

Evaluating the Impacts of Mobi's Equity Program on Access and Use of Public Bike Share in Vancouver

Research
Report

August
2023

A Socio-Spatial Analysis

Christine Yanagawa, Kate Hosford, Meghan Winters



**MOBILIZING
JUSTICE** _____

Towards Evidence-Based
Transportation Equity Policy

About Mobilizing Justice

The Mobilizing Justice Partnership is funded by the Social Sciences and Humanities Research Council (SSHRC). Based at the University of Toronto Scarborough, the national intersectoral research partnership aims to understand and address transportation poverty in Canada and to improve the well-being of Canadians at risk of transport poverty. Learn more at www.mobilizingjustice.ca.

Acknowledgments

We would like to thank our partners at the City of Vancouver and at Mobi by Rogers for their contributions, essential feedback, and commitment throughout the project.

This report was prepared on the unceded ancestral territories of the x^wməθk^wəyəm (Musqueam), S^kwxwú7mesh (Squamish), and səlilwətaɬ (Tseil-Waututh), Kwikwetlem (k^wik^wəłəm), and Tsawwassen First Nations. We are grateful to our traditional hosts for access to the lands on which our work took place.



Table of Contents

About Mobilizing Justice	2
Acknowledgments	2
Executive Summary	3
RESULTS HIGHLIGHTS	3
OPPORTUNITIES	4
Project Background	5
Study Overview	5
Methods	6
Data Sources	6
Study Area & Bike Share Service Area Boundaries	6
Equity Measures	6
Analysis	7
RESULTS	8
Mobi's Bike Share Service Area	8
Changes In Service Area Access By Socioeconomic Disadvantage	9
Changes IN Service Area Access By Priority Population	11
Opportunities	13
Limitations	14
Conclusion	14
References	15
Appendices	16

Executive Summary

In 2016, the City of Vancouver launched its public bike share system (Mobi by Rogers) to provide a convenient and affordable mode of transportation for people's daily trips. Since this time, the City of Vancouver and Mobi have introduced several equity initiatives to make bike share more accessible for residents.

With funding from the Mobilizing Justice Innovative Pilots & Policies, our research team evaluated the impacts of these equity initiatives on access and use of Vancouver's public bike share system. The three research objectives were:

1. To assess whether the bike share service area expansion improved equity in spatial access,
2. To characterize bike share members and their use of the system, with a focus on community pass members and e-bike usage, and
3. To explore the benefits of and facilitators and barriers to Mobi's Community Pass program.

This report shares findings from a socio-spatial analysis of the bike share service area expansion since the initial system launch to determine whether the new stations added in this expansion resulted in a more equitable distribution of stations across neighbourhoods (objective 1).

RESULTS HIGHLIGHTS

Mobi's *total*, service area:

- Has 241 docking stations.
- Serves nearly half of the city's population and 482 dissemination areas¹ (DAs).
- Covers approximately one-third (38 km²) of the total land area in Vancouver.

Mobi's *expansion* service area:

- Has 132 new docking stations.
- Serves approximately 18% more of the city's residents and 202 additional DAs compared to the initial service area.
- Covers an added land area of 19 km² compared to the initial service area.

Changes in Service Area Access by Socioeconomic Status

Expanding the service area has helped to reduce the equity gap in public bike share access in the City of Vancouver. Nevertheless, socio-spatial inequities still exist as access remains substantially lower in socio-economically disadvantaged areas. For instance, the distribution of access to new stations did not occur evenly. Notably, the most disadvantaged DAs of the city received the smallest share of the service area expansion.

The expansion occurred in areas adjacent to the metro core, toward the south and east in moderately and highly disadvantaged DAs, and toward the west in highly advantaged DAs. Many areas in the south, east, and southeast of the city, where many of the most disadvantaged DAs are located, did not gain access.

¹ A dissemination area (DA) is a geographical unit with ~ 400–700 people and is the smallest unit for which detailed sociodemographic data are available in Canada.

Changes in Service Area Access by Priority Population²

Public bike share access for priority populations has increased over time: we saw the greatest increase in access for Indigenous populations, in particular Indigenous women. Yet, socio-spatial inequities still exist as a large proportion of the priority populations still reside outside of the expanded service area. In addition, access remains lower in DAs with high proportions of priority populations. This gap in many instances is substantial, particularly for visible minority, Filipino, and Chinese populations. For example, as of 2022, only 1% of DAs with the highest proportion of visible minorities have access to the bike share system.

OPPORTUNITIES

Despite an improved accessibility to public bike share achieved by the service area expansion, continued efforts are required to understand and address the existing gaps in the distribution of docking stations. Next steps could include further expansions of stations into DAs located outside of the current service area and where many of the priority populations reside, particularly in the south, east, and southeast regions of the city. Provided that supportive infrastructure exists, extending services to these areas could reach and benefit a greater diversity of users.

We also recommend a continued focus on reducing socioeconomic barriers to bike share access within the existing service area through equity initiatives, such as Mobi's Community Pass, to complement the program's goals of increasing accessibility for underrepresented communities and promoting mobility equity.

² Populations comprising individuals and communities with barriers to equal access, opportunities, and resources due to social and economic disadvantage and discrimination. In this report we have considered the following groups: children, older adults, those of Indigenous identity, including Indigenous women, immigrants, visible minorities, Black, Chinese, South Asian, and Filipino populations.

Project Background

Vancouver's public bike share system, Mobi by Rogers [Mobi], has been operating since 2016. Previous research conducted by our research team found there were inequities in terms of access and use of public bike share. The bike share service area disproportionately served higher socioeconomic status neighbourhoods and attracted riders who were wealthier, more educated, and less racially diverse than the general Vancouver population.^{1,2}

Mobi has since implemented numerous changes to reduce barriers, enhance uptake, and make bike sharing more equitable. The specific changes include hiring an equity coordinator, expanding the service area, adding e-bikes to the fleet, reducing financial barriers through a community pass program, and partnering with community organizations to reach more diverse populations.

With funding from the Mobilizing Justice Innovative Pilots & Policies, our research team aimed to evaluate the impacts of these equity initiatives on access and use of Vancouver's public bike share system. The three research objectives were:

4. To assess whether the bike share service area expansion improved equity in spatial access,
5. To characterize bike share members and their use of the system, with a focus on community pass members and e-bike usage, and
6. To explore the benefits of and facilitators and barriers to Mobi's Community Pass program.

This report shares results from the first objective. Report for the second and third objectives can be found [here](#) and [here](#).

STUDY OVERVIEW

Intervention

Of the changes made by the City of Vancouver and Mobi to reduce barriers, enhance uptake, and make the system more equitable, we focus on the expansion that occurred from January 2018 - December 2022, including the addition of new stations which extended access into new neighbourhoods across the metro core and into adjacent areas.

Study Purpose and Objective

The purpose of this analysis is to understand how socio-spatial access to the Mobi public bike share system has changed over time for priority populations in the City of Vancouver.

Our primary objective is to evaluate whether adding new docking stations since the expansion has resulted in more equitable access to and distribution of stations across a diversity of neighbourhoods, relative to the initial service area.

Methods

DATA SOURCES

Mobi, Vancouver's bike share operators, provided data for both the initial and the expanded bike share stations. We geocoded each station according to its latitude and longitude in Arc GIS Pro 3.0 using the NAD 1983 coordinate system.

STUDY AREA & BIKE SHARE SERVICE AREA BOUNDARIES

The study area for this analysis is the census subdivision for Vancouver. We chose dissemination areas (DAs) as the geographical unit of analysis. With a population of 400–700 people, DAs are the smallest geographical unit for which detailed socioeconomic data are disseminated.³ The geographical size of DAs varies; more densely populated DAs have smaller land areas.

We defined the bike share service area boundaries using a 500-metre distance from each docking station—a standard distance used in walkability research, and also a comparable measure to the 2017 baseline study. DAs that were fully or partially located in the bike share service area were categorized as being within the bike share service area. These methods allowed us to examine spatial access to Mobi's public bike share over time.

EQUITY MEASURES

We used two sets of measures to quantify spatial access to Vancouver's public bike share over time for priority populations.

Material Deprivation Index

Widely used in health inequality research, the Pampalon Deprivation Index is an area-based composite index that employs socioeconomic indicators to measure levels of social and material deprivation in Canada.⁴ Deprivation is described as a disadvantage relative to the community or the wider society to which an individual belongs.^{4,5} In this report, we use the terms advantage and disadvantage to discuss levels of material deprivation.

The 2016 material deprivation index combines three census variables: average income, the proportion of individuals without a high school diploma, and the proportion of employed individuals. Through principal component analysis, a factor score is calculated at the DA level, with lower factor scores assigned to DAs with lower levels of deprivation (i.e., less disadvantaged) and higher factor scores to DAs with higher levels of deprivation (i.e., more disadvantaged). More details on how this index is calculated are found elsewhere.⁶

Based on the deprivation scores for the City of Vancouver, we assigned DAs to quintiles, the method conventionally used by the Pampalon Deprivation Index,⁴ from least disadvantaged (quintile 1) to most disadvantaged (quintile 5), where each quintile represents 20% of the total number of DAs.

Priority Populations

We selected socioeconomic indicators for priority populations from the 2021 Census⁷ to better understand the extent to which spatial access to bike share has become more equitable over time. These populations

were chosen using a set of criteria: use elsewhere, applicability to the City of Vancouver, data availability, repeatability in the future, and feedback from project partners (City of Vancouver and Mobi).⁸⁻¹⁰

Thus, our analysis includes priority populations who:

- are aged 14 years and under and aged 65 and over
- identify as Indigenous³, including Indigenous women
- are immigrants
- identify as a visible minority⁴
- are Black
- are Chinese, South Asian, and Filipino (the three largest groups of visible minorities in Vancouver by population size)

To compare the distribution of bike share service access according to priority populations in the city, we assigned DAs for each socioeconomic indicator to a quartile, where each quartile represents 25% of the total number of DAs in the city. Quartile 1 indicates DAs with lower proportions of the priority populations (e.g., DAs with lower proportions of older adults) while quartile 4 indicates DAs with higher proportions of the priority populations (e.g., DAs with higher proportions of older adults). Refer to Appendix B for the specific cut points.

We also calculated the total number of people belonging to each priority population group inside of the bike share service area, to compare that to the total population of that group in the City of Vancouver.

ANALYSIS

We joined each bike share station location from both the initial service area and the expanded service area to DAs⁵, and calculated summary statistics, including population, area (km²), population density, and the number of DAs inside and outside of the service area. To determine the spatial access for each equity measure, we used the Census data to calculate the proportion of DAs (of each quintile of disadvantage, and quartile of priority population) living within the bike share service area.

We compared data findings for each group from the initial to the expanded service area to assess the extent of change in socio- spatial access. A favourable outcome was achieved if service area access was evenly distributed across all quintiles and all quartiles. In other words, for socioeconomic disadvantage, if spatial access was equal, there would be a 20% distribution of bike share access for each quintile (Q1-Q5). Similarly for priority populations, if spatial access was equal, there would be a 25% distribution of access for each quartile (Q1-Q4).

³ To note, Indigenous identity is not included in the visible minority categorization in the Statistics Canada census.

⁴ Increasingly, the term “racialized population” is replacing the term “visible minorities” by academia and other groups. For 2021, Statistics Canada continues to use the term “visible minority”; however, a review is currently being conducted to identify more appropriate terminology.

⁵ Analyses of the initial and expanded service areas both use DAs from the 2016 Pampalon Index, thus our findings should not reflect geographic changes in the DAs between 2016 and 2021. These changes are likely to be minor within the study area.

RESULTS

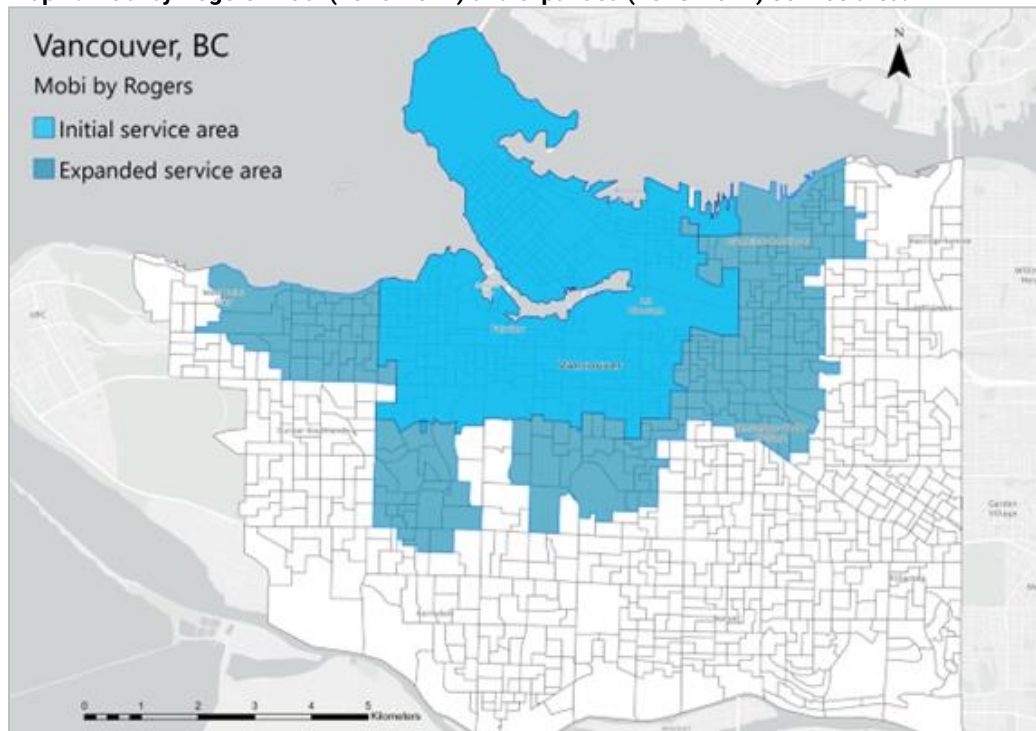
MOBI'S BIKE SHARE SERVICE AREA

- Almost 1/2 of the city's population has access to a public bike share docking station (327,534 people).
- The bike share service area⁶ covers nearly 1/3 of the total land area in Vancouver (38 km²).
- Almost 1/2 of the city's dissemination areas⁷ (DAs) have access to public bike share (482 of 993 DAs).

Key takeaway #1: Since the expansion, public bike share service access and coverage has increased in the City of Vancouver.

- Mobi's bike share now serves approximately 18% more of the city's population compared to the initial service area.
- 202 additional DAs now have access to a docking station.
- The service area now covers an additional 19 km² of the city, doubling the geographical size of the initial service area.

Map 1. Mobi by Rogers initial (2016-2017) and expanded (2018-2022) service area.



⁶ The service area is defined by a 500-metre buffer zone around each docking station.

⁷ A dissemination area (DA) is a geographical unit with an approximate population of 400–700 people and is the smallest unit for which sociodemographic data are available in Canada.

Table 1. Summary statistics from the initial and expanded service area.

Service area	# of docking stations initial	# of docking station expansion	Population (% of total) initial	Population (% of total) expansion	Area (km ²) (% of total) initial	Area (km ²) (% of total) expansion	# of DAs ^a initial	# of DAs ^b expansion
Inside	109	241	216,028 (34.3)	327,534 (51.9)	19.0 (16.4)	37.9 (32.6)	280 (28.2)	482 (48.5)
Outside	—	—	415,458 (65.6)	303,952 (48.1)	97.1 (83.6)	78.2 (67.4)	713 (71.8)	511 (51.4)
Total	109	241	631,486	631,486	116.1	116.1	993	993

^a DAs include missing 2011 material deprivation data for Vancouver (inside service area: 25, outside service area: 22).

^b DAs include missing 2016 material deprivation data for Vancouver (inside service area: 31; outside service area: 13).

Table 2. Change in summary statistics, from initial to expanded bike share service area.

	Change in # of docking stations	Change in population served (% of total)	Change in area (km ²) with bike share service (% of total)	Change in # of DAs with docking stations
Inside Service Area	+ 132	+111,506 (+ 17.6%)	+ 18.9 (+16.2%)	+202

CHANGES IN SERVICE AREA ACCESS BY SOCIOECONOMIC DISADVANTAGE

Key takeaway #2: Expanding the service area reduced inequities in spatial access to public bike share in terms of area-level socioeconomic status, but access remains substantially lower in areas of lower socioeconomic status.

197⁸ additional DAs gained access with the expansion, but new docking stations were not distributed evenly across these additional DAs.

- Quintile 5, the most disadvantaged DAs, received the smallest increase in service area access (shown in darkest blue, **Figure 1**).

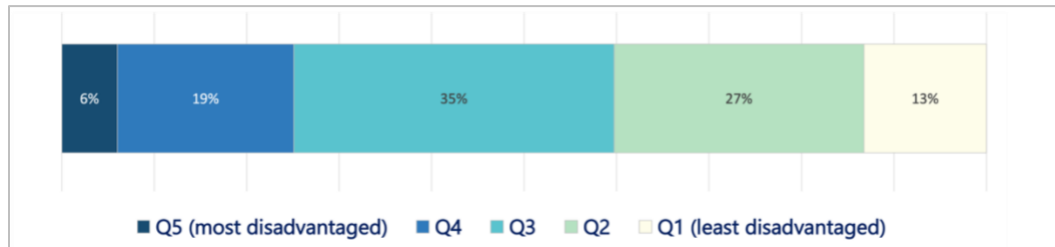


Figure 1. Distribution of the new bike share access according to DA- level socioeconomic disadvantage. See Appendix A1 for a table format of these data.

⁸ DAs with missing material deprivation scores are not included.

While the service area expansion has made progress in reducing inequities in access to public bike share in the City of Vancouver, access to the service area remains lower in disadvantaged areas. More DAs in quintiles 4 & 5 (the most socioeconomically disadvantaged areas) still have the smallest share of access to the service area (see darker blue shades, **Figure 2**).

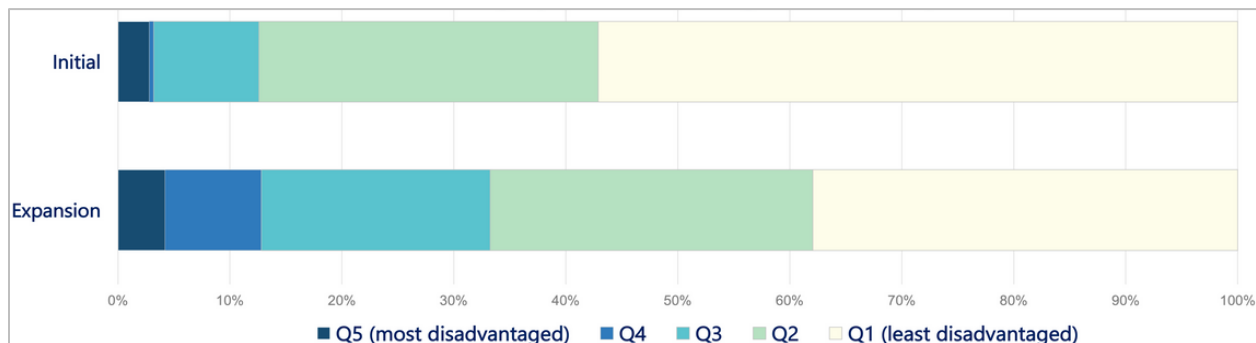
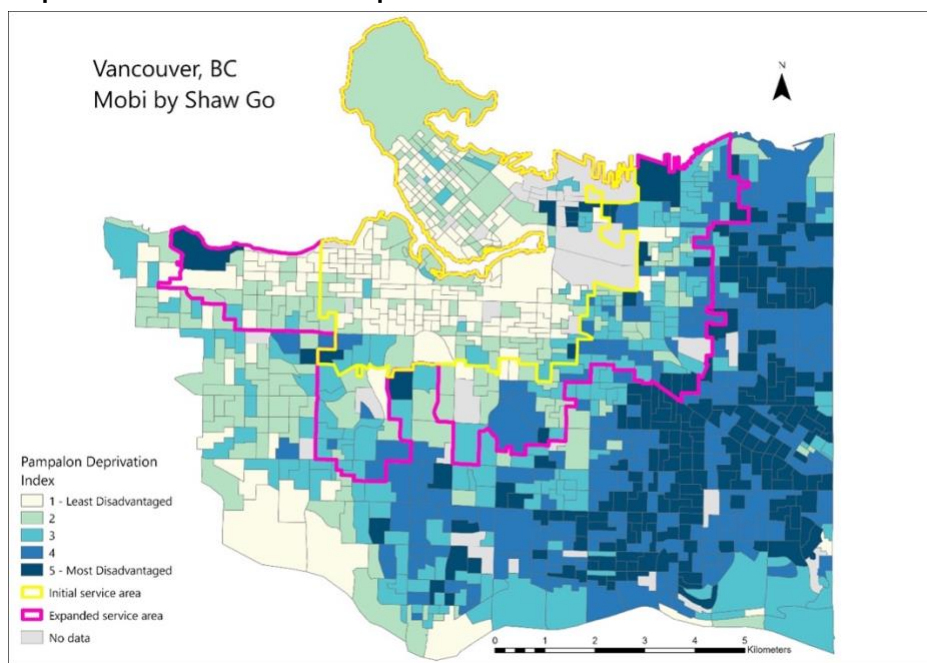


Figure 2: Distribution of access in the initial and expanded service area according to DA-level socioeconomic disadvantage. Note: See Appendix A2 for a table format of these data. See Appendix A2 for a table format of these data.

The expansion increased the geographical coverage of access for all quintiles of deprivation.

- Expansions occurred in areas adjacent to the initial service area.
- In general, expansions occurred in moderate and highly disadvantaged DAs in the south and east areas of the city, and in more advantaged DAs in the west of the city.
- DAs in the south, east, and southeast areas of the city, where many of the most disadvantaged DAs are located, did not gain access to the service area.

Map 2. Access to the initial and expanded bike share service area & DAs based on socioeconomic disadvantage.



CHANGES IN SERVICE AREA ACCESS BY PRIORITY POPULATION

Key takeaway #3: Area-level inequities in access either stayed the same or improved for priority populations, with the greatest increase in access occurring for children, Indigenous residents, and Indigenous women, respectively. There was no change in access by area-level immigrant status over time. Across all priority populations, areas with higher proportions of priority populations were less likely to be in the service area. Areas with higher proportions of visible minorities still have the worse spatial access to bike share.

We found that bike share access for each priority population has increased over time, however:

- The amount of change is not equal among priority populations.
- Large proportions of priority populations still reside outside of the expanded service area.

Figure 3 shows the change in access over time for priority populations.

- Access for 'Age 15 to 64 years' and 'not a visible minority'⁹ are provided as comparison groups.
- The pale yellow represents the proportion of each priority population with access to the initial service area. The darker yellow represents the additional proportion of each priority population that gained access with the expanded service.
- The grey area represents proportion of the priority population residing outside of the service area.

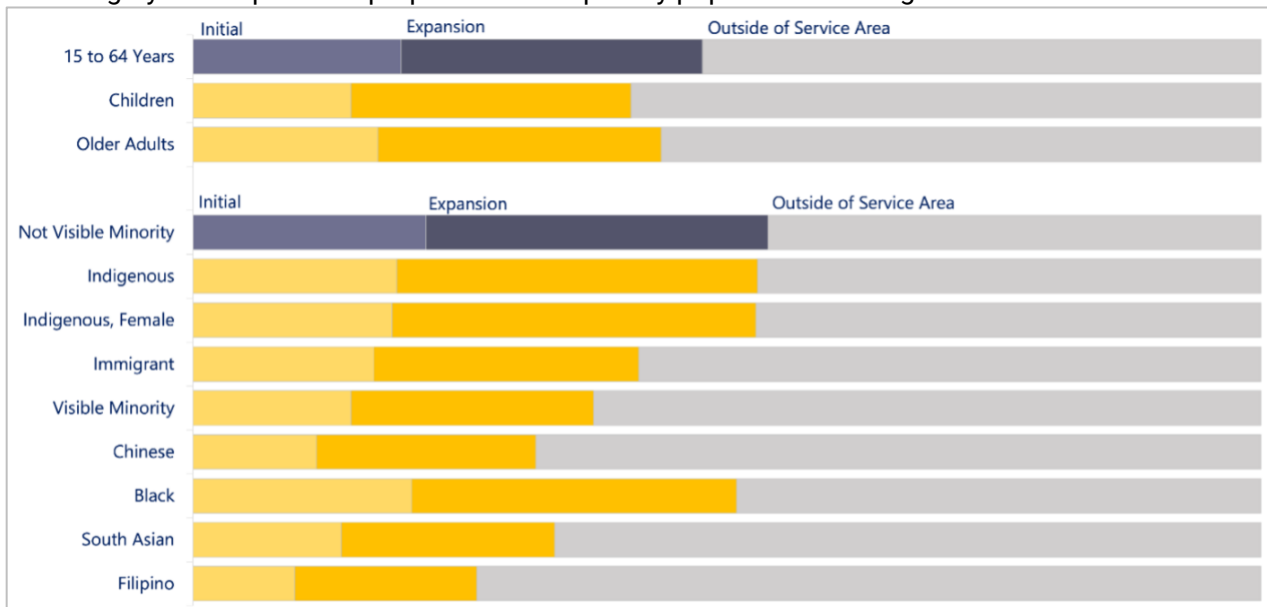


Figure 3. Priority population inside the service area compared to the total population of the priority population in Vancouver. See Appendix B1 for a table format of these data.

⁹ According to Census Canada, 'Not a visible minority' includes persons who identified as White, that are not associated with a group designated as a visible minority (e.g., 'Israeli', 'Italian', 'Polish', 'Scottish' or 'Swedish'), that are a combination of White and not associated with a group designated as a visible minority, or that are a combination of White and 'Arab', 'White' and 'Latin American', or 'White' and 'West Asian'. 'Not a visible minority' includes persons who identified as First Nations, Métis and/or Inuit.

We also considered bike share access for priority populations from an area-level perspective. We assigned each DA inside the service area to a quartile (quartile 1 to 4) based on each priority population, with quartile 4 (Q4) having the highest proportion of that priority population (higher priority), and quartile 1 (Q1) having the lowest proportion of that priority population (lower priority).

Figure 4 shows the distribution of access in the initial and expanded service area across quartiles of priority populations.

- 'Equal Distribution' shows equal spatial access. In other words, if access was equal, each quartile would occupy an even 25% section in the bar.
- 'Not a visible minority' is shown (purples and greys) as a reference for the priority populations.
- In yellows and greys, quartile 1 refers to DAs with the lowest proportion of the priority population and quartile 4 refers to DAs with the highest proportion of the priority population.

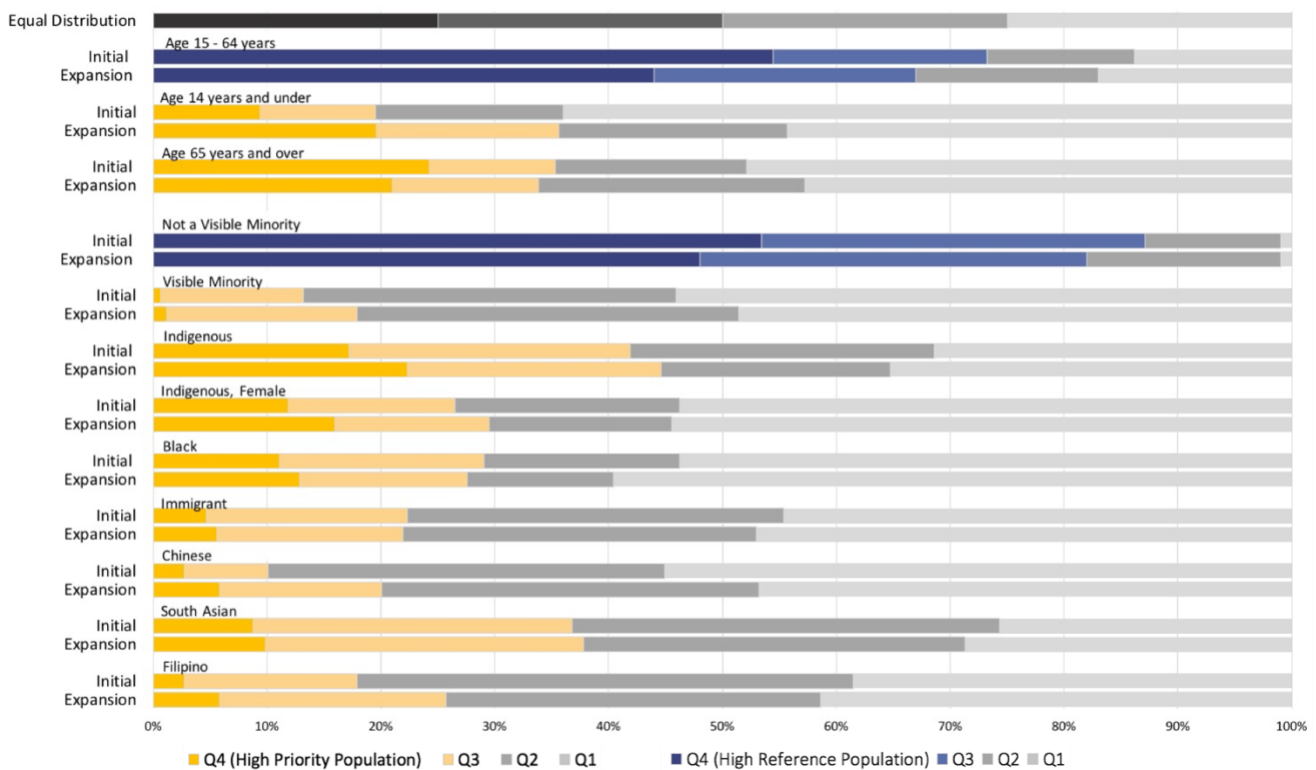


Figure 4. Distribution of access in the initial and expanded service area across quartiles of priority populations. Quartile 4 represents areas with highest proportion of the priority population and Quartile 1 represents DAs with the lowest proportion of the priority population. Table B2 in the Appendix provides the proportions across quartiles.

Opportunities

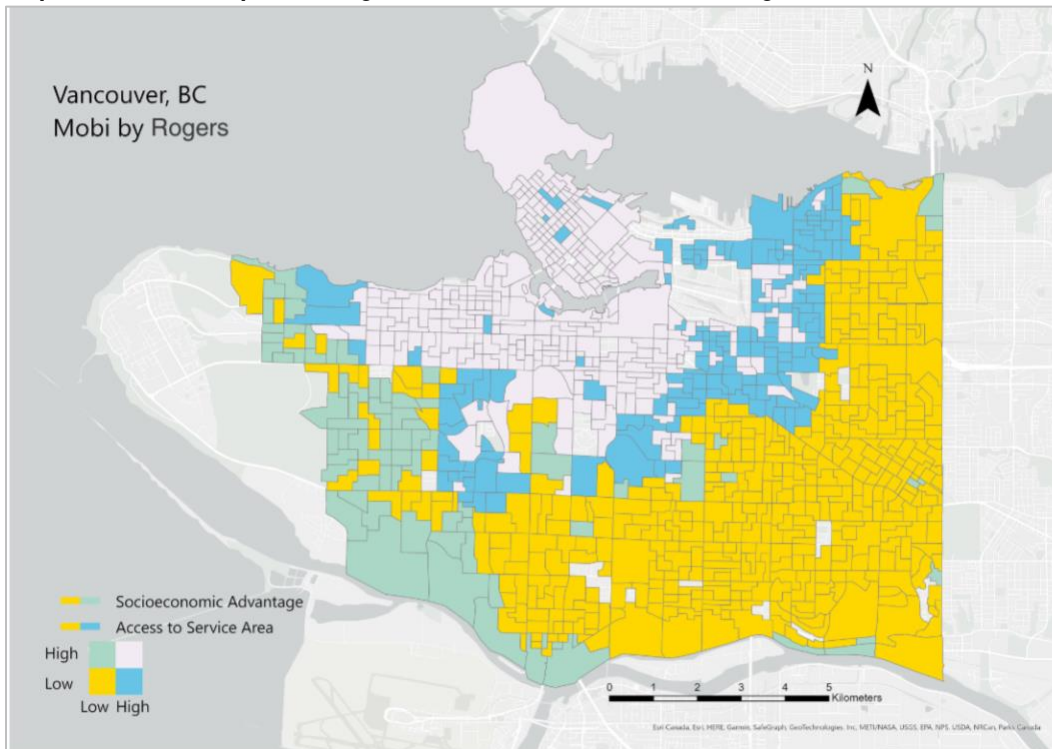
We can identify and prioritize areas for future interventions using a map that combines two variables: socioeconomic advantage (classified as 'high' or 'low'), and bike share access (classified as 'access' or 'no access'). Using this approach, future expansions could target DAs with low socioeconomic advantage and no access, found in the south, east, and southeast areas of the city (yellow in Map 3), where many of the priority populations reside. Provided that supportive infrastructure exists, extending services to these areas could reach and benefit a greater diversity of users.

Additionally, continued focus on understanding and reducing socioeconomic barriers to bike share access through equity initiatives, such as Mobi's Community Pass, would complement the program's goals of increasing accessibility for underrepresented communities and of promoting equity in mobility. Additional maps for each priority population can be found in Appendix C.

Interpreting the map

- Clusters of low socioeconomic advantage with no access to docking stations (yellow) are located in the south, east, and southeast DAs of the city.
- Clusters of low sociodemographic advantage with access to docking stations (blue) are located in the central and northeast DAs, along the edges of the metro core.
- Clusters of high sociodemographic advantage with no access to docking stations (green) are primarily located along the western/ southwestern boundaries of the city.
- Clusters of high sociodemographic advantage with access to docking stations (grey) are located in the metro core of the city and extend southwest.

Map 3. A bivariate map combining the level of socioeconomic advantage and service area access



Limitations

Our analysis shows the status of spatial access, which is one approach to examine equity and act on (e.g., prioritizing expansions into low access/ high priority areas). Our other work (past and future) includes interviews with those who use and do not use bike share and can speak more specifically to meeting the needs of specific groups beyond spatial access.

A few specific limitations to note:

- This study does not consider other barriers to bike share usage, including cost and language barriers, which can limit access.
- This analysis does not consider factors related to the social and built environment (e.g., housing, bike networks, public services, economic infrastructure, etc.) that are associated with settlement patterns.
- Employing aggregated census data risks simplifying historical and contemporary complexities and intersectional factors that shape socio-cultural identities. We acknowledge that by focusing on specific priority populations, we overlook others.
- Area-level deprivation measures used here do not represent the status of all individuals living within these DAs. Our intent is not to reinforce deficit by generalizing characteristics of individuals or communities, but to report findings at a population level to inform future programs and initiatives.

Conclusion

Bike share programs have the potential to bridge gaps in a city's transportation network while offering an active and sustainable mode of transportation. However, the benefits of these programs are not always experienced equally across populations. In the City of Vancouver, we found that while service area expansions over time have made access to public bike share more equitable, areas of greater sociodemographic advantage and areas with a lower presence of our priority populations still have the most access.

As Mobi's bike share program continues to expand, further consideration could be put into extending the service area to more disadvantaged DAs, and continued effort could be focused on supporting equity-based programs for priority populations residing inside the existing service area.

References

1. Hosford, K., Lear, S.A., Fuller, D., Teschke, K., Therrien, S., Winters, M. Who is in the near market for bicycle sharing? Identifying current, potential, and unlikely users of a public bicycle share program in Vancouver, Canada. 2018. BMC Public Health 18, 1326. Available from: <https://doi.org/10.1186/s12889-018-6246-3>
2. Hosford, K., Winters, M. Who are public bicycle share programs serving? An evaluation of the equity of spatial access to bicycle share service areas in Canadian cities. 2018. Transp. Res. Rec.
3. Statistics Canada. Dissemination area (DA) [Internet]. Dictionary, Census of Population, 2021. 2021 [cited 2023 Jun 19]. Available from: <https://www.statcan.gc.ca/census-recensement/2021/ref/dict/az/Definition-eng.cfm?ID=geo021>
4. Pampalon R, Hamel D, Gamache P, Philibert M. An Area- based Material and Social Deprivation Index for Public Health in Quebec and Canada. Can J Public Health Rev Can Santé Publique. 2012 Sep 1; 103: e S 17 – 22.
5. Townsend P. Deprivation. J Soc Policy. 2009 / 01 / 20 ed. 1987; 16 (2): 125 – 46.
6. Pampalon R, Hamel D, Gamache P, Philibert MD, Raymond G, Simpson A. Un indice régional de défavorisation matérielle et sociale pour la santé publique au Québec et au Canada. Can J Public Health. 2012 Sep; 103 (S 2) : S 17 – 22 .
7. Statistics Canada. Census Profile, 2021: Aggregate Dissemination Areas [Internet].
8. 2021 [c i ted 2023 Jun 19]. Available from: <http://datacentre.chass.utoronto.ca/>
9. Keltie Craig Consulting, Luna Aixin Consulting, Kapenda K, Licker Geospatial. Social Equity & Regional Growth Study Considerations for integrating social equity into regional planning and Metro 2050 [Internet]. 2021 Jan [cited 2023 Jun 19] p.11. Available from: [http://www.metrovancouver.org/services/regional-planning/ Planning Publications/ MV Social Equity- Regional Growth Study. Pdf](http://www.metrovancouver.org/services/regional-planning/PlanningPublications/MV_Social_Equity_Regional_Growth_Study.Pdf)
10. Fischer J, Winters M. COVID- 19 street reallocation in mid-sized Canadian cities: socio- spatial equity patterns. Can J Public Health. 2021 Jun 1; 112 (3): 376 – 90.
11. Firth CL, Hosford K, Winters M. Who were these bike lanes built for? Social- spatial inequities in Vancouver' s bikeways, 2001 – 2016. J Transp Geogr. 2021 Jun 1;94: 103122.

Appendices

Appendix A

Geographic expansion & area-level sociodemographic disadvantage

Table A1. Distribution of new bike share access according to area-level socioeconomic disadvantage.

Quintile by Pampalon Deprivation Index	Change in # of DAs Inside Service Area (% of total new DAs)
1 –Least Deprived	↑ 26 (13)
2	↑ 53 (27)
3	↑ 68 (35)
4	↑ 38 (19)
5 – Most Deprived	↑ 12 (6)
Total	↑ 197 DAs*

Table A2. Changes in the distribution of bike share access according to area- level socioeconomic disadvantage from initial to expanded service area.

Quintile by Pampalon Deprivation Index	# of DAs* Inside Initial Service Area (% of total)	# of DAs* Inside Expanded Service Area (% of total)
1 –Least Deprived	145 (57)	171 (38)
2	77 (30)	130 (29)
3	24 (9)	92 (20)
4	1 (0.4)	39 (9)
5 – Most Deprived	7 (3)	19 (4)
Total	254 DAs	451 DAs

Appendix B

Evaluating Service Area Access by Priority Population

Table B1. The proportion of the priority group inside the service area compared to the total population of the priority group in the City of Vancouver.

Priority Populations	Initial (% of total)	Expansion (% of total)
Total 'ages 15 to 64 years' inside service area	178, 195 (37)	258,650 (54)
Total 'ages 15 to 64 years' in Vancouver	478,910	478,901
Total children inside service area	17,735 (25)	31,430 (45)
Total children in Vancouver	70,610	70,610
Total older adults inside service area	34,830 (31)	53,210 (47)
Total older adults in Vancouver	112,800	112,800
Total 'not a visible minority' inside service area	139,730 (47)	205,560 (70)
Total 'not a visible minority' in Vancouver	295,585	295,585
Total Indigenous identity inside service area	5,245 (41)	9,275 (72)
Total Indigenous Identity in Vancouver	12,935	12,935
Total Indigenous identity, woman inside service area	2,435 (40)	4,445 (72)
Total Indigenous identity, woman in Vancouver	6,170	6,170
Total Immigrant inside service area	79,695 (29)	116,920 (43)
Total Immigrant in Vancouver	274,335	274,335
Total visible minority inside service area	83,990 (24)	128,840 (36)
Total visible minority in Vancouver	354,650	354,650
Total Black inside service area	2,695 (42)	3,990 (62)
Total Black in Vancouver	6,450	6,450
Total Chinese inside service area	28,770 (17)	50,860 (30)
Total Chinese in Vancouver	168,300	168,300
Total South Asian inside service area	9,155 (21)	13,170 (30)
Total South Asian in Vancouver	43,615	43,615
Total Filipino inside service area	4,840 (13)	8,650 (23)
Total Filipino in Vancouver	37,280	37,280

Table B2. Proportion of DAs of each quartile according to reference and priority population inside the initial and expanded service area. Quartile 4 represents areas with highest proportion of the priority population and Quartile 1 represents DAs with the lowest proportion of the priority population.

Sociodemographic Measures Reference Population	Q4 (Lower priority)	Q3	Q2	Q1 (Higher priority)
Age 15- 64 years - Initial	14%	13%	19%	55%
Age 15- 64 years - Expansion	17%	16%	23%	44%
Sociodemographic Measures Priority Population	Q4 (Higher priority)	Q3	Q2	Q1 (Lower priority)
Age 14 years and under - Initial	64%	17%	10%	9%
Age 14 years and under - Expansion	44%	20%	16%	20%
Age 65 years and over - Initial	48%	17%	11%	24%
Age 65 years and over - Expansion	43%	23%	13%	21%
Sociodemographic Measures (%) Reference Population	Q4 (Lower priority)	Q3	Q2	Q1 (Higher priority)
Not a visible minority - Initial	1%	12%	34%	54%
Not a visible minority - Expansion	1%	17%	34%	48%
Sociodemographic Measures Priority Population	Q4 (Higher priority)	Q3	Q2	Q1 (Lower priority)
Indigenous identity - Initial	31%	27%	25%	17%
Indigenous identity - Expansion	35%	20%	22%	22%
Indigenous identity, female - Initial	53%	20%	15%	12%
Indigenous identity, female - Expansion	54%	16%	14%	16%
Immigrant - Initial	45%	33%	18%	5%
Immigrant - Expansion	47%	31%	16%	6%
Black - Initial	54%	17%	18%	11%
Black - Expansion	60%	13%	15%	13%
Visible minority - Initial	54%	33%	13%	1%
Visible minority - Expansion	49%	34%	17%	1%
Chinese - Initial	55%	35%	7%	3%
Chinese - Expansion	47%	33%	14%	6%
South Asian - Initial	26%	38%	28%	9%
South Asian - Expansion	29%	34%	28%	10%
Filipino - Initial	39%	44%	15%	3%
Filipino - Expansion	41%	33%	20%	6%

Appendix C

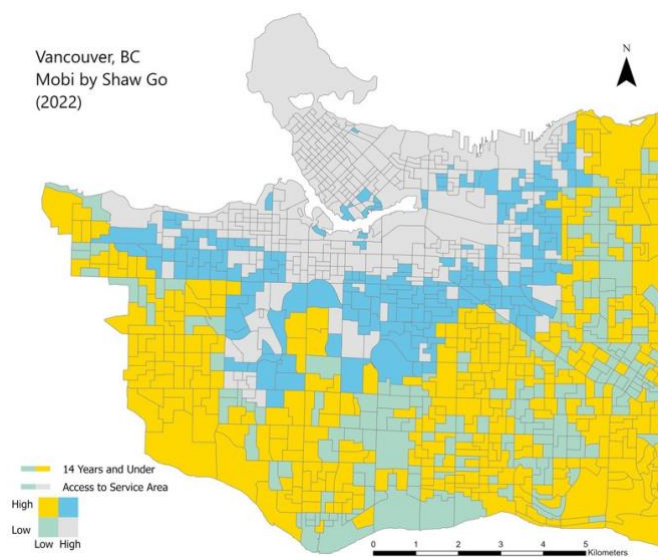
Priority Populations Bivariate Map

Interpreting the Maps

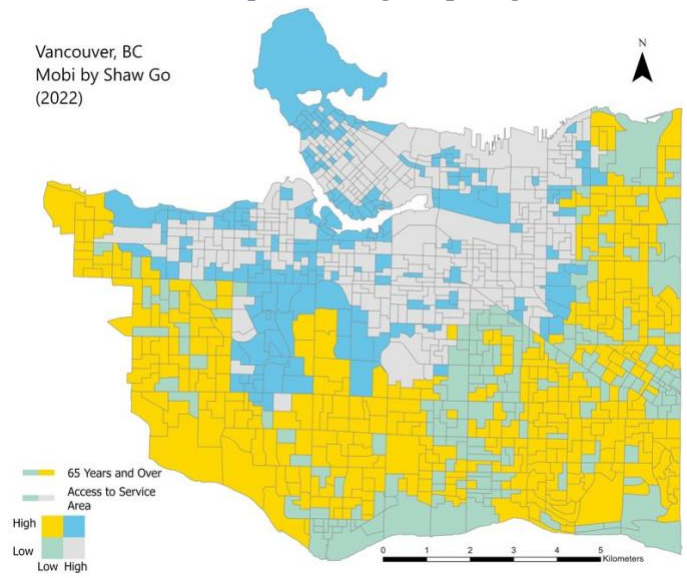
Potential bike service area expansions could include DAs that have a high proportion of the priority population with no access to the service area (in yellow). Equity initiatives seeking to reduce other barriers to bike share access could also focus on DAs that have a high proportion of the priority population with access to the service area (in blue).

Areas in green on the map indicate DAs with low proportions of the priority population with no access to the service area, and areas in grey indicate DAs with low proportions of the priority population with access to the service area.

Population group: Age 14 Years and Under

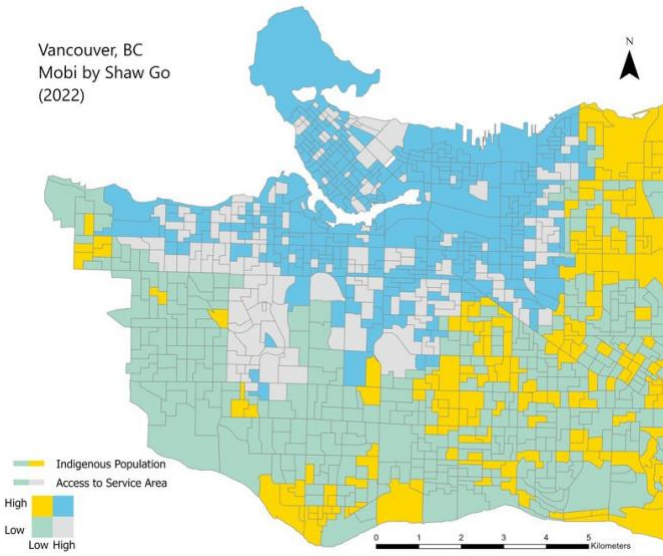


Population group: Age 65

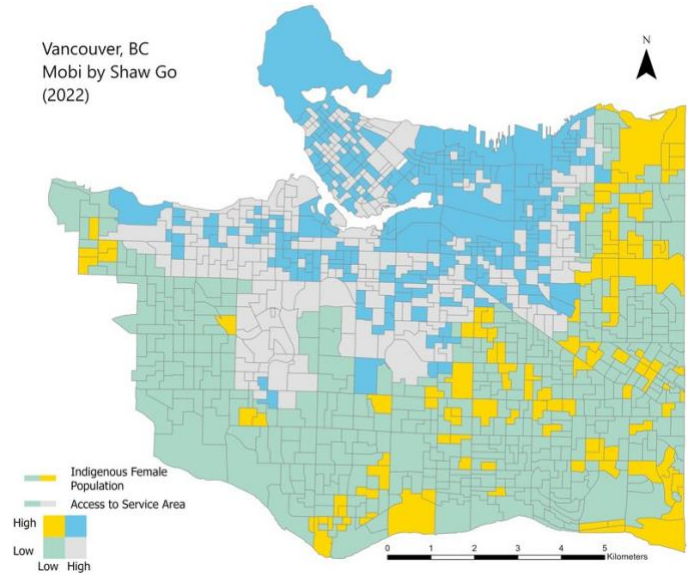


Years and Over

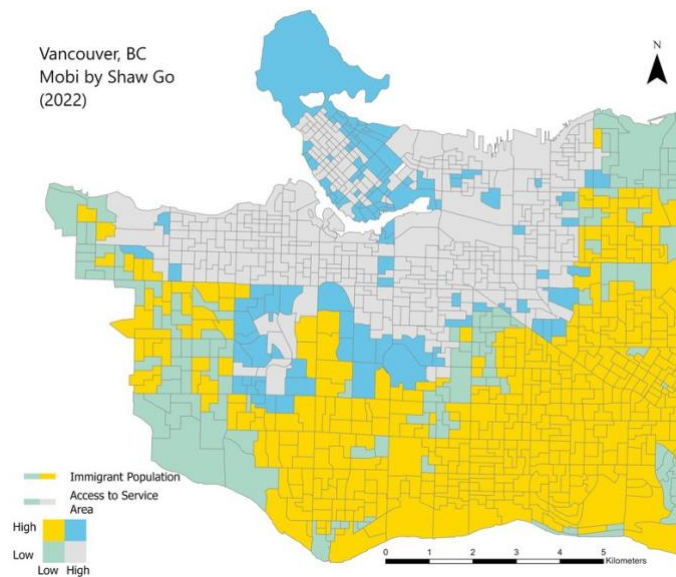
Population group: Indigenous



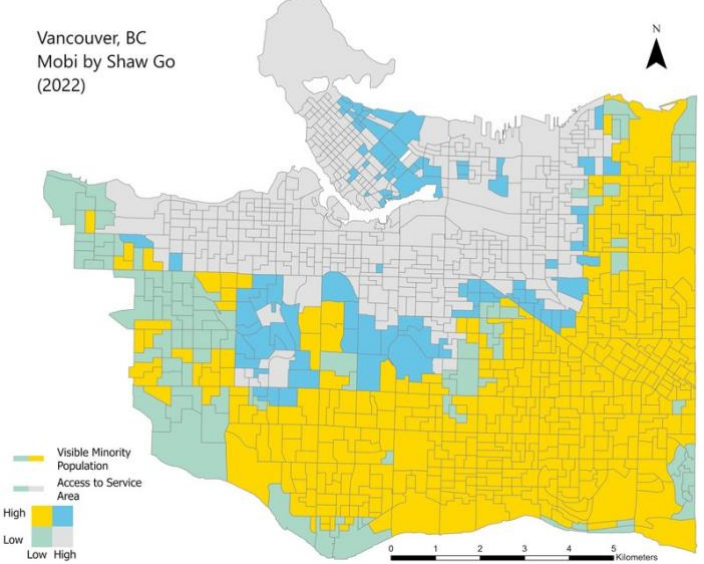
Population group: Indigenous, Female



Population group: Immigrant



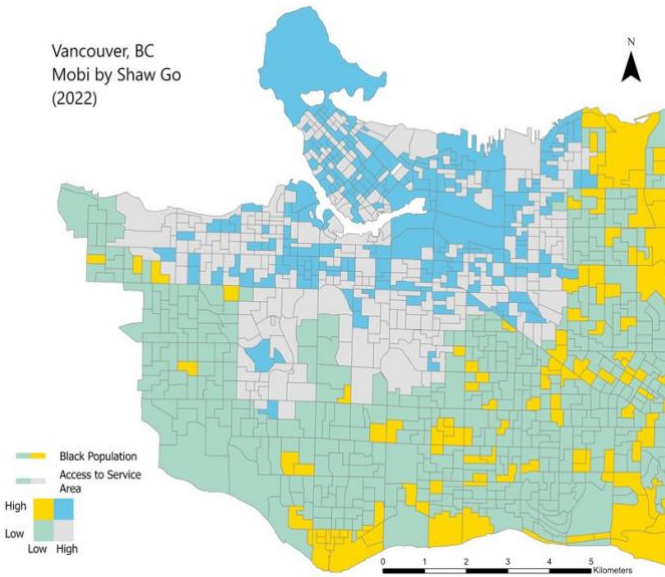
Population group: Visible



minority

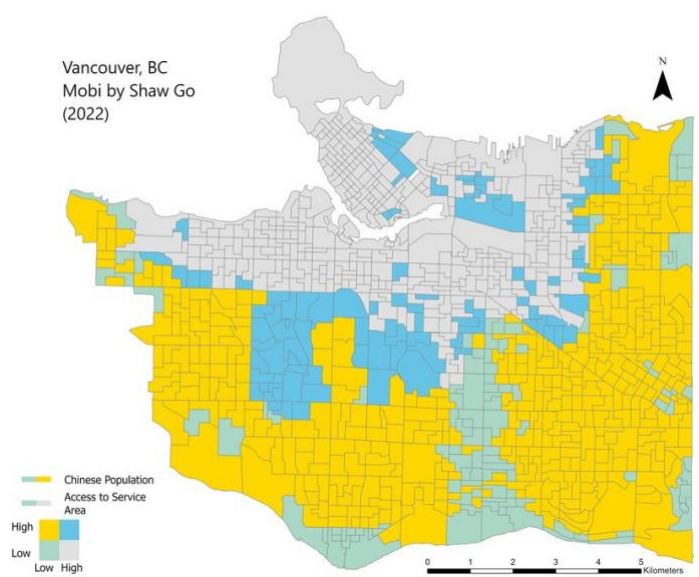
Population group: Black

Vancouver, BC
Mobi by Shaw Go
(2022)

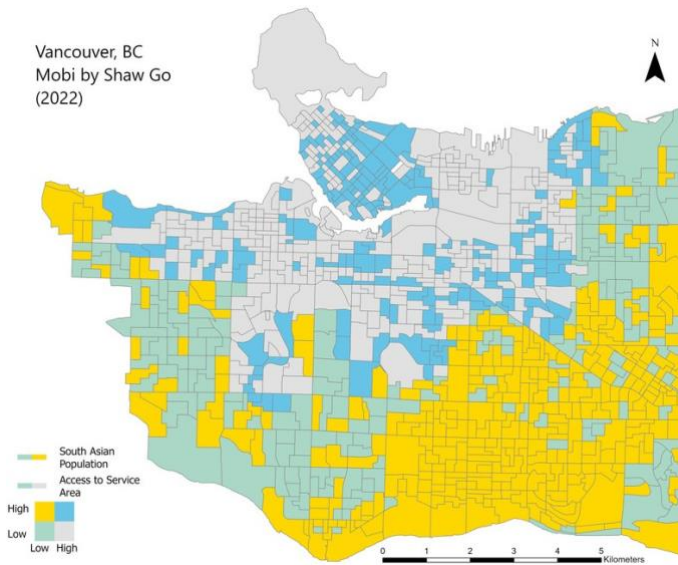


Population group: Chinese

Vancouver, BC
Mobi by Shaw Go
(2022)

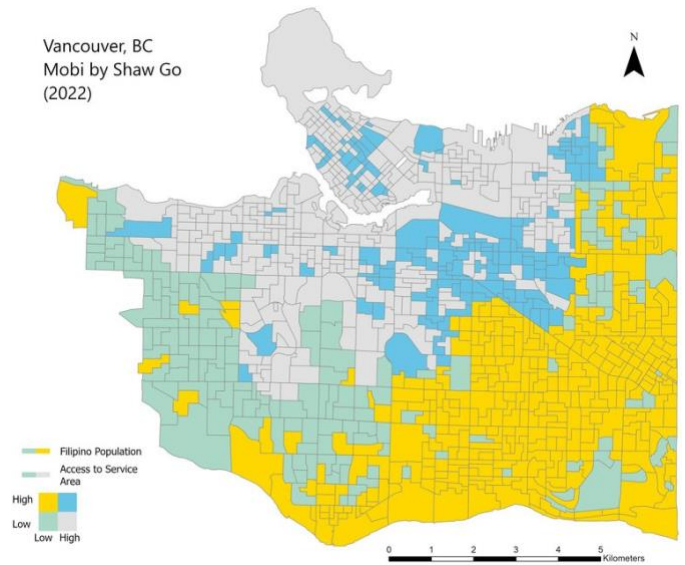


Vancouver, BC
Mobi by Shaw Go
(2022)



Population group: South Asian

Vancouver, BC
Mobi by Shaw Go
(2022)



Population group: Filipino