

**An Analysis of Placemaking and Wayfinding Initiatives on the
Halifax and Dartmouth Harbourwalk for Wheelchair Users**

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Chapter 1: Introduction

1.1.0 - Background

Public spaces are designed to be accessible and contribute to the general well-being and quality of life of those who utilize them. They are spaces designed and organized to reduce barriers and be as accessible to as many individuals as possible, promoting inclusivity and user-friendliness. As such, they are vital in promoting equity within the space to ensure everyone can enjoy themselves without worrying about obstacles to accessing these areas.

Equity, as defined by the Cambridge Dictionary, is the “*situation in which everyone is treated fairly according to their needs*” (Cambridge Dictionary, n.d.). It is an important concept to consider within public spaces, as the more accessible they are, the improved mental health and well-being they provide (The Saint John Human Development Council & Department of Justice Canada, 2021). Although equity is essential in creating these public spaces, it is not easy to achieve due to the complexity of accommodating individuals to their personalized needs. As a result, publicly available spaces should be monitored and analyzed to determine whether they meet accessibility requirements and ensure maximum equitable access and use by all people.

Consideration towards equity within public spaces is an increasingly important practice that needs to be followed as it contributes towards sustainable urban development practices within cities. It allows everyone to feel safe within without worrying about barriers to accessibility, with the freedom to move anywhere. Despite this, however, there is still much work that needs to be done to achieve this, as major Canadian cities like Calgary, Vancouver and Ottawa have been reported to have nearly 60 percent of their public spaces deemed to not be fully accessible overall for individuals with disabilities (AccessNow, 2023). Although this analysis was not done

in Halifax, Nova Scotia, it has one of the fastest-growing downtowns in the country (Statistics Canada, 2022), with one of the highest percentages of persons with disabilities, with 28.5% of the population reported to have a disability in 2017 (Statistics Canada, 2019). As a result, it brought forward questions about whether accessibility standards are met within Halifax and whether there are considerations toward equity in the built environment.

1.2.0 - Research Questions

In narrowing down the scope of the thesis, the general focus is on wheelchair accessibility analysis on placemaking and wayfinding infrastructure within the Halifax and Dartmouth Harbourwalk. Wheelchair accessibility was decided upon based on different accessibility requirements around standards and having the most documented information at the municipal and provincial levels. Addressing the accessibility of placemaking and wayfinding infrastructure was aimed at addressing and identifying barriers that hinder the equitable use of spaces within existing infrastructure meant for equitable use. The public space was chosen because it is one of Halifax's more well-known public spaces that attracts tourists. In addition, the study area consists of two distinct trails with different purposes served: one is a tourist destination with vendors and shops. At the same time, the other is classified as a multi-use pathway.

Through this analysis, research questions were stated to inform the understanding of equitable standards within the study area for wheelchair users:

1. Along the Harbourwalks, what types of placemaking and wayfinding infrastructure are inclusive or exclusive for wheelchair users?
2. Are there differences in wheelchair user equitable standards between the Halifax and Dartmouth Harbourwalks?

3. Are there areas in which the Harbourwalks could be improved as public spaces to be more inclusive and equitable for wheelchair users?

1.3.0 - Significance of the Study

As mentioned previously, public spaces are meant to provide more inclusivity for any individual. There have been considerable efforts to remove such barriers within Halifax, such as the Accessibility Strategy implemented in 2021, which outlines 30 action items to make the HRM accessible (Halifax Regional Municipality, 2021). However, it is necessary to analyze the progressions made regarding accessibility and improve a general understanding of how to eliminate boundaries that impact well-being and be more inclusive.

Halifax is a city that has had a history of discrimination and exclusivity towards many communities. Broken treaties, mistreatment, and forced deportation of the Mi'kmaq people (Native Council of Nova Scotia, n.d.) and a history of environmental racism and discrimination of the African Nova Scotians (Archives, 2023) demonstrate that barriers to social sustainability are essential to address. Under no circumstances should communities go through such terrible experiences again, nor should any communities feel barriers or discrimination. Although more recognition and considerations have been made recently through city planning and increased infrastructure implementation, there is always room for improvement. For instance, Halifax should implement more bottom-up approaches to allow individuals to feel more involved throughout the planning process, especially those who are underrepresented. This would allow for more significant social sustainability standards to be achieved overall.

Social sustainability refers to the approaches and methods that ensure communities can thrive equitably and healthily and maintain a good quality of life (Brian Ka Chan, 2020). Concerning wheelchair accessibility, this sustainability approach can help promote inclusivity and equitable uses within spaces by ensuring accessibility. This can help reduce inequalities and help reduce barriers within their lives, improving their experiences and mental health. Within the scope of the Sustainable Development Goals (SDGs), these initiatives towards social sustainability can help make these initiatives towards a more sustainable world more achievable.

1.4.0 - Limitation Acknowledgement

A significant limitation that should be acknowledged is that an abled-bodied individual did this research. It is significant to understand that this thesis is mainly done by observing and analyzing existing Halifax and Dartmouth Harbourwalk infrastructure based on existing documentation. However, this research should not be taken fully into account as the experience of wheelchair users should be prioritized and focused upon more than the findings and analysis contained in this paper. Personalized experiences of wheelchair users within public spaces are more significant as their experiences could differ and not be addressed within these documents – which is essential to urban planners’ understanding of an equitable public space’s considerations. This thesis aims to identify areas of poor placemaking and wayfinding infrastructure with a generalized analysis that would allow for potential further research.

Chapter 2 – Literature Review

2.1.0 – Introduction to the Literature Review

As the thesis is aimed toward the recognition and observation of placemaking and wayfinding infrastructure within the study area and their usability for wheelchair users, it is essential for relevant research practices to take place prior to the analysis. Research and observations made in the literature review can help future initiatives toward equitable practices through policies, design standards, and practices that aim for the inclusivity of wheelchair users. As a non-disabled individual, conducting research and understanding such practices are vital in strengthening potential gaps in the research.

2.2.0 – Hostile Architecture and Universal Design Practices

Hostile architecture, or defensive design, is a systemic design deliberately or accidentally meant to exclude certain groups from the space (Keil & Le-Moal, 2019). As a result, it can potentially present a significant barrier to accessibility within urban environments. This form of design intervention, whether intentional or not, restricts how individuals can utilize public spaces and limits the usability of these areas (Keil & Le-Moal, 2019). While wheelchair users may not be direct targets of hostile architecture, certain design features can inadvertently create unwelcoming or limiting conditions for wheelchair users. It is crucial to acknowledge these potential barriers to accessibility to ensure that placemaking infrastructure remains inclusive and usable for all individuals. It is essential to consider this within the scope of the thesis, as hostile architecture can be a significant barrier for wheelchair users and should be observed when analyzing infrastructure accessibility.

Universal design, as defined by the Nova Scotia Accessibility Directorate (2023b), is a concept to ensure that existing spaces are accessible and can be utilized by all people regardless of their ages, sizes, abilities, or disability. As such, these principles can offer a framework for creating environments that are equitable, accessible and inclusive. According to the Nova Scotia Accessibility Directorate (2023b), universal design ensures that any environment's design meets everyone's needs without imposing barriers based on physical or cognitive characteristics. When considering placemaking and wayfinding infrastructure, it is essential to assess whether design features create barriers for wheelchair users. Common negative barriers include the presence of staircases and rough terrain, which can limit access and usability for individuals with mobility impairments.

2.3.0 – Importance of Placemaking and Wayfinding Infrastructure

The thesis will observe wayfinding and placemaking infrastructure concerning wheelchair users within two distinct study areas. They both have essential purposes within cities, to help enhance their experience within the space while tailored towards the contribution of a functional, livable, and accessible city. Placemaking is defined as the approach around the built environment within public spaces that are built for people. It can help promote the individual's health, well-being, and happiness based on the interactive and social elements it can bring (Discover Halifax, 2020). On the other hand, wayfinding is defined as a guide to help with navigation or could provide an understanding of the space, such as historical or cultural significance and characteristics (Discover Halifax, 2020). As a result, such infrastructures can improve wheelchair users' feeling more included and allow them to use the space in the same way as able-bodied individuals can if public spaces are constantly improved and equitable infrastructure is implemented. This is why

improving accessibility and usability is essential in placemaking and wayfinding infrastructure for wheelchair users. It could be improved through frequent methods and analysis of surveying and research, such as within this thesis.

2.4.0 – Wheelchair User Acknowledgement in Provincial and Municipal Documentation

Observations on publicly existing documentation are necessary as they help determine the scope and provide hindsight on what initiatives various sectors have made towards providing the necessary accommodations and initiatives for wheelchair users. When observing wheelchair accessibility at the provincial and municipal levels, it is essential to synthesize publicly available documentation to discern their scope and understanding of accommodating wheelchair users. Starting with the Nova Scotia Accessibility Act by the Nova Scotia Legislature (2017), this document emphasizes and aims for collaboration to make Nova Scotia accessible by 2030. This extended to the built environment, including placemaking and wayfinding initiatives, which helped align the goals that the Halifax Regional Municipality (HRM) (2021) focused on in their Accessibility Strategy with 30 action items. This strategy emphasized inclusivity, addressing barriers within the built environment, which is evident in its references to the Rick Hansen Certification and the CSA B651-18 standards outlined.

Another document set in motion after establishing the Nova Scotia Accessibility Act was the Interim Accessibility Guidelines for Indoor and Outdoor Spaces by the Nova Scotian Accessibility Directorate (2023b). This document further amplified the awareness of accessibility standards by providing an Accessibility Index and regulatory framework for spaces, including placemaking and wayfinding infrastructure, utilizing the CSA B651-18 as a guide. Finally, the

HRM Integrated Mobility Plan (IMP) (2017) delved into the broader concerns for wheelchair users, indirectly affecting placemaking and wayfinding initiatives by considering street design practices and the movement of individuals. These interconnected strategies on the municipal and provincial levels have collectively provided diverse perspectives and standards crucial for comprehensive qualitative and quantitative analysis of placemaking and wayfinding initiatives.

However, some characteristics of wayfinding infrastructure were either not considered or discussed thoroughly, which may impact usability and accessibility within the provincial and municipal scope. Informational signage may be designed as plaque signage, where, dependent on the angle of the signage, it may impact the visibility and usability of the infrastructure. This information was also not found at the federal level. The most relatable information was established by Accessibility Services Canada (2018), which briefly discussed the angle of interactive touchscreens. As a result, an improvised method for analyzing signage angles will be made to reduce errors within the analysis.

Another characteristic not addressed within regulations was the required or preferred signage height for wheelchair users to improve its overall visibility and considerations towards the limited movement of wheelchair users. Although there are regulations regarding signage characteristics such as fonts and character sizes, information surrounding appropriate signage height may have been underprioritized or considered unimportant compared to other regulations. As a result, guidelines established by the Northern Region Inclusion and Access Committee (2020) on Accessible Signage will be utilized, as optimal viewing points for wheelchair users were provided within the source.

2.5.0 – Relevance to Sustainable Development Goals

The SDGs, outlined by the United Nations (2015), provided a framework to address global issues and promoted sustainable practices within different sectors of society. The SDGs provide a lens through which to assess the thesis's regulations regarding themes and topics. Relevant SDGs will be analyzed concerning the thesis's scope and overall relevancy.

Goal 3: Good Health and Well-Being

Physical and mental well-being can be improved through creating accessible environments that would not exclude wheelchair users. Following Grace Katharine Forster et al. (2023), there are correlations between the relationship and accessibility of the built environment to an individual's psychological and mental well-being. Through the research and implementation of inclusive placemaking and wayfinding practices, improvements can be made toward a wheelchair user's health and well-being to use infrastructure without barriers or issues.

Goal 10: Reduced Inequalities

Placemaking and wayfinding initiatives can help remove inequalities by assuring that equitable access to public spaces and services will be provided for all, including wheelchair users. As a result, it is essential to identify inequitable practices within design practices to help improve equity and inclusivity, no matter who the individual is. Addressing inequities requires effort and research toward prioritizing practices of inclusivity and accessibility within public spaces through the involvement of marginalized communities through community engagement and research.

SDG 11: Sustainable Cities and Communities

Placemaking and wayfinding infrastructure help support goals for safe, inclusive, and sustainable cities and communities. Improving accessibility and one's experience helps contribute to being vibrant and accessible within a public space. In the case of the thesis, inclusive and equitable infrastructure and sustainable practices for wheelchair users are needed to improve social aspects and well-being.

As a result, incorporating SDGs within placemaking and wayfinding practices is essential for wheelchair users to help promote sustainable, inclusive, and accessible practices within public spaces. As a result, further research into the field is essential to improve and enhance the experiences that wheelchair users face within public spaces to observe areas of improvement.

Chapter 3 – Methodologies

3.1.0 - Study Area: Halifax and Dartmouth Harbourwalk

The study area must be delineated based on the various visualizations and conceptualizations of the Harbourwalks, including where it starts and ends.

This is vital to ensure the consistency and accuracy

of the information

presented. The source

heavily utilized for defining

the study area was the existing informational signage throughout both study areas, displayed in Appendix A. Despite the outdated nature of the provided map, it provides a foundation for providing information for its users to identify their location. Through the analysis and observation of different depictions, the study area was outlined based on different considerations, as outlined in Figure 3.1. Like the informational signage within the Harbourwalks, this representation excludes the Port of Halifax from the study area. The Active Travelways shapefile was extracted from the HRM (2018a)'s HRM Open Data database to outline this study area, which was clipped and modified to represent the outlined study area.

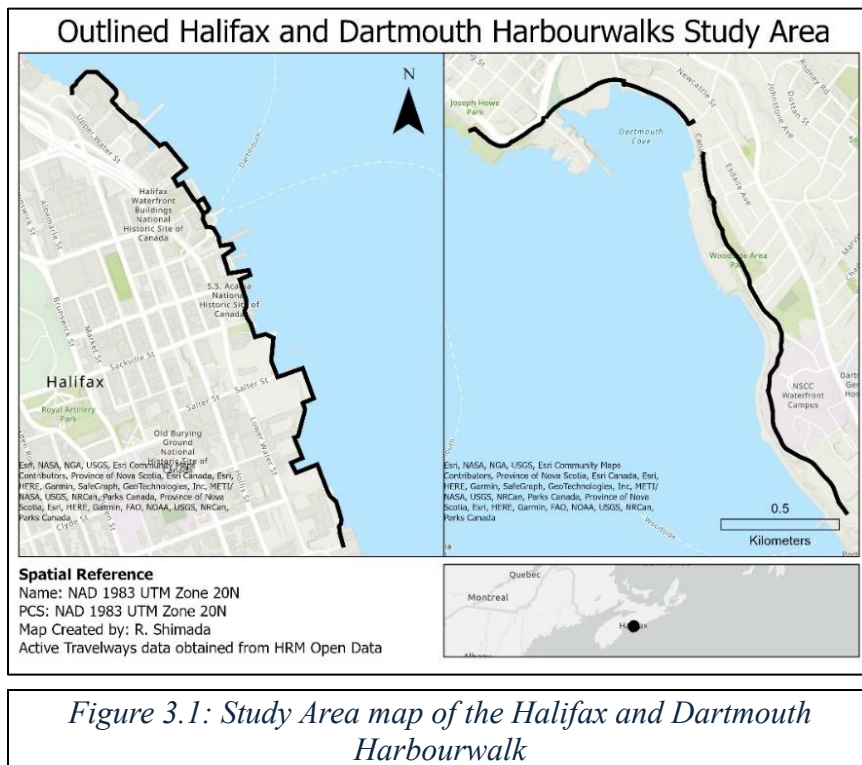
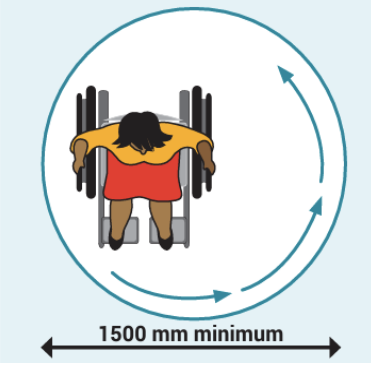
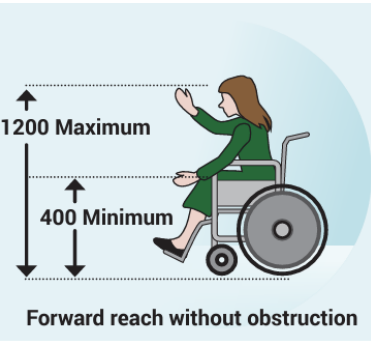
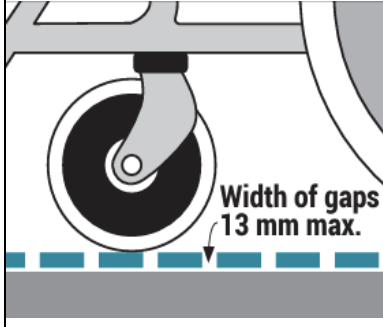
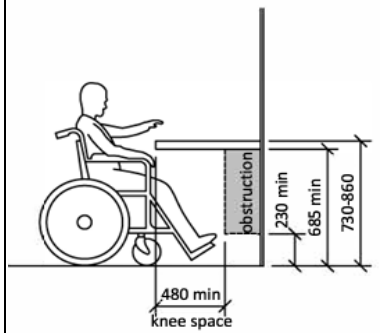
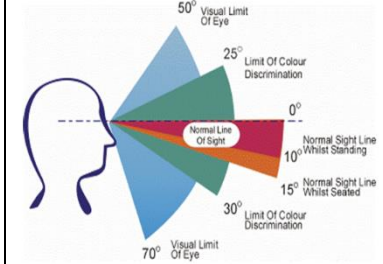


Figure 3.1: Study Area map of the Halifax and Dartmouth Harbourwalk

3.2.0 – General Wheelchair User Guidelines

This thesis observed general requirements for placemaking and wayfinding infrastructure design for wheelchair users. Such observations are essential, as barriers could be imposed when outlined design requirements are not met to help remove barriers for wheelchair users. As a result, guidelines and advice provided at the provincial and municipal level will be consulted and utilized to outline critical considerations necessary to improve equitable standards for wheelchair users. One design regulation/consideration made within the guideline recommendations on the vertical field of view was provided through personalized research and thoughts.

Design Regulations/ Considerations	Diagram/Image (if any)	Purpose for placemaking and wayfinding initiatives	Source
Design considerations towards a wheelchair user's turning radius		Placemaking and wayfinding infrastructure should be considered to ensure that the space and design are accessible and usable for wheelchair users. Failing to meet the minimum standards would result in barriers to access and infrastructure usability.	Nova Scotia Accessibility Directorate, 2023c
Design regulations for a wheelchair user's reach		Considerations towards the forward reach of wheelchair users are essential as interactive features and signage are positioned within reach of wheelchair users without requiring excessive stretching or straining. Such considerations would promote and ensure equitable use.	Nova Scotia Accessibility Directorate, 2023a

<p>Design considerations of floor width gaps</p>		<p>When approaching infrastructure, wheelchair users should not encounter obstacles or hazards that could impede their movement within the outdoor environment. A lack of consideration could result in a wheelchair user facing difficulties maneuvering through the environment.</p>	<p>Nova Scotia Accessibility Directorate, 2023d</p>
<p>Design regulations towards knee space/clearance</p>		<p>Although Newfoundland and Labrador outlined the regulation, it outlined the minimum knee space needed for wheelchair users to avoid obstruction. This can apply to signage plaques and placemaking infrastructure and could help identify whether such considerations are made.</p>	<p>Department of Transportation and Infrastructure & Government of Newfoundland and Labrador, 2021</p>
<p>Design Considerations Towards a Vertical Field of View</p>		<p>Further research into an individual’s average vertical view provided angles for standard observations. Such considerations can determine a wheelchair user’s ability to perceive wayfinding infrastructure, especially at an angle. As wheelchair users have a lower eye level than standing individuals, it is vital to consider a wheelchair’s users' vertical field of view when analyzing wayfinding infrastructure suitability.</p>	<p>Environmental Protection Department & The Government of the Hong Kong Special Administrative Region, 2017</p>

Signage character regulations towards letters and numerals	Generalized signage character regulations for letters and numerals shall: <i>Be in Sans Serif</i> <i>Have Arabic Numbers</i> <i>Required width-to-height ratio between 3:5 and 1:1</i> <i>Required stroke-width-to-height ratio between 1:5 and 1:10</i>	Following these guidelines may be generalized for overall accessibility standards. However, these guidelines are essential for ensuring the visibility of the contents on the signage for wheelchair users.	Canadian Standards Association Group, 2018
Signage Height Considerations	Signs should be placed between 1400 and 1600 mm from ground level as that is the optimal viewing point for wheelchair users and people standing.	Considerations should be made towards optimal signage height for wheelchair users. Not following the regulations could impact visibility and cause strain in viewing the signage.	Northern Region Inclusion and Access Committee (2020)

3.3.0 – Universal Design Outlines by the Nova Scotia Accessibility Directorate

Universal design principles are crucial to ensuring equitable access to placemaking and wayfinding infrastructure. Although there are no mandates towards universal design considerations, they are imperative to utilize as they provide guidelines on what should be observed to ensure that standards are met. Especially for the thesis, it was essential to ensure that equitable considerations and prioritizations were made for wheelchair users. Taking inspiration from the North Carolina State University’s Centre for Universal Design, the Nova Scotia Accessibility Directorate (2023b) proposed principles for universal design concepts. The following are principles relevant to the thesis and were observed throughout data collection:

- **Equitable use:** The overall design considers people with diverse abilities to ensure they can use the space.
- **Flexibility in use:** The design is accommodating to the preferences and abilities of its users.

- **Tolerance for error:** The design considers minimizing accidents, consequences, or possible hazards.
- **Low physical effort:** The design considers the users' efficiency and comfortability to ensure they do not experience fatigue.
- **Size and space for approach and use:** Appropriate size and space considerations are made for approach, reach, manipulation, and use of the design regardless of the user's abilities.

3.4.0 – Different types of wayfinding and placemaking infrastructure

Identifying different types of placemaking and wayfinding infrastructure can be vital to understanding potential barriers in wayfinding and placemaking infrastructure. Through analysis, the connection could be made towards whether one type of infrastructure is more serviceable than others and why that is the case. The following are the different types of wayfinding and placemaking infrastructure that will be utilized for identification through the thesis:

Types of Wayfinding Signage (AGC Signs, 2020):

- Identification signage: Inform the individual when they arrive at the destination.
- Directional signage: Directs individuals on where they are going, a guide towards a destination.
- Informational signage: Provides overall information on whereabouts in an area or space.
- Regulatory signage: Focused on safety and liability concerns and regulations.

Types of Placemaking Infrastructure (Wyckoff, 2014):

- Standard placemaking: Public spaces are designed to be permanent and long-term, where people want to live, work, plan, and learn.
- Creative placemaking: Consists of artistic and cultural elements within the design or surroundings of a public space – meant to provide creativity and showcase an individual's or group's identity within a space.

3.5.0 - Phase 1: Identification

In the first phase of the thesis, both Harbourwalks will be traversed through to identify existing wayfinding and placemaking infrastructure to identify these spaces. The first phase of this project will be operated in January, where placemaking and wayfinding infrastructure located within

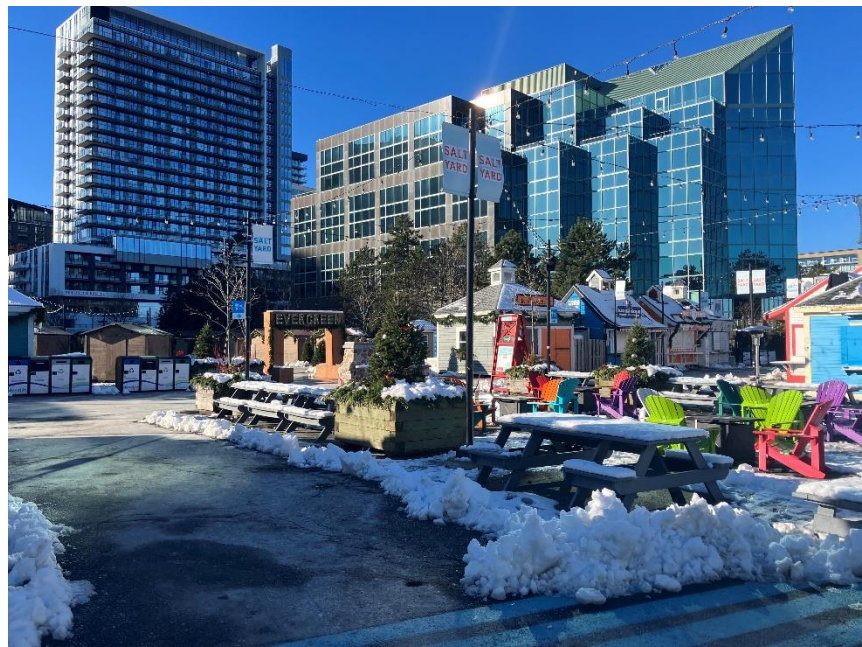


Figure 3.2: Image on the Halifax Harbourwalk with permanent placemaking infrastructure (front of image), and temporary placemaking infrastructure (back of image)

the study area will be recorded. When identifying placemaking and wayfinding infrastructure, the GPS UTM tool will record the infrastructure coordinates and provide a brief description and photo. In addition, temporary placemaking or wayfinding infrastructure that is seasonal or not permanent will be ignored. For instance, Figure 3.2 displays placemaking and wayfinding infrastructure for the Evergreen Festival at the Halifax Harbourwalk; however, as the

infrastructure is seasonal, it will be ignored to ensure consistency. During the data collection process, only infrastructure that is accessible and usable for wheelchair users will be included, while infrastructure such as benches will be excluded from the analysis. This selective approach ensures that the focus remains on assessing the accessibility of wheelchair users by observing existing infrastructure that meets their needs. Including infrastructure not designed for wheelchair users would distort the data, excluding it from the analysis. After recording the infrastructure, the data and coordinates will be digitalized, and all information will be digitized onto ArcGIS Pro and Microsoft Excel to organize and refer to throughout the analysis.

3.6.0 - Phase 2: Quantitative Analysis

Through the quantitative analysis, different approaches will be used to observe the suitability of placemaking and wayfinding infrastructure throughout the harbourwalks. The ArcGIS Pro application will be utilized as the primary software for analyzing the distribution of such amenities throughout the Harbourwalks. The following steps will be followed to ensure that proper analysis of quantitative data can be observed:

1. Identify and categorize the wayfinding and placemaking infrastructure on ArcGIS software.
2. Create an Accessibility Index Score (AIS) Index that scores placemaking and wayfinding infrastructure and implements it into the database.
3. Observe clusters or dispersal of infrastructure within the study areas and compare the AISs of different types of placemaking and wayfinding initiatives.

A feature class will be made manually through ArcGIS Pro, in which placemaking or wayfinding infrastructure is identified, and the feature class will be represented as points. They will then be classified between placemaking and wayfinding. To ensure that consistencies within the thesis are assured, the following definitions were outlined for placemaking and wayfinding:

- **Placemaking** infrastructure is based upon the interaction with the space or built environment – whether it gives individuals a reason to use the space in one way or another, to stop and observe, or to use it as a space for individuals to meet. It improves the quality of life in the space and may be significant to individuals. It must be a distinguished design piece that provides a reason for individuals to be there.
 - *Examples: Murals, historical pieces, statues, playgrounds*
- **Wayfinding** infrastructure is based upon signage informing an individual about their space and whereabouts, providing directions or caution to their surrounding spaces. It aims to reduce confusion and inaccuracies in using the space or to assist in safely going through it.
 - *Examples: Street signs, building names on a plaque, park maps, and danger signs*

The final product for this step will be a map with identified placemaking and wayfinding infrastructure within the study area, with the types of wayfinding or placemaking infrastructure stated in each dataset. In addition, different fields showcase the AIS given for each question and an overall AIS total calculated through the “Calculate Field” function on ArcGIS Pro.

Utilizing the Nova Scotia (NS) Accessibility Directorate (2023b) as inspiration, a custom-made AIS analysis will be established to ensure consistency with data collection for placemaking and

wayfinding infrastructure. This personalized AIS is made to be broad and help compare the scores of different infrastructures consistently and straightforwardly. Scores will be given based on the infrastructure's serviceability and usability for wheelchair users based on questions created. The responses to the closed questions help determine the score that it receives, where the following responses are scored as follows:

Yes = 2 points

Adequately/Sometimes = 1 point

No = 0 point

Not Applicable = 0 points

Space for additional information is provided to state the reasoning behind the scores. The worksheets that will be utilized for analyzing wayfinding and placemaking infrastructure will be showcased in Appendix B and C. The following is a table with closed questions and additional contexts for wayfinding and placemaking infrastructure:

Type of Infrastructure	Question
Placemaking	Is it serviceable, interactable, or usable for people in wheelchairs?
	Is the space barrier-free when it comes to accessing the space?
	Does the space take universal design guidelines into perspective?
	Is it considerate of a wheelchair user's limited movements (such as turning radius and height limitations)?
	Are there no notable damages or poor conditions observed from the placemaking infrastructure?
Wayfinding	Is the wayfinding infrastructure up to date and well maintained?
	Is the wayfinding infrastructure appropriately located (does the location make sense) and easily accessible (obstructions, shadows)?
	Does the signage consider universal design guidelines and appropriately considerate of wheelchair users (wayfinding infrastructure with no lean and such)?

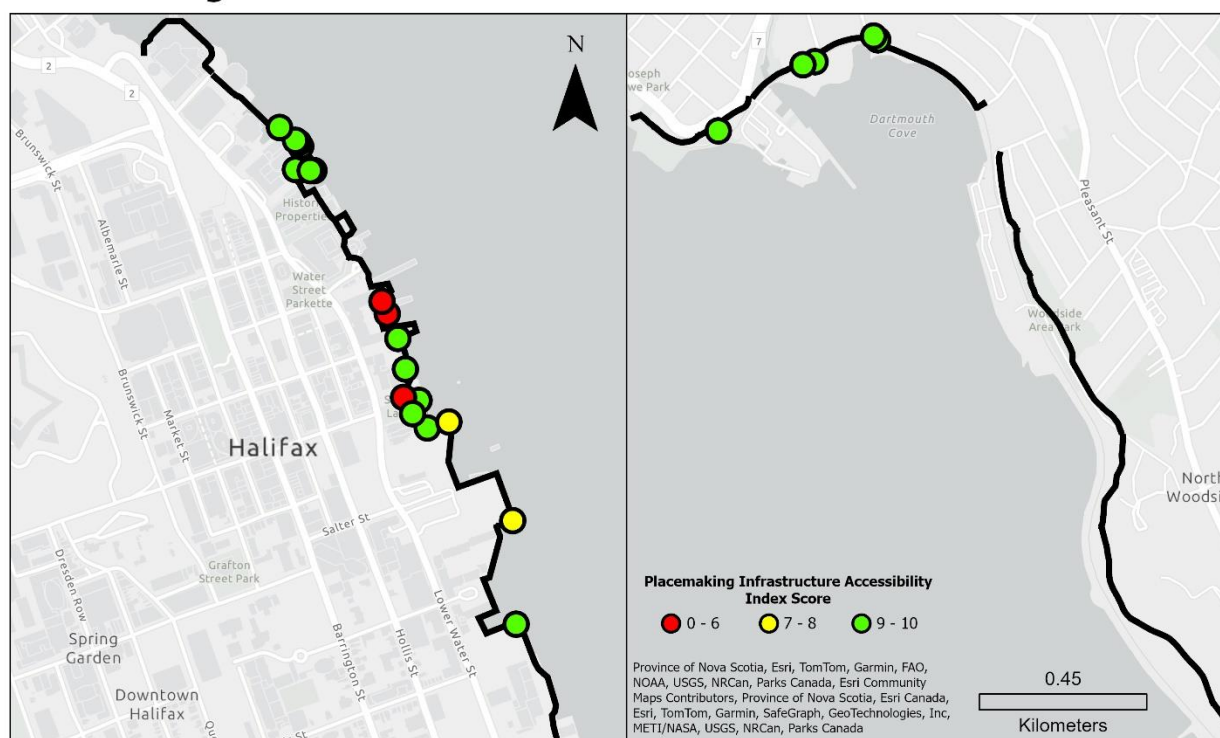
	According to the Canadian Standards Association Group (2018), does the wayfinding infrastructure meet character height ratios and size guidelines and accommodate those with impaired sight?
	Are the wayfinding signage appropriately heighted for wheelchair users?

After determining the AISs of placemaking and wayfinding infrastructure, the scores will be imported into the ArcGIS software, outlined and detailed in the following chapter. Qualitative analysis will then be made towards the common barriers or problems observed throughout both study areas and suggestions on how the study area can improve as a public space to help accommodate wheelchair users. Finally, recommendations will be made regarding what the Halifax Regional Municipality should make to address inequitable barriers and limitations within the research.

Chapter 4 – Findings

Data was collected for three days to identify placemaking and wayfinding infrastructure within the two study areas in Halifax and Dartmouth. Different directions and paths are taken to ensure the relevant infrastructure is recorded, as visibility could vary based on the location. The map of the placemaking and wayfinding infrastructure in the study areas was created using the ArcGIS Pro software to delineate the two study areas. The map to the left represents the Halifax Harbourwalk, while the map to the right showcases the Dartmouth Harbourwalk.

Placemaking Infrastructure at the Halifax and Dartmouth Harbourwalks



Spatial Reference

Name: NAD 1983 UTM Zone 20N

PCS: NAD 1983 UTM Zone 20N

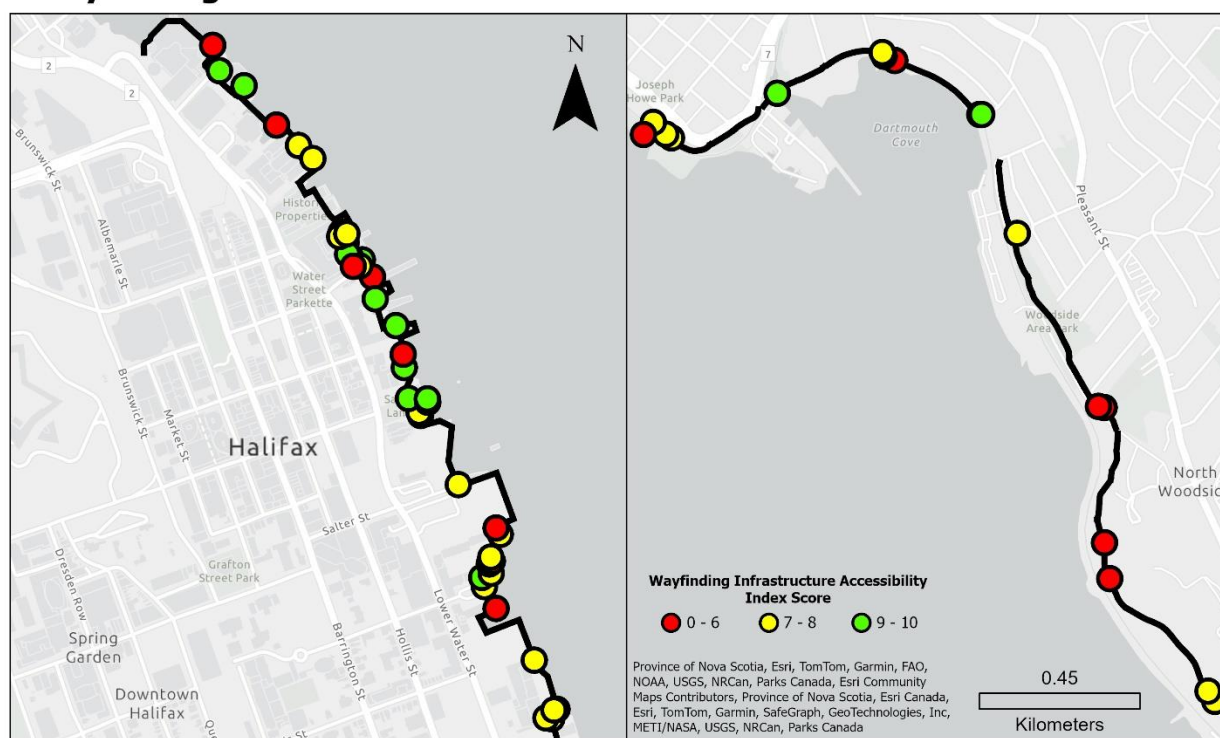
Map Created by: R. Shimada

Active Travelways data obtained from HRM Open Data

Placemaking Infrastructure data recorded by R. Shimada



Wayfinding Infrastructure at the Halifax and Dartmouth Harbourwalks



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Active Travelways data obtained from HRM Open Data

Wayfinding Infrastructure data recorded by R. Shimada



A wayfinding and placemaking infrastructure dataset was created separately to create the maps.

The coordinates were entered and recorded as points using the *Absolute X, Y, Z* toolset. Although the application recorded the coordinates, “GPS UTM” was utilized to collect coordinates.

However, they may not accurately reflect the infrastructure. However, it was the most efficient out of other applications on the App Store. A field was then added to each data point to implement AIS onto each point, with the scores ranging from one to ten. Finally, to make the map more visually contextual towards how each score was in comparison to each other, the symbology was changed to where red meant inadequate/poor ($0 \leq AIS \leq 6$), yellow meant okay/decent ($7 \leq AIS \leq 8$), and green meant good/excellent ($9 \leq AIS \leq 10$). This range was decided upon considering how slight issues within infrastructure would impact the experience

and usability of wheelchair users. As mentioned in the previous chapter, the concept and idea around the AISs have been obtained from the Nova Scotia Accessibility Directorate (2023b) and modified based on the data collection of the thesis. All data are listed in Appendix D and E, which include placemaking and wayfinding scores with notes and coordinates.

A table was made to observe the types of wayfinding and placemaking infrastructure, their overall accessibility, and the differences in variability of wayfinding and placemaking infrastructure scores. For practical analysis, the mean, the number of variables, and the minimum, maximum, and median of the AIS were showcased in the table, where each descriptive statistic served a purpose in analyzing scores. The minimum and maximum will also be utilized to observe for outliers within the data and the range of AISs. Observing both the mean and median AIS also serves a purpose, with the mean more beneficial to observe when there are more variables and the median being more helpful to observe with fewer variables. This was due to outliers, which can effectively skew and affect the mean if there are fewer variables, which can be observed through the minimum and maximum. As a result, the minimum and maximum variables will be observed to determine whether the mean or median should be utilized when comparing the AISs of different infrastructures.

For placemaking initiatives, it was evident from the data for standard placemaking infrastructure

Type of Placemaking Infrastructure	Number of Variables	Mean	Minimum	Maximum	Median
Creative Placemaking	16	9.1	8	10	9
Standard Placemaking	7	7.4	2	10	9

that it was skewed by observing the range of AISs from the minimum and maximum, ranging between two and ten. With the small number of variables, the mean is easily influenced by the

outliers, which skews the data negatively. From observing the descriptive statistics, the two types of placemaking initiatives are generally suitable for wheelchairs despite some poorly suited placemaking infrastructure.

The Halifax Harbourwalk consisted mainly of wheelchair-friendly placemaking infrastructures, including wheelchair-usable tables, murals, and memoirs of historical significance. They were considerate primarily of a wheelchair user's limited movements. They were interactable and mainly concentrated within the centre of the Harbourwalk. However, the Queen's Marque (QM) consisted of the least interactable placemaking initiatives, which lacked awareness of wheelchair users' limited movements and universal design standards despite being the newest implemented infrastructure on the Halifax Harbourwalk. Although the Dartmouth Harbourwalk was limited in placemaking infrastructure, it consisted of good placemaking infrastructure because it primarily consisted of murals, which were part of the Dartmouth Cove Art Project. However, they are concentrated near the Alderney Ferry Terminal, whereas the rest of the Harbourwalk lacks placemaking infrastructure.

The varying types of wayfinding infrastructure are generally suitable for wheelchair users, meeting most accessibility standards and equitable considerations. However, informational signage within the study area could be improved. Factors such as small font sizes, a lack of maintenance, and outdated or incorrect information have affected the overall ASI statistics. Another common problem with informational signage was its angle and height, making it harder for wheelchair users to use the infrastructure well.

Type of Wayfinding Infrastructure	Number of Variables	Minimum	Maximum	Mean	Median
Directional Signage	14	7	10	7.9	8
Informational Signage	36	5	10	6.9	7
Regulatory Signage	9	6	10	8.4	9

The Halifax Harbourwalk consisted of some wayfinding initiatives, where common problems were noticed, such as the lack of universal design considerations towards font sizes and awkward placement that impacted the visibility of wheelchair users. The lack of snow clearance also impacted the AISs of the wayfinding signage, where there was obstruction towards approaching and observing the infrastructure. However, despite this, the signage was reasonably close to others, making it easier to navigate the space without getting lost.

One of the significant issues with the Dartmouth Harbourwalk was that directional signage was not placed in proximity and in reasonable locations, which would have made it difficult for not only wheelchair users but any individual walking through the space to get lost. In addition, vandalism and damage were common elements found within the wayfinding infrastructure throughout the Dartmouth Harbourwalk, which impacted the ability of one to use the signage. They showed that the space was poorly maintained. Like the Halifax Harbourwalk, there were issues with universal design considerations that impacted the usability of the existing wayfinding infrastructure, which impacted the AISs.

The AISs focused on wheelchair accessibility and showcased that compared to most placemaking initiatives. There are many problems surrounding existing wayfinding infrastructure. This is based on several commonalities, such as poor universal design considerations and obstructions.

Overall, there are clusters of good and bad placemaking and wayfinding initiatives throughout the Harbourwalks.

Chapter 5 – Analysis and Recommendations

5.1.0 – Introduction to Analysis and Recommendations

In the previous chapter, the results of the Accessibility Index Scores (AISs) were shared and statistically discussed in determining the best or worst types of placemaking and wayfinding infrastructure for wheelchair users. Although it has provided valuable insight into overall accessibility levels, analysis is essential to observe commonalities in poor scores and provide recommendations for improvements. This section of the thesis will discuss an overarching analysis of the infrastructure and a discussion on the outliers in AISs of placemaking and wayfinding infrastructure, with an analysis of the reasoning behind the low suitability of wheelchair users. Recommendations will also be provided overall, with specified recommendations towards low AISs. Finally, obstacles to implementing the provided recommendations and their limitations will be discussed.

5.2.0 – An Analysis of Placemaking Infrastructure

Generally, the overall placemaking infrastructure AISs showcase inclusive considerations for wheelchair users despite a few outliers, such as the Submarine Playground and the Queen's Marque (QM). However, common concerns were shared between most placemaking infrastructures requiring increased awareness to ensure the Harbourwalks are wheelchair accessible. These concerns should be addressed or observed over the next few years, especially as the trails are designed as public spaces meant to be inclusive and open to everyone.

A common concern noticed throughout both Harbourwalks was the initiatives and priorities made by maintenance staff toward snow clearance. Data was collected on three separate days –

two recorded a few days after snowfall. From these instances, it was clear that there were different priorities between the two trails on instructed snow clearance, which impacts the usability of infrastructure for wheelchair users.

On the Halifax side, there is a priority towards clearing the Harbourwalk path and leaving snow to the side, which can be seen in Figure 5.1, where the path is cleared. Snow clearance can help individuals travel through the path and use the space efficiently without barriers. However, in Figure 5.2, although the playground is by the Harbourwalk, it was not cleared. For some placemaking infrastructure, snow will be a barrier to accessibility. The existence of snow could

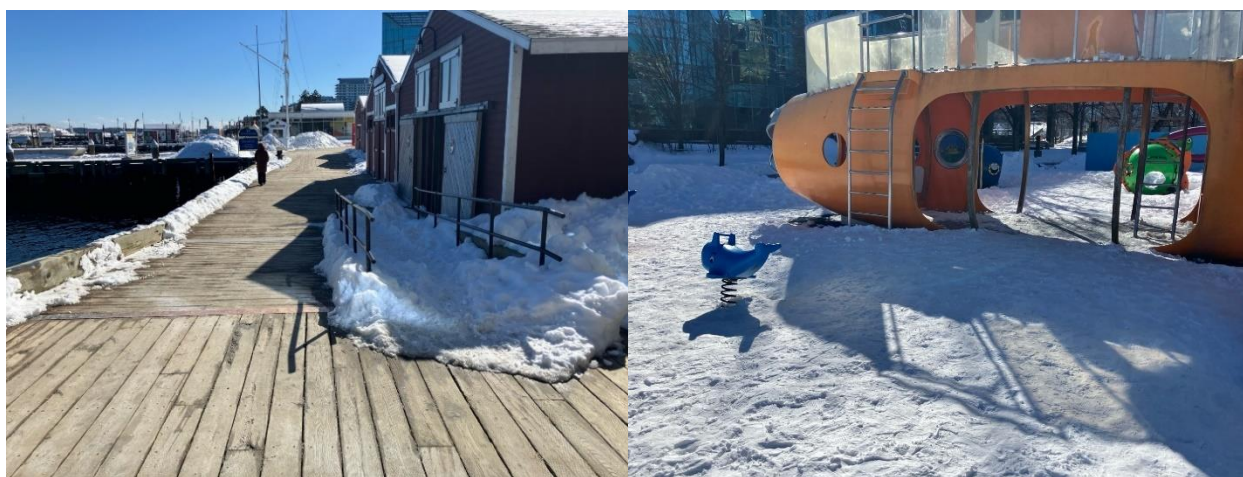


Figure 5.1 (left): Image on the Halifax Harbouwalk trail
Figure 5.2 (right): Image of the Submarine Playground, right next to the trail

not only cause wheelchair users to use the space differently but may even prevent them from using it. Snow is a significant seasonal hazard that can impact their ability to travel through space, per the Nova Scotia Accessibility Directorate (2023b). As a result, further initiatives should be made towards more efficient practices of snow clearance within the Harbourwalk to ensure that the existing placemaking infrastructure is usable, especially for wheelchair users.

The Submarine Playground is one of the most recognizable elements within the Halifax Harbourwalk. It is the only playground within both study areas that is popular with children and parents who use the space. However, there are characteristics within the space other than the lack of snow clearance that would have affected the ability of a wheelchair user to utilize the space. The playground is designed with a second floor, which would prevent wheelchair users from utilizing elements within a playground – especially as there are more interactive elements than the ground-level aspects. Although it is classified as a wheelchair-accessible infrastructure on the first level (Build Nova Scotia, 2022), it lacks many elements. While from the above level, children can access a slide, a helm, and different approaches to get up, there are barely any characteristics to the bottom, as seen in Figures 5.3 and 5.4. Compared to the top, the lack of interactive elements on the bottom lacks consideration of equitable use and should have further interactive elements. For children in wheelchairs, there should be more consideration towards integrating interactive elements and equitable opportunities for them to have experiences like those of other children who would use the space. Instead, it imposes a significant barrier that violates universal design guidelines.





Figure 5.4 (above): Images of the interior of the Halifax Submarine. While there are images of marine life around, there are not many elements to this space.

Although the QM has been the newest implemented element on the Harbourwalks, the overall characteristic of the built environment is overwhelmingly poor for the accessibility of wheelchair users. Approaching the top of the QM infrastructure is meant to give individuals a view of the Bedford Basin and the Harbourfront. However, the view of the waterbody is impeded by the height of the wall, which prevents wheelchair users from having a view as the wall is at a height of 1420 mm, as shown in Figure 5.5. As a result, this exceeds the visibility of a wheelchair user, impacting their experience. This is not helped by the existence of staircases, which imposes a significant problem towards universal design considerations. It does not allow for equitable considerations toward wheelchair users. It forces them to take another route to the top, as seen in Figure 5.6. However, this would require wheelchair users to take an elevator to the top, operated seasonally, and staff members would have to operate the elevator. Although most criticism is

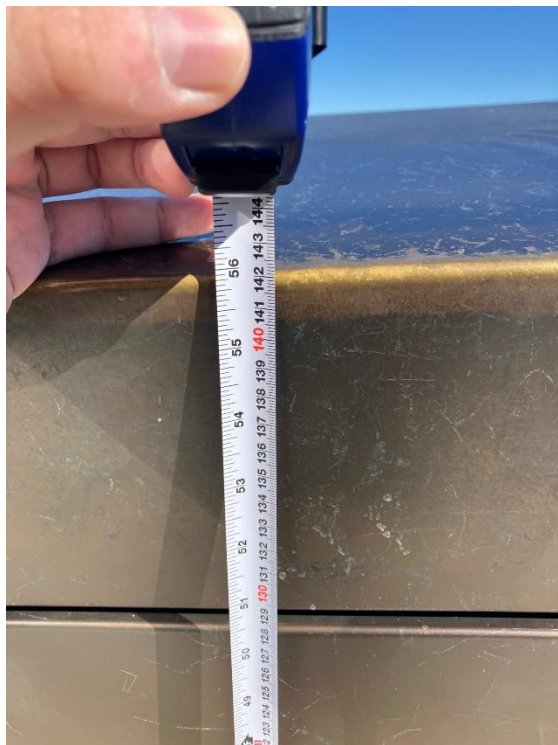


Figure 5.5: Height of the viewing platform at the top of the QM

aimed toward the upward staircase to the top of the built environment, similar critiques must be shared towards the staircase to the ocean right by it. Even if it does provide a view, staff from Develop Nova Scotia (now called Build Nova Scotia), Jennifer Angel, has suggested to the Canadian Broadcasting Corporation (2022) that it was a space where people could swim, fish, or launch kayaks. Due to poor considerations towards the ability of wheelchair users and a lack of awareness of their limited movements, low AISs were assigned to the built environment within QM.

Although Dartmouth has significantly better AISs than Halifax, there are concerns about a lack of placemaking initiatives within the trail. Although some existing elements, such as murals, are consistent within one section of the Dartmouth

Harbourwalk. This may be because the Dartmouth trail is considered a multi-use pathway within most of the space, which is meant to be designed for walking, rolling, and cycling (Halifax Regional



Figure 5.6: Upward Staircase of the QM

Municipality, 2018b), as seen in Figure 5.7. As a result, a lack of placemaking infrastructure may have been the incentive placed when the Dartmouth Harbourwalk was implemented. Despite this, there should be further incentives to provide the rest of the Harbourwalk placemaking incentives to give the space more personality or characteristics, such as increased murals.

A lack of placemaking infrastructure may also be due to Dartmouth being a less developed space than Halifax. According to Ramos and MacNabb (2018), the average individual income



Figure 5.7: The Dartmouth Harbourwalk signage indicating that the space is a Multi-Use Pathway

between the 1980s and 2015 shows that while many regions within the Halifax peninsula have increased income by 10 to 79 percent, Dartmouth has overseen a significant decrease of 10 to 33 percent. As Dartmouth has a lower socioeconomic status than Halifax, this may have led to a lack of prioritization towards development in placemaking infrastructure within the Dartmouth Harbourwalk. The Halifax Harbourwalk is a significant landmark within the Halifax Regional Municipality for tourism purposes, which may be why newer developments such as the QM have been implemented. At the same time, Dartmouth Harbourwalk has not overseen upgrades nor maintenance, with the trail needing renovation and redevelopment. As a result, the Dartmouth side should oversee a new perspective on design and placemaking considerations tailored not only for wheelchair users but also for those who utilize the space.

5.3.0 – An Analysis of Wayfinding Infrastructure

Wayfinding infrastructure has overseen some mixed AISs overall where, although there were some good scores, there were a lot of shared problems in achieving ideal wheelchair accessibility. Compared to the AISs of placemaking, the scores were generally worse overall. They seemed to vary a lot more in accessibility without outliers.

A common problem found within existing wayfinding signage is what was mentioned in the placemaking analysis around snow removal, specifically on the Halifax side. However, the snow is moved onto the path to the wayfinding infrastructure, which impacts visibility and access to the space overall, as seen in Figures 5.8 and 5.9. This would significantly impact a wheelchair user's ability to observe the wayfinding infrastructure, as the snow can exceed their visibility

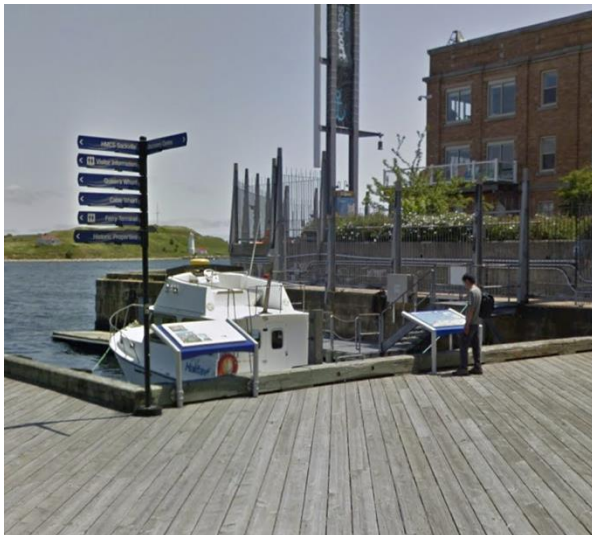


Figure 5.8: An image of the Halifax Harbourwalk Signage in July 2018 from Google Street View



Figure 5.9: An image of the Halifax Harbourwalk signage in January 2024

range depending on the area of the Harbourwalk. For newcomers to the Harbourwalk, it makes viewing the infrastructure practically impossible in the winter. Although the snow was initially not considered in the study, it gave a good overview of barriers and considerations on visibility and how a lack of snow clearance could impact one's approach to utilizing a public space.

The ideal height for universally designed wayfinding signage needs to be established. Although the Northern Region Inclusion and Access Committee (2020) provided a recommendation for signage height between 1400 and 1600 mm, this was not fully implemented within existing signage and was a common problem that was found. Primarily, as the Halifax and Dartmouth Harbourwalks are both classified as trails, it is a concern that signage height recommendations have not been met for the most part. Out of all the existing signage, around 60% of the recorded signage was reported to be too tall or lacked considerations in signage height overall (Northern Region Inclusion and Access Committee, 2020).

Finally, across the Halifax and Dartmouth Harbourwalks, common problems were found within the existing Halifax and Dartmouth Harbourwalk signage. A significant problem, when it came to analyzing the infrastructure was considering whether the

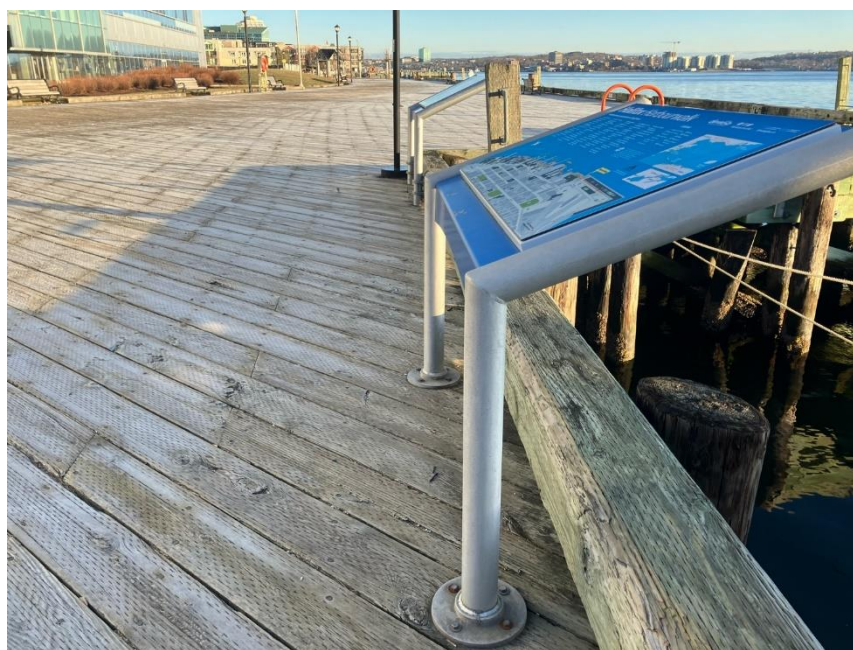


Figure 5.10: The Harbourwalk Signage viewed from the side

informational signage was impacted by visibility based on the angle at which it was placed, as seen in Figure 5.10. In addition, there is not enough space toward the knee for wheelchair users' legs to go underneath the signage, which would also cause wheelchair users to have difficulty observing the signage. However, this was difficult to determine as no research or regulations on recommendation signage angle for visibility existed. As a result, it was determined through

several observations and considerations towards a vertical field of view that it would make it difficult for wheelchair users to read the signage, especially as the signage height was just above 1100 mm at its base. In addition to this, the signage was outdated, with Build Nova Scotia's old firm name placed on it, as well as some fonts on the signage that were hard to read.



Figure 5.11: A vandalized Dartmouth Harbourwalk Map

Unlike the Halifax Harbourwalk, the Dartmouth side had area-related problems with wayfinding signage. Many wayfinding initiatives on the Dartmouth Harbourwalk include vandalism and damages, as seen in Figure 5.11, which can significantly impact the

infrastructure's readability and

usability. In addition, it shows that the Dartmouth trail has under-maintained infrastructure compared to the Halifax trail. Although the vandalism is not significantly negative to impact readability in Figure 5.11, it shows the lack of awareness of Dartmouth infrastructure vandalism, as well as care towards replacing it with a newer, up-to-date wayfinding infrastructure, especially infrastructure that can accommodate the limited movements and constraints that wheelchair users have. In addition, while Halifax has only one wayfinding infrastructure that was vandalized or damaged significantly, the Dartmouth side has seen five overall. This follows a similar trend in focusing on infrastructure development and improvement between the Halifax and Dartmouth areas. Despite establishing the Centre Plan for the Regional Centre by the HRM (2022), which

focuses on complete communities and strategic growth, much more work must be done. Based on personal observations from data collection and living in the HRM for the past four years, there is a significant lag in the development priorities between Halifax and Dartmouth. If there are priorities towards increasing density and development within Dartmouth, further incentives should be made towards reducing poorly suited infrastructure designs and conditions such as those on the Dartmouth Harbourwalk. Instead, there should be significant changes and improvements within Dartmouth's public spaces to help accommodate wheelchair accessibility and create an equitable and inclusive environment for all. This can help put Dartmouth in a positive direction toward growth if such accommodations and considerations are made.

5.4.0 - Recommendation on ongoing practical considerations

When designing public spaces to be inclusive for wheelchair users, practical considerations play a significant role in ensuring accessibility and equitable practices. This allows individuals to consider factors when making decisions, assess various practices, and analyze their risks, costs, and challenges. As a result, such initiatives can allow wheelchair users to easily communicate their concerns and contribute to improving public spaces. As a result, the following are two recommendations concerning practical considerations that should be made within the Harbourwalks.

Snow Removal Considerations

Snow removal initiatives are complex to provide recommendations for as it is hard to satisfy the needs of individuals who utilize the space and determine which areas to clear of snow. However, as observed from the two occasions, some areas on the Dartmouth Harbourwalk are not cleared of snow. In contrast, the trail of the Halifax Harbourwalk is cleared out. This can be a severe

problem as the weather could impact the overall usability of the trail and make it icy for individuals to use. Especially for wheelchair users, it could make it more challenging to gain traction or become stuck within the space (Ripat et al., 2020) – which impacts the overall usability of the public space. As a result, rather than leaving out parts of the Harbourwalks, they should aim towards clearing all the snow out of the pathways to enable its overall use.

Maintenance Request Considerations

There should be a way for wheelchair users to contact a help centre in areas of poor accessibility or maintenance.

Especially in areas like the Dartmouth Harbourwalk, where there are signs of poor maintenance and vandalism, there should be signage along the Harbourwalk informing individuals to report any problems seen. This can lead to swift improvements made toward the experiences of any wheelchair users utilizing the space. This initiative could also be utilized to complain about



Figure 5.12: Image of an HRM-owned signage plaque with information on who to contact for maintenance concerns

inaccessible infrastructure or regions within the public space. Although the HRM has website space for requesting repairs or concerns on their websites, it is not publicly known. It can only be found mostly through research on the internet. Within public spaces, information on maintenance requests is only found on HRM-owned signage plaques that indicate whom to contact, as shown

in Figure 5.12. A few exist throughout both Harbourwalks. As a result, there should be more accessible information signage that informs the public on whom to contact when there are maintenance concerns.

5.4.1 - Recommendation on the Submarine Playground

Build Nova Scotia should research playground design that allows for equitable use. Not only does it promote concepts of universal design, but such elements are essential for individuals at a young age to not feel left out or excluded, as it could affect their health and well-being (Moore et al., 2022). As mentioned previously, it is stated that the space is wheelchair-accessible (Build Nova Scotia, 2022). However, there is a significant problem with its overall usability, where wheelchair users, especially children in wheelchairs, would not have the same experience as non-disabled people. A recommendation is made to observe guidelines for inclusive spaces to ensure that the standards are met and towards further equitable and inclusive practices. A significant document that can help is from the Rick Hansen Foundation (2020) on creating accessible play spaces. In this document, they refer the user to a toolkit for evaluating the accessibility of the existing play space, suggestions towards accessibility standards for people with disabilities, and methods in public consultation (to be referred to in another recommendation).

5.4.2 - Recommendation on ideal wayfinding signage guidelines for wheelchair users

Further research into case studies and initiatives of other cities should be made to create a framework to accommodate the limited movements and abilities of wheelchair users. Especially as there are not many documents outlining ideal signage angles, signage heights, and ideal

designs for wheelchair users, the HRM could help implement a framework with the Canadian Standards Association and the Rick Hansen Foundation towards further recommendations on signage. Within equitable infrastructure and considerations, wheelchair users must be able to use infrastructure like any other individual. For instance, wayfinding monolith signage could help address accessibility concerns depending on its design and height. It would not only help potentially accommodate the needs of wheelchair users but can also be designed in a unique way, such as through cultural or locational features or designs.

5.4.3 - Recommendation on reconsidering the name of Harbourwalk

Although both study areas are classified as Harbourwalks, they serve different purposes to their surroundings. The Halifax Harbourwalk is a tourist attraction with many events, vendors, and activities hosted within the public space. In contrast, the Dartmouth Harbourwalk is designed as a multi-use pathway. Different names, such as harbourfront, waterfront, and trail, are also used to classify the study area. As a result, more consistency and simplicity are needed to comprehend the purposes of the two study areas. The name of Harbourwalk would not necessarily fit the Halifax side, primarily due to activities hosted there, which would impact the travel time of the trail and the experience. As a result, there should be more consistency in renaming the two spaces to fit the characteristics and experiences that the spaces offer. Although the recommended change in classification may seem minor, it would have a significant impact on wheelchair users as it could provide clarity in the identity of the space. This can result in fitting projects or initiatives within the spaces that could accommodate different wheelchair necessities – such as more wheelchair-friendly placemaking initiatives on the Halifax side to contribute to the events

and more wheelchair-friendly wayfinding initiatives on the Dartmouth side to ensure wheelchair users do not get lost in the multi-use trail.

5.4.4 - Recommendation on Community Engagement Initiatives

There should be further incentives in community engagement, especially on the Dartmouth Harbourwalk, towards accommodating and listening to Dartmouth residents on further placemaking or wayfinding initiatives. Compared to the Halifax Harbourwalk, Dartmouth Harbourwalk lacks a sense of place. As a result, the community members who live close to Dartmouth Harbourwalk could provide feedback on their thoughts on changes that could be made and share their experiences of going through the space. The concept of engagement would allow for better practices in diversity, equity, inclusion, and accessibility of the public, where they can provide feedback on overall thoughts. As there is potential for expansion for both Harbourwalks, incentives should be considered more concerning equity within public spaces. Especially with the newest infrastructure on the trail being the least accessible, future projects must include thoughts and perspectives to observe whether inclusive and equitable considerations are made.

As a result, many existing documents at different levels could be utilized as guides and strategies towards the practice for future incentives towards community engagement. The following are some community engagement documents that are recommended, as well as detailed information that could be found there that is unique or useful within the context of the Harbourwalk:

HRM (n.d.) Planning and Development Department Public Engagement Strategy

This document assists HRM Planning and Development staff members create an appropriate public engagement approach. While this is meant towards amendments to planning documents and proposals within policies, this can be utilized to observe practices that are done on a basis which can then be modified to fit within the scope of receiving feedback on placemaking and wayfinding infrastructure on the Harbourwalk. For instance, a guide is established in the document over the levels of engagement and the influence that participants have on the project overall, with an overall document outlining the best approaches to public engagement based upon the stated criteria. For wheelchair users, this can help provide a voice to concerns they may have from travelling along the Harbourwalks and existing infrastructure.

A Guide to Creating Accessible Play Spaces from the Rick Hansen Foundation (2020)

This guide aims to enable accessibility within public spaces, and it is a public consultation workshop guide that enables creativity and inclusivity for children and adults of all abilities. This includes initiatives towards group activities and images of public spaces for inspiration and a chance for participants to design play spaces and model them using different materials. Each group then presents their designs and receives feedback. All designs get ranked towards meeting the needs of children and caregivers with a wide range of abilities. An approach primarily aimed toward further placemaking incentives on the Harbourwalk could be utilized for more inclusive and equitable spaces.

Inclusive Public Engagement Policy from the Government of Newfoundland and Labrador

This document is aimed at discussing the best approaches to community engagement. It discusses external factors to the activity, such as venues, promotions, and accessibility

regulations. This document also consists of an accessibility checklist to ensure that the session venue will be accessible overall. This is a crucial characteristic to consider as locations could limit an individual's ability to go to the space to share their opinions, especially for those with accessibility concerns, such as wheelchair users. A list like this could help create an inclusive environment that would help assure comfort for all.

5.4.5 – Recommendations for observing best practices within other cities

In recent years, there has been growing recognition of the importance of creating inclusive and accessible urban practices to remove barriers to wheelchair users in cities. Exploring inclusive practices within other cities can help identify approaches and strategies for a city's pursuit of inclusivity. By learning from other cities' experiences, the HRM can utilize this to obtain valuable insight into approaches towards promoting accessibility and equity standards within public spaces.

For instance, in the City of Kelowna, based upon their Health City Strategy – Community for All approach (City of Kelowna and Interior Health, n.d.), their approaches towards a healthy city emphasized the involvement of different ages and groups who faced issues or concerns towards the city. In addition, the outcomes of each organized public engagement event were outlined and made publicly available. Another initiative made by Kelowna involved an Online Accessible Guide (People in Motion, 2016), which identified public spaces and accessible amenities based on different standardizations. As a result, such a database can be helpful for individuals with accessibility issues within the HRM to identify public spaces and amenities that are accessible or inaccessible, including those with wheelchair mobility concerns.

New Brunswick also ensures that accountability is taken for equity towards individuals with disabilities, according to New Brunswick's Disability Action Plan for Persons with a Disability published by the Government of New Brunswick and Premier's Council on Disabilities (2020).

Although this is vastly different in terms of the scope and size of the HRM, audits and accountability need to be taken into consideration in new and existing developments.

Significantly, as the HRM is growing in population every year and has one of the highest disability rates in Canada (Statistics Canada, 2019), there should be more initiatives towards accountability.

Observing best practices within other Canadian cities or provinces can help the HRM initiate their own approaches towards a more inclusive and accessible municipality. As it aligns well with the SDGs, taking inspiration from accessibility approaches and implementing them can improve social sustainability. However, further research is recommended to observe cities of similar populations and geography to help ensure consistency and to observe the best approaches within continually growing municipalities like the HRM.

5.5.0 – Obstacles to the Recommendations and Limitations

As of March 2024, the HRM has placed initiatives towards improving the Dartmouth Harbourwalk due to its current inaccessibility and a new plan towards accommodating cruise traffic (Ryan, 2024). As this is relatively new, the thesis has not considered these new initiatives that are being discussed soon. Instead, it is focused on the currently existing infrastructure. Especially as it is challenging to observe plans of changes being made on the Halifax and Dartmouth Harbourwalk, the HRM and Build Nova Scotia were not contacted during the

duration of the thesis. This is a significant obstacle to the recommendations, as approaches to the thesis could have been discussed or considered by those who own the space.

Snow removal can have significant obstacles, as the HRM has overseen worse weather impacts over time, such as more rain, snow, and storms. This is likely due to the impact of climate change, where warmer air consumes more moisture, which increases the amount of snow and rain during colder weather (Environmental Defense Fund, n.d.). Especially as the weather has been getting significantly worse over time, it is vital to acknowledge that snow removal initiatives could face difficulties based on this. This also makes it harder to determine ideal days to remove snow, which would impact the overall accessibility of the space for wheelchair users.

As mentioned earlier, future publicly unavailable plans on the Harbourwalk could affect decisions behind priorities in placemaking and wayfinding initiatives on the Halifax and Dartmouth Harbourwalk. There may be plans to improve infrastructure to accommodate wheelchair users or initiatives towards community engagement to receive feedback. As a result, some recommendations that could impact its usefulness could already be in the works or have been done. Especially around reading and analyzing existing wayfinding documents, only fully published versions around accessibility guidelines on the provincial and municipal levels were observed. Although some proposals and documents were found around wayfinding signage research in the HRM, as these strategies were not fully published, they were not utilized.

Chapter 6 - Conclusion

In this study, wheelchair accessibility was observed within placemaking and wayfinding infrastructure on the Halifax and Dartmouth Harbourwalk. Halifax has one of the highest disability rates in Canada and, in recent years, has overseen significant growth within the municipality. Despite the implementation of the SDGs and their importance in achieving a socially sustainable future, much work still needs to be done to ensure accessible standards and inclusive practices for all, regardless of their age, size, abilities, or disability. As a result, the project aimed to observe wheelchair accessibility standards within the Harbourwalks to observe whether there were commonalities in the type of infrastructure that were found accessible, as well as provide recommendations on how the space can improve overall. A mixed methods approach helped score and analyze the existing infrastructure based on different criteria. From physically going into these spaces and analyzing their suitability for wheelchair users, observations have been made that the QM area in the Halifax Harbourwalk lacked much consideration towards wheelchair users as a placemaking space. Low suitability was due to the lack of consideration towards a wheelchair user's limited movements and a lack of consideration towards universal design. In addition, the overall wayfinding infrastructure could be improved further to focus more on considerations in a wheelchair user's movement, as well as considerations towards the height and angle of the signage.

Based upon research on existing wheelchair accessibility guidelines on the municipal and provincial levels, further initiatives are needed to make spaces more socially sustainable and inclusive. For instance, there should be further considerations towards snow removal initiatives as they could help remove barriers to accessing the infrastructure for wheelchair users. In

addition, further research on accessibility and best practices is recommended to understand equitable accessibility standards, with research recommended on best practices of other cities and organizations. Although this research has a significant limitation towards the analysis researched by an abled-bodied individual, it could provide significant insights into the best approaches in making the HRM more socially sustainable, as well as address further research initiatives needed to improve infrastructure designs and accessibility within the Halifax and Dartmouth Harbourwalk.

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Appendix

Appendix A – Wayfinding maps on the Halifax and Dartmouth Harbourwalk

Halifax Harbourwalk

Main Office: 902.432.8999 | Security Office: 902.471.9019
 Board Administration: | Office: 902.209.2000
developns.ca

HARBOURWALK AND NEARBY ATTRACTIONS

<ol style="list-style-type: none"> 1 Casino Nova Scotia 2 Purdy's Tower II 3 Purdy's Wharf 4 Purdy's Tower I 5 Purdy's Landing 6 Halifax Marriott Harbourfront Hotel 7 Develop Nova Scotia Office 8 Historic Properties 9 Granville Mall 10 NSCAD University Granville Campus 11 Nathan Green Square 12 Law Courts 13 City Hall 	<ol style="list-style-type: none"> 14 Halifax Ferry Terminal 15 Ferry Boat Lane 16 Water Street Terminal 17 Chebucto Wharf 18 Cable Wharf Plaza 19 Queen's Marquee 20 Cable Wharf Kitchen & Patio 21 Grand Parade 22 St. Paul's Church 23 Province House (provincial legislature) 24 Art Gallery of Nova Scotia 25 Dominion Public Building 26 CSS Acadia 	<ol style="list-style-type: none"> 27 Maritime Museum of the Atlantic 28 HMCS Sackville 29 Visitor Information Centre 30 Children's Playground 31 Develop Nova Scotia Marina Office 32 Sackville Landing 33 Summit Place 34 Salt Yard (seasonal dining and shopping) 35 Waterfront Warehouse 36 St. Mary's Basilica 37 Alexander Keith's Nova Scotia Brewery/Historic Farmers Market
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LEGEND

<ul style="list-style-type: none"> — Harbourwalk Route ■ Public Green Space ● Information ● Public Washroom ● Pay Parking ● Halifax Transit Terminal ● Marina Access 	<ul style="list-style-type: none"> ● Dining ● Shopping ● Littering ● Playground ● Tours & Rentals (seasonal) ● Hammocks
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You are in Mi'kmaq the ancestral and unceded territory of the Mi'kmaq who have been living on these lands since time immemorial. Recognizing Mi'kmaq is a small but meaningful step in reconciliation and the continued effort of building a strong relation to Anishinabe relations. We are all Treaty People.

Dartmouth Harbourwalk

Main Office: 902.432.8999 | Security Office: 902.471.9019
 Board Administration: | Office: 902.209.2000
developns.ca

HARBOURWALK ATTRactions

<ol style="list-style-type: none"> 1 Woodside Ferry Terminal 2 Advanced Systems Training Facility 3 Nova Scotia Hospital 4 Dartmouth General Hospital 5 Nova Scotia Community College Waterfoot Campus 6 North Woodside Community Centre 7 Sewage Treatment Plant 8 former Canadian Coast Guard Dartmouth Base 9 Newcastle Street Park 10 Evergreen House and Dartmouth Heritage Museum 11 Forestall Fine Art 12 Dartmouth Cove Mural Project 13 Harbourfront Village Market 14 Dartmouth Curling Club 15 St. James United Church 16 The Dart Gallery 17 Shakespearean Canal Park 18 Wolford Pedestrian Bridge 19 Ferry Terminal Park 	<ol style="list-style-type: none"> 20 World Peace Pavilion 21 Women's Playground 22 Alderney Ferry Terminal 23 Trans Canada Trail Pavilion 24 Alderney Landing - Market, Theatre, Salsery 25 Halifax Public Library Alderney Gate Branch 26 Alderney Gate 27 Stereo Building 28 Joe Howe Park 29 Queen's Square 30 Belmont House 31 Quaker House Museum 32 Christ Church Cemetery 33 Lightfoot Dillman Memorial Park 34 Park Avenue Community Oven 35 Dartmouth Commons
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LEGEND

<ul style="list-style-type: none"> — Harbourwalk Route — Under Construction ★ You Are Here ● Public Washroom ● Pay Phone ● Information (Seasonal) ● Parking ● Marina Access 	<ul style="list-style-type: none"> ● Metro Transit Stop ● Dining ● Shopping ● Access to Harbourwalk Trail ● Playground ● Entertainment ■ Green Space
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Waterfront Development

my.waterfront.ca
info@wfd.ca (902) 422-6091

Appendix B – Accessibility Index Scoring Sheet for Placemaking Infrastructure

	Yes (+2)	Adequately/Kind of/Sometimes (+1)	No (0)	N/A (0)	Comments
Is it serviceable, interactable, or usable for people in wheelchairs?					
Is the space barrier-free when it comes to accessing the space?					
Does the space take universal design guidelines into perspective?					
Is it considerate of a wheelchair user's limited movements (such as turning radius and height limitations)?					
Are there no notable damages or poor conditions observed from the placemaking infrastructure?					

Appendix C – Accessibility Index Scoring Sheet for Wayfinding Infrastructure

	Yes (+2)	Adequately/Kind of/Sometimes (+1)	No (0)	N/A (0)	Comments
Is the wayfinding infrastructure up to date and well maintained?					
Is the wayfinding infrastructure appropriately located (does the location make sense) and easily accessible (obstructions, shadows)?					
Does the signage consider universal design guidelines and appropriately considerate of wheelchair users (wayfinding infrastructure with no lean and such)?					
According to the Canadian Standards Association Group (2018), does the wayfinding infrastructure meet character height ratios and size guidelines and accommodate those with impaired sight?					
Are the wayfinding signage appropriately heighted for wheelchair users?					

Appendix D – Placemaking Infrastructure Scores

Placemaking Infrastructure Name	UTM Location	Type of Signage	Location	Q1	Q2	Q3	Q4	Q5	AIS	Notes
The Grand Derangement	20T 454980 4943481	Standard Placemaking	Halifax	2	1	2	2	2	9	Barriers in accessing behind because of snow
Maud Lewis Interactive Art	20T 454974 4943678	Creative Placemaking	Halifax	2	1	2	1	2	8	Space is one-way access, and is not considerate of turning radius
Halifax Harbourwalk Instruments	20T 454811 4943855	Creative Placemaking	Halifax	2	1	2	2	2	9	Some barriers because of snow
The Wave	20T 454795 4943907	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier
Halifax Harbourwalk Playground	20T 454766 4943913	Creative Placemaking	Halifax	1	1	1	1	2	6	Second Floor not usable, barrier by snow, not considerate of wheelchair user's limited movement because of second floor not allowing for equitable use and consideration of movement
Surfing Individual Mural	20T 454769 4943967	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier
Metal Boat Art	20T 454755 4944025	Creative Placemaking	Halifax	2	2	2	2	2	10	N/A
Queen's Landing Downstairs	20T 454735 4944072	Standard Placemaking	Halifax	1	0	0	2	2	5	A lot of problems with it in general.
Queen's Landing Upstairs	20T 454725 4944096	Standard Placemaking	Halifax	0	0	0	0	2	2	More problems than before
Dartmouth Cove Mural Art Project	20T 455557 4945989	Creative Placemaking	Dartmouth	2	2	2	2	2	10	N/A
Mural	20T 455546 4945999	Creative Placemaking	Dartmouth	2	2	2	2	2	10	N/A
Underwater Mural	20T 455388 4945930	Creative Placemaking	Dartmouth	2	2	2	2	2	10	N/A
Mural	20T 455356 4945922	Creative Placemaking	Dartmouth	2	2	2	2	2	10	N/A
Daffodil Garden for Cancer Survivors	20T 455128 4945744	Standard Placemaking	Dartmouth	2	1	2	2	2	9	Barriers because of snow
Duck Mural	20T 454560 4944347	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier
Canada TIAC Infrastructure	20T 454595 4944345	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier
Go with the Flow Mural	20T 454588 4944345	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier
Peacock Mural	20T 454570 4944391	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier
Mural	20T 454566 4944398	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier
Ship Anchor Mural	20T 454560 4944402	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier

First European Settlers in Nova Scotia Mark	20T 454530 4944427	Standard Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier
Lebanese Settlers Statue	20T 454852 4943866	Standard Placemaking	Halifax	2	1	2	1	2	8	Information of Statue requires angle of visibility but snow barrier limits visibility
Norwegian Merchant Navy Memorial	20T 454783 4943882	Standard Placemaking	Halifax	2	2	2	2	2	10	Barriers in accessing behind because of snow,
The Grand Derangement	20T 454980 4943481	Standard Placemaking	Halifax	2	1	2	2	2	9	Space is one-way access, and is not considerate of turning radius
Maud Lewis Interactive Art	20T 454974 4943678	Creative Placemaking	Halifax	2	1	2	1	2	8	Some barriers because of snow
Halifax Harbourwalk Instruments	20T 454811 4943855	Creative Placemaking	Halifax	2	1	2	2	2	9	Snow as a barrier

Appendix E – Wayfinding Infrastructure Scores

Wayfinding Infrastructure Name	UTM Location	Type of Signage	Location	Q1	Q2	Q3	Q4	Q5	AIS	Notes
Halifax Seaport Map	20T 455048 4943300	Informational Signage	Halifax	2	2	1	1	1	7	Not allowing for equitable use for vision purposes, some character height can limit visibility and height is too tall
Halifax Seaport Map	20T 455037 4943301	Informational Signage	Halifax	2	2	1	1	1	7	Not allowing for equitable use for vision purposes, some character height can limit visibility and height is too tall
Discovery Centre Signage	20T 455015 4943411	Directional Signage	Halifax	2	1	2	2	1	8	Poor location and too high
Halifax Harbourwalk Map	20T 454942 4943510	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Bishop's Landing Map	20T 454920 4943552	Informational Signage	Halifax	2	2	2	1	1	8	Character height is small, and could be shorter
Halifax Waterfront Informational Signage	20T 454915 4943569	Regulatory Signage	Halifax	2	1	2	2	2	9	Location could be improved - maybe not in front of a restaurant
France and Canada Informational Signage	20T 454933 4943577	Informational Signage	Halifax	2	2	1	1	1	7	Signage not universally design + snow, poor character sizes, and a bit too high
Bathroom Signage	20T 454929 4943595	Directional Signage	Halifax	2	2	1	2	1	8	Not appropriate size considerations, not appropriately heighted
Halifax Harbourwalk Map	20T 454935 4943600	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Bathroom Signage	20T 454932 4943608	Directional Signage	Halifax	2	2	1	2	1	8	Not appropriate size considerations, not appropriately heighted
A Gateway to Canada Informational Signage	20T 454950 4943651	Informational Signage	Halifax	2	2	1	1	1	7	Signage not universally design + snow, poor character sizes, and a bit too high

Halifax Harbourwalk Map	20T 454942 4943663	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Halifax Harbourwalk Signage	20T 454870 4943746	Directional Signage	Halifax	1	2	2	1	1	7	DevelopNS non-existent, character height could be improved and could be reduced by height
Halifax Harbourwalk Map	20T 454798 4943878	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Halifax Harbourwalk Signage	20T 454795 4943884	Directional Signage	Halifax	1	2	2	1	1	7	DevelopNS non-existent, character height could be improved and could be reduced by height
Halifax Waterfront Informational Signage	20T 454775 4943910	Informational Signage	Halifax	2	2	2	2	2	10	N/A
Halifax Waterfront Informational Signage	20T 454767 4943969	Regulatory Signage	Halifax	2	2	2	2	2	10	N/A
Maritime Museum Hours Signage	20T 454765 4943994	Informational Signage	Halifax	1	1	2	1	1	6	Not up to date, obstructed by snow, character height poor, too high
Halifax Harbourwalk Map	20T 454707 4944142	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Chebucto Landing Signage	20T 453687 4944174	Informational Signage	Halifax	2	2	2	1	2	9	Character Height minimal,
Halifax Ferry Terminal Directional Signage	20T 454665 4944179	Directional Signage	Halifax	2	2	1	1	1	7	Some physical effort might be needed towards viewing it, character height is small, too high
Dartmouth Harbourwalk Signage	20T 456488 4944170	Informational Signage	Dartmouth	1	1	2	1	2	7	DevelopNS does not exist, snow obstruction, character height needs improvement
Multi-Use Signage	20T 456469 4944199	Regulatory Signage	Dartmouth	1	2	2	2	1	8	Poor Maintenance, too high
Public Washroom Signage	20T 456194 4944514	Informational Signage	Dartmouth	1	1	2	1	1	6	Poor Maintenance,

										obstructed by snow, poor character size, poor height
Dartmouth Harbourwalk Map	20T 456179 4944615	Informational Signage	Dartmouth	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Dartmouth Harbourwalk Signage	20T 456178 4944994	Regulatory Signage	Dartmouth	1	1	2	1	1	6	Vandalized, obstructed, character height, poorly heighted
Dartmouth Harbourwalk Map	20T 456162 4944997	Informational Signage	Dartmouth	0	2	1	1	1	5	Not up to date or poorly maintained, signage not universally design + snow, poor character sizes, and a bit too high
Dartmouth Harbourwalk Signage	20T 455934 4945482	Regulatory Signage	Dartmouth	2	2	2	1	1	8	character height, poorly heighted
Stop Signage	20T 455830 4945815	Regulatory Signage	Dartmouth	1	2	2	2	2	9	Vandalized
Greenway Map	20T 455835 4945815	Directional Signage	Dartmouth	2	2	2	2	2	10	N/A
Dartmouth Harbourwalk Map	20T 455592 4945966	Informational Signage	Dartmouth	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Rail Signage	20T 455562 4945978	Regulatory Signage	Dartmouth	0	1	2	2	1	6	Barely readable, snow and gravel location, too tall
Dartmouth Cove Mural Art Project Sign	20T 455557 4945989	Informational Signage	Dartmouth	2	2	2	1	0	7	Too high, character height small
A Vessel's Journey Map	20T 455262 4945874	Informational Signage	Dartmouth	2	2	2	1	2	9	Character Height too small
Dartmouth Harbourwalk Signage	20T 454966 4945749	Directional Signage	Dartmouth	2	2	1	2	1	8	No units, too high
Dartmouth Waterfront Trail Signage	20T 454950 4945760	Directional Signage	Dartmouth	2	2	1	2	1	8	No units, too high
Dartmouth Harbourwalk Signage	20T 454915 4945793	Directional Signage	Dartmouth	2	2	1	2	1	8	No units, too high
Dartmouth Harbourwalk Map	20T 454888 4945759	Informational Signage	Dartmouth	1	1	1	1	1	5	Not up to date, snow obstruction, signage not universally design + snow, poor character sizes, and a bit too high

Halifax Ferry Terminal Signage	20T 454656 4944207	Directional Signage	Halifax	2	2	2	2	1	9	Too high
Halifax Harbourwalk Map	20T 454647 4944227	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Halifax Harbourwalk Map	20T 454596 4944363	Informational Signage	Halifax	1	1	1	1	1	5	Not up to date, snow obstruction, signage not universally design + snow, poor character sizes, and a bit too high
Halifax Harbourwalk Map	20T 454524 4944431	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Purdy Wharf Signage	20T 454462 4944506	Regulatory Signage	Halifax	2	2	2	2	2	10	N/A
Casino Signage	20T 454415 4944535	Directional Signage	Halifax	2	2	1	2	2	9	Angles might affected visibility, universal design consideration lacking
Halifax Harbourwalk Map	20T 454402 4944583	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Mariott Halifax Harbourfront Signage	20T 454566 4944392	Informational Signage	Halifax	2	2	2	1	1	8	Could be lowered, character height should be bigger
Halifax Waterfront Signage	20T 454659 4944185	Regulatory Signage	Halifax	2	2	2	2	2	10	N/A
Halifax Harbourwalk Signage	20T 454593 4944367	Directional Signage	Halifax	1	2	2	1	1	7	DevelopNS non-existent, character height could be improved and could be reduced by height
Halifax Harbourwalk Map	20T 455058 4943318	Informational Signage	Halifax	1	2	1	1	1	6	Not up to date, signage not universally design + snow, poor character sizes, and a bit too high
Port of Halifax Signage	20T 455053 4943316	Informational Signage	Halifax	2	2	1	1	1	7	Character height could be improved and could be reduced by height, lean
Halifax Harbourwalk Signage	20T 455052 4943316	Directional Signage	Halifax	1	2	2	1	1	7	DevelopNS non-existent, character height could be improved and

										could be reduced by height
Queen's Landing Signage	20T 454751 4944049	Informational Signage	Halifax	2	2	2	1	2	9	Character Height too small
Queen's Marque Signage	20T 454712 4944100	Informational Signage	Halifax	2	2	2	1	2	9	Character Height too small
Here We Began Signage	20T 454682 4944163	Informational Signage	Halifax	2	0	2	1	2	7	Not accessible at all, character height should be bigger
The Dockyard Clock Signage	20T 454670 4944162	Informational Signage	Halifax	1	1	1	1	2	6	Accessibility issues due to terrain, vandalized, lean could be improved, character height could be better
Nathan Green Square Signage	20T 454644 4944219	Informational Signage	Halifax	2	1	2	1	2	8	Obstructions by snow, character height should be bigger
Nathan Green Square Park Signage	20T 454658 4944224	Informational Signage	Halifax	2	1	1	1	2	7	Character height could be bigger, stairs a big obstruction
Canadian Merchant Seamen Plaque	20T 454812 4943903	Informational Signage	Halifax	2	1	2	2	2	9	Snow issues
Millennium Legacy Flagpole Plaque	20T 454811 4943909	Informational Signage	Halifax	2	1	2	2	2	9	Snow issues