Pedaling Towards Equity

Analyzing Transportation Access in Metro Vancouver's Cycling Network

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About this Report

This equity report highlights the importance of integrating equity considerations into planning active transportation routes and networks by transportation planners, regional agencies, and the province. It builds upon data from the *State of Cycling and the Cycle Highways in Metro Vancouver* reports, contributing to the region's ongoing dialogue on transportation equity. The report expands upon previous work conducted by HUB Cycling and other research completed in Metro Vancouver.

Previous related work completed by HUB Cycling

In 2019, the *Benchmarking the State of Cycling in Metro Vancouver* report, released jointly by TransLink and HUB Cycling, revealed that more than half of the bikeway network was not adequately safe and Comfortable for Most people, with unequal access to quality cycling facilities across the region. The 2022 *Cycling and Older Buildings* report explored the relationship between equity and access to end-of-trip facilities and secure bike storage. The *Cycle Highways in Metro Vancouver* project examined the potential for long-distance cycling routes, incorporating an equity component within the framework of cycle highways. This report builds on that previous work, while consolidating and expanding on the equity aspects of the cycle highway project.

Equity work in Metro Vancouver

Research conducted in Metro Vancouver highlighted ongoing disparities in the distribution of cycling infrastructure, revealing that inequities persist between more advantaged and less advantaged groups despite two decades of bike network development. Metro Vancouver's *Social Equity & Regional Growth* study, a three-phase project on equity, emphasizes the integration of justice and fairness into planning and policymaking. As part of Transport 2050, TransLink released the *Rapid Implementation Design Guide for Bikeways* in Metro Vancouver, which incorporates a focus on social equity and recommends prioritizing projects in areas with limited cycling access or higher concentrations of equity-seeking groups.

Acknowledgements

Land Acknowledgements

We acknowledge that HUB Cycling, through our various projects, operates on the traditional unceded territories of many First Nations in British Columbia. Learn more about the distinct languages, economic backgrounds, and First Nations communities in regions across British Columbia on this interactive map.

Report Acknowledgments

We want to express our sincere gratitude and appreciation to all individuals and organizations who contributed to completing this report on transportation equity in Metro Vancouver.

We are grateful to TransLink for their collaboration and support. The joint efforts between TransLink and HUB Cycling on the *Cycle Highways in Metro Vancouver* project provided crucial data and insights that enriched the content and recommendations of this report.

We acknowledge the researchers and professionals who have dedicated their time and expertise to studying equity in transportation within Metro Vancouver. Their studies on cycling infrastructure distribution and Metro Vancouver's *Social Equity & Regional Growth* project have deepened our understanding of the persistent disparities and the need for equitable planning practices.

We want to extend our special thanks to the Cycle Highway Working Group for their invaluable contributions to developing the equity elements during the cycle highway project. Their feedback and insights have been instrumental in shaping the foundation of this report on transportation equity. Working Group members included Geneviève Bowers, Navdeep Chhina, Gavin Davidson, Lisa Josephson, Paul Kennedy, Erin O'Melinn, and Alex Taciuk.

This report would not have been possible without the collective efforts and collaboration of all those involved. Thank you for your contributions and commitment to promoting equity in transportation planning in Metro Vancouver.

About HUB Cycling

HUB Cycling is a charitable not-for-profit organization that has spent over 25 years removing barriers to cycling in Metro Vancouver while cultivating the health, environmental, and economic benefits that active transportation can bring. HUB has educated thousands of people, motivated thousands more, and championed improvements such as #UnGapTheMap to create a connected cycling network. HUB Cycling's mission is to get more people cycling more often. We make cycling better through education, action and events. More cycling means healthier, happier, more connected communities. We're leading the way in making cycling an attractive choice for everyone.

Meet the Team

Evan Hammer - Transportation Planner and Project Manager

Evan is an urban planner with experience in equity-focused projects, including affordable housing and homelessness initiatives. His expertise in sustainable transportation encompasses a range of areas, including cyclist route selection, bike sharing, and transportation planning. As the Infrastructure Planning and Policy Manager at HUB Cycling, Evan leads the transformative #UnGapTheMap initiative. Last year, he managed the release of the influential *Cycle Highways in Metro Vancouver* report. Evan actively engages with local, municipal, and provincial decision-makers, offering feedback on key policy initiatives such as Clean BC, Active Transportation Strategy, Transport 2050, Climate 2050, and Metro 2050. He also provides input on significant projects involving cycling facilities, including the new Massey Crossing, Pattullo Bridge replacement, and Surrey-Langley SkyTrain extension. Evan has a Masters of Arts in Planning from the School of Community and Regional Planning at UBC.

Giovanna Lanius-Pascuzzi - Researcher and Project Assistant

Giovanna recently completed an internship with HUB Cycling, conducting research to advocate for the development of cycle highways across Metro Vancouver as part of her Masters thesis. While pursuing her studies in Bio-Inspired Innovation at Utrecht University, she gained a comprehensive understanding of environmental perspectives and urbanism. Living in the Netherlands has provided firsthand experience of the positive impact of cycling on transportation and the crucial role of infrastructure. With a strong passion for sustainability in urban settings, Giovanna's interest in cycle infrastructure stems from recognizing the wide-ranging benefits, including environmental and health advantages, associated with promoting cycling as a mode of transportation.

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Cody is a multi-disciplinarian urban planner with a background in transportation and GIS. Cody has a Bachelors in Human Geography from the University of Alberta and a Masters in Sustainable Urban Planning from HafenCity Universität in Hamburg, Germany. After gaining professional experience in Germany, Denmark and Sweden, Cody moved back to Canada to work for Vancouver Bike Share and the City of Vancouver, focusing on sustainable transportation planning. Cody now provides international GIS consulting and is based in Vienna, Austria.

Executive Summary

Section Overview

Executive Summary

Cycling has gained recognition as an effective means of improving health outcomes, reducing greenhouse gas emissions, and providing economic benefits to individuals and society. It offers numerous health benefits, including physical, mental, and social well-being, and can reduce healthcare costs. Furthermore, cycling contributes to environmental sustainability by reducing reliance on fossil-fuel burning modes of transportation. Economically, cycling is an affordable mode of transportation that stimulates the local economy and creates more jobs per dollar spent compared to automobile roads.

However, transportation inequities persist in Metro Vancouver, posing challenges for the region's residents. The high cost of living and low-income rates make living in Metro Vancouver increasingly unaffordable for many households, leaving them with limited transportation options and an increasing reliance on personal vehicles. This exacerbates existing transportation inequalities. Moreover, motor vehicle transportation investments often lead to gentrification and displacement of vulnerable populations. Integrating equity considerations into cycle network planning to address these issues is crucial.

This report examines the current state of cycling infrastructure in Metro Vancouver, identifies areas of inequity, and provides recommendations for improving access to quality cycling infrastructure.

The equity analysis focused on two types of equity: social equity and spatial equity in transportation. Social equity considers household economics, transit-dependent populations, racial/ethnic minority and Indigenous populations, and populations with lower education levels. Spatial equity was assessed by analyzing vehicle access, transit access, and cycling infrastructure/path access.

The analysis revealed areas with higher transportation inequity, indicated by a lack of access to high-quality bike infrastructure, and areas with lower transportation inequity, where people were more likely to meet their transportation needs.

The results showed a correlation between the population and the coverage of Comfortable for Most cycling facilities. The categories representing higher relative transportation equity had a greater share of Comfortable for Most facilities compared to their population. In comparison, the categories representing lower relative transportation equity had less access to such facilities compared to their population.

The analysis highlighted areas in Metro Vancouver that face higher transportation inequity and have less access to high-quality bike infrastructure. These findings can help identify areas that would benefit from improved cycling facilities to promote transportation equity.

Expanding the best quality-cycling infrastructure, which is comfortable for most users, is critical in Metro Vancouver, with a particular focus on the most equity-deserving neighbourhoods. Areas lacking transportation access need to be a focus of improved transportation options, including long-distance, safe, and comfortable cycling facilities such as cycle highways.

Key Findings

- Social equity factors, such as household economics, transit dependency among specific populations (youth and seniors), and racial/ethnic minority and Indigenous populations, notably impact transportation choices and accessibility in Metro Vancouver.
- Spatial equity, mainly related to car accessibility, transit access, and bike infrastructure/path access, is crucial in determining regional transportation equity. Areas with limited car ownership, lack of transit access, and inadequate bike infrastructure face higher levels of transportation inequity.
- The analysis revealed notable disparities in transportation equity across Metro Vancouver. Certain dissemination areas showed a disproportionately high concentration of equity-seeking groups, indicating a need for targeted interventions to improve transportation access and options for these communities.
- The combination of social and spatial equity considerations helped identify areas with higher transportation inequity, highlighting the areas that would benefit from implementing high-quality cycling facilities, including cycle highways.
- Disadvantaged areas in Metro Vancouver have less access to Comfortable for Most facilities compared to more advantaged areas, indicating a concentration of comfortable cycling infrastructure in the latter. This finding underscores the need for a more equitable distribution of high-quality cycling infrastructure across the region to address transportation inequality.

Recommendations

- **Adopt an equity-informed design approach:** Transportation planners and decision-makers in Metro Vancouver should prioritize an equity-informed design and implementation of cycling infrastructure. This approach should focus on creating cycling routes that are high quality, safe and comfortable for various users, including building long-distance functional connections (cycle highways). The infrastructure should be accessible and distributed equitably across the region.

- **Define equity scores and prioritize underserved areas:** Define equity scores based on factors such as youth, seniors, immigrant populations, low-income populations, and Indigenous populations. Prioritize areas with low coverage and conduct accessibility analyses to identify and address inequities in bike infrastructure networks.

- **Develop and build a safe, comfortable, and equitable regional cycling network while improving access to transit for underserved areas.** Municipal transportation planners should collaborate with TransLink to plan, develop, and build a high-quality cycling network across Metro Vancouver. The network should prioritize safety and comfort for people cycling while ensuring equitable access for all, particularly in underserved areas. Simultaneously, planners and decision-makers should enhance access to transit in these communities. This entails designing transit routes that effectively serve underserved areas, secure bike parking and other connections for multi-modal users, ensuring affordability and reliability of transit options, and considering access to employment opportunities through transit. By integrating these two objectives, Metro Vancouver can create a comprehensive and equitable transportation system that meets the diverse needs of its residents.

- **Engage and empower vulnerable populations:** Meaningful engagement with vulnerable populations, including racialized communities, low-income individuals, and women, is crucial in understanding their specific transportation needs and addressing the barriers they face. Incorporating their perspectives into decision-making will result in more equitable and inclusive cycling infrastructure.

- **Incorporate UNDRIP in active transportation planning:** Review existing transportation plans and policies (and legislature) to ensure they align with UNDRIP principles and address Indigenous peoples' specific needs and aspirations.

- **Monitor and evaluate equity outcomes:** Establish mechanisms for monitoring and evaluating the equity outcomes of cycling infrastructure projects. Regularly assess the impact of infrastructure improvements on vulnerable populations to ensure that the intended goals of increased accessibility and equity are being achieved.

Equitable access to quality cycling infrastructure is essential for promoting active transportation, reducing congestion, and improving health outcomes in communities across Metro Vancouver. By integrating equity considerations into cycle network planning and adopting an equity-informed design of cycling infrastructure, Metro Vancouver can create a transportation system that is accessible, safe and provides equitable opportunities for all residents. Implementing cycle highways and prioritizing equity in transportation planning will improve mobility options, enhance public health, reduce environmental impact, and stimulate the local economy.

This report recommends increasing investment in cycling infrastructure in areas of inequality, developing a regional strategy for coordinating infrastructure and reviewing existing infrastructure to identify areas for improvement. Community empowerment is also vital to ensuring that decision-making processes are inclusive. By implementing these recommendations, Metro Vancouver can create a more equitable and sustainable transportation system, reduce mortality, strengthen equity-deserving populations in urban and suburban areas, including Indigenous communities, and ensure that all residents of Metro Vancouver have access to quality cycling infrastructure while enjoying the numerous benefits of active transportation.

Introduction

Section Overview

Introduction

Cycling is widely recognized as an effective means of improving health outcomes, reducing greenhouse gas emissions, and providing economic benefits to individuals and society. The health benefits of cycling include physical, mental, and social well-being.[1–3] Cycling is associated with reduced healthcare costs, particularly for e-bike users who experience the health benefits of cycling while reducing the physical strain associated with traditional biking.[4] In addition to the health benefits, cycling also provides significant environmental benefits, primarily by reducing reliance on fossil-fuel burning modes of transportation.[1,3,5] The economic benefits of cycling are seen at both the individual and societal levels. Cycling is an affordable mode of transportation, and people who ride bikes often spend more money at local businesses, thereby stimulating the local economy.[6] Furthermore, cycling infrastructure is relatively inexpensive compared to automobile roads and creates more jobs per dollar spent.[1,7]

While cycling has the potential to address transportation inequity, this can only be achieved by providing adequate supporting infrastructure. Canadian cities, such as Winnipeg and Victoria, have already included equity considerations in their cycle network planning, and Metro Vancouver should follow suit. Previous research on bike infrastructure in the City of Vancouver has shown disparities in access, which has not been addressed with recent investments. Greater transportation equity can be achieved by further facilitating bike use, one of the cheapest and most accessible transportation modes. Equity in bike infrastructure is contributed by the design of cycling networks – high-quality functional connections that are safe and comfortable for various users.

Along with quality infrastructure, cycling education encourages more cycling and is needed to increase people's skills and confidence to bike for transportation. Education is especially important related to equity concerns. Women and other vulnerable groups often have lower cycling skills and confidence for various reasons.[8] Providing cycling education can help address this disparity.

Metro Vancouver faces significant equity challenges, especially regarding transportation networks and infrastructure. The area's high cost of living and low-income rates make it increasingly unaffordable for

residents, with many households spending a large portion of their income on housing and transportation costs.[9] Almost one in three households spend over 70% of their before tax income on housing and transportation costs.[9] This creates a situation where people have to leave urban centers due to expensive housing and are left with fewer transportation options, leading to increased reliance on cars. This, in turn, worsens existing transportation inequalities.

Moreover, transportation investments in certain areas often lead to gentrification and displacement of vulnerable populations.[9] The gap between people with safe travel options, affordable living, discrimination-free mobility, and being able to go to the places they need continues to be an issue.[9] TransLink notes that continued improvement in transportation across the region is required to help address these issues.[9]

Cycling is an affordable mode of transportation with a relatively low cost compared to other modes of transport, especially when compared to private vehicles. The average cost of owning and maintaining a car in Canada is $9,500 per year while the average cost of owning and maintaining a bicycle is $300/year.[10] [11] Public transportation passes are an average of $940 per year but come with limitations for those that live in areas without nearby or frequent transit options.[35] This means that people who bike also save money; they have more money to spend, save on health insurance costs, and alleviate the need to develop relatively expensive and space-inefficient vehicle parking.[6]

The importance of equity in transportation and cycle infrastructure planning is increasing. Inequitable transportation in urban areas often correlates with areas with lower-socioeconomics indicators and minority populations. The impacts of transportation planning decisions can be significant and diverse. Cycling is a very equitable form of mobility and can help address transportation inequities. However, equitable and supporting bicycle infrastructure is needed to ensure the success of cycling.

Planning for equity in bike transportation must consider the distribution and accessibility of the network, in addition to the types of facilities implemented.

Metro Vancouver municipalities and transportation authorities, like TransLink, should better integrate equity issues into policy and planning. Community design that prioritizes personal vehicle use over transporting people lacks transit frequency and disproportionally impacts racialized, low-income, and female populations. This also negatively affects their health and access to employment, education, and recreation.

An equity-informed design and implementation of cycling infrastructure addresses equity concerns in both transportation and bike infrastructure planning. Cycling is one of the cheapest and most accessible modes of transportation, and improving cycling leads to greater equity in transportation.

Cycle highways can also contribute to equity in cycling infrastructure, as they can connect neighbourhoods across the region and provide high-quality infrastructure linking more affordable housing with key destinations that are safe and comfortable for various users of all ages and abilities (AAA).

This report examines the equitable distribution of quality cycling infrastructure in Metro Vancouver. Cycling is an increasingly popular mode of transportation and is the fastest-growing mode among commuters in urban areas.[12] Demand for other forms of micro mobility, such as e-bikes, continues to increase.[13,14] To accommodate this increasing demand, cycling infrastructure must be accessible and safe for everyone, regardless of location or socio-economic status. In this report, we analyze the current state of cycling infrastructure in Metro Vancouver, identify areas of inequity, and make recommendations for improving access to quality cycling infrastructure.

Leveraging Cycling as a Solution for Transportation Inequality

Photo credit: Cycle Superhighways, Capital Region of Denmark

Section Overview

Leveraging Cycling as a Solution for Transportation Inequality

Photo credit: Paul Krueger

Context

Equity in transportation means that the impacts, benefits and costs are considered fair and appropriate.[15] The impacts of transportation planning decisions are both significant and diverse. These include effects on individuals' economic and social opportunities, external costs, including congestion and collision risk, and impacts on land value, local economic activities (including employment and economic development), and household expenses.[15] High levels of public resources, such as tax funding and road right-of-ways, are also used, which disproportionately favour some users.[15]

In terms of equity, "bicycles are the cheapest and most accessible form of mobility" [16]; however, often, the supporting infrastructure for using a bike as transport is poor or absent. Although the bike itself is equitable, it cannot operate equitably without the infrastructure that supports equitable access. The National Association of City Transportation Officials (NACTO) has highlighted that poor or absent bike infrastructure disproportionately affects low-income communities and communities of colour.[17] In Vancouver, we see transportation inequality with specific demographics being overrepresented as transit users compared to the general population and certain minorities having less access to quality bike infrastructure than the regional average.[18,19]

There must be more significant equity considerations when designing our transportation infrastructure and systems.[20,17] Numerous studies have found an inequitable distribution of transportation infrastructure around our urban areas. For example, less transportation infrastructure accessibility is correlated with areas with poorer socio-economic indicators and minority populations.[19,21]

Mobility has been tied with economic opportunity, health, and quality of life, and therefore inequitable transportation means an inequitable distribution of its consequences and that, along with shifting mobility needs, means our most vulnerable populations need to be taken into greater consideration.[20,15]

Equity Factors and Consequences

Within transportation, there is a distinction between different types of equity, including social and spatial equity.[22]

Social equity refers to the socio-demographics of a population, such as household economic, ethnic populations, or education levels. Metro Vancouver's report on equity in the region defines it as follows:

"The promotion of access to context-appropriate opportunities and representation within systems of power for those that face systemic barriers and are the most negatively impacted by regional decisions, often due to intersecting and compounding factors such as race, ethnicity, Indigeneity, gender, sexuality, religion, age, socio-economic status, and mental or physical disability." [23]

Spatial equity refers to distributional effects, such as accessibility to transit and bike infrastructure.

Several social equity indicators impact transportation equity. Household economics play a role, as those with lower household incomes spend a high proportion of their earnings on transportation.[21,24–26] Age also especially affects those younger and older who are often unable or less likely to drive a car.[19,21,24–26] Racial and ethnic minorities have also been correlated with transportation inequality. [19,21,25,26]

These elements are further compounded with aspects of spatial equity. Spatial equity is affected by whether or not a household has access to a car,[21] if they can reach public transit options within a reasonable distance[23], and if they have access to nearby bike infrastructure [21,27]. It is crucial that various types of equity, and the variables that affect them, are considered in transportation planning to ensure higher levels of equitable distribution and access across a regional population.

Research in Melbourne, Australia, looked at individual travel patterns, social exclusion, and well-being. Residents averaged 3.8 daily trips (all modes), but trip numbers declined as the number of social exclusion risk factors (income, employment, political engagement, participation in activities, and social support) increased. For example, 2.8 fewer daily trips were made by people with two or more risk factors.[28] Research investigating the travel behaviour of females in the U.K. found that access to a car significantly impacted a woman's ability to obtain a job – a metric of economic inclusion.[29] Their

analysis concluded that car access helped achieve equity objectives in automobile-dependent areas. However, as efforts are being made to reduce automobile use, the needs of vulnerable groups must be considered.[29] Overall, when different transportation modes are available, individuals can choose the best fitting option for each trip, reducing chauffeuring costs, increasing independence – especially for younger and older adults - increasing exercise, saving money, and improving access.[15]

Research investigating the travel behaviour of females in the U.K. found that **access to a car significantly impacted a woman's ability to obtain a job** – a metric of economic inclusion.[29]

Cycle Infrastructure Planning for Equity

Several Canadian cities have included equity in their analysis of the cycle networks and plans. Winnipeg defined an equity score by considering youth, seniors, immigrants, aboriginal, and low-income populations.[30] This was combined with a level of service analysis which considered the number of bikeway facilities in different neighbourhoods. [2,30] These together defined census tracts with low coverage and a scoring highest in equity, which justifies priority in future infrastructure improvements.[30]

An equity analysis was also conducted for the City of Victoria to help plan its future bike network.[31] One project aim was "to develop a well-connected network for cycling that serves all areas of the city and includes areas that have a high density of historically underserved population and relatively low levels of facilities currently." [31] They assessed equity by creating a low-income score and mapped out the relevant regions to serve.[31]

As part of their Active Transportation Plan, Saskatoon conducted an in-depth equity analysis, considering the same five factors as Winnipeg (e.g. youth, seniors,

etc.) and highlighting the most inequitable areas. They also assessed the accessibility of their network, slightly differently than Winnipeg, by identifying area gaps. Gaps were defined by being outside a 400m buffer surrounding their bikeways network.[27] They note that a complete bikeway network would mean that residents in every part of the city could access a designated bike facility within 400m. [27]

Equity in Metro Vancouver

Equity issues in the Metro Vancouver region are receiving increasing attention, highlighting the need for greater consideration and integration into policy and planning.[23]

The *Social Equity & Regional Growth Study* emphasizes the integration of social equity into the Metro 2050 plan, highlighting two important equity indicators related to transit: 'relative access to transit' and 'employment access (transit).' [23] The former indicator sheds light on the challenges faced by transit-dependent residents, particularly those who are racialized, low-income, and women. Factors such as an auto-oriented community design and limited transit frequency disproportionately impact their access to employment, education, health, and recreation.[23] Suburban and rural areas that lack proximity to major bus or SkyTrain routes are of particular concern.[23] The latter indicator, 'employment access (transit),' specifically highlights the reduced job opportunities and economic well-being experienced by populations reliant on transit.[23]

TransLink has found that the people using public transit – bus, sea bus, and SkyTrain – differ when compared to the broader adult population of Metro Vancouver.[18] They find a higher proportion of transit riders between 18 and 24 years old (and fewer between 55 and 64 years of age) are less likely to be employed full-time, more likely to be employed part-time, more likely to be unemployed, more likely to be students and more likely to have university-level education.[18] TransLink also highlights the difference between 'choice' and 'captive' riders, the latter being defined by not having regular vehicle access. Captive transit riders compose 48% of transit users and 56% of all trips. The proportion of captive transit users (48%) is significantly higher than in 2019, where captive riders composed only 35% of transit ridership.[18] Captive riders are more likely to be younger (18-24), students, employed part-time, less affluent (household income of <$40K), and taking work-related trips than choice riders.[18]

Choice riders have regular access to a vehicle. **Captive riders** do not have regular vehicle access. Captive riders are more likely to be younger (18-24), students, employed part-time, less affluent (household income of <$40K), and taking work-related trips than choice riders.[18]

Research in the city of Vancouver assessed the equity of their bikeway facilities and whether it had changed between 2001 and 2016 with the increased investments in cycle infrastructure and corresponding increased ridership rates.[19] The study found that there were disparities in access, which were not addressed by the investments made in cycle infrastructure.[19] The authors highlight that areas with more children or Chinese residents had comparatively less access to protected bike lanes; this contrasted with areas with more university-educated adults having higher levels of bike infrastructure access.[19] Areas with more local street bikeways saw more bike commuting, highlighting the effect of access to safe infrastructure on an individual's choice of commuting by bike.[19] The study concludes that inequity in the distribution of bikeways has persisted and continues independent of investments and increased infrastructure and calls for future solutions to promote active transportation for all communities and residents.[19]

HUB Cycling and TransLink's joint report Benchmarking the State of Cycling in Metro Vancouver (2019) found that only 46% of the current cycling network is comfortable for most users. Some of the municipalities, including West Vancouver (18%), Maple Ridge (36%), Delta (29%), and Surrey (28%), had even lower numbers.

While 65% of people are within 400 metres of a comfortable cycling facility, people's access varies across the region. In Vancouver, New Westminster, UBC, and the City of North Vancouver, over 80% of people are within 400 metres of a Comfortable for Most facility. This contrasts with the Districts of North and West Vancouver, Coquitlam, Maple Ridge, Port Coquitlam, and the City and Township of Langley, where 50% of the population (or less) are close (400 metres) to one of these safe and comfortable cycling facilities.[32]

A Snapshot of the State of Cycling in Metro Vancouver

Source: Benchmarking the State of Cycling in Metro Vancouver (2019)

Decision-makers and transportation planners must consider equity when designing our transportation infrastructure, specifically bike infrastructure, in order to create an equitable mobility network.

Other regions within Canada have already begun doing so. In Metro Vancouver, TransLink's recently released and award-winning *Rapid Implementation Design Guide for Bikeways in Metro Vancouver* calls for social equity to be considered in the planning and design of cycling projects.[33] This is a good start and is a framework to build on to develop an overarching equity analysis relevant to our cycling facilities and integrated within our planning decision, which is currently lacking.

Equity Analysis

Section Overview

Equity Analysis

Background for Analysis

In order to investigate transportation equity across Metro Vancouver, we looked at two types of equity: social equity and spatial equity. Social equity (such as socio-demographic factors) and spatial equity (effects of access) in transportation are in line with previous research.[15,22]

We selected the criteria below for the following reasons:

- They align with previous equity research conducted in transportation planning.
- They are considered relevant to provide a comprehensive understanding of equity within the context of Metro Vancouver.
- They are feasible to implement using GIS software capabilities.
- The required data is accessible and can be imported into the GIS software, even if not originally available in a GIS format.

Social equity has notable effects on individual mobility choices within a region. For example, how much money someone makes directly affects their ability to purchase a car. Household economics impact transportation choices and have been previously measured by median income level [19,24] or living below the poverty line. [21,25,26,30] Other demographics unevenly impacted by transportation accessibility are youth (under 18) and seniors (over 65).[19,21,25,26,30] These groups are more likely to be transit-dependent and less likely to drive.[21] Racial and ethnic minority populations are also important to consider when planning bike infrastructure [19,21,25,26], including aboriginal populations.[27,30] Previous research conducted for the City of Vancouver found notable inequalities in access for Chinese people, children, and folks with lower education levels.[19] The researchers stress that the socio-demographic groups with noted inequalities are prioritized for subsequent equality analysis.[19]

Spatial equity, especially within the North American car-centric planning context, can be measured by assessing car accessibility, specifically zero-car households.[21] However, city planning can also improve the effect not having access to a car has on transportation equity. This can be achieved by providing robust public transit services and active transportation options. Access to transit has been recognized as a significant contributing factor to inequality in Metro Vancouver, with areas within 1km of a transit stop considered as having access.[23] Transit-reliant populations and areas with lower connectivity face isolation, delays, and fewer opportunities than the rest of the region.[23] Access to bike infrastructure and paths contributes to improved transportation equity.[21,27] Similarly, access to cycling infrastructure and paths is crucial in enhancing transportation equity. [21,27]

The proximity to bike infrastructure is commonly defined as within a 400m radius in urban areas, representing a reasonable distance for accessibility.[21,27,34] Saskatoon states in their active transportation plan, "for a complete bikeway network, these buffers would overlap to cover the entire city, ensuring all residents are within a 400-metre bicycle ride of a designated bicycle facility" and used these criteria to assess their current network coverage.[27]

Based on the above research, we considered the following factors for the equity analysis of the cycling network in Metro Vancouver.

The variables under consideration are divided into the following two overarching categories.

Social Equity

1) Household economics
- Median Income level or living below the poverty line

2) Transit dependent populations
- Youth
- Seniors

3) Racial/Ethnic minority and Indigenous populations

4) Populations with lower education levels

Spacial Equity

5) Vehicle access
- Zero-car households[1]

6) Transit access
- Areas without transit access (stop/station farther than 1km)

7) Bike infrastructure/path access
- Areas without bike infrastructure access (outside buffer space of 400m or 1/4mile)

[1] While a robust transportation system where people have a variety of options to get around (walking, cycling, transit, car share, shared mobility, etc.) improves accessibility, many areas in Metro Vancouver are still very auto-oriented and lack transportation options. People who don't have access to a vehicle have less mobility in the region.

Data Collection

Most of the data used for the equity analysis was available through Statistics Canada or regional organizations, such as TransLink or Metro Vancouver. Income and education data was from Statistics Canada's 2016 Census and information on people identifying as First Nation or a visible minority. Statistics Canada had data available for people over the age of 65, but only had data on those 14 and younger, not 18 and younger as hoped.

Vehicle ownership information also was not readily available at a scale that met our analysis requirements. Instead, we used income and mode share data from Statistics Canada as a rough proxy for vehicle ownership. TransLink had data available on the transit network across Metro Vancouver (called the General Transit Feed Specification). We used this to determine access to the transit network. Access to cycling facilities focused on the Comfortable for Most (CfM) category and drew upon the previously conducted State of Cycling project by TransLink and HUB Cycling.

Analysis

Preliminary maps were created using the seven equity criteria listed above.

Social Equity

Using the median total household income from Statistics Canada by census tract area, the regional average for income was calculated ($78,000). Then, households above and below that average were determined using standard deviation to create a middle range ($57,000 – $99,000). We mapped out education levels in a similar way. The regional average of those with a high school education or less (35%) was determined, and then the standard deviation was used to create a middle range. Areas above this range then had lower education rates than the average, while areas below had higher education rates. This was done using dissemination areas (a smaller area than the census tract).

We used age to determine potentially transit-dependent populations. We combined those over 65 and under 14 to determine the percentage for each dissemination area. We then averaged this across Metro Vancouver (average was 32%) and used standard deviation to create a middle range with the percent of transit-dependent populations (24% - 40%). We then identified the areas that were either above or below that average range.

To determine ethnic makeup, the average concentration for those who identified as First Nation and other minority groups (these two were not combined) was calculated for the region and the middle range using standard deviation. This was done by dissemination areas.

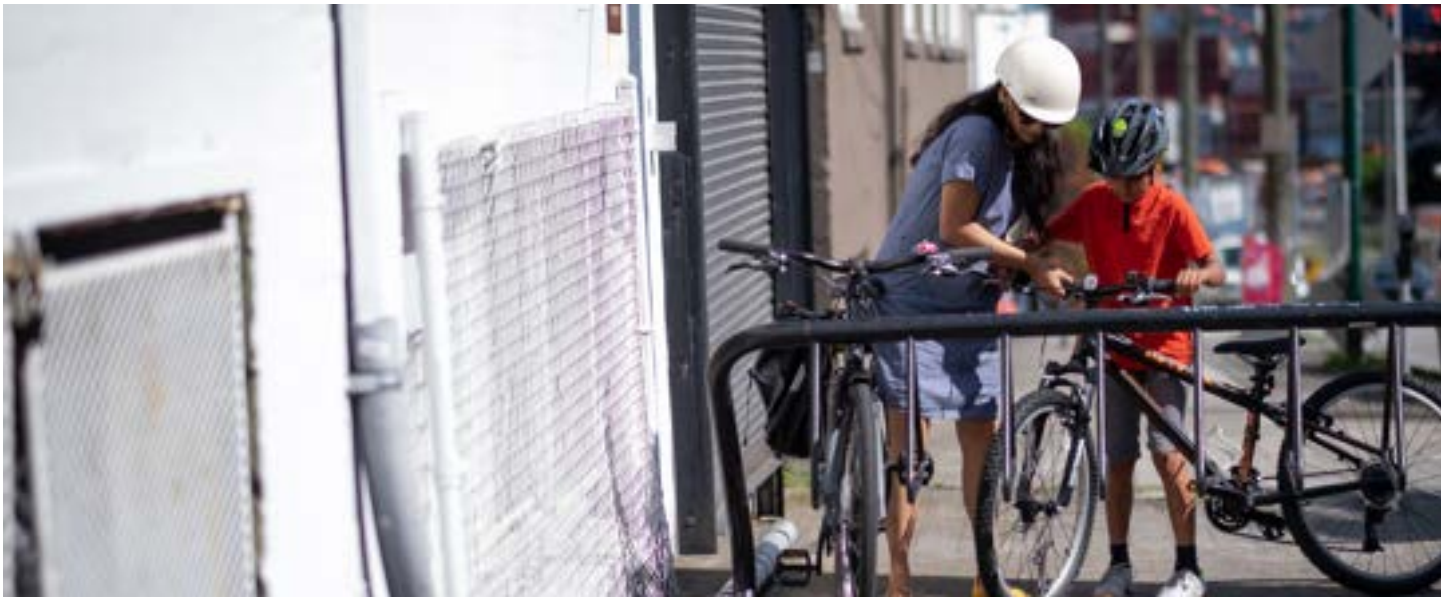
Spatial Equity

We used Statistics Canada income and mode share data as a rough proxy for vehicle access. We used median total household income by census tract and determined the average income for the region ($78,000). Census tracts were then defined as above or below-average income levels. From the mode share data, the average driving share percentage was calculated at the census tract level, and areas falling above and below were defined. Income and driving share percentage were then used to create four categories:

- above-average income and above-average driving
- above-average income and below-average driving
- below-average income and above-average driving
- below-average income and below-average driving
- Below-average income and below-average driving were used as our rough proxy for vehicle access.

Access to transportation was investigated by identifying the centre (or centroid) of each dissemination area. If the centroid was further than 1 kilometre from any transit stop or facility, we classified this as poor access.

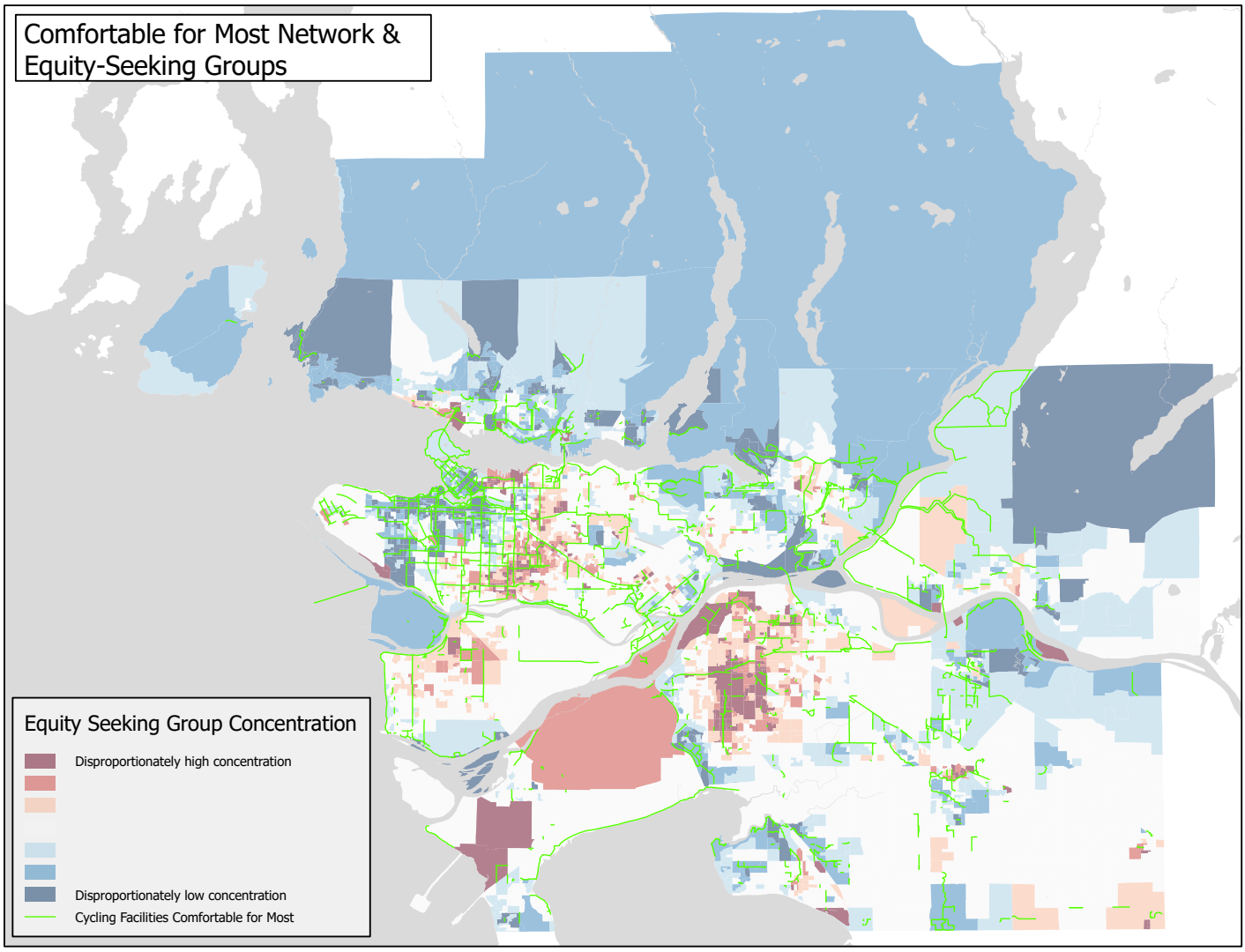
HUB Cycling and TransLink's 2019 State of Cycling report classified all bike routes across Metro Vancouver by comfort level - Comfortable for Most, Some, Few and Very Few. We focused on the Comfortable for Most (CfM) category. Using dissemination areas, we calculated whether a Comfortable for Most facility was either within 400 metres of the centre (or centroid) or if the dissemination area contained or intersected with a Comfortable for Most facility. Areas not meeting either criterion were identified as having less access to the quality-cycling network.



Results

Combining the social and spatial equity considerations, we designated each dissemination area as one of seven equity-seeking levels. The levels varied from disproportionately high concentration of equity-seeking groups to disproportionately low concentration. The Comfortable for Most (CfM) cycling network was then overlaid, allowing us to see which areas face higher transportation inequity and have less access to Comfortable for Most bike infrastructure. This is shown in the map below (Figure 1): the Comfortable for Most network (green) and the relative transportation equity scores of the dissemination areas.

Figure 1: Map of Metro Vancouver, displaying relative equity and overlaid with the Comfortable for Most network



Dissemination areas with higher levels of transportation inequity are depicted in red and thus highlight areas of concern. Blue denotes areas with lower relative levels of transportation inequity, implying that people are more likely to have their transportation needs met within these regions. This map helps highlight areas that may benefit from implementing high-quality cycling facilities, such as cycle highways. In other words, these areas lack high-quality bike infrastructure and face high transportation inequity.

We further investigated the distribution of the Comfortable for Most (CfM) network by looking at coverage by area. A 400-metre buffer was added to the Comfortable for Most facilities, and the proportion of CfM coverage was divided by the area dissemination block. This is in line with the analysis done in Victoria and Winnipeg.[30 31] As parks and natural areas included large amounts of land and had little contribution to the population, their areas were excluded from the total area of each dissemination area.

To investigate the distribution of Comfortable for Most infrastructure across the levels of transportation inequity, we compared within each of the seven equity score categories: (a) the percentage of the total Metro Vancouver population with (b) the percentage coverage of the CfM cycle infrastructure (Figure 2):

Figure 2: Share of the Population Compared to Share of "Comfortable for Most" Facilities Across Social Equity Measures

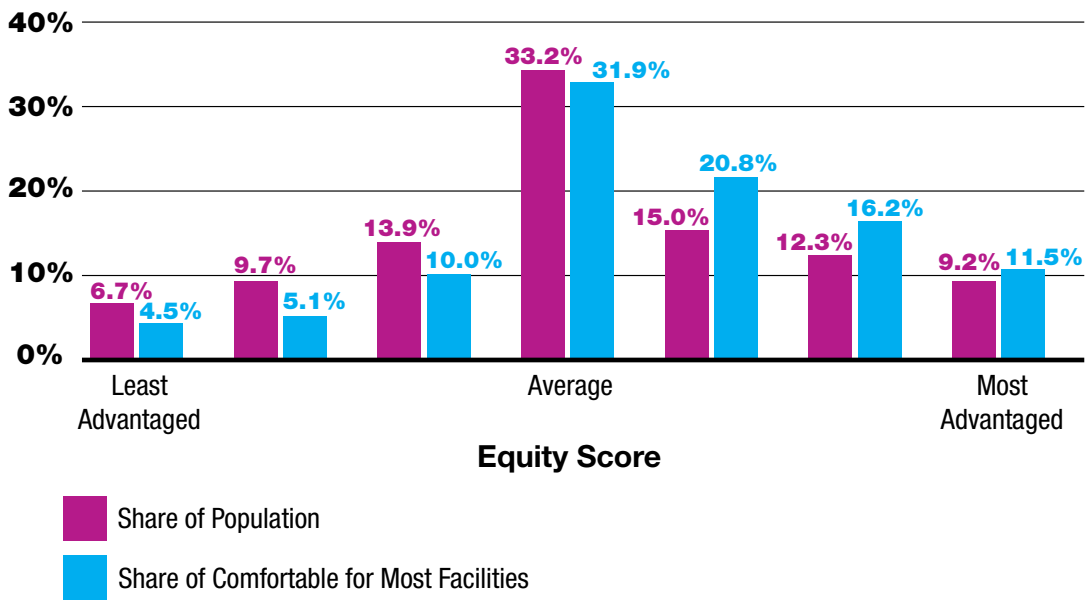


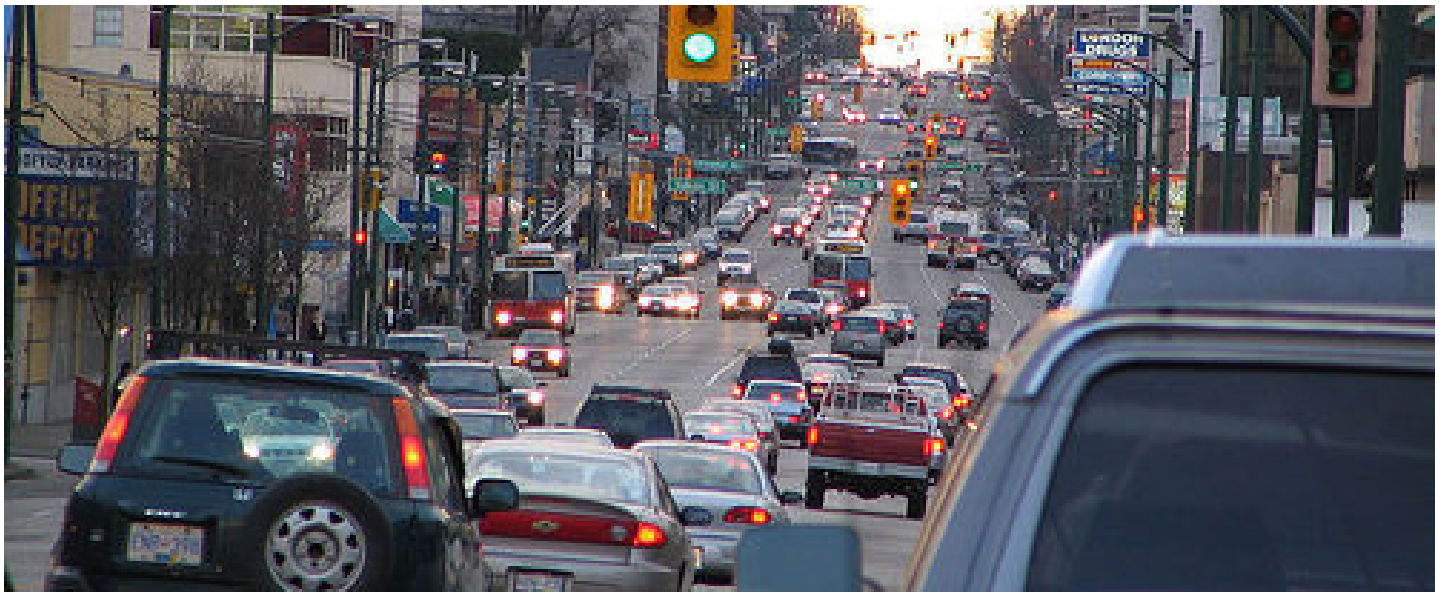
Figure 2: The percentage share of the total Metro Vancouver population (pink) and the percentage of total coverage of the Comfortable for Most cycle infrastructure in the region, compared within each of the seven relative equity categories.

Figure 2 above shows a similar distribution between population and coverage of Comfortable for Most facilities. However, on the left, we see the percentage of the population outweighing Comfortable for Most access, and on the right, the opposite is true. Looking at the 'average' category, the share of the population and Comfortable for Most facilities are almost equal; there is approximately a 1 percent discrepancy. If the highest quality Comfortable for Most cycling facilities were equitably distributed across Metro Vancouver, the share of the population compared to the share of Comfortable for Most facilities would be roughly equal, similar to the 'average' category.

The figure above suggests that the three categories representing higher relative transportation equity (more advantaged) have a higher share of the Comfortable for Most facilities and are disproportionate to their respective population. This discrepancy ranges from 2.3% to 5.8% more than their population equivalent. The opposite is seen for the three categories representing lower relative transportation equity; their share of Comfortable for Most facilities is between 2.2% and 4.6% lower than their respective population equivalent.

This figure shows that the least advantaged areas in Metro Vancouver have less access to Comfortable for Most facilities compared to the most advantaged areas. Comfortable cycling facilities are more concentrated in the more advantaged areas across Metro Vancouver.

The least advantaged areas in Metro Vancouver have **less access to Comfortable for Most facilities** compared to the most advantaged areas. Comfortable cycling facilities are more concentrated in the more advantaged areas across Metro Vancouver.



Initial Findings and Implications

Transportation equity is essential to address in any transportation planning work. Our equity analysis shows that several areas across Metro Vancouver score low on transportation equity. This preliminary analysis suggests that the coverage of the Comfortable for Most cycling facilities has greater representation in more advantaged areas. Further study by researchers, TransLink, the Ministry of Transportation and Infrastructure (MoTI) and municipal staff is needed to create a complete picture and make more concrete conclusions.

This transportation equity analysis provides valuable insights for decision-makers and transportation planners. It highlights the importance of considering specific destinations when designing cycling routes and developing cycling network plans (such as the Major Bikeway Netowrk). By addressing concerns related to transportation equity, we can create safer and more comfortable cycling networks that cater to the needs of all communities.

Areas with the highest concentration of equity-seeking groups, represented in shades of red, across Metro Vancouver (Figure 3, next page), illustrate areas that were less advantaged on social equity measures and also had limited access to transit or comfortable cycling facilities or vehicle access (spatial equity). Identifying these areas of concentration can guide planners in prioritizing resources and interventions for maximum impact.

Figure 3: Map of Metro Vancouver, displaying poor access to transit or cycling or driving

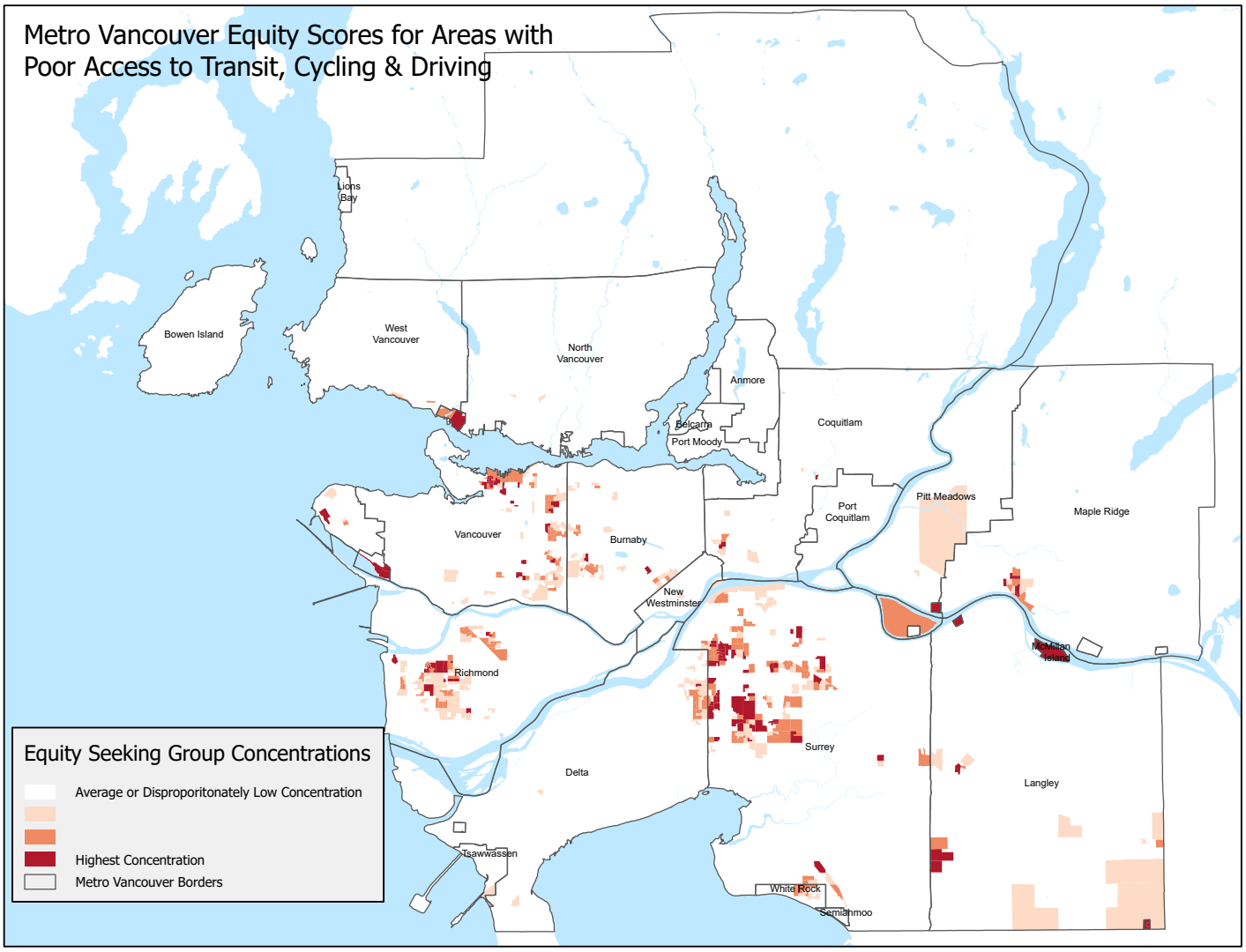


Figure 3: Areas with the highest concentration of equity-seeking groups that also had limited access to comfortable cycling facilities or transit or vehicle access, denoted in shades of red, across Metro Vancouver.

Our goal is that this information contributes to developing cycling networks that will improve safety and comfort, address concerns relevant to transportation equity, and help guide which regions may benefit most from implementing new cycling routes, including long-distance routes such as cycle highways.

Cycle Highways as a Way to Improve Equity

Photo credit: Cycle Superhighways, Capital Region of Denmark

Section Overview

Cycle Highways as a Way to Improve Equity

Photo credit: Cycle Superhighways, Capital Region of Denmark

In 2022, HUB Cycling published a report on the case for Cycle Highways in Metro Vancouver.

Cycle highways are the highest quality bike routes, covering long distances (5km+) and providing regional connections between major destinations. They are direct, paved, protected, lit, of ample width, and with intersections prioritizing people cycling. This, along with clear signage, branding, and regular maintenance, ensures cycle highways are safe, comfortable, and easy to use for people of all ages and abilities at all times of the day and year.

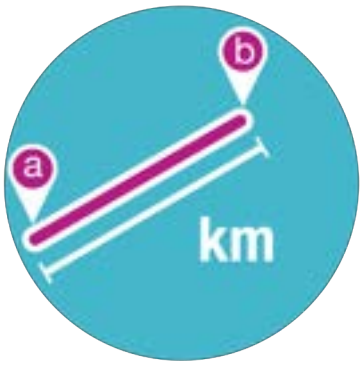
Cycle highways offer a range of benefits, including increased mobility options, improved travel times, and enhanced safety for people cycling and using active transportation.

The report drew on examples of cycle highways in Europe, the U.K. and elsewhere and developed six key criteria for a cycle highway: major destinations, minimal slope, directness, priority intersections, protection from traffic if on the roadway, and at least 5 kilometres in length.

Major Destinations (including equity-deserving areas)

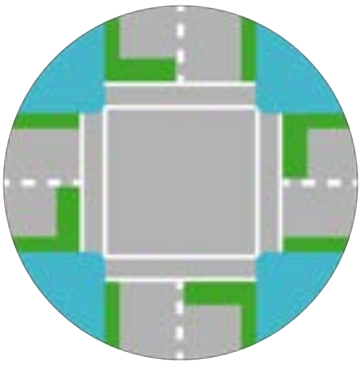
Minimal Slope

Direct



5km+ long

Road type & Speed



Priority Intersections

Elements of an equity analysis were also used to identify areas with the highest concentrations of equity-seeking groups (see Figure 3 above). These equity considerations were added to the major destination criteria included in the six criteria.

Existing cycle routes and potential cycling corridors in Metro Vancouver were analyzed and ranked using those six criteria. The four top-scoring routes were:

- B.C. Parkway (including an extension along 10th Ave to the Arbutus Greenway)
- Central Valley Greenway
- Adanac + Francis Union (plus extensions to SFU and through downtown to the North Shore)
- Tri-Cities to North Shore Corridor

Each proposed route connects with disadvantaged areas within Metro Vancouver, as illustrated in the map below (Figure 4).

Figure 4: Map of Metro Vancouver, displaying cycle highway route & corridor segment evaluation scores and equity evaluation

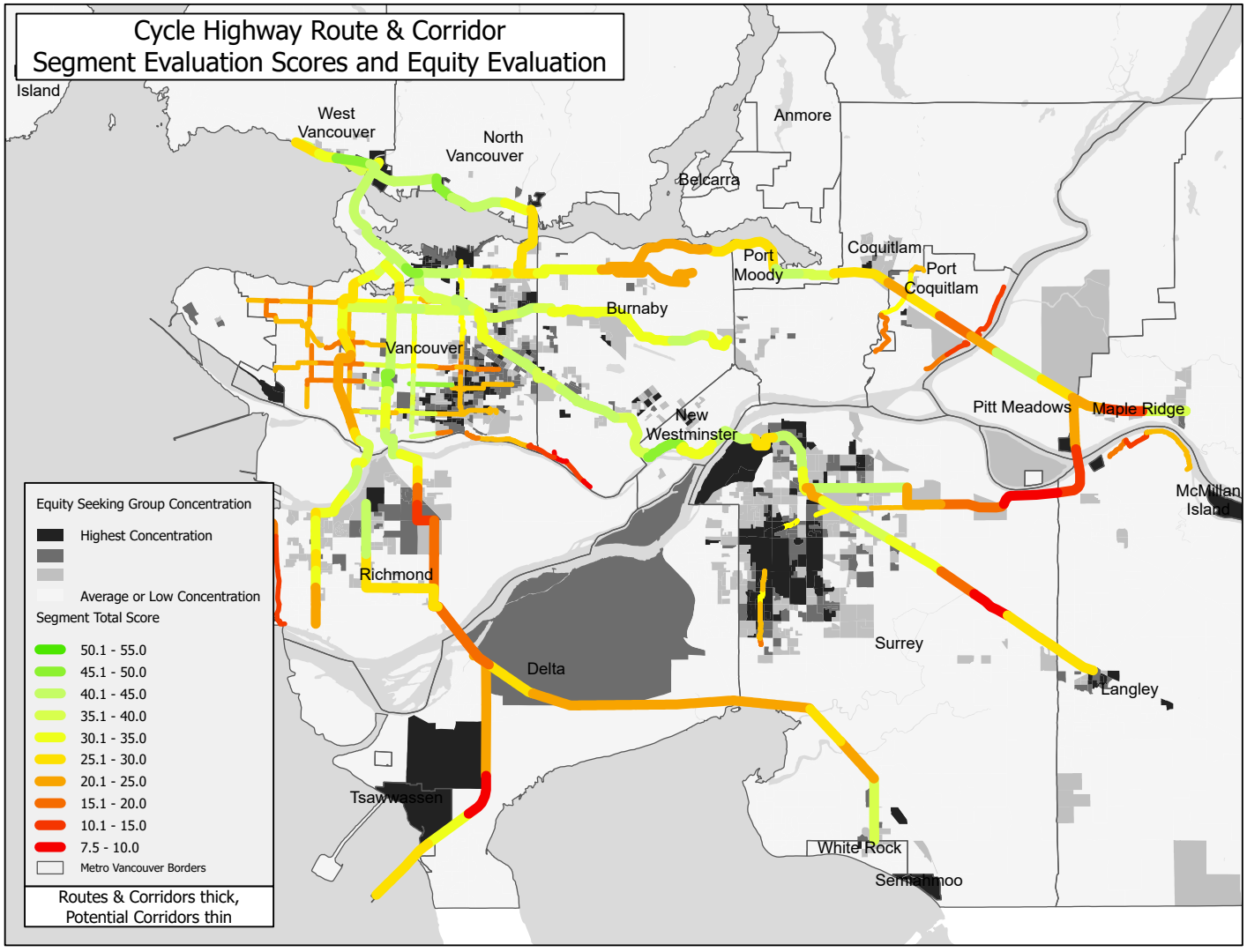


Figure 4: The relative scores of segments of proposed cycle highways, overlaid on the concentration of equity-seeking groups across Metro Vancouver

Cycle highways are one way to address transportation equity issues by providing efficient and safe connections across the region. The identified potential cycle highway routes address transportation equity concerns and link disadvantaged areas together. The BC Parkway, in particular, establishes connections between regions that would greatly benefit from improved transportation, including North Surrey, parts of Burnaby, and the southern and eastern areas of Vancouver. These routes may be eligible for funding from TransLink, further supporting their viability. However, any cycle highway project in Metro Vancouver should consider regional and context-specific factors and receive support from local municipalities and First Nations groups.

Cycle highways should be distributed equitably across the region, considering factors such as socio-economic disparities, access to services, and transportation needs of marginalized communities. By prioritizing equity, Metro Vancouver can address transportation inequalities and provide all residents equal access to high-quality cycling infrastructure.

Limitations and Future Study

Section Overview

Limitations and Future Study

The analysis conducted in this study aims to incorporate and integrate equity considerations, building upon the results of the equity analysis included in the 2022 Cycle Highway report.

As part of this work, there were some limitations of the GIS analysis performed, primarily stemming from data availability and project duration. Although we carefully selected and managed the data for the equity analysis to ensure it aligned with our objective, there was a lack of data for the age group of 14-18, who were considered transit dependent. Additionally, vehicle access was estimated using a proxy based on average income and driver share percentages, assuming that groups with lower incomes and lower driver share percentages would have reduced vehicle access. However, this proxy is susceptible to confounding variables. Furthermore, the analysis did not include access to car share options, which can significantly impact mobility choices. Obtaining age data for those 18 and under and data on car ownership across the region would be valuable for future equity research and the development of cycle networks.

While the underlying equity work provides a solid foundation for regional understanding, further research can delve deeper into the social and spatial equity aspects, incorporating additional data for a more comprehensive and nuanced analysis.

Recommendations

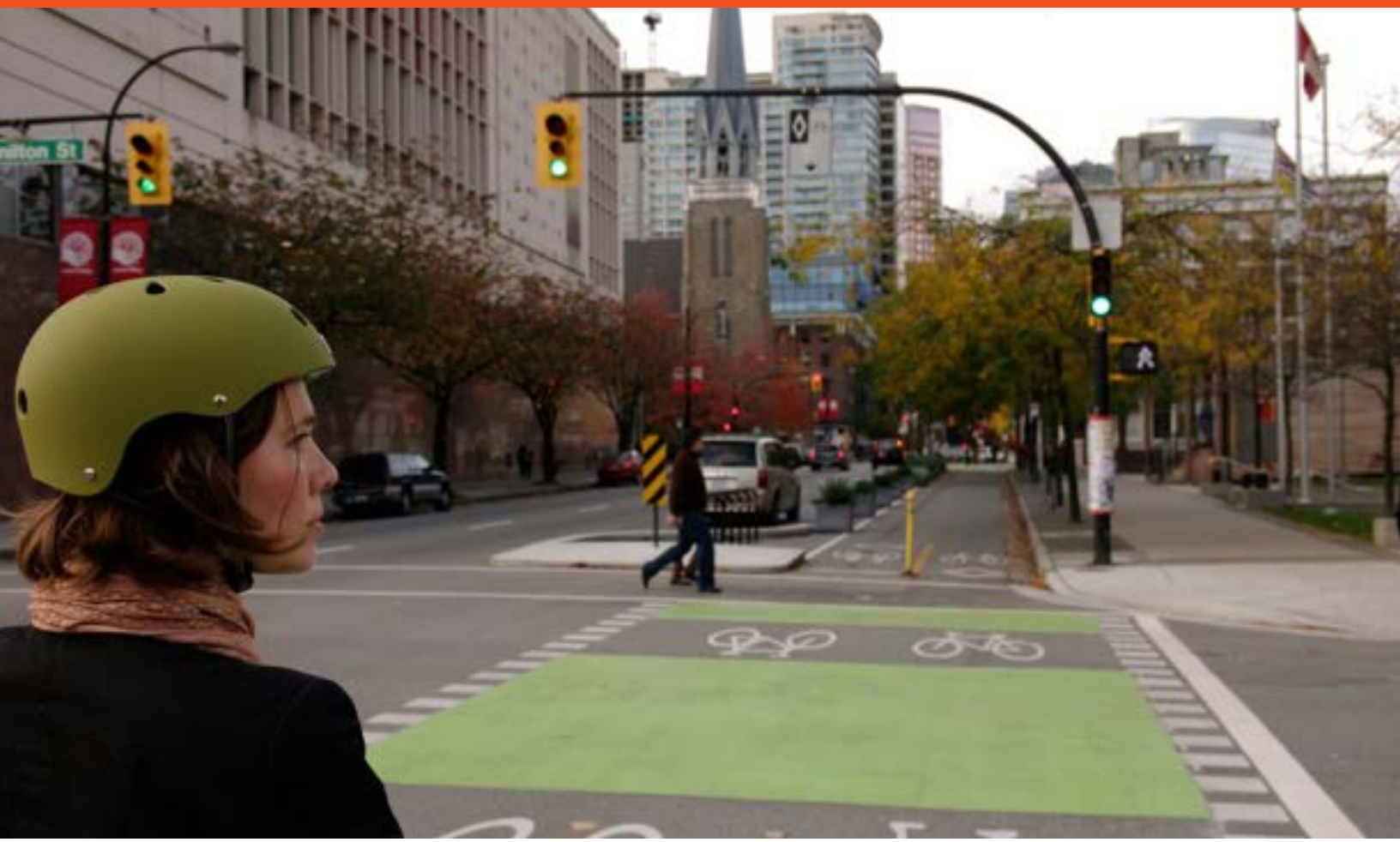


Photo credit: Paul Krueger

Section Overview

Recommendations

As cycling continues to gain popularity as a mode of transportation, access to quality cycling infrastructure must be equitable and inclusive for all members of the community, regardless of their location or socio-economic status.

Transportation equity is a pressing issue in Metro Vancouver, as the region faces significant challenges regarding affordability and access to transportation networks. High living costs and low-income rates contribute to the unaffordability of housing and transportation for many residents, forcing them to seek alternative options and often leading to increased reliance on private vehicles. This exacerbates existing transportation inequalities, limiting mobility options for those with limited means.

Furthermore, transportation investments in certain areas can inadvertently contribute to gentrification and the displacement of vulnerable populations. This further widens the gap between individuals with access to safe and reliable transportation options and those who face barriers to mobility and opportunities. Integrating equity considerations into policy and planning processes to address these issues is essential.

Cycling presents an affordable and accessible mode of transportation, offering numerous benefits for individuals and communities. However, supporting infrastructure that ensures equal access is crucial to fully realize the potential of cycling as an equitable mode of mobility. The design and implementation of cycling infrastructure should prioritize safety, comfort, and connectivity, considering the needs of diverse user groups and addressing disparities in access.

Cycle highways provide an example of how to improve transportation options for people, especially for the most equity-deserving in the most under-served areas. By implementing cycle highways, Metro Vancouver can significantly improve regional connectivity, enhance access to various destinations, and promote cycling as a viable transportation option for all residents. These dedicated routes will contribute to a more equitable and

sustainable transportation system, fostering healthier communities and reducing the dependence on private vehicles.

Several Canadian cities, including Winnipeg, Saskatoon, and Victoria, have incorporated equity analyses and considerations into their cycle network planning. Decision-makers and planners in Metro Vancouver should follow suit and integrate equity issues into policy and planning processes. Doing so can promote greater equity in transportation, improve access to opportunities, enhance health outcomes, and foster a more inclusive and sustainable urban environment.

In this recommendation section, we will explore the potential of cycling to address transportation inequality in Metro Vancouver. We will examine various equity factors and their consequences, highlighting the significance of social and spatial equity in transportation planning. Furthermore, we will draw on the experiences and lessons learned from other cities to propose actionable recommendations for improving the equitable distribution of quality cycling infrastructure in Metro Vancouver. By implementing these recommendations, we can create a more equitable and accessible cycling network that benefits the entire community.

Recommendations

1. **Conduct an equity analysis of cycling infrastructure in Metro Vancouver:** In order to address transportation inequalities and ensure equitable access to quality cycling infrastructure, regional decision-makers, including TransLink, should direct transportation planners to conduct a comprehensive equity analysis. This analysis should consider social equity factors such as household economics, age demographics, and racial and ethnic populations. Spatial equity factors, including access to transit and bike infrastructure, should also be included in the analysis. Planners can use already available data on equity, including regional data developed by Metro Vancouver as part of the Social Equity & Regional Growth project. By identifying areas of inequity, targeted improvements can be made to prioritize investments and infrastructure development in underserved communities.

2. **Integrate equity considerations into cycle network planning:** Metro Vancouver must integrate equity considerations into cycle network planning, such as the Major Bikeway Network. This includes defining equity indicators, such as low-income populations, youth, seniors, and racial and ethnic minorities, and prioritizing infrastructure improvements in areas with low coverage or accessibility. Explicitly considering equity in the planning process ensures that the needs of vulnerable populations are addressed and that cycling infrastructure is distributed more equitably across the region.

3. **Address disparities in access and distribution of cycling infrastructure:** Previous research in Vancouver has identified disparities in access to cycling infrastructure, particularly for areas with more children, Chinese residents, or higher proportions of university-educated adults. These disparities have not been adequately addressed with previous investments. Transportation planners in Metro Vancouver need to prioritize improvements in these underserved areas to ensure equitable access to safe and high-quality cycling infrastructure for all residents. They can achieve this by implementing protected bike lanes, local street bikeways, and other infrastructure enhancements that are safe and comfortable for all ages and abilities (AAA).

4. **Incorporate UNDRIP (United Nations Declaration on the Rights of Indigenous Peoples) in active transportation planning:** Review existing transportation plans and policies (and legislature) to ensure they align with UNDRIP principles and address Indigenous peoples' specific needs and aspirations. The particular incorporation of UNDRIP into active transportation planning will vary depending on the local context, the jurisdiction, and the unique needs and aspirations of Indigenous communities. Therefore, it is crucial to establish ongoing dialogue and collaboration with Indigenous peoples to ensure that their perspectives and rights are respected throughout the planning process.

5. **Facilitate active engagement and empowerment of vulnerable populations through meaningful participation and power sharing.** It is essential to actively involve and collaborate with vulnerable communities, including racialized groups, low-income individuals, women, and Indigenous populations, to comprehensively understand their unique transportation requirements and address the obstacles they encounter. Barriers to participation should be addressed, such as providing childcare and eldercare support and including compensation for their time. We can foster a more equitable and inclusive approach to developing cycling infrastructure by empowering these communities to lead the decision-making process. Their active involvement will contribute to more tailored solutions that better meet their needs and promote social equity in transportation planning.

6. **Develop and build a safe and comfortable regional cycling network:** Municipal and regional transportation planners should work with TransLink and MoTI to plan, develop and build a high-quality cycling network across the region. Network planners should ensure that equity-seeking people, especially in underserved areas, have fair access to the network.

7. **Develop a regional cycle highway network:** Decision makers in Metro Vancouver, including TransLink, should prioritize the development of a well-connected and comprehensive cycle highway network that spans the region. This network should prioritize routes that serve multiple communities, major activity centers, and employment hubs and prioritize equity in the distribution of cycle highways. By strategically planning and investing in cycle highways, the region can establish essential connections, fill gaps in the existing cycling infrastructure, and address transportation inequalities, ensuring seamless and safe journeys on high-quality cycling infrastructure for all residents.

8. **Improve access to transit for underserved areas:** TransLink and transportation planners in Metro Vancouver should prioritize improving access to transit for underserved areas. This includes designing transit routes to serve these communities effectively and ensuring that transit options are affordable and reliable. Access to employment opportunities through transit should also be a key consideration. Transit hubs and stations should include secure parking options for active transportation and shared mobility devices. Transit agencies like TransLink should allow bikes and other micromobility devices on transit vehicles to allow for multi-modal trips, especially in lower-density areas with low transit frequency.

9. **Develop an overarching equity analysis framework for cycling facilities:** Currently, there is a lack of an overarching equity analysis relevant to cycling facilities in Metro Vancouver. Developing a comprehensive framework that incorporates equity considerations into the decision-making process for cycling infrastructure planning is recommended. This framework should include criteria related to social equity (e.g., household economics, age demographics, and racial and ethnic populations) and spatial equity (e.g., accessibility to transit and bike infrastructure). By having a standardized framework, decision-makers can ensure that equity is consistently considered when making infrastructure investments and policy decisions.

10. **Promote active transportation for all communities and residents:** To achieve transportation equity, it is important to promote active transportation, including cycling, as an accessible and affordable mode of transportation for all communities and residents. This can be done through educational campaigns, community engagement initiatives, and targeted programs that provide resources and support for individuals who may face barriers to cycling. By actively promoting cycling and addressing barriers such as safety concerns, lack of infrastructure, and accessibility issues, more individuals from diverse backgrounds will be encouraged to use cycling as a mode of transportation, leading to greater equity in the transportation system.

11. **Monitor and evaluate the impact of equity-focused interventions:** Once equity-focused interventions are implemented, it is crucial to monitor and evaluate their impact on transportation equity in Metro Vancouver. This includes assessing changes in cycling infrastructure accessibility, ridership rates among different demographic groups, and overall transportation outcomes. By regularly monitoring and evaluating the effectiveness of equity-focused interventions, adjustments can be made to improve their outcomes and ensure that transportation equity goals are being met.

By implementing these recommendations, Metro Vancouver can significantly address transportation inequalities and improve all residents' access to quality cycling infrastructure. By prioritizing equity considerations in the planning and implementation processes, a more equitable and accessible transportation system can be created, promoting healthier communities, reducing greenhouse gas emissions, and enhancing the overall quality of life.

Promoting active transportation, particularly walking and cycling, is of paramount importance. The construction of cycle highways is a strategic approach to providing safe, dedicated routes for people cycling and using other active modes, encouraging more people to adopt active transportation as a viable mode of transportation. Expanding cycling networks and implementing pedestrian-friendly infrastructure will further enhance the accessibility and convenience of active transportation options.

Successful implementation of these recommendations requires collaboration and coordination among various stakeholders, including government agencies, transportation authorities, community organizations, and residents. Engaging in open dialogue, sharing resources and expertise, and fostering partnerships will be instrumental in realizing the proposed solutions effectively.

Metro Vancouver has the opportunity to transform its transportation system into a model of sustainability, accessibility, and innovation. By implementing the recommendations, the region can create a transportation landscape that supports economic growth, enhances the quality of life, and preserves the natural environment for current and future generations. The integration of cycle highways as a vital component of the transportation network will contribute to a safer, more convenient, and environmentally friendly system for people cycling and rolling.

Conclusion

Photo credit: Mike Vlasman

Section Overview

Conclusion

Cycling has the potential to address transportation inequality and promote equitable access to transportation options. Like many other regions, Metro Vancouver faces significant equity challenges in its transportation network, with specific populations experiencing limited access to affordable and reliable transportation options. By incorporating equity considerations into cycle network planning and infrastructure development, the region can make significant progress in addressing these challenges.

Cycling is an affordable mode of transportation that offers numerous health, environmental, and economic benefits. It can improve physical and mental well-being, reduce healthcare costs, and contribute to a cleaner and greener environment. Moreover, cycling infrastructure is relatively inexpensive compared to automobile roads and can stimulate the local economy by attracting more customers to local businesses.

To ensure equity in cycling infrastructure, it is crucial to consider the distribution and accessibility of the network. Previous research has highlighted disparities in access to bike infrastructure, particularly among certain demographic groups. Areas with more children or Chinese residents have had comparatively less access, while areas with a higher proportion of university-educated adults have higher levels of access.

These inequities have persisted despite investments in cycle infrastructure, indicating the need for a more equitable approach to planning and implementation.

The analysis done in this report underscores this point, showing that the least-advantaged people have less access to the high-quality cycling network compared to their more-advantaged peers.

Canadian cities such as Winnipeg, Saskatoon, and Victoria have already taken steps to incorporate equity analyses and considerations in their cycle network planning. Decision makers and planners in Metro Vancouver should follow suit and better integrate equity issues into policy and planning processes. This includes

conducting an overarching equity analysis relevant to cycling facilities and incorporating the findings into decision-making processes.

Cycle highways, in particular, have the potential to address transportation inequalities by providing long-distance functional connections that are safe and comfortable for a variety of users. By prioritizing the design and implementation of cycle highways with equity in mind, Metro Vancouver can ensure that cycling infrastructure is accessible to all, regardless of location or socio-economic status.

By promoting cycling and implementing equitable cycling infrastructure, Metro Vancouver can improve access to affordable and sustainable transportation and contribute to a more equitable and inclusive region. It is essential to prioritize equity considerations in cycle network planning and infrastructure development to ensure that the benefits of cycling are accessible to all residents, regardless of their socio-economic background or demographic characteristics.

Through these concerted efforts, Metro Vancouver can continue to thrive as a vibrant and livable region, setting an example for other urban areas facing similar transportation challenges. The time for action is now, and with careful planning and collective commitment, a more sustainable and resilient transportation future awaits Metro Vancouver, where cycle highways play a significant role in promoting active and eco-friendly commuting options and reducing transportation inequalities.

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