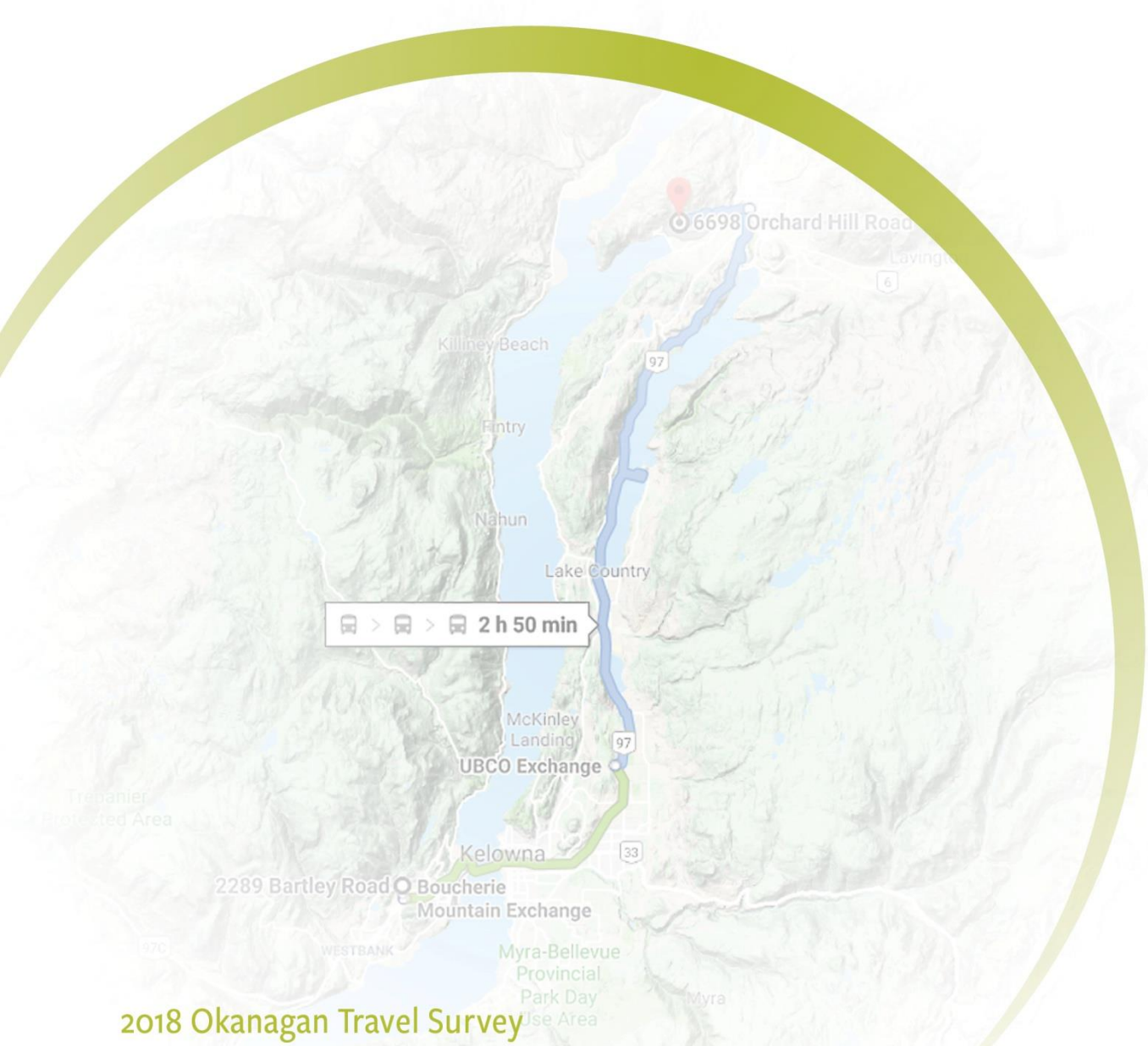
malatest

2018 Okanagan Travel Survey

Report 3: Analysis of Survey Results & Trends

February 2020

smartTRIPS OKANAGAN TRAVEL SURVEY



2018 Okanagan Travel Survey

Report 3: Analysis of Survey Results & Trends

Prepared for:
City of Kelowna
City of Vernon
City of West Kelowna
Westbank First Nation
District of Lake Country
District of Peachland
Regional District of Central Okanagan
BC Ministry of Transportation and Infrastructure

February 2020

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Survey Highlights

2018 Okanagan Travel Survey

The 2018 Okanagan Travel Survey was conducted between late October and mid December of 2018. It is the third such survey, with previous surveys having been conducted in 2007 and 2013. The survey was completed with 4,886 households, representing a 4.8% sample of households in Vernon, Kelowna and the rest of the Central Okanagan. The survey gathered information on household and demographic characteristics relevant to understanding travel patterns. The survey also captured detailed trip information for residents aged 5+ years that provides a snapshot of the 24-hour travel patterns of residents of the study area over the course of a typical fall weekday.

Major Trends since the 2007 Baseline Survey

It has been eleven years since the baseline 2007 Okanagan Travel Survey. In this time, the following trends can be observed:

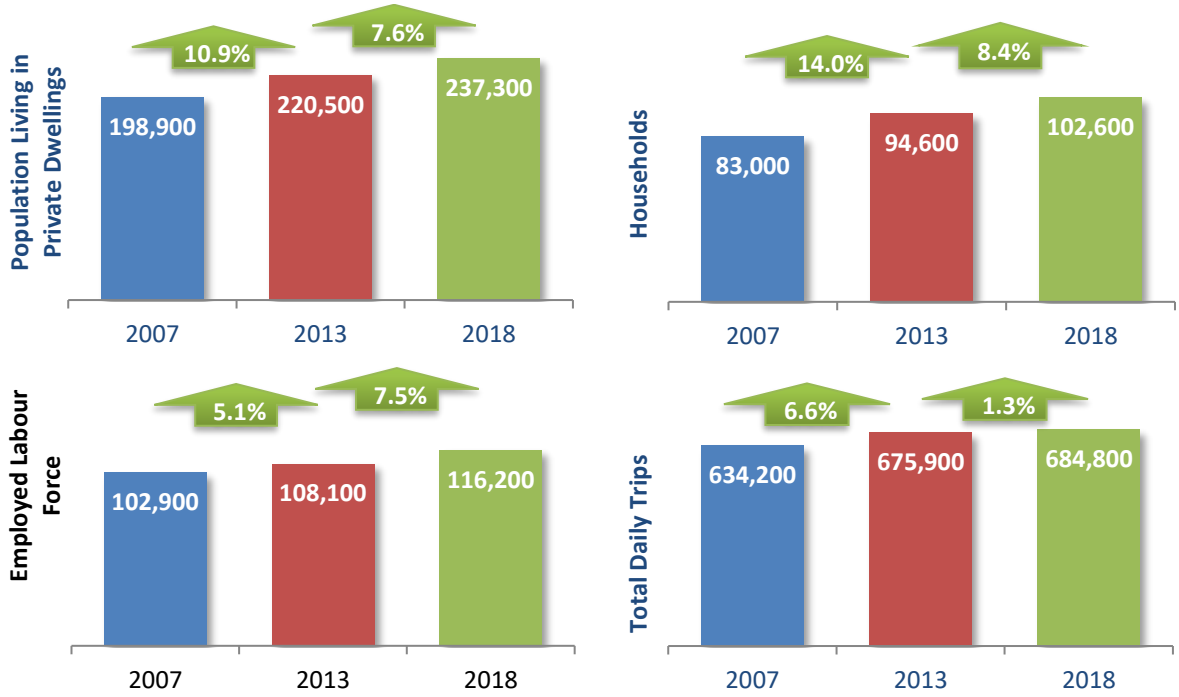
- a 24% increase in households,
- a 19% increase in population (with average household size decreasing from 2.40 to 2.31 persons),
- a 16% increase in vehicles,
- a 17% increase in bicycles,
- a 14% increase in the employed labour force,
- a 40% increase in retirees,
- only an 8% increase in trips made by household members aged 5+ years, but with
- an 18% increase in the estimated cumulative straight-line distance of all trips, and
- a 13% increase in the estimated cumulative straight-line distance of vehicle driver trips.

It may be noted that the 8% growth in trips is not even across the survey area. Kelowna witnessed a 10% increase in total trips across eleven years, compared to a 1% decrease in Vernon, and a 10% increase in the rest of the Central Okanagan. The greater increases in the total distances (18%) and vehicle distances (13%) travelled suggests that while there may be fewer reported trips per person, with those trips being longer, the pressure on the region's transportation systems is still significant.

The survey results suggest a diminishment in trip rates in recent years, from 3.37 daily trips per person on average in 2007 to 3.02 in 2018. This trend may be the result of a number of factors including the aging population, slow growth in the size of the workforce, and/or changing travel habits that may be related to societal shifts in work arrangements, leisure, entertainment, and/or shopping patterns. A closer look at trip rates by age group revealed that population aged 35 to 49 has the highest trip rates (3.73-3.79 daily trips), likely related to both work and family responsibilities. A gender-based analysis also revealed that women have higher trip rates than men (3.16 vs. 2.87 daily trips) and a slightly different profile of trip volumes throughout the day.

The charts that follow illustrate the trends in population, households, workers, and trips by survey cycle. In comparison to the growth in population illustrated, the average population increase in Canada was 5.9% from 2006 to 2011 and 5.0% from 2011 to 2016.

Population and Households, 2007-2018



Vernon, Kelowna, and the Rest of the Central Okanagan

The analysis of the 2018 Okanagan Travel Survey looks at three sub-areas: Kelowna, with 55% of the population, the rest of the Central Okanagan (28%), and Vernon (17%). The household, demographic, and employment characteristics of these areas differ, which, along with their geographies, have an impact on the travel patterns. The table below summarizes some key characteristics which may provide some perspectives on the differences between these areas.

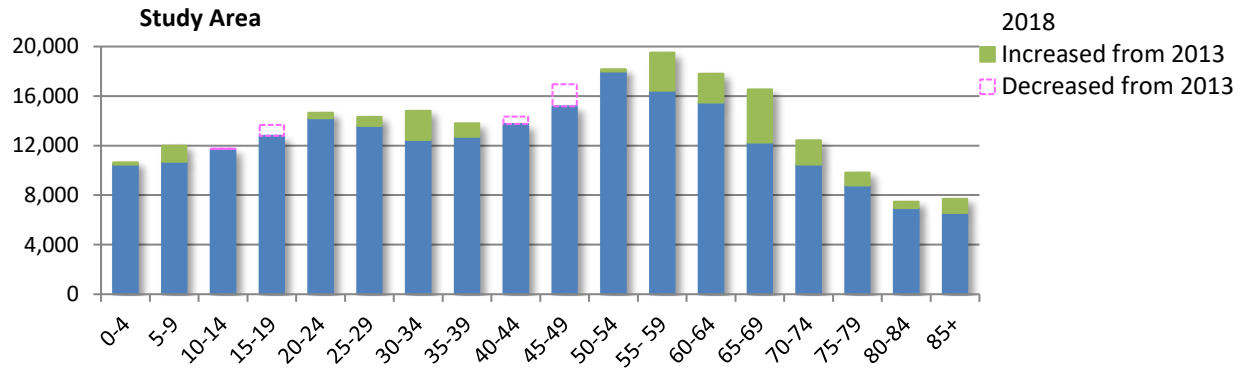
	Vernon	Kelowna	Other Central Okanagan
Households	18,500	56,500	27,600
Population	40,200	129,800	67,200
Household Size	33% 1-person	29% 1-person	21% 1-person
	40% 2-person	39% 2-person	45% 2-person
	27% 3+persons	32% 3+ persons	34% 3+ persons
Dwelling Types	50% house	46% house	66% house
	24% apartment or condo	30% apartment or condo	9% apartment or condo
	26% other	24% other	25% other
Household Income	21% under $30,000	14% under $30,000	10% under $30,000
	36% over $80,000	41% over $80,000	42% over $80,000
Average Age	45.1 (up from 43.8 in 2007)	42.3 (up from 41.9 in 2007)	44.2 (up from 42.4 in 2007)
	26% 65+	20% 65+	23% 65+
School & Work	18% students	21% students	19% students
	44% workers	51% employed	47% employed
	29% retirees	23% retirees	26% retirees

Note: some students are also workers

Aging Population

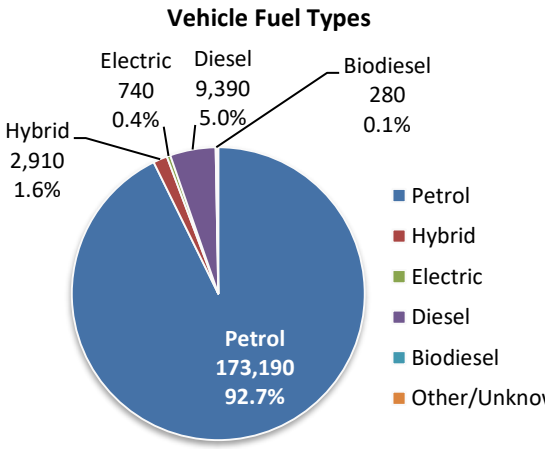
The chart below illustrates the age profile of the study area. As illustrated, there is a larger population 'hump' in age groups between 50 years and 70 years. Much of the 7.6% population growth between 2013 and 2018 has been associated with increases in the number of people in older age groups (whether via the aging of the population or migration of older people to the Okanagan for retirement). Of note is the net loss in the number of people 15-19 years of age and only slight growth in those 20-24 years, as well as the net losses in those between 40 and 49 years. As transportation mode choices and travel purposes vary as people age, the changing age profile has implications for travel patterns.

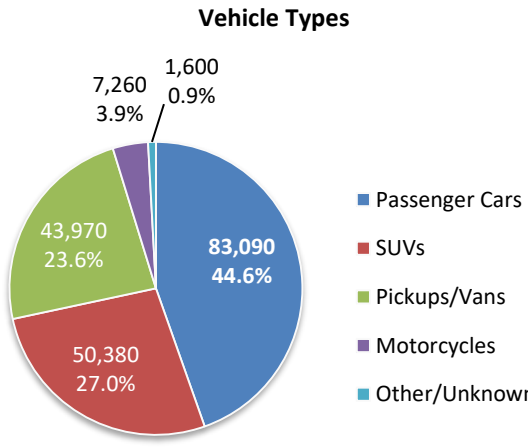
Population Distribution by Age, with Change from 2013-2018



Transportation Options

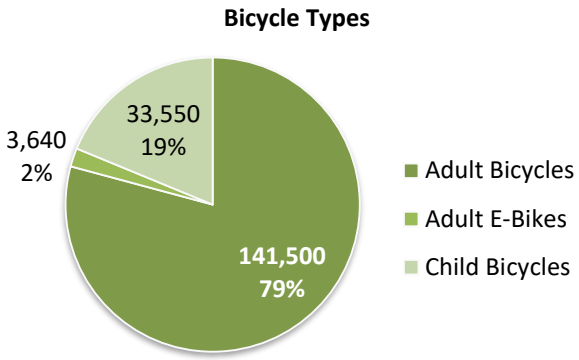
Vehicles. Residents of the study area own or have access to 186,800 household vehicles. Overall, 97% of households have at least one vehicle. This proportion is lower amongst those living in apartments or condominiums, at 89%. About 7% of all vehicles use alternative fuels, with 1.6% being hybrids and 0.4% electric. This is the first survey year the question about alternative fuel types has been asked, and will serve as a good baseline against which to measure changes in the household vehicle fleet over time.





Drivers. There are 186,500 licensed drivers in the study area. The percentage of the population aged 16+ years with a driver's licence has increased over the last eleven years, from 81% in 2007 to 85% in 2018. This follows an earlier decline in the licensed drivers in the early 2000's documented in other studies (suggesting that more young people may have delayed getting their licence, but do so eventually).

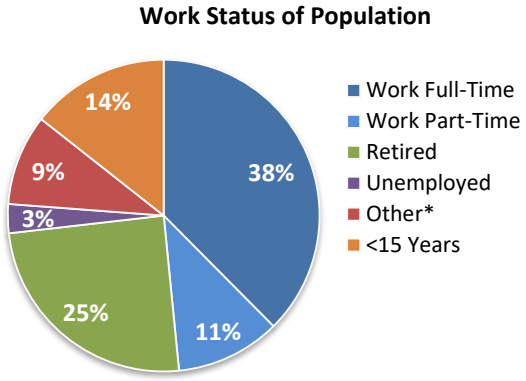
Bicycles. Residents of the study area own 178,800 working bicycles, of which 19% are children's bicycles (compared to 15% of the population being under 15 years of age). The rate of bicycle ownership over the past 11 years has stayed relatively flat at 0.75 bicycles per person. The survey results suggest that each day (in the late fall period of the survey, from late October to mid December), about 5% of people 5+ years of age, or approximately 11,000 people, make one or more cycling trips. Of note, the survey results also indicate that while the female population accounts for 54% of all trips by all modes, they make only 32% of bicycle trips.



Mobility Challenges. Overall, 2.7% of the population (about 15,300 people) use mobility aids to get around, with another 3.5% reporting limitations to their mobility but not using an aid. For those 65-74 years of age the proportion using mobility aids is 10.9%, and for those 75 years or older, it is 24.9%. In the eleven years since the 2007 baseline survey, the percentage of the population using mobility aids has increased somewhat, from 2.2% to 2.7%, particularly in the Vernon area (currently at 3.6% of total population). As the 50-69 year hump in population ages forward, and as the Okanagan attracts more retirees, accommodation of mobility limitations may become more important as well.

Employment and Student Status

Across the study area, there are 89,100 full time and 25,800 part-time workers, for a total of 114,900 workers, representing approximately half of the total population. There are also 58,700 retirees, a 40% increase in the eleven years since 2007, representing 25% of the total population.



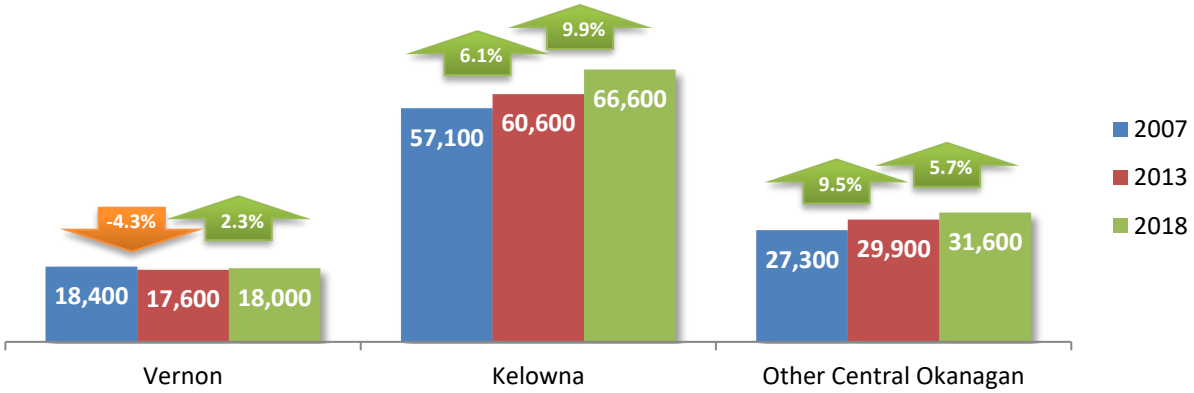
In total there are also 28,200 K-12 students and 16,300 post-secondary students. In the past five years, Kelowna has seen a 9% increase in K-12 students, whereas Vernon and the Other Central Okanagan sub-area have seen drops of 8% and almost 5% respectively.

In the same five-year period since 2013, enrolment at the three public post-secondary campuses has risen 29% (although it may be noted that the survey does not represent the portion of those students who live on campus or outside the study area). Post-secondary students are important

transit users. Approximately 31% of trips to post-secondary school are via transit, and the transit mode share is highest amongst 20-24 year olds, at 13% of all trips made.

The employed labour force has grown most in Kelowna, particularly in the last five years, whereas growth has been more modest in the rest of the Central Okanagan, and relatively flat in Vernon. This has implications for the share of trips which are work commutes.

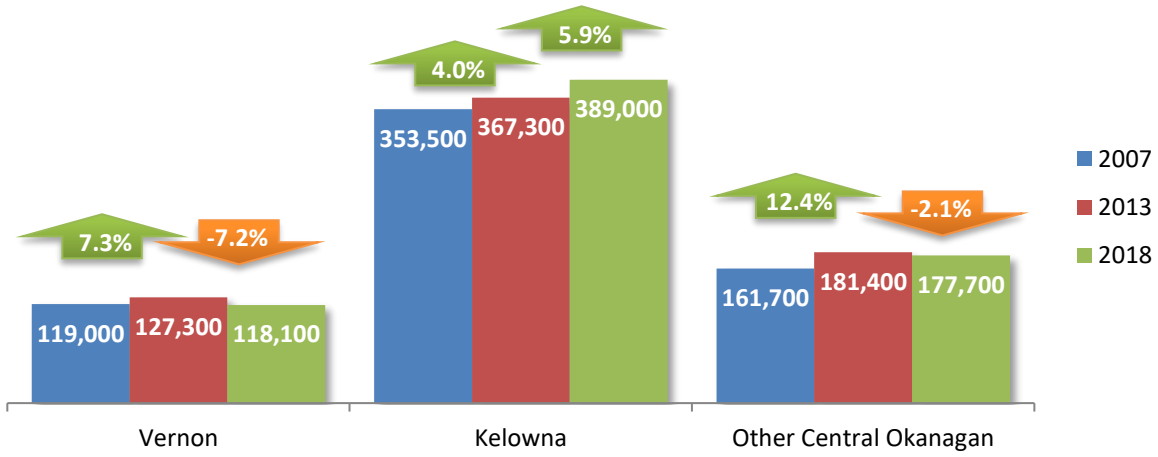
Employed Labour Force by Sub-Area 2007-2018



Trip Volumes

Each weekday, residents of the study area make approximately 684,800 trips, an increase of 8% over eleven years compared to a 19% increase in population. The change in the number of trips since the baseline survey has varied by survey cycle and varies by community. The variations by sub-area are consistent with the different trends in the communities in terms of aging population, changes in the labour force, and the proportion of households with children. Shifts in work arrangements, leisure, entertainment, and/or shopping patterns may also influence this trend.

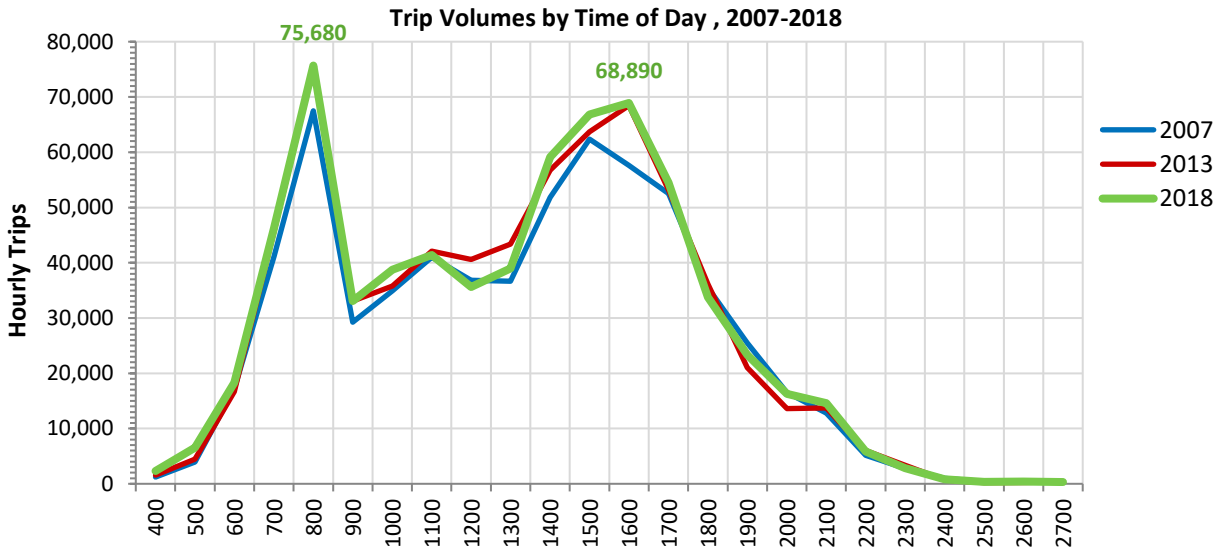
Total Daily Trips by Sub-Area 2007-2018

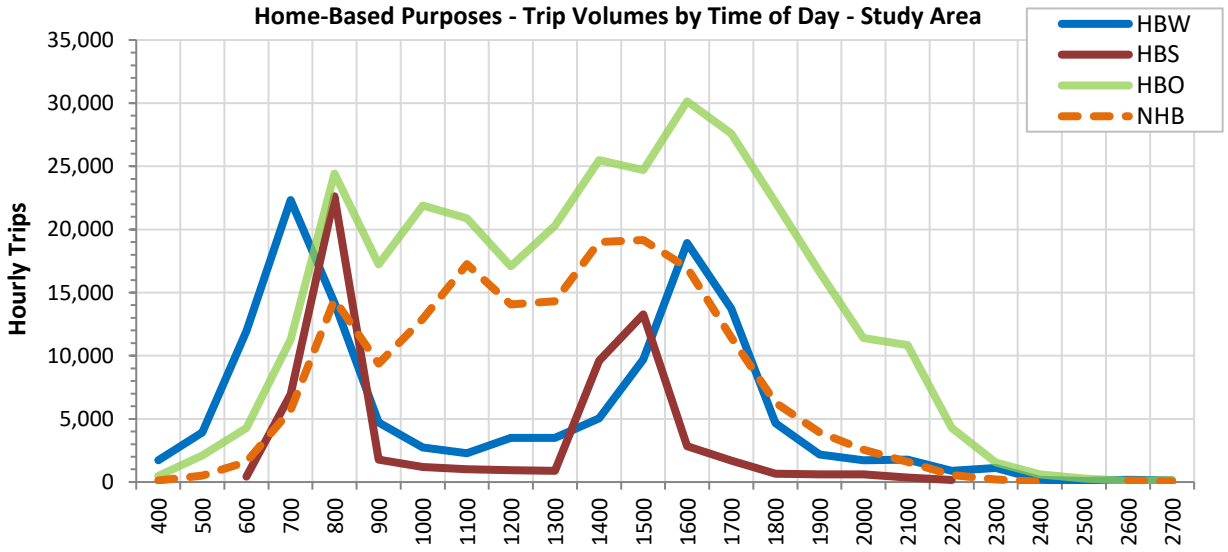


Trip Volumes by Time of Day

Looking at the volume of trips by time of day reveals that the peak hour is at 8 AM, a pattern which has been consistent, with a modest increase, since 2007. The PM Peak period has experienced some spreading since 2007, and covers a four-hour period from 2 PM to 6 PM. The afternoon peak spreading is consistent with the higher growth in older people than in workers.

Breaking down the trip volumes by overall purpose reveals that home-based work (HBW) and school (HBS) commutes dominate the AM Peak (where a 'home-based' trip is either from home or a return home). The work trip peak is at 7 AM and the school trip peak at 8 AM, with a number of home-based other (HBO) passenger drop-off trips in this period as well. Home-based other (HBO) trips dominate the rest of the day, peaking at 4PM, the same time as the afternoon HBW peak.

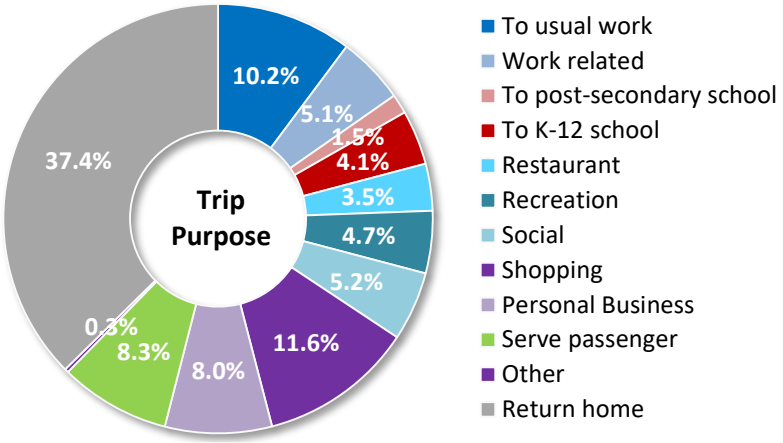




The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).
HBW = home-based work/work-related. HBS = home-based school (K-12 or PSE). HBO = home-based other. NHB = non-home-based.

Destination Activity

Approximately one in ten trips is to work, while another one in twenty is to a work-related activity, for about 15% overall. K-12 and post-secondary school commutes together make up a little under 6% of all trips. Another 8% are 'serve-passenger' trips, a good portion of which may be pick-up and drop-off trips for children's school commutes and recreational/social activities.

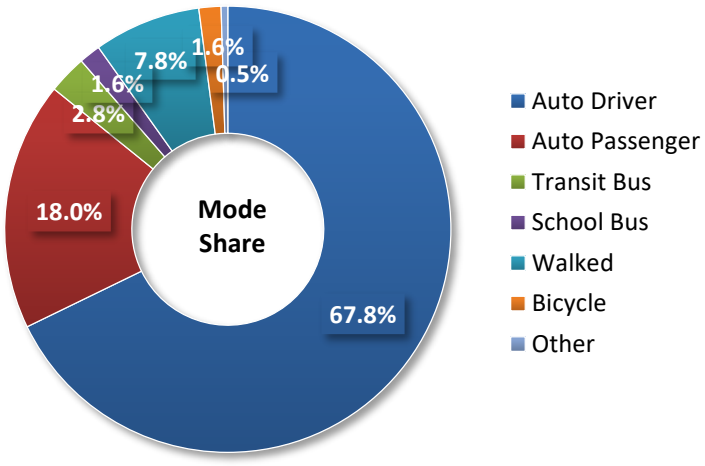


Non-commute purposes are substantial: trips for shopping make up almost 12%, personal business comprises another 8%, and leisure purposes (recreational, social and restaurant trips) combined make up another 18% of all trips. Of the total daily trips, 37% of trips are returning home from commutes or other of the activities noted.

By sub-area, Vernon residents have proportionately fewer work, work-related, school, and restaurant trips and more social, shopping, and personal business trips, which is consistent with the older demographics of this community. Kelowna, on the other hand has proportionately more work and school related trips. The Other Central Okanagan area has the greatest percentage of work-related trips, which may reflect the overall profile of jobs held by these residents (with more workers reporting not having a fixed workplace address).

Transportation Modes

Mode Share. Automobile trips dominate: 67.8% of all trips are made as auto drivers, and 18.0% as auto passengers. Transit mode share is modest, accounting for 2.8% of all trips, while cycling and walking account for 1.6% and 7.8%, respectively.



The Other Central Okanagan sub-area has the highest driving mode share (72.5%), Vernon had the highest walk share (9.9%), and Kelowna has the highest transit (3.4%) and cycling shares (2.2%).

Looking across the eleven years since the 2007 baseline reveals the following trends in mode shares:

- a 2.6%-pt decrease in auto driver mode share,
- a 1.4%-pt increase in transit mode share (doubling this mode share),
- a 2.3%-pt increase in walking trips,
- a 0.7%-pt decrease in school bus trips, and

- a 0.3%-pt decrease in bicycle trips since 2007. As the 2018 survey was conducted at a different time (late fall) than the 2007 survey (mid spring) and the 2013 survey (early fall), this result is difficult to assess. Closer review of the data suggests that with colder weather some travellers may choose to walk instead of cycle (particularly children 5-19 years of age). Also encouraging is the fact that bicycle ownership per capita has remained relatively steady.

Sustainable Mode Share. Combined, sustainable modes (transit, school bus, walking, and cycling) comprise a 13.7% mode share, which is a 2.7%-pt increase from 11.0% in 2007.

Active Mode Share. Looking at just active modes (walking and cycling) reveals that, combined, the active modes comprise a 9.4% mode share (up 2.0%-pts from 7.3% in 2007).

Impact of Survey Timing on Mode Share. While the past 11 years shows a net positive growth in both sustainable and active mode shares, the survey data suggest that most of the growth was between 2007 and 2013, with a slight decline in the last five years to 2018. However, it should be noted that the 2013 survey was conducted in the early fall (September 23 to November 30) while the 2018 survey period was a month later (October 24 to December 21), with the weather likely affecting mode shares. Methodological differences and sampling errors associated with surveying a random sample of the population may also affect the fluctuations from survey cycle to survey cycle.

Transit Trips. Residents of the study area make approximately 19,100 transit trips each day, with 23,800 boardings (23% of transit trips entail at least one transfer). This is more than double the 7,500 trips and 8,100 boardings observed in the 2007 baseline survey. In 2018, approximately one-tenth of trips involved driving (Park and Ride, 4%) or being driven (Kiss and Ride, 6%) to or from one of the transit stops, while 1% involved cycling.

Vehicle Occupancy. Average vehicle occupancy is 1.35 people (including the driver), with almost three-quarters (73%) of all vehicle trips being in single-occupant vehicles (SOVs). The vehicle occupancy rate and single-occupancy proportion is almost universal across the three survey sub-areas, and similar to that in previous survey cycles.

Sustainable Mode Choice. The great majority (70%) of residents who depart on a trip from home via a sustainable mode (transit bus, walking, cycling) make the choice to do so rather than drive. The people who make the other 30% of sustainable-mode journeys leaving home did not have access to a household vehicle or have no vehicles. These journeys may therefore be considered dependent on the sustainable mode. This dependence varies by mode: 62% who use transit are reliant on this mode, compared to 20% of those who walked, and 26% of those who travelled via bicycle. The high reliance amongst transit users underscores both the importance of this mode to serve the needs of the population and the challenge of making transit an appealing choice to those with vehicles.

If travelled by a non-auto mode of travel, was a vehicle available for your travel (but you chose not to drive)?	Survey Average	Transit	Walked	Bicycle
Yes, vehicle available	70%	38%	80%	74%
No, not available	30%	62%	20%	26%

Based on trips leaving home via a non-automobile mode made bay persons 16+ years of age.

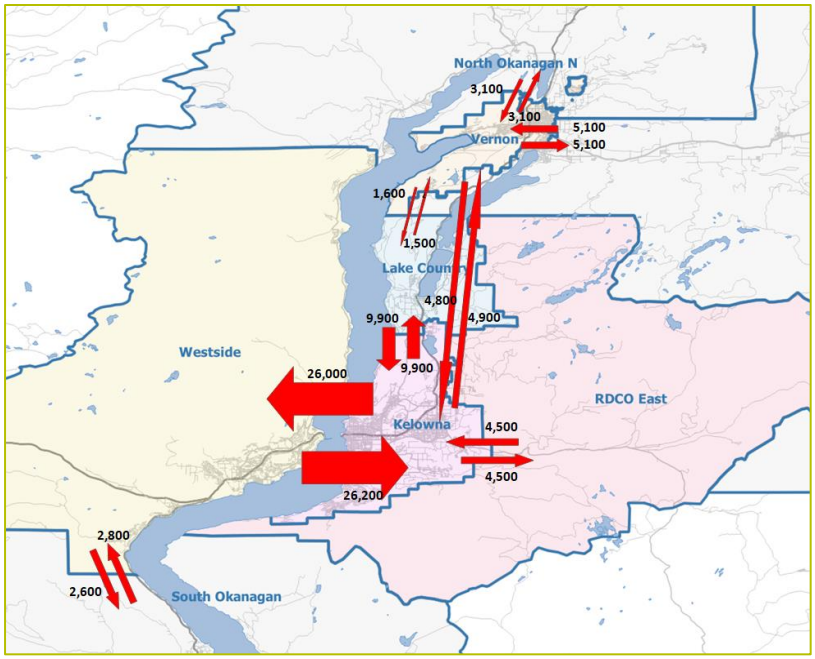
Vehicle Kilometres Travelled

The 2018 survey estimated the actual vehicle kilometers travelled (VKT) for auto driver trips based on the most likely route taken at the time of day of the trip as suggested by Google Maps. The average length of auto driver trips is estimated to be 10.4 km.

- Each household vehicle in the study area averages 25.8 km per day. This average is lowest in Kelowna (21.6 km) and highest in Other Central Okanagan (31.2 km) and Vernon (29.2 km).
- In total, residents of the study area drive about 4.81 million km each weekday for personal trips.
- Across an entire year, this amounts to 1.24 billion km of road travel generated by personal vehicles on weekdays (excludes commercial driving trips and weekend trips).

Inter-Regional Traffic Flows

The map illustrates the 24-hour inter-regional flows within and outside the study area. There is considerable exchange between communities across the study area, but with the bulk between the Westside and Kelowna, with over 26,000 personal trips in each direction with trip ends within these communities. The pattern in the AM Peak period reveals that much of this flow is from the Westside residents to Kelowna destinations, with over 9,500 trips crossing the bridge in this direction during the AM Peak (6 AM to 9 AM), and much of this occurring during the 8 AM peak hour.



The City of Kelowna is a net attractor of trips as the largest hub of jobs, shops and services, particularly in the City Centre/Pandosy and Central Kelowna districts. Examination of work locations reveals that Kelowna accounts for 57% of workers living in the area but accounts for fully 64% of the places of work of study area residents. Within the city, the City Centre/Pandosy and Central districts combined accounting for 19% of workers but 39% of all places of work in the study area.

Internalization of Trips. The survey analysis also looked at 'trip internalization, or the extent to which residents of each district or municipality make trips contained within their home district – a measure of the accessibility of work, school, shopping and other opportunities to the traveller's place of residence. Across the entire study area, 27% of residents' trips are made within the same district their home is located in. Residents of the Vernon City Core / Alexis Park / Harwood / North Vernon fulfill 66% their trip purposes within the set of neighbourhoods that comprise this district. Next highest are Central Kelowna and Kelowna City Centre / Pandosy, at 39% and 42% respectively. Lake Country also has a high degree of internalization at 37%.

Conclusions

Overall, the survey results show a growing region with significant population growth (exceeding the Canadian average) and a significant increase in housing units. The characteristics of households and population are undergoing some changes, with a decrease in household size, an aging population (with possible migration to the region as a retirement destination), and a workforce that is growing at a slower rate than the rest of the population. While vehicle ownership is high (with 97% of households having at least one vehicle), greener fuel types are beginning to emerge (with 2% of household vehicles reported as hybrids or electric vehicles). Bicycle ownership is also high, with 0.75 bicycles per person, even if only about 5% of the population uses their bicycle on a given weekday.

Trips rates have decreased somewhat, the reasons for which may be related to both the aging population and shifts in travel behaviours. As a result the total number of household trips has not grown as fast as population. However, one of the shifts in travel behaviour appears to be an increase in the distance of the trips taken. This has resulted in increases to the cumulative distance travelled on the transportation network, with, across 11 years, a seemingly modest 4% increase in auto driver trips actually resulting in a 13% increase in cumulative daily trip distance across all auto driver trips. Auto driver trips dominate, at a 67.8% mode share, with three-quarters of these trips made as single-occupant vehicles. Auto driver mode shares do, however, appear to be declining slightly (from 68.1% in 2013 and 70.4% in 2007). Encouragingly, the number of transit trips has doubled in the past eleven years, to a 2.8% mode share. Younger adults and post-secondary students appear to make up a significant portion of transit users, with the greatest increases in transit mode share observed amongst those 15-19 years of age.

The overall increases since 2007 in sustainable mode share, and within this, active mode share can be looked upon positively (especially considering that the active mode shares reported were likely dampened by colder weather in the period of the 2018 survey cycle). This finding is tempered somewhat by the fact that survey results suggest that much of this increase was in the earlier period from 2007 to 2013, and there may even have been a slight decline in sustainable modes in the later period from 2013 to 2018. The shorter-term survey cycle to survey cycle trends are difficult to assess as comparisons may be affected by survey timing, random sampling error, and/or methodological differences (with a comparison against historical transit ridership data suggesting that the 2013 results possibly over-state transit mode share). The aging of the population may also be a factor in the changes from 2013 to 2018, with the greater population increase being amongst older age groups having greater automobile ownership and the highest auto mode shares. Nevertheless, the net changes since 2007 are positive ones.

The information presented in this highlights section is explored in greater depth in the body of this report, including more of the survey results broken out for the Vernon, Kelowna, and Other Central Okanagan sub-areas.

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This project would not be possible without the contributions of over 4,800 participating households that responded to this survey, via phone interview or online, and told us about their daily travel. We thank you for your participation in the region's third household travel survey; you have contributed to transportation planning data that will be useful for years to come.

1 Project Overview

1.1 Project Background

The 2018 Okanagan Travel Survey (OTS) is an initiative of the City of Kelowna, City of Vernon, Regional District of Central Okanagan, West Kelowna, Lake Country, Peachland and Westbank First Nation, as well as the BC Ministry of Transportation and Infrastructure. The survey was undertaken with the support of the smartTRIPS program, an initiative of the Sustainable Transportation Partnership of the Central Okanagan (STPCO).

The OTS uses a household travel survey methodology and is carried out every five years in the Central Okanagan and City of Vernon area. The household travel survey model collects information about daily travel for each member of the household's (5 years of age or older) travel on the previous day. The previous data collection cycles of the Okanagan Travel Survey took place in 2007 and 2013. The survey data collected helps provide local municipalities and regional planners with information critical for making data-based decisions on improvements to transportation infrastructure and services as well as transportation planning and investment decisions.

The Regional District of Central Okanagan, West Kelowna, Lake Country, Peachland and Westbank First Nation, as well as the BC Ministry of Transportation and Infrastructure are responsible for collecting, analysing and distributing data that helps inform decision-makers with regard to transportation systems, planning and infrastructure. Transportation research and origin-destination studies can help to track growth trends in communities. An important input to forecasting models is a profile of residents' travel behaviour, and how this changes over time. Origin-destination (O-D) surveys are commonly used by municipalities and urban areas around the world to develop these types of transportation profiles.

Similar to the goals of the 2007 and 2013 Okanagan Travel Surveys, the 2018 OTS data collected forms a database of resident travel behaviours that can be used as a basis for policy development and transportation planning across the Central Okanagan and The City of Vernon. The 2018 OTS also supports the broader goals of monitoring regional travel patterns in the area, and the development of a regional transportation demand model for the region.

1.2 2018 Okanagan Travel Survey

The 2018 OTS was conducted between late October and mid December of 2018. The survey was a 24-hour recall household travel survey that captured household characteristics, the demographics of all household members, and the details of travel undertaken by household members 5+ years of age on the most recent previous weekday. Respondents could complete the survey online or over the telephone. An address-based sample of households was randomly selected and invited to participate by letter, with some households with matched phone numbers also contacted by phone to target selected areas with low online response rates.

The 2018 survey captured information on 4,886 households, 10,801 people, and 30,299 trips, after data validation and rejection of surveys with data issues. When weighted to compensate for non-response bias and expanded to the population, the survey data represent approximately 237,300 residents of 102,600 households in the study area, for a sampling rate of 4.8% of households or 4.6% of the population living in private residences[1]. The trip data captured by the survey provide a snapshot of 24-hour travel patterns of residents of the study area over the course of a typical fall weekday.

Overall, the household-level survey results are subject to a margin of sampling error of ±1.7% at a 95% confidence level, taking into account the effects of data weighting.[2] The margin of sampling error for results for the three sub-area geographies analyses is ±2.3% for the City of Kelowna, ±3.3% for the rest of the Central Okanagan, and ±4.1% for the City of Vernon.

1.3 Report Organization

This report is one of three that document the survey methodology, dataset, and results. The three reports are:

- *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct*
- *Report 2: 2018 Okanagan Travel Survey – Survey Database*
- *Report 3: 2018 Okanagan Travel Survey – Analysis of Survey Results and Trends*

This report describes the analysis and results of the survey, including comparison to the 2007 and 2013 surveys. For further information regarding the survey methodology, survey administration, or the database, refer to Reports 1 and 2, respectively.

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

Section 2: Survey Conduct
Section 3: Households, Vehicles, and Demographics
Section 4: Travel Patterns and Trends
Section 5: Residents' Views of Transportation Issues in their Community

Two appendices accompany this report, providing survey results by individual district and respondents' opinions as to what they believe are the most important transportation issues facing their communities:

Technical Appendix 1: Reference Tables by Survey Geography
Technical Appendix 2: Respondent Verbatim Comments

[1] Excludes approximately 2.4% of the population living in collective residences (senior's care homes, university residences, group homes, prisons, barracks, etc.) or who are homeless.
[2] 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.

2 Survey Conduct

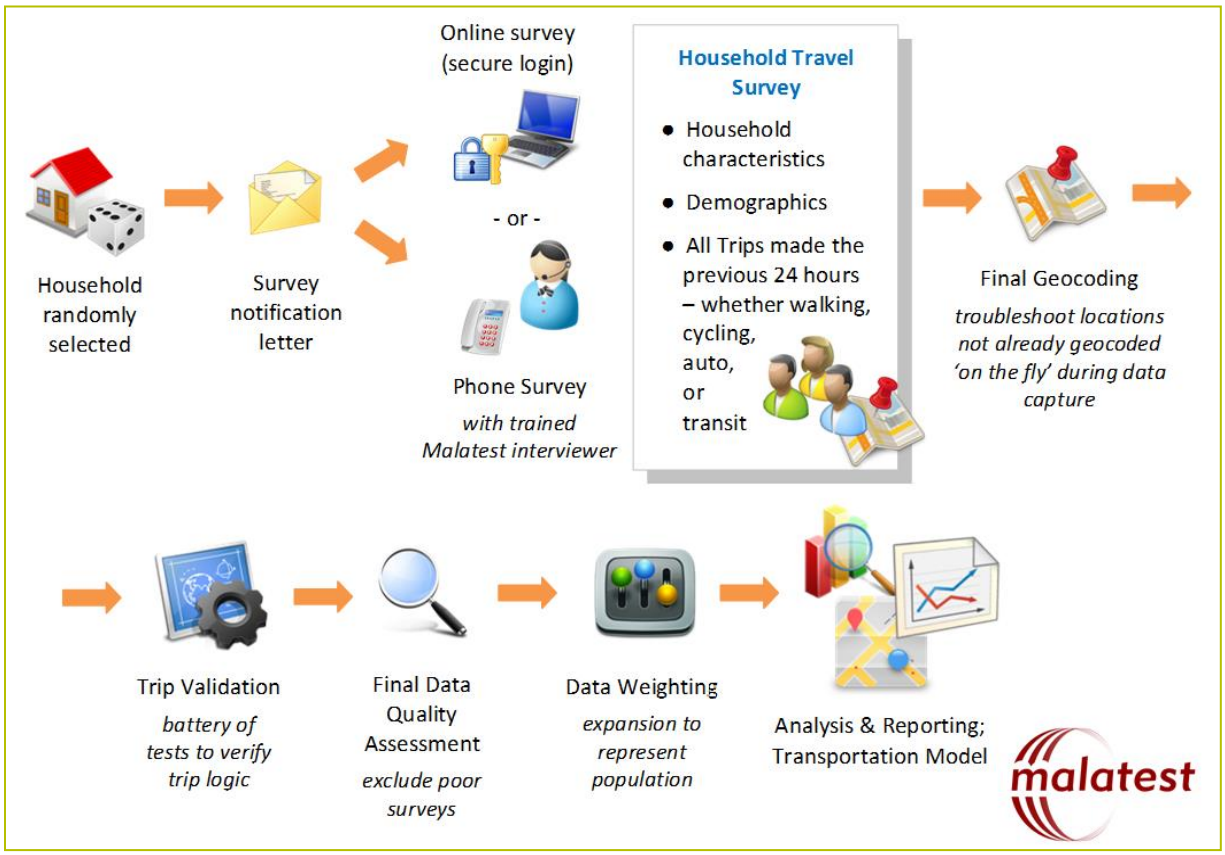
2.1 Overview

The OTS was designed to obtain information on mode shares and travel patterns in the study area. The survey captured information on key household characteristics (number of household members, number of vehicles, dwelling type, income); household residents' demographics, socio-economic characteristics, and places of work and school; and trips taken over the course of 24 hours (from 4:00 a.m. to 3:59 a.m. the next day).

The methodology for this study included the completion of surveys both by telephone and online via a 24-hour recall survey. Respondents were given the option of participating via telephone interview or via an online survey form. Triptelligence™, Malatest's CATI/CAWI (Computer Assisted Telephone/Web Interview) system accommodated both of these survey modes on a single integrated platform.

The diagram below illustrates the general process for the household travel survey. The survey process is summarized in the sections that follow and discussed in further detail in *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct*.

Figure 1. Survey Process Overview



2.2 Survey Geography

The 2018 study area consists of the six communities in the Central Okanagan (City of Kelowna, Regional District of Central Okanagan, West Kelowna, Lake Country, Peachland and Westbank First Nation), the City of Vernon, and the Okanagan Indian Band lands within these bounds (Duck Lake Indian Reserve No. 7, bordering Lake Country and Kelowna, and Priest's Valley Indian Reserve No. 6 bordering Vernon). The daily travel patterns and socioeconomic characteristics of residents of households in the study area were captured through the survey. The Study Area is shown in **Figure 2**.

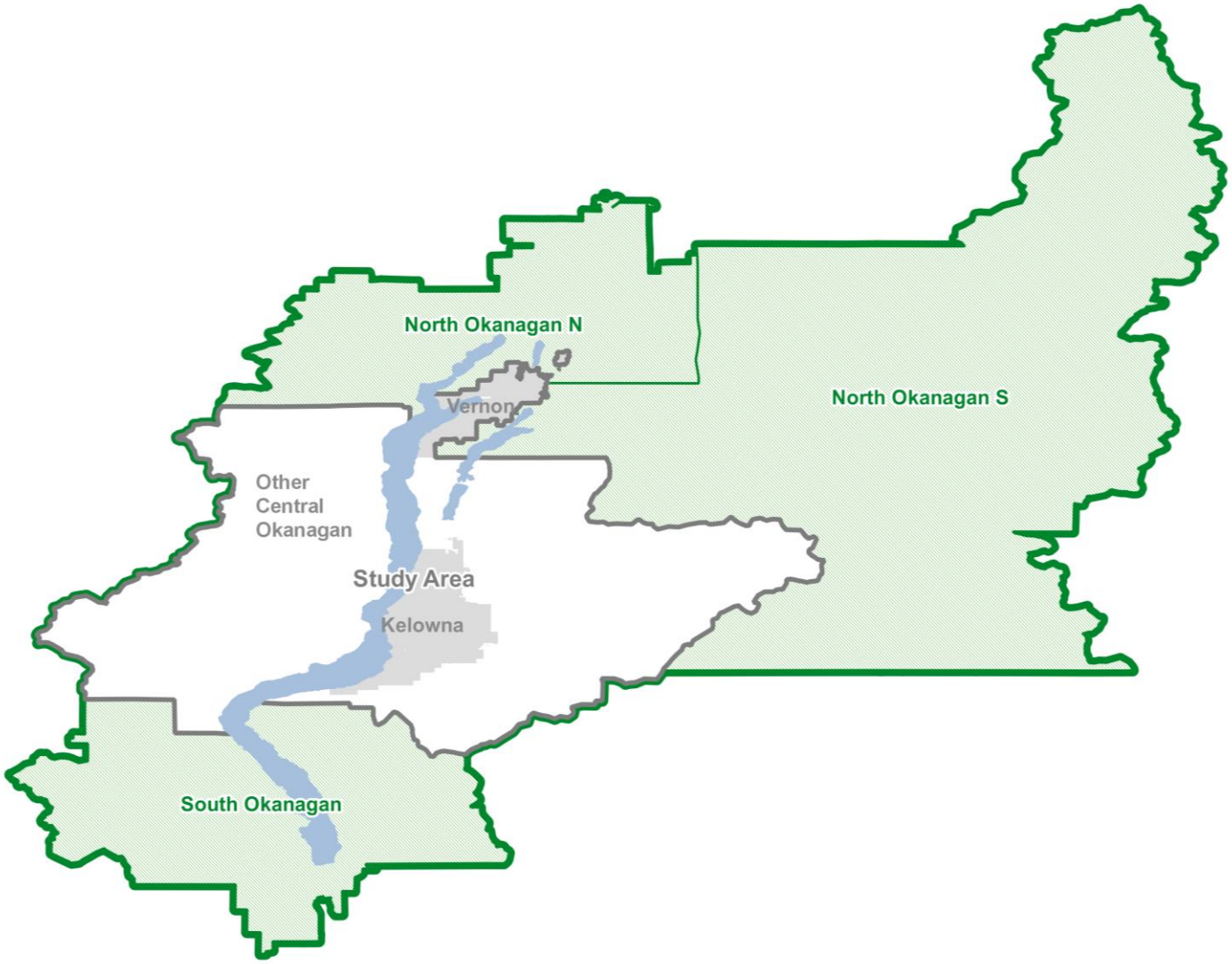
For analysis, most survey results are summarized for three sub-regions: **Vernon, Kelowna,** and **Other Central Okanagan** (comprising all other communities in the Central Okanagan, excluding Kelowna).

For the purposes of defining trips external to the study area, a wider geographical 'Travel Area' was developed (**Figure 3**, following page), so that relatively local trips to, from, and within nearby communities are accounted for, and only trips well beyond the study area bounds are considered true 'external trips'.

Figure 2. Study Area

The Travel Area includes a wider boundary around the study area to encompass parts of the North and South regions of the Okanagan. The Okanagan South travel area includes Summerland and nearby areas in the Okanagan-Similakeen Regional District. To the North, the Travel Area includes two areas outside the study area: North Okanagan South (including Coldstream, Lumby and other areas more likely to approach Vernon from the South or East) and North Okanagan North (including Armstrong, Enderby, and other nearby areas more likely to approach Vernon from the North).[3] The map below shows the external areas and also the three sub-areas in the study area that are the focus of much of the analysis.

Figure 3. Travel Area



[3] It may be noted that a similar approach was taken in the 2013 cycle of the Okanagan Travel Survey, where trips within the local study area as well as beyond to North Okanagan, South Okanagan and some surrounding external areas adjacent to the Okanagan Valley were included in the capture and reporting of trips, although the boundaries differed somewhat.

The travel area is organized into various levels of geography (**Table 1**). 'Municipal sectors' aggregate First Nations communities with municipal boundaries they are located within or adjacent to. In total, 19 sub-municipal 'districts' within these sectors were used for data weighting as well as for selected analyses that illustrate the pattern of results within municipalities and sub-areas. The districts within Kelowna, West Kelowna, and Vernon are mapped in **Figure 4** (following page). It may be noted that the 2013 cycle of the Okanagan Travel Survey did not undertake analysis by the same sub-municipal districts.

Most analysis is undertaken for three 'sub-areas' which are easily identifiable from the municipal sectors below: **Vernon** ('Vernon+' municipal sector), **Kelowna** ('Kelowna+' sector), and **Other Central Okanagan** (aggregating all other sectors within the Central Okanagan).

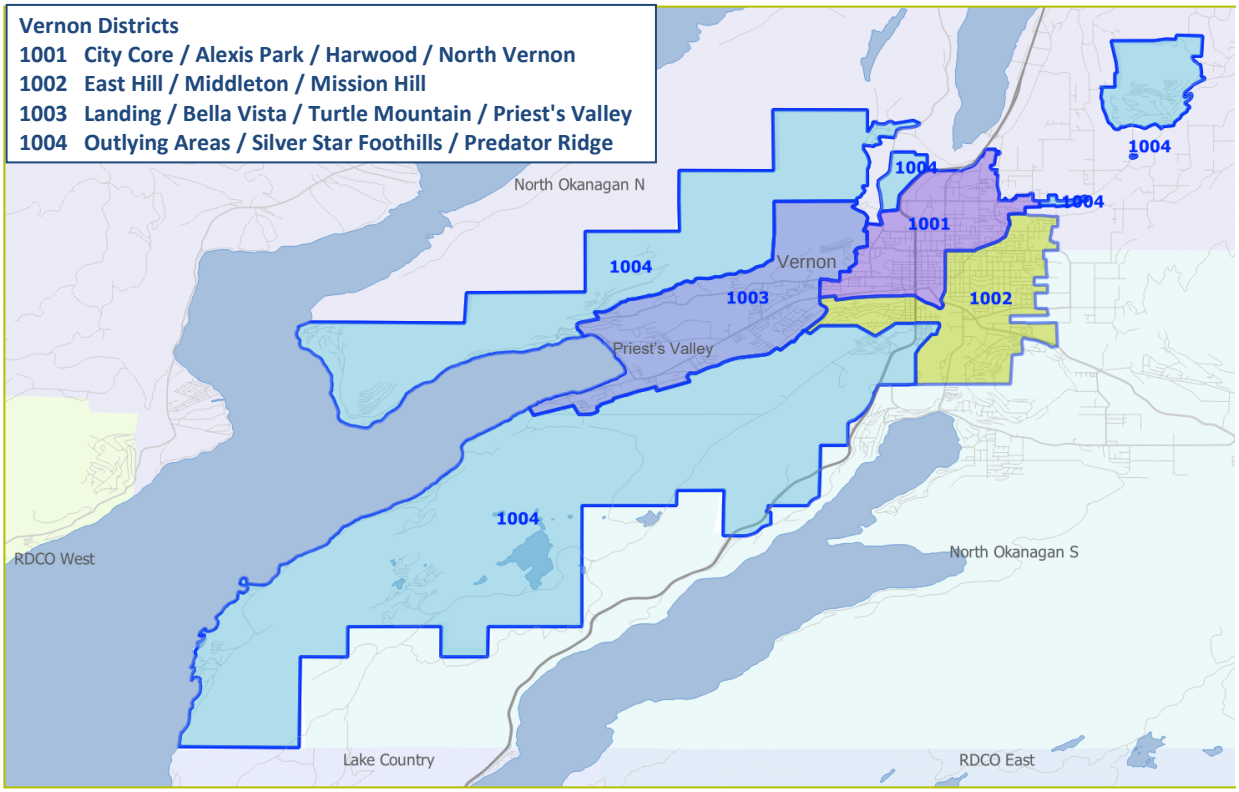
Table 1: Travel Area Geographies

Travel Area	Census Division	Municipal Sector	Census Subdivision	District	
Study Area	Vernon (part of RD of North Okanagan)	Vernon+	City of Vernon	1001	City Core / Alexis Park / Harwood / North Vernon
				1002	East Hill / Middleton / Mission Hill
				1004	Outlying Areas
				1003	Landing / Bella Vista / Turtle Mountain / Priest's Valley 6
			Priest's Valley 6		
	Central Okanagan	Lake Country	Lake Country	2000	Lake Country
		Kelowna+	City of Kelowna	3001	City Centre / Pandosy
				3002	Central Kelowna
				3003	Glenmore
				3004	Rutland
				3005	Mission
				3006	Black Mountain / Southeast
				3007	Kelowna North
			Duck Lake 7	3008	Duck Lake 7
		Westside	City of West Kelowna	4001	Glenrosa / Westbank
				4002	Rose Valley / Lakeview
			Tsinstikeptum 9	5001	Westbank First Nation (WFN)
			Tsinstikeptum 10		
			Peachland	6000	Peachland
			Central Okanagan J	7000	Central Okanagan J
		RDCO East	Central Okanagan	8000	Central Okanagan
North Okanagan	(portion of RD of North Okanagan)		Coldstream, Lumby, North Okanagan B (portion), C (portion), D, and E	10001	North Okanagan – South
			Spalumcheen DM, Armstrong, Enderby, Okanagan B (portion) and C (portion), Enderby 3, Harris 3, Okanagan (Part) 1	10002	North Okanagan – North
South Okanagan	(portion of Okanagan Similkameen RD)		Summerland, Okanagan-Similkameen E, Okanagan-Similkameen F.	11000	Okanagan South
External				99999	External

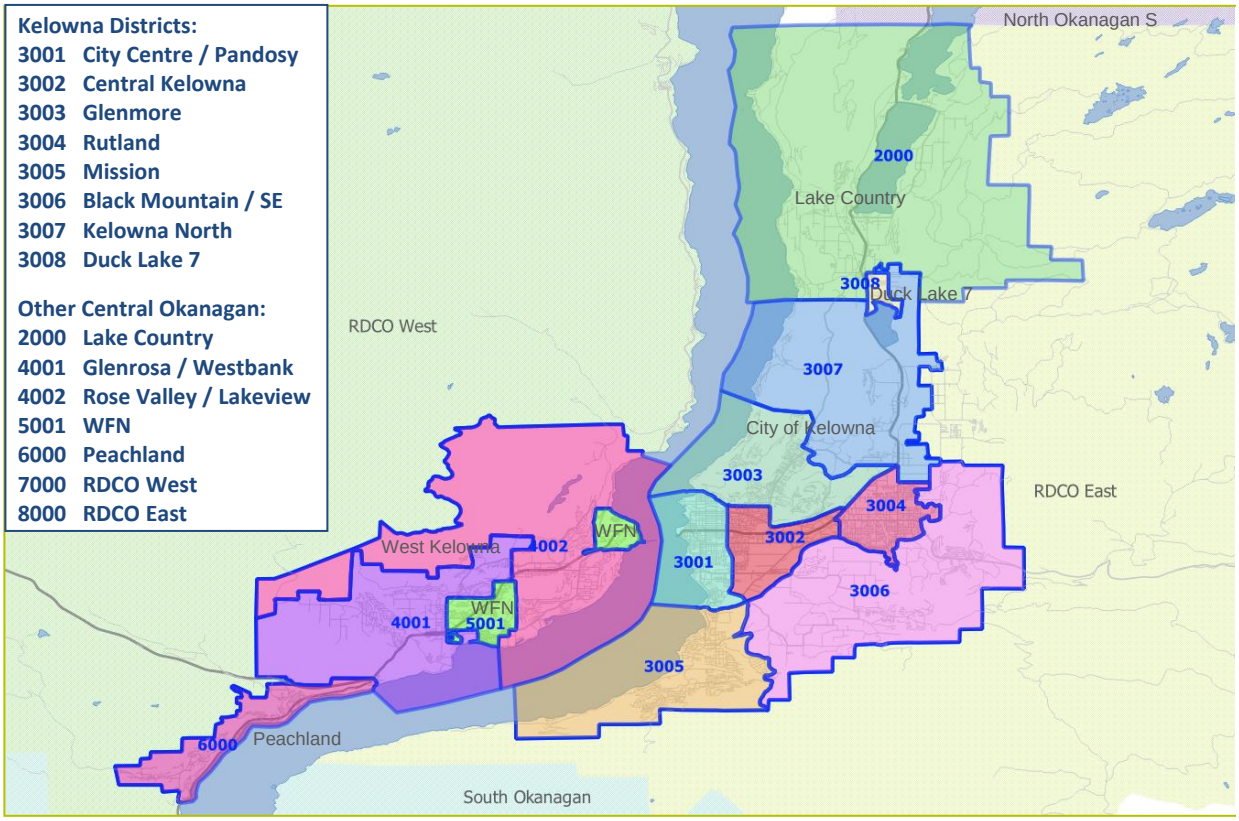
RD = Regional District RDCO = Regional District of Central Okanagan

+ = sector is defined by the municipal boundaries plus First Nations communities within/adjacent to the municipal boundaries.

Figure 4. Sub-Municipal Districts



Vernon



2.3 Survey Design

The survey was a household-based survey that collected demographic information on all household members and trip information for household members 5 years of age and older. The survey employed a 24-hour recall method that asked survey respondents to report on their trips on the previous weekday, from 4:00 a.m. on the previous day to 3:59 a.m. the next day. The survey could be completed online or over the phone. The survey was conducted using Malatest's Triptelligence™ system, an integrated CATI/CAWI (computer assisted telephone/web interview) system incorporating Google Maps and data handling features developed specifically for origin-destination surveys.

Outlined below are the types of information collected by the survey:

HOUSEHOLD LEVEL	PERSON LEVEL For each person in the household	TRIP LEVEL For each trip made by each household member 5+ years of age
Home location	Gender	Origin location
Dwelling type	Age	Destination location
Household size (# people)	Driver's licence	Trip departure time
Number of vehicles by vehicle type and fuel type	Mobility devices used, if any	Arrival time at destination
	Student status (f/t, p/t)	Purpose (destination activity)
Number of bicycles (adult pedal	School level	Mode(s) of travel (up to 5)

bikes, adult e-bikes, children's)	School location	Transit routes taken (if bus)
Household Income	Employment status (f/t, p/t)	Number of vehicle occupants (if driver or passenger)
	Workplace location	Vehicle availability for non-auto trips leaving home
	Type of job	
	Other occupational status (retired, unemployed, etc)	
	Whether took trips on travel day (if age 5+)	

The survey used the following definition of a trip: A trip is a journey from one place (origin) to another (destination) with a single purpose that may involve more than one mode of travel. Travel to work with a stop at a coffee shop is two separate trips: one with a purpose of restaurant/dining, another with a purpose of work. Travel to work which involved driving to a park & ride location then taking transit the rest of the way is considered a single trip with a primary mode of transit and a transit access mode of driving.

2.4 Survey Conduct

To obtain coverage of both all households in the study area, including cell-phone-only households, an address-based sampling approach was taken. Households were randomly selected from databases of mailable residential addresses, with a portion of these households having only address listings (address-only), while a portion had addresses that could be matched to listed phone numbers (address-and-phone). Households were sent survey invitation letters with secure access codes and instructions for completing the survey online or over the telephone. In geographies with lower response rates, addresses with listed landlines received follow-up telephone calls to complete the survey over the telephone or encourage online completion. Overall, across both sample types, the survey had a 9.3% response rate before rejection of invalid surveys.

The survey was field tested October 25-27, 2018 and full survey administration was undertaken between October 30 and December 8, 2018. While the majority of the data collection was completed by December 8, additional online surveys were still allowed between December 9 and 21 to allow interested residents to complete the survey and to allow for extra surveys in case others were rejected during data validation. The later survey completions were reviewed to determine whether the travel patterns could be considered typical, and some households were removed if they had particularly unusual patterns that might have been influenced by the holiday season or if they had school-aged children and the travel date was after schools closed regular classes. The overall response rate to the survey was 9.1% after rejection of invalid surveys.

A total of 4,993 surveys were completed, well exceeding the survey target of 4,601 surveys. A total of 107 surveys were rejected during data validation, for a final dataset of 4,886 validated households. This represents a sampling rate of 4.8% of the 102,594 households estimated to be in the study area in 2018.

These households provided information for 10,801 people, with 30,299 trip records reported for 10,418 persons 5+ years of age.

2.5 Data Processing

After data collection, the survey data were subjected to a battery of validation tests to ensure that the survey questions were completed as intended and to flag possible errors in the data or issues with trip logic. Each night, Malatest's Triptelligence™ data validation system automatically ran a battery of tests on survey completions from the previous day, and assigned flags for different issues with different levels of priority (critical issue, possible error, warning, etc.) for review by data validation staff. The data validation staff reviewed each flagged survey and either made logical corrections, re-geocoded locations, called back respondents to clarify information, or rejected the survey as unsalvageable. Surveys that passed all data validation tests were randomly selected for manual review to verify that such surveys appeared to be correct and that validation tests were working as expected. In the data validation, only 2.1% of surveys were rejected.

The data were also systematically reviewed and tested by data analysts to quality control the dataset and rule out the possibility of any systematic data issues. Any relevant recodes to the data were undertaken (such as combining captured information on work status, school status, or other status into a single occupation variable).

A small number of missing data points was imputed. In preparation for the data weighting, the few person records with unknown age or gender were imputed, and those reporting non-binary gender were randomly assigned to male or female for the purpose of weighting and analysis (with the original responses preserved in the final dataset).

After finalization of the dataset, all latitude/longitude coordinates for locations captured by the survey (home, work, school, trip origin, trip destination) were geocoded using GIS tools to relevant study geographies and to Universal Transverse Mercator (UTM) zone 11 x-y coordinates.

2.6 Data Expansion and Weighting

The data for the surveyed households were expanded to represent the population living in residential households in the study area and were weighted to more accurately represent the distributions of households by household characteristics and demographics. This is necessary to address non-response bias and uneven sampling rates in the final survey sample.

The study area geography was organized into expansion zones (also referred to as weighting districts). The expansion zones were developed based on Statistics Canada Census Subdivisions (CSDs) and, within Kelowna, Vernon, and West Kelowna, were further based on aggregated neighbourhoods mapped against Statistics Canada Dissemination Areas (DAs). It may be noted that the boundaries of the expansion zone share the same definitions as the 19 districts in the study area used for reporting (see **Table 1**), with the exception of a few instances where the boundaries of a component DA straddled the boundaries of the neighbourhoods that define the districts. Rather than attempting to split the DA-level Census data to two different expansion zones, the DAs were assigned to either one expansion zones or

another, thus a few expansion zones have slightly different boundaries from the reporting zones. As these overlaps were few, and affected only a small portion of all households in each expansion zone / reporting district, these slight discrepancies should not overly skew the weighted data or the demographic profiles when analysed by reporting district. Users of the data should be careful to select the field appropriate district geography for their purposes, which in most instances will be the reporting district.

An iterative proportional fitting (IPF) method was employed to balance household weights and person weights for the multiple weighting controls. In this method, incremental adjustments to the household weights are made in succession for each of the household controls, as well as a composite adjustment to each household weight to account for the disproportionate distribution by age/gender amongst the members of each household. Each successive adjustment to balance a given control may slightly or significantly unbalance the correction previously introduced for a different control. However, iteratively cycling through each control results in convergence to a solution where all household and population controls have expected distributions (to within reasonable tolerance; some deviations may be expected, particularly for weighting districts with smaller sample sizes). In this manner, all persons within each household carry the same weight as the household. Limits were set on extreme weights, although they were allowed to range from 0.25 to 4.0 times the base expansion weight for the household's district. The weights received final calibrations to ensure that the total number of households in each district matched the control totals.

The weighting controls were developed from 2016 Census data. The controls were selected for having significant influence on trip-making behaviour and for completeness of the information in the survey data. The weighting controls included, for each weighting district:

- **total households** (private dwellings occupied by usual residents),
- household counts by **dwelling type** (house, apartment, other ground oriented),
- household counts by **household size** (1-person, 2-person, 3-person, 4-person, 5+ person), and
- population counts by **age and gender** (12 age ranges, 2 genders).

Estimates for 2018 were projected forward from 2016 Census counts using 2011 Census to 2016 Census growth rates by CSD or Aggregated Dissemination Area (ADA) where appropriate. The population counts by age and gender were rescaled to represent population living in private residential dwellings (reducing the population count by the 2.4% of the population living in collective dwellings or without fixed address, who are not represented by the survey; and accounting for unequal distribution of this segment of the population by age group, i.e., people in older age groups are more likely to be living in collective dwellings). In some small weighting districts, age and/or gender categories may have been collapsed further due to small sample sizes or cells with no sample.

Three lower-priority secondary weighting adjustments were introduced at the beginning of the weighting process (one pass only):

- **incidence of travel in rejected surveys vs. in accepted surveys.** As only a small proportion of all

survey completions was rejected, this factor was small;[4]

- **distribution of households by Statistics Canada Dissemination Area (DA)** so that the initial weighted distributions would be better geographically balanced within each expansion zone; and
- **total public post-secondary enrolment** across the study area for UBC Okanagan, Okanagan College, Okanagan College Vernon Campus, excluding students living in residence (who were not surveyed).

It may be noted that these adjustments were only used to 'seed' the weights, in the hopes of steering the distributions to be more representative for these attributes. Afterwards, the adjustments for the primary weighting controls were allowed to determine final weights. The secondary controls were not used in subsequent iterations of the IPF weighting. The weighted survey data may not necessarily align as closely with the census counts by DA or the overall enrolment counts by post-secondary campus.

No attempt was made to adjust the weighting to balance the survey sample by day of week. It may be noted that travel on Thursdays and Fridays is somewhat over-represented, while travel on Mondays, Tuesdays, and Wednesdays is somewhat under-represented.

2.7 Validation of the Weighted Survey Data

The weighted survey data were validated against reference data, with the following observations about the representativeness of the weighted data:

- The weighted data were found to align very closely with the dwelling type aggregations[5], household size, age and gender distributions from the Census (projected to 2018), as might be expected as these were the weighting controls.
- Weighted counts of total workers living in the study area and counts of workers who have a fixed place of work outside the home also matched Census counts projected to 2018.
- Amongst employed survey respondents, the distribution of the weighted data by occupational group (10 National Occupational Classification major groups) varied somewhat from the Census, with workers in Health Services occupations somewhat over-represented (122% of expected counts) and workers in the following occupations somewhat under-represented (79%-82% of expected counts): sales and service occupations; natural resource, agriculture and related occupations; and occupations in manufacturing and utilities. For other occupational groups, the weighted counts were between 88% and 99% of expected.
- Looking at weighted survey counts for post-secondary student enrolments revealed some under-representation of students, with weighted counts for UBC Okanagan representing 77% of the 9,973 enrollment in the 2018/19 academic year (which is not unsurprising as this survey of

[4] As people who did not travel on their travel day had little chance of rejection of their surveys, while those who did travel have more data points thus more chances to be rejected during data validation, a slight adjustment factor was applied to accepted household surveys with travel to compensate for the higher rejection rate amongst travelling households.

[5] While the dwelling type aggregations (single-detached, apartment or condominium, and other ground oriented) aligned well, it may be noted that within the other ground oriented aggregation, row/townhouses were somewhat over-represented and semi-detached houses were under-represented.

private residential addresses does not represent the over 1,600 students living in residence on campus); 91% of enrolments at Okanagan College's main campus in Kelowna; and 77% of enrolments at Okanagan College Vernon campus, which is to be expected as the Vernon campus likely attracts students from nearby communities in the North Okanagan that were not part of the sampled study area.

- Comparing Census data on reported 2015 pre-tax household income against the 2018 OTS valid survey responses suggests that the survey results may somewhat under-represent households at the lowest (below $30,000 per year) and highest income ranges ($125,000 or more), and slightly over-represent those in income brackets in-between. This comparison should be interpreted with caution, however, as incomes for working people will have increased from 2015 to 2018, and only 17% of survey respondents refused to provide a response to this question.
- Census data on workers' journeys to work were also compared to the survey results. It may be noted that these data are not strictly comparable: The Census journey-to-work data ask persons who workers what their usual mode of travel was in the last week before the May 10 Census, or if not employed that week, their longest-held job in the last 16 months[6]; In contrast, the Okanagan Travel Survey asked persons who were currently employed what their mode of travel was if they worked on a single day (the previous weekday in late October through mid-December), with some workers not commuting on the sampled day (e.g., due to not being scheduled to work, working from home, away on travel, or sick). Thus one might expect the survey counts to be lower than the Census counts, which they were, by about 24%. Comparing the mode shares (% distributions), the Census data and weighted survey results are relatively similar, with some differences (survey results for auto driver and bicycle commute mode shares are slightly higher than Census journey-to-work shares, and slightly lower for transit shares). Given the differences between the data definitions and time of year, it is difficult to say whether the differences suggest bias in the survey results.
- Transit ridership figures for the Kelowna Regional Transit System were compared against the weighted survey data. This comparison shows weighted survey counts virtually equal to ridership figures, both when compared to total trips and when compared to total estimated boardings (trips that involve transfers between bus routes have more than one boarding). It may be noted that official ridership figures may under-count total ridership.[7] In this context, it may

[6] Main mode of commuting "reported for population aged 15 years and over, in private households, who worked at some time since January 1, 2015. Persons who indicated that they either had no fixed workplace address, or specified a usual workplace address, were asked to identify the mode of transportation they usually used to commute from home to work. The variable usually relates to the individual's job held during the week of Sunday, May 1 to Saturday, May 7, 2016. However, if the person did not work during that week but had worked at some time since January 1, 2015, the information relates to the job held the longest during that period. ...Persons who used more than one mode of commuting were asked to identify the single mode they used for most of the travel distance. As a result, the question provides data on the main mode of commuting." (Statistics Canada. Dictionary, Census of Population 2016, Main mode of commuting, release data May 3, 2017; https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/pop177-eng.cfm)

[7] While monthly passes are scanned and cash fares are counted, post-secondary students with a U-Pass simply have to present their pass, and some drivers may not consistently manually register each student boarding.

be possible that despite the match between the weighted survey counts and official ridership, the survey may slightly under-represent actual transit trips. At the very least, survey data do not represent the local transit trips of students living in on-campus accommodation, as collective residences were not included in the survey sample.

- Ridership data for the Vernon Regional Transit System were not examined. As this transit system services Vernon, Coldstream, and the North Okanagan, any comparisons to the survey data for just Vernon residents would likely be difficult to interpret.

Overall, the weighted survey data appear to align very well with the reference data examined, which should provide confidence in the survey results. Notwithstanding the efforts to ensure that the survey data are representative of the population as a whole, it should be noted that it may not be possible to correct for all sources of non-response bias. The survey data may not provide a perfect match for all population characteristics (as evidenced by the modest differences in the comparisons against college and university enrolments, occupation type, and household income).

More detail on the validation of the weighted data can be found in *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct*.

2.8 Treatment of the 2007 and 2013 Survey Data for Longitudinal Comparisons

An aspect of transportation research of great interest is to track trends over time, to understand changing transportation demand and to measure the impact of transportation initiatives and policies. Therefore the 2007 and 2013 travel survey data are invaluable for tracking how the key indicators such as mode share and trip rates change over time. In order to facilitate this analysis, aspects of the 2013 dataset were reworked to provide a better basis for comparison and the data were reweighted. The 2007 baseline survey included a number of municipalities in the North Okanagan other than Vernon. In 2013 and 2018 Vernon was the only North Okanagan municipality surveyed, so these records were dropped from the 2007 data set. The 2013 survey included surveys with 24 UBCO students living in residence on campus. The 2018 survey did not survey collective dwellings, so the on-campus records were dropped from the 2013 dataset to provide the same basis for comparison. Location data in both the 2007 and 2013 datasets were recoded to the geographic systems used in 2018 in order to facilitate longitudinal comparisons at the sub-regional level. As a result of these adjustments, statistics for the earlier survey cycles reported here may in some cases differ slightly from those reported at the time of those survey cycles.

It may be noted that there may be other methodological differences between the different survey cycles related to question wording, sampling, data processing, or other aspects of the research design that may affect the comparability of the datasets. The usefulness of the comparisons is strengthened by the fact that the survey was conducted in the same season of the year with a questionnaire with the same core data elements in each cycle, and by the adjustments to the previous data sets to provide a similar basis for comparison.

The weather during the time period of the survey may also affect the data in each survey, with the

surveys having been conducted mid April to mid May 2007, late September to early November 2013, and late October to mid December 2018, respectively. While commutes, school enrolments, and other activity patterns may be equivalent for the most part, of all the transportation indicators presented, the cycling and walking mode shares may be most influenced by weather, so caution should be exercised when making longitudinal comparisons.

2.9 Statistical Reliability

2.9.1 Data Reliability

The 2018 OTS was conducted with a sample of about 4.8% of households in the study area. As with any survey, the data collected can be subject to sources of error or bias that can affect the reliability of the survey results. Potential sources of error can include the following:

- *Undercoverage.* Coverage error is associated with the failure to include some populations in the same frame used for sample selection, which may occur with samples of convenience such as telephone directories. The 2018 sample frame was enriched by City of Kelowna address data amalgamated with the Canada Post database of mailable residential addresses; this hybrid sampling approach should provide excellent coverage of private dwellings in the study area, reducing the concern of under-coverage. However, both data sources may miss some housing types, such as basement/secondary suites, mobile home parks and other non-conventional dwelling types.
- *Non-response bias.* Non-response bias occurs when individuals who do not participate in a survey differ in relevant ways from individuals who do participate. For example, younger people are often less inclined to participate in surveys. This bias has also been addressed, in part, through the data expansion process, including the weighting by dwelling type, age, and gender. However, it should be noted that there can be other, hidden biases in the data that could not be corrected by the data weighting.
- *Measurement error.* This type of error is associated with the failure of survey instruments to capture correct information (e.g., through misunderstanding survey questions). To control for this, the questionnaire and associated materials were based on previously well-tested survey questions, thoroughly reviewed for content and meaning, and field-tested with a sample of respondents prior to the full survey administration. Telephone interviewers were trained on the objectives of the survey, definitions of key terms, the intent of survey questions, and how to address different trip circumstances described by respondents. During survey administration, interviews were regularly monitored by a supervisor to ensure consistent application of questions. The online survey also included a number of built-in tests to prompt respondents to confirm key data and clarify illogical responses.
- *Processing error.* Processing errors include data entry, coding, editing, and imputation errors. These potential sources of error were addressed through comprehensive training of survey staff and survey validation staff, continuous quality management practices, and data validation.

- *Sampling error.* Sampling error refers to the variability that occurs by chance because a sample was surveyed, rather than the complete population. As best as possible, sampling error was controlled in the sample design by over-sampling from districts with smaller populations, as a strictly proportional sample design would have resulted in very few completions for smaller districts.
- *Error due to extreme weights when analysing small samples.* Notwithstanding the limiting of very extreme weights in the data weighting, small sample sizes for some strata and non-response bias may contribute to the assignment of high weights for some cases relative to others within the same geographic district or population stratum. Users of the data should take note that the sample sizes for some districts are relatively modest, and the survey results for such districts should be interpreted with caution. Caution should also be exercised when analysing any small subgroups of the total population.

2.9.2 Estimates of Sampling Error

Sampling error can be estimated based on the size of the sample universe (number of households in the region) and the number of household survey completions. The estimated margin of error for the survey results at the household level is presented in **Table 2** for each district, as well as for the aggregations used in reporting. The estimated margin of error for the survey results at the person level is presented in **Table 3**. The sampling errors have been corrected to account for the effects of the data weighting.

Overall, the margin of error for the household-level survey results is estimated at ±1.7% at a 95% confidence level (theoretically, for a given survey question, the true response proportion for the population would be somewhere within the margin of error of the survey results 19 times out of 20). For person- and trip-level survey results for the entire study area is estimated to be ±1.1%.

Sampling errors increase when the study area is disaggregated into sub-areas and districts. The sampling design included higher sampling rates for smaller populations, in order to reduce the sampling errors when reporting on these districts individually. Nevertheless, survey results for geographies with smaller samples and higher sampling errors should be interpreted with caution.

Reporting of survey results related to trips originating in or destined to given sub-areas or sub-municipal districts will include trips made by residents of the given geography as well as other residents of the study area from outside the given geography. For example, while the survey sample for residents of Kelowna North is modest (104 households with 250 persons), the reporting on trips within the district is based on a considerably larger sample of surveyed residents (943 persons) who reported travelling to, from, or within this district (UBC Okanagan in this district is an significant attractor of trips). Therefore the sampling error associated with information on trips to, from or within the area would be much better that that for just the trips made by residents of the area. Sampling errors for trips destined to each geography are also listed in **Table 3**. It may be noted that the sampling errors for person-level information can be considered to carry over to the trips those people make (i.e., the sampling error is associated with the entire trip chain). Therefore the calculation of sampling error was undertaken using the number of persons as the samples size rather than number of trips. [8]

It should be understood that sampling error is not the only possible source of error. While efforts have been made to weight the data to be more representative of the population, there may be non-response bias or other sources of error not accounted for in the data weighting and data processing.

[8] It may also be noted that the person-level sampling errors are a crude estimate, in that the actual sample units were households, and individual persons were not independently sampled. The sampling errors have not been adjusted to take into account the clustered nature of the sampling of persons.

Table 2. Survey Completions and Sampling Errors – for Household Level Statistics

Geography of Residence	District	2018 Occupied Dwelling Units (N)[1]	Household Surveys Completed (n)	Sampling Rate [2]	Theoretical Margin of Error [3]
Study Area		**102,600**	**4,886**	**4.8%**	**±1.7%**
Central Okanagan		84,100	4,002	4.8%	±1.9%
Vernon		18,500	884	4.8%	±4.1%
Kelowna		56,500	2,617	4.6%	±2.3%
Other Central Okanagan		27,600	1,385	5.0%	±3.3%
City Core / Alexis Park / Harwood / North Vernon	1001	5,800	234	4.0%	±7.6%
East Hill / Middleton / Mission Hill	1002	6,400	292	4.6%	±7.4%
Landing / Bella Vista / Turtle Mountain / Priest's Valley	1003	4,200	209	5.0%	±8.5%
Outlying Areas *	1004	2,000	149	7.4%	±9.1%
Lake Country	2000	5,300	251	4.7%	±7.5%
City Centre / Pandosy	3001	13,400	613	4.6%	±4.6%
Central Kelowna	3002	8,900	365	4.1%	±6.1%
Glenmore	3003	8,200	381	4.6%	±5.8%
Rutland	3004	11,100	497	4.5%	±5.1%
Mission	3005	6,600	332	5.0%	±6.3%
Black Mountain / Southeast	3006	5,400	247	4.6%	±8.0%
Kelowna North *	3007	2,100	104	4.9%	±11.5%
Duck Lake 7 *	3008	800	78	9.7%	±13.5%
Glenrosa / Westbank	4001	7,300	318	4.4%	±6.5%
Rose Valley / Lakeview	4002	5,400	247	4.5%	±7.5%
West Kelowna Subtotal		*12,700*	*565*	*4.4%*	*±4.9%*
WFN	5001	4,700	201	4.3%	±8.0%
Peachland *	6000	2,500	141	5.6%	±11.2%
RDCO West *	7000	900	106	11.7%	±12.1%
RDCO East *	8000	1,500	121	7.9%	±11.7%

[1] Estimated dwelling units in 2018, projected forward from 2016 by using population growth trends from the 2011 Census to the 2016 Census by aggregated dissemination area.

[2] Sampling rate: the percentage of households surveyed.

[3] Sampling error: in random sampling, the actual results for the population may be expected to lie within the range of the survey result plus or minus the sampling error, at a 95% confidence level (i.e., 19 times out of 20). The sampling errors estimated above have been adjusted for possible design effects due to over-/under-sampling.

* Districts with smaller sample sizes / higher sampling errors. Results for these districts should be interpreted with caution.

Table 3. Survey Samples, Sampling Errors – for Person-Level Statistics & Trips Made by those Persons

Geography of Residence	District	Sampling Error For Trips Made by Residents of District: 2018 Estimated Population (N) [1]	Persons Surveyed (n)	Sampling Rate [2]	Theoretical Margin of Error [3]	Trip Records for Persons Living in District	For Trips Destined to District: Trips Records for Trips Destined to District	Sample Size (n) (Persons with Trips Destined to District)	Theoretical Margin of Error [3]
Study Area		**237,300**	**10,801**	**4.6%**	**±1.1%**	**30,299**	**29,554**	**8,608**	**±1.3%**
Central Okanagan		197,000	8,963	4.5%	±1.2%	25,135	24,810	7,362	±1.4%
Vernon		40,200	1,838	4.6%	±2.9%	5,164	4,744	1,594	±3.1%
Kelowna		129,900	5,831	4.5%	±1.5%	17,015	18,900	6,223	±1.5%
Other Central Okanagan		67,200	3,132	4.7%	±2.2%	8,120	5,910	2,830	±2.3%
City Core/ Alexis Park / Harwood/ North Vernon	1001	10,300	419	4.1%	±5.6%	1,097	2,460	1,163	±3.6%
East Hill / Middleton / Mission Hill	1002	15,200	646	4.3%	±4.9%	1,986	1,263	726	±4.6%
Landing/ Bella Vista/ Turtle Mountain/ Priest's Valley	1003	10,000	444	4.5%	±5.9%	1,103	629	420	±6.0%
Outlying Areas *	1004	4,800	329	6.9%	±6.3%	978	392	303	±6.9%
Lake Country	2000	13,200	603	4.6%	±4.7%	1,680	1,257	655	±4.5%
City Centre / Pandosy	3001	25,200	1,178	4.7%	±3.4%	3,626	4,842	2,824	±2.2%
Central Kelowna	3002	17,100	717	4.2%	±4.3%	2,143	5,716	3,259	±2.1%
Glenmore	3003	20,400	948	4.6%	±3.7%	2,980	1,920	1,164	±3.4%
Rutland	3004	27,100	1,153	4.3%	±3.4%	3,204	2,564	1,504	±3.0%
Mission	3005	18,900	827	4.4%	±3.9%	2,487	1,651	993	±3.6%
Black Mountain / Southeast	3006	14,500	615	4.2%	±5.0%	1,545	876	631	±4.9%
Kelowna North *	3007	5,000	250	5.0%	±7.3%	642	1,176	943	±3.8%
Duck Lake 7 *	3008	1,600	143	9.2%	±9.9%	388	155	122	±11.1%
Glenrosa / Westbank	4001	18,500	723	3.9%	±4.4%	1,768	1,386	873	±4.0%
Rose Valley / Lakeview	4002	14,300	617	4.3%	±4.8%	1,623	1,167	786	±4.2%
West Kelowna Subtotal		*32,800*	*1,340*	*4.1%*	*±3.2%*	*3,391*	*2,553*	*1,429*	±3.1%
WFN	5001	9,700	395	4.1%	±5.9%	984	1,134	749	±4.3%
Peachland *	6000	5,500	294	5.3%	±7.8%	749	434	268	±7.9%
RDCO West *	7000	2,000	213	10.9%	±8.6%	494	187	153	±10.0%
RDCO East *	8000	3,900	287	7.3%	±7.6%	822	345	260	±7.8%
External to Study Area		n/a	n/a	n/a	n/a	n/a	159	157	±9.6%

[1] Estimated population living in private dwellings 2018, projected forward from 2016 by using population growth trends from the 2011 Census to the 2016 Census by aggregated dissemination area.

[2] Sampling rate: the percentage of households surveyed.

[3] Sampling error: in random sampling, the actual results for the population may be expected to lie within the range of the survey result plus or minus the sampling error, at a 95% confidence level (i.e., 19 times out of 20). The sampling errors estimated above have been adjusted for possible design effects due to over-/under-sampling.

* Districts with smaller sample sizes / higher sampling errors. Results for these districts should be interpreted with caution.

2.9.3 Caveats

The margins of sampling error detailed above should not be interpreted as circumscribing all sources of error. While every effort has been made to control for possible error and correct for non-response bias, there may still remain some error or bias in the survey data beyond the sampling error.

Expanded counts from the survey data should be understood to be estimates not exact counts. The weighted survey data are based on a 4.6% sample of population expanded to represent the total population of persons living in private dwellings (excluding population living in collective dwellings).

While efforts were made to ensure the survey data for different cycles had a similar basis for comparison, differences in sampling methodology, survey design, data processing and/or the time period of the survey may affect the comparability of results. Although most survey questions remain essentially consistent, it should be noted that some questions have been changed and new questions added (hence are not comparable). The geographies covered may also have some differences. All of the above may affect the accuracy of the longitudinal comparisons. Nonetheless, the comparisons can be viewed as indicative.

3 Households, Vehicles and Demographics

This section profiles the households and population in the study area, including trends in the growth of households, population, vehicles, and bicycles from the baseline survey in 2007 to the second survey in 2013 to the 2018 survey. Household characteristics and population demographics are explored, along with tracking of selected trends in those demographics. This provides the context for the analysis of the travel patterns examined later in this report.

The importance of presenting the demographics of the survey area is twofold. First, it profiles the region's residents: these are the people who are making trips. Second, the demographics help explain the reasons for travelling and the travel choices people make. The explanations, in turn, enable a further understanding of the travel characteristics.

Most results are presented for three sub-areas: Vernon, Kelowna, and Other Central Okanagan (See **Section 2.2** for definitions of the study area geography). Certain results, such as exploration of relationship between dwelling type and vehicle ownership, are presented only for the study area as a whole, as the observations may apply equally to all of the communities, albeit with some local variation. As each of the sub-areas is not necessarily homogenous, selected results are also featured for the 19 sub-municipal districts to provide an idea of the differences between the communities that make up the study area.

Some trends are examined across 11 years and others for the six- and five-year increments between the 2007, 2013, and 2018 survey cycles. It should be noted that some fluctuations over time may be due to error associated with random sampling of a population, differences in survey design, and/or different biases in the samples for different survey cycles, however major trends should usually reveal themselves even if there is some imprecision in the comparisons.

The survey results are based on a 4.8% random sample of households expanded to represent the total private households and population of the study area. The expanded results should be understood to be estimates only. When presenting expanded survey counts, some larger figures are rounded to the closest 100, while other figures are rounded to the closest ten, so as not to give an undue impression of precision. It should be noted that the actual margin of error of the expanded results may often be much greater than the closest ten or closest 100.

3.1 Population and Households, 2007 to 2018

The entire survey area encompasses 237,300 residents living in 102,600 private dwellings in 2018. This figure excludes the 2.4% of the total population living in collective dwellings (care homes, group homes, student residences) or without fixed address, who were outside the survey scope. Based on the survey data, there has been a 19% increase in population and a 24% increase in households in the 11 years since the baseline survey in 2007, with the increases in the past five years being 7.6% and 8.4% respectively.

The Central Okanagan accounts for 84,100 households with 197,000 residents. Population growth in the Central Okanagan has been brisk, at 8.1% across the five years from the last survey in 2013 to the 2018 survey (about 1.6% per year). For analysis, the Central Okanagan is broken out into two sub-areas: two-thirds of the population live in the Kelowna sub-area, at 56,500 households and 129,900 residents (**Figure 6**)[9], while the other geographies are aggregated as the Other Central Okanagan sub-area, at 27,600 households and 67,200 residents (**Figure 7**).

Vernon, located in the Regional District of North Okanagan (RDNO), accounts for an additional 18,500 households and 40,200 residents[10] (**Figure 8**), with a somewhat less dramatic population increase of 5.5% over the previous five years (about 1% per year). Other communities in the RDNO were not surveyed.

Table 4 summarizes these figures for the major geographies in the study area. All areas have experienced a reduction in average household size since the 2007 baseline although this trend appears to have slowed somewhat.

Table 4. Households and Population 2007-2018 – Study Area

Survey Year	Study Area	Central Okanagan Subtotal	Vernon	Kelowna	Other Central Okanagan	Study Area	Central Okanagan Subtotal	Vernon	Kelowna	Other Central Okanagan
Households						**% Change Since Previous Survey**				
2007	83,000	66,930	16,070	45,970	20,960	n/a	n/a	n/a	n/a	n/a
2013	94,650	77,460	17,190	52,310	25,150	14.0%	15.7%	7.0%	13.8%	20.0%
2018	102,590	84,140	18,460	56,530	27,600	8.4%	8.6%	7.4%	8.1%	9.7%
Population Living in Private Dwellings						**% Change Since Previous Survey**				
2007	198,870	162,690	36,180	108,140	54,560	n/a	n/a	n/a	n/a	n/a
2013	220,470	182,350	38,110	120,340	62,010	10.9%	12.1%	5.3%	11.3%	13.7%
2018	237,250	197,030	40,220	129,860	67,180	7.6%	8.1%	5.5%	7.9%	8.3%
Avg. Household Size						**% Change Since Previous Survey**				
2007	2.40	2.43	2.25	2.35	2.60	n/a	n/a	n/a	n/a	n/a
2013	2.33	2.35	2.22	2.30	2.47	-2.8%	-3.2%	-1.5%	-2.2%	-5.3%
2018	2.31	2.34	2.18	2.30	2.43	-0.7%	-0.5%	-1.7%	-0.1%	-1.3%

[9] For analysis, the 'Kelowna area' includes Duck Lake 7 (Okanagan Indian Band), est. 2018 population in private dwellings: 1,550.

[10] For analysis, the 'Vernon area' includes Priest's Valley (Okanagan Indian Band), est. 2018 population in private dwellings: 550.

Figure 5. Population and Households 2007-2018 – Study Area

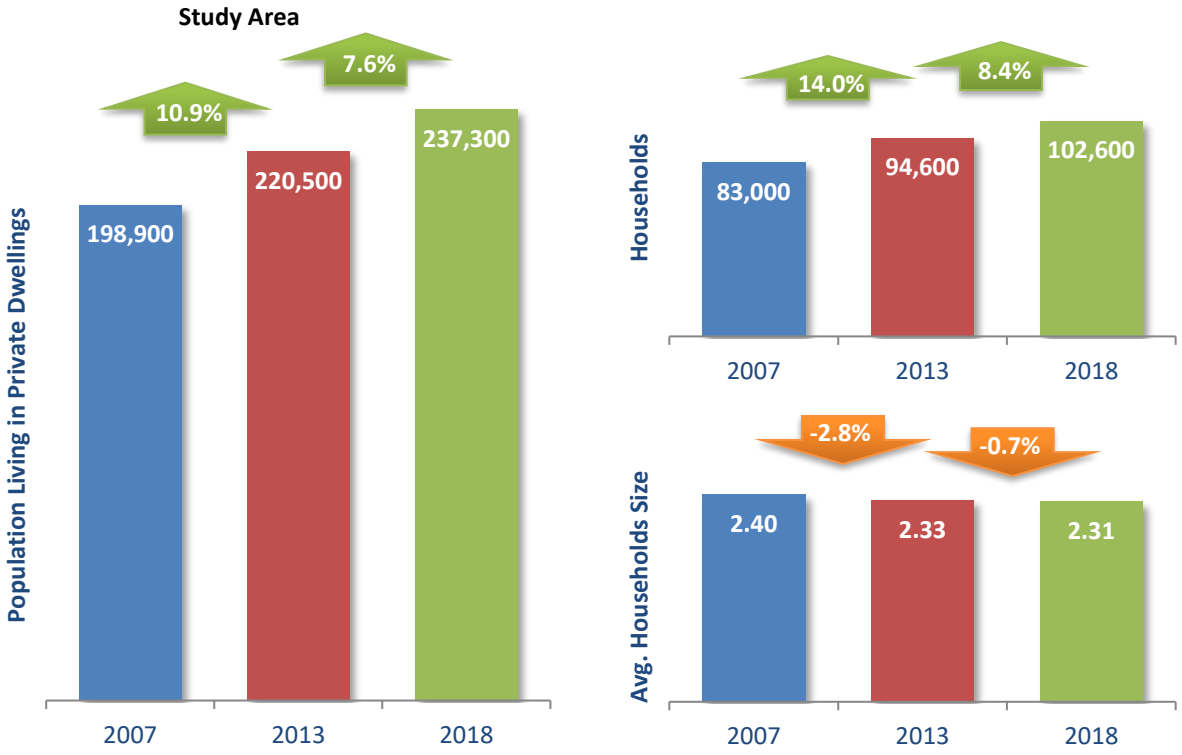


Figure 6. Population and Households 2007-2018 – Kelowna

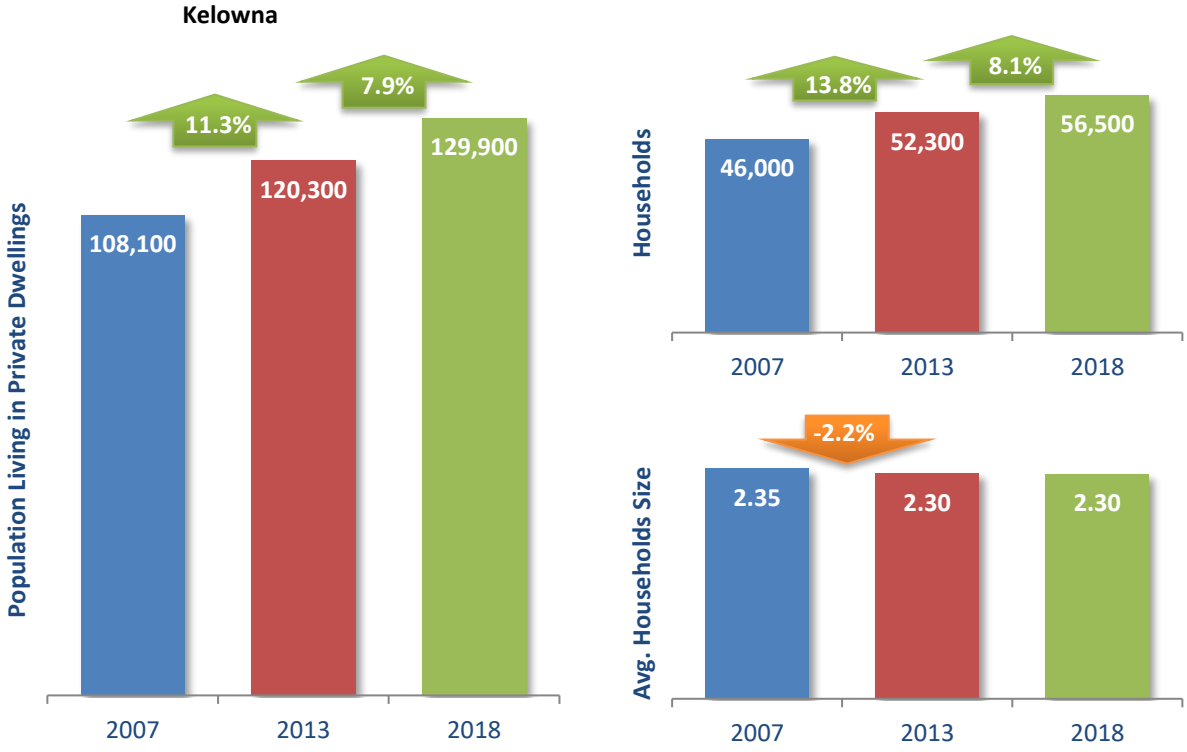


Figure 7. Population and Households 2007-2018 – Other Central Okanagan

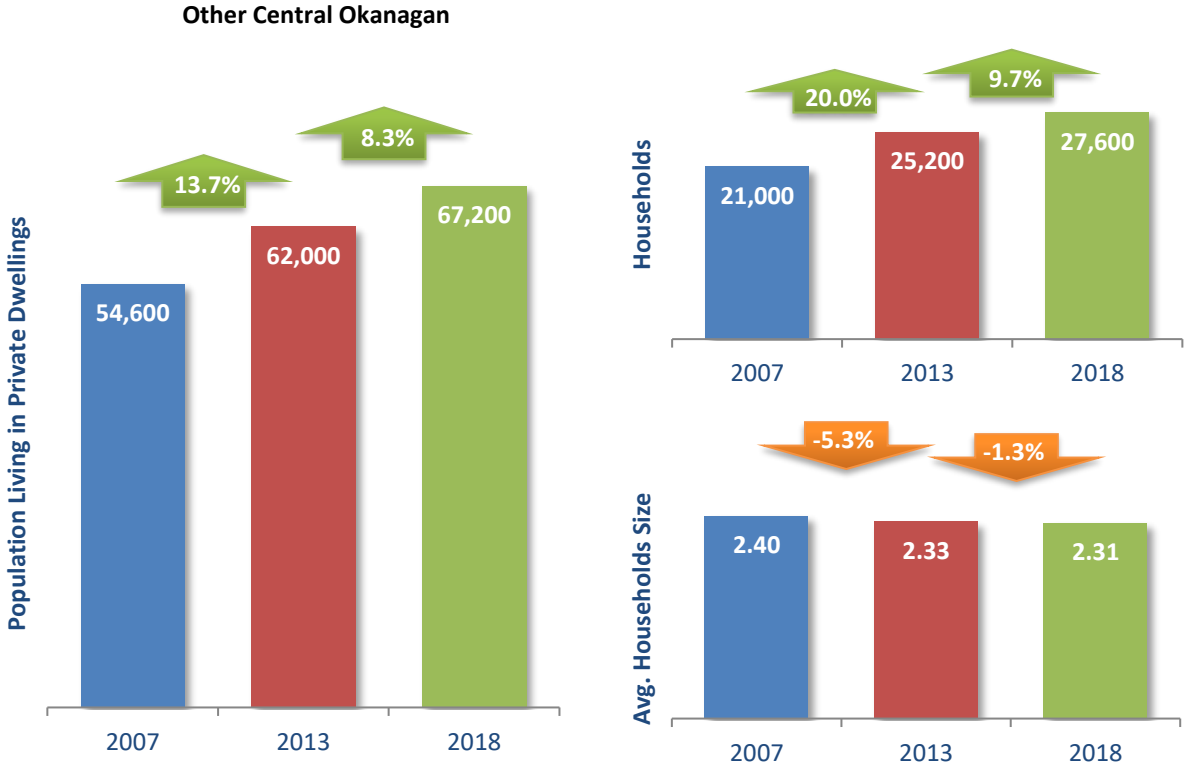


Figure 8. Population and Households, 2007-2018 – Vernon

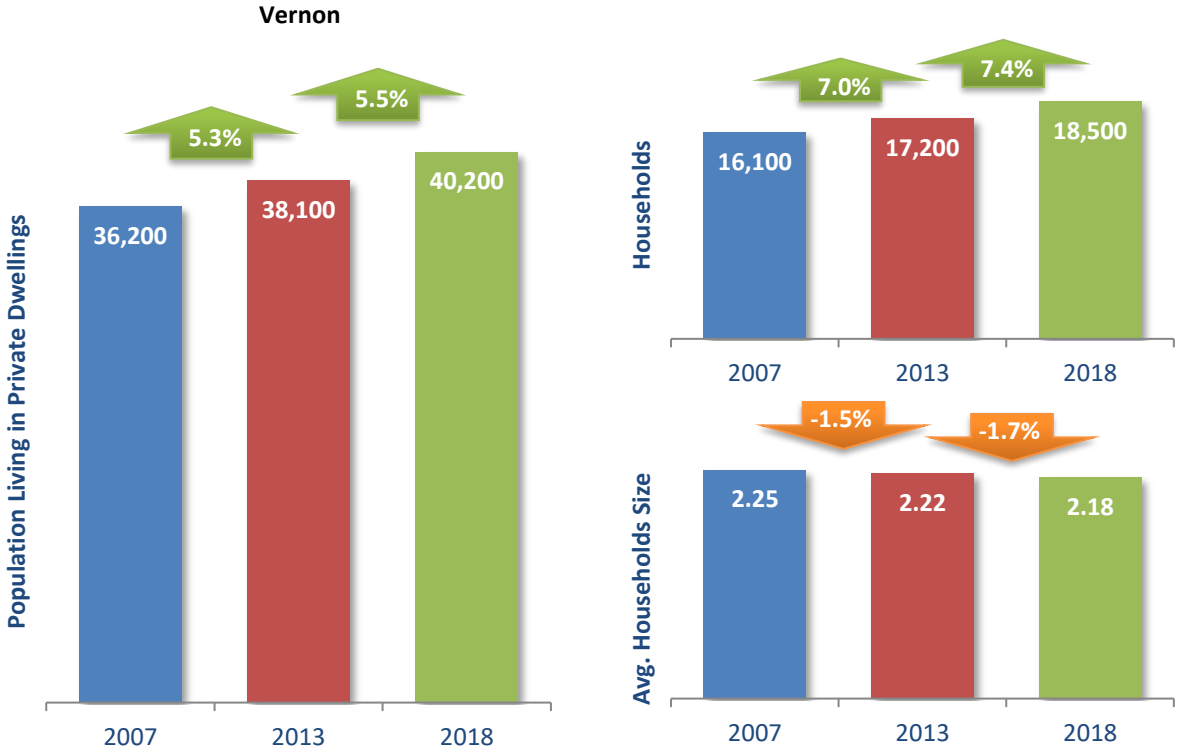
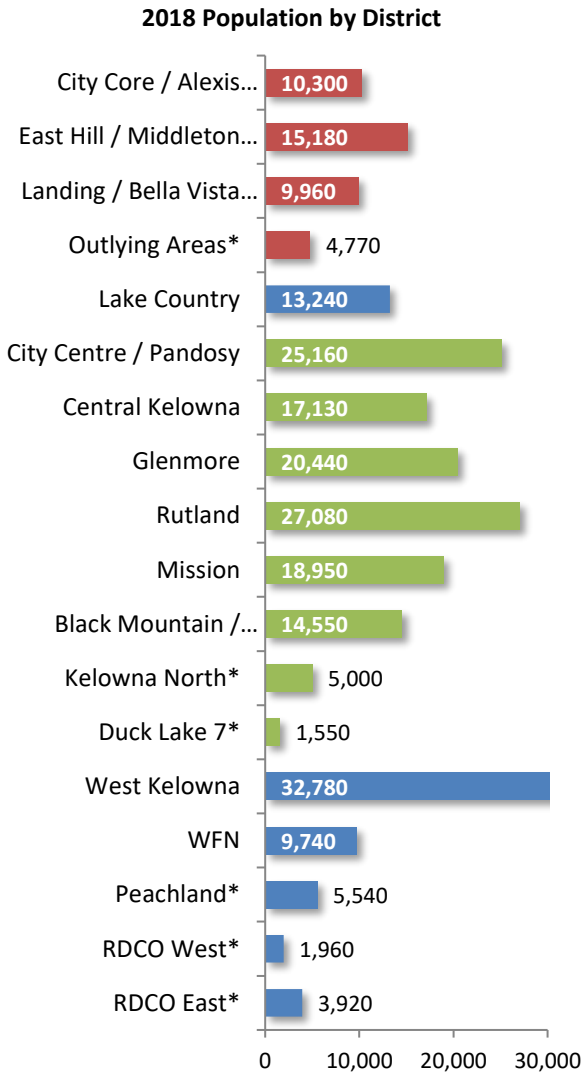
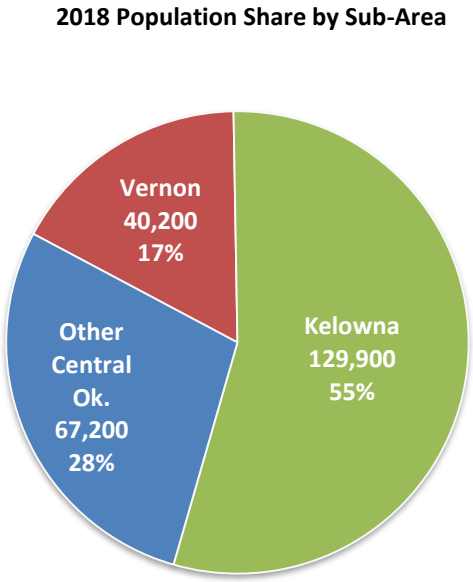


Figure 9 illustrates the population in each of the districts in the study area. Sub-municipal districts in the Vernon and Kelowna areas are grouped as different colours. For analysis, the Okanagan Indian Band community in Duck Lake 7 is grouped with the Kelowna, as its own district, while that in Priest's Valley is grouped with Vernon in a district with the Landing, Bella Vista, and Turtle Mountain neighbourhoods. Districts denoted with an asterisk (*) have smaller survey samples (n=78 to n=149).

Overall, the Kelowna area accounts for 55% of the population in the study area, the rest of the Central Okanagan 28%,[11] and Vernon 17%. The analysis in this report focuses on these three study sub-areas.

Figure 9. Population Distribution, 2018





Districts denoted with an asterisk (*) have smaller sample sizes (n=78 to n=149 surveys). Survey samples for other districts range from n=200 (West Bank First Nation) to n=613 (Kelowna City Centre/Pandosy).

[11] It may be noted that within the Other Central Okanagan area, the area formed by the two West Kelowna districts and the Westbank First Nation lands comprises 42,500 residents, or approximately 18% of the total population in the study area, while the communities of Lake Country, Peachland, RDCO East, and RDCO West account for the other 10% (24,700 residents).

3.1.1 Population and Households by District

Table 4 presents 2018 population and household counts by district, with household size and growth in the five years since 2013. The following districts have the smallest household sizes on average: Kelowna City Centre/Pandosy; Central Kelowna; and Vernon City Core/Alexis Park/ Harwood/ North Vernon (ranging from 1.76 to 1.92, compared to the survey average of 2.31). This expected for city centres with more apartments. The changes in household size over time are likely the product of demographic trends (aging population, changing family compositions) as well as neighbourhood growth patterns.

The areas with the highest population growth since 2013 were Westbank First Nation (25% over five years), Kelowna North (13%), Mission (12%), East Hill/Middleton/Mission Hill (11%), Lake Country (10%), Black Mountain/Southeast (10%) and Glenmore (10%).

Table 5. 2018 Households and Population by District

			2018			% change since 2013		
Geography		District	Households	Population in Private Dwellings	Avg. Household Size	Households	Pop'n	Avg. Hhld Size
Study Area			**102,590**	**237,250**	**2.31**	**8.4%**	**7.6%**	**-0.7%**
Study Area	Central Okanagan		84,140	197,030	2.34	8.6%	8.1%	-0.5%
	Vernon		18,460	40,220	2.18	7.4%	5.5%	-1.7%
Central Okanagan	Kelowna		56,530	129,860	2.30	8.1%	7.9%	-0.1%
	Other Central Okanagan		27,600	67,180	2.43	9.7%	8.3%	-1.3%
By District								
Vernon	City Core / Alexis Park / Harwood / North Vernon	1001	5,840	10,300	1.76	8.6%*	1.0%*	-7.0%*
	East Hill / Middleton / Mission Hill	1002	6,400	15,180	2.37	7.0%*	11.2%*	3.9%*
	Landing / Bella Vista / Turtle Mountain / Priest's Valley	1003	4,210	9,960	2.37	11.7%*	6.0%*	-5.1%*
	Outlying Areas	1004	2,010	4,770	2.37	-2.9%*	-2.1%*	0.9%*
	Lake Country	2000	5,300	13,240	2.50	12.3%	10.2%	-1.8%
Kelowna	City Centre / Pandosy	3001	13,380	25,160	1.88	7.4%	8.2%	0.8%
	Central Kelowna	3002	8,930	17,130	1.92	6.9%	7.7%	0.7%
	Glenmore	3003	8,230	20,440	2.48	10.6%	9.6%	-0.9%
	Rutland	3004	11,090	27,080	2.44	3.7%	3.5%	-0.2%
	Mission	3005	6,630	18,950	2.86	13.3%	12.1%	-1.1%
	Black Mountain / Southeast	3006	5,350	14,550	2.72	11.5%	9.9%	-1.4%
	Kelowna North	3007	2,110	5,000	2.37	17.2%	13.4%	-3.3%
	Duck Lake 7	3008	810	1,550	1.91	-12.0%	-14.8%	-3.3%
West Kelowna	Glenrosa / Westbank	4001	7,280	18,530	2.55	5.1%	4.7%	-0.3%
	Rose Valley / Lakeview	4002	5,430	14,250	2.62	5.6%	5.2%	-0.4%
	*West Kelowna Sub-Total***		*12,710*	*32,780*	*2.58*	*5.3%*	*4.9%*	*-0.4%*
	WFN	5001	4,660	9,740	2.09	28.7%	25.2%	-2.7%
	Peachland	6000	2,500	5,540	2.22	6.4%	5.5%	-0.8%
	RDCO West	7000	910	1,960	2.15	4.6%	1.0%	-3.4%
	RDCO East	8000	1,520	3,920	2.58	0.0%	3.4%	3.4%

* For Vernon districts, interpret changes since 2013 with caution due to issues with geographic boundaries when reweighting the 2013 data.

**For some analyses by district in this report, the two West Kelowna districts have been combined to provide the overall municipal result.

3.2 Household Characteristics

3.2.1 Dwelling Type

Dwelling type often has a strong relationship to household income, vehicle availability, proximity to transit, and the closeness of services. Household dwelling types for Kelowna, the rest of the Central Okanagan and Vernon are compared in **Figure 10** to the right.

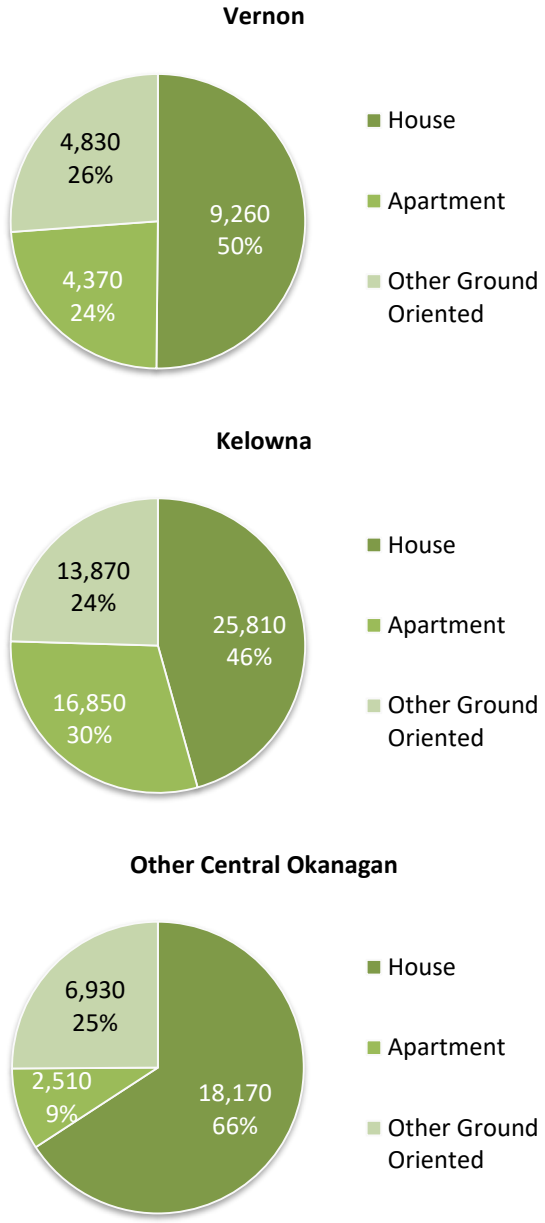
In Kelowna, 46% of households live in single-family (single-detached) dwellings, with another quarter living in other ground-oriented dwellings (row or town house, semi-detached, or mobile home), while three in ten live in apartments. Closer examination of the data reveals that the City Centre/Pandosy and Central Kelowna districts are comprised of 50% apartments.

In the rest the Central Okanagan, two-thirds of households live in single family dwellings.

In Vernon, half of households live in single-family dwellings, while apartments and other ground oriented dwelling types account for about one-quarter of households each. Within the city, the City Centre/North Vernon district has the highest concentration of apartments, with 52% of households living in apartments.

Comparison against the previous cycle revealed that in Vernon and Kelowna, apartments and in other ground oriented dwelling units are each being built at about 3 to 4 times the rate of new single-detached houses, while in the rest of the Central Okanagan, the greatest growth is in other ground oriented units.

Figure 10. Households by Dwelling Type, 2018



*other ground oriented = row/town house, semi-detached, secondary suite, mobile home

3.2.2 Household Size

The distribution of households by number of household members is presented in the charts in **Figure 11**.

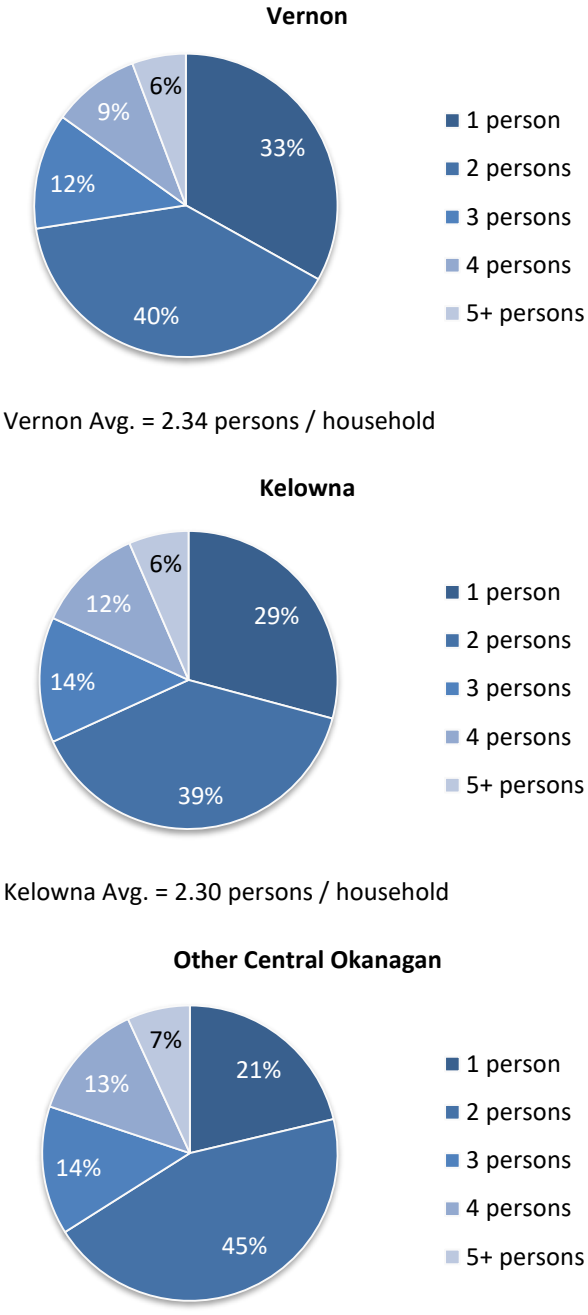
The Other Central Okanagan sub-area has proportionately more two-person households and fewer one-person households than Kelowna and Vernon.

Households with three or more persons comprise only 27% of households in Vernon, compared to 32% and 34% in Kelowna and the rest of the Central Okanagan respectively, which may be indicative of a slight drop in the number of families with children in the sub-area and consistent with the somewhat slower population growth compared to the Central Okanagan.

Comparison of the survey data to the 2013 cycle confirms that the proportions of three and four person households is declining in most areas, although the proportion of households with five or more persons has experienced a slight uptick.

See also in **Table 5** in **Section 3.1** for more information on average household size by district and the trend since 2013.

Figure 11. Households by Size, 2018



3.2.3 Household Income

Income is an important consideration for transportation as it is often correlated to transportation behaviours. The household income profile of each of the geographic areas is presented in **Figure 12**.

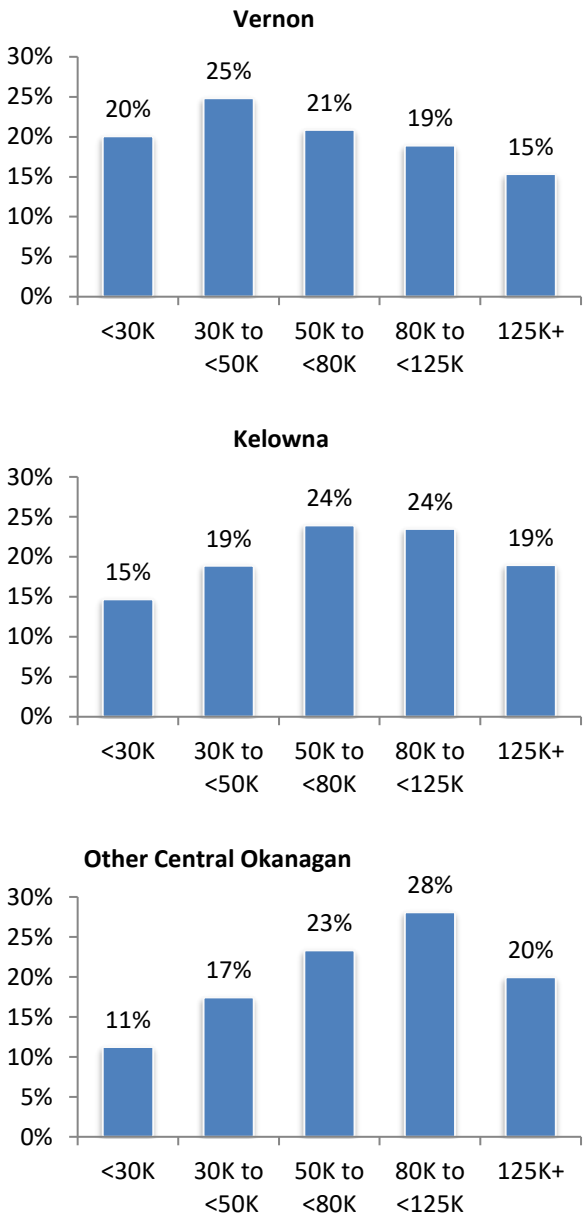
The Other Central Okanagan area appears to be generally more affluent as a whole, with almost 48% of all households having incomes of more than $80,000 per year, and only 11% under $30,000 per year.

Vernon appears to be the least affluent as a whole, with 20% of households having incomes of less than $30,000 per year. Overall, close to half (46%) make less than $50,000. Just over one-third (34%) make more than $80,000.

Kelowna sits between these extremes, with 15% of households bringing in less than $30,000 per year and a more even profile curving across the other income brackets. A total 43% of households have incomes of greater than $80,000.

It should be noted that fully 17% of households surveyed either declined to provide their household income range or did not know it, and it is not known whether their income distributions follow the same distribution profile as for those who did.

Figure 12. Household Income (% of Households), 2018



The survey question on household income was subject to 17% non-response. In the data weighting there was no correction for non-response bias by income level. Therefore the survey results may not necessarily be representative of all households in the area.

3.3 Household Vehicles

3.3.1 Household Vehicles, 2007 to 2018

The expanded survey results suggest that across the study area there are about 186,800 insured household vehicles (including cars, light trucks, vans, and motorcycles, and including vehicles provided by employers that household members use for commuting or personal business). This is up from expanded survey counts of 184,400 in 2013 and 160,700 in 2007, for a 16% increase over 11 years. Across the 11 years since the 2007 baseline survey, the 16% increase in vehicles has lagged a bit behind population growth (19% across this period).

Figure 13 illustrates this growth by region. It is unclear whether the uneven growth pattern for Kelowna is the result of sampling error or other biases in the survey data in one or more of the survey cycles, or an actual trend of slower rates of vehicle acquisition followed by higher recent growth.

Figure 13. Total Household Vehicles, 2007-2018

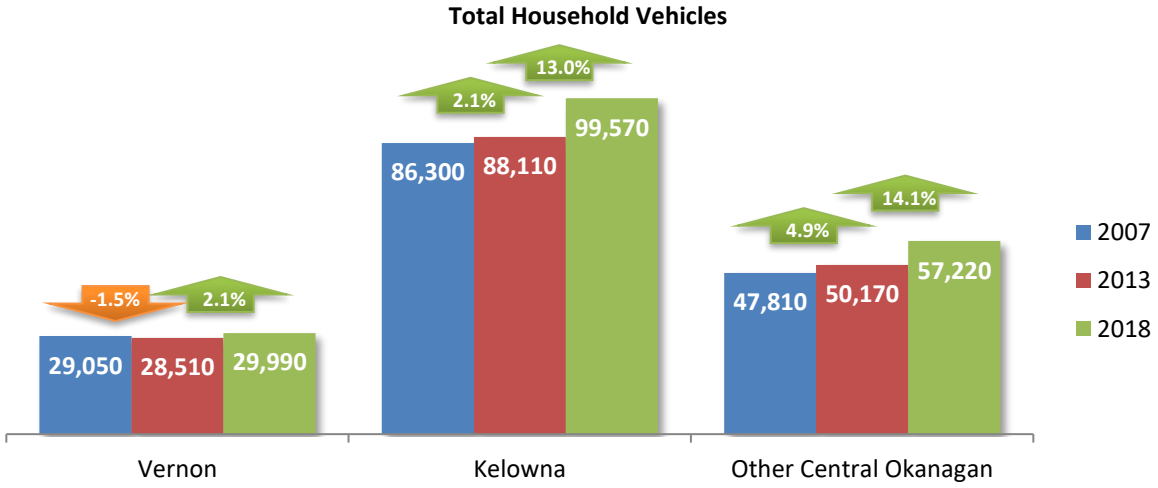
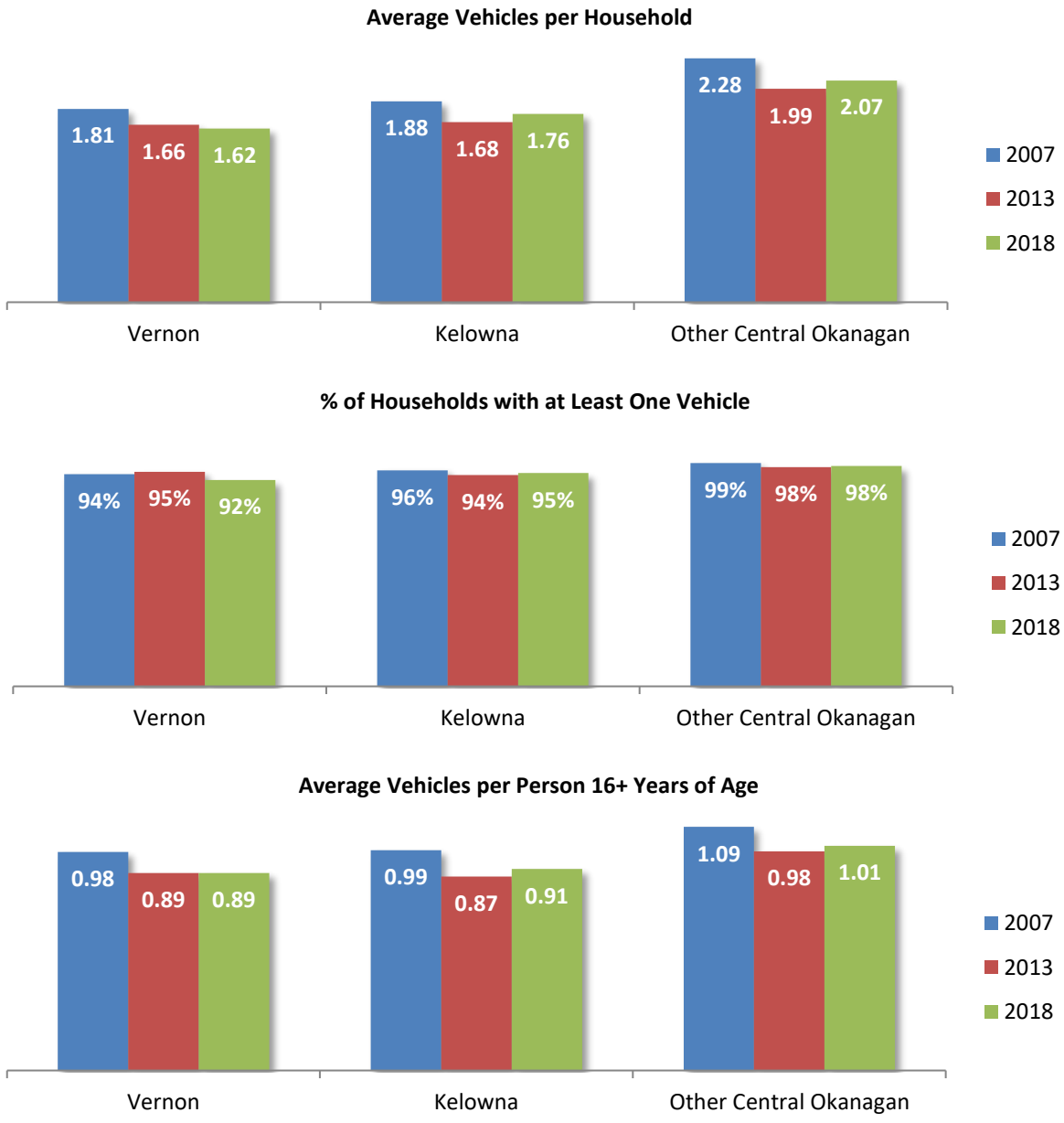


Figure 14 below illustrates trends in vehicle ownership. As noted above, some of the fluctuations between survey cycles may be attributable to sampling error and/or different biases in the data collected in each cycle. Nevertheless, overall trends do appear in the data. The average number of vehicles per household has dropped slightly overall. This is consistent with a slight decrease in household size.

The percentage of households with at least one vehicle has been relatively constant in each of the communities. A small portion of households in Vernon and Kelowna are without a vehicle (8% and 5% respectively), with fewer still in the rest of the Central Okanagan (2%). The survey results also suggest slight drops in the number of vehicle per person eligible for a driver's license with about 0.9 vehicles per person 16+ years of age in Vernon and Kelowna, and 1.0 vehicles per person 16+ in the rest of the Central Okanagan (when compared to 2007, a drop of about 8%-9% in each region).

Figure 14. Trends in Vehicle Ownership, 2007-2018



3.3.2 Vehicle Types

The distributions of household vehicles by type and fuel types are presented in **Figure 15** and **Figure 16**. As might be expected given its geography, the Other Central Okanagan sub-area has proportionately more pickups and vans than Kelowna and Vernon. Looking at use of alternative fuels, the Other Central Okanagan sub-area leads in terms of diesel vehicles (6% of vehicles in this area), while Kelowna has more hybrid and electric vehicles (1.8% and 0.4% respectively) compared to the other sub-areas.

Figure 15. Vehicle Type, 2018

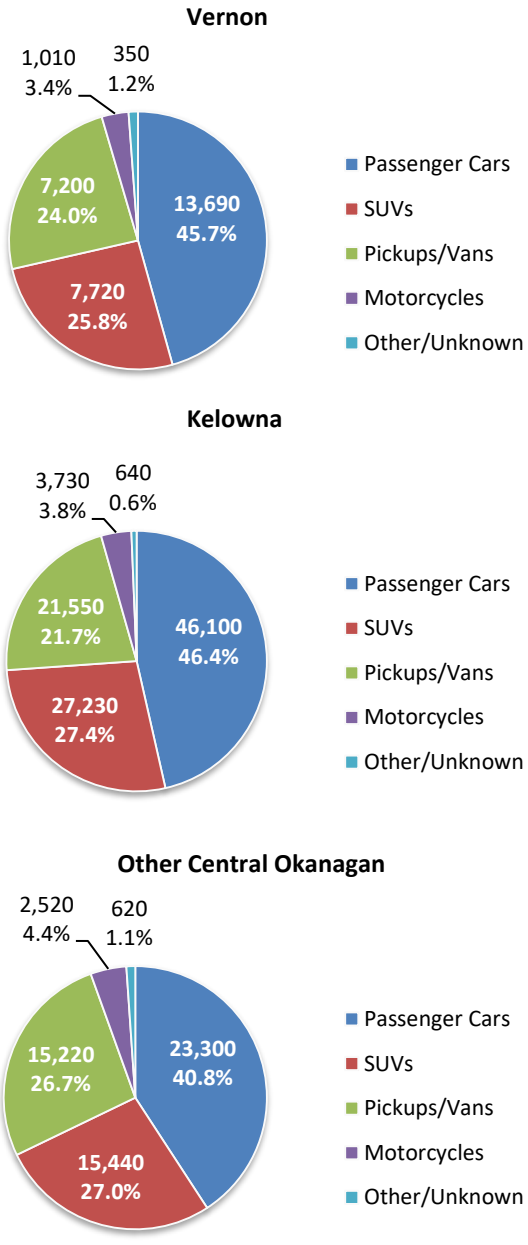
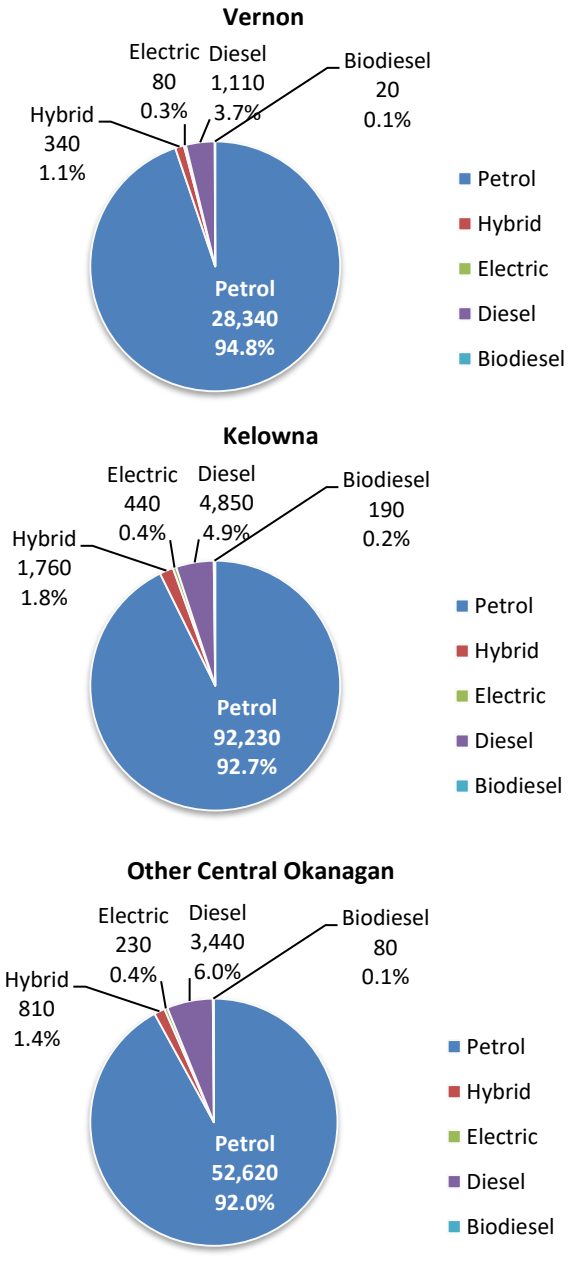


Figure 16. Vehicle Fuel Type, 2018



Figures in the table are estimates based on a survey sample of 4.8% of all households and may be subject to non-response bias.

3.3.3 Relationship between Household Characteristics and Vehicle Availability

Figure 17 illustrates the relationship between household size and availability of household vehicles across the study area. Single-person households are somewhat less likely to have vehicles, whereas almost all households with two or more people are likely to have at least one vehicle. As household size increases from one person to two and three persons, the number of vehicles per household increases, but flattens off at four persons and above. As household size increases, there is corresponding decline in the number of vehicles required per household member over the age of 16 years age.

Figure 18 illustrates the relationship of dwelling type to vehicle availability. The average number of vehicles per single-detached house is 2.21, dropping to 1.63 vehicles per households for other ground-oriented dwellings (townhouses, duplexes, etc.) and 1.15 for apartments.

Figure 17. Relationship of Household Size to Vehicle Access – Study Area, 2018

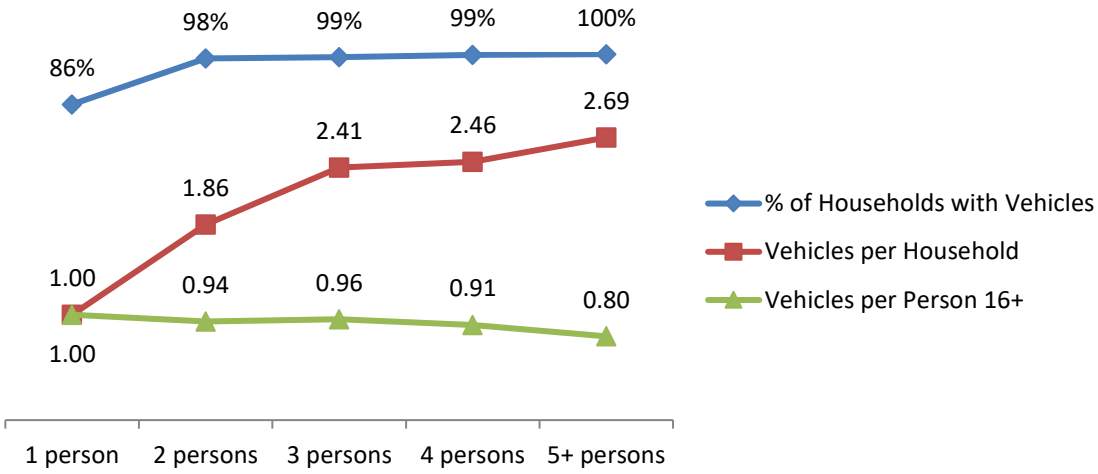
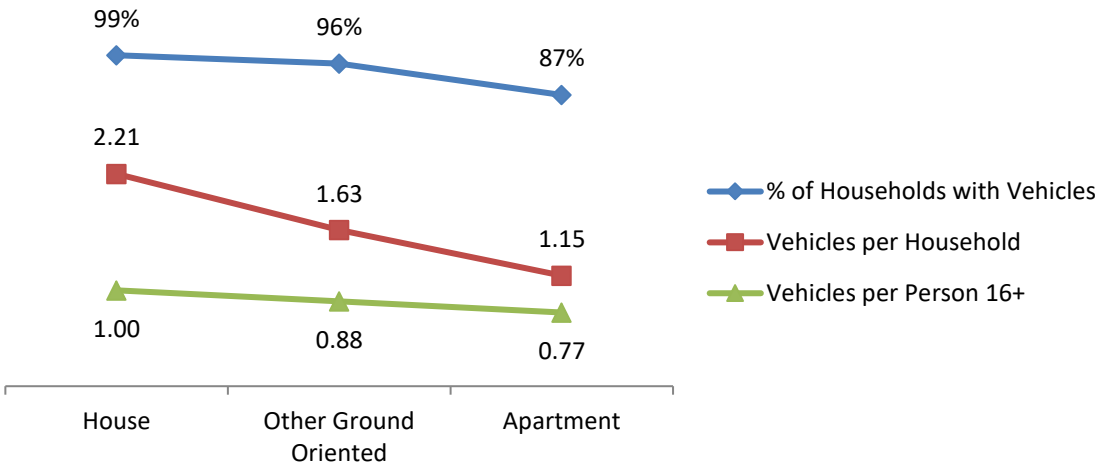


Figure 18. Relationship of Dwelling Type to Vehicle Access – Study Area, 2018



The survey results by geographic sub-area are detailed in Table 6. The patterns within each geographic area are very similar to the overall trend presented for the study area above, with some differences in the Other Central Okanagan sub-area having more vehicles. These differences likely have to do with the more suburban and rural areas included in this area, the type of work residents do, and less concentration of jobs, shopping, and local services. This may result in increased reliance on household vehicles for both work purposes and personal business.

Table 6. Vehicles per Household by Household Size

Geography	Household Characteristic	Households	% of Households with Vehicles	Vehicles	Vehicles per Household	Persons 16+*	Vehicles per Person 16+
Kelowna	Total	56,530	95%	99,570	1.76	110,020	0.91
Rest of Central Ok.	Total	27,600	98%	57,220	2.07	56,760	1.01
Vernon	Total	18,460	92%	29,990	1.62	33,840	0.89
Household Size							
Kelowna	1 person	16,490	86%	16,150	0.98	16,490	0.98
	2 persons	22,060	98%	39,690	1.80	43,660	0.91
	3 persons	7,700	99%	18,010	2.34	19,090	0.94
	4 persons	6,610	100%	15,760	2.38	18,220	0.86
	5+ persons	3,670	100%	9,960	2.71	12,560	0.79
Other Central Okanagan	1 person	5,880	92%	6,920	1.18	5,880	1.18
	2 persons	12,350	100%	25,210	2.04	24,570	1.03
	3 persons	3,890	99%	10,100	2.60	10,030	1.01
	4 persons	3,590	99%	9,600	2.67	9,600	1.00
	5+ persons	1,900	100%	5,410	2.85	6,680	0.81
Vernon	1 person	6,110	80%	5,520	0.90	6,110	0.90
	2 persons	7,280	98%	12,800	1.76	14,520	0.88

	3 persons	2,280	97%	5,260	2.31	5,600	0.94
	4 persons	1,730	98%	3,970	2.29	4,510	0.88
	5+ persons	1,060	96%	2,450	2.31	3,090	0.79
Dwelling Type							
Kelowna	House	25,810	98%	56,740	2.20	58,430	0.97
	Other Ground Oriented	13,870	97%	22,770	1.64	25,830	0.88
	Apartment	16,850	89%	20,060	1.19	25,760	0.78
Other Central	House	18,170	99%	41,940	2.31	40,160	1.04
Okanagan	Other Ground Oriented	6,930	96%	11,990	1.73	12,720	0.94
	Apartment	2,510	94%	3,300	1.31	3,870	0.85
Vernon	House	9,260	98%	19,070	2.06	19,300	0.99
	Other Ground Oriented	4,830	94%	6,930	1.43	8,570	0.81
	Apartment	4,370	75%	3,980	0.91	5,970	0.67

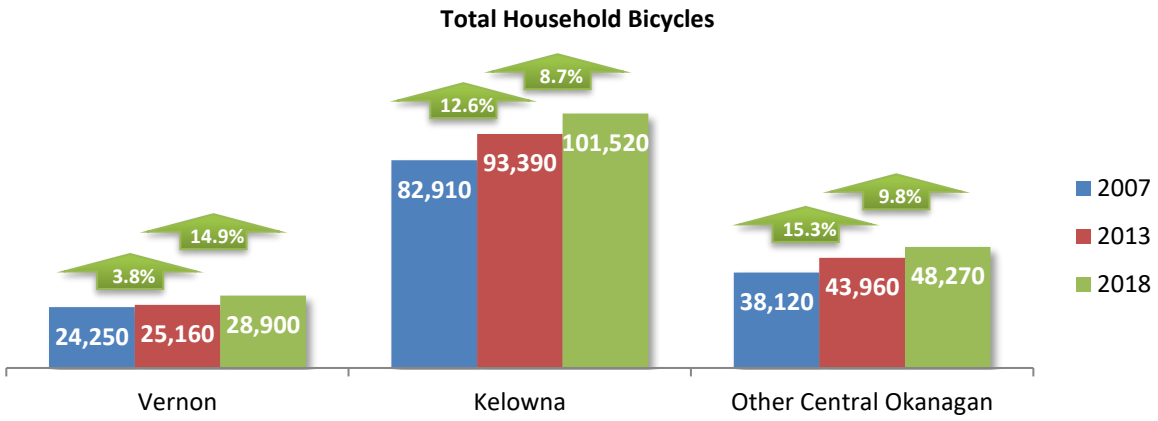
*Population 16 years or older who are eligible for a driver's licence, whether or not they hold a licence.

3.4 Household Bicycles

3.4.1 Household Bicycles, 2007 to 2018

The 2018 survey asked respondents to report all working adult bicycles and e-bikes and all working children's bicycles that have been used in the last year. The survey results suggest a steady increase in the number of bicycles to a total of 178,700 bicycles across the study area. This is up from 162,500 in 2013 and 145,300 in 2007, or a 17% increase across 11 years (compared to a 19% increase in population in the same period).[12] **Figure 19** illustrates the increase in bicycles by sub-area.

Figure 19. Household Bicycles, 2007-2018



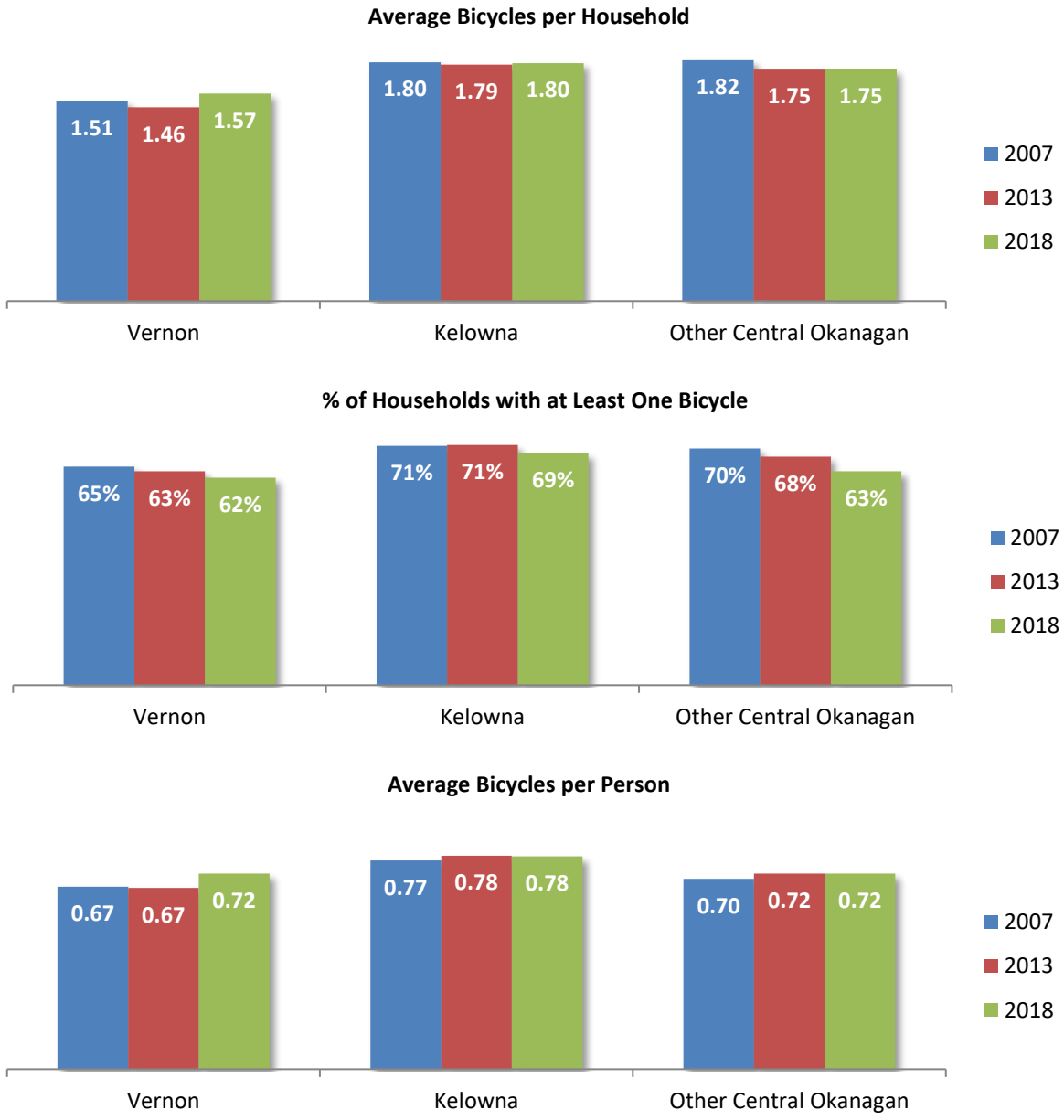
Trends in bicycle ownership are illustrated on the following page (**Figure 20**). The percentage of households with at least one bicycle has seen a decline over the last few years. This might be the product of a decrease in average household size (see **Section 3.1**).

Average bicycle ownership per person has stayed relatively flat, however, at 0.78 bicycles/person in Kelowna, and 0.72 in the rest of the Central Okanagan. This statistic appears to have increased slightly in Vernon from 0.67 in 2007 through 2013 to 0.72 in 2018.

Of note, examination of the expanded trip data revealed that while the female population accounts for 54% of all trips, they make only 32% of bicycle trips. This may be a consideration for initiatives that promote cycling.

[12] It may be noted that there may be some differences in definition that could affect the longitudinal comparisons: The 2018 survey asked respondents to report all working adult bicycles and e-bikes and all working children's bicycles that have been used in the last year, whereas the 2013 survey asked for a count of all bicycles in working condition, and the 2007 survey asked simply for a count of all bicycles.

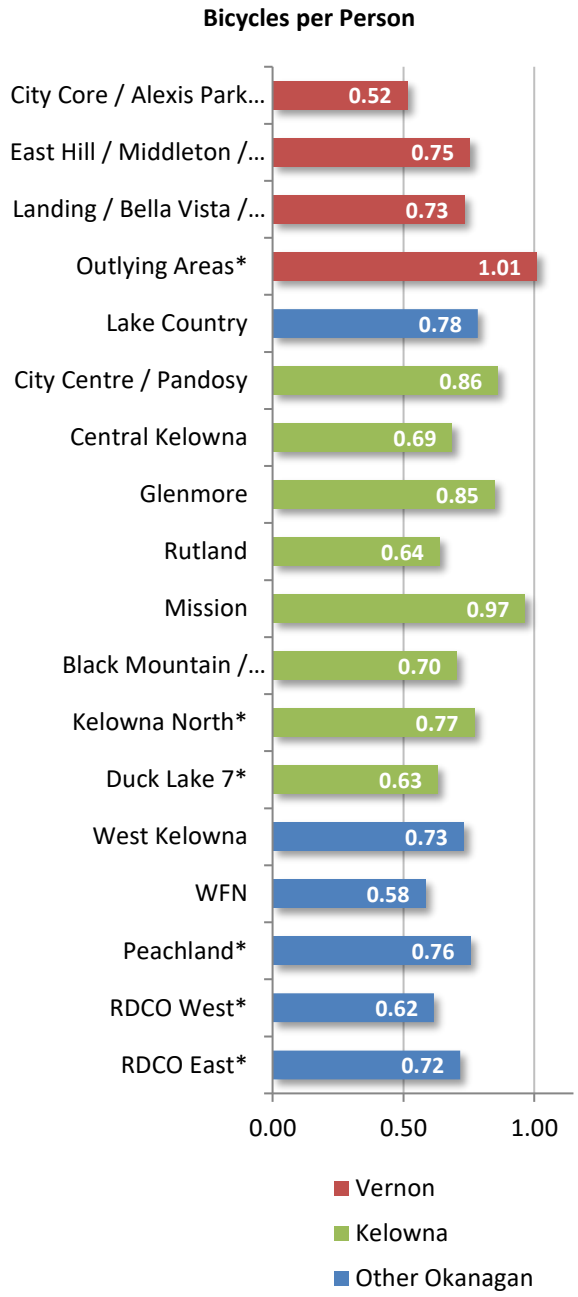
Figure 20. Trends in Bicycle Ownership, 2007-2018



3.4.2 Levels of Bicycle Ownership by District

Figure 21 breaks out levels of bicycle ownership per capita by district. The variation in average bicycles per person may be the product of a number of geographical or demographic factors. This might include the age distribution of residents, the number of families with children, proximity to jobs and services, the rideability or safety of local streets and arterial roads, and/or other socio-economic factors.

Figure 21. Bicycles per Person by District, 2018



* results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.

3.4.3 Bicycle Types

Figure 22 breaks out the bicycles in each sub-area into adult bicycles, adult e-bikes (electric assist bicycles with an integrated electric motor), and working children's bicycles.

In each sub-area, about four-fifths of bicycles are adult bicycles, whether regular bicycles or e-bikes.

While e-bikes are still a relatively small proportion of the total pool of bicycles, the growing adoption of e-bikes may be of interest to transportation planners. Closer examination of the data revealed certain districts with above-average proportions of adult e-bike ownership:

Kelowna

- Mission (e-bikes represent 2% of all household bicycles)

Other Central Okanagan:

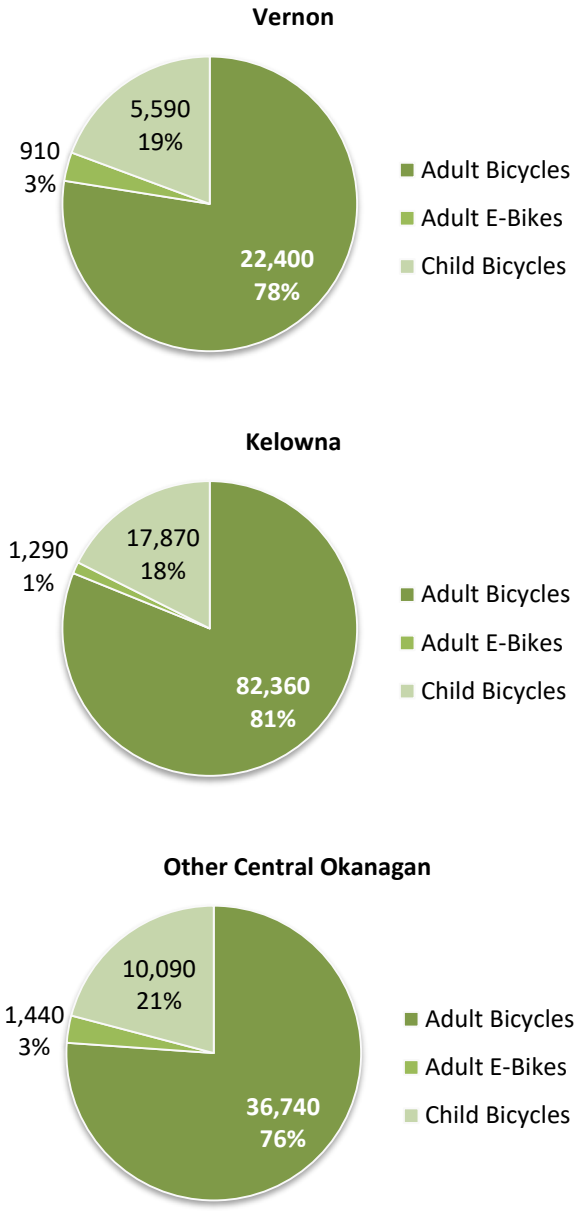
- Rose Valley/Lakeview (4%)
- Westbank First Nation (4%)
- Peachland (4%)

Vernon:

- Outlying Areas (5%)
- Landing/ Bella Vista/ Turtle Mountain/ Priest's Valley (4%)

The results of this survey should provide a useful baseline against which to track the growth in adoption of e-bikes.

Figure 22. Types of Bicycle, 2018



3.5 Age Distribution

The age profile of each survey sub-area is presented in **Figure 23** on the following page, based on Census 2016 distributions scaled up to estimated 2018 levels. The green sections of the bars show the increase in population in the given age range in the five years since 2013. The red dotted lines should population loss in the given age range. Increases or decreases in population in a given age range may be due to births, population aging out of one range and into another, and/or migration into or out of the area. Comparison is not made to 2007 data as the 2007 survey data were not weighted by age.

Both Vernon and the Other Central Okanagan area have a large older population which is growing. Both areas show a 'bubble' of older population in the age ranges between 50 and 74. There have been substantial gains for these population groups in the past five years, and somewhat more modest gains for those 75+ years of age. In age groups younger than 50, there have only been modest increases, or even decreases. Both sub-areas show modest losses in the 45-49 age group and in the 15-19 age group, without a corresponding increase in the next age bracket up. The latter may be the result of youth moving away for post-secondary education and employment after high school. While Kelowna also shows increases in its population 55 to 74 years of age, it has more growth in the age ranges between 20 and 39, and more in the 5 to 9 age bracket. The overall profile is less senior-heavy than the other two regions.

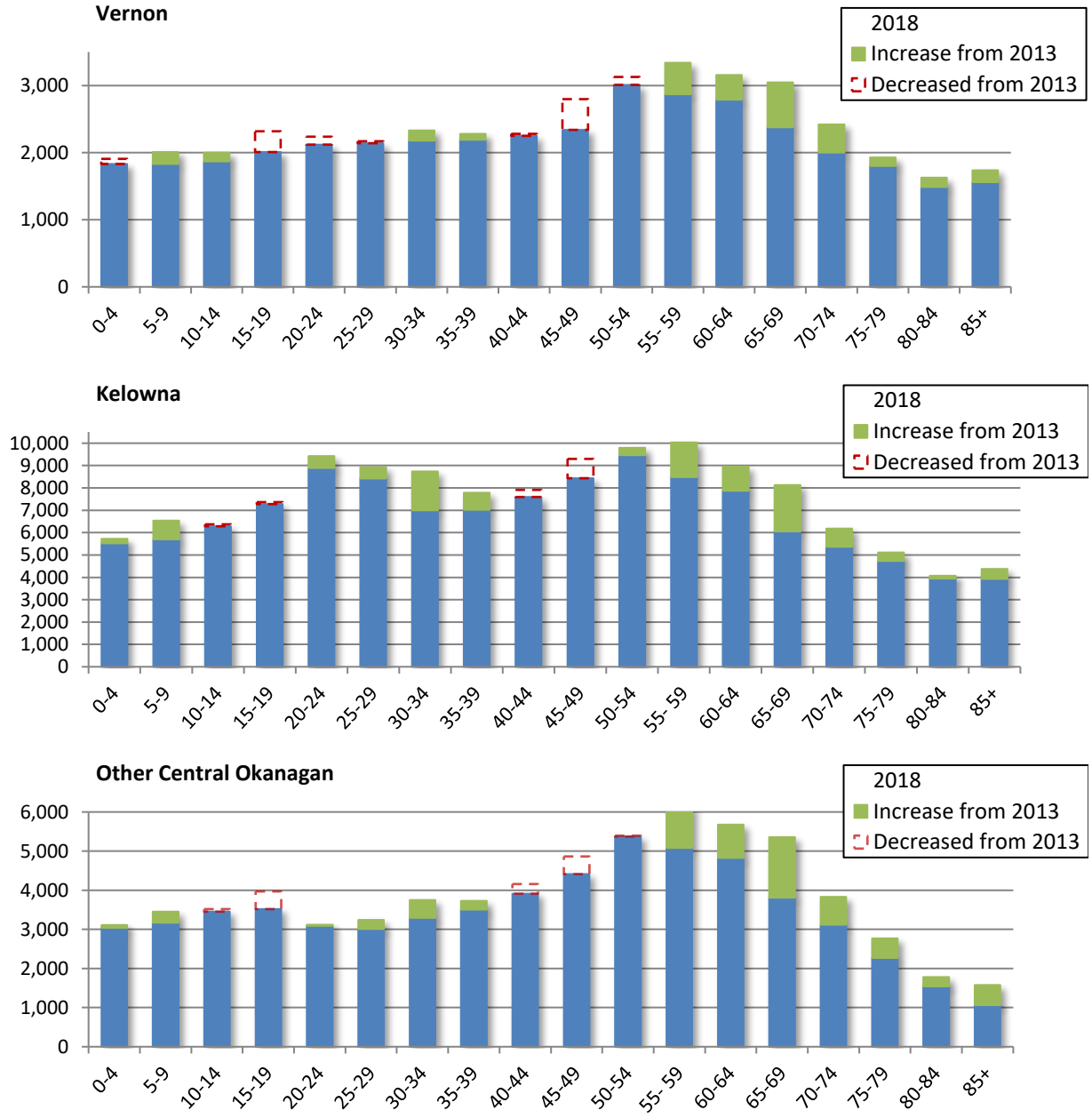
The survey data suggest that the average age is 42.3 years in Kelowna, 44.2 in Other Central Okanagan, and 45.1 in Vernon (up from 41.9, 42.4, and 43.8, respectively, in 2013).

Table 7 below summarizes the percentage distributions aggregated to 10-year groups (except 0-4 years) as well as the changes in proportion since 2013. Green highlighting indicates an increase in the proportion in the given age group, while orange indicates a decrease. Summing up counts reveals that proportion of the population that is 65 years of age or older is 20.9% in Kelowna, 22.5% in the rest of the Central Okanagan and 25.9% in Vernon.

Table 7. Population by Age Group, 2018, with Change in Proportions since 2013 (Based on Census Stats)

	Vernon				Kelowna				Other Central Okanagan			
Age Group	Pop.	% of Total	%-Pt Change Since 2013	% Female	Pop.	% of Total	%-Pt Change Since 2013	% Female	Pop.	% of Total	%-Pt Change Since 2013	% Female
Total	41,570	100%	-	53%	133,390	100%	-	52%	68,210	100%	-	51%
0-4	1,830	4.4%	-0.4%	48%	5,720	4.3%	-0.2%	49%	3,110	4.6%	-0.3%	48%
5-14	4,000	9.6%	+0.3%	49%	12,830	9.6%	-0.2%	50%	6,900	10.1%	-0.6%	50%
15-24	4,130	9.9%	-1.5%	49%	16,710	12.5%	-0.7%	49%	6,630	9.7%	-1.5%	48%
25-34	4,470	10.8%	-0.2%	50%	17,670	13.2%	+0.7%	49%	7,000	10.3%	+0.2%	51%
35-44	4,530	10.9%	-0.3%	52%	15,370	11.5%	-0.6%	50%	7,640	11.2%	-1.0%	50%
45-54	5,350	12.9%	-2.0%	53%	18,220	13.7%	-1.6%	52%	9,780	14.3%	-2.0%	52%
55-64	6,500	15.6%	+1.4%	54%	19,000	14.2%	+1.0%	54%	11,820	17.3%	+1.5%	52%
65-74	5,470	13.2%	+2.1%	54%	14,310	10.7%	+1.5%	53%	9,200	13.5%	+2.4%	51%
75-84	3,570	8.6%	+0.3%	55%	9,180	6.9%	-0.1%	55%	4,550	6.7%	+0.6%	49%
85+	1,720	4.1%	+0.2%	66%	4,380	3.3%	+0.1%	63%	1,580	2.3%	+0.6%	58%

Figure 23. 2018 Population by Age, with Gains or Losses since 2013 (Based on Census Statistics)



Source: 2011 and 2016 Statistics Canada Census projected to 2013 and 2018 with a single factor across all age groups. Therefore, the distributions represent Census year distributions, but the counts represent 2013 and 2018.
Note: The age profile in the Okanagan Travel Survey datasets from both years is close to this profile but does not yield a perfect match, since most weighting by age group was undertaken for 10-year age brackets. Also, the age distributions presented above include all population, whereas the survey only represents population in private dwellings. Approximately 2.4% of the total population live in collective dwellings, although the proportion is much higher amongst those older than 75 years of age.

3.5.1 Average Age by District

The figure to the right profiles the average age of the population in each district as reflected in the survey responses. This provides an idea as to which districts are generally 'younger' or 'older' (although it cannot provide insight into the spread across different age ranges).

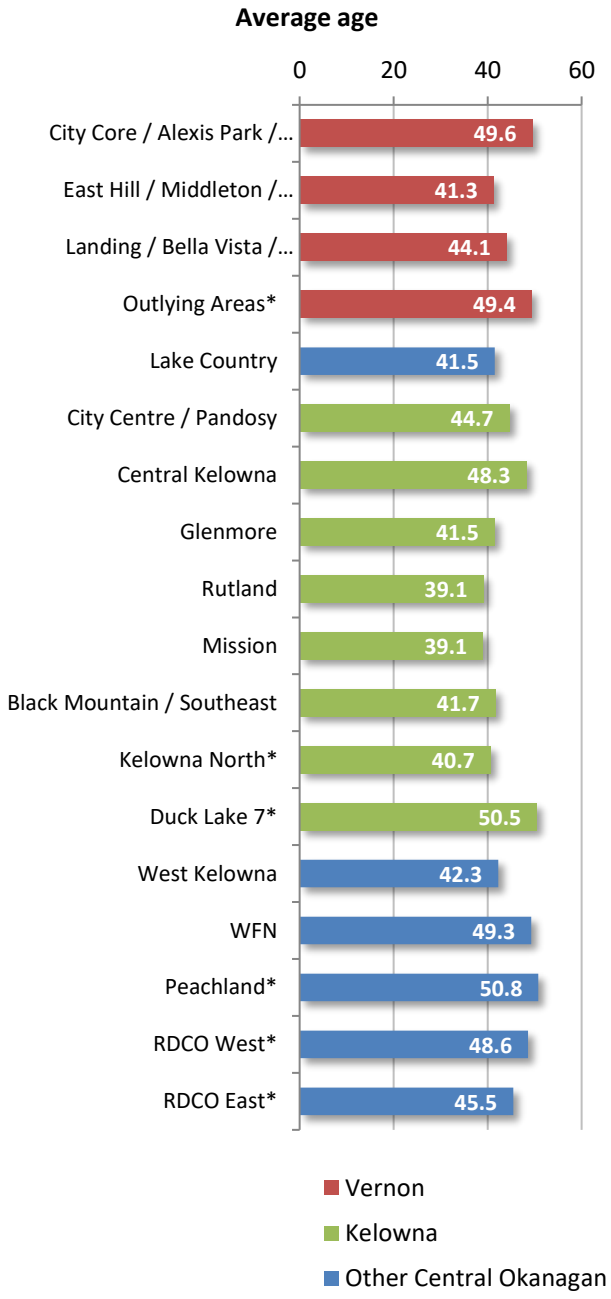
Interestingly, the more central districts in Vernon and Kelowna have higher average ages. Closer examination of the survey data reveals that, while all these central areas have lower than average incidence of children, the reasons differ:

- For the both the City Core/North Vernon and Central Kelowna areas, the higher average ages (49.6, 48.3) are due to larger proportions of seniors (33% of the population in each district is over the age of 65, compared to the Kelowna average of 22%).
- For the City Centre/Pandosy district, the higher average age (44.7) is mainly due to a higher incidence of 25-44 year olds (at 29%), while seniors are just slightly above the Kelowna average (at 25%).

Other districts with 30% or more seniors include Peachland, Westbank First Nation, and Duck Lake.

RDCO West and East are differentiated from other districts by having proportionately high populations of 45-64 year-olds (41% and 37%, respectively compared with the study area average of 29%). These districts have lower than average proportions in other age ranges.

Figure 24. Average Age by District, 2018



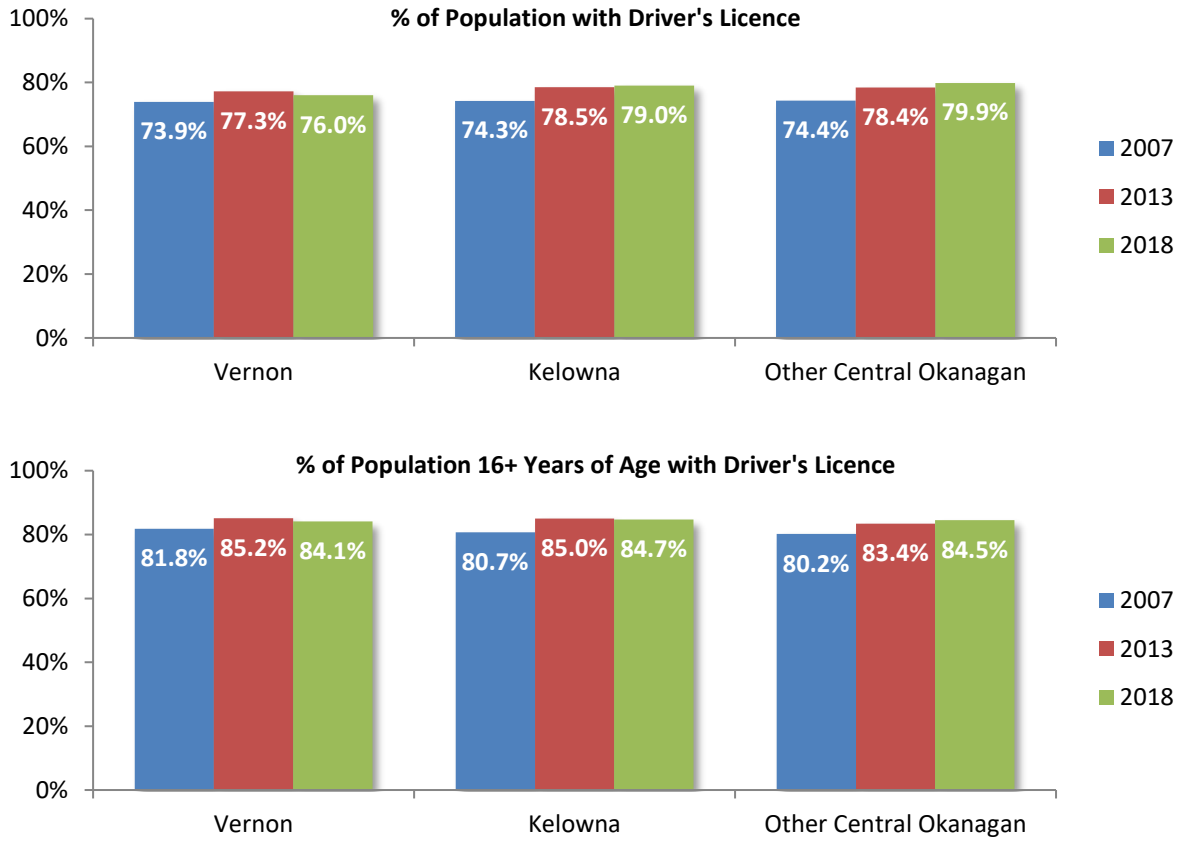
* Results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.

3.6 Licensed Drivers

Across the study area, approximately 79% of the population has a driver's licence, which is just a slight increase from 78% in 2013. Looking at just population 16+ years of age (those eligible for a licence) the percentage has been steady at close to 85% since 2013. Results are presented by region below (**Figure 25**).

Overall, the survey results suggest that there are 186,500 people with driver's licenses in the region, with about 102,600 of these in Kelowna, 53,700 in the rest of the Central Okanagan, and 30,600 in Vernon.

Figure 25. Possession of a Driver's Licence, 2007-2018

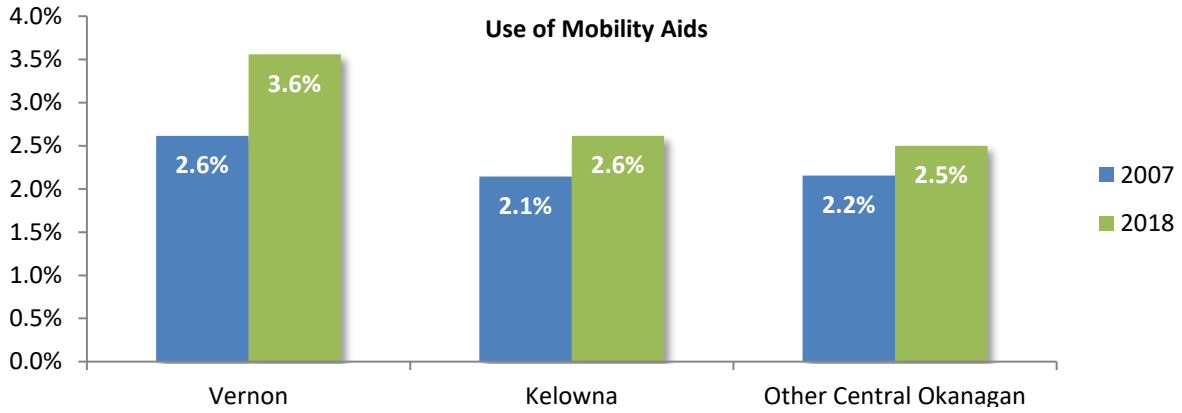


3.7 Mobility Challenges

Across the study area, the proportion of residents who reported having a physical disability or condition that limits their mobility is 6.2%. This proportion is 5.7% in both Kelowna and the Other Central Okanagan area, and highest in Vernon at 8.5% of the population. Not all of these people use a mobility aid.

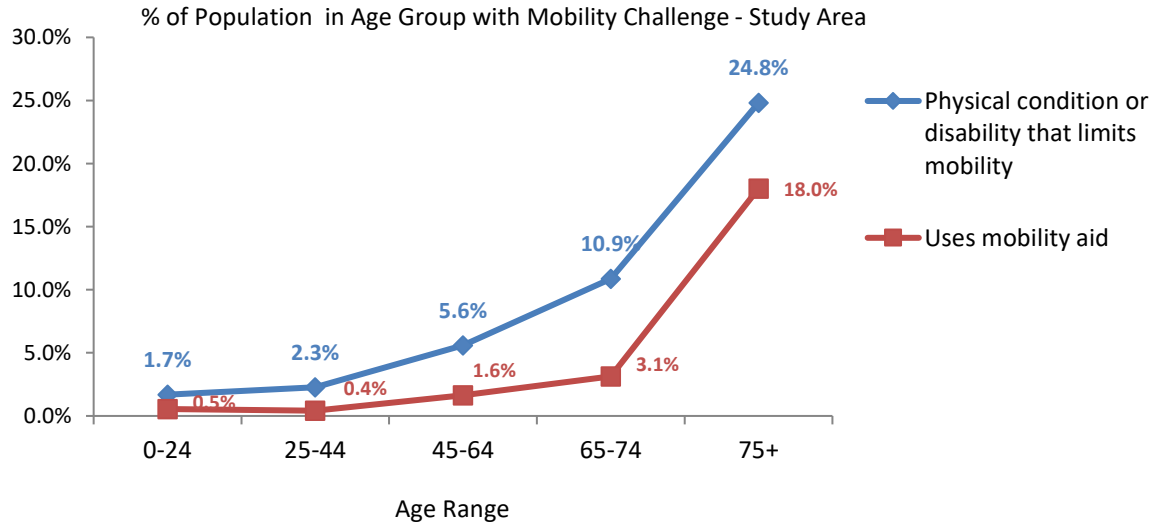
Across the study area, 2.7% of the population reported using a mobility aid. This proportion is highest in Vernon, at 3.6%, up from 2.6% in 2007 (**Figure 26**). Rates in Kelowna and the rest of the Central Okanagan were similar, at 2.5%-2.6%, up from 2.1%-2.2% in 2007. The increase may be consistent with the aging of the population. **Figure 27** highlights the relationship between age and mobility challenges.

Figure 26. Percent of Population Using a Mobility Aid, 2007-2018



The 2013 survey results are not displayed due to irregularities in the data for this one question.

Figure 27. Increase in Mobility Challenges with Age – Study Area, 2007-2018



Canes are the most common mobility aid used (used by 1.8%), followed by walkers (1.1%), with wheelchairs scooters and crutches reported by fewer respondents (Table 1). Readers are reminded that these statistics apply to people living in private dwellings, and do not include people living in collective dwellings such as care homes and group homes.

Table 8. Mobility Challenges and Mobility Aids, 2018

	Study Area	Vernon	Kelowna	Other Central Okanagan
Population living in private dwellings	237,300	40,200	129,900	67,200
No mobility challenges	93.8%	91.5%	94.3%	94.3%
Has physical disability or condition that limits mobility	6.2%	8.5%	5.7%	5.7%
Has limits to mobility, but does not use an aid	3.5%	4.9%	3.1%	3.2%
Uses mobility aid	2.7%	3.6%	2.6%	2.5%
Type of Mobility Aid Used*				
Wheelchair	0.3%	0.3%	0.2%	0.4%
Scooter	0.2%	0.2%	0.2%	0.1%
Walker	1.1%	1.4%	1.1%	1.0%
Cane	1.8%	2.2%	1.9%	1.4%
Crutch	0.2%	0.2%	0.1%	0.5%

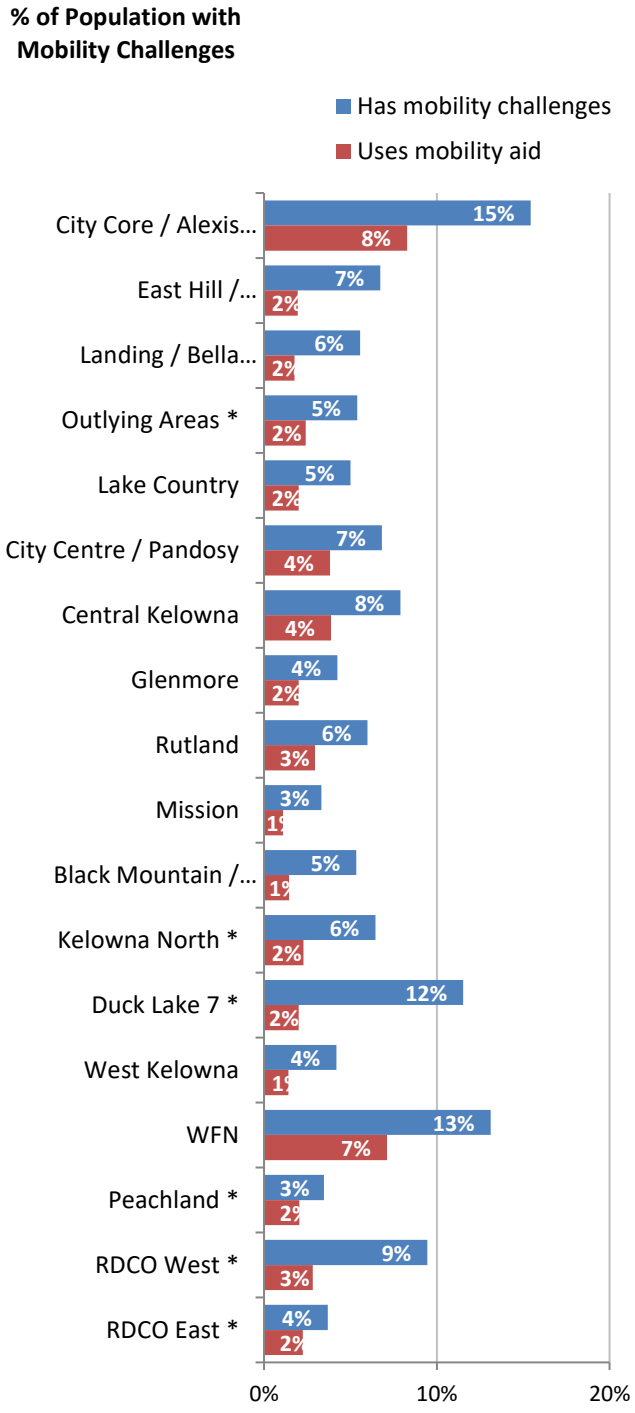
*Answers may add to greater than the total % who use a mobility aid as some people use more than one mobility aid.

3.7.1 Mobility Challenges by District

The chart to the right provides information on the incidence of physical disabilities/conditions that limit mobility and use of mobility aids by district (Figure 28).

Readers are reminded that the results for districts with smaller sample sizes should be interpreted with caution.

Figure 28. Mobility Challenges by District, 2018



* Results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.

3.8 K-12 and Post-Secondary School Enrolments

The student population in the study area comprises about one-fifth of the total population, or about 46,700 students. Across the study area, about 64% of students (29,900) are in the K-12 (Kindergarten to Grade 12) system. **Table 9** presents figures on the number of students by school type for each sub-region. Readers are reminded that all numbers in the charts are based on a survey sample expanded to represent the population. All figures should be interpreted as approximate estimates.[13]

Changes in the size of the size of the K-12 and post-secondary student populations over time are examined on the next page.

Table 9. Students by Type by Sub-Area of Residence 2018

	Study Area	Vernon	Kelowna	Other Central Okanagan
Total Pop	237,250	40,220	129,860	67,180
Total Students	46,710	7,050	27,180	12,480
% of Population	19.7%	17.5%	20.9%	18.6%
K-12 students	29,940	4,920	16,350	8,680
Full-Time PSE/other	12,940	1,660	8,310	2,970
Part-Time PSE/other	3,820	480	2,520	820
PSE/other – breakdown				
College or university - FT	11,980	1,240	8,040	2,700
College or university - PT	2,300	240	1,400	660
Alternate, adult basic education, or other*	500	40	340	120
Online / distance learning - FT**	810	410	230	170
Online / distance learning - PT**	1,160	200	820	140

PSE = Post Secondary Education
K-12 = Kindergarten to Grade 12
*includes mix of full-time and part-time
**includes some middle or high school students taking online/distance learning

[13] The K-12 survey counts have not been validated against actual school enrolment figures, although may be expected to be within a reasonable range given that the survey data were weighted by age distribution.

Table 10 presents the change in the number of K-12 students between 2013 and 2018 based on the survey data. Figures for the 2007 baseline survey are not listed, as school type was not captured as part of the dataset. Based on the survey data, it appears that the number of K-12 students has increased by 9% in Kelowna, but has decreased by 8% in Vernon and by over 4% in the Other Central Okanagan sub-area. The 2018 survey figures have not been verified against school enrolments, although as the data compare well to Census counts by age range, and the vast majority of those aged 5 to 18 years of age are coded in the data as attending K-12 school, the survey figures are likely fairly reliable.

The main public post-secondary campuses in the region are: UBC Okanagan Campus (UBCO), Okanagan College, Okanagan College, and Okanagan College Vernon campus. **Table 11** outlines the increase in enrolments since 2013 (using enrolment figures put out by the institutions), with comparison to the expanded 2018 survey counts. The survey represents the most but not all enrolments at these campuses, which is expected, as some students would not have been within the survey scope.[14]

Table 10. K-12 Students by Place of Residence, 2013-2018

	Study Area	Vernon	Kelowna	Other Central Okanagan
2013	29,420	5,370	14,960	9,090
2018	29,940	4,920	16,350	8,680
% change 2013-2018	1.8%	-8.4%	9.3%	-4.5%

K-12 = Kindergarten to Grade 12

Figures are based on survey data, not school enrolment figures. Figures are counts of students living in each sub-area (place of residence). The location of the school enrolled will usually but not always been in the same community.

Table 11. Post-Secondary School Enrolments, 2013-2018

	2013 Enrolment	2018 Enrolment	% Change Since 2013	2018 Survey Count
UBC Okanagan Campus (UBCO)	8,388*	9,973*	+19%	7,670
Okanagan College	4,193	6,126	+46%	5,540
Okanagan College Vernon	714	1,088	+52%	770
Total	13,295	17,187	+29%	13,980

*Within these enrolments, UBCO houses up to 1,676 students in on-campus housing, which was not surveyed.

[14] Students living in UBCO on-campus residences are not counted in this total as collective dwellings were not surveyed. Also, all three institutions may attract students who live in outside the survey area and are not represented in the survey data.

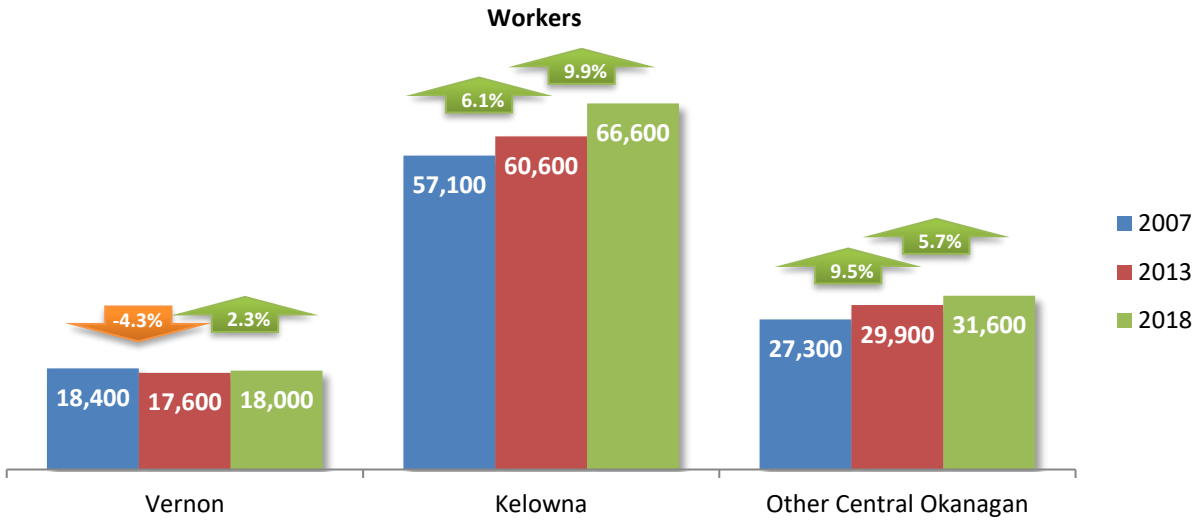
3.9 Employed Labour Force

3.9.1 Total Workers, 2007-2018

Based on the survey results, the total employed labour force in the study area in 2018 is estimated to be 116,200 workers[15], up from 108,100 in 2013 and 102,900 in 2007. Growth has been somewhat accelerated since 2013, at 7.5% over the past five years, compared to 5.8% over the previous six years from 2007 to 2013. Overall, this represents a 13% increase over 11 years, not quite keeping pace with the 19% increase in population over the same period.

This growth has been focused in Kelowna, which in the past five years has experienced 9.9% growth in working population (**Figure 29**). Growth in the rest of the Central Okanagan has been more modest at 5.7% since 2013. The survey data suggest that the size of the employed labour force in Vernon has remained comparatively flat over the last 11 years. Census figures for Vernon differ slightly but are for different time frames and support this general pattern in the survey data: 16,310 employed labour force in the 2006 Census, 16,710 in the 2011 National Household Survey, and 17,505 in the 2016 Census.[16]

Figure 29. Employed Labour Force, 2007-2018



[15] The expanded survey result compares favourably with 2016 Census figures projected forward to 2018 (117,800 workers).
[16] Sources: Statistics Canada profiles for Vernon, British Columbia (Code5937014): *2006 Community Profiles* (Statistics Canada Catalogue no. 92-591-XWE. https://www12.statcan.gc.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E), National Household Survey (NHS) Profile (Statistics Canada Catalogue no. 99-004-XWE. Ottawa. Released September 11, 2013. http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E,. *Census Profile. 2016 Census* (Statistics Canada Catalogue no. 98-316-X2016001. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E.)

3.9.2 Detailed Occupation Status

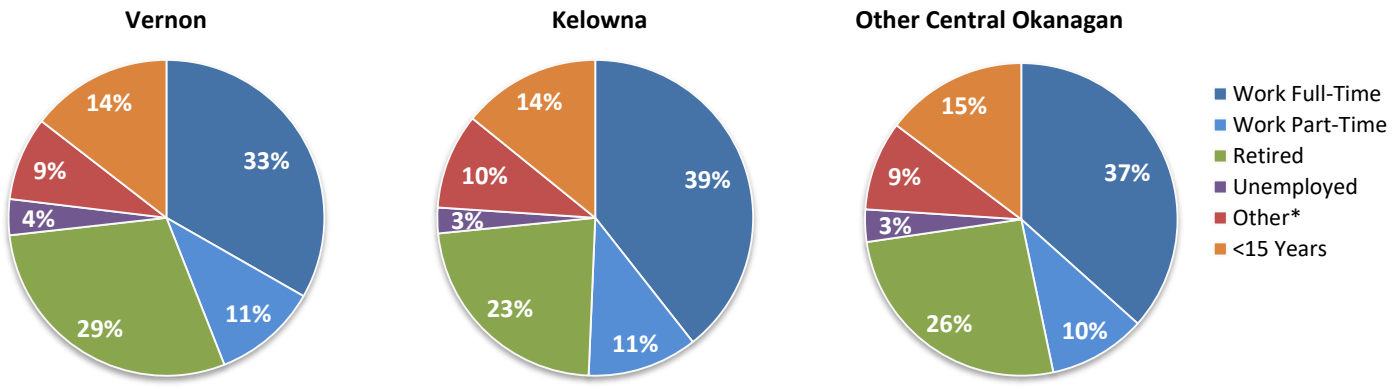
Table 12 presents a breakdown of occupation status across the entire population, combining the survey responses on questions about employment, student status, or other status. Summing up across categories, 49% of the population is employed (38% full-time, 11% part-time), and 20% are students (of all levels). The pie charts that follow (**Figure 30**) summarize the distributions for the sub-areas. As indicated, Kelowna has the largest proportion of population being full-time employed (39%), as compared to 37% in the rest of the Central Okanagan, and 33% in Vernon.

Table 12. Occupation Status, 2018

	Expanded survey counts				% of Total Population				% of Population 15+ Years of Age (eligible for labour force)			
	Study Area	Vernon	Kelowna	Other Central Ok.	Study Area	Vernon	Kelowna	Other Central Ok.	Study Area	Vernon	Kelowna	Other Central Ok.
Total Population	237,250	40,220	129,860	67,180	100%	100%	100%	67,180				
Population 15+ years of age	203,140	34,390	111,460	57,280	86%	86%	86%	85%	100%	100%	100%	100%
Work Full-Time	89,130	13,380	51,160	24,590	37.6%	33.3%	39.4%	36.6%	43.9%	38.9%	45.9%	42.9%
Work Part-Time	26,980	4,610	15,320	7,040	11.4%	11.5%	11.8%	10.5%	13.3%	13.4%	13.7%	12.3%
Unemployed	7,140	1,480	3,410	2,250	3.0%	3.7%	2.6%	3.3%	3.5%	4.3%	3.1%	3.9%
Other	5,510	1,170	2,550	1,790	2.3%	2.9%	2.0%	2.7%	2.7%	3.4%	2.3%	3.1%
Retired	58,730	11,750	29,540	17,440	24.8%	29.2%	22.7%	26.0%	28.9%	34.2%	26.5%	30.4%
Student (PSE/Other)	16,330	1,930	10,740	3,650	6.9%	4.8%	8.3%	5.4%	8.0%	5.6%	9.6%	6.4%
High School Student 15+ Yrs	6,850	1,130	3,810	1,920	2.9%	2.8%	2.9%	2.9%	3.4%	3.3%	3.4%	3.4%
5-14 Years of Age (student)	23,670	4,040	12,730	6,900	10.0%	10.0%	9.8%	10.3%				
0-4 Years of Age	10,450	1,800	5,670	2,980	4.4%	4.5%	4.4%	4.4%				
Overlapping categories												
Work FT + Student FT or PT	1,800	240	1,400	160	0.8%	0.6%	1.1%	0.2%	0.9%	0.7%	1.3%	0.3%
Work PT + Student FT or PT	4,520	540	2,990	980	1.9%	1.3%	2.3%	1.5%	2.2%	1.6%	2.7%	1.7%
Work PT + High School Student 15+ Years	1,210	280	680	260	0.5%	0.7%	0.5%	0.4%	0.6%	0.8%	0.6%	0.5%

PSE = Post Secondary Education, FT= Full Time, PT=Part Time.
*The vast majority of those 5-14 years of are K-12 students, with the exception of some with disabilities, early entry to post-secondary education, or other reasons.
In this table, #'s add to greater than total population and %'s add to greater than 100% due to overlapping categories (multiple responses)

Figure 30. Occupational Status (% of Population), 2018



*Other includes post-secondary and high school students aged 15+ years who are not employed

3.9.3 Type of Occupation

The survey asked employed respondents what type of occupations they worked at, using major occupational groups from the National Occupational Classification (NOC) system, with further breakdowns of categories of interest.

The distribution of workers by occupational group was close to that in the 2016 Census, validating the general representativeness of the survey data, but with some apparent over- and under-sampling of certain occupations. **Table 13** presents both the survey distributions and the Census data for reference. Most notably, the survey data somewhat under-represent the incidence of people in sales and service occupations (e.g., in Kelowna the survey proportion is 23% compared to 28% per the Census. This is the most common occupation (both per the Census and the survey data).

The comparisons should be interpreted with caution as survey respondents were asked to self-identify their occupational group, whereas the Census data are rigorously coded to the NOC system using information on specific job titles and job responsibilities. Occupation Type was not used as one of the data weighting controls in the preparation of the weighted survey data.

Table 13. Occupational Type (Employed Persons), 2018

Occupation Type	Vernon		Kelowna		Other Central Okanagan	
	Census	Survey	Census	Survey	Census	Survey
Total workers living in area	**18,000**	**18,000**	**67,300**	**66,600**	**32,400**	**31,600**
Management Occupations	10%	9%	12%	10%	13%	12%
Business Finance and Admin Occupations	14%	12%	15%	15%	16%	15%
Natural and Applied Science Occupations	6%	5%	6%	6%	5%	5%
Health Services Occupations	10%	12%	9%	11%	8%	10%
Education, Law & Social, Community & Government Services excl. K-12 Teachers	10%	5%	11%	7%	9%	5%
Secondary and Elementary School Teachers		4%		5%		3%
Performing and Facilitating Art, Culture, Recreation, and Sports	2%	2%	3%	3%	3%	3%
Sales & Service Provision	29%	22%	28%	23%	27%	22%
Trades, Transport & Equipment Operators excl. Commercial Driver	17%	15%	16%	13%	19%	16%
Commercial Driver		2%		1%		1%
Natural Resources, Agriculture & Related Production	4%	3%	3%	2%	4%	3%
Manufacturing and Utilities	5%	5%	3%	2%	3%	2%
Unknown	n/a	3%	n/a	3%	n/a	3%

3.9.4 Place of Work

About three-quarters of workers in the study area work at a usual place of work outside their home, while 12% work from home and 13% have no fixed workplace address (e.g., plumber, travelling salesperson, commercial driver, etc.), **Table 15**. Of note, the survey results suggest that the Other Central Okanagan sub-area has proportionately more residents who do not have a fixed workplace and more who work from home.

Table 14. Workplace Type, 2018

	Study Area	Vernon	Kelowna	Other Central Okanagan
Total workers living in area	116,200	18,000	66,600	31,600
Usual place of work outside the home	74%	76%	76%	69%
No fixed workplace address	13%	14%	11%	16%
Work from home	12%	10%	12%	14%
Unknown	1%	0%	0%	1%

3.9.5 Place of Work by District

Table 15 (following page) presents the distribution of workers by place of residence vs. places of work. For the purpose of this analysis, respondents with no fixed workplace have been coded to their home district, although for many it is likely that their work cover many districts. In reviewing the results, it is important to note that the distribution of places of work does not include jobs held by residents who live outside the study area (for example, a resident of Coldstream who works in Vernon). Nevertheless the survey likely captures the great majority of employment located in the surveyed communities and provides useful information in understanding the concentrations of jobs and where workers live.

The survey results reveal that Kelowna is a net attractor of workers from the study area, with about 74,900 jobs relative to the 66,600 workers who live in Kelowna.

- In particular, one-fifth (20%) of all jobs in the study area are located the Kelowna City Centre/Pandosy district, with a similar proportion in Central Kelowna (19%).
- Other districts which are net attractors of work commutes are the Vernon Core (7% of places of work), Kelowna North (8%).

Districts which are net generators of commutes from home with low ratios of jobs to workers (of about 0.5 or below) are:

- in Vernon: Landing / Bella Vista / Turtle Mountain / Priest's Valley;
- in Kelowna: Glenmore, Rutland, Mission, and Black Mountain / Southeast; and
- in the rest of the Central Okanagan: Peachland, RDCO West, and RDCO East.

Of note, the West Kelowna total (two districts combined) reveals that this city represents fully 13% of all workers and 9% of all places of work (with many workers living in West Kelowna commuting outside the City boundaries for work).

Table 15. Distribution of Workers' Places of Residence and Places of Work by District

Geography	District	Workers (by place of residence)	% of Workers	Jobs† (workers by place of work)	% of Jobs†	Ratio of Jobs to Workers
Study Area		116,230	100.0%	109,560	94.3%	0.94
External to Study Area				6,670	5.7%	
Sub-Areas						
Vernon		18,010	15.5%	15,100	13.0%	0.84
Kelowna		66,580	57.3%	74,900	64.4%	1.12
Other Central Okanagan		31,640	27.2%	19,560	16.8%	0.62
Districts						
City Core / Alexis Park / Harwood / North Vernon	1001	4,160	3.6%	7,710	6.6%	1.85
East Hill / Middleton / Mission Hill	1002	7,370	6.3%	4,750	4.1%	0.64
Landing / Bella Vista / Turtle Mountain / Priest's Valley	1003	4,450	3.8%	1,450	1.2%	0.33
Outlying Areas *	1004	2,030	1.7%	1,190	1.0%	0.59
Lake Country	2000	6,920	6.0%	4,190	3.6%	0.61
City Centre / Pandosy	3001	13,900	12.0%	23,250	20.0%	1.67
Central Kelowna	3002	8,120	7.0%	22,330	19.2%	2.75
Glenmore	3003	10,530	9.1%	5,020	4.3%	0.48
Rutland	3004	14,430	12.4%	7,330	6.3%	0.51
Mission	3005	8,960	7.7%	4,160	3.6%	0.46
Black Mountain / Southeast	3006	7,380	6.3%	3,040	2.6%	0.41
Kelowna North *	3007	2,590	2.2%	9,450	8.1%	3.65
Duck Lake 7 *	3008	670	0.6%	320	0.3%	0.48
Glenrosa / Westbank	4001	8,610	7.4%	4,830	4.2%	0.56
Rose Valley / Lakeview	4002	6,860	5.9%	5,410	4.7%	0.79
West Kelowna Subtotal (4001+4002)		*15,470*	*13.3%*	*10,240*	*8.8%*	*0.66*
WFN	5001	3,870	3.3%	2,950	2.5%	0.76
Peachland *	6000	2,400	2.1%	1,240	1.1%	0.52
RDCO West *	7000	930	0.8%	450	0.4%	0.48
RDCO East *	8000	2,050	1.8%	490	0.4%	0.24
North Okanagan outside Vernon S				760	0.7%	
North Okanagan outside Vernon N				1,610	1.4%	
South Okanagan				1,160	1.0%	
Unknown				590	0.5%	
Outside of Okanagan				2,540	2.2%	

Blue shading highlights areas with a greater share of workers or jobs.

Green or orange shading highlights areas with greater or lesser jobs-to-workers ratios.

† The expanded estimates of jobs should not be taken to be definitive. In addition to jobs captured by the survey, these counts cannot account for jobs held by workers who live outside the survey area. This may be particularly relevant for Vernon, which may attract workers from the various other communities in North Okanagan.

* results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution, although the large number of jobs in the Kelowna North area may be more reliable, as the figure is a product of survey responses from many other districts reporting that their workplace is located in this district.

3.10 Retirement

Retired people have different travel habits (leisure activities, trip purposes, time of day of travel) and transportation needs. The survey estimates suggest that across the entire study area, there are about 58,700 retirees, up from 48,200 in 2013 and 41,860 in 2007. This is an increase of 21.8% over the last 5 years, compared to 15.2% over the previous six years; this amounts to a 40% increase over the 11 years since the baseline survey, more than double the increase in total population over the same period (19%). Some of this growth is due to the aging of long term residents (as seen earlier in the 'moving hump' in the age distribution in **Figure 23**, **Section 3.5**), but some of this increase is likely also attributable to the attractiveness of the Okanagan as a retirement destination due to its natural features, amenities and leisure opportunities.

Of note, not all retirees are over the age of 65 (age of eligibility for full CPP benefits): 75% are 65 years or older, 15% are between 60 and 64, and 9% are under 45. Also of note, 11% of residents 65+ years of age are still employed (4% full-time, 7% part-time), which is up from 10% in 2007 and 8% in 2007.

The charts below (**Figure 31**, **Figure 32**) present the results for the three sub-areas.

Figure 31. Total Retirees, 2007-2018

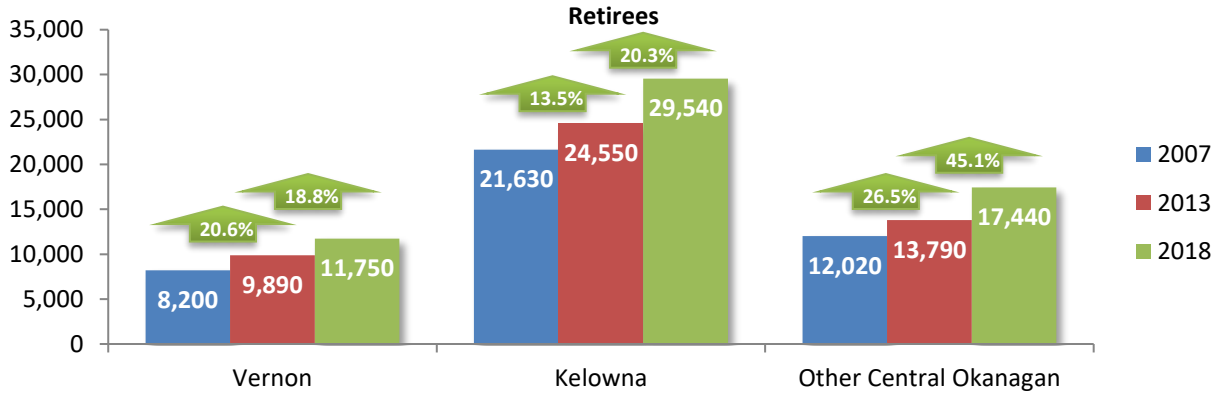
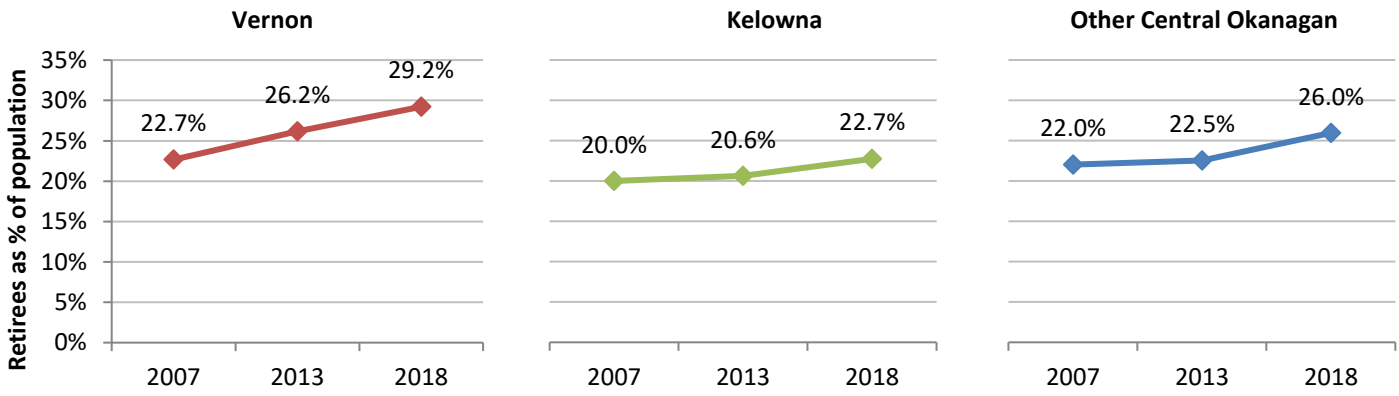


Figure 32. Retirees as % of Population, 2007-2018



4 Travel Patterns and Trends

4.1 About the Trip-Level Survey Results

This chapter of the report presents trips characteristics for the weighted data. Trip details were collected from household members who were 5 years of age or older for a sampled weekday in the fall of 2018 (with travel days ranging from late October through mid-December). For this survey, a trip is defined as a journey from one location to another for a single purpose that may involve more than one mode of travel (for example, in the instance of a Park & Ride trip, or walking from a transit stop to a destination more than 100 metres away). Key trip characteristics captured by the survey included the time of departure, mode of travel used, purpose of the trip (or activity at the destination location), and the specific location of each trip's origin and destination.

As with the results in the previous chapter, the expanded survey results should be understood to be estimates only. When presenting expanded survey data on estimated trip volumes, many of the results are rounded to the closest 100, so as not to give an undue impression of precision. Therefore, sometimes breakdowns of rounded trip counts for individual categories may not appear to sum to the rounded survey total across all categories. Trip rates and percentages have generally been computed using the unrounded expanded counts, so attempts to reproduce these statistics using the rounded trip counts may not always provide the same result.

Some differences between 2007, 2013, and 2018 survey cycles may be fluctuations due to the error associated with random sampling of a population or methodological differences, although overall trends usually should be apparent when comparing 2018 against the 2007 baseline year. This chapter includes sections providing context for certain of the differences observed between survey cycles.

This chapter is generally organized as follows:

- The first section looks at trends in total trips and trip rates (average daily trips per person or per household), followed by a section examining the trip volumes and trip rates for different household and demographic characteristics. (**Sections 4.2** , **4.3**)
- The next section presents a profile of trips by hour of day, illustrating the AM Peak and extended PM Peak periods. (**4.4**)
- The next two sections present key survey results on trips by mode of travel and by purpose, looking more closely at these measures from a number of different perspectives. (**4.5**, **4.6**)
- Following sections examine other trip characteristics, such as number of passengers in vehicle trips, bus routes used for transit trips, and distances travelled. (**4.7**, **4.8**, , **4.10**, **4.11**)
- The final sections examine the trip flows between different communities, the extent to which trips in each community are internalized, and origin-destination matrices. (**4.12**, **4.13**, **4.14**)

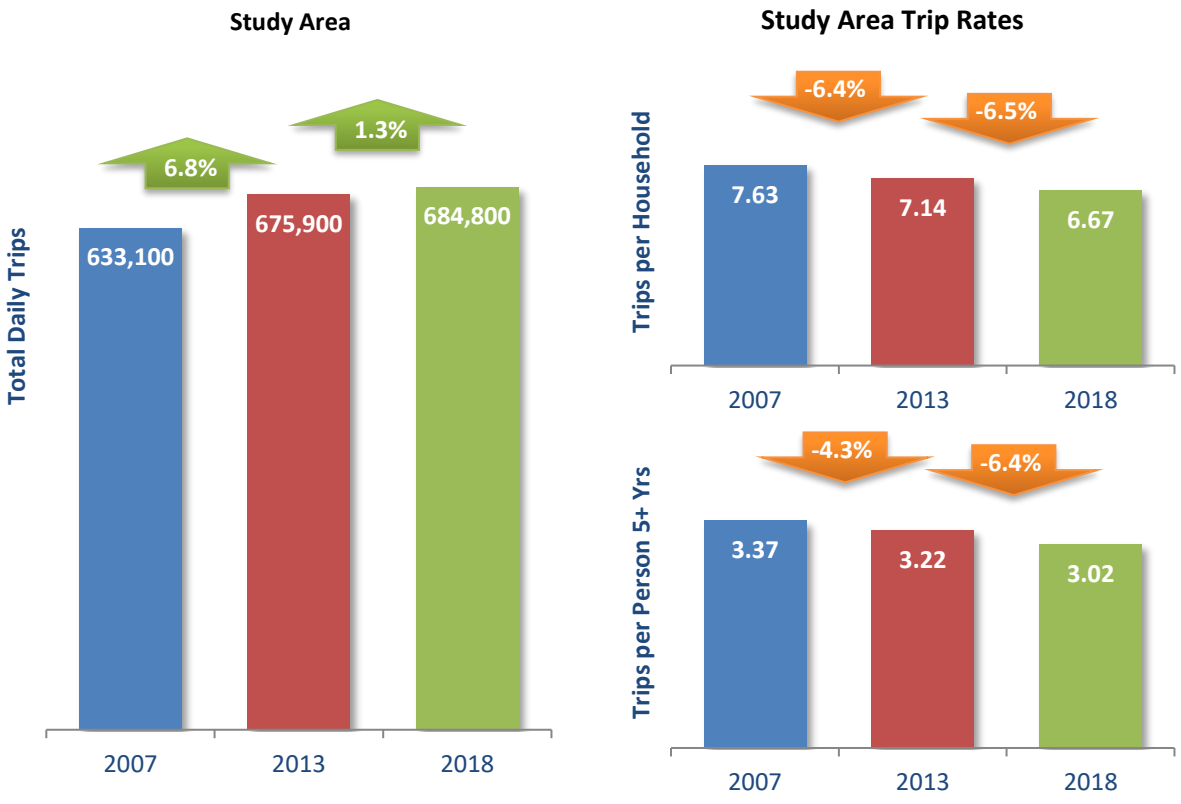
4.2 Total Trips and Trip Rates

Over the course of a typical 24-hour fall day, residents of the study area make a total of 684,800 trips. On average, each household makes 6.67 trips each day, while each person over the age of five makes 3.02 trips per person each day.

The current volume of trips is an increase of 8.0% over the 11 years since the baseline survey in 2007, but only 1.3% growth over the last five years. This compares to 20.6% growth in persons 5+ years of age (those for whom trips were surveyed) over the past 11 years, and 8.2% over the last five years. The fall in household- and person-level trip rates provides interesting context. Unlike total trips, the declines in trip rates have been relatively steady trend over the same time periods. At the household level, trip rates have declined from an average of 7.63 trips per household in 2011 to 6.67 in 2018. This is consistent with shrinking average household size. At the person level, trip rates have declined from 3.37 trips per person in 2007 to 3.02 trips per person in 2018.

It may be noted that some of the fluctuation between survey cycles may be attributed to sampling error (the error associated with randomly sampling a percentage of the population to survey), and the results may also be affected by differences in methodology. Nonetheless, underlying the overall trend across the study area, a very interesting regional picture emerges, as discussed on the following pages.

Figure 33. Total Trips and Trip Rates – Study Area, 2007-2018



On a given day, not all people travel: 85.5% of all persons 5+ years of age were reported to have made at least one trip in the survey area (with the remaining 14.5% either being outside of the survey area or not having a reason to leave home[17]). This result was slightly up from both 2007 (84.3%) and 2013 (85.5%), despite the decline in overall trip rates. This might suggest a similar number of outings leaving home but fewer individual destinations / reasons to stop on those outings, though further investigation of trip tours would be needed to confirm this. By sub-area, the proportion of persons 5+ travelling was 87.2% in Kelowna, 84.4% in Vernon, and 82.8% in Other Central Okanagan.

Looking at the results of the survey by sub-area reveals that the decline in trip rates is not uniform (**Figure 34**, following page). The survey results suggest that Kelowna has seen overall growth in person trips (+5.9% in the last 5 years), albeit somewhat below population growth due to the decreases in trips per person (-2.5% in the last 5 years). In contrast, Vernon and the Other Central Okanagan sub-areas have witnessed significant decreases in person trip rates despite increases in population. The information in the charts is summarized in **Table 16** below.

The declining trip rate may be consistent with demographic trends such as an aging population and static number of workers, but could also be the product of other societal trends such as shifts in work arrangements, the expansion of at-home leisure options (streaming entertainment, video games), and changes in household maintenance activities (online banking, online shopping) which are beyond the scope of this survey to definitively correlate to the observed trip patterns. Later sections in this report explore related trends in trips by purpose, by age group, and in total trip distances or VKT per person.

Table 16. Average Daily Trips per Household and per Person by Geography of Residence, 2007-2013

		Expanded Estimates and Trip Rates					% change on previous cycle				
Measure	Year	Study Area	Central Okanagan	Vernon	Kelowna	Other Central Ok.	Study Area	Central Okanagan	Vernon	Kelowna	Other Central Ok.
Households	2007	83,000	66,900	16,100	46,000	21,000					
	2013	94,700	77,500	17,200	52,300	25,200	+14.0%	+15.7%	+7.0%	+13.8%	+20.0%
	2018	102,600	84,100	18,500	56,500	27,600	+8.4%	+8.6%	+7.4%	+8.1%	+9.7%
Persons 5+ Years of Age	2007	188,100	154,200	33,900	102,600	51,600					
	2013	209,700	173,200	36,500	114,400	58,800	+11.5%	+12.3%	+7.9%	+11.5%	+14.0%
	2018	226,800	188,400	38,400	124,200	64,200	+8.2%	+8.8%	+5.3%	+8.6%	+9.2%
Total Trips	2007	634,200	515,200	119,000	353,500	161,700					
	2013	675,900	548,700	127,300	367,300	181,400	+6.8%	+6.6%	+7.3%	+4.0%	+12.4%
	2018	684,800	566,700	118,100	389,000	177,700	+1.3%	+3.3%	-7.2%	+5.9%	-2.1%
Household Trip Rate	2007	7.64	7.70	7.41	7.69	7.71					
	2013	7.14	7.08	7.40	7.02	7.21	-6.5%	-8.0%	-0.1%	-8.7%	-6.5%
	2018	6.67	6.74	6.40	6.88	6.44	-6.5%	-4.9%	-13.6%	-2.0%	-10.8%
Person Trip Rate	2007	3.37	3.34	3.51	3.45	3.13					
	2013	3.22	3.17	3.49	3.21	3.09	-4.4%	-5.2%	-0.7%	-6.8%	-1.5%
	2018	3.02	3.01	3.07	3.13	2.77	-6.4%	-5.1%	-11.9%	-2.5%	-10.3%

[17] Note: Some may have left home for leisure or exercise without a destination. Such outings for walking the dog, going for a run, or going for a bicycle ride returning home without stopping for another purpose were not captured as trips.

Expanded counts have been rounded to the closest 100

Figure 34. Total Trips and Trip Rates – by Sub-Area of Residence, 2007-2018

4.2.1 Trips and Trip Rates by District

The number of daily trips and trip rates are broken out by district in the following charts (**Figure 35** and **Figure 36**). The figure on the right provides an illustration of the 11-year growth or decline in trips made by residents of each district. As illustrated, the survey results suggest that the growth or decrease in trips has not been uniform within each sub-area. Also, the daily person trip rates can be seen to vary by individual district.

Figure 35. Total Daily Trips by District of Residence, with Net Change from 2007 to 2018

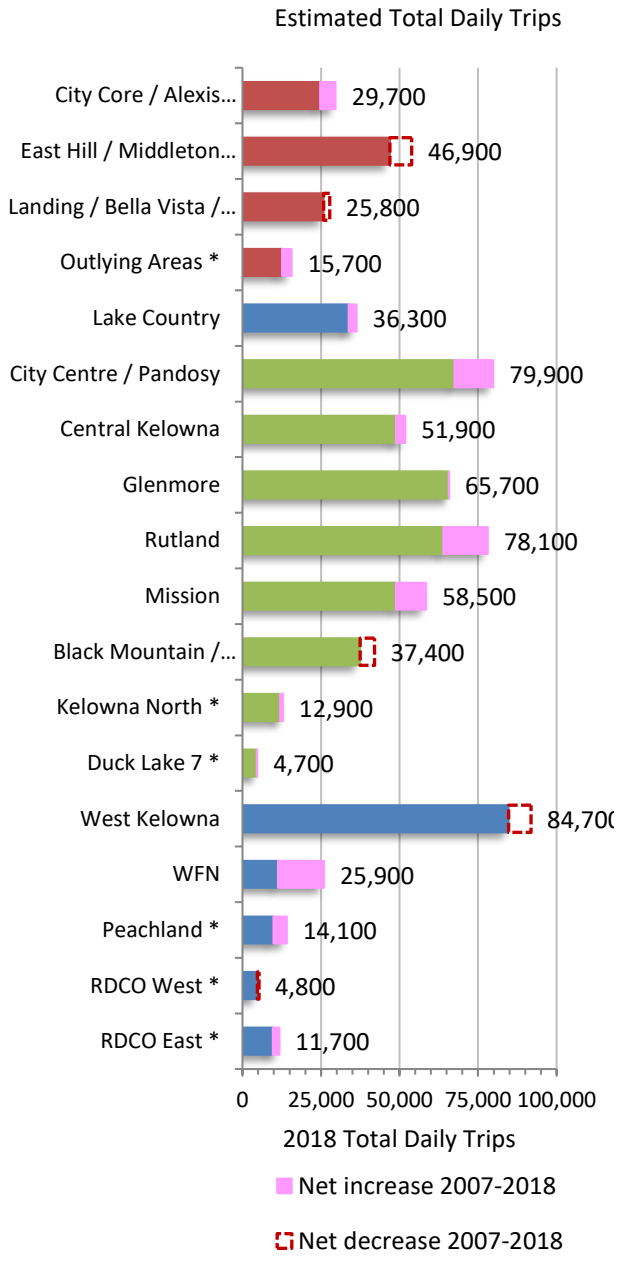
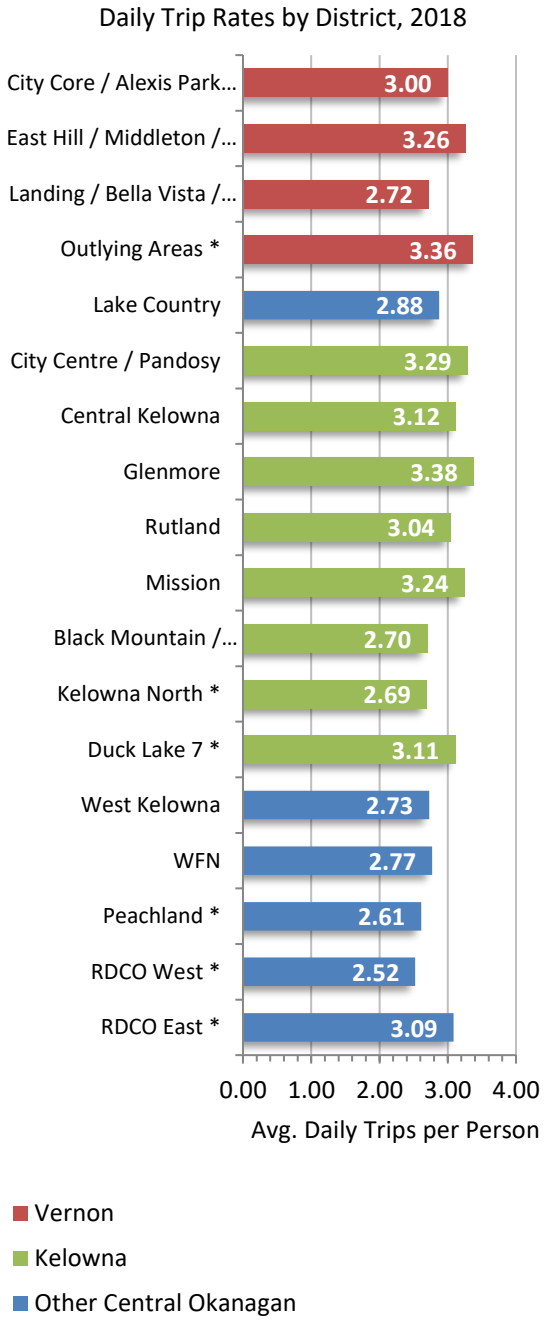


Figure 36. Person Trip Rates by District of Residence, 2018



* Results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.

4.3 Trip Rates by Selected Characteristics

4.3.1 Trip Rates by Household Characteristics

The following table demonstrates the relationship of household characteristics to trip rates (**Table 17**). As dwelling type, household income and vehicle ownership all have a correlation to household size, the household trip rates vary considerably by category. While this is meaningful for modelling purposes, to understand the differences it may be more meaningful to look at the person trip rates. Of note, the highest trip rates are for one-person households (which stands to reason as one person is responsible for all trips for shopping and household errands) and for four-person households (which are more likely to be multi-child families). Overall, there were few differences by dwelling type, although in Vernon, those living in apartments had notably lower trip rates (2.56 trips per person), perhaps a product of a larger senior population living in condominiums or apartments and lack of employment growth. People living in lower income households (less than $30,000 per year) had lower trip rates (2.71 trips per person), while those in the highest income bracket had the most (3.20 trips per person). The small proportion of the population living in households without vehicles also incurred fewer trips per person (2.25 on average). Within the three main sub-areas, there may be variations from the overall pattern for the study area that are in keeping with different demographic profiles of these sub-areas.

Table 17. Total Daily Trips and Trip Rates by Household Characteristics, 2018

Household Characteristic	Study Area			Vernon			Kelowna			Other Central Okanagan		
	Trips	Hhld Trip Rate	Person Trip Rate	Trips	Hhld Trip Rate	Person Trip Rate	Trips	Hhld Trip Rate	Person Trip Rate	Trips	Hhld Trip Rate	Person Trip Rate
Survey Total	**684,750**	**6.67**	**3.02**	**118,100**	**6.40**	**3.07**	**389,000**	**6.88**	**3.13**	**177,660**	**6.44**	**2.77**
By Household Size												
1 person	94,890	3.33	3.33	20,440	3.34	3.34	57,010	3.46	3.46	17,450	2.97	2.97
2 people	240,640	5.77	2.89	41,760	5.73	2.87	133,100	6.03	3.03	65,780	5.33	2.66
3 people	110,480	7.97	2.86	20,960	9.20	3.26	62,810	8.15	2.95	26,720	6.87	2.46
4 people	141,190	11.84	3.23	19,550	11.32	3.09	79,090	11.97	3.27	42,550	11.85	3.24
5+ people	97,550	14.73	2.97	15,400	14.57	3.07	56,990	15.53	3.13	25,160	13.28	2.62
By Dwelling Type												
House	416,310	7.82	3.01	70,620	7.63	3.09	215,290	8.34	3.12	130,390	7.18	2.80
Apartment	109,540	4.62	3.01	15,760	3.61	2.56	82,480	4.89	3.14	11,300*	4.51*	2.79*
Other ground-oriented	158,910	6.20	3.05	31,720	6.57	3.36	91,220	6.58	3.14	35,970	5.19	2.64
By Household Income												
Less than $30K	50,930	3.97	2.71	13,240	4.15	2.70	28,170	3.99	2.77	9,520*	3.71*	2.55*
$30K to <$50K	94,030	5.53	3.08	22,300	5.64	3.24	51,510	5.67	3.24	20,220	5.08	2.59
$50K to <$80K	135,750	6.74	3.08	21,090	6.36	2.95	79,230	6.89	3.18	35,440	6.66	2.94
$80K to <$125,000	163,370	7.88	3.08	23,550	7.82	3.34	88,640	7.85	3.13	51,170	7.98	2.91
$125,000 or more	150,460	9.34	3.20	23,510	9.64	3.41	90,560	9.93	3.37	36,390	7.99	2.76
Unknown	90,210	5.71	2.70	14,420	5.66	2.59	50,870	6.00	2.82	24,920	5.22	2.54
By Vehicle Ownership												
At least 1 vehicle	670,540	6.87	3.04	114,200	6.74	3.14	379,620	7.08	3.15	176,720	6.53	2.78
No household vehicles	14,220	2.87	2.25	3,910*	2.60*	1.86*	9,380*	3.23*	2.68*	930*	1.72*	1.30*

* Interpret with caution due to smaller sample sizes.

4.3.2 Trip Rates by Demographic Characteristics

The next table demonstrates the relationship of household characteristics to trip rates (**Table 18**).

As shown, employed people have the highest trip rates (3.19 daily trips per full-time worker and 3.39 per part-time worker, on average), with retirees having the next highest (2.84 trips per person). Students tend to have lower trip rates, particularly post-secondary students. People who use mobility aids make the fewest daily trips on average (2.00 trips per person).

Of note, 55% of all daily trips made by residents of the study area are made by employed people, and 24% are made by retirees. This pattern differs by sub-area, with 30% of Vernon residents' trips being made by retirees, and 51% being made by workers, while 22% of all trips made by Kelowna residents are made by retirees, with 57% made by workers.

Table 18. Total Daily Trips and Trip Rates for Selected Demographic Characteristics, 2018

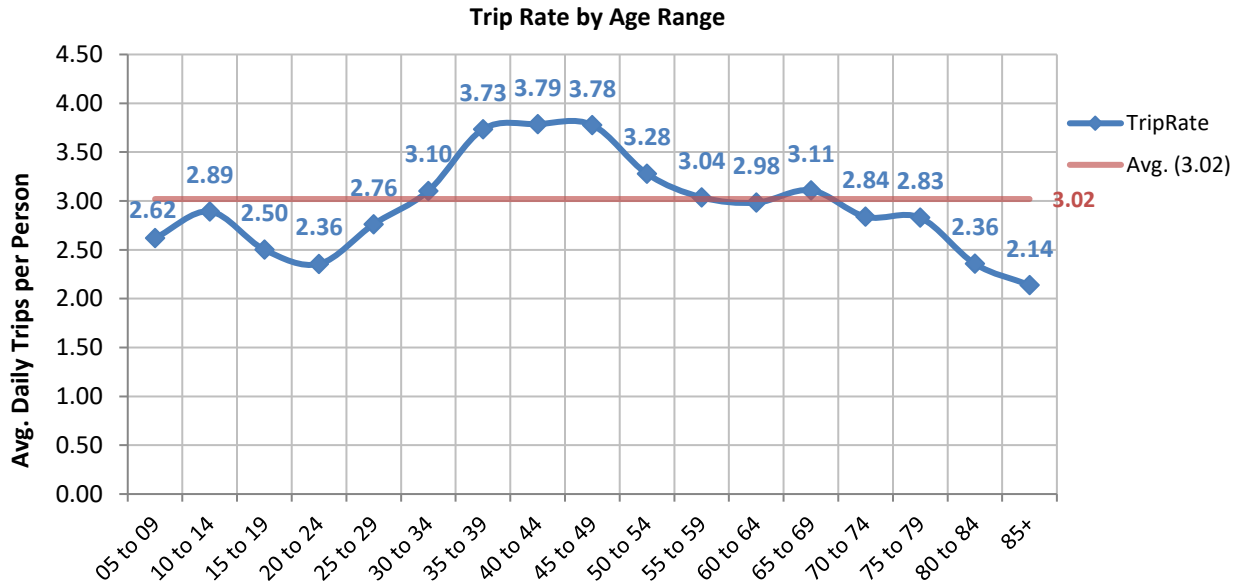
Demographic Characteristic	Study Area		Vernon		Kelowna		Other Central Okanagan	
	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate
Survey Total	**684,750**	**3.02**	**118,100**	**3.07**	**389,000**	**3.13**	**177,660**	**2.77**
By Employment Status								
Work Full-Time	284,140	3.19	45,610	3.41	166,070	3.25	72,460	2.95
Work Part-Time	91,450	3.39	14,930	3.24	55,200	3.60	21,320	3.02
Unemployed	19,470	2.73	3,100*	2.10*	11,490*	3.37*	4,880*	2.17*
Other**	58,000	2.74	8,890*	2.81*	33,020	2.75	16,090	2.70
Retired	166,510	2.84	35,300	3.01	87,070	2.95	44,130	2.53
Not applicable (5-14 yrs)	65,190	2.75	10,270*	2.54*	36,150	2.84	18,770	2.72
By Student Status								
K-12 student	82,790	2.76	12,440	2.53	47,220	2.89	23,130	2.66
PSE	37,770	2.64	5,250*	3.55*	25,120	2.66	7,400*	2.20*
Other / online	8,440*	3.42*	2,090*	3.19*	5,340*	3.84*	1,020*	2.39*
Not a student	555,750	3.09	98,330	3.13	311,320	3.21	146,110	2.83
Mobility Challenges								
No mobility challenges reported	648,160	3.05	109,230	3.11	370,770	3.17	168,160	2.78
Has physical disability or condition that limits mobility but not use mobility aid	23,610	2.98	6,320*	3.31*	10,640*	2.73*	6,660*	3.15*
Uses mobility aid	12,980	2.00	2,550*	1.79*	7,590*	2.24*	2,840*	1.69*

* Interpret with caution due to smaller sample sizes.

**Other employment status includes post-secondary and high school students >15 years of age who are not employed.

Figure 37 illustrates the relationship between age and trip rates for the entire study area. As shown, the highest trip rates are amongst those 35 through 49 years old (averaging 3.73 to 3.78 trips per day). This is to be expected as these are prime productive years for careers and raising families (which often require serve-passenger trips to/from school and activities). The average age of mothers at childbirth in BC was 31.6 years in 2016, and has been over 30 years of age since 2004.[18] The lowest trip rates are amongst children and youth, with the lowest rates observed for those 20 to 24 years of age (2.36 trips per days on average), with those 20 to 24 being the lowest at 2.36 trips per day on average, and amongst the elderly, showing a decline in trip rates from age 80 onwards. Readers are reminded that the survey does not represent population living in collective dwellings, and so does not include elderly people living in care homes, for whom trip rates may be different.

Figure 37. Trip Rate by Age – Study Area, 2018



[18] Source: Report on the Demographic Situation in Canada, Fertility: Overview, 2012 to 2016, Statistics Canada (https://www150.statcan.gc.ca/n1/pub/91-209-x/2018001/article/54956-eng.htm).

Figure 38 provides another perspective: trip rates for women and men by age group. Trip rates for both genders follow a similar pattern, with trip rates peaking between the ages of 35 and 49. However, between the ages of 15 and 69, the trip rate is consistently higher for women, with significantly higher trip rates during the peak from ages 35 to 49.[19]

Figure 38. Trip Rate by Age and Gender – Study Area, 2018

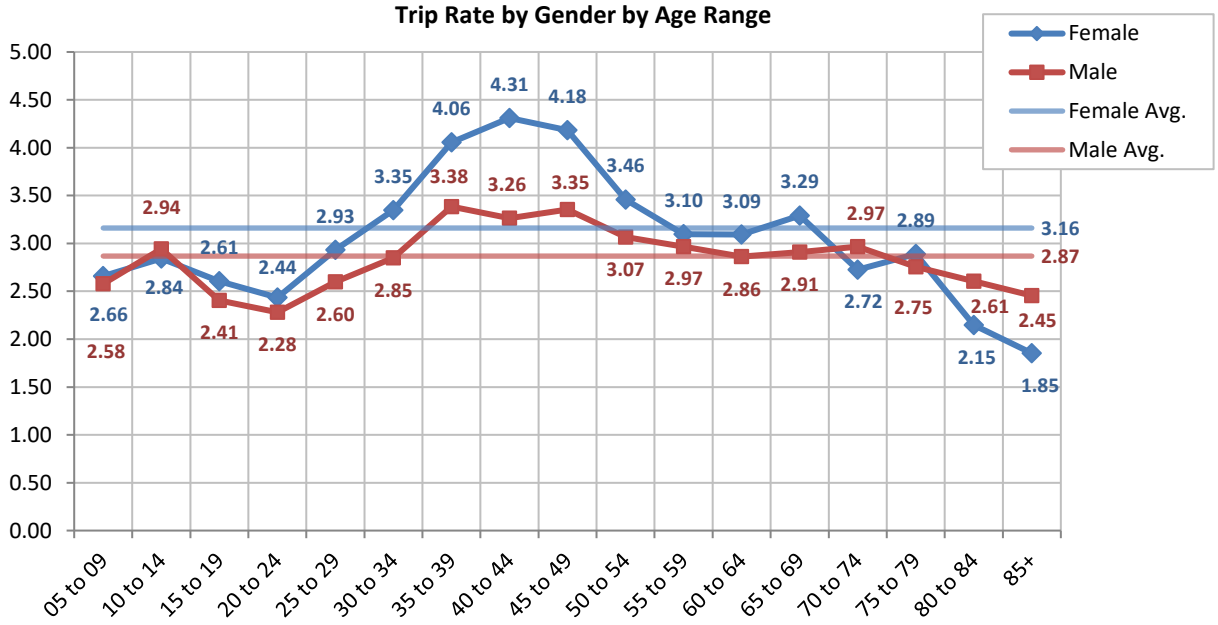


Figure 39 on the next page presents the trip rates by age for 2018 compared to 2007 and 2013. The survey results suggest that between 2007 and 2013, trip rates fell for all age ranges between 25 and 49 years of age, but were relatively steady for children and youth under 25 years of age, and also for those 50 to 74. It may be noted that the higher fluctuation in 2013 for those 75 years and older is more likely to be a product of sampling error, as the sample sizes for older age groups are considerably smaller. Between 2013 and 2018, trip rates for those between 30 and 49 (prime productive years) stayed about the same; however there appears to have been a further reduction in trip rates for those between the

[19] Of note, amongst the 72% of households with two adults of mixed genders, the primary respondent who filled out the survey for the household was a woman 57% of the time. The primary respondent can be expected to report all their own trips. While they may be aware of important trips made by other household members (to work, drop off children, etc.) they may not always be aware of all discretionary trips made by others (e.g., lunch trips). The higher proportion of women primary respondents might result in more under-reporting of discretionary trips for men as other household members. However, the gender split in primary respondents may not be sufficient to explain the entire difference illustrated. Even if the difference might be over-emphasized, it is likely that women in the noted age groups do in fact make more trips than men, as has been observed in other surveys. No trip correction factors to compensate for under-reporting of other household members' trips were applied in any of the three survey cycles. Of note, the same trend was observed in 2007 and 2013, even with the different trip diary method.

ages of 15 to 29, as well as those 50 to 64 years of age. Again, one can speculate that the reasons could be to do with societal changes in terms of work, leisure, entertainment, and/or shopping patterns.

Figure 39. Trip Rate by Age – Study Area, 2007-2018

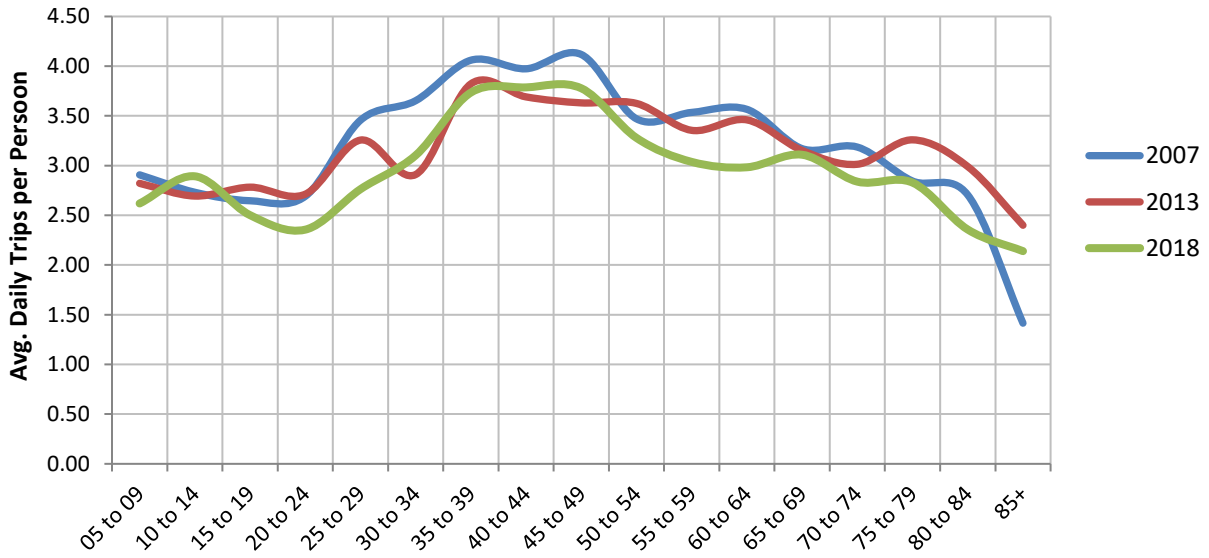


Table 19 below presents the trip rate profile by age for each of the sub-areas. The profile fits the same general trend, however, some caution should be exercised as the sample sizes in some of the five-year age ranges are on the smaller size, particularly in Vernon and Other Central Okanagan.

Table 19. Total Daily Trips and Trip Rates by Age (5-Year Age Range), 2018

	Study Area		Vernon		Kelowna		Other Central Okanagan	
Age Range	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate
5 to 9 years	31,490	2.62	4,700	2.30	18,020	2.77	8,770	2.52
10 to 14 years	33,700	2.89	5,570	2.78	18,130	2.91	10,000	2.92
15 to 19 years	31,680	2.50	4,320	2.20	19,640	2.72	7,720	2.22
20 to 24 years	33,100	2.36	4,230	2.34	22,610	2.45	6,260	2.08
25 to 29 years	38,800	2.76	6,120	2.90	25,160	2.88	7,510	2.35
30 to 34 years	45,510	3.10	7,680	3.33	27,050	3.15	10,790	2.86
35 to 39 years	53,850	3.73	10,030	3.95	31,140	3.86	12,680	3.32
40 to 44 years	49,060	3.79	7,380	3.74	28,080	3.90	13,600	3.60
45 to 49 years	55,160	3.78	10,580	5.00*	29,940	3.64	14,640	3.43
50 to 54 years	60,850	3.28	9,610	3.01	34,570	3.52	16,670	3.01
55 to 59 years	55,630	3.04	9,870	3.11	29,300	3.07	16,450	2.95
60 to 64 years	55,650	2.98	10,020	3.07	29,180	3.19	16,450	2.64
65 to 69 years	51,820	3.11	9,890	3.24	27,410	3.31	14,530	2.73
70 to 74 years	33,710	2.84	6,910	2.96	17,520	3.06	9,290	2.43
75 to 79 years	28,240	2.83	4,970	2.61	16,400	3.00	6,870	2.63
80 to 84 years	16,280	2.36	4,610	2.73	8,140	2.34	3,530	2.04

85+ years	10,230	2.14	1,610	1.68	6,720	2.49	1,900	1.68

* interpret with caution; extreme value may be the result of smaller sample sizes by five-year age range.

4.4 Trips by Start Hour

4.4.1 Profile of Trips by Start Hour

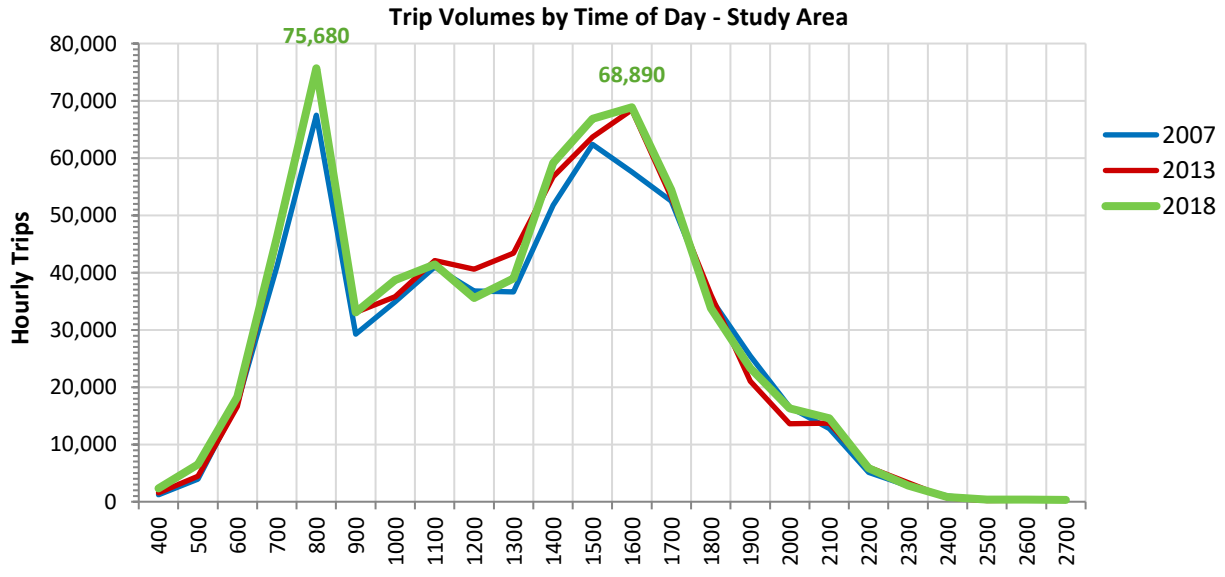
Overall, across the entire study area, the distribution of trips across the day by trip start time (**Figure 40**) shows a classic pattern, with the following profile:

- A concentrated AM peak that begins its build at 6 AM with only 18,300 trips, then 46,200 in the hour starting at 7 AM, then reaches about 75,700 trips in the hour from 8 AM, this peak largely being formed of commute trips and drop off trips serving other household members' commutes.
- This is followed by a five-hour inter-peak period from 9 AM to 2 PM, which fluctuates between 33,000 to 41,000 trips per hour.
- After this is an extended four-hour afternoon peak period starting at 2 PM (59,000 trips that hour) that continues to rise until it maxes out at 4 PM (with about 69,000 trips that hour) then dropping again to about 54,500 trips in the hour starting at 5 PM, followed by a steady decline after 6 PM.

Looking at the change in the profile over time shows some variability in growth by time of day:

- The AM Peak appears to have almost exactly the same profile in 2018 as in 2013 (after a notable increase from 2007 to 2013).
- The PM peak has seen some spreading with increases in volumes in the first two hours starting at 2 PM, but the next two hours from 4 PM following about the same profile as 2013.
- There appears to have been an increase in trips at the start of the inter-peak period but a decrease in the two hours starting at noon.
- The 2018 survey data also suggest a modest increase in evening trips in the three hours from 7 PM, which is up from 2013 but fairly equivalent to 2007.

Figure 40. Trip by Start Hour – Study Area, 2007-2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).

By sub-area, comparing the 2013 and 2018 trip distributions by hour (**Figure 41**, following page), different patterns emerge for each community:

- Looking first at Vernon, this community appears to have experienced a slight decrease in trip volumes in the 8 AM to 9 AM peak hour, although the volume of trip starts in the neighbouring hours of 7AM and at 9AM have remained steady each cycle. This community has also seen some spreading of the afternoon peak, with a drop in the 3 PM to 4 PM hour and small increases in the other hours. Furthermore, the survey suggests drops in trips in the four-hour period between 10 AM and 2 PM. The lack of growth in trips made by Vernon residents during the morning and afternoon peak may be consistent with the size of the workforce appearing to be relatively stable according to the survey results (see **Section 3.9**).

- Kelowna has experienced growth in trip volumes in the 8 AM to 9 AM peak hour and across the four hours between 2 PM and 6 PM. This is consistent with a growth in workers living in the city. Trip volumes appear to have remained relatively steady or had only slight increases at other times of day, with the exception of a slight drop in trips between noon and 2 PM.

- The rest of the Central Okanagan has seen morning peak trips remain steady since 2013, but, similar to Vernon, it shows an overall reduction in trips during the afternoon between 3 PM and 6 PM, and a slight drop in trips between noon and 2 PM.

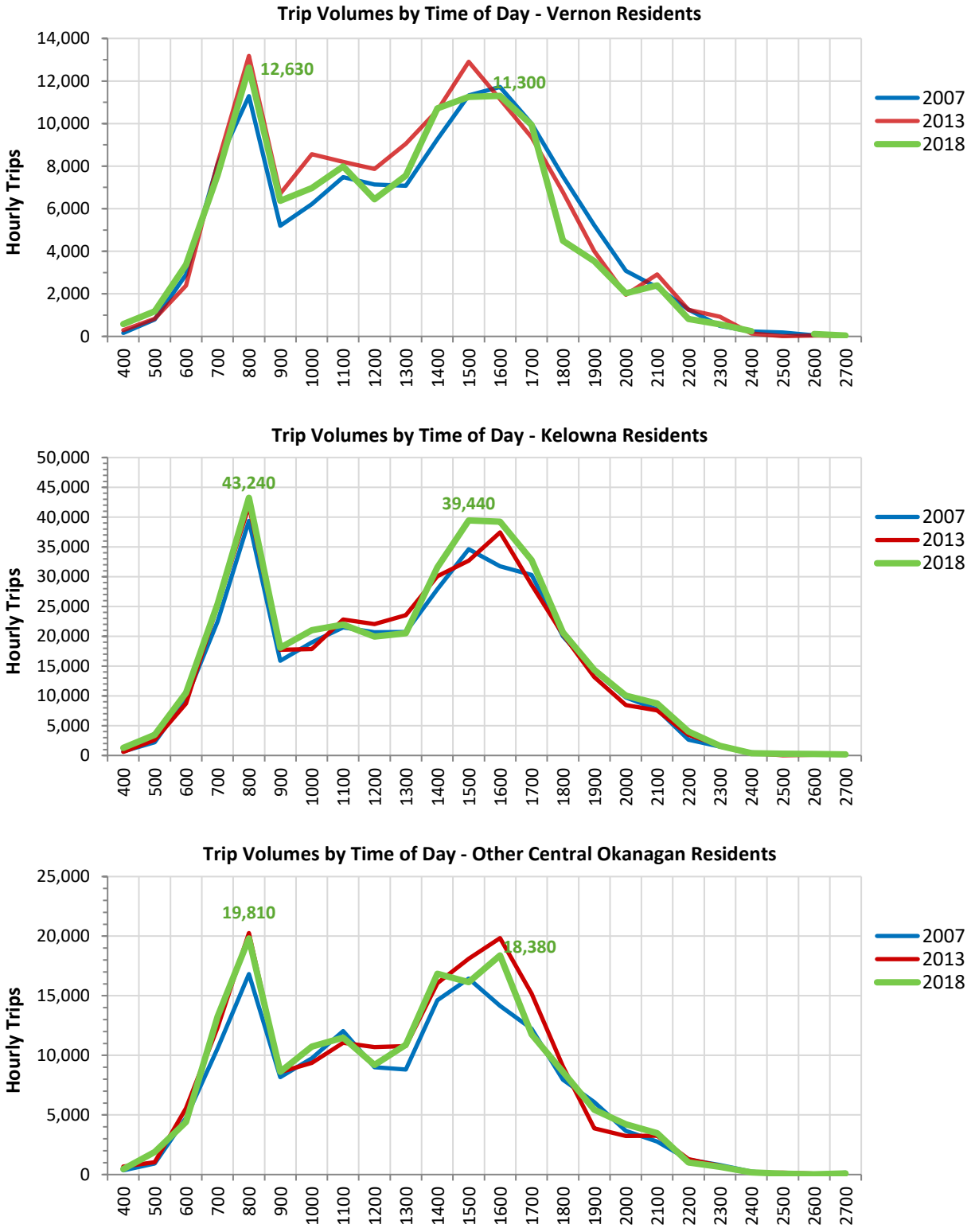
The differences from cycle to cycle appear to be generally consistent with the different demographic trends within each community (increased employment in Kelowna, increased seniors population in Vernon, etc.). Some of the change may also be associated with changes in work (e.g., increased work from home), leisure (e.g., increased options for home-based entertainment) or other patterns (e.g., online shopping). Readers are reminded that, as noted earlier, differences between survey cycles may be the product of sampling error and/or differences in methodology.[20]

Readers are also reminded that the survey captured the personal (non-commercial) trips of residents of the above-noted areas. These figures may not necessarily align with screen line counts in these communities, as the survey did not capture commercial trips, nor trips made by residents of nearby communities (for example, residents of Coldstream travelling to and from Vernon).

Readers are also referred to **Section 4.5.8** Trip Mode by Start Hour, **Section 4.6.3** Trip Purpose by Start Hour, and **Section 4.6.1** Home-Based Trip Purposes for further exploration of hourly trip patterns.

[20] The fact that the survey shows a decrease in trips during the noon hour in all sub-areas could either indicate a real reduction in trips at this time, or a difference that may be attributable to differences in data collection methods. It may be possible that a portion of respondents to the 24-hour recall method employed in 2018 may have more easily neglected to report short walking trips for lunch (not considering them important) or certain discretionary trips for other household members (as the main respondent might know about others' important commute trips, but not certain other trips, such as going to get lunch or a coffee outside the workplace), as compared with the trip diary method employed in 2013 (which asked each household member to carry around a diary to document all of their trips on their pre-assigned travel day). Further investigation of the data would be required to test this theory.

Figure 41. Trips by Start Hour – by Sub-Area of Residence, 2007-2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).

4.4.2 Trips by Start Hour by Gender and Employment Status

While the gaps between women and men in terms of rates of employment and vehicle ownership may be changing, taken as groups, women and men may have different travel patterns and/or transportation choices. This section of the report provides a gender-based analysis of the pattern of trips by start hour.

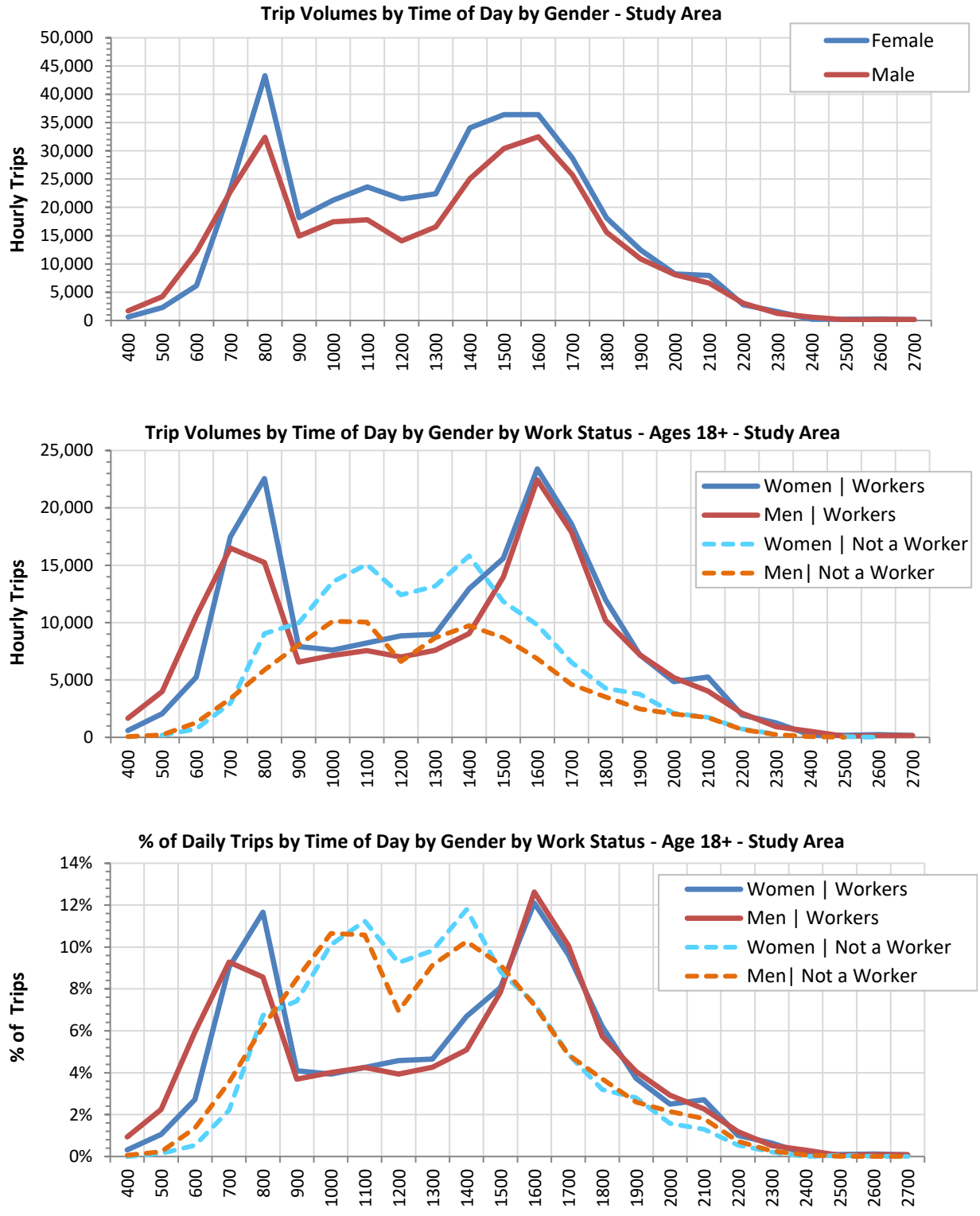
As presented earlier, on average, women have higher trip rates than men. Overall, the female population accounts for 51.5% of the population but 54.1% of trips. The first graph in **Figure 42** on the next page illustrates the higher volume of trips by time of day. As illustrated, it appears that females account more of the total trips made between the hours of 8 AM to 4 PM but have similar profiles after 5 PM.

To explore this further, the second graph plots the hourly trip volumes by gender, separating out workers and non-workers 18+ years of age (to exclude the trips of school-age children). Of note, 48.7% of workers in the study area are women, and they account for 52.1% trips made by workers. In particular they appear to account for considerably more trips in the AM Peak hour (8 AM) than working men.

The third graph is normalized to the percentage of daily trips (to remove differences associated with higher or lower daily trip rates). This graph confirms that working men as a group tend to make more early morning trips between 4 AM and 6 AM. By comparison, working women make more of their trips in the hour starting at 8 AM, and also somewhat more in the hour starting at 2 PM. This may be due to differences in the type of work done by some women and some men as well as due to women having more trips picking up or dropping of children at school. Interestingly, the profile of trips for working women and men is very similar at other times during the daytime, and almost identical from 3 PM on through the evening.

Looking at non-workers reveals another interesting pattern. Looking again at the second graph, it illustrates the fact that, non-working women account for a larger volume of trips than non-working men. Women account for 56.2% of non-workers and 58.5% of all non-workers' trips. Interestingly, amongst non-workers, the trip profile by hour of day in the third graph is very similar for both men and women, with slight differences: non-working men make proportionately slightly more early-morning and mid-evening trips, and non-working women make more trips during the mid-day.

Figure 42. Trips by Start Hour by Gender, Study Area



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).
Survey respondents who indicated non-binary gender or who refused to say were randomly assigned to one gender or another.

4.5 Primary Mode

The following table and chart (**Figure 43**, **Table 20**) provide an outline of the mode shares, based on the primary mode of the trip.[21] Automobile trips dominate, with 67.8% of all person-trips being made by auto drivers, and 18.0% as auto passengers. Transit mode share is modest, accounting for about 2.8% of all trips. The low mode share for cycling (1.6%) is almost certainly tied to the time of year dictated by the survey project timelines, with the survey results covering travel dates from October 24 to December 21, 2018. Walking trips, at 7.8% may also be influenced by the time of year.

Of note, examination of the expanded trip data revealed that while women account for 54% of all trips, women make only 32% of bicycle trips. This may be a consideration for initiatives that promote cycling. The only other mode with a gender imbalance was auto passenger trips, with 62% made by women.

Figure 43. Daily Mode Shares – Study Area, 2018

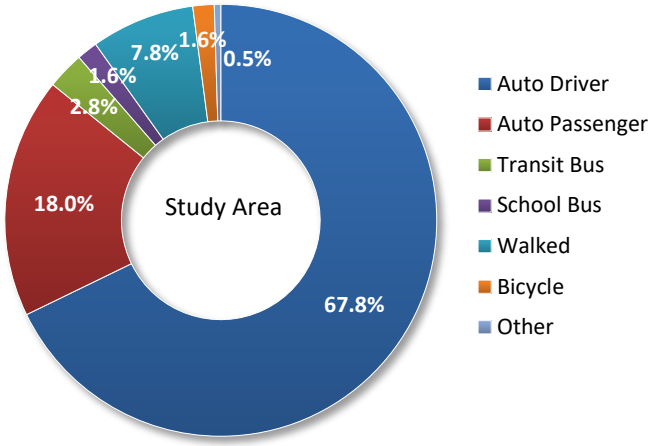


Table 20. Estimated Total Daily Trips by Primary Mode of Travel

Mode	Expanded Trips	Mode Share (%)
Auto driver	684,800	67.8%
Auto passenger	464,300	18.0%
Transit bus	123,300	2.8%
Bicycle	19,100	1.6%
Walked the entire way	10,700	7.8%
School bus	53,100	1.6%
Other	11,000	0.5%

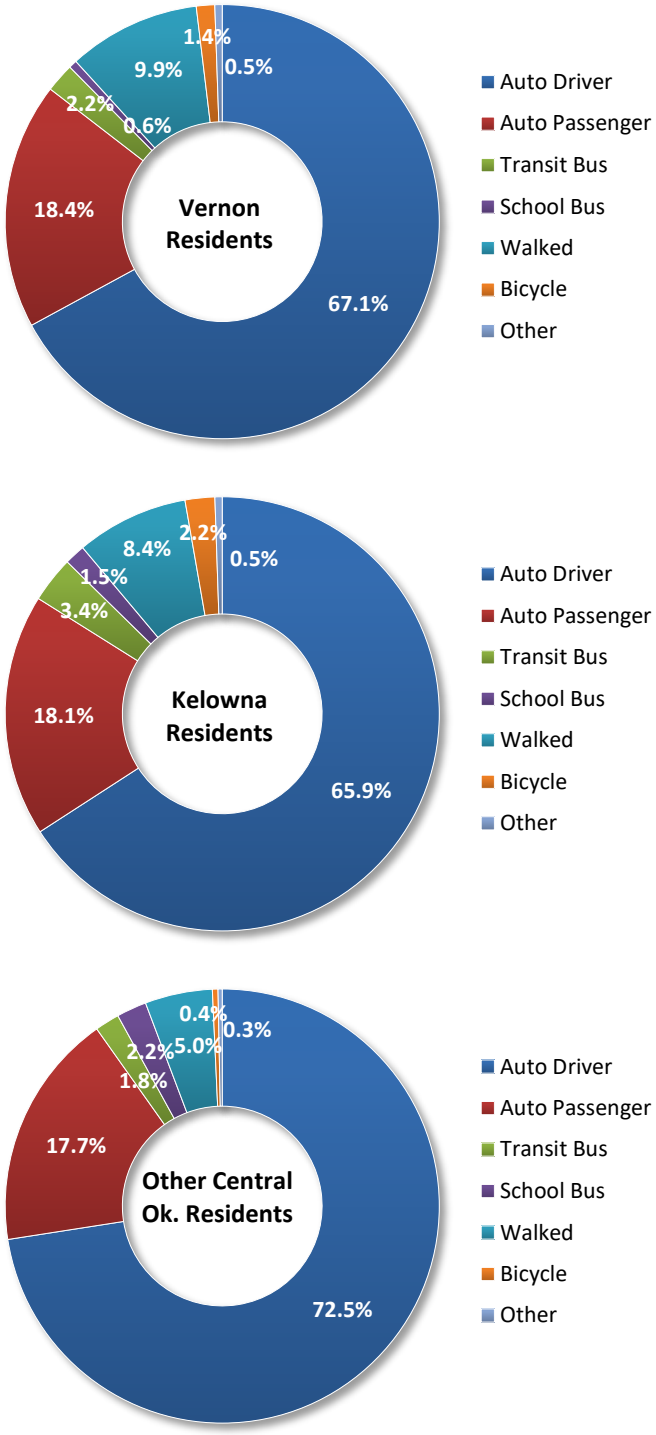
[21] A trip may entail more than one mode of travel (such as Park & Ride trips). In such instances, the primary mode was assigned based on the following hierarchy (with transit, at the top of the hierarchy, always being assigned if a trip involved transit and another mode): transit, school bus, auto driver, auto passenger, other, bicycle, walked. Generally speaking, the primary mode assigned to a multi-mode trip is usually the mode by which the greatest distance would be travelled. The 'Other' mode classification includes motorcycle, taxi, intercity bus, HandyDart or shuttle bus.

4.5.1 Mode Shares by Sub-Area

The mode shares in the sub-areas follow the same general pattern as the overall result, with some notable differences (**Figure 44**). The following observations can be made:

- Vernon has the highest walk mode share (9.9% of all trips); although transit (2.2%) and bicycle (1.4%) are somewhat lower than the average for the study area; while school bus mode shares are the lowest in the study area (0.6%). Just over two-thirds (67.1%) of all trips are auto driver trips.
- Similar to Vernon, auto driver trips represent two-thirds (65.9%) of all trips made by Kelowna residents. However, the residents of this area are most likely to rely on transit, with 3.4% of trips being transit trips. Walk shares are also high at 8.4%, and bicycle shares are higher than average for the study area, at 2.2%.
- The communities that comprise rest of the Central Okanagan have, on average, the highest reliance on automobiles, with 72.5% of all trips being auto driver trips. The sub-area shows the lowest shares of walking (5.0%), transit use (1.8% of all trips), and bicycle use (0.4%). The mode share profile is not surprising given the spread out geography of the area and mix of urban, suburban and rural land use.

Figure 44. Mode Shares by Sub-Area, 2018



4.5.2 Mode Shares, 2007-2018

The survey data for three surveys (**Figure 45**) suggest modest positive changes in mode shares since 2007, with much of that change happening from 2007 to 2013. Overall, driving mode shares are down from 70.4% in 2007, currently at 67.8% of trips (only slightly less than in 2013). Auto passenger mode shares (18.0% of all trips) have modestly increased since a dip in 2013, and are equivalent again to 2007. Walk mode shares have increased since 2007, remaining steady at 7.8% since 2013.

Transit mode shares (2.8%) are double that in 2007 (1.4%). The 2013 survey's higher transit mode share may be somewhat overstated. A comparison of the survey data to ridership figures is presented in the next section for context (**Section 4.5.3**).

Bicycle mode shares for the 2018 survey were 1.6%, but it should be noted that the 2018 survey started later than in 2013 and mode shares may have been influenced by the weather at the time of the survey (as explored in more detail in **Section 4.5.4**).

Table 21 outlines the changes in terms of estimated trip counts for each mode as well as mode shares. Shading highlights larger changes. It is important to note that while auto driver mode shares have decreased, the total number of such trips has increased. Readers are reminded that some of the differences between survey cycles may be the result of actual trends in evolving travel patterns, while others may be fluctuations due to random sampling or methodological differences.

Figure 45. Mode Shares – Study Area, 2007-2018

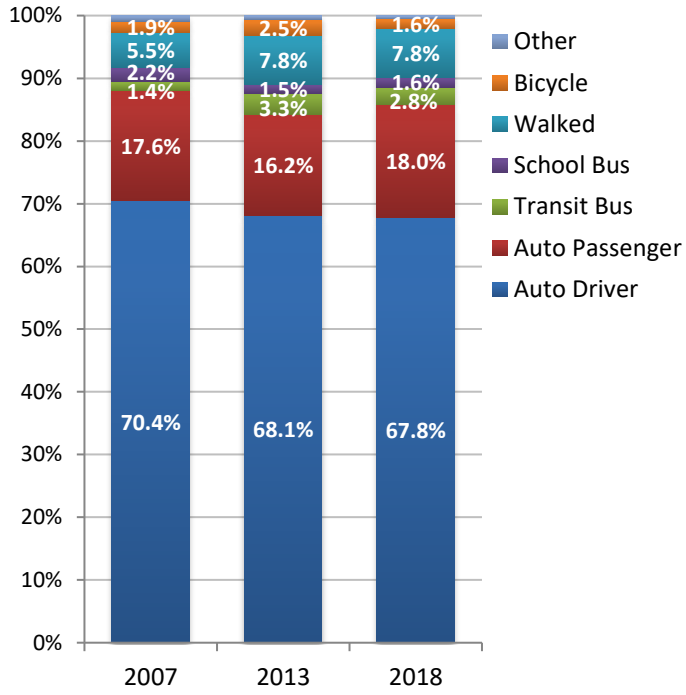


Table 21. Total Trips by Mode, Mode Shares – Study Area, 2007-2018

	Trips			% Change in # of Trips			Mode Shares			%-Pt Change		
Primary Mode	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change
Total Trips	634,200	675,900	684,800	+6.6%	+1.3%	+8.0%	100.0%	100.0%	100.0%			
Auto Driver	446,700	460,500	464,300	+3.1%	+0.8%	+3.9%	70.4%	68.1%	67.8%	-2.3%	-0.3%	-2.6%
Auto Passenger	111,800	109,200	123,300	-2.3%	+12.9%	+10.3%	17.6%	16.2%	18.0%	-1.5%	+1.9%	+0.4%
Transit Bus*	9,000	22,500*	19,100	+150.0%*	-14.9%	+112.7%	1.4%	3.3%*	2.8%	+1.9%*	-0.5%	+1.4%
School Bus	14,200	9,900	10,700	-30.7%	+8.2%	-25.0%	2.2%	1.5%	1.6%	-0.8%	+0.1%	-0.7%
Walked	34,800	52,500	53,100	+50.9%	+1.1%	+52.6%	5.5%	7.8%	7.8%	+2.3%	+0.0%	+2.3%
Bicycle**	11,800	17,100	11,000	+45.5%	-36.1%	-7.1%	1.9%	2.5%	1.6%	+0.7%	-0.9%	-0.3%
Other	5,800	4,200	3,300	-28.0%	-21.0%	-43.1%	0.9%	0.6%	0.5%	-0.3%	-0.1%	-0.4%

* Interpret with caution: transit use in 2013 may be somewhat over-stated. See Section 4.5.3 of this report.

** Interpret with caution: the surveys were conducted at different times of year and bicycle use may be tied closely to weather. See Section 4.5.4

.

Table 22 details information on mode share by sub-area. Where fluctuations between the three survey cycles show unusual variations, some trends may be better discerned by looking more broadly at the 11-year differences between 2007 and 2018, for which the overall trend may still emerge through the noise between individual cycles. Readers are encouraged to read the caveats regarding cycle-to-cycle fluctuations discussed elsewhere in this report.

Table 22. Total Trips by Mode, Mode Shares – by Sub-Area, 2007-2018

	Trips			% Change in # of Trips			Mode Shares			%-Pt Change		
Primary Mode	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change
Vernon												
Total Trips	119,000	127,300	118,100	+7.0%	-7.2%	-0.7%	100.0%	100.0%	100.0%			
Auto Driver	83,500	86,400	79,200	+3.4%	-8.3%	-5.1%	70.2%	67.9%	67.1%	-2.3%	-0.8%	-3.1%
Auto Passenger	21,100	22,600	21,700	+7.1%	-4.1%	+2.7%	17.8%	17.8%	18.4%	0.0%	+0.6%	+0.6%
Transit Bus*	1,200	1,600	2,500	+26.8%	+63.6%	+107.5%	1.0%	1.2%	2.2%	+0.2%	+0.9%	+1.1%
School Bus	2,800	1,600	700	-42.6%	-55.1%	-74.2%	2.3%	1.3%	0.6%	-1.1%	-0.6%	-1.7%
Walked	8,300	12,600	11,600	+52.0%	-7.3%	+40.9%	6.9%	9.9%	9.9%	+2.9%	0.0%	+2.9%
Bicycle**	1,100	1,800	1,600	+67.6%	-9.5%	+51.6%	0.9%	1.4%	1.4%	+0.5%	0.0%	+0.5%
Other	1,000	800	600	-23.5%	-15.5%	-35.3%	0.8%	0.6%	0.5%	-0.2%	-0.1%	-0.3%
Kelowna												
Total Trips	353,500	367,300	389,000	+3.9%	+5.9%	+10.0%	100.0%	100.0%	100.0%			
Auto Driver	245,300	243,900	256,200	-0.6%	+5.1%	+4.4%	69.4%	66.4%	65.9%	-3.0%	-0.5%	-3.5%
Auto Passenger	61,800	54,600	70,300	-11.7%	+28.6%	+13.6%	17.5%	14.9%	18.1%	-2.6%	+3.2%	+0.6%
Transit Bus*	6,200	16,000	13,300	+157.9%	-16.9%	+114.5%	1.8%	4.4%	3.4%	+2.6%	-0.9%	+1.7%
School Bus	5,800	4,300	6,000	-25.5%	+39.1%	+3.7%	1.6%	1.2%	1.5%	-0.5%	+0.4%	-0.1%
Walked	21,400	32,300	32,500	+50.8%	0.8%	+52.0%	6.1%	8.8%	8.4%	+2.7%	-0.4%	+2.3%
Bicycle**	9,600	13,700	8,600	+42.6%	-37.2%	-10.5%	2.7%	3.7%	2.2%	+1.0%	-1.5%	-0.5%
Other	3,300	2,500	2,100	-24.6%	-15.3%	-36.1%	0.9%	0.7%	0.5%	-0.3%	-0.1%	-0.4%
Other Central Okanagan												
Total Trips	161,700	181,400	177,700	+12.2%	-2.1%	+9.9%	100.0%	100.0%	100.0%			
Auto Driver	117,900	130,300	128,900	+10.6%	-1.1%	+9.3%	72.9%	71.8%	72.5%	-1.1%	+0.7%	-0.4%
Auto Passenger	28,800	32,000	31,400	+10.9%	-1.9%	+8.8%	17.8%	17.6%	17.7%	-0.2%	+0.0%	-0.2%
Transit Bus*	1,500	4,900	3,200	+215.9%	-33.6%	+109.7%	1.0%	2.7%	1.8%	+1.7%	-0.9%	+0.9%
School Bus	5,700	4,000	4,000	-30.3%	+0.2%	-30.1%	3.5%	2.2%	2.2%	-1.3%	+0.1%	-1.3%
Walked	5,100	7,600	8,900	+49.3%	+16.7%	+74.2%	3.2%	4.2%	5.0%	+1.0%	+0.8%	+1.9%
Bicycle**	1,100	1,700	700	+48.7%	-55.5%	-33.9%	0.7%	0.9%	0.4%	+0.2%	-0.5%	-0.3%
Other	1,500	900	600	-38.4%	-40.9%	-63.6%	0.9%	0.5%	0.3%	-0.4%	-0.2%	-0.6%

* Interpret 2013 transit counts and mode shares with caution: transit use in 2013 may be somewhat over-stated. See Section 4.5.3 of this report.

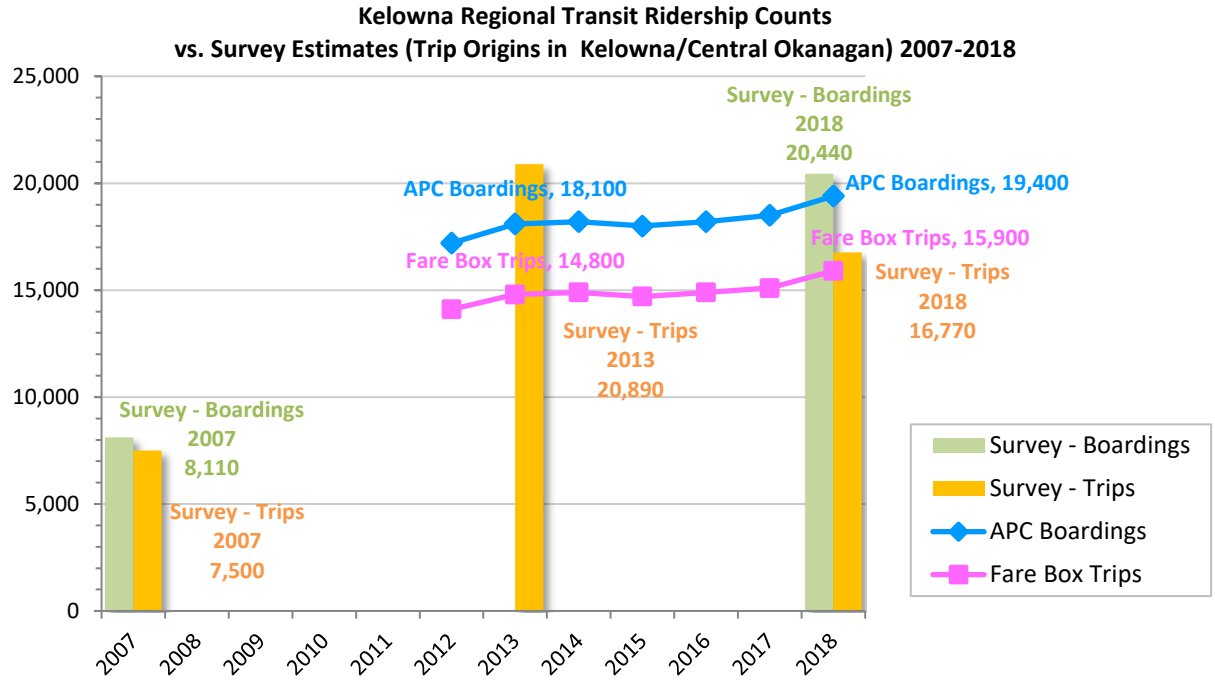
** Interpret with caution: the surveys were conducted at different times of year and bicycle use may be tied closely to weather. See Section 4.5.4

4.5.3 Interpreting Differences in Transit Mode Shares

The differences between survey cycles in terms of mode share should be interpreted with caution. A comparison of BC Transit ridership data suggests that 2018 survey estimates are in line with both fare box and Automatic Person Counter (APC) counts for the same year (**Figure 46**). Fare box counts capture the approximate number of trips, and APC counts capture boardings, with some trips entailing transfers, i.e., multiple boardings per trip. By contrast, the 2013 survey estimates exceed the fare box counts by a considerable volume. No official ridership data were available to validate the 2007 survey estimates. The reasons for the differences between the fare box trips and the survey estimates in 2013 are difficult to determine, as ridership counts are not always precise.

Given the above, it is difficult to draw conclusions about the differences between 2007 and 2013 and between 2013 and 2018. What the data do seem to clearly suggest, however, is that transit ridership has increased significantly over the entire 11 years since the baseline survey in 2007.

Figure 46. Comparison of Survey Transit Estimates to BC Transit Ridership Figures, 2007-2018



Survey estimates of trips with first transit boarding location in the Central Okanagan, i.e., excludes transit trips with boarding locations in Vernon (served by the Vernon Regional Transit System) and outside of the Central Okanagan.
APC = Automatic Person Counter. APCs may underestimate the number of boardings during busy periods.
Fare Box = fares paid via cash, ticket, bus pass, or UPass. UPass fares may be undercounted as UPasses only need to be flashed to the bus driver, and bus drivers may not always manually register each UPass flashed.
Survey estimates for 2007 and 2018 transit boardings are based on the number of bus routes reported for each transit trip; 2013 bus routes were not included in the data, so it was not possible to estimate the number of boardings for each trip.

4.5.4 Interpreting Differences in Bicycle Mode Shares

The difference in bicycle mode shares by cycle may be attributable to the different time frames of each of the surveys, with the majority of the surveys for the 2018 OTS completed a month later than the majority of surveys for the 2013 cycle,[22] while the 2007 cycle was undertaken in the spring (**Table 23**). Given the different weather conditions, a difference in cycling mode shares does not necessarily indicate a clear overall reduction in use of bicycles as mode of transport. It may also be noted that the differences in survey timing may also contribute to fluctuations between cycles in terms of other modes shares such as walking.

In this context, it may be difficult to speculate as to the extent to which cycling in equivalent weather might have increased or decreased since 2007. Readers are reminded that the growth in bicycles in the region has been very close to the population growth (17% increase in bicycles over 11 years, compared to a 19% increase in population in the same period), while the average number of bicycles per person has been relatively steady, although other trends such as the aging population may contribute to a reduction in bicycle usage (**Section 3.4**). Also, examination of mode shares by age group later in this report (**Section 4.5.7**) reveals that the significant 2013-to-2018 decrease in bicycle usage amongst children is balanced somewhat by an increase in their walking trips, which is consistent with the theory that the colder weather during the time frame of the 2018 survey had an impact on the measurements.

It may be noted that the survey data on bicycle trips have not been validated against bicycle screenline counts in the region. Longitudinal examination of the bicycle screenline counts was outside the scope of this research but could provide useful context into the survey results and insight into trends in bicycle usage.

Table 23. Survey Time Periods and Temperature Norms, 2007-2018

Survey	Range of travel dates surveyed	Average daily min - max, average daily temperature*	Monthly precipitation*	Bicycle Mode Share
2007	13 April to 18 May 2007	April: 1.3°C to 15.5°C, avg. 8.4°C **May: 5.4°C to 20.0°C, avg. 12.8°C (most surveys)**	April: 29 mm **May: 40 mm**	1.9%
2013	23 Sept. to 30 Nov. 2013 90% of surveys by 4 Nov	Sept: 5.9°C to 21.7°C, avg. 13.9°C **Oct: 1.3°C to 13.4°C, avg. 7.4°C (most surveys)** Nov: -2.4°C to 5.6°C, avg. 1.6°C	Sept: 32 mm **Oct: 29 mm**	2.5%
2018	24 Oct. to 21 Dec. 2018, 90% of surveys by 6 Dec	Oct: 1.3°C to 13.4°C, avg. 7.4°C **Nov: -2.4°C to 5.6°C, avg. 1.6°C (most surveys)** Dec: -5.9°C to 0.7°C, avg. -2.6°C	Oct: 29 mm **Nov: 40 mm**	1.6%

* Environment Canada Canadian Climate Normals 1981-2010 Station Data, Kelowna Station A, (https://climate.weather.gc.ca/climate_normals/index_e.html)

[22] Of note, examination of the weighted 2018 survey data showed an average bicycle mode share of 1.8% prior to the end of November, and 0.9% in December, however, it may be noted that the data were not tested to see if the two sub-samples examined had similar representation of population characteristics.

4.5.5 Sustainable and Active Mode Shares

Aggregating the figures for sustainable and active modes provides another perspective on mode shares (**Table 24**):

- Combined, sustainable modes (transit, school bus, walking, and cycling) comprise a 13.7% mode share, which is a 2.7%-pt increase from 11.0% in 2007.
- Looking at just active modes (walking and cycling) reveals that, combined, the active modes comprise a 9.4% mode share, up 2.0%-pts from 7.3% in 2007.

The overall increases since 2007 in sustainable mode share and within this, active mode share can be looked upon positively. This finding is tempered somewhat by the fact that the survey results suggest that much of this increase was in the earlier period from 2007 to 2013, and there even appears to have been a slight decline in sustainable modes in the later period from 2013 to 2018. As discussed previously, shorter-term survey cycle to survey cycle trends can be difficult to assess as comparisons may be affected by survey timing, random sampling error, and/or methodological differences. This includes the possible over-representation of transit trips in 2013 as discussed earlier (see **Section 4.5.3**) and the likelihood that the active mode shares reported in 2018 were likely dampened by colder weather in the period of the 2018 survey cycle (see **Section 4.5.4**), with some of the decrease in bicycle trips made by children being offset by an increase in their walking trips (see **Section 4.5.7** later in this report). The aging of the population may also be a factor in the changes from 2013 to 2018, with the greater population increase being amongst older age groups having greater automobile ownership and the highest auto mode shares. Nevertheless, the net changes since 2007 are positive ones, and the impact of the over-representation of transit trips in 2013 and the colder weather in 2018 survey would suggest that the decrease since 2013 may not necessarily be as significant as it appears to be.

Table 24. Sustainable and Active Mode Shares – by Sub-Area, 2007-2018

	Trips			% Change in # of Trips			Mode Shares			%-Pt Change		
Primary Mode	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change
Sustainable Modes (Transit Bus + School Bus + Bicycle + Walk)*, **												
Study Area	69,800	102,000	93,900	46.1%	-8.0%	34.4%	11.0%	15.1%	13.7%	4.1%	-1.4%	2.7%
Vernon	13,300	17,500	16,500	31.2%	-5.6%	23.8%	11.2%	13.8%	14.0%	2.5%	0.2%	2.8%
Kelowna	43,000	66,300	60,500	54.2%	-8.8%	40.6%	12.2%	18.1%	15.5%	5.9%	-2.5%	3.4%
Other Central Ok.	13,500	18,200	16,900	34.9%	-7.1%	25.3%	8.3%	10.0%	9.5%	1.7%	-0.5%	1.2%
Active Modes (Bicycle + Walk)**												
Study Area	46,600	69,700	64,100	49.5%	-8.0%	37.5%	7.3%	10.3%	9.4%	3.0%	-0.9%	2.0%
Vernon	9,300	14,400	13,300	53.8%	-7.6%	42.1%	7.8%	11.3%	11.2%	3.4%	0.0%	3.4%
Kelowna	31,000	46,000	41,100	48.3%	-10.6%	32.6%	8.8%	12.5%	10.6%	3.7%	-1.9%	1.8%
Other Central Ok.	6,200	9,300	9,700	49.2%	3.8%	54.8%	3.9%	5.1%	5.4%	1.3%	0.3%	1.6%

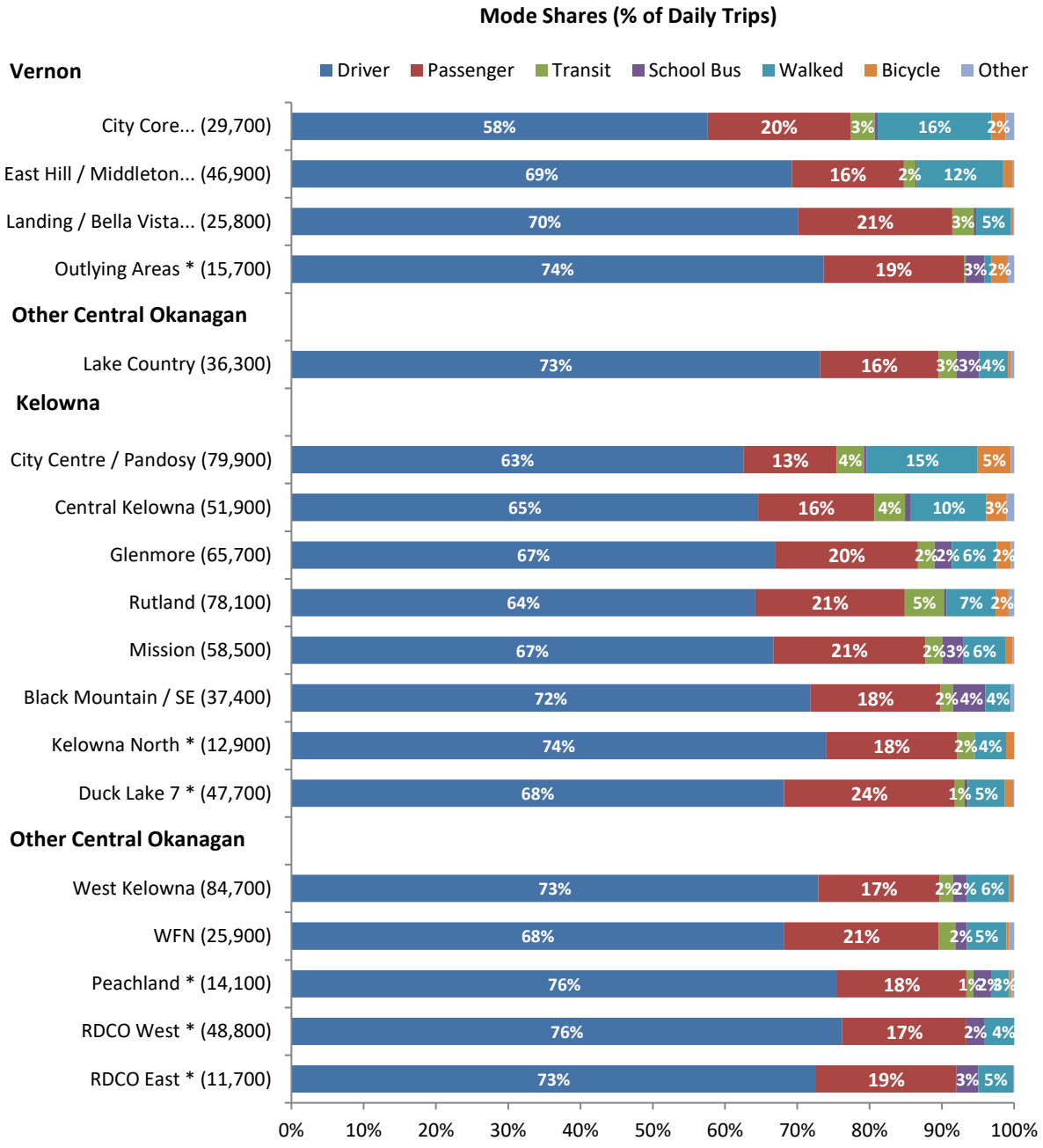
* Interpret 2013 sustainable counts and mode shares with caution: transit use in 2013 may be somewhat over-stated. See Section 4.5.3 of this report.

** Interpret with caution: the surveys were conducted at different times of year (2007: April-May; 2013: Sept-Nov; 2018: Oct-Dec). See Section 4.5.4

4.5.6 Mode Shares by District of Residence

The chart below highlights the variation in mode shares by district within each sub-area (Figure 47). The figures in brackets on the right indicate the expanded number of trips made by residents of each district.

Figure 47. Mode Shares by District, 2018



* Results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.

4.5.7 Mode Shares by Age Group

The following two tables illustrate travel mode shares by age group (**Table 26**), and estimated volumes of trips by mode (**Table 26**). For the latter table, readers are reminded that trip volumes presented are estimated volumes based on weighted survey data, not exact counts. In both tables, age groups are organized into ten-year ranges, with the exception of 15 to 19 and 20 to 24 which are split out to highlight distinct differences in mode shares, and 85+ which aggregates all of the smaller-population age ranges above 85 years.

The survey results reveal the following:

- Over two-thirds of trips made by those 5-14 years are as auto passengers, and 11% are via school bus, with the highest walk share of any age group, at 18%.
- Amongst 15-19 year olds, just over one-quarter (27%) of trips are as auto drivers, one-third are as passengers, while 14% are via transit bus, the highest reliance on transit of any age group. Walk shares are also high, at 14%.
- Amongst 20-24 year olds, driving trips are dominant at two-thirds of all trips, passenger trips drop to 12%. This age group shows the second-highest reliance of transit, at a 13% share of all trips.
- Amongst 25-34 year olds, driving trips are dominant at three-quarters of all trips, and transit drops to a little over 3%.
- Cycling mode shares are highest for those 25-34 and 35-44 (at 2.4% of trips for each age range).
- Those between 35 and 54 years (20-year span) show peak reliance on auto driving. Driving trips account for the vast majority of all trips (ranging from 82% to 83%), with passenger trips dropping to 7%-8%, and walking shares dropping to 6% starting at age 45-54. Transit trips are a very small minority for all age ranges above 35 years of age.
- For age ranges from 64 years up, as age increases, there is a modest decrease in reliance on auto driver trips (dropping from three-quarters for 65-74 to two-thirds for ages 85+), though they are still the majority, and increased reliance on passenger trips. Walking mode shares decline from 6% to 4% starting at age 75-84.

The charts that follow the tables (**Figure 48**, page 102) track changes in mode share by age cohort over time. The following observations can be made:

- From 2007 to 2018, overall, there is a noticeable reduction in auto driver mode shares for age cohorts between 15 and 44, with some fluctuation between in 2013 and 2018 depending on the age group. There is just a slight reduction amongst those in age cohorts from 45 through 75.
- Transit mode shares show a marked increase from 2007 to 2018 amongst youth in the 15 to 19 and 20 to 24 cohorts, and little new uptake amongst those over the age of 35.

- Walk mode shares show an increase amongst children in the 5 to 14 and 15 to 19 cohorts, although this is offset by decreases in bicycle mode shares. As discussed earlier in Section 4.5.4, the later start to the 2018 survey may affect the comparability of the data sets with respect to this mode. Combining both of these active transportation modes shows a more even trend. While the timing of the survey cycles makes it somewhat more difficult to draw conclusions from the longitudinal comparison, the patterns presented here do provide an insight: it appears that as the weather turns in the fall, bicycle trips amongst children under 20 years of age appear to be likely replaced by other active travel in the form of walking trips. Overall, in the 11 years from 2007 to 2018 there appears to have been an increase in active mode shares for most age groups, albeit with levels higher in 2013 than in 2018 for some age groups (which might be influenced by the dampening effect of colder weather at the time of the 2018 survey).

Table 25. Mode Shares by Age Group – Study Area, 2018

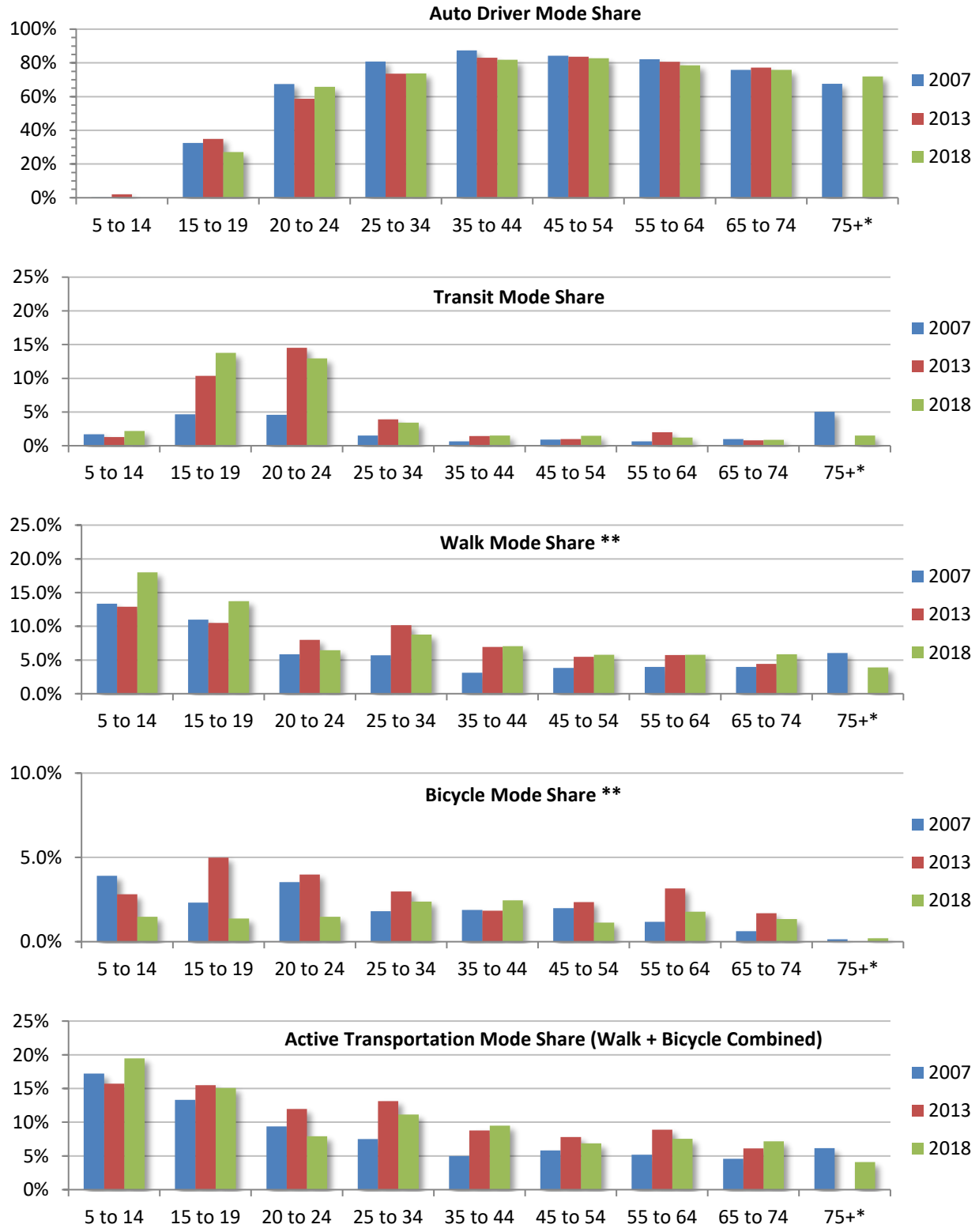
Age	Total Trips	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other
Survey Total	684,800	67.8%	18.0%	2.8%	1.6%	7.8%	1.6%	0.5%
5 to 14 years	65,200	-	67.4%	2.2%	10.8%	18.0%	1.5%	0.2%
15 to 19 years	31,700	27.1%	33.4%	13.8%	10.7%	13.7%	1.4%	-
20 to 24 years	33,100	65.9%	12.4%	12.9%	-	6.5%	1.5%	0.9%
25 to 34 years	84,300	73.8%	11.2%	3.4%	0.1%	8.8%	2.4%	0.4%
35 to 44 years	102,900	81.8%	6.9%	1.5%	-	7.1%	2.4%	0.3%
45 to 54 years	116,000	82.8%	8.2%	1.5%	0.1%	5.8%	1.1%	0.6%
55 to 64 years	111,300	78.5%	12.2%	1.2%	0.1%	5.8%	1.8%	0.5%
65 to 74 years	85,500	75.8%	15.5%	0.9%	0.0%	5.8%	1.3%	0.6%
75 to 84 years	44,500	73.2%	20.5%	1.3%	0.1%	4.1%	0.3%	0.6%
85+ years	10,200	66.5%	25.8%	2.5%	-	3.2%	-	2.0%

Table 26. Estimated Daily Volume of Trips by Mode by Age Group – Study Area, 2018

Age	Total Trips	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other
Survey Total	684,800	464,300	123,300	19,100	10,700	53,100	11,000	3,300
5 to 14 years	65,200	-	43,900	1,400	7,000	11,700	1,000	100
15 to 19 years	31,700	8,600	10,600	4,400	3,400	4,300	400	-
20 to 24 years	33,100	21,800	4,100	4,300	-	2,100	500	300
25 to 34 years	84,300	62,200	9,400	2,900	<50	7,400	2,000	400
35 to 44 years	102,900	84,100	7,100	1,500	-	7,300	2,500	300
45 to 54 years	116,000	96,000	9,600	1,700	100	6,700	1,300	700
55 to 64 years	111,300	87,300	13,600	1,300	100	6,400	2,000	500
65 to 74 years	85,500	64,800	13,300	800	<50	5,000	1,100	500
75 to 84 years	44,500	32,600	9,100	600	100	1,800	100	300
85+ years	10,200	6,800	2,600	300	-	300	-	200

Expanded trip estimates are rounded to the closest 100.

Figure 48. Mode Share Changes by Age, 2007-2018



* 2013 results for 75+ removed due to smaller samples. ** Walk and bicycle shares are likely to have been affected by different weather conditions when surveyed: the 2007 survey was Apr. 13-May18; 2013 was Sept 24-Nov. 30; and 2018 was Oct. 24-Dec 21.

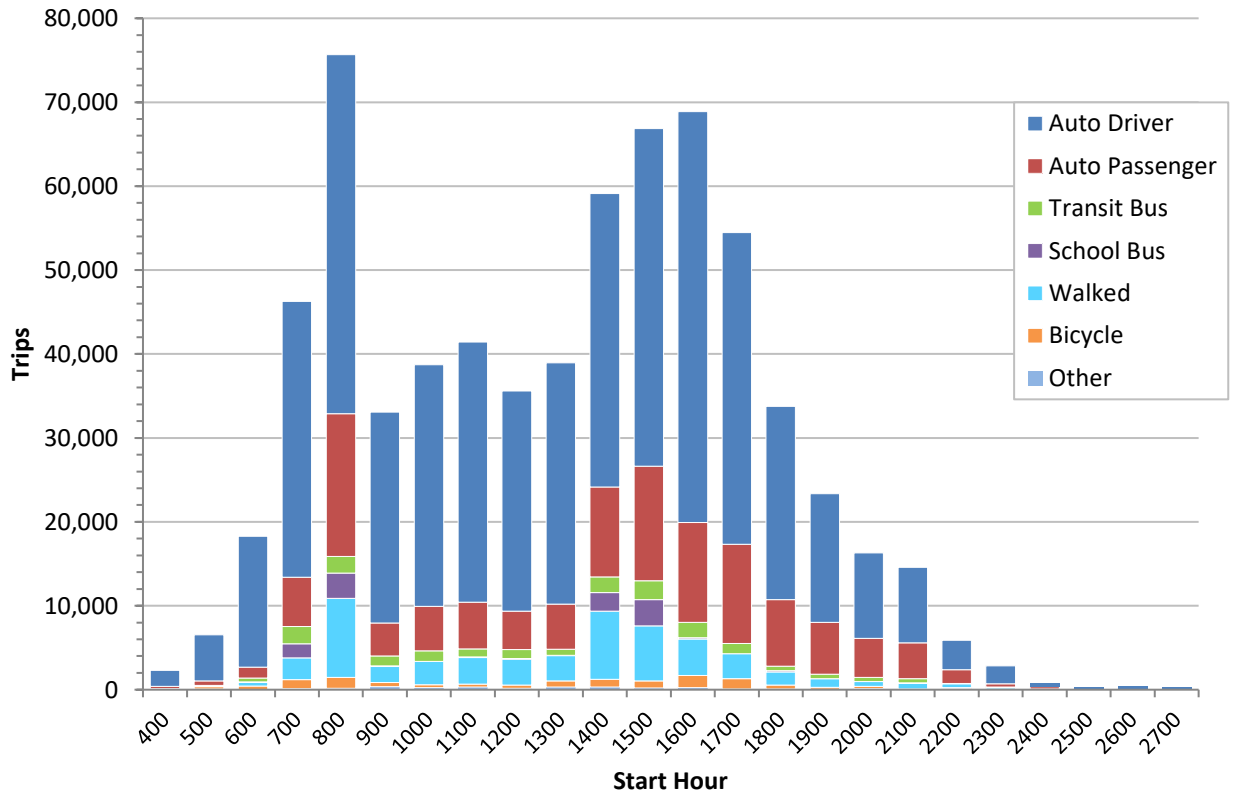
4.5.8 Trip Mode by Start Hour

The hourly distribution of trips by mode is presented in **Figure 49**. Auto driver trips are the dominant mode for every hour of the day. During the morning peak hour at starting at 8 AM, there are almost 42,800 auto driver trips. However, proportionately, auto driver trips comprise only 57% of all trips during that hour (vs. the 24-hour average of a 68%) since auto passenger, transit bus, school bus, walking, and cycling trips either peak or are at near their daily peak during in this hour. The highest volume of auto driver trips (49,000) is in the hour starting at 4 PM. Auto passenger trips peak at 17,000 during the hour starting at 8 AM. Walking trips peak in the hour starting at 8 AM (9,400 trips) and again at 2 PM (8,100 trips).

Transit mode shares are the greatest between 7 AM and 9 AM, at about 2,000 transit trips each hour, and again between 2 PM and 5 PM, with volumes ranging from 1,800 to 2,300 trips in each of the three hours (with the peak of 2,300 in the hour starting at 3 PM).

Cycling trips are highest in the two hours between 7 AM and 9 AM (1,000-1,300 trips each hour) and again between 4 PM and 6 PM (1,500-1,200 trips each hour), with volumes of 700 to 900 trips per hour between 1 PM and 4 PM. As noted elsewhere, cycling volumes may be higher than this during warmer weather earlier in the fall (as the 2018 survey started collecting travel data October 24).

Figure 49. Trips by Mode by Start Hour – Study Area, 2018

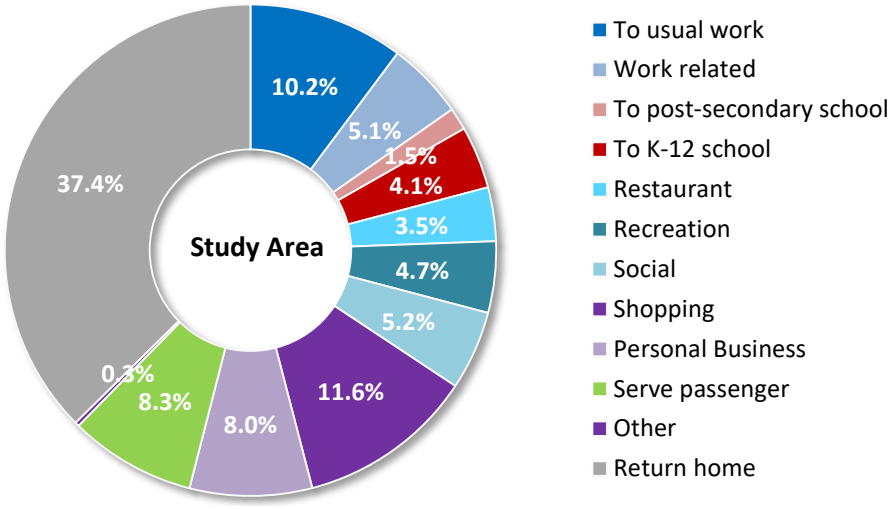


The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).

4.6 Trip Purpose

Trips to work and work-related destinations account for a total of 15% of all trips, followed by shopping at 12%, personal business at 8% (**Figure 50**). Trips to social and recreational destinations account for about 5% each. Trips to school account for a little under 6%, while trips to serve passengers (pick-up or drop-off) account for 8% (with many of those trips being to school or work of other household members). Of the total, 37% of trips are returning home from these various destinations. The patterns for the three sub-areas all have a very similar profile (**Table 27**), with a few variations. Vernon residents have proportionately fewer work, work-related, school, and restaurant trips and more social, shopping, and personal business trips, which is consistent with the older demographics of this community. Kelowna, on the other hand has proportionately more work and school related trips. The Other Central Okanagan area has the greatest percentage of work-related trips, which may reflect the overall profile of jobs held by these residents (with more workers reporting not having a fixed workplace address).

Figure 50. Trips Purposes – Study Area, 2018



*Work-related may include business errands, meetings, or trips to worksites for workers without a usual workplace.

Table 27. Trips Purposes (Trips and % of Trips) by Sub-Area, 2018

Geography	Total	To usual work	Work related*	To post-secondary school	To K-12 school	Restau-rant	Rec-reation	Social	Shopping	Personal Business	Serve pass-enger	Other	Return home
Daily Trips													
Study Area	684,800	69,900	34,800	10,100	28,200	24,200	32,100	35,700	79,700	55,100	57,100	1,900	256,000
Vernon	118,100	11,000	5,100	1,200	4,500	3,600	5,900	6,400	14,600	10,800	10,300	500	44,100
Kelowna	389,000	41,800	18,600	6,700	15,700	13,900	19,300	20,300	43,200	29,500	32,900	1,300	145,700
Other Central Ok.	177,700	17,100	11,000	2,100	8,000	6,700	7,000	8,900	21,800	14,800	13,900	200	66,200
% of Trips													
Study Area	100%	10.2%	5.1%	1.5%	4.1%	3.5%	4.7%	5.2%	11.6%	8.0%	8.3%	0.3%	37.4%
Vernon	100%	9.4%	4.4%	1.0%	3.8%	3.1%	5.0%	5.5%	12.3%	9.1%	8.7%	0.4%	37.3%
Kelowna	100%	10.7%	4.8%	1.7%	4.0%	3.6%	5.0%	5.2%	11.1%	7.6%	8.5%	0.3%	37.5%
Other Central Ok.	100%	9.6%	6.2%	1.2%	4.5%	3.8%	3.9%	5.0%	12.3%	8.3%	7.8%	0.1%	37.2%

Expanded trip estimates are rounded to the closest 100. *Work-related: business errands, meetings, or trips to worksites for workers without a usual workplace.

4.6.1 Trip Purposes, 2007-2018

The table below highlights trends in trip purposes over time (**Table 28**). Given that there may have been differences in how trips recorded as 'other purpose' were treated or recoded in the data processing, some of the year-over-year comparisons may be difficult to interpret for discretionary trip purposes (such as recreation, social, and personal business). Readers are reminded that some fluctuations between survey cycles may be the product of random sampling or differences in methodology. Nevertheless, some trends do emerge with respect to work and school purposes:

- Overall, from 2007 to 2018, the total number of trips to work or for work-related purposes have diminished (a 7% decrease over the entire 11 years, despite a modest increase in the last five years since 2013). This compares with a 14% increase in workers and 19% increase in population over this period. This may be due in part to demographic trends (aging of the population, net in-migration of retirees settling in the area) and in part due to the changing nature of work, such as a possible increase in flexible work arrangements or telecommuting.
- The overall number of school trips has increased 15% over 11 years. This is consistent with the population growth in school-age children and youth lagging behind total population increase.
- Of note, the increase in the proportion of trips that are 'return home' trips may suggest that residents may be undertaking fewer individual trips on each outing that they undertake.

Table 28. Trips Purposes (Trips and % of Trips), 2007-2018

	Total Trips	To Usual Work or Work Related	To post-secondary school*	To K-12 school*	Restau-rant	Rec-reation	Social	Shopping	Personal Business	Serve pass-enger	Other / Unknown **	Return home
Trips												
2007	634,200	112,700	33,300*		22,600	28,900	24,000	75,000	36,800	52,600	28,800	219,500
2013	675,900	101,700	10,200	26,400	19,400	34,600	33,500	75,200	53,800	55,600	24,000	241,600
2018	684,800	104,700	10,100	28,200	24,200	32,100	35,700	79,700	55,100	57,100	1,900	256,000
% Change in Trips												
'07-'13 (6-yr change)	+7%	-10%	+10%*		-14%	+20%	+40%	0%	+46%	+6%	-16%	+10%
'13-18 (5-yr change)	+1%	+3%	-1%	+7%	+25%	-7%	+6%	+6%	+3%	+3%	-92%**	+6%
'07-'18 (11-yr change)	+8%	-7%	+15%*		+7%	+11%	+49%	+6%	+50%	+9%	-93%**	+17%
% of Trips												
2007	100%	17.8%	5.3%*		3.6%	4.6%	3.8%	11.8%	5.8%	8.3%	4.5%	34.6%
2013	100%	15.1%	1.5%	3.9%	2.9%	5.1%	5.0%	11.1%	8.0%	8.2%	3.6%	35.7%
2018	100%	15.3%	1.5%	4.1%	3.5%	4.7%	5.2%	11.6%	8.0%	8.3%	0.3%	37.4%
%-Pt Change												
'07-'13 (6-yr change)		-2.7%	+0.2%*		-0.7%	+0.6%	+1.2%	-0.7%	+2.2%	-0.1%	-1.0%	+1.1%
'13-18 (5-yr change)		+0.2%	0.0%	+0.2%	+0.7%	-0.4%	+0.2%	+0.5%	+0.1%	+0.1%	-3.3%**	+1.6%
'07-'18 (11-yr change)		-2.5%	+0.3%*		0.0%	+0.1%	+1.4%	-0.2%	+2.3%	0.0%	-4.3%**	+2.8%

* The 2007 survey did not record school type, so school types have been aggregated for the 2007-2013 and 2007-2018 comparisons.

** 2007 and 2013 surveys had 4.5% and 3.6% of trips with 'other' or unknown purpose, whereas the 2018 survey had few trips (0.3%) that could not be coded to a specific category. It is possible that many of the 2007 and 2013 trips with other or unknown purpose were discretionary trips with actual purposes such as serve passenger, recreation, social, or personal business. Interpretation of the categories by respondents or in data processing may also be a factor. Given this, year-to-year comparisons for the various discretionary trip purposes should be interpreted with caution, and there may be some impact on the comparisons for individual trip purposes.

4.6.2 Trend in Daily Number of People with Work Commutes

Given the overall decrease in trips to work or for work-related purposes, it is of interest to focus in on whether the number of workers travelling to or for work has changed similarly. As illustrated in **Table** 29, the number of full-time workers has grown 14% in the 11 years since 2007, while the number of full-time workers who took at least one work trip (to work or for a work-related purpose) has also increased by 14% over this time period. Overall, 78% of full-time workers reported a work trip on their travel day. The story is different for part-time workers, the number of which increased by 15% since 2007 but with only a 4% increase in the number reporting travelling for work at 4%. Proportionately fewer part-time workers reported at least one trip to work in 2018 (44%) as compared to 2007 (50%). This is not enough to explain the drop in the total number of trips to work or with work-related purposes presented in the preceding section. Possible reasons may include a drop in the number of trips for work-related purposes while at work or under-reporting of work-related trips or discretionary trips while at work (e.g., going to get lunch and returning to work). The 2018 survey also asked workers who did not travel to work why not (**Table 30**). The results reveal that on an average weekday 7% of full-time workers and 11% of part-time workers either work from home or telecommute.

Table 29. Workers with at Least One Work Trip, 2007-2018

	# of Workers			% change		
	2007	2013	2018	2007-2013 6-Yr Change	2013-2018 5-Yr Change	2007-2018 11-Yr Change
Workers						
Full-time	78,200	81,600	89,100	+4%	+9%	+14%
Part-time	24,000	25,500	27,500	+6%	+8%	+15%
Total	102,200	107,000	116,700	+5%	+9%	+14%
Workers with at least 1 work trip						
Full-time	61,200	62,200	69,500	+2%	+12%	+14%
Part-time	11,900	10,000	12,400	-15%	+24%	+4%
Total	73,100	72,300	81,900	-1%	+13%	+12%
	% of Workers			%-pt change		
	2007	2013	2018	2007-2013 6-Yr Change	2013-2018 5-Yr Change	2007-2018 11-Yr Change
Workers with at least 1 work trip						
Full time workers	78%	76%	78%	-2%	+2%	0%
Part time workers	50%	39%	44%	-10%	+6%	-4%
Total Workers	71%	68%	70%	-4%	+3%	-1%

*Excludes trips with work purpose for people who were not reported as employed. Such trips may be a result of errors in reported trip purpose (e.g., reporting 'work-related' when travelling for volunteer work) or reported employment status.

Table 30. Reasons for not Travelling to Work, 2007-2018

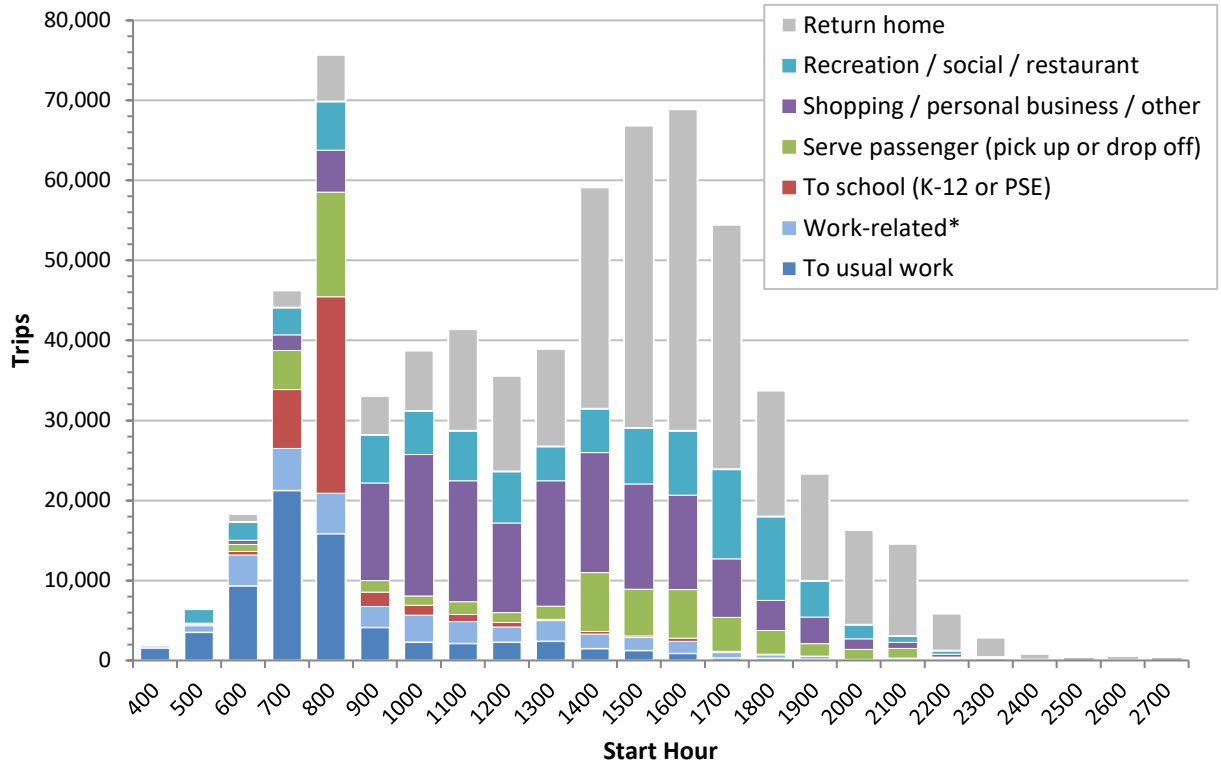
% of Workers Who...	Full-Time	Part-Time	Total
Went to work or had work related trip	78%	44%	70%
Worked from home / telecommuted	7%	11%	8%
Out of town / away on business	3%	2%	3%
Sick/ill or caring for other sick/ill household member	1%	1%	1%
Other reason	0%	1%	1%
Not scheduled / did not work	10%	41%	18%

4.6.3 Trip Purpose by Start Hour

Figure 51 provides another view of daily trips, illustrating the distribution of trip purposes by time of day (by one-hour interval based on the time of departure). Some trip purposes have been grouped to reduce the number of categories displayed in the chart.

This classic profile has a concentrated AM peak dominated by commute trips to work and school, as well as related trips to drop off passengers, ending by 9 AM. Other kinds of trip purposes such as shopping and personal business begin to increase by 10 AM. The extended PM peak, which begins mid-afternoon, is dominated by return-home trips, but with notable proportions of trips with pick-up/drop-off, shopping/personal business and social/recreational purposes.

Figure 51. Trips by Grouped Purposes by Start Hour – Study Area, 2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).
*Work-related may include business errands, meetings, or trips to worksites for those without a usual workplace.

4.6.4 Mode Shares by Trip Purpose

Mode shares and volumes by trip purpose are presented in the following two tables (Table 31, Table 32). The survey results illustrate the predominance of driving as a travel mode for work commutes (with four out of five trips to a usual workplace outside the home), while the small auto passenger share (5%) for underlines the fact that most work commutes are in single-passenger vehicles. Transit is important for a good portion (31%) of post-secondary school commutes, although it may be noted that despite the existence of a free U-Pass system for public post-secondary students, 50% of trips to post-secondary school are as an auto driver. Of note, travel to post-secondary school is the single most common use of the transit system: 3,100 out of 19,100 transit trips, with presumably a similar number of associated return-home trips. Also of note, while walking and school buses are important for K-12 school commutes (17% and 22% mode shares), just over half of trips to school are as an auto passenger (53%).

Table 31. Mode Shares by Trip Purpose – Study Area, 2018

Trip Purpose	Total Trips	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other
Total Trips	684,800	67.8%	18.0%	2.8%	1.6%	7.8%	1.6%	0.5%
To usual work	69,900	80.3%	5.3%	3.1%	0.1%	7.0%	3.6%	0.6%
Work related*	34,800	85.2%	7.7%	1.7%	0.2%	3.7%	1.0%	0.5%
To post-secondary school	10,100	49.9%	11.7%	30.8%	-	5.2%	1.4%	1.0%
To K-12 school	28,200	1.9%	53.3%	3.9%	17.4%	21.8%	1.8%	-
Restaurant	24,200	63.3%	22.7%	0.8%	-	11.9%	0.6%	0.7%
Recreation	32,100	65.3%	22.5%	1.6%	0.0%	8.0%	2.3%	0.2%
Social	35,700	62.0%	25.1%	2.3%	0.8%	7.8%	1.2%	0.9%
Shopping	79,700	73.4%	16.8%	2.1%	0.0%	6.7%	0.8%	0.2%
Personal Business	55,100	72.4%	18.3%	1.2%	0.2%	5.5%	1.4%	0.9%
Serve passenger	57,100	81.1%	13.4%	0.2%	0.2%	4.7%	0.4%	0.1%
Other	1,900	28.4%	22.0%	3.2%	14.4%	30.6%	0.0%	1.4%
Return home	256,000	66.1%	18.6%	3.2%	1.9%	8.0%	1.8%	0.5%

*Work-related may include business errands, meetings, or trips to worksites for those without a usual workplace.

Table 32. Estimated Daily Volume of Trips by Mode by Trip Purpose – Study Area, 2018

Trip Purpose	Total Trips	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other
Total Trips	684,800	464,300	123,300	19,100	10,700	53,100	11,000	3,300
To usual work	69,900	56,100	3,700	2,200	100	4,900	2,500	400
Work related*	34,800	29,700	2,700	600	100	1,300	300	200
To post-secondary school	10,100	5,000	1,200	3,100	-	500	100	100
To K-12 school	28,200	500	15,000	1,100	4,900	6,100	500	-
Restaurant	24,200	15,300	5,500	200	-	2,900	200	200
Recreation	32,100	21,000	7,200	500	<50	2,600	800	100
Social	35,700	22,100	8,900	800	300	2,800	400	300
Shopping	79,700	58,500	13,400	1,700	<50	5,400	600	200
Personal Business	55,100	39,900	10,100	700	100	3,000	800	500
Serve passenger	57,100	46,300	7,600	100	100	2,700	200	100
Other	1,900	600	400	100	300	600	-	<50
Return home	256,000	169,300	47,600	8,100	4,800	20,400	4,500	1,300

Expanded trip estimates are rounded to the closest 100. *Work-related: business errands, meetings, or trips to worksites for workers without a usual workplace.

4.6.1 Home-Based Trip Purposes

The preceding sections examine trip purposes in terms of the reporting destination activity. It can also be useful to examine trips in terms of an overall purpose as identified from looking at both the origin and the destination. The following four 'home-based purpose' categories take into account both the origin and destination location or purpose: home-based work (HBW), home-based school (HBS), home-based other (HBO), and non-home-based (NHB). These categories or ones similar to them are often used in the development of transportation models. Table 33 presents the trip distributions for each of the sub-areas in 2018, while Table 34 highlights the change across the study area since 2007.

Overall, HBW trips account for 19% of all trips, while HBS accounts for half that. The largest category is HBO trips at 46%, followed by NHB (the trips between destinations away from home) at 25%. Looking at the results over time, the apparent increase in the share of HBO trips and reduction in the share NHB trips should be interpreted with caution, as a portion of the change may be the result of methodological differences,[23] as much as the result of other trends explored elsewhere in this report (changes in age distribution, work patterns, leisure and shopping patterns, and trip rates).

Table 33. Home-Based Trip Purposes, 2018

Purpose		Study Area	Vernon	Kelowna	Other Central Ok.
Total Trips		**684,800**	**118,100**	**389,000**	**177,700**
# of Trips	HBW	131,700	20,800	76,700	34,200
	HBS	65,600	9,900	38,500	17,300
	HBO	315,300	57,200	177,300	80,800
	NHB	172,200	30,200	96,600	45,400
% of Trips	**HBW**	**19.2%**	**17.6%**	**19.7%**	**19.2%**
	HBS	9.6%	8.3%	9.9%	9.7%
	HBO	46.0%	48.4%	45.6%	45.5%
	NHB	25.1%	25.6%	24.8%	25.5%

Table 34. Home-Based Trip Purposes – Study Area, 2007-2018

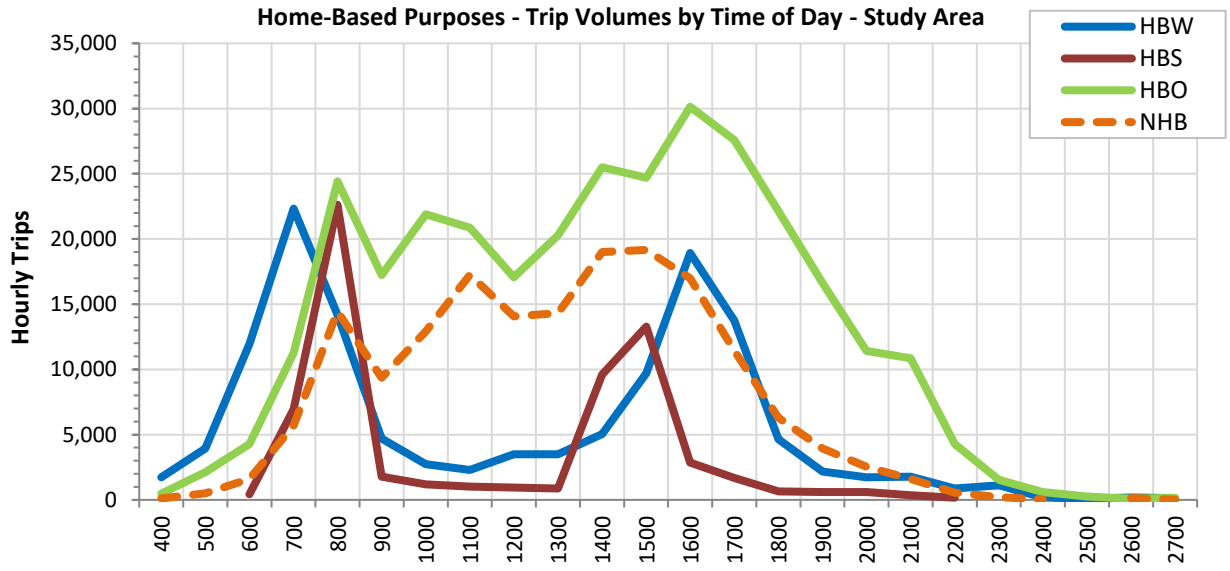
	Purpose	2007	2013	2018	Change:	2007-2013 (6-Year)	2013-2018 (5-Year)	2007-2013 (11-Year)
	Total Trips	**634,200**	**675,900**	**684,800**		**+6.6%**	**+1.3%**	**+8.0%**
#	HBW	126,500	125,200	131,700	**% Change**	-1.0%	+5.2%	+4.1%
	HBS	54,900	58,200	65,600		+6.0%	+12.8%	+19.6%
	HBO	269,000	305,400	315,300		+13.5%	+3.2%	+17.2%
	NHB	183,800	187,200	172,200		+1.8%	-8.0%	-6.3%
%	HBW	19.9%	18.5%	19.2%	**%-Pt Change**	-1.4%	+0.7%	-0.7%
	HBS	8.7%	8.6%	9.6%		0.0%	+1.0%	+0.9%
	HBO	42.4%	45.2%	46.0%		+2.8%	+0.9%	+3.6%
	NHB	29.0%	27.7%	25.1%		-1.3%	-2.5%	-3.8%

[23] On the one hand, it is possible that the trip diary approach used in 2007 and 2013 may have resulted in the capture of more discretionary NHB trips such as other householders going somewhere for a lunch break which the primary respondent in the 2018 survey method might not be aware of. On the other hand, the 2018 survey took a rigorous approach to correcting 'return home' trip purposes that went to the same location coordinates of home but stated a different purpose (such as going home to pick someone up or for recreation), whereas this approach might not be have been undertaken in the earlier surveys.

Looking at the trips for different home-based purposes by hour across the day (**Figure 52**) reveals a more complete picture of travel patterns than just looking at purposes at the destination end, as the return-home trips get categorized by the previous activity (at the trip origin). [24]

- The survey results show a morning peak in HBW trips in the hour starting at 7 AM and an afternoon peak in the hour starting at 4 PM, with a considerable volume in the 5 PM hour also.
- HBS trips peak at 8 AM, with the afternoon peak HBS trips spread across two hours, 2 PM and 3 PM, likely the result of different school day end times at different types of school.
- HBO trips also peak at 8AM in the morning, then are steady throughout the day, and peak again across two hours from 5 PM to 6 PM. A portion of the HBO trips during the morning and afternoon peaks may be part of work and school commutes if there is a stop along the way for another purpose in between home and the commute destination.
- Non home-based trips are spread throughout the daytime, dying down after 5 PM. A portion of such trips may be the result of trips made between work or school and another activity.

Figure 52. Home-Based Trip Purposes by Time of Day – Study Area, 2018



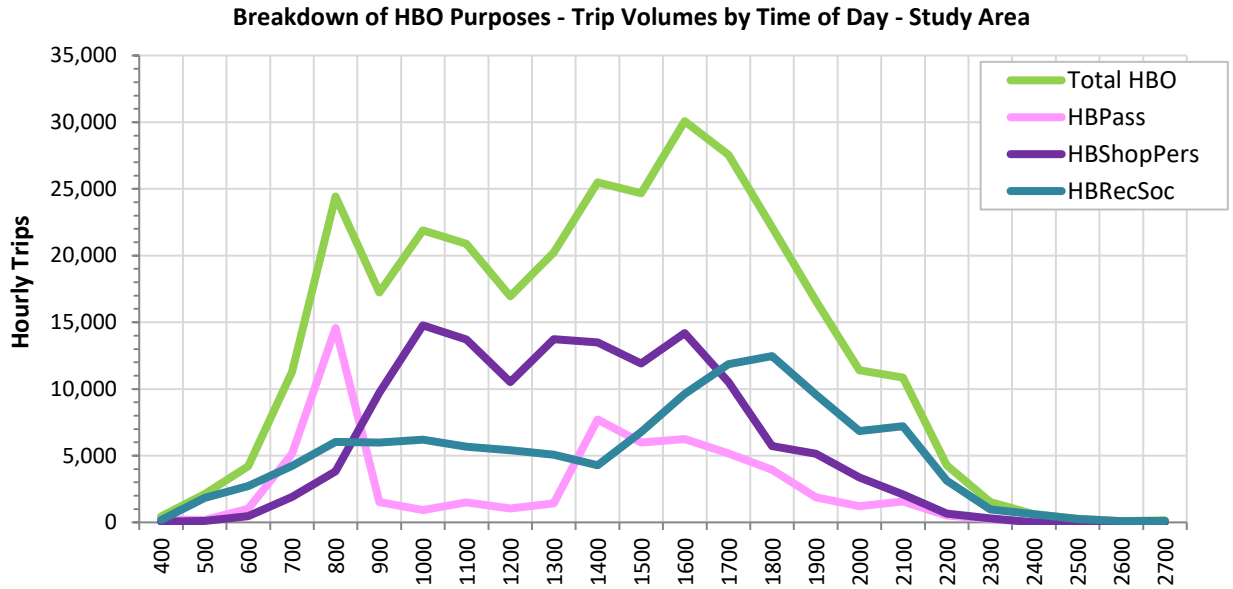
The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).
HBW = home-based work/work-related. HBS = home-based school (K-12 or PSE). HBO = home-based other. NHB = non-home-based.

[24] It may be noted that HBW and HBS categorizations do not necessarily capture all commute-related trips. Commutes that stop along the way (e.g., to grab a coffee or drop of/pick up a child at school) are split into HBO trips between home and the stop along the way, and NHB trips between work/school and the stop. Even so, HBW and HBS trips should provide a good picture of commute patterns without undertaking more complex tour identification work (not part of the research scope).

Figure 53 provides a breakdown of just the HBO trips into HBPAss, home-based serve passenger (pick-up or drop off trips); HBShopPers, home-based shopping and personal business; and HBRecSoc, home-based recreational, social, and restaurant trips.

This breakdown reveals that home-based trips to serve passengers peak in the morning at the same time as the school trips peak (see previous chart) but when they pick up again at 2 PM, they are spread across the afternoon and early evening. The majority of shopping and personal business related trips that leave or return to home are spread from 10 AM to 5 PM. Social, recreational, and restaurant trips have modest volumes from the morning through early afternoon, but starting at 4 PM they rise to a peak at 6 PM which declines steadily until 10 PM.

Figure 53. Breakdown of Home-Based Other (HBO) Purposes by Time of Day – Study Area, 2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).
HBO = home-based other. HBPass = home-based serve passenger (pick up or drop off someone else).
HBShopPers = shopping, personal business (medical appointment, banking, personal care, etc.), other
HBRecSoc = recreation, social outing, restaurant (whether eat-in or take out)
Chart excludes HBW, HBS, and NHB trips (see previous chart).

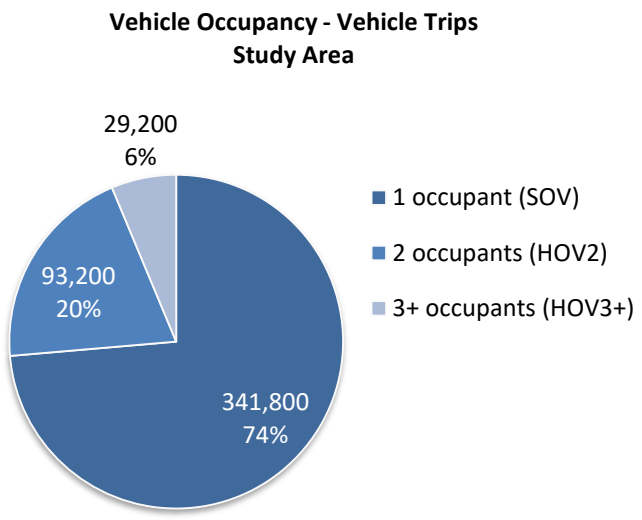
4.7 Vehicle Occupancy

The survey asked respondents who reported auto driver trips to indicate the total number of vehicle occupants, including the driver. The survey results for the study area are reported in **Figure 54**.

As illustrated, three-quarters of all vehicle trips (74%) were in single-occupant vehicles (SOVs). One-fifth of trips were two-person high-occupancy vehicle trips (HOV-2), while only 6% had three or more vehicle occupants (HOV-3). The average vehicle occupancy in 2018 was 1.35 occupants per vehicle.

Both the distribution of SOV, HOV-2, and HOV-3+ vehicle trips and the average vehicle occupancy were virtually identical to the survey average for Vernon, Kelowna, and Other Central Okanagan.

Figure 54. Vehicle Occupancy – Study Area, 2007-2018



When the data for the districts within each of the sub-areas were examined, the average vehicle occupancy was remarkably uniform at around the average, with only a few exceptions (ranging from a low of 1.28 for resident of both Kelowna City Core/Pandosy and Central Kelowna, perhaps related to the higher proportions of workers and smaller households, to 1.42 in Mission, perhaps related to the higher average household size).

Comparisons were not made with the previous survey cycles because the 2007 survey did not collect information on vehicle occupancy and the 2013 survey data were missing responses for a number of auto driver trips. The fact that the mode share for auto passenger trips in 2018 was about the same in 2007 and a bit lower in 2013 (see **Section 4.5.2**) suggests that vehicle occupancy is likely about the same as in 2007 and slightly higher than in 2013.

Readers are reminded that the figures above are based only on trips made via vehicles available to the household. These trips may have included some work-related travel for business meetings, errands, or in the case of people who drive as part of their living, their first trip to their first worksite, but would not have captured commercial travel.

4.8 Transit Boardings and Transit Access Modes

Table 35 provides information on transit trips made in the study area. The 2018 survey results suggest transit ridership of just over 19,100 person-trips, with just over 23,800 bus boardings in total across both the Kelowna Regional Transit System and Vernon Regional Transit System. In total, about 23% of trips involved transfers, but very few involved more than one transfer. The proportion varies by geography. Transit riders who reside in the Vernon and the Other Central Okanagan sub-areas are more likely to take more than one bus route in a single trip (with 41% and 38% of trips, respectively, requiring either one or more transfers).

A portion of transit riders travel to (or from) their boarding (or alighting) bus stop via a mode other than walking. Overall, just over one-tenth (11%) of transit trips entail modes other than walking: 4% drive-access transit ('park and ride'), with this being more than twice as common in Kelowna and Other Central Okanagan compared to Vernon; almost 6% drive-access passenger ('kiss and ride' or taxi), most common in Other Central Okanagan; and 1% bicycle-access transit, observed only in the survey data only amongst Kelowna residents.

The table on the next page (Table 36) provides a breakdown of the expanded survey data on transit routes reported by respondents living in the different sub-areas. The table has been provided to illustrate the survey results, which are based on a relatively small sample of transit users (n=308 persons out of an estimated daily 10,600 daily users). These results not been validated against actual boarding counts by route and may or may not be representative of actual route usage by the entire population.

Readers are also referred to Section 4.5.3 earlier in this report for trends in ridership counts since 2007.

Table 35. Number of Bus Routes Taken, Transit Access Modes, 2018

	Survey Total	Vernon Residents	Kelowna Residents	Other Central Ok. Residents
Transit Trips	19,110	2,550	13,320	3,250
Boardings	23,810	3,760	15,470	4,590
Avg. Boardings per Transit Trip	1.25	1.48	1.16	1.41
# of buses taken (% of trips)				
1 route (no transfers)	77.2%	59.2%	84.4%	61.7%
2 routes (1 transfer)	21.0%	34.0%	15.0%	35.5%
3 routes (2 transfers)	1.8%	6.8%	0.6%	2.9%
Transit Access (% of trips)				
Walk-Access Transit (WAT)	89.2%	92.8%	91.1%	78.5%
Drive-Access Transit (DAT)	4.2%	1.8%	4.6%	4.0%
Drive-Access Transit - Passenger (DAT-P)	5.6%	5.4%	2.8%	17.5%
Bicycle-Access Transit	1.0%	-	1.5%	0.0%

WAT = both transit access and egress mode were walking (or bus stop was right at trip origin and/or destination).
DAT = at least one end of the transit trip had access or egress mode of auto driver or motorcycle.
DAT-P = at least one end of the transit trip had access or egress mode of auto passenger or taxi, and did not have auto driver at the other end.

Table 36. Bus Routes Taken (Expanded # of Boardings from Survey Responses), 2018

Route Name	Survey Total	Vernon Residents	Kelowna Residents	Other Central Ok. Residents
Total Boardings	**23,810**	**3,760**	**15,470**	**4,590**
Kelowna Regional Transit System - Subtotal	**20,120**	**440**	**15,440**	**4,240**
1 Lakeshore	1,890		1,580	320
2 North End Shuttle	40		40	
3 Dilworth Mt.	260		260	
4 Pandosy / UBCO Express	750		630	120
5 Gordon	690		560	140
6 Glenmore / UBCO Express	1,310	100	1,070	150
8 University / OK College	3,930	170	3,730	30
9 Shopper Shuttle	30		30	
10 North Rutland	1,510		1,510	
11 Rutland	1,870		1,710	160
12 McCulloch	150		150	
13 Quail Ridge	120		120	
14 Black Mountain	240		240	
16 Kettle Valley	410		410	
17 South Ridge	260		260	
18 Glenmore/Downtown	420		420	
19 Glenmore/Orchard Park	330		330	
20 Lakeview	180			180
21 Glenrosa	500		60	440
22 Peachland	190		70	120
23 Lake Country	510		90	420
24 Shannon Lake	380			380
25 East Boundary	100		40	60
28 Smith Creek	30			30
29 Bear Creek	50			50
97 Okanagan	3,970	170	2,140	1,660
Vernon Regional Transit System - Subtotal	**3,690**	**3,320**	**30**	**350**
1 Coldstream (Vernon)	190	190		
2 Pleasant Valley (Vernon)	260	260		
3 Alexis Park (Vernon)	560	560		
4 East Hill (Vernon)	70	70		
5 South Vernon (Vernon)	180	180		
6 College (Vernon)	410	410		
7 Okanagan Landing (Vernon)	510	510		
8 Bella Vista (Vernon)	240	240		
9 North End (Vernon)	380	380		
60 Enderby (Vernon)	10	10		
90 UBCO Connector (Vernon)	880	500	30	350

Boardings by surveyed residents of the study area (n=308 persons reporting 554 transit trips).

Transit systems may also serve residents of neighbouring communities outside the survey area, whose trips are not included above.

4.9 Vehicle Availability for Trips Made via Sustainable Modes

The survey asked respondents who reported using non-automobile modes of travel whether or not a vehicle was available for the first trip in each trip chain that left home. This question gets at whether people are exercising a choice to travel via sustainable modes or have no choice but to do so. The question was only asked of those 16+ years of age who had a driver's licence. In 2018, to reduce survey response burden, this question was only asked of respondents leaving home via a sustainable mode, as that is when the key choice to drive or not is made (and can be assumed to carry on to other trips via sustainable mode in the trip chain until they return home again).

The survey results reveal that overall, the great majority of applicable travellers (16+, have a licence) who travel via a sustainable mode make the choice to do so rather than drive, with 70% of trips leaving home reflecting this choice (**Table 37**). The people who make the other 30% of sustainable-mode journeys leaving home either did not have access to a household vehicle or the household has no vehicles. These journeys may therefore be considered dependent on the sustainable mode. Dependence on sustainable modes varies: the survey results suggest that 62% of those who use transit are reliant on this mode, compared to 20% of those who walked, and 26% who travelled via bicycle (**Table 38**). The high reliance on transit amongst users underscores both the importance of this mode to serve the needs of the population and the challenge of making transit an appealing choice to those with vehicles.

Table 37. Vehicle Availability for Trips by Sustainable Mode, by Sub-Area, 2013-2018

	Study Area		Vernon**		Kelowna		Other Central Okanagan**	
	2013	2018	2013	2018	2013	2018	2013	2018
Applicable trips leaving home via sustainable mode *	25,350	21,240	4,330	3,230	18,190	15,180	2,820	2,830
Yes, vehicle available	71%	70%	70%	67%	72%	71%	64%	70%
No, not available	29%	30%	30%	33%	28%	29%	36%	30%

* Filtered to just the sub-sample of trips leaving home via a non-automobile mode (transit, walked, bicycle, school bus, other). Those without household vehicles were not asked the question, but answers of no are assumed, and they are included in the results. Trips made by people under the age of 16 or with no licence are excluded.
Note: the different survey periods may affect the # of walking and cycling trips, with 2018 being lower due to colder weather.
**Interpret results for Vernon and Central Okanagan with caution due to smaller sample sizes.

Table 38. Vehicle Availability for Trips by Sustainable Mode, 2013-2018

	Transit		Walked		Bicycle	
	2013	2018	2013	2018	2013	2018
Applicable trips leaving home via sustainable mode *	5,530	4,050	14,180	12,370	5,690	3,810
Yes, vehicle available	42%	38%	75%	80%	92%	74%
No, not available	58%	62%	25%	20%	8%	26%

* Filtered to just the sub-sample of trips leaving home via a non-automobile mode (transit, walked, bicycle, school bus, other). Those without household vehicles were not asked the question, but answers of no are assumed, and they are included in the results. Trips made by people under the age of 16 or with no licence are excluded.
In this table school bus and other mode trips are not detailed due to very small sample sizes of applicable trips by persons over the age of 16 with driver's licenses.
Note: the different survey periods may affect the # of walking and cycling trips, with 2018 being lower due to colder weather.

4.10 Trip Distances

4.10.1 Average Trip Distance

Mean trip distances are presented below (**Table 39**). In this analysis, trip distance was calculated as the straight-line distance between origin and destination (not actual distance travelled on streets).

Work trips are longest (average of 9.0 km). School trips are shortest (4.9 km), although auto driver school trips are longer (11.4 km) as many of these would be post-secondary commutes to UBCO or one of the OC campuses. Other home-based purposes averaged 6.0 km, with non home-based trips averaging 5.0 km.

The average auto driver trip distance was 6.9 km, and auto passenger trips 6.4 km. Transit trips averaged 7.1 km and school bus trips averaged 4.1 km. The average cycling trip was 2.9 km and the average walking trip was 700 m.

Averages vary by sub-area, with residents of Vernon and Other Central Okanagan tending to make longer trips for all modes, other than walking and HBS school bus trips, which are relatively similar across the entire region.

Table 39. Average Trip Distance (km) by Trip Purpose and Mode, 2018

Purpose	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other	Total
Study Area								
HBW	9.8	9.1	7.1	*	1.0	3.6	5.2	**9.0**
HBS	11.4	3.9	9.2	4.1	0.7	2.5	9.0	**4.9**
HBO	6.2	7.5	4.6	*	0.7	2.7	7.0	**6.0**
NHB	5.3	5.2	5.5	13.7	0.5	1.6	16.3	**5.0**
Total	**6.9**	**6.4**	**7.1**	**5.3**	**0.7**	**2.9**	**8.8**	**6.2**
Vernon								
HBW	10.9	15.4	13.0	*	0.9	2.3	*	**10.2**
HBS	15.8	2.8	22.5	4.1	0.6	*	-	**5.4**
HBO	6.9	8.3	5.0	-	0.5	2.5	*	**6.6**
NHB	6.1	7.0	*	*	0.5	1.4	*	**6.1**
Total	**7.6**	**7.6**	**12.0**	**4.2**	**0.6**	**1.8**	*****	**7.0**
Kelowna								
HBW	7.9	6.5	5.1	*	1.0	3.8	6.3	**7.1**
HBS	6.9	3.7	6.1	4.4	0.7	2.7	*	**4.0**
HBO	4.7	5.8	4.1	-	0.8	2.6	5.6	**4.6**
NHB	4.5	4.1	5.5	*	0.4	1.8	2.6	**4.2**
Total	**5.4**	**5.0**	**5.3**	**6.5**	**0.7**	**3.1**	**5.2**	**4.9**
Other Central Okanagan								
HBW	13.0	11.0	11.7	-	0.8	3.6	*	**12.4**
HBS	18.3	4.9	14.1	3.8	0.6	*	*	**6.8**
HBO	8.6	10.7	6.0	*	0.7	*	*	**8.7**
NHB	6.3	6.5	5.7	*	0.4	*	*	**6.0**
Total	**9.3**	**8.4**	**10.5**	**3.8**	**0.6**	**3.8**	**10.1**	**8.5**

HBW=home-based work, HBS=home-based school, HBO=home-based other, NHB=non-home based. *suppressed (small n).
Distances of >100 km for inter-city travel were excluded (the top 0.5% of all trip distances), so as not to overly skew averages.

4.10.2 Trends in Trip Distance, 2007-2018

Given decreasing daily trip rates (3.37/person in 2007 to 3.02/person in 2018) it is of interest to further explore the impact changing travel patterns on transportation networks. **Table 40** presents average straight-line trip distances by survey for trips with known distance. **Table 41** extrapolates these averages to all trips (compensating for unknown distances for some trips). While people may be making fewer daily trips, the average length of those trips has increased. Possible explanations for this trend include: increasing urban sprawl increasing distances some residents travel for jobs/services; fewer discretionary stops when travelling for other main purposes (e.g., reduced shopping due to increased e-commerce or food delivery services); differences in how trips were reported in different cycles; and/or population trends. Looking at the cumulative straight-line distances across all cycles suggests that the daily total has increased by 18% over 11 years (in line with the 19% population increase). By mode, the 13% increase in cumulative distance for auto driver trips compares to only a 4% increase in the number of such trips. The increase in total distance for all passenger trips is more significant (36%). Transit trip distance figures should be interpreted with caution for reasons discussed in **Section 4.5.3**. The recent declines in the total distance associated with walking and cycling trips may be due to colder weather for the 2018 survey (and/or perhaps an increase in urban densification or walkability in some areas).

Table 40. Trend in Average Trip Distance by Mode, 2007-2018

Average Daily Trip Distance	2007	2013	2018	2007-2013 6-Yr Change	2013-2018 5-Yr Change	2007-2018 11-Yr Change
All Trips	5.7	5.8	6.2	+1%	+8%	+9%
Auto Driver	6.3	6.3	6.9	-1%	+9%	+9%
Auto Passenger	5.2	6.1	6.4	+18%	+4%	+23%
Transit Bus	4.6	8.4	7.1	+82%	-15%	+54%
School Bus	5.1	4.5	5.3	-12%	+19%	+5%
Walked	0.9	1.0	0.7	+12%	-34%	-25%
Bicycle	3.5	2.8	2.9	-22%	+6%	-17%
Other	6.9	4.2	8.8	-39%	+110%	+29%

Distances of >100 km for inter-city travel were excluded so as not to overly skew averages.

Table 41. Estimated Cumulative Distance of All Daily Trips by Mode, 2007-2018

Cumulative Daily Distance	2007	2013	2018	2007-2013 6-Yr Change	2013-2018 5-Yr Change	2007-2018 11-Yr Change
Total Distance	3,625,900	3,906,600	4,260,800	+8%	+9%	+18%
Auto Driver	2,821,200	2,887,100	3,186,600	+2%	+10%	+13%
Auto Passenger	577,900	668,100	784,100	+16%	+17%	+36%
Transit Bus	41,500	188,200*	135,600	+354%*	-28%*	+227%
School Bus	72,000	44,000	56,800	-39%	+29%	-21%
Walked	32,100	54,500	36,500	+70%	-33%	+14%
Bicycle	41,500	47,200	32,000	+14%	-32%	-23%
Other	39,700	17,500	29,100	-56%	+66%	-27%

Cumulative distance estimated as the average for trips with known distance X the total trips of each mode. This approach was undertaken rather than summing up all straight-line distances calculated for each trip because the 2007 and 2013 data had notable proportions of trip destinations with unknown XY coordinates (14% in 2007 and 4% in 2013). As the average trip distances were computed excluding trips of greater than 100 km, this also serves to limit the inclusion of distance travelled outside the study area. The total cumulative distance listed above is the sum of the distances for all of the individual modes.

* Interpret with caution: the number of transit trips in 2013 may be somewhat over-stated.

4.11 Vehicle Kilometres Travelled (VKT)

As part of the 2018 study, trip origins, destinations, departure times, and modes of travel were processed via a Google API to determine the most likely actual distance travelled, based on Google's recommended route for that mode for that time of day.[25] This section focuses on only auto driver trips, which represent the vehicle trips. For these trips, the Google distances were used to estimate the actual daily vehicle kilometres travelled (VKT) by residents of the study area. While the average straight-line distance of auto driver trips is 6.9 km, the average actual distance driven is estimated to be 9.3 km (for trips in or near the study area, i.e., excluding longer trips of >150 km; or 10.4 km when including longer trips). VKT is often of interest as it has a direct relationship to vehicle emissions. VKT also provides estimates of actual daily usage of the available kilometers of road network for personal trips.

The survey results suggest that the 464,100 daily auto driver trips incur an estimated 4.81 million daily kilometres of vehicle travel (including trips>150 km). Of note, while the Other Central Okanagan area accounts for 27% of population, it accounts of fully 37% of daily VKT. This stands to reason given the nature of the communities and often longer journeys to access jobs, services or shopping. Kelowna, which has higher urban density, accounts for 55% of population and 45% of the daily VKT. Projecting the results across a year of weekdays suggests that 1.24 billion kilometres of road travel are generated each year by personal vehicle trips on weekdays. Of note, the Google distances also suggest that each weekday residents cycle a total of 44,506 km, walk 51,942 km, and travel 210,062 km via transit.

Readers are reminded that these results only account for VKT for personal trips made by residents of the area on weekdays in mid to late fall 2018. The survey did not capture commercial trips or travel on weekends, which also contribute to VKT and emissions.

Table 42. VKT-Related Statistics, 2018

Measure	Study Total	Vernon	Kelowna	Other Central Ok.
Households	102,600	18,500	56,500	27,600
Population	237,200	40,200	129,800	67,200
Vehicles	186,700	30,000	99,600	57,200
Drivers	186,800	30,600	102,600	53,700
Persons Driving on a Given Weekday	133,700	21,700	73,000	39,000
Est. Household Vehicles Driven*	131,007	21,244	71,301	38,461
Total Vehicle Trips	464,300	79,200	256,200	128,900
Total Daily VKT	4,813,400	875,600	2,150,400	1,787,400
Average VKT per Trip	10.37	11.06	8.40	13.88
Average Daily VKT per Household	46.91	47.33	38.06	64.76
Average Daily VKT per Capita**	20.29	21.78	16.56	26.61
Average Daily VKT per Vehicle***	25.78	29.20	21.60	31.24
Total VKT per Year from Weekday Driving	1,254,922,100	228,281,400	560,640,000	466,000,700

[25] Distances returned by the Google Map Directions may differ from actual distance travelled, as the survey respondent may not have taken the same route recommended by Google for the time of day and typical driving conditions. Estimates were not returned for some multi-mode auto-transit trips or school bus trips. Missing Google distances for driving trips were imputed.

*Estimated from assigning each driver to a household vehicle, adjusting for households with fewer or more vehicles than drivers.
**Total population (all ages), whether drove or not on a given day. ***Total registered household vehicles, whether driven on not.

4.12 Inter-Regional Travel

The travel area examined in this survey is divided up into three sub-areas within the study area (Vernon, Kelowna, and Other Central Okanagan). This section examines trip flows between these regions. Of approximately 684,800 daily trips undertaken by residents of the study area, approximately 126,300 or 18.5% are inter-regional flows between sub-areas within the region and/or external areas (**Table 43**). During the AM Peak period, the proportion of total trips that are inter-regional is higher, at 20.9%.

The most significant inter-regional flows are between the communities in the Other Central Okanagan sub-area and Kelowna, at over 40,400 trips flowing each way over the course of the day. The AM Peak flows from these communities to Kelowna (about 14,700) are higher than those from Kelowna to the rest of the Central Okanagan (about 4,700) due to Kelowna's status as a locus of jobs for many residents.

The flows between Vernon and external areas (9,000-9,500 trips each way) serve as a reminder that Vernon is adjacent to Coldstream (and near other communities in the North Okanagan) with jobs and other purposes that attract trips from Vernon. The two-way Vernon-External flows are greater than those between Vernon-Kelowna and Vernon-Other Central Okanagan combined. Of note, of the Vernon-External trips, approximately 5,100 each way are to and from the North Okanagan South external area (which includes Coldstream) and about 3,000 each way are to and from the North Okanagan North external area, with the remainder to places either further north or east of the study area.

Table 43. Inter-Regional Flows, 2018

	24-Hour Total	AM Peak 6AM-8:59AM (3 hours)	PM Peak 2PM-5:59PM (4 hours)	Off-Peak (all other times of day)
Total Trips	**684,750**	**140,230**	**249,340**	**295,190**
Vernon internal	90,020	17,680	32,630	39,720
Kelowna internal	380,630	75,410	139,430	165,780
Other Central Okanagan internal	85,750	17,520	31,800	36,450
Entirely external	2,020	280	780	960
Inter-Regional Flows	126,340	29,340	44,700	52,290
Inter-Regional Flows				
Other Central Okanagan → Kelowna	40,530	14,690	9,200	16,640
Kelowna → Other Central Okanagan	40,400	4,730	19,160	16,510
Other Central Okanagan → Vernon	2,210	770	710	720
Vernon → Other Central Okanagan	2,400	490	850	1,060
Other Central Okanagan → External	3,380	1,480	510	1,390
External → Other Central Okanagan	3,590	180	2,050	1,370
Vernon → Kelowna	4,820	1,280	1,030	2,510
Kelowna → Vernon	4,860	560	2,330	1,960
Vernon → External	9,060	3,010	2,320	3,740
External → Vernon	9,470	770	4,540	4,150
Kelowna → External	3,030	1,130	660	1,240
External → Kelowna	2,590	250	1,340	1,000

The Other Central Okanagan sub-area is comprised of a number of communities that are geographically spread out throughout the study area. These communities can be organized into three geographies considering the geographic separations between them: Westside, comprised of all of the adjacent communities to the west of Okanagan Lake (City of West Kelowna, WFN, Peachland, and RDCO West); Lake Country to the east of the lake, between Vernon and Kelowna; and RDCO East, to the east of Kelowna. For those interested in the flows between these geographies, they are presented in **Table 44**. Detailed flows between individual districts can also be found in the Origin-Destination matrices in **Section 4.14** of this report. Readers are reminded that all figures are survey estimates and have not been validated against screenline counts.

Table 44. Other Central Okanagan – Flows between Westside, Lake Country and RDCO East, 2018

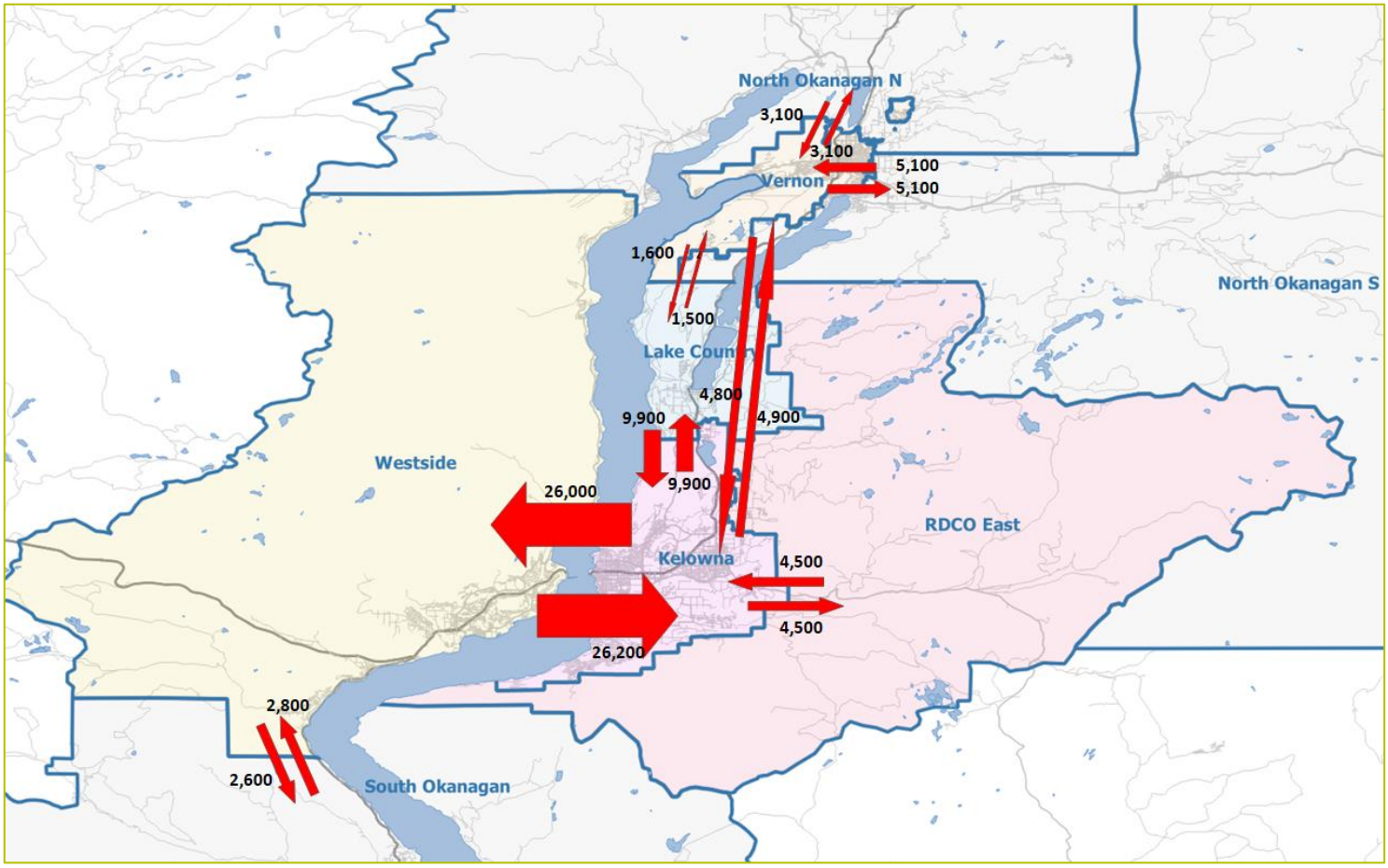
	24-Hour Total	AM Peak 6AM-8:59AM (3 hours)	PM Peak 2PM-5:59PM (4 hours)	Off-Peak (all other times of day)
Total Trips to from or within Other Central Okanagan	**178,260**	**39,860**	**64,280**	**74,140**
Westside internal	69,830	13,560	25,530	30,790
Lake Country internal	14,180	3,460	5,550	5,170
RDCO East internal	690	250	380	60
Inter-regional and between the three areas within Other Central Okanagan	93,560	22,580	32,850	38,180
Trip Flows				
Westside → Kelowna	26,170	9,490	5,820	10,860
Kelowna → Westside	26,040	2,890	12,690	10,470
Westside → Vernon	660	300	180	190
Vernon →Westside	730	130	310	310
Westside → Lake Country	160	20	50	90
Lake Country → Westside	190	110	80	<5
Westside → RDCO East	220	20	20	180
RDCO East → Westside	90	30	50	20
Westside → External	2,590	1,160	350	1,080
External → Westside	2,870	150	1,600	1,120
Lake Country → Kelowna	9,880	3,350	2,490	4,040
Kelowna → Lake Country	9,870	1,580	4,360	3,940
Lake Country → Vernon	1,530	480	520	530
Vernon → Lake Country	1,630	350	540	740
Lake Country → RDCO East	190		50	140
RDCO East → Lake Country	160		100	60
Lake Country → External	740	310	150	270
External → Lake Country	650	30	420	200
RDCO East → Kelowna	4,490	1,860	890	1,740
Kelowna → RDCO East	4,490	270	2,110	2,100
RDCO East → Vernon	40	<5	30	10
Vernon → RDCO East	40	30	<5	10
RDCO East → External	50	20		40
External → RDCO East	80		40	40

The map below highlight the 24-hour flows discussed above (**Figure 55**). Only flows with more than 1,500 trips are displayed. The map on the next page presents the AM Peak trip flows (**Figure 56**). Only flows with more than 350 trips are displayed.

The maps reveal considerable flow of traffic throughout the region, with much of it being between the Westside communities and Kelowna, with the AM Peak map showing that this travel is heavier from Westside to Kelowna than in the reverse direction, likely due to work commutes.

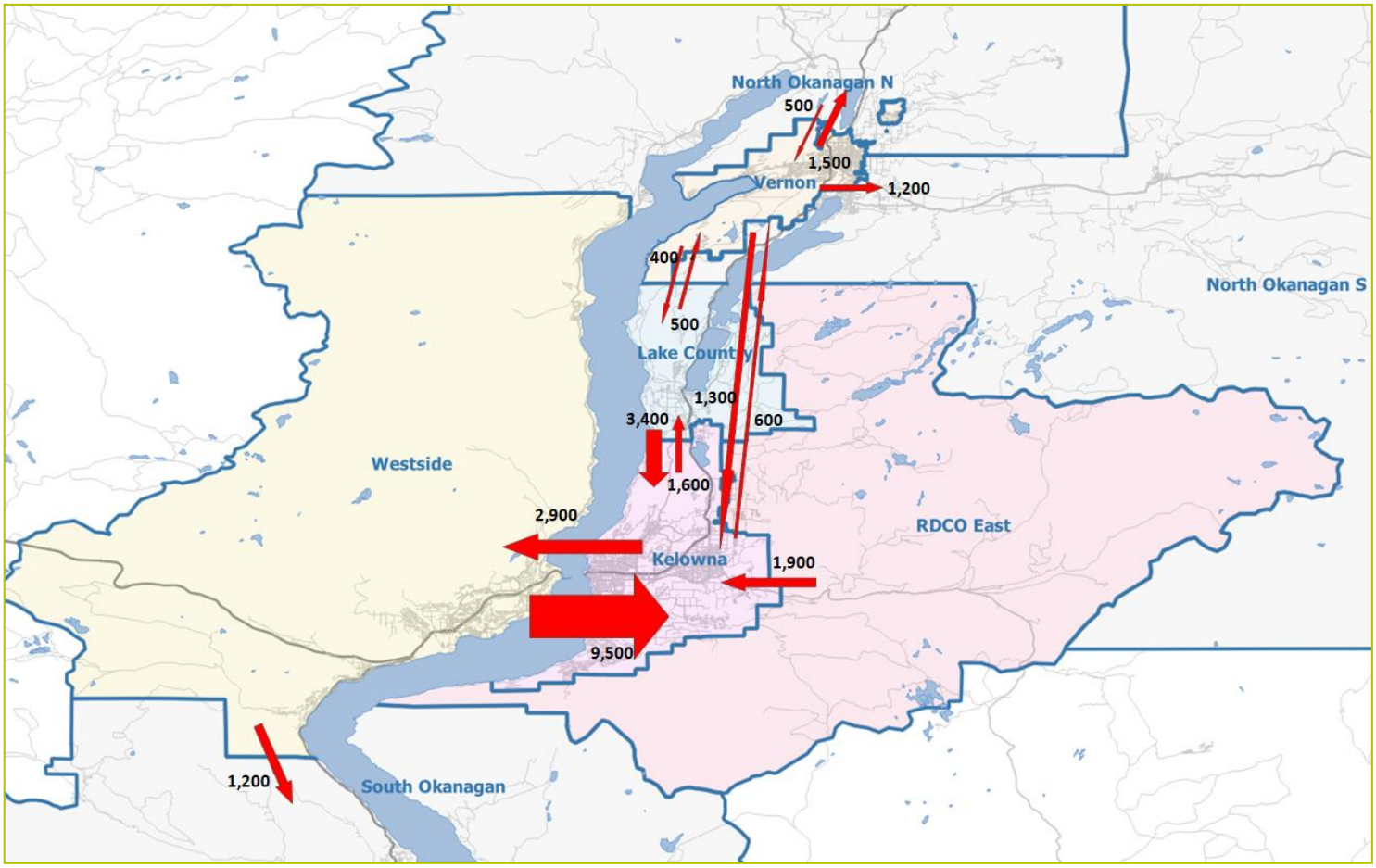
Readers are also referred to the origin destination tables in **Section 4.14** of this report which detail the trip flows between districts, and the section on places of work (**Section 3.9.5**), which provides a more detailed breakdown on the locations of places of employment at businesses within Kelowna and Vernon.

Figure 55. 24-Hour Inter-Regional Flows



24-Hour inter-regional trip flows by residents of the survey area. The Other Central Okanagan Sub-Area has been broken out into Westside, Lake Country, and RDCO East. Only flows with more than 1,500 trips are represented. The trip estimates from the survey are rounded to the nearest 100. Only personal trips captured by the survey are represented. Commercial trips and trips made by residents of nearby communities external to the survey area are not accounted for.

Figure 56. AM Peak Inter-Regional Flows



AM Peak inter-regional trip flows by residents of the survey area. The Other Central Okanagan Sub-Area has been broken out into Westside, Lake Country, and RDCO East. Only flows with more than 350 trips are represented. The trip estimates from the survey are rounded to the nearest 100. Commercial trips and trips made by residents of nearby communities external to the survey area are not accounted for.

4.13 Internalization of Travel

The chart to the right examines internal travel. This is a measure of the accessibility of opportunities – work, school, shopping and so on – relative to a traveller's place of residence. The closer proximity of these activities to one's home can be more conducive to sustainable transportation alternatives to driving alone, especially walking and cycling.

Across the entire study area, 27% of residents' trips are made within the same district their home is located in. Readers are referred to **Figure 4** on page 25 of this report for a map illustrating the district geographies. Within the cities of Vernon, Kelowna, and West Kelowna, the districts are aggregations of adjacent neighbourhoods.

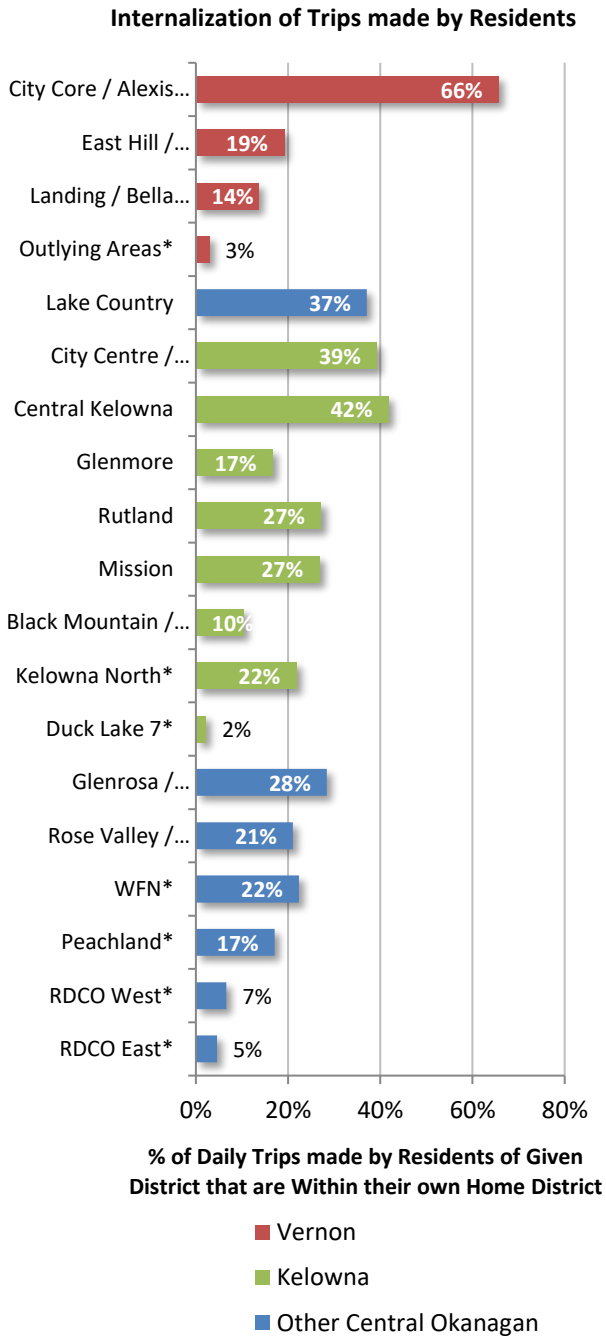
The chart to the right (**Figure 1**) summarizes the extent to which residents' travel is internal to their own home community.

As indicated, residents of the Vernon City Core/ Alexis Park / Harwood / North Vernon fulfill most of their trip purposes within the set of neighbourhoods that comprise this district, with 66% of trips being internalized.

Next highest are Central Kelowna and Kelowna City Centre / Pandosy, at 39% and 42% respectively. Lake Country also has a high degree of internalization at 37%.

Lower levels suggest districts that are more suburban or rural in nature for which fewer jobs and services are close to home.

Figure 57. Internalization of Trips by Home District



* results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.

Table 45 summarizes internalization rates for HBW, HBS and HBO trip for residents of each district.[26] Degrees of blue shading highlight areas with higher rates of internalization. Overall, one-fifth (20%) of HBW trips are internal to the district of the trip maker's residence, one-third (33%) of HBO trips are internalized, while a higher rate (45%) of HBS trips are internalized (reflecting the proximity of K-12 schools to residential neighbourhoods). As might be expected, the city centres have the highest rates of internalization of HBW trips. Kelowna North has the highest HBS rate, at 69%, which may be related to UBCO students living near to the school.

Table 45. Internalization of Trips by Home District for HBW, HBS and HBO purposes, 2018

	Total Trips Made by Residents of District		HBW Trips Made by Residents of District		HBS Trips Made by Residents of District		HBO Trips Made by Residents of District	
Total Trips Made	Total Trips Made	% Internalized to Home District	HBW Trips	% Internalized to Home District	HBS Trips	% Internalized to Home District	HBO Trips	% Internalized to Home District
Total Daily Trips	684,800	27%	131,700	20%	65,800	45%*	315,500	33%
(% of Total Daily Trips)	(100%)		(19%)		(46%)		(10%)	
1001 City Core / Alexis Park / Harwood / North Vernon	29,700	66%	5,400	47%	1,700	66%*	16,200	74%
1002 East Hill / Middleton / Mission Hill	46,900	19%	8,600	22%	5,400	43%	21,700	18%
1003 Landing / Bella Vista / Turtle Mountain / Priest's Valley	25,800	14%	4,800	9%	2,000	50%*	12,700	16%
1004 Outlying Areas	15,700	3%	2,100	6%	900	0%*	6,600	5%
2000 Lake Country	36,300	37%	7,400	20%	4,000	68%	14,900	49%
3001 City Centre / Pandosy	79,900	39%	16,800	43%	4,600	61%	38,100	44%
3002 Central Kelowna	51,900	42%	9,700	34%	3,500	13%	26,000	53%
3003 Glenmore	65,700	17%	11,600	9%	7,100	27%	30,900	23%
3004 Rutland	78,100	27%	16,800	14%	8,800	43%	32,500	38%
3005 Mission	58,500	27%	9,600	9%	7,600	58%	26,300	34%
3006 Black Mountain / Southeast	37,400	10%	8,400	3%	4,900	31%	15,900	12%
3007 Kelowna North	12,900	22%	2,900	17%	1,600	69%*	5,200	19%
3008 Duck Lake 7	4,700	2%*	800	2%	400	0%*	2,400	4%
4001 Glenrosa / Westbank	46,600	28%	9,700	18%	5,800	61%	20,500	33%
4002 Rose Valley / Lakeview	38,200	21%	7,600	17%	3,700	55%	17,000	26%
5001 WFN	25,900	22%	4,100	15%	1,500	0%*	13,900	33%
6000 Peachland	14,100	17%	2,200	18%	900	44%*	8,000	19%
7000 RDCO West	4,800	7%*	800	5%	300	15%*	1,900	11%
8000 RDCO East	11,700	5%	2,400	2%	1,100	12%*	4,800	7%

HBS, HBW and HBO trips include trips from home or returning to home. NHB trips are included in the total trips but not broken out separately.
'Internal' = both origin and destination are in the same district at the traveller's home. Trip estimates are rounded to the closest 100.
*Interpret with caution: smaller sample size (n<100 trip records).

[26] The trip counts do not capture all work and school commutes, only home-based work and school trips. I.e., the counts do not include trips to/from work or school that have been interrupted by a stop along the way for another purpose. Nevertheless, these statistics should still provide a good indicator of the extent to which commutes are internalized within a given district.

4.14 Origin-Destination Matrices

The tables on the following pages provide origin-destination matrices for the 19 districts in the study area and the external geographies. Sub-totals are provided for each of the three sub-areas and for all external geographies combined, as well as a total across all trips reported.

Origin-destination matrices have been provided for four time periods:

- 24-hour daily total
- AM Peak: trips with departure times between 6 AM and 8:59 AM (3-hour period)
- PM Peak: trips with departure times between 2 PM and 5:59 PM (4-hour period)
- Off Peak: all other times outside the peak periods, including the inter-peak period, evening, and overnight.

It may be noted that while the hour starting at 6 AM has a relatively modest volume of trips, it was included in the AM Peak period noted above as most of the trips in this hour are commute trips and contribute to our understanding of commute flows.

Blue shading is used to highlight origin-destination trip flows with higher trip volumes.

The expanded survey counts are based on a random sample of the population and should be understood to be estimates. All expanded survey counts have been rounded to the closest 10. The sum of individual cells may not add to the listed survey totals or sub-area subtotals due to rounding.

Table 46. Origin - Destination Matrix by District (24-Hour Trips)

Continued on next page...

24-Hour Total	1001	1002	1003	1004	2000	3001	3002	3003	3004	3005	3006	3007	3008	4001	4002	5001	6000	7000	8000					
Origin \ Destinations	City Core..	East Hill ...	Land-ing ...	Outly-ing ...	Lake Coun-try	City Ctr...	Central	Glen-more	Rutland	Mission	Black Mtn...	Kelow-na North	Duck Lake	Glen-rosa ...	Rose Vly...	WFN	Peach-land	RDCO West	RDCO East	North Ok. S	North Ok. N	South Ok.	Other External	Survey Total
1001 City Core..	29,550	11,150	5,480	2,730	890	330	440	170	150	10	140	570	40		60	50		380		1,090	2,390		470	56,080
1002 East Hill...	11,470	9,320	1,930	870	390	400	480	60	80	150		360		80	30			30	30	1,520	1,490		140	28,820
1003 Landing...	5,600	2,080	3,960	950	140	220	260	20	30	20	30	250		70				20	0	230	640		190	14,710
1004 Outlying	2,670	950	840	470	220	60	260	110	20	10	30	130	10	20		20			10	180	560	30	130	6,710
2000 Lake Ctry	770	390	160	210	14,180	1,510	2,740	980	790	150	240	2,520	960	80	10	80	10	10	190	140	260	60	270	26,710
3001 City Ctr...	440	170	210	70	1,480	41,660	24,950	7,250	5,680	10,060	3,190	3,140	70	3,010	3,380	2,710	370	220	650	40	100	150	240	109,230
3002 Central...	510	510	370	210	3,180	23,050	45,430	11,070	13,770	6,890	6,310	3,650	330	2,010	3,190	2,910	470	190	1,480	110	40	180	570	126,420
3003 Glenmore	100	100	20	30	870	7,830	10,780	11,520	2,950	1,050	600	3,660	40	540	400	290	50	10	300	70	130	90	50	41,440
3004 Rutland	240	110	10	70	710	6,140	12,260	2,930	23,330	1,560	4,010	4,100	150	970	410	550	30		1,200	90		170	370	59,410
3005 Mission	30	130	20	10	180	10,450	6,820	930	1,200	16,350	540	1,370		510	730	280	70	0	60	10		30	210	39,910
3006 Black Mtn.	160		40	30	160	3,480	6,250	610	3,440	710	4,010	1,390	10	110	380	160		40	220			90	90	21,340
3007 Kelowna N.	590	330	190	160	2,350	3,380	4,370	3,730	4,160	1,430	990	4,330	260	1,010	410	330	270	20	560	20	10		190	29,060
3008 Duck Lake	0	10	20	10	940	60	360	30	160		10	280	180		10	20			20				10	2,100
4001 Glenrosa...	50		70	20	40	2,970	2,480	380	930	320	200	1,050		14,240	4,920	5,500	1,450	130		50		530	120	35,470
4002 Rose Vly...	60				60	3,230	3,450	370	460	700	310	690	10	4,740	8,610	3,520	790	210	150	50	10	420	20	27,870
5001 WFN	40					2,620	2,780	200	420	160	110	400		5,760	3,790	8,030	1,100	220	70			280	170	26,130
6000 Peachland	10				10	480	400	30	30	20		400		1,450	790	1,030	2,550	110		10		710	40	8,040
7000 RDCO W.	360	10	20	0	50	240	240	10	10	10	50	20		140	210	90	120	330		10	160	0	20	2,110
8000 RDCO E.	10	20		0	190	700	1,160	540	1,250	30	200	610	20		10	80			690			10	40	5,550
North Ok. S	1,020	1,530	370	130	160	40		50	130	10		40		30	70			10		300	10		40	3,940
North Ok. N	2,050	1,900	650	540	230	20	40	160	100			10			10			170	20	40	790		90	6,820
South Ok.				10	20	90	270	90	130	30	100			520	270	350	740	0				580	10	3,190
Other External	440	330	370	110	240	190	130	260	240	190	180	80	30	220	70	160	240	20	60		80		70	3,710
Vernon	49,300	23,490	12,220	5,010	1,630	1,010	1,440	360	280	190	190	1,320	50	170	80	60		420	40	3,020	5,080	30	930	106,300
Kelowna	2,060	1,350	860	580	9,870	96,050	111,210	38,060	54,680	38,050	19,640	21,910	1,020	8,150	8,900	7,250	1,260	480	4,490	340	270	700	1,730	428,910
Other Central Ok.	1,300	430	250	240	14,540	11,750	13,240	2,520	3,880	1,380	1,100	5,680	990	26,410	18,350	18,330	6,030	1,000	1,100	260	430	2,020	680	131,870
External	3,510	3,760	1,400	800	650	320	430	570	610	230	270	130	30	770	420	500	990	190	80	340	890	580	210	17,670
Survey Total	56,160	29,030	14,730	6,620	26,690	109,130	126,320	41,500	59,450	39,850	21,190	29,030	2,090	35,500	27,750	26,140	8,270	2,090	5,700	3,950	6,680	3,320	3,550	684,750

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24-Hour Total

Destinations / Origin	Vernon	Kelowna	Other Central Okanagan	External	Survey Total
1001 City Core..	48,920	1,850	1,360	3,940	56,080
1002 East Hill...	23,590	1,530	550	3,150	28,820
1003 Landing...	12,590	820	230	1,070	14,710
1004 Outlying	4,930	620	260	900	6,710
2000 Lake Ctry	1,530	9,880	14,570	740	26,710
3001 City Ctr...	870	96,000	11,830	520	109,230
3002 Central...	1,600	110,490	13,430	910	126,420
3003 Glenmore	250	38,420	2,450	330	41,440
3004 Rutland	440	54,470	3,860	630	59,410
3005 Mission	190	37,660	1,820	240	39,910
3006 Black Mtn.	220	19,880	1,070	180	21,340
3007 Kelowna N.	1,260	22,640	4,950	220	29,060
3008 Duck Lake	30	1,070	990	10	2,100
4001 Glenrosa...	150	8,340	26,280	710	35,470
4002 Rose Vly...	60	9,230	18,080	500	27,870
5001 WFN	40	6,680	18,960	450	26,130
6000 Peachland	10	1,340	5,940	750	8,040
7000 RDCO W.	400	580	950	180	2,110
8000 RDCO E.	40	4,490	970	50	5,550
North Ok. S	3,050	280	270	350	3,940
North Ok. N	5,140	330	430	930	6,820
South Ok.	10	690	1,910	590	3,190
Other External	1,260	1,300	1,000	150	3,710
Vernon	90,020	4,820	2,400	9,060	106,300
Kelowna	4,860	380,630	40,400	3,030	428,910
Other Central Ok.	2,210	40,530	85,750	3,380	131,870
External	9,470	2,590	3,590	2,020	17,670
Survey Total	106,540	428,570	132,140	17,500	684,750

Table 47. Origin - Destination Matrix by District (AM Peak)

Continued on next page...

AM Peak (6AM-8:59AM)	1001	1002	1003	1004	2000	3001	3002	3003	3004	3005	3006	3007	3008	4001	4002	5001	6000	7000	8000					
Origin \ **Destinations**	City Core..	East Hill ...	Land-ing ...	Outly-ing ...	Lake Coun-try	City Ctr...	Central	Glen-more	Rutland	Mission	Black Mtn...	Kelow-na North	Duck Lake	Glen-rosa ...	Rose Vly...	WFN	Peach-land	RDCO West	RDCO East	North Ok. S	North Ok. N	South Ok.	Other External	Survey Total
1001 City Core..	4,220	1,050	300	150	160	100	30		70			230						30		390	420		90	7,240
1002 East Hill...	3,250	3,070	330	230	130	170	70		30	60		110		80					30	710	350		110	8,730
1003 Landing...	1,980	420	1,060	100	40	80	20		10		10	100								10	300		20	4,160
1004 Outlying	960	350	120	70	20	30	100	20				20				20				30	450	30	100	2,320
2000 Lake Ctry	250	120	20	90	3,460	560	960	490	200	30	40	1,030	50	20	10	80				60	90		160	7,720
3001 City Ctr...	40	30			60	7,440	3,750	640	330	870	200	930		380	460	190			40	30	20	20	70	15,490
3002 Central...	40			130	240	3,610	3,530	810	700	390	140	1,270		230	160	110		0	20		10	100	250	11,740
3003 Glenmore	20	100			350	3,470	2,710	2,540	780	290	40	1,690		240	70	40	20		50	10	30	30	50	12,510
3004 Rutland	30			60	90	2,320	3,310	650	5,730	350	1,240	2,060	10	260	170	40			40	30		110	40	16,550
3005 Mission				10	40	3,360	2,250	210	220	5,360	50	730		50	150	50			30				110	12,610
3006 Black Mtn.			20		60	1,750	1,720	230	1,240	180	1,450	690		10	70	50		40	80			90	30	7,710
3007 Kelowna N.	70	20			490	570	840	660	350	20	150	1,270		70		10	20	10	10		10		70	4,630
3008 Duck Lake		10			250	40	30		80		10	160	10		10				0					600
4001 Glenrosa...	20		70			1,380	930	140	410	90	30	580		4,270	1,270	720	190	10		40		310	30	10,490
4002 Rose Vly...	20					1,230	1,320	150	70	230	80	350		1,190	2,650	250	180	20	20	50		150	20	7,980
5001 WFN	20					830	720	20	130	30	10	210		350	530	400	50					140	70	3,510
6000 Peachland					10	200	60		20			50		340	310	140	440	40				280		1,870
7000 RDCO W.	150	10		0	10	70	140			10	20	10			140	10	40	20		10	50			670
8000 RDCO E.	0				70	340	530	100	600		50	240			10	20			250			10	0	2,220
North Ok. S	180	50										20								50	10			310
North Ok. N	80	290	20	60																	100		20	580
South Ok.																	20					80		100
Other External			80		30		10	160		20		20	20	80		50					30			500
Vernon	10,410	4,900	1,810	550	350	380	220	20	110	60	10	470		80		20		30	30	1,150	1,530	30	300	22,460
Kelowna	200	150	20	190	1,580	22,550	18,140	5,740	9,430	7,460	3,290	8,790	20	1,230	1,090	490	30	50	270	80	80	350	620	81,840
Other Central Ok.	460	130	90	90	3,550	4,600	4,650	900	1,430	380	230	2,460	50	6,170	4,930	1,620	900	90	270	160	140	890	290	34,460
External	260	350	100	60	30		10	160		20		40	20	80		50	20			50	130	80	20	1,480
Survey Total	11,330	5,530	2,030	890	5,510	27,530	23,020	6,820	10,970	7,920	3,530	11,760	90	7,540	6,020	2,170	950	170	570	1,440	1,880	1,350	1,230	140,230

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AM Peak

Origin / Destinations	Vernon	Kelowna	Other Central Okanagan	External	Survey Total
1001 City Core..	5,730	430	190	900	7,240
1002 East Hill...	6,880	450	230	1,170	8,730
1003 Landing...	3,570	220	40	340	4,160
1004 Outlying	1,500	180	40	610	2,320
2000 Lake Ctry	480	3,350	3,580	310	7,720
3001 City Ctr...	70	14,150	1,120	150	15,490
3002 Central...	170	10,450	770	360	11,740
3003 Glenmore	110	11,520	760	120	12,510
3004 Rutland	80	15,670	610	190	16,550
3005 Mission	10	12,180	310	110	12,610
3006 Black Mtn.	20	7,260	310	120	7,710
3007 Kelowna N.	90	3,860	600	80	4,630
3008 Duck Lake	10	320	260		600
4001 Glenrosa...	100	3,550	6,470	380	10,490
4002 Rose Vly...	20	3,430	4,310	230	7,980
5001 WFN	20	1,950	1,330	210	3,510
6000 Peachland		320	1,270	280	1,870
7000 RDCO W.	160	240	220	60	670
8000 RDCO E.	0	1,860	340	20	2,220
North Ok. S	230	20		60	310
North Ok. N	460			120	580
South Ok.			20	80	100
Other External	80	230	160	30	500
Vernon	17,680	1,280	490	3,010	22,460
Kelowna	560	75,410	4,730	1,130	81,840
Other Central Ok.	770	14,690	17,520	1,480	34,460
External	770	250	180	280	1,480
Survey Total	19,780	91,640	22,920	5,890	140,230

Table 48. Origin - Destination Matrix by District (PM Peak)

Continued on next page...

PM Peak (2PM-5:59PM)	1001	1002	1003	1004	2000	3001	3002	3003	3004	3005	3006	3007	3008	4001	4002	5001	6000	7000	8000					
Origin \ **Destinations**	City Core..	East Hill ...	Land-ing ...	Outly-ing ...	Lake Coun-try	City Ctr...	Central	Glen-more	Rutland	Mission	Black Mtn...	Kelow-na North	Duck Lake	Glen-rosa ...	Rose Vly...	WFN	Peach-land	RDCO West	RDCO East	North Ok. S	North Ok. N	South Ok.	Other External	Survey Total
1001 City Core..	11,230	4,840	2,580	1,210	250	50	50	60	10			70	20			20		170		190	700		40	21,490
1002 East Hill...	2,880	3,390	760	320	130	70	130	20		90		40			20			10		350	870			9,070
1003 Landing...	1,400	660	1,560	430	50	130	40	20			10	30		70				0	0	10	30		80	4,520
1004 Outlying	540	330	330	170	120		80	70	20	10		20	10	20						30	20			1,750
2000 Lake Ctry	250	90	100	80	5,550	240	620	260	200	20	150	550	450	60			10	10	50	20	110		30	8,840
3001 City Ctr...	160	90	80	70	650	15,240	9,570	3,230	2,660	4,440	1,770	900	30	1,570	1,660	1,150	200	160	260			50	40	43,980
3002 Central...	290	280	240	70	1,660	8,090	15,820	5,250	6,070	3,440	2,290	1,120	150	1,240	1,680	1,360	200	150	730	60	30		110	50,310
3003 Glenmore	50		20	30	380	1,870	3,150	5,260	1,080	350	180	950		200	210	160			190		60			14,120
3004 Rutland	140	20	10		230	1,170	3,190	1,110	9,240	720	1,850	580	120	240	150	270	10		620				180	19,850
3005 Mission	10	60			30	2,940	1,660	430	240	6,260	230	230		130	320	30	70	0	10				100	12,750
3006 Black Mtn.	160		10		70	350	1,500	70	1,450	120	1,560	260	10	50	190	100			70					5,940
3007 Kelowna N.	150	120	190	70	990	1,680	2,150	2,140	2,290	860	420	1,440	140	610	210	170	210	10	230	20			10	14,110
3008 Duck Lake			20		350	20	50		40			50	10											540
4001 Glenrosa...						600	660	140	340	20	10			5,500	1,930	1,730	590	70				20	60	11,670
4002 Rose Vly...	40				10	680	750	110	300	270	200	50	10	1,620	3,450	1,090	210	160	10			70		9,010
5001 WFN	20					470	570	50	80	90	30	20		2,080	960	3,660	500	160	10			30	70	8,790
6000 Peachland						70	80					140		190	160	140	940	70				40		1,840
7000 RDCO W.	100		20		40	50	10				30			40	20	10	80	170			70			630
8000 RDCO E.	10	20		0	110	100	240	160	220		80	70	20			50			380					1,460
North Ok. S	540	820	280	70	100	40			130					10						50			40	2,090
North Ok. N	810	700	310	370	110	10	40	70	100						10			50	20	40	580			3,200
South Ok.				10	20	50	70	70	130		100			450	120	260	440					30		1,750
Other External	170	260	130	80	190	100	90	50	120	120	40	30	10	110	30	60	40	20	20		40			1,660
Vernon	16,050	9,230	5,230	2,130	540	250	300	170	30	100	10	150	20	90	20	20		180	0	580	1,620		120	36,820
Kelowna	960	570	560	240	4,360	31,350	37,080	17,480	23,050	16,200	8,290	5,530	450	4,040	4,420	3,230	680	320	2,110	80	90	50	440	161,590
Other Central Ok.	410	110	120	90	5,710	2,210	2,920	720	1,130	400	500	840	470	9,480	6,520	6,680	2,330	640	450	20	170	170	160	42,220
External	1,520	1,780	720	530	420	200	190	180	490	120	140	30	10	570	160	320	480	70	40	90	620	30	40	8,710
Survey Total	18,920	11,680	6,630	2,980	11,030	34,010	40,490	18,550	24,700	16,820	8,940	6,550	950	14,170	11,110	10,250	3,490	1,200	2,600	760	2,500	260	750	249,340

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PM Peak

Origin / Destinations	Vernon	Kelowna	Other Central Okanagan	External	Survey Total
1001 City Core..	19,860	260	440	930	21,490
1002 East Hill...	7,360	340	150	1,220	9,070
1003 Landing...	4,040	230	120	120	4,520
1004 Outlying	1,370	200	140	40	1,750
2000 Lake Ctry	520	2,490	5,680	150	8,840
3001 City Ctr...	390	37,840	5,660	90	43,980
3002 Central...	880	42,220	7,010	190	50,310
3003 Glenmore	100	12,830	1,130	60	14,120
3004 Rutland	170	17,970	1,530	180	19,850
3005 Mission	80	11,980	590	100	12,750
3006 Black Mtn.	170	5,310	470		5,940
3007 Kelowna N.	530	11,110	2,430	40	14,110
3008 Duck Lake	20	170	350		540
4001 Glenrosa...		1,770	9,810	80	11,670
4002 Rose Vly...	40	2,360	6,540	70	9,010
5001 WFN	20	1,310	7,370	90	8,790
6000 Peachland		290	1,500	40	1,840
7000 RDCO W.	120	90	360	70	630
8000 RDCO E.	30	890	540		1,460
North Ok. S	1,710	170	110	90	2,090
North Ok. N	2,190	210	190	610	3,200
South Ok.	10	420	1,300	30	1,750
Other External	640	540	450	40	1,660
Vernon	32,630	1,030	850	2,320	36,820
Kelowna	2,330	139,430	19,160	660	161,590
Other Central Ok.	710	9,200	31,800	510	42,220
External	4,540	1,340	2,050	780	8,710
Survey Total	40,210	151,000	53,860	4,270	249,340

Table 49. Origin - Destination Matrix by District (Off-Peak)

Continued on next page...

Off Peak	1001	1002	1003	1004	2000	3001	3002	3003	3004	3005	3006	3007	3008	4001	4002	5001	6000	7000	8000					
Origin \ **Destinations**	City Core..	East Hill ...	Land-ing ...	Outly-ing ...	Lake Coun-try	City Ctr...	Central	Glen-more	Rutland	Mission	Black Mtn...	Kelow-na North	Duck Lake	Glen-rosa ...	Rose Vly...	WFN	Peach-land	RDCO West	RDCO East	North Ok. S	North Ok. N	South Ok.	Other External	Survey Total
1001 City Core..	14,100	5,260	2,600	1,370	480	180	360	110	70	10	140	270	20		60	30		180		500	1,260		350	27,350
1002 East Hill...	5,340	2,850	840	320	140	160	280	40	50			220			10			30		460	270		30	11,020
1003 Landing...	2,220	990	1,350	420	50	20	200		20	20		120						20		200	310		90	6,020
1004 Outlying	1,170	270	390	230	70	30	80	20			30	90							10	120	100		40	2,630
2000 Lake Ctry	270	180	40	40	5,170	720	1,160	230	380	110	40	940	460						140	70	70	60	80	10,150
3001 City Ctr...	240	50	130		770	18,980	11,630	3,380	2,700	4,750	1,220	1,310	40	1,070	1,260	1,380	170	60	350	10	80	70	130	49,760
3002 Central...	180	230	130	10	1,280	11,350	26,080	5,010	7,000	3,060	3,880	1,260	180	540	1,360	1,430	280	40	730	60		80	210	64,370
3003 Glenmore	30				140	2,500	4,920	3,720	1,090	410	380	1,020	40	110	120	100	30	10	60	50	30	60		14,810
3004 Rutland	80	100		20	390	2,650	5,760	1,180	8,360	490	910	1,460	20	470	90	230	20		540	60		60	150	23,010
3005 Mission	20	70	20		120	4,160	2,910	290	750	4,730	260	410		330	260	200			20	10		30		14,560
3006 Black Mtn.				30	30	1,380	3,030	310	760	400	990	440		50	120	20			70				60	7,690
3007 Kelowna N.	370	180		90	870	1,130	1,370	930	1,520	560	420	1,620	120	330	200	160	50	10	320				110	10,320
3008 Duck Lake	0			10	340	0	280	30	40			60	160			20			20				10	960
4001 Glenrosa...	30			20	40	990	890	110	180	200	170	480		4,470	1,720	3,050	680	40		10		200	30	13,310
4002 Rose Vly...					50	1,330	1,370	110	90	210	40	290		1,940	2,510	2,180	410	40	120		10	190		10,880
5001 WFN						1,320	1,500	130	210	40	60	170		3,340	2,290	3,970	550	60	60			110	30	13,830
6000 Peachland	10					210	260	30	10	20		200		920	330	760	1,170	0		10		380	40	4,340
7000 RDCO W.	120	10				120	100	10	10			10		100	50	70	0	140			40	0	20	820
8000 RDCO E.		10			20	260	390	280	430	30	60	300	0		10	10			60				40	1,880
North Ok. S	300	650	100	60	60			50		10		20		20	70			10		190	10			1,550
North Ok. N	1,160	910	310	110	120	10		100				10						110		10	110		80	3,030
South Ok.						30	200	20		30				80	150	80	280	0				470	10	1,340
Other External	270	80	170	40	20	90	30	60	120	50	130	30	0	30	50	50	200		40		20		70	1,550
Vernon	22,840	9,360	5,180	2,330	740	380	920	170	140	30	160	700	20		60	30		220	10	1,290	1,940		510	47,020
Kelowna	910	630	280	150	3,940	42,150	55,990	14,850	22,200	14,390	8,060	7,580	560	2,890	3,400	3,530	540	110	2,100	180	100	290	670	185,490
Other Central Ok.	430	190	40	60	5,280	4,940	5,670	900	1,320	600	370	2,380	470	10,770	6,910	10,040	2,800	280	380	80	120	960	230	55,200
External	1,730	1,640	580	210	200	130	230	230	120	90	130	60	0	130	260	130	480	120	40	190	140	470	150	7,480
Survey Total	25,910	11,820	6,070	2,750	10,150	47,600	62,800	16,140	23,780	15,110	8,720	10,720	1,050	13,790	10,630	13,720	3,830	720	2,540	1,750	2,300	1,720	1,560	295,190

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Off Peak

Destinations / Origin	Vernon	Kelowna	Other Central Okanagan	External	Survey Total
1001 City Core..	23,330	1,170	740	2,110	27,350
1002 East Hill...	9,350	730	170	770	11,020
1003 Landing...	4,980	370	70	610	6,020
1004 Outlying	2,060	240	80	250	2,630
2000 Lake Ctry	530	4,040	5,310	270	10,150
3001 City Ctr...	420	44,010	5,060	280	49,760
3002 Central...	550	57,820	5,650	350	64,370
3003 Glenmore	30	14,070	570	140	14,810
3004 Rutland	190	20,830	1,730	260	23,010
3005 Mission	100	13,500	920	30	14,560
3006 Black Mtn.	30	7,320	290	60	7,690
3007 Kelowna N.	630	7,670	1,920	110	10,320
3008 Duck Lake	10	570	380	10	960
4001 Glenrosa...	50	3,020	9,990	250	13,310
4002 Rose Vly...		3,440	7,240	200	10,880
5001 WFN		3,420	10,270	140	13,830
6000 Peachland	10	730	3,170	430	4,340
7000 RDCO W.	130	250	370	60	820
8000 RDCO E.	10	1,740	90	40	1,880
North Ok. S	1,110	90	150	190	1,550
North Ok. N	2,490	110	240	190	3,030
South Ok.		270	590	480	1,340
Other External	550	530	390	90	1,550
Vernon	39,720	2,510	1,060	3,740	47,020
Kelowna	1,960	165,780	16,510	1,240	185,490
Other Central Ok.	720	16,640	36,450	1,390	55,200
External	4,150	1,000	1,370	960	7,480
Survey Total	46,560	185,930	55,380	7,330	295,190

5 Residents' Views of Transportation Issues in their Community

After completing the survey, respondents were asked to state their opinion as to what is the most important transportation or challenge in their community. A total of 3,345 respondents provided some kind of comment on this question. The number of answers reflects the importance of transportation in area residents' lives.

The comments have not been coded thematically for analysis of the frequency of themes, however, an initial review of the comments revealed a number of recurring themes:

- **Traffic congestion** (traffic congestion generally, during rush hour, during summer, too many cars, desire for bypass, lack of left-hand turn lanes/lights, lack of truck passing lanes, non-auto options limited)
- **Public transit** (lack of buses serving my area, lack of feeder routes, frequency of service, travel time, cost, reliability, lack late night service, school bus issues, empty buses, loss of Greyhound, want LRT)
- **Cycling / bicycle lanes** (need more generally, need more divided lanes, like recent improvements, safety concerns, roads too narrow, no choice but to drive as too hilly to cycle and limited transit options)
- **Traffic lights** (timing of lights, too many lights on highway, need lights in certain locations)
- **Safety** (speed violators, drivers running red lights, bad drivers generally, lack of enforcement, bicycle safety, pedestrian safety, erratic cyclists, inconsistent speed limits, visibility of road lines)
- **Pedestrian Issues** (lack of sidewalks/paths, safety, danger at night due to wildlife or lack of lighting, drivers do not respect crosswalks, amenities not in walking distance, too hilly to walk in some areas)
- **Parking** (too little, inconvenient, payment options, lack parking in specific areas, not match redevelopment)
- **Mentions of specific roads or trouble spots** (Highway 97, Bennett bridge between West Kelowna and Kelowna, HOV lane ineffective, Beaver Lake Road, Chute Lake Road, Glenmore Road, Harvey Avenue, Lakeshore Road, Shannon Lake Road, Silver Star Road, and various other roads and intersections)

A selection of residents' comments is provided over the next few pages. These comments were randomly selected and do not necessarily reflect the opinions of the research consultant or the municipalities. The comments that follow represent about 1% of all comments provided. Readers are referred to ***Technical Appendix 2: Verbatim Respondent Comments*** for a complete listing of all of the comments provided, organized by municipality.

In your opinion, what is the most important transportation issue or challenge in your community?
Random selection of answers

Traffic build up on HWY 97, especially coming over the bridge into Kelowna.

- Kelowna resident

Aged and aging population, having accessible and timely public transportation.

- Vernon resident

Reliance on cars. Living in a hilly area makes bike commuting difficult although we do it sometimes in the summer. Hoping to increase with the purchase of an e-bike

- West Kelowna resident

In your opinion, what is the most important transportation issue or challenge in your community?
Random selection of answers

There are too many cars for the amount of roads we have. Everybody wants to live in Kelowna and they flock in here, and there is not enough room for everyone. We need to update the infrastructure to accommodate the number of people.

- Kelowna resident

Congestion, especially in the summer months. Commute time from work to home increases with tourist season. It can also get backed up on Spall road by Enterprise and the HWY in the late afternoon daily - there should be more left hand turn lights throughout the city

- Kelowna resident

Infrequency of buses; lack of consistent bike lanes; heavy traffic making bike travel dangerous; heavy traffic through the Hwy 97 corridor

- Vernon resident

As a family we do not feel safe/confident riding bikes alongside traffic - would like too, but it causes great anxiety - especially thinking of children crossing multiple busy roads to get to school each day independently.

- Vernon resident

The public transit service in my residential area is quite minimal and doesn't provide a realistic alternative to using the car. My neighbourhood is very hilly and so bicycling is not a practical option for most people. Having said that, this is a rural area where there wouldn't typically be an expectation for a very frequent bus service. When I do have to drive in [to Kelowna] I usually encounter congestion coming off the bridge. This does not appear to be due to bridge incapacity but due to the traffic signals at Abbott, Water & Ellis. Linking signals may help but what would probably help even more is to have the signals for eastbound traffic at Abbott to operate only on pedestrian demand but with of course a realistic minimum green.

- West Kelowna resident

Traffic congestion, especially during rush hour. Turning onto Hyw 97 from the north end of Glenmore Road from 4-5:30 often takes 15 minutes or more. Parking in Kelowna is terrible, especially around the Hospital during the day. Side street parking in Kelowna is terrible, especially where multi units are being built without adequate off street parking.

- Lake Country resident

Single lane highway through Peachland, highway going through downtown Westbank, traffic lights on Hwy 97 through to bridge.

- Peachland resident

Public safety and road surface management during the winter season

- Vernon resident

Lots of very slow speed limit zones in rural areas. Way too much congestion at Hospital Hill bottom area. Not enough downtown parking, especially free, so businesses can prosper and employees don’t have to plug meters all day.

- Priest’s Valley resident

In your opinion, what is the most important transportation issue or challenge in your community?
Random selection of answers

Traffic congestion. There are no bypasses and too many stoplights on the highway. A 80km zone often doesn't get above 60km with all the starts and stops. Need to streamline some areas of traffic to keep traffic moving. Remove the HOV lane and focus on getting commercial trucks into one lane and more signage and education regarding slower traffic keep right.

- Kelowna resident

Bus service from UBCO to points north of the airport i.e. Lake Country could be better. More frequent bus trips from Lake Country to Vernon would be helpful.

- Lake Country resident

Regular dependable bus service. Safe bike lanes away from roads. I would love to see a safe bike route from North Glenmore to Reid's Corner. I would like to ride my bike to work but currently far too dangerous.

- Kelowna resident

In terms of traffic in general I am appalled at the lack of enforcement of speed limits and accepted driving conventions in our city . . . I notice a lot of stop sign and stop light 'creep, of drivers who don't come to a complete stop at the indicated location . . . And, saving the worst for last, the number of people who run red lights is absolutely terrifying.

- Kelowna resident

I appreciate the expansion of walking and biking trails in the community for the use of both pleasure and business.

- Vernon resident

As I previously lived in the UK I feel like we lack consistent bus schedules. They don't come very often. When I try to walk anywhere you feel like you are the only one walking on the streets as most streets are designed for vehicles not walkers

- Vernon resident

Traffic lights along highway 97. Take a page out of Kamloops or Penticton's book and route the highway around town with minimal or no stops. Adding lights constantly has to stop. Lobby the provincial government and then kick in the necessary city contribution to build interchanges instead of lights. That is the #1 reason why we have so much congestion and so many accidents that cause delays.

- Kelowna resident

Lack of public transit options on the Westside to get downtown. Routes take too long to be useful for social outings or work. Not enough taxi service in the peak seasons - very difficult to get home or go out. Taxis don't answer calls.

- West Kelowna resident

We have so many vehicles on the roads with one person, either commuting or running errands. An LRT through and connecting the major cities would be such a step forward for the Okanagan.

- RDCO West resident

I am a cyclist and the excellent bike lanes in Kelowna are an important factor to me. Bottle necks when driving to events or shopping.

- Kelowna resident

In your opinion, what is the most important transportation issue or challenge in your community?
Random selection of answers

Charging parents for school buses. When there are 4 children in the family this becomes more expensive than many families can afford, necessitating arrangements for other family members, if available, to drive them and pick them up from school.

- Vernon resident

If there was a bus that came down Commonwealth Road, my neighbor would take it a lot, I would take it sometimes, and there are many other people in our building and the nearby trailer park who would take it as well.

- Duck Lake resident

People live too far from their work, play and shopping.

- Kelowna resident

Bicycle lanes and sidewalks. I appreciate the bike corridors being built throughout Vernon, let's make more of them! I reside on East Hill in Vernon; it is completely unacceptable that some streets do not have sidewalks on every road (both sides). The catchment for Silver Star Elementary is very small and it is a 'walking school' (very limited bus use). The children need a safe way to walk home. There are too many children walking on streets that do not have sidewalks. In addition, it is difficult for those with mobility issues (this includes my 1 year old) that need a safe space to walk.

- Vernon resident

Is there one? The city is well served, in my opinion. Multiple seniors residences close to town centre, streets well laid out. One thing to consider - licence golf carts to travel on non-highway city streets. They can go 40-50 km/hour, easy to handle, easy to park. Multiple US cities have done so. Environmentally friendly, with up to 4 passengers. Think outside the box. Scheduled carriers (i.e. buses) cannot help. Provides independence safely.

- Vernon resident

It would seem that Enterprise is a bottleneck of traffic and especially during summer tourist times. Building is going on at a tremendous rate.

- Kelowna resident

Traffic! High volume times specifically morning rush hour, any time after 3 until 6:30. The HOV lane needs to be better policed.

- RDCO East resident

Urban Sprawl

- Vernon resident

The roadways getting into Kelowna. Congestion due to single lanes roads.

- Lake Country resident

No left hand turn lanes. Improper settings of street lights. Speed. Road too narrow without extra lanes. Lines not painted bright enough with reflectors.

- Peachland resident

Snow removal along tight shoulderless winding roads and pot holes/ road surfacing condition along our Westside Road

- RDCO West resident

In your opinion, what is the most important transportation issue or challenge in your community?
Random selection of answers

Bus routes down Carrington Road are not frequent enough. There are now many seniors living in this area (and more coming up) who need more reliable transportation. It is a bit difficult to get to many parts of West Kelowna on the bus. The 97 Express bus is awesome for trips into Kelowna! Thanks for adding that.

- WFN resident

Lots of traffic on Hwy 97 from Kelowna to Lake Country. The speed limit from Commonwealth Rd to Lake Country on Hwy 97 is too fast. The speed limit is 90kmh, but that is easily surpassed. The speed limit in Winfield is 50kmh, but everyone drives well over that. I have seen no radar speed traps set up on Hwy 97 in Winfield in the past year.

- Duck Lake resident

Lights on Hwy 97

- Lake Country resident

Dramatic traffic increase over the last 3-4 years. I feel HOV lanes might be helpful in large cities like Vancouver . . . but believe they are not helpful / practical in Kelowna. Many local residents only stay on the highway for a few blocks . . . The short distance between crossroads makes weaving in / out of traffic even more stressful. Further, I am in full support of re-routing traffic that is only passing through West Kelowna, Kelowna, Vernon to take the burden of the cities.

- RDCO East resident

Having lived in both large metropolitan cities and small towns I find that Vernon streets/roads/intersections etc are simply not large enough to handle the volume of traffic they see. I notice that the sets of lights on 97 and 25th Ave are backed up anytime traffic is heavy. There aren't enough alternate lanes for turning at lights . . . Thank you for working on this.

- Vernon resident

Driving from Vernon to Kelowna during high traffic hours are very slow due to many people having to turn at major intersections but due to the limited number of lanes there are no turning lanes so that traffic can continue to flow . . . Second issue is too many commercial vehicles in the left lane that are trying to pass traffic but do not have the ability to pass that are slowing traffic further.

- Vernon resident

Housing development outpacing road infrastructure construction.

- Kelowna resident

Highway 97 getting on and off it and trying to go left or right. Sometimes you can only go one way.

- WFN resident

Chicken and egg issue of the bus system - i.e. need more people taking the bus to put in a good system, but can't take the bus because the system isn't flexible enough. Few direct routes without having to change, and going somewhere by bus takes 3 times longer than by car. We make it as a single car family because the two parents work primarily from home

- Kelowna resident

Readers are referred to the technical appendix for all 230 pages of comments.

6 Reference Tables by District

Accompanying this report under a separate cover as ***Technical Appendix 1: Reference Tables*** is a set of tabulations of selected survey results for various geographies used in this study.

Important note on use of the survey data presented in the reference tables:

Readers are reminded that the survey counts presented in the reference tables are estimates based on weighted survey data expanded to represent the size of the population for the given survey geography, with these expanded counts rounded to the nearest ten. These estimates are based on a modest survey sample of 4.6% of the population living in private residences and should not be taken to represent exact counts. When making use of figures in these reference tables in other contexts, we recommend rounding counts to the nearest 100, so as not to give a false impression of the accuracy of the data.

It should also be noted that the sample sizes for individual districts are relatively modest (ranging from 78 to 613 households). Results for districts with small sample sizes should be interpreted with caution, as they are subject to greater likelihood of variance from the true values for the population due to higher margins of sampling error. If greater reliability is required, it is advisable to further aggregate the districts.

All statistics are for households in the given geography, including trip statistics (i.e., trip statistics are not for trips to/from the given geography made by those residing in all geographies). Some figures in the reference tables may differ from figures in this report due to rounding, different filtering, or different treatments for analysis.

The reference tables are presented for the following districts and aggregate geographies. The districts and aggregate geographies are outlined in more detail in **Section 2.2** of this report.

Study Area Total

Regional District of Central Okanagan (Study Area minus Vernon)

Sub-Areas:
- Vernon (Vernon + Priest's Valley 6)
- Kelowna (Kelowna + Duck Lake 7)
- Other Central Okanagan

Individual cities:
- City of Vernon (i.e., does not include Priest's Valley 6)
- City of Kelowna (i.e., does not include Duck Lake 7)
- City of West Kelowna (districts 4001+4002)

Special aggregation:
- Westside (all of the communities in the study area to the west of Lake Okanagan: City of West Kelowna, WFN, Peachland, RDCO West)

Districts:

1001	City Core / Alexis Park / Harwood / North Vernon
1002	East Hill / Middleton / Mission Hill
1004	Outlying Areas
1003	Landing / Bella Vista / Turtle Mountain / Priest's Valley 6
2000	Lake Country
3001	City Centre / Pandosy
3002	Central Kelowna
3003	Glenmore
3004	Rutland
3005	Mission
3006	Black Mountain / Southeast
3007	Kelowna North
3008	Duck Lake 7
4001	Glenrosa / Westbank
4002	Rose Valley / Lakeview
5001	Westbank First Nation (WFN)
6000	Peachland
7000	RDCO West (Central Okanagan J CSD)
8000	RDCO East (Central Okanagan CSD)