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2019 North Shore Transportation Survey

Final report
September 2020

Prepared for: City of North Vancouver,
District of North Vancouver, and
District of West Vancouver

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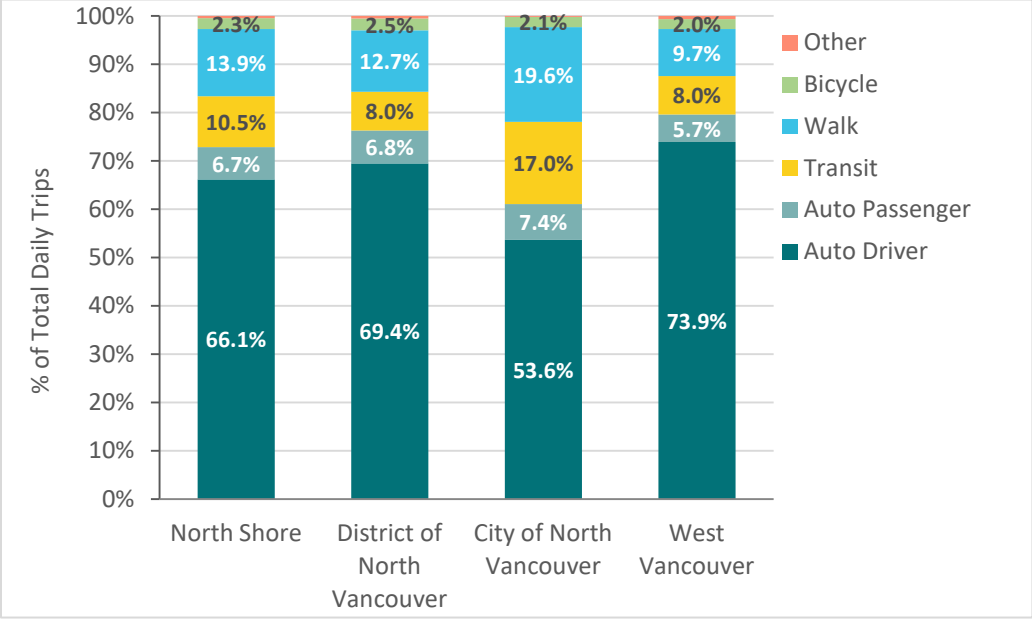
Executive Summary

This report summarizes the results of the first North Shore Transportation Survey (NSTS) conducted in the fall of 2019. The NSTS is intended to track trends in transportation mode shares and other metrics associated with North Shore residents' daily travel. The survey also collects information on other aspects of residents' travel habits, such as frequency of cycling and transit use, and gathers residents' input on issues relevant to transportation planning.

The 2019 NSTS serves as a baseline for comparison of the results for future survey cycles. The survey will be conducted every two years, with mini-surveys being conducted in alternate years to maintain contact with survey participants. In the fall of 2019, the survey was completed with a sample of 1.2% of the population of the North Shore municipalities and First Nations (the City of North Vancouver, the District of North Vancouver, and the District of West Vancouver, Tsleil-Waututh Nation lands, and Squamish Nation lands within the North Shore area), for 1,905 surveys with residents. The survey gathered information on 6,821 trips made on a prior weekday. When weighted and expanded, the survey data represent over 158,000 residents from 76,000 private households in the study area, and 579,000 weekday trips.

The following chart highlights the mode shares for residents 15+ years of age overall for the North Shore and by municipality.

Trip Mode Share - North Shore and by Municipality[1]



[1] Mode shares of 1% or less are included in the chart, but values are not displayed. 'Other' modes (low speed motor vehicle, taxi, ferry, intercity coach bus, train, airplane, etc.) represent 0.5% of all daily trips made by North Shore residents, 0.5% of trips made by DNV residents, 0.2% of trips made by CNV residents, and 0.7% of trips made by DWV residents.

The survey results suggest that under normal weekday conditions (outside of the impacts of the current COVID-19 pandemic), two-thirds (66.1%) of all trips made by North Shore residents over the age of 15 are made by auto drivers, with another 6.7% made as auto passengers. More than one in ten trips is via transit, at a 10.5% mode share. Active modes make up 16.2% of all trips, with a 13.9% walk mode share and a 2.3% cycling mode share.

By municipal area (with the results for residents of the First Nations lands included with adjacent municipalities), the following observations can be made:

- The District of West Vancouver (DWV) has the highest percentage of auto driver trips with almost 74% of trips while the City of North Vancouver (CNV) has the lowest percentage with around 54% of trips.
- Auto passenger trips represent around 7.4% of trips in CNV while they represent only 5.7% in DWV.
- Transit trips are significantly higher for CNV residents at almost 17% of trips, while they represent only 8% for both District of North Vancouver (DNV) and DWV residents.
- CNV has significantly higher walking trips, at 20% of trips. Walking trips for DNV and DWV residents represent 13% and 10% of trips, respectively.

The expanded survey data provide estimates on the daily number of trips by different modes. Of the 579,000 daily person-trips, it is estimated that almost 383,000 are auto driver trips (which represents the number of private vehicle trips) and 38,800 are auto passenger trips (with most being served by the auto driver trips). Each weekday, North Shore residents also make about 61,000 trips by transit, 80,500 walking trips, and 13,000 cycling trips. Automobile drivers incur about 3,200,000 vehicle kilometers each weekday on roads on the North Shore and in nearby municipalities, excluding longer-distance trips outside the Metro Vancouver region.

The survey results reveal that North Shore residents make a considerable number of trips crossing the Burrard Inlet, with 25% of daily trips being to or from locations south of the Burrard Inlet, many of which are work-related. This includes destinations in the Vancouver downtown (Central Business District/West End) with 27,000 daily trips from the North Shore to this area each day, and an equivalent number returning), the rest of Vancouver (20,700 daily trips), Burnaby (10,600 daily trips) and other destinations in the Metro Vancouver region outside the North Shore.

Future survey cycles will allow tracking of how mode shares and other travel patterns change over time as the North Shore grows, population demographics change, new transportation initiatives are implemented, and residents' travel patterns evolve.

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1 Introduction

1.1 Project Overview

1.1.1 Background and Objectives

The North Shore Transportation Survey (NSTS) is a biennial survey of residents of the North Shore that tracks key transportation metrics associated with residents' travel patterns. The survey is an initiative of the City of North Vancouver (CNV), District of North Vancouver (DNV), and District of West Vancouver (DWV).

In 2018, the Integrated North Shore Transportation Planning Project (INSTPP) report identified a number of key access and mobility challenges. Identified challenges include: land use is largely car oriented; transit and alternative modes of travel are often not competitive with travel by car; measures are lacking to manage road use; road use exceeds capacity at peak times and pinch points; the road network has gaps that reduce choice and increase congestion. The North Shore municipalities, in partnership with various levels of government and stakeholders, are enacting a number of initiatives that aim to address these transportation challenges.

The NSTS is intended to track trip rates, mode shares, vehicle kilometres travelled, and other key metrics that will help the municipalities assess the impact of transportation initiatives and plan future transportation investments. The 2019 NSTS is the first such survey and will serve as a baseline measurement against which future survey cycles can be compared.

1.1.2 Design and Administration of the 2019 North Shore Transportation Survey

The 2019 NSTS was conducted between late October and early December 2019 with residents of the North Shore. The survey was a voluntary 24-hour recall travel survey that captured residents' household characteristics, demographics, and trips undertaken by the survey participant on the most recent previous weekday. The questionnaire also included some attitudinal questions and reporting of usual transportation-related habits. The survey was open to residents 15 years of age or older. The survey questionnaire is included in Appendix A of this report.

Survey participants could complete the survey online or over the telephone. An address-based sampling approach was used to randomly select households across the North Shore to participate. In order to set survey targets that would ensure a geographically representative sample, the North Shore was organized into 26 sampling districts based on Statistics Canada Aggregated Dissemination Area geographies. Selected households were invited to participate via an invitation letter (included in Appendix B of this report). Households with a corresponding phone number were also contacted by phone. A small number of supplementary surveys (to obtain better representation of younger demographics) were also collected by way of asking participants to invite other members of their household under the age of 40 years old to participate, with four such surveys obtained. Over 95% of the surveys were completed between October 22 and November 22, 2019, with the survey kept open to December 13, 2019 to target a few sampling districts with low response rates.

The 2019 NSTS gathered information from 1,905 North Shore residents after data validation, trip logic checks, and rejection of surveys with data issues. The survey captured 6,821 trips made by survey participants on a prior weekday. The survey data set was weighted to compensate for non-response bias and expanded to represent the target population. Weighting controls for household-level information included dwelling counts, dwelling type, and household size for eight geographic data expansion zones. Weighting controls for person- and trip-level information included population counts by dwelling type and population counts by age and gender for the same data expansion zones.

When weighted and expanded, the survey data represent approximately 158,000 residents from 76,300 private households in the study area, for a sampling rate of 2.5% of households or 1.2% of population 15+ years of age living in private residences[2]. The trip data captured by the survey provide a snapshot of 24-hour travel patterns of residents of the study area over the course of a typical fall weekday. The weighted and expanded trip records represent an estimated total of 579,000 trips made each day by residents 15+ years of age.

It may be noted that during the survey administration period, transit staff undertook job actions from November 1, 2019 through November 27, 2019. During this period, some transit bus, SkyTrain, and SeaBus services were impacted by actions ranging from transit operators working out of uniform, refusal of overtime on alternating days, and reductions in service. Disruptions to individual routes occurred on a rotating basis, but a system-wide shut down was never implemented. Survey administration continued throughout the period of the job actions, with the final mail out of invitations letters to target low-response areas delayed until after the strike actions were over. Additional survey questions were added to help assess the impact to travel behaviour of residents within the study area. After consideration of the responses, no adjustments were made to the survey data or data weighting, although it should be noted that the job actions may have had minor impacts on mode shares and trip rates.

More detailed documentation of the survey design and conduct is provided in a separate methodology report.

1.1.3 Comparison to the TransLink Metro Vancouver Regional Trip Diary Survey

TransLink, the transportation authority for the regional transportation network of Metro Vancouver including public transport, major roads and bridges periodically undertakes a household travel survey of Metro Vancouver households, including residents of the North Shore. The last two cycles of the Metro Vancouver Regional Trip Diary Survey were undertaken in 2011 and 2017.

The NSTS differs from the TransLink trip diary in a number of important ways.

- First, the NSTS is intended to be undertaken on a more regular basis than the Metro Vancouver trip diary, albeit with a more modest sample, in order to provide regular and ongoing tracking of residents' travel patterns.
- The TransLink trip diary is conducted with a new cross-section of the population in each survey cycle. The NSTS is designed as a panel survey, meaning that survey participants are asked to

[2] Excludes approximately 1.5% of the population living in collective residences (senior's care homes, university residences, group homes, prisons, barracks, etc.) or who are homeless.

participate again in future cycles, with repeat surveys being supplemented by recruitment of new participants to account for attrition in the survey panel. This allows for longitudinal data collection and theoretically better assessment of trends (with comparisons subject to less variance due to random sampling).

- Second, the TransLink trip diary is conducted as a complete household travel survey, for which demographics and trips are captured for all members of the household, and the survey is confined to capture of factual information on travel patterns. The NSTS focuses on a single household member over the age of 15 (sampled from within the household to obtain a representative sample). As only one member of the household is surveyed, this provides the opportunity to obtain a richer dataset by asking more in-depth questions, including a number of attitudinal questions, details of usual travel behaviours, and matters of topical interest to transportation planners relating to transportation initiatives under consideration.
- Third, the NSTS is intended to illuminate differences in travel patterns at a sub-municipal level, whereas the TransLink trip diary data are weighted for analysis at the municipal level.

Given their different methods, frequency of data collection, and data use cases, both surveys have important and complimentary roles for transportation planning for the region.

It may be noted that comparisons of the NSTS survey results with the TransLink trip diary survey results should be undertaken with caution. The published TransLink trip diary results are based on all household members of all ages, whereas the NSTS results are based on only residents who are 15 years of age and older. In addition, there may be significant or even minor differences in sampling, survey design, and data weighting methodologies that may affect the comparisons. For example, the NSTS collects information on leisure and exercise trips that leave and return to the same place without stopping at a destination (such as walking the dog, going for a jog, or going for a scenic drive without stopping along the way), representing about 3% of trips captured, whereas the TransLink survey may not.

1.1.4 Analysis of the Survey Results

Prior to analysis of the survey results, a review of the North Shore geography was undertaken to organize the survey area into sub-municipal geographies that would be suitable for sub-municipal analysis. Similar to the multi-agency approach of INSTPP, the North Shore's transportation network, population densities, and land uses were examined with a holistic view that "transportation knows no borders", rather than strictly adhering to municipal city limits. This approach should enable more useful analysis of travel patterns at the regional level and across jurisdictions. The survey results are analysed for three municipal areas and eight sub-municipal zones.

Overall, the survey results are subject to a margin of sampling error of ±3.0% at a 95% confidence level, taking into account the effects of data weighting.[3] Survey results for sub-populations are subject to

[3] 19 times out of 20, for a given survey question, the survey response percentage should be somewhere within the margin of error of the survey results. The margin of error has been corrected to take into account the increase in error associated with data weighting to correct for over-/under-sampling and/or non-response bias. The formula for margin of error is $E = \pm z \sqrt{\frac{\bar{p}(1-\bar{p})}{n}} \times \sqrt{\frac{N-n}{N-1}} \times \sqrt{deff}$,

higher margins of sampling error. The results for the 905 surveys completed with DNV residents are subject to sampling error of ±4.5%, the 550 surveys with CNV residents are subject to a sampling error of ±5.6%, and the 450 surveys for DWV residents are subject to a sampling error of ±6.1% (at a 95% confidence level).

The margins of sampling error may be considered reasonable for reporting survey results for the North Shore, by municipality, and by zone (with the understanding that the zone-level samples are modest and subject to higher sampling error). That is, the weighted survey data should be an accurate enough reflection of the population from which the survey sample was drawn that the survey results will provide a good understanding of the population's characteristics and travel habits, and will allow us to identify differences in travel patterns between municipalities and zones. It should be noted that the expanded survey counts are estimates not exact counts, and the weighted survey results may differ somewhat from the true results for the total population (if it could be known). The survey results could also differ from the results of another random sample of the population or if travel was captured on a different day of the week for the same survey participant. In addition, sampling error is not the only possible source of error. There may be errors or biases in the data that could not be corrected for in the data processing or data weighting, although every attempt has been made to reduce other sources of error (e.g., sample frame under-coverage, participant reporting error, data handling, etc.).

For the above reasons, in the future cycles of the NSTS, we recommend undertaking longitudinal comparisons at higher levels of aggregation (above the zone level). Even then, the longitudinal analysis will be subject to the caveat that some of the variations that may be observed in results from survey year to survey year may be the result of sampling errors or other errors, rather than reflective of a trend. Nevertheless, we can expect that major differences in the results from year to year will signal actual changes in the population and/or their travel patterns. True trends should become apparent in the survey measurements over time despite the 'noise' from cycle-to-cycle variations due to sampling errors or other sources of error.

1.1.5 Use of the 2019 NSTS as a Baseline Survey

This was the first survey of the NSTS project, and will establish a baseline for a series of full surveys to be completed every two years. Interim mini-surveys will be conducted in years in between in order to maintain the panel of repeat participants and find out about residents' behaviours and attitudes on issues of topical interest. In Fall 2020, a brief update survey will be undertaken with 2019 NSTS participants who agreed to be contacted in future cycles. In Fall 2021, a full survey will be undertaken again capturing a snapshot of travel at that time, and will include panel participants as well as recruitment of new participants to replace previous participants who do not continue with the panel.

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where *N* is the size of the sample universe, *n* is the size of the survey sample, *p* is the proportion being assessed (in this case *p=0.50* to obtain the maximum sample error), *z*=1.96, the z-score associated with a 95% confidence level, and *deff* is the design effect associated with the weighting of the sample (with *deff* computed as the sample size times the sum of the squares of the weights divided by the square of the sum of the weights).

1.1.6 The COVID-19 Pandemic and the NSTS Research Program

At the time of finalization of this report, the COVID-19 pandemic has had profound impacts on travel for work, school, recreation, and most other discretionary purposes since March of 2020. The results in this report are written up as if they are current behaviours, although that is not obviously the case at present. Transportation planning has a long-range horizon. The trip-level results are typical of an average fall day in 2019 and the travel behaviours examined are those prior to the implementation of COVID-19 restrictions and their related economic impacts. The theoretical "as-is" scenario as of Fall 2019 should still have great relevance for planning for "to-be" scenarios anywhere from a few years from now to decades from now. It is uncertain how travel patterns will evolve in the long term. Some travel patterns may return to something similar to the patterns described by this report. Other travel patterns may be changed for years, whether due to economic impacts with a short- or medium-term horizon or due to longer-term behavioural shifts that may come about as a consequence of the pandemic. Such potential shifts could include changes in how people work, study, shop, obtain services, or go about other areas of human activity. This underscores the usefulness of the North Shore Transportation Survey program in undertaking regular updates in order to chart trends, both as the impacts and consequences of the pandemic continue to unfold and evolve and as ongoing transportation initiatives, development, and population growth affect transportation demand and supply.

1.2 Report Organization

The remainder of this report is organized into the following sections:

Section 2: Survey Geography
Section 3: Participant Characteristics
Section 4: Daily Trip Characteristics
Section 5: Travel Patterns
Section 6: Topical Issues
Section 7: Lessons Learned and Next Steps

1.3 Interpreting the Survey Results

Readers should keep the following in mind when interpreting the survey results presented in this report:

- The survey results are based on a 1.2% sample of the population of the North Shore. **All figures should be understood to be estimates.**
- **Expanded household, person, and trip counts presented in this report have been rounded to the closest 10**, but the actual margin of error is usually considerably greater than units of 10.
- **Figures presented for individual categories may not always sum to exactly the reported total across those categories due to rounding**.
- Survey response proportions have either been rounded to the nearest percent or one-tenth of a percent. **Individual percentages may not always add to exactly 100% or 100.0% due to rounding.**

1.4 Acknowledgements

The survey research was conducted by R.A. Malatest & Associates Ltd. (the Consultant) in association with Associated Engineering, with the guidance of the project partners: City of North Vancouver, District of West Vancouver and the District of North Vancouver.

We gratefully acknowledge the direction and guidance of Banafsheh Rahmani, Transportation Engineer with the District of North Vancouver, Christopher French, Planning Assistant–Transportation with the City of North Vancouver, Cindy Liu, Transportation Engineer with the District of West Vancouver, and John Calimente, Transportation Planner with the District of West Vancouver.

This project would not be possible without the contributions of over 1,900 residents of the Tsleil-Waututh Nation, Squamish Nation, City of North Vancouver, District of North Vancouver, and District of West Vancouver who completed the survey. We thank all those who responded to this survey, via phone interview or online, and told us about their daily travel and transportation habits. Your participation in the 2019 North Shore Transportation Survey has contributed to transportation planning data that will be useful for years to come.

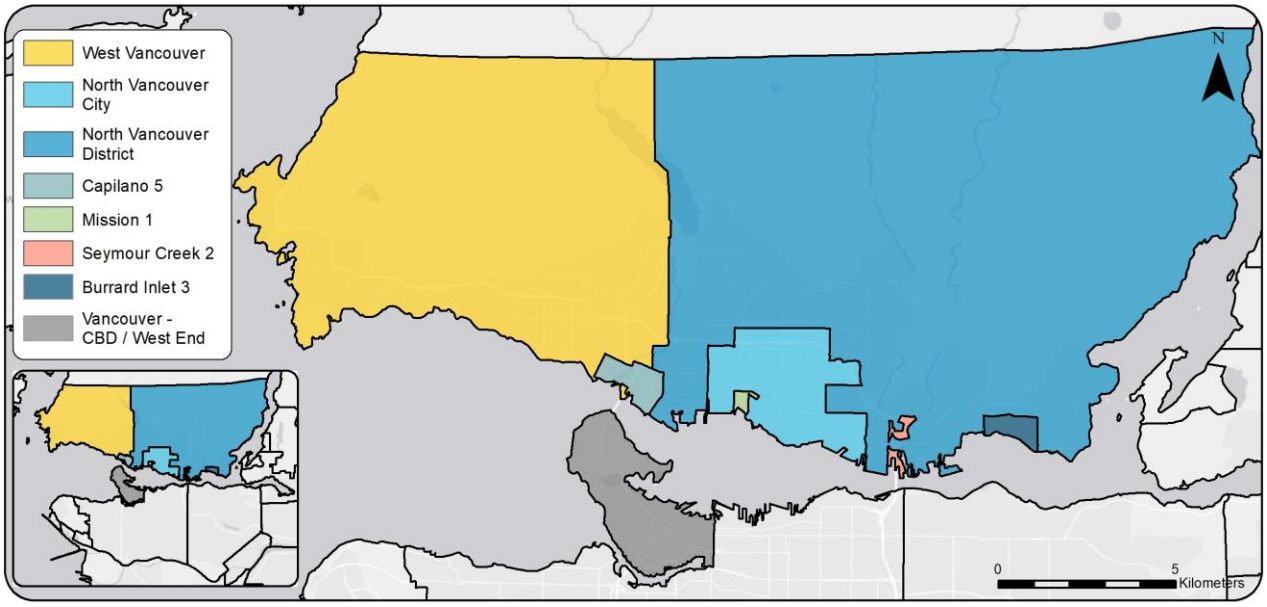
2 Survey Geography

2.1 Survey Scope

The 2019 North Shore Transportation Survey study area comprised the entire North Shore, including Tsleil-Waututh Nation (Burrard Inlet 3 Census Subdivision), Squamish Nation lands within the North Shore area (Mission 1, Seymour Creek 2, and Capilano 5 Census Subdivision), the CNV, DNV and DWV. The study area is presented in **Figure 1** below. The Vancouver downtown CBD/West End, which is outside the study area, is highlighted on the map for reference, as this is a common external destination for North Shore residents.

For the purposes of defining trips external to the study area, a wider geographical 'travel area' was developed that includes the rest of the Metro Vancouver Regional District and the Fraser Valley Regional District. Locations captured by the survey within this travel area were geocoded to regional, municipal, or sub-municipal areas as appropriate for analysis of work locations and trip destinations outside the North Shore.

Figure 1. Map of Study Area



2.2 Survey Geographies

The North Shore includes a number of different municipalities and First Nations, as noted above. For the purpose of analysis by municipal area, First Nations lands have been combined with the municipality they border or are situated within the boundaries, as outlined in **Table 1** below.

Table 1. Municipal Areas with 2019 Projections of 2016 Census Counts

Municipal Area for Analysis	Census Subdivisions in Municipal Area	Land area (sq km)	Total private dwellings	Total Population	Private Households Occupied by Usual Residents	Population 15+ Years of Age in Private Dwellings	2019 NSTS Survey Completions
1. District of North Vancouver (DNV)	District of North Vancouver	160.76	32,704	86,146	31,192	70,379	883
	Burrard Inlet 3	1.06	1,077	2,145	1,064	1,879	22
	Seymour Creek 2	0.49	44	134	40	114	0
2. City of North Vancouver (CNV)	City of North Vancouver	11.85	27,333	54,714	25,491	46,686	548
	Mission 1	0.28	178	577	160	476	2
3. District of West Vancouver (DWV)	West Vancouver	87.26	18,701	42,592	16,981	35,920	427
	Capilano 5	1.72	1,507	3,081	1,376	2,691	23
North Shore	**Total**	**263.42**	**81,545**	**189,390**	**76,305**	**158,146**	**1,905**

A set of eight geographies, or "sub-municipal zones", was also developed for use in data weighting and analysis at a more disaggregate level than municipality. The zones were developed looking at the North Shore as a whole, to group together similar residential and commercial areas, and in consideration of the road and transit networks available to residents, even if the boundaries of like areas sometimes bridge municipal boundaries. The map on the next page (**Figure 2**) illustrates the boundaries of the eight zones that were developed. The colouring of the map depicts population densities for Statistics Canada Dissemination Areas, one of the smallest levels at which data from the national Census are released. The eight sub-municipal zones and their populations are listed in **Table 2**, following.

Figure 2. Map of Sub-municipal Zones with Population Density by Dissemination Area (Population per Hectare)

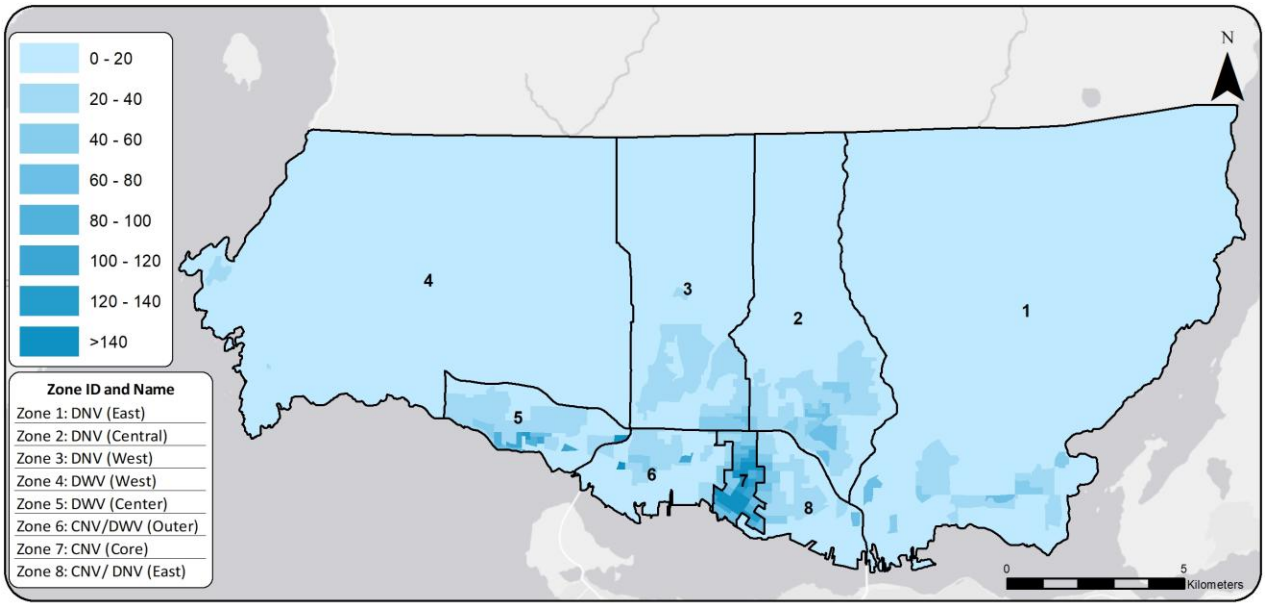


Table 2. Sub-municipal Zones with 2019 Projections of 2016 Census Counts

	Land area (sq km)	Total private dwellings	Total Population	Private Households Occupied by Usual Residents	Population 15+ Years of Age in Private Dwellings	2019 NSTS Survey Completions
Zone 1: DNV (East)*	101.9	10,853	28,441	10,539	23,460	299
Zone 2: DNV (Central)	28.1	11,141	30,430	10,710	24,576	303
Zone 3: DNV (West)	27.6	8,765	23,514	8,234	19,220	241
Zone 4: DWV (West)	79.9	9,105	22,770	8,189	19,217	214
Zone 5: DWV (Center)†	7.5	11,184	22,624	10,292	19,233	239
Zone 6: CNV / DWV (Outer)‡	8.1	6,633	15,977	6,178	13,110	159
Zone 7: CNV (Core)	2.7	17,204	29,667	16,060	26,248	306
Zone 8: CNV / DNV (East)^	7.6	6,660	15,968	6,103	13,038	144
North Shore Total	**263.4**	**81,545**	**189,391**	**76,305**	**158,101**	**1,905**

* Zone 1 also includes Burrard Inlet 3 (Tsleil-Waututh Nation) and part of Seymour Creek 2 (Squamish Nation);

† Zone 5 also includes part of Capilano 5 (Squamish Nation);

‡ Zone 6 also includes Mission 1 and part of Capilano 5 (Squamish Nation);

^ Zone 8 also includes part of Seymour Creek 2 (Squamish Nation)

3 Participant Characteristics

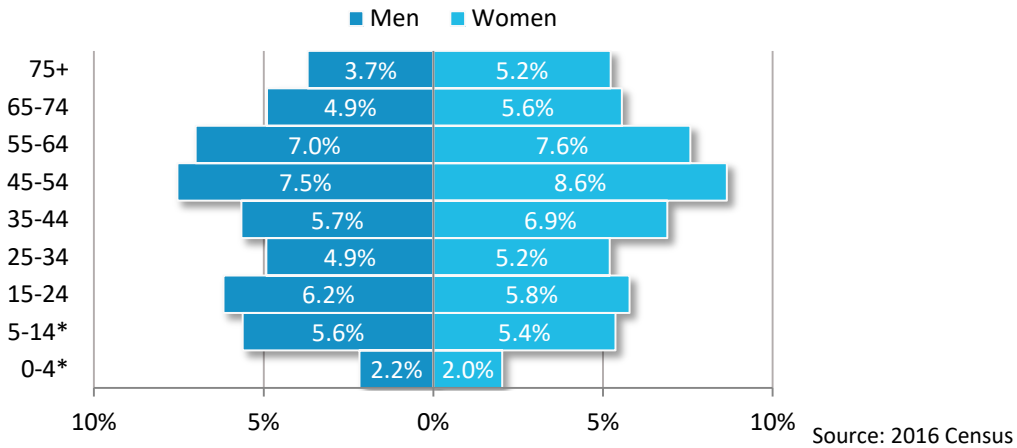
This section describes the characteristics of North Shore residents and their households, as captured by the survey, including age, gender, household, health status, occupation, bike access, and vehicle access characteristics. The purpose of capturing these characteristics is to better understand travellers' needs, challenges, and patterns. The results are based on the survey sample with selected information from the 2016 census.

3.1 Age and Gender Distribution

As the survey data somewhat under-represent people 15-24 years old, Census data have been used to illustrate actual distributions. The distribution of population by age based on 2016 Census data (**Figure 3**) shows a larger population between 45 and 64 years of age, with notably less population 25 to 44 years. This may have implications for travel patterns and provision of services as the population ages.

Table 3 provides a comparison of the Census distributions against the weighted and expanded survey data, using total population of all ages as the base for percentages for comparability. As indicated, the survey data somewhat under-represent residents 15-24 years of age (due to small sample sizes for this age range and limits placed on extreme weights), and slightly over-represent age ranges above this.

Figure 3. North Shore Population Distribution by Age/Gender



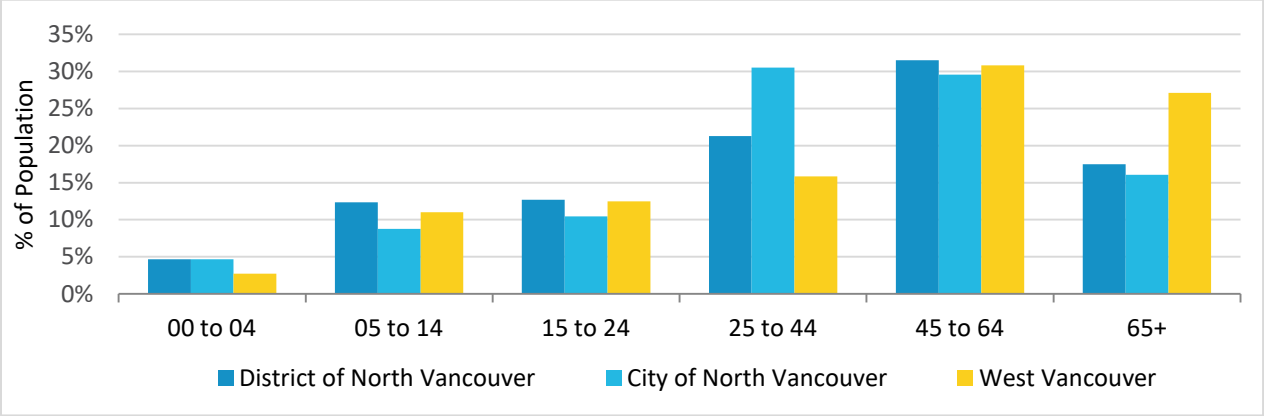
Source: 2016 Census

Table 3. North Shore Population Distribution vs. Survey Age Distributions

	Census		Survey	
	Men	Women	Men	Women
0-4	2.2%	2.0%	not surveyed	not surveyed
5-14	5.6%	5.4%	not surveyed	not surveyed
15-24	6.2%	5.8%	3.6%	4.4%
25-34	4.9%	5.2%	4.4%	5.5%
35-44	5.7%	6.9%	6.0%	7.2%
45-54	7.5%	8.6%	8.0%	9.3%
55-64	7.0%	7.6%	7.5%	8.2%
65-74	4.9%	5.6%	5.4%	6.2%
75+	3.7%	5.2%	3.8%	5.0%

Figure 4 shows the age distribution per municipality based on the Census data. DWV generally has the highest percentage of 65+ age group (27%) while the CNV has the highest percentage of the 25 to 44 age group (31%). The other age groups are generally similar across the municipalities.

Figure 4. Age Distribution by Municipality



3.2 Household Characteristics

3.2.1 Dwelling Type

Figure 5 shows the distributions of dwellings by type for each of the municipalities. Just over 50% of private dwellings occupied by usual residents in DNV and DWV are single-detached houses while only 13% of CNV dwellings are single-detached houses. Around 40% of CNV dwellings are apartment or condominium buildings with less than five storeys. Figure 7 on the next page maps these distributions by sub-municipal zone. The weighted survey data very closely match the Census distributions, so comparisons with the Census have not been presented.

Figure 6 provides a slightly different perspective, illustrating the distribution of the survey target population by dwelling type. About six in ten residents aged 15 years and older in DNV and DWV live in single-detached houses (60% DNV, 61% DWV) while this percentage is 19% for CNV residents. Around 35% of CNV's 15+ population lives in apartment or condominium buildings with less than five storeys.

Figure 5. Dwelling Type by Municipality (% of Private Dwellings Occupied by Usual Residents)[4]

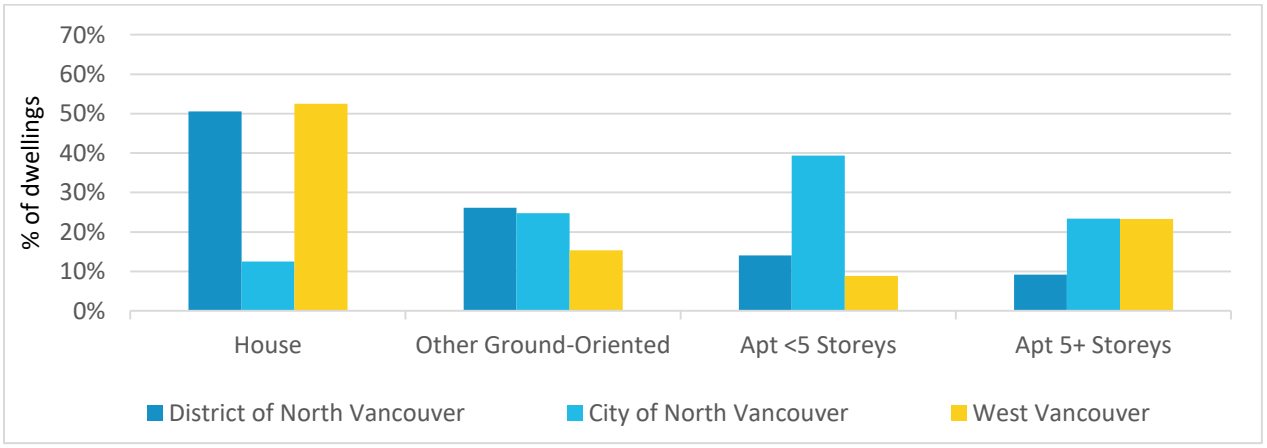
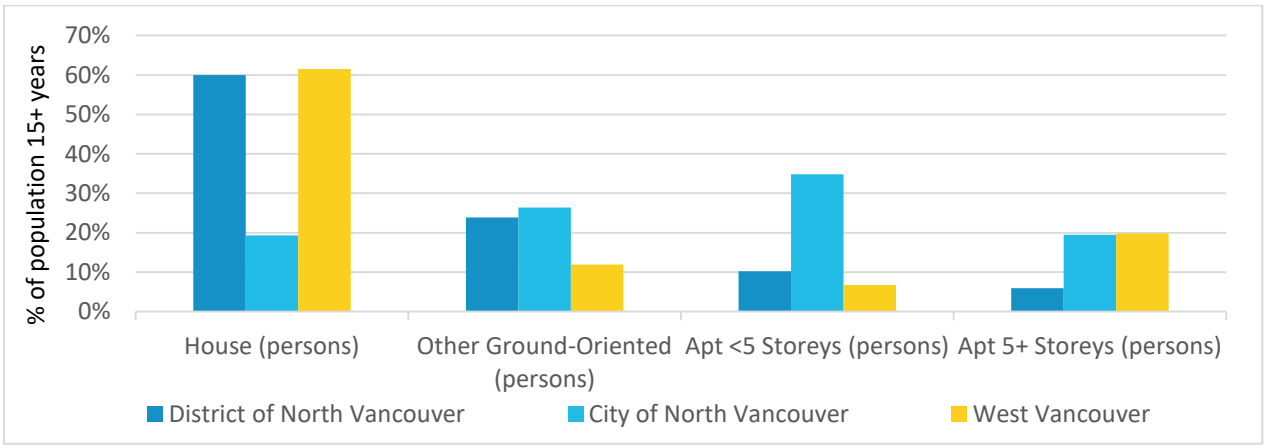
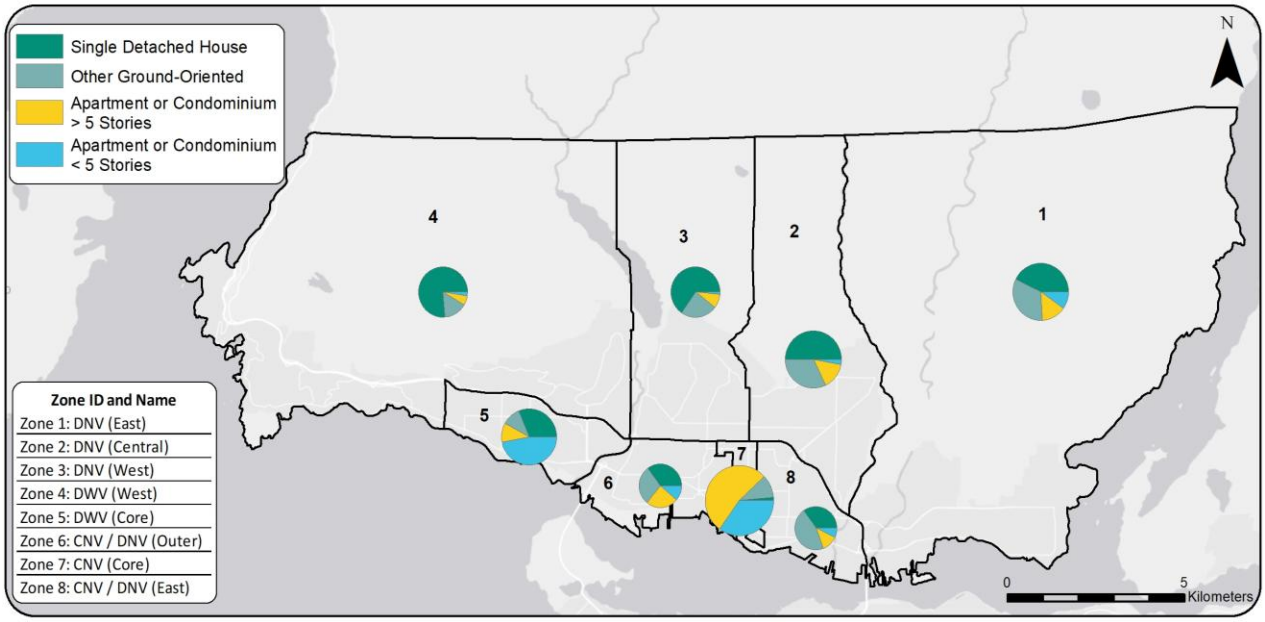


Figure 6. Survey Population by Dwelling Type by Municipality (% of Population 15+ Years of Age)



[4] Other ground-oriented = rowhouse, townhouse, semi-detached, mobile home or other dwelling type.

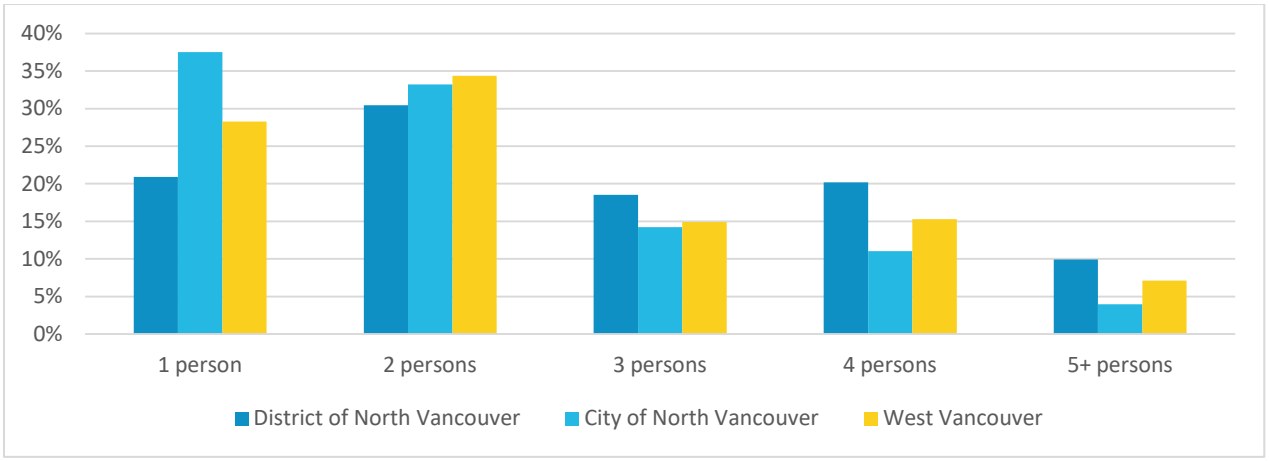
Figure 7. Map of Dwelling Type by Sub-Municipal Zone (% of Private Dwellings Occupied by Usual Residents)



3.2.2 Household Size

Figure 8 shows the distribution of household size by municipality. Single-person households represent the highest percentage in CNV with almost 38% of households. Two-person households represent the highest percentage in DNV and DWV with 30%, and 34%, respectively. The percentages of households with three, four, and five or more persons are generally similar among municipalities except for CNV where 4 or 5 or more person households are almost 6 to 10 percentage-points less than DNV and DWV. The weighted survey data closely match the Census distributions.

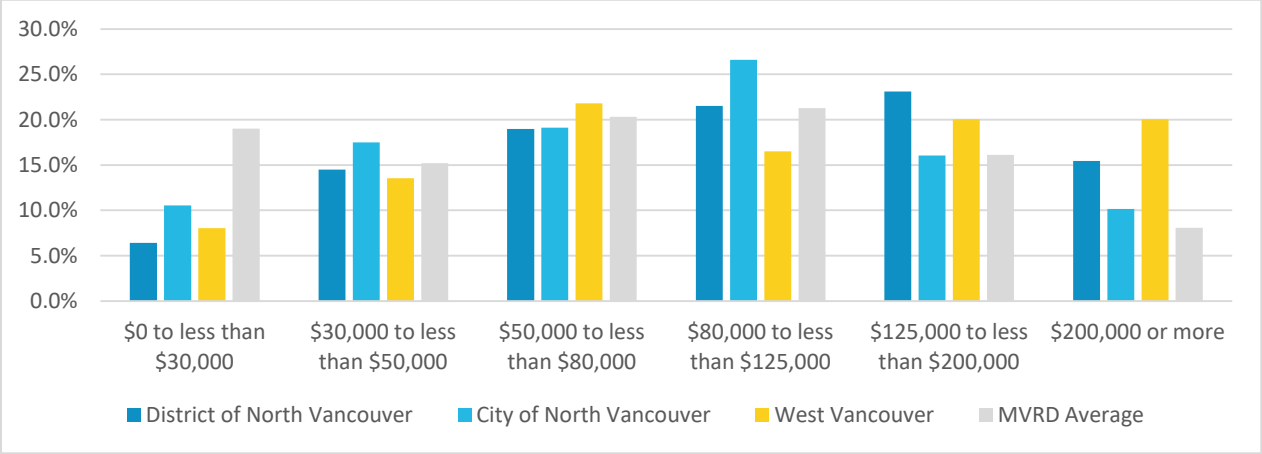
Figure 8. Household Size by Municipality



3.2.3 Household Income

Figure 9 shows the household income distribution by municipality from the 2019 survey results and in comparison with the Metro Vancouver Regional District (MVRD) from Census distributions. Compared with the MVRD, the North Shore municipalities have proportionately more households with household income of $125k or more (with, overall, double the proportion of households with $200k or more), and much fewer with under $30k. In CNV, the most common household income bracket is $80k to $125k (27% of households). In DNV, almost one-quarter of households (23%) are in the $125k to $200k bracket, with another 16% with $200k or higher. DWV has the largest proportions in high-income brackets, with 20% in $125k to $200k and 20% in $200k and higher (around 40% of households higher than $125k).

Figure 9. Household Income Distribution by Municipality[5]



[5] Household income distributions exclude 11% of survey participants who declined to answer this question.

3.3 Language and Level of Education

Figure 10 shows the distribution of survey participants' language most often spoken at home by municipality. It may be noted that the Census allowed multiple responses, while the NSTS captured a single language, and the Census results are based on total population, while the survey was open only to population 15+ years of age. In addition, almost 7% of survey participants declined to answer. These differences may affect the comparisons. Nevertheless, the comparison does suggest that the survey may under-represent residents who speak languages other than English, despite provisions made to encourage response from non-English speakers (with the invitation letter offering to complete the survey by phone with an interviewer fluent in the participant's preferred language). The English language represents around 86% of the weighted survey sample, compared to 78% in the Census. The survey sample most notably appears to under-represent Persian (Farsi) and Mandarin. The 2016 Census suggests that Farsi is most often spoken at home by 7% of DWV residents, 6% of CNV residents, and 4% of DNV residents, while Mandarin is spoken by 9% of DWV residents but only 1%-2% of CNV and DNV residents (**Table 4**).

Figure 10. Language Most Often Spoken at Home

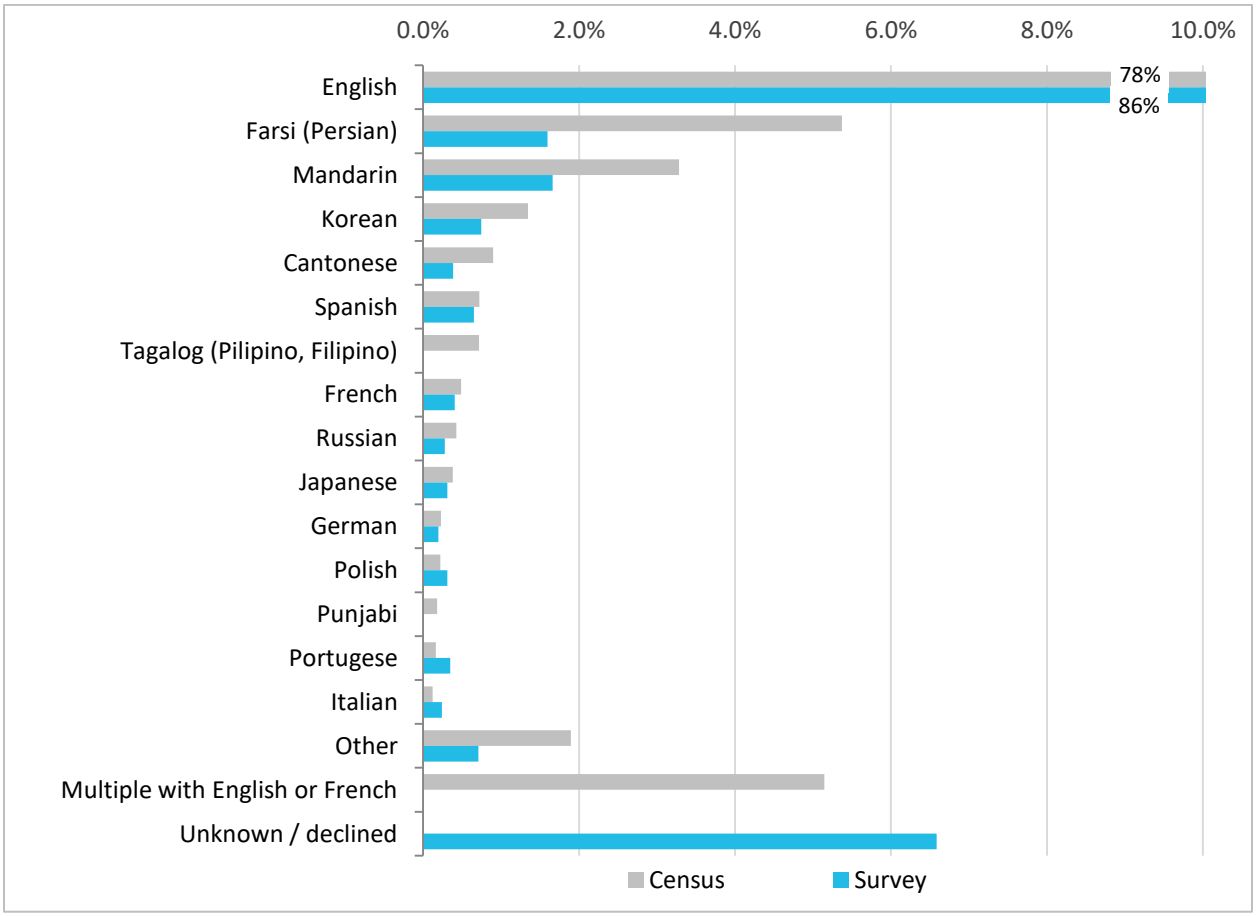
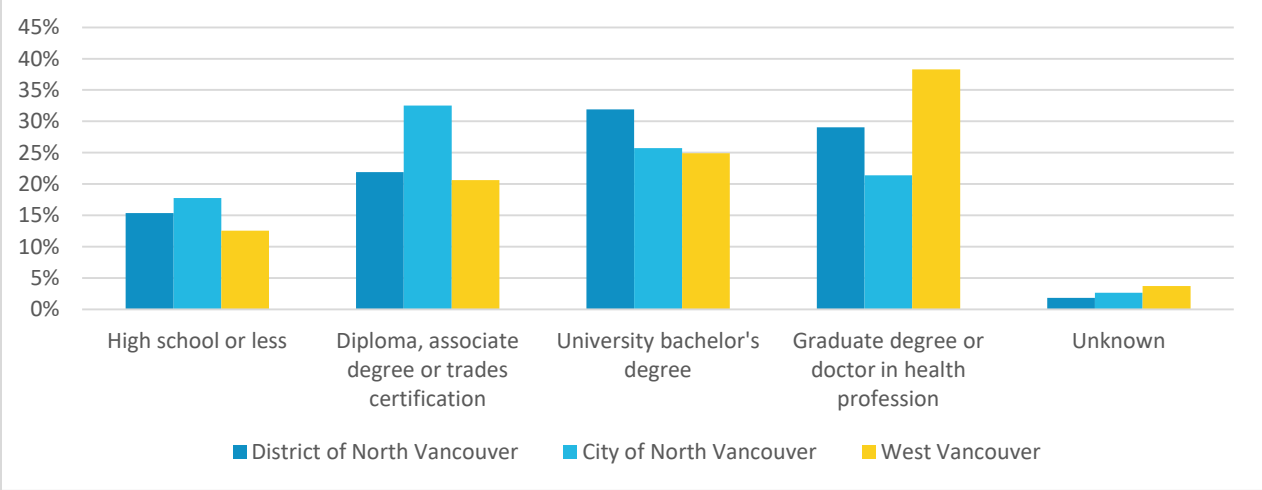


Table 4. Most Common Languages Spoken at Home by Municipality per 2016 Census

District of North Vancouver	City of North Vancouver	West Vancouver
English (83.1%)	English (76.4%)	English (71.7%)
Farsi (4.1%)	Farsi (5.8%)	Mandarin (9.1%)
Mandarin (1.7%)	Tagalog (Pilipino, Filipino) (1.7%)	Farsi (7.2%)
Korean (1.2%)	Korean (1.6%)	Korean (1.2%)
Cantonese (0.9%)	Mandarin (1.0%)	Cantonese (1.1%)
Spanish (0.7%)	Spanish (0.9%)	
	Cantonese (0.7%)	

Figure 11 shows the distribution of survey participants by highest level of education by municipality. Almost 38% of survey participants in DWV have a Graduate Degree or a Doctor in a health profession, the most common level of education in DWV. Participants with a university bachelor's degree represent the highest percentage in DNV at 32%. Participants with a diploma, associate degree or trades certification represent the highest percentage in CNV at 33%. Examination of these results against the Census revealed that the participants with high school or less type of degree are generally under-represented in the three municipalities by around half.

Figure 11. Highest Level of Education by Municipality



3.4 Health Status

Figure 12 shows survey participants' reporting of their level of physical activity by municipality. Between 60% and 65% of participants self-rate as moderately active or very active, with DNV highest at 65%, DWV at 63%, and CNV the lowest at 60%. One-third (33%) of CNV participants reported light physical activity.

Figure 12. Health Status and Level of Physical Activity by Municipality

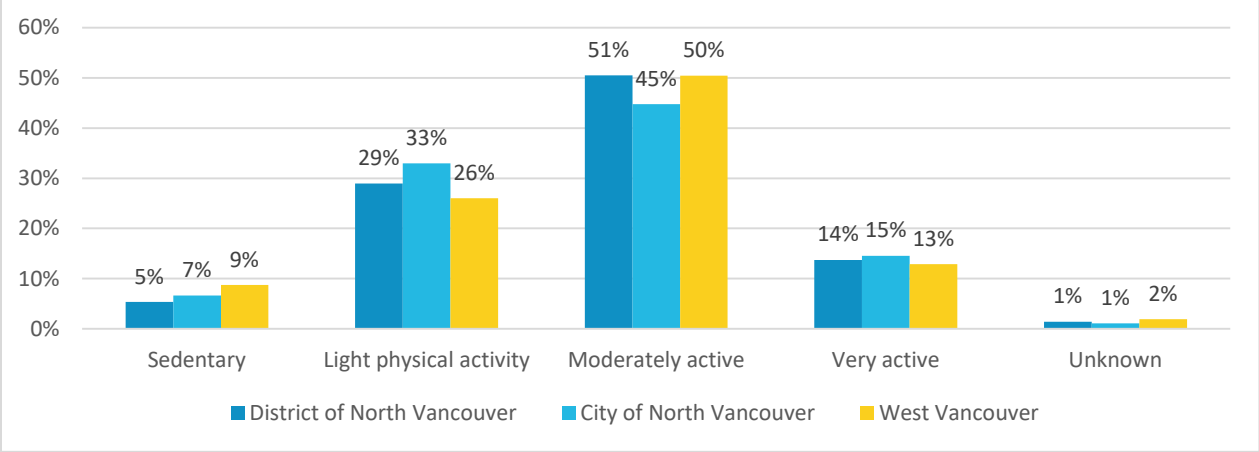


Table 5 shows the percentage of survey participants who have a mobility challenge and who use assisted mobility devices by municipality. DWV has the highest percentage of people with mobility challenge, at 10%, with 6% who use an assisted mobility device. DNV and CNV have 7% and 6% of population 15+ years with mobility challenges, respectively, with 3% and 4% indicating the use of an assisted mobility device.[6]

Table 5. Mobility Challenges and Use of Assisted Mobility Devices by Municipality

	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
Population 15+ years in private dwellings	158,101	72,386	47,145	38,571
Mobility challenge (has cognitive or physical condition or illness that affects the ability to travel, whether permanent or temporary)	9%	7%	6%	10%
Uses an assisted mobility device (such as a wheelchair, walker, crutch, cane, prosthesis, or mobility scooter)	4%	3%	4%	6%

[6] It may be noted that the survey sample frame included population aged 15+ years living in private dwellings. The survey results do not reflect the 1.4% of population living in collective dwellings, many of whom may be older and and/or may be more likely to have mobility challenges.

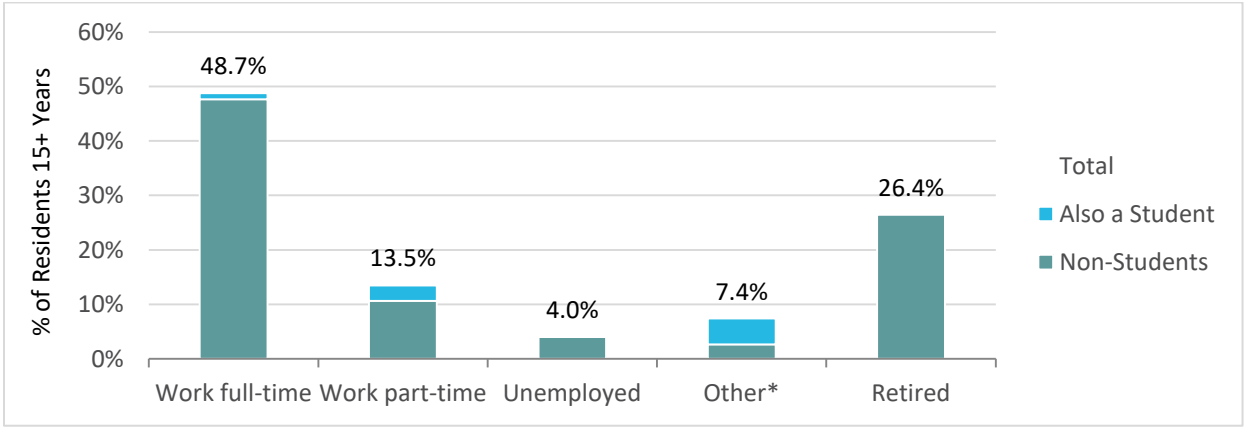
3.5 Occupational Characteristics

This section describes the survey participants' occupational characteristics which include employment status, employment type, and employer support programs related to travel demand management. The survey results are based on the population sample of age 15 years or more. It may be noted that the age bracket of 15 to 19 years old is somewhat underrepresented in the survey data compared to the Census data.

3.5.1 Occupational Status

Figure 13 shows employment status and student status aggregated for the North Shore. The survey results suggest that almost half (49%) of residents 15+ years of age work full-time, while 13% work part-time, for a total of around 62% who are employed in some capacity. 26% of residents are retired. Unemployed participants represent around 4%. Overall, 9% of the population 15+ years of age are students. Of these, one-third (34%) are high school students, half (49%) are in full-time Post-Secondary Education (PSE) or other studies (adult basic education, etc.), and 17% are in part-time PSE or other studies. There is overlap between students and workers: almost 4% of the population 15+ years works full-time or part-time while attending school.

Figure 13. Employment Status and Student Status



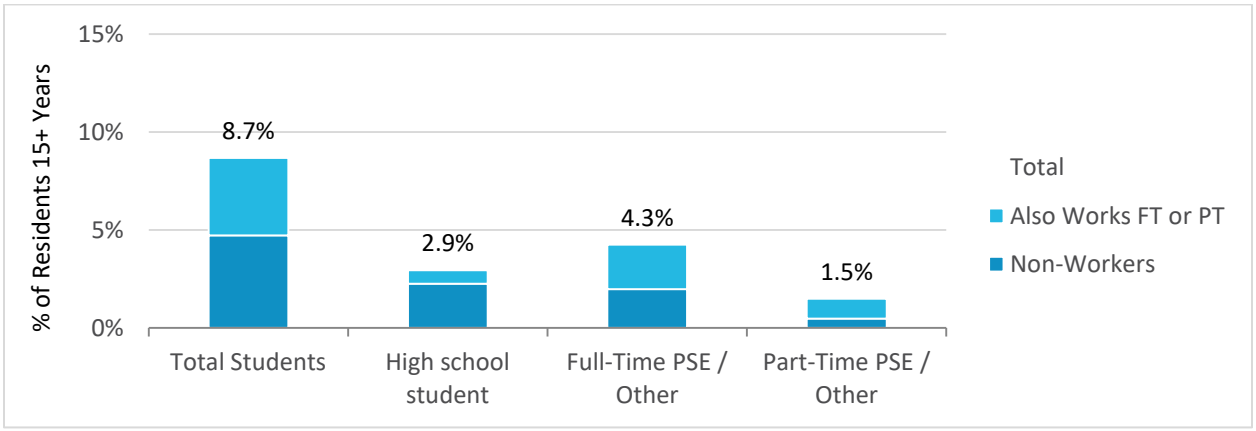
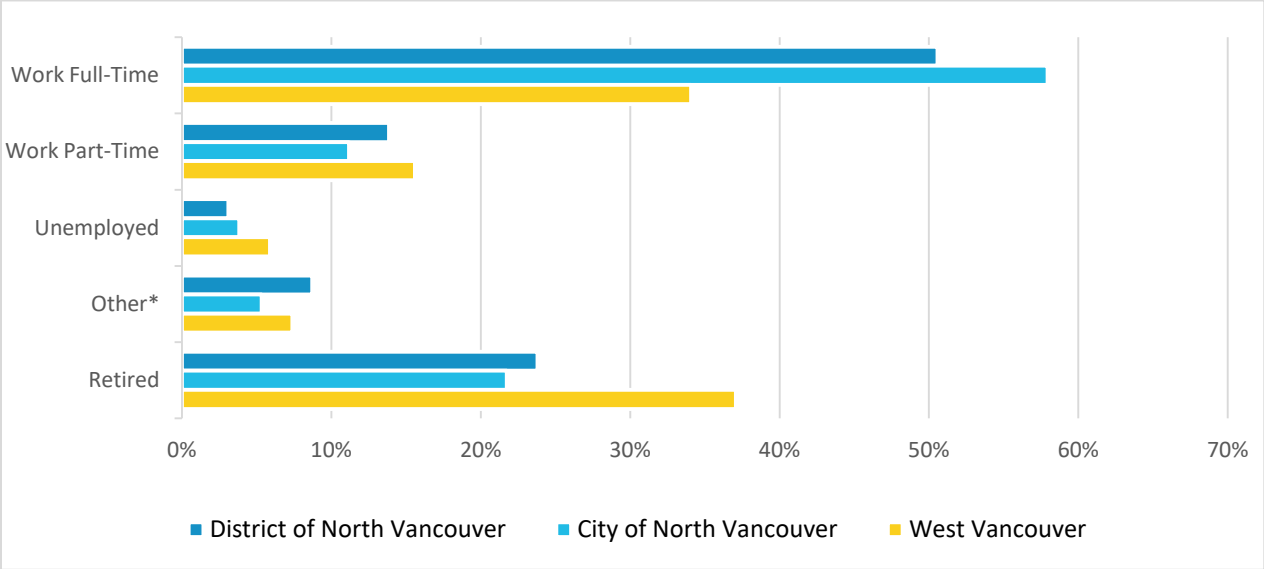


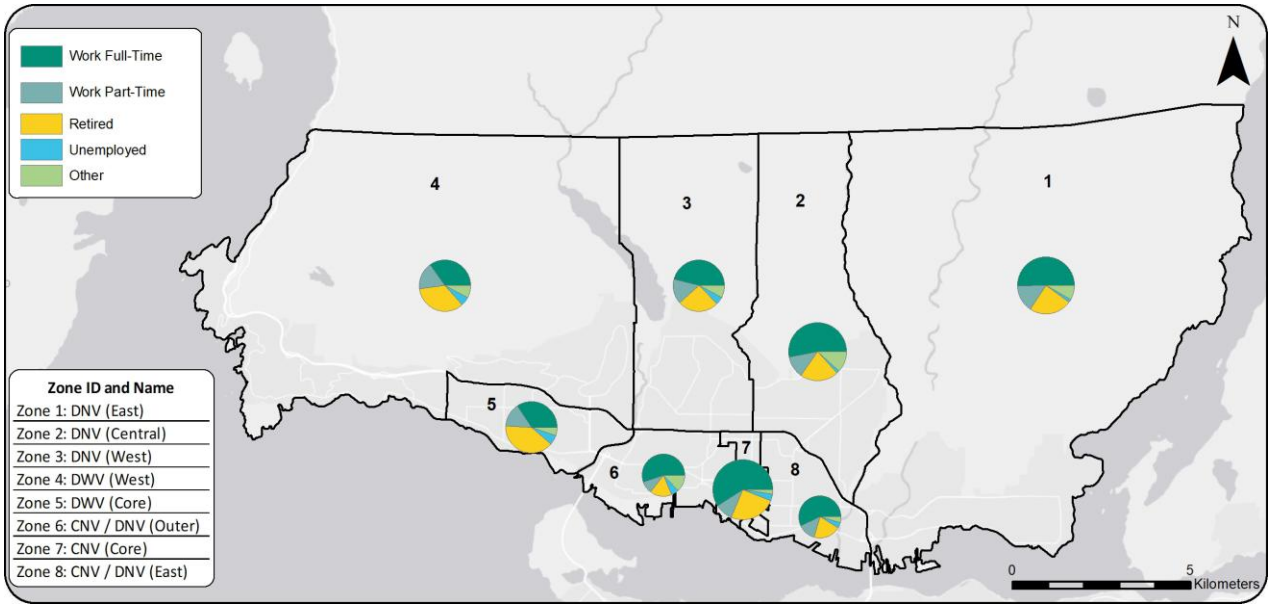
Figure 14 shows employment status by municipality, while **Figure 15** shows this by zone. Almost six in ten CNV residents over the age of 15 and half of DNV residents over the age of 15 work full time (58% and 51%, respectively). DWV has the highest proportion who are retired, at 38%. Full-time workers living in DWV represent around 35% of population 15+, with having the highest proportion of part-time workers, at 15%, as well as the highest proportion who categorized themselves as unemployed, at 6%. Of note, examination of the survey data reveals that students represent 10% of the survey population in DNV, 9% in CNV, and 5% in DWV. DNV, within which Capilano University is located, has a greater proportion of post-secondary/other students (at 6%).

Figure 14. Employment Status by Municipality



*'Other' includes students who are not employed, home-makers, those on disability, and other statuses.

Figure 15. Map of Employment Status by Sub-Municipal Zone



3.5.2 Employment Characteristics

Figure 16 shows occupation type by municipality. DWV has relatively higher percentages of these occupation types:

- Sales & Service Provision (17%)
- Business Finance and Admin Occupations (17%)
- Management Occupations (18%)

CNV has relatively higher percentages of these occupation types:

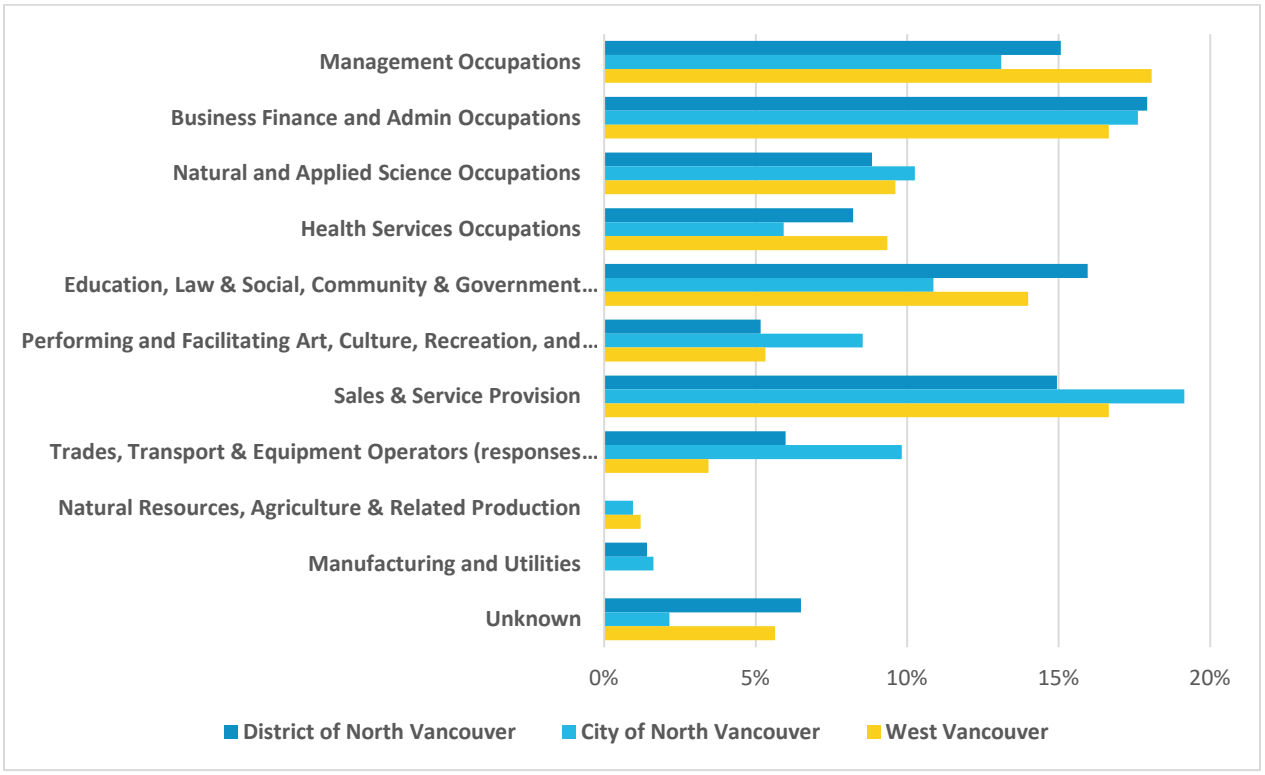
- Sales & Service Provision (19%)
- Business Finance and Admin Occupations (18%)

DNV has relatively higher percentages of these occupation types:

- Sales & Service Provision (15%)
- Education, Law & Social, Community & Government Services (16%)
- Business Finance and Admin Occupations (18%)
- Management Occupations (15%)

It may be noted that comparison of the survey results against the Census suggest that the survey sample may somewhat under-represent Sales & Service occupations in all municipalities, although they are generally representative for most other occupational categories.

Figure 16. Occupation Type by Worker's Place of Residence



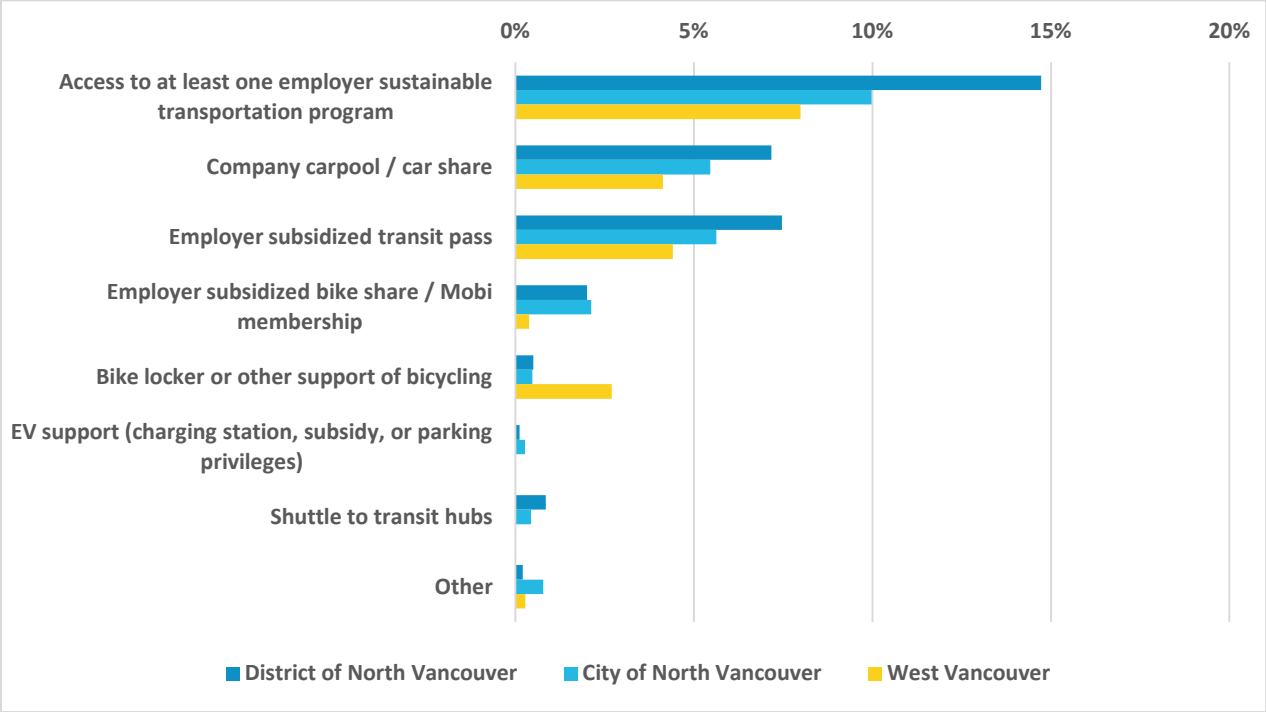
3.5.3 Employer Support for Travel Demand Management Programs

Figure 17 presents the proportion of workers living on the North Shore whose employer supports travel demand management (TDM) programs. Survey participants were asked if they had access to such programs, regardless of whether or not they took advantage of these programs. These programs range from providing electric vehicle charging infrastructure to having a company carpool/car share program to employer-subsidized transit passes.

Overall, 12% of workers who reside on the North Shore have access to at least one employer-supported program of any kind. Employer-subsidized transit passes and support of car pooling or car sharing are most common, each with 6% of workers having access to such a program.

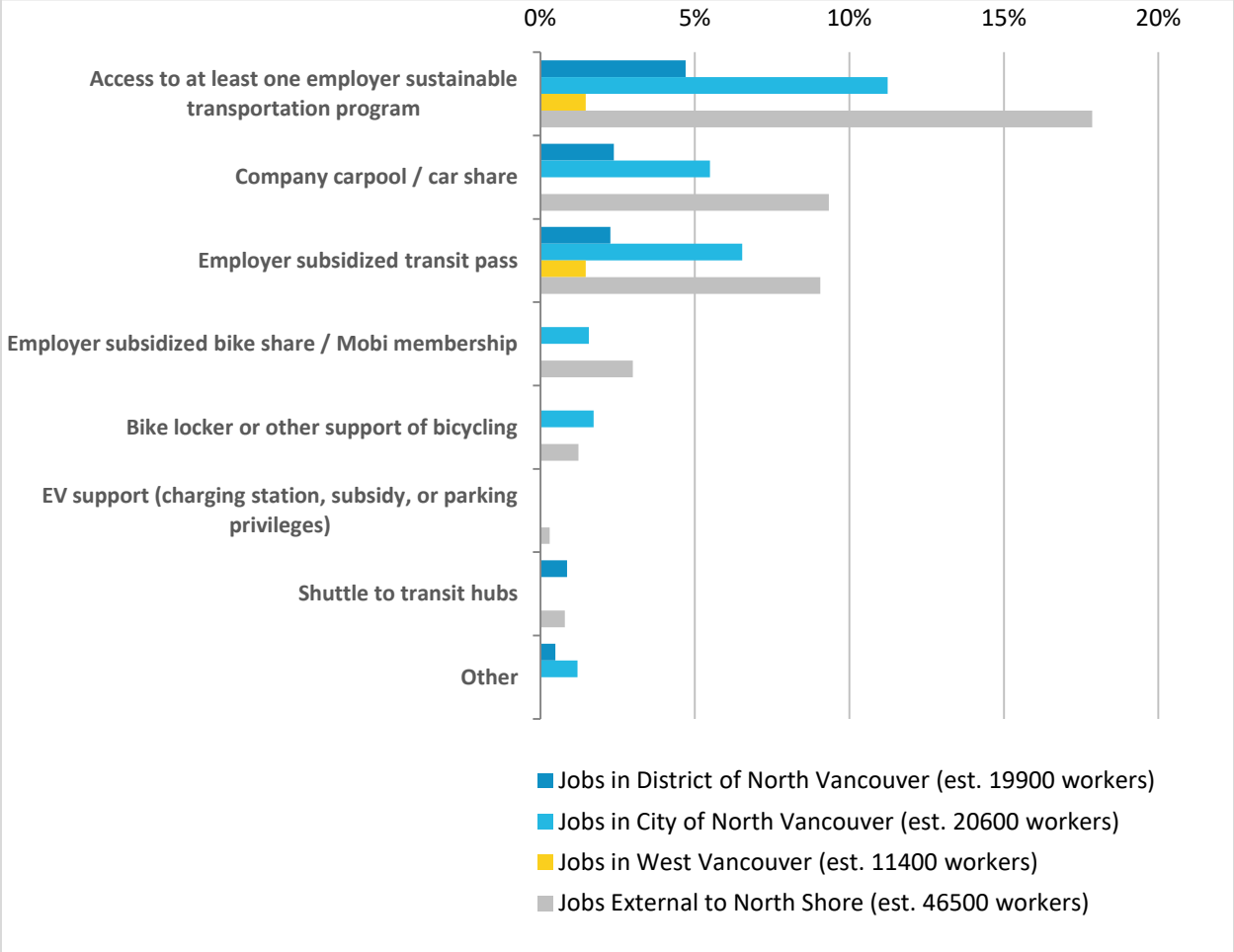
From the perspective of workers' places of residence, the survey shows that residents of the DNV have the most employer support for travel demand management programs followed by the CNV and then DWV.

Figure 17. Employer Support of Transportation Programs by Municipality (Based on Place of Residence)



From the perspective of workers' places of work (where their jobs are located) as presented in **Figure 18**, North Shore residents whose employers are located outside of the North Shore (who represent just under half of workers residing on the North Shore) are more likely to have employers who support sustainable transportation. Overall, 18% of external jobs have employers who support these programs. Closer examination of the data reveals that this percentage is lower for jobs in Vancouver's Central Business District and West End (12%) and higher for jobs located elsewhere in Vancouver (22%) or other external locations (23%). On the North Shore, CNV employers provide the most employer support for travel demand management programs (with 11% of North Shore residents working in the CNV having access to at least one program) followed by DNV and then DWV (5% and 1%, respectively).

Figure 18. Employer Support of Transportation Programs by Municipality (Based on Place of Work for Residents of the North Shore)[7]



[7] Jobs represented in the chart are jobs held by North Shore residents who are workers. The survey was conducted only with North Shore residents, and the 'jobs external to North Shore' group is composed only of workers who reside on the North Shore and work at jobs located external the North Shore. (I.e., the statistics on employer supports should not be taken to represent all jobs external to the North Shore).

3.6 Bicycle Access

3.6.1 Bicycle Availability

Table 6 provides statistics on bicycle ownership while Figure 19 illustrates the number of bicycles per household by municipality. DNV has the highest number of adult bicycles per household (1.7 bike/hh) while CNV and DWV have averages of 1.2 and 1.4 adult bicycles per household, respectively. The survey results suggest that residents of the North Shore own more than 4,100 electric bicycles, about 4% of adult bicycles owned by residents. Overall, 64% of the North Shore population aged 15+ years has access to an adult bicycle, with this figure being higher amongst DNV residents (71%), and lower amongst CNV and DWV residents (57% and 61% respectively). Figure 20 on the next page maps access to bicycles by sub-municipal zone, revealing that residents of Zone 2 and Zone 7, both of which have higher urban density, have less access to adult bicycles than their counterparts in other areas.

Table 6. Bicycles and Bicycle Access

	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
Estimated total adult bicycles (including e-bikes)	109,010	53,390	30,390	25,230
% of households with at least one adult bicycle	58%	63%	53%	57%
Average adult bicycles per household	1.43	1.65	1.18	1.37
Estimated number of e-bikes	4,130	1,970	1,310	850
% of adult bicycles that are e-bikes	4%	4%	4%	3%
% of pop 15+ with access to an adult bicycle	64%	71%	57%	61%

Figure 19. Average Number of Standard Bicycles and E-Bicycles per Household by Municipality

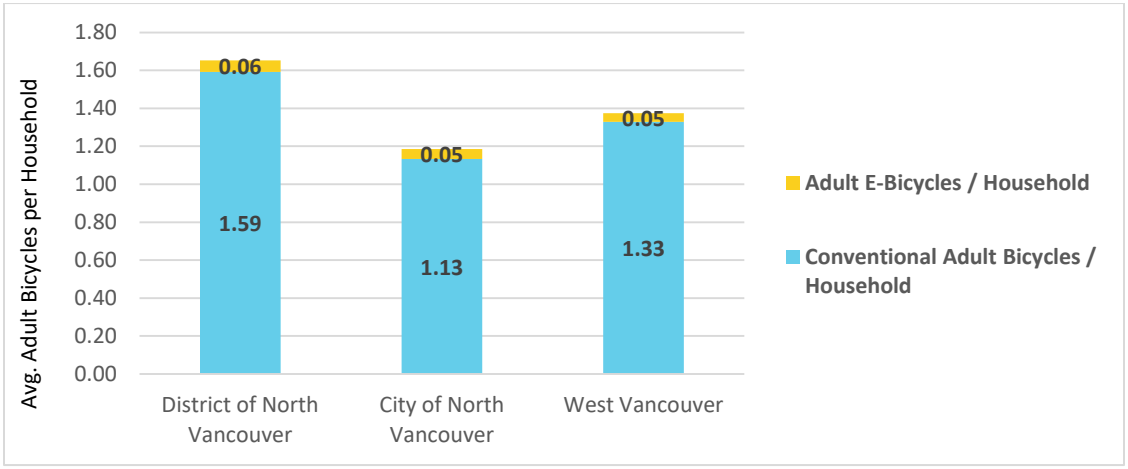


Figure 20. Map of Bicycle Availability by Zone (% of Residents 15+ with Access to an Adult Bicycle)

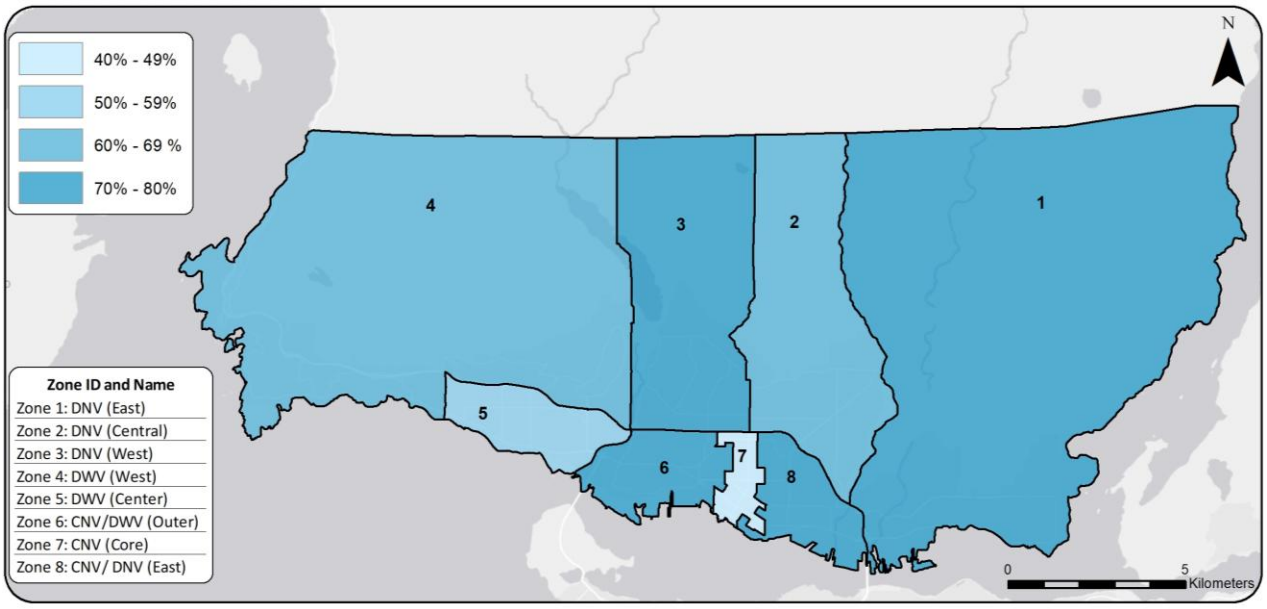
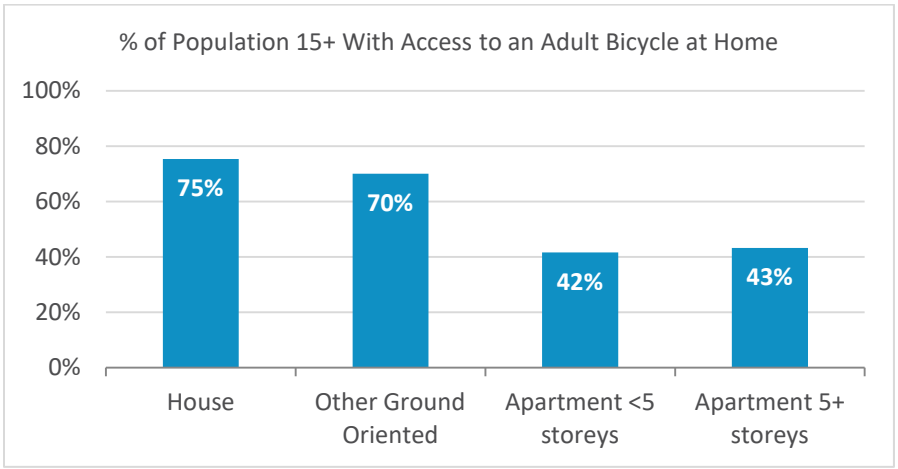


Figure 21 below illustrates the relationship between dwelling type and access to an adult bicycle. Most residents living in houses and other ground-oriented dwellings (townhouses, semi-detached, etc.) have access to a bicycle (75% and 70% of population respectively). For residents living in apartments, it is the minority who have access (42% for those in apartments fewer than five storeys and 43% for those in apartments with five or more storeys).

Figure 21. Average Number of Standard Bicycles and E-Bicycles per Household by Municipality



3.6.2 Bike Share Membership

Amongst North Shore residents, membership in bike share programs is low. Currently there are no bike share programs on the North Shore. Any memberships reported by participants are for use of bicycles in municipalities outside the North Shore, as shown in **Table 7** below.

Table 7. Bike Share Membership (Overall and by Municipality)

% Population with Bike Share Membership	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
None	99.5%	99.9%	99.2%	99.1%
Mobi	0.4%	0.0%	0.6%	0.9%
Other	0.1%	0.1%	0.2%	0.0%

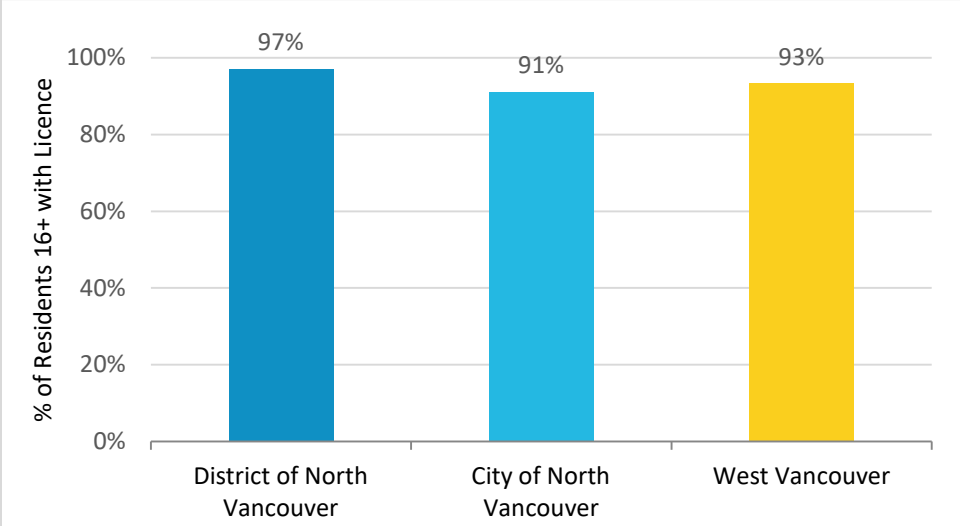
3.7 Private Vehicle Access

This section describes the survey participants' access to private vehicles which include the percentage of licensed drivers, private vehicle availability, vehicle types, and parking availability.

3.7.1 Licensed Drivers

Figure 22 shows the proportion of population 16 years and older for those who have a driver's license out of those who are eligible to have one. DNV has the highest percentage, at 97%, with CNV and DWV at 91% and 93%, respectively.

Figure 22. Licensed Drivers by Municipality (of Population 16+)



3.7.2 Private Vehicle Availability

Table 8 shows the percentage of survey participants (aged 15 or more) who have access to at least one vehicle. DNV has the highest availability with 97% of the survey populations while CNV and DWV have 90%, and 93%, respectively.

Figure 23 maps the proportion of population 15+ who live in a household with at least one vehicle. It appears that in zones with higher urban density, somewhat fewer residents have access to a vehicle, although the proportions are still large majorities (85% in zone 8 being the lowest).

Table 8. Private Vehicle Availability by Municipality

	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
Estimated household vehicles	125,530	58,360	34,150	33,020
Average vehicles per household*	1.65	1.81	1.33	1.80
Average vehicles per person 16+	0.80	0.82	0.72	0.86
% pop 15+ with access to at least one vehicle	94%	97%	90%	93%

*based on total households in area, including those without vehicles.

Figure 23. Map of Private Vehicle Availability by Sub-Municipal Zone (% of Residents 15+ with Access to a Vehicle)

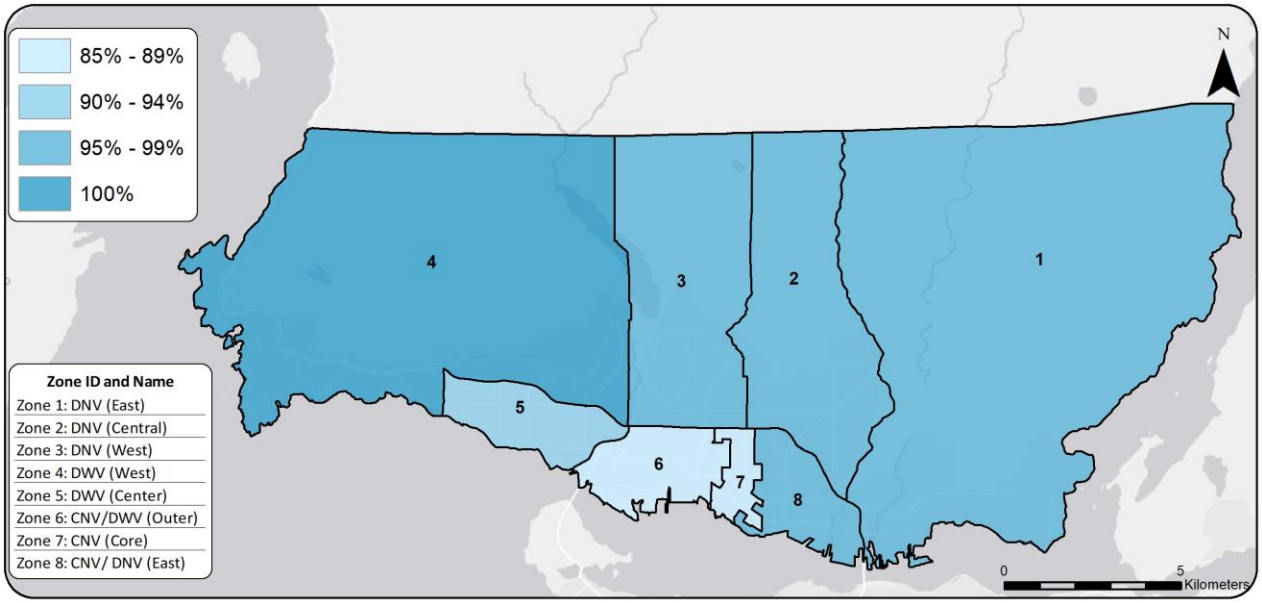


Figure 24 presents vehicle availability by dwelling type. As illustrated, virtually all (98% to 99%) North Shore residents in houses and other ground-oriented dwellings (semi-detached, townhouses, etc.) have access to at least one household vehicle. As dwelling density increases, vehicle availability decreases, with 87% of residents living in low-rise apartments having at least one household vehicle, and 80% for those living in mid- or high-rise apartments.

Figure 25 presents vehicle availability by age range. Vehicle availability varies only somewhat, with 90% of residents under the age of 35 having access to a household vehicle, between 94% and 98% for age ranges between 35 and 74, and a drop off with higher ages , with 92% between 75 and 84, and 78% after the age of 85.

Figure 24. Private Vehicle Availability by Dwelling Type

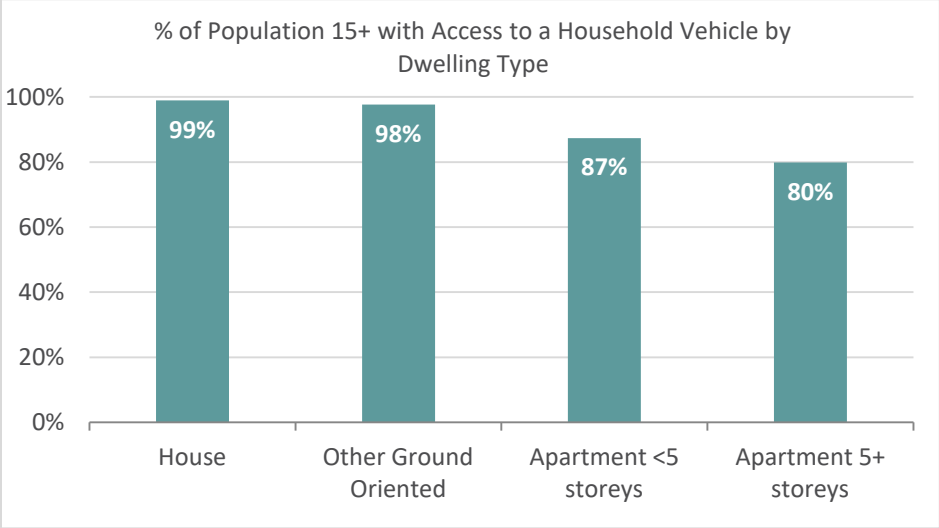
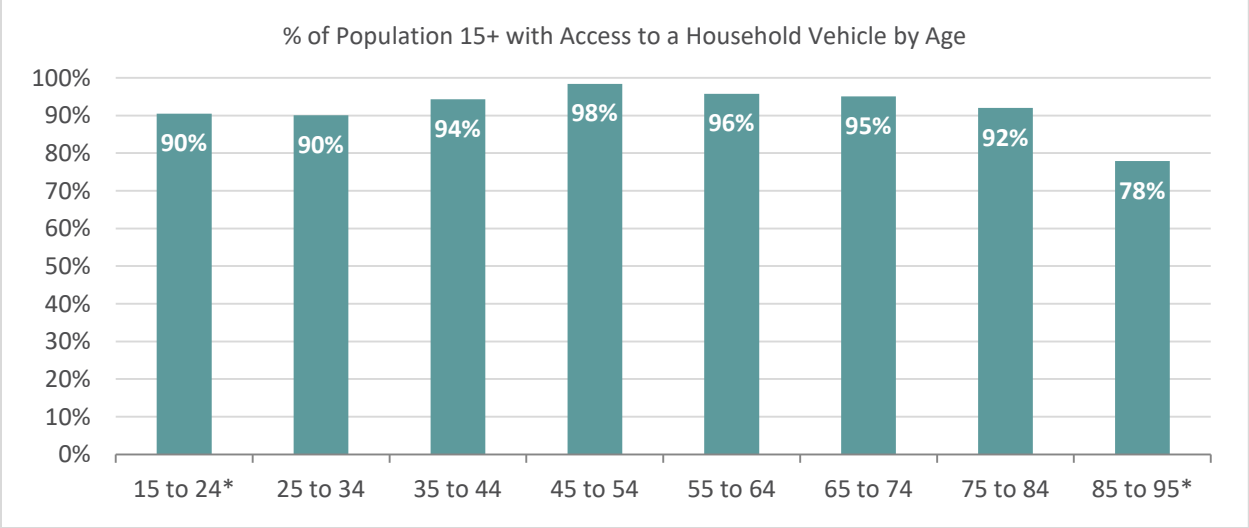


Figure 25. Private Vehicle Availability by Age Range[8]

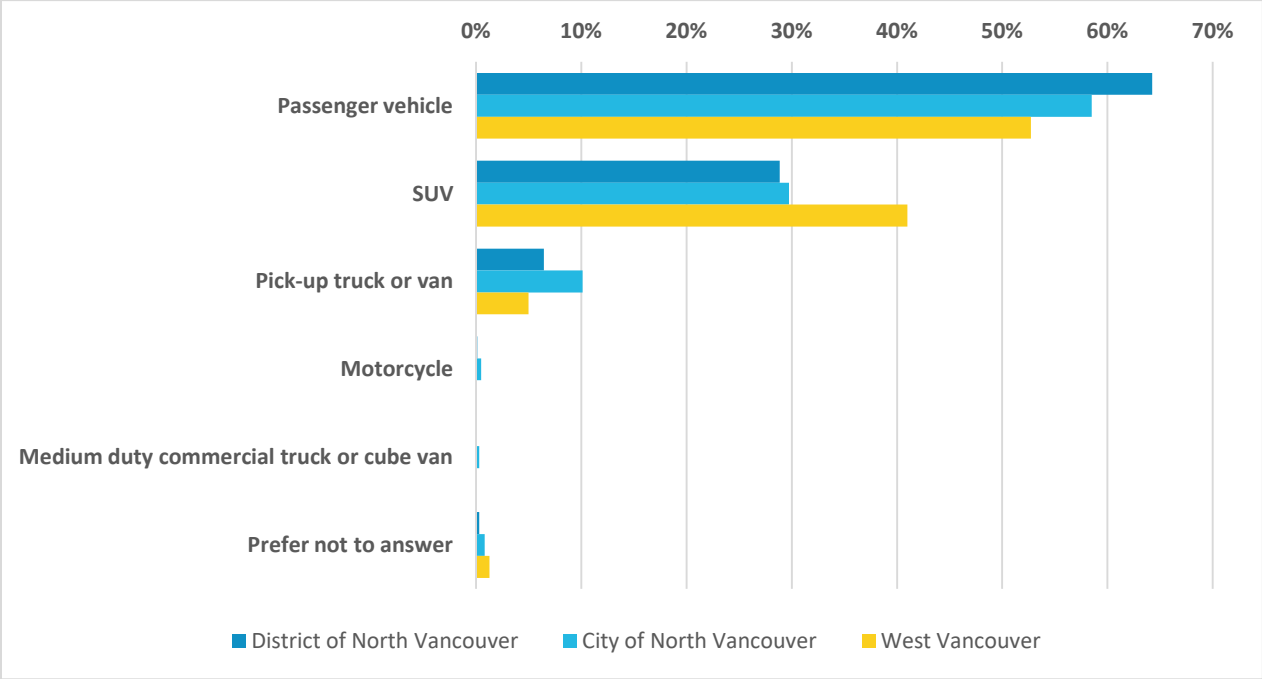


[8] Results for age ranges marked with asterisk should be interpreted with caution due to smaller sample sizes (n<60).

3.7.3 Vehicle Types

Figure 26 shows the percentage of vehicle types for survey participants that regularly drive. Passenger vehicles are the dominant type of vehicle for the North Shore with 64% for DNV, 58% for CNV and 53% for DWV. Other vehicle types are similar across municipalities except for SUVs, for which DWV is around 11 percentage-points higher than both CNV and DNV.

Figure 26. Vehicle Types by Municipality (Usual Vehicle Driven)

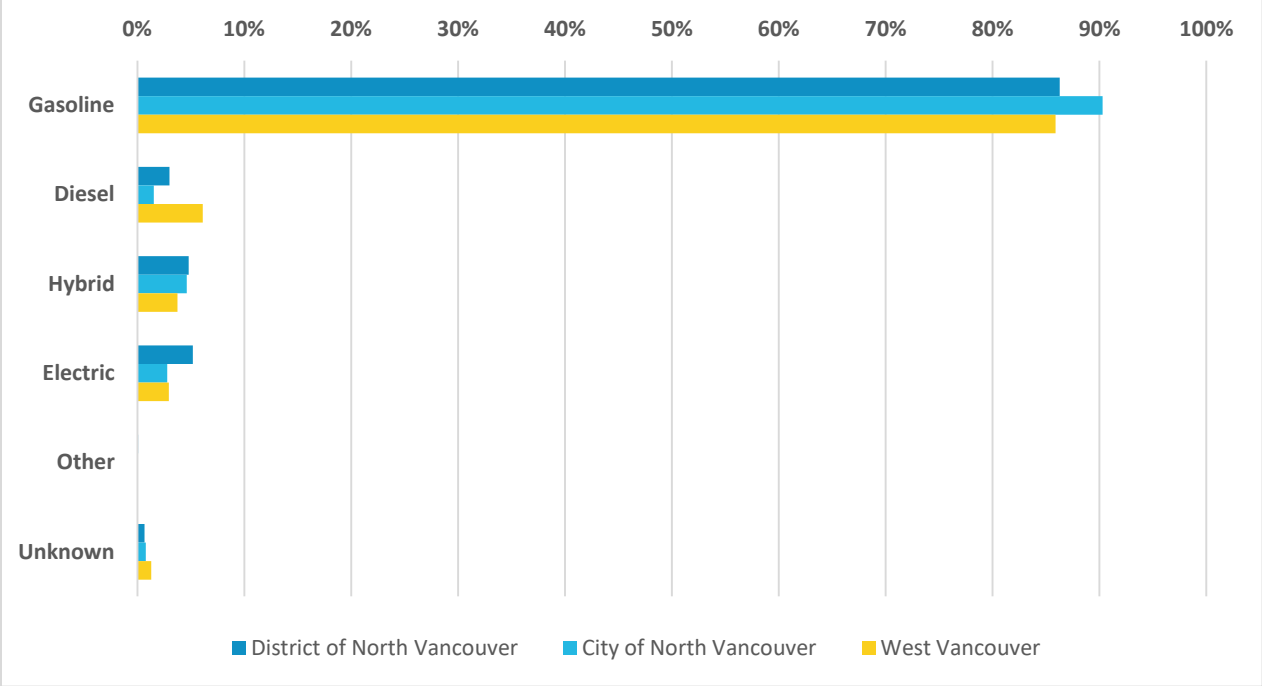


3.7.4 Vehicle Fuel Type

Figure 27 shows the fuel type for vehicles that survey participants regularly drive. Conventional gasoline vehicles predominate (90% for CNV, 86% for both DNV and DWV). Diesel vehicles appear to be slightly more common amongst DWV residents (6%) than DNV and CNV residents (3% and 2% respectively). Overall, 10% of DNV residents reported driving either a hybrid or an electric vehicle. This proportion is 7% for both CNV and DWV residents.

At 8% overall for the entire North Shore, the proportion of hybrids and electric vehicles appears to be somewhat higher than what has been observed in other mid-sized urban areas in BC in which similar research was undertaken in 2017 and 2018,[9] though this could be more related to the progression of the technology than the nature of the communities surveyed. As hybrid and electric vehicles become more widely adopted, it will be interesting to track the proportions of North Shore residents who drive such vehicles in future survey cycles.

Figure 27. Vehicle Fuel Types by Municipality (Usual Vehicle Driven)

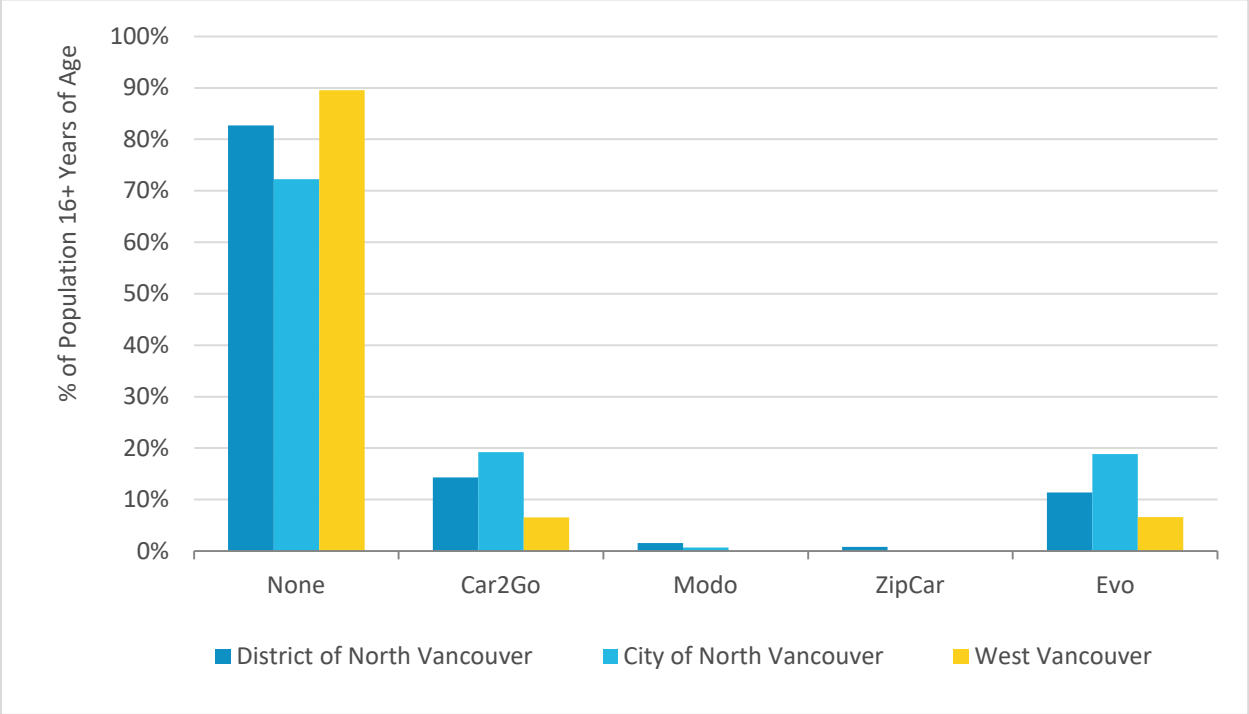


[9] For example, in a household travel survey conducted in 2018 in the Okanagan, 2% of all household vehicles were hybrids or electric vehicles, and in a household travel survey conducted in the BC Capital Regional District in 2017, 3% of all household vehicles were hybrids or electric vehicles.

3.7.5 Car Share Membership

Figure 28 shows the percentage of survey participants (aged 16+) who had car share membership by municipality at the time of the survey in Fall 2019. CNV had the highest proportion of car share members with around 28%. DNV and DWV had around 20% and 10% of survey participants with car share membership, respectively. Evo and Car2Go were the most popular, with a number of residents being members of both services. Only small proportions of North Shore residents had memberships with Modo or ZipCar. In February 2020, Car2Go ceased operations in North America, and some of its membership may have migrated to Evo (if not already a member) and/or other services.

Figure 28. Membership in Car Share Services by Municipality



3.7.6 Parking Availability at Home

Figure 29 and **Figure 30** show, by municipality and by zone, the estimated percentage of home parking demand that is accommodated by off-street parking spots at home, with the remainder presumably accommodated by on-street parking or other arrangements. These figures were estimated by comparing the reported number of household vehicles to the reported number of off-street parking spots available to participants at home. While most vehicles are accommodated by the available off-street parking, the survey results suggest that up to 17% of parking demand in CNV is accommodated by on-street parking or other arrangements, with this percentage being 11% and 6% in DNV and DWV, respectively.

Figure 29. Estimated Percentage of Parking Demand for Private Vehicles Accommodated by On-street and Off-Street Parking

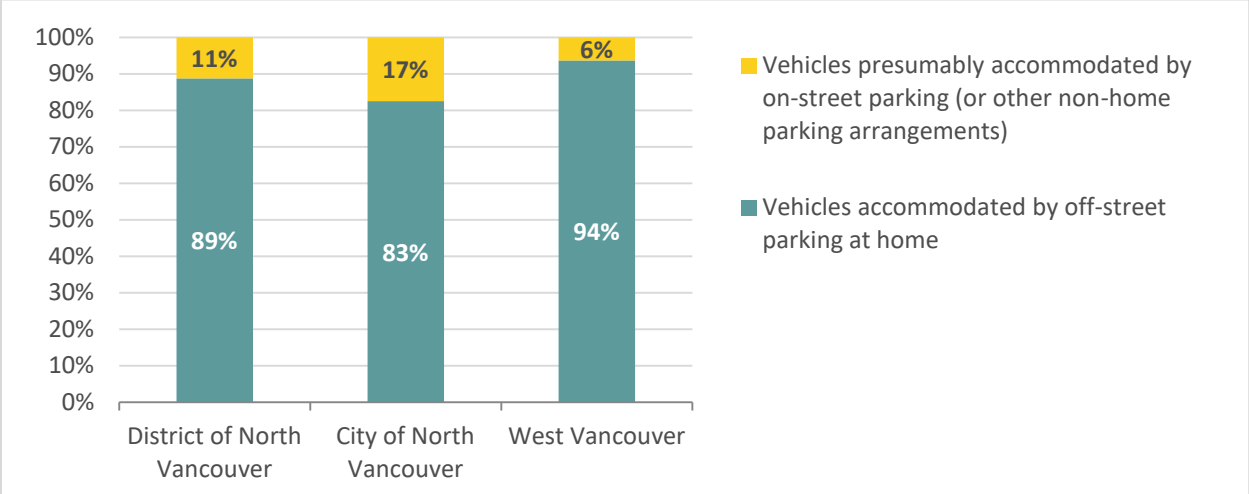
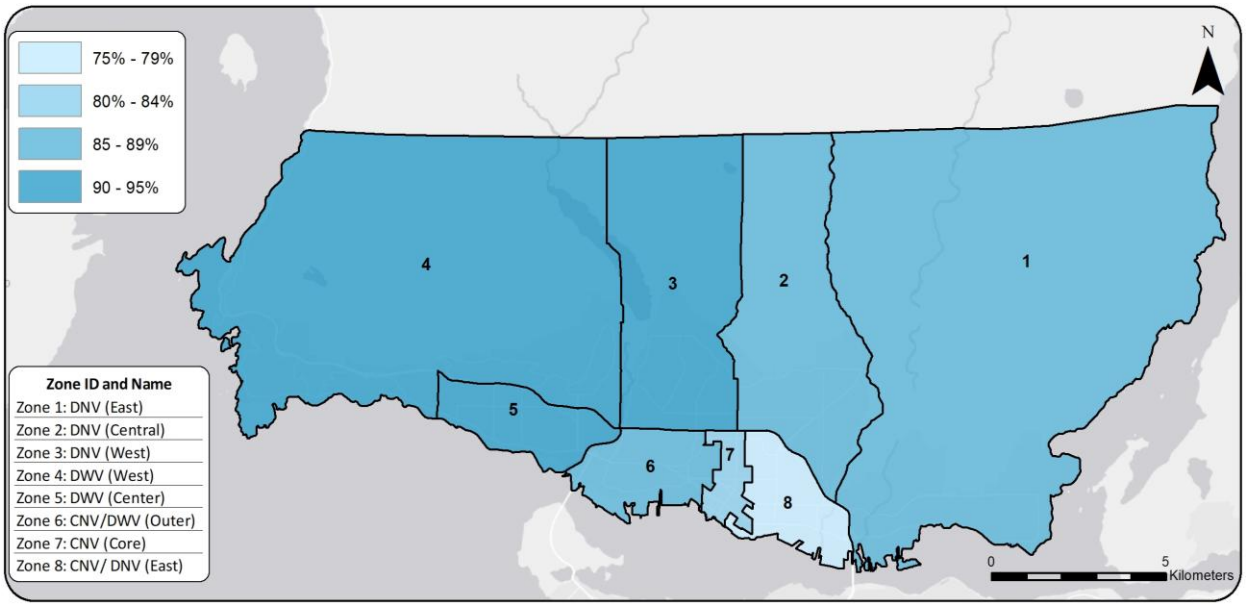


Figure 30. Map of Estimated Percentage of Private Vehicles Accommodated by Off-Street Parking at Home



4 Daily Trip Characteristics

This section provides a snapshot of daily (24-hour) travel patterns from the trips reported by survey participants. The section includes trip demand, purpose, mode share, and distribution

4.1 Trip Demand

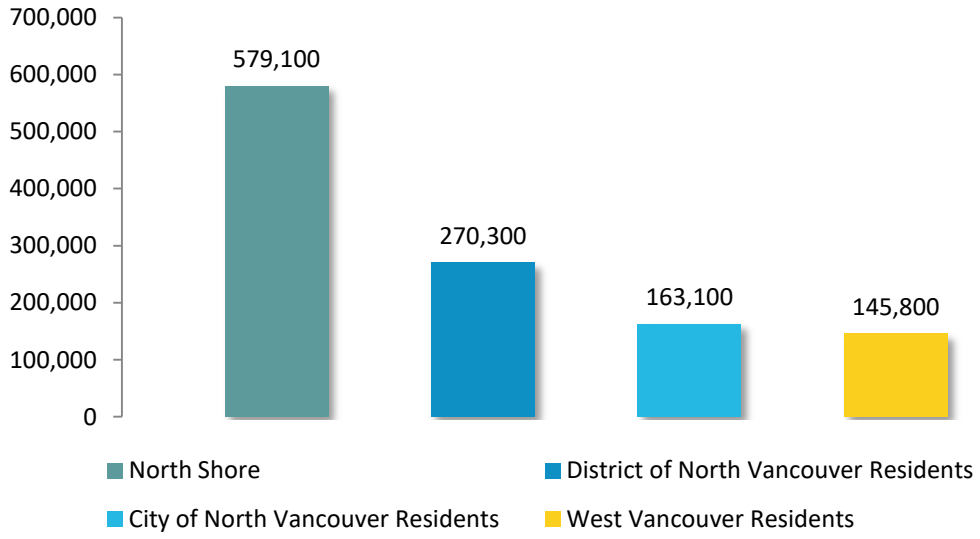
This section provides the trip demand characteristics which include daily trips, trip volumes by time of the day, and annual vehicle kilometres travelled (VKT).

4.1.1 Daily Trips

Figure 31 illustrates the volume of daily trips generated by the residents of each municipality (ages 15+). DNV has around 270k trips per day while CNV and DWV have 163k and 146k trips per day, respectively. The 2019 survey results will serve a baseline against which future cycles of the survey can be compared to track how travel demand changes over time as population increases and travel patterns evolve.

The average daily trip rate (trips made each day per person 15+ years of age) for North Shore residents is 3.66 trips per day. By municipality, trip rates for CNV residents are lower, averaging 3.46 trips per day, and higher for DNV and DWV residents, at 3.73 and 3.78 respectively.

Figure 31. Estimated Total Daily Trips by Municipality (Population Aged 15+)[10]



[10] Figures in the chart have been rounded to the closest 100. Figures displayed for individual municipalities do not sum to the North Shore total due to rounding.

Figure 32 shows the average daily trip rate by sub-municipal zone. Zone 4 has the highest average daily trip rate of around 4.1 trips per day while zone 6 has the lowest average daily trip rate of around 3.3 trips per day.

Figure 32. Map of Average Daily Trips by Municipality of Residence

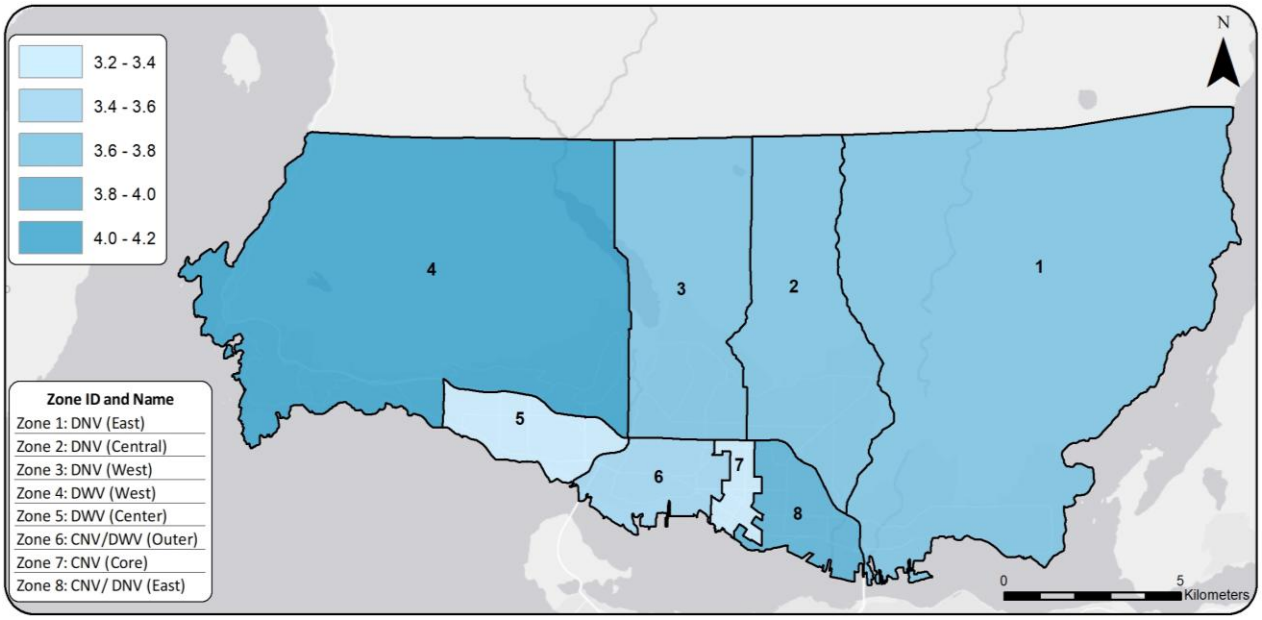


Figure 33 shows the average daily trip rate by age group and gender for the North Shore. The survey results suggest that women and men 40 to 49 years old have the highest average daily trip rates, at 4.77 and 4.62 trips per day, respectively. Women generally have higher average daily trips rates than men across all age groups except for those older than 80 years old and between 15 to 29 years old.

Figure 33. Trip Rates by Age Group and Gender – North Shore

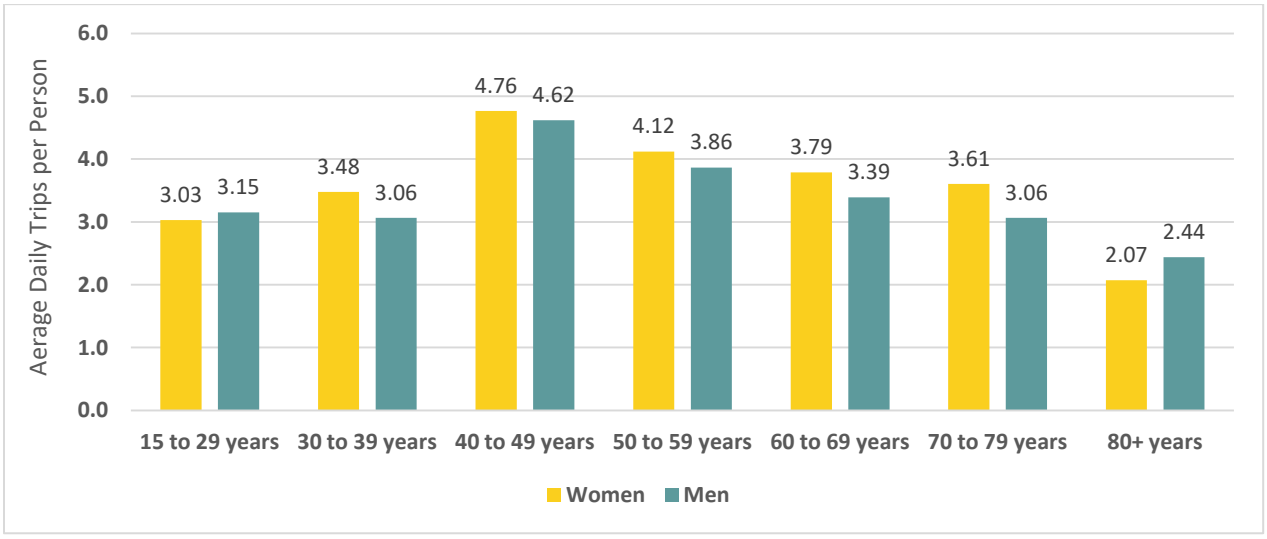
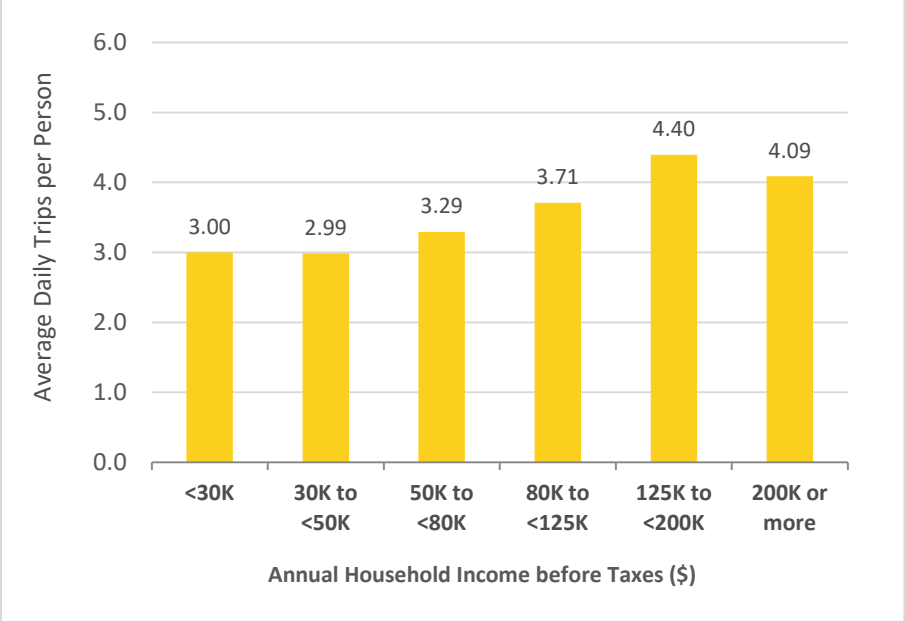


Figure 34 illustrates the relationship between annual household income and the average daily trip rate. As indicated, those with lower annual incomes tend to have lower trip rates (2.99 to 3.00 trips per day for incomes below $50,000 per year

Figure 34. Trip Rates by Household Income – North Shore[11]

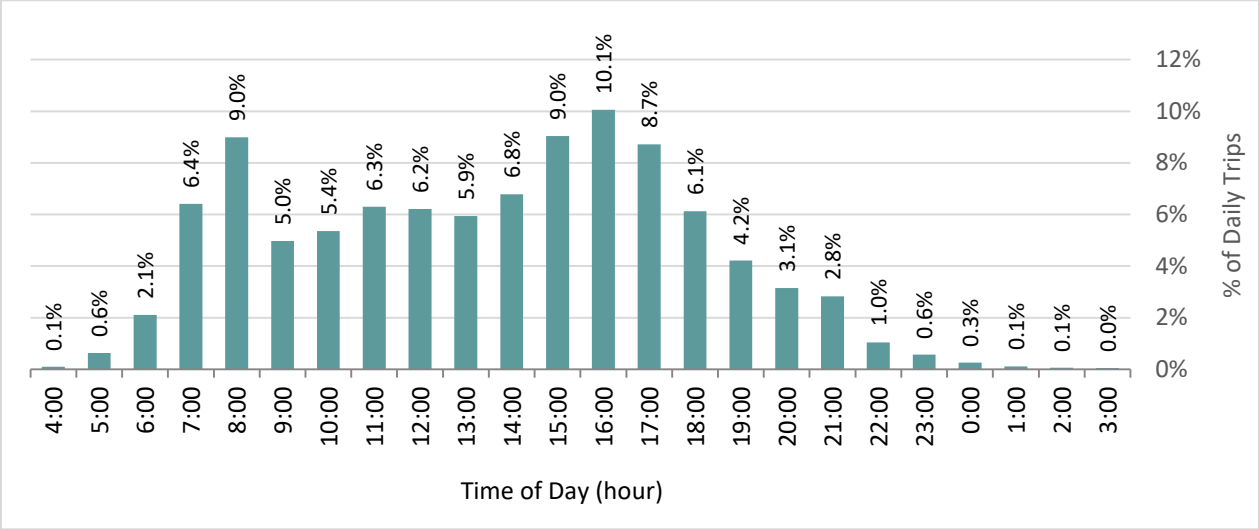


[11] Figure excludes trip rates for persons who declined to provide household income, who averaged 3.43 trips per day.

4.1.2 Trip Volumes by Time of Day

Figure 35 shows the percentage of North Shore residents' weekday trip volumes by the time of day of the trip departure.[12] The highest trip demand in the morning period occurs from 8:00 AM to 9:00 AM with 9.0% of total daily trips (52,000 trips in that hour). The highest trip demand in the afternoon period occurs from 4:00 PM to 5:00 PM with 10.1% of total daily trips (58,200 trips in that hour), with high volumes also in the adjacent hours from 3:00 PM to 4:00PM and 5:00 PM to 6:00 PM.

Figure 35. Percentage of Weekday Trips by Time of Day – North Shore Residents



[12] The survey results include a small proportion of trips that take place entirely externally, i.e., with neither the trip origin nor the trip destination on the North Shore. Overall, 5% of residents' trips are entirely external.

4.1.3 Vehicle Kilometers Travelled (VKT)

The VKT results are estimated in **Table 9** for the total private vehicles in households, average annual VKT per household vehicle, and estimated annual VKT for private vehicles by the North Shore and each municipality. DNV has the highest average annual VKT with 12,900 per year, while the CNV and DWV have 11,000 and 11,700 VKT per year. **Figure 36** shows the distribution of annual VKT on the North Shore where almost 50% of vehicles have an annual VKT between 8,000 to 16,000 VKT per year.

These estimates were derived from survey participants' reports of their current odometer readings and vehicle year for their usual vehicle driven. The estimates have been scaled to adjust for some participants being unable to provide odometer readings. These estimates include travel for all days of the week spread cross. For information on average daily VKT on weekdays, refer to Section **4.5**.

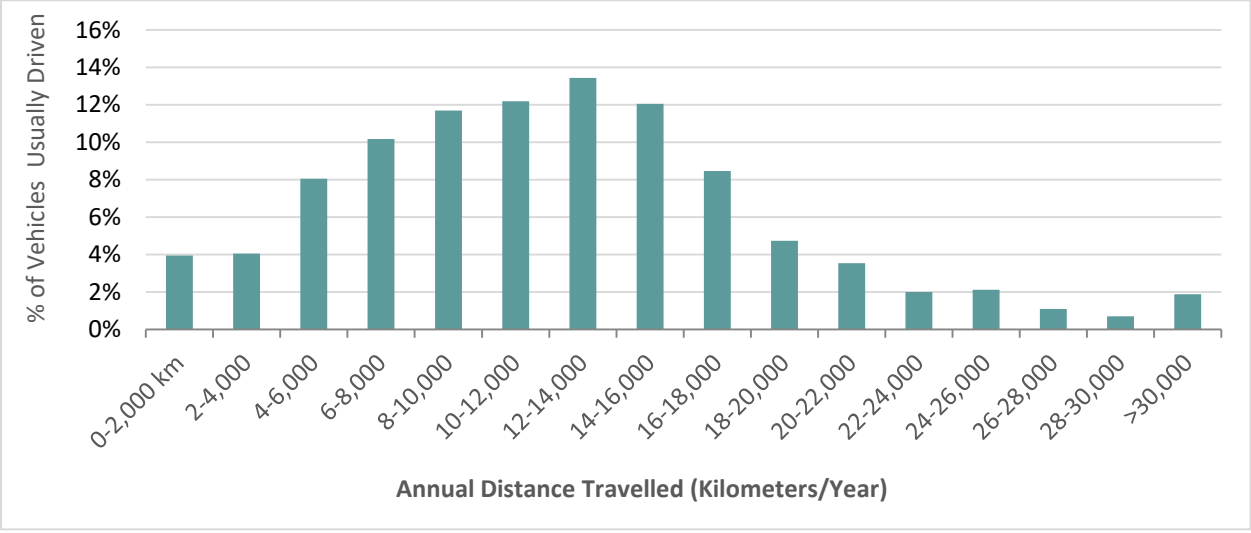
It may be noted that the annual VKT estimates are based on the available information in the 2019 NSTS baseline survey year. The estimates are predicated on the assumption that annual vehicle usage is similar across the life of the vehicle since its year of manufacture. In future survey cycles, panel participants who provided odometer meetings in 2019 will be asked if they drive the same vehicle as in 2019, and if so, will be asked to provide an updated odometer reading, which will allow for more accurate estimates of annual VKT for repeat participants.

Table 9. Vehicle Kilometer Travelled Survey Results

	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
Private vehicles in households	125,530	58,360	34,150	33,020
Estimated average annual VKT per household vehicle	12,100	12,900	11,000	11,700
Estimated total annual VKT incurred for private vehicles*	1,513,107,000	751,181,000	375,470,000	386,456,000

*Total annual VKT rounded to the nearest 1,000. All figures are estimates scaled to take into account non-responses.

Figure 36. Distribution of Annual Vehicle Kilometer Travelled – North Shore

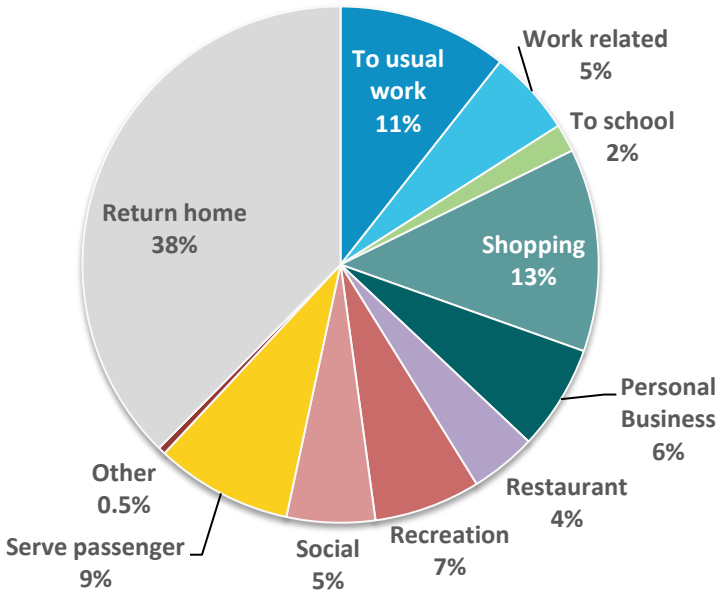


4.2 Trip Purpose

For this survey, a trip was defined as a journey from one place (origin) to another (destination) with a single purpose that may involve more than one mode of travel. Travel to work with a stop at a coffee shop is two separate trips: one with a purpose of restaurant/dining, another with a purpose of work. Travel to work which involved driving to a park & ride location then taking transit the rest of the way is considered a single trip with a primary mode of transit and a transit access mode of driving. It may also be noted that the survey allowed survey participants to enter trips for exercise or leisure that return to the trip origin without stopping at a destination along the way. This includes trips taking a dog for a walk around the block, going for a jog or bicycle ride for exercise only (not to get somewhere), or going for a scenic drive (without stopping at a destination).[13]

Figure 37 shows the distribution of trip purposes for weekday trips made by residents of the North Shore. Usual trips to work and work-related trips represent around 16% of total daily trips. Shopping trips represent 13% of trips. Close to one in ten trips is to drive someone somewhere or to pick someone up ('serve passenger' trips, 9%), such as driving children to or from school or dropping someone off for an appointment.

Figure 37. Weekday Daily Trip Purposes[14]



[13] Such trips represent approximately 3% of all trips, with most being recorded as having recreational or social purposes.

[14] Trip purposes are assigned based on the purpose of the trip at the trip destination, without consideration of the trip origin. Trips that return home from activities outside the home are characterized as 'return home' trips. I.e., trips returning home are not categorized according to the most recent activity outside the home or the original reason for leaving home.

4.3 Trip Mode Share

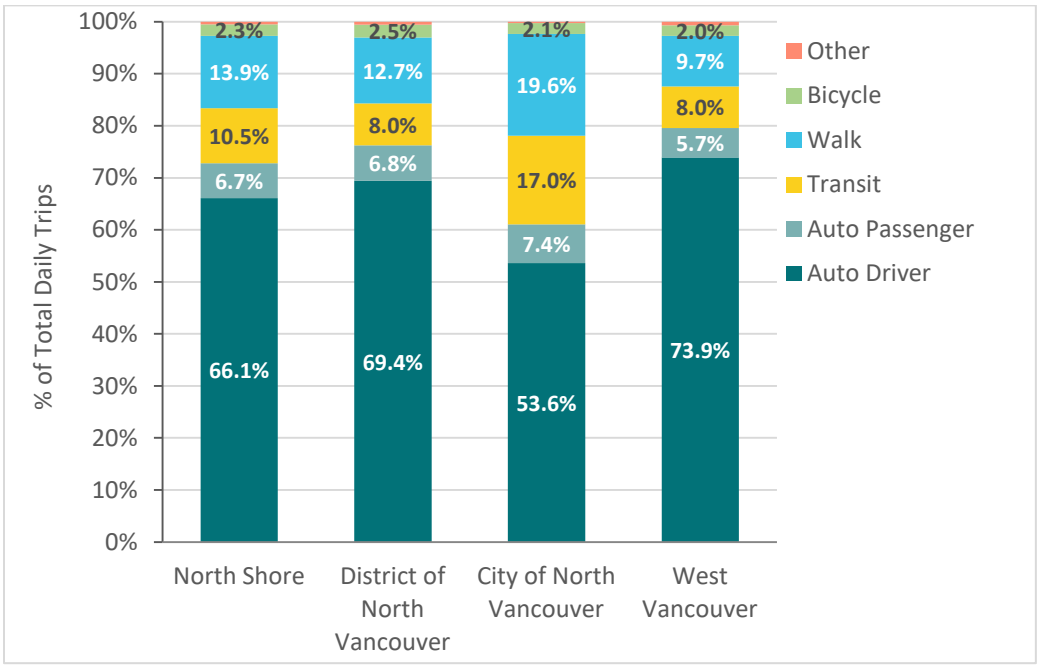
4.3.1 Mode Shares

Figure 38 shows the trip mode share for residents 15+ years of age overall for the North Shore and by municipality.

- DWV has the highest percentage of auto driver trips with almost 74% of trips while CNV has the lowest percentage with around 54% of trips.
- Auto passenger trips represent around 7.4% of trips in CNV while they represent only 5.7% in DWV.
- Transit trips are significantly higher for CNV residents at almost 17% of trips, while they represent only 8% for both DNV and DWV residents.
- CNV has significantly higher walking trips, at 20% of trips. Walking trips for DNV and DWV residents represent 13% and 10% of trips, respectively.

Table 10 on the following page provides the corresponding estimated number of daily trips for each mode from the expanded survey results. Overall, of over 579,000 daily person-trips, almost 383,000 are auto driver trips (which represents the number of private vehicle trips) and 38,800 are auto passenger trips (with most being served by the auto driver trips). Each day, North Shore residents also make about 61,100 trips by transit, 80,500 walking trips, and 13,000 cycling trips.

Figure 38. Trip Mode Share - North Shore and by Municipality[15]



[15] Mode shares of 1% or less are included in the chart, but values are not displayed due to space limitations. 'Other' modes (low speed motor vehicle, taxi, ferry, intercity coach bus, train, airplane, etc.) represent 0.5% of all daily trips made by North Shore residents, 0.5% of trips made by DNV residents, 0.2% of trips made by CNV residents, and 0.7% of trips made by DWV residents.

Table 10. Daily Trip Volumes by Mode by Municipality

	North Shore		District of North Vancouver		City of North Vancouver		West Vancouver	
TOTAL DAILY TRIPS	**579,140**	**100.0%**	**270,280**	**100.0%**	**163,060**	**100.0%**	**145,800**	**100.0%**
Auto Driver	382,900	66.1%	187,700	71.4%	87,470	53.6%	107,730	75.3%
Auto Passenger	38,810	6.7%	18,440	6.8%	12,090	7.4%	8,290	3.8%
Transit	61,070	10.5%	21,640	6.5%	27,770	17.0%	11,660	8.2%
Walk	80,470	13.9%	34,380	12.7%	31,920	19.6%	14,180	11.4%
Bicycle	13,030	2.3%	6,650	2.5%	3,450	2.1%	2,930	0.8%
Other	2,860	0.5%	1,470	0.1%	380	0.2%	1,020	0.4%

4.3.2 Alternative Modes

Some of the mode shares presented above are aggregations of more specific response categories on the survey questionnaire. Categories of interest to the municipalities that were included as mode response options in the survey were as follows:

- The questionnaire allowed participants to record whether their trip was undertaken as a car share driver (with these responses representing only a 0.2% mode share) or car share passenger (less than 0.1% mode share). In the analysis, these survey responses were aggregated with the auto driver and auto passenger mode shares, respectively.
- Rolling (skateboard, rollerblades, scooter, assisted mobility device) had a 0.2% mode share. Survey responses of rolling were aggregated with walking.
- Low speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike) had a 0.1% mode share. Such responses were aggregated with 'other' modes (along with taxi, motorcycle, airplane, BC Ferry, etc).

While the mode share percentages for these alternative modes of transportation were relatively small, it may be of interest to track whether these percentages increase over time.

4.3.3 Detailed Mode Shares including Vehicle Occupancy, Transit Services Used, and Transit Access Modes

Figure 39 shows the weekday mode share for the North Shore breaking out auto driver mode shares by vehicle occupancy and transit mode shares by service and by transit access mode.

- HOV auto driver trips represent around 18% of all trips while SOV trips represent around 46%.
- Bus trips represent around 9% of all trips while the SeaBus and SkyTrain represent 2.5% and 1.6%, respectively (with there being some overlap between uses of services, e.g., a trip involving both SeaBus and SkyTrain).
- Access to transit is primarily via walking. Of all daily trips, just over 9% are transit trips accessed by walking to and from transit, with about 1% being auto-access transit trips whether as a vehicle driver or passenger (Park & Ride or Kiss & Ride trips).[16]

Figure 39. Weekday Mode Shares – North Shore

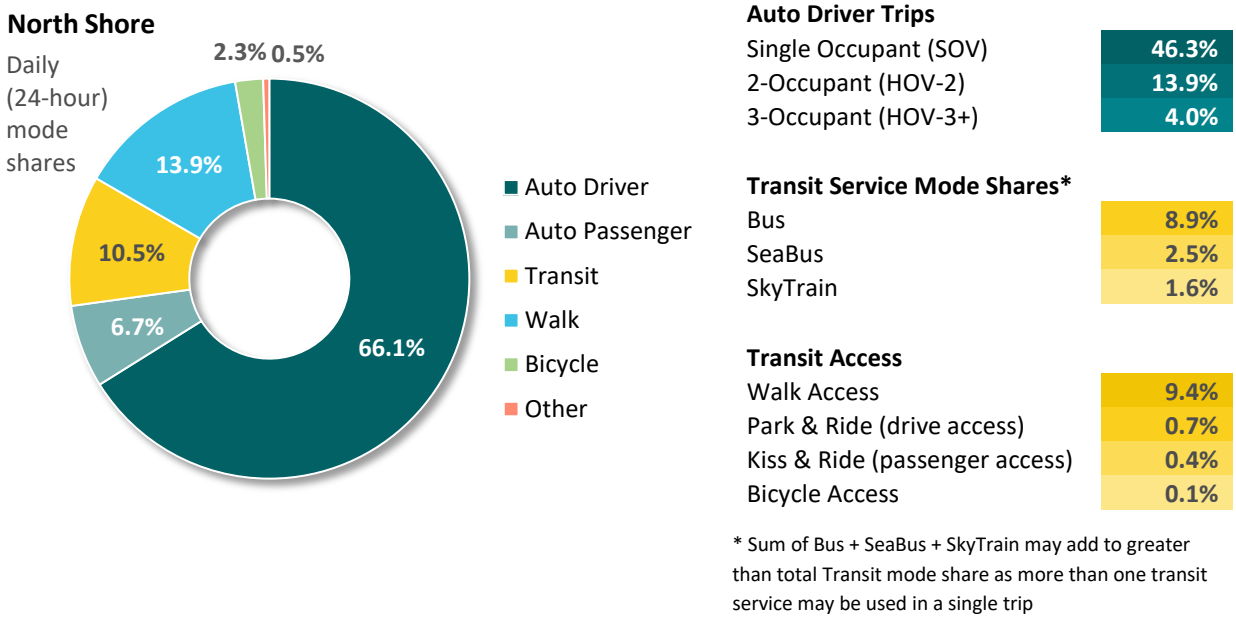
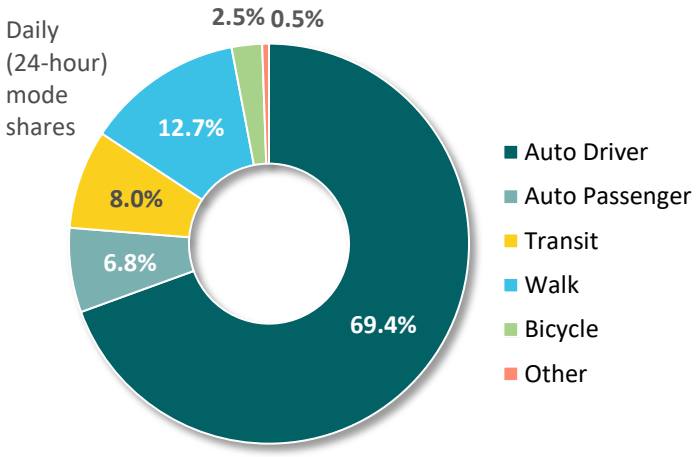


Figure 40 shows the detailed mode shares for residents of each municipality. HOV trips are higher for DWV residents, representing around 23.1% of trips. The primary transit mode share is through buses for the North Shore except for CNV residents, for whom SeaBus and SkyTrain represent 7.4% and 3.4%, respectively, reflecting the large proportion of the population with commute destinations or other purposes south of the North Shore.

[16] "Transit access mode" refers to the primary mode used to get to and/or from the transit stop. Park & Ride (drive-access) transit trips are those for which the survey participant either drove to their first transit boarding location or drove from their last transit stop to their destination. Kiss & Ride (passenger-access) transit trips are those for which the participant was either driven to their first transit boarding location or driven from their last stop (without driving at either end), while bicycle-access is where the participant cycled to and/or from transit (without the driving or being a passenger at either end). Walk-access transit trips are those for which the survey participant walked at both ends of the trip.

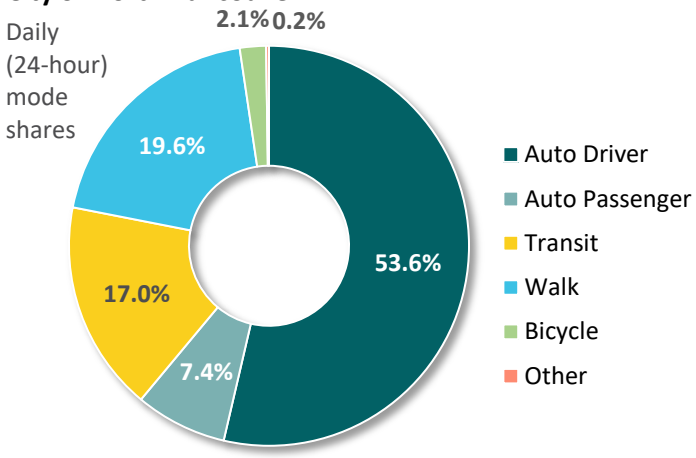
Figure 40. Weekday Mode Shares by Municipality

District of North Vancouver



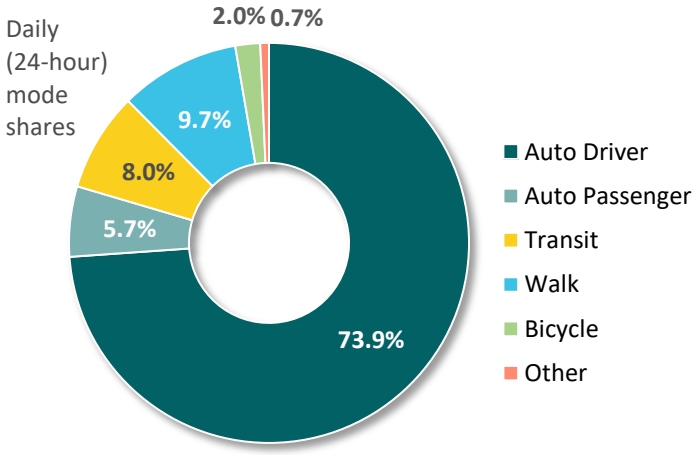
Auto Driver Trips	
Single Occupant (SOV)	49.2%
2-Occupant (HOV-2)	12.9%
3-Occupant (HOV-3+)	5.2%
Transit Service Mode Shares*	
Bus	7.2%
SeaBus	0.9%
SkyTrain	1.0%
Transit Access	
Walk Access	7.0%
Park & Ride (drive access)	0.6%
Kiss & Ride (passenger access)	0.3%
Bicycle Access	0.1%

City of North Vancouver



Auto Driver Trips	
Single Occupant (SOV)	39.3%
2-Occupant (HOV-2)	11.4%
3-Occupant (HOV-3+)	1.7%
Transit Service Mode Shares*	
Bus	12.7%
SeaBus	7.4%
SkyTrain	3.4%
Transit Access	
Walk Access	15.8%
Park & Ride (drive access)	0.7%
Kiss & Ride (passenger access)	0.5%
Bicycle Access	0.1%

West Vancouver



Auto Driver Trips	
Single Occupant (SOV)	48.8%
2-Occupant (HOV-2)	18.6%
3-Occupant (HOV-3+)	4.5%
Transit Service Mode Shares*	
Bus	7.9%
SeaBus	0.1%
SkyTrain	0.6%
Transit Access	
Walk Access	6.8%
Park & Ride (drive access)	0.7%
Kiss & Ride (passenger access)	0.5%
Bicycle Access	0.0%

*Sum of Bus + SeaBus + SkyTrain may add to greater than total Transit mode share as more than one transit service may be used in a single trip

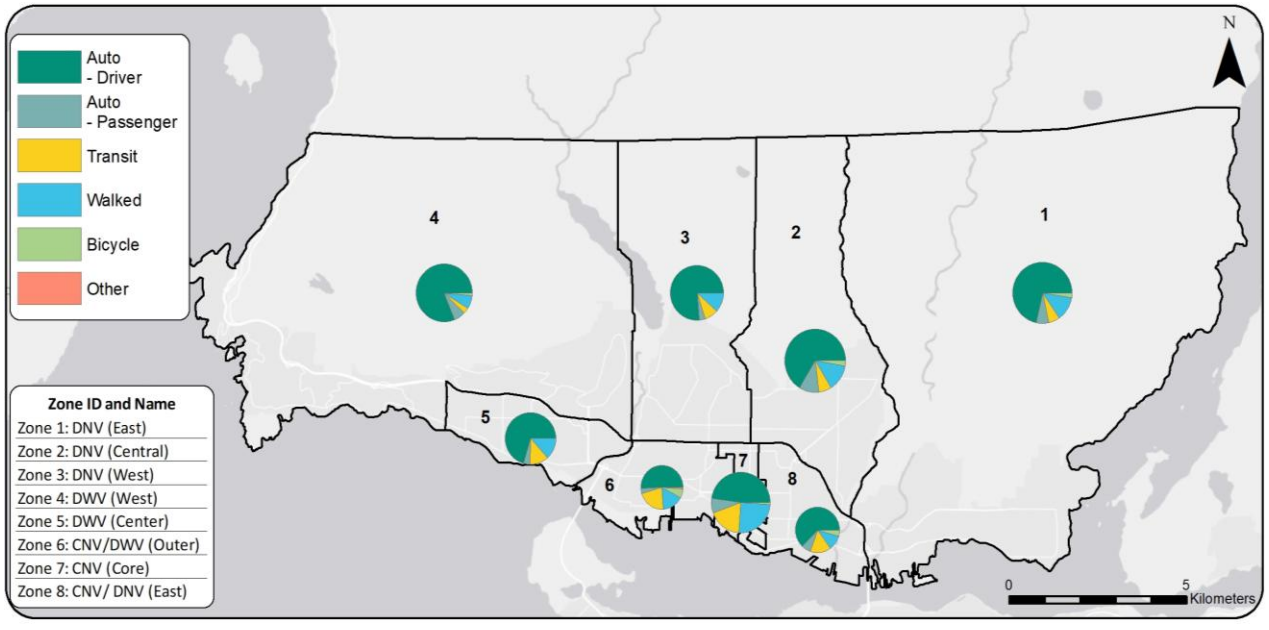
4.3.4 Mode Share by Sub-Municipal Zone

North Shore residents' weekday mode shares are presented by zone of residence in **Table 11** and **Figure 41**. Auto driver mode shares are highest for residents of Zones 3 and 4 (75% and 81% respectively). Auto driver mode shares lowest for Zones 6 and 7 (51% and 48% respectively), which comprise most of CNV and a small part of DWV. Zones 6 and 7 also have the highest sustainable and active mode shares, with 21% and 18% transit mode shares, respectively, and 16% and 25% walk mode shares, respectively, and with Zone 6 residents having an almost 7% cycling mode share. Cycling was also observed to be high for survey participants from Zone 8 (almost 5%).

Table 11. Weekday Mode Shares by Sub-Municipal Zone

Mode Shares by Place of Residence	North Shore	Zone 1 DNV East	Zone 2 DNV Central	Zone 3 DNV West	Zone 4 DWV West	Zone 5 DWV Center	Zone 6 CNV /DWV	Zone 7 CNV Core	Zone 8 CNV /DNV E
Auto Driver	66.1%	71.4%	66.2%	75.3%	80.5%	69.6%	50.9%	47.7%	62.1%
Auto Passenger	6.7%	6.8%	10.4%	3.8%	6.7%	4.2%	4.0%	7.9%	7.1%
Transit	10.5%	6.5%	6.7%	8.2%	3.2%	11.9%	21.4%	18.1%	15.1%
Walk	13.9%	12.7%	13.3%	11.4%	7.5%	13.1%	16.1%	25.0%	10.3%
Bicycle	2.3%	2.5%	2.9%	0.8%	1.4%	0.4%	6.6%	1.1%	4.6%
Other	0.5%	0.1%	0.5%	0.4%	0.6%	0.8%	1.2%	0.2%	0.8%
Subtotals									
Sustainable (Transit + Walk + Bike)	26.7%	21.7%	22.9%	20.4%	12.1%	25.4%	44.0%	44.2%	30.1%
Active (Walk + Bike)	16.1%	15.2%	16.2%	12.2%	8.9%	13.5%	22.7%	26.0%	15.0%

Figure 41. Map of Weekday Mode Shares by Sub-Municipal Zone

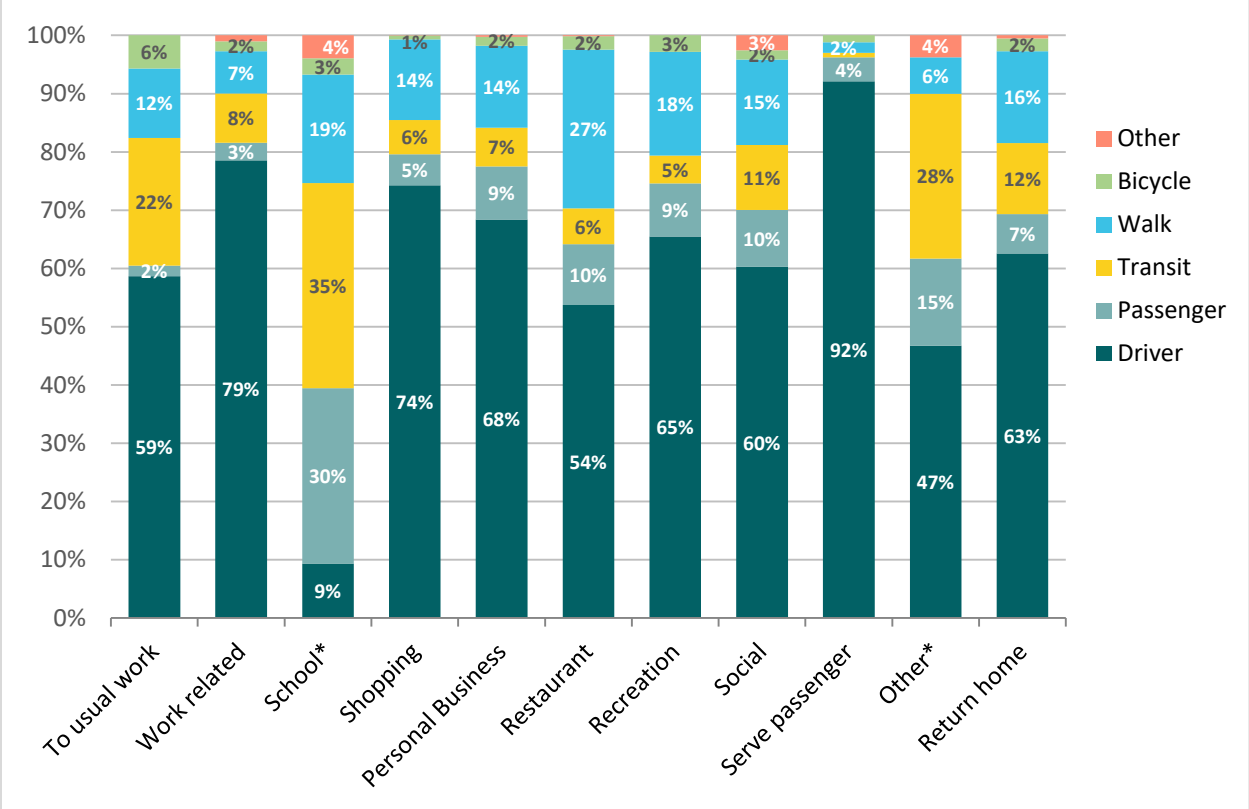


4.3.5 Mode Share by Trip Purpose

Figure 42 illustrates how mode shares vary by trip purpose.

- The highest auto driver mode shares are for serve-passenger (drop off or pick up) trips (92%), work-related (79%), and shopping (74%).
- Passenger mode shares are highest for trips to attend school (made by the post-secondary students and high school students over the age of 15[17]) (30%).
- Transit shares are highest for school and work commutes (35% and 22% respectively) and the small number of trip purposes categorized as 'other'.
- Walk mode shares are highest for restaurant, school, and recreation trips (27%, 19%, and 18% respectively).
- Cycling mode shares are highest for work commutes (6%), and between 2% to 3% for most other purposes, except for shopping, which has a negligible cycling mode share.

Figure 42. Weekday Mode Share by Trip Purpose - the North Shore[18]



[17] When interpreting mode shares for trips to school, readers are reminded that the survey only included residents 15 years of age and older. I.e., the survey did not include students under the age of 15, whose mode shares would differ from those presented here for post-secondary students and high school students 15+ years of age.

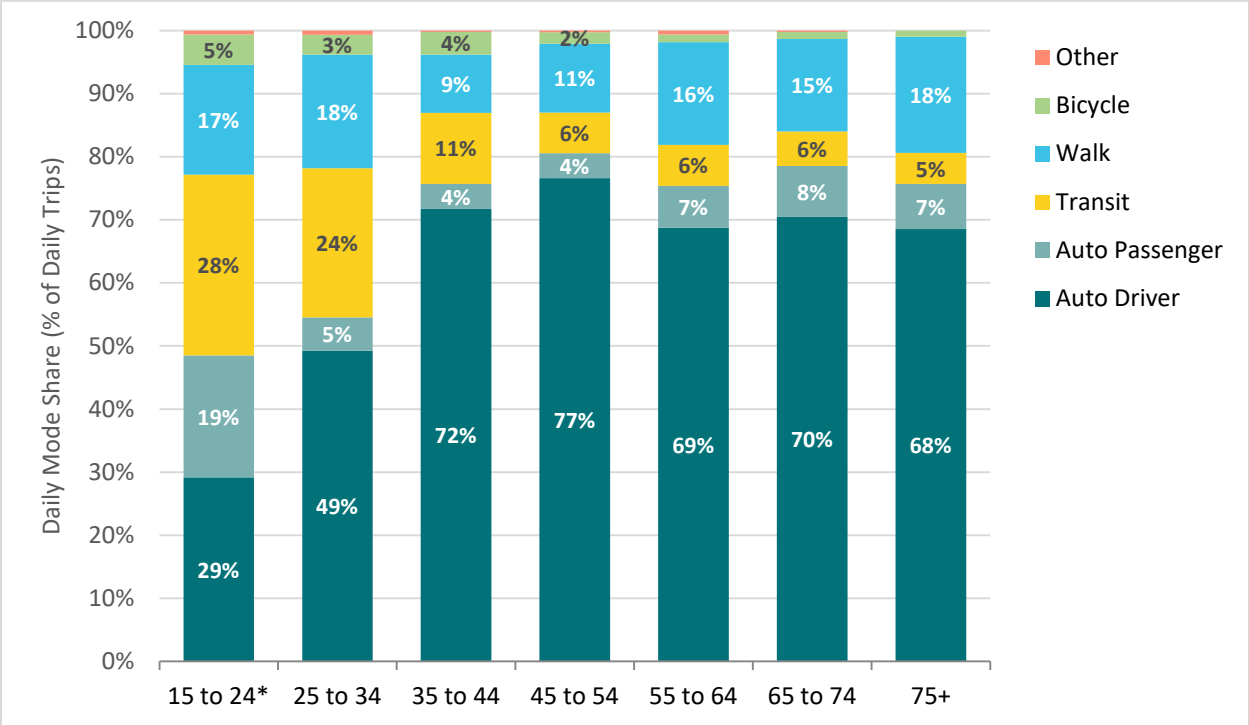
[18] Interpret results for purposes marked with an asterisk (*) with caution due to small sample sizes (n<50 trip records).
Mode shares of 1% or less are included in the chart, but values are not displayed. Shopping has a 1% bicycle share, Serve Passenger has a 1% bicycle share and an 1% transit share, while Return Home has an 1% Other mode share.

4.3.6 Mode Share by Age Group

Figure 43 shows mode shares by age group.

- The 45 to 54 age group has the highest percentage of auto driver trips with around 77% of their daily trips while the 15 to 24 age group has the lowest percentage with around 29% of their daily trips.
- The 15 to 24 age group has the highest percentage of auto passenger trips with around 19% of daily trips, while the age group of 35 to 54 has the lowest percentage with 4%.
- Participants in the 15 to 24 age group have the highest percentage of transit trips with 28% of their daily trips, while the age group of 75 years or older has the lowest percentage of 5% of their daily trips.
- Participants in the 15 to 34 and 75+ age groups have the highest percentage of walking trips with 17% and 18%, respectively.
- Participants in the 15 to 24 age group have the highest percentage of bicycle trips representing 5% of their daily trips.

Figure 43. Weekday Mode Share by Age Range – North Shore[19]



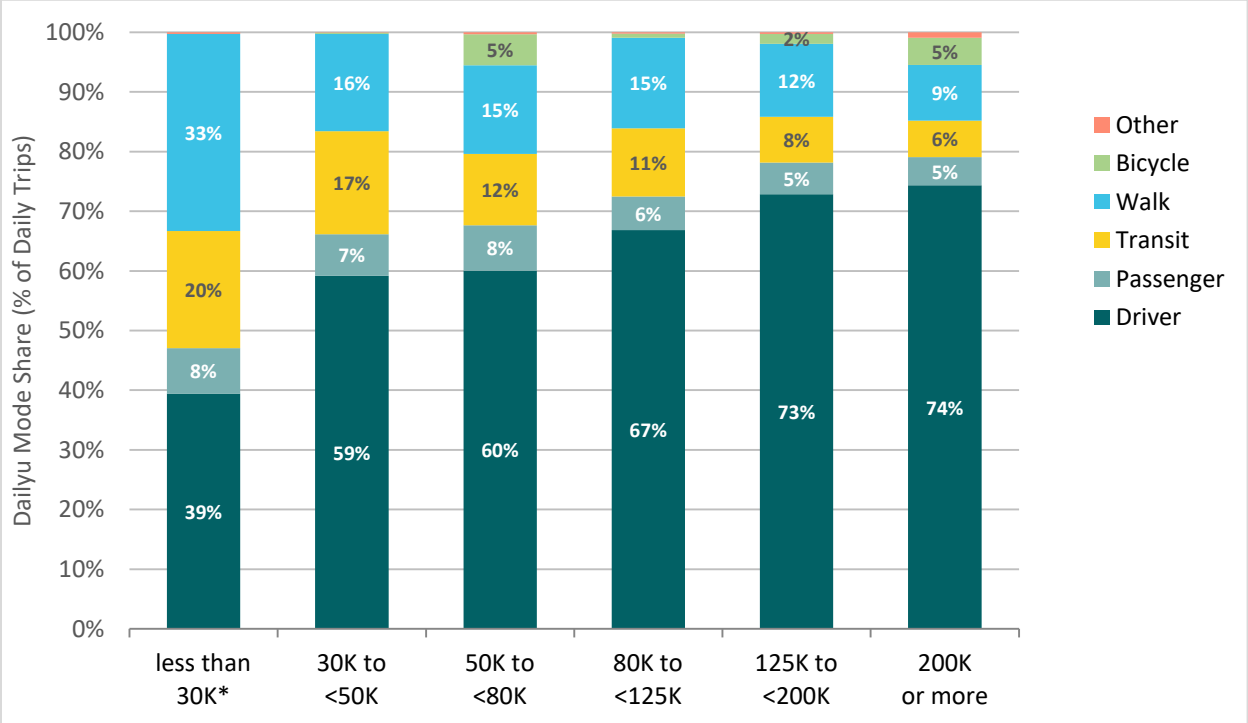
[19] Age groups with an asterisk "*" have smaller samples size and should be interpreted with caution. Mode shares of 1% or less are included in the chart, but values are not displayed. Bicycling has a 1% mode share for age ranges of 55-64, 65-74, and 75+. Other modes (low speed motor vehicle, taxi, ferry, airplane, etc.) have shares of less than 1% for all age ranges (0.6%, 0.7%, 0.2%, 0.3%, 0.6%, 0.2%, and 0.0% for the respective age ranges categories from 15-24 through to 75+.).

4.3.7 Mode Share by Income

Figure 44 shows mode shares by household income.

- Vehicle use increases with income, with auto driver trips representing four in ten trips for the lowest-income households (39% mode share for those in households with income of less than 30K per year) and increasing to three-quarters of all trips for the highest (74% mode share for those with incomes greater than $200k per year).
- Use of public transit is highest amongst lower-income households. One in five trips made by those in the lowest-income households is via transit (20% mode share for those in households with incomes less than $30k per year) and 17% for those with incomes of $30k to $50k. This drops as income increases, from 12% for those in households with $50k to $80k, and only 6% for those with incomes of $200k or more.
- One third of trips made by residents of the lowest-income households are via walking, with this percentage varying between 15% to 16% for residents the three income ranges between $30k per year and $125k per year, dropping to 12% for those with household incomes of $125k to $200k and 9% for the highest-income households.

Figure 44. Weekday Mode Share by Household Income – North Shore[20]



[20] Income groups with an asterisk "*" have smaller samples size and should be interpreted with caution. Mode shares of 1% or less are included in the chart, but values are not displayed. Bicycling has a 0.2% mode share for '30K to <50K' and 1% for '80K to <125K'. Other modes (low speed motor vehicle, taxi, ferry, airplane, etc.) have shares of less than 1% for all household income ranges (0.3%, 0.1%, 0.3%, 0.2%, 0.3%, 1.0% for the respective income categories from 'less than 30K' through to '200K or more').

4.4 Trip Distributions

This section describes the trip distributions for the survey which include the trip origin and destinations and internal capture of trips.

4.4.1 Trip Origins and Destinations

Table 12 shows the Origin-Destination flows by the sub-municipal Zone. The O-D matrix is generally balanced between the O-D zones.

Of the estimated 579,100 total daily trips made by North Shore residents 15+ years of age:

- 71% (410,900 trips) are made entirely within the North Shore;
- almost one-quarter (24% or 138,400 daily trips) are between the North Shore and places external to the North Shore (about equally split between those leaving and returning to the North Shore); while
- 5% are made entirely outside the North Shore (29,900 trips with both the origin and destination being external).[21]

Zone 5 (DWV central) and Zone 7 (CNV core) are the most popular destination zones, respectively attracting 40,600 and 47,300 daily trips from other zones each day (with equivalent numbers of trips outbound from these zones).

Looking at flows to destinations external to the North Shore, the City of Vancouver downtown peninsula (CBD/West End) attracts 27,000 trips from the North Shore each day, the rest of Vancouver/UEL attracts 20,700, and Burnaby 10,600 (with equivalent numbers of trips returning home to the North Shore from all of these external locations). Other destinations south of the North Shore combined attract another 9,600 daily trips, while about 900 daily trips are destined to locations north of the North Shore or other external locations outside the MVRD and FVRD.

The highest flows between individual zones are from Zone 5 (DWV central) to Zone 4 (DWV west) with around 14,000 daily trips.

[21] For example, if a North Shore resident who works in Vancouver walks from work in downtown Vancouver to a downtown Vancouver cafe for lunch, then from the cafe back to work, the trips to and from the cafe would be considered entirely external to the North Shore. Such external trips are counted in the daily trip totals for the survey participant. If a survey participant travelled to a faraway place outside the Lower Mainland travel area, such as Toronto, then made trips while in Toronto, the trips within Toronto would not be included in the survey dataset.

Table 12. Origin-Destination Flows by Sub-municipal Zone (Daily Trips Made by Residents of the North Shore)

Destination / Origin	Destinations on the North Shore								External Destinations								Total Daily Trips
	Zone 1 DNV East	Zone 2 DNV Central	Zone 3 DNV West	Zone 4 DWV West	Zone 5 DWV Center	Zone 6 CNV /DWV	Zone 7 CNV Core	Zone 8 CNV /DNV E	Van CBD / West End	Rest of Van	Rich-mond	Burn-aby	New West	NE Sector	Other MVRD/ FVRD	North of North Shore	Other External	
Zone 1 DNV (East)	28,200	3,100	2,000	400	2,800	3,400	5,300	5,000	1,900	3,900	400	2,400	300	400	300	-	-	59,900
Zone 2 DNV (Central)	3,600	28,700	3,700	1,400	2,300	3,800	5,700	5,000	3,000	3,000	200	2,100	400	200	400	300	-	63,600
Zone 3 DNV (West)	2,100	3,100	18,000	2,500	3,400	4,900	4,800	3,000	3,400	3,000	100	1,100	300	100	500	-	-	50,400
Zone 4 DWV (West)	1,200	1,000	2,600	16,900	11,800	3,900	1,900	1,200	2,200	1,600	300	400	-	800	400	200	-	46,300
Zone 5 DWV (Center)	2,400	2,600	3,600	14,200	39,000	4,600	3,300	1,200	3,400	2,400	500	700	200	200	400	100	-	78,800
Zone 6 CNV/DWV (Outer)	2,600	3,500	5,200	3,000	5,800	19,700	7,500	3,600	4,700	1,600	100	700	200	100	-	100	-	58,500
Zone 7 CNV (Core)	5,000	6,300	5,000	1,300	4,700	7,700	30,800	5,700	5,100	3,500	200	1,300	200	300	800	-	-	78,000
Zone 8 CNV/DNV (East)	6,100	5,100	3,200	1,000	800	3,300	6,500	10,000	3,200	1,700	400	1,800	100	-	800	100	100	44,200
Van CBD/West End	2,200	3,100	2,700	1,800	3,600	4,500	4,900	3,900	8,100	1,500	600	200	-	-	-	-	200	37,300
Rest of Vancouver/UEL	3,300	3,000	2,000	1,200	2,600	1,400	3,300	3,500	1,600	6,700	400	900	-	300	100	-	-	30,200
Richmond	400	200	300	700	900	200	500	100	-	300	1,200	100	200	100	100	-	400	5,800
Burnaby	1,900	2,300	1,300	500	800	700	2,300	1,400	400	300	100	1,800	100	400	300	-	-	14,400
New Westminster	300	100	300	-	-	100	200	100	-	400	200	100	100	-	200	-	-	2,100
Northeast Sector	300	400	-	700	100	200	300	300	200	-	-	500	-	400	100	-	-	3,500
Other MVRD/FVRD	500	400	500	200	600	-	700	500	100	100	-	300	100	100	400	-	100	4,800
North of North Shore	-	-	-	200	200	-	-	100	-	-	-	-	-	-	-	100	-	500
Other External	-	-	100	-	400	-	100	-	-	100	100	-	-	-	-	-	-	900
Total Daily Trips	60,000	63,100	50,600	46,100	79,600	58,600	78,100	44,400	37,300	30,100	4,900	14,400	2,100	3,500	4,600	900	800	579,100

All trip estimates from the survey are rounded to the closest 100. Figures for individual origin-destination pairs may not sum to listed row or column totals due to rounding.
Van CBD/West End = City of Vancouver Central Business District (CBD) and West End which together are the entirety of the downtown peninsula.
Rest of Vancouver = the rest of the City of Vancouver outside the CBD and West End as well as the University Endowment Lands (UEL) on which UBC is located.
NE Sector = Port Moody, Coquitlam Centre, Coquitlam North, Burquitlam, Coquitlam South, Port Coquitlam.
Other MVRD/FVRD = other locations in the Metro Vancouver Regional District or Fraser Valley Regional District.

Figure 45 below provides a graphical overview of the 24-hour flows of trips from origins in each of the eight sub-municipal zones to destinations within each zone and external to each zone. **Figure 46** through **Figure 53** on the following pages map the flows of trips from each zone examined individually.

The size of the circles in the geographic centre of each zone represents the number of trips entirely internal to the given sub-municipal zone. The width of the lines on the maps represents the number of outgoing trips from the given zone to another zone or external geography. Different shades of blue are used to differentiate between trips to North Shore destinations and trips to external destinations.

Figure 45. Destinations of Daily (24-Hour) Trips from Zones 1 through 8

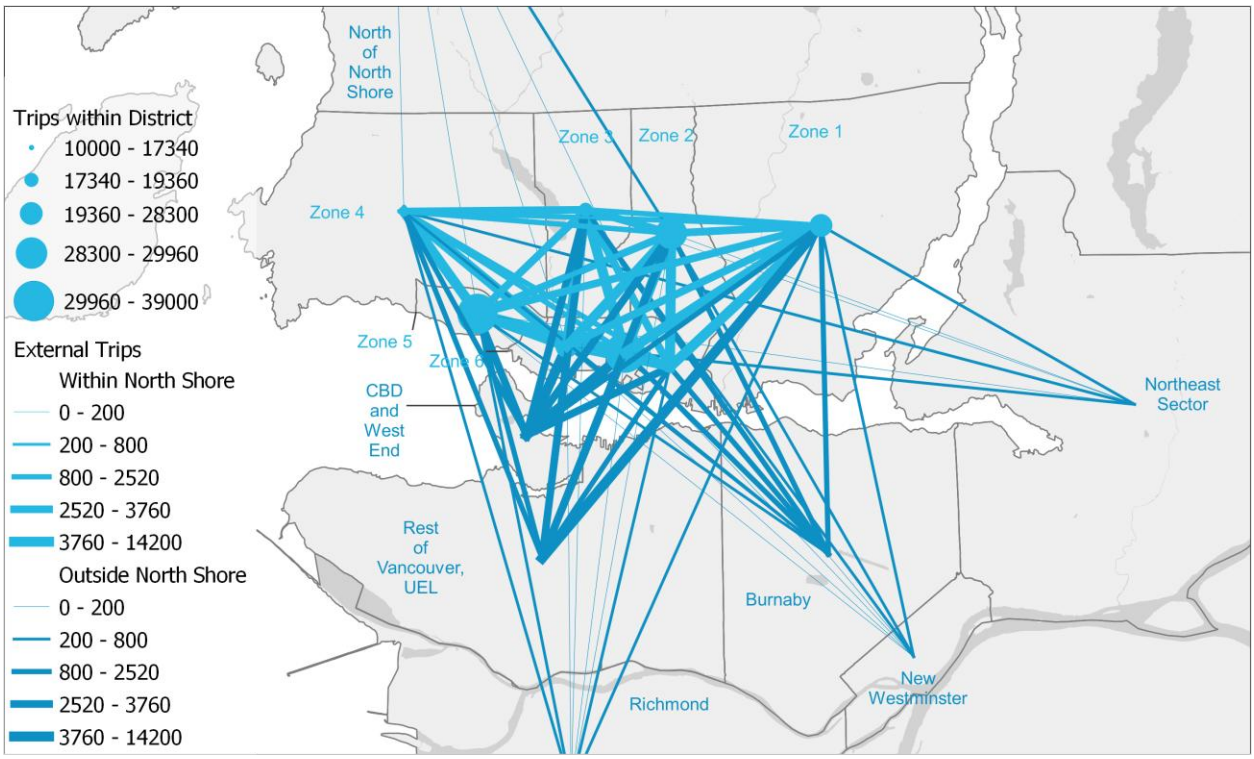


Figure 46. Destinations of Daily (24-Hour) Trips from Zone 1

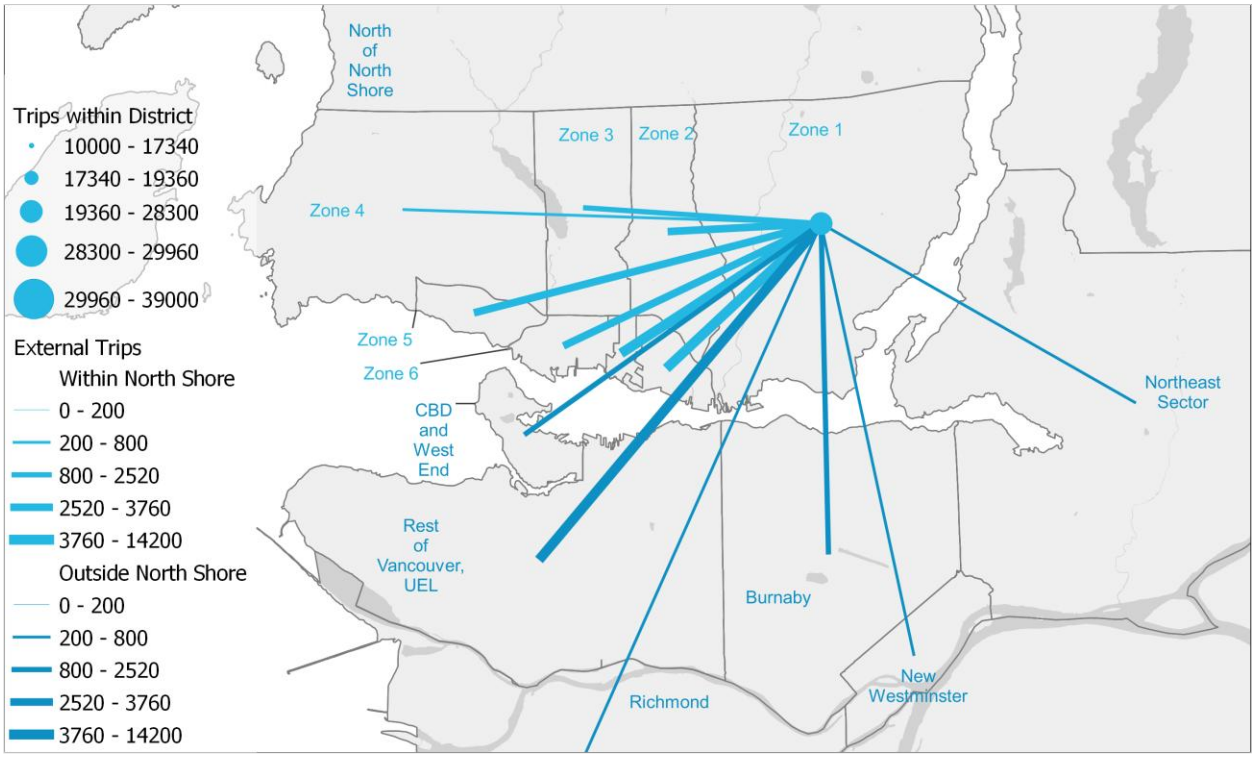


Figure 47. Destinations of Daily (24-Hour) Trips from Zone 2

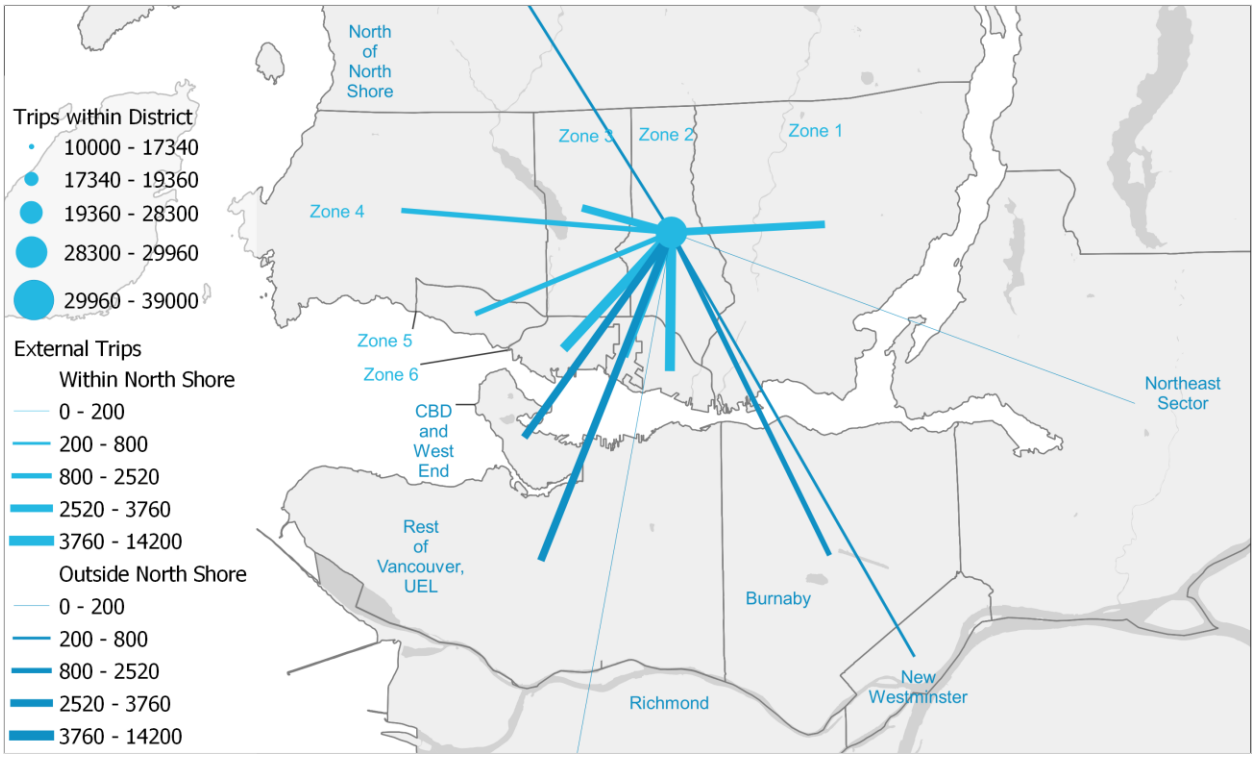


Figure 48. Destinations of Daily (24-Hour) Trips from Zone 3

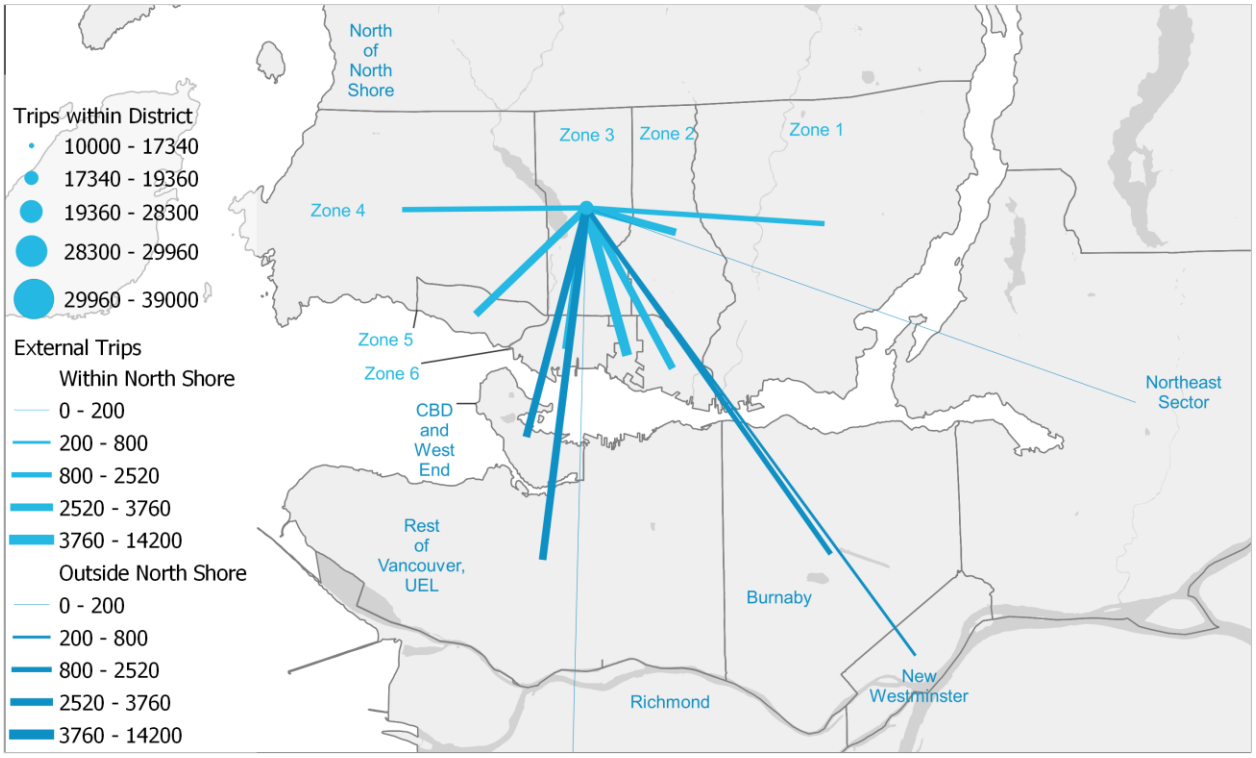


Figure 49. Destinations of Daily (24-Hour) Trips from Zone 4

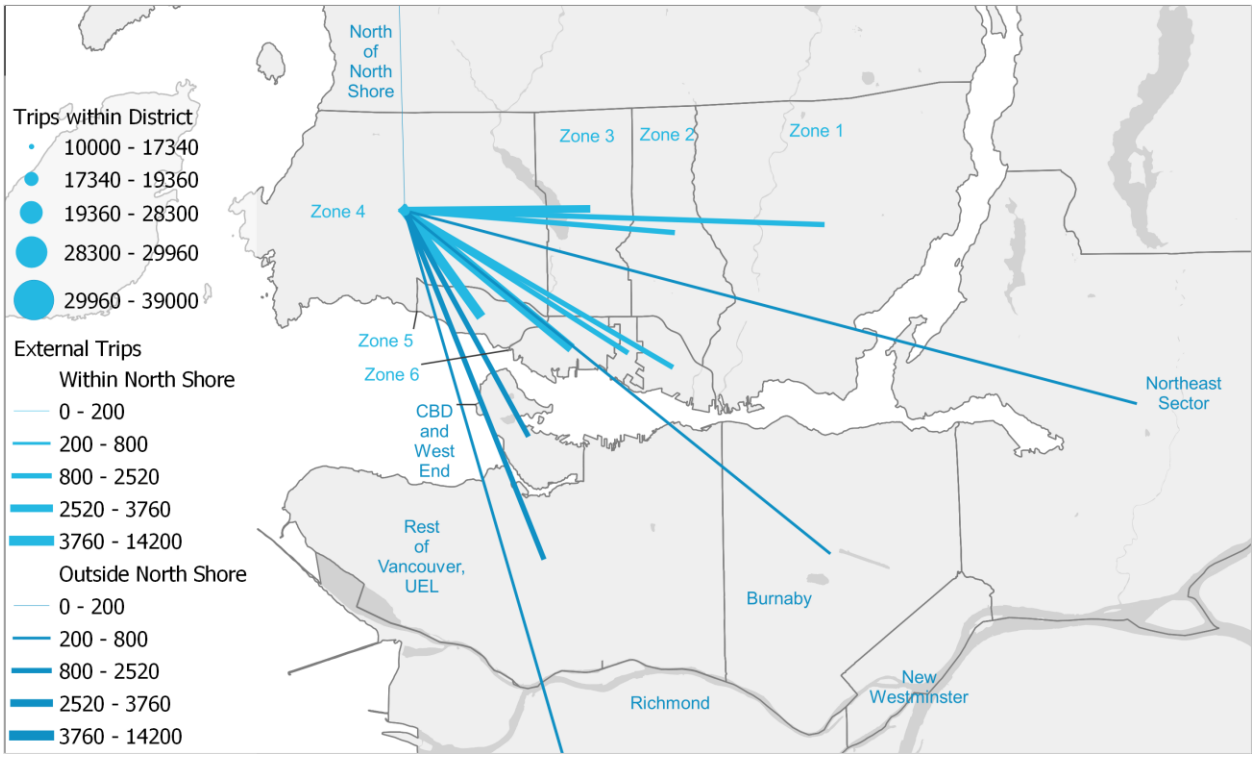


Figure 50. Destinations of Daily (24-Hour) Trips from Zone 5

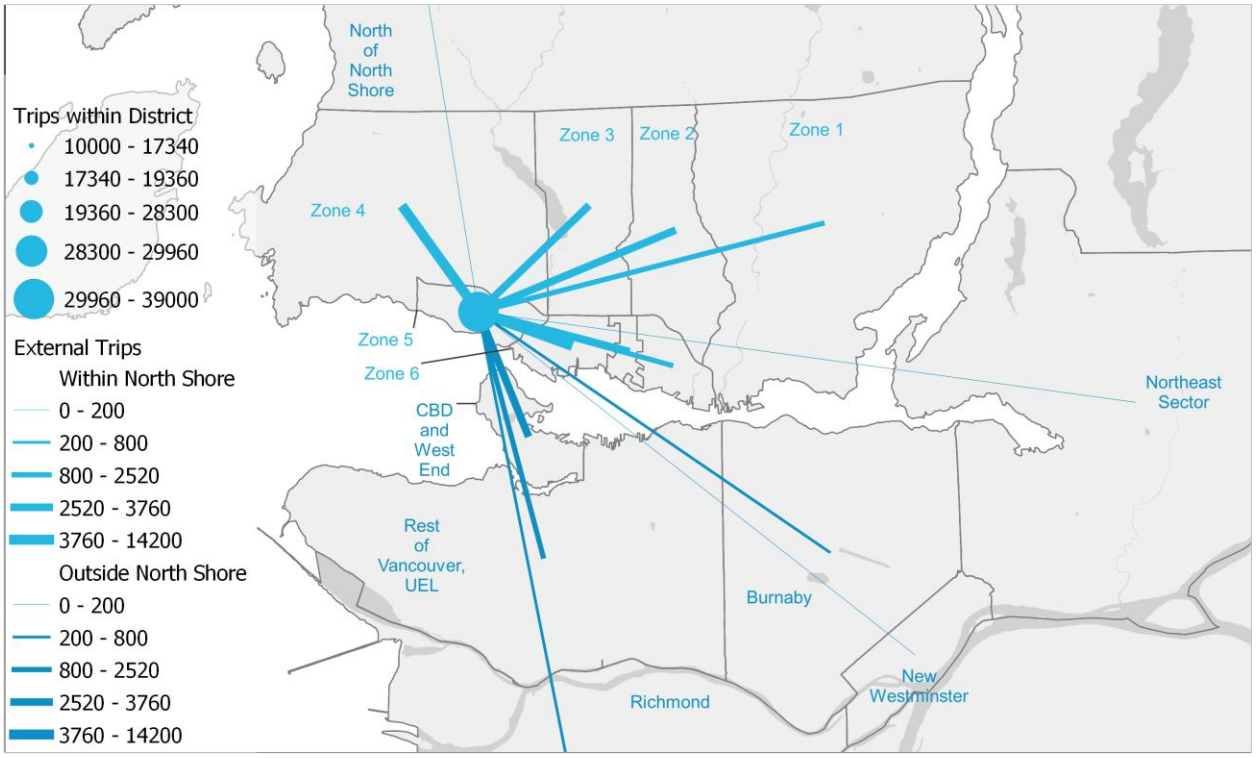


Figure 51. Destinations of Daily (24-Hour) Trips from Zone 6

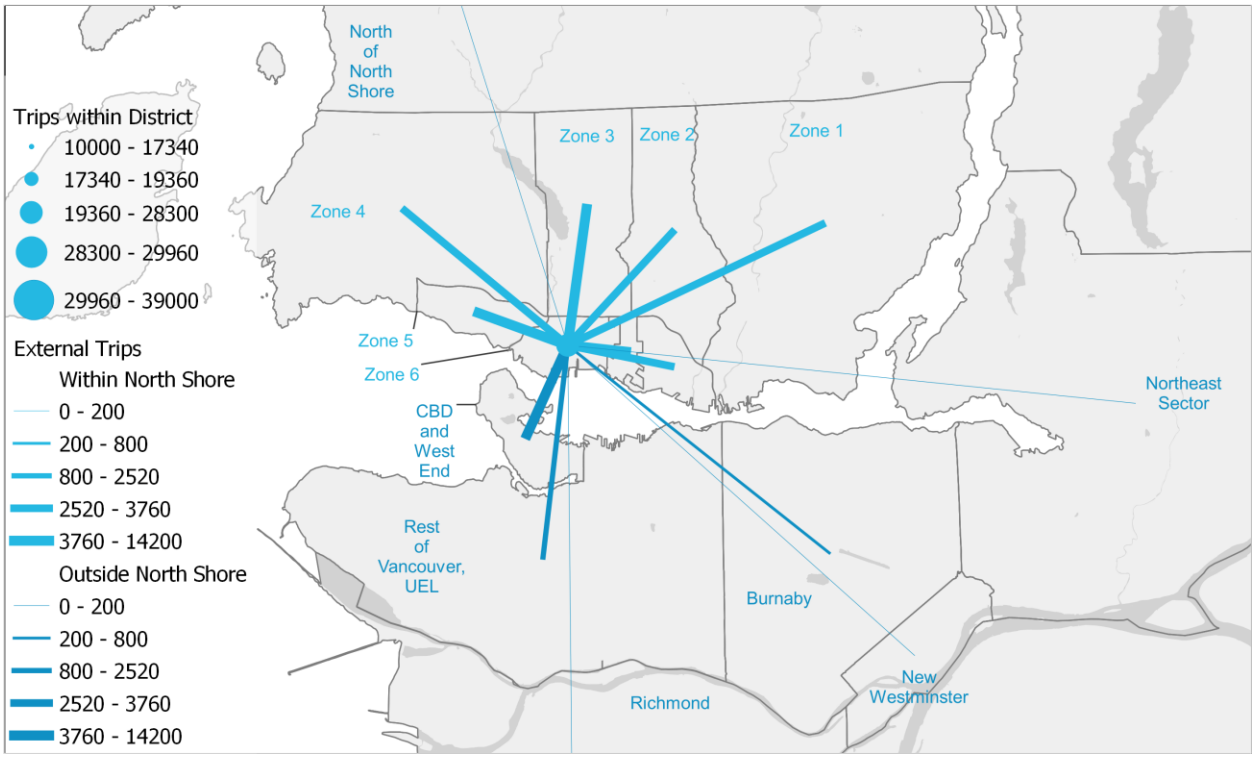


Figure 52. Destinations of Daily (24-Hour) Trips from Zone 7

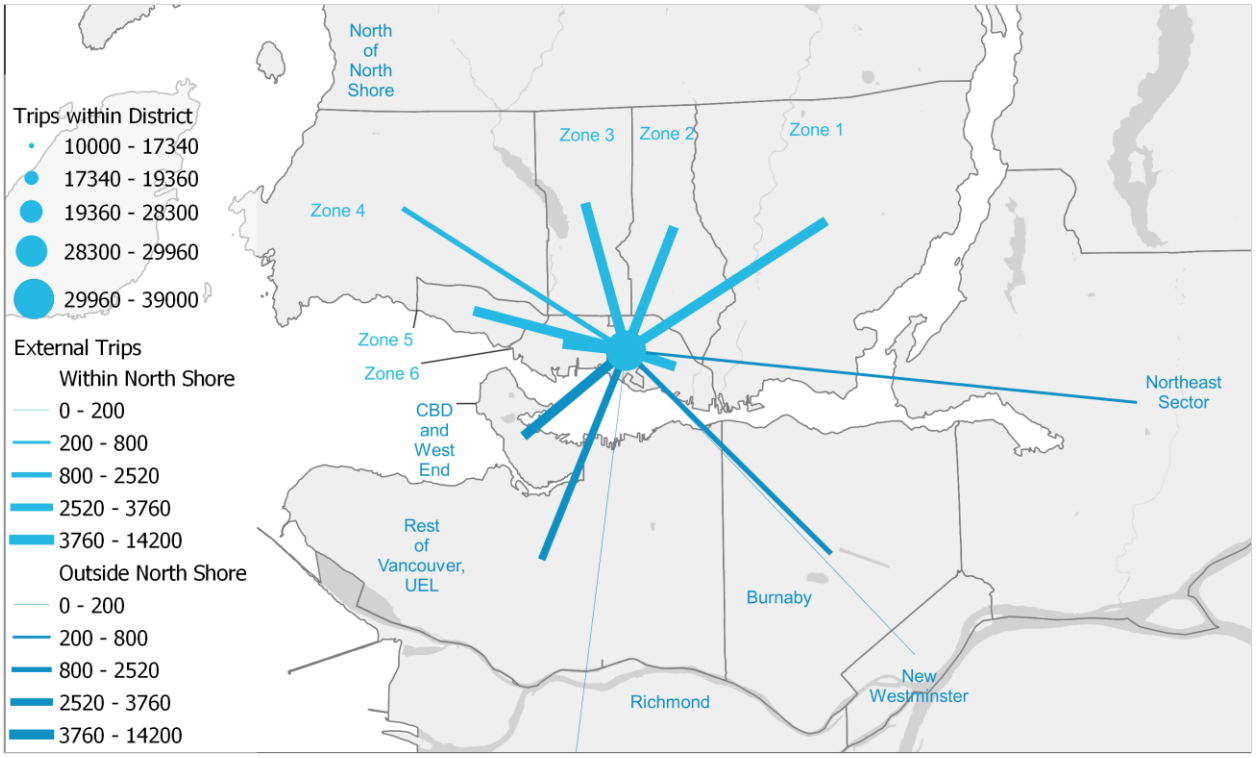
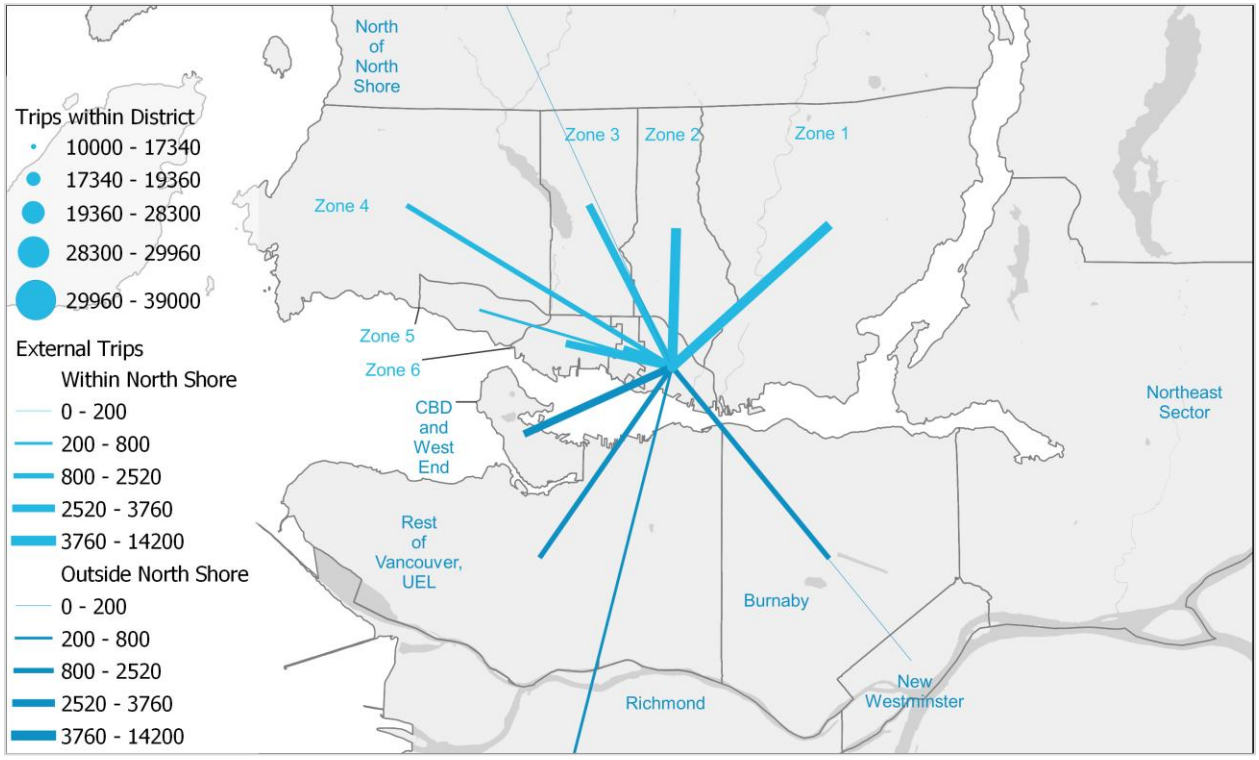


Figure 53. Destinations of Daily (24-Hour) Trips from Zone 8



4.4.1 Crossings of Burrard Inlet

Table 13 shows the crossing use by the destination for flows originating from the North Shore. Each day, residents of the North Shore make almost 68,000 southbound trips that cross Burrard Inlet to get to destinations in the rest of the Metro Vancouver Region (with an equivalent number of northbound return trips back to the North Shore).

- Lions Gate Bridge carries almost 66% of traffic destined to Vancouver CBD/West End, 51% of the traffic to the rest of Vancouver/UEL and 40% of the traffic to Richmond.
- Ironworkers Memorial Second Narrow Bridge carried 92% or more of traffic destined to Burnaby, New Westminster, Northeast Sector, and FVRD.
- The SeaBus carried 11% of traffic destined outside the North Shore (mainly Vancouver CBD, Rest of Vancouver, Richmond, and Burnaby). SeaBus usage is highest for trips destined to the Vancouver CBD/West End (20% of trips to this area) and Richmond (16%).

Table 13. Crossing Use for Southbound Origin-Destination flows between North Shore and Rest of Metro Vancouver Region[22]

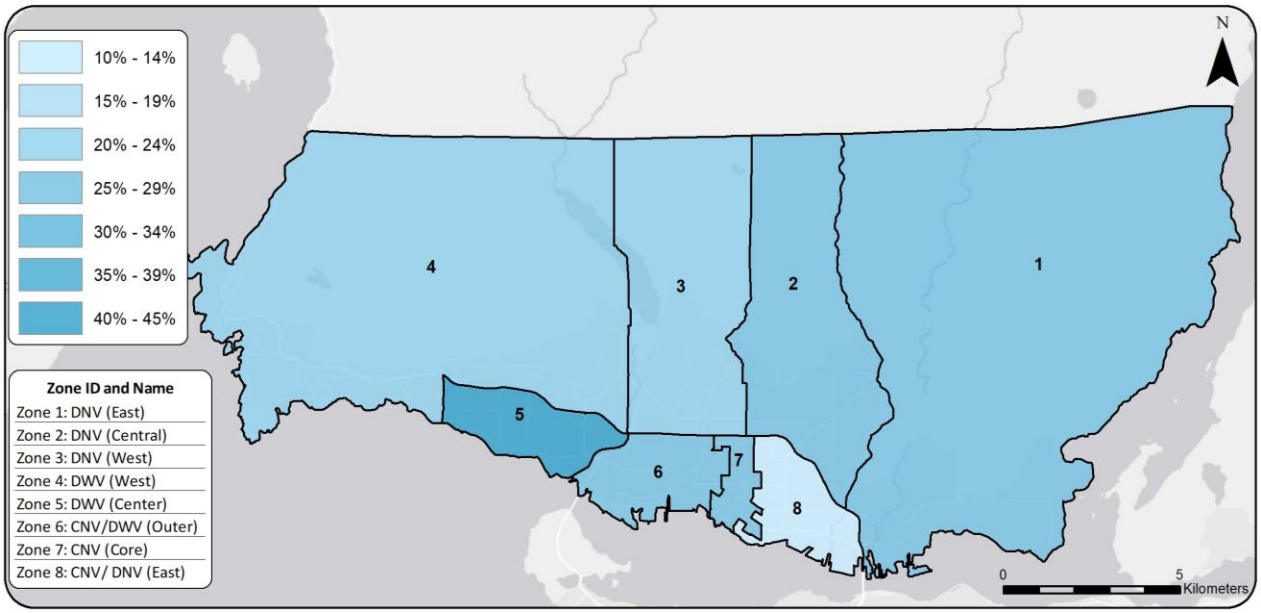
Destination	Estimated Daily Trips	Lions Gate Bridge	Ironworkers Memorial Second Narrows Bridge	SeaBus
Vancouver CBD/West End	26,960	66%	14%	20%
Rest of Vancouver, UEL	20,650	51%	43%	6%
Richmond	2,290	40%	44%	16%
Burnaby	10,590	1%	96%	4%
New Westminster	1,600	0%	100%	0%
Northeast Sector	2,200	0%	100%	0%
Other Metro Vancouver or FVRD	3,500	7%	92%	0%
Total Trip Destinations South of the North Shore	67,790	44%	46%	11%

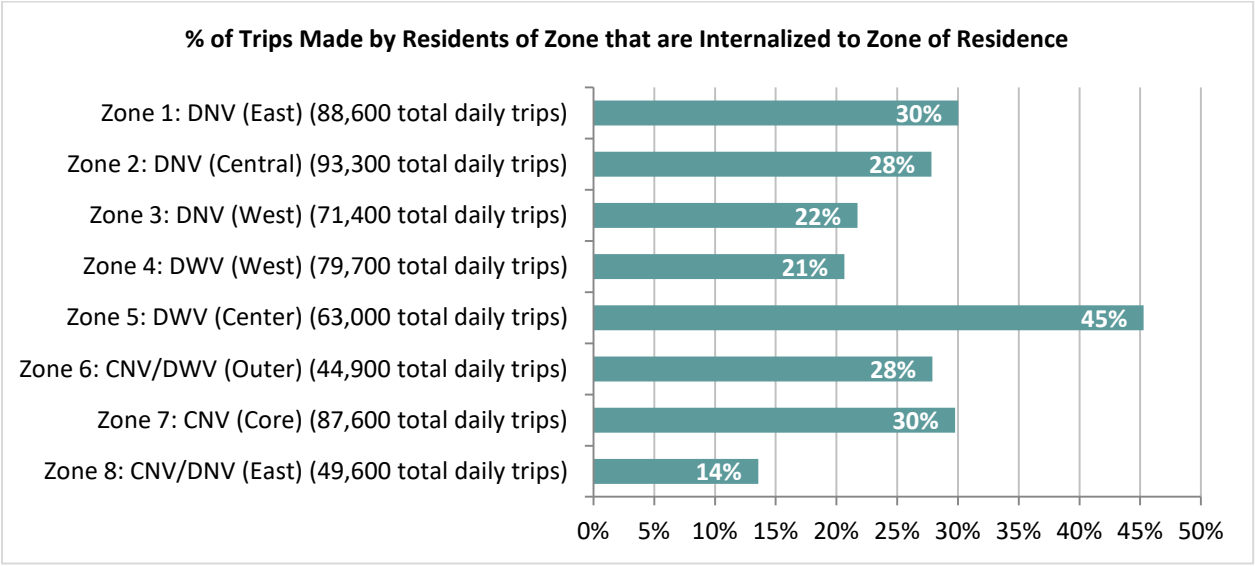
[22] Percentages in the table are row percentages. For example, 66% of the 29,960 daily trips destined to Vancouver CBD/West end area are made via Lions Gate Bridge, with 14% via Second Narrows Bridge, and 20% via SeaBus.

4.4.2 Trip Internal Capture

Figure 54 shows the trip internal capture, or 'internalization' of trips, for each of the sub-municipal zones, or the proportion of trips made by residents of the zone that are within the zone. This provides an indication of the extent to which shopping, services, work, and other trip purposes are met locally. Zone 5 DWV (Center) captures around 45% of trips made by its residents which is the highest percentage of all zones, with the wide range of amenities within the zone and the high proportion of retired people (about 40% of residents over the age of 15 in this zone are retired) likely being factors. Zone 8 CNV/DNV (East) captures 14% trip internalization which is the least among all zones. The fact that Zone 7 CNV (Core) has only 30% internalization is likely the result of the large number of Zone 7 residents commuting to work locations south of the North Shore (see Section 5.1.2).

Figure 54. Map of Internalization of Trips made by Residents of Each Sub-Municipal Zone



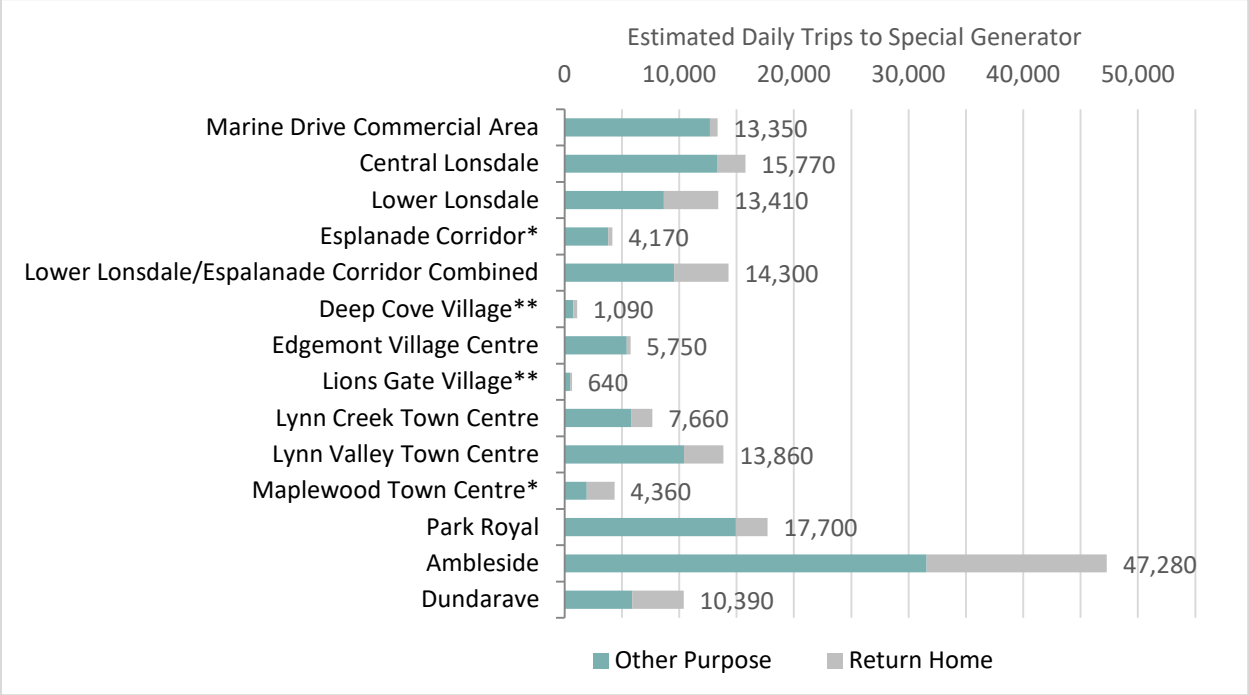


4.4.3 Special Generators

Figure 55 shows the survey estimates of the number of daily trips made by North Shore residents to selected 'special generators', popular North Shore destinations that attract trips made by residents, (including trips made within the boundaries of these generators). Some of the areas of interest to the municipalities are largely commercial areas or town centres, while others are entire neighbourhoods with a mix of both residential and commercial/institutional land uses (e.g., Ambleside and Dundarave). The graph shows return home trips in a different colour than trips for other purposes outside the home. Readers are reminded that the survey results are not exact counts but are survey estimates based on trip destinations reported by a 1.2% sample of the population aged 15+ years.

The trips to the special generator areas account for 26% of North Shore residents' daily trip destinations including external destinations outside the North Shore, or 32% of residents' North Shore destinations (excluding external destinations). Looking at just purposes outside the home (i.e., excluding return home trips), trips to the special generators represent 31% of North Shore residents' destinations outside the home or 43% of their destinations on the North Shore. **Table 14** on the following page details the origin zones of trips destined to the special generators.

Figure 55. Daily Trips Made by North Shore Residents to Special Generator Destinations[23]



[23] The Lower Lonsdale and Esplanade Corridor areas overlap. Results have been presented separately as well as combined. The majority of the Esplanade Corridor destinations are within the Lower Lonsdale boundaries as well.
* Interpret special generators marked with an asterisk (*) with caution due to small sample sizes (n=40 to 60 trip records with destinations within the boundaries of the special generator)
** Interpret special generators marked with two asterisks (**) with more caution due to smaller sample sizes (n<20 trip records with destinations within the boundaries of the special generator)

Table 14. Origins of North Shore Residents' Trips to Special Generators[24]

Special Generator (Trip Destination): / Zone of Trip Origin	City of North Vancouver					District of North Vancouver						West Vancouver		
	Marine Drive Commercial Area	Central Lonsdale	Esplanade Corridor*	Lower Lonsdale	Esplanade Corridor /Lower Lonsdale Combined	Deep Cove Village **	Edgemont Village Centre	Lions Gate Village **	Lynn Creek Town Centre	Lynn Valley Town Centre	Maplewood Town Centre*	Park Royal	Ambleside	Dundarave
Zone 1 DNV (East)	760	1,190	250	610	610	710	120	40	1,560	350	1,530	1,160	1,320	230
Zone 2 DNV (Central)	760	1,780	420	820	1,060	60	380	40	740	7,890	150	560	1,620	130
Zone 3 DNV (West)	1,380	1,550	130	650	690	-	3,000	40	180	540	490	1,220	1,520	140
Zone 4 DWV (West)	490	360	100	200	200	-	370	90	830	300	130	2,180	6,030	1,600
Zone 5 DWV (Center)	1,200	510	190	820	940	60	190	60	130	170	360	4,800	26,650	5,650
Zone 6 CNV/DWV (Outer)	4,450	1,000	390	1,300	1,510	130	800	250	480	990	50	2,900	2,180	1,320
Zone 7 CNV (Core)	2,480	6,380	1,980	5,520	5,700	130	370	20	1,040	770	50	2,220	2,080	350
Zone 8 CNV/DNV (East)	920	1,940	210	710	800	-	420	30	1,170	1,030	340	370	710	50
Van CBD/West End	590	280	480	1,870	1,870	-	40	60	20	430	180	1,510	2,200	230
Rest of Vancouver/UEL	160	450	-	590	590	-	80	-	860	580	910	410	1,450	350
Richmond	-	70	-	-	-	-	-	-	70	-	30	50	540	220
Burnaby	120	80	-	240	240	-	-	-	490	770	-	100	430	30
Other	20	180	-	80	80	-	-	-	70	40	140	210	550	90
Total	13,350	15,770	4,170	13,410	14,300	1,090	5,750	640	7,660	13,860	4,360	17,700	47,280	10,390

[24] The Lower Lonsdale and Esplanade Corridor areas overlap. Results have been presented separately as well as combined. The majority of the Esplanade Corridor destinations are within the Lower Lonsdale boundaries as well.
* Interpret special generators marked with an asterisk (*) with caution due to small sample sizes (n=40 to 60 trip records with destinations within the boundaries of the special generator)
** Interpret special generators marked with two asterisks (**) with more caution due to smaller sample sizes (n<20 trip records with destinations within the boundaries of the special generator)

4.5 Trip Distance and Duration

Trip distances and durations for each trip captured in the survey data have been estimated for the most efficient route available based on the trip origin, destination, mode of travel, and time of day of travel. Figure 56 shows the average distance of home-based work trips and all trips by mode for North Shore residents. Auto driver trips have longer trip distances for home-based work trips than for trips for other purposes. Transit trips average around 10.2 km per trip while bike trips average 7.6 km. Participants who bike to work have a longer average trip distance of 10.2 km which is almost 30% longer than the average distance of all trips. Trips via other modes (taxi, low speed motor vehicle, ferry, intercity coach bus, train, airplane) represent the longest average distance, which is understandable given that a portion of such trips are via intercity travel modes.

Figure 56. Average trip Distance for Home-based Work Trips and All Trips – North Shore

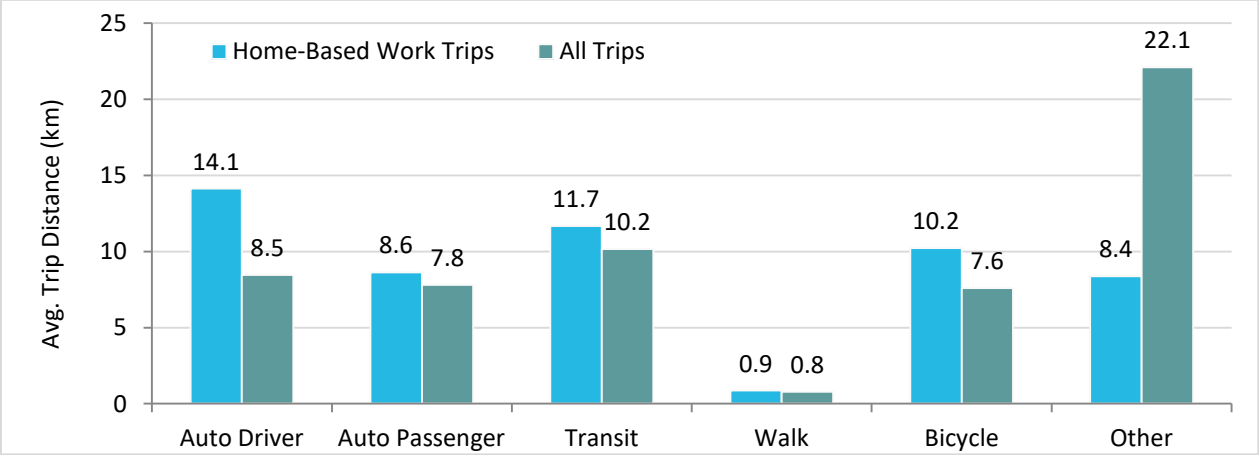


Table 15 shows the daily person-km trips on weekdays across modes. Auto Driver trips still account for almost 75% of the daily person-km travelled while auto passenger accounts for around 7%. Transit represents around 14% of total person-km travelled. Distances were not computed for certain modes categorized as 'other' (such as school bus trips and trips involving air travel).

Table 15. Total Daily Person-KM in Weekdays

	Auto Driver	Auto Passenger	Transit	Walk	Bicycle	Other
Total Daily Person-Km (Weekdays)	**3,198,400**	**300,000**	**616,100**	**53,600**	**95,700**	**6,200**

Figure 57 illustrates the distribution of trip distances by mode of travel. The majority of walk trips are all relatively short with almost 93% of such trips being within 2 km, and 74% being within 1 km (as noted on the chart). Of note, while 40% of bicycle trips captured by the survey were within 4 km cycling distance, 23% were greater than 12 km, suggesting that some cyclists are quite active.

Figure 57. Trip Distance Distributions by Mode

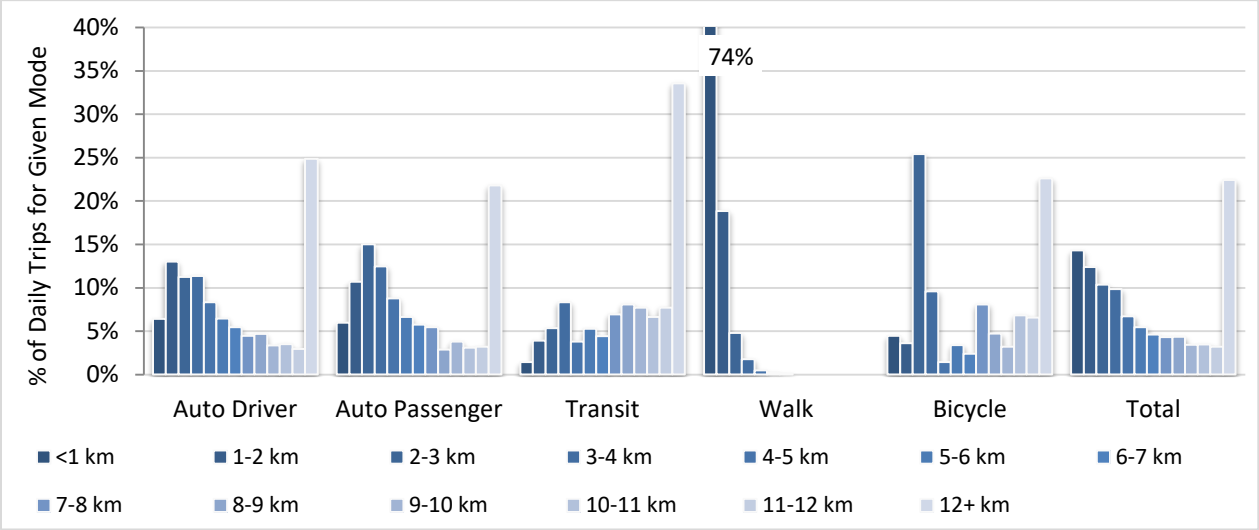
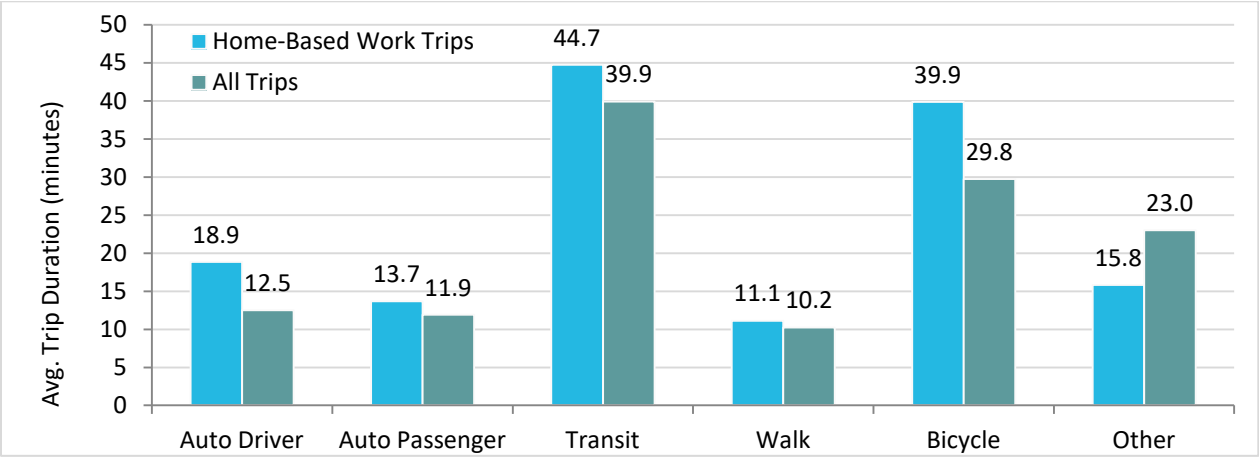


Figure 58 shows the average trip duration by mode for residents of the North Shore. Transit and bike trips have the longest durations, with home-based work trips averaging 45 and 50 minutes respectively, and all trips averaging 40 and 30 minutes respectively. The high average bike trip distance may have something to do with the portion of such trips being longer than 12 km as noted above. Auto driver home-based work trips have an average trip duration of around 19 minutes while all trips have an average of 12.5 minutes. Walk trips average about 10 minutes or 11 minutes for home-based work trips.

Figure 58. Average Trip Duration by Mode



5 Travel Patterns

This section includes the overall travel patterns, habits, preferences and attitudes. This section provides an understanding of the "usual" travel behaviour which is differentiated from the snapshot of a travel day presented in the survey participant responses. This section includes commute travel patterns, usual non-commute mode, walking, cycling, transit, and automobile trips.

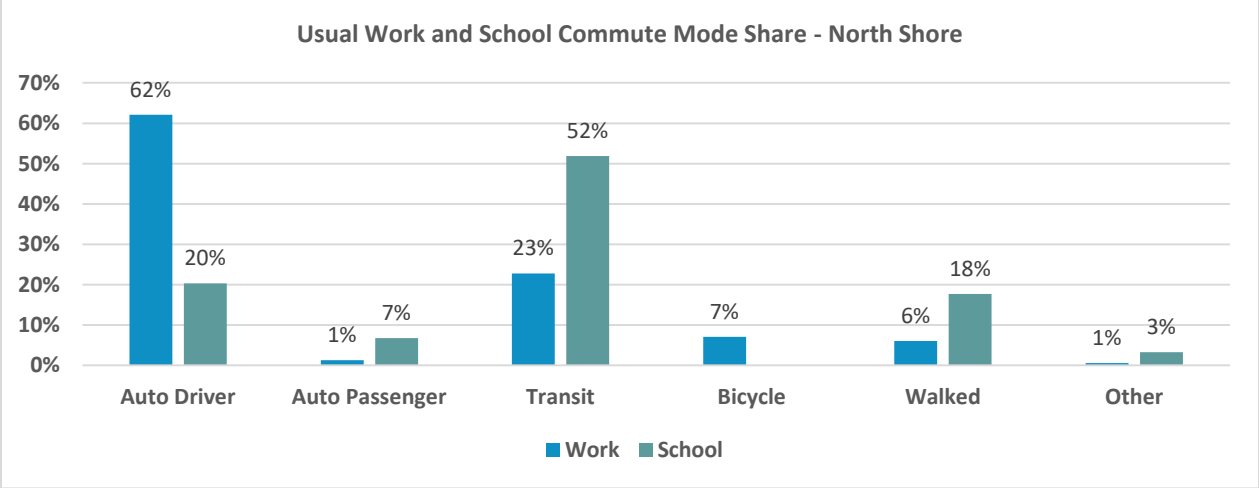
5.1 Commute Travel Patterns

The commute travel patterns explored in this section include North Shore residents' reported usual mode of travel for work and school commutes, the work destinations they commute to, work parking arrangements, frequency of telecommuting, and their satisfaction with their work commutes. School commutes have not been analysed in the same depth as work commutes due to the small sample size for the subpopulation of students 15+ years of age.

5.1.1 Usual Commute Mode

As shown in **Figure 59** below, a total 63% of survey participants on the North Shore who commute to work reported that their usual mode of transport[25] was by car, with the majority of commuters driving themselves (62%) and only 1% as auto passengers. Of note, 7% of workers indicated that cycling is their usual commute mode. 52% of students indicated that transit is their usual commute mode. The results for school commutes should be interpreted with caution due to a relatively small sample size. Readers are also reminded that the survey does not include population under the age of 15 years, most of whom are K-12 students who may have different school commute modes than those 15 years of age and older.

Figure 59. Usual Mode of Travel to Commute – North Shore



[25] Usual mode shares are those reported by all surveyed workers, and may differ from the daily mode shares for work trips reported in Section 4.3.5 (page 50) which is based on the actual mode used by just the surveyed workers who worked on their travel day.

Figure 60 shows the usual mode of travel to work by municipality, while Figure 61 breaks this out by sub-municipal zone. Survey participants from CNV have the lowest auto driver mode share for work commutes, at 53%, while having the highest use of transit and walking with 31% and 9%, respectively. DNV and DWV have generally similar mode share split except for transit use where DWV has almost 23% mode share and DNV has 17%. School commutes have not been broken out by municipality or zone due to the small survey sample of students.

Figure 60. Usual Mode of Travel for Work Commute by Municipality of Residence

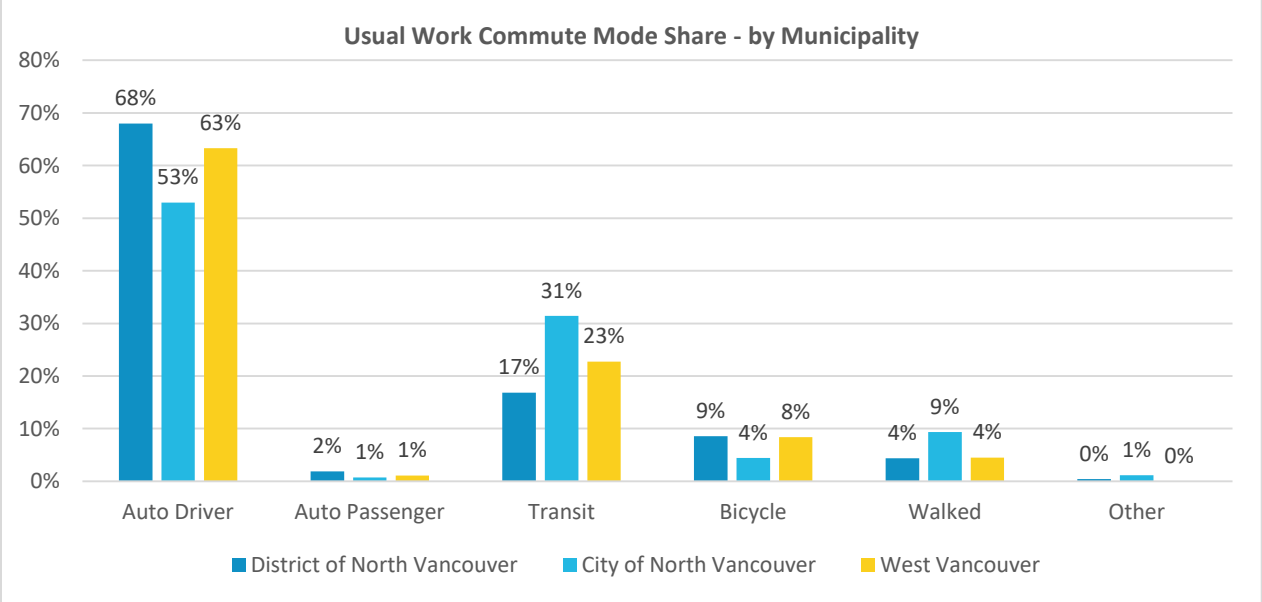
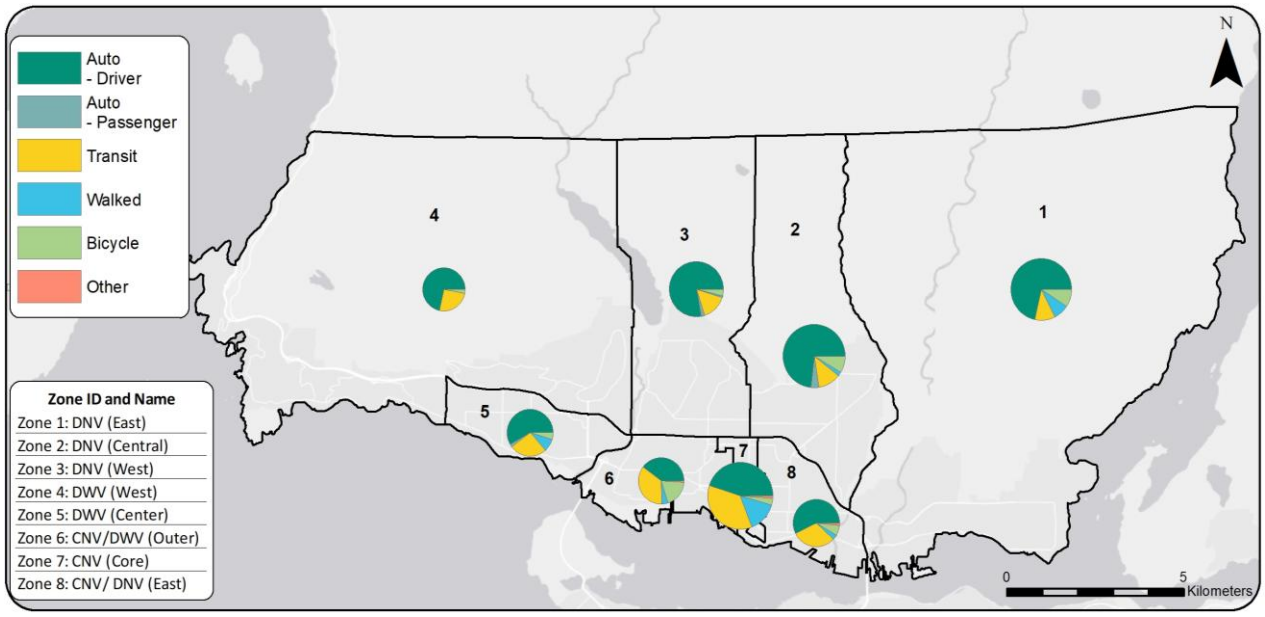


Figure 61. Map of Usual Mode of Travel for Work Commute by Zone of Residence



5.1.2 Work Commute Destinations

Figure 62 shows the distribution of usual place of work locations for the workers living on the North Shore who participated in the survey (who work outside their homes and have a usual place of work). Just over half (53%) work at jobs located on the North Shore, with 11% being in Zone 7 CNV (Core) and 9% in Zone 6 CNV/DWV (Outer). Almost half (47%) work in municipalities external to the North Shore. Around 19% work in the Vancouver CBD / West End, which represents the highest proportion among all locations, with 13% of usual workplaces located in the rest of Vancouver/UEL, and 7% in Burnaby.

Table 16 shows the zone-to-zone work commute flows. The greatest volumes are for Zone 7 CNV Core to the Vancouver CBD/West End (an estimated 3,510 commuters) and from Zone 3 DNV West to Vancouver CBD/West End (2,970), with Zones 2, 5, 6, and 8 also having more than 2,000 commuters who work in the Vancouver CBD/West End. Zone 7 CNV Core also has substantial internalized work commutes (3,280 workers living in this zone and commuting within this zone). Of note, Zones 1 and 2 in Eastern and Central DNV have substantial commute flows to the Rest of Vancouver outside the CDB/West End (2,710 and 2,570 commuters from each zone respectively) and to Burnaby (1,830 and 1,220 commuters respectively). It should be noted that the number of daily commute trips may be less than this as not all commuters will necessarily travel to work on every weekday.

Figure 62. Distribution of Usual Place of Work Locations - North Shore Residents

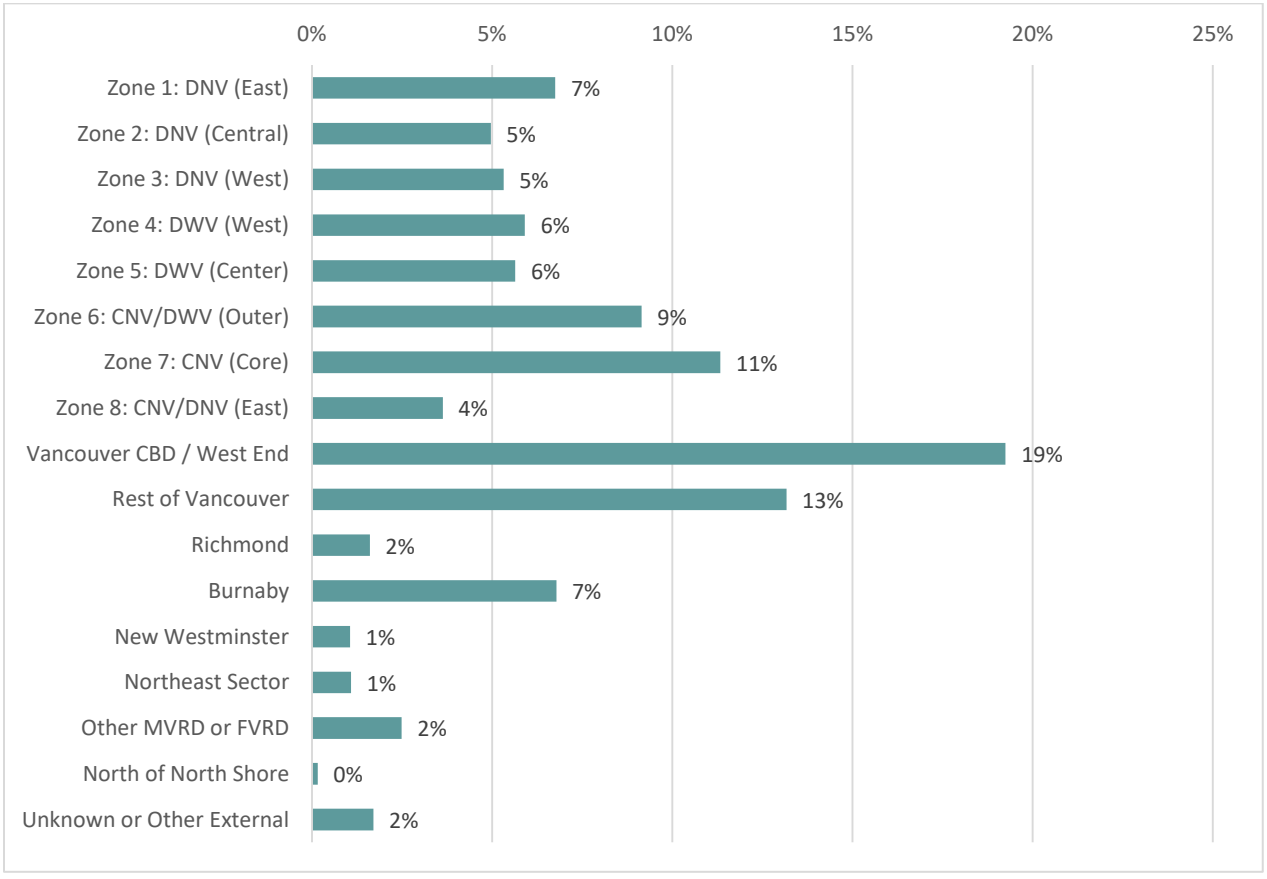


Table 16. Home-Commute Location Matrix

Workplace Location / Home	Work from Home	No Fixed Work place	Usual Workplace on the North Shore								External Usual Workplace								
			Zone 1 DNV East	Zone 2 DNV Central	Zone 3 DNV West	Zone 4 DWV West	Zone 5 DWV Center	Zone 6 CNV /DWV	Zone 7 CNV Core	Zone 8 CNV /DNV E	Van CBD / West End	Rest of Van /UEL	Rich-mond	Burn-aby	New West	NE Sector	Other MVRD/ FVRD	North of North Shore	Other Extern-al	Total
Zone 1 DNV (East)	2,200	490	2,290	170	490	310	60	830	920	150	1,450	2,710	270	1,830	260	330	150		380	15,290
Zone 2 DNV (Central)	2,240	1,000	220	660	590	720	620	1,110	910	350	2,370	2,570	560	1,220	220	40	630		110	16,140
Zone 3 DNV (West)	1,090	1,020	130	130	210		450	460	1,330	400	2,970	1,640	410	800	270		530		0	11,840
Zone 4 DWV (West)	3,300	600	80		630	400	190	900	410	90	1,660	600		220		560	110		280	10,030
Zone 5 DWV (Center)	1,000	920	340			230	1,660	150	220		2,360	1,290	60	340	100	50	330		430	9,480
Zone 6 CNV/DWV (Outer)	870	600	350		220		240	1,630	110	350	2,280	1,000	110	410	130		60		100	8,460
Zone 7 CNV (Core)	1,400	2,120	520	280	170	250	300	1,960	3,280	220	3,510	2,010	140	550	70	80	620	160	350	17,990
Zone 8 CNV/DNV (East)	1,000	950		430	840		140	510	450	40	2,360	1,150	30	1,300					40	9,240
Total	13,100	7,700	3,930	1,670	3,150	1,910	3,660	7,550	7,630	1,600	18,960	12,970	1,580	6,670	1,050	1,060	2,430	160	1,690	98,470

5.1.3 Commute Distances

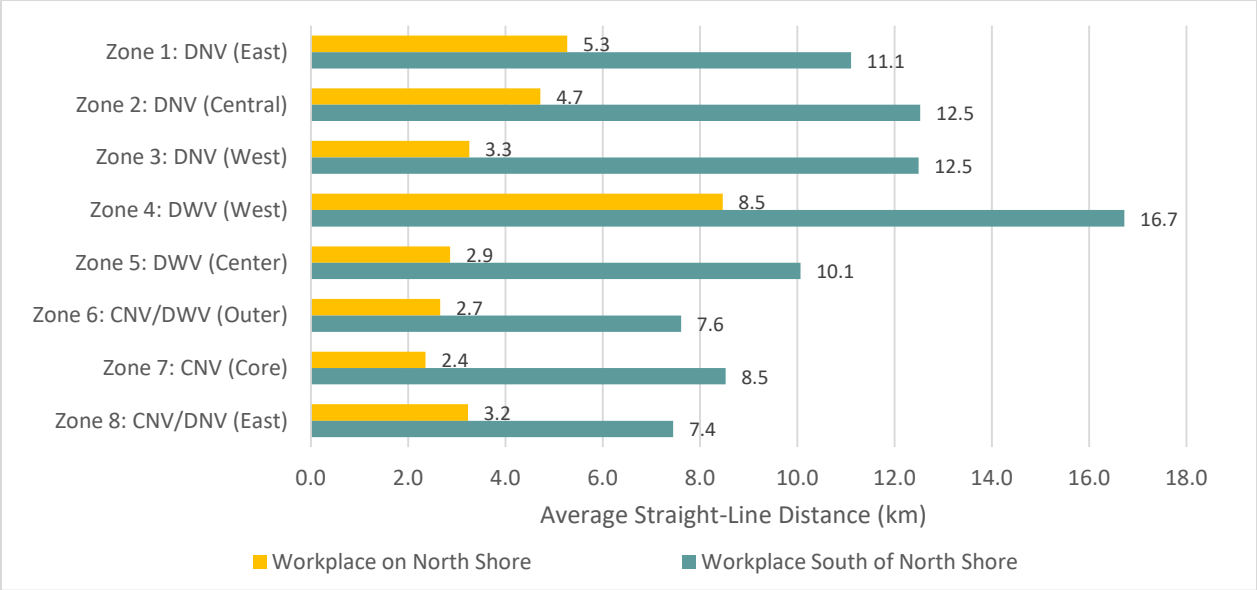
Table 17 shows the average straight-line commute distance between home and place of work for the survey participants by municipality[26]. Residents of CNV have the shortest commute distance compared to DNV and DWV. Residents who work and live in the North Shore have an average commute distance range from 2.6 to 5.6 km. Participants who live in the North Shore and work south of the North Shore have an average commute distance ranging from 9.1 to 12.4 km.

Table 17. Average Straight-Line Commute Distances (km) by Municipality

Municipality	Sample Size	Workers	Average for Total Workers	Workplace on North Shore	Workplace South of North Shore	Usual Workplace Elsewhere
District of North Vancouver	385	37,300	8.7	4.4	11.4	n/a
City of North Vancouver	257	25,980	6.8	2.6	9.1	48.2
West Vancouver	118	12,740	9.9	5.6	12.2	270.8

Figure 63 shows the average straight-line distance by sub-municipal zone. As expected, residents of the North Shore who work south of the North Shore travel longer distances than those who live and work on the North Shore. Residents of Zone 4 West Vancouver (West) have the longest average commute distance of 16.7 km for people who work south of the North Shore and 8.5 km for those who work within the North Shore.

Figure 63. Average Straight-Line Commute Distances Based on Place of Work



[26] This metric is only presented for survey participants who work outside their homes and have a usual place of work.

5.1.4 Parking at Commute Destination

Figure 64 illustrates the proportion of workers with a usual place of work outside the home, while Table 18 provides the breakdown by sub-municipal zone. The survey results suggest that, overall, two-thirds of workers who live on the North Shore use free parking at work. Fully one-fifth (20%) pay for it. This varies considerably depending on the location of the workplace: 28% of workers who work south of the North Shore use pay parking at work; however, this percentage is only 10% for those who work in CNV and 7% for both DWV and DNV.

Figure 64. Use of Parking at Work

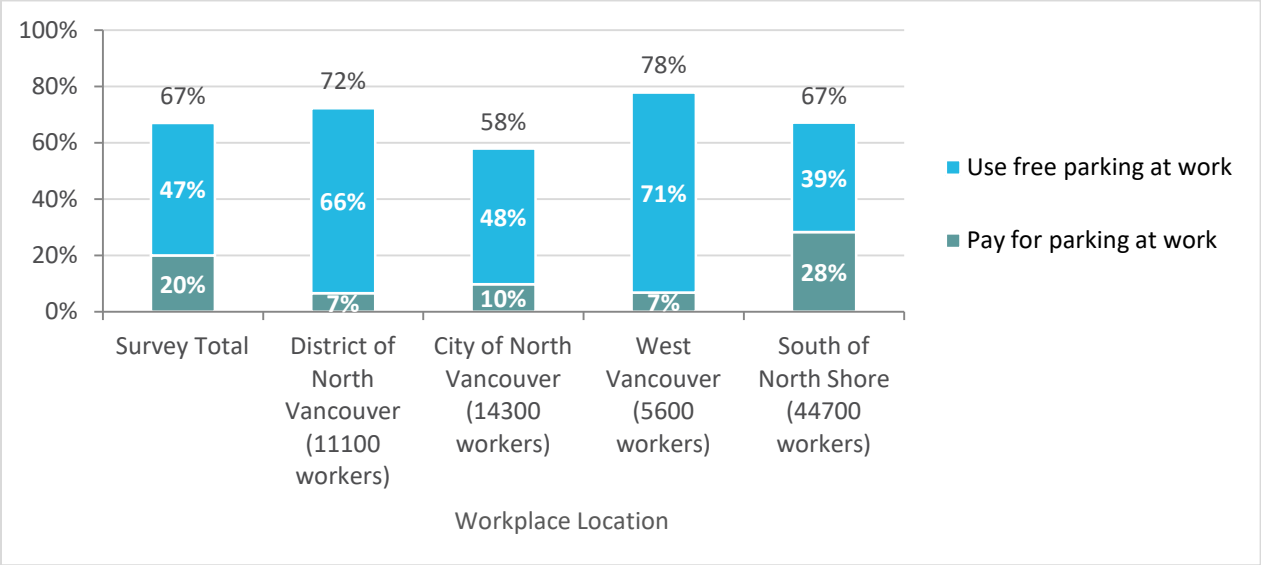


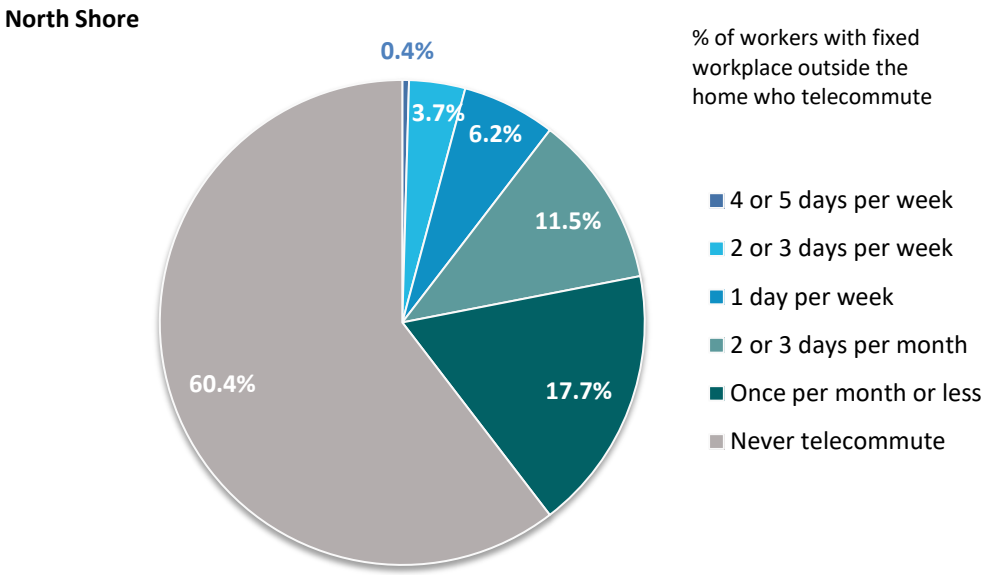
Table 18. Use of Parking at Work by Sub-municipal Zone of Workplace Location

Workplace Location on North Shore:	Zone 1: DNV (East)	Zone 2: DNV (Central)	Zone 3: DNV (West)	Zone 4: DWV (West)	Zone 5: DWV (Center)	Zone 6: CNV/DWV (Outer)	Zone 7: CNV (Core)	Zone 8: CNV/DNV (East)
Pay for parking at work	10%	0%	4%	4%	8%	7%	13%	4%
Use free parking at work	58%	83%	69%	72%	70%	53%	38%	96%
Total who park at work	68%	83%	73%	76%	78%	61%	50%	100%

5.1.5 Telecommuting

Figure 65 shows the frequency of telecommuting for survey participants who have their usual workplaces outside of their homes. Around 60% never telecommute. A little over 10% regularly telecommute at least once per week, with another 12% doing so 2 or 3 days per month. The remaining 18% telecommute once per month or less. This survey was conducted in Fall 2019 and therefore is expected to form an important baseline for future surveys to see how the COVID-19 pandemic might change workplace commutes and telecommuting even after health risks have been contained and economies recover.

Figure 65. Frequency of Telecommuting



5.1.6 Satisfaction with Usual Commute Mode

Overall, 57% of survey participants who work at a usual workplace outside the home are satisfied or very satisfied with their commute, while one-quarter (25%) are dissatisfied or very dissatisfied (**Figure 66**). These figures vary by municipality, with 69% of residents of DWV satisfied with their work commute, compared to 51% of DNV residents and 58% of CNV residents. Of note, when the data were examined by location of work, 28% of those working south of the North Shore were dissatisfied with their commute compared to just 17% who live and work on the North Shore. Satisfaction with work commutes varies by usual commute mode (**Figure 67**). A total of 31% of auto drivers are dissatisfied compared to 19% of transit commuters, and 9% of walk commuters. No usual bike commuters surveyed indicated dissatisfaction with their commute (with 85% of bike commuters being satisfied or very satisfied).

Figure 66. Satisfaction with Commute by Municipality of Residence[27]

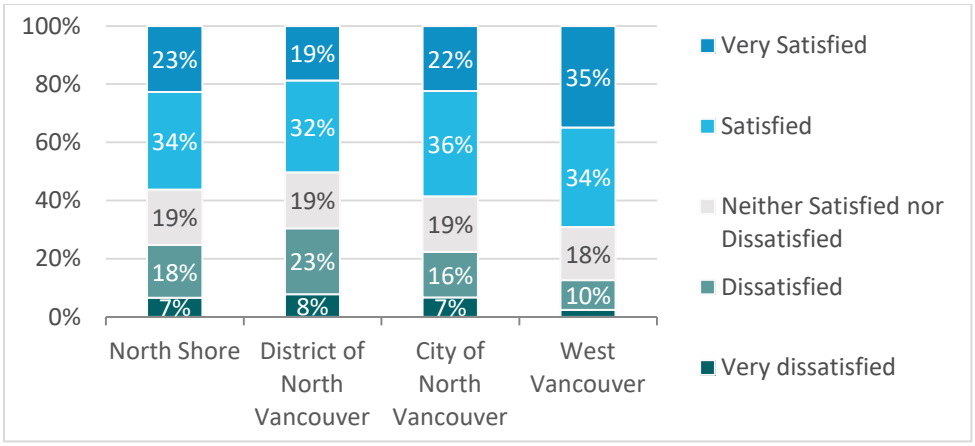
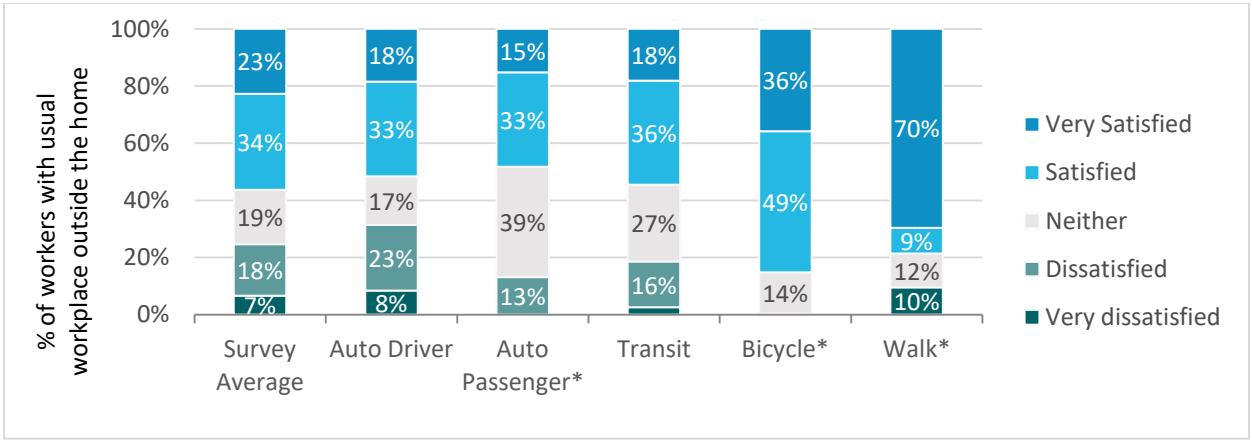


Figure 67. Satisfaction with Commute by Usual Commute Mode[28]

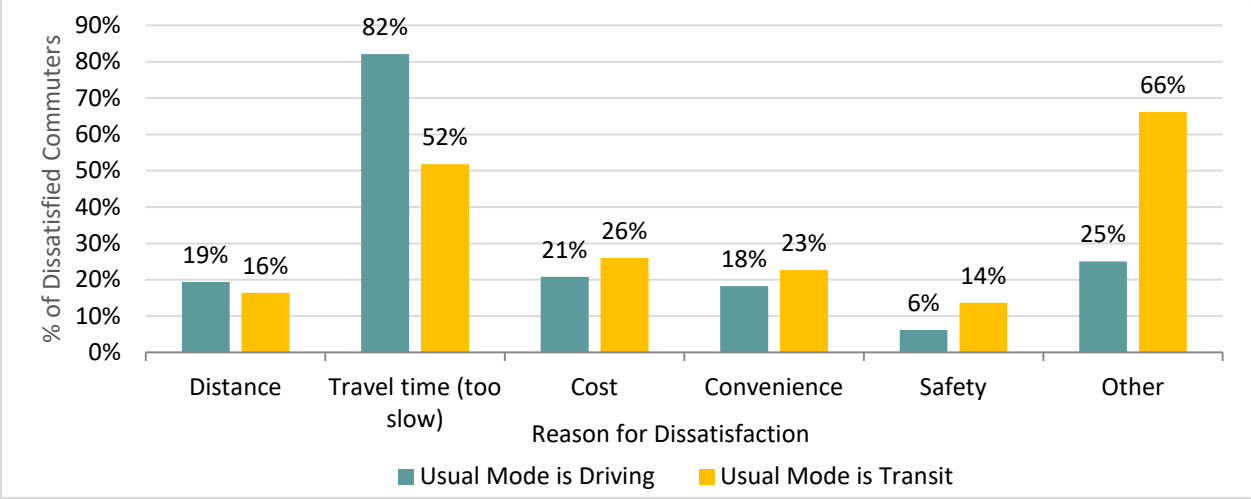


[27] The small 'very dissatisfied' proportion (2%) for West Vancouver residents is not listed due to the small size of the segment.

[28] Interpret results marked with an asterisk (*) with caution due to smaller sample sizes.
The figure for the small 'very dissatisfied' proportion (3%) for Transit is not listed due to the small size of the segment.

Those dissatisfied with their commute were allowed to select multiple reasons for their dissatisfaction. **Figure 68** presents reasons for dissatisfaction, for dissatisfied drivers and transit users. The results for walkers and cyclists are not analysed due to the very small sample of survey participants who are dissatisfied with their travel to work using these modes. Of those dissatisfied, over four-fifths (82%) of car commuters stated that travel time was a reason for their dissatisfaction with their commute, with "travel time" in this context meaning that the commute is "too slow", not necessarily that it is too far. This compares to half (52%) of dissatisfied transit commuters who gave travel time as a reason. Dissatisfied transit commuters were more likely than car commuters to indicate cost, convenience, safety or other reasons. Specific other reasons for dissatisfaction cited by car commuters included congestion generally, congestion on bridge crossings, and construction. Specific other reasons for dissatisfaction cited by transit commuters included bus crowding, late buses / inconsistent timing, and scheduled frequency.

Figure 68. Reasons for Dissatisfaction with Commute



5.2 Usual Non-Commute Mode

Figure 69and Figure 70 shows the usual mode share for non-commute trips. The usual non-commute trips include trip purposes of shopping, meeting friends and family, recreation and other discretionary trip purposes. The stated mode preference does not necessarily follow the actual daily trip mode shares collected as part of the survey (as reported in Section 4.3 of this report). CNV has generally higher percentages for walking and transit trips compared to DNV and DWV. CNV has a lower percentage for auto driver trips (66%) compared to DNV and DWV (79% and 77% respectively).

Figure 69. Usual Mode Share for Non-Commute Trips by Municipality

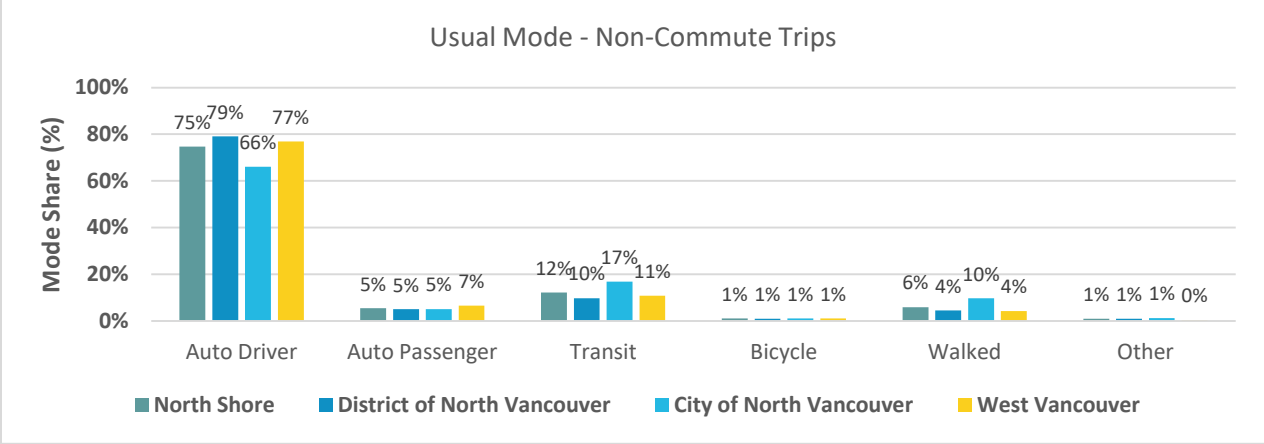
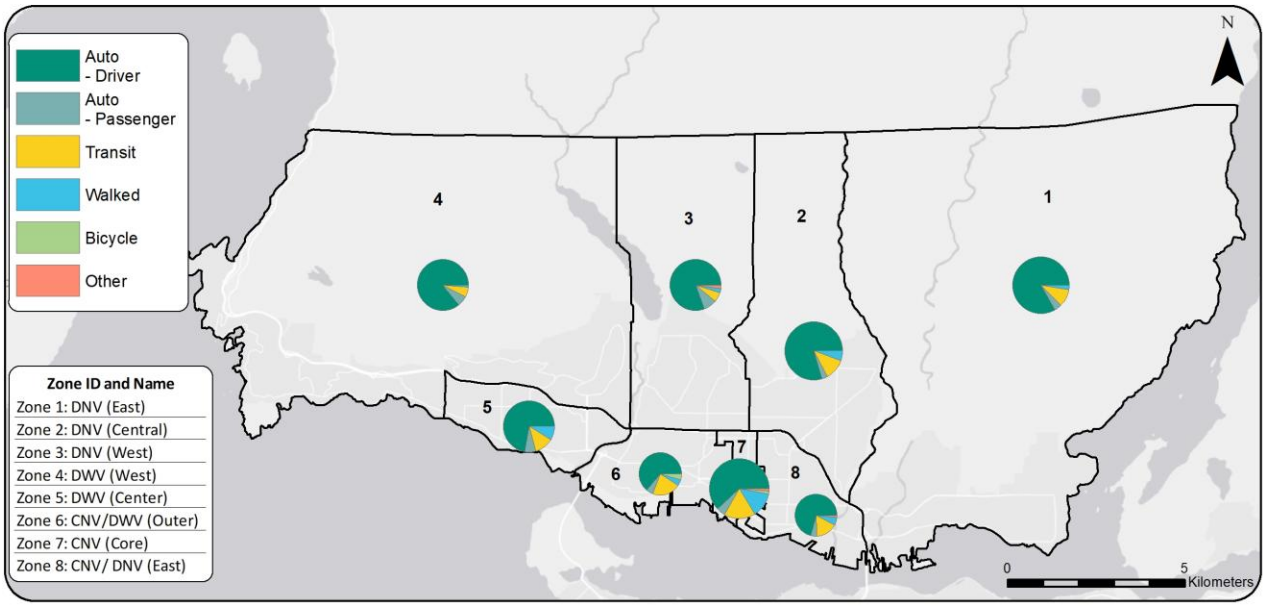


Figure 70. Map of Usual Mode Share for Non-Commute Trips by Sub-Municipal Zone



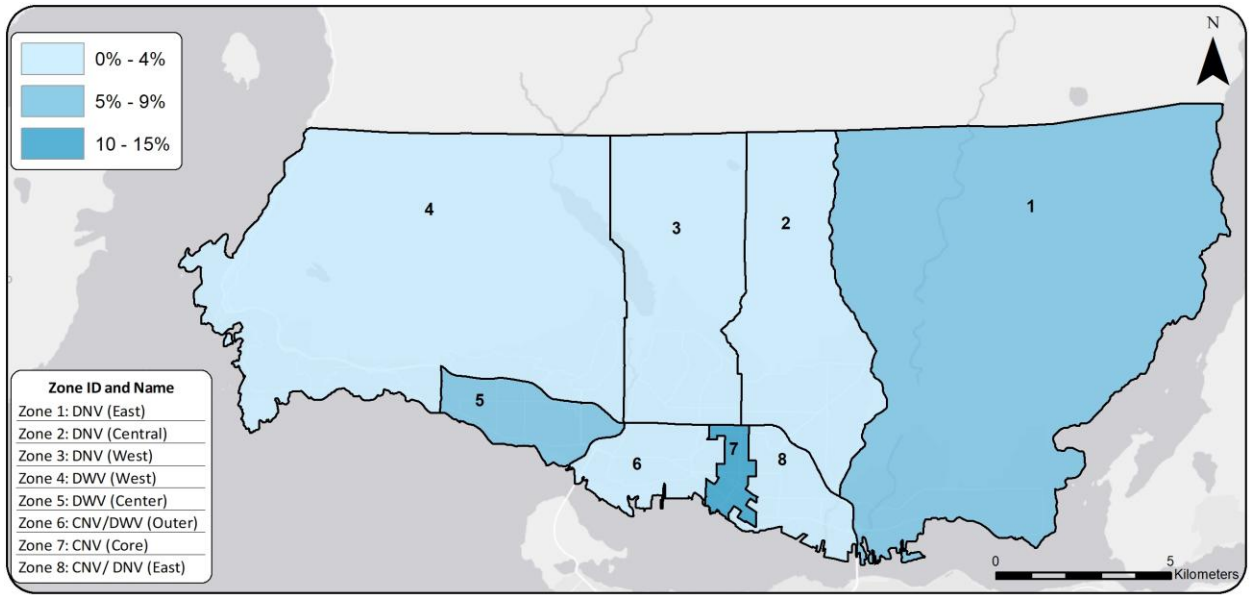
5.3 Walking

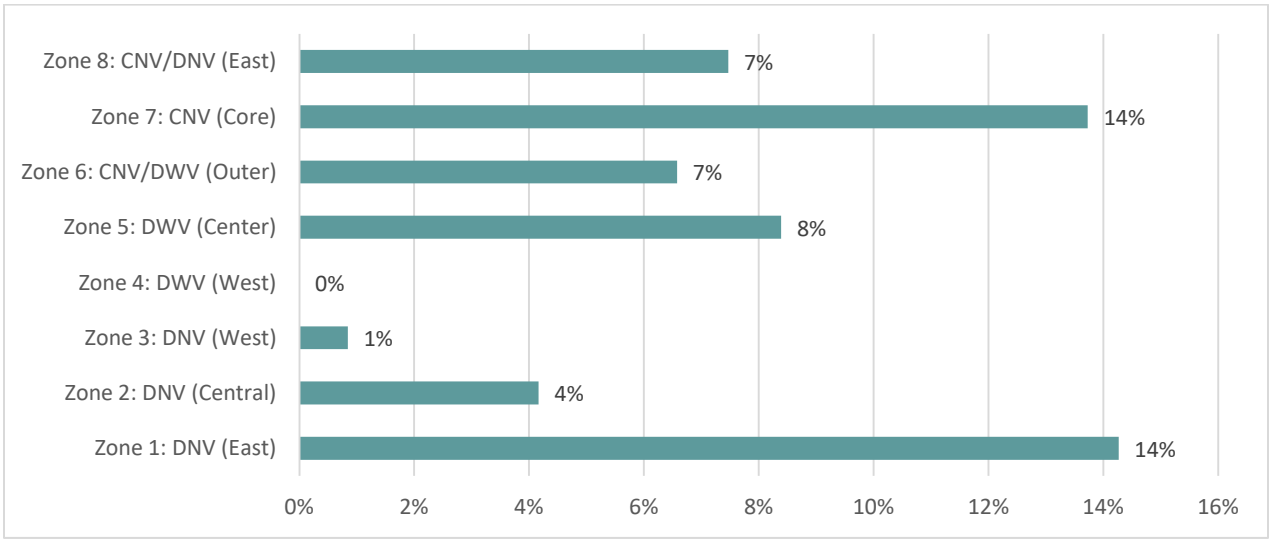
5.3.1 Walking for Commutes

This section provides the overall walking travel patterns within the North Shore. **Figure 71** shows the percentage of the population (age 15+) who commute by walking to work or school.

Zone 1 DNV (East) and Zone 7 CNV (Core) have the highest percentage of walk commute mode with 14%, each. Zone 4 (DWV) and Zone 3 DNV (west) have the lowest percentage of walk commute trips with less than 1%.

Figure 71. Map of Percentage of Population 15+ Who Walk for Usual Commute to Work or School – by Zone





5.3.2 Perception of Reasonable Walking Distance

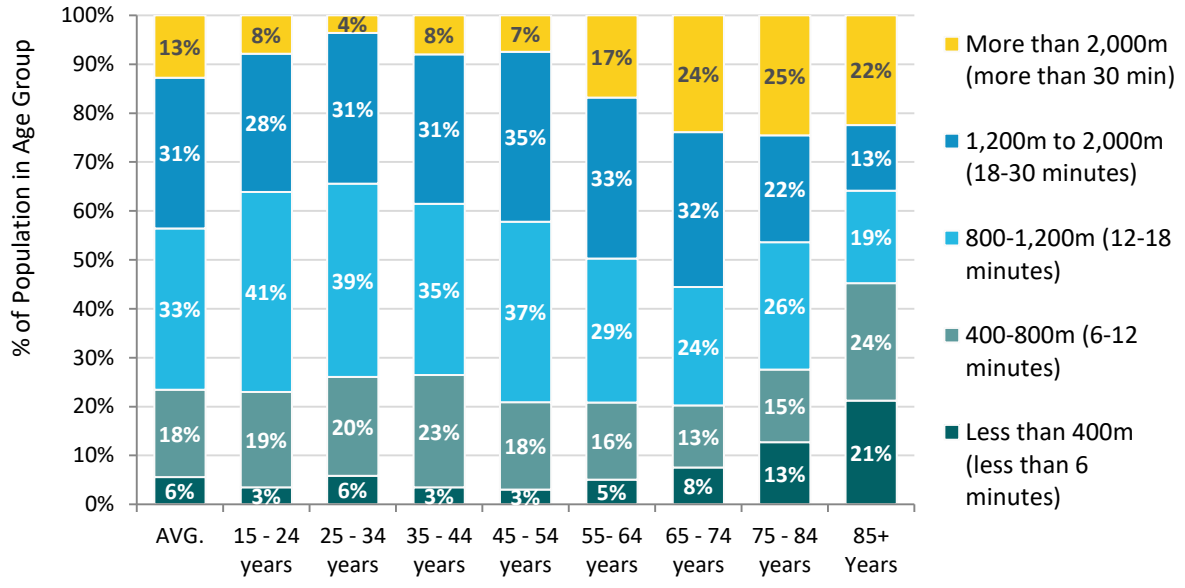
Survey participants were presented with a set of distance ranges and asked what they would consider to be a reasonable walking distance. **Figure 72** presents the results for this question by ten-year age group. Overall, 44% of residents surveyed consider distances of up to 2 km as reasonable to walk (with 13% believing more than 2km is also reasonable). One-third consider 800-1,200 metres to be reasonable, while 18% consider 400-800 metres reasonable and 6% would not consider distances of more than 400 metres.

The proportion of the population that considers longer distances reasonable appears to increase with age.

- 50% of those 55 to 64 and 56% of those 65 to 74 consider distances of up 2 km as reasonable (with 17% and 24%, respectively, of the opinion that more than 2 km is reasonable).
- This compares to between 35% and 39% of those in the 15 to 24, 25 to 34, and 35 to 44 age brackets who consider that trips of up to 2 km are reasonable (with 8% of fewer considering more than 2 km as reasonable).
- Above the age of 75, opinion becomes somewhat polarized. While 45% indicated that they consider shorter distances reasonable (21% less than 400 m; 24% 400-800 m), perhaps in consideration of physical limitations that may be more likely with age, fully 35% thought that distances of greater than 1,200 m were reasonable (13% from 1,200 m to 2 km; 22% more than 2 km).

In practice, amongst those who walk, over 90% of daily trips recorded by the survey were within 1.7 km in length, with a bit less than 10% exceeding this distance (see Section **4.5** earlier in this report).

Figure 72. Perception of Reasonable Walking Distance by Age Group



5.4 Cycling

5.4.1 Cycling Frequency

The frequency with which survey participants cycle is presented in **Figure 73**. Overall, just under (48%) of residents reported ever riding a bicycle, with 13% doing so at least twice per week in fair weather (5% at least five times per week and 8% at least twice per week), with this figure being 6% for rainy weather, while the remainder cycle less often. Overall, just over half (about 53%) of the population never rides a bicycle (47%) or is physically unable to ride a bicycle (5%).

Table 19 shows the percentage of the population 15+ years of age who cycle two or more times per week by municipality. DNV has the highest percentage with 16% who bike at least twice per week in fair weather and 7% in rainy weather. Table 20 shows the percentage of the population who cycle two or more times per week by sub-municipal zone. Zone 6 CNV/DWV (outer) has the highest percentage of regular cyclists with 16% in fair weather and 15% in rainy weather. Of note, CNV has the lowest cycling percentages. This may be a function of the proximity of amenities to CNV residents' homes, as evidenced by the CNV having higher walk mode shares than the other municipalities and proportionately more people living in apartments, for whom bicycle storage may sometimes be a challenge. (See Section **4.3.1** for daily trip mode shares and Section **3.2** for dwelling types.)

Figure 73. Percentage of Population 15+ Who Ride a Bicycle in Fair Weather vs. Rainy/Cold Weather

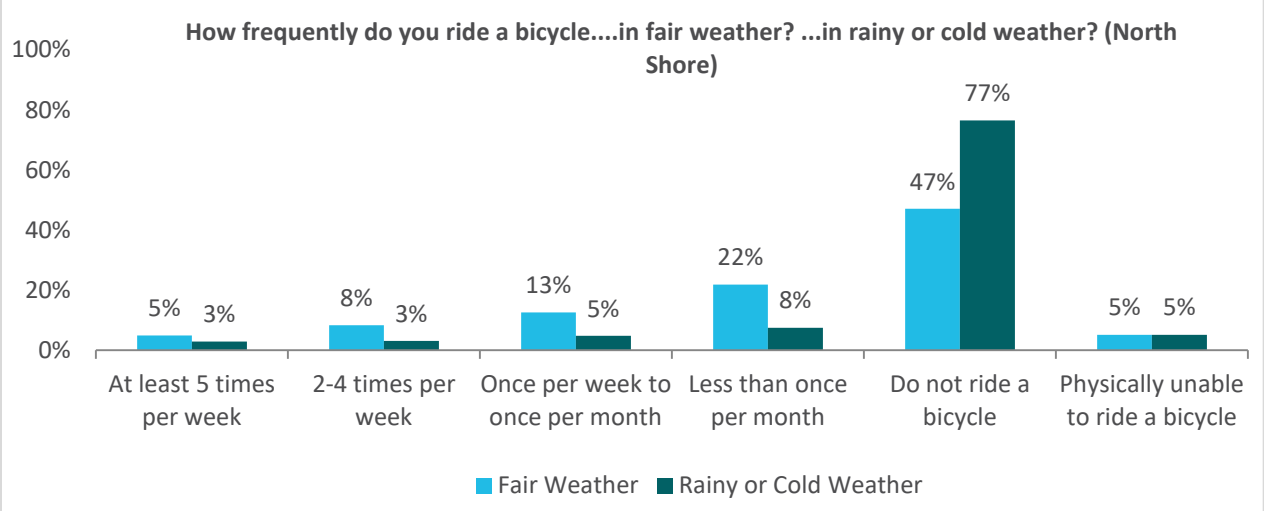


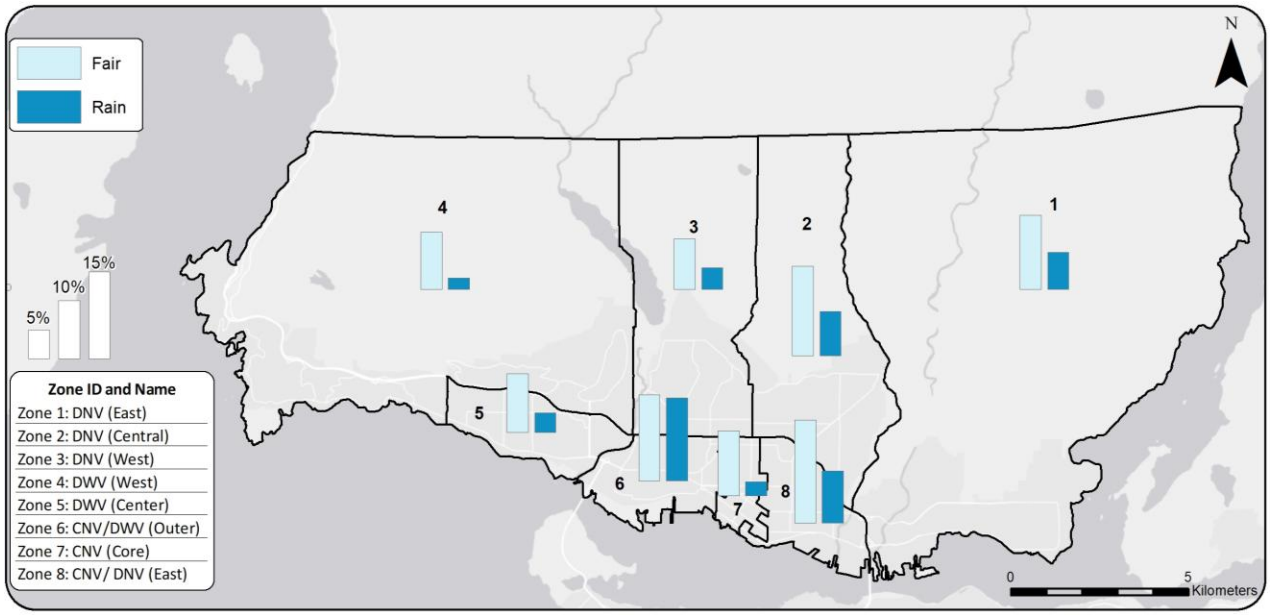
Table 19. Cycling Frequency in Fair Weather vs. Rainy/Cold Weather by Municipality

	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
At least twice per week in fair weather (#)	20,760	11,210	5,080	4,470
At least twice per week in fair weather (%)	13%	16%	11%	12%
At least twice per week in rainy weather (#)	9,360	5,340	2,380	1,640
At least twice per week in rainy weather (%)	6%	7%	5%	4%

Table 20. Percentage of Population Who Cycle Two or More Times per Week – by Zone

	Zone 1: DNV (East)	Zone 2: DNV (Central)	Zone 3: DNV (West)	Zone 4: DWV (West)	Zone 5: DWV (Center)	Zone 6: CNV/DWV (Outer)	Zone 7: CNV (Core)	Zone 8: CNV/DNV (East)
At least twice per week in fair weather	14%	17%	9%	11%	11%	16%	12%	19%
At least twice per week in rainy weather	7%	8%	4%	2%	4%	15%	3%	10%

Figure 74. Map of % of Population Who Cycle at Least Twice Per Week in Fair Weather and in Rainy Weather by Zone



5.4.2 Interest in Cycling More

Figure 75 shows the percentage of the North Shore population 15+ years of age who would like to travel by bicycle more often, overall and by municipality, while **Table 19** provides more detail on the survey responses. Almost 36% of survey participants in the North Shore are interested in travelling by bicycle more often. This interest is slightly less in DWV compared to DNV and CNV. Almost 19% of North Shore residents are happy with their current cycling frequency. Residents of DWV have the highest percentage of people who are not interested in cycling at all.

Figure 75. Percentage of Population 15+ Who Would Like To Travel by Bicycle More Often – by Municipality

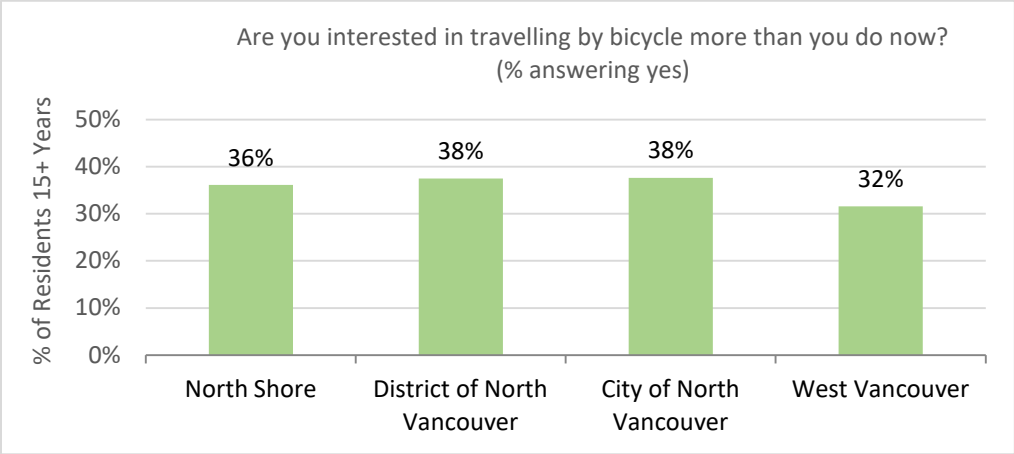


Table 21. Detailed Responses to Question on Cycling More (% of Residents 15+) [29]

	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
Yes, interested in cycling more	36%	38%	38%	32%
No, I am happy with current cycling frequency	19%	22%	17%	18%
No, I want to travel less by bicycle	2%	1%	2%	2%
No, I am not interested in cycling at all	37%	35%	38%	41%
Physically unable to ride a bicycle	5%	5%	5%	7%

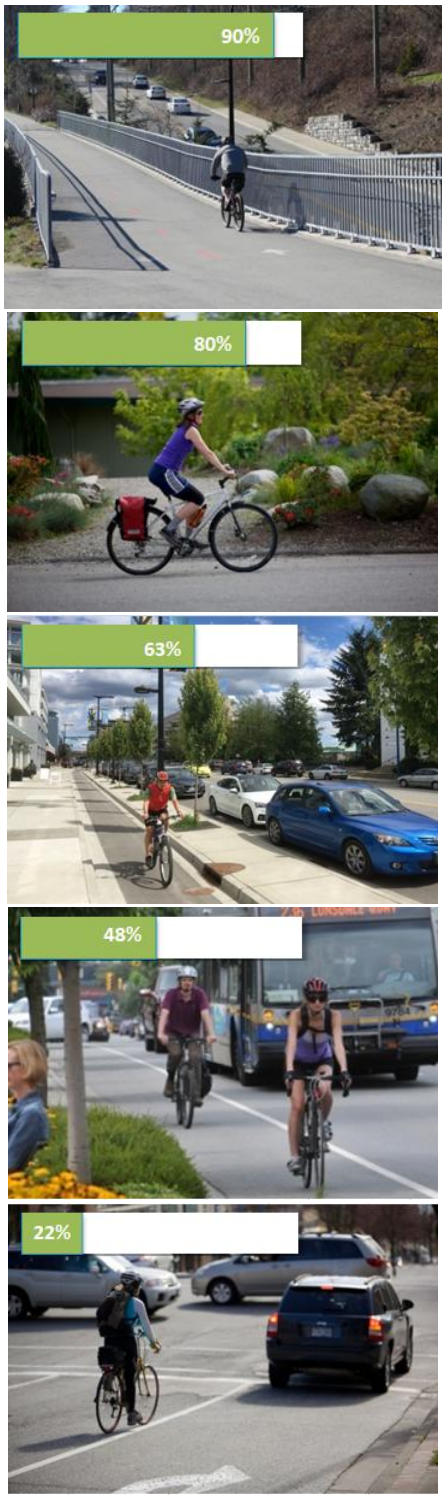
5.4.3 Cycling Environments Residents are Most Comfortable Cycling In

Figure 76 illustrates the extent to which North Shore residents 15+ years of age are comfortable cycling in different types of cycling environments or cycling facilities. Survey participants could choose multiple environments that they felt comfortable cycling in. The denominator for the percentages excludes the 45% of residents who have no interest in cycling at all or who are physically unable to cycle. The results indicate that 90% of people who currently cycle or are interested in cycling are comfortable using a separate bicycle path far from motor vehicles. Comfort levels decline for other types of cycling facilities, with a low of only 22% of survey participants feeling comfortable with cycling on city streets with no dedicated cycling facilities. As shown in Figure 77 below, the level of comfort seems to be very similar across municipality with a slightly higher level of comfort for residents of DNV and CNV.

[29] Table excludes a small number of non-responses.

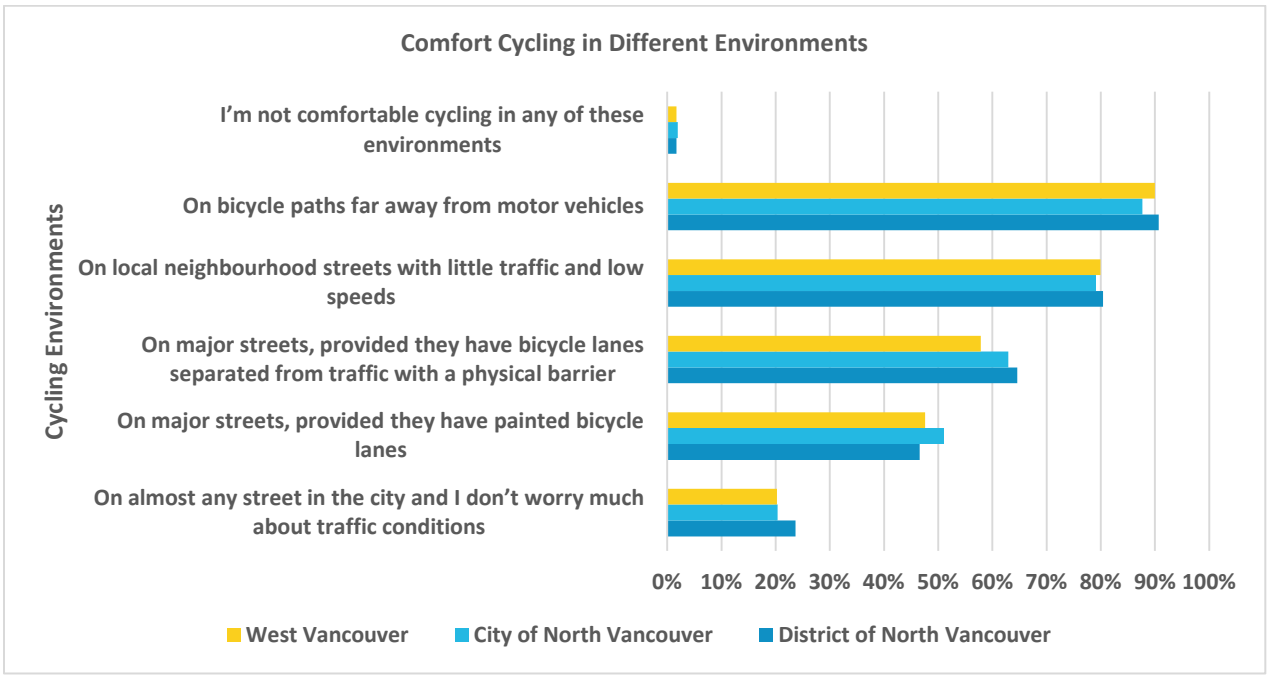
Figure 76. Comfort Cycling in Different Cycling Environments (% of Residents 15+ who Cycle or who are Interested in Cycling)

Comfort Cycling in Different Environments



Excludes 45% of residents 15+ years with no interest in cycling (39%) or who are physically unable to cycle (5%).

Figure 77. Comfort Cycling in Different Cycling Environments by Municipality



5.5 Transit

As seen in Sections **4.3** and **5.1** above, just over one in ten trips (10.5%) made on weekdays are via public transit, with transit being the second largest mode of transportation for workers and the largest mode for students. As illustrated in **Figure 78**, the survey results indicate that the residents of CNV are more likely to take public transit, with 64% saying that they take public transit at least once per month (with 28% saying they take it multiples times per week). The percentage of public transit users is lower in DNV and DWV, at around 48% of residents.

Figure 78. Frequency of Transit Use by Municipality

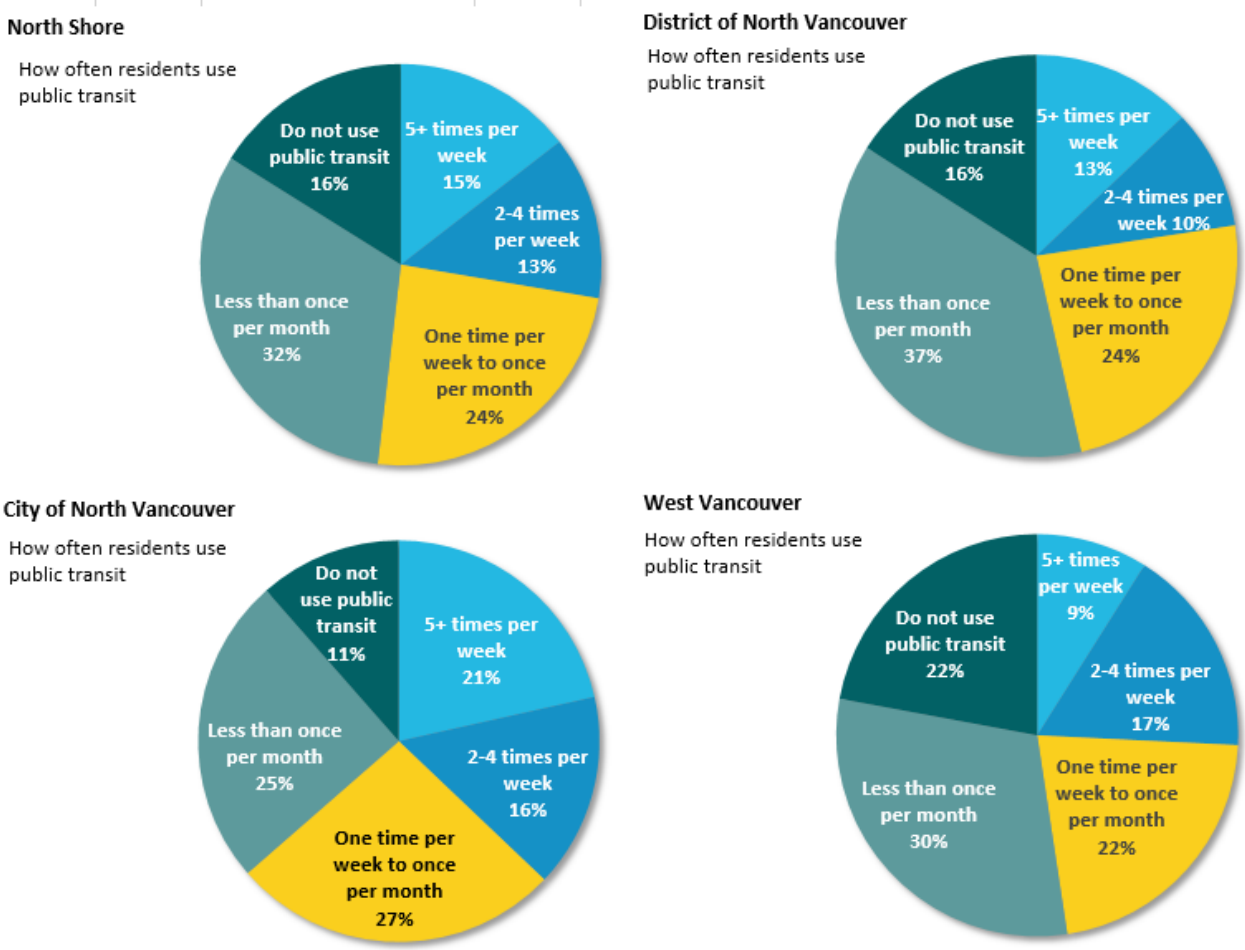
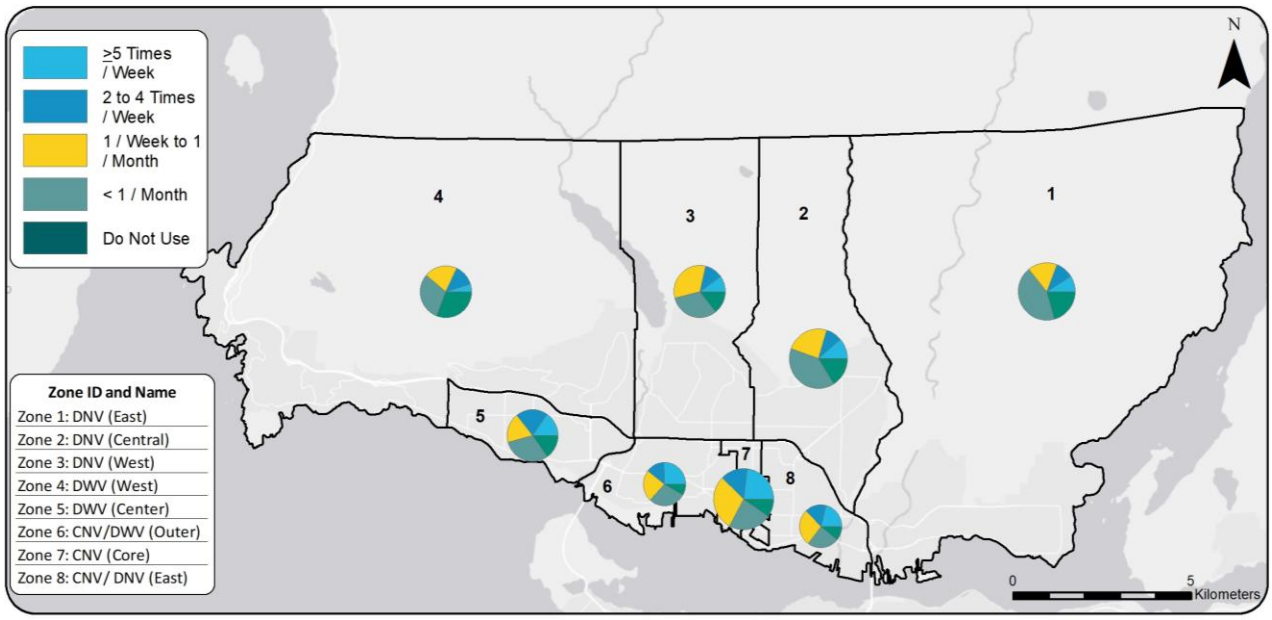


Figure 79. Map of Frequency of Transit Use by Sub-municipal Zone



As shown in **Figure 80**, Zones 5, 6, 7, and 8 all have relatively high proportions of residents who use transit at least twice per week (35% to 39%), with many of these being daily or almost daily transit users (between 15% and 25% who use transit 5+ times per week). By comparison, zones 1, 2, 3, and 5 have between 18% and 21% of residents who use transit at least twice per week with a more modest proportion who use transit daily or almost daily (between 5% to 11%).

Figure 80. Regular Transit Use by Sub-municipal Zone

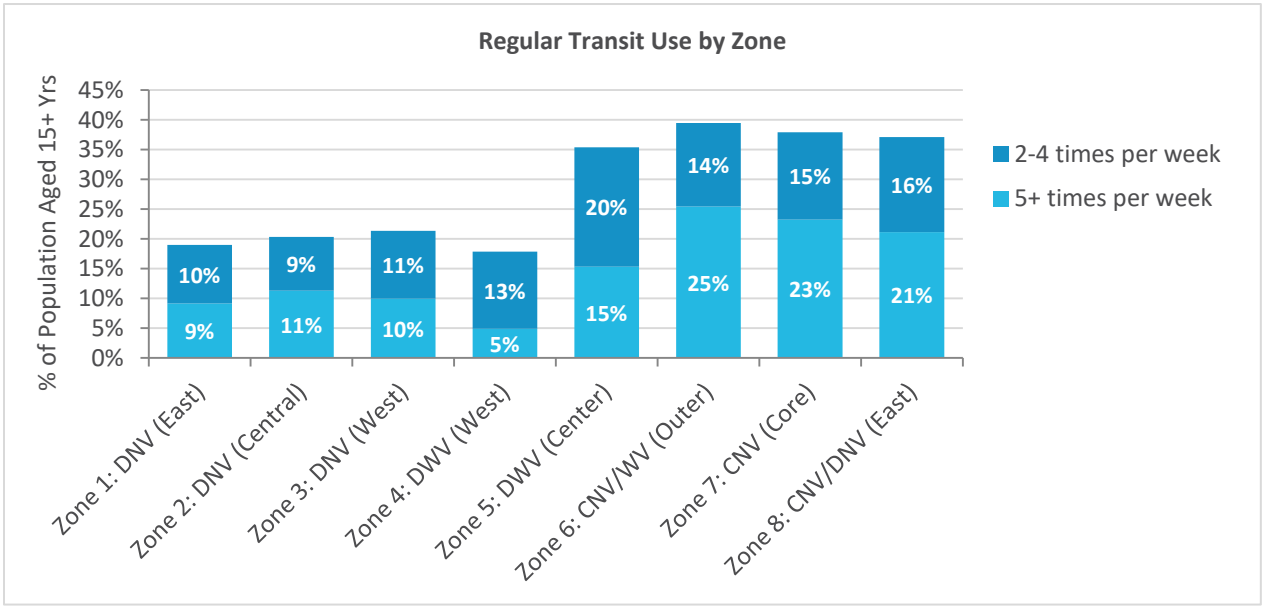
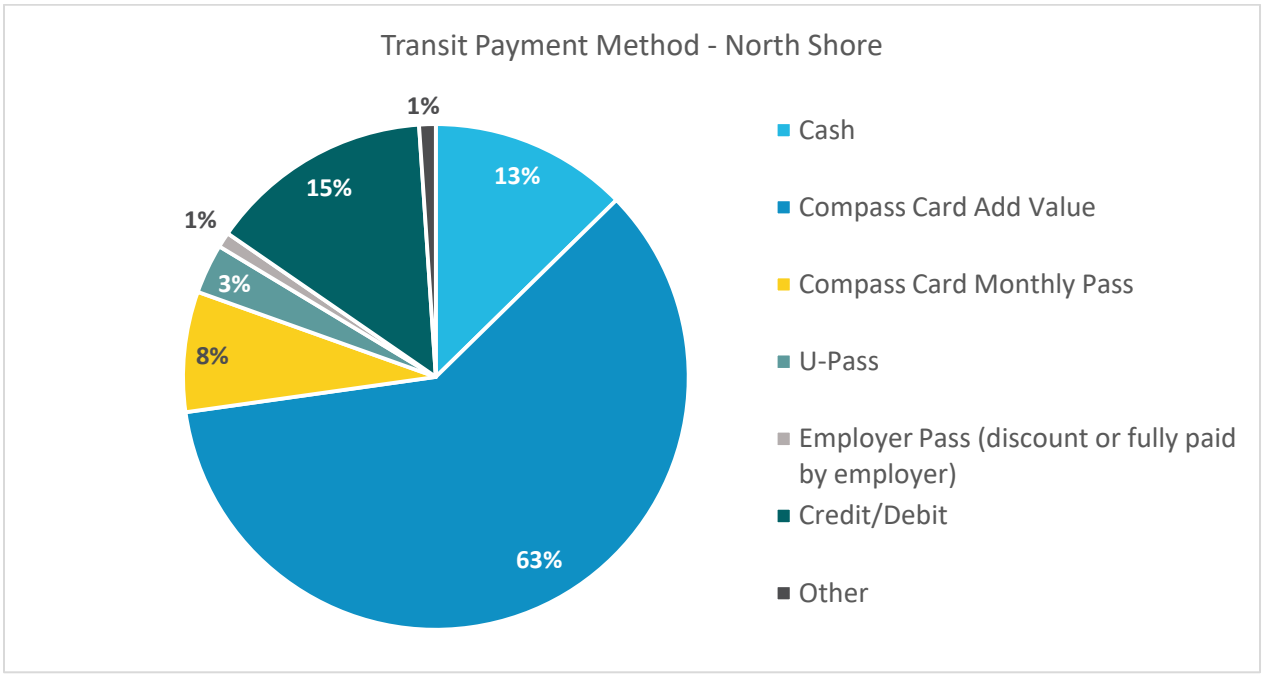


Figure 81 shows the usual method of payment for public transit on the North Shore. The Universal Transit Pass or U-Pass is a form of monthly pass available to students enrolled in 10 post-secondary institutions across the lower mainland that gives access to bus, Skytrain, and SeaBus service. The survey results suggest that most common form of fare payment used by North Shore residents is the Compass card, with 63% using the Add Value Compass Cards and 8% using Compass Card Monthly Passes. The 13% who indicated that they pay via cash would include single-use or DayPass Compass tickets purchased with cash at Compass Vending Machines (CVMs) as well as cash fares paid when boarding transit. The combined shares of monthly passes, U-Passes, and employer passes makes up 12% of the payment methods, which is consistent with other survey results that indicate that 15% of residents take transit five or more times per week.

Figure 81. Transit Payment Method

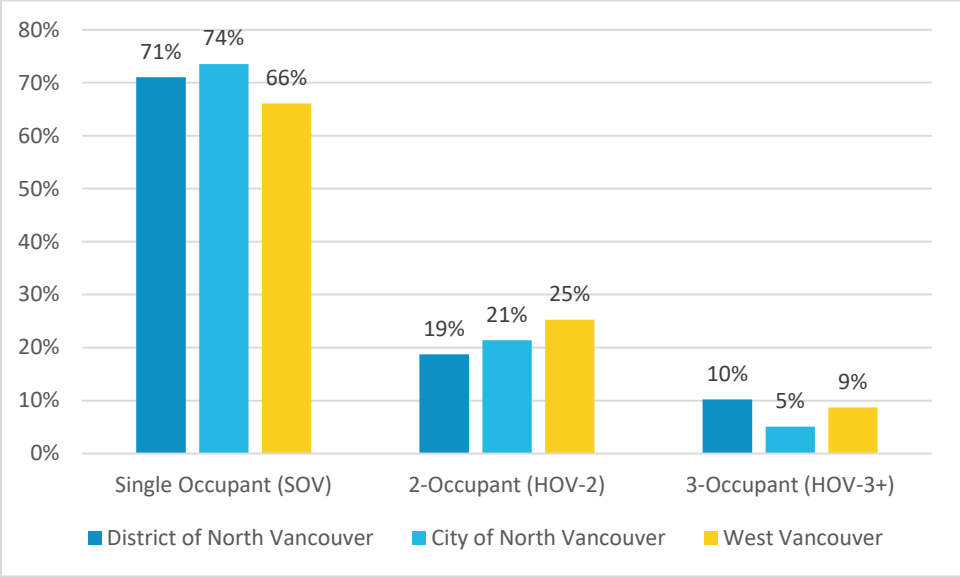


5.6 Automobile Trips

5.6.1 Vehicle Occupancy

Figure 82 shows the vehicle occupancy by municipality. Single Occupancy Vehicle trips compromise the highest percentage of vehicle trips on the North Shore with CNV having the highest SOV percentage at 74%. DWV had the highest percentage of High-Occupancy Vehicle trips, with HOV-2 and HOV-3 trips representing 25% and 9% of vehicle trips, respectively.

Figure 82. Vehicle Occupancy by Municipality



5.6.2 Vehicle Parking

Table 22 presents the type of parking reported for auto driver trips to North Shore destinations. Use of on-street parking is highest in Zone 3 DNV (West) and Zone 7 CNV (Core), with 30% and 29% of all vehicle trips destined to these locations using on-street parking.

Table 22. Type of Parking by Destination Municipality and Sub-Municipal Zone

	North Shore Total	DNV	CNV	DWV	Zone 1 DNV East	Zone 2 DNV Central	Zone 3 DNV West	Zone 4 DWV West	Zone 5 DWV Center	Zone 6 CNV /DWV	Zone 7 CNV Core	Zone 8 CNV /DNV E
Vehicle Trips	320,880	135,930	87,430	97,510	42,410	38,560	37,960	37,590	59,300	34,880	52,410	50,780
On-street	23%	20%	31%	20%	13%	19%	30%	18%	22%	22%	29%	15%
Off-street	74%	77%	66%	77%	85%	78%	67%	80%	74%	75%	46%	42%
Unknown	3%	2%	3%	3%	3%	3%	2%	2%	4%	3%	25%	43%

Vehicle Trips = trips with primary mode of Auto Driver with destination on the North Shore.
On-street = parking location was on a city street. Off-street = parking in a parking lot, driveway, or parkade.

5.7 Walkability and Bikeability of Motorized Trips

The surveyed trips were examined to determine the extent to which trips that were made using a motorized mode could have feasibly utilized an active mode instead (i.e. walking or cycling). The distance threshold for a "bikeable" trip was set at 4.6 km, based on the finding that 90% of reported cycling trips had an estimated actual cycling distance within this distance. The distance threshold for a "walkable" trip was set at 1.6 km, based on 90% of reported walking trips having an estimated actual distance on existing sidewalks and pathways within this threshold. For trips taken using motorized modes, the trip origin, destination, and time of day were processed to determine the estimated actual cycling and walking distances via the most efficient available cycling and pedestrian routes. If the cycling or walking distance was found to be within the appropriate threshold, the trip was deemed bikeable or walkable for the purposes of this analysis.

Figure 83 illustrates the percentage of daily motorized trips for each of the current mode shares that may be considered walkable or bikeable based on distance alone. Around 45% of auto driver trips (19% of total daily trips by all modes) are bikeable, while 16% of auto driver trips are walkable (11% of total daily trips by all modes). This suggests that 19% of total daily trips are within an appropriate distance for potential mode-shifting from auto driver to cycling, with 11% that could be shifted from driving to walking.

Of auto passenger trips, 48% are bikeable and 11% are walkable, although the volume of auto passenger trips is quite a lot smaller than the volume of auto driver trips. One fifth (20%) of transit trips are bikeable and only a small portion (4%) are walkable. Transit trips are longer on average than trips by other modes, as explored in Section **4.5** of this report. Looking at transit and auto driver trips relative to total daily trips by all modes, walkable trips for each of these modes represent less than 1% of total daily trips, bikeable auto passenger trips represent 3% of total daily trips, and bikeable transit trips represent 2% of total daily trips. This suggests that even if there is potential for some mode-shifting away from auto passenger and transit, the impact on overall mode shares would be quite modest.

Figure 83. Percentage of Walkable and Bikeable Trips from Current Mode Share – North Shore

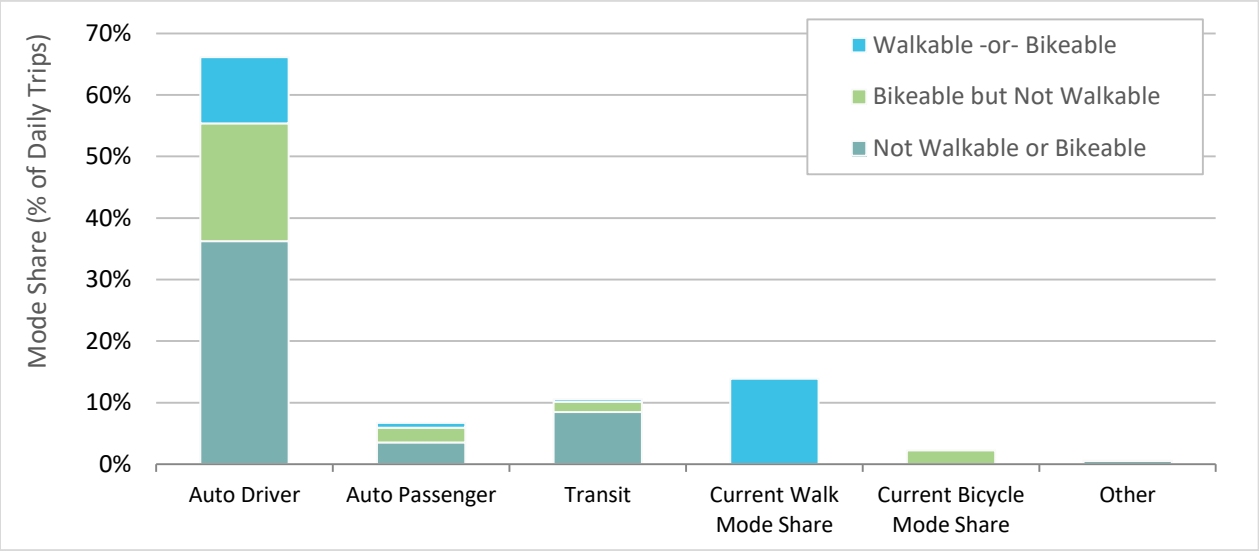


Table 23 provides a breakdown of the bikeable and walkable auto driver trips made by residents of each municipality and sub-municipal zone.

Table 23. Mode Shift Potential by Municipality and Sub-municipal Zone of Residence

	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
Auto Driver Trips	382,900	187,700	87,470	107,730
Auto Driver Mode Share	66%	69%	54%	74%
Bikeable Trips	173,130	78,710	46,780	47,640
% of Auto Driver Trips	45%	42%	53%	44%
Mode shift potential	30%	29%	29%	33%
Walkable Trips	62,200	25,110	17,380	19,710
% of Auto Driver Trips	16%	13%	20%	18%
Mode shift potential	11%	9%	11%	14%

	Zone 1: DNV (East)	Zone 2: DNV (Central)	Zone 3: DNV (West)	Zone 4: DWV (West)	Zone 5: DWV (Center)	Zone 6: CNV/DWV (Outer)	Zone 7: CNV (Core)	Zone 8: CNV/DNV (East)
Auto Driver Trips	63,220	61,730	53,770	64,160	44,550	22,850	41,810	30,800
Auto Driver Mode Share	71%	66%	75%	80%	70%	51%	48%	62%
Bikeable Trips	23,120	28,570	23,580	23,820	23,690	12,880	22,320	15,150
% of Auto Driver Trips	37%	46%	44%	37%	53%	56%	53%	49%
Mode shift potential	26%	31%	33%	30%	37%	29%	25%	31%
Walkable Trips	7,610	9,830	6,430	7,540	11,840	4,720	8,810	5,420
% of Auto Driver Trips	12%	16%	12%	12%	27%	21%	21%	18%
Mode shift potential	9%	11%	9%	9%	19%	10%	10%	11%

It should be noted that this analysis does not take into account real or perceived barriers that may influence the practicability of cycling or walking along a route of a given trip. These may include considerations involving the physical infrastructure in place to support active modes, the physical ability for an individual to make a trip using an active mode, and whether the trip involves the transport of larger cargo that would not be practical to transport on foot or a standard bicycle. Furthermore, trips may have been a part of a broader trip chain with longer travel times or distances that necessitated the use of a vehicle, which also factors into the choice of mode for non-home-based trips. Therefore, the number and proportion of walkable and bikeable trips should be considered an upper limit for the potential to shift these types of trips to active modes.

6 Topical Issues

This section highlights the survey topics of particular interest in the current survey cycle. The survey results for some topical questions have been reported in earlier sections of the report; others are featured in the report sections that follow.

6.1 Summary of Topical Issues

Certain survey questions were included in the 2019 NSTS design in order to provide a better understanding of transportation-related issues of current interest or to inform upcoming policy planning. These questions are not part of the core data requirements for trend tracking, and may not be asked again in the next survey cycles. Some of these questions were of specific topical interest in the 2019 survey cycle only. Other questions may pertain to perceptions, attitudes or travel patterns that may be slow to change. Such questions could alternate full survey cycles (ask every 4 years) or be revisited much later (for example, every 10 years), unless there is a distinct policy need to ask them sooner.

Topical questions in the 2019 NSTS that do not necessarily need to be asked about in the next survey cycle are as follows:

- Parking availability at home (Section **3.7.6**, page **43**)
- Perception of reasonable walking distance (reported in Section **5.3.2**, page **82**)
- Interest in cycling more (Section **5.4.2**, page **84**)
- Level of comfort cycling in different environments (Section **5.4.3**, page **85**)
- Interest in e-bike share services (reported below, Section **6.2**, page **94**)
- Impact of November 2019 transit strike (reported below, Section **6.3**, page **96**)

Whether to include any of the topical questions in future survey cycles will be a subject of discussion for planning for the next cycle of the NSTS. A short update survey will be conducted in the fall of 2020 which will maintain contact with the panel of participants who agreed to participate in future surveys. The updated survey may include a few new topical questions, but will not capture detailed information on travel patterns. The next full cycle of the NSTS will be conducted in the fall of 2021. Whether any of the above questions are asked again in the 2021 cycle will be considered, although it might be expected that not all would be.

6.2 Interest in E-Bike Share Services on the North Shore

Survey participants were presented with the following context and question about their interest in using an e-bike share service, were one offered for the North Shore:

> *New shared electric micromobility services such as e-bikes and e-scooters are becoming more common in major cities. In some cities, shared e-bikes are available across the city. Users pay a fee per minute, hour, day or monthly subscription to access the e-bikes. To go on a trip, a user will unlock the e-bike with a smart phone or key fob and ride to their destination, where they drop off the e-bike for someone else to use next.*

How interested would you be in using an e-bike share service on the North Shore?

Figure 84 illustrates the response to this question, overall and by municipality. In total, 30% of survey participants indicated that they would be very interested (14%) or moderately interested (16%). By municipality, the level of positive interest varied only somewhat (from 12% to 15% very interested and from 16% to 17% moderately interested). Responses are detailed by zone in Table 24.

It should be noted that the survey only captured an expression of interest in a North Shore e-bike service, the potential pool of interested residents, but not necessarily the achievable market. Translation of interest into actual choices to use an e-bike service would take place when individuals weigh their interest against actual costs, availability, convenience, and/or restrictions.

Figure 84. Residents' Level of Interest in an E-Bike Service

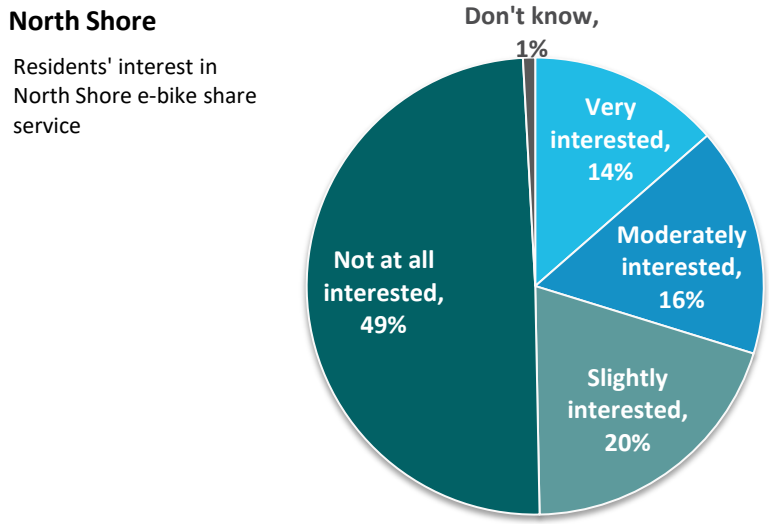


Table 24. Level of Interest in North Shore E-Bike Service by Municipality and Sub-Municipal Zone

Level of interest in North Shore e-bike share service	North Shore Total	DNV	CNV	DWV	Zone 1 DNV East	Zone 2 DNV Central	Zone 3 DNV West	Zone 4 DWV West	Zone 5 DWV Center	Zone 6 CNV /DWV	Zone 7 CNV Core	Zone 8 CNV /DNV E
Very interested	14%	14%	15%	12%	10%	15%	13%	9%	13%	17%	15%	21%
Moderately interested	16%	16%	17%	16%	18%	13%	17%	21%	13%	19%	18%	10%
Slightly interested	20%	20%	24%	15%	24%	20%	24%	15%	13%	18%	19%	28%
Not at all interested	49%	49%	43%	57%	48%	50%	46%	56%	61%	46%	46%	41%
Don't know	1%	1%	1%	0%	0%	2%	1%	0%	1%	1%	2%	0%

6.3 Impact of November 2019 Transit Strike

The survey was administered between October 22, 2019 and December 13, 2019. Unionized employees of the Coast Mountain Bus Company (CMBC), which operates the SeaBus and most bus service in Metro Vancouver, and British Columbia Rapid Transit (BCRT), which runs the SkyTrain Expo and Millennium Lines, undertook job actions from November 1, 2019 through November 27, 2019. During this period, some transit bus, SkyTrain, and SeaBus services were affected by actions ranging from transit operators working out of uniform, refusal of overtime on alternating days, and reductions in service. Disruptions to individual routes occurred on a rotating basis, but a system-wide shut down was never implemented. Survey administration continued throughout the period of the job actions, although the final mail out of invitations letters to target low-response areas delayed until after the strike actions were over. Overall, 899 of the 1,905 survey completions were obtained during the job action period.

Once the job actions were announced, additional survey questions were added to help assess the impact to travel behaviour of residents of the North Shore. The unweighted survey results for just the survey participants with travel dates of November 1-27, 2019 are reported in **Table 25**. Overall, only 6% of survey participants during the strike period reported that their travel was affected by job actions on their travel day. Approximately 2.2% changed their mode of travel (the affected trips which taken across the dataset including participants outside the travel dates could make from a 0.5% to 1% difference in transit mode shares), while 0.7% took fewer trips and 0.2% took more trips. Other impacts experienced by small percentages of residents included travel taking longer, more congestion, and changes to when residents travelled.

In processing the 2019 survey data, no action was undertaken to add trips or modify modes, as the strike action did not result in a complete system-wide service shutdown and only a small proportion of participants reported impacts. However, as evidenced above, effects were felt by some residents. This may be a minor caveat to longitudinal comparisons of daily trip results captured in future survey cycles against the 2019 baseline. It is important to note that the brief transit strike action would not affect various other metrics such as access to vehicles, access to bicycles, work status, reported usual mode of travel, and so on.

Table 25. Job Action Impacts (% of Participants Surveyed During Job Action Period[30]

	% of Participants
Total affected by strike (% with travel days from Nov 1-27 for whom strike affected travel)	**6.0%**
Used another mode of travel (I would normally have taken transit, so drove, took a taxi, or used another mode to travel the same places as usual)	2.2%
Made fewer trips (I could not travel to certain places as transit was not available)	0.7%
Made more trips (I had to drive someone else to work or school or errands who would normally take transit)	0.2%
I changed the time(s) of at least one of my trips (I travelled at a different time due to reduced or cancelled transit service)	1.4%
Transit trips took longer (I took different routes, transit ran slower, wait times were longer)	0.6%
Other trips took longer / congestion (more cars on the road)	0.8%
Other impacts	1.3%

[30] Individual percentages add to greater than the total affected due to multiple responses.

6.4 Impact of COVID-19 on Travel Patterns

The COVID-19 pandemic has had profound impacts on travel for work, school, recreation, and most other discretionary purposes since March of 2020.

The results in this report are written up as if they are current behaviours, although that is not obviously the case at present. The trip-level results are typical of an average fall day in 2019 and the travel behaviours examined are those prior to the implementation of COVID-19 restrictions and their related economic impacts. The theoretical "as-is" scenario as of Fall 2019 should still have great relevance for planning for "to-be" scenarios anywhere from a few years from now to decades from now.

In the short to medium term, while health risks persist and varying levels of pandemic-related restrictions are in place in response to waves of the pandemic, there may be differences in trip rates, commute patterns, telecommuting, travel purpose distributions, and mode shares (in particular, a reduction in transit use, with a likely increase in cycling and other modes to replace transit).

It is uncertain how travel patterns will evolve in the long term. Some travel patterns may return to something similar to the patterns described by this report. Other travel patterns may be changed for years, whether due to economic impacts with a short- or medium-term horizon or due to longer-term behavioural shifts that may come about as a consequence of the pandemic. Such potential shifts could include changes in how people work, study, shop, obtain services, or go about other areas of human activity.

The North Shore Transportation Survey program will be very useful to track how transportation patterns evolve as the short and medium term impacts of COVID-19 continue to be felt. The Fall 2020 NSTS update survey could include some questions as to how the pandemic has affected survey panel participants' travel in the short term, although it is not expected to furnish information on daily trip rates and mode shares. The Fall 2021 NSTS full survey will furnish information on daily trip rates and mode shares, and comparison to the 2019 results may reveal some of the medium-term impacts of the pandemic. It may be of interest to ask certain of 2019's topical questions again relating to cycling.

7 Lessons Learned and Next Steps

Outlined below are some of the lessons learned from the 2019 cycle and recommendations for the next steps for the North Shore Transportation Survey.

- **Data collection period.** We recommend completing all survey data collection for the next full survey in 2021 by November 15. The 2019 NSTS survey data collection started October 22 and concluded December 13 (with delays in data collection experienced due to holding off on final invitation letters due to the transit strike). We recommend starting the next full survey cycle earlier in the fall, with most surveys completed prior to November 10, so as to obtain more surveys in weather conditions that are reasonable for walking and cycling (daytime temperature highs above 10°C and lows above 5°C). It may be noted that the difference in time frames may have a slight effect on the comparability of the two surveys with respect to mode shares (with a possibility of higher active mode shares in better weather), although it may be noted that in 2019 that 95% of data collection was completed by November 22.

- **Maintain core survey design.** Considerable effort went in to designing the 2019 baseline survey to obtain information on transportation metrics of interest to the municipalities, and the programmed survey performed well to collect that information. As the NSTS is a tracking study, we recommend maintaining the core questionnaire to maximize comparability from cycle to cycle, particularly for questions related to key transportation metrics such as trip rates and mode shares. Specific questions to add, revise or drop should be considered carefully with respect to the impact of any changes on improving results and on comparability. Any possible changes to the core questionnaire will be discussed over the next year in collaboration with the municipalities.

- **Topical questions.** As discussed in Section 6 of this report, the 2019 survey included a number of questions of topical interest that may be useful to current transportation planning considerations and do not necessarily need to be asked in future cycles. New topics of interest can be explored in future survey cycles.

- **Panel sample design.** The survey was conceived as a panel survey, meaning that participants in the 2019 baseline survey who agreed to participate in future cycles will constitute a survey panel that will be invited to participate in future cycles as long as they are willing. To compensate for attrition in the panel (due to those who do not agree to participate in future cycles, who move away from the North Shore, or who cannot be contacted in the next cycle), new participants will be recruited from the general population. This approach has certain advantages, including cost efficiency and the unchanging core panel of participants reducing cycle-to-cycle variation due to random sampling. However, it may be noted that over time, and depending on the extent of attrition, the core panel may develop some bias in terms of its representativeness of the population (e.g., may favour more established residents who rarely move). The panel methodology will be confirmed with the municipalities prior to the start of the next full cycle. The panel composition should be monitored over time, and decisions made as appropriate to balance the size of the existing panel against recruitment of a new cross-section

in each survey cycle. Over 80% of 2019 NSTS participants agreed to be contacted again for future survey cycles.

- **Representation of young people.** The 2019 survey somewhat under-represented younger residents, particularly those between the ages of 15 and 24, who are generally less likely to participate in surveys. We recommend continuing to undertake address-based sampling to include coverage of all residents living in private dwellings, including cell-phone-only households. We also recommend continuing to offer spin-off sampling to ask participants in households with other household members under the age of 40 to recruit another household member to participate. It may also be possible to undertake other measures to encourage young people to participate.

- **Targeting of sample districts.** Based on the 2019 cycle, we have obtained good information on which sampling districts that have above or below average survey response rates. The 2021 sampling plan to recruit new participants can be tailored accordingly to send proportionately more survey invitations to areas that have traditionally lower response rates, so that less remedial sampling has to be undertaken late in the survey cycle.

- **Fall 2020 mini-survey.** Contact with the survey panel participants will be maintained, for example, to let them know when the report is publicly released, and to invite them to participate in the 2020 NSTS mini survey to be conducted in the fall. The 2020 mini-survey may include some new topical questions of interest to the municipalities (e.g., a question on how residents prefer to hear about local road construction and delays may be included). The 2020 mini-survey could also include questions on impacts of the COVID-19 pandemic, if there is interest in including such questions. The 2020 mini-survey will not entail detailed questions on daily travel.

- **Fall 2021 full survey.** The next full cycle in 2021 will collect information on residents' daily travel and detailed travel patterns again. The results of the 2021 cycle will provide a comparison of how indicators are changing over time. For reporting the 2021 results, we recommend that longitudinal comparisons be focussed on key indicators of greatest interest to track over time, and that the longitudinal comparisons should be undertaken mainly for overall results across the entire North Shore, with only limited longitudinal comparison by municipality or sub-municipal zone (due to the smaller sample sizes for sub-populations). When undertaking longitudinal comparisons for key metrics such as trip rates and mode shares, it may be useful to undertake tests of statistical significance.

Appendix A: Survey Questionnaire

2019 North Shore Transportation Survey
Online Survey / Telephone Interview Script

1. INTRODUCTION – ONLINE TRAVEL SURVEY

[CLIENT LOGO(S)]

To begin the survey, please enter the secure access code found on the top of your notification letter.
Secure Access Code:_____ **Begin Survey**

Welcome to the North Shore Transportation Survey.

The City of North Vancouver, the District of North Vancouver, and the District of West Vancouver are jointly undertaking a transportation survey to learn more about the travel patterns of residents of the North Shore. This research is being undertaken as part of the Integrated North Shore Transportation Planning Project (INSTPP), a joint initiative of the local governments and First Nations on the North Shore and provincial and federal agencies (visit www.instpp.ca for more info).

The goal of the survey is to understand where people are going and how they get there by collecting information on the trips made by one member of your household. The information provided will be used to make informed decisions on future planning for roads, public transit, cycling and pedestrian infrastructure, and other transportation facilities.

In appreciation of your time, you'll be entered for a chance to win one of 65 gift certificates ranging from $25 to $100 in value upon the completion of this survey.

How long does it take to complete the survey? Approximately 10-20 minutes. It is extremely important all your data is entered completely and accurately. You can also complete the survey by telephone with one of our professional interviewers by calling us toll-free at **1-855-412-1940**.
What kinds of questions are asked? The survey asks questions about your household and demographic characteristics, all trips taken on the previous weekday, as well as your opinions on some transportation-related issues on the North Shore.
Will my privacy be protected? Yes. Your survey responses will be combined with others' responses before they are analyzed. Your contact information will only be used to contact you for follow up about the survey. Click here to view our **Privacy Statement**.
How was I selected for the survey? Your household was selected at random from households across the North Shore. A limited number of households receive an invitation to join the study, so the few minutes you take to participate will have a big impact. The survey is voluntary, but to truly represent the travel behaviour of all types of residents in your neighbourhood, we hope that you or a member of your household will choose to participate.

Who is being surveyed? We will be surveying randomly selected households across the North Shore, including the City of North Vancouver, the District of North Vancouver, and the District of West Vancouver. Only a limited number of invitations are sent out, so your participation is important.
Who is conducting the survey? The survey has been contracted to independent research firm R.A. Malatest & Associates Ltd. to conduct the survey.
Are there incentives for participation? Participants who complete the survey are eligible to enter a prize draw. You could win one of five $100 gift certificates to local merchants or one of 60 $25 e-gift certificates. Odds of winning are 1 in 30. The prize draw is administered by R.A. Malatest & Associates Ltd. and will be drawn once the survey administration period is completed.

What day of the week should I report on? We are interested in your travel on the most recent previous weekday. It is important that you provide a snapshot of what you actually did on that day, even if it was not a typical day, and even if you did not travel.

Who do I contact for more information or for help?

- If you would prefer to complete the survey by telephone, please call **1-855-412-1940** (toll free).
- You may also call the number above for assistance with the online survey, or email us at info@northshoretrips.ca.
- If you wish to validate the authenticity of this survey you may contact Chris French at the City of North Vancouver (cfrench@cnv.org, 604-983-7318), Banafsheh Rahmani at the District of North Vancouver (rahmanib@dnv.org, 604-990-2363) or Cindy Liu at the District of West Vancouver **(**cliu@westvancouver.ca**,** 604-925-7157**).**
- For more information about this survey, please visit northshoretrips.ca.

Please note that your answers to the survey are saved each time you click on the Previous or Next Buttons.

R1. Are you the only person in your household who is 15 years of age or older?
1. Yes
2. No

R2. [if R1=No]
In order to obtain a representative cross-section of the population, it is important that we randomize the selection of the person in your household who completes the survey.

Of all of the people in your household who are 15 years of age or older, are you the person whose birthday comes next?

1. Yes
2. No

R3. [If R2=No]
In order to randomize the selection of the person who completes the survey, we would like to do the survey with the person in your household whose birthday comes next.

If this person is available now:
Please ask this person to complete the survey. If they will use the same computer or mobile device as you are using now, click here to **return to the Introduction**, so that this person can start from the beginning.

If this person is not available now, or will do the survey on another computer or mobile device:
Please ask this person to complete the survey. They can log in at **northshoretrips.ca** with the secure access code from your household's invitation letter. Your secure access code is: [recall access code].

Or, you can send this person an email invitation. Fill out the email address below and add your own personal message, and click Send Email to have our system send a link to the survey.

Email address: _____
Personal Message: _____
Your name: _____
(please enter your name so that this person knows you sent this to them)
[SEND EMAIL BUTTON]
The email address entered will only be used to send a link with the secure access code for your household. The email address will not be used for any other purpose and will be destroyed after use.

The protection of your privacy is important to us. The secure access code is intended for your household's use only. Do not share your access code with anyone outside your household if you do not want them to have access to your survey answers. Once the survey is complete, access to the survey will be closed and your data will be secure.

Click here to **return to the Introduction**.

[PROGRAMMER: The above page is a cul de sac. It should only have the Previous and Send Email buttons, and no continue button]

R4.

[when the send email button is clicked please redirect the survey to the following message:

An email has been sent to the person in your household identified as the next person who will celebrate a birthday.

The goal of the North Shore Transportation Survey is provide the municipalities of the North Shore with an understanding of where people are going and how they get there by collecting information on the trips made by one member of your household. This information will be used for planning purposes and to make informed decisions on transportation infrastructure.

We ask that the person with the next birthday complete the survey in order to randomize the selection within each household and obtain a representative sample or all types of people in the North Shore.

Click here to **return to the Introduction**.

[PROGRAMMER: this page is also a cul-de-sac]

2. INTRODUCTION – TELEPHONE INTERVIEW

Hello, my name is _____ , and I am calling on behalf of the [City of North Vancouver, the District of North Vancouver, and the District of West Vancouver, depending on sample segment] to follow up on an invitation we recently sent you to participate in a major study of the travel patterns of North Shore residents. This survey is being conducted as part of the Integrated North Shore Transportation Planning Project, a joint initiative of the municipalities, First Nations, and federal and provincial agencies.

The data collected in this study will help inform decisions to improve transportation infrastructure and services across the region. On this survey, we will ask some questions about the trips made by one member of your household yesterday.

To randomize our interviews, may I speak to the person in your household who is 15 years of age or older and whose birthday comes next?

(INTERVIEWER: If sounds young, verify 15 years of age or older. If no, ask to talk to appropriate person and restart intro. If person 15+ years with the next birthday is not available, schedule a callback.)

USE FOLLOWING SCRIPTS AS NECESSARY:

The survey will be about the transportation choices people make.

- This survey is about the transportation choices people make. The survey results will be used to help plan improvements to roads, transit infrastructure, and pedestrian and cycling facilities across the region.
- Your household has been randomly. The survey is voluntary, but to truly represent the travel behaviour of residents in your area, it is important that you, or someone else in your household who is 15 years of age or older, participate.
- It is important that we complete the survey with a random cross-section of the entire population that is 15 years of age or older. We ask to speak the person who will next celebrate a birthday to randomize the choice within each household.
- The survey takes about 10-20 minutes depending on your answers.
- The survey contains questions about your household and your demographics. It also asks about the trips you made on a previous weekday, as well as a few opinion questions on transportation issues facing the North Shore.

- Even if you did not make any trips yesterday, it is important that we record that information as well. The survey will be shorter for you.

- I work for R.A. Malatest & Associates Ltd, a professional research firm. The City of North Vancouver, the District of North Vancouver, and the District of West Vancouver have contracted our firm to conduct this survey on their behalf.

- If you wish to validate the authenticity of this survey you may contact the Chris French at the City of North Vancouver (cfrench@cnv.org, 604-983-7318), Banafsheh Rahmani at the District of North Vancouver (rahmanib@dnv.org, 604-990-2363) or Cindy Liu at the District of West Vancouver (cliu@westvancouver.ca, 604-925-7157).

- I can send you an email with information about the study, and a link to the website for this study. (If you prefer I can mail you information about the purpose of the survey, and call you back after you have reviewed the information.)

- Participants that complete the survey are eligible to enter a prize draw. You could win one of five $100 gift certificates to a local merchant or one of 60 e-gift certificates to a local merchant. Your chances of winning a prize are approximately 1 in 30. A total of $2,000 in prizes will be awarded. The prize draw is administered by R.A. Malatest & Associates Ltd. and will be drawn once the survey administration period is completed.

A2. [ONLY ASKED OF TELEPEHONE INTERVIEW RESPONDENTS. ASSUME ONLINE RESPONDENTS HAVE RECEIVED THE LETTER IN THE MAIL IN ORDER TO GET ACCESS CODE TO LOG ON]
Have you received the letter in the mail describing this study?

1. Yes
2. No
3. Don't know

INTERVIEWER: IF RESPONDENT DID NOT RECEIVE LETTER AND WISHES MORE INFORMATION BEFORE PROCEEDING:
I can send you an email with information about the study, and a link to the website for this study. (If you prefer I can mail you information about the purpose of the survey, and call you back after you have reviewed the information.)

3. SURVEY PRIVACY STATEMENT

[available anywhere there is a link to the Privacy Statement]

The survey team is dedicated to protecting the privacy of its participants.

Collection of information for the survey is being undertaken in accordance with Sections 26 through 36 of BC's *Freedom of Information and Protection of Privacy Act (FOIPPA)*. The confidentiality of any information collected is protected under the provisions of the Act.

Any information obtained from each household is processed, stored, and used in a form that does not permit any particular household to be identified. Your survey answers will be aggregated with that of other households when the data are analysed.

Canadian-based research firm R.A. Malatest & Associates Ltd. is conducting the survey data collection under the direction of the City of North Vancouver, the District of North Vancouver, and the District of West Vancouver with the highest standards of the protection of privacy and confidentiality. Click here for a link to the firm's Privacy Policy [URL: http://www.malatest.com/Privacy.htm [LAUNCH IN SEPARATE WINDOW].

For more information, please contact 1-855-412-1940 (toll free) or email **info@northshoretrips.ca.**

To contact your municipality regarding privacy questions or concerns, please send an email to the appropriate municipal contact for your municipality:

cfrench@cnv.org Chris French, City of North Vancouver
rahmanib@dnv.org Banafsheh Rahmani, District of North Vancouver
cliu@westvancouver.ca Cindy Liu, District of West Vancouver

Per FOIPPA requirements, your information will be securely retained for at least 12 months after the conclusion of data collection. If you give your permission to be contacted for a follow-up survey, your contact information and linked survey responses will be retained for the purpose of a follow up survey in one year. If after completing the survey you wish to withdraw your consent to collect or retain your information, please email info@northshoretrips.ca.

For more information about this research study please visit northshoretrips.ca.

4. HOUSEHOLD INFORMATION

PHONE: **Before we begin, I'd like to let you know that this survey is entirely confidential.**
WEB: **This survey is entirely confidential and uses secure internet protocols.**

Your survey responses will only be analyzed after all personal identifying information has been removed. Survey responses will be aggregated for analysis and will be used only for transportation and city planning purposes.

PHONE: **I am now going to ask you some general questions concerning your household**

B1A. **Please provide a phone number and email address you may be reached for follow up about this survey.**
Name: [NAME]
Phone Number: [PHONE NUMBER] Extension: _____
Email: _____

Your contact information will be kept confidential and will not be shared with anyone. We will contact you only in the event we need to verify your responses or to invite you to complete a follow-up survey in another year.
Click here to view our Privacy Statement.

B2. [if address exists in sample file AND street address flag=1 (i.e., address is not a mailing address like a rural route or PO Box])]
The home address we have on file for you is listed below. Please verify the address and correct it if necessary. This information is required to identify the location of your trips.

We are interested in the physical address of your home, not your mailing address.
STREET ADDRESS
CITY / TOWN
POSTAL CODE

Confirm address is correct, or edit the fields displayed
1. Yes
2. No
9. Prefer not to answer

B2X. [IF DECLINE TO ANSWER IN B2]

Unfortunately, the survey cannot proceed without an answer to this question. Your participation is very important, and all personal information you provide will be kept strictly confidential. Click here to view our Privacy Statement.

If you are uncomfortable providing us your exact street address and you live in an urban area, you may provide your postal code. If you live in a rural area, please provide your street address, or at least the closest cross-streets.

PHONE: **Rather than terminating the survey, would you reconsider answering this question?**

[if agree, go back to previous question]

[If still refuse:] Thank you for your time. Have a pleasant day / evening.

HOME_LOCATION

[Map the address provided using Google Maps]

[If no address in sample or if address flag indicates a mailing address such as PO Box and address page was skipped]: **Please provide the address of your place of residence. This information is required to identify the location of your trips. Please do not provide a rural route or a PO Box.**

[If confirmed address on previous page:] [display confirmed address above Google Map]

WEB: **Does the map correctly show where your home address is located? If not, please move the marker to where it is located, or use the Search box to search for your correct address.**

PHONE: CONFIRM WITH RESPONDENT WHAT THE MAP SHOWS: E.g., I am looking at the location on Google Maps. It looks like your home is near the intersection of [STREET] and [STREET]. Is that correct?

LOCATION CAPTURE [HOME COORDINATES]

5. LOCATION CAPTURE MODULE

*The general format of the location capture screen is as follows, modified for each survey question as required. Anywhere the survey indicates **LOCATION CAPTURE** in the survey instrument this format will be used.*

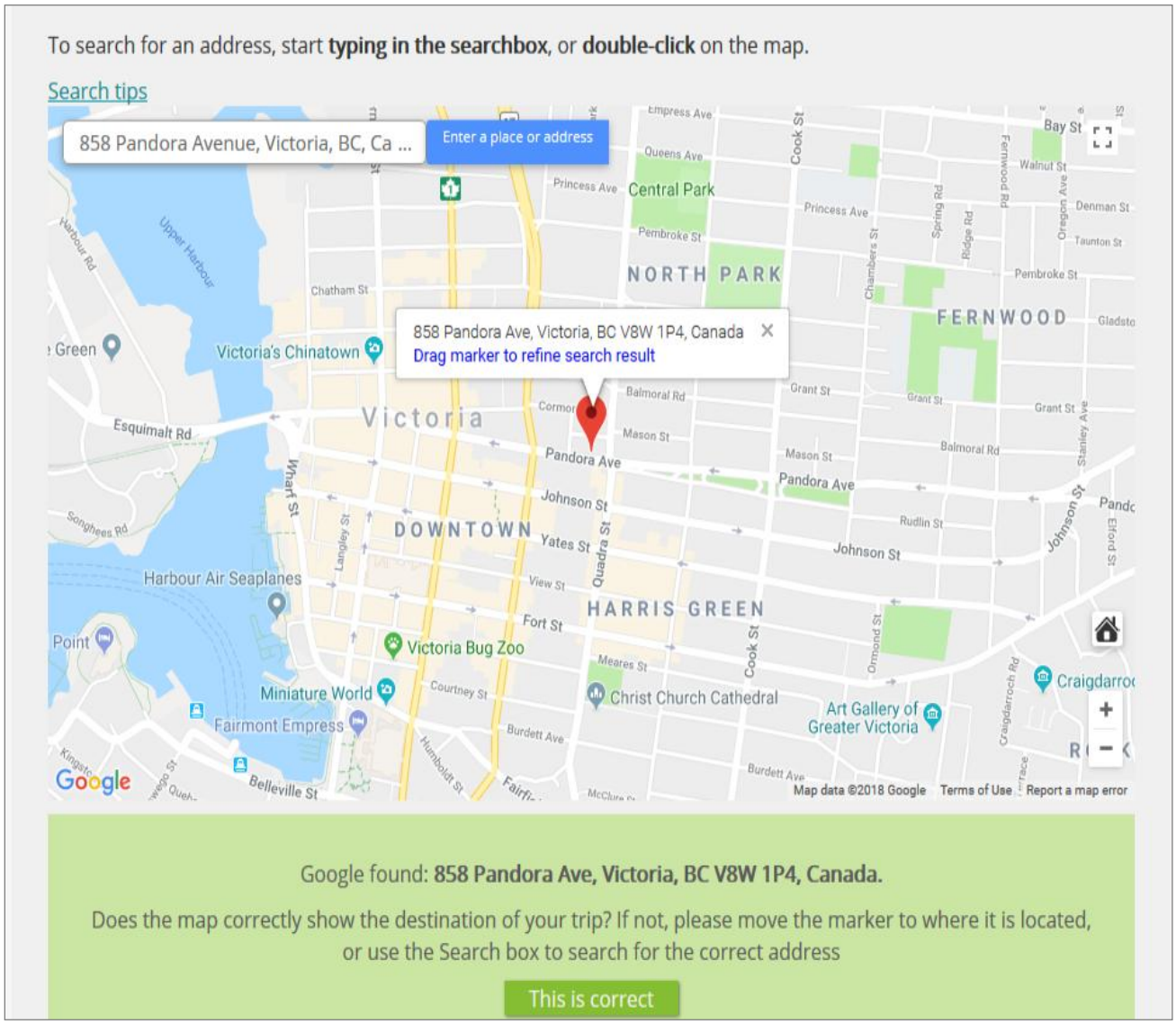
LOC1
- **Home** (display confirmed address, from sample or as captured in the survey)
- your main **work** location (display address captured in survey)
- your **school** (display address captured in survey)
- [previously captured destination #1]
- [previously captured destination #2]

...etc...

- On the road / no fixed location (no fixed place of work) [Work and school location capture only]
- Other location [Google Geocode searches and Google Maps confirmation]

Example screen shot: First page allows respondent to pick from locations already given by the household, or indicate that it is another location:

Example screen shot: If respondent selects 'Other location' they can provide their location by via Google search, double-clicking on the map, or dragging the marker.



6. HOUSEHOLD INFORMATION (CONT'D)

B3. ONLINE: **Please identify the type of dwelling you reside in:**
PHONE: **What type of dwelling do you live in?**

1. single-detached house
2. row house or townhouse
3. semi-detached house (side-by-side)
4. a secondary suite in a house (e.g., basement apartment, upstairs apartment)
5. on-campus student residence
6. apartment or condominium in a high rise building (5 or more storeys)
7. apartment or condominium in a low rise building (fewer than 5 storeys)
8. mobile home
9. residential care or long term care facility

77. other, please specify:_____

B4. **How many people are currently living in your household, including yourself?**
(Include children only if living in your household on your Travel Day.
Include roommates, housemates, live-in housekeepers, and lodgers if they share communal facilities. Exclude anyone living in a separate apartment within the building.
Do not include visitors, even if they are staying for an extended period of time.)
___ Total # persons in household
(confirm with respondent)
99. Prefer not to answer [go to B5]

B5. [IF DECLINE TO ANSWER IN B4]
Unfortunately, the survey cannot proceed without an answer to this question. Your participation is very important, and all personal information you provide will be kept strictly confidential. Click here to view our Privacy Statement.
PHONE: **Rather than terminating the survey, would you reconsider providing this information?**
WEB: **Click the Previous button to go back and provide a response, or click End Survey to quit**
[if agree, go back to previous question]
[If still refuse, record as refusal:] Thank you for your time. Have a pleasant day / evening

B4A. [NumHouseholders>1]
How many people in your household are 15 years of age or older?
___ Total # persons in household 15 years if age or older
99. Prefer not to answer [go to B5]

B6. **How many licensed (insured) motor vehicles (including cars, light trucks, vans, motorcycles and licensed scooters or mopeds) are available to the members of your household, including yourself?**

Please include personal and business vehicles. This includes vehicles that you own as well as vehicles provided by employers that you have regular access to and that can be brought home and parked overnight.

Do not count any motor vehicles which are not registered. Do not count any that are registered to an owner in the household but not insured to be on the road. Do not count car share vehicles.

___
77. none
99. Don't know

[Note: CoV survey excludes motorcycles, but we have included them as they speak to the transportation options available to household members.]

B7D. **At your current place of residence, how many parking spaces are available to members of your household, excluding parking on city streets?**

_____ (# of spaces) [allowable range: 0-20]
77. None
99. Don't know

B8. **How many working bicycles and electric bicycles are available to members of your household, including yourself?**
Adult bicycles: ____
E-bicycles: ____
99. Don't know

7. DEMOGRAPHICS

The next section is about your demographics. You will be asked to provide some information about yourself before moving on to recording your trips in the next section of the survey.

Your responses are entirely confidential. Your personal information will be protected, and any identifying information will be deleted from the data prior to analysis. Click here to view our Privacy Statement.

C1. **What best describes your gender?**

[INTERVIEWER: do not ask unless necessary – record only]

1. male
2. female
3. prefer to self-describe: _____
9. prefer not to say

C2. **What is your age?**

___

9. prefer not to answer

[Note: it is easier to adapt our existing template if we can just ask age rather than year of birth. For people who opt in to the panel, we can translate from age to approximate year of birth, and ask for update in subsequent cycles.]

C2A. [if not provide specific age] **What age range do you belong to?**

(INTERVIEWER: Read the age ranges, starting at a relevant one)

1. 0 – 14 years
4. 15 – 17 years
5. 18 – 24 years
6. 25 – 34 years
7. 35 – 44 years
8. 45 – 54 years
9. 55 – 64 years
10. 65 – 74 years
11. 75+ years
99. prefer not to answer

C2B. [if 99 to C2A]

Unfortunately, the survey cannot proceed without an answer to this question. Demographic information such as age is crucial to transportation research. Your participation is very important, and all personal information you provide will be kept strictly confidential. Click here to view our Privacy Statement.

PHONE: **Rather than terminating the survey, would you reconsider answering this question?**

If you are uncomfortable providing us your exact age, please select from the ranges below to continue the survey.

1. 0 – 14 years
3. 15-64 years
4. 65+ years

INTERVIEWER: Go back to previous question if precise range given or select from broad ranges above
[If still refuse:] Thank you for your time. Have a pleasant day / evening.

[Note: ages given in age ranges will be randomly imputed for data weighting and analysis purposes]

C2C. [If age<15 IN C2 or C2A age range=1 or C2B age range =1]
[Cul-de-sac page with only Previous and End Survey buttons]
This survey must be completed by someone 15 years of age or older.
If you are 15 years of age or older, click the Previous button to change your answer.
If you are under the age of 15, please have a member of your household who is 15 years of age or older fill out the survey.

C3. [if age >= 16, or C2A>=4 or C2B >=3]
Do you have a valid driver's licence?
[mouseover for valid driver's licence: This includes any category of motor vehicle licence, including a temporary learner's permit. Answer 'No' if the licence has expired and has not been renewed or if it has been suspended.]

1. Yes
2. No
99. Prefer not to answer

C4. **Which of the following apply to you? Select all that apply.**
PHONE:
INTERVIEWER: ASK ABOUT BOTH EMPLOYMENT STATUS AND STUDENT STATUS
Are you currently working (i.e., an employee or self-employed)? Is that full-time or part-time?
Do you currently attend school or another educational institution? (K-12 or post-secondary) Is that full-time or part-time?

1. Work full-time (30 or more hours per week)
2. Work part-time (less than 30 hours per week)
3. Student full-time
4. Student part-time
5. Unemployed
6. Retired [only display if age 40 +]
77. Other, specify: _____

[PROGRAMMING NOTE: cannot select 'unemployed' if work full-time or part-time]

8. DEMOGRAPHICS – SCHOOL DETAILS

C4X. [if respondent indicated both f/t student and f/t worker, provide confirmation message:]
From your answers, it appears that you attend school full-time and also work full-time (more than 30 hours per week at your main job). Is this correct?
1. Yes, attend **school full-time** and **work full-time** (more than 30 hours/week)
2. No, attend **school part-time** and **work full-time** (more than 30 hours/week)
3. No, attend **school full-time** and **work part-time** (less than 30 hours/week)
4. Unsure

C4A. [if student]
What kind of school do you attend?
2. Secondary school (high school)
5. College or university
6. Alternate, adult basic education, or other
7. Online / distance learning only, please specify level (high school, college, university, adult basic education: _____)
8. Prefer not to answer

C4B. [if student]
What is the name of your school?
(you can choose from suggestions that appear as you type, or, if none of the suggestions applies, you can type the name exactly as you know it)
1. School Name: _____ [Auto-suggest as you type]
8. Home schooled (does not attend a school outside the home)

[List of K-12 schools obtained from provincial list, supplemented with public post-secondary, and larger private post-secondary]
[Include street address and municipality in description of school location]

C4D. [skip location capture if SchoolType = 7. online/distance education or if SchoolName=8. home schooled]
[If not on list] **What is the location of the school?**
[If on list, map location:] **Does this location appear to be correct?** (If it is not correct, please drag the marker on the map, double-click, or use the search bar to find the correct location)
LOCATION CAPTURE [SCHOOL CO-ORDINATES / TAZ]

C4E. [Person is student AND has driver's licence AND SchoolType not equal to 7. Online or distance learning]

Do you use parking at school? If so, do you pay for parking?

1. Yes, use free parking at school
2. Yes, pay for parking at school
3. No, do not use parking at school

9. DEMOGRAPHICS – WORK DETAILS

C6A. [if employed] **What is the address of your normal place of work (main job)?**

(This is the address of the worksite that you normally commute[s] to every day)

1. Work from home
3. No fixed workplace address / no usual place of work
6. Work at a workplace you go to regularly (away from home) –> identify address on map

LOCATION CAPTURE [WORK CO-ORDINATES / TAZ]

C6C. [if employed AND has driver's licence AND regular workplace outside the home (not home or no fixed workplace)]

Do you use parking at work? If so, do you pay for parking?

1. Yes, I use free parking at work
2. Yes, I pay for parking at work
3. No, I do not use parking at work
99. Prefer not to answer

C6J. [if employed]

Which of the following best fits the nature of your occupation?

1. Management Occupations
   (mouseover: senior government managers, financial and administrative services managers, health, education and social services managers, construction and transportation managers, etc.)
2. Business, Finance & Administration Occupations
   (mouseover: HR and business services professionals, financial auditors and accountants, office and administrative support, legal and medical administrative assistants, payroll and banking clerks, postal workers, shipping and receiving, inventory, dispatchers, survey interviewers and statistical clerks, etc.)
3. Natural & Applied Sciences Occupations
   (mouseover: physicists, chemists, civil, mechanical, electrical, chemical, industrial and other professional engineers, geoscientists, architects, land surveyors, computer and information systems professionals, technical professions etc.)
4. Health Services Occupations
   (mouseover: registered nurses, physicians, dentists, veterinarians, optometrists, chiropractors, pharmacists, nutritionists, therapy and assessment professionals, paramedics, medical technologists and technicians etc.)
11. Secondary and Elementary School Teachers
   (mouseover: secondary and elementary school teachers)
5. Post Secondary Education, Law & Social, Community & Government Services
   (mouseover: university and college instructors, judges, lawyers, policy and program researchers, social and community service workers, police officers, firefighters, correctional officers, by-law enforcement etc.)
6. Performing & Facilitating Art, Culture, Recreation & Sports

(mouseover: librarians, authors, journalists, creative arts, photographers, graphic arts technicians, occupations in motion pictures, broadcasting and the performing arts, athletes, recreation and sport instructors, graphic designers, interior designers etc.)

7. Sales & Service Provision
   (mouseover: retail sales, food and beverage services, travel agents, tour guides, cashiers, cooks, janitors, building superintendents, retail and wholesale buyers etc.)
8. Trades, Transport & Equipment Operators
   (mouseover: contractors, industrial, electrical and construction trades workers, machinists, iron workers, welders, machine operators, electricians, cable technicians, plumbers, carpenters, roofers, painters, cabinet makers, millwrights, automotive technicians, crane operators, drillers in surface mining, quarrying and construction, truck drivers, bus drivers, taxi drivers, trades helpers and labourers etc.)
77. Commercial driver (such as a courier, taxi, or bus driver)
9. Occupations in Natural Resources, Agriculture & Related Production
   (mouseover: oil and gas well drillers servicers, testers and related workers, logging and forestry workers and supervisors, fishing, farming, landscaping, trappers and hunters, harvesting, mine workers and supervisors etc.)
10. Occupations in Manufacturing & Utilities
    (mouseover: processing and manufacturing supervisors and workers, motor vehicle assembly, electronics and electrical products manufacturing, petroleum, gas and chemical process operators, utilities equipment operators and controllers, chemical plant machine operators, plastics and rubber processing machine operators and workers, pulp and paper production, wood processing, mechanical, electrical and electronics assemblers, furniture assembly and finishing, mineral and metal processing etc.)
80. Other, please specify: _____
99. Don't know

[based on the 10 major categories of the NOC classification system]

[PROGRAMMER: use list with mouseover programming from OTS]

C6L. [if employed]
Do you have access to employee programs that support or provide the following? Check all that apply.

1. Company carpool / car share
2. Employer subsidized transit pass
3. Employer subsidized bike share / Mobi membership
4. Other, specify: _____
77. No, I do not have access to such programs
99. Don't know

[Note: CoV survey appears to skip this question if do not make trips for business purposes during the work day, but we think it should be asked of all employed people]

[PROGRAMMER: do not allow selection of 77. No and other options]

10. TRIPS INTRODUCTION

D1.
This section consists of questions about the trips you took **during a single <u>weekday</u>** (your Travel Day).

In order to ensure the most accurate recollection of your travel, please use [yesterday/TRAVELDAY] as your Travel Day.

We will ask you about the trips you made on [TRAVEL DAY], that is any trip during the 24-hour period between 4:00 a.m. yesterday ([TRAVEL DAY]) and 4:00 a.m. this morning, whether for work, school, shopping or any other purpose.

This section will have a series of questions for each separate trip.

What is a trip? A trip is a one-way journey from one location to a destination for a single purpose. A trip may include more than one mode of travel, such as car and transit.

- It is important to report **all trips**, even for a short distance, on foot for instance.
- If you stopped off on your way to somewhere else, such as to drop off a child at school or pick up a coffee, then that journey would have two trips. The return portion of a journey is also considered a separate trip.
- Report all trips, whether made by walking, car, truck, bicycle, transit or any other mode of travel.
- [if person is employed:] <u>Report</u> your trips for business meetings and work-related purposes.
- Report recreational outings that end at the same place they started, such as walking the dog or going for a jog.
- Do not report moving around between classes on campus or within the same building complex.

[Recreational trips with no destination (walking the dog, going for a jog) will be captured. However they might be reported on separately, and excluded from the reporting of mode shares, depending on how other jurisdictions do it (for comparability).]

How precise do locations need to be? We will ask you where you travelled to. Please try to describe locations as precisely as possible, to the accuracy of street address. Use the Google Map provided to search for a specific business or place, or double click on the map to set a 'pushpin' marker. You can drag the marker to the exact location. If possible, try to avoid placing markers at intersections – drag them to the actual destination you travelled to.

[if person is employed as a commercial driver:]
If you are a commercial driver (bus driver, taxi driver, courier, traveling salesman): You do not have to tell us about the all the work trips you made for commercial deliveries, or while driving a taxi or bus. But please report the following:

- Your first trip to where you started your work day (terminal, office) or your first delivery or stopping point if you started your delivery/work schedule directly from home.

- Your final work-related stopping point if it is different from the one above.
- A return trip to your home or other non-work related location at the end of your work day.
- All personal trips by any mode of travel.

(INTERVIEWER: If the person was out of town yesterday, we can capture their travel if it passed through or ended up in the North Shore).

11. TRIP CAPTURE – START OF TRAVEL DAY

E1. **Did you make at least one trip - by any mode of travel whether car, bus, cycling, or walking - at any time [yesterday/TRAVELDAY])?**
(Note: Trips include those made via any mode of travel, including all motorized modes of transportation and any non-motorized modes of transportation such as walking, cycling, rollerblading, skateboarding, and so on)
(If SchoolType=college or university: **Do report trips to or from school campuses or any trips made off-campus. Do not report trips moving around between classes on the same campus or within the same building complex.**
1. Yes
2. No

E1X. [If E1=2 (no trips):]
Why did you not leave home or make any trips [yesterday/TRAVEL DAY]?
1. Out of town for entire day
2. Sick/ill or care for other sick/ill household member
3. Not scheduled for school classes or activities
4. Not scheduled for work or on extended leave from work (paternity/maternity, short-term disability)
5. Worked from home, and did not leave home for any reason
6. No need to leave home
7. Could not leave home, no transportation available
8. [if B3 dwelling type=5 on-campus residence:] I did not leave campus all day.
9. I did not make any trips because I was unable to use public transit due to the job actions/strike affecting the availability or frequency of some transit routes. [Nov 1 - Nov 27 travel days only]

Mouseover on job actions/strike:

Workers at Coast Mountain Bus Company, which provides bus service throughout most of Metro Vancouver and operates the SeaBus routes are currently undertaking strike/job actions which may affect the availability or frequency of some transit routes.

If response 9 above is selected, and travel day is between Nov 1 and Nov 27, display this question:

How many trips would you have taken if transit was available? Please provide your best estimate.

Please note that each trip is a one-way journey, so a trip to the grocery store and then home would be considered two trips.

77. Other (specify): _____
100. Actually, I did leave home to go to work or school or to make at least one other kind of trip [GO BACK TO E1]

E1X1. [if employed=yes AND (E1X=3 or 6 or 7 or 8 or 77), regardless of whether work from home or not]
You did not report going to work [yesterday/on TRAVEL DAY].
Were you working at home?
8. [if B3 dwelling type=5 on-campus residence:] No, worked on the same campus where I live, so did not have off-campus trips.
1. Yes, worked from home (telecommuted)
2. No, away on business / working on the road
3. No, did not work
4. No, actually I worked and did take work-related trips
5. Other, specify: _____

E1X2. [if E1X1=1 actually did make work trips)]
Please report your trips to and from work, or for work-related purposes, whether you walked or used another mode of travel.
[PROCEED TO E4]

E1X3. [if a student AND (E1X=4 or 5 or 6 or 7 or 8 or 77), regardless of whether home-schooled or not]
You did not report going to school. Did you attend school [yesterday/on TRAVELDAY]?
8. [if B3 dwelling type=5 on-campus residence:] Yes, attended classes on the same campus where I live, so did not report trips.
1. Yes, did go to school
2. Attended school from home (home schooled, distance learning)
3. No, did not have any scheduled classes, stayed home sick, or did not attend school for another reason
4. No, away on a field trip or other travel
5. Other, specify: _____

E1X4. [if E1X3=1 actually did make school trips)]
Please report your trips to and from school, or for school related purposes, whether you walked or used another mode of travel.
[PROCEED TO E4]

E4. **Did your first trip start from home?**
1. Yes, my first trip started from home
2. No, my first trip started somewhere else

E4A. [If E4 <> home]
You mentioned that your first trip of the day started at a location other than your home. Is it that you were…?
1. Working a night shift (past 4 am, the start of the travel day)
2. Staying overnight at another household? (friend's, relative's, parent's, etc.)
3. Away from home on business travel?
4. Away from home on vacation (or other personal travel)?
5. Another reason, please specify: _____

E4B. [if E4A=3, 4 (away on business or vacation travel)]
You mentioned that you started the travel day away from home because you were away on business or vacation travel. Did you travel back to the North Shore between 4:00 a.m. [yesterday/TRAVEL DAY] and 3:59 a.m. [today/TRAVELDAY +1]?
1. Yes
2. No
[PROGRAMMER: In E4B above, add a modal pop up to North Shore: The North Shore includes the the City of North Vancouver, the District of North Vancouver, the District of North Vancouver, Tsleil-Waututh Nation, and the lands of the Skwxwú7mesh Úxumixw (Squamish Nation) that are adjacent to North Vancouver.]

E4X. [If E4B=no]
You said that you were away the entire day due to business or vacation. Since you did not return to the survey area, you do not have to enter trips for this day.

If you did return, please click the Previous button below to change your answer to Yes, and then please report on your travel for the day.

[PROGRAMMING NOTE: if E4B=no, conclude trip capture and log person as "No trips"]

E4C. [If E4=another location and (E4B=yes or E4A=1,2,or 5)]
What was the starting point of your first trip [yesterday/TRAVEL DAY]?
LOCATION CAPTURE [ORIGIN CO-ORDINATES]

12. TRIP CAPTURE – LOCATION, TIME, PURPOSE, MODES

E5. [if trip=1:] **Where did you go first?**
[if trip>1:] **Where did you go next?**

If this is a recreational trip where your start and end locations are the same, please select the location you returned to. (Examples of recreational trips are dog walking, jogging, scenic drive with no destination, etc)

[if trip>1 and ORIGIN=Usual Work and OccType<>77 Commercial Driver:] If you left work at any time before the end of your work day, such as to go for coffee or a lunch outside your workplace or for a business errand, please report each trip to such a destination.

[if trip>1 and ORIGIN=Usual School:] If you left school at any time before the end of your school day, such as to go for coffee or a lunch outside or for an errand, please report each trip to such a destination.]

(Note: For trips requiring air travel: please treat the trip to the airport as a separate trip from the trip on the airplane.)
LOCATION CAPTURE [DESTINATION CO-ORDINATES / TAZ]
[WORK LOCATIONS AND SCHOOL LOCATIONS FOR ALL HOUSEHOLD MEMBERS ARE INCLUDED IN LIST OF KNOWN LOCATIONS]

E5R. [if ORIGIN=DESTINATION]
It appears that your origin ([ORIGIN ADDRESS]) and destination ([DESTINATION ADDRESS]) are the same.

Was this a recreational trip such as walking the dog, or going for a jog or bike ride with the same start and end location?
1. Yes
2. No

[if ORIGIN=DESTINATION and RecreationTrip=No]
It appears that your origin ([ORIGIN ADDRESS]) and destination ([DESTINATION ADDRESS]) are the same.

If you are entering trips out of sequence, please continue. Otherwise, if you have missed reporting a stop, please go back and revise your answer.

Modal with a button label that says: *Is this a recreational trip for exercise or walking the dog?*

Modal text on click:

If you walked your dog, went jogging, cycled for exercise, or took a scenic drive with no destination:

- If your start and end locations are the same and you did not stop anywhere along the way, please enter the same destination as where you started your trip. For example, if you left home to walk the dog and returned home, enter home as your destination.
- If you stopped along the way, please enter the place you stopped at.

If you travelled to a specific place where exercise took place, such as a trip to the gym, or a drive to a park where you then went for a hike:

- Please enter the place you travelled to. Your travel to that place is one trip. Your travel leaving from that place to return home or go somewhere else will be a separate trip.

E2. **At what time did you leave on this trip?**
Please enter a time between 4:00 a.m. the previous day [TRAVELDAY] and 3:59 a.m. [TRAVELDAY+1]
Time: [Dropdown with hours and AM/PM] Minutes: _____ [0-59]
Please provide your best guess if you cannot give the exact time.

E5Q. [if RecreationTrip = yes]
About how many minutes was this trip?
_____ minutes

[if destination selected above = home, assume purpose is RETURN HOME and do not ask this question]
[if RecreationTrip = Yes, assume purpose is 42 Recreational and do not ask this question]

E3. **What was the main purpose of this trip?**

10. Travel to work (usual place of work)
11. Work-related
    [mouseover: Trips to attend meetings, and for other work-related purposes.
    If job hunting or volunteering, please select 'Other'.]
12. Working on the road / itinerant workplace / no fixed work address
20. Attend post-secondary school (university, college, private post-secondary)
30. Attend school (K-12)
    [mouseover: Trips made for the purpose of attending school.
    If driving someone to/from school, select 'Pick up a passenger' or 'drop off a passenger'.
    If parent attending parent-teacher meeting, select 'Other'.
    If work at the school, select Work.]
41. Dining / restaurant (whether eat-in or take-out)
42. Recreational (sports, leisure activity)
43. Social (visiting friends, family, religious)
44. Shopping or household maintenance (grocery, clothing store, auto repair, gas station)
45. Personal business (e.g., bank, dentist, health appointments, personal care, volunteering)
91. Pick up a passenger (e.g., pick up child at school or daycare, pick up someone at work, etc)
92. Drop off a passenger (e.g., drop off child at school or daycare, drop off someone at work, etc)
80. RETURN HOME ([recall address])

888. Other, please specify: _____

E5B. [Include probes to clarify if trip purpose = RETURN HOME but did not select home as destination]

E5C. [Include probes to clarify if trip purpose <> RETURN HOME but select destination=home]

E7. **How did you get there? Please select up to 5 modes, in order of use.**

If you used more than public transit mode (bus, SkyTrain, SeaBus, West Coast Express), please list them separately in the order you took them.

INTERVIEWER: If Transit bus, Sea Bus, Sky Train or West Coast Express in first mode, probe: how did you get to the bus stop or transit station?
If only one mode, prompt: did you use another mode of transportation?
If answer of "carpooling": was that as a passenger or as a driver?
What was your first mode of transportation?

Mode 1: [select from drop down]
Mode 2: [select from drop down]
Mode 3: [select from drop down]
Mode 4: [select from drop down]
Mode 5: [select from drop down]

1. Auto driver – private vehicle
2. Auto passenger – private vehicle
21. Car share driver (Modo, Car2Go, ZipCar, Evo, etc)
22. Car Share passenger (Modo, Car2Go, ZipCar, Evo, etc)
3. Transit Bus
4. SeaBus
5. SkyTrain
6. West Coast Express
7. HandyDART
8. School bus
9. Bicycle (incl. pedal-assist e-bikes)
10. Rolling (skateboard, roller-blades, scooter, mobility device, longboard)
11. Walking (incl. jogging)
12. Taxi
13. Motorcycle
14. Low speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike)
17. Other (please specify): _____

[note: response numbering is not in sequence as it matches how modes are already numbered in the underlying programming template]

E5X1. [if origin is on North Shore and destination is south of the harbour, and none of the modes is SeaBus]
[or if origin is south of the harbour and destination is on North Shore, and none of the modes is SeaBus]
It looks like you crossed Vancouver Harbour when you travelled from [origin] to [destination].

How did you cross the water?
1. Lion's Gate Bridge (through Stanley Park via Highway 99)
2. Second Narrows Bridge (Iron Workers Memorial Bridge - Highway 1)
3. SeaBus
4. Other, specify: _____

13. TRIP CAPTURE – TRANSIT

E7A. [if first mode recorded was 3|4|5|6 transit]
How did you get to the bus stop or transit station?
19. Transit station or bus stop was right at or within 50m of my origin (the starting point of the trip: [previous destination])
[+ Same list of modes as above excluding public transit]

E7A2. [If any of the following scenarios apply:
E7A=1|2|21|22|8|9|12|13|14|7|17 and Mode1=3
Mode1=1|2|21|22|8|9|12|13|14|7|17 and Mode2=3
Mode2=1|2|21|22|8|9|12|13|14|7|17 and Mode3=3
Mode3=1|2|21|22|8|9|12|13|14|7|17 and Mode4=3
Mode4=1|2|21|22|8|9|12|13|14|7|17 and Mode5=3]

Where did you get on the first bus you took?
[LOCATION CAPTURE]

E7B. [If last of the modes recorded was 3|4|5|6 transit (last mode could be in any of Mode2-5)]
How did you get from the bus stop or transit station to your final destination ([destination of this trip])? Or did transit drop you off right at or within 50m of your destination?
19. Transit station or bus stop was right at my destination ([recall current destination])
[+ Same list of modes as above excluding public transit]

E9. [if transit bus]
PHONE: What bus routes did you take? (in the order that they were taken)
(After capturing one bus route, prompt: Did you take another bus route?)
WEB: **Please list the bus routes that you took (in the order that they were taken)**
First route: ___
Second route: ___
Third route: ___

Fourth route: ___
Fifth route: ___

E9S. [if any of Modes 1-5 = Sky Train or any of Modes 1-5 = West Coast Express]

What was the first station you boarded SkyTrain, West Coast Express or SeaBus on this trip? And what was the last station you got off at?

First Station: Dropdown
Last Station: Dropdown

1	**--- select station ---**
100	**--- SeaBus Stations ---**
101	Lonsdale Quay
102	Waterfront
200	**--- SkyTrain Expo Line ---**
201	Waterfront
202	Burrard
203	Granville
204	Stadium–Chinatown
205	Main Street-Science World
206	Commercial-Broadway
207	Nanaimo
208	29th Avenue
209	Joyce-Collingwood
210	Patterson
211	Metrotown
212	Royal Oak
213	Edmonds
214	22nd Street
215	New Westminster
216	Columbia
220	**--- SkyTrain Expo Line to King George ---**
221	Scott Road
222	Gateway
223	Surrey Central
224	King George
230	**--- SkyTrain Expo Line to Production Way ---**
231	Sapperton
232	Braid
233	Lougheed Town Centre
234	Production Way-University
400	**--- SkyTrain Millenium Line ---**
301	VCC-Clark
302	Commercial-Broadway
303	Renfrew
304	Rupert
305	Gilmore
306	Brentwood Town Centre
307	Holdom
308	Sperling-Burnaby Lake
309	Lake City Way
310	Production Way-University
311	Lougheed Town Centre
312	Burquitlam
313	Moody Centre
314	Inlet Centre
315	Coquitlam Central
316	Lincoln
317	Lafarge Lake-Douglas
400	**--- West Coast Express ---**
401	Waterfront
402	Moody Centre
403	Coquitlam Central
404	Port Coquitlam
405	Pitt Meadows
406	Maple Meadows
407	Port Haney
408	Mission City
500	--- Canada Line ---
501	Waterfront
502	Vancouver City Centre
503	Yaletown-Roundhouse
504	Olympic Village
505	Broadway-City Hall
506	King Edward
507	Oakridge-41st Avenue
508	Langara-49th Avenue
509	Marine Drive
510	Bridgeport
520	--- Canada Line to YVR ---
521	Templeton
522	Sea Island Centre
523	YVR-Airport
530	--- Canada Line to Richmond ---
531	Aberdeen
532	Lansdowne
533	Richmond-Brighouse
900	**----------**
999	Don't Know

Canada Line Stations
Waterfront
Vancouver City Centre
Olympic Village
Broadway-City Hall
King Edward
Oakridge-41st Avenue
Langara-49th Avenue
Marine Drive
Bridgeport

Canada Line to YVR
Templeton
Sea Island Centre
YVR-Airport

Canada Line to Richmond
Aberdeen
Lansdowne
Richmond-Brighouse

E7B2. [If any of the following scenarios apply:
Mode1=3 and Mode2=1|2|21|22|8|9|12|13|14|7|17
Mode2=3 and Mode3=1|2|21|22|8|9|12|13|14|7|17
Mode3=3 and Mode4=1|2|21|22|8|9|12|13|14|7|17
Mode4=3 and Mode5=1|2|21|22|8|9|12|13|14|7|17
Last Mode=3 and E7B=1|2|21|22|8|9|12|13|14|7|17

Where did you get off the last bus you took?
LOCATION CAPTURE

E9W. [If (E7A=Walk or Roll) or (E7B=Walk or Roll) or (any of Modes 1-5 is 3|4|5|6) {(any of Modes 1-5 = Walk or Roll) AND (any of Modes 1-5 =a mode other than Walk or Roll)}]

In total, about how much did you [AS APPROPRIATE: walk/roll] as part of this trip?
____ minutes

14. TRIP CAPTURE –TRANSFER BETWEEN OTHER NON-TRANSIT, NON-WALK/ROLL MODES

E9X. [if any of the following scenarios apply:
Mode1=1|2|21|22|8|9|12|13|14|7|17 and Mode2=1|2|21|22|8|9|12|13|14|7|17
Mode2=1|2|21|22|8|9|12|13|14|7|17 and Mode3=1|2|21|22|8|9|12|13|14|7|17
Mode3=1|2|21|22|8|9|12|13|14|7|17 and Mode4=1|2|21|22|8|9|12|13|14|7|17
Mode4=1|2|21|22|8|9|12|13|14|7|17 and Mode5=1|2|21|22|8|9|12|13|14|7|17]
[PROGRAMMER: record in ModeTransferType which scenario triggered the question
12=Mode1xMode2; 23=Mode2xMode3, 34=Mode3xMode4, 45=Mode4xMode5]

[If Mode1=1|2|21|22|8|9|12|13|14|7|17 and Mode2=1|2|21|22|8|9|12|13|14|7|17]
Where did you change transportation modes from [Mode1] to [Mode2]?

[If Mode2=1|2|21|22|8|9|12|13|14|7|17 and Mode3=1|2|21|22|8|9|12|13|14|7|17]
Where did you change transportation modes from [Mode2] to [Mode3]?

[If Mode3=1|2|21|22|8|9|12|13|14|7|17 and Mode4=1|2|21|22|8|9|12|13|14|7|17]
Where did you change transportation modes from [Mode3] to [Mode4]?

[If Mode4=1|2|21|22|8|9|12|13|14|7|17 and Mode5=1|2|21|22|8|9|12|13|14|7|17]
Where did you change transportation modes from [Mode4] to [Mode5]?

[LOCATION CAPTURE]

15. TRIP CAPTURE – AUTO DRIVER OR PASSENGER

E19A. [if (E7 mode or E7A or E7B = auto driver OR motorcycle OR car share driver) AND not licensed to drive]

[if auto driver:] **You reported that you were an automobile driver for this trip; however, you previously indicated that you do not have a driver's licence. Which of the following best applies…?**
[if motorcycle:] **You reported that you were traveled by motorcycle on this trip; however, you previously indicated that you do not have a driver's licence. Which of the following best applies…?**

1. I actually have a driver's licence
2. I travelled as a [if motorcycle: motorcycle] passenger, not the driver
3. I travelled as a learning driver
7. Other, please specify: _____

E19B. [If (E7 mode or E7A or E7B = auto driver OR motorcycle OR car share driver) AND no vehicles available to the household (B6=0)]
You reported that you were an automobile driver for this trip; however, you previously indicated that your household has no vehicles available for your use. Which of the following applies…?
1. I drove a work vehicle, rental, or borrowed vehicle
2. I drove a car share vehicle
3. My household actually has vehicles. Please specify how many: _____
6. No, I was a actually a passenger, not the driver

E10. [if E7 mode or E7A or E7B = automobile driver OR auto passenger OR car share driver OR car share passenger (look at answers of all of main mode question and of access and egress mode questions)]
How many people were in the car, including yourself?
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7 or more
9. Don't know

E11B. [{(if by automobile (driver) or car share driver in E7=1 or 21) AND (destination is on the north shore} OR {origin is on the north shore AND mixed mode (auto driver/car share driver x transit bus OR auto driver/car share driver x SeaBus OR E7A=auto driver/car share driver))}]
Did you park on the street or off-street (parking lot, driveway, or parkade)?
1. On-street
2. Off-street parking lot, driveway, parkade
99. Don't know

16. TRIP CAPTURE – OTHER STOPS

[Note: answers in this section will be used to split original trip record reported into multiple trip records, but will not be included in the final dataset.]

E50. [ask this question if Age>14 and {(Origin=Home and Destination=any householder's work or school) OR (Origin= any householder's work or school and Destination=Home)}. Intent is to capture missed incidental trips during commute trips without forcing respondent to go back and correct previous info.]
In your trip from [ORIGIN] to [DESTINATION], did you make any other stops along the way? (stopped for gas, went through drive-through, picked someone up, or dropped someone off)
1. Yes
2. No

E50B. [If E50=Yes]
Where did you stop?
LOCATION CATPURE

E50C. [If E50=Yes]
Why did you stop there?
[Repeat list of trip purposes]

E50D. [If E50=Yes and E50C = picked someone up and Mode=Driver]
How many people did you pick up there?
___

E50E. [If E50=Yes and E50C = dropped someone off and Mode=Driver]
How many people did you drop off there?
___

E50F. **What time did you arrive at [location in E50B]?**
Please enter a time between 4:00 a.m. the previous day [TRAVELDAY] and 3:59 a.m. [TRAVELDAY+1]
Time: [Dropdown with hours and AM/PM] Minutes: _____ [0-59]

E50F. **What time did you leave [location in E50B] to go to [E5 DESTINATION]?**
Please enter a time between 4:00 a.m. the previous day [TRAVELDAY] and 3:59 a.m. [TRAVELDAY+1]
Time: [Dropdown with hours and AM/PM] Minutes: _____ [0-59]

17. TRIP CAPTURE – OTHER INFORMATION

E11N.

PHONE: INTERVIEWER: If there is anything unusual about a trip (e.g., round trip from home to home) or the individual trip chains, or if useful information, please make notes here, otherwise proceed to next question without delay. Use only when necessary.

WEB: Please note any exceptions on this trips or issues/errors you may have had (e.g., clarification of location, purpose, etc.)]?

_____

For assistance, please contact 1-855-412-1940 or email us at info@northshoretrips.ca.

E12. **Prompt: Did you make another trip after that?**

1. Yes
2. No

18. TRIP CAPTURE – END OF TRAVEL DAY

E13. [if E12 = No AND (destination <> home OR trip purpose <> home)

From your answers, it appears you did not return home.

Just to confirm, were you at this final destination, [RECALL DESTINATION], until at least past 4 a.m. [today/TRAVEL DAY+1] (the end of the travel day)?

1. Did not return home, was at this final destination until past 4 a.m.
2. Returned home (more trips to record) [RETURN TO E12 AND CORRECT ANSWER]

E14. [if E14 = 1. yes]

Why did you not return home before the end of the day?

(Note: for this survey, the end of the Travel Day extends past midnight to 4 am the next day)

(We are only asking as a check to ensure that we captured your entire travel)

1. Worked a night shift past 4 am
2. Stayed overnight at another household (whether friend, relative, parent)?
3. Away from home on business travel
4. Away from home for vacation travel
5. Other, please specify: _____

E16. [if employed=yes AND did not make a work-related trip AND no trip destination of 'usual workplace' (E5<>main work location) AND E12=777 (No more trips)]

You did not report going to work [yesterday/on TRAVEL DAY].

Were you working at home?

1. Yes, worked from home (telecommuted)
2. No, away on business / working on the road
3. No, did not work

4. No, actually I worked and did take work-related trips
5. Other, specify: _____

E17A. [if E16=Yes actually did work)]
Please add your trips to and from work, on the Trips Overview page whether you walked or used another mode of travel.
Please also record any other trips by modes other than walking that you may have missed.
Link to Trips Overview page.

E16A. [if a full time student AND did not make a school-related trip AND no trip destination of 'school' (E5<>person's own school) AND E12=777 (No more trips)]
You did not report going to school. Did you attend school [yesterday/on TRAVELDAY]?
1. Yes, did go to school
2. Attended school from home (home schooled, distance learning)
3. No, did not have any scheduled classes, stayed home sick, or did not attend school for another reason
4. No, away on a field trip or other travel
5. Other, specify: _____

E17B. [if went to school E16A=Yes and usual school location other than 'home']
Please add your trips to and from school, on the Trips Overview page whether you walked or used another mode of travel. *Link to Trips Overview Page*
Please also record any other trips by modes other than walking that you may have missed.

E20. Your trips can be reviewed and edited on this page before exiting the trip section of the survey. You can also add additional trips here that you may have missed. Can you think of any other trips you made [yesterday/TRAVEL DAY] either during the day or in the evening that we may have missed?
If so, click on Add Trips or use the Edit trip links to edit a trip you've already entered.
If you are done entering trips, click on Go to Household Summary where you can continue through the final questions of the survey once you've finished your trip entries.

19. TRANSIT STRIKE IMPACT

Transit strike questions added and displayed as of Monday Nov 4th for travel dates equal or greater than Friday Nov 01 and less than Nov 28:

STRIKE_1
Workers at Coast Mountain Bus Company, which provides bus service throughout most of Metro Vancouver and operates the SeaBus routes are currently undertaking strike/job actions which may affect the availability or frequency of some transit routes.

Did the transit bus strike / job action affect your travel yesterday? (E.g., did not take transit, took fewer or more trips, did not travel at all)

1 --Yes
2 -- No

STRIKE_2 [STRIKE_1 == 1]
[MULTIPLE RESPONSE QUESTION]
How did the transit strike affect your travel yesterday? Please select all that apply.

1 --Used another mode of travel (I would normally have taken transit, so drove, took a taxi, or used another mode to travel the same places as usual)
2--Made fewer trips (I could not travel to certain places as transit was not available)
3--Made more trips (I had to drive someone else to work or school or errands who would normally take transit)
4—I changed the time(s) of at least one of my trips (I travelled at a different time due to reduced or cancelled transit service)
6 Transit trips took longer (I took different routes, transit ran slower, wait times were longer)
7 Other trips took longer (congestion, more cars on the road)
5—Other (Please specify):

[If STRIKE_2= 1] display STRIKE_3 with a list of the trips recorded with a tick box beside each one so that the respondent can tick off which trips they would have taken via public transit.

STRIKE_3
Please select the trips you would have normally taken transit on:
[PROGRAMMING: RECALL TRIP TIME, LOCATION, MODE, and SHORTENED FORM OF PURPOSE (For ex. ATTEND SCHOOL, TRAVEL TO WORK, ETC.]

[Trip 1]	7:15 am trip to: 300 W Georgia St -- Auto driver - private vehicle, SeaBus, SkyTrain -- for the purpose of: Travel to work (usual place of work)
[Trip 2]	12:00 pm trip to: 300 W Georgia St -- Walking (incl. jogging) -- (a recreational trip)
[Trip 3 etc...]	7:05 pm trip to: 321 18th St W -- Walking (incl. jogging), SkyTrain, SeaBus, Auto driver - private vehicle -- for the purpose of: Returning home

[X] Don’t know / Prefer not to Answer

STRIKE_4 [STRIKE_2 == 2]
How many more trips would you have taken if transit was available? Please provide your best estimate.

99 - Don’t Know / Unsure

STRIKE_5 [STRIKE_2 == 3]
How many trips would you have avoided taking entirely if transit was available? Please provide your best estimate.

[ ]
99 - Don't Know / Unsure

20. OTHER TRAVEL HABITS

Thank you for reporting your travel information for your travel day! The next set of questions asks about your use of different modes and your usual travel habits.

C3C. **Are you a member of any car share services? (Check all that apply)**
1. None
2. Car2Go
3. Modo
4. ZipCar
5. Evo
6. Other, specify: _____
99. Prefer not to answer
[PROGRAMMING NOTE: None is mutually exclusive from other options]

C3D. **Are you a member of any bike share services? (Check all that apply)**
1. None
2. Mobi (City of Vancouver's bike share system)
3. Other, please specify: _____
99. Prefer not to answer
[PROGRAMMING NOTE: None is mutually exclusive from other options]

C3D. **New shared electric micromobility services such as e-bikes and e-scooters are becoming more common in major cities.**

In some cities, shared e-bikes are available across the city. Users pay a fee per minute, hour, day or monthly subscription to access the e-bikes. To go on a trip, a user will unlock the e-bike with a smart phone or key fob and ride to their destination, where they drop off the e-bike for someone else to use next.

How interested would you be in using an e-bike share service on the North Shore?
1. Not at all interested
2. Slightly interested
3. Moderately interested
4. Very interested
99. Prefer not to answer

C4F. [if student AND SchoolName not Home Schooled AND SchoolType not Online only]
What is your <u>usual mode of transportation</u> at this time of year for trips to or from school as a student? If you usually use more than one mode (such as auto and transit on the same trip), please select the one used for most of the travel distance. Select one only.

1. Auto driver – private vehicle
2. Auto passenger – private vehicle
21. Car share driver (Modo, Car2Go, ZipCar, Evo, etc)
22. Car Share passenger (Modo, Car2Go, ZipCar, Evo, etc)
3. Transit Bus
4. SeaBus
5. SkyTrain
6. West Coast Express
7. HandyDART
8. School bus
9. Bicycle (incl. pedal-assist e-bikes)
10. Rolling (skateboard, roller-blades, scooter, mobility device, longboard)
11. Walking (incl. jogging)
12. Taxi
13. Motorcycle
14. Low speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike)
17. Other (please specify): _____

C4G. [if student AND SchoolName not Home Schooled AND SchoolType not Online only]
What is your <u>secondary</u> mode of transportation for trips to or from school (on the days you do not use your usual mode)? If your travel entails more than one mode of travel, please select the one used for most of the travel distance. Select one only.

77. I never use a different mode of travel to school
1. Auto driver – private vehicle
2. Auto passenger – private vehicle
21. Car share driver (Modo, Car2Go, ZipCar, Evo, etc)
22. Car Share passenger (Modo, Car2Go, ZipCar, Evo, etc)
3. Transit Bus
4. SeaBus
5. SkyTrain
6. West Coast Express
7. HandyDART
8. School bus
9. Bicycle (incl. pedal-assist e-bikes)
10. Rolling (skateboard, roller-blades, scooter, mobility device, longboard)
11. Walking (incl. jogging)
12. Taxi
13. Motorcycle
14. Low speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike)

17. Other (please specify): _____

C4H. [if student AND SchoolName not Home Schooled AND SchoolType not Online only]
How satisfied are you with your usual commute to school?
1. Very dissatisfied
2. Dissatisfied
3. Neither Satisfied nor Dissatisfied
4. Satisfied
5. Very Satisfied
99. Prefer not to answer

C4H2 [if C4H <= 2]
Why are you dissatisfied with your usual commute to school? (select all that apply)
[PROGRAMMING: randomize order of options 1-5]
1. Distance
2. Travel time (too slow)
3. Cost
4. Convenience
5. Safety
7. Other, please specify: _____
99. Prefer not to answer

C6F. [if employed AND regular workplace outside the home (not home or no fixed workplace)]
What is your usual mode of transportation at this time of year for trips to or from work? If you usually use more than one mode (such as auto and transit on the same trip), please select the one used for most of the travel distance. Select one only.
1. Auto driver – private vehicle
2. Auto passenger – private vehicle
21. Car share driver (Modo, Car2Go, ZipCar, Evo, etc)
22. Car Share passenger (Modo, Car2Go, ZipCar, Evo, etc)
3. Transit Bus
4. SeaBus
5. SkyTrain
6. West Coast Express
7. HandyDART
8. School bus
9. Bicycle (incl. pedal-assist e-bikes)
10. Rolling (skateboard, roller-blades, scooter, mobility device, longboard)
11. Walking (incl. jogging)
12. Taxi
13. Motorcycle
14. Low speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike)
17. Other (please specify): _____

C6G. [if employed AND regular workplace outside the home (not home or no fixed workplace)]
What is your <u>secondary</u> mode of transportation for trips to or from work (on the days you do not use your usual mode)? If your travel entails more than one mode of travel, please select the one used for most of the travel distance. Select one only.

77. I never use a different mode of travel to work
1. Auto driver – private vehicle
2. Auto passenger – private vehicle
21. Car share driver (Modo, Car2Go, ZipCar, Evo, etc)
22. Car Share passenger (Modo, Car2Go, ZipCar, Evo, etc)
3. Transit Bus
4. SeaBus
5. SkyTrain
6. West Coast Express
7. HandyDART
8. School bus
9. Bicycle (incl. pedal-assist e-bikes)
10. Rolling (skateboard, roller-blades, scooter, mobility device, longboard)
11. Walking (incl. jogging)
12. Taxi
13. Motorcycle
14. Low speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike)
17. Other (please specify): _____

C6H. [if employed AND regular workplace outside the home (not home or no fixed workplace)]
How satisfied are you with your usual commute to work?

1. Very dissatisfied
2. Dissatisfied
3. Neither Satisfied nor Dissatisfied
4. Satisfied
5. Very Satisfied
99. Prefer not to answer

C6H2 [if C6H <= 2]
Why are you dissatisfied with your usual commute to work? (select all that apply)
[PROGRAMMING: randomize order of options 1-5]

1. Distance
2. Travel time (too slow)
3. Cost
4. Convenience
5. Safety
7. Other, please specify: _____
99. Prefer not to answer

C6I. [if employed AND regular workplace outside the home (not home or no fixed workplace)]
Do you ever telecommute (work from home instead of a commuting to your regular workplace)? If so, how often?

1. No, never telecommute
2. Once per month or less
3. 2 or 3 days per month
4. 1 day per week
5. 2 or 3 days per week
6. 4 or 5 days per week

99. Prefer not to answer

C15. **What is your usual mode of travel for trips for shopping, meeting friends and family, recreation, and other non-commute purposes? (i.e., trips other than travel to/from work and school). If you use more than one mode, please choose the one you use most often.**

1. Auto driver – private vehicle
2. Auto passenger – private vehicle

21. Car share driver (Modo, Car2Go, ZipCar, Evo, etc)
22. Car Share passenger (Modo, Car2Go, ZipCar, Evo, etc)

3. Transit Bus
4. SeaBus
5. SkyTrain
6. West Coast Express
7. HandyDART
8. School bus
9. Bicycle (incl. pedal-assist e-bikes)
10. Rolling (skateboard, roller-blades, scooter, mobility device, longboard)
11. Walking (incl. jogging)
12. Taxi
13. Motorcycle
14. Low speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike)
17. Other (please specify): _____

C16. **How often do you typically travel by public transit? Public transit includes TransLink buses, SkyTrain, SeaBus, or West Coast Express.**

1. At least 5 times per week
2. 2-4 times per week
3. Once per week to once per month
4. Less than once per month
5. I do not use public transit

99. Prefer not to answer

C17. [if TransitRecent=1 Yes]
How do you usually pay for your travel by transit at this time of year? (Check all that apply)
1. Cash
2. Compass Card Add Value
3. Compass Card Monthly Pass
4. U-Pass
5. Employer Pass (Discount or fully paid for by employer)
6. Credit/ Debit
7. Other Specify:_____
99. Prefer not to answer

C21. **How often do you typically travel by bicycle in fair weather?**
1. At least 5 times per week
2. 2-4 times per week
3. Once per week to once per month
4. Less than once per month
5. I do not ride a bicycle at all
6. I am physically unable to ride a bicycle
99. Prefer not to answer

[PROGRAMMER: Implement the following error message iIf BikeFreq=5|6 AND (SchoolCommute1=9 bike OR WorkCommute1=9 bike OR OtherUsualMode=9 bike):] Earlier, you indicated you use a bicycle as your usual mode of travel for trips to work, school, or for other purposes. Please correct your answer here or click the Previous button to correct your mode(s) of travel on previous questions.]

C22. [if BikeFreq=1-4]
How often do you typically travel by bicycle in rainy or cold weather?
1. At least 5 times per week
2. 2-4 times per week
3. Once per week to once per month
4. Less than once per month
5. I do not ride a bicycle in rainy or cold weather
99. Prefer not to answer

C23. [if BikeFreq=1-5]
Are you interested in travelling by bicycle more than you do now?
1. Yes
2. No, I am happy with how much I currently bicycle [if BikeFreq=1-4]
3. No, I want to travel less by bicycle [if BikeFreq=1-4]
4. No, I am not interested in travelling by bicycle at all [if BikeFreq=5 not ride]
99. Prefer not to answer
[PROGRAMMER: if respondent answered BikeFreq=5, suppress option 2 and 3, but display option 4]

C24. [if BikeMore=1-3]

If you were travelling by bicycle on your own, which of the following environments would you generally feel comfortable riding on: (Select all that apply)

Click on the links below to see pictures of different cycling environments.

1. On almost any street in the city and I don't worry much about traffic conditions. Example↗
2. On major streets, provided they have painted bicycle lanes. Example↗
3. On major streets, provided they have bicycle lanes separated from traffic with a physical barrier. Example↗
4. On local neighbourhood streets with little traffic and low speeds. Example↗
5. On bicycle paths far away from motor vehicles. Example↗
6. I'm not comfortable cycling in any of the above environments

99. Prefer not to answer

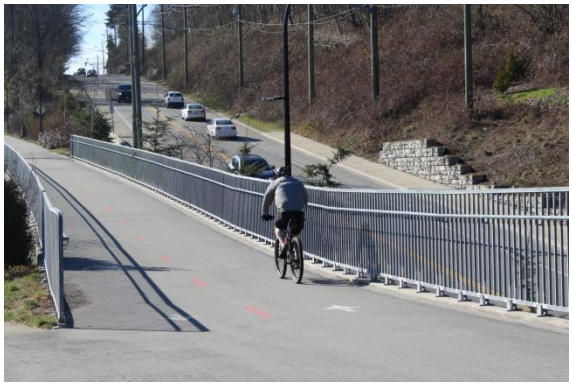
Example1: regular city street

Example 2: major street with painted bicycle lane

Example 3: major street with bicycle lane separated by physical barrier

Example 4: local neighbourhood street with little traffic

Example 5: bicycle path far away from motor vehicles



C24. **In terms of walking, what would you consider a reasonable distance for travel purposes (work, school, shopping, errands, etc). Please indicate the farthest distance you think is a reasonable to walk.**

1. Less than 400m (less than 6 minutes)
2. 400-800m (6-12 minutes)
3. 800-1,200m (12-18 minutes)
4. 1,200m to 2km (18-30 minutes)
5. More than 2km (more than 30 minutes)

99. Prefer not to answer

21. FINAL DEMOGRAPHICS

We have some final demographic questions that will help us better understand the transportation needs of different populations on the North Shore.

C30. **What is the highest level of education you have completed?**

1. Have not completed high school
2. Completed high school (or secondary school equivalent such as ABE or GED)
3. Trades certificate/diploma or completed apprenticeship (achieved journeyperson designation)
4. Non-university certificate or diploma from a community college, CEGEP or nursing school
5. University certificate or diploma below bachelor's level
6. Bachelor's degree
7. University certificate or degree above bachelor level
8. Degree in medicine, dentistry, veterinary medicine or optometry
9. Graduate degree (master's degree or doctorate)
99. Prefer not to answer

C31. **In general, would you say your health is....?**

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor
99. [PHONE: DO NOT READ:] Prefer not to answer

C32. **Taking into account work, recreation, and activities around your home, which of the following best describes your lifestyle and level of physical activity ....?**
[PHONE: ONLY READ TEXT IN BRACKETS IF NECESSARY TO CLARIFY]

1. Sedentary (desk job, little or no exercise)
2. Light physical activity (on your feet some of the day, light exercise once or twice per week)
3. Moderately active (on your feet most of the day, moderate exercise 3 to 7 times per week)
4. Very active (walking most of the day, hard exercise almost every day)
99. [DISPLAY FOR BOTH ONLINE AND PHONE; BUT FOR PHONE, DISPLAY INSTRUCTION PHONE: DO NOT READ:] Prefer not to answer

C33. **Do you have a cognitive or physical condition or illness that affects your ability to travel? This includes both permanent and temporary conditions (such as a broken leg).**

1. Yes
2. No
99. Prefer not to answer

C34. [if MobilityChallenge = yes]
Do you use an assisted mobility device? (such as a wheelchair, walker, crutch, cane, prosthesis, or mobility scooter)
1. Yes
2. No
99. Prefer not to answer

C36. What language do you speak **most often** at home?
1. English
5. Cantonese
8. French
11. German
15. Italian
10. Japanese
4. Korean
3. Mandarin
2. Persian (Farsi)
12. Polish
14. Portuguese
13. Punjabi (Panjabi)
9. Russian
6. Spanish
7. Tagalog (Pilipino, Filipino)
77. Other, please specify: _____
99. Prefer not to answer

[Responses other than English to be listed in alphabetical order. Numbering indicates rank as of 2016 Census. Only the top 15 languages from the Census are displayed.]

B9. WEB: **Which of the following ranges best describes your household's total income last year? (Please consider all sources of income for all household members, before taxes)**
PHONE: May I ask which of the following ranges best describes your household's total income last year? (Consider all sources of income, before income taxes)? (INTERVIEWER: read answers until confirmation)

This information is useful for transportation planning purposes, to get a better understanding of the travel patterns of different types of households. Your answers will remain entirely confidential. Click here to see our Privacy Statement.

1. $0 to less than $30,000
2. $30,000 to less than $50,000
3. $50,000 to less than $80,000

4. $80,000 to less than $125,000
5. $125,000 to less than $200,000
6. $200,000 or more
99. Prefer not to answer

[The ranges above would have, in the 2016 Census year, divided North Shore households into six similarly-sized household income groups: 16%, 13%, 18%, 19%, 18%, and 16% of households, respectively.]

B7B. [if # household vehicles>=1 and has drivers licence]
What type of motor vehicle do you usually drive for personal use?

1. Passenger vehicle
2. SUV
3. Pick-up truck or van
4. Motorcycle
5. Medium duty commercial truck or cube van
6. Heavy duty truck or tractor
7. Other, please specify: _____
8. Not applicable / I almost never drive
9. Prefer not to answer

B7B. [if # household vehicles>=1 and has drivers licence]
What is the fuel type of the vehicle you usually drive?

1. Gasoline
2. Diesel
3. Hybrid (gas/electric)
4. Electric-only
5. Biodiesel
6. Other, please specify: _____
9. Prefer not to answer

B21 **We would like to better understand how many kilometers residents drive in a year, as it helps to provide a measure of fuel consumption and emissions, which impact air quality and climate change.**

Would you like to enter your odometer reading right now, or send yourself a link to enter it later? We can email or text you a link, so that you can fill out the odometer reading in your car with your smartphone or tablet, if you choose.

1. Enter my odometer reading right now
2. Email me a link to enter my odometer reading later to this email address: _____
3. Text me a link to this phone number: _____

[PROGRAMMER: ALSO SET UP SEPARATE FORM THAT ALLOWS THE ENTRY OF THE ODOMETER READING TO THE SAME DATA FIELD IN THE HOUSEHOLD TABLE, SO THAT THEY CAN STILL MAKE AN ENTRY EVEN AFTER THIS FORM IS SUBMITTED AND CLOSED FROM FURTHER ACCESS. IF THE RESPONDENT CHOOSES TO BE SENT A LINK TO ENTER THEIR ODOMETER READING, EMAIL OR TEXT A LINK TO THEIR CASE IN THE SEPARATE FORM. EMAIL TEXT:
Subject: North Shore Transportation Survey Odometer Reading
Please use the following link to enter the current odometer reading for your vehicle: [Link]
SMS TEXT: North Shore Transportation Survey Odometer Reading: Please use the following link to enter the current odometer reading for your vehicle: [Link]
THE CASE IN THEIR SEPARATE FORM SHOULD BE GENERATED BY THE TIME THEY REACH THIS POINT IN THE SURVEY]

B22 [If VehicleKmEntry=1]
Please enter the current odometer reading for your vehicle to the nearest 100 km. If unsure, you may check the vehicle and return to enter it later.

_____

What is the year of manufacture of your vehicle? This will help determine how many km are driven each year, on average.

_____

B10A. **Did you have any difficulty reporting your trip information? Or do you have any comments about the information you provided on your survey?**

_____

99. No

INTERVIEWER: Do not ask the respondent if they have any final comments to make. Do not record any information here unless it pertains to potential issues in the trip data collected (e.g., you think you made an error in capturing trips, or the system did not perform as expected).

22. PRIZE DRAW

F1. **Participants in the survey are eligible to enter a prize draw. A total of $2,000 in prizes will be awarded. Would you like to enter into the draw?**

INTERVIEWER: If more information requested

Prizes include:

- 5 $100 gift certificates to local merchants
- 60 $25 e-gift certificates to local merchants.

Your chances of winning a prize are about 1 in 30. The prize draw is administered by R.A. Malatest & Associates Ltd. and will be drawn once the survey administration period is completed.

1. Yes
2. No

F2. [If yes]

PHONE: **May I confirm your name and phone number, so that we can contact you to let you know if you have won?**

Your name and phone number will be kept confidential and will be used only to contact you in the event your name is selected in the prize draw.

WEB: **Please confirm your name and phone number, so that the survey administrator can contact you at this phone number in the event your name is selected in the prize draw.**

This personal information will not be used for any other purpose nor will it be shared with anyone else.

Name: _____ [prepopulate with first name, if respondent provided their name earlier]

Phone: _____ [prepopulated with household phone number. Allow edits in case respondent wants to be contacted at another number]

Email:_____ [prepopulate with household email, allow edits]

23. PANEL ENROLMENT

B11. One of the goals of this annual survey is to understand and track changes in North Shore residents' travel patterns over time. We would like to conduct a short follow-up survey with you again in another year. There will be a separate prize draw for next year's survey as well.

In order to do a follow-up survey with you next year, your contact information and linked survey responses would need to be retained by the North Shore Transportation Survey partner municipalities (City of North Vancouver, District of North Vancouver, and District of West Vancouver) until the next survey.

Your privacy is important to us. Your survey responses will be stored securely and your contact information will only be used to contact you for the follow-up survey. Click here to see our Privacy Statement.

Do you agree to allow the partner municipalities to securely store your contact information and linked survey responses for the sole purpose of conducting a follow-up survey next year?

1. Yes
2. No

24. CONCLUSION

Please click on the Submit button to submit your survey answers and conclude the survey.
After you click Submit, you will no longer be able to edit your answers.

_____

That concludes the 2019 North Shore Transportation Survey.
Thank you very much for your participation!

Your survey answers have been saved. Click here to see our Privacy Statement.

[PROGRAMMER: IF HAS VEHICLE AND B22 (ODOMETER READING) IS EMPTY:
If you still need to fill in your odometer reading, you can do so here: Link]

If you wish to change any of your answers, or if you have any concerns about the survey, please contact **info@northshoretrips.ca** or **1-855-412-1940**

PHONE ONLY: That concludes the survey. Thank you very much for your cooperation. Have a pleasant evening.

For more information about the survey, please visit: **northshoretrips.ca**

Appendix B: Survey Invitation Letters

Log in at
northshoretrips.ca
Your secure access code is
N123XYZ

Occupant
Street Address
City Province Postal Code

Dear North Shore resident,

I'm pleased to let you know that you have been randomly selected to participate in the **North Shore Transportation Survey**, as part of the Integrated North Shore Transportation Planning Project (INSTPP). More details about INSTPP can be found at www.instpp.ca.

Your participation will go a long way in shaping how your community moves. By understanding how, where, and why residents travel within the North Shore, we can better plan our future transportation system and services.

You can complete the survey in two ways:

- Take the survey online at **northshoretrips.ca** using the secure access code at the top of this letter; OR
- Over the phone by calling the survey toll-free hotline at 1-855-412-1940.

B.C.-based research firm R.A. Malatest & Associates Ltd. will be conducting the survey on behalf of the City of North Vancouver, District of North Vancouver, and District of West Vancouver. All information that you provide will be kept strictly confidential. Your personal information will not be shared with any other individual or organization, in accordance with the Freedom of Information and Protection of Privacy Act.

As a thank you for your participation, you will have a 1-in-30 chance to win one of 65 gift certificates ranging from $25 to $100! Details on the prize draw are available once you access the survey.

Thank you for your participation and contributions towards building a better North Shore.

Sincerely,

Cindy Liu
Transportation Engineer
District of West Vancouver

Log in at
northshoretrips.ca
Your secure access code is
N123XYZ

Occupant
Street Address
City Province Postal Code

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Thank you for your participation and contributions towards building a better North Shore.

Sincerely,

Banafsheh Rahmani
Transportation Engineer
District of North Vancouver

Occupant
Street Address
City Province Postal Code

Log in at
northshoretrips.ca
Your secure access code is
N123XYZ

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Thank you for your participation and contributions towards building a better North Shore.

Sincerely,

Andrew Devlin
Manager - Transportation
City of North Vancouver