the train tracks.

Figure 4.4: Siteplan


GRAND AVENUE
PARK
AUDLEY STREET
MANCHESTER
TENNIS COURTS
& PARK
MANCHESTER
DOG PARK
MANCHESTER STREET
Siteplan 1:2000

The site of Mimico GO is located in the center of the MQ neighbourhood, causing the space to be very valuable to real-estate and commercial opportunities. Further enriching the site are the five major greenspaces that surround the property on all sides: Grand Avenue Park, Memorial Gardens, Coronation Park, Manchester Dog Park, and Manchester Tennis Courts and Park. Due to the proximity of the parks to the station, the site allows for the opportunity to continue the landscape through pedestrian corridors connecting these greenspace.

Each pedestrian corridor is outfitted with wide pathways, greenery, and accessible seating benches for resting. Located at the north of the site are future residential condominiums called Grand Central Mimico (GCM), proposed to take over the two properties adjacent to the former Mimico GO station parking lot, and the block located on Audley Street. These three condominiums will fill the space with new GO Transit customers, users in need of fresh air, ground floor level commercial spaces, and an abundance of underground parking spaces.

The design of the north site allows for all the above opportunities as the details work together to create a central hub of the MQ neighbourhood. These details provide a vast set of options to interact with the space with a focus on accommodating for variations in ability difference. The many sidewalk conditions within the landscape specifically provide accessibility options that are carefully woven into the design details, further integrating all ability types together. For example, the north site prioritizes the pedestrian users through a thoroughly designed bus loop layout that focuses on the safe arrival, departure, and movement within of passengers.

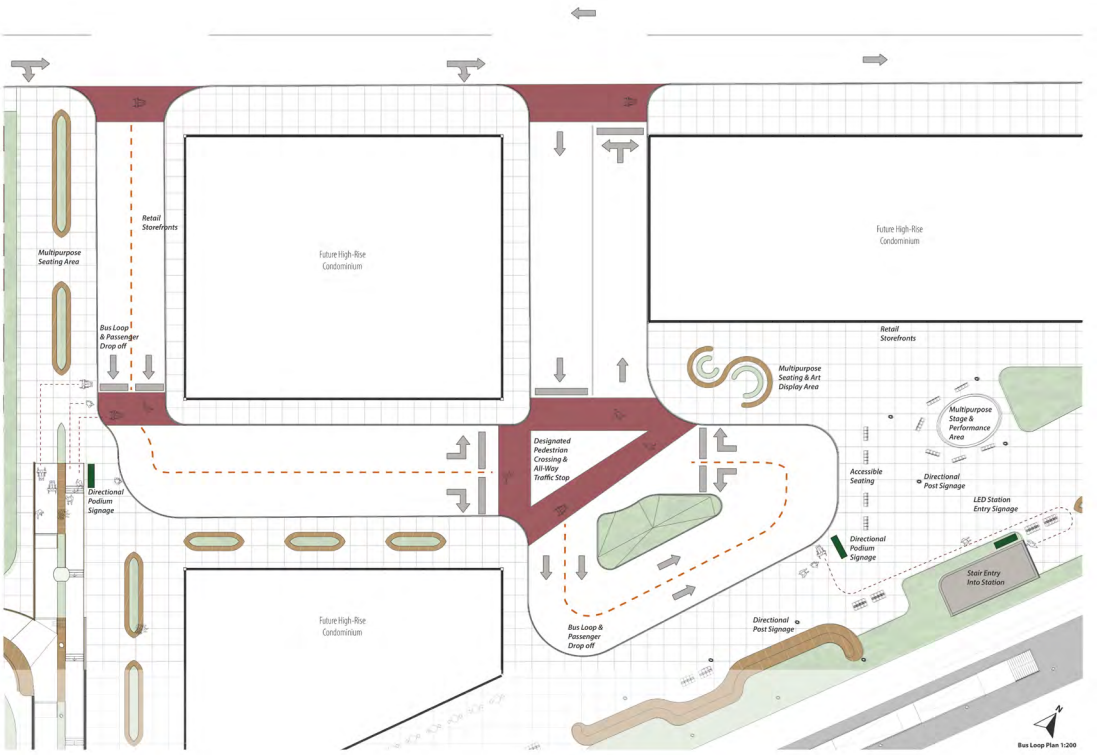


Figure 4.5: Bus Loop Plan

The bus loop consists of a one way entrance on Windsor Street that will drop passengers off at the first stop by the north entrance, and then loops towards the stage to drop off closer to the stair end entrance. The bus loop alone provides the option to choose the entrance into the station and landscape that best suits the needs of the individual user.

The entire north site includes a variety of seating types such as integrated step seating with ramp access, bench seating with planters, and accessible support seating with spaces between for mobility aid devices. A few other sidewalk conditions include multipurpose grass spaces, public vendor spaces, public stage for performances, and public art displays with seating for viewing. These design choices were made to introduce other cultural formats and

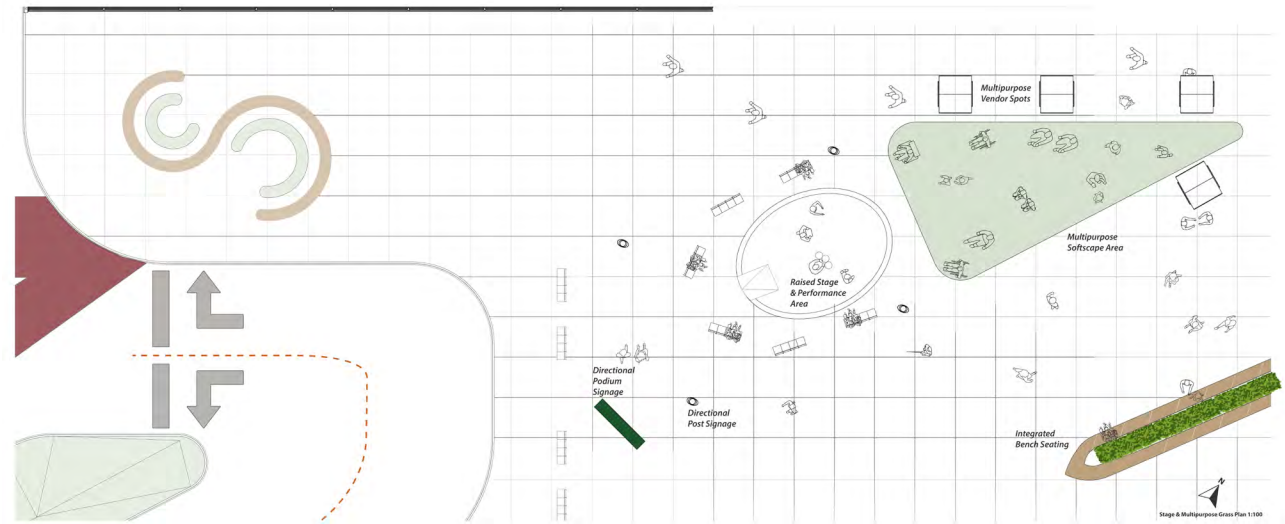


Figure 4.6: Stage & Performance Area

the ability to transform the space into an outdoor community landscape for a multitude of purposes.

Working in consideration of a pedestrian-friendly pathway proposed by the developers of GCM, the design reflects similar interests in the design of the shared community landscape with focus on integrating the existing community values within. The designed stage and art display conditions provide the opportunity to bring local art, exhibitions, and performances to the area, creating a direct link between the new modern era with the historic significance of the MQ neighbourhood.

Figure 4.7: Stage & Grass Area

The Grand Central Mimico development will bring opportunities for new retail stores and shops to occupy the commercial spaces within the ground level of their footprint. Unfortunately, these trendier businesses could hinder the success of existing local shops, bakeries and services that are a five to ten minute walking distance away. The multipurpose vendor areas allow for pop up shops, and marketspaces bringing local vendors closer to the steps of future developments and to anyone travelling by GO train. Thus, providing access to the benefits, values, and historic culture of the neighbourhood to all no matter each individual's circumstance. Whether users are arriving to catch a train, biking home, on lunch break, enjoying coffee with friends, people-watching, etc. the multi-purpose spaces allow the opportunity for all activities on the entire spectrum of ability difference.

Figure 4.8: Vendors & Marketspace

Vendors & Marketspace

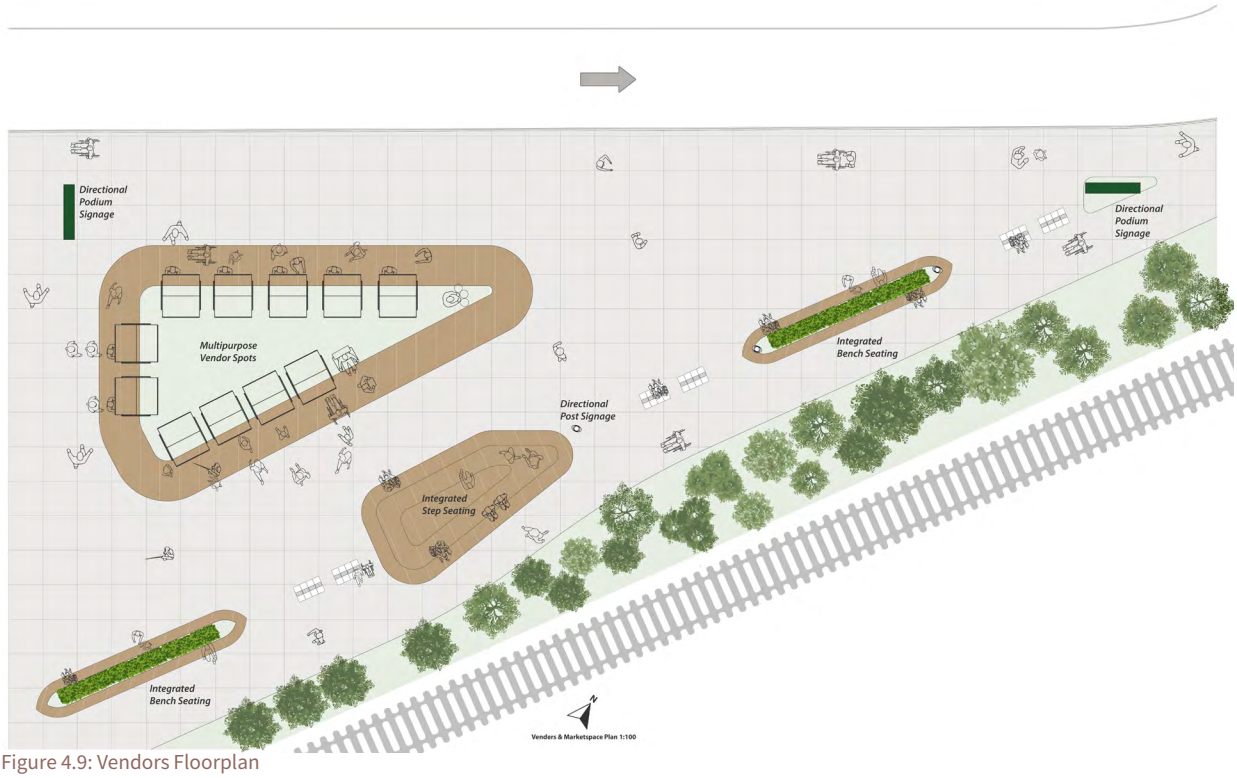


Figure 4.9: Vendors Floorplan

4.2 Canopy Structures as a Landscape

The overall landscape of Mimico GO has three levels: the ground floor, the below ground, and the canopy above. The canopies above the ground floor serve a multitude of purposes that work together as a whole system to improve the sensorial experiences of the users and solve for a numerous ability differences simultaneously.

Beginning with the coverage of the site, the independent canopy acts as an umbrella structure to protect the space underneath from unideal weather conditions such as rain, snow, excessive sunlight, and direct sunlight. The canopies are placed strategically along the platforms to allow for plenty of walking space on either side as well as to not interfere with vertical travel structures. The canopies located in the center of the platform span across the tracks and connect to the opposite platform to provide extra coverage at the level-boarding areas. These areas of the platform require extra attention as passengers may require further assistance and safety measures when boarding the train due to ability differences such as

being in a mobility aid device, requiring immediate medical aid, total visual or hearing loss, travelling with a guide dog, and being on the autism spectrum.

The size of the canopies on the platform extend past the platform edges to allow precipitation to trickle onto the track floor, keeping a dry and safe pedestrian platform for commuters. The heights of the canopies vary throughout the landscape ensuring the minimum height clearance for the various types of train cars that pass through. The variation of heights allows for shorter canopies that extend into the neighbourhoods of the future and existing residential developments to maintain clear views of outdoor spaces without any obstructions. Due to the large pedestrian corridors running parallel with the tracks, there is a need to provide shading, protection, and safety for all. The canopies provide this solution through smaller clusters as to not impede on future developments while prioritizing the access points to the community public space.

As a whole, the canopies create a multitude of concave facets that aid in the process of diffusing noise pollution from both the train and the users of the space. The concave shapes allow sound to bounce off its surface in multiple directions, causing a reduction of sound intensity to the human ear. When the concave shapes are multiplied and used in conjunction with fabric material, the sound will be

re-directed and absorbed in multiple formats. Thus, allowing users who rely heavily on sound navigation to find their destination more easily and for users with a sensitivity to sound feel more comfortable throughout the entire station.

As each canopy works as a separate structure there are more posts required which allow for the posts to be used as both structure and signage at once. The post signage vary at specific conditions: the street level, the platform level and level-boarding area. This is to provide a distinction in change of area and proposed function of the spaces. At the street level, the post signage works as directional signage, integrated into the post instead of hanging or cantilever methods. These signs indicate a particular space, and the posts may be coloured accordingly. Each post along the platform are equipped with an electronic train display, showing the times of each train and platform number. These posts include a red emergency assistance button and text signage to indicate the direction the train will travel such as Westbound Trains. At the level-boarding platform, these posts remain the same except are painted blue with the universal accessibility logo to indicate this area provides a dedicated GO Transit employee for extra assistance as needed.

The materiality of the canopies consist of three major aspects: glulam wood, concrete posts and stretch tensile fabric. The glulam wood beams are located in the center with equal load on either side of the concrete post, dimensioned at 13-inch width by 40-inch depth to allow for 30-meter wide total spans. The thinner, light-weight wood wave components are made of typical two-by-four wood framing with sheathing to match the style of glulam beams and affixed to the center beam through steel connectors. These wave frames allow the tensile fabric to be stretched and conform to an asymmetrical concave shape, allowing the facets to create an overlapping pattern. The next component of the canopies are the concrete posts that measure 30-inch in diameter to support the weight of the large spanning beam and frames. The concrete posts allow for the opportunity to create a cavity pocket within for the concealment of precipitation drainage. The last component of the canopy is the stretch tensile, used for three purposes: sound absorption, precipitation collection and controlled light conditions. The fabric mixed with the overlapping concave shapes help to re-direct and absorb excessive noise from people, vehicles, trains, and announcements. The stretch tensile is securely attached to the wave frames and the concrete post to easily collect and channel any rain or snow run-off. Due to the thin materiality and partially translucency, the fabric allows for conditions providing shade and controlled lighting through artificial or natural light. The materiality of the canopies are crucial as the wood allows for a soft, warm, and inviting feel in contrast to surrounding concrete and steel. The materiality contribute to effectively integrate the modern structures with the use of natural tree canopies and vegetational sound barriers. Thus, creating a connection between the natural and modern landscapes while providing equal opportunity to maximize each condition for various ability differences.

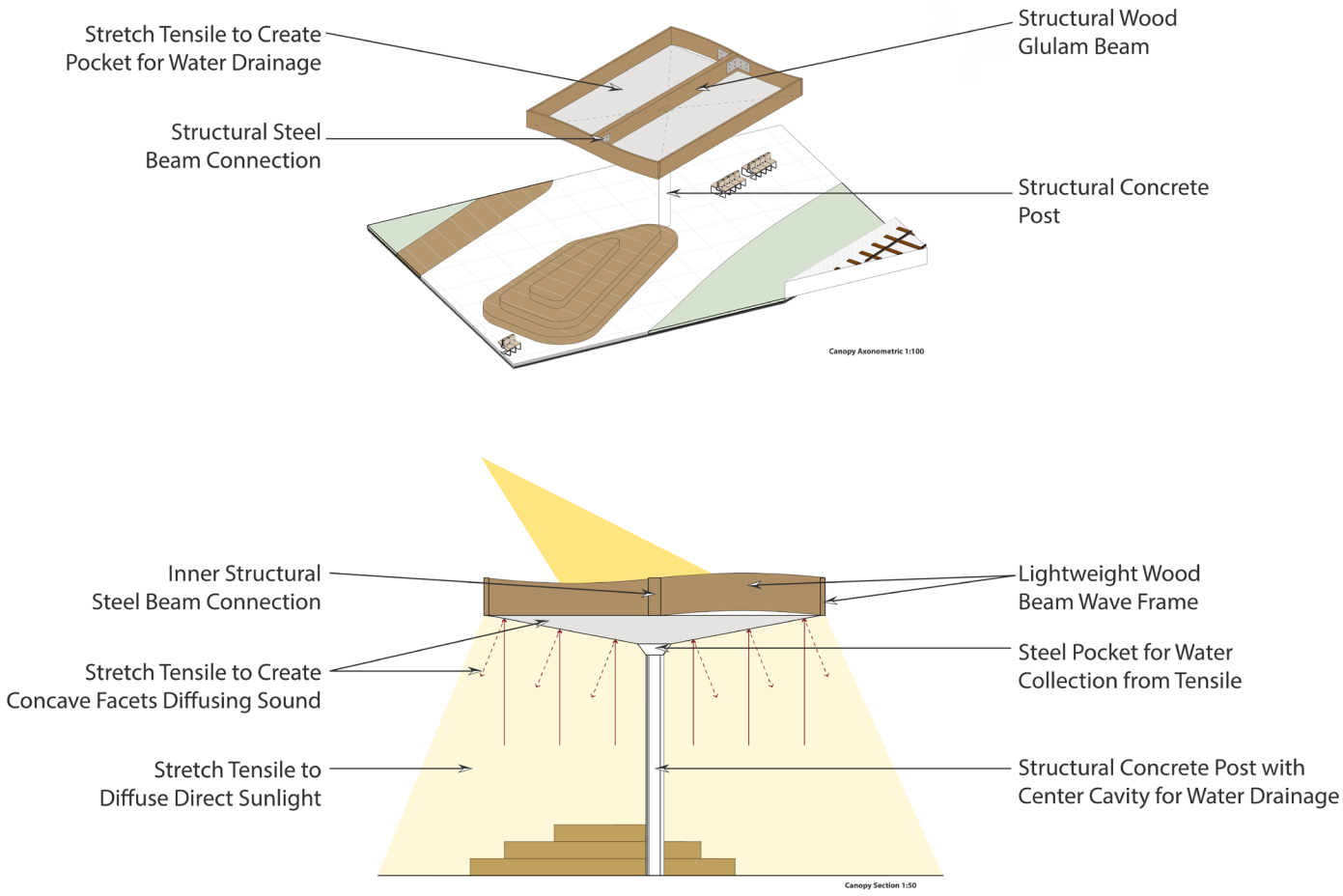


Figure 4.10: Canopy Details

4.3 Diverse Entries to Below Ground Station Landscape

The existing conditions of Mimico GO prove that entrances into the station and to the property are extremely important in terms of accessibility, connection, safety, and efficient fluid travel. In order to solve for this main issue for both pedestrians and vehicular traffic the design must accommodate for designated spaces in each cardinal direction. The strategic placement of the station in the center further creates the opportunity to access the station from every direction. Due to the historic background of the existing train tracks and platform, there is extensive engineering that goes along with the desire to rearrange, re-route, or redesign these permanent parameters. The design focuses on creating spaces that improve and enhance the site's current conditions to accommodate for ability differences while staying true to the reality of permanent structures. This design choice will be used as a typological method to rethink all other stations in the perspective of user experience through ability difference.

One of the main issues at hand at majority of the GO Transit stations are the location and placement of the station building as it is typically placed on one side of the tracks as well as on the end of a platform. This causes numerous issues such as further travel within the property, disorientation, and customer traffic. The design of the proposed Mimico GO solves this issue through creating a central station directly below the train tracks. This allows for the existing operation of trains and station to remain intact during the construction of the new underground station. While also providing a cost effective solution in contrast to building a station above and only one major structural component is required between the track slab and station ceiling. Other advantages to the underground station is a lower ceiling height clearance requirement and ability to upkeep the station.

Pedestrian Tunnel & Station vs. Pedestrian Overpass & Second Story Station							
Tunnel				*Overpass*			
Pros		Cons		Pros		Cons	
Vertical Clearance	4.5m - 5.0m			Vertical Clearance	5.2m - 5.5m		
BF Ramp Ratio	1 in 12			BF Ramp Ratio	1 in 12		
Ramp Length	54m - 60m					Ramp Length	62.4m - 66m
Landing length		1670 mm		Landing length		1670 mm	
Landing intervals		9m maximum		Landing intervals		9m maximum	
Top Landing		1670 mm		Top Landing		1670 mm	
Bottom Landing		1670 mm		Bottom Landing		1670 mm	
Unrailed Ramp Slope		1 in 20		Unrailed Ramp Slope		1 in 20	
Unrailed Ramp Length	90m - 100m					Unrailed Ramp Length	104m - 110m
Cost	Less costly					Cost	More costly
Structure	Typical concrete and posts - no need to consider impeding on existing track or platform for post placement					Structure	Engineered bridgework for long spans and ramps - will have to consider location of tracks and impeding on platforms for post placement
		Lighting	Dim, dark, more artificially powered			Views	Potential obstruction views for planned condos
		Atmosphere	Damp, Sketchy Tends to attract more unsafe activity	Material	All Glass	Material	Glass could allow too much sunlight - too hot in the summer
		Safety	Potential for dark	Safety	More visible		
Material	Glass for more welcoming and safe environment	Material	material to make spaces feel small	Lighting	bright, warm, welcoming, more naturally powered		
Temperature	Geothermal heating during the winter - Easier to keep cooler in the summer					Temperature	Difficult to keep temperature at a controlled rate if a lot of glazing
Views	No above ground obstructions			Atmosphere	tends to feel more safe and inviting due to brightness and visibility		
Weatherproofing	drainage and maintenance only needed					Weatherproofing	full enclosure with proper drainage - constant maintenance all year long
Loads	occupany					Loads	occupancy and snow
Station location	will not impede on parking lot					Station Location	potentially impede on parking lot or extra load on bridge

Figure 4.11: Above vs. Below

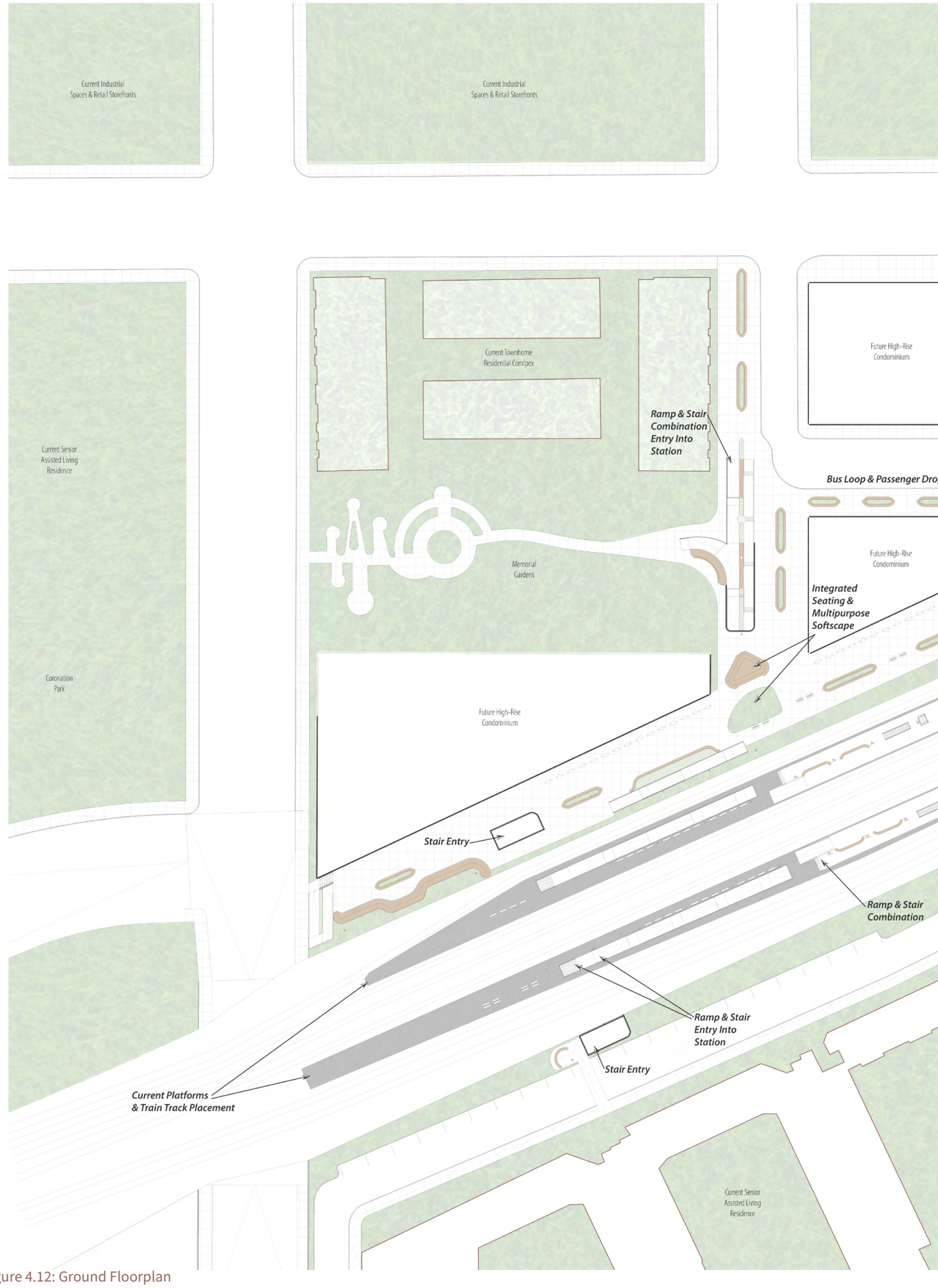
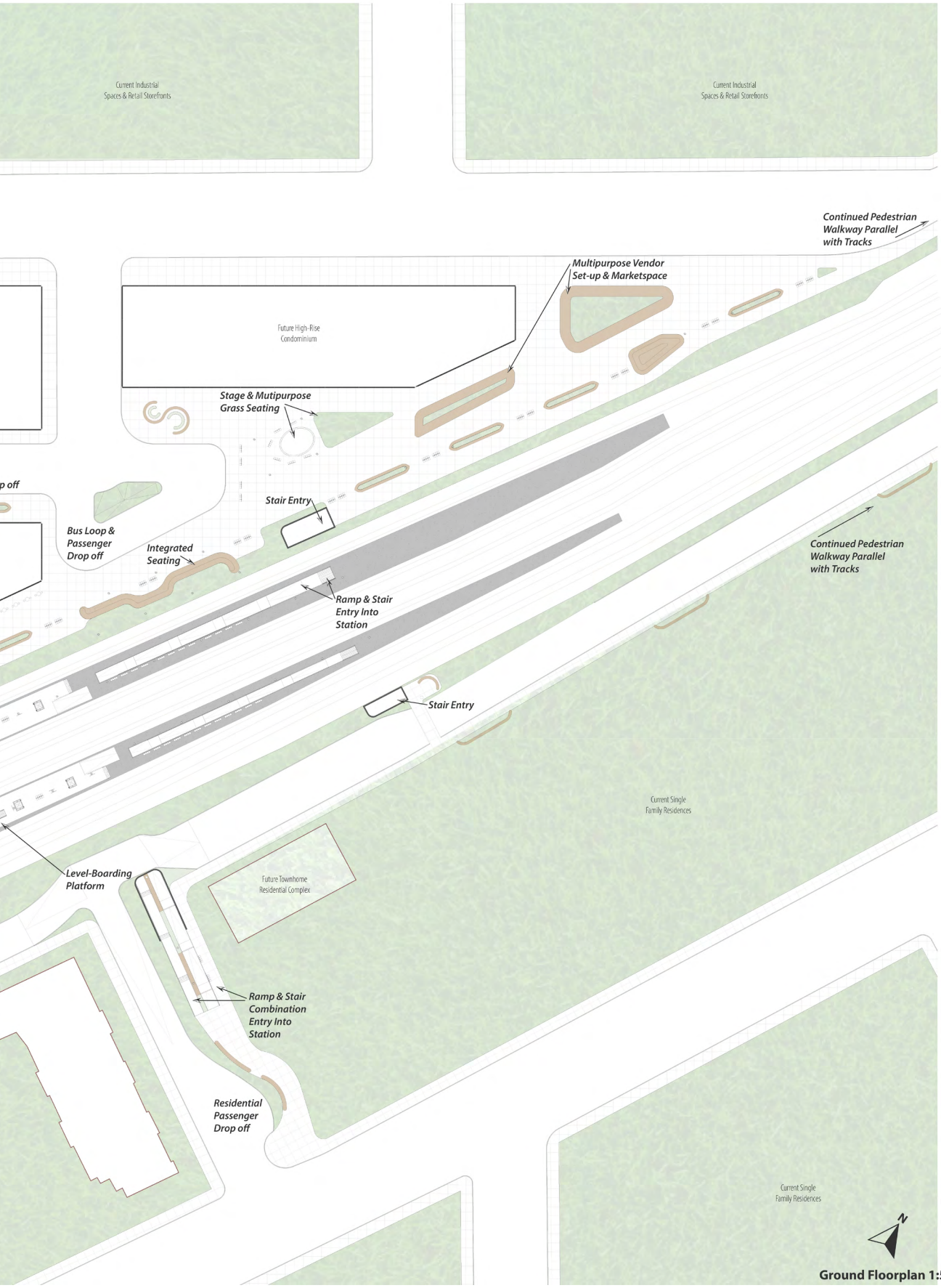


Figure 4.12: Ground Floorplan



Ground Floorplan 1:500

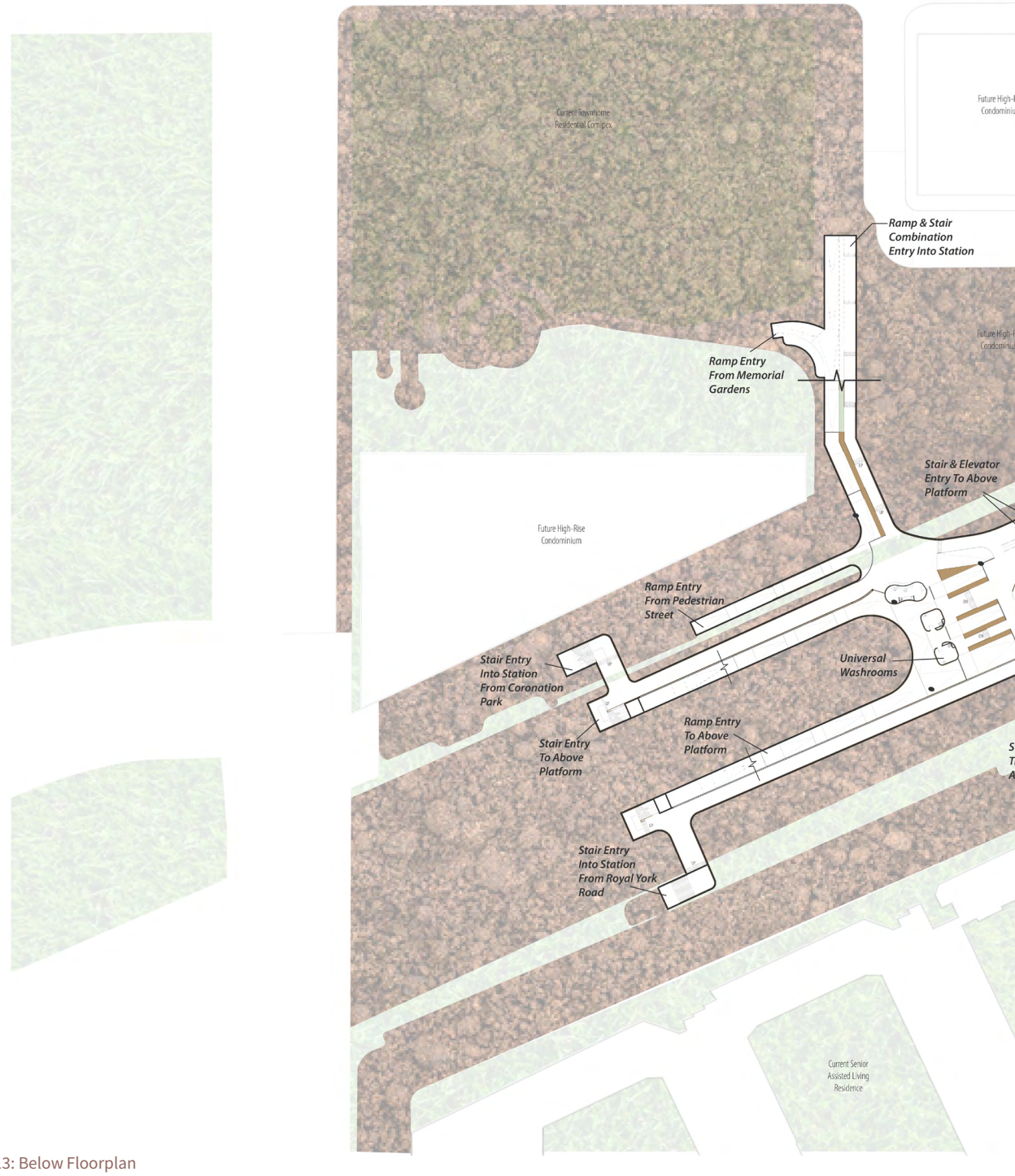
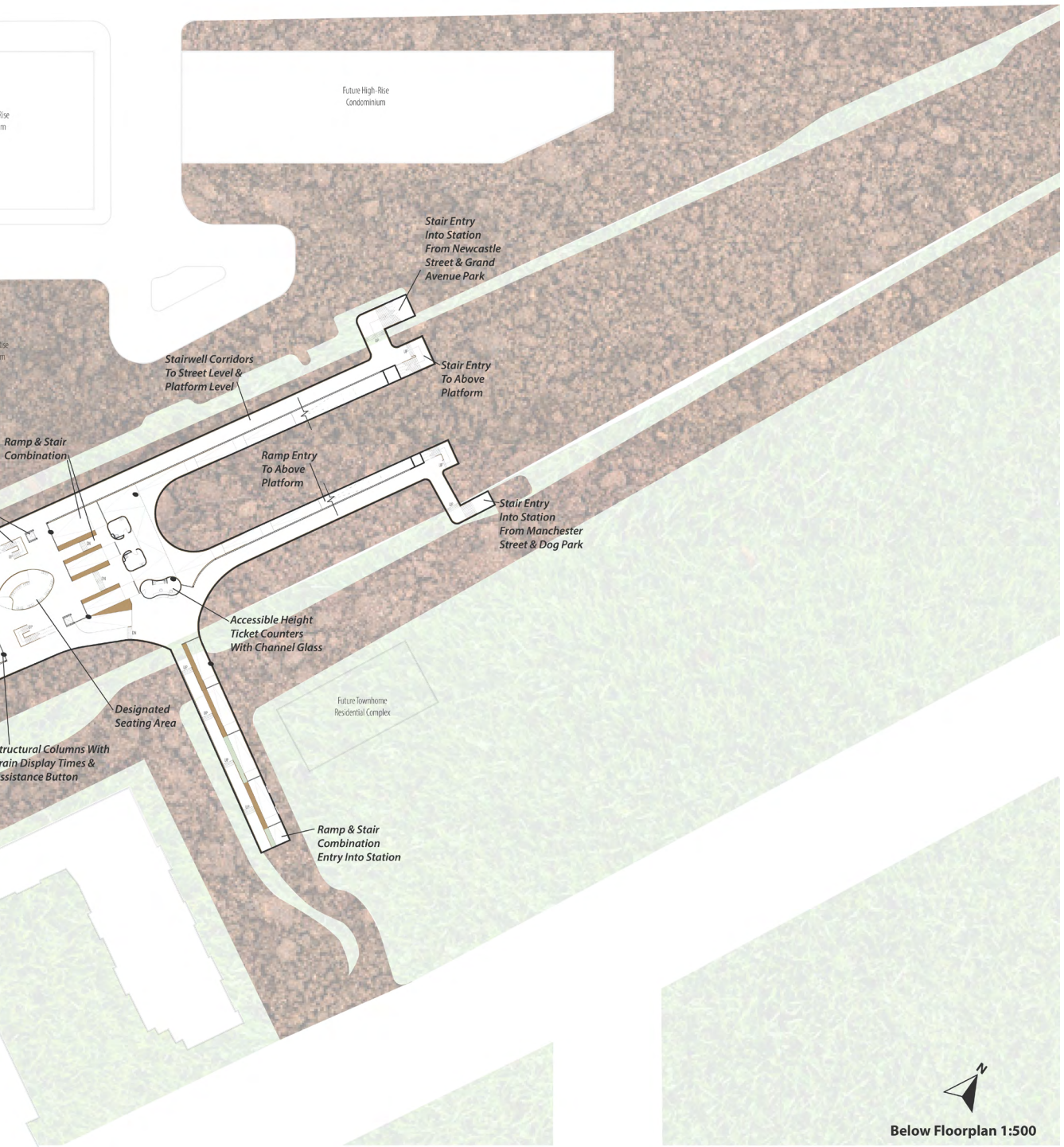


Figure 4.13: Below Floorplan



Below Floorplan 1:500

Since the ceiling height clearance ranges between 3.5-meters and 4.5 meters below the finished train track reinforcement, this allows the feasibility for two gradual slope ratios for entering the station from the street-level and the platform. The entry ramps from Windsor Street and Blue Goose Street are designed with a 1:20 slope ratio in which both ramps end at the midpoint of both roads. The ramps that connect up to the platform level consist of a 1:15 slope ratio to accommodate for the limited length along the existing platforms. At each entryway ramp, there is an adjacent set of stairs to allow users the opportunity to choose the option that best suits their ability difference or situation. These entrances provide the combination option and navigate directly to the station ticket booths and platform entrances. Further proving that integration of options provides independence and lessens the attention to ability difference for those who struggle to use conventional options in comparison to others.

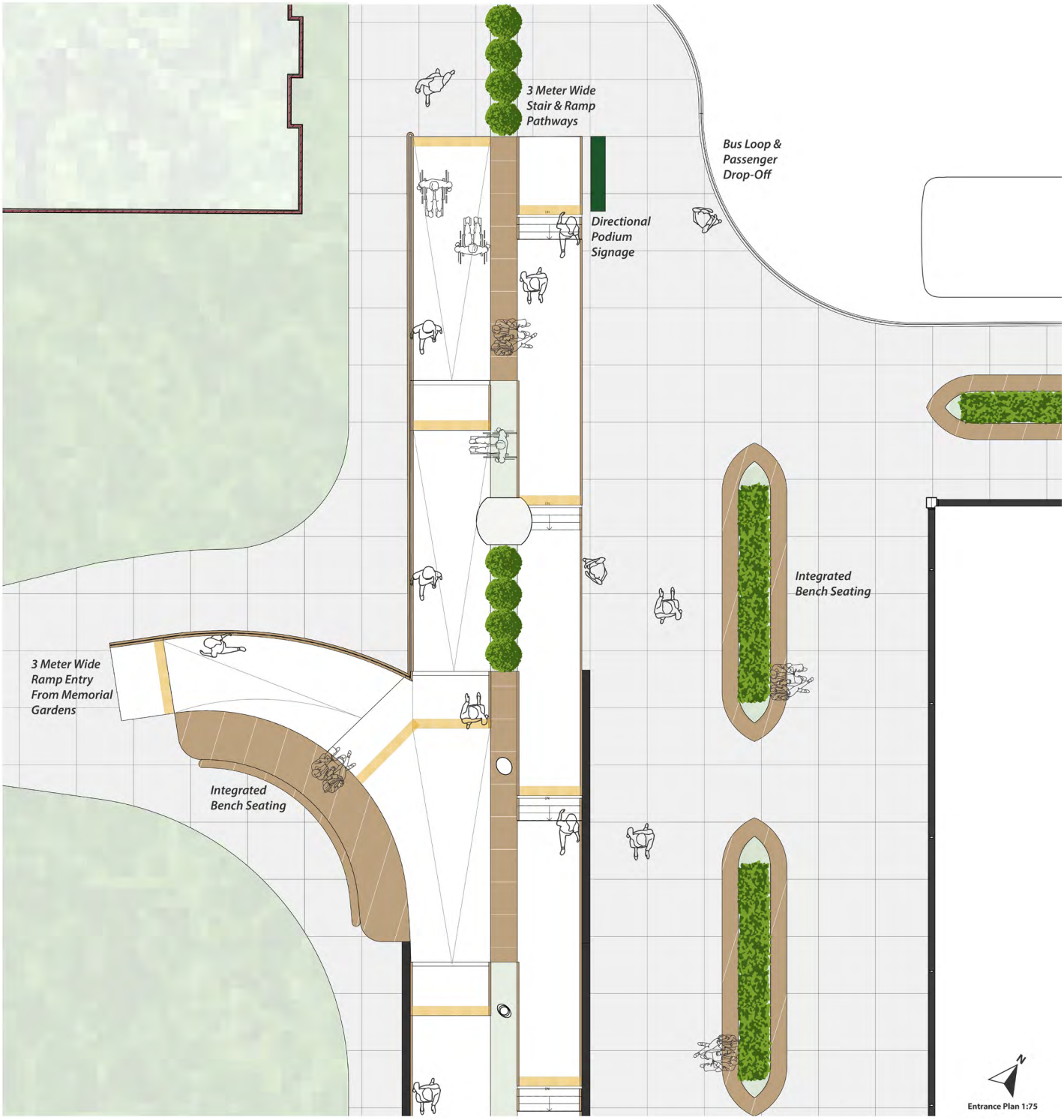


Figure 4.14a: Combination Ramp & Stair

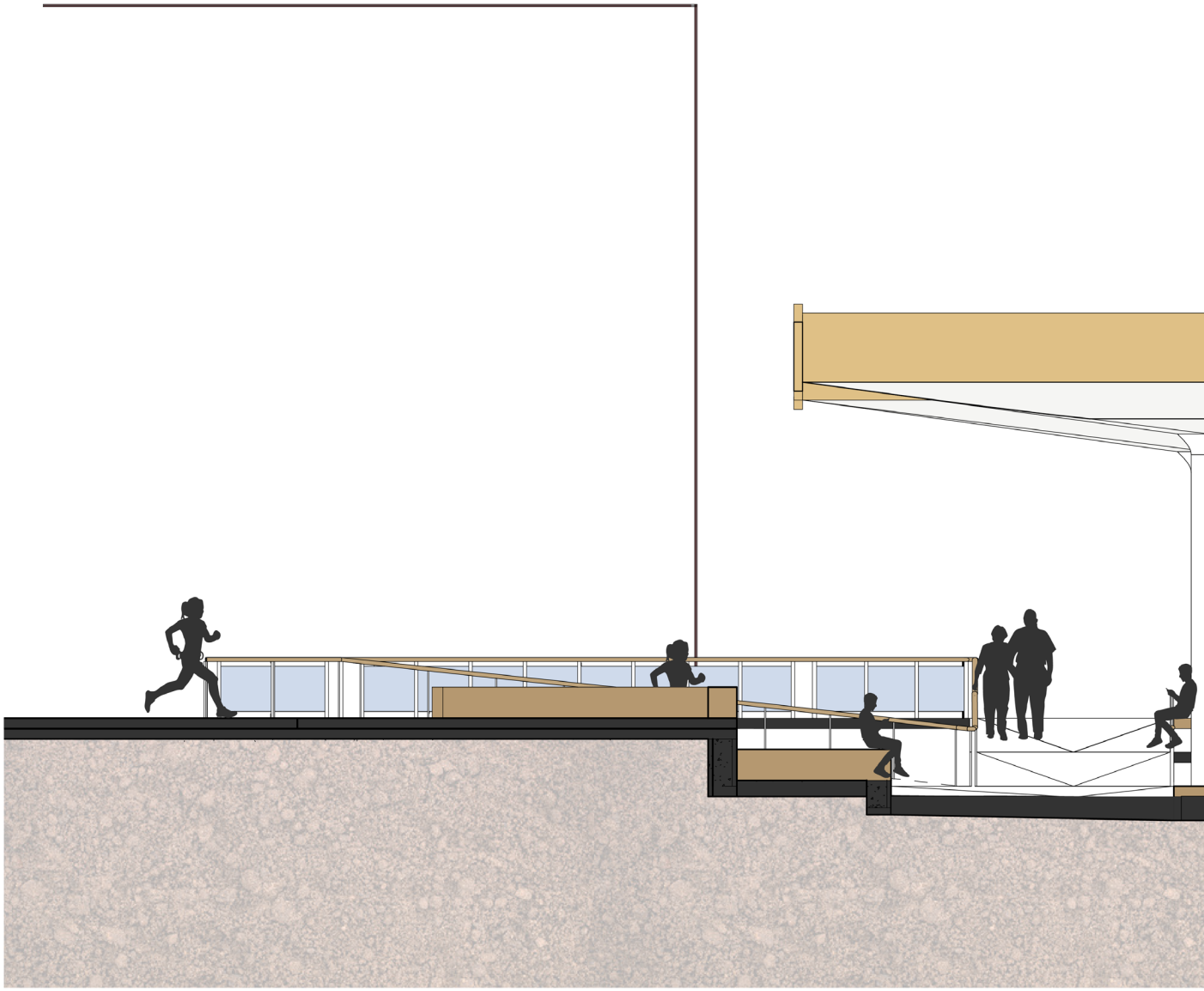
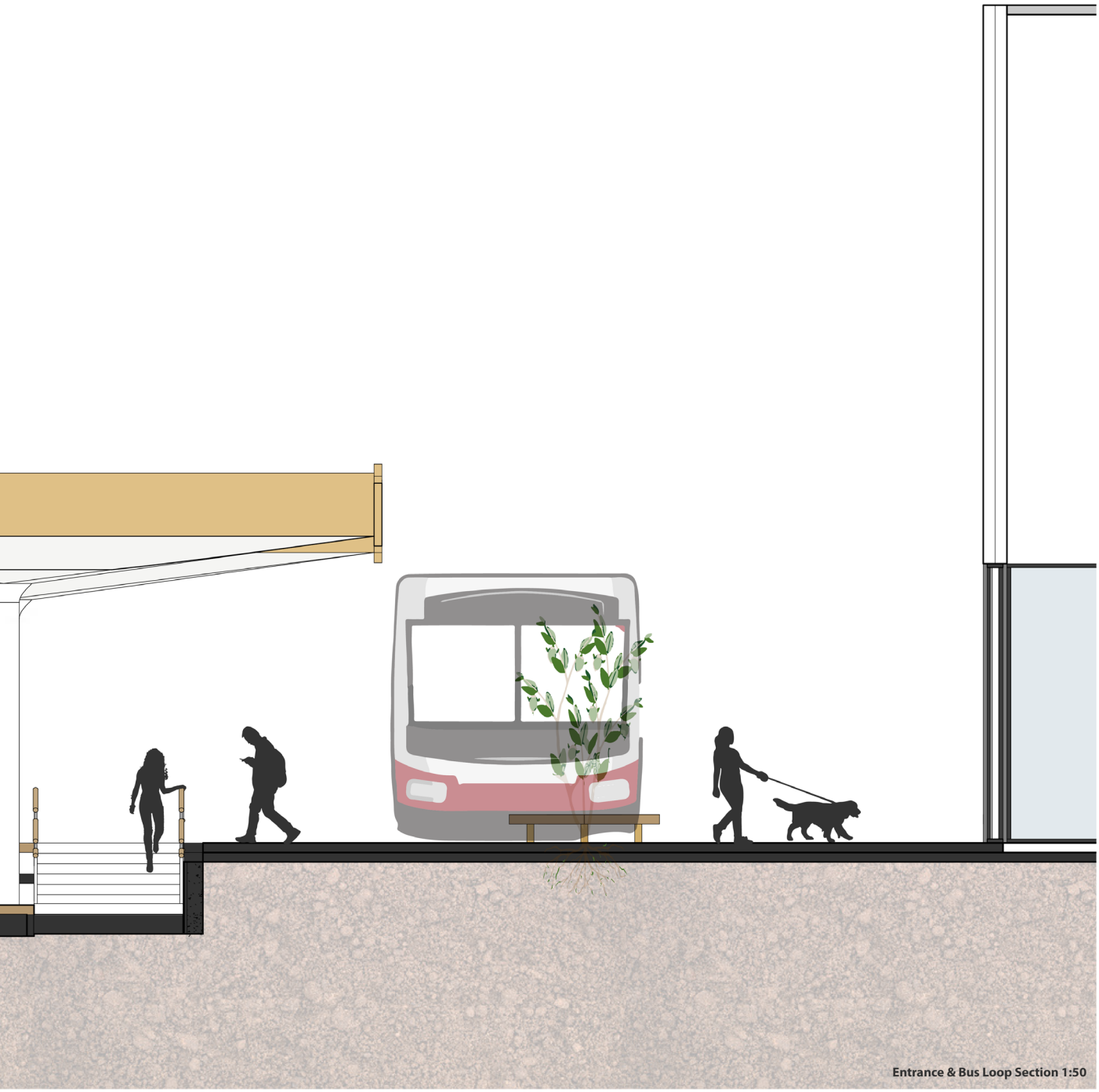


Figure 4.14b: Entrance Section



Entrance & Bus Loop Section 1:50

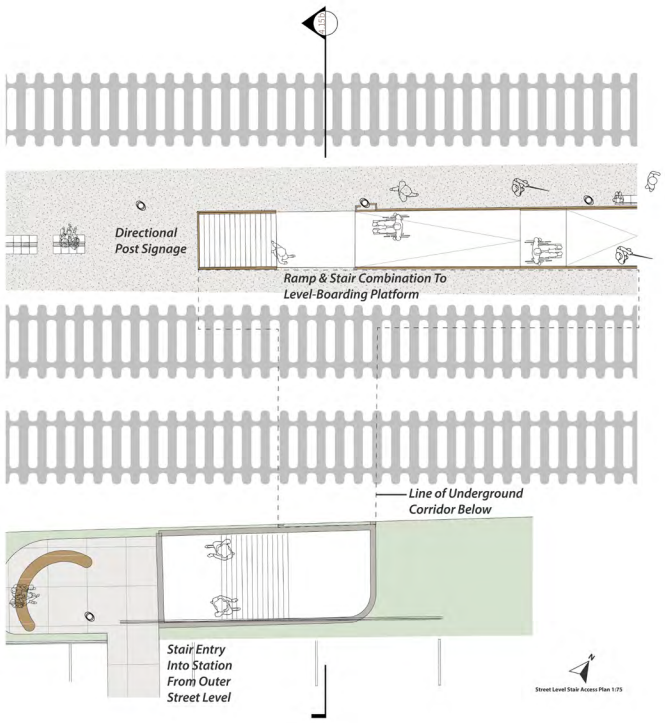


Figure 4.15a: Stair End Entrances Plan

The ramps on each end of the platform provide a set of stairs that can be accessed from the street level by Royal York Road, Audley Street and Manchester Street. These stairwell access points provide an effective and shorter pathway to enter the platform for a typical, everyday commuter. These are placed on the ends as many commuters have ticket passes that do not require patrons to enter the station building, thus contributing to the ease and efficiency of operations. All the entrances are located at four cardinal points as there are further connections to bus stops, pedestrian corridors, local shops, and vehicular drop-off sites that contribute to maintaining the flow of users within the community hub.

There are always negative effects that come with vertical travel in which anyone who struggles with long walking distance or multiple flights of stairs will always find the need to rest in between.

Figure 4.15b: Stair End Section

As seen in both ground floorplan and below ground floorplan, there are integrated bench seating located between each ramp-stair combination set. This allows plenty of opportunity for users of any age and ability difference to rest and relax while travelling throughout the station building. The bench seating becomes a typical form that is repeated and integrated into the landscape of the broader site to connect the two landscape lines.

Within the station there are 3 main facility types designed to critique existing accessibility barriers and promote fluid traffic: ticket booth, universal washroom, and designated seating area. The ticket booths are located directly in view from the two main street level entrances that include frosted channel glass walls, accessible height counters, rounded walls, and train display screens. This allows customers to easily locate assistance when needed, lessen the chance of

Figure 4.16: Ticket Booth

Accessible Ticket Booth

bumping into corners, and most importantly provide opportunity for those with ability differences to both work behind the counter and be a customer. The universal washrooms are centrally located and placed at the beginning of each platform ramp to be easily accessed and seen from any part of the station. The washrooms provide gender neutral and accessibility accommodations due to each being an individual private washroom. The walls provide a small section at the top as frosted channel glass to allow for diffused lighting conditions as well as a line of site to areas behind the facilities from opposite ends of the station.

The designated seating area is accessed through a short ramp and strategically placed lower than the main floor of the station. This is to protect users who are waiting for their train from getting trampled by rushing commuters or people passing through. This seating area is surrounded by a wood railing that provides braille directional wayfinding. The braille indicates the directional cues for those with visual impairments to find the appropriate platform with independence. This braille railing detail becomes a type of wayfinding solution that is repeated throughout the railings along the walls of the station, stairwells, rampwells, and platforms. Further proving that the railing can be used as both a support structure and navigational tool together. An additional method of wayfinding and safety used throughout the station is the utilization of flooring material. The flooring is made of a rubber track surface that is applied as a smooth or textured surface according to particular circumstances. The flooring is easily installed by a pouring method that allows for interchangeable GO Transit yellow edge tiles at the top of each landing and linear floor drains at the bottom of each ramp or stair.

Working alongside the textured wayfinding details as informational tools and safety cues, the station requires detailed signage.

The signage used throughout the station uses large font formats with contrasting colours to indicate a specific space, the direction of travelling trains for the platform and the directional cues the user is travelling towards. The large font size along with a contrasting colour scheme provides clear and easy to read information from any point within the station. The lettering of the signage has a slight glow that emits light and will contribute further to readability in low light conditions for both indoor and outdoor settings.

While the outdoor landscape of Mimico GO utilizes canopies for light and sound control, the interior of the station is designed in a similar manner for the ceiling acoustics and lighting conditions. The nature of tunnels through materiality and the way both sound and light move throughout creates uncomfortable conditions for pedestrians such as echoes, low-light conditions, damp, and hard materials. The ceiling uses a particular pattern and spacing of alternating suspended wood wave tiles with linear LED strip lights and ventilation. The placement of each component runs East to West, creating a visual cue of the direction of the platforms. The specified spacing of wave tiles allows for varied conditions: a pocket of space for sound to travel through, space for ventilation and other HVAC components, and interchangeable with thin suspended linear LED downlights. The wave tiles create concave facet shapes similar to the canopy wave frames dispersing sound in all directions. These tiles overlap with one another and are made of acoustic cork wood to match the materiality of the canopies, trap and absorb sound and to bring a warmer, softer feel to the below ground landscape. The materiality of the tiles work together with the LED downlights in creating an inviting atmosphere where the lights reduce excessive lighting conditions, glare, and a multitude of reflections. Thus, creating a clear and safe space with focus on efficiency of comfort and fluidity.

Figure 4.17: Designated Seating


WESTBOUND TRAINS
WESTBOUND TRAINS
BUS CONNECTION
NORTHBOUND
Windsor
Tickets
Billets

4.4 Fluid Pathways

Efficiency and safety are two of GO Transit's top priorities when it comes to the operations of the system as a whole. This is a key component that is carefully considered in the details of each designed solution especially through the movement and fluidity of users through pathways.

At every entrance to the station property, there are set conditions for specified environments such as the stairwell entries for fast-paced daily commuters, the main entrances for anyone unfamiliar with the station, and the neighbourhood entrances for those just passing through. All situations call for different parameters, speed, and time but all collide in the middle at the station property. The proposed design creates multiple routes with available options and conditions to meet the requirements of any user. This is due to the difference in abilities that varies from one user to the next. One of

the main components to achieve detailed designs and abundance of options are the dimensions of both vertical and horizontal paths. All hallways, stairwells, and rampwells extending horizontally or vertically measure a minimum of 3-meters wide to accommodate space for two manual powered wheelchairs side-by-side. The ramps used throughout the site are coupled with a landing at every 9-meter length interval, to provide a flat resting area permitting a manual-powered aid device to make 360-degree turns. These landings are then combined with a side wood section for those with mobility devices such as wheelchairs to park and rest out of the way of moving traffic.

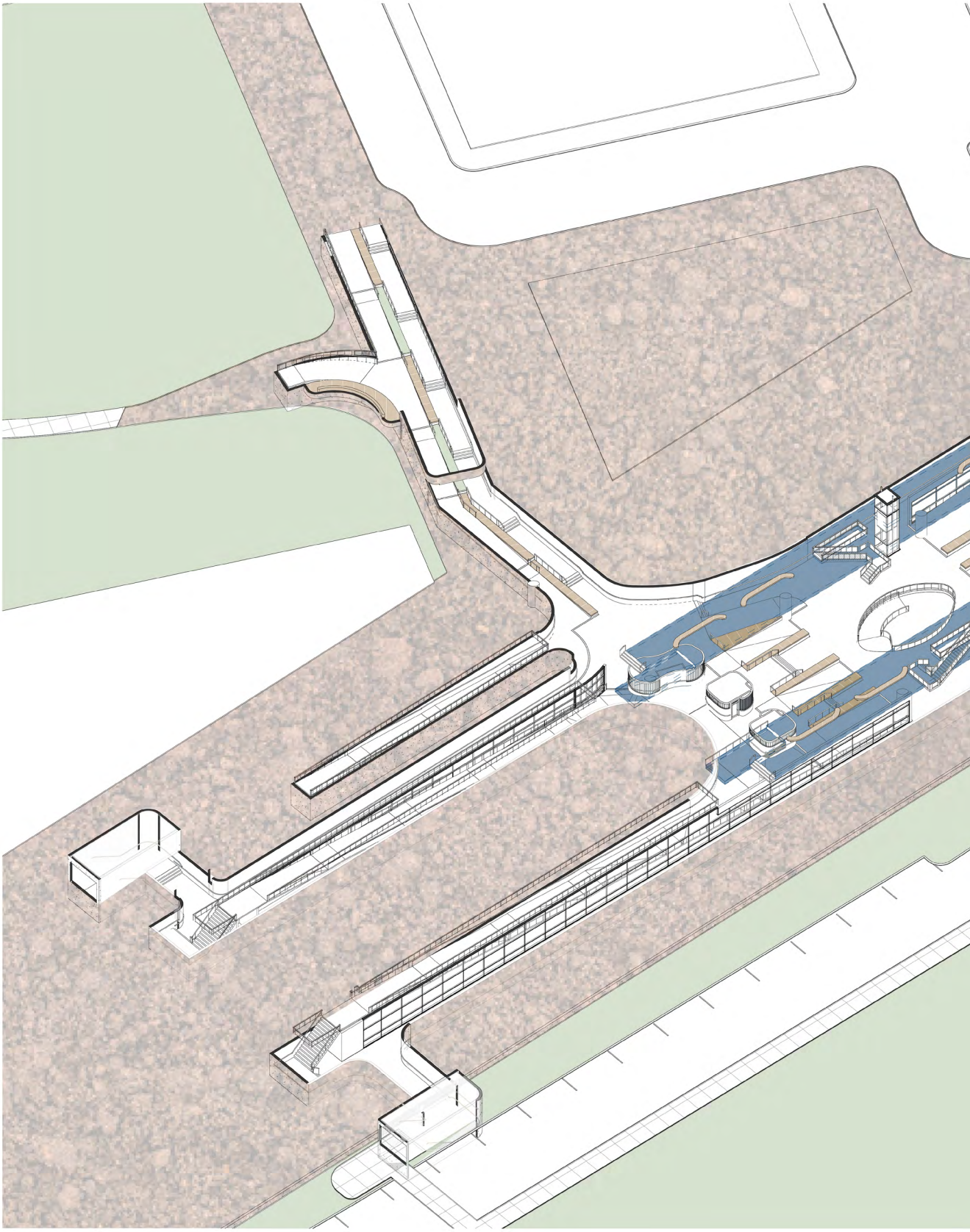
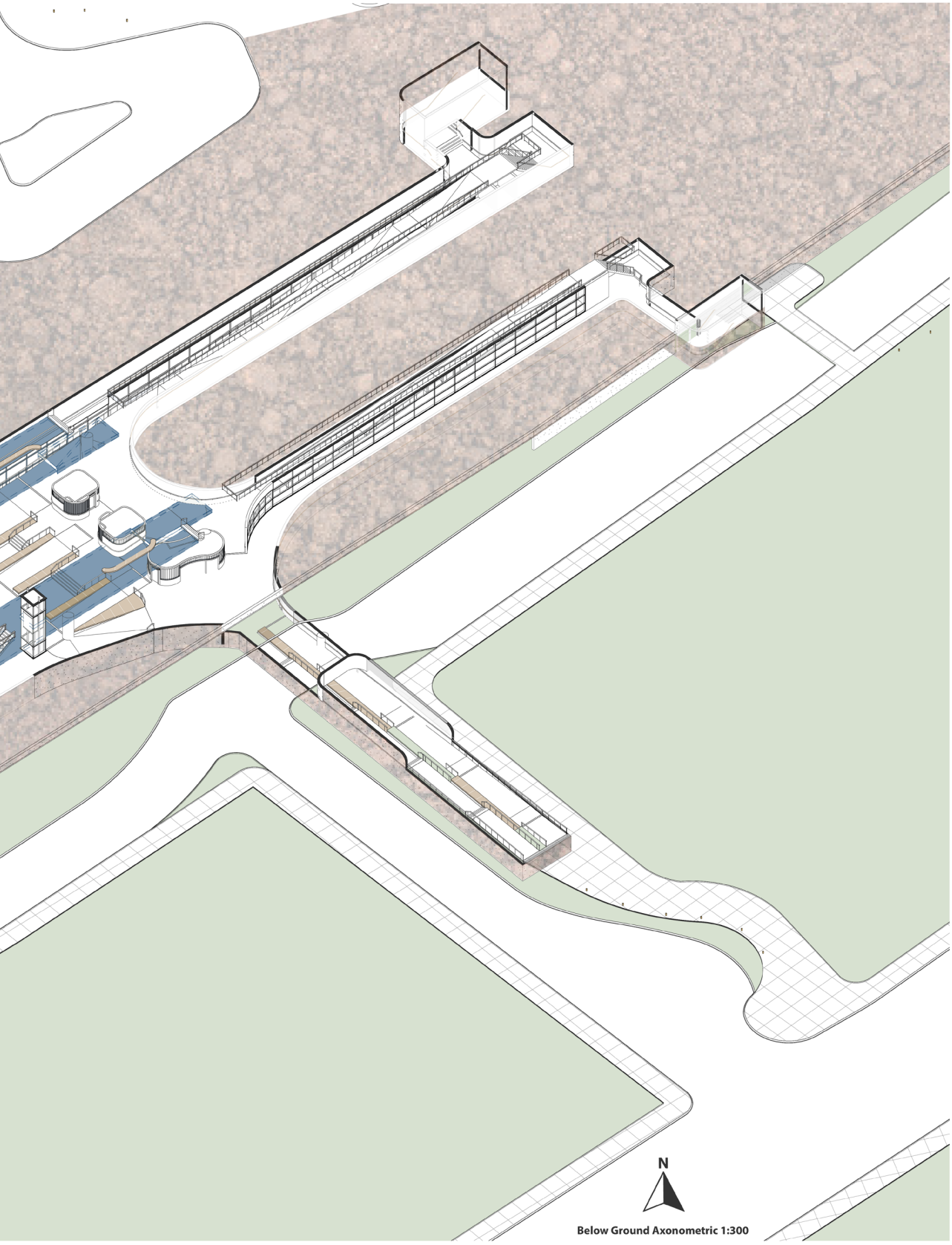


Figure 4.18: Below Ground Axonometric



Below Ground Axonometric 1:300

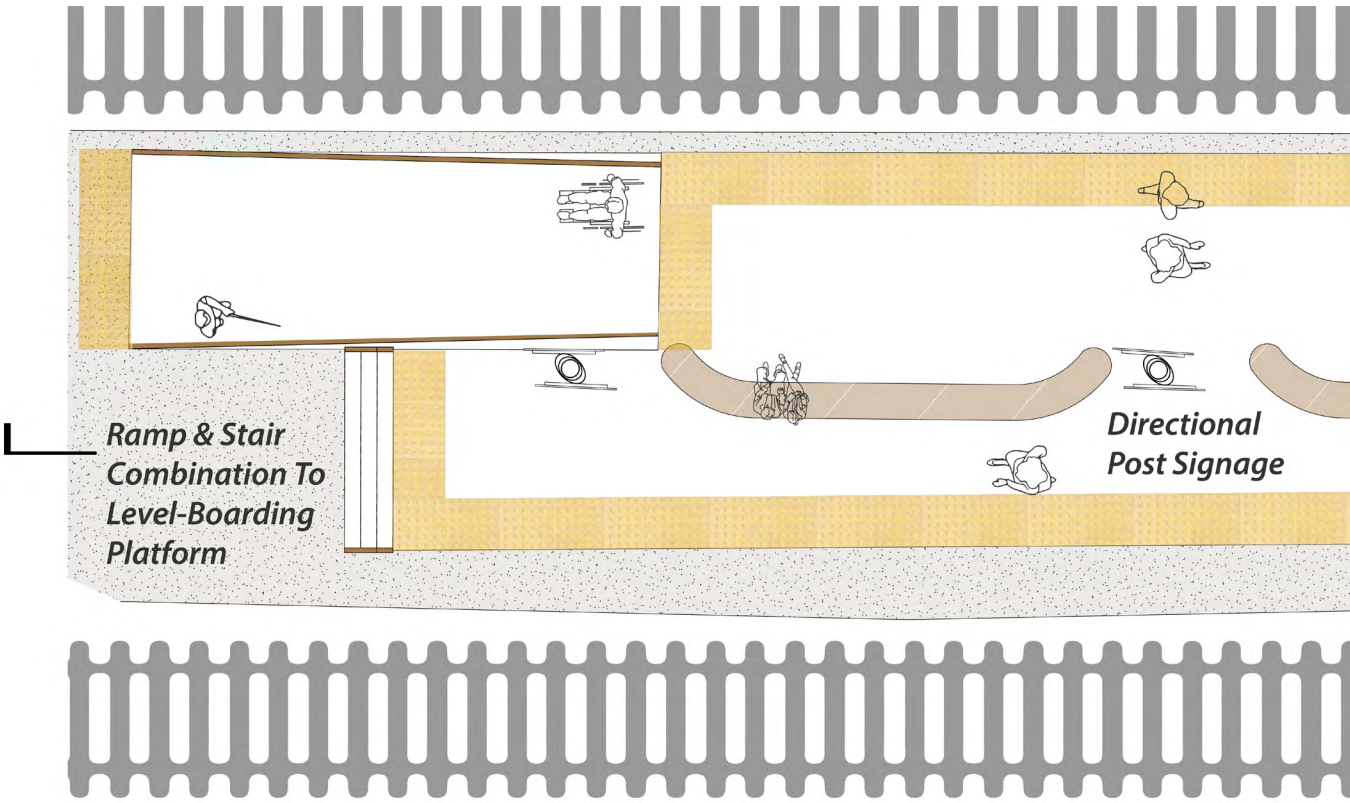
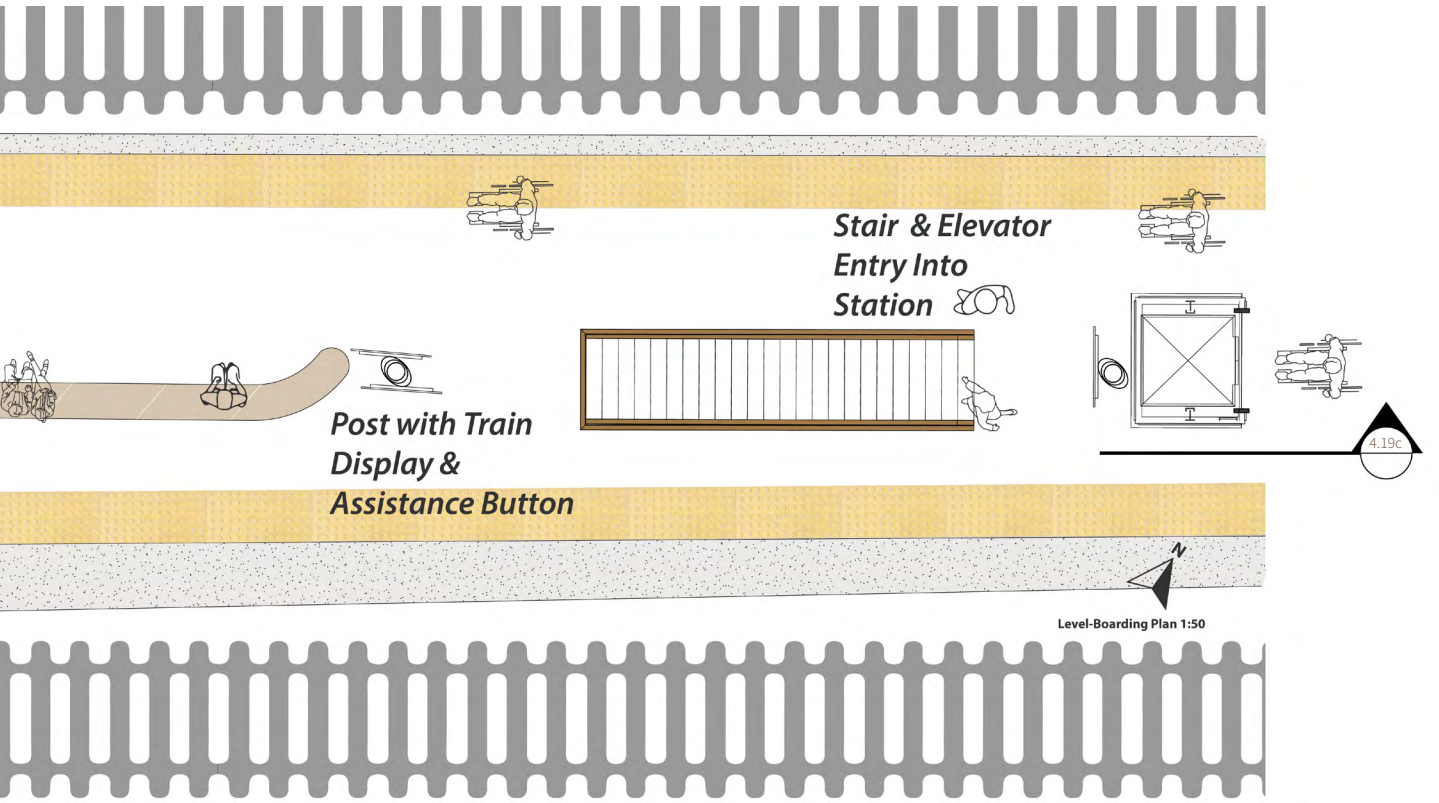


Figure 4.19a: Level-Boarding Plan

The placement of pathways is another aspect that must be considered for the safety of users especially on the platform level. The rampwells and stairwells are located in the center of the platforms and run in line with the platform length to ensure a minimum 1800-milimeter width from edge of platform to the railing. This minimum requirement allows for a safe passing width away from the edge and any trains passing by.

The seating area and pathways along the level-boarding platform function differently compared to the existing platform level as this area provides a higher level of accommodation services that go



beyond architectural design. The level-boarding section has changed to be centered and in line on both platforms which is then enlarged to accommodate for at least three GO Transit coaches in length. Due to the varying heights of train cars that utilize the station, creating the entire platform equal with floors of all GO Transit cars was not feasible and would cause the proposed ramps to extend further out by an additional 9-meters in length. This design choice would in turn encourage Metrolinx to place multiple accessibility coaches in a row as there is the space to do so, ultimately providing accessibility accommodation that goes beyond the minimum.

Figure 4.19b: Level-Boarding Platform

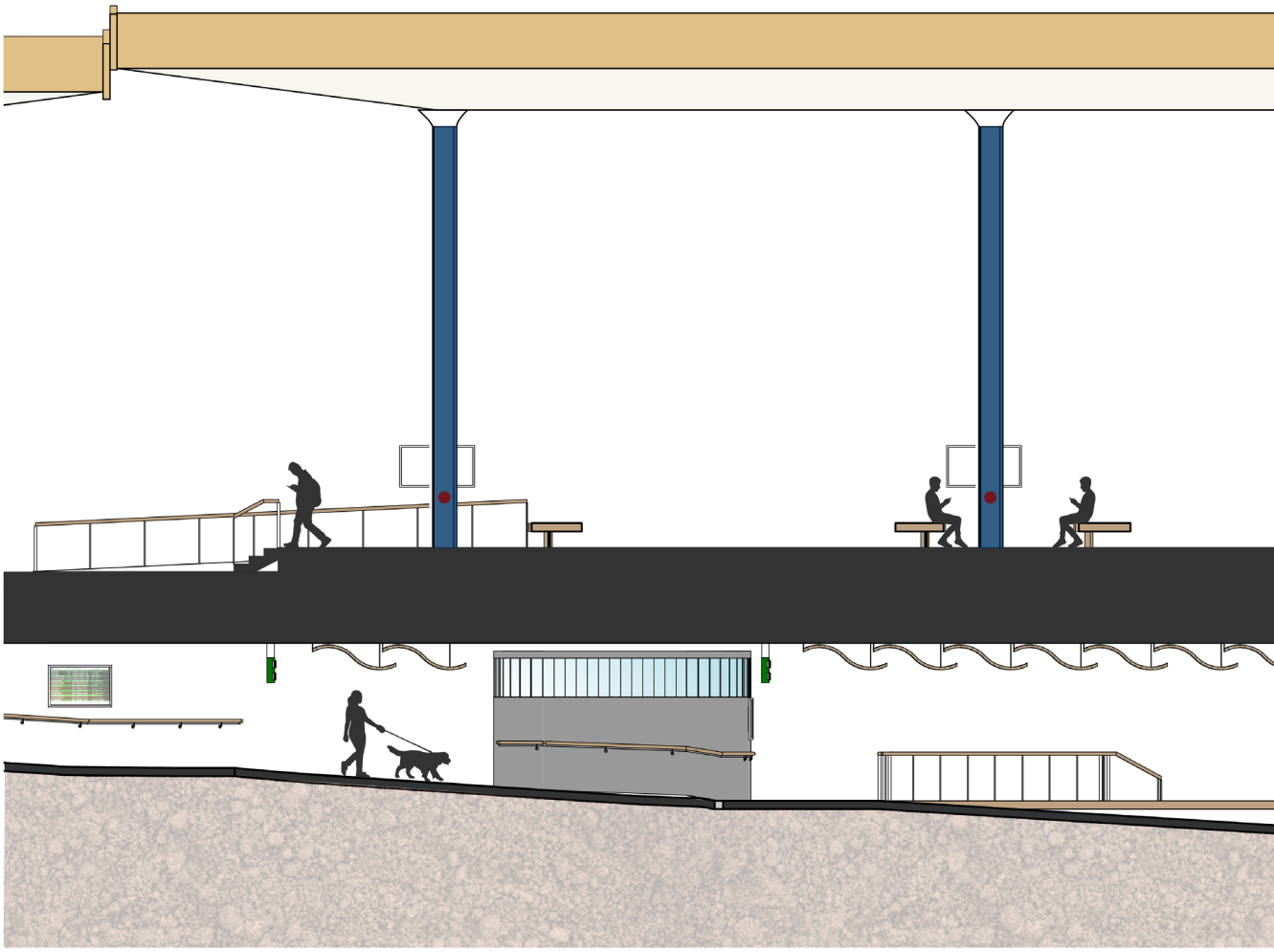
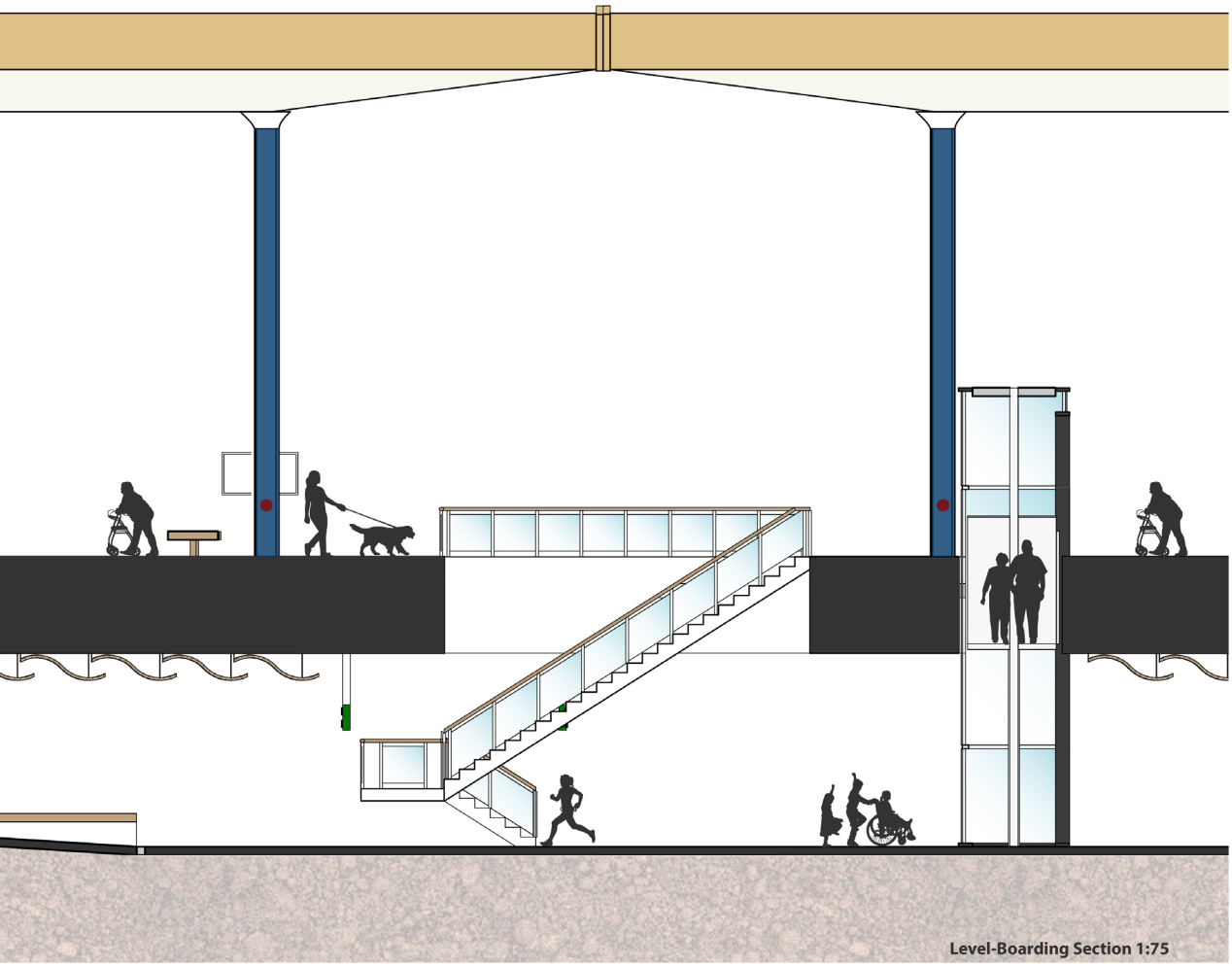


Figure 4.19c: Level-Boarding Section

Along with the extension of the level-boarding platform, train conductors would have a larger space allotted to stop the train, increasing operational accuracy, efficiency, profit, and customer satisfaction. The level-boarding platform consists of an abundance of seating options, plenty of signage indicating the direction of train travel. Equipped at coach length intervals along the entire platform is a variation of the braille rail.



These rails indicate the direction the train will travel through raised braille inscription and include a specified number of oval rings placed at the center. These rings indicate the coach number that will arrive nearest to the user's location on the platform, for example, three oval rings means the user is 3 coaches away from the accessibility coach which is located at the center of the train line. Ultimately providing a rail that acts as a tool for physical support or transfer of information that increases the independence and sensorial experience of riders utilizing the GO Transit system.

Figure 4.20: Memorial Gardens Entrance

Memorial Gardens Ramp Entrance

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Except accessibility does not stop at architecture, rather accessibility begins with design and then further required to integrate with other disciplines in order to be fully accommodating, universal and effective as a whole.

Conclusion

Conclusion: Beyond Architectural Design

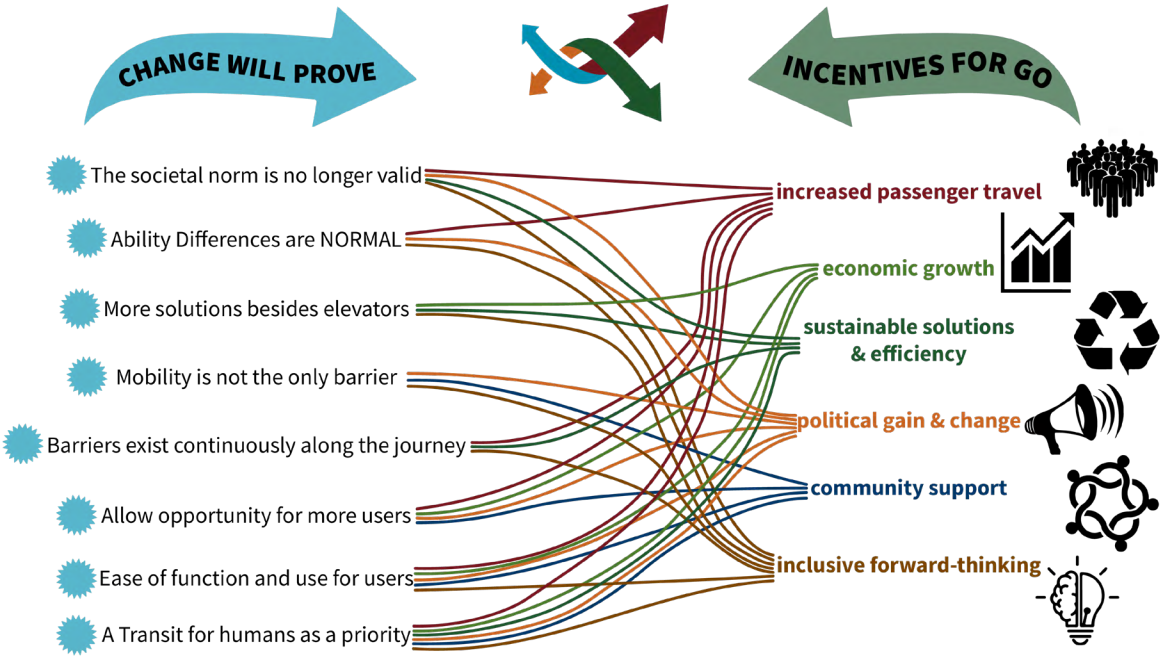

Figure 5.1: Incentives

Throughout the design process of the Mimico GO station, there were several parameters that presented itself as barriers to overcome to create an accommodating space for as many ability differences as possible. Through the use of the Ability Matrix, accessibility studies, and architectural design components, the overall design of the station proves there is no single solution that solves the issue at hand. Thus, there are many architectural design solutions that must work together to come close to enhancing experiences for the masses. Except accessibility does not stop at architecture, rather accessibility begins with design and then further required to integrate with other disciplines in order to be fully accommodating, universal and effective as a whole. A few disciplines with backgrounds differing from architecture that would be required to evaluate projects of public transportation hubs are politics, urban planning,

Figure 5.2: Pedestrian Corridor

Pedestrian Corridor & Multipurose Grass

psychologists, feminists, sociologists, education, healthcare, law enforcement, and theorists on disability studies. These few are imperative to creating a fluid space that accommodates for all walks of life in the public realm. These disciplines will not only improve the designed spaces through perspective but can implement other services that contribute to the operational accommodations such as education of workers, education of the community, policies for inspection, legal enforcement of penalties, etc. The implementation of policies for situations such as costly penalties for having an elevator broken for over four hours or damage to pedestrian pathways of any kind will incentivise the public to be vigilant about proper maintenance, safety, and accessibility. Several other services that would go beyond the minimum and could be considered a standard practice for accessibility accommodation are onsite emergency personnel, one-on-one

personal care travel assistants, safety ambassadors, yellow flower lanyards for those who specialize in assisting with patrons with autism and GO Transit audible announcements of all train services such as trains arriving, the time of day, and where to find extra assistance. The project proposal at hand proves that accessibility can be considered first and with equal importance in comparison to other priorities providing comfort, independence, confidence, choice, and education through the experience of the space. Therefore, sensorial enhancement through design is a method that works alongside a multi-disciplinary spectrum to improve the overall experience of each individual that utilizes this space. Ultimately, demonstrating that every human no matter their difference in ability deserves to benefit from the opportunities offered to the public without being discriminated against.

EVERY HUMAN NO MATTER THEIR DIFFERENCE IN ABILITY DESERVES TO BENEFIT FROM THE OPPORTUNITIES OFFERED TO THE PUBLIC WITHOUT BEING DIS-CRIMINATED AGAINST.

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