2023 North Shore Transportation Survey

Final Report
April 2024
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city of north vancouver

DISTRICT OF NORTH VANCOUVER

west vancouver

Acknowledgements

Executive Summary

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 2023 NSTS was conducted with 2,380 residents, for a sampling rate of 2.9% of households or 1.4% of the population, with both previously and newly recruited participants. It is the third survey undertaken over the last five years (previous surveys were undertaken in 2019 and 2021), providing an opportunity to observe and analyze longitudinal travel trends across the North Shore.

An address-based sampling approach was used to randomly select households across the North Shore to participate. The 2023 NSTS study area comprises the entire North Shore, including Tsleil-Waututh Nation (Burrard Inlet 3 Census Subdivision), Squamish Nation within the North Shore area (Mission 1, Seymour Creek 2, and Capilano 5 Census Subdivision), City of North Vancouver (CNV), District of North Vancouver (DNV) and District of West Vancouver (DWV). 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 included attitudinal questions and reporting of usual transportation-related habits. The survey was open to residents 15 years of age or older.

The survey results suggest that residents of the North Shore made 11,700 more daily trips in 2023 than in 2021 (a 2.3% increase), in line with the 2.5% increase in population during that time frame as shown in Figure E1. The average resident made 3.12 trips per day in 2023, in line with the 3.13 trips per day in 2021, but lower than the 3.66 trips per day in 2019. The increase in work commuting trips since 2021, which is still below 2019 volumes, has been offset by a decrease in shopping trips from 2021 to 2023.

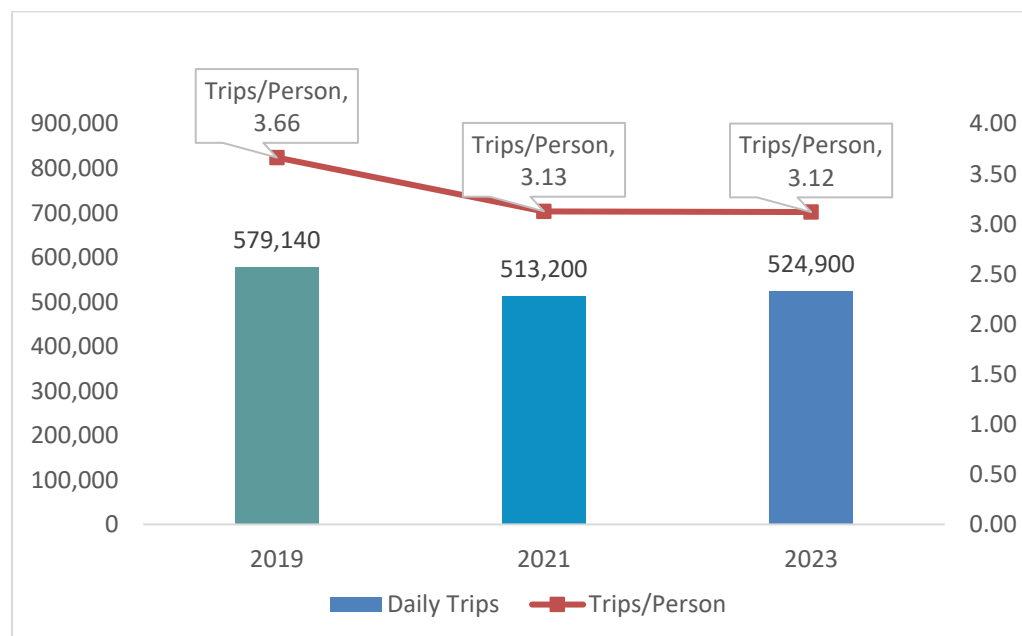*Figure E1. Daily Trip Volumes and Person Trip Rates – 2019 to 2023*

Figure E2 presented below shows trips originating and staying within the North Shore, as well as the trips originating from the North Shore and travelling to external destinations beyond the North Shore. The associated Table E1 shows the aggregated origins of North Shore residents' trips and their destinations (including the trips that originate from external locations not depicted on the map). The majority of trips by North Shore residents originate in and are destined within the North Shore. The most popular external destinations are the Vancouver CBD and the rest of Vancouver and the University Endowment Lands. For trips that are destined outside of the North Shore south of Burrard Inlet, approximately half of those have additional trips outside the North Shore. Only 1,100 trips that leave the North Shore are destined to and from the north up the Sea to Sky corridor.

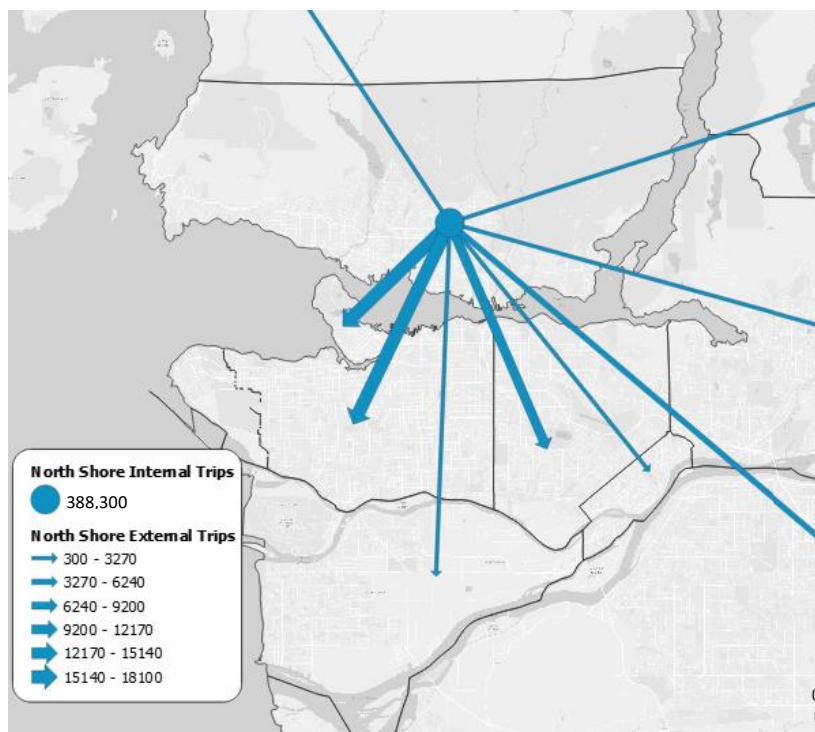*Figure E2. Flows For Trips Originating in North Shore*

Table E1. Trip Origin and Destinations for All Trips

Trip Origin Destination	Daily Trips
Within the North Shore	388,300
From the North Shore Across Burrard Inlet	55,200
From the North Shore to the North	1,000
From Across Burrard Inlet to the North Shore	54,600
From the North to the North Shore	1,100
While outside the North Shore	23,800
Other External Undefined	1,000
Total Trips	524,900

Figure E3 presents the mode share of the whole North Shore for 2019, 2021, and 2023 as reported by survey participants, weighted and expanded to represent the total population living in private households. The number of auto trips has stayed relatively similar from 2021 to 2023, now representing a slightly smaller proportion. The number and proportion of transit trips have increased from 2021 to 2023 but are still below 2019 volumes and proportions. The number of walking and cycling trips have increased from 2021 but are still below 2019 levels. Mode share varies based on trip purpose, with school trips (58%), usual recreation (37%), and usual commute to work trips (33%) having the highest sustainable mode shares.

Figure E3. Total Trips by Mode and Mode Share - North Shore, 2019 to 2023
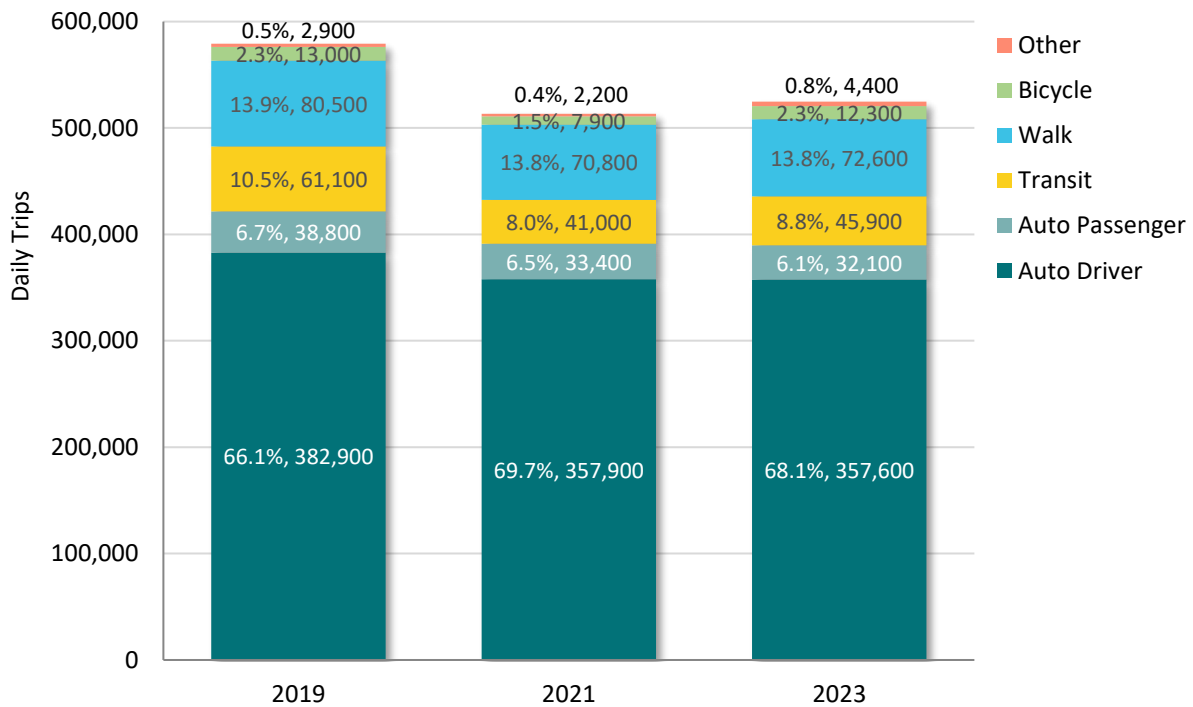
The number of private vehicles in households for the whole North Shore region, as estimated from the survey results, has seen a gradual increase of approximately 5.5% from 125,500 in 2019 to 132,420 in 2023. This compares with a population growth of 5.8% in the same time period (189,390 in 2019 and 200,400 in 2013). The estimated average annual vehicle kilometres traveled (VKT) per household vehicle reflects an increase from 2021, with VKT rising from 8,900 km per household vehicle in 2021 to 10,100 km per household vehicle in 2023, still below 2019's 12,100 km per household vehicle. With the increase in vehicle numbers on the North Shore, there has been an increase in the ownership of hybrid and electric vehicles from 2019 to 2023. Hybrid vehicle ownership rose from 4% to 7%, while electric vehicle ownership increased from 4% to 8%, resulting in a combined growth from 8% to 15% for hybrid and electric vehicles together from 2019 to 2023.

The survey results suggest that approximately 15% of households on the North Shore possess at least one e-bike and 4% possess at least one alternative e-micromobility device.[1] Survey estimates suggest that the ownership of e-bikes significantly increased from 4,100 in 2019 to 17,920 by 2023. Despite this growth in e-bike ownership, the total number of (non-electric) bicycles as estimated from the survey results appears to have decreased from 117,900 in 2021 to 105,110 in 2023.

Each of the three municipalities have different travel patterns, explained on the following pages.

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[1] For the purpose of this survey, e-bikes are treated separately from other kinds of e-micromobility device (such as e-scooters, hoverboards, etc.)

The District of North Vancouver

DNV had an increase in sustainable transportation mode share compared to 2021 because of an increase in transit trips and bicycle trips, despite a decrease in walk trips. For auto uses, there was a shift from auto passenger trips to auto drivers, which would translate to proportionately more vehicles on the road. Table E2 shows the daily trip volumes by mode and year for these trips and Figure E4 shows the 2023 weekday mode share for DNV.

Table E2. Trip Volumes by Mode – DNV

Daily Trips by Mode	2019	2021	2023
Auto Driver	187,700	172,700	181,970
Auto Passenger	18,400	18,800	13,580
Transit	21,600	13,700	19,980
Walk	34,400	31,200	27,140
Bicycle	6,700	3,700	7,120
Other*	1,500	1,200	1,680
Total Daily Trips	270,300	241,300	251,460
Mode Shares	2019	2021	2023
Auto Driver	69.4%	71.6%	72.4%
Auto Passenger	6.8%	7.8%	5.4%
Transit	8.0%	5.7%	7.9%
Walk	12.7%	12.9%	10.8%
Bicycle	2.5%	1.6%	2.8%
Other*	0.5%	0.5%	0.7%
Sustainable Mode Share (Transit + Walk + Bike)	23.2%	20.1%	21.6%
Active Share (Walk + Bike)	15.2%	14.5%	13.6%

Figure E4. Weekday Mode Shares – DNV
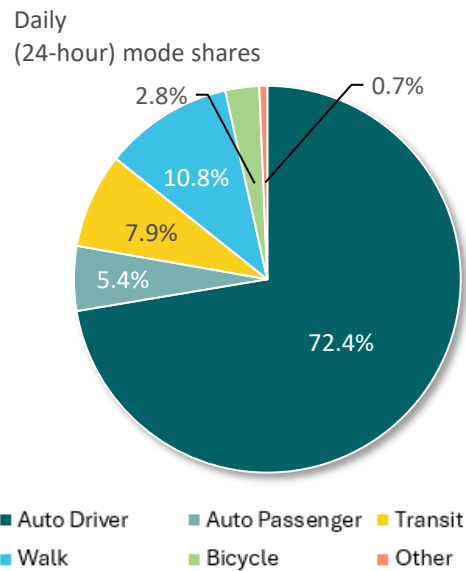
Daily (24-hour) mode shares

Many of the trips that were taken by auto driver are short enough to be taken by other modes. Of the 182,000 auto driver trips in DNV, 77,700 (or 43%) are short enough to be bikeable trips (less than 4.6 km) and 22,700 (or 12%) are short enough to be walkable trips (less than 1.6 km).

Sustainable mode share varies significantly by trip purpose, with a higher number of transit trips and a lower number of walking trips for commute trips compared with non-commute trips. The percentage of trips made to work (usual workplace) has seen a slight increase from 9.2% in 2021 to 9.8% in 2023, remaining below 2019 levels of 10.9%. Conversely, work-related trips[2] decreased from 6.2% in 2021 to 4.9% in 2023 and shopping trips (the most popular trip type other than return home) decreased from 13.7% in 2021 to 12.2% in 2023. The largest increase in trip purpose from 2021 to 2023 is observed in recreational trips, which rose from 6.8% to 8.8%, and in trips for picking up or dropping off passengers, which increased from 9.6% to 10.3%.

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[2] Work-related trips are all trips related to work except travelling to/from work such as travel to meetings
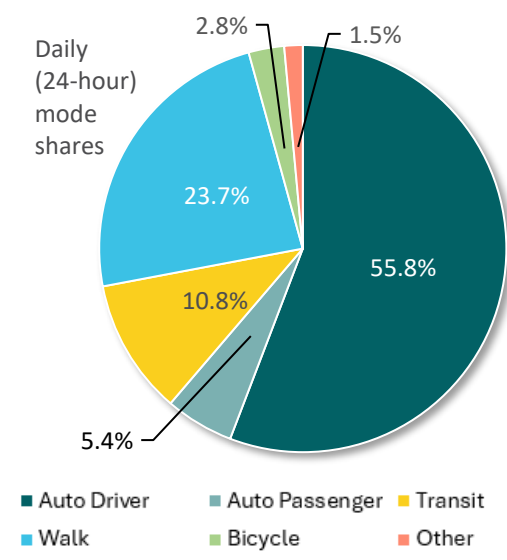
The City of North Vancouver

CNV has seen an increase in active mode share from 2021 to 2023 exceeding 2019 levels. Transit ridership continues to decrease from 2019 through to 2023. The number of auto driver trips increased from 2021, to similar levels seen in 2019. Table E3 shows the daily trip volumes by mode and year, and Figure E5 shows the 2023 weekday mode share for CNV.

Table E3. Trip Volumes by Mode – CNV

Daily Trips by Mode	2019	2021	2023
Auto Driver	87,500	85,400	87,760
Auto Passenger	12,100	6,200	8,570
Transit	27,800	19,900	16,930
Walk	31,900	26,800	37,250
Bicycle	3,500	2,800	4,440
Other*	400	700	2,300
Total Daily Trips	163,100	141,800	157,250
Mode Shares	**2019**	**2021**	**2023**
Auto Driver	53.60%	60.20%	55.80%
Auto Passenger	7.40%	4.40%	5.40%
Transit	17.00%	14.10%	10.80%
Walk	19.60%	18.90%	23.70%
Bicycle	2.10%	2.00%	2.80%
Other*	0.20%	0.50%	1.50%
Sustainable Mode Share (Transit + Walk + Bike)	38.70%	34.90%	37.30%
Active Share (Walk + Bike)	21.70%	20.90%	26.50%

Figure E5. Weekday Mode Shares – CNV

Daily (24-hour) mode shares

Auto Driver 55.8%, Walk 23.7%, Transit 10.8%, Auto Passenger 5.4%, Bicycle 2.8%, Other 1.5%

The percentage of trips made to work increased from 2021 and surpassed 2019 levels. This is due to an increase in the number of residents who never telecommuted and a decrease in those who exclusively work from home. This can be seen as a contributing factor to an increase in auto trips as well as an increase in cycling trips. Cycling by trip purpose is highest for trips to work. For transit, to-work trips are the second most popular trip purpose however the increase in to-work trips has not translated to more transit trips for CNV residents.

Approximately 58% of the survey population lives in apartments, a 3 percentage point increase from 2021. Walking trips make up approximately 20% of trips for those residing in apartments. The increase of residents living in apartments combined with proximity to amenities may be a contributing factor to the observed increase in walking trips by CNV residents. Of the 87,800 auto driver trips in CNV, 44,400 (or 51%) are short enough to be bikeable trips (less than 4.6 km) and 15,600 (or 18%) are short enough to be walkable trips (less than 1.6 km).
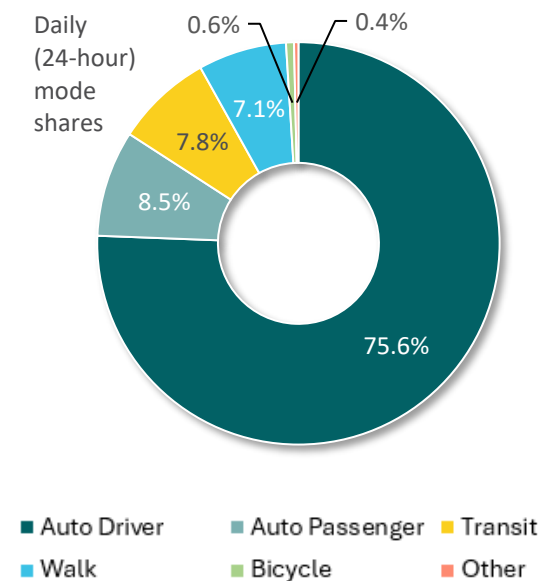
The District of West Vancouver

DWV has seen a decrease in the number of daily trips by auto drivers from 99,800 in 2021 to 87,840 in 2023, reflecting a continued decline from 107,700 in 2019. The number and proportion of walking trips has decreased from 2021. Table E4 shows the daily trip volumes by mode and Figure E6 shows the 2023 weekday mode share for DWV.

Table E4. Trip Volumes by Mode – DWV

Daily Trips by Mode	2019	2021	2023
Auto Driver	107,700	99,800	87,840
Auto Passenger	8,300	8,400	9,910
Transit	11,700	7,400	9,030
Walk	14,200	12,900	8,250
Bicycle	2,900	1,400	740
Other*	1,000	300	410
Total Daily Trips	145,800	130,100	116,190
Mode Shares	2019	2021	2023
Auto Driver	73.9%	76.70%	75.60%
Auto Passenger	5.7%	6.50%	8.50%
Transit	8.0%	5.70%	7.80%
Walk	9.7%	9.90%	7.10%
Bicycle	2.0%	1.00%	0.60%
Other*	0.7%	0.20%	0.40%
Sustainable Mode Share (Transit + Walk + Bike)	19.70%	16.60%	15.50%
Active Share (Walk + Bike)	11.70%	10.90%	7.70%

Figure E6. Weekday Mode Shares – DWV

Daily (24-hour) mode shares

- 0.6%
- 0.4%
- 7.1%
- 7.8%
- 8.5%
- 75.6%

Legend: Auto Driver, Auto Passenger, Transit, Walk, Bicycle, Other

Transit trips have increased from 2021 and approached 2019 levels. Transit mode is popular for to school trips and for residents living in apartments. The percentage of school trips has increased in DWV (from 0.7% in 2021 to 2.4% in 2023) and the survey population living in apartments has increased by 2 percentage points. These may be contributing factors to the increase in transit trips.

Many of the trips that were taken by auto driver are short enough to be taken by other modes. Of the 87,800 auto driver trips in DWV, 35,000 (or 40%) are short enough to be bikeable trips (less than 4.6 km) and 11,600 (or 13%) are short enough to be walkable trips (less than 1.6 km).

DWV has seen full-time workers decrease from 44% in 2021 to 34% in 2023. The number of workers who work exclusively from home has remained relatively steady from 2019 to 2021, and 2023 (23%, 22%, and 20% respectively). The decrease in full time workers may be a contributing factor to the decrease in number of overall trips in DWV. VKT by DWV residents increased to 10,400 km, an almost 2,000 km increase from 2021 and 2020 levels, nearing 2019 levels of 11,700 km. Residents are making fewer trips, however when they do make a trip and are driving, they are travelling further.

Table of Contents

List of Figures

List of Tables

Commonly Used Acronyms

CBD	Central Business District (e.g., Vancouver CBD)
CNV	City of North Vancouver
CSD	Census Subdivision
DNV	District of North Vancouver
DWV	District of West Vancouver
EV	Electric Vehicle
FVRD	Fraser Valley Regional District
hh	Household
HBW	Home-based work (trips directly from home to work or directly from work to home)
INSTPP	Integrated North Shore Transportation Planning Project
MVRD	Metro Vancouver Regional District
NSTS	North Shore Transportation Survey
TDM	Transportation Demand Management
VKT	Vehicle Kilometres Travelled

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. Survey participants are randomly sampled from across the three municipalities and First Nations communities on the North Shore. The survey is an initiative of the City of North Vancouver (CNV), District of North Vancouver (DNV), and District of West Vancouver (DWV), and results are shared with Squamish Nation and Tsleil-Waututh Nation staff.

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.

Building on the work of INSTPP, the North Shore Connects partnership was formed by the municipal and First Nations governments of the North Shore (Squamish and Tsleil-Waututh Nations) to work with other levels of government and stakeholders to address these identified challenges and plan, secure funding for, and implement projects that improve transportation on, to and from the North Shore.

The NSTS was initiated to track trip rates, mode share, vehicle kilometres travelled (VKT), and other key metrics that will help the municipalities assess the impact of transportation initiatives and plan future transportation investments. The intent is to regularly conduct surveys to monitor progress. The following surveys have been completed:

- The first survey was conducted in the fall of 2019 with 1,901 residents of the North Shore.
- A shorter interim survey was conducted in the fall of 2020 with 1,081 returning participants. The interim survey kept participants engaged with the survey program and collected information on transportation issues of interest, including the impact of the COVID-19 pandemic on the travel of the panel of previous participants.
- The full survey was conducted again in 2021 with 2,131 residents.
- The focus of this report is the 2023 NSTS, which was conducted with 2,380 residents, both previously and newly recruited participants. This was the third full-length survey and will allow for comparisons against the 2019 and 2021 surveys.

1.1.2 Design and Administration of the 2023 North Shore Transportation Survey

The 2023 NSTS was conducted between mid October and December 2023 and captured household characteristics, demographics, and trips undertaken by the survey participants on the most recent

previous weekday. The survey was a voluntary 24-hour recall travel survey that included attitudinal questions and reporting of usual transportation-related habits. The survey was open to residents 15 years of age or older.

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 A** of this report). Survey participants could complete the survey online or over the telephone. Households with a corresponding phone number were also contacted by phone. A small number of supplementary surveys (to obtain a 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 (total of 40 participants). Additionally, a small number of participants were recruited via social media through targeted advertisements aimed at residents under the age of 35 years old. Over 90% of the surveys were completed between October 17, 2023 and November 22, 2023, with the survey kept open until December 20, 2021, to target sampling districts with low response rates. This time period is similar to previous survey cycles:

Survey Cycle	90% of surveys completed	Survey Close
2019	October 22 – November 21, 2019	December 13, 2019
2021	October 26 – November 30, 2021	December 18, 2021
2023	October 17 – November 22, 2023	December 20, 2023

The 2023 NSTS gathered information from 2,380 North Shore residents after data validation, trip logic checks, and rejection of surveys with data issues. A total of 1,050 surveys were from previous participants, with 53% of previous participants completing the 2023 survey. A total of 1,330 new participants were recruited to complete the survey, the majority of which were recruited by address-based sampling, with 40 recruited via the spin-off sampling approach where participants under 40 were invited from other household members and an additional 8 recruited via social media. The new recruit response rate was 10% (survey completions relative to letters sent), which can be considered a quite positive response to a survey of this type. Of the new participants, 1,077 agreed to be contacted again for future surveys.

The survey data set was weighted to compensate for non-response bias and expanded to represent the target population, using the 2021 Census population and dwelling counts projected forward to 2023. Weighting controls for household-level information included dwelling counts, dwelling type, and household size for eight geographic data expansion zones, referred to as sub-municipal zone in this report. 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 represents approximately 168,000 residents from 82,100 private households in the study area, for a sampling rate of 2.9% of households or 1.4% of

population 15+ years of age living in private residences[3]. Comparing to similar surveys in the region, this is a higher household-level sampling rate and a fairly equivalent person-level sampling rate to the 2023 TransLink Regional Trip Diary, which had a target of 1.25% of households in the Metro Vancouver region[4] and surveyed all individuals in each household of all ages. It is also a higher sampling rate than the City of Vancouver's annual transportation survey, which in 2022 surveyed 1.1% of households or 0.6% of the population 18+ years of age,[5] although given the difference in the sizes of the municipal populations, the NSTS gathered less than two-thirds the number of surveys collected in the Vancouver survey.

The 2023 NSTS captured 7,602 trips made by survey participants on a prior weekday, which provides 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 524,900 trips made each day by residents 15+ years of age.

1.1.3   Analysis of the Survey Results and Comparison to Previous Survey Cycles

As part of the first survey in 2019, a review of the North Shore geography was undertaken to organize the survey area into sub-municipal zones 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 enables 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. First Nations lands on the North Shore are included within the geographies used for analysis but are not analysed separately due to small sample sizes. The survey geographies are outlined in Section 2 of this report.

It should be noted that sample sizes for certain zones may be small, so the distributions should be taken as indicative of an overall pattern rather than exact. Similarly, results presented by age category are also subject to small sample sizes, particularly for the younger age categories, as are results pertaining specifically to students (e.g., usual mode of commute to school). These findings should be interpreted with caution and should be viewed as an overall snapshot in time.

The core questions on demographic characteristics and key travel behaviours have remained the same in each survey cycle, with only minor refinements since the baseline survey. Additional modules of questions to address current issues of interest to the municipalities have been added or removed in subsequent cycles. Longitudinal comparisons (i.e., comparisons over time) in this report are made between 2019, 2021, and 2023. While 2019 data was intended to serve as a baseline to compare with future surveys, it is important to note that the COVID-19 pandemic had significant impacts on travel habits and usual behaviour. The 2019 data can be considered a pre-pandemic baseline as the data collection period closed prior to the onset of the COVID-19 pandemic. The 2021 and 2023 data show

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[3] 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 experiencing homelessness.
[4] Source: TransLink.

[5] 2022 Vancouver Transportation Survey, City of Vancouver (https://vancouver.ca/files/cov/2022-transportation-survey-report.pdf)

impacts of the pandemic on travel habits and patterns. Over time, these data may show a pattern of recovery to pre-pandemic travel volumes or will illuminate new post-pandemic trends in travel habits and patterns.

Overall, the 2023 survey results are subject to a margin of sampling error of ±2.9% at a 95% confidence level, taking into account the effects of data weighting.[6] Survey results for sub-populations are subject to higher margins of sampling error. The results for the 730 surveys completed with CNV residents are subject to a sampling error of 4.9%, the 1,099 surveys with DNV residents are subject to a sampling error of ±4.3%, and the 551 surveys for DWV residents are subject to a sampling error of ±6.1% (at a 95% confidence level, and taking into account the effects of data weighting). The survey sample may be considered robust enough to provide good results for the North Shore as a whole and by municipality and to provide useful insight into transportation indicators for the eight zones in the region, although one should keep in mind that the margin of error will be larger for smaller sample sizes at the zone level or when examining other demographic subpopulations.

1.1.4   Comparison with Other Surveys with North Shore Travel Data

There are two other surveys that can provide insight into North Shore residents' travel behaviour, complementing the NSTS. These are TransLink's Metro Vancouver Regional Trip Diary and the Census Profile 2021 (Commuting). All three surveys aim to understand travel patterns and preferences and employ different methodologies making them complementary sources of information.

The Census and the TransLink Metro Vancouver Regional Trip Diary are conducted every five years. The Census, a mandatory survey, was last conducted in 2021 and provides a detailed snapshot of the country's population including information on work commuting patterns, and household demographics. TransLink's Metro Vancouver Trip Diary was last conducted in 2023 with new cross-sections of the population each survey cycle. The NSTS is a biennial panel survey with information on commuting and non-commuting patterns and with regular refreshment of the sample with new recruits. NSTS data is typically available within four months of data collection where as the other two sources are typically available one to three years after data collection.

The Census commuting data only provides information on work commuting of Canadian population aged 15 and older living in private households.[7] The TransLink Regional Trip Diary is conducted as a complete household travel survey, for which demographics and all trips are collected for all members of the household. Each sub-region is given a target completion rate proportionate to its population size to

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[6] 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

$$E = \pm\, z\, \sqrt{\frac{\overline{p}(1-\overline{p})}{n}} \times \sqrt{\frac{N-n}{N-1}} \times \sqrt{deff}$$ 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).
[7] Statistics Canada. Commuting Reference Guide, Census of Population. 2021.

reduce the need for post-data collection weighting. [8] The NSTS focuses on a single household member over the age of 15 (sampled from within the household to obtain a representative sample). North Shore municipalities may undertake further analysis of the NSTS data as the data files are made available to them.

The Census commuting data is used in conjunction with age, gender, labour and income variables to provide additional context of those who commute. The Census commuting data is available at different scales from dissemination areas to the municipal, regional, provincial, and national level, and data is suppressed when numbers are too small at any given scale. The NSTS is intended to illuminate differences in travel patterns at a sub-municipal level and the data are weighted at a sub-municipal level, whereas the TransLink Regional Trip Diary data are weighted for analysis at the municipal level.

It should be noted that the 2021 Census data on labour, workplace location, and commuting was gathered during a peak wave of the COVID-19 pandemic (May 11, 2021) and thus provides a view of work arrangements and commuting patterns that was unique to that time and may not be applicable today. This should be kept in mind when comparing the NSTS results against the 2021 Census for such topics.

The NSTS and the TransLink Regional Trip Diary have similar questions about trips taken on a sampled travel day, although there may be differences in wording, definitions, and how the data are reported. The NSTS includes additional questions on attitudes, usual travel habits, and potential barriers to using different modes, offering a more nuanced understanding of factors affecting travel decisions in the North Shore. The TransLink Regional Trip Diary is broader in scope capturing a comprehensive dataset of travel behaviours across the Metro Vancouver Region. Disparities in findings between the NSTS and TransLink Regional Trip Diary surveys may arise due to differences in sampling, survey design, geographic context, and data weighting methodologies. Disparities in findings between the two surveys does not indicate conflicting data but rather additional perspectives on travel behaviours within the region.

1.2   Report Organization

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

Section 2: Survey Geography
Section 3: Daily Trip Characteristics
Section 4: Travel Patterns
Section 5: Participant Characteristics

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[8] Ipsos Reid. 2011 Metro Vancouver Regional Trip Diary Survey: Final Methodology Report. December 18, 2012

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 1.4% sample of the population of the North Shore. **All figures should be understood to be estimates.**
- **The survey results represent the population 15 years of age and older who live in private residences.** This excludes approximately 15% of the population who are aged 0-14 years and approximately 1.5% of the population living in collective residences (seniors' care homes, university residences, group homes, prisons, barracks, etc.) or who are experiencing homelessness.
- **Expanded household, person, and trip counts presented in this report have been rounded to the closest 100 or 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% due to rounding.**

2   Survey Geography

2.1   Survey Scope

The 2023 NSTS study area comprises the entire North Shore, including Tsleil-Waututh Nation (Burrard Inlet 3 Census Subdivision), Squamish Nation within the North Shore area (Mission 1, Seymour Creek 2, and Capilano 5 Census Subdivision), CNV, DNV and DWV. The study area is presented in Figure 1 below. The Vancouver downtown Central Business District/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 these broader travel areas 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
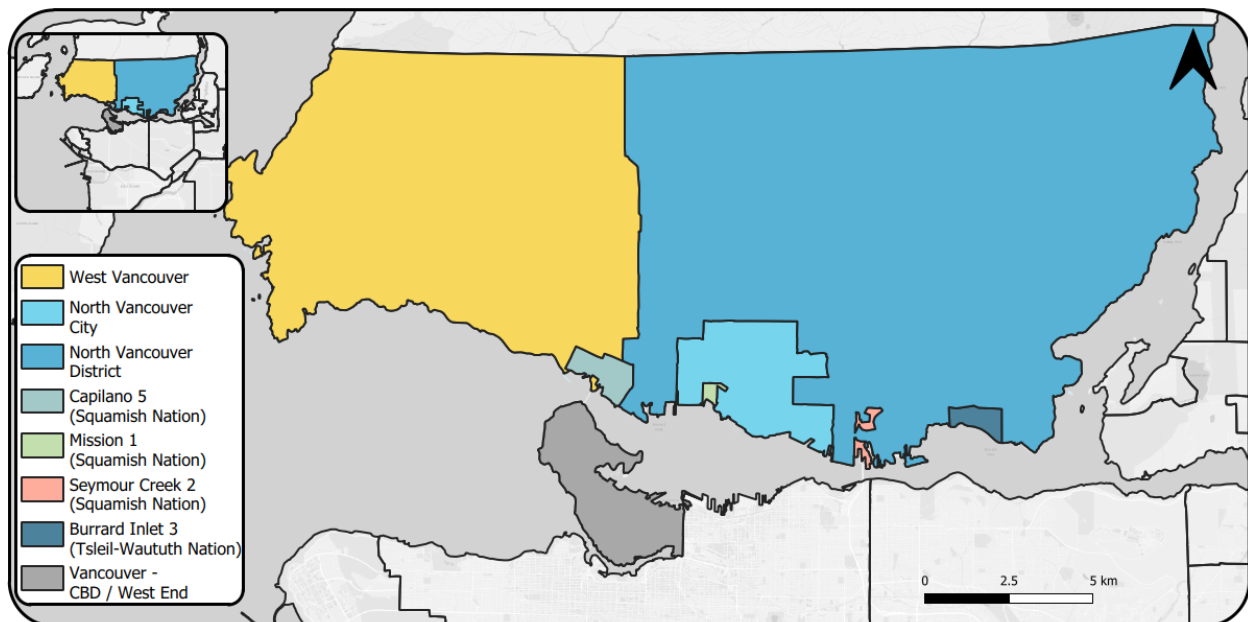
2.2 Survey Geographies and Population Counts

The North Shore includes several different municipalities and First Nations, as noted above. For the purpose of analysis by municipal area, due to their small population sizes, First Nations lands have been combined with the municipality they border or are situated within the boundaries of. Table 1 below shows the composition of the municipal areas with 2023 population data projected from 2021 Census Data.

Table 1. Municipal Areas with 2023 Projections of 2021 Census Counts

Municipal Area for Analysis	Census Subdivisions in Municipal Area	Land area (sq km)	Total Private Dwelling Units	Total Population	Households (Private Dwellings Occupied by Usual Residents)†	Population 15+ Years of Age in Private Dwellings	2023 NSTS Survey Completions
1. District of North Vancouver (DNV)	District of North Vancouver	160.66	34,865	89,077	33,356	73,598	1,052
	Burrard Inlet 3	1.12	1,271	2,619	1,236	2,202	47
	Seymour Creek 2	0.49	34	99	28	75	0
2. City of North Vancouver (CNV)	City of North Vancouver	11.83	30,230	60,350	28,430	52,148	728
	Mission 1	0.28	205	568	177	493	2
3. District of West Vancouver (DWV)	District of West Vancouver	87.18	19,127	44,799	18,002	37,831	516
	Capilano 5	1.72	1,475	2,886	1,344	2,594	35
North Shore	**Total**	**263**	**87,200**	**200,400**	**82,500**	**168,900**	**2,380**

Source: Statistics Canada 2021 Census population and dwelling counts projected to 2023 based on 2016 to 2021 growth rates by Census Subdivision.
† Private dwelling occupied by usual residents refers to a private dwelling in which a person or a group of persons in permanently residing.

As mentioned in Section 1.1.3, a set of eight geographies, or "sub-municipal zones", was 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 zones 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 zones and their populations are listed in Table 2. The table shows the same information as Table 1 at a more disaggregated zone level.

Figure 2. Map of Zones with Population Density by Dissemination Area (Population per Hectare)
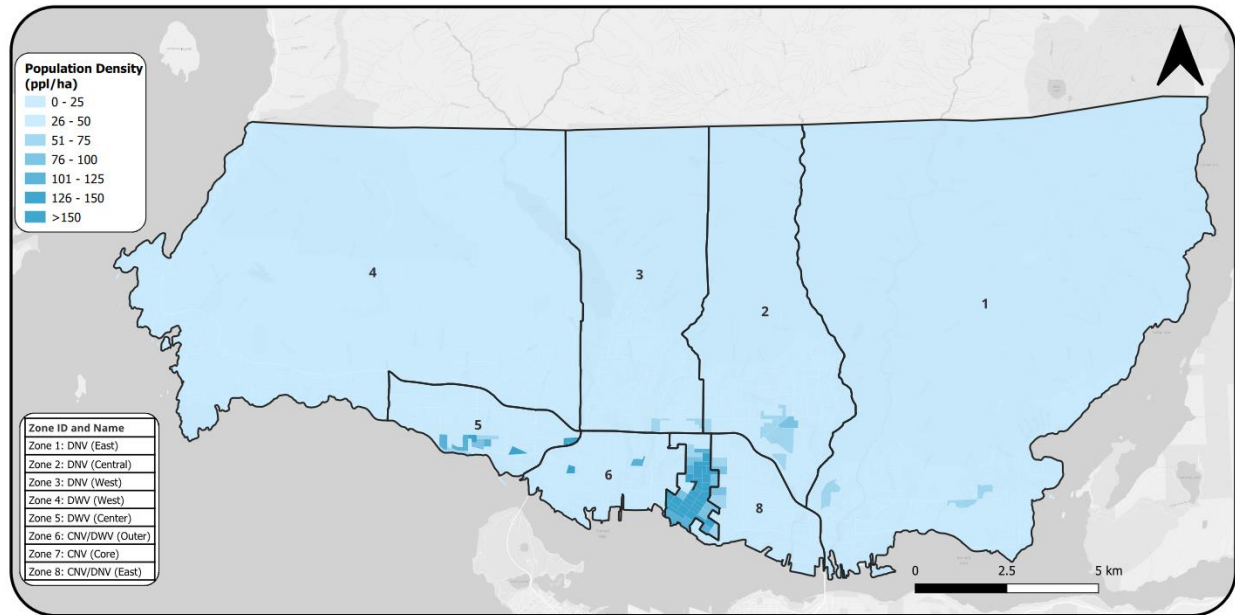
Source: 2021 Census.

Table 2. Zones with 2023 Projections of 2021 Census Counts

	Land area (sq km)	Total Private Dwelling Units	Total Population	Households (Private Dwellings Occupied by Usual Residents) ††	Population 15+ Years of Age in Private Dwellings	2023 NSTS Survey Completions
Zone 1: DNV (East)*	101.91	11,124	28,123	10,708	23,353	344
Zone 2: DNV (Central)	28.1	11,765	31,278	11,230	25,338	340
Zone 3: DNV (West)	27.57	9,229	24,788	8,798	20,426	322
Zone 4: DWV (West)	79.83	9,292	24,069	8,746	20,352	266
Zone 5: DWV (Center)†	7.47	11,641	23,780	10,818	20,316	284
Zone 6: CNV / DWV (Outer)‡	8.06	7,205	17,103	6,720	14,353	191
Zone 7: CNV (Core)	2.73	19,286	33,180	17,941	29,810	445
Zone 8: CNV / DNV (East)^	7.62	7,665	18,077	7,159	14,992	188
North Shore Total	**263**	**87,200**	**200,400**	**82,500**	**168,900**	**2,380**

Source: Statistics Canada 2021 Census population and dwelling counts projected to 2023 based on 2016 to 2021 growth rates by Census Subdivision applied at the Dissemination Area level with each CSD, then aggregated to Zone.
* 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).
†† Private dwelling occupied by usual residents refers to a private dwelling in which a person or a group of persons in permanently residing.

3 Daily Trip Characteristics

This section provides a snapshot of daily (24-hour) travel patterns from the trips reported by survey participants, weighted and expanded to represent the whole population. The characteristics include trip demand, purpose, mode share, and distribution. Some trips included in the analysis may not be to, from, or within the North Shore. The survey results include a small proportion of trips that take place by North Shore residents entirely externally, i.e., with neither the trip origin nor the trip destination on the North Shore. The analysis also does not account for trips made in or through the North Shore by non-residents.

3.1 Trip Demand

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

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. A journey to work that involves being driven to a transit station then taking a bus to work is a single trip with two modes (passenger, transit). The survey asks participants to report on all trips they made throughout the course of a single 24-hour day by all modes of travel, including short trips (such as a trip leaving work to walk to an appointment eight blocks away, then the subsequent trip back to work for which they hopped on a bus conveniently headed their way).

3.1.1 Daily Trips

The survey results suggest that residents of the North Shore made 11,700 more daily trips in 2023 than in 2021 (a 2.3% increase), in line with the 2.5% increase in population during that time frame. Trip rates are illustrated in Figure 3 and detailed in Table 3. The average resident made 3.12 trips per day in 2023, in line with the 3.13 trips per day in 2021 but lower than the 3.66 trips per day in 2019. This suggests residents' commuting patterns and other activities such as work-from-home arrangements, social interactions and trips for personal business (such as banking, medical appointments, vehicle repair, etc.) are showing a new normal with 15% fewer trips per person than pre-pandemic activities (i.e., compared to 2019 trip rates). Occupational status is another factor that led to fewer trips per day. Personal trips have gone down, however this doesn't necessarily translate to less traffic if some personal trips have been replaced with goods delivery to the home. Changes in residents' volumes of trips for different purposes are detailed in Section 3.2 of this report.

Figure 3. Daily Trip Volumes and Person Trip Rates – 2019 to 2023
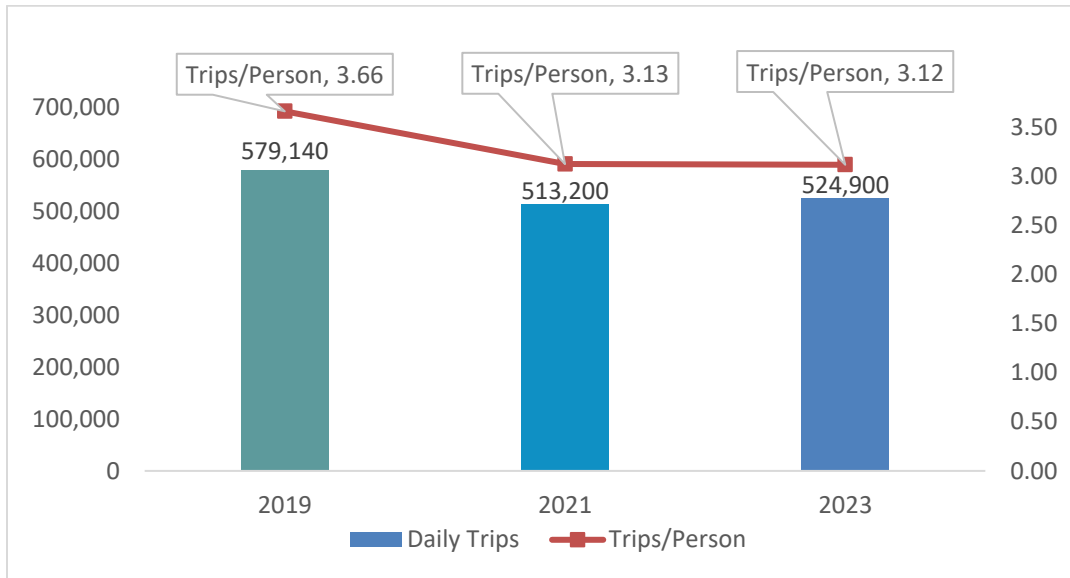
Table 3. Daily Trips and Person Trip Rates, 2019 to 2023

	2019	2021	2023	% Change (2023 – 2019)	% Change (2023 – 2021)
Population 15+	158,100	164,200	168,310	6%	3%
Daily Trips	579,140	513,200	524,900	-9%	2%
Trips/Person	3.66	3.13	3.12	-15%	0.3%

Examining the survey estimates by municipality (Figure 4 and Table 4) reveals that daily trip rates changed differently by municipality across the three surveys. The DNV and CNV had a decrease in trips from 2021 to 2019 followed by a small increase in trips in 2023 (3.34 and 2.98 trips per person, respectively). The DWV had a continuous decline in trips and went from the highest trip rate of the three municipalities in 2019 to the lowest in 2023 (2.89 trips per person). The shape of these fluctuations is similar to Figure 28 Daily Work Mode Shares which shows number of commute trips by municipality, indicating a potential co-relation between the number of commuter trips and the number of daily trips.

Figure 4. Estimated Total Daily Trips and Trip Rates by Municipality (Population Aged 15+) – 2019 to 2023
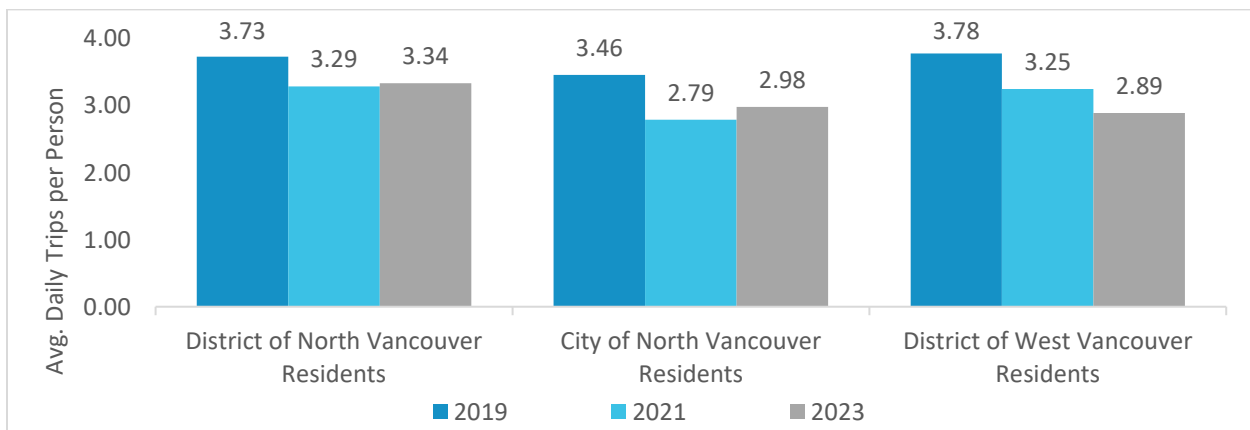
Table 4. Daily Trips and Person Trip Rates by Municipality, 2019 to 2023

	2019	2021	2023	% Change (2023-2019)	% Change (2023-2021)
District of North Vancouver					
Population 15+	72,400	73,400	75,400	4%	3%
Trips	270,300	241,300	251,500	-7%	4%
Trip Rate	3.73	3.29	3.34	-11%	1%
City of North Vancouver					
Population 15+	47,100	50,800	52,700	12%	4%
Trips	163,100	141,800	157,300	-4%	11%
Trip Rate	3.46	2.79	2.98	-14%	7%
District of West Vancouver					
Population 15+	38,600	40,000	40,200	4%	1%
Trips	145,800	130,100	116,200	-20%	-11%
Trip Rate	3.78	3.25	2.89	-24%	-11%

Table 5 presents the average daily trip rates for residents of each zone. Daily trip rates are highest for residents of Zone 1 (DNV East), at 3.48, and lowest for residents of Zone 5 (DWV Centre), at 2.81. The relatively lower trip rate associated with residents of Zone 5 (DWV Centre) may be related to the higher proportion of retired folks and smaller proportions of individuals working full-time or part-time compared to other zones, which is shown in Table 34. Similarly, Zone 1 was among the zone with higher proportions of adults working full-time and lower proportions of retired adults, likely contributing to an increase in daily trips. Each zone has different age, work, and income profiles, and some of the variation in trip purposes may be related to how people in each zone have changed their habits.

Table 5. Average Daily Trips by Municipality of Residence

	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)
2019	3.78	3.79	3.71	4.15	3.33	3.43	3.34	3.81
2021	3.11	3.22	3.53	3.34	3.23	3.03	2.84	2.62
2023	3.48	3.52	3.15	2.97	2.81	2.98	2.83	3.19

Figure 5 shows the average daily trip rates by age and gender for the North Shore. The results suggest that women and men 40 to 49 years old have the highest average daily trip rates for their genders, at 4.14 and 3.56 trips per day, respectively. Women generally have higher daily trips rates than men for most of the age groups except for those older than 70 and those between 30 and 39 years old.

Figure 5. Trip Rates by Age Group and Gender – North Shore
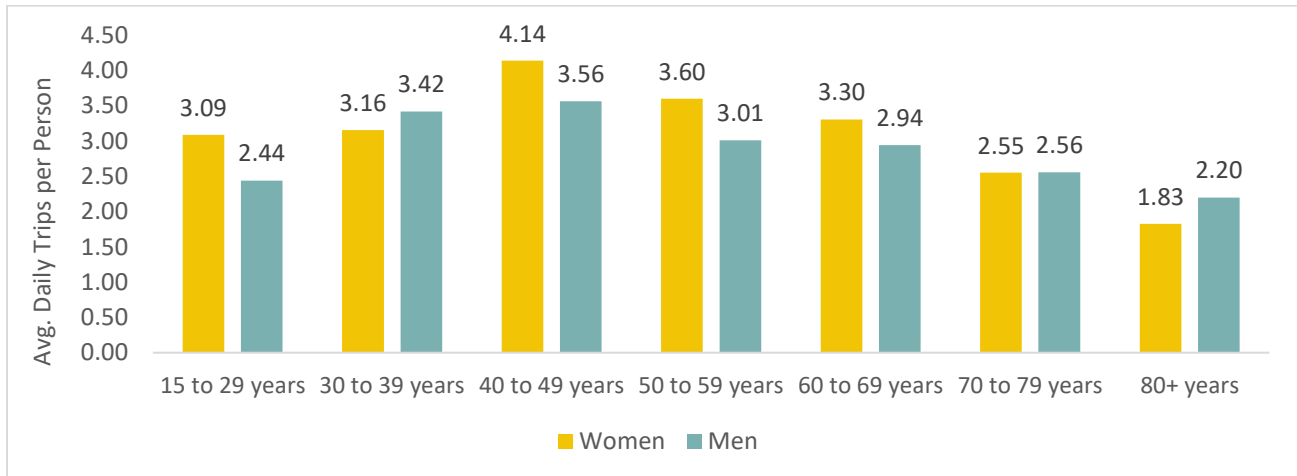
Figure 6 illustrates the relationship between annual household income and the average daily trip rate. Those with lower annual incomes tend to have lower trip rates, while there is a clear trend with increasing trip rates as household income rises above $80,000

Figure 6. Trip Rates by Household Income – North Shore
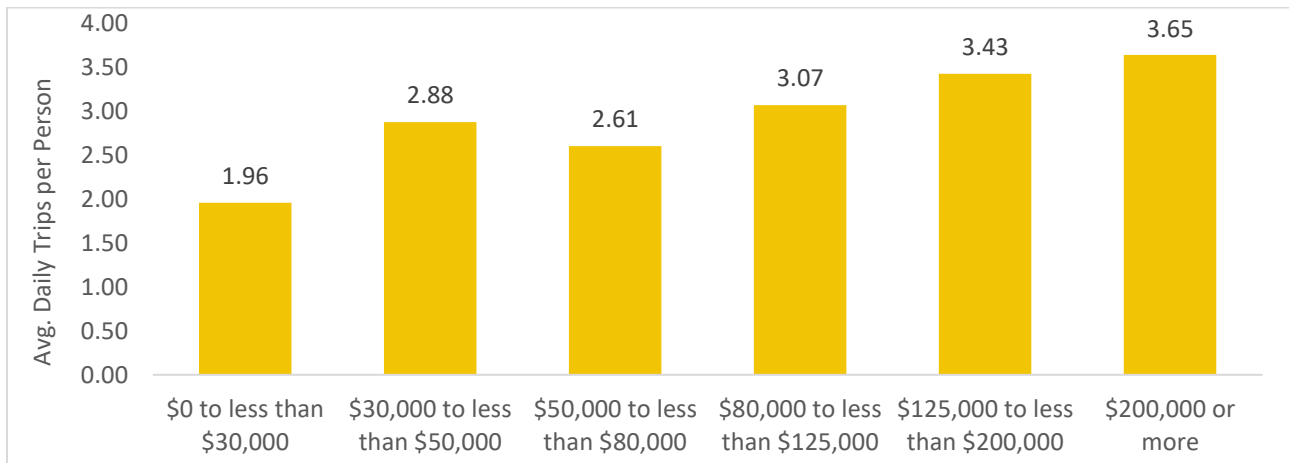
3.1.2 Trip Volumes by Time of Day

Figure 7 shows the percentage of North Shore residents' weekday trip volumes by time of the trip departure for 2019, 2021, and 2023 survey cycles, yielding the following observations:

- The highest trip demand in the morning period occurs from 8:00 AM to 9:00 AM with 50,600 trips in that hour (a slight increase from 48,200 in 2021 and still below 52,100 in 2019).
- The highest trip demand in the afternoon period occurs from 4:00 PM to 5:00 PM with 51,200 in that hour (up from 45,500 trips in 2021 and below 58,200 in 2019). Slightly lower than peak, but still relatively high volumes may also be observed in the adjacent hours from 3:00 PM to 4:00PM and 5:00 PM to 6:00 PM.

Figure 7. Number of Trips by Hour of Day – North Shore, 2019 to 2023
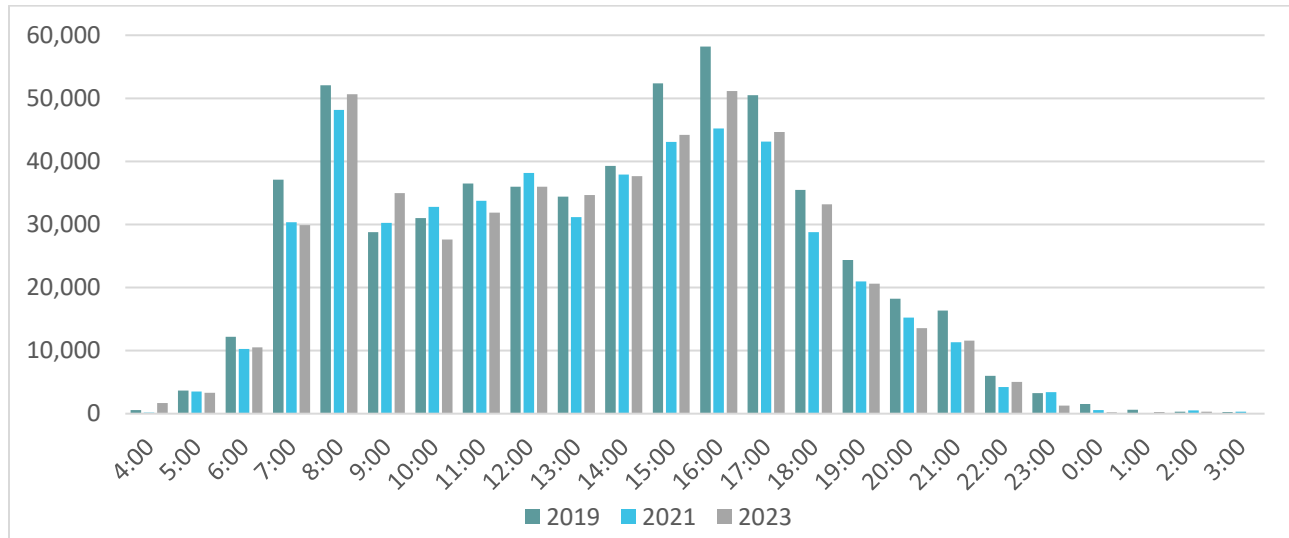
3.1.3   Vehicle Kilometres Travelled (VKT)

Survey participants were asked to confirm information about the vehicle that they usually drive (vehicle type, fuel type, make and model year) and to report the odometer reading for that vehicle. Odometer readings for previous survey participants who drove the same vehicle as in 2021 were used to calculate the average annual VKT, discarding particularly high or low outliers. As there has been two years between surveys, the sample of participants who had provided valid odometer readings that could be used to calculate VKT was relatively modest (n=453). The resulting VKT estimates have been compared against those developed from the 2019, 2020, and 2021 surveys in Table 6 and Figure 8. It should be noted that as 2019 was the first year of this survey, the 2019 VKT estimates were based on the average VKT across the lifetime of the vehicle (based on the odometer reading at the time of the survey and year of manufacture).

In interpreting the results, it is important to consider the context: the 2019 results are prior to the COVID-19 pandemic, and the 2020 results reflect about five months of regular travel in typical pre-pandemic conditions followed by about seven months of travel after COVID-19 restrictions, as modified bar and restaurant hours, social distancing, ban on sports teams, and closing of non-essential businesses were first imposed. The 2021 results reflect a full year of COVID-19 conditions with varying degrees of restrictions and returns to work throughout the period. Finally, the 2023 results reflect a period of three years after the pandemic was declared and had no associated restrictions on travel or work for about two years, but reflecting some persistent changes to human activity patterns due to the disruptive impact of the pandemic (such as an increase in working from home and hybrid work arrangements compared to 2019).

Overall, the survey results suggest that the average annual VKT per vehicle for North Shore residents is approximately 10,100 km. This is a 14% increase over 2021, but still well below the 2019 estimate of 12,900 km (16% less than 2019). Similar patterns can be observed for DNV and DWV, while CNV shows a decrease in VKT from 2021 to 2023 (-8%), and also the lowest VKT estimate at 8,400 km per vehicle, per year.

Table 6. Vehicle Kilometres Travelled Survey Results, 2019 to 2023

	District of North Vancouver	City of North Vancouver	District of West Vancouver	North Shore
Estimated private vehicles in households				
2019	58,400	34,200	33,000	125,500
2020	58,900	34,300	34,600	127,700
2021	60,400	36,700	33,200	130,200
2023	60,410	37,180	34,830	132,420
Estimated average annual VKT per household vehicle				
2019 (avg annual VKT per vehicle over life of vehicle)	12,900	11,000	11,700	12,100
2020 (avg annual VKT per vehicle for past year)	9,400	8,700	8,200	8,900
2021 (avg annual VKT per vehicle for past year)	9,500	9,100	8,400	9,100
2023 (avg annual VKT per vehicle for past year)	10,800	8,400	10,400	10,100
Estimated total annual VKT incurred for private vehicles*				
2019	751,181,000	375,470,000	386,456,000	1,513,107,000
2020	554,267,000	298,016,000	282,744,000	1,136,597,000
2021	573,104,000	333,414,000	280,381,000	1,182,541,000
2023	652,428,000	312,312,000	362,232,000	1,337,442,000

*Total annual VKT rounded to the nearest 1,000. All figures are estimates scaled to take into account non-responses. These figures only estimate travel made by North Shore residents based on their odometer readings, and thus includes travel with their vehicles outside the North Shore. There figures should not be interpreted to represent total vehicle kilometres incurred on the North Shore transportation network by residents, non-residents and commercial traffic.

Figure 8. Average Annual VKT, by Municipality, 2019 to 2023 (Past Year Odometer Difference)[9]

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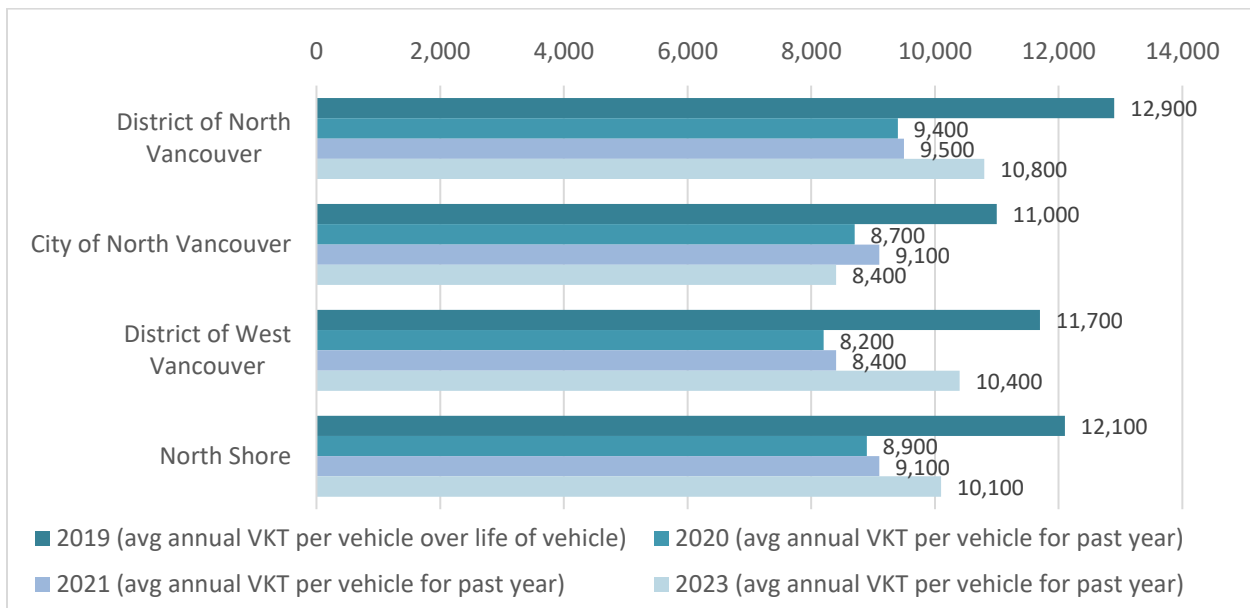
[9] As 2019 was the baseline survey, there were no previous years' odometer readings to compare against, and the VKT estimates are based on the average kilometres per year based on the lifetime of the vehicle since manufacture. n=1,404 in 2019, n=393 in 2020, n=434 in 2021, n = 453 in 2023.

MALATEST   Associated Engineering

Page 31

3.2   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. A driver of a personal vehicle who drops off a passenger (such as taking a child to school) has a pickup/drop-off (serve passenger) trip purpose. The pickup/drop-off trips of a taxi or Uber driver are commercial trips that were not captured as part of this survey.[10] Travelling back home from any location is considered a return home trip.

The survey also allowed 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 for 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).[11] It may be noted that while the most recent (2023) TransLink Regional Trip Diary survey's trip definition is line with that used in the NSTS, and the TransLink survey capture such recreational trips without destination, such trips will be excluded from TransLink's reporting, for comparability with the previous surveys which did not capture such trips, which may affect comparability. Also of note, the Census commuting data capture only usual travel to work, and exclude non-work trips of all kinds.

Figure 9 shows the distribution of trip purposes for weekday trips made by residents of the North Shore by year, without the return home trips. The biggest changes in daily trips from 2019 (pre-COVID-19) to 2023:

- Recreational trips have increased to 46,600 from 38,600 and "Other" trips to 5,900 from 2,700, while all other trip purposes have decreased.
- Work trips and work-related trips have decreased from a total of 91,500 to 77,400.
- The largest declines in trips are for social trips (32,000 to 19,300) and shopping/household maintenance trips (73,700 to 65,300).
- The number of pickup/drop-off trips were generally similar.

Changes in daily trips from 2021 (with some COVID-19 restrictions) to 2023:

- Increased trips to work (42,800 to 53,200, although still notably lower than 2019), personal business (such as banking, medical appointments, vehicle repair, or personal care 25,300 to 33,800), and recreational trips (38,600 to 46,600).
- The largest declines were for shopping/household maintenance trips (74,500 to 65,300), and work-related trips (30,300 to 24,200), although the latter may be somewhat offset by the increase in trips to work.

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[10] The NSTS is intended to capture residents' personal trips, not commercial driving trips. Commercial drivers who participated in the survey were asked to report only their personal trips, as well as their first trip to start work or their last trip in their return from working. During data validation, if four or more work-related trips were recorded in a row, the survey was flagged for review to determine whether these might be commercial driving trips that should be removed. Work-related trips, such as attending a business meeting, are included in the data.

[11] Such trips represent approximately 2.5% of all trips, with most being recorded as having recreational or social purposes.

- Pickup/drop-off trips saw a slight increase from 2021 (equivalent again to 2019 volumes), while social trips and restaurant trips saw modest decreases from 2021, continuing the decline from 2019.

Figure 9. Weekday Daily Trip Purposes 2019 to 2023
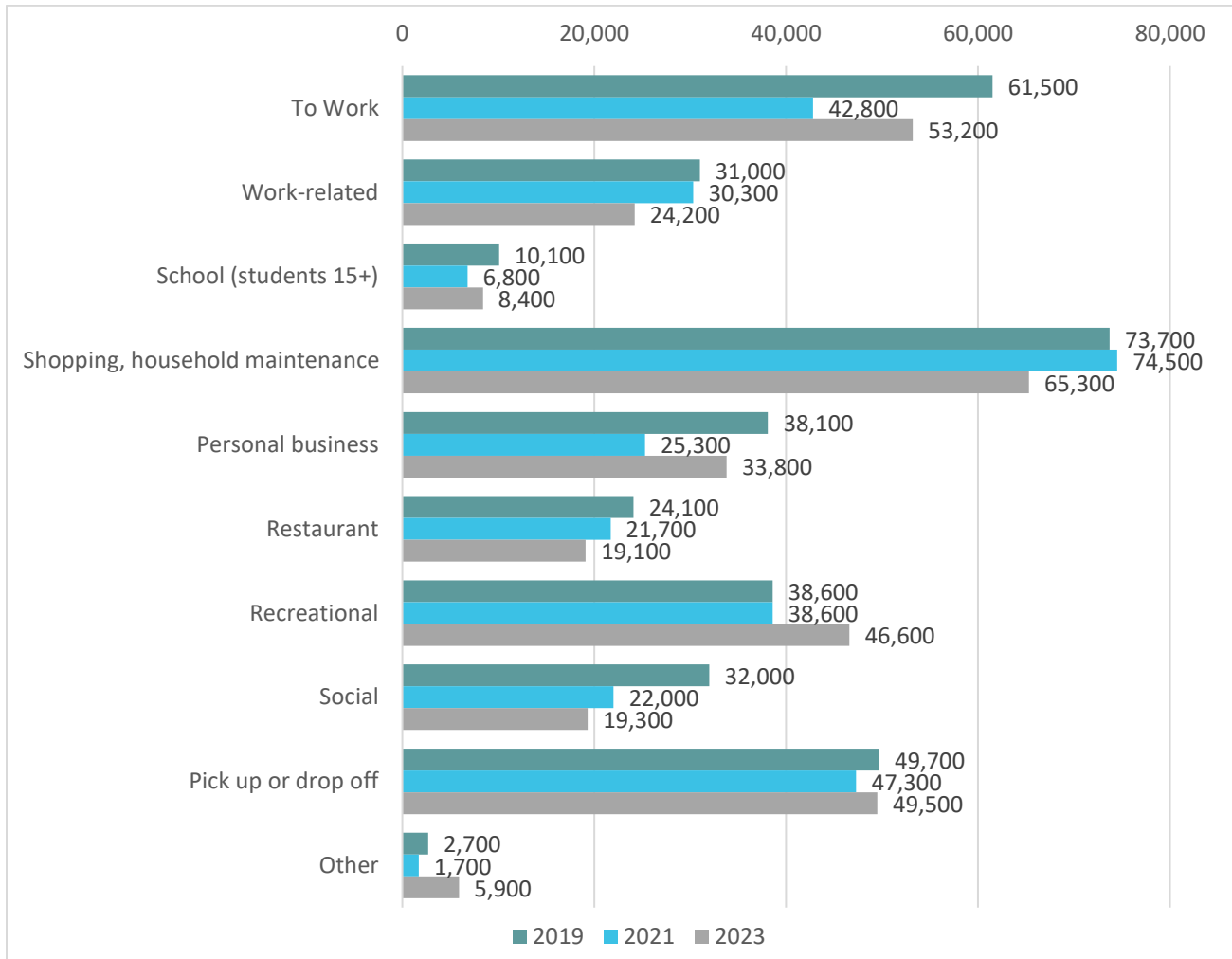
Table 7 shows the daily trip purpose by municipality for 2019, 2021, and 2023. The main findings are as follows:

- District of North Vancouver
  - Total trips had a net decrease of 6.9% from 2019 to 2023
  - Largest proportion of trips, excluding return home, are shopping or household maintenance trips (12.2%).
- City of North Vancouver
  - Total trips had a net decrease of 3.6 % from 2019 to 2023
  - Largest proportion of trips, excluding return home, are trips to work (13.8%), which is the highest proportion in the North Shore.
- District of West Vancouver

- o Total trips had a net decrease of 20.3% from 2019 to 2023
- o Significantly lower proportion of trips to work (6%) in relation to other municipalities.

Table 7. Trip Purpose by Municipality

DNV			
	2019	2021	2023
Total Trips	270,300	241,300	251,500
Percent change 2023-2019			-6.9%
Percent change 2023-2021			+4.2%
Trip Purposes			
To work (usual workplace)	10.9%	9.2%	9.8%
Work-related	6.1%	6.2%	4.9%
School (students 15+ years of age)	2.0%	1.8%	1.6%
Shopping, household maintenance	12.8%	13.7%	12.2%
Personal business	6.8%	4.9%	6.7%
Restaurant	3.6%	4.4%	3.4%
Recreational	6.3%	6.8%	8.8%
Social (visit friends, family, religious)	5.0%	3.8%	3.6%
Pick up or drop off passenger	8.8%	9.6%	10.3%
Other	0.4%	0.2%	1.0%
Return Home	37.3%	39.4%	37.8%
CNV			
	2019	2021	2023
Total Trips	163,100	141,800	157,200
Percent change 2023-2019			-3.6%
Percent change 2023-2021			+10.9%
Trip Purposes			
To work (usual workplace)	13.2%	9.9%	13.8%
Work-related	4.9%	6.4%	4.2%
School (students 15+ years of age)	2.0%	1.1%	1.1%
Shopping, household maintenance	10.7%	13.9%	11.9%
Personal business	5.1%	4.8%	5.6%
Restaurant	5.0%	4.6%	4.7%
Recreational	6.8%	8.2%	8.4%
Social (visit friends, family, religious)	6.0%	4.1%	3.7%
Pick up or drop off passenger	6.2%	6.6%	7.4%
Other	0.4%	0.3%	1.1%
Return Home	39.6%	40.1%	38.2%
DWV			
	2019	2021	2023
Total Trips	145,800	130,100	116,200
Percent change 2023-2019			-20.3%
Percent change 2023-2021			-10.7%
Trip Purposes			
To work (usual workplace)	7.1%	5.1%	5.9%
Work-related	4.5%	4.9%	4.4%
School (students 15+ years of age)	1.0%	0.7%	2.4%
Shopping, household maintenance	14.8%	16.7%	13.7%
Personal business	7.8%	5.0%	7.1%
Restaurant	4.3%	3.6%	2.8%
Recreational	7.2%	8.2%	9.7%
Social (visit friends, family, religious)	6.0%	5.3%	3.9%
Pick up or drop off passenger	10.8%	11.3%	10.3%
Other	0.6%	0.6%	1.4%
Return Home	35.9%	38.6%	38.2%

Individual percentages have been rounded and may not add to 100%

3.3   Trip Mode Share

To provide an overview of trends in transportation mode shares, this report usually breaks out modes by six broad groups: Auto Driver, Auto Passenger, Transit, Walk, and Other. Within these mode groups, a number of specific modes are often used. They are organized as outlined below. Intercity modes, such as intercity bus, airplane, VIA rail, etc., are usually excluded from the data, although the mode of the local trip to the transportation terminal is retained.

Auto Driver	Auto driver (personal vehicle)
	Car share driver
Auto passenger	Auto passenger (personal vehicle)
	Car share passenger
Transit	Transit bus
	SeaBus
	SkyTrain
	West Coast Express
Walk	Walking (including jogging)
	Rolling (skateboard, rollerblades, assisted mobility device, or other non-electric micro-mobility device)
Bicycle	Personal bicycle (including pedal-assisted e-bike)
	Bike share bicycle or e-bike (Mobi or Lime)
Other	HandyDART
	School bus
	Motorcycle
	Ride-hailing service
	Low speed motor vehicle (including moped, limited-speed motorcycle, scooter-style e-mobility device)
	Taxi
	Other (heavy truck, boat, etc.)

For trips that involve multiple modes of travel (such as a park-and-ride trip), a primary mode has been assigned for analysis. The primary mode is selected from the modes reported according to the following general hierarchy, which prioritizes the mode most likely to involve the longest travel: 1. transit, 2. auto driver, 3. auto passenger, 4. other, 5. bicycle, 6. walk. For example, for a park-and-ride trip involving both transit and automobile, the primary mode is transit. For more detailed analysis of different types of transit trips, if multiple transit modes were chosen, the hierarchy used to determine the primary transit mode is as follows: SkyTrain, SeaBus, West Coast Express, transit bus.

3.3.1 Mode Shares

Figure 10 presents the mode shares of the 524,900 trips made by North Shore residents in 2023, compared to the mode shares of the 513,200 trips residents made in 2021, as estimated from the weighted and expanded survey results. As with other analyses presented here, the mode share appears to be stabilizing to a new normal post COVID 19 travel restrictions being removed.

- Automobile mode shares (combined driver and passenger trips) went from 72.8% in 2019 then to 76.2% in 2021, and 74.2% in 2023, showing in overall increase of 1.4% since 2019.
- Transit mode share had a corresponding net decrease of 1.7% in mode share since 2019.
- Walk mode share remains stable at 14%, while cycling recovered back to 2.3% mode share from 1.5% mode share in 2021. The number of trips via these active modes increased by 1,800 and 4,400 respectively, representing a 3% increase in the volume of walking trips and a significant 56% increase in volume for cycling trips.
- Other modes (0.8% of trips in 2023) include taxi, ride-hail (Uber, Lyft, etc.), motorcycle, low-speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike), HandyDart, minibus, and intercity modes (such as airplane, rail, or coach bus).

Figure 10. Total Trips by Mode and Mode Share - North Shore, 2019 to 2023
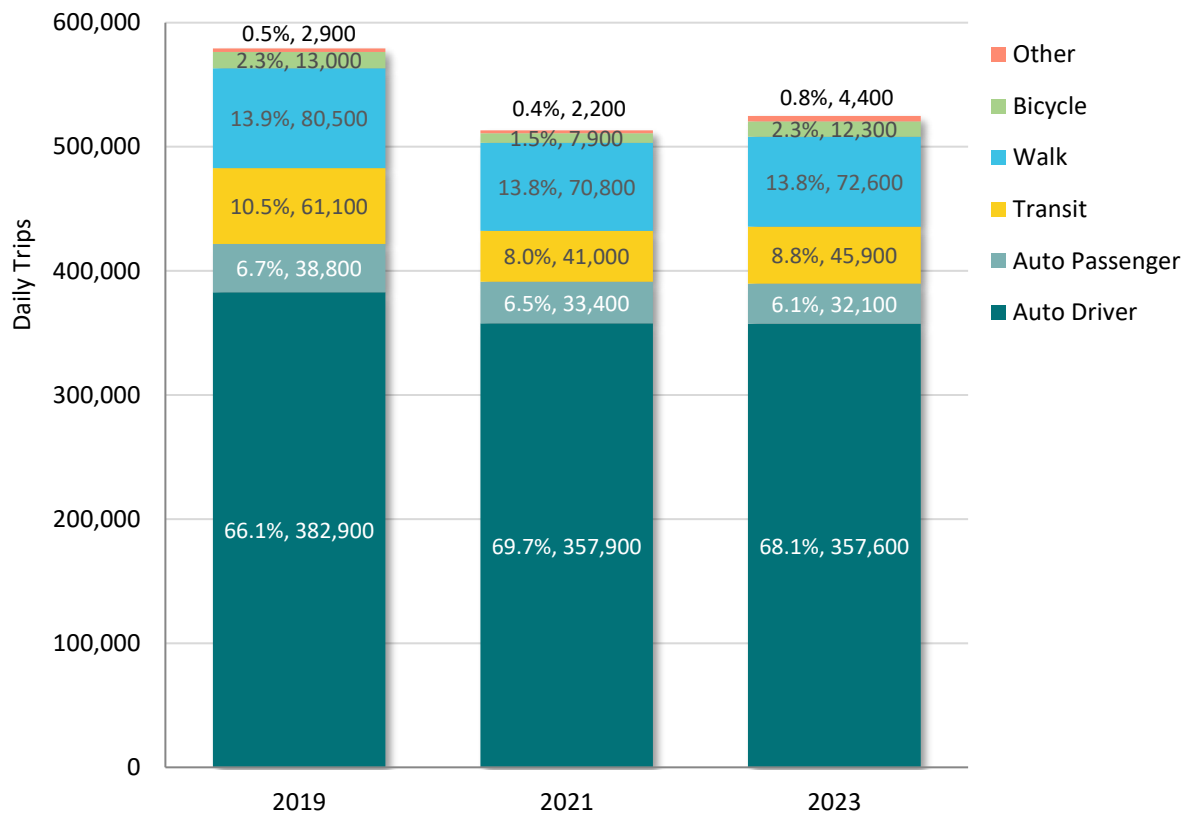
Individual percentages have been rounded and may not add to 100%
Percentages for Other are <0.5% and are not displayed.

Mode shares are presented longitudinally, by municipality in Figure 11 below and Table 8 on the following page. Examining the 2023 survey results:

- DWV residents have the highest combined auto driver and auto passenger mode share, at 84% of all trips, with CNV residents having a notably lower auto driver mode share than the other municipalities at 61%.
- Auto passenger trips represent 8.5% of trips in DWV, but only 5.4% in DNV and CNV.
- Despite an ongoing decrease since 2019, the transit mode share remained highest amongst CNV residents at 10.8%. DNV and DWV recorded transit mode shares that are similar to 2019 levels, at nearly 8%.
- CNV has notably higher walk mode share, at 24%, while this share is 11% for DNV and 7% for DWV.
- Bicycle mode share increased in DNV and CNV with both at 2.8% in 2023. The bicycle mode share decreased in DWV to 0.6%.

Combining all sustainable modes (transit, walk, and bike), CNV has the highest sustainable mode share, at 37%, while DNV has 22% and DWV 16%. The DNV and CNV saw similar increases in mode share while it decreased in DWV. The most notable change is that a shift from transit to walk mode has occurred in the CNV. In DNV and DWV, the transit mode share percentage was similar in 2019 and 2023.

Figure 11. Total Trips by Mode and Mode Share - by Municipality, 2019 to 2023
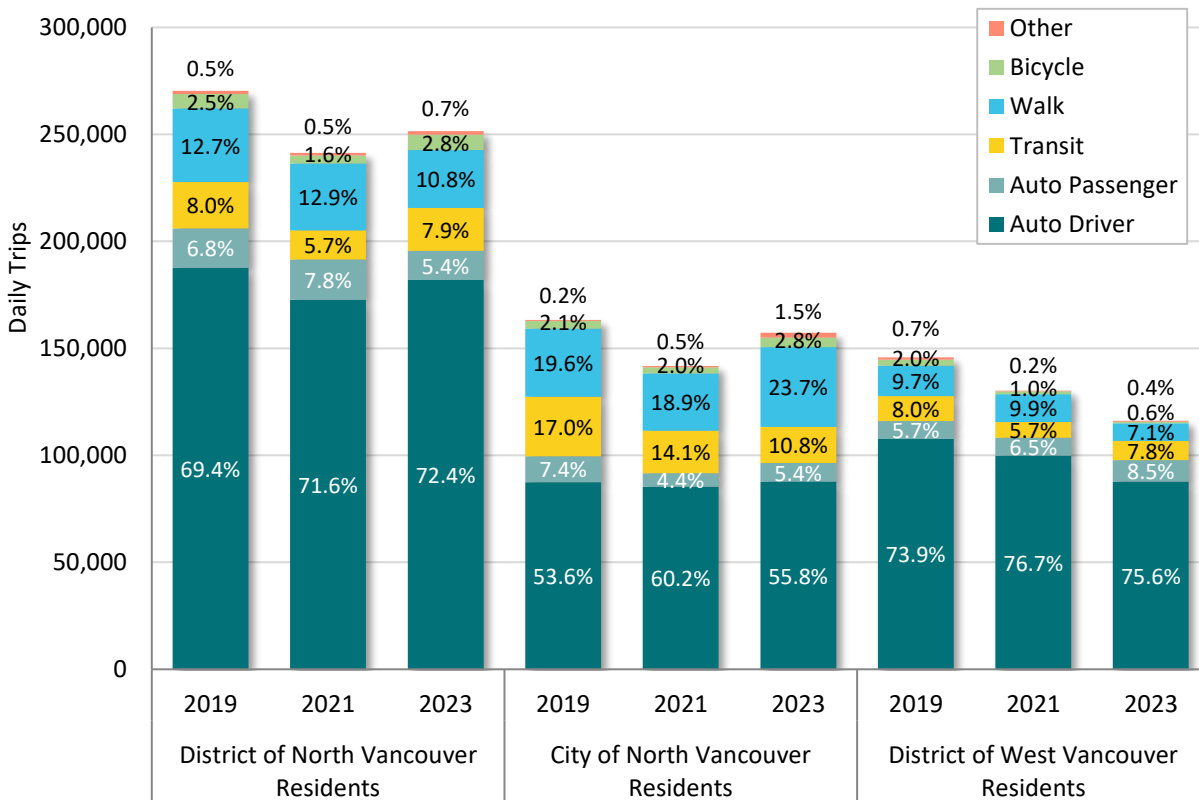
Individual percentages have been rounded and may not add to 100%.

Table 8. Daily Trip Volumes by Mode by Municipality [12]

	North Shore			DNV			CNV			DWV		
Daily Trips by Mode	2019	2021	2023	2019	2021	2023	2019	2021	2023	2019	2021	2023
Auto Driver	382,900	357,900	357,570	187,700	172,700	181,970	87,500	85,400	87,760	107,700	99,800	87,840
Auto Passenger	38,800	33,400	32,070	18,400	18,800	13,580	12,100	6,200	8,570	8,300	8,400	9,910
Transit	61,100	41,000	45,930	21,600	13,700	19,980	27,800	19,900	16,930	11,700	7,400	9,030
Walk	80,500	70,800	72,640	34,400	31,200	27,140	31,900	26,800	37,250	14,200	12,900	8,250
Bicycle	13,000	7,900	12,300	6,700	3,700	7,120	3,500	2,800	4,440	2,900	1,400	740
Other*	2,900	2,200	4,390	1,500	1,200	1,680	400	700	2,300	1,000	300	410
Total Daily Trips	579,100	513,200	524,900	270,300	241,300	251,460	163,100	141,800	157,250	145,800	130,100	116,190
Mode Shares	2019	2021	2023	2019	2021	2023	2019	2021	2023	2019	2021	2023
Auto Driver	66.1%	69.7%	68.1%	69.4%	71.6%	72.4%	53.6%	60.2%	55.8%	73.9%	76.7%	75.6%
Auto Passenger	6.7%	6.5%	6.1%	6.8%	7.8%	5.4%	7.4%	4.4%	5.4%	5.7%	6.5%	8.5%
Transit	10.5%	8.0%	8.8%	8.0%	5.7%	7.9%	17.0%	14.1%	10.8%	8.0%	5.7%	7.8%
Walk	13.9%	13.8%	13.8%	12.7%	12.9%	10.8%	19.6%	18.9%	23.7%	9.7%	9.9%	7.1%
Bicycle	2.3%	1.5%	2.3%	2.5%	1.6%	2.8%	2.1%	2.0%	2.8%	2.0%	1.0%	0.6%
Other*	0.5%	0.4%	0.8%	0.5%	0.5%	0.7%	0.2%	0.5%	1.5%	0.7%	0.2%	0.4%
Sustainable Mode Share (Transit + Walk + Bike)	26.7%	23.3%	24.9%	23.2%	20.1%	21.6%	38.7%	34.9%	37.3%	19.7%	16.6%	15.5%
Active Share (Walk + Bike)	16.1%	15.3%	16.2%	15.2%	14.5%	13.6%	21.7%	20.9%	26.5%	11.7%	10.9%	7.7%

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

Figure 12 shows the weekday mode share for North Shore residents, breaking out auto driver mode share by vehicle occupancy and transit mode share by service and by transit access mode. Readers are reminded that these mode shares are based on all daily trips made by North Shore residents (as estimated by the expanded survey results), including trips external to the North Shore. This is why SkyTrain trips are shown even though there isn't a SkyTrain on the North Shore.

- High Occupancy Vehicle (HOV) auto driver trips represent around 20% of all trips while Single Occupancy Vehicle (SOV) trips represent around 47%.
- Bus trips represent around 6.8% of all trips while the SeaBus and SkyTrain represent 0.8% and 1.1%, respectively.
- Access to transit is primarily via walking. Of all daily trips, 7.7% 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). Approximately 0.1% of all daily trips were transit trips accessed by biking to and from transit (or approximately 1.2% of all transit trips were accessed by biking).

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[12] * Other modes include taxi, ride-hail (Uber, Lyft, etc.), motorcycle, low-speed motor vehicle (moped, limited-speed motorcycle, scooter-style e-bike), HandyDart, minibus, and intercity modes (such as airplane, rail, or coach bus).

Figure 12. Weekday Mode Shares – North Shore[13]

North Shore

Daily (24-hour) mode shares

- Auto Driver
- Auto Passenger
- Transit
- Walk

68.1%
6.1%
8.8%
13.8%
2.3%
0.8%

Auto Driver Trips
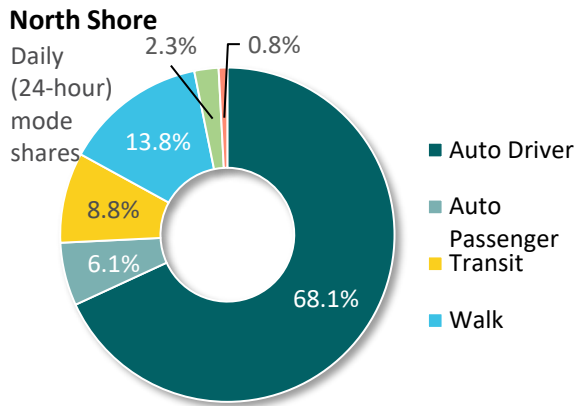
Single Occupant (SOV)	47.1%
2-Occupant (HOV-2)	15.8%
3-Occupant (HOV-3+)	3.7%

Transit Service Mode Shares

Bus	6.8%
SeaBus	0.8%
SkyTrain	1.1%

Transit Access

Walk Access	7.7%
Park & Ride (drive access)	0.5%
Kiss & Ride (passenger access)	0.3%
Bicycle Access	0.1%

Figure 13 shows the detailed mode shares for residents of each municipality.

Figure 13. Weekday Mode Shares by Municipality

District of North Vancouver

Daily (24-hour) mode shares

- Auto Driver
- Auto Passenger
- Transit
- Walk
- Bicycle
- Other

72.4%
5.4%
7.9%
10.8%
2.8%
0.7%

Auto Driver Trips
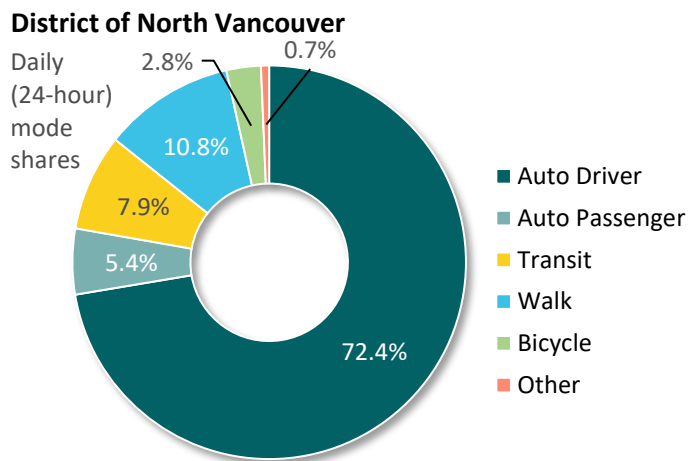
Single Occupant (SOV)	49.9%
2-Occupant (HOV-2)	17.2%
3-Occupant (HOV-3+)	3.9%

Transit Service Mode Shares

Bus	7.1%
SeaBus	0.7%
SkyTrain	0.2%

Transit Access

Walk Access	6.9%
Park & Ride (drive access)	0.7%
Kiss & Ride (passenger access)	0.1%
Bicycle Access	0.2%

[13] "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. Also note that in 2021 survey participants were asked to report on transit routes. This information was not collected in 2023, therefore transit service mode shares add to the total transit mode share (unlike previous years where this total exceeded the total transit mode share, due to multiple modes).

City of North Vancouver
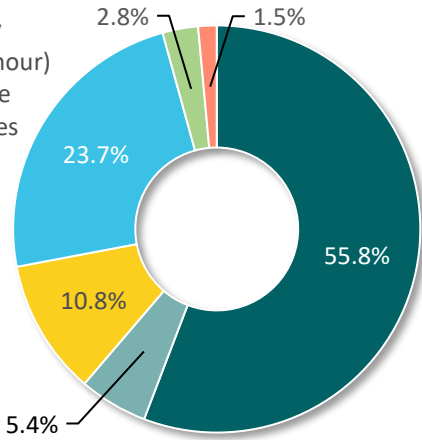
Daily (24-hour) mode shares

Legend:
- Auto Driver
- Auto Passenger
- Transit
- Walk
- Bicycle
- Other

Values: 55.8%, 5.4%, 10.8%, 23.7%, 2.8%, 1.5%
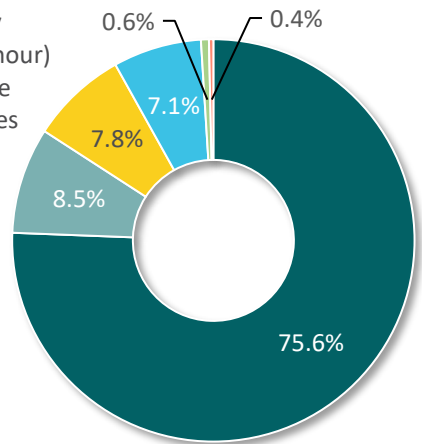
Auto Driver Trips

Single Occupant (SOV)	39.7%
2-Occupant (HOV-2)	11.1%
3-Occupant (HOV-3+)	3.0%

Transit Service Mode Shares

Bus	6.9%
SeaBus	1.5%
SkyTrain	2.4%

Transit Access

Walk Access	9.8%
Park & Ride (drive access)	0.4%
Kiss & Ride (passenger access)	0.3%
Bicycle Access	0.2%

District of West Vancouver

Daily (24-hour) mode shares

Legend:
- Auto Driver
- Auto Passenger
- Transit
- Walk
- Bicycle
- Other

Values: 75.6%, 8.5%, 7.8%, 7.1%, 0.6%, 0.4%

Auto Driver Trips

Single Occupant (SOV)	51.0%
2-Occupant (HOV-2)	19.4%
3-Occupant (HOV-3+)	3.9%

Transit Service Mode Shares

Bus	6.0%
SeaBus	0.2%
SkyTrain	1.6%

Transit Access

Walk Access	6.6%
Park & Ride (drive access)	0.3%
Kiss & Ride (passenger access)	0.9%
Bicycle Access	0.0%

3.3.3 Mode Share by Zone

North Shore residents' weekday mode shares are presented by zone of residence in Table 9. Auto driver mode shares are highest for residents of Zones 1 and 4 (77% and 79% respectively). Auto driver mode shares are lowest for Zones 6 and 7 (54% and 47% 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 approximately 15% transit mode shares each and 18% and 30% walk mode shares, respectively. Zones 6 and 7 report cycling mode shares at under 1% and almost 3% respectively. Cycling was highest for survey participants from Zone 8 (over 4%) and Zone 1 (4%).

The total sustainable mode share that combines Transit + Walk + Bike is particularly notable. Zone 7 stands out with a 48% sustainable mode share, meeting a target that is commonly strived for by other communities. This is an impressive increase from 40% in 2021. While the following observations are anecdotal, Zone 7 has many of the features of a 15-minute community including amenities, high-density residential, proximity to sustainable transportation modes and proximity to employment. In contrast, Zone 4 has the lowest sustainable mode share with 10%, reflective of the land use characteristics, lack of density and distance from core services and high-frequency transit.

Table 9. Mode Shares by 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	68.1%	77.0%	73.4%	70.9%	79.4%	72.2%	54.4%	46.7%	70.8%
Auto Passenger	6.1%	5.6%	3.6%	5.2%	10.6%	6.4%	8.0%	5.0%	7.2%
Transit	8.8%	3.9%	8.7%	9.8%	6.4%	7.1%	15.0%	15.3%	3.5%
Walk	13.8%	9.0%	11.7%	11.9%	3.2%	10.6%	17.8%	29.7%	14.1%
Bicycle	2.3%	4.0%	1.9%	2.0%	0.2%	2.5%	0.5%	2.7%	4.4%
Other	0.8%	0.5%	0.8%	0.3%	0.3%	1.1%	4.2%	0.6%	0.0%
Subtotals									
Sustainable (Transit + Walk + Bike)	24.9%	16.9%	22.2%	23.6%	9.8%	20.3%	33.4%	47.7%	22.0%
Active (Walk + Bike)	16.2%	13.0%	13.6%	13.9%	3.4%	13.1%	18.4%	32.4%	18.5%

3.3.4   Mode Share by Trip Purpose

Figure 14 illustrates how mode shares vary by trip purpose.

- The highest auto driver mode share is for serve-passenger (drop off or pick up) trips (88%). Work-related, personal business and shopping are at 77%, 71%, 74%, respectively.
- 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[14]) (14%) and other purposes (17%).
- Transit shares are highest for school and work commutes (50% and 20% respectively).
- Walk mode shares are highest for recreation and restaurant trips (32% and 27%, respectively).
- Cycling mode share is highest for work commutes (7%).

Figure 14. Mode Share by Trip Purpose - the North Shore[15]

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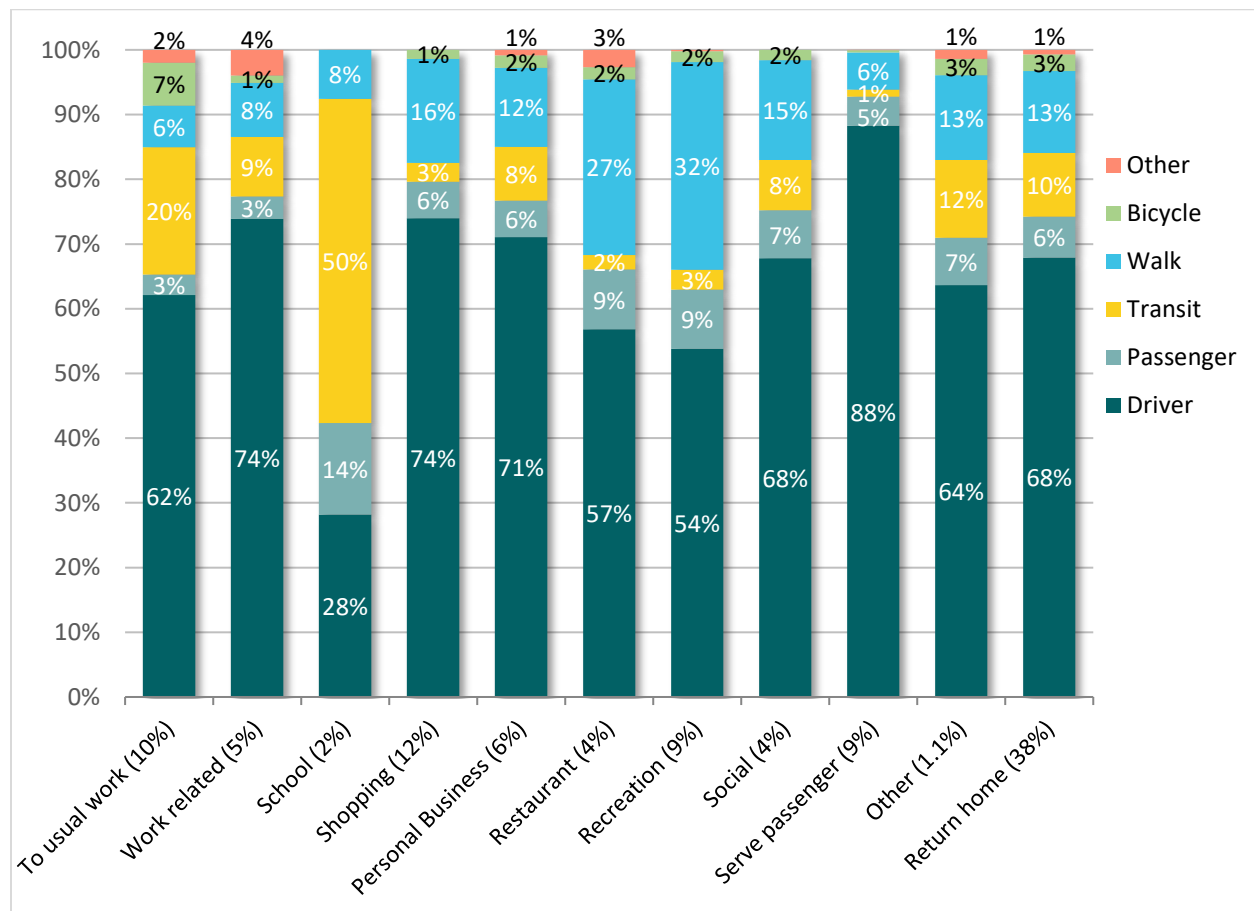
[14] When interpreting mode shares for trips to school, readers are reminded that the survey only included residents 15 years of age and older. I.e., the survey did not include students under the age of 15, whose mode shares would differ from those presented here for post-secondary students and high school students 15+ years of age.
[15] Mode shares of 1% or less are included in the chart, but values are not displayed. All other modes for which percentages are not displayed in the chart have less than 0.5% share.

3.3.5 Mode Share by Age Group

Figure 15 shows mode shares by age group.

- Survey participants 35 and older have auto driver mode shares of greater than 70% of their daily trips and participants younger than 35 have auto driver mode shares of less than 50% of their daily trips.
- The 15 to 24 age group has the highest percentage of auto passenger trips with 18% of daily trips, while residents between 25 to 64 have 5% passenger mode shares.
- Participants in the 15 to 24 age group have the highest percentage of transit trips, at 26% of their daily trips, while those in age groups older than 45 have only 4%-6% transit mode shares.
- Participants in the 25 to 34 age group have the highest percentage of walking trips, with 23%. The 45 to 54 age group has the lowest percentage of walking trips, with 9%. The remaining age groups range between 12% to 16%.

Figure 15. Mode Share by Age Range – North Shore[16]

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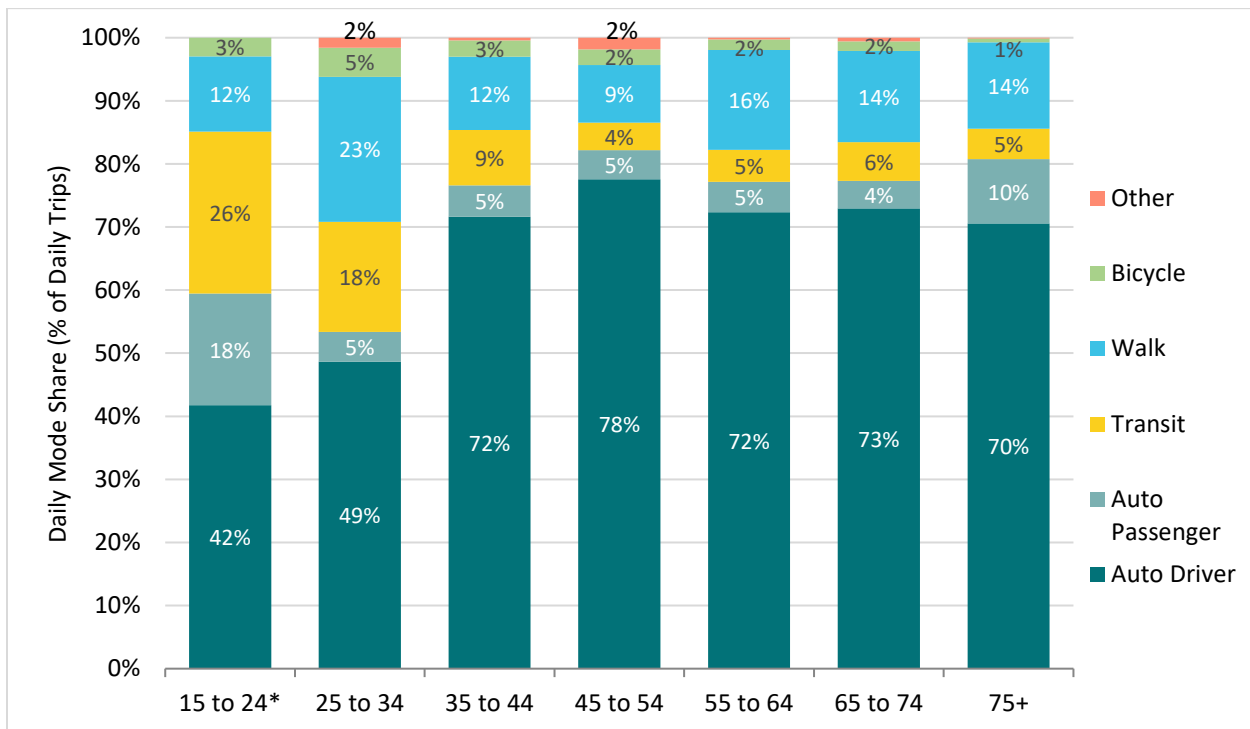
[16] Age groups with an asterisk "*" have modest samples size (n<150 trips) and should be interpreted with caution.
Mode shares of 1% or less are included in the chart, but values are not displayed. Other modes (low speed motor vehicle, taxi, ride-hail, ferry, airplane, etc.) have shares of less than 0.5% for all age ranges except 25-34 (2%), 45-54 (1%), and 65-74 (1%).

3.3.6   Mode Share by Income

Figure 16 shows mode shares by household income.

- Vehicle use increases with income, with auto driver trips representing between 43% and 58% of trips for the lowest-income households (residents with annual household income of less than $30K, and those of between $30K and $50K) and in the range of 70% for other household income groups.
- Use of public transit is highest amongst lower-income households. 19% of trips made by those in the lowest-income (less than $30k per year) households are via transit and 16% for those with incomes of $30k to $50k. This drops as income increases, from 14% for those in households with $50k to $80k, and only 6% to 8% for those with incomes of $80k or more.
- About a quarter of trips made by residents of the lowest-income households are via walking, at 28% and 21% for residents with less than $30K income and between $30K to $50K respectively, dropping to 11% for residents of households in the $125K-to-$200K income bracket.
- The results show a negligible bicycle mode share for lower income households below $50K. Higher income brackets show 2% to 3% bicycle mode shares.

Figure 16. Weekday Mode Share by Household Income – North Shore[17]
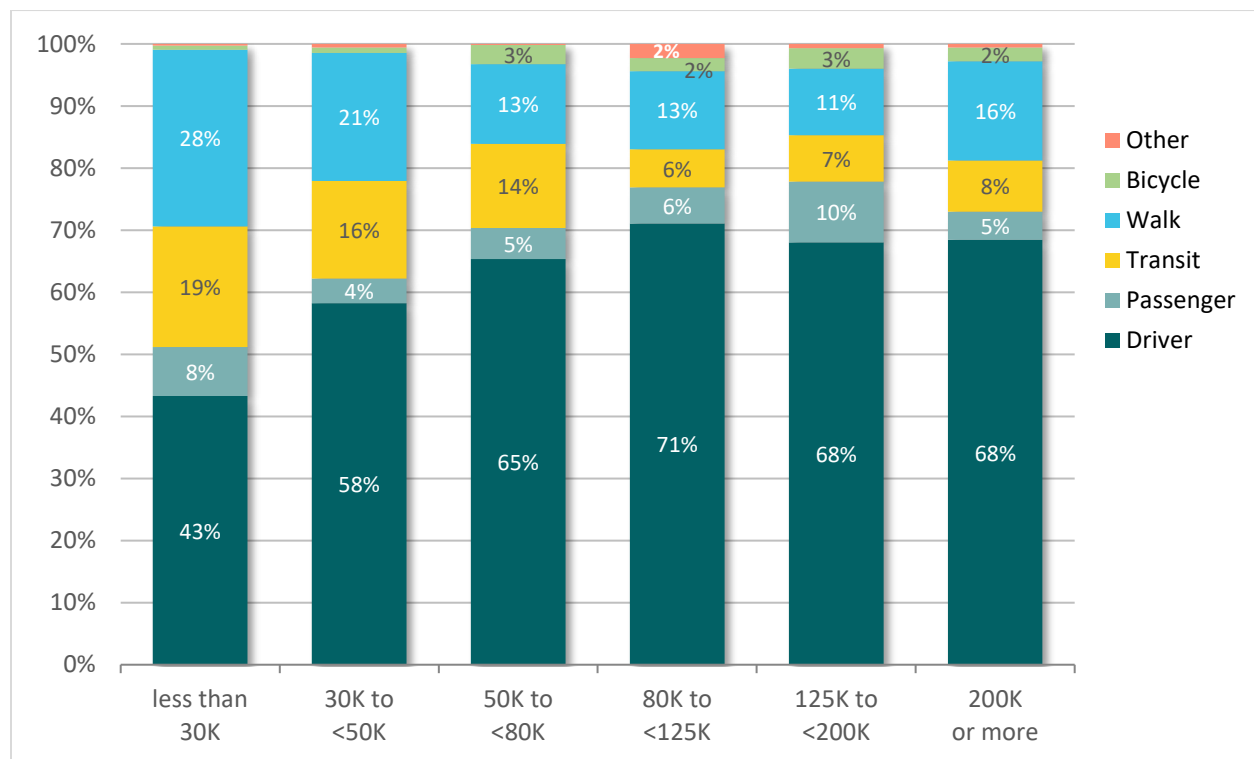
3.3.7 Mode Share by Immigration Status/Year

The survey results suggest that recent immigrants (those who settled in Canada within the last five years) are likely to use sustainable transportation modes (Figure 17) close to the same proportion of those born in Canada, 25% and 26% respectively. Residents who settled 5 to 10 years ago had the highest sustainable transportation mode share at 38%. Residents who immigrated more than 10 years ago had the lowest sustainable transportation mode share, at 21%.

Note that sustainable mode shares (transit, walk, bike) have been collapsed due to small sample sizes. These results should be considered an indication of an overall pattern, rather than exact.

Figure 17. Weekday Mode Share by Immigration Status – North Shore
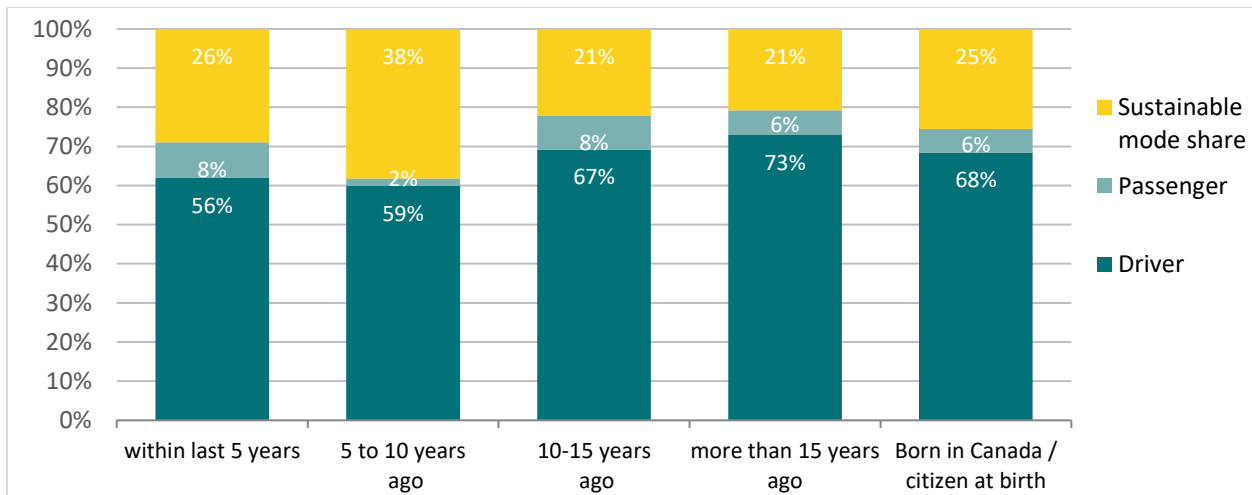
3.3.8   Mode Share for Visible Minority Populations

The survey results suggest that people who self-identified in a visible minority population group are more likely to use transit, with a 14% mode share, compared to 7% for non-minorities (Figure 18). Auto reliance is roughly equivalent for both groups. Non-minorities cycle with a 3% mode share while it is only 0.5% for visible minorities. Survey sample sizes for individual racial identity groups were too small to allow for a more detailed analysis by specific population group.

Figure 18. Mode Shares for Visible Minorities – North Shore
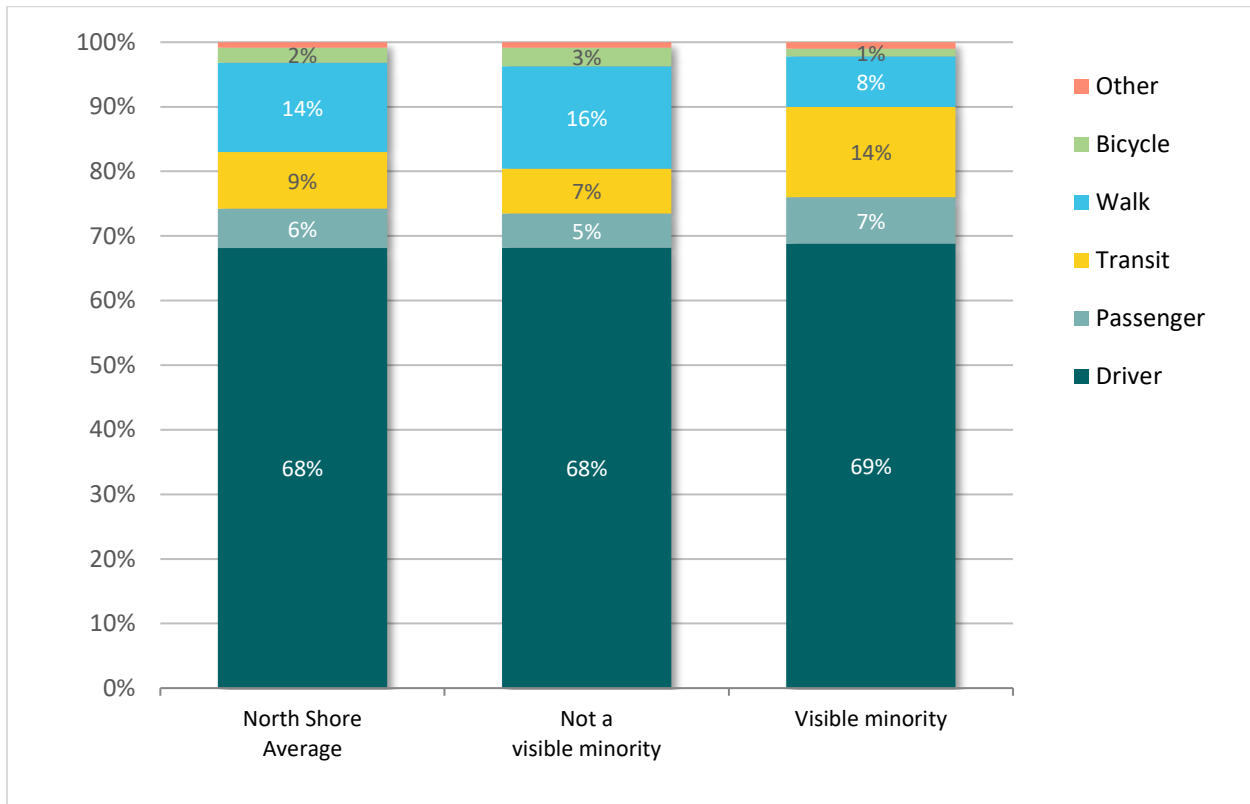
3.3.9   Mode Share by Dwelling Type

Figure 19 shows an interesting but not surprising pattern of higher walk mode and transit mode shares associated with apartment buildings and higher auto driver mode shares associated with houses or other ground-oriented dwellings. This likely reflects a few things, including limited access to parking if living in an apartment building and the increased ease of accessing amenities and services that is usually associated with higher density living that comes with apartment buildings as well as better access to transit for many of them.

Figure 19. Mode Share by Dwelling Type
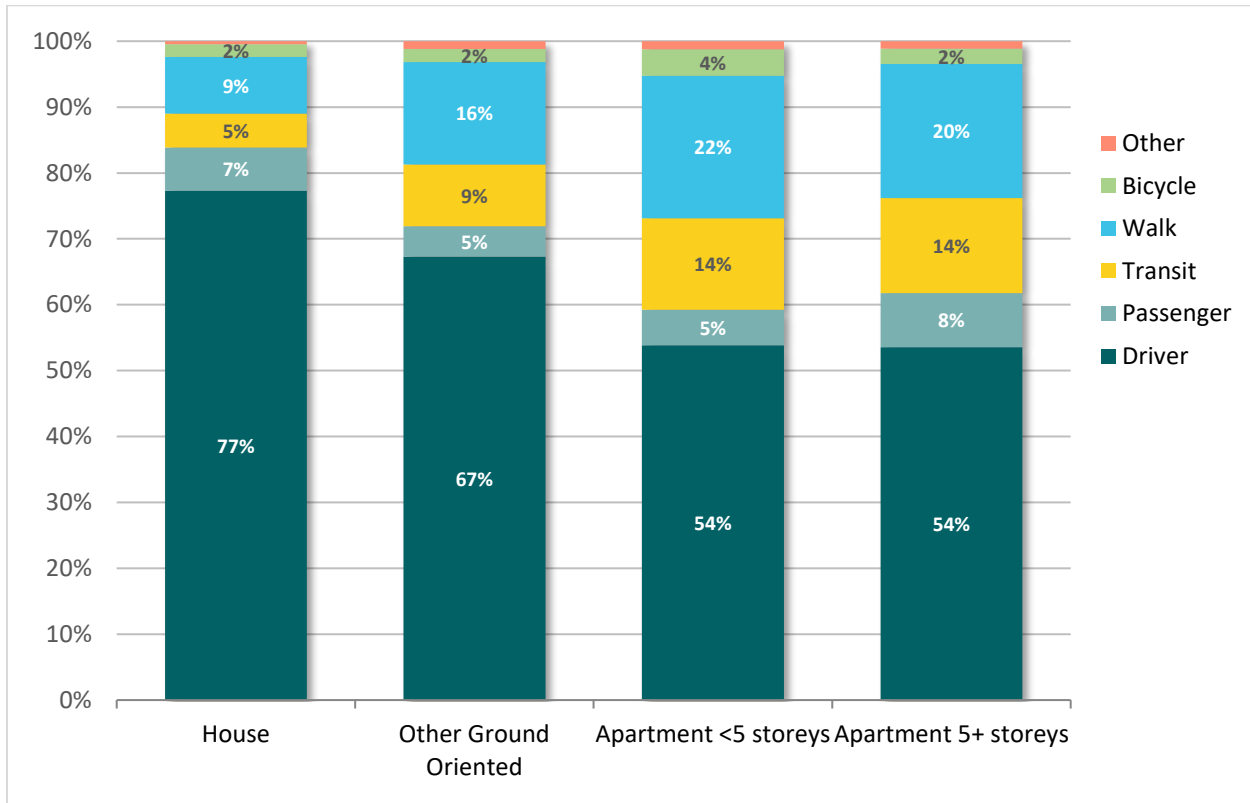
3.4 Trip Distributions

This section describes the trip distributions for trips reported by survey participants, including the trip origin and destinations and internal capture of trips.

3.4.1 Trip Origins and Destinations

Table 10 shows the origin-destination (O-D) flows by the sub-municipal Zone. The O-D matrix is generally balanced between the O-D zones. Figure 20 shows the external destination of North Shore residents.

Of the estimated 524,900 total daily trips made by North Shore residents 15+ years of age:

- 74% (388,300 trips) are made entirely within the North Shore (73% in 2021 and 71% in 2019);
- More than one fifth (21%, or 112,900 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) (22% in 2019 and 24% in 2019); while
- 5% are made entirely outside the North Shore (23,800 trips with both the origin and destination being external) (5% in 2021 and 2019).[18]

Zone 1 (DNV East) and Zone 7 (CNV core) are the most popular destination zones, respectively attracting 58,600 and 68,300 daily trips from other zones each day (with approximately equivalent numbers of trips outbound from these zones). These two zones have the highest amount of commercial land uses on the North Shore, including a regional shopping centre and regional athletic fields in Zone 5 and a central business district and recreation district in Zone 7.

Looking at flows to destinations external to the North Shore, also pictured in Figure 20, the City of Vancouver downtown peninsula (CBD/West End) attracts 17,900 trips from the North Shore each day, the rest of Vancouver/University Endowment Lands (UEL) attracts 18,200, and Burnaby 10,800 (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 3,000 daily trips, while about 1,500 daily trips are destined to locations north of the North Shore or other external locations outside the MVRD and the Fraser Valley Regional District (FVRD).

All told, trips from the North Shore to destinations south of the North Shore accounted for 56,600 daily trips, a slight increase from the 54,600 trips reported in 2021 but down 17% from the 67,700 trips estimated in the 2019 survey results. This aligns with the somewhat stable trip rate between 2021 and 2023 within the North Shore, which is about 8% less than the 2019 trip rate. Assuming that many trips to MVRD are for work purposes, this is likely a reflection of the ongoing reduced commuting volumes associated with the rise in flexible work arrangements since the onset of the COVID-19 pandemic.

The highest flows between individual zones are from Zone 4 (DWV west) to Zone 5 (DWV central) with around 10,000 daily trips. For all zones, trips within that zone are most common.

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[18] 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 10. Origin-Destination Flows by 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)	32,200	6,100	3,100	1300	2,800	3,100	5,000	4,900	1,800	3,000	100	2,400	-	400	900	-	-	67,100
Zone 2 DNV (Central)	5,900	23,300	3,100	1,600	1,700	2,300	5,700	5,000	2,700	2,800	100	1,200	300	300	700	-	100	56,800
Zone 3 DNV (West)	3,200	2,800	17,300	1,500	2,800	4,000	5,700	2,000	1,900	1,400	500	1,400	-	200	300	100	100	45,200
Zone 4 DWV (West)	900	1,400	900	16,200	10,000	3,200	2,100	900	1,600	3,300	400	1000	-	-	300	-	-	42,200
Zone 5 DWV (Center)	2,000	2,000	3,000	9,800	26,800	4,400	4,900	2,800	2,900	1,800	500	1200	300	200	300	200	-	63,300
Zone 6 CNV/DWV (Outer)	2,900	2,900	4,800	3,300	4,800	15,500	7,300	2,800	2,000	900	100	800	-	-	200	100	100	48,400
Zone 7 CNV (Core)	5,600	4,400	5,100	1,800	4,900	7,500	29,100	9,000	3,800	3,200	300	1,500	-	200	1200	200	-	77,800
Zone 8 CNV/DNV (East)	5,800	5,100	2,100	800	2100	3,800	8,500	10,600	1,100	1,800	300	1,300	-	200	100	500	100	44,100
Van CBD/West End	1,900	2,600	1,900	1,600	3,200	2,100	3,600	1,200	4,300	1,700	-	300	-	-	-	-	100	24,600
Rest of Vancouver/UEL	2,800	2,800	1,200	2,300	2,900	1,100	2,500	2,200	2,300	5,100	-	1100	-	100	100	-	-	26,500
Richmond	300	100	300	500	200	100	400	200	-	200	600	100	-	-	-	-	-	3,000
Burnaby	3,200	1,200	1,400	1000	800	1300	1,200	1,200	-	1300	-	1,900	-	300	-	-	-	14,900
New Westminster	-	300	-	-	200	-	-	-	100	-	-	-	100	100	-	-	-	800
Northeast Sector	200	300	300	-	-	-	200	200	-	-	-	300	100	1,300	300	100	-	3,400
Other MVRD/FVRD	700	500	500	200	100	400	900	200	-	400	-	400	-	100	600	-	-	5,000
North of North Shore	-	100	100	100	100	-	300	400	-	-	-	-	-	-	-	-	-	1100
Other External	100	-	100	100	-	-	100	200	-	-	-	-	-	-	-	-	-	700
Total Daily Trips	67,700	56,000	45,200	42,200	63,300	48,800	77,600	43,700	24,700	27,000	2,900	14,900	900	3,400	5,000	1100	400	524,900

Blue shading is used to highlight greater trip volumes, with the intensity of the colour increasing with volume. Grey shading indicates trips entirely within the given zone (both origin and destination).

Figure 20. Destination Flows by Area For Trips Originating in North Shore (Daily Trips Made by Residents of the North Shore)
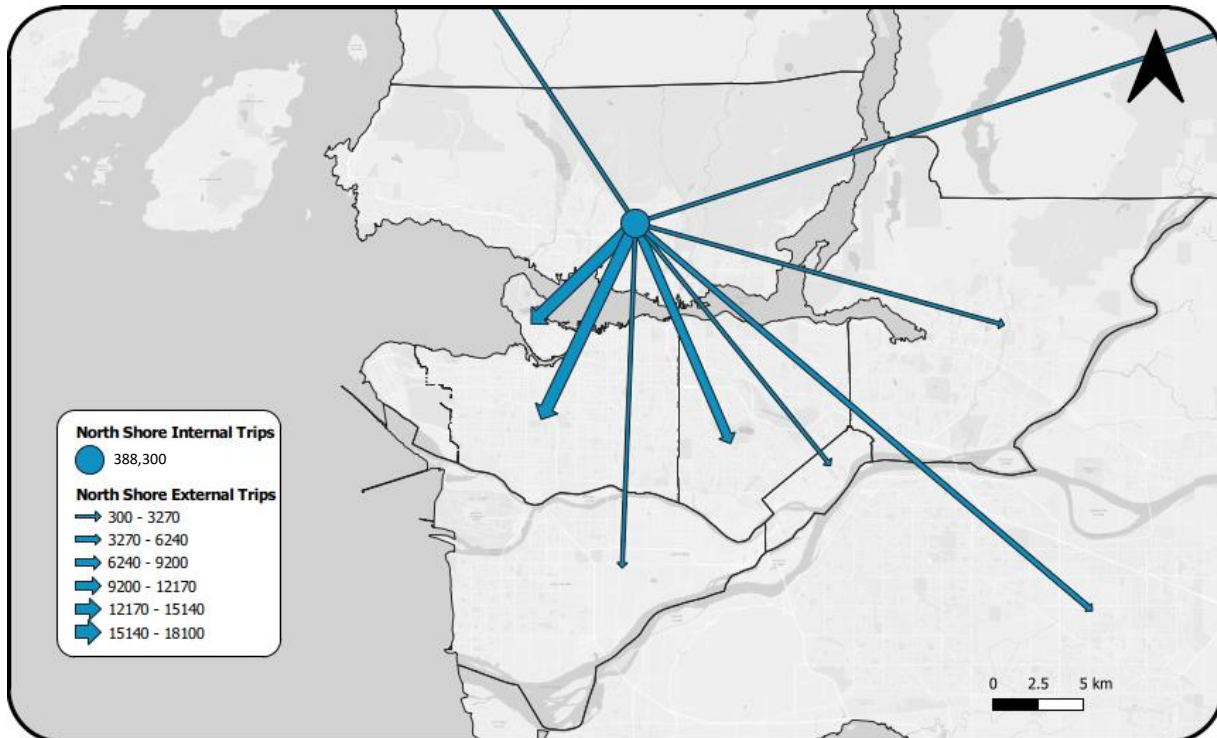
3.4.1 Crossings of Burrard Inlet

Table 11 shows the crossing use by destination for flows originating from the North Shore.[19] Each day, residents of the North Shore make almost 54,400 southbound trips that cross the Burrard Inlet (with an equivalent number of northbound return trips back to the North Shore). The reader is reminded that these are only the trips made by residents of the North Shore and does not include Burrard Crossing Inlets for non-residents. Note also that this includes trips via all modes of travel (not just vehicle trips).

- Lions Gate Bridge carried about 63% of trips reported on the survey that were destined to Vancouver CBD/West End, 46% of those to the rest of Vancouver/UEL and 61% of those to Richmond.
- Ironworkers Memorial Second Narrow Bridge carried 80% or more of trips destined to Burnaby, New Westminster, Northeast Sector, and FVRD.
- The SeaBus carried 8% of trips destined outside the North Shore (mainly Vancouver CBD, Rest of Vancouver, and Richmond). SeaBus usage is highest for trips destined to the Vancouver CBD/West End (17% of trips to this area).

The survey results suggest that the volume of trips by residents to destinations south of the North Shore is down slightly in 2023 compared to 2021, with a drop in trips via the SeaBus. Note: some of the

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[19] Survey participants who reported trips crossing from the North Shore to locations south of the North Shore by any mode other than SeaBus were asked which bridge crossing they used.

variance on crossing choice for destinations with smaller volumes of trips may be the result of small sample sizes rather than an actual shift in travel patterns.

Table 11. Burrard Inlet Crossing Use for North Shore Residents for Southbound Origin-Destination flow[20]

| Destination | Survey Year | Estimated Daily Trips | % of Daily Trips made by North Shore residents via Each Crossing (row %) | | |
			Lions Gate Bridge	Ironworkers Memorial Second Narrows Crossing	SeaBus
Vancouver CBD/West End	2019	29,960	66%	14%	20%
	2021	17,760	64%	17%	19%
	2023	17,870	63%	20%	17%
Rest of Vancouver, UEL	2019	20,650	51%	43%	6%
	2021	17,360	39%	56%	5%
	2023	18,160	46%	48%	5%
Richmond	2019	2,290	40%	44%	16%
	2021	3,330	52%	24%	23%
	2023	2,200	61%	33%	7%
Burnaby & New Westminster	2019	12,190	1%	97%	3%
	2021	11,070	3%	86%	3%
	2023	11,540	8%	86%	0%
Northeast Sector	2019	2,200	0%	100%	0%
	2021	1,650	0%	100%	0%
	2023	1,280	0%	100%	0%
Other Metro Vancouver/FVRD	2019	3,500	7%	92%	0%
	2021	3,730	2%	98%	0%
	2023	3,530	4%	96%	1%
Total Trip Destinations South of the North Shore	2019	67,790	44%	46%	11%
	2021	54,900	38%	52%	10%
	2023	54,580	41%	51%	8%

Figure 21 show volumes in total southbound traffic counts across the Lions Gate bridge and Second Narrows bridges from 2019 to 2023 for all vehicles, including those driven by non-residents of the North Shore and including vehicles on commercial trips. The results show that southbound traffic counts on the bridges dropped considerably in 2020 with some recovery in the following years. In 2023, traffic counts on the Second Narrows Bridge were only 3% below 2019 levels. 2023 traffic counts for the Lions Gate Bridge show an increase from 2022 level but are still approximately 8% below 2019 volumes.

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[20] Excludes 'Other' crossing methods such as via airplane or private boat. Percentages calculated excluding trips for which crossing used is unknown.

Figure 21. Second Narrows Bridge and Lions Gate Bridge Southbound 2019 - 2023 Monthly Average Weekday Traffic

Second Narrows Bridge Traffic Counts
September, Southbound

Y-axis: Average daily southbound traffic (weekdays)

- September 2019: 66,600
- 2020: 60,900
- September 2021: 64,300
- 2022: 65,200
- September 20023: 65,300

Lions Gate Bridge Traffic Counts
December, Southbound

Y-axis: Average daily southbound traffic (weekdays)

- December 2019: 28,953
- 2020: 24,106
- December 2021: 26,527
- 2022: 25,828
- December 2023: 26,709

Source: BC Ministry of Transportation and Infrastructure Monthly Volume Calendar

3.4.2 Trip Internal Capture

For all zones, trips within that zone are most common. Figure 22 shows the internal trip capture, or 'internalization' of trips, for each of the sub-municipal zones, or the proportion of trips made by residents of the zone that remain 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) has the highest internalization, with 37% of trips, the highest of all subzones. The high internalization of trips may be attributed to the number of amenities within the zone and the high proportion of retired people (38% of residents over the age of 15 are retired). Zone 8 CNV/DNV (East) captures 17% trip internalization which is the least among all zones. The fact that Zone 7 CNV (Core) has only 31% internalization, despite its urban density is likely the result of the large number of Zone 7 residents commuting to work locations outside of the North Shore and its proximity to Vancouver's CBD.

Figure 22. Internalization of Trips made by Residents of Each Zone
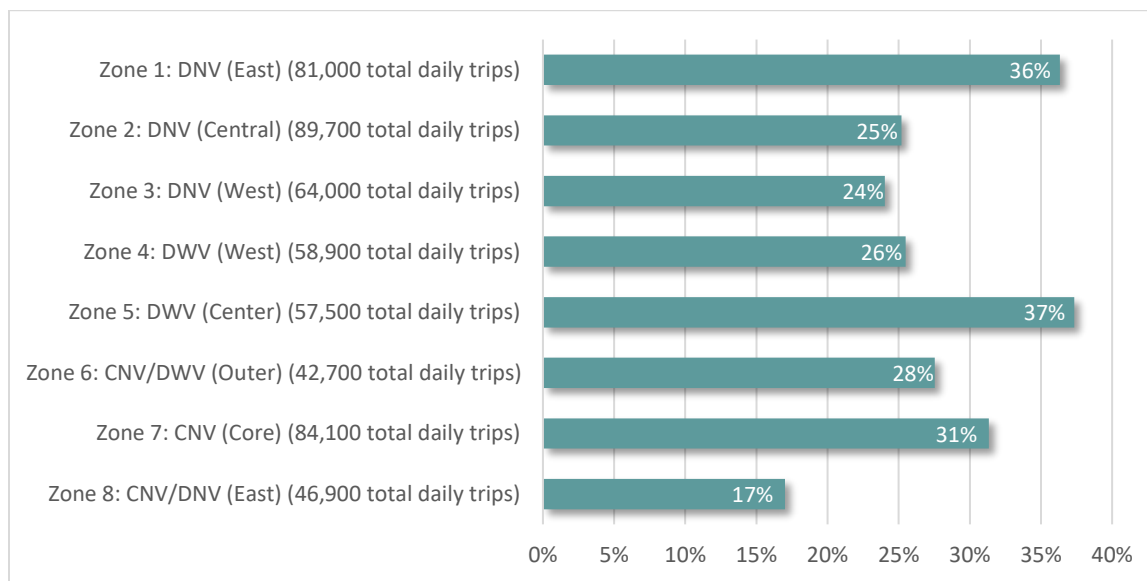
3.4.3 Special Generators

Figure 23 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 grey in order to distinguish the volumes of trips for purposes of activities that attract travellers to each generator. The mix of return home trips are different for each generator depending on how many residential dwellings there are within the geographic boundaries provided for each generator.

The trips to the special generator areas account for 27% 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 32% of North Shore residents' destinations outside the home or 43% of their destinations on the North Shore.

Figure 23. Daily Trips Made by North Shore Residents to Special Generator Destinations[21]

Estimated Daily Trips to Special Generator

Destination	Value
Marine Drive Commercial Area	9,090
Central Lonsdale	17,550
Lower Lonsdale*	15,310
Esplanade Corridor	6,370
Lower Lonsdale/Espalanade Corridor Combined	18,510
Deep Cove Village**	360
Edgemont Village Centre	7,100
Lions Gate Village**	2,470
Lynn Creek Town Centre	10,490
Lynn Valley Town Centre	13,770
Maplewood Town Centre*	3,610
Park Royal	14,180
Ambleside	32,710
Dundarave	11,290

■ Other Purpose   ■ Return Home

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[21] 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).

3.5   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. As shown in Figure 24, auto drivers have the longest trip distance for home-based work trips,[22] averaging 13.1 km, while transit users have the longest trip distance for all trips, averaging 10.5 km. The shortest trips are made by those who walk, averaging 1.0 km for work trips and 0.9 km for all trips. Interestingly, the average distance of transit work trips (11.4 km) is similar to the average distance of auto driver work trips (13.1 km).

Comparison to the results from 2021 revealed slight differences in the average work commute distances by mode. The average trip distance for auto driver work trips increased from 12.7 km in 2021 to 13.1 km in 2023, while the average across all auto driver trips was more stable at 8.5 km in 2023 compared 8.3 km in 2021. Conversely, the average length of auto passenger work trips increased from 9.8 km to 10.8 km. Transit and walk trips remained similar, while the average bicycle work trip increased from 9.5 km to 11.6 km (although this result should be interpreted with caution due to the small sample of bicycle work trips). Compared to 2019, the 2023 average trip distances to work are comparable except for auto passenger trips that have increase from an average of 8.6 km in 2019 to 10.8 km in 2023.

Figure 24. Average trip Distance for Home-based Work Trips and All Trips – North Shore, 2023[23]
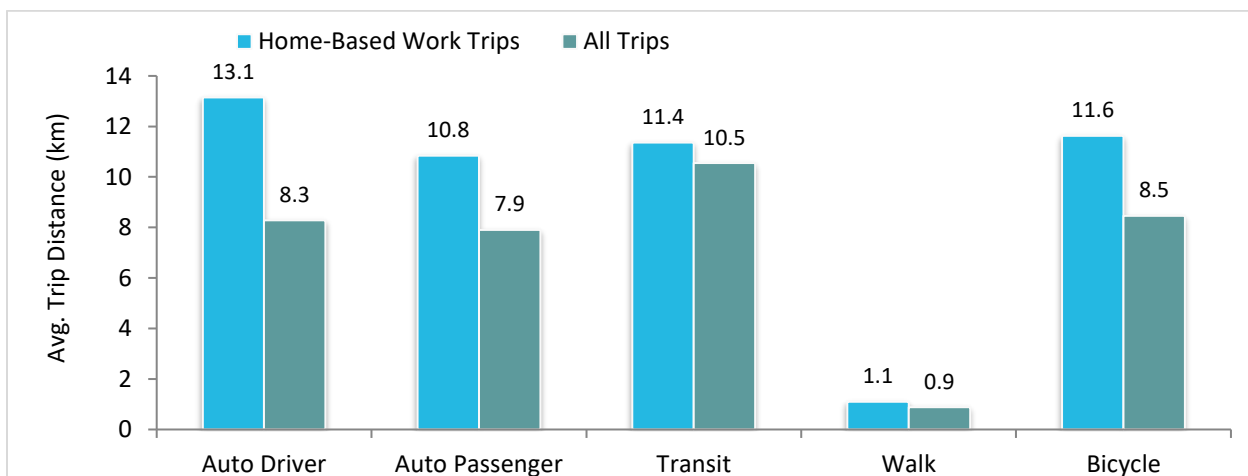
Table 12 shows the daily person-km trips on weekdays across modes for all three survey cycles, as estimated from trips reported on the survey expanded to the population 15+ years of age. Auto driver trips account for 76% of the daily person-km travelled and auto passenger accounts for an additional 7%. Transit trips account for 12% of total person-km travelled.

Looking across the years, person-km travelled decreased for most modes between 2019 and 2023. Between 2019 and 2021, the impact of the COVID-19 pandemic can be seen in the notable decrease in all modes except walking, which increased 12%. Between 2021 and 2023, total person-km travelled decreased for auto drivers (4% decrease), passengers (5% decrease), transit (11% reduction), and walking (7% decrease), but increased significantly for bicycle trips (70% increase). In 2023, person-km

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[22] Home-based work trips are trips directly from home to work or directly from work to home.

[23] Other modes are excluded due to small sample size

travelled remains lower than 2019 rates for auto driver (-9%), auto passenger (-17%), and transit (-24%), while person-km travelled for walk and bike trips is above 2019 by 4% and 8%, respectively.

Table 12. Total Daily Person-KM on Weekdays[24]

	Total Daily Person-Km (Weekdays)					
	Auto Driver	Auto Passenger	Transit	Walk	Bicycle	Other*
2019	3,198,400	300,000	616,100	53,600	95,700	6,200
2021	3,025,200	262,800	524,400	60,000	60,800	n/a
2023	2,918,500	250,000	467,700	56,000	103,300	n/a

Figure 25 summarizes average trip distances by mode of travel. Unsurprisingly, the majority of walking trips are short, with 70% of such trips being within 1km and another 20% within 2km. Approximately 38% of auto trips, either as driver or passenger trips, were 5km or shorter. An analysis of short distance car trips that are "bikeable" and "walkable" is available in Section 4.6. Also notable is the 31% of bicycle trips greater than 12km, this may be attributed in part to cyclists accessing the bridges to cross the Burrard Inlet, potentially increasing the distance to such trips.

Figure 25. Trip Distance Distributions by Mode

TRIP DISTANCES

AUTO DRIVERS & PASSENGERS
38% of trips were <5km
21% of trips were 12km+

PEDESTRIANS
70% of trips were <1km
No one reported trips 4km+

TRANSIT USERS
18% of trips were <5km
35% of trips were 12km+

CYCLISTS
33% of trips were <5km
31% of trips were 12km+

TOTAL
44% of trips were <5km
20% of trips were 12km+

NOTE: For illustrative purposes, the trip modes 'Auto Driver' and 'Auto Passenger' have been collapsed into a single category due to their similar percentages.

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[24] *Other modes are excluded from the 2021 and 2023 results due to small sample size (<30)*

Figure 26 shows the average trip duration by mode for residents of the North Shore. Transit and bicycle home-based work trips have the longest duration at 45.1 minutes. Walking and auto passenger trips have the shortest duration at approximately 15 minutes for home-based work trips and 12 minutes for all trips. This suggests that people who are currently choosing to travel via transit or bicycle may be willing to experience longer travel times. Shorter travel times relative to the distance travelled may be an important reason for many residents' choice of automobile as their usual mode of travel for both commuting and non-commuting purposes and may present a barrier in trying to convince people to shift to more sustainable modes.

Figure 26. Average Trip Duration (in minutes) by Mode
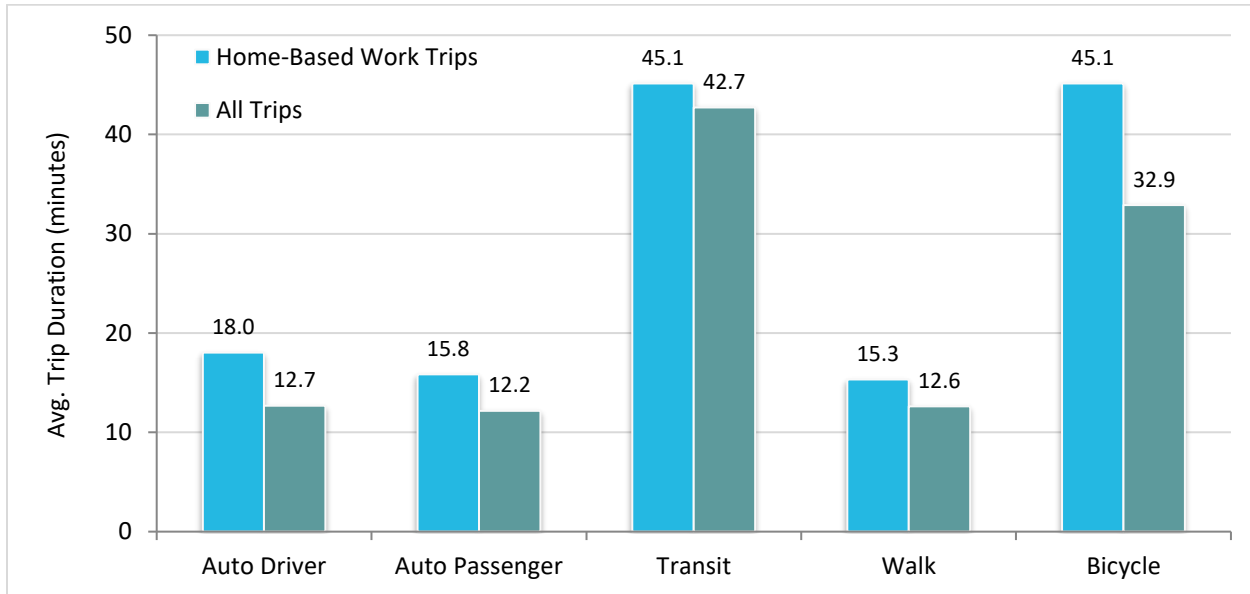
As shown in Table 13 there has been little change in the average trip duration between 2019 and 2023; this is unsurprising as trip distances have remained consistent over time. It appears that residents may be more willing to cycle slightly longer distances both to work and for all trips as the average trip duration has increased from 29.8 minutes for all trips in 2019 to 32.9 minutes in 2023.

Table 13. Average Trip Duration (in minute) by Mode, 2019 to 2023

Home-Based Work Trips					
	Auto Driver	Auto Passenger	Transit	Walk	Bicycle
2019	18.9	13.7	44.7	11.1	39.9
2021	17.1	15.8	45.0	11.6	36.6
2023	18.0	15.8	45.1	15.3	45.1
All Trips					
	Auto Driver	Auto Passenger	Transit	Walk	Bicycle
2019	12.5	11.9	39.9	10.2	29.8
2021	12.7	12.6	43.5	12.7	32.0
2023	12.7	12.2	42.7	12.6	32.9

MALATEST Associated Engineering

4   Travel Patterns

This section discusses overall travel patterns, habits, preferences, and attitudes for the "usual" travel behaviour. This is differentiated from the snapshot of actual travel on a specified day. It includes usual commute travel patterns, usual non-commute mode, and travel patterns related to walking, cycling, and transit.

4.1   Work Commute Patterns

The commute travel patterns explored in this section include North Shore residents' reported usual mode of travel for work commutes, the work destinations they commute to, frequency of telecommuting, and their satisfaction with their work commutes.

4.1.1   Workers and Workplaces

Table 14 provides a basis for understanding the survey results on commuting patterns that will follow. It also highlights the impact of the COVID-19 pandemic with a significant fluctuation in the proportion of the population 15 years and older commuting to work at least some of the time between 2019 and 2023.

- The weighted and expanded survey data suggest that in 2023 there were 101,400 workers on the North Shore, compared to 104,000 in 2021 and 96,800 in 2019.
- Overall, in 2023 an estimated 74,800 workers reported having a usual workplace outside the home that most (74,200) commute to at least some of the time. The workers who reported having a usual workplace outside the home represent 74% of all workers, up from 68% in 2021 but not quite a full return to pre-pandemic levels (79% in 2019).
- The proportion of workers reporting no fixed workplace (e.g., professional drivers, trades contractors, and others whose worksite may change regularly) is 10% in 2023 (10,300 workers), this a decrease from 12% (12,800 workers) in 2021 but not as low as the 2019 estimate of 8% (about 7,700 workers).
- The proportion of workers reporting they work exclusively from home has also decreased from 20% in 2021 to 16% in 2023 (from 20,500 to 15,800), which is still larger than the 14% reported in 2019 (13,100 workers).

Table 14. Work Arrangements and Daily Commutes by Municipality, 2019 to 2023

	North Shore			DNV			CNV			DWV		
	2019	2021	2023	2019	2021	2023	2019	2021	2023	2019	2021	2023
	USUAL WORKPLACE OUTSIDE HOME:			**USUAL WORKPLACE OUTSIDE HOME:**			**USUAL WORKPLACE OUTSIDE HOME:**			**USUAL WORKPLACE OUTSIDE HOME:**		
Currently commute at least some of time	76,000	64,200	74,200	37,300	31,000	35,600	25,900	21,300	27,890	12,700	11,800	11,900
	NO USUAL WORKPLACE OUTSIDE HOME:			**NO USUAL WORKPLACE OUTSIDE HOME:**			**NO USUAL WORKPLACE OUTSIDE HOME:**			**NO USUAL WORKPLACE OUTSIDE HOME:**		
No fixed workplace outside the home	7,700	12,800	10,300	2,900	5,100	4,300	3,300	3,800	3,320	1,600	3,800	2,660
Work exclusively from home	13,100	20,500	15,800	6,000	8,800	6,620	3,000	7,000	4,760	4,200	4,800	4,370

4.1.2   Telecommuting

The trends presented in the preceding sections suggest that the proportions of workers who work exclusively from home may be returning to near-pre-pandemic levels. The proportion of workers reporting that they telecommute or work from home at least some of the time has decreased slightly in 2023, at 55% compared to 57% in 2021, but is still considerably higher than 2019 (45%). Figure 27 shows the frequency of telecommuting for survey participants who work. It is interesting to observe changes in the frequency of telecommuting over time. More workers are telecommuting two or more days per week in 2023 compared to previous years. In 2021 more workers were reporting working exclusively from home during the COVID-19 pandemic, while pre-pandemic nearly 50% of workers never telecommuted. Time will tell if the pattern observed in 2023 will remain stable or continue to shift.

Figure 27. Frequency of Telecommuting
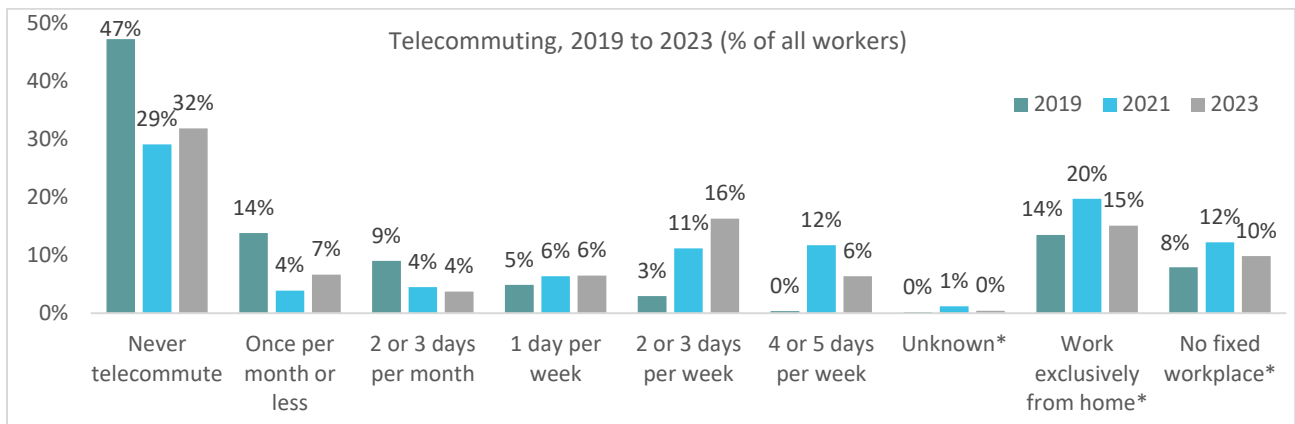
Table 15 shows the frequency of telecommuting for survey participants who have a usual workplace outside of their home by municipality. Between 2021 and 2023 the proportion of participants reporting that they never telecommute increased in CNV (from 31% to 40%) and DWV (from 17% to 23%). DNV saw a slight decrease in the proportion of survey participants reporting that they never telecommute (from 33% to 30%).

Table 15. Frequency of Telecommuting by Municipality, 2019 to 2023

	DNV		
	2019	2021	2023
Total Workers	46,100	48,500	48,500
Never telecommute	47%	33%	30%
3 days per month or less	24%	8%	11%
1 day per week	7%	7%	9%
2 or 3 days per week	2%	10%	19%
4 or 5 days per week	1%	11%	5%
Unknown*	0%	1%	0%
Work exclusively from home*	13%	18%	14%
No fixed workplace*	6%	11%	9%
Subtotal Regular Telecommuters			
% who have a usual workplace outside the home and telecommute at least 2 days per week	3%	21%	24%
Subtotal Regularly Work from Home			
% who either telecommute at least 2 days per week or who do not have a usual workplace outside the home and work from home exclusively	15%	40%	38%
	CNV		
	2019	2021	2023
Total Workers	32,200	34,200	34,240
Never telecommute	51%	31%	40%
3 days per month or less	23%	9%	11%
1 day per week	3%	5%	4%
2 or 3 days per week	4%	10%	17%
4 or 5 days per week	0%	13%	8%
Unknown*	0%	0%	1%
Work exclusively from home*	9%	20%	14%
No fixed workplace*	10%	11%	10%
Subtotal Regular Telecommuters			
% who have a usual workplace outside the home and telecommute at least 2 days per week	4%	23%	25%
Subtotal Regularly Work from Home			
% who either telecommute at least 2 days per week or who do not have a usual workplace outside the home and work from home exclusively	13%	43%	39%
	DWV		
	2019	2021	2023
Total Workers	18,500	21,400	21,400
Never telecommute	42%	17%	23%
3 days per month or less	21%	6%	9%
1 day per week	2%	8%	5%
2 or 3 days per week	4%	16%	10%
4 or 5 days per week	0%	10%	6%
Unknown*	0%	2%	1%
Work exclusively from home*	23%	22%	20%
No fixed workplace*	9%	18%	12%
Subtotal Regular Telecommuters			
% who have a usual workplace outside the home and telecommute at least 2 days per week	4%	26%	16%
Subtotal Regularly Work from Home			
% who either telecommute at least 2 days per week or who do not have a usual workplace outside the home and work from home exclusively	27%	48%	36%

4.1.3 Usual Work Commute Mode

Figure 28 and Table 16 show the usual and secondary modes of travel for commute purposes. By looking at secondary mode, we can see what mode people may have the most potential to shift to. That is, these people have access to the mode (e.g., own a car, own a bicycle, live near transit, etc.), and either sometimes use the mode or can envision using it when their usual mode is unavailable. Secondary modes do not sum to 100% as some workers stated that they did not use a secondary mode of transportation for work trips. The proportion of workers who indicated a secondary mode for commuting increased to 65% in 2023, compared to only 61% in 2021 but remains lower than the 81% who reported a secondary mode in 2019.

It is important to note that the proportions depicted in Table 16 do not represent the mode shares of actual work commutes on an average day. Table 16 represents the usual mode choice for those who "currently commute at least some of time" whether they commuted that day or not. On a given day, some workers may not be scheduled to work, take vacation, work from home, or travel to work a different way. Readers are referred to Section 4.1.4 for actual daily work travel patterns. To reflect the usual commuting patter for those who "currently commute at lease some of the time", Table 16 excludes participants who do not currently commute or have no fixed workplace location.

The following observations can be made:

- Overall, driving has decreased its share of usual commute modes to near 2019-levels, at 64% in 2023 compared 62% in 2019 and 67% in 2021.
- Just under one-fifth (18%) of commuters currently cite transit as their usual mode of travel to work, down from 23% in 2019 but similar to the 19% reported in 2021.
- Active modes also saw changes, with cycling being the usual mode for 9% of commuters in 2023, compared to only 5% in 2021 and 7% in 2019. Walk commute remained stable at 4% in both 2021 and 2023, which is slightly lower than 6% reported in 2019.

Interestingly transit is the secondary mode choice for 40% of commuters. This is an increase over pre-pandemic, 2019 levels when 32% of participants reported transit as their secondary mode of travel to work. During the pandemic, in 2021, only 23% of commuters reported transit as their secondary mode of travel to work.

Figure 28. Usual Mode of Travel to Commute – North Shore, 2023[25]
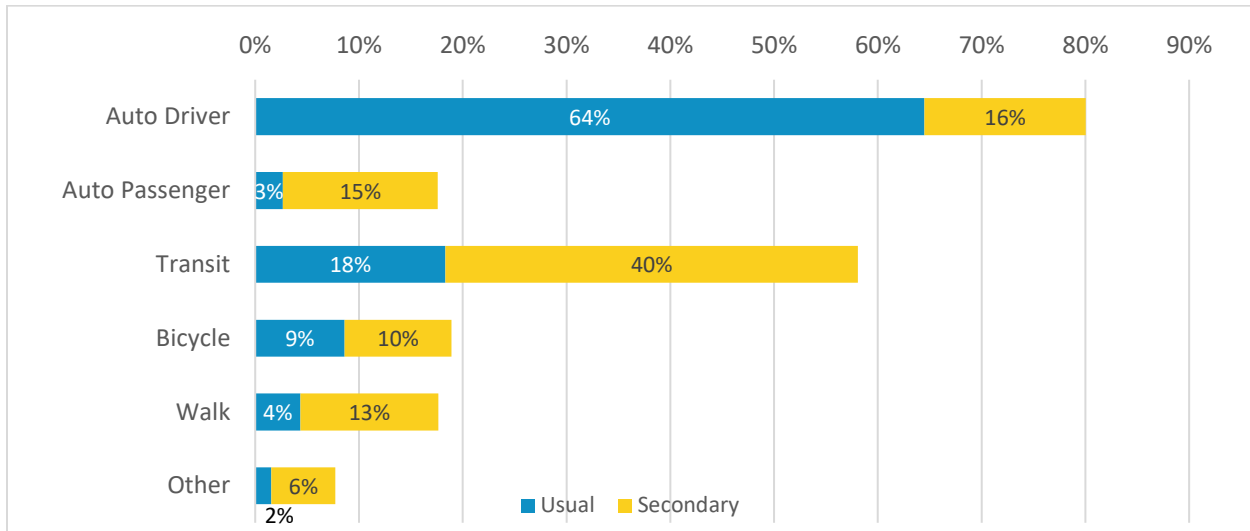
Table 16 presents the same results by municipality. CNV shows an increase in the estimated number of workers regularly commuting from 2019 to 2023 (25,900 and 27,900 respectively) while DNV and DWV show a drop in the estimated number of workers regularly commuting (from 37,300 to 35,600 for DNV and from 12,700 to 11,900 for DWV). Amongst those that commute, there was a decrease in the proportion of workers who commute as drivers. In DNV and CNV there was an increase in bike commute proportions, while DWV saw an increase in auto passenger commute proportions.

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[25] Bars for usual mode (blue) add to 100% (although %s shown may not add to exactly 100% due to rounding small percentages not displayed in the chart: Other, usual mode, <0.5%. Excludes workers with a usual workplace outside the home who say that they currently are not travelling to work at all.

Table 16. Usual Mode of Travel for Work Commute by Municipality, 2019 to 2023[26]

	North Shore					
	2019		2021		2023	
*Commuters:	76,000		64,200		75,400	
	Usual	2nd	Usual	2nd	Usual	2nd
Auto Driver	62%	14%	69%	9%	64%	16%
Auto Passenger	1%	16%	4%	10%	3%	15%
Transit	23%	32%	19%	23%	18%	40%
Bicycle	7%	8%	5%	8%	9%	10%
Walk	6%	7%	4%	8%	4%	13%
Never use a secondary mode	n/a	19%	n/a	40%	n/a	35%
	DNV					
	2019		2021		2023	
Commuters:	37,300		31,000		35,600	
	Usual	2nd	Usual	2nd	Usual	2nd
Auto Driver	68%	9%	71%	9%	69%	14%
Auto Passenger	2%	24%	5%	12%	1%	20%
Transit	17%	27%	16%	19%	13%	41%
Bicycle	9%	11%	5%	8%	12%	10%
Walk	4%	7%	3%	5%	2%	13%
Never use a secondary mode	n/a	18%	n/a	44%	n/a	40%
	CNV					
	2019		2021		2023	
Commuters:	25,900		21,300		27,900	
	Usual	2nd	Usual	2nd	Usual	2nd
Auto Driver	53%	20%	64%	7%	56%	16%
Auto Passenger	1%	8%	1%	6%	2%	8%
Transit	31%	37%	24%	33%	25%	41%
Bicycle	4%	4%	6%	10%	7%	12%
Walk	9%	7%	6%	12%	8%	17%
Never use a secondary mode	n/a	21%	n/a	28%	n/a	29%
	DWV					
	2019		2021		2023	
Commuters:	12,700		11,800		11,900	
	Usual	2nd	Usual	2nd	Usual	2nd
Auto Driver	63%	13%	70%	10%	65%	20%
Auto Passenger	1%	11%	5%	13%	9%	17%
Transit	23%	37%	17%	15%	17%	33%
Bicycle	8%	5%	4%	2%	2%	6%
Walk	5%	8%	5%	8%	2%	5%
Never use a secondary mode	n/a	19%	n/a	47%	n/a	31%

[26] *Workers with usual workplace outside the home who currently commute. Excludes workers with a usual workplace outside the home who say that they currently are not travelling to work at all. Percentages of usual modes may not add to exactly 100% due to rounding. Percentages for secondary mode add to less than 100% as not all survey participants use a secondary mode.

Table 17 presents commuters' reported usual mode choices by zone. Zones 6 and 7 (CNV/DWV (Outer) and CNV (Core)) have the lowest auto driver proportions, at 50% and 51% respectively, and the highest transit proportions at 30% and 29% respectively. Table 17 represents the reported usual mode for those who "currently commute at least some of time" and may not be representative of commuting patterns on a given day.

Table 17. Usual Mode of Travel for Work Commute Zone of Residence (2023)

	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	76%	69%	71%	65%	70%	50%	51%	67%
Auto Passenger	1%	1%	1%	17%	0%	5%	2%	0%
Transit	7%	12%	20%	13%	18%	30%	29%	16%
Bicycle	16%	12%	6%	3%	8%	2%	7%	11%
Walk	1%	4%	1%	2%	1%	5%	11%	6%

4.1.4 Travel to Work Daily Mode Shares

Work arrangements, telecommuting patterns, usual mode choice, work schedules, and daily circumstances all contribute to the daily volumes of *actual* work trips on a given day. Table 18 breaks these results out by workplace type. This analysis combines daily trips reported (specifically, the first work trip)[27], information on work arrangements, and answers to validation questions built into the survey.

The survey results suggest that on any given day:

- Four-in-five (80%) workers work across all work locations.
- One-half of workers travel to their usual workplace (50%) and another 9% travel for work-related purposes (e.g., business meeting, work errand, arriving at a worksite, starting the workday as a driver, etc.).
- About one-in-five (21%) work from home, with 9% of those being workers with a usual workplace who are working from home instead of travelling to work, and 12% being either those who work exclusively from home or those with no fixed workplace who worked from home on the given day.

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[27] Each worker's trip data were scanned to identify the first trip to usual work or, barring this, first work-related trip. The primary mode of the first trip was also identified. If the trip to work did not originate from home, preceding trips were scanned up to the trip leaving home to identify the most appropriate reported mode to use as the work commute mode. E.g., if someone reported three trips, first walking to a post office, then taking transit to a coffee shop, then walking from the coffee shop to work, the primary work commute mode was identified as transit (as the mode most likely to travel the longest distance in the overall multi-trip commute tour).

Table 18. Daily Work Travel and Telecommute Pattern by Workplace Type

	Works exclusively from home	No fixed workplace address	Usual workplace outside the home	Total workers
Workers	15,700	10,300	75,400	101,400
Reported trip to usual workplace	n/a	n/a	67%	50%
Reported other work trip(s) (but not to usual workplace)	11%	58%	3%	9%
Away on business / working on the road	0%	1%	0%	0%
Telecommuted (did not travel to usual workplace)	n/a	n/a	12%	9%
Not scheduled for work	9%	25%	17%	16%
Unknown whether worked from home, did not report work trips	12%	6%	1%	3%
Subtotal known to have worked (either reported work trip(s) or reported working from home/telecommuting)	79%	69%	82%	80%
Subtotal reported at least one trip to usual workplace or for other work-related purpose	11%	58%	70%	59%
Subtotal known to have worked from home	67%	10%	12%	21%

Figure 29 provides another view of the mode shares for travel to work by year and by individual municipality. As illustrated, the total number of workers travelling to work or for work purposes remains lower in 2023 than in 2019 but has increased from 2021. In total, about 61,200 workers made at least one work trip. This is an increase from about 54,000 in 2021 but remains 15% below the total of 72,000 workers travelling to or for work in 2019. This is the net impact of the trends in work arrangements and telecommuting discussed in preceding sections of this report. As shown, the auto driver mode share has returned to near-2019 levels, at 66% in 2023 compared to 65% in 2019, after increasing to 70% in 2021. Similarly, transit, walk, and bike trips have all increased in 2023 compared to 2021, but remain below 2019 levels. By municipality, it is interesting to note that the number of driving trips in the CNV has increased by about 11% from 2019 to 2023. In both DWV and DNV the total number of driving trips has decreased and remains below 2019 levels. In DNV the number of trips by sustainable modes has increased from 2021 to 2023 but remains below 2019.

Figure 29. Daily Work Mode Shares

North Shore
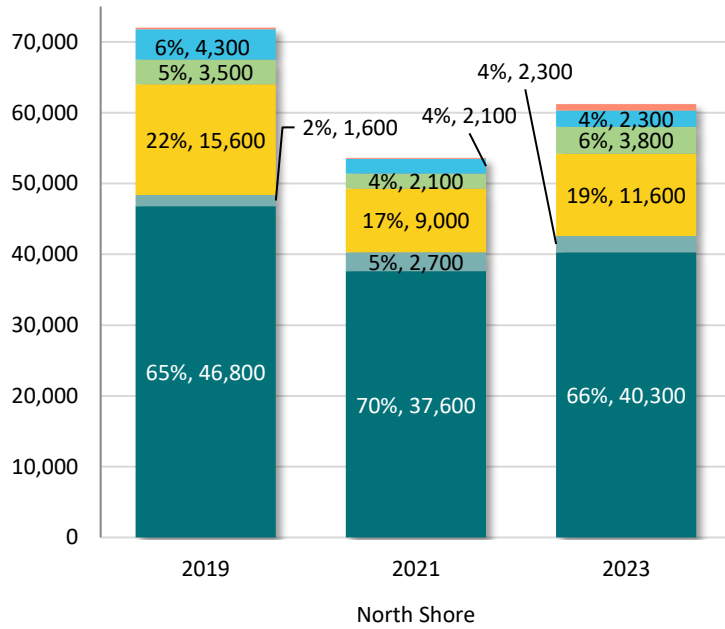
District of North Vancouver
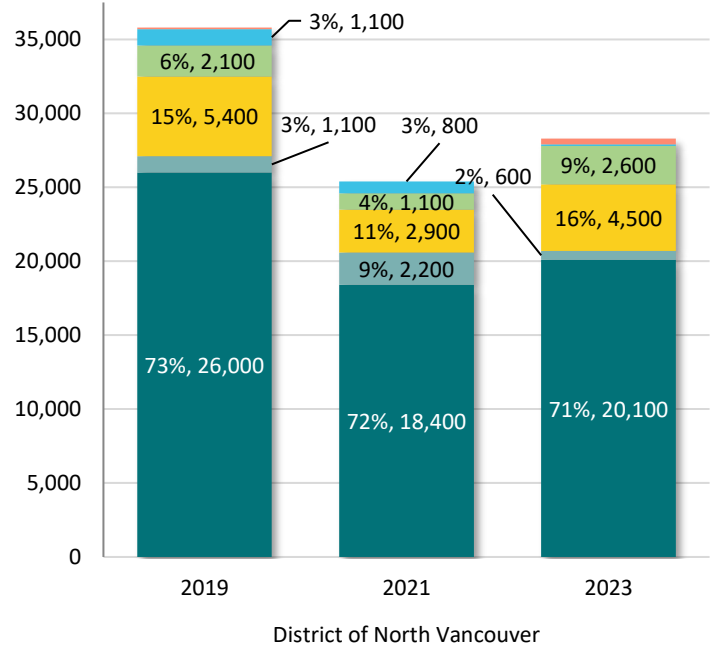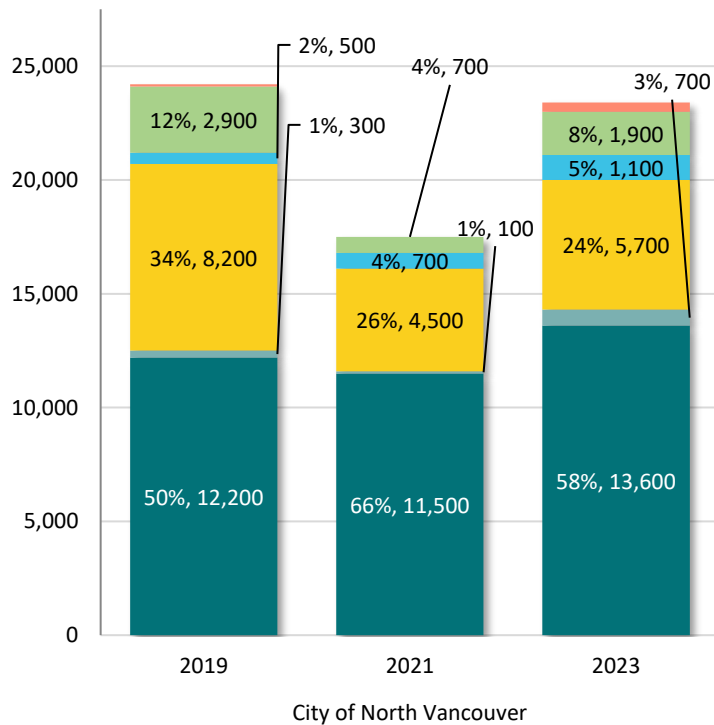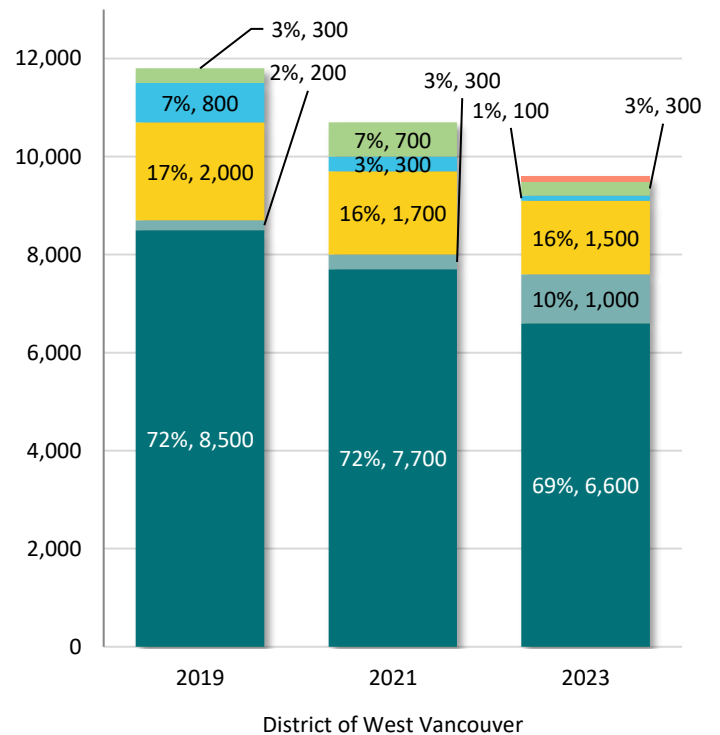
City of North Vancouver

District of West Vancouver

Legend: Other, Walked, Bicycle, Transit, Auto Passenger, Auto Driver

4.1.5   Work Locations

Figure 30 shows the distribution of usual place of work locations for the workers living in the North Shore who participated in the survey, who also work outside their homes and have a usual place of work. More than one-half (56%) of North Shore residents over the age of 15 work at jobs located in the North Shore, with the largest proportions working in zone 7 CNV (Core; 12%) and Zone 5 DWV (Centre; 8%). Around 44% work in municipalities external to the North Shore with the largest proportion working in Vancouver CBD / West End (19%) or the rest of Vancouver (11%). North of North Shore, Northeast Sector, and Other External were removed from figure as they each amounted to less than 0.5% of all work locations (or 0% when rounded).

Figure 30. Distribution of Usual Place of Work Locations - North Shore Residents
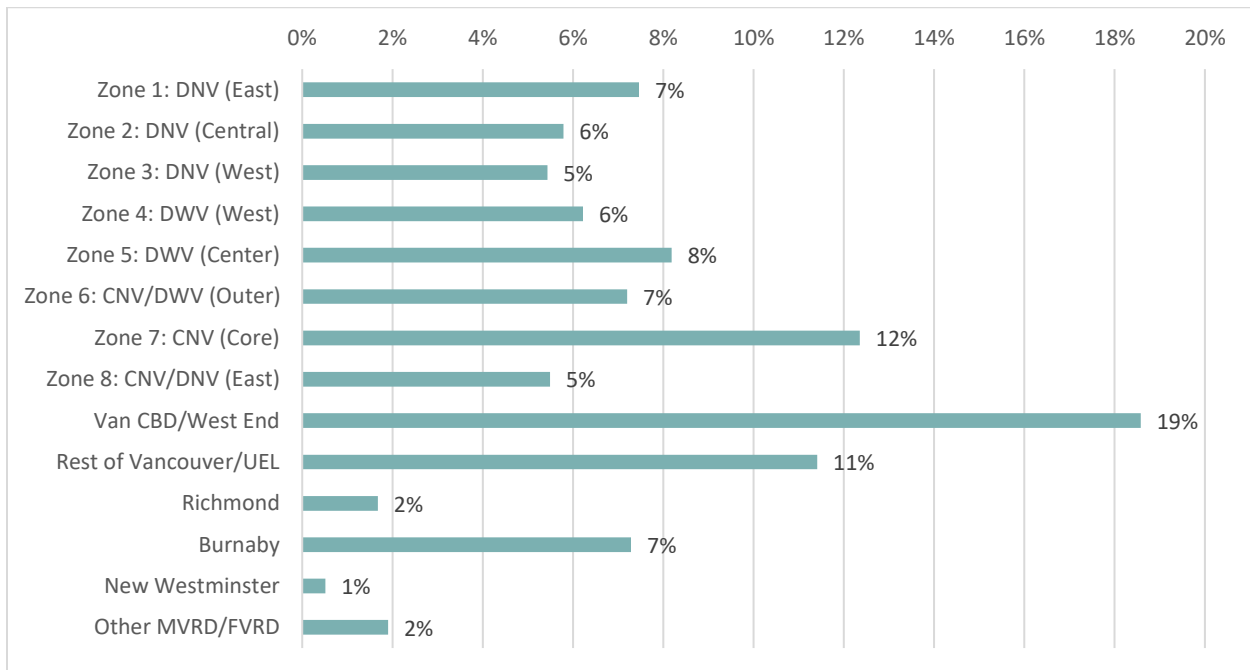
Excludes regions with less than 0.5% of total work locations (North of North Shore, Northeast Sector, Other External).

Table 19 shows the zone-to-zone work commute flows. The greatest volumes, excluding those who work from home, are for Zone 7 CNV (Core) to the Vancouver CBD/West End (an estimated 3,930 commuters) and from Zone 2 DNV (Central) to the Vancouver CBD/West End (3,180). Zones 3 and 6 also have more than 2,000 commuters travelling to the Vancouver CBD/West End for work. Zone 7 has a substantial number of internalized work trips with over 2,000 commuters living and working within the zone, compared to around 1,100 or fewer in other zones. Also of note is the large number of workers who work from home in zones 1, 3, 4 and 7, with over 2,200 workers in each zone working exclusively from home.

Table 19. Home-Commute Location Matrix, Zone-to-Zone

Workplace Location: Home	Work from Home	No Fixed Work place	Internal to 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	External Van CBD / West End	Rest of Van /UEL	Rich-mond	Burn-aby	New West	NE Sector	Other MVRD/ FVRD	North of North Shore	Other External	Total
Zone 1 DNV (East)	2,210	1,570	1,120	250	540	230	60	650	1,350	410	1,820	1,730	190	1,960	250	70	140			14,550
Zone 2 DNV (Central)	1,900	1,720	640	670	450	530	500	660	1,210	1,250	3,180	1,870	420	1,250	40		400			16,690
Zone 3 DNV (West)	2,390	650	220	50	230	30	1,160	980	1,440	400	2,830	640	330	320	40		390			12,100
Zone 4 DWV (West)	2,370	1,490	410			980	480	440	90		1,800	1,560	300	110			130		30	10,190
Zone 5 DWV (Center)	1,920	1,190	560		250	70	1,120	40	490	70	1,480	1,490	50	770	180	20	120		30	9,850
Zone 6 CNV/DWV (Outer)	1,300	810	130		10	140	390	1,000	650	70	2,050	1,130	20	1,220			20			8,940
Zone 7 CNV (Core)	2,780	1,510	710	450	710	380	1,100	1,110	2,060	250	3,930	1,940	230	1,250		10	550	150	40	19,160
Zone 8 CNV/DNV (East)	1,030	1,410	30	880	290	150	410	370	1,010	730	1,840	1,250	160	530	20		200	130		10,440
Total	15,900	10,350	3,820	2,300	2,480	2,510	5,220	5,250	8,300	3,180	18,930	11,610	1,700	7,410	530	100	1,950	280	100	101,920

Blue shading is used to highlight greater numbers, with the intensity of the colour increasing with increasing numbers.

Table 20 shows the municipality-to-zone work commute flows.

Table 20. Home-Commute Location Matrix, Municipality-to-Zone

Workplace Location: Home	Work from Home	No Fixed Work place	Internal to 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	External Van CBD / West End	Rest of Van /UEL	Rich-mond	Burn-aby	New West	NE Sector	Other MVRD/ FVRD	North of North Shore	Other External	Total
DNV	6,660	4,320	1,630	1,230	1,200	930	1,940	2,730	4,420	1,740	8,000	5,750	1,020	4,120	350	70	640			46,750
CNV	4,820	3,360	1,390	1,070	1,030	530	1,720	2,030	3,690	1,300	7,770	3,300	330	2,410		10	1,060	280	40	36,140
DWV	4,420	2,670	800		250	1,050	1,560	490	190	140	3,160	2,560	350	880	180	20	250		60	19,030
Total	15,900	10,350	3,820	2,300	2,480	2,510	5,220	5,250	8,300	3,180	18,930	11,610	1,700	7,410	530	100	1,950	280	100	101,920

Blue shading is used to highlight greater numbers, with the intensity of the colour increasing with increasing numbers.

MALATEST   Associated Engineering

4.1.6 Commute Distances

Zone-to-zone work commute distances are reported separately for jobs located on the North Shore and jobs south of the North Shore. Average commute distance for jobs located north of the North Shore have not been presented separately due to the very small survey sample of workers with jobs located up the Sea to Sky corridor. Straight line distances are presented as a common basis for comparison because actual distance travelled will vary depending on mode choice and, for travel to work south of the North Shore, crossing used.

Table 21 shows the average straight-line commute distance between home and place of work for survey participants by municipality.[28] Residents of CNV have the shortest average commute distance (at 6.4 km) compared to DNV (8.1 km) and DWV (9.4 km). Residents who work and live on the North Shore have an average commute distance ranging from 3.2 km to 4.8 km. Residents who live in the North Shore and work south of the North Shore have a longer average commute, ranging from 8.7 km to 12.2 km.

Table 21. Average Straight-Line Commute Distances (km) by Municipality

Municipality	Sample Size	Workers	Average Straight-Line Distance from Home to Work (km)		
			For Total Workers	For Workers with Workplace on North Shore	For Workers with Workplace South of North Shore
District of North Vancouver	433	35,810	8.1	4.8	10.7
City of North Vancouver	325	27,960	6.4	3.2	8.7
District of West Vancouver	140	11,940	9.4	4.8	12.2

Excludes workers who work exclusively from home or with no fixed workplace.

Figure 31, on the next page, shows the average straight-line commute distance by sub-municipal zone. Residents who live in the North Shore and work south of the North Shore have longer average commute distances than those who live and work in the North Shore. Residents of Zone 4 DWV (West) have the longest average commute distance of 13.2 km for people who work south of the North Shore while residents of Zone 1 DNV (east) had the longest commute distance for those who work within the North Shore at 5.8 km.

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[28] This metric is only presented for survey participants who have a usual place of work outside their home that they travel to regularly or occasionally. Excludes workers who work exclusively from home and with no fixed workplace address.

Figure 31. Average Straight-Line Commute Distances Based on Place of Work

Average Straight-Line Distance (km)

■ Workplace on North Shore   ■ Workplace South of North Shore
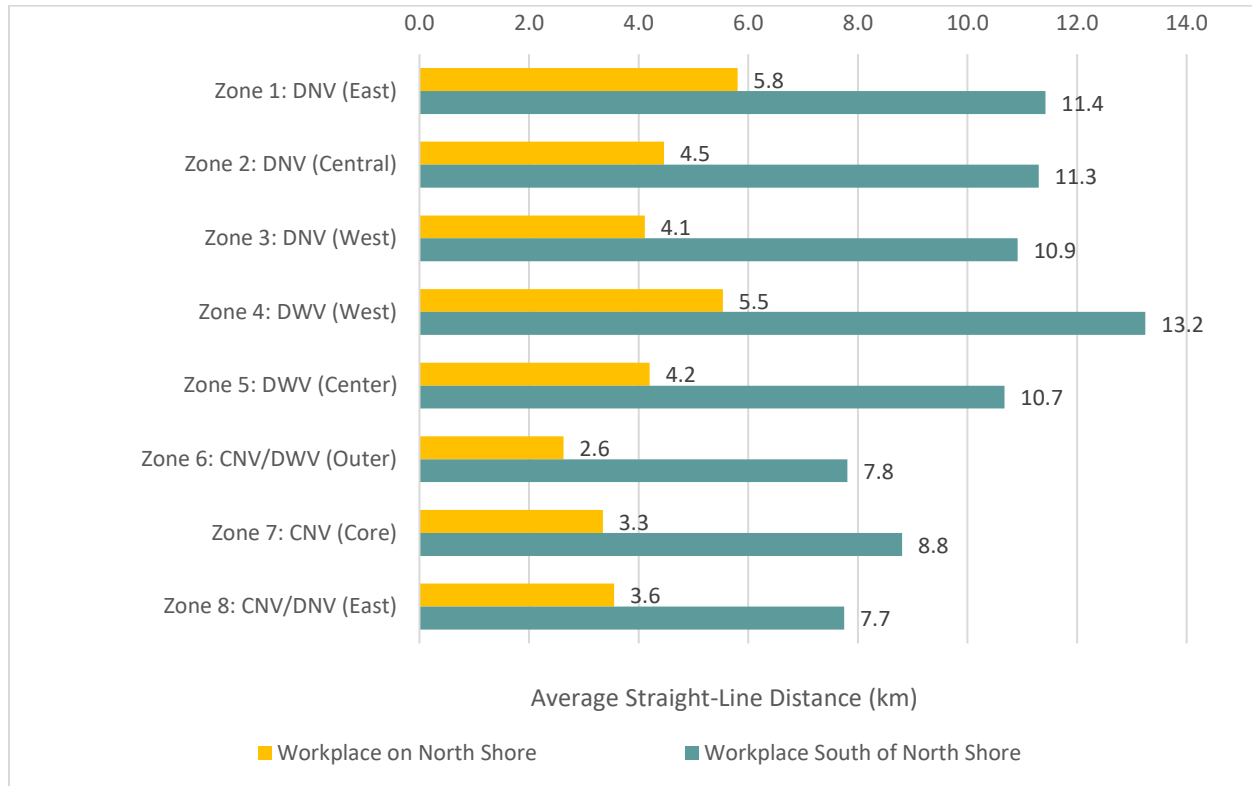
Excludes workers who work exclusively from home or with no fixed workplace.

Table 22 presents the work commute distances for all geographies for work locations on the North Shore and those south of the North Shore between 2019 and 2023. There appears to be a pattern of increasing commute distance for workers with workplaces on the North Shore (+.2km since 2019) and a slight decrease in distances for workers with workplaces south of the North Shore (-.5km since 2019). Possible factors may include job changes, changes in residence (e.g., regular telecommuters moving to live further away from work), or changes in work arrangements (e.g., some workers shifting to working exclusively from home). Some of the variation between cycles may also be the result of random sampling.

Table 22. Average Straight-Line Commute Distances (km) by Municipality, 2019 to 2023

| | | Average Straight-Line Distance from Home to Usual Work (km) | | | | | |
| | | For Workers with Workplace on North Shore | | | For Workers with Workplace South of North Shore | | |
Geography	Sample Size	2019	2021	2023	2019	2021	2023
North Shore Average	757-760	4.0	4.3	4.2	10.7	11.0	10.2
District of North Vancouver	385-387	4.4	4.8	4.8	11.4	11.1	10.7
City of North Vancouver	234-257	2.6	3.3	3.2	9.1	10.0	8.7
District of West Vancouver	118-136	5.6	5.1	4.8	12.2	12.2	12.2

Excludes workers who work exclusively from home or with no fixed workplace.

4.1.7   Satisfaction with Usual Commute

As shown in Figure 32, the majority (67%) of survey participants are satisfied with their usual commute. This is holds true in all municipalities but the size of the satisfied majority varies, ranging from 57% for DWV residents to 74% for CNV residents.

Overall, the level of satisfaction with usual commute has increased compared to what was reported in previous years, which in 2021 was 57%. This increase in overall satisfaction should be considered in the context of the disruptions to commuting associated with the COVID-19 pandemic. In 2021, concerns about safety on public transit may have coloured some survey participants' opinions of those who were commuting at that time. Since 2021, some workers in the types of jobs that allowed them to work from home during the pandemic have now returned to commuting, with some in hybrid work arrangements that do not require them to commute every day. Both factors may have some influence on levels of satisfaction with commutes.

Figure 32. Satisfaction with Commute by Municipality of Residence
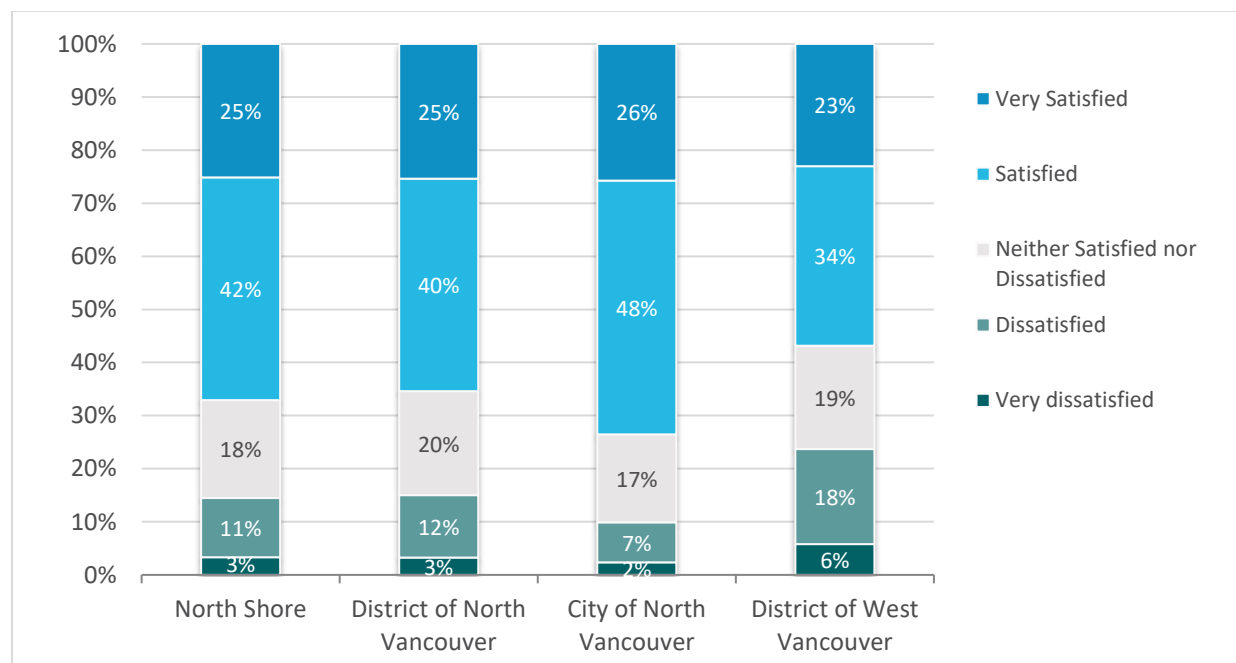
Figure 33 shows that satisfaction with usual commute varies by mode, with those who walk (96%), take transit (71%), or cycle (71%) are most likely to be satisfied with the usual commute mode. Those relying on other modes of transportation were more likely to be dissatisfied, with 13% of transit users, 14% of auto drivers, and 41% of auto passengers being dissatisfied with their usual commute mode.

Figure 33. Satisfaction with Commute by Usual Commute Mode
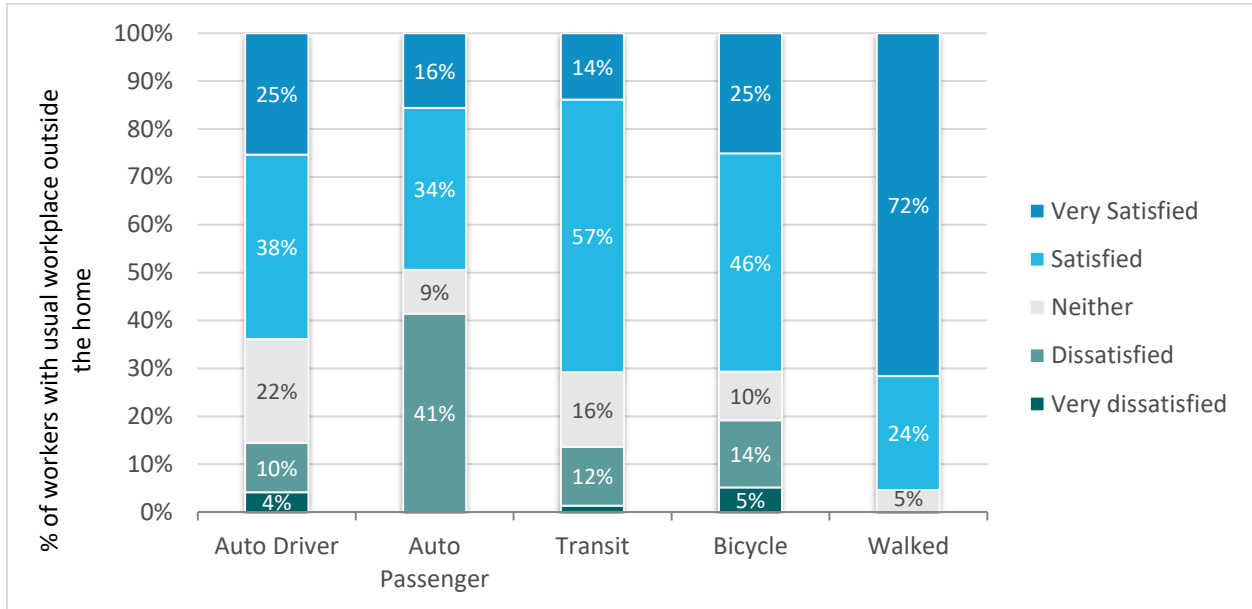
Those dissatisfied with their commute were allowed to select multiple reasons for their dissatisfaction. Survey results are presented for dissatisfied auto drivers and transit users. Results have not been presented for dissatisfied commuters who use other modes due to small samples sizes. As shown in Figure 34, participants who reported their usual commute mode as transit were most often dissatisfied because of distance. Participants who reported their usual commute mode as driving were most likely to be dissatisfied because of travel time.

Figure 34. Reasons for Dissatisfaction with Commute
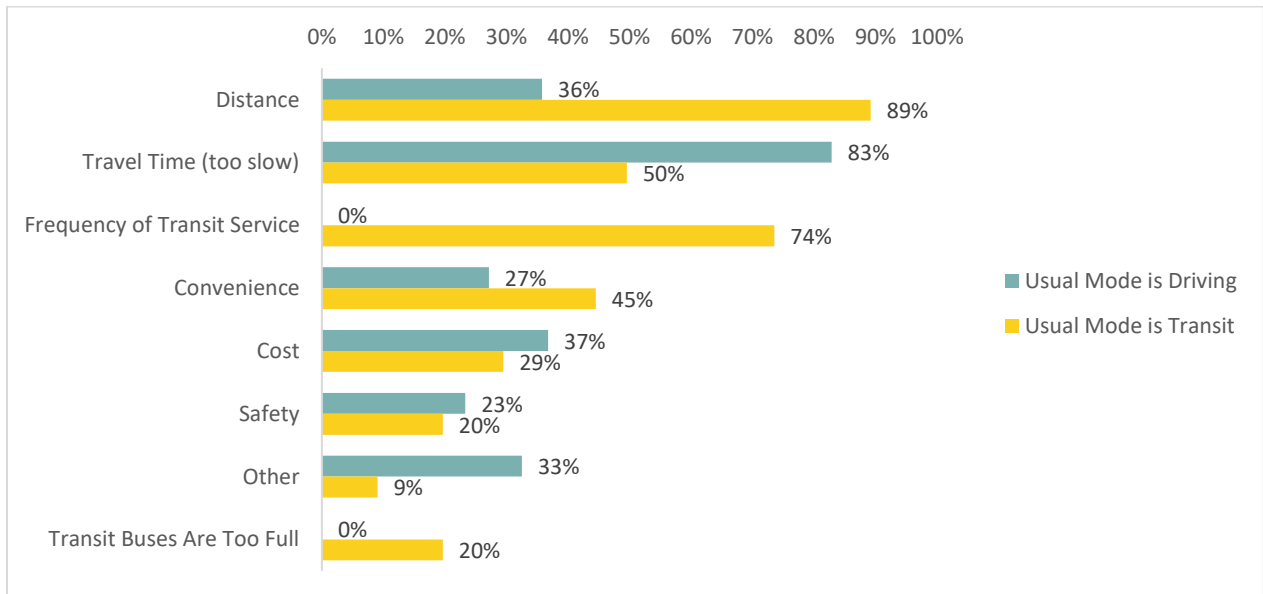
'Frequency of Transit Service' and 'Transit Buses Are Too Full' were common themes coded from "Other, specify" responses.

4.2   Usual Non-Commute Mode

This section describes the usual non-commute trips which include trip purposes of shopping, meeting friends and family, recreation and other discretionary trip purposes.

Figure 35 shows usual and secondary mode share for non-commute trips for the North Shore. Overall, auto driver accounts for 73% of all non-commute trips. Transit accounts for 9% of all non-commute trips, auto passenger accounts for 7%, and walking accounts for 8%, while biking and other modes account for only 2% and 1% respectively. These findings are largely unchanged from 2019 and 2021.

Figure 35. Usual and Secondary Mode Share for Non-Commute Trips (% of Population 15+ Years)
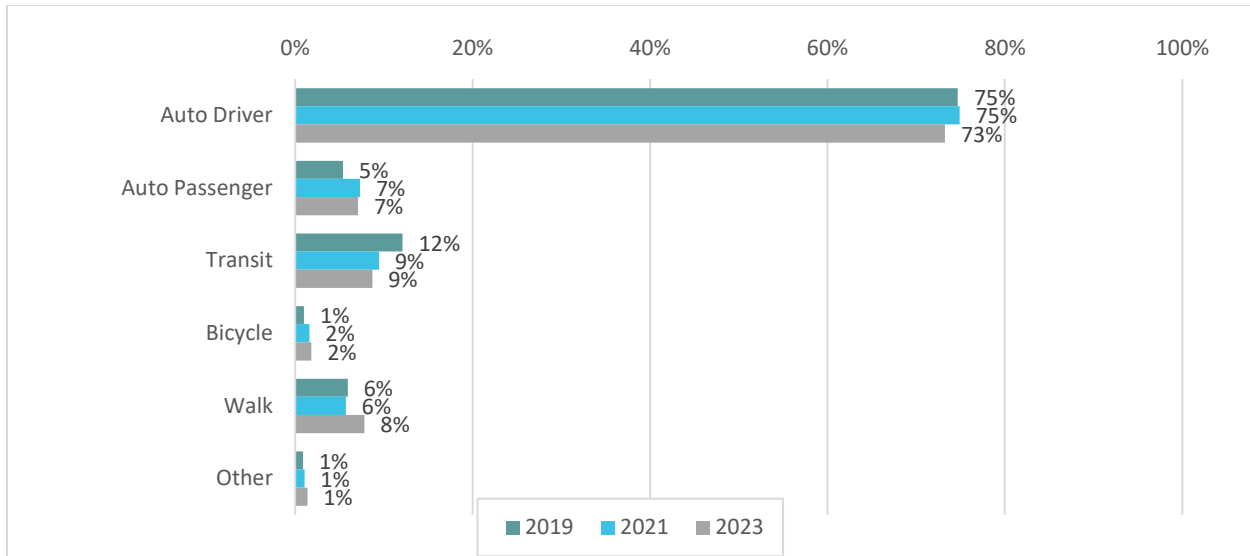
As shown in Figure 36, walking and transit are the most common secondary modes for non-commute trips.

Figure 36. Usual and Secondary Mode Share for Non-Commute Trips
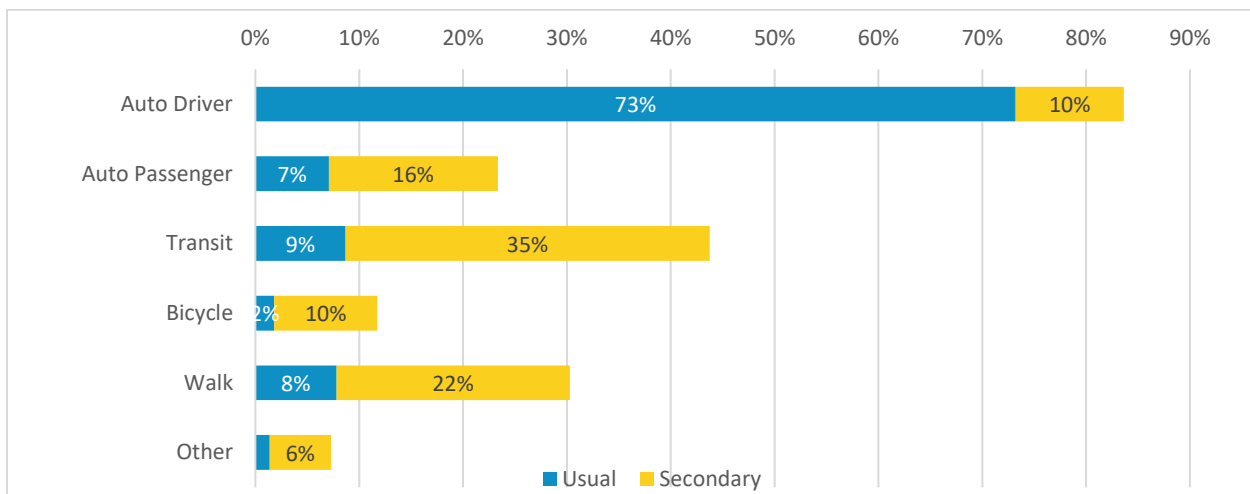
Table 23 provides an overview of usual mode share for non-commute trips by year and municipality. While auto driver remains the most common usual non-commute mode by municipality, residents of CNV are less likely to report auto driver as their usual non-commute mode and more likely to report transit or walking as their usual non-commute mode compared to residents of DNV or DWV.

Table 23. Usual Non-Commute Mode by Municipality

	North Shore			DNV			CNV			DWV		
	2019	2021	2023	2019	2021	2023	2019	2021	2023	2019	2021	2023
Auto Driver	75%	75%	73%	79%	78%	79%	66%	68%	63%	77%	78%	76%
Auto Passenger	5%	7%	7%	5%	8%	6%	5%	5%	7%	7%	8%	9%
Transit	12%	9%	9%	10%	8%	5%	17%	13%	16%	11%	8%	6%
Bicycle	1%	2%	2%	1%	2%	2%	1%	2%	2%	1%	1%	1%
Walk	6%	6%	8%	4%	4%	6%	10%	10%	12%	4%	4%	5%
Other	1%	1%	1%	1%	1%	1%	1%	2%	1%	0%	1%	3%

As detailed in Table 24, the highest proportions of residents reporting auto driver as their usual non-commute mode were in Zones 1 (DNV East) and 4 (DWV West). Residents in Zone 7 were much more likely to report transit or walk as their usual non-commute mode, compared to all other zones. A high proportion of survey participants in Zone 6 (20%) reported transit as their usual mode for non-commute trips.

Table 24. Usual Mode for Non-Commute Trips by Zone (2023)

	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	83%	80%	77%	84%	71%	62%	57%	74%
Auto Passenger	4%	5%	7%	10%	7%	9%	8%	6%
Transit	2%	5%	9%	2%	6%	20%	18%	7%
Bicycle	4%	3%	0%	0%	2%	0%	2%	3%
Walk	6%	6%	6%	0%	10%	7%	15%	11%
Other	1%	1%	0%	3%	3%	1%	1%	1%

4.3 Walking

This section provides the overall walking commute patterns within the North Shore.

4.3.1 Walking for Commutes to Work or School

Figure 37 show the percentage of the population over the age of 15 who commute to school or work by walking. Zone 7 CNV (Core) has the highest percentage of residents who walk for their commute to work or school at 11%; followed by Zone 8 CNV/DNV (East) with 6%. All other zones have between 1% and 3% of residents reporting walk as their usual commute mode to work or school. Given the small number of survey participants who reported walking as a usual commute mode, these survey results should be interpreted with caution.

Figure 37. Map of Percentage of Population 15+ Who Walk for Usual Commute to Work or School– by Zone
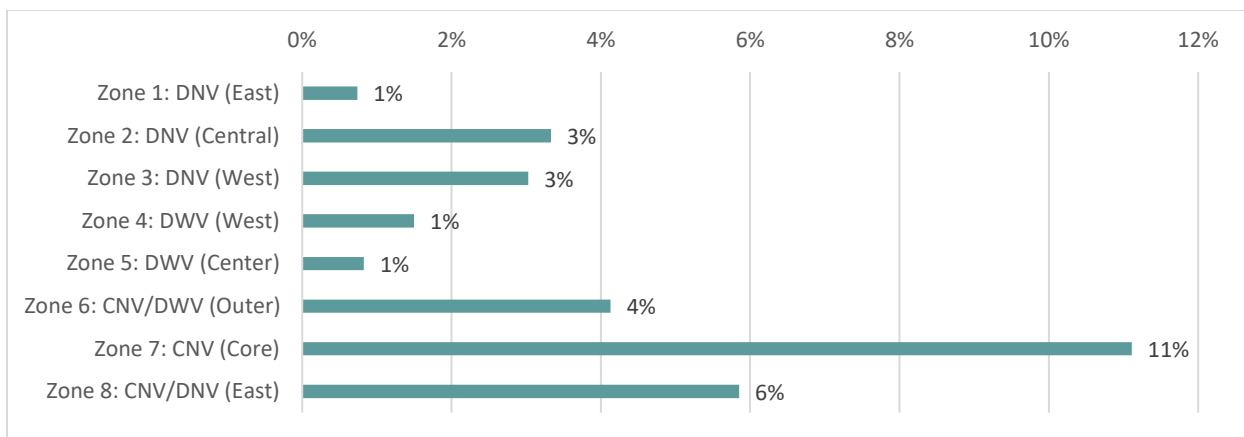
4.4 Cycling

4.4.1 Cycling Frequency in Different Weather Conditions

Figure 38 shows the frequency with which survey participants cycle (whether using an e-bike or a conventional bicycle). Nearly one-half (46%) of survey participants reported ever riding a bicycle, with 19% of residents cycling less than once per month, 13% cycling between one time per week and one time per month, and 14% cycling two or more times per week, in fair weather. Unsurprisingly, North Shore residents are much less likely to cycle during rainy or cold weather, with 19% reporting that they ever ride a bicycle in rainy or cold weather. Overall, about one-half of residents never ride a bicycle (49%) or are physically unable to do so (5%). Compared to 2019 and 2021, these results are quite similar (as captured in Table 25).

Figure 38. Percentage of Population 15+ Who Ride a Bicycle in Fair Weather vs. Rainy/Cold Weather
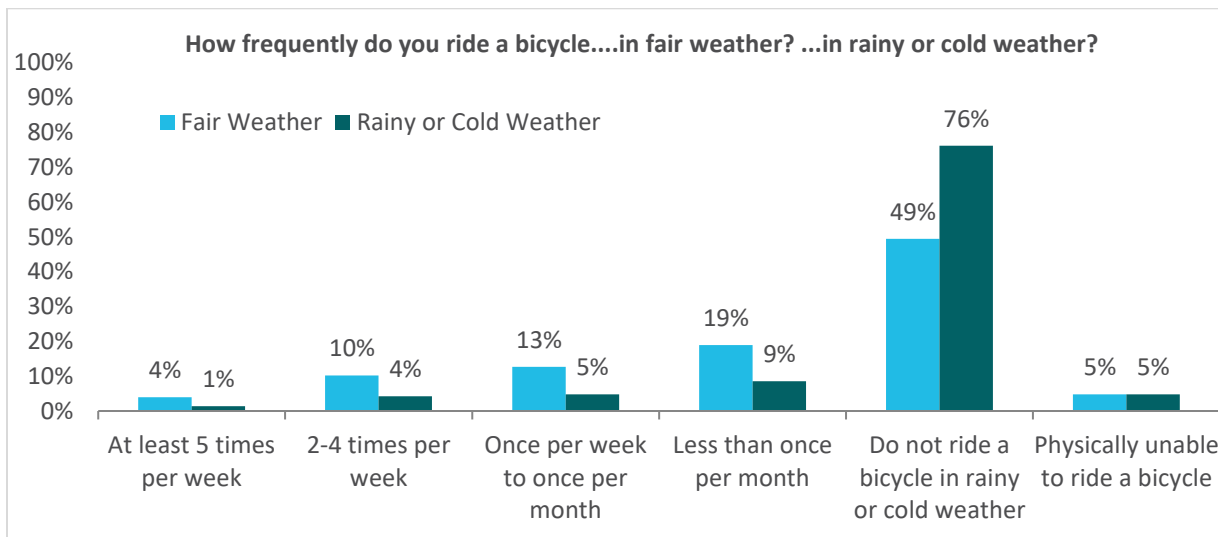
Table 25. Cycling Frequency in Fair Weather vs. Rainy/Cold Weather, 2019 to 2023

	Fair Weather			Rainy or Cold Weather		
	2019	2021	2023	2019	2021	2023
At least 5 times per week	5%	3%	4%	3%	1%	1%
2-4 times per week	8%	10%	10%	3%	3%	4%
Once per week to once per month	13%	16%	13%	5%	5%	5%
Less than once per month	22%	22%	19%	8%	9%	9%
Do not ride a bicycle	47%	46%	49%	77%	78%	76%
Physically unable to ride a bicycle	5%	4%	5%	5%	4%	5%

Table 26 shows the percentage of the population 15+ years of age who cycle two or more times per week by municipality. Residents of CNV (16%) and DNV (16%) are more likely than residents of DWV (8%) to cycle twice per week in fair weather. The pattern is the same for those who cycle in rainy or cold weather, though only very small percentages (7% or less) of survey participants reported cycling in rainy or cold weather more than two times per week. It may be that residents of DWV have to travel further to access services and amenities, making them less likely to cycle, compared to residents of CNV or DNV, as residents of DWV were also less likely to consider their area to be walkable.

Table 26. Cycling Frequency in Fair Weather vs. Rainy/Cold Weather by Municipality

|	North Shore	District of North Vancouver	City of North Vancouver	District of West Vancouver
At least twice per week in fair weather (# of cyclists 15+ years)	23,900	11,900	8,700	3,400
At least twice per week in fair weather (% of persons 15+ years)	14%	16%	16%	8%
At least twice per week in rainy weather (# of cyclists 15+ years)	9,500	4,700	3,600	1,200
At least twice per week in rainy weather (% of persons 15+ years)	6%	6%	7%	3%

4.4.2   Cycling for Commutes

Figure 39 shows the percentage of the population over the age of 15 who cycle for their usual commute to work or school, by zone. Overall, 9% of North Shore residents commute to work or school by cycling. Zone 6 CNV/DWV (Outer) has the lowest percentage of cycle commute mode at 2%, followed by Zone 4 DWV (West) at 3%. Zone 1 DNV (East) has the highest percentage of cycle commute at 15% followed by Zone 2 DNV (Central) at 12%. The values reported in Figure 39 show the frequency with which survey participants reported cycling as their usual commute mode to work or school. This may vary from the snapshot of actual cycling commuting proportions on a given day reported by North Shore residents.

Figure 39. Percentage of Population 15+ Who Cycle for Usual Commute to Work or School – by Zone
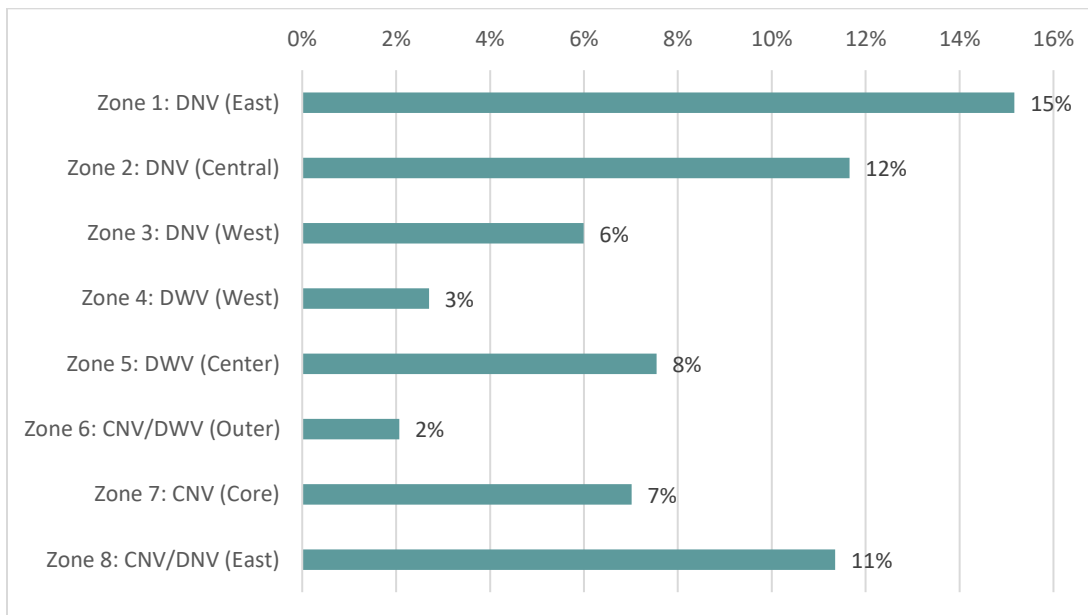
4.4.3   Interest in Cycling More

Survey participants were asked if they are interested in cycling more than they currently do. As shown in Figure 40, 37% of North Shore residents ages 15+ are interested in cycling more. Residents of CNV (39%) and DNV (40%) were more likely than residents of DWV (28%) to indicate that they were interested in cycling more often. Compared to 2019 and 2021, there are no notable differences.

Figure 40. Survey Participant Interest in Cycling More – by Municipality
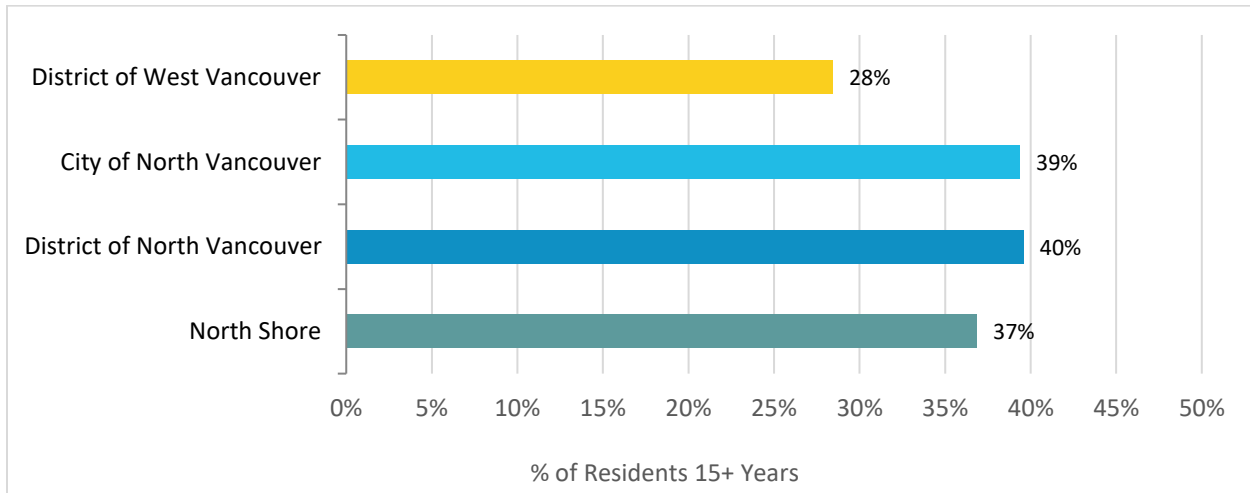
4.4.4 Barriers to Cycling in Rainy or Cold Weather

Survey participants who responded that they do not cycle as often in rainy or cold weather, compared to fair weather,[29] were asked to select the reason(s) why. As shown in Figure 41, most cyclists (72%) cycle less often in cold and rainy weather because they do not like getting cold or wet. Approximately one-half of these participants did not feel safe from other traffic in poor weather. The below barriers between the North Shore municipalities were looked at and the results were largely the same.

Figure 41. Barriers to Cycling in Rainy or Cold Weather as Much as in Fair Weather[30]

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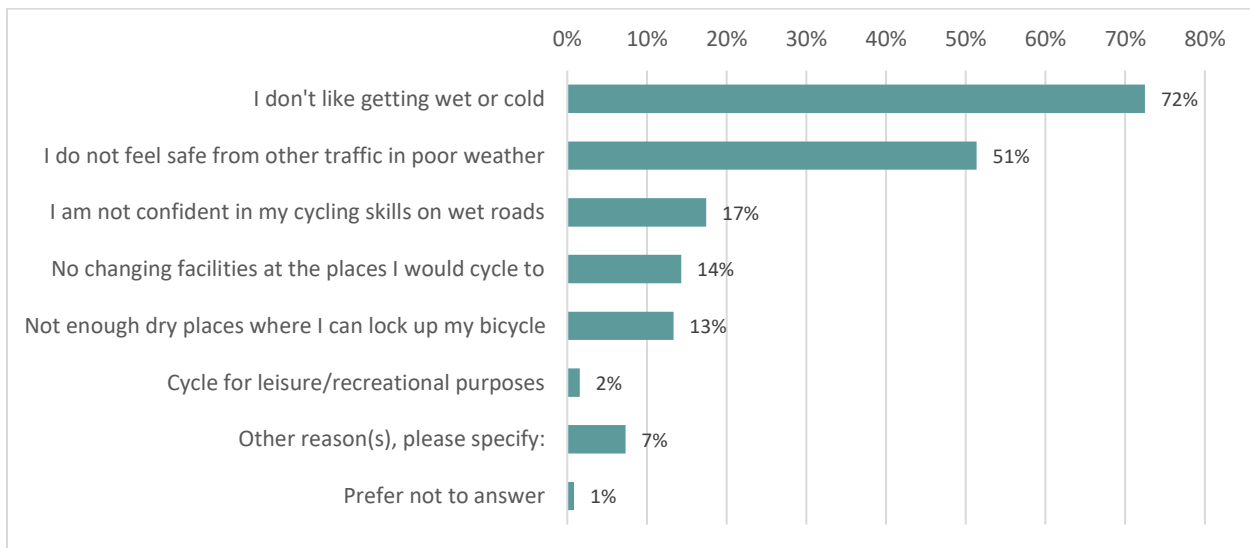
[29] See Section 4.4.1 earlier for reporting on the frequency of cycling in different weather conditions.

[30] Asked of survey participants who reported cycling in cold and rainy weather less frequently than they cycle in fair weather. 'I only cycle for leisure/recreational purposes' was added as the most common theme amongst 'other, specify' responses.

4.5 Transit

As shown in Figure 42 and Table 27, most (82%) of North Shore residents use transit, which is an increase from 75% in 2021 and similar to 81% in 2019. Overall, there was a decrease in regular transit use (i.e., they use transit two or more times per week) between 2019 and 2021, but in 2023 we see that regular transit use has started to increase, however still below 2019 levels. This slight increase trend from 2021 to 2023 is present for CNV and DWV, while there seems to be no increase in regular transit use for DNV residents from 2021 to 2023. In 2023, 26% of CNV, 16% of DWV, and 13% of DNV, residents took transit at least two times per week.

Figure 42. Transit Use in the Past Month, 2019 to 2023[31]
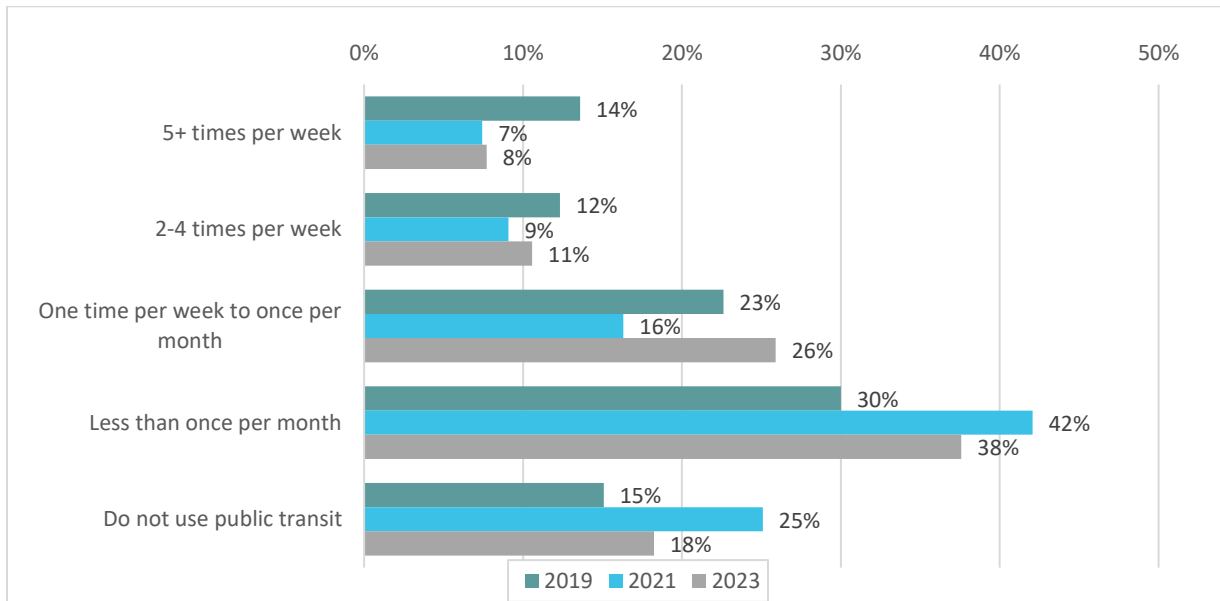
Table 27. Frequency of Transit Use by Municipality, 2019 to 2023 [31]

	North Shore			DNV			CNV			DWV		
	2019	2021	2023	2019	2021	2023	2019	2021	2023	2019	2021	2023
5+ times/week	14%	7%	8%	12%	6%	7%	19%	11%	11%	9%	5%	4%
2-4 times/ week	12%	9%	11%	9%	7%	6%	14%	13%	15%	16%	8%	12%
One time per week to once per month	23%	16%	26%	23%	16%	23%	24%	19%	34%	21%	14%	21%
Less than once per month	30%	42%	38%	36%	43%	43%	22%	42%	29%	29%	40%	38%
Do not use public transit	15%	25%	18%	15%	28%	20%	10%	15%	11%	21%	33%	25%

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[31] Percentages may add to less than 100% due to rounding.

Figure 43 summarizes the frequency of transit use by zone. Zone 1 DNV (East) has the highest percentage of residents who do not use transit, at 29%, followed by Zone 2 DNV (Central) at 21%. Zone 7 CNV (Core) has the highest percentage of regular transit users at 29%, followed by Zone 6 CNV/DWV (Outer) at 28%.

Figure 43. Frequency of Transit Use by Zone
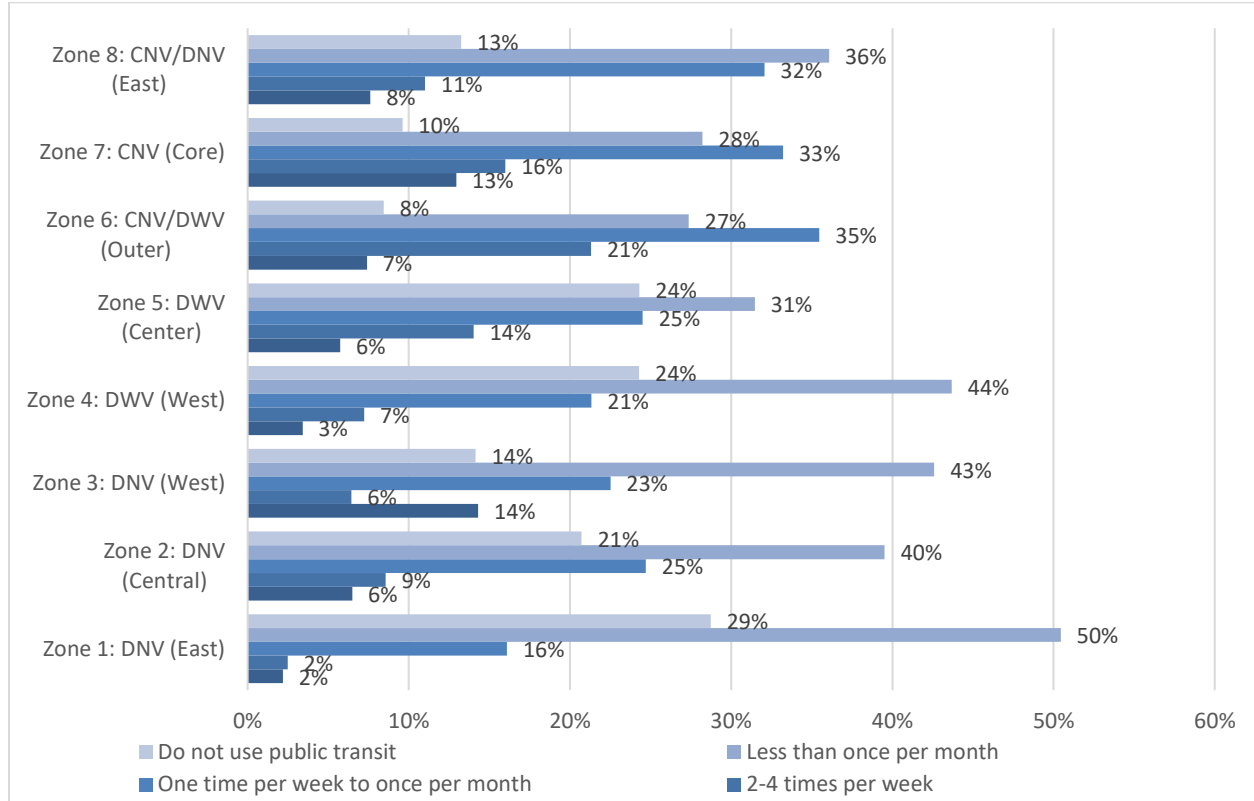
4.6 Walkability and Bikeability of Motorized Trips

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 (actual distance travelled on available bike routes), based on the finding that 90% of reported cycling trips in 2019 had an estimated actual cycling distance within this threshold. The distance threshold for a "walkable" trip was set at 1.6 km (actual distance travelled), based on 90% of reported walking trips in 2019 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.

About 44% of auto driver trips (30% of total daily trips by all modes) are bikeable, while 14% are walkable (10% of all daily trips by all modes). As shown in Figure 44, overall, this suggests that 20% of all trips were within what is considered an appropriate cycling distance for potential mode-shifting from auto driver to cycling, and an additional 10% could be potentially shifted from auto driver to walking.

Figure 44. Percentage of Walkable and Bikeable Trips from Current Mode Share – North Shore
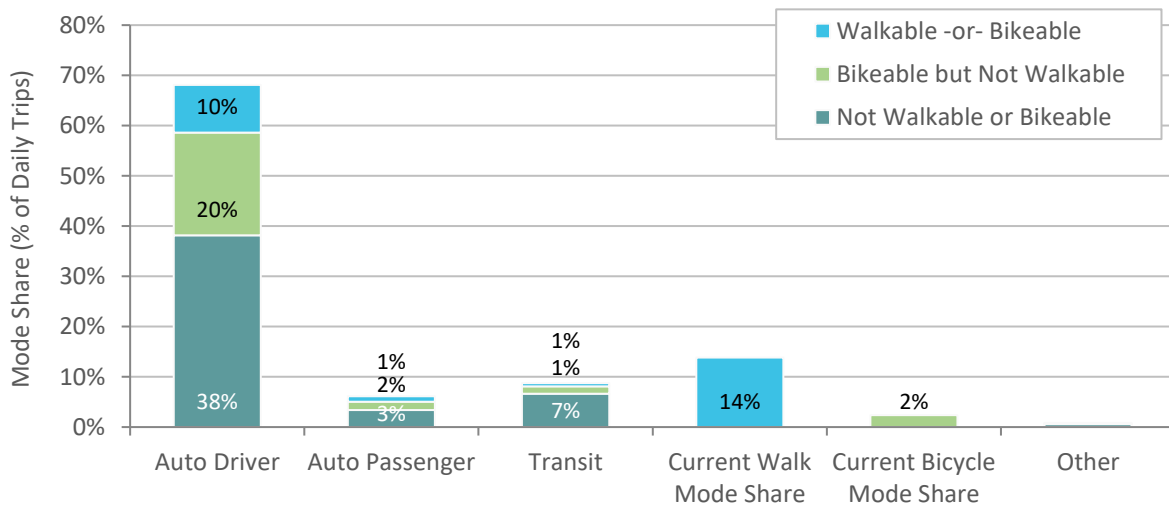
Table 28 and Table 29 provide a breakdown of bikeable and walkable auto driver trips by municipality of residence and zone of residence. Potential for mode shifting across municipalities is similar; approximately 30% of *all daily trips* are auto driver trips that could shift to cycling (representing 44% *of all auto driver trips*) and 10% could shift to walking (representing 14% *of all auto driver trips*). When examined by zone, Zone 8 CNV/DNV (Core) shows the most potential for mode shifting from auto driver to cycling, at a 39% share of all trips, and from auto driver to walking (a 19% share of all trips).

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. Barriers to cycling more are discussed in Section 4.4.4. 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.

Table 28. Mode Shift Potential by Municipality of Residence (Daily Trips)

	North Shore	District of North Vancouver	City of North Vancouver	District of West Vancouver
Auto Driver Trips	357,600	182,000	87,800	87,800
Auto Driver Mode Share	68%	72%	56%	76%
Bikeable Trips	157,200	77,700	44,400	35,000
% of Auto Driver Trips	44%	43%	51%	40%
Mode shift potential	30%	31%	28%	30%
Walkable Trips	50,000	22,700	15,600	11,600
% of Auto Driver Trips	14%	12%	18%	13%
Mode shift potential	10%	9%	10%	10%

Table 29. Mode Shift Potential by Zone of Residence (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 (Outer)	Zone 7: CNV (Core)	Zone 8: CNV/DNV (East)
Auto Driver Trips	62,400	65,800	45,400	46,800	41,500	23,200	39,300	33,200
Auto Driver Mode Share	77%	73%	71%	79%	72%	54%	47%	71%
Bikeable Trips	27,400	29,700	18,800	17,000	17,700	9,800	18,300	18,400
% of Auto Driver Trips	44%	45%	41%	36%	43%	42%	47%	55%
Mode shift potential	34%	33%	29%	29%	31%	23%	22%	39%
Walkable Trips	6,400	10,700	5,600	4,800	6,700	3,600	5,800	6,400
% of Auto Driver Trips	10%	16%	12%	10%	16%	16%	15%	19%
Mode shift potential	8%	12%	9%	8%	12%	8%	7%	14%

5 Participant Characteristics

This section describes the characteristics of North Shore residents and their households, as captured by the survey, including but not limited to age, gender, household, lifestyle/level of physical activity, occupation, bicycle 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 2021 census (scaled to reflect 2023 population counts, where possible). In this section, footnotes beneath each table identify the source of the data.

5.1 Age and Gender Distribution

Table 30 provides a comparison of the Census distributions against the weighted and expanded survey data, using the total population of all ages as the base for percentages for comparability. The NSTS aggregates non-binary persons in the gender categories "Men+" and "Women+" due to the small population and confidentiality protection. This is consistent with reporting methods as used by Statistics Canada.[32] The survey data under-represent residents 15-24 years of age due to small sample sizes for this age range and limits placed on extreme weights. Overall, however, it appears that the weighted survey frame is a good match in terms of the actual population of the studied region.

Table 30. North Shore Census Population Distribution vs. Survey Age Distributions

	2021 Census		2023 Survey	
	Men+	Women+	Men+	Women+
0-4	Excluded	Excluded	Not surveyed	Not surveyed
5-14	Excluded	Excluded	Not surveyed	Not surveyed
15-24	4.6%	3.2%	6.3%	6.7%
25-34	6.8%	5.7%	6.5%	6.2%
35-44	8.6%	7.5%	8.4%	7.2%
45-54	9.7%	8.5%	9.3%	8.0%
55-64	9.9%	8.7%	9.0%	8.1%
65-74	7.8%	7.2%	6.8%	6.0%
75+	6.6%	5.3%	6.6%	4.9%

Sources: 2021 Census, Survey Data.

Figure 45 shows the age distribution per municipality based on the Census data. DWV generally has the highest percentage of 65+ age group (28%) 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.

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[32] Men+ = men plus a randomly assigned portion of persons who are non-binary, prefer to self-describe, or who refused the gender question; Women+ = women plus a randomly assigned portion of persons who are non-binary, prefer to self-describe, or who refused the gender question.

Figure 45. Age Distribution by Municipality
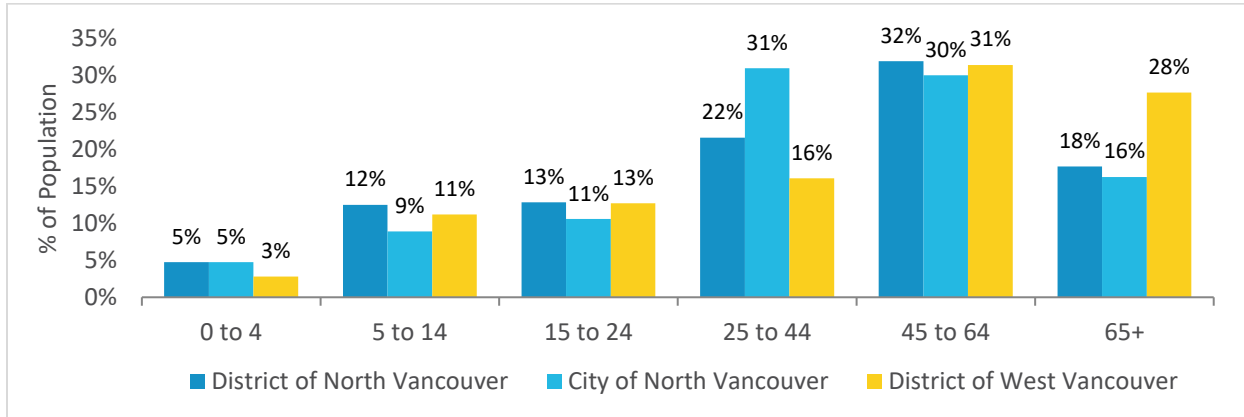
Source: 2021 Census

5.2 Household Characteristics

5.2.1 Dwelling Type

Figure 46 shows the distributions of dwellings by type for each of the municipalities. Approximately two-thirds of private dwellings occupied by usual residents in DNV (70%) and DWV (62%) are single-detached houses while only 19% of CNV dwellings are single-detached houses. Over 50% of CNV dwellings are apartment or condominium buildings with less than five storeys or other ground-oriented dwellings. Table 31 shows these distributions by sub-municipal zone. The weighted survey data closely match the 2021 Census distributions.

Figure 46. Dwelling Type by Municipality (% of Private Dwellings Occupied by Usual Residents) [33]
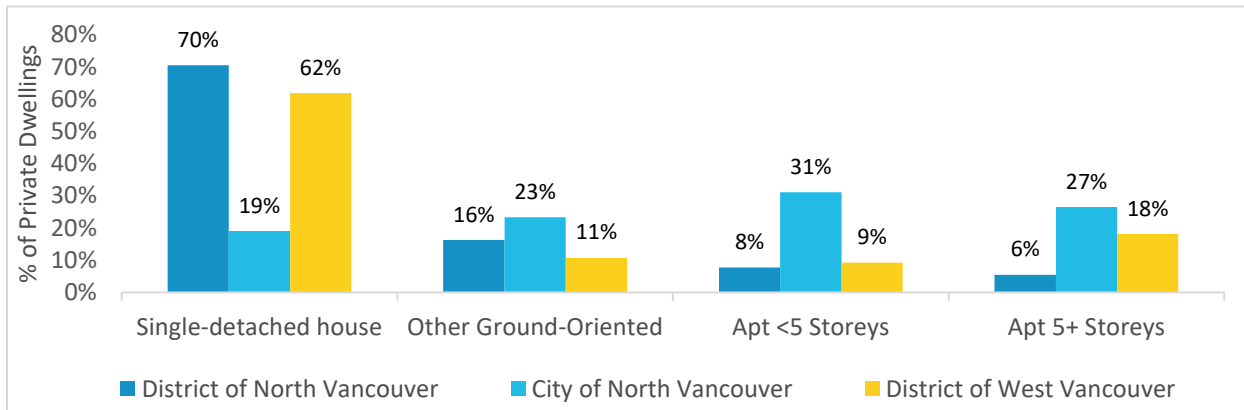
Source: Survey Data. Survey data were weighted by dwelling type, so should closely match the 2021 Census.

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[33] Other ground-oriented = row house, townhouse, semi-detached, secondary suite in a house, mobile home or other dwelling type.

Table 31. Dwelling Type by Zone

|	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)
Single-Detached House	52%	55%	77%	82%	80%	41%	45%	2%	52%
Other Ground Oriented	16%	26%	9%	8%	11%	7%	32%	15%	29%
Apartment <5 stories	16%	12%	9%	9%	6%	10%	15%	44%	11%
Apartment 5+ stories	16%	7%	5%	0%	2%	42%	8%	40%	8%

Source: Survey Data. Survey data were weighted by dwelling type, so should closely match the 2021 Census.

Figure 47 provides a different perspective, illustrating the distribution of the survey population by dwelling type. Approximately 70% of residents aged 15 years and older in DNV and 62% in DWV live in single-detached houses while 20% of CNV residents live in single-detached houses. One-third (33%) of CNV residents 15 years and older live in apartment or condominium buildings with less than five storeys.

Figure 47. Survey Population by Dwelling Type by Municipality (% of Population 15+ Years of Age)
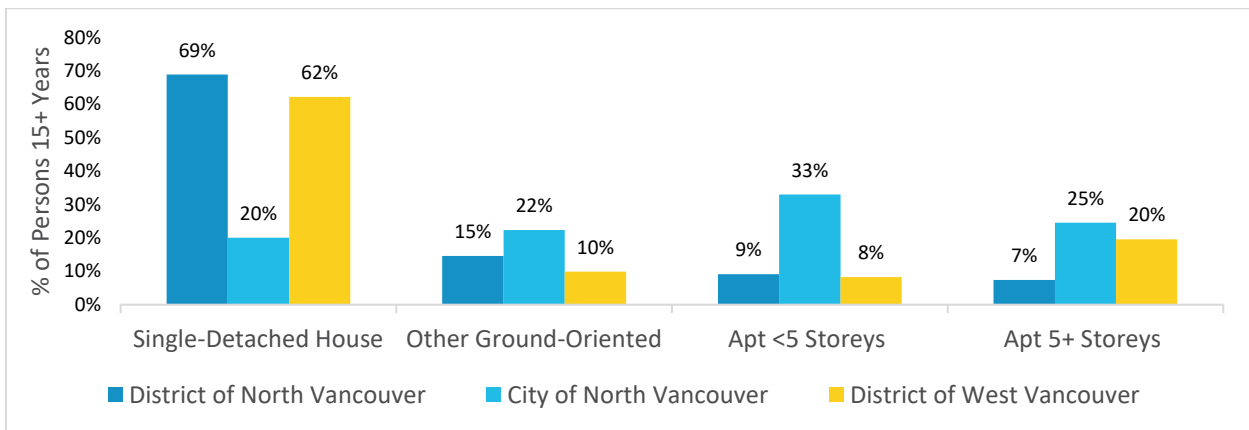
Source: Survey Data

5.2.2   Household Size

Figure 48 shows the distribution of household size by municipality. Within CNV, single-person households represent the largest percentage of households (37%), followed closely by two-person households (25%). Two-person households represent the highest percentage in DNV (32%) and DWV (33%). The distribution of three-person households is generally similar across municipalities (14-18%). Four-person and five-person households are less common in CNV (10% and 5%) compared to DNV (20% and 7%) and DWV (15% and 6%). The weighted survey data closely match the Census distributions.

Figure 48. Household Size by Municipality
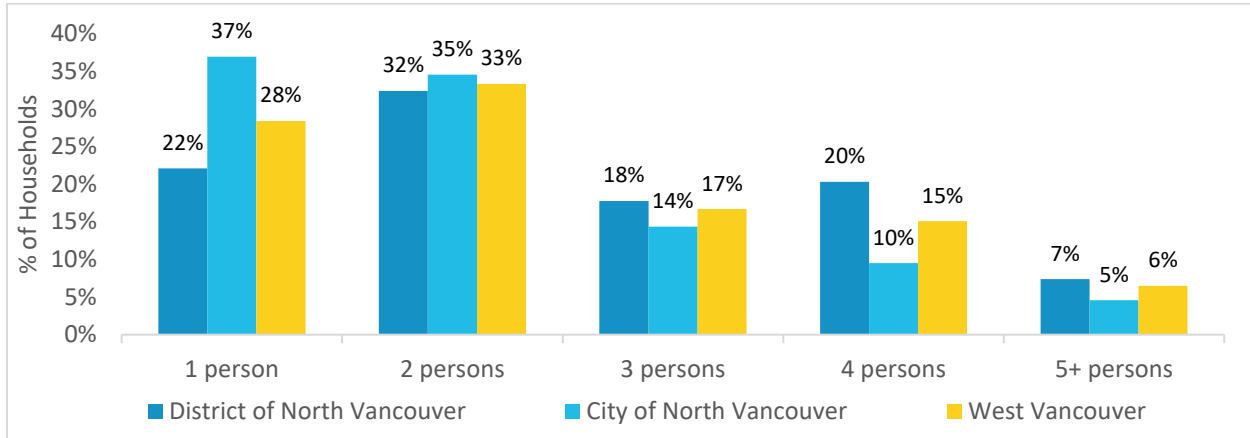
Source: Survey Data. Survey data were weighted by household size, so should closely match the 2021 Census.

Table 32 presents average household size by dwelling type by municipality. As might be expected, households in single-detached houses and other ground-oriented dwelling types (town house, row house, semi-detached, etc.) are larger, at 3.04 persons and 2.58 persons respectively, than apartment dwellers, at 1.83 for apartments with fewer than five stories and 1.61 for those with five or more stories.

Table 32. Average Household Size by Dwelling Type by Municipality

|	North Shore	District of North Vancouver	City of North Vancouver	District of West Vancouver
Single-Detached House	3.04	3.10	2.87	2.98
Other Ground Oriented	2.58	2.54	2.83	2.09
Apartment <5 stories	1.83	1.90	1.82	1.67
Apartment 5+ stories	1.61	1.58	1.59	1.67
Total	2.43	2.69	2.09	2.45

Source: Survey Data. Survey data were weighted by household size, so should closely match the 2021 Census.

5.2.3   Household Income

Figure 49 shows the household income distribution by municipality from the 2023 survey results and a comparison to the Metro Vancouver Regional District (MVRD) results that are from 2021 Census distributions. Compared to the MVRD, the North Shore municipalities have a higher proportion of households with household incomes above $125,000 and up to three times the proportion of households with incomes of $200,000 or more. All municipalities have substantially fewer households with incomes under $30,000 compared to the MVRD. In CNV, the most common household income bracket is $80,000 to $125,000 (24% of households). DNV has the largest proportion of households in high-income brackets, with 27% of households in the $125,000 to $200,000 bracket and an additional 25% of households with incomes of $200,000 or more. DWV has the second largest proportions in high-income brackets, with 19% in the $125,000 to $200,000 bracket and 27% with household incomes of $200,000 or more. The weighted survey sample underrepresents households with annual incomes of less than $30,000, and slightly over-represent households with annual incomes of over $80,000 when comparing against 2021 Census data.

Figure 49. Household Income Distribution by Municipality [34]
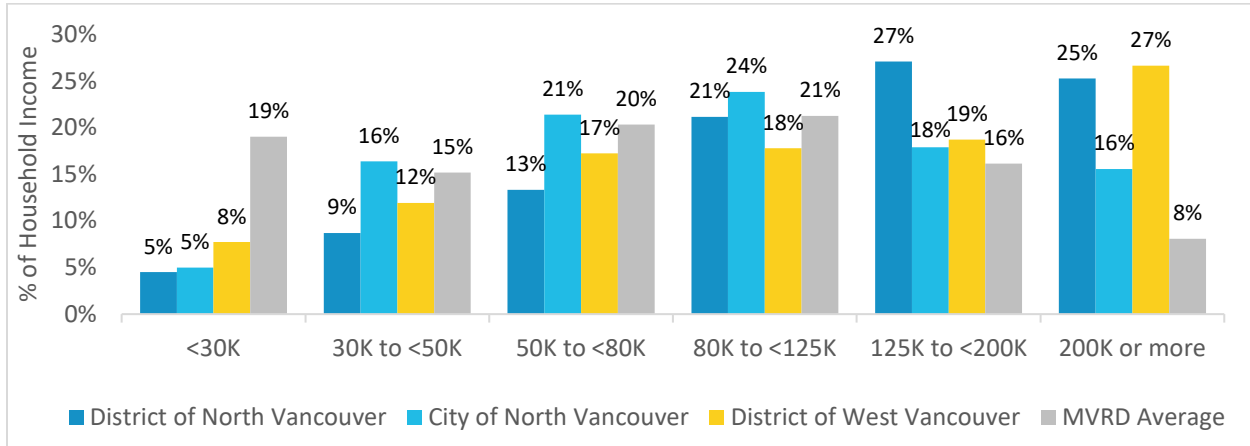
Source: Survey Data, except MVRD, which is from 2021 Census

5.3   Lifestyle

Figure 50 shows survey participants' self-assessment of their level of physical activity by municipality. Between 55% and 62% of participants self-rate their activity level as moderately active or very active, with DNV highest at 62%, CNV at 60%, and DWV the lowest at 55%. One-third (33%) of CNV participants reported light physical activity.

Figure 50. Level of Physical Activity[35] by Municipality, 2023
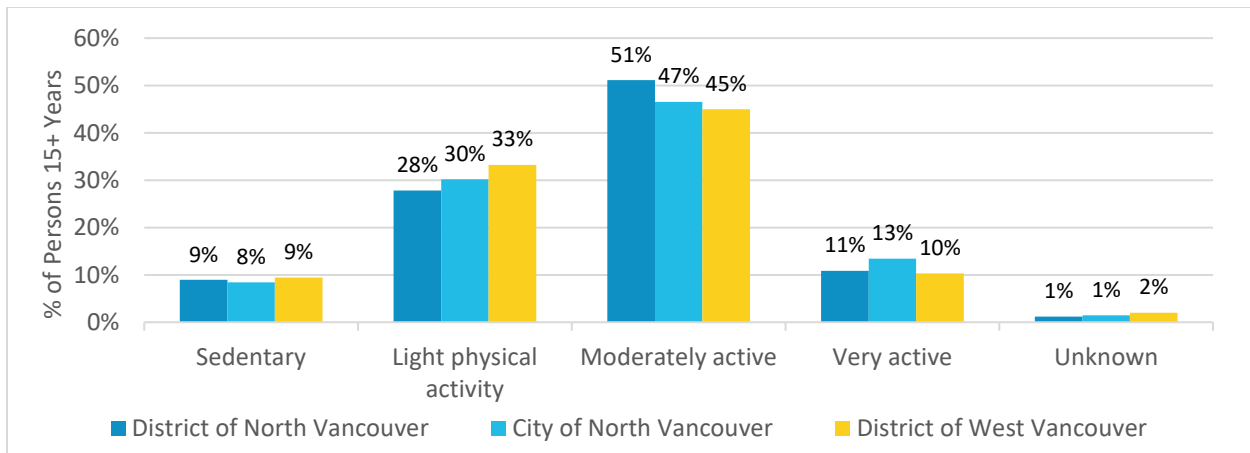
Source: Survey Data

Figure 51 shows that self-assessed activity levels have remained similar since 2019. Table 33 shows similar self-assessed activity levels across municipalities. Similar changes in activity level from 2021 to 2023 are observed across municipalities, though the largest change was seen in the CNV with the proportion of residents reporting a moderately active lifestyle decreasing from 54% in 2021 to 47% in 2023. Similarly, the proportion of residents reporting a very active lifestyle increased from 9% in 2021

[34] Household income distributions exclude 9% of survey participants who declined to answer this question.
[35] Activity levels were defined as follows: Sedentary- desk job, little or no exercise; Light physical activity- on your feet some of the day, light exercise once or twice per week; Moderately active- on your feet most of the day, moderate exercise 3 to 7 times per week; Very active- walking most of the day, hard exercise almost every day.

to 13% in 2023 and light physical activity increased from 28% to 30%. These changes, though minimal, are notable as lifestyle has impacts on travel habits such as mode selection since more active people may be more attracted to active travel modes and more able to use them.

Figure 51. Level of Physical Activity, 2019 to 2023
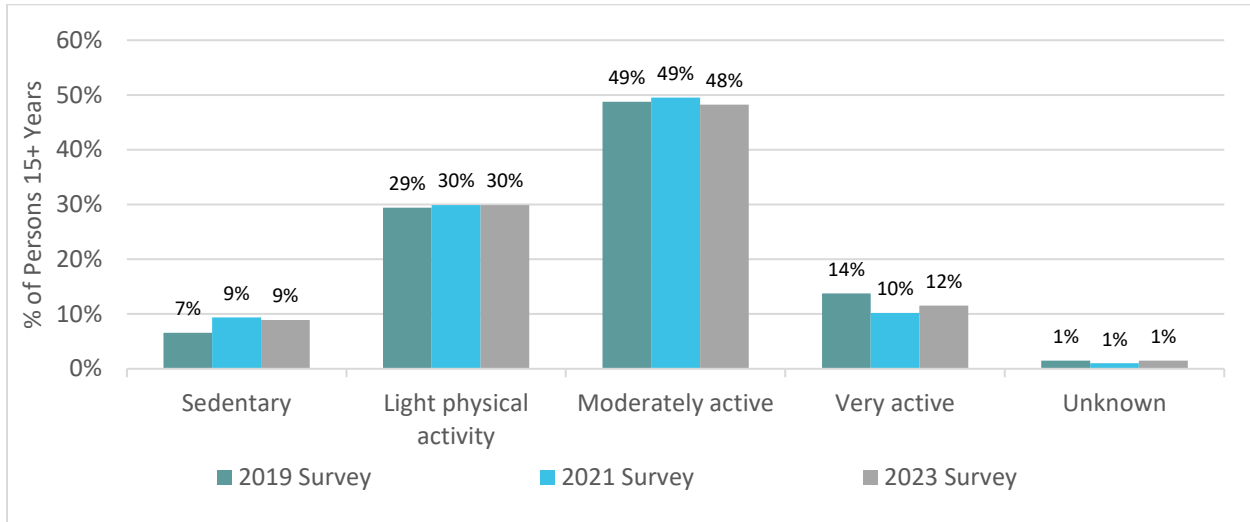
Source: Survey Data

Table 33. Level of Physical Activity by Municipality, 2019 to 2023

	DNV			CNV			DWV		
	2019	**2021**	**2023**	**2019**	**2021**	**2023**	**2019**	**2021**	**2023**
Sedentary	5%	10%	9%	7%	7%	8%	9%	10%	10%
Light physical activity	29%	28%	28%	33%	28%	30%	26%	36%	33%
Moderately active	51%	50%	51%	45%	54%	47%	50%	42%	45%
Very active	14%	10%	11%	15%	9%	13%	13%	11%	10%
Unknown	1%	1%	1%	1%	1%	2%	2%	1%	2%

Source: Survey Data

5.4   Highest Level of Education

Figure 52 shows the distribution of survey participants by highest level of education by municipality. About one-third of survey participants in DWV have advanced degrees (e.g., Graduate Degree or a Doctor in a health profession); this is the most common level of education in DNV and DWV. Participants with a university bachelor's degree represent the highest percentage in CNV at 33%. Participants with a diploma, associate degree or trades certification made up 23% of survey participants in DNV and CNV versus 19% in DWV. Examination of these results against the 2021 Census reveals that residents with high school or less are generally under-represented in the three municipalities by around half, while residents with advanced degrees are over- represented by about the same amount.

Figure 52. Highest Level of Education by Municipality (% of Private Dwellings Occupied by Usual Residents)
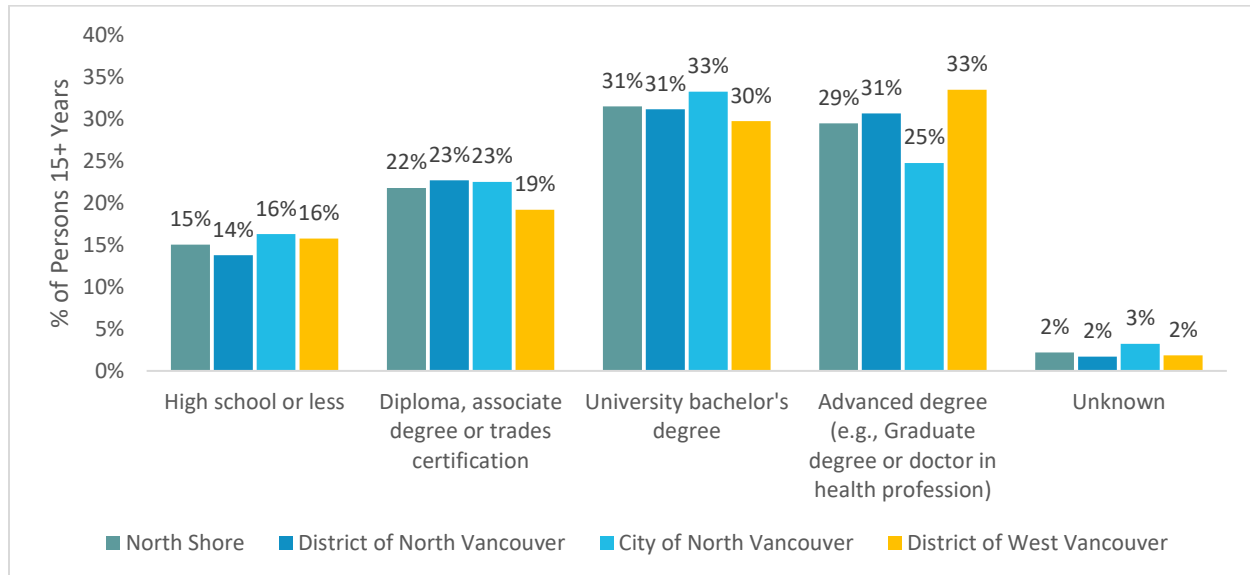
Source: Survey Data

5.5 Occupational Characteristics

This section describes the survey participants' occupational characteristics, including employment and/or student 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. Note: in most statistical analyses, 15 years old is considered the age of eligibility for participation in the labour force.[36]

5.5.1 Occupational Status

Figure 53 shows employment status and student status aggregated for the North Shore. The survey results suggest that approximately one-half (49%) of residents over the age of 15 work full-time and 11% work part-time, for a total of 60% of residents over the age of 15 being employed. Approximately one-third (29%) of labour-force-eligible residents are retired, which is an increase from 26% in 2021. Statistics Canada does not report retirement but the number of those above retirement age (i.e., 65 years or older) can be used as a proxy when comparing to Census Data. Survey data shows approximately 24% of the eligible workforce is 65 years or older compared to 23% in 2021. The Metro Vancouver average of the eligible workforce 65 years or older is 19% based on 2021 Census data. This suggests that the North Shore likely has more retirees than the rest of Metro Vancouver. Unemployed survey participants represent 5% of the labour-force eligible population. Of the survey participants who are students, 65% are high school students, and the remainder are evenly split between full-time or part time (17% each) Post-Secondary Education (PSE) or other studies (adult basic education, etc.). There is overlap between students and workers: approximately 3% of the population 15+ years works full-time or part-time while attending school.

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[36] In B.C., children aged 14 or 15 can participate in light work with consent of a guardian, however, Statistics Canada treats age 15 years the age of eligibility for participation in the labour force, for which labour-related data are collected.

Figure 53. Employment Status and Student Status [37]
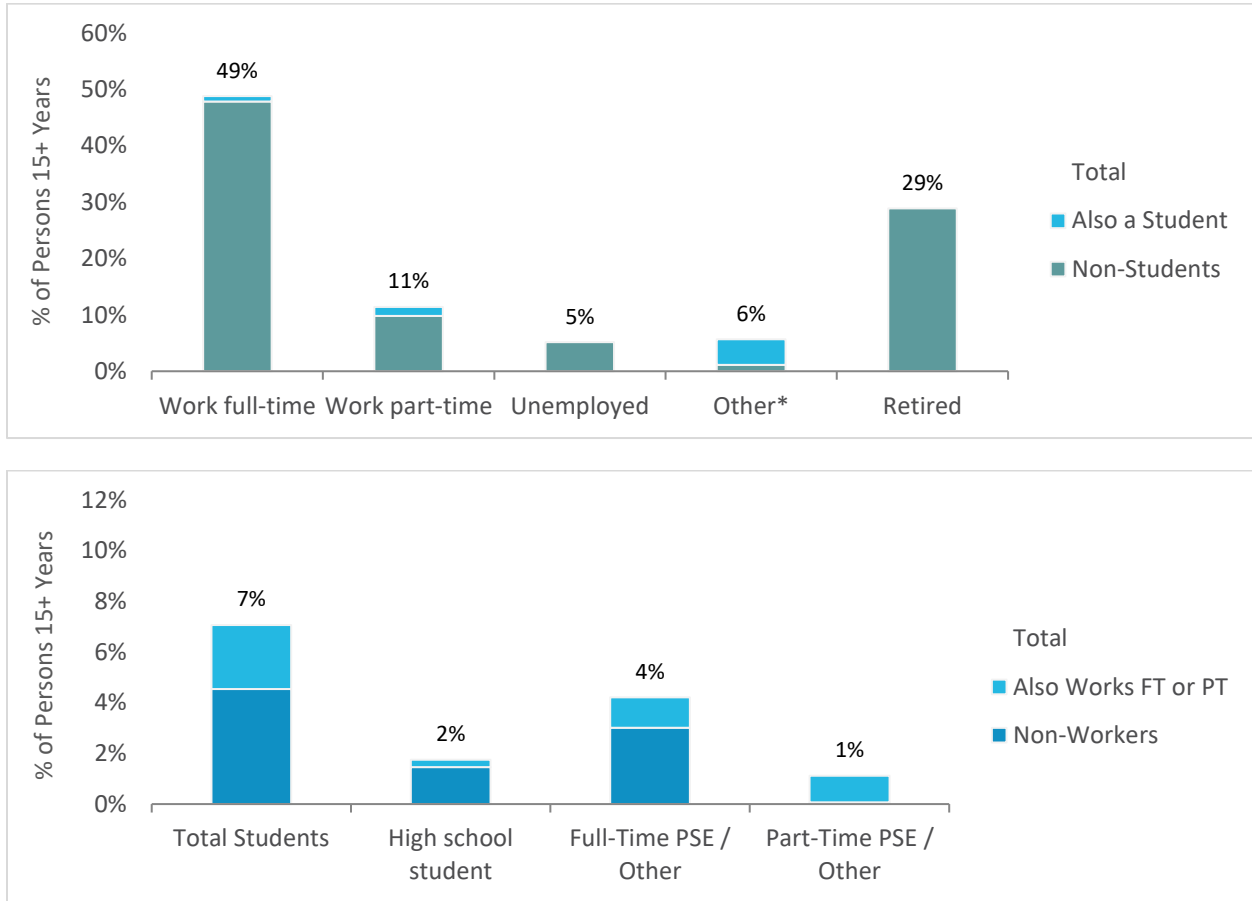
Source: Survey Data

Figure 54 shows employment status by municipality. At least one-half of CNV residents and DNV residents over the age of 15 work full time (58% and 50%, respectively). DWV has the highest proportion who are retired, at 38%. Full-time workers living in DWV represent around 34% of the population 15+. As shown in Table 34, Zones 4 and 5, in DWV have the lowest proportion of residents who are employed full-time (35% and 38% respectively). Zone 4 has one of the highest proportions of residents reporting "other" work arrangements (12%) and a relatively high proportion of retired residents (29%). Zone 5 has the highest proportion of retired residents, at 46%.

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[37] *'Other' includes students who are not employed, homemakers, those on disability, and other statuses.

Figure 54. Employment Status by Municipality [38]
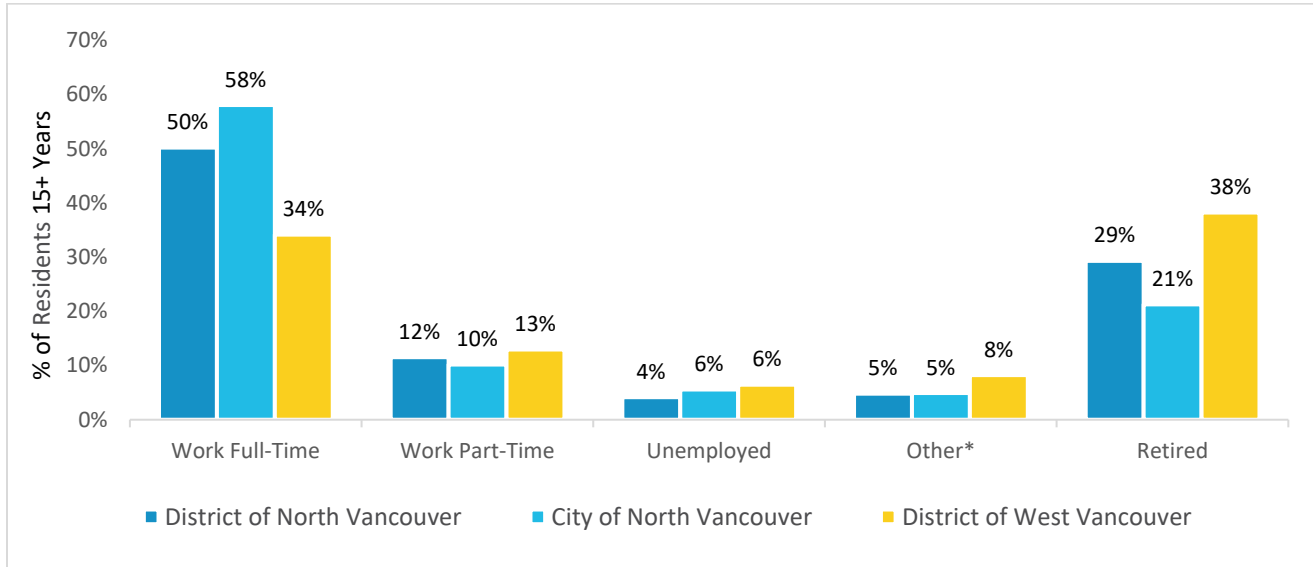
Source: Survey Data

Table 34. Employment Status 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)
Work Full-Time	55%	53%	47%	35%	38%	49%	56%	55%
Work Part-Time	8%	12%	13%	16%	10%	13%	8%	15%
Unemployed	4%	3%	5%	9%	3%	7%	6%	3%
Other*	0%	2%	12%	12%	2%	9%	6%	5%
Retired	33%	30%	24%	29%	46%	22%	24%	23%

Source: Survey Data

5.5.2   Employment Characteristics

Figure 55 shows occupation type by municipality for survey participants. DWV has relatively higher percentages of these occupation types:

- Business Finance and Admin Occupations (22%)
- Sales & Service Provision (20%)
- Health Services Occupations (12%)

CNV has relatively higher percentages of these occupation types:

- Business Finance and Admin Occupations (21%)
- Education, Law & Social, Community & Government Services (16%)
- Sales & Services Occupations (14%)

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[38] *'Other' includes students who are not employed, homemakers, those on disability, and other statuses.

DNV has relatively higher percentages of the following occupation types:

- Business Finance and Admin Occupations (23%)
- Sales & Service Provision (17%)
- Education, Law & Social, Community & Government Services (14%)

Figure 55. Occupation Type by Worker's Place of Residence
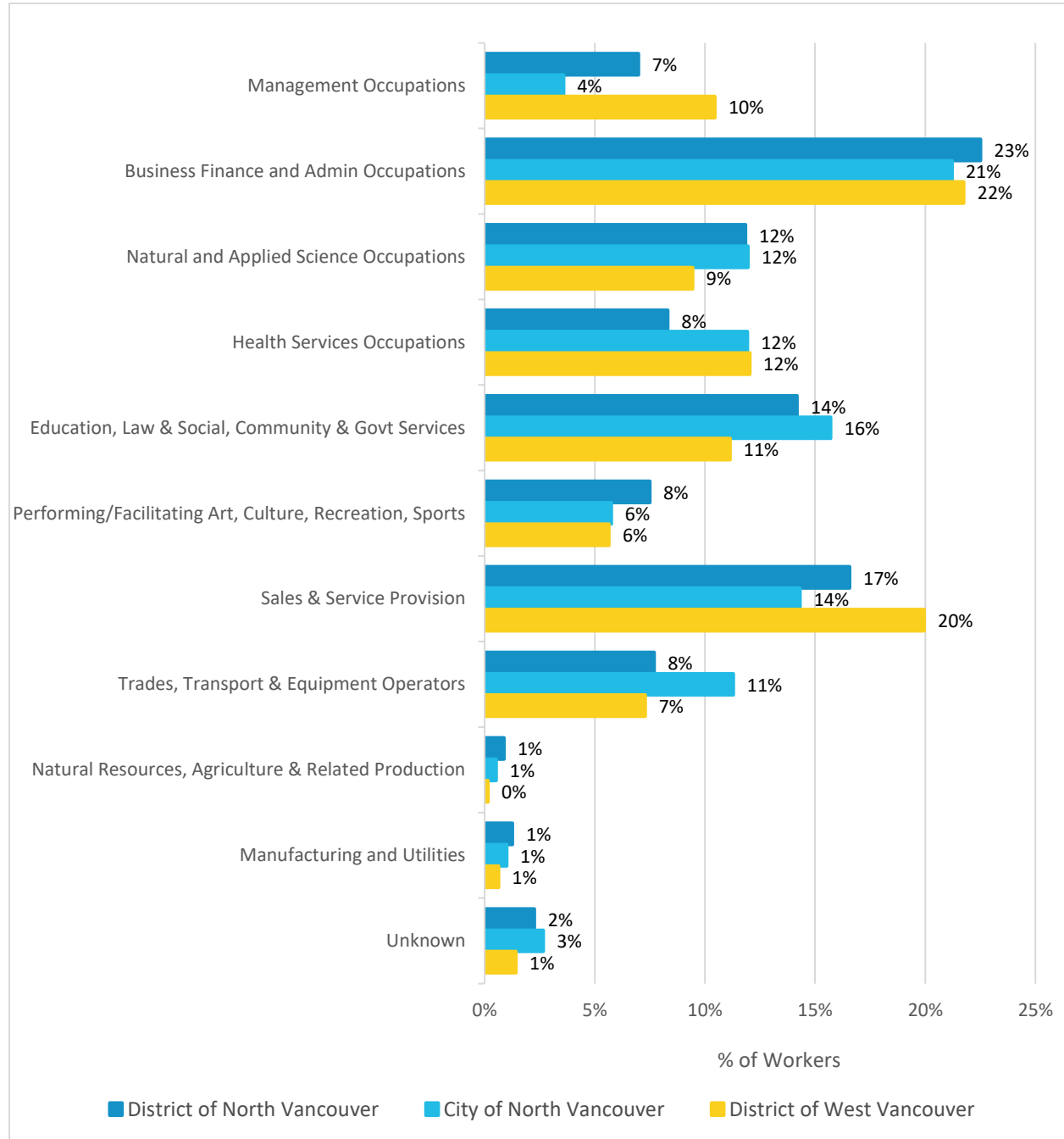
Source: Survey Data

It may be noted that a comparison of the survey results against the 2021 Census suggests that the survey sample is generally representative of most occupational categories, although with some under-representation of sales and service occupations (23% per the Census, 16% of weighted survey participants) and some over-representation of management occupations and of health services occupations. This comparison should be interpreted with caution, as the Census distributions by occupation are based on all persons who have been employed at any time in the year previous to the Census (with sales and service occupations often subject to seasonal variations), whereas the survey results are based on persons who are currently employed.

Table 35 provides some insight into the differences in workplace location and travel patterns for workers in different types of occupation. As indicated, workers in sales and service occupations are more likely to take transit, while those in management or business/finance/administration occupations are more likely to drive. Interestingly, the survey results suggest that workers in natural and applied science occupations have the lowest average daily trip rates, which is likely associated with almost one-quarter working from home, and the highest cycling mode shares.

Table 35. Selected Transportation Indicators by Type of Occupation, North Shore, 2023

	% of Workers		Workplace				Daily Mode Share					
	Census	Survey	Work from home	No fixed work-place	Usual work-place	Daily trip rate	Driver	Pass-enger	Transit	Walk	Bicycle	Other
Management	3%	6%	18%	4%	79%	3.3	76%	2%	4%	11%	3%	3%
Business, finance, admin	22%	22%	19%	7%	74%	3.4	75%	5%	6%	12%	1%	0%
Natural and applied science	10%	11%	23%	2%	75%	2.9	68%	4%	7%	12%	9%	0%
Health services	8%	10%	4%	4%	92%	3.1	66%	5%	9%	15%	1%	4%
Education, law, social, community, government	13%	14%	8%	4%	88%	3.3	65%	7%	10%	14%	4%	0%
Performing and facilitating art, culture, recreation and sport*	7%	7%	27%	19%	54%	3.3	62%	8%	11%	13%	5%	0%
Sales and service *	23%	16%	20%	17%	62%	3.1	67%	4%	16%	10%	3%	0%
Other occupations*†	14%	11%	2%	28%	70%	3.1	66%	1%	16%	11%	2%	4%
Unknown**	0%	2%										
Survey Total	100%	100%	16%	10%	74%	3.2	69%	5%	10%	12%	3%	1%

Source: 2021 Census; 2023 Survey results. Some caution should be exercised when comparing Census results with survey results. Census results are based on anyone who has worked in the year prior to the Census. Survey results are based on current employment status. Sample sizes for the categories above are, in order: 203, 278, 168, 143, 171, 76, 94, 84, 30.
Blue shading highlights cells with higher values within each column, to make it easier to discern high values for a given category.
* Smaller sample sizes (n<100); Interpret results with caution.
** Results have been suppressed for unknown occupation type (n=30).
† Other occupations combines the following occupational groups: trades, transport, and equipment operators; natural resources, agriculture & related production occupations; manufacturing and utilities occupations.

5.5.3   Employer Support for Travel Demand Management Programs

Figure 56 presents the proportion of workers with jobs on the North Shore whose employer supports travel demand management (TDM) programs. These programs range from providing electric vehicle (EV) charging infrastructure to having a company carpool/car share program or employer-subsidized transit passes. About 29% of workers with jobs on the North Shore have access to at least one employer-supported transportation program of any kind; compared to 21% in 2021. Workers with jobs in the CNV are more likely than workers in DNV or DWV to report having access to at least one of these programs.

Figure 56. Employer Support of Transportation Programs by Municipality (Based on Place of Work for Residents of the North Shore)
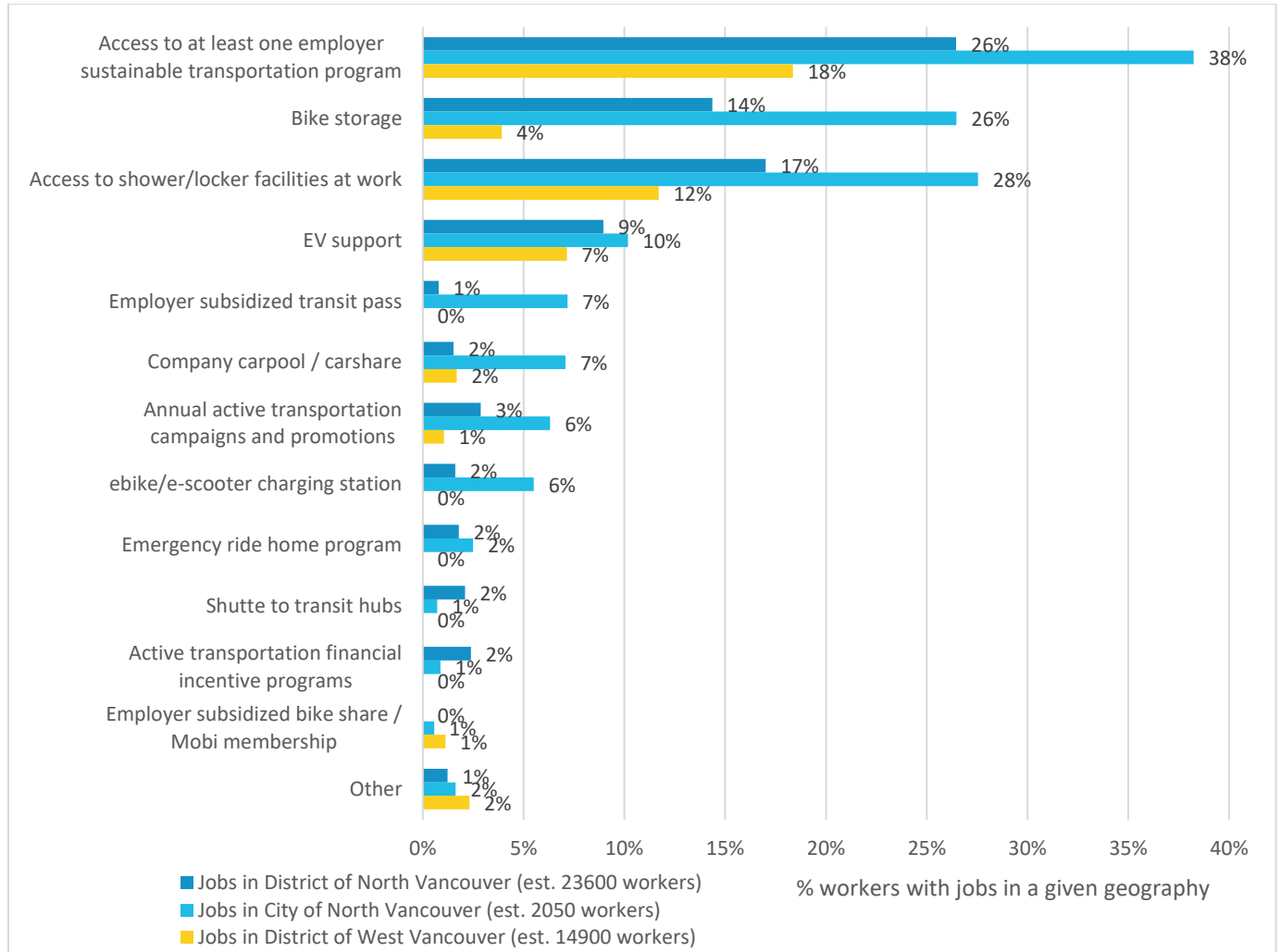
Source: Survey Data

Overall, 42% of workers who live on the North Shore have access to at least one employer-supported transportation program of any kind; up from 32% in 2021. Access to bicycle storage and/or shower/locker facilities at work were the most frequently reported programs. The data show a trend of increasing employer support for such programs which may have an impact on people's choice of usual mode for commute purposes.
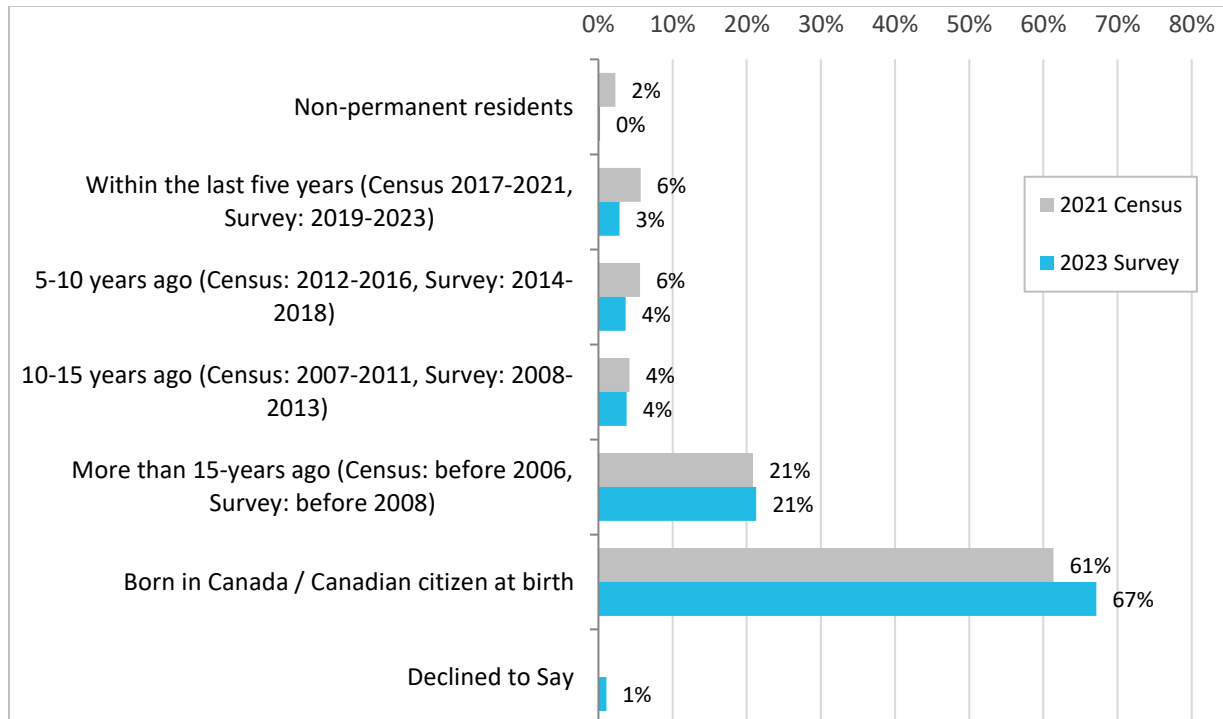
5.6 Year of Immigration and Racial Identity

The 2023 survey included additional demographic questions related to immigration status and racial identity. Such information was collected to better address equity barriers in transportation choices.

5.6.1 Year of Immigration

As highlighted in Figure 57, over two-thirds (67%) of survey participants identified themselves as "non-immigrants" (i.e., born in Canada). Of the approximately one-third of participants who indicated that they had immigrated to Canada, the majority would be considered "long term" residents as they have resided in Canada for more than 10 years. Overall, coverage of immigrants in the survey generally reflects the actual distribution based on census data, although representation of "new immigrants" (i.e., those that arrived in Canada in the last ten years) is below that of the estimated population based on census data. Reasons for nonresponse could include but are not limited to: language ability, lower levels of engagement in surveys generally, and/or higher mobility with respect to place of residence and thus decreased likelihood of being retained in the panel of previous participants. It should be highlighted that survey sample sizes for recent immigrants are modest (n=33 who immigrated within the last five years, or n=60 within the last ten years). Thus, while the analysis of transportation indicators by immigration status may yield results that illuminate the topic, the sample size is not sufficient to confidently examine longitudinal trends.

*Figure 57. Year of Immigration, 2023 Survey Data Compared with 2021 Census*

Source: 2021 Census, Survey Data

5.6.2 Racial Identity

As with immigration status, additional data was collected in the 2021 survey to allow survey participants to indicate their racial identity. While race is a social construct with no biological or scientific basis, racial identity (or perceived racial identity) has real and important impacts on equity as race is often used to establish and justify systemic/societal systems of power, privilege, and oppression. Collecting this information from survey participants will allow for some equity-based analysis to be conducted. Based on Census population group categories, non-white respondents may be referred to as visible minorities.[39]

As shown in Figure 58, while the survey results provide a generally good representation of visible minorities, there is not a perfect alignment between the survey data and the estimated actual proportions based on the most recent (2021) census data. Black and Latin American respondents were overrepresented in the 2023 survey data. The remaining visible minority groups were slightly underrepresented in the 2023 survey data. It should be noted that sample sizes for some categories are quite small (ranging from 4 to 50 survey participants), and as such it not possible to observe longitudinal trends in the survey data by racial identity or breakdowns of mode share (for example) by racial identity.

Figure 58. Year of Immigration, 2023 Survey Question on Racial Identity Compared with 2021 Census Visible Minority Group

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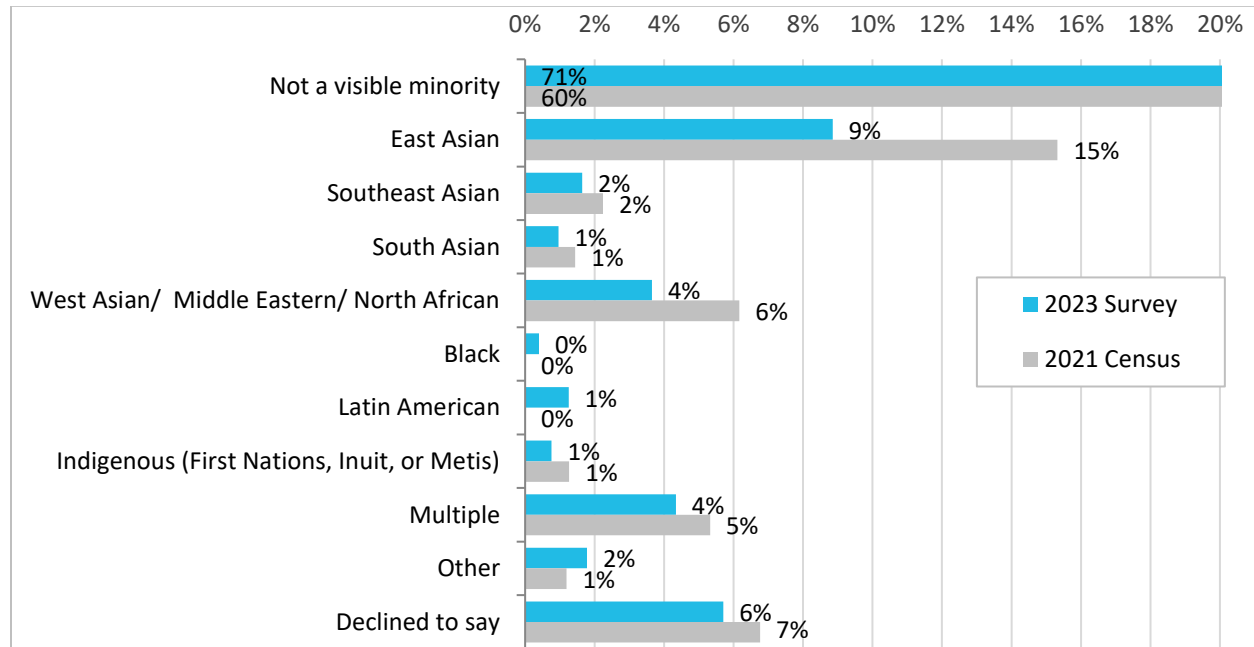
[39] The Census definition states that visible minority refers to whether a person belongs to a visible minority group as defined by the Employment Equity Act and, if so, the visible minority group to which the person belongs. The Employment Equity Act defines visible minorities as 'persons, other than Indigenous peoples, who are non-Caucasian in race or non-white in colour. (https://www12.statcan.gc.ca/census-recensement/2016/ref/guides/006/98-500-x2016006-eng.cfm). For purposes of the NSTS, Indigenous people are reported separately from "not a visible minority" both in the survey results and in presentation of the Census data. Categories of West Asian and Middle Eastern/North African have been combined.

5.7   Bicycle and Micromobility Device Access

5.7.1   Bicycle Availability

Table 36 and Figure 59 show the number of bicycles per household for the North Shore overall and by municipality, estimated based on the survey results. As shown in Table 36, the 220 survey results suggest that residents of the North Shore own an estimated 105,100 bicycles, of which 17,900 are e-bikes. This equates to approximately 49% of households or 54% of the population 15 years of age or older having access to a bicycle. While the estimated total number of bicycles overall is down from 117,900 in 2021, it is notable that the number of e-bikes reported has increased significantly compared to 2021 (from only 4,100 in 2019 to 10,600 in 2021, and up to 17,900 in 2023).[40] Overall, 15% of survey participants reported that their household had at least one e-bike. A potential factor contributing to the rise in the ownership of e-bikes may be from provincial purchase incentive programs.

DNV has the highest number of adult bicycles per household at 1.57 bikes per household (bike/hh), while CNV and DWV have averages of 1.06 and 1.08 bikes/hh respectively. While residents of DNV have the highest number of adult bicycles and e-bikes, a slightly lower proportion of them are e-bikes (16% e-bikes to total bikes vs 18% for CNV and DWV).

Table 36. Bicycles and Bicycle Access

	North Shore	District of North Vancouver	City of North Vancouver	District of West Vancouver
Estimated total adult bicycles (including e-bikes)	105,100	54,100	30,200	20,900
% of households with at least one adult bicycle	49%	55%	47%	42%
Average adult bicycles per household	1.28	1.57	1.06	1.08
Estimated number of e-bikes	17,900	8,600	5,600	3,800
% of adult bicycles that are e-bikes	17%	16%	18%	18%
% of pop 15+ with access to an adult bicycle	54%	58%	54%	47%

Source: Survey Data

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[40] Readers are reminded that all survey figures are estimates. It may be noted that the expanded survey results for certain household-level characteristics such as the number of bicycles and total number of vehicles are estimates based on a survey sample that has been weighted by geography, household size and dwelling type only, and may not always have the same precision in adjustment as person-level results (which additional have age and gender adjustments) and consistency across survey cycles. The survey sample is a blend of previous participants and a new randomly-sampled cross-sectional sample and the difference between 2023 and 2021 estimates in household bicycles could be related changes in sample composition in terms of bicycle ownership. The fact that the number of estimated e-bikes is up even as the estimate of total bicycles is down is indicative of the strong growth in e-bike ownership.

Figure 59. Average Number of Conventional Bicycles and E-Bikes per Household with Bikes by Municipality
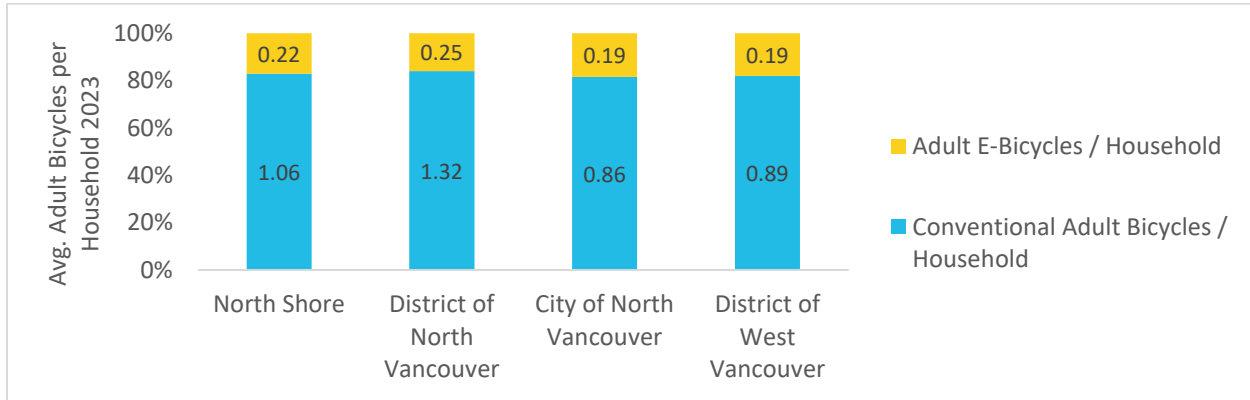
Source: Survey Data

Table 37 illustrates access to bicycles by sub-municipal zone. Residents of Zone 5 and Zone 7, both of which have higher urban density, have less access to adult bicycles than their counterparts in other areas.

Table 37. Bicycle Availability by Zone (% of Residents 15+ with Access to an Adult Bicycle)

	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)
Estimated total adult bicycles (including e-bikes)	105,100	17,400	20,000	12,500	11,300	9,400	8,800	14,100	11,700
% of households with at least one adult bicycle	49%	56%	61%	51%	48%	36%	49%	41%	58%
Average adult bicycles per household	1.28	1.63	1.77	1.42	1.30	0.86	1.31	0.78	1.65
Estimated number of e-bikes	17,900	2,700	3,000	2,500	1,600	2,000	1,600	2,900	1,600
% of adult bicycles that are e-bikes	17%	16%	15%	20%	14%	21%	18%	21%	14%
% of pop 15+ with access to an adult bicycle	54%	59%	61%	57%	54%	41%	53%	48%	66%

Source: Survey Data

The charts in Figure 60 show the distributions of residents with access to an e-bike or with access to any bicycle by age range. The survey results suggest that more 55-to-64-year-olds have access to an e-bike (about 5,800 residents), with the next most common age ranges being 25 to 34 and 35 to 44 years of age (about 5,000 residents with access to an e-bike in each age group). Interestingly, uptake amongst 45-to-54-year-olds appears to be lower than for adjacent age groups, despite the high number of residents in this age group with access to any kind of bicycle. The reasons for this are not clear, but there may be different use profiles for younger and older residents (use for commuting versus use for discretionary trips and recreation).

Figure 60. Population with Access to E-bikes, Population with Access to Any Adult Bicycle by Age Range
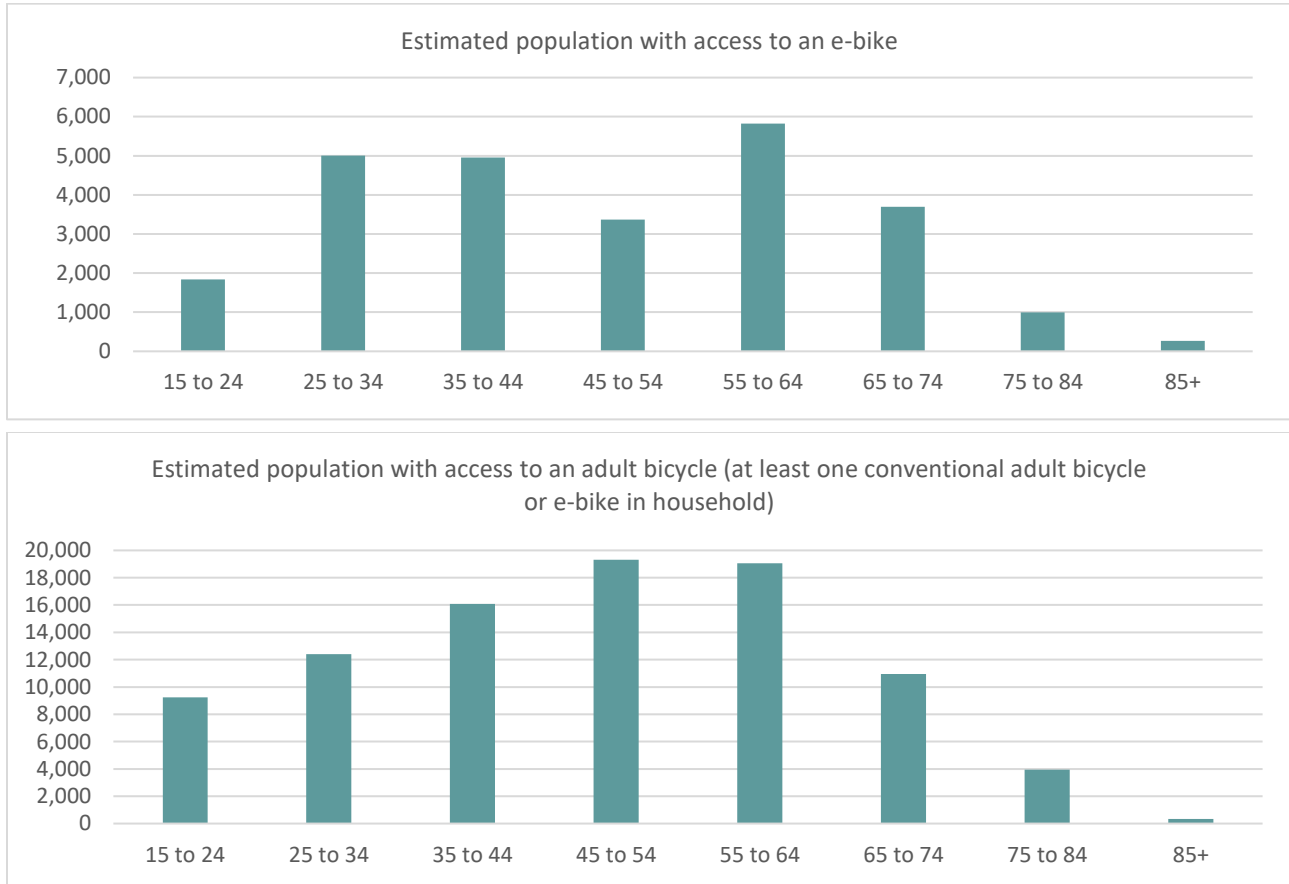
Source: Survey Data

Readers are reminded that the age profile of residents on the North Shore is not uniform across age groups.[41] Table 38 lists the proportion of population in each age group that has access to an e-bike or to any adult bicycle, overall and broken out by municipality, providing a different perspective. Residents 24 to 34 years old have the highest rate of e-bike access, at 24% of their age group, while those 55 to 64 years old are next highest, at 19%. Caution should be exercised when interpreting the results by age group within each municipality, as sample sizes for certain age groups (e.g., 15-24) may be small at the municipal level. Note that access to a household bicycle does not necessarily mean that the person has individual ownership of the bicycle or that they use it; i.e., in multi-person households, the bicycle(s) could be owned and used by other household members.

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[41] Of the weighted survey participants, about 8% are 15 to 24 years of age, 13% are 25 to 34, 16% are 35 to 44, 18% are 45 to 54, 19% are 55 to 64, 15% are 65 to 74, 9% are 75 to 84, and 2% are 85 year or older. This may not exactly match 2021 Census distributions due to limits placed on extreme weights for age categories with smaller samples and higher non-response bias.

Table 38. Bicycle Availability by Age Range (% of Residents in Age Group with Access)

Age Range	Access to e-bike				Access to any adult bicycle (at least one e-bike or conventional bicycle in household)			
	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver	North Shore	District of North Vancouver	City of North Vancouver	West Vancouver
15 to 24*	14%	25%	15%	n/a**	70%	82%	76%	50%
25 to 34	24%	28%	18%	33%	59%	59%	65%	33%
35 to 44	18%	18%	21%	14%	59%	61%	60%	52%
45 to 54	11%	12%	13%	7%	63%	68%	55%	62%
55 to 64	19%	20%	14%	21%	61%	66%	54%	58%
65 to 74	15%	18%	11%	14%	44%	47%	38%	44%
75 to 84	6%	6%	7%	6%	25%	26%	22%	25%
85+*	7%	n/a**	n/a**	n/a**	9%	n/a**	n/a**	n/a**
TOTAL	15%	18%	15%	12%	54%	58%	54%	47%

Source: Survey Data

*Interpret results with caution at the municipal level due to small sample sizes for certain age groups.

**Result suppressed due to small sample size and/or unusual result.

5.7.2   Lime Bike Share Use

Bike share use is on the rise on the North Shore. The Lime e-bike share service launched in 2021, and about 5% of 2021 survey participants indicated they use a bike share service, compared to about 7% in 2023. As shown in Table 39, reported Lime bike share usage of participants is most common in DWV (17%) compared to DNV (10%) and CNV (7%). The data in the table below is not reflective of per capita usage or total number of e-bike trips.

Table 39. Bike Share Usage (Overall and by Municipality)

	North Shore	District of North Vancouver	City of North Vancouver	District of West Vancouver
2023	7%	10%	7%	17%

Source: Survey Data

5.7.3   E-Micromobility Device Availability

For the purposes of this survey, e-micromobility devices include any non-motorized device with wheels that are not a bicycle (e.g., e-scooter, e-skateboard, e-monowheel, hoverboard). They are not defined as a vehicle in the B.C. Motor Vehicle Act and therefore not legally allowed on the streets, except through bylaw. In early 2022, CNV and DNV adopted an e-scooter bylaw to enable the personal use of them on their streets through participating in the Provincial Electric Kick Scooter Pilot Project, and inter-municipal collaboration supported by the BC Ministry of Transportation and Infrastructure. The use of e-scooters is in force in CNV and DNV under the provincial pilot regulations, while DWV did not allow the use of e-scooters at time of survey (Fall 2023).

As shown in Table 40, the survey results suggest that approximately 4% of households across the North Shore have access to at least one e-micromobility device, for an average of 0.06 e-micromobility devices per household or an estimated 5,100 in total, a significant increase from 3,600 in 2021. E-micromobility device ownership is generally consistent across the North Shore at 4% with residents of DWV at 5%.

It should be noted that e-micromobility devices are relatively uncommon based on those surveyed. Depending on the random sample of the population surveyed, the expanded survey estimates of the number of such devices may over- or under-represent the actual number on the North Shore. The results presented here should be interpreted with caution.

Table 40. E-Micromobility Devices and E-Micromobility Device Access

	North Shore	District of North Vancouver	City of North Vancouver	District of West Vancouver
Estimated total e-micromobility devices	5,100	1,330	1,260	910
% of households with at least one e-micromobility device	4%	4%	4%	5%
Average e-micromobility devices per household	0.06	0.06	0.06	0.06

Source: Survey Data

5.8   Private Vehicle Access

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

5.8.1   Licensed Drivers

The survey results suggest that 95% of North Shore residents aged 16 or older (those eligible) have a drivers license. DNV and DWV have higher proportions, at 96%, while CNV has a slightly lower proportion at 93%.

5.8.2   Private Vehicle Availability

Table 41 shows the percentage of survey participants (over the age of 15) who have access to at least one private vehicle. The survey results suggest that, overall, 94% of residents have access to a private vehicle. This percentage is highest for DNV and DWV (97% and 96% respectively) and lowest for CNV (90%).

The survey results suggest that North Shore residents have an estimated total of 132,400 vehicles compared to 130,200 vehicles in 2021 and 125,530 in 2019; an increase of 5.4% since 2019. However, the average number of vehicles per household of 1.61 is only slightly lower than 2019 (1.65) or 2021 (1.62), a negligible change, suggesting that the growth in vehicles is due to the growth in households between 2019 and 2023.

*Table 41. Private Vehicle Availability by Municipality*

	North Shore	District of North Vancouver	City of North Vancouver	District of West Vancouver
Estimated household vehicles	132,400	60,400	37,200	34,800
Average household size	2.58	2.54	2.83	2.09
Average vehicles per household*	1.61	1.76	1.30	1.81
Average vehicles per person 16+	0.79	0.80	0.71	0.88
% pop 15+ with access to at least one vehicle	94%	97%	90%	96%

Source: Survey Data

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

Figure 61 shows the proportion of participating households with access to at least one vehicle by household type. Residents living in houses (99%) and other ground-oriented housing (97%) are more likely than those living in apartment or condominium buildings (83%-86%) to have access to a vehicle.
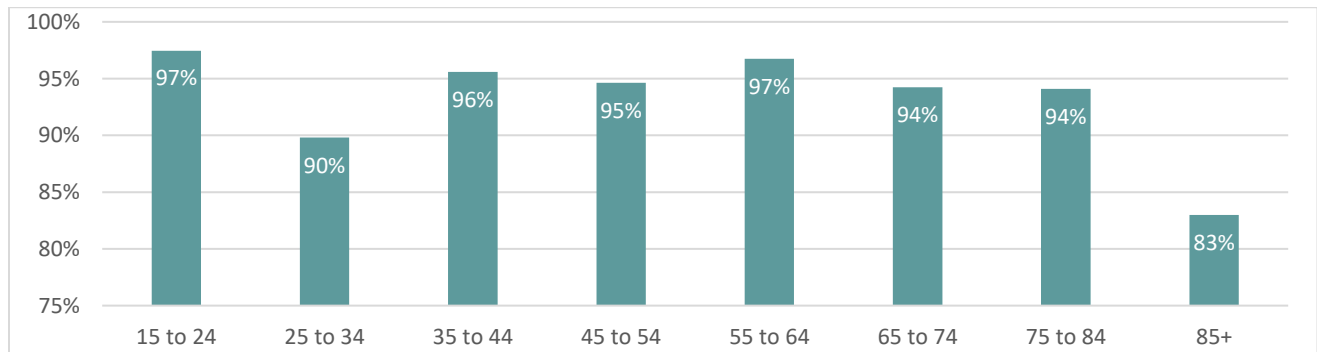
Figure 61. Private Vehicle Availability by Dwelling Type [42]
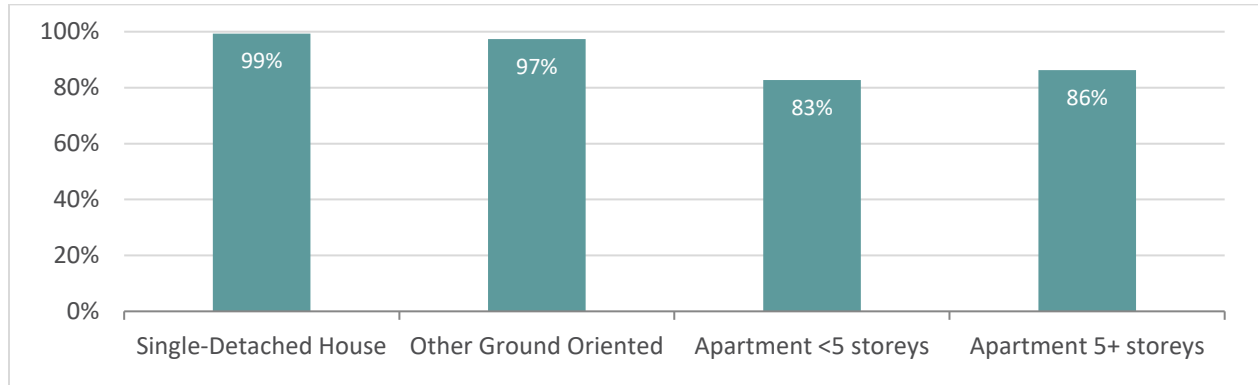
Source: Survey Data

Figure 62 shows the proportion of households with access to at least one vehicle by age. Residents aged 25 to 34 years old and those over the age of 84 are least likely to have access to a vehicle.

*Figure 62. Private Vehicle Availability by Age Range*

Source: Survey Data

Figure 63 below presents the average number of vehicles per household by type of dwelling, overall and by municipality. As indicated, households in single-detached houses average 2.15 vehicles, those in other ground-oriented dwellings average 1.66, and those in apartments have the fewest vehicles, averaging 1.07 and 1.11 for apartments with fewer than five stories and more than five stories, respectively. It is interesting to note that there is some variation by municipality, with DNV having slightly more vehicles per households in all but single-detached houses.

[42] Other ground-oriented = rowhouse, townhouse, semi-detached, secondary suite in a house, mobile home or other dwelling type.

Figure 63. Average Number of Private Vehicles per Household by Dwelling Type
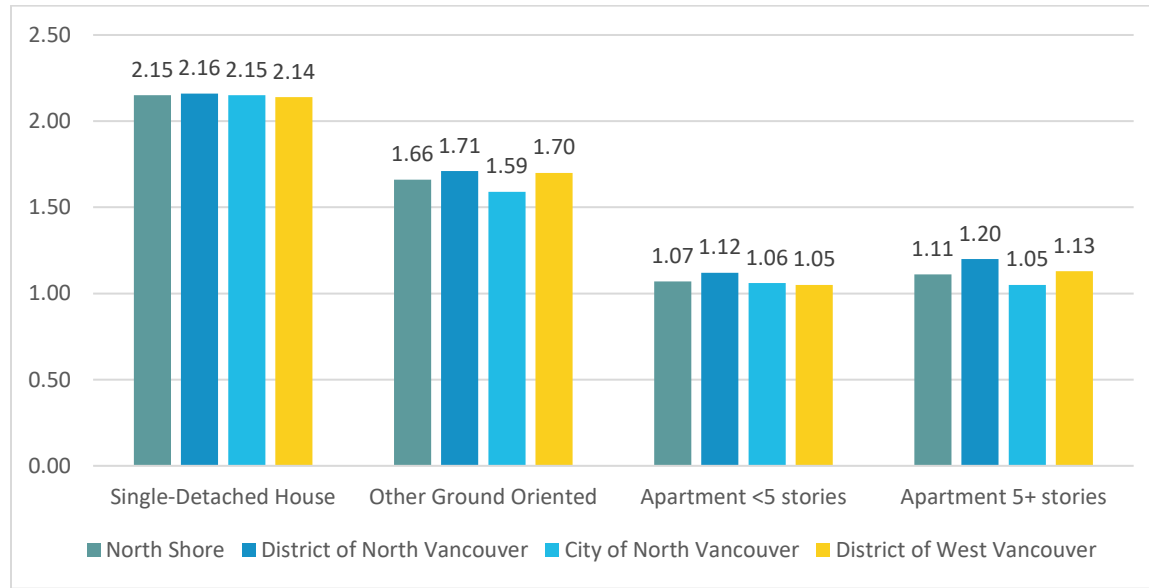
Source: Survey Data

5.8.3   Vehicle Fuel Type

Table 42 shows the fuel type for vehicles that survey participants regularly drive by municipality. Gasoline vehicles are the majority (79% DNV, 89%, CNV, and 77% DWV). Diesel vehicles are slightly more common among DWV residents (4%) than DNV and CNV residents (2% and 1% respectively).

Table 42. Vehicle Fuel Types by Municipality (Usual Vehicle Driven)

Vehicle Fuel Type	North Shore	District of North Vancouver	City of North Vancouver	District of West Vancouver
Gasoline	81%	79%	89%	77%
Diesel	2%	2%	1%	4%
Hybrid	7%	9%	5%	7%
Electric	8%	9%	4%	13%
Other	0%	1%	0%	0%
Unknown	1%	1%	1%	0%

Source: Survey Data

Table 43 shows that electric vehicle ownership is on the rise. In 2019, 8% of North Shore residents owned hybrids or electric vehicles; in 2021, that percentage increased to 13% and in 2023 it has increased again to 15% (an 88% increase from 2019). The most notable increase in hybrid or EV ownership was seen in DWV where an increase of 13 percentage points has been observed since 2019. DWV is also the region with the highest overall hybrid or EV ownership at 20%, compared to 8% in CNV and 18% in DNV. The rise in ownership of hybrid and EV vehicles likely reflects provincial programs that incentivize the purchase of such vehicles, including improvements to EV infrastructure; like access to charging stations; concurrent with rising gas prices and shifts in EVs desirability for vehicle purchasers.

*Table 43. Increase in Hybrid and Electric Vehicles, 2019 to 2023*

	2019	2021	2023	% Pt Change (2023-2019)	% Pt Change (2023-2021)
North Shore					
Hybrid	4%	6%	7%	+3%	+1%
Electric	4%	7%	8%	+4%	+1%
Subtotal Hybrid + Electric	8%	13%	15%	+7%	+2%
DNV					
Hybrid	7%	5%	9%	+2%	+4%
Electric	5%	3%	9%	+4%	+6%
Subtotal Hybrid + Electric	12%	7%	18%	+6%	+9%
CNV					
Hybrid	5%	7%	5%	+0%	-2%
Electric	3%	5%	4%	+1%	-1%
Subtotal Hybrid + Electric	7%	12%	9%	+2%	-3%
DWV					
Hybrid	4%	4%	7%	+3%	+3%
Electric	3%	12%	13%	+10%	+1%
Subtotal Hybrid + Electric	7%	16%	20%	+13%	+4%

Source: Survey Data

5.8.4 Vehicle Types

Figure 64 shows that passenger vehicles are the dominant type of vehicle throughout the North Shore, with approximately 55% ownership, based on the survey results. There is a downtrend of passenger vehicle ownership from 2019 through to 2023 from 60% to 55%. Conversely SUV ownership has been increasing from 32% in 2019 to 37% in 2023. From 2021 to 2023 pick-up truck or van ownership decreased 2 percentage points from 7% in 2021 and 2019 to 5% in 2023.

*Figure 64. Vehicle Types by Municipality (Usual Vehicle Driven)*
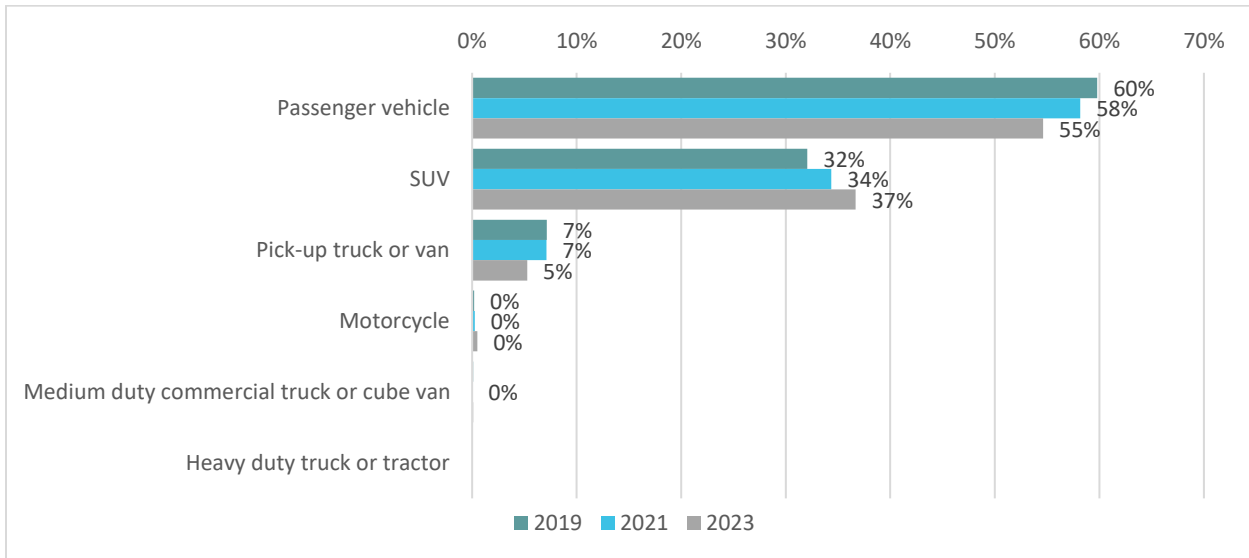
5.8.5   Use of Car Share Services

Figure 65 shows the percentage of survey participants over the age of 15 who had car share memberships (at the time of the survey in fall 2023) by municipality. Currently, the available 'A-to-B' service is Evo, which is primarily available in CNV, with availability in small portions of DNV and DWV. Currently, the available 'A-to-A' service is Modo, which is largely only available in CNV, plus a single car available in Lynn Valley in DNV. Both services are also available in large portions of the City of Vancouver and with pockets of coverage in other Metro Vancouver municipalities. It may be noted that both A-to-A and A-to-B car share services generally become more viable and thus more available as neighbourhoods increase in population density and/or employment density.

CNV had the highest percentage of car share memberships while DWV had the lowest. Overall, the percentage of residents with at least one car share membership has remained relatively stable for CNV and DWV residents. Car share memberships for CNV residents increased from 25% to 27% and DWV residents increased from 6% to 7% from 2021 to 2023. Car share membership has increased slightly in DNV, from 11% in 2021 to 15% in 2023.

Examination of the survey responses on modes of transportation used on their reported travel day, about 0.2% of automobile trips made by survey participants were via car share automobiles.

Figure 65. Membership in Car Share Services by Municipality
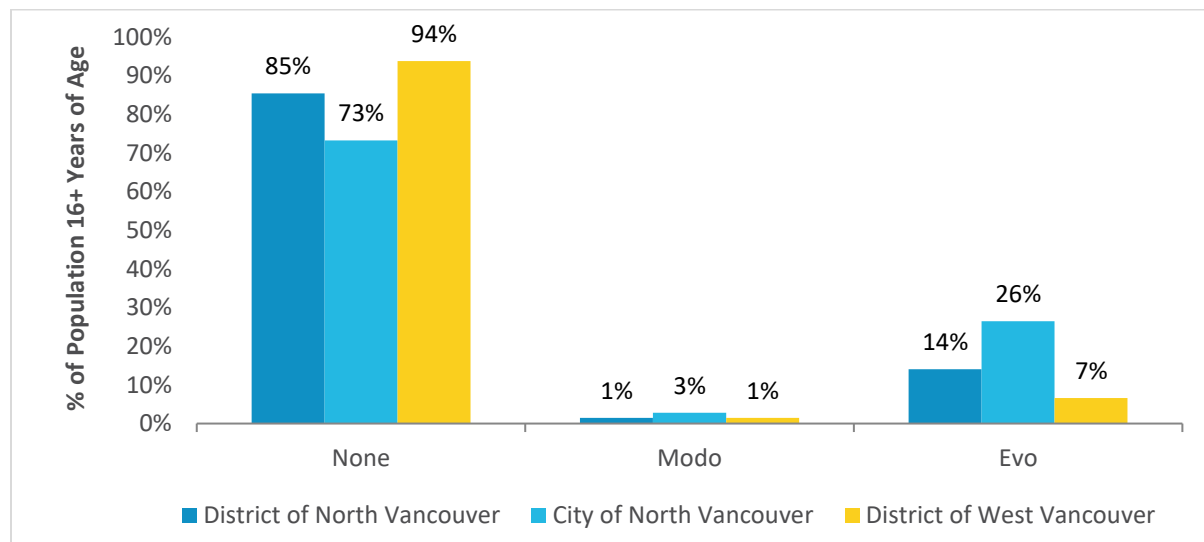
Source: Survey Data

Appendix A: Survey Invitation Letter

Occupant
Street Address
City Province Postal Code

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

Hello North Shore resident,

You have been randomly selected to participate in the **North Shore Transportation Survey**, as part of the Integrated North Shore Transportation Planning Project (INSTPP). This biennial survey helps the City of North Vancouver, District of North Vancouver, and District of West Vancouver better understand residents' travel patterns and behaviours, to better address transportation issues in our community.

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 1-855-522-2887.

B.C.-based research firm R.A. Malatest & Associates Ltd. will be conducting the survey on behalf of the North Shore municipalities. 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.

The survey is anticipated to take 20-25 minutes to participate. As a thank you for your time and participation, you will have a 1-in-30 chance to win one of 65 prizes ranging from $25 to $100! Details on the prize draw are available once you access the survey.

We would like to note that TransLink, the regional transportation authority in Metro Vancouver, will also be conducting their own transportation survey during the same time period. This survey is unique from the North Shore Transportation Survey and collects data for regional transportation and land-use planning purposes. Residents are welcome and encouraged to participate in both surveys if also contacted by TransLink.

If you have questions, please contact NSTS@cnv.org and one of the project representatives will get back to you shortly.

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

You can see how this information will be used in our previous 2021 survey report here: https://www.cnv.org/Streets-Transportation/Transportation-Planning/North-Shore-Transportation-Survey

Sincerely,

Mac Fitzgerald
Transportation Planner
District of North Vancouver

Cindy Liu, M.Eng., P.Eng.
Transportation Engineer
District of West Vancouver

Blair Underhill, RPP MCIP
Senior Planner
City of North Vancouver

North Shore Transportation Survey

The City of North Vancouver and Districts of North Vancouver and West Vancouver are collecting information on the travel patterns of approximately 1,900 North Shore households. This information will provide city officials with a better picture of tra patterns in the region and will assist in the planning of improved transportation services.

What kinds of questions does the survey ask?

Survey participants will be asked three different types of questions:

Resident information
Age and gender
Licensed to drive?
Occupation
Place of work, school

Household information
Type of dwelling
Number of householders
Number of vehicles available for personal use, and type of fuel
Number of bicycles

Trip information
Departure and Arrival time
Purpose
Origin and destination
Mode(s) of travel (car, transit, etc.)
Transit: access, route(s)

Questions are asked about trips made during the previous weekday's 24-hour period. There are also a few questions about transportation issues and your usual travel choices.

All survey answers will remain confidential. Answers will be aggregated for analysis and reporting.

How do I take the survey?

You can participate in two different ways:

Go to **northshoretrips.ca** to access our secure website. Login using the access code provided on the first page of this letter. If you begin the survey online and require assistance, we provide phone-in support at: 1-855-412-1940 (9 AM - 9 PM weekdays, 10 AM - 6 PM on Saturdays and 12 PM - 8 PM on Sundays).

Give us a call at **1-855-522-2887** during the calling hours listed above and one of our professional interviewers will be happy to conduct the survey with you over the telephone.

Where can I go to learn more?

www.northshoretrips.ca

info@northshoretrips.ca

1-855-522-2887 (toll free)

How long does it take?
Transportation surveys can take 10-20 minutes to fill out.

As a thank you to participants, Malatest & Associates is offering a **prize draw** for a chance to win **$25 and $100 gift certificates** for local merchants. Odds of winning a prize are about 1 in 30.

To complete the survey in another language call

نظرسنجی را به زبان فارسی انجام دهید, لطفا با دفتر ما تماس بگیرید.

如需國語(普通話)或粵語(廣東話)來完成本次調查, 請致電

如需国语(普通话)或粤语(广东话)来完成本次调查, 请致电

한국어 설문지를 원하시면 다음 번호로 연락하십시오

1-855-522-2887 (toll-free)

Confidentiality of the information collected is protected under the Freedom of Information and Protection of Privacy Act.
*For more on how your data is protected, visit **www.northshoretrips.ca** and look for the Privacy Statement link at the bottom of the page.*